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Sliding door drive unit
KS1000
Assembly-and operating instructions



KBB Automated Entrances Inc.

KS1000 Assembly-and operating instructions

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Advice

<<Assembly and Operating instructions>> defines not only the responsibilities of quality guarantee between KBB and Users, but also the stipulation of generating and ceasing right & obligation in after-sales service respect. Please seriously read <<Assembly and Operating instructions>> before applying to KBB products

1. Summary

1 . 1 Instruction of this manual

- The manual offers instructions for the installation, adjustment, the maintenance, and troubleshooting.
- The manual is just for professional persons from Metal construction and electronic technology
- The manual includes the instruction to main components and all specifications of KS1000 sliding door
- The instructions for optional device are included in the deliveries of optional device of KS1000 Sliding door drive Unit.
- Uses the following signs as important mark of certain dangers and significant explanation

:



Warning:

Be danger to the life and limb



Attention :

Could cause components to be damaged or malfunction



Notes :

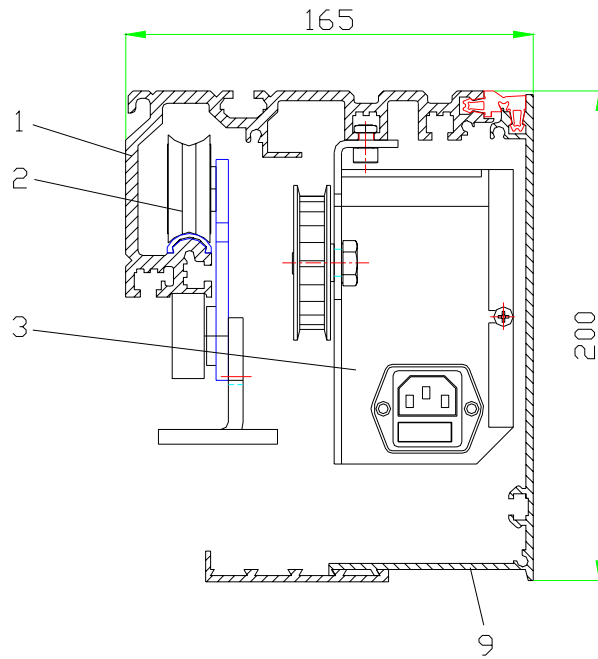
Clues that facilitate the work

- KBB keep the right to modify its products. If some modification is done, we will not inform users about it.
- All dimensions unit without label are “ mm”

1 . 2 Product Description

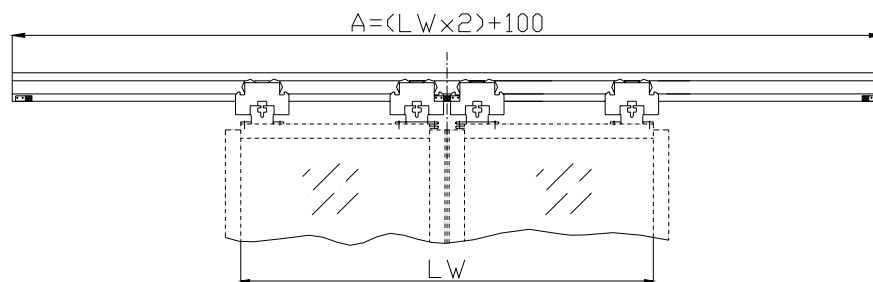
Sliding door drive unit use modular design, including DC motor, microprocessor control unit, control panel, individual module, and optional components that required in the order. The drive unit is connected with an electronic cable.

The structure of sliding door drive unit sees below:



- 1、 Carrier profile 2、 Running gear 3、 Drive unit

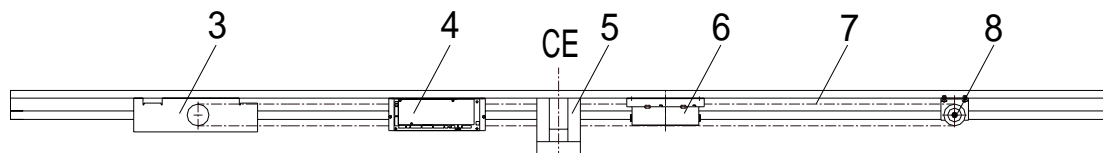
Figure 1.1 Section drawing of installing drive unit



A Overall length of guide way profile

LW Valid passage width

Figure 1.2 Installation drawing of door leaves



- 1 Carriage profile
 2 Running gear
 3 Drive unit
 4 Control unit
 5 Electron-mechanic lock
 6 Spare battery
 7 Dentiform belt
 8 Reverse wheel

9 Hinge-shape covering

CE Closing point

Figure 1.3 Spare parts distributing drawing inside drive unit

1 . 3 Application area

Type	Specification	Net passage width	Max.weight /sliding door	Max.speed (according to weight of door)
Single wing (left or right opening)	107..115	700-1500mm	140kg	0.45-0.65m/s
Double wings	208..230	800-3000mm	90k g	0.45-0.65m/s
Two-wings double drive door	210..230	1000-3000mm	140k g	0.45-0.65m/s
Two-wings telescopic door (Left or right opening)	211..230	1100-3000mm	90k g	0.45-0.65m/s
Four-wings telescopic door	414..440	1400-4000mm	60k g	0.45-0.65m/s
Four- wings double drive telescopic door	419..440	1900-4000mm	90k g	0.45-0.65m/s



Attention: The application limits of KS1000 sliding drive unit are defined in the sales documents. Any application beyond the limits is not allowed.

1 . 4 Technical parameters

The socket and main cable supplied by user 220V \pm 10% , 50/60Hz , 10A

Power consumption 200W

Max driving power (static) 150N

In case of power failure, the spare battery guarantees full operation for: 30min

Temperature of working environment -30 ~ +50

The product only is used in dry rooms Max relative humidity90%

Protection level IP23

1 . 5 Security

Once a sliding door is applied, the max. opening and closing speeds are automatically adjusted depending on the wing weight. Therefore, the door users are not necessary to do any presetting

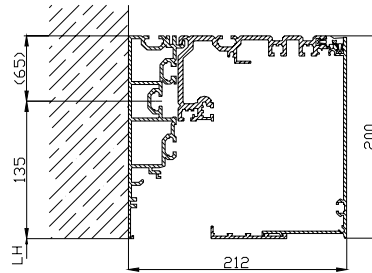
The entire security device has to be checked to ensure their faultless functions

2. Basic Assembly

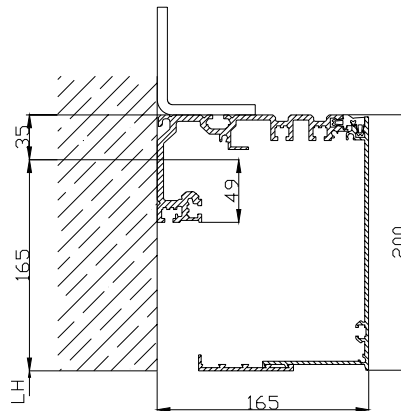
2.1 Assembly Types

There are 6 assembly types available.

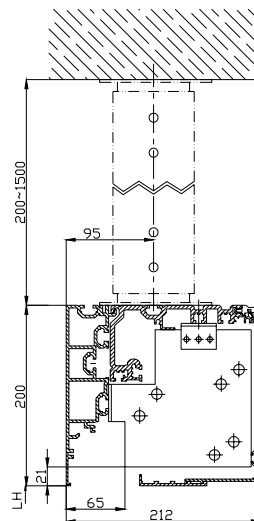
A The assembly of lintel that made up of carrier profile and supporting profile.



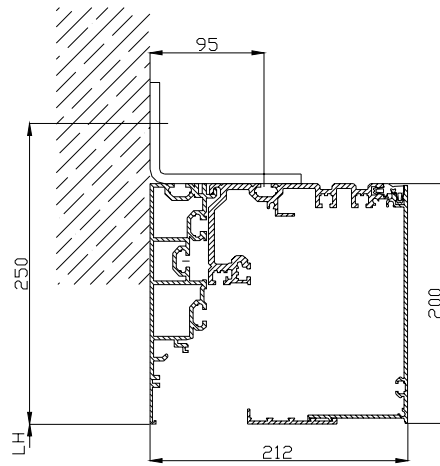
B Lintel assembly with angle.



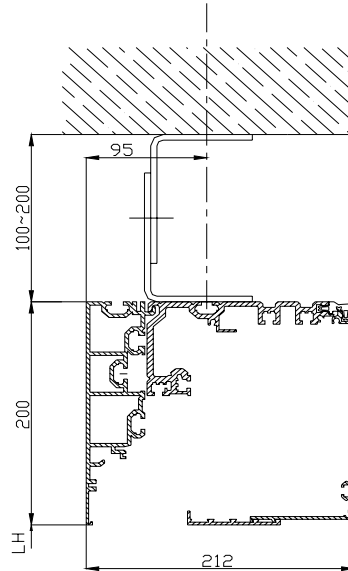
C Hanging assembly of steel board structure.



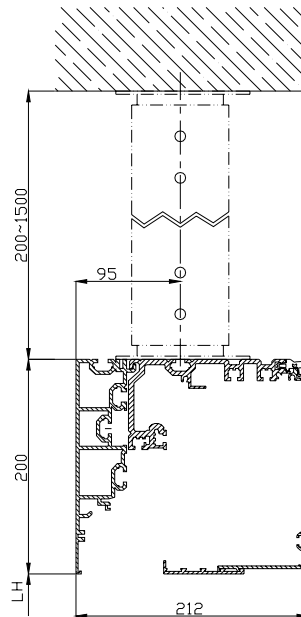
D Hanging assembly in corner



E Hanging on ceiling assembly in corner

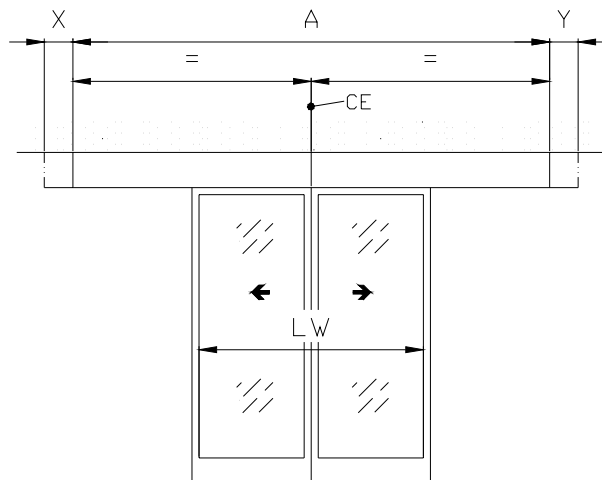


F Hanging on Ceiling assembly with steel tube



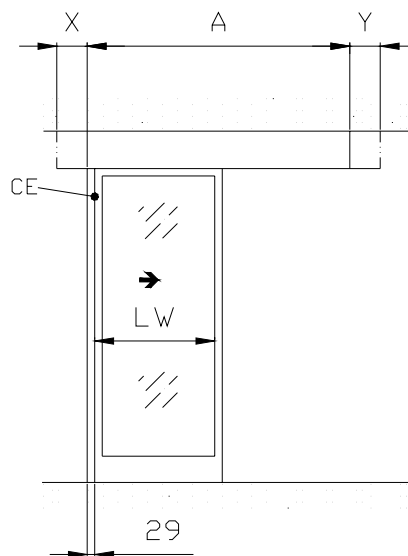
2 . 2 Assembly

Assembly closing point CE determining the assembly position of the carrier profile
 Double winged sliding door



Single-winged sliding door

The assembly way of opening from the right. (mirror image for version when opening from the left)



A Min. carrier profile length ($2+LW+100$)

X, Y Possible over-length of carrier profile

LW valid passage width

CE Closing edge

The following description is assembly example for double winged sliding door systems. It describes the assembly process of supporting frame and carrier profile. Other types of systems are assembled as the same on CE basis.

Assembly carrier profile

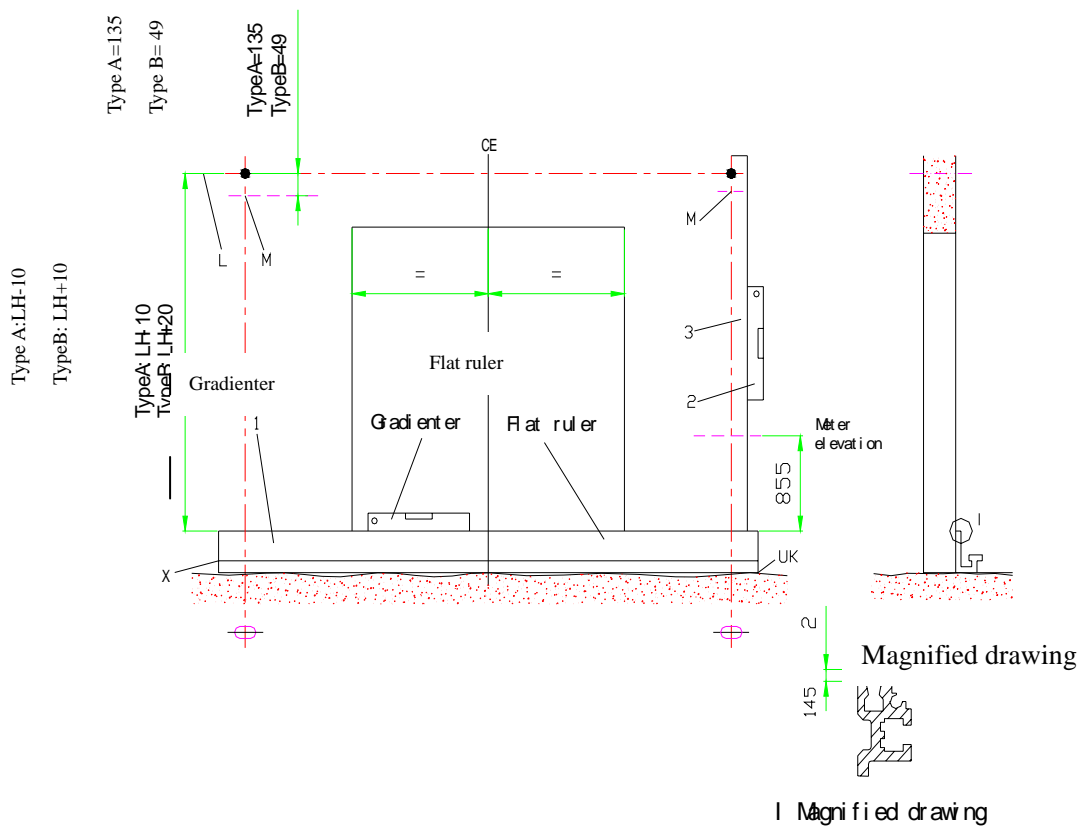
- 1 . Mark out the closing point CE on the carrier profile. Place the carrier frame on the floor and use gradienter to adjust the level and mark out the water level line UK

! Attention: Horizontal deviation <math><1\text{mm/m}</math>.

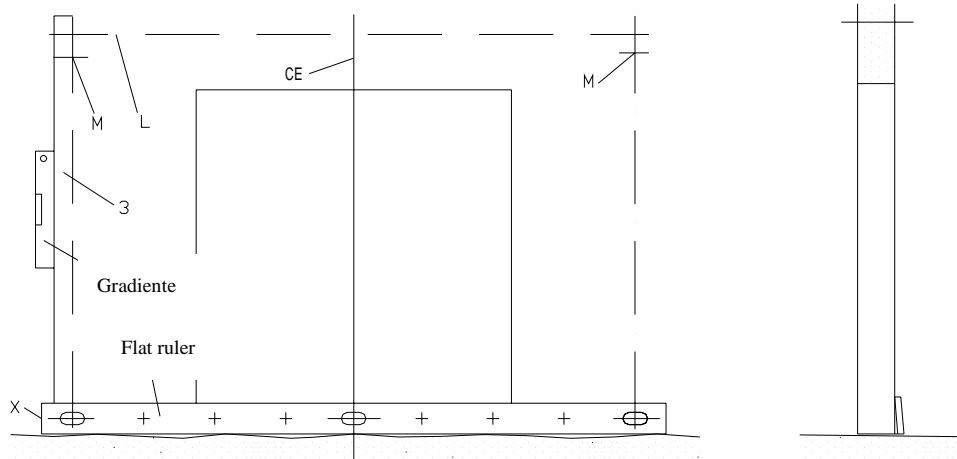
CE Closing edge

UK water level line that cause from the joint of carrier profile' bottom edge and flatness floor

LH Headroom



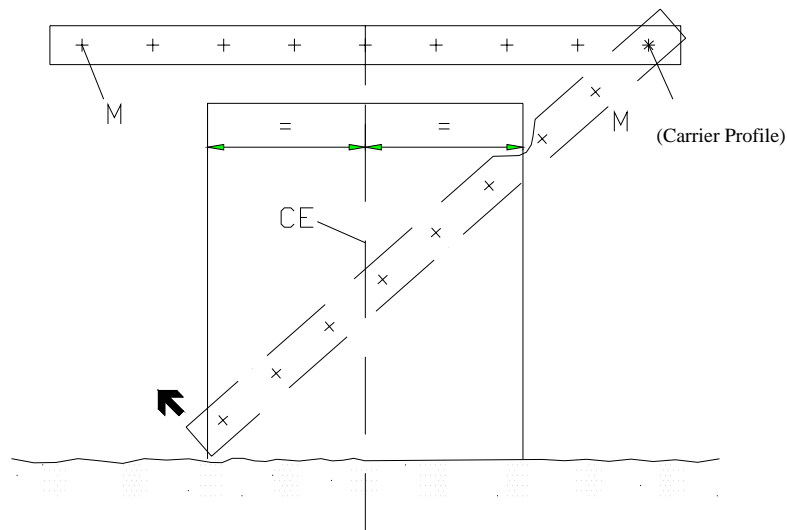
- 2 . According to the following data, mark out the line L.
Assemble type A : LH-10 Assemble type B : LH+20
- 3 . Draw the lower assembly edge of carrier profile.
- 4 . Draw the vertical line of L line through the two centers of long-round holes at both ends of carrier profile, and mark out the intersection point Q



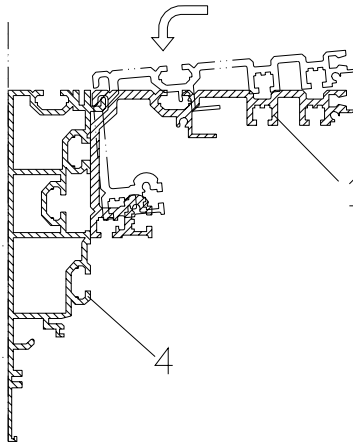
- 5 . Drill the mounting holes for screws M8.
- 6 . Use screws and thinner washer to fix supporting profile (with type A) and carrier profile (with style B). Notice to align the lower assembly edge M with closing point CE.

! **Attention:** Maximum difference between closing point and M point is not more than 2mm

➔ Note : After installation of carrier profile, install the running carriage set on carrier profile, and then put two blocks at two ends of carrier profile to prevent running carriage set from sliding out.



- 7 . Drill the other holes
- 8 . Assemble other fixing screws.
- 9 . When assembling supporting profile(taking assembly type A as Example), hang the carrier profile into supporting profile; adjust mounting holes and screw down using the screws (one screw every 400mm)M8X20 and washers



3.Components Installation

3 . 1 Installation of running carriage set

The basic set of running carriage includes:

- Running carriage set 2 sets
- Stop piece 1set
- Wiper brush 2sets
- Belt nip 1set

3 . 1 . 1 Assembling the running carriage

- 1 . Fix the wiper brush (4) on the outside of outer running carriage set by using the cheese head screw M6x6 and washer
- 2 . According to the actual situation, select the required number running carriage sets(2) to insert the carrier profile (1) from the side. If insufficient lateral space, loose the screw.(3), and rotate running carriage sets to the right position from the front

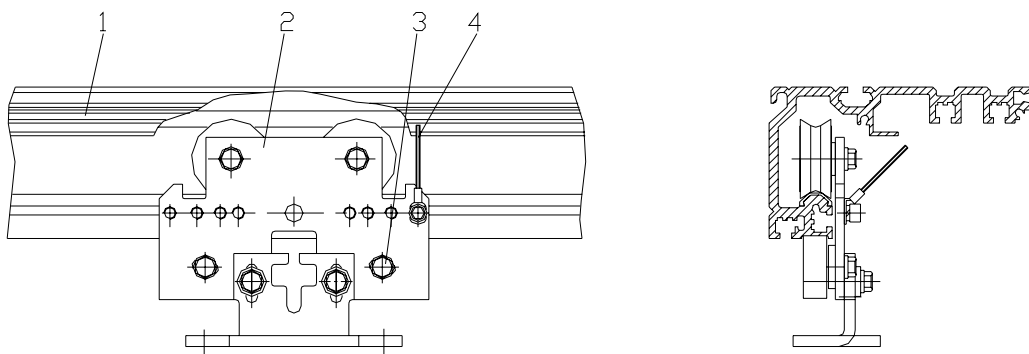


Figure 3.1

3 . 1 . 2 Assemble the stop piece on running carriage

Please fix the stop piece(5) on the running carriage sets(2) by using the cheese-head screw M6X10 and washer. See Figure 3.2 & Figure 3.3.

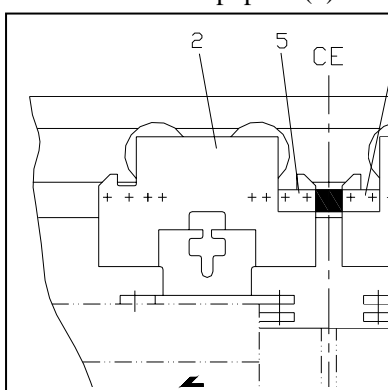


Figure 3.2

Double-winged
Sliding doors

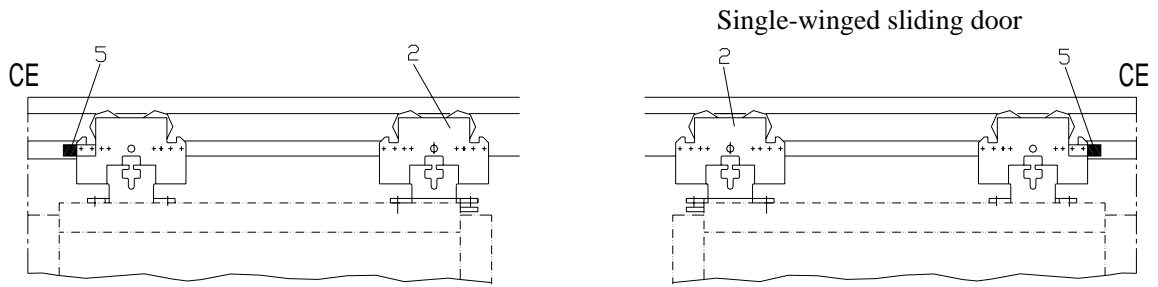


Figure 3.3

3 . 1 . 3 Installation of the sliding wings

- 1 . On the running carriage screwed the sliding wings.

! **Attention:** For both winged sliding door, when sliding wings closed, the stop pieces must touch at the closing point CE (The closing pressure applied on the sliding wings must not exceed a maximum value of 80N) For both winged sliding door, when sliding wings closed, the stop pieces must touch at the closing point CE (The closing pressure applied on the sliding wings must not exceed a maximum value of 80N)

- 2 . After completing the installation of the sliding wings, we should check the flexibility of the counter-pressure roller (6) to make sure that the counter –pressure roller can be pushed manually, when running carriage (2) is shifted, the pressure ruler (6) must be able to stop.
- 3 . Adjust counter- pressure roller(6): slightly loose the Screw(7) about 1/2 circle, push the screw along the slanting slots until the right position, and then screw it down. See Figure 3.4

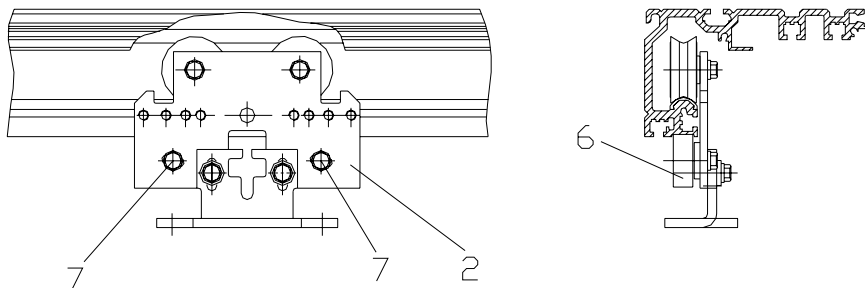


Figure 3.4

3 . 1 . 4 The installation of stop piece on the carrier profile

- 3 . 1 . 4 . 1 Double-winged sliding door

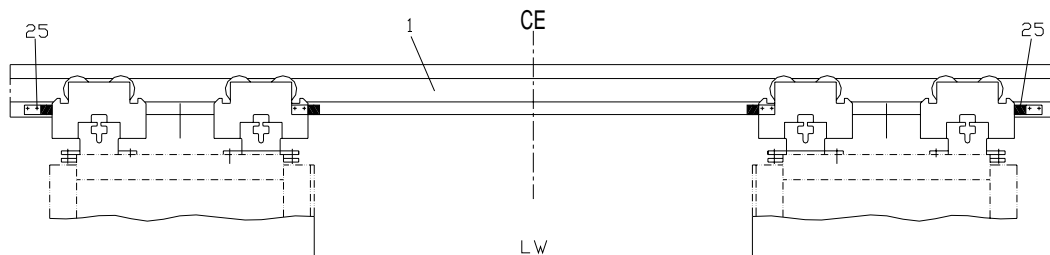


Figure 3.5

Each stop piece (25) include :

- 2 pieces inner hexagon screw

- 2 pieces washer
- 2 pieces M6 square nut.

Fix the stop pieces on the carrier profile directly. See Figure3.5

3 . 1 . 4 . 2 Single-winged sliding door

Open the door to right side(See Figure 3.6). Mirror –image for version opening to the left.

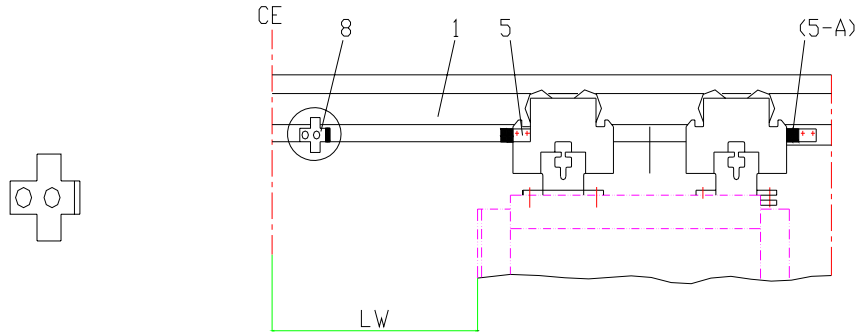


Figure 3.6

The stop piece (5-A) and the cross stop piece (8) include the following components:

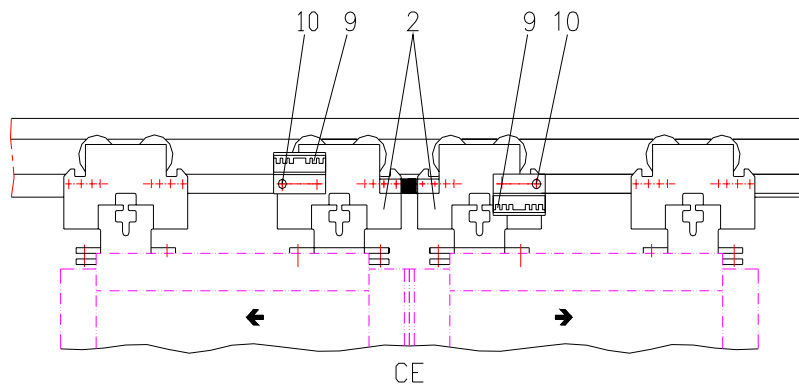
- 2 pieces cheese-head screws
- 2 pieces washer
- 2 pieces M6 square nut.

Fix the stop pieces on the carrier profile directly. See Figure3.6

! Attention: When the door closing, the stop piece(5) and the stop piece(8) must touch. The closing pressure on the sliding wings must not exceed a maximum value of 80N

3 . 1 . 5 The installation of belt driver

The sketch map of double-winged sliding door installation:



- 2 Running carriage sets
- 9 Belt driver
- 10 Fastening screw

Figure 3.7

The sketch map of single-winged sliding door installation: (next page)

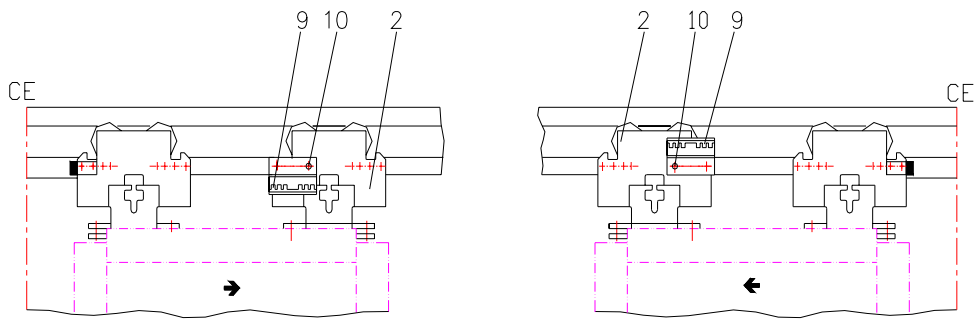


Figure 3.8

According to different assembly types, tentatively fix the belt driver onto the running carriage set(2) by using the component (10) (including 2 pieces cheese-head screws M6x10 and 2 pieces 6 washers) . The final installation is made after adjusting the door center.

3 . 2 The installation of drive unit.

! Attention: Prior to fixing the driver unit on the carriage profile, check if the four cables are plugged into the control panel.

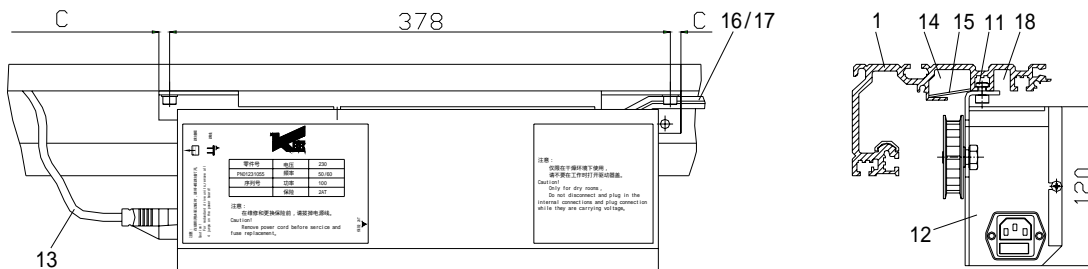


Figure 3.9

Refer to the figure 3.9, and mark out measure “C” on the carrier profile.

- 1.Insert square nuts into T groove.
- 2.Fasten the drive unit (12) on measure point “C” of the carrier profile with inner hexagon screws and washer
- 3.Connect the cable (13) towards the groove (14), insert the line cable(15) into the groove from the side, and then fasten the cable.
4. After assembly of the control unit, connect the cables (16) and (17).

➔ Note: The groove(14) is applied to mount outer cables and control components, such as PSA. Prior to fix the cable, install the components. The groove(18) is applied to in-house connect battery control panel of control unit.

3 . 3 The installation of the reverse wheel

Assembly position of the reverse wheel in the carrier profile is shown in appendix.

- 1.Insert nut into “T” groove.

2. Tentatively fix the reverse wheel(19) on the carrier profile(1) with inner hexagon screw and washer.

The final assembly is carried out after the toothed belt has been in position. See Figure3.10

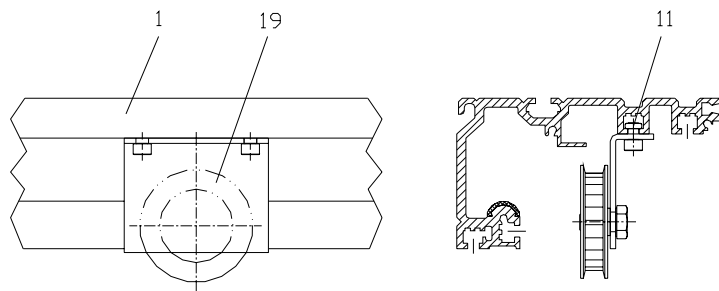


Figure 3.10

3 . 4 Installation of the toothed belt

- 1 . According to the attached drawing, determine the length "D" of toothed belt.

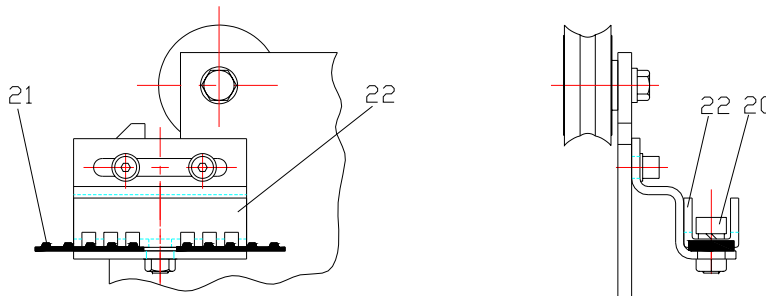


Figure 3.11

- 2 . Slightly loosen the fasten screws.
- 3 . Insert toothed belt(21) ends each with 3 teeth into belt clip (22)
- 4 . Tighten the screw(20) Fig. 3.11
- 5 . Place the toothed belt onto the drive pulley and the reverse wheel

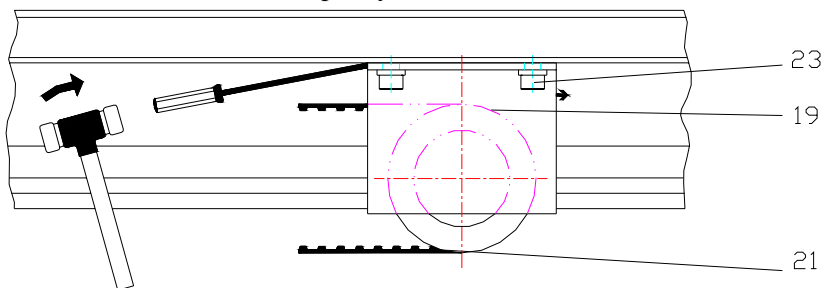


Figure 3.12

- 6 . Push the reverse wheel(19) outwards until toothed belt(21) lies flat. Tighten the screws slightly(23).
- 7 . Use a hammer to knock reverse wheel(19) until the dentiform belt has the following tension. See Fig. 3.13

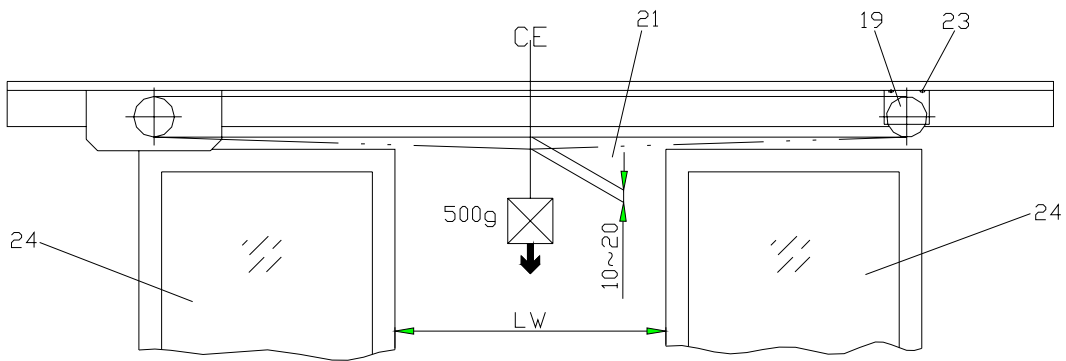


Figure 3.13

! Attention: Take care when tightening the toothed belt (21). If insufficient and excessive tension of the toothed belt increases the wear and causes noise during the operation.

8 . Tighten fastening screw(23)

Setting the door Center(Take the double-winged door as example) When adjusting, belt-clip (9) must not be tightened.◦

1 . Push the sliding wings(24) until distances A and B are the same. If adjusting is insufficient , check the belt lengths or dimension C. See the drawing Figure 3.14 in appendix.

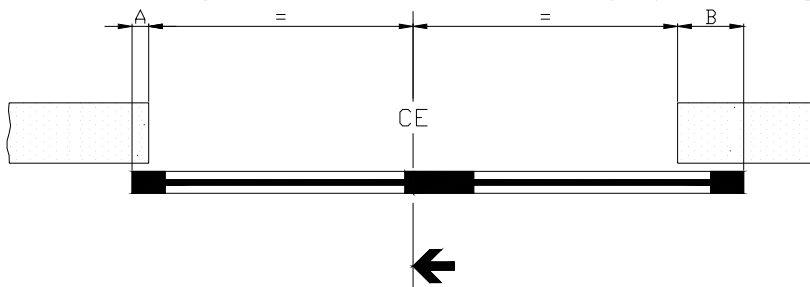


Figure 3.14

2 . Tighten the belt clip.◦

! Attention: Checking the door “open” stop pieces. In the open position , the sliding wing(24) must touch the two stop pieces at the same time.

3 . 5 The installation of the control unit

Assembly position in the carrier profile. See the drawing in appendix

! Attention: If the installation is equipped with locking combination parts and spare battery, this unit must be installed before the control is mounted

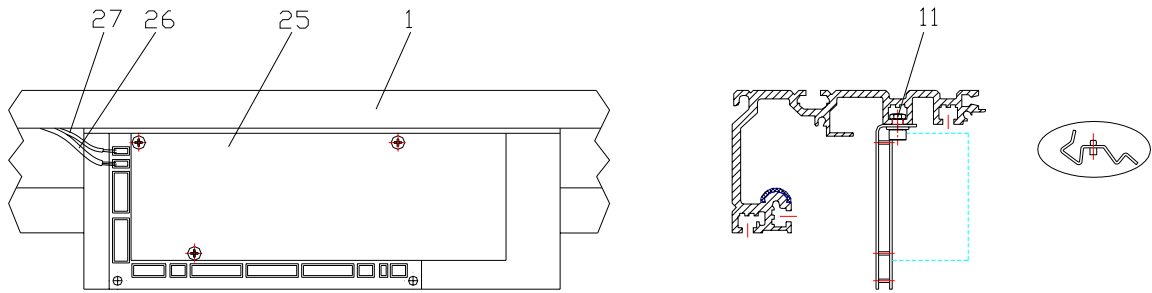


Figure 3.15

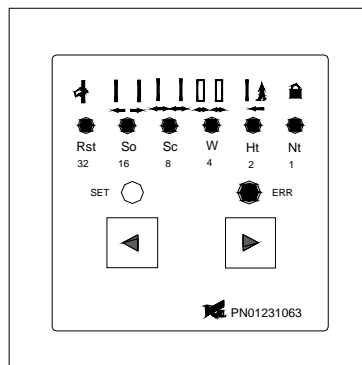
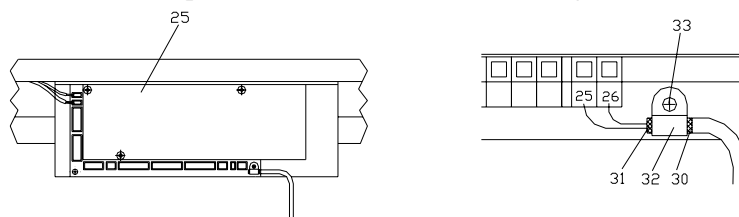
- 1 . Insert nuts(11) in “T” groove.。
2. Fasten the control unit (25) onto the carrier profile with inner hexagon screws and washer.
Tighten the screws
3. Connect the cable of drive unit (26)

3 . 6 The installation of control panel PSA.

The location of control panel is determined by the actual installation project. The position of inlet box and connecting cable is determined by the requirement of customers.

! **Attention:** Max length of the connecting cable is 50m. A shielded plug must be used

- 1 . According to the wire diagram of the control unit, connect cable plugs to the control panel (terminals 25/26) The shielding must be fastened to the control unit.。
- 2 . Connect the cable(30) to the PSA panel (terminals 1/2). The shielding must be fastened to



PSA metal parts.


PSA lock

- 1 . To lock PSA , dismantle strap of PSA panel. 。
- 2 . Concrete operation process: See chapter 5.。

4. Adjustment

4 . 1 Preparation before operation


- All KS1000 basic components and optional parts have been fixed and arranged .
All cables are ready for using.◦

 **Attention:** If there are no light barriers fitted, two wire links must be connected at the corresponding terminals according to the connection diagram of control unit.

- Any additional control and security units have been fixed and connected

4 . 2 Electrical Settings

No preliminary settings can be made before the first application.(Stop pieces must be fixed as requirement). The running distance , the maximum permission speed , and maximum force are set automatically during the set-up(reset) process of drive unit.

 **Attention:** For the single- winged door opening to right: soft switch 12 must to be set to ON

Setting-up procedure :

The setting-up procedure is implemented when the drive unit is taken in the operation for the first time or after a reset.◦

- During the first operation, all the values on the second level are reset to standard. After the door has already been in operation, reset is made with “Reset” switch(Figure 5.1) or PSA(Figure 5.2.2)
- If the door weight exceeds approx .10kg, all the values on the second level remain memorized after a power failure accident. It means that no setting-up procedure is needed.◦
- A RESET will not influence the value of any third level

Function of setting up procedure:

- Test all the hardware components of the control unit.
- Check all the connected components(PSA panel, electro-mechanical lock, battery board) The door closes as far as the “closed” position with a set-up speed of 0.07m/s
- When the program selector is set in the locking position, sliding door is locked and remains such status. In all the other programmed positions, the opening signal is effected automatically.
- The sliding door opens with a set-up speed of 0.075m/s as far as the “open” position.◦ During opening process, the lock is checked and average friction is determined.
- A short-time acceleration of wing checks the quality of the door. The quality determined the maximum permission speed.

Total wing weight (KG)	Maximum opening speed (m/s)
25-125	0.65
125-160	0.55
>160	0.4

The closing speed is 66% of the maximum opening speed

4.3 System Start-up.

1. Being the sliding wings into the center position
2. Plug in the power plug
3. On KS1000 control board, LEDES 5V/24V and POWER are lit
4. With PSA, LED 32 flashes approx.5 seconds after plug-in. The installation set its up and remains open. LED 32 operating function manual is lit. If another LED is lit along with the flashing LED 32, then the corresponding operating function is set. ◦

4.4 Interruption of self -inspection

The setting up procedure can be interrupted by the following things:

- Program switch or PSA is on a locked operating position (lock/one way)

The door closes and remains. The setting up procedure can be completed only after a valid opening command(key), or after selecting another operating function. E.g.” automatic” with PSA: LED32 flashes and LED 1” lock” or LED2 “one way” is lit. SEE chapter 5.2.1 for setting the operation functions.

- When setting up, the door opens first: Check the assembly position of the belt joint as per the attached drawing
- The sliding door does not move: No light barrier or no strap fitted.
- For PSA, red error LED flashes along with red LED. See chapter 5.2.4
- KS1000 motor driver unit: safety problem.

5 Control unit and PSA control panel (Optional)

5.1 General

KS1000 drive unit can be operated as follows:

5.1.1 Adopt PSA control panel or Program/ Selection switch (Standard)

When selecting the Program/Selection switch, input 21, 22 have four positions for your selection: lock-up, one-way, full-open (Automatic), partial open (Automatic), (refer to chapter 5.4 Inputs).

Reset via inputs 25,26 (Press for 2 seconds at least).

PSA can be used as a temporary programming unit for function selection or fault code analysis stated in chapter 5.2.2, 5.2.3. Upon moving the PSA, restart the power switch to preserve the programming values.

5.1.2 PSA control board (Optional)

The inputs 25,26 connecting PSA will realize the functions of the sliding door, PSA functions could be locked by the following mode:

1. Connect one switch (i.e.: switch lock) to the inputs 3/4 of the PSA (Refer to chapter 3.7).
2. Apply soft switch No.9 (Refer to 5.2.3) to make PSA control lock effective. An operation is only possible after entering the code ← ← → → ← ← , after one minute without operation, the PSA resumes the locked states.

5.2 PSA control unit (Optional)

All the functions can be identified and set by the PSA control panel. The Number of the LED’s on

the front board corresponds to their binary value.

The soft switch and the related error number are obtained by adding the numbers next to the lit LED's.

Examples: The lit LED's 16/4/1 $\longrightarrow 16+4+1=21 \longrightarrow$ soft switch/error code 21

Communication between control unit and PSA control panel are fail-safe and tamper-proof via a modern bus system (Two wire line).

There are four levels in PSA

1st level Operation functions

2nd level Setting functions

3rd level Program functions. At this level, settings can only be made by professional expert

4th level Malfunction indication functions

5.2.1 Operation (1st level)

1. The operation function sign appears above the LED of the PSA control panel.

2. The operation functions selected are indicated by the related LED

3. \longleftarrow button, and \longrightarrow button can be used for selecting the program. The LED will be effective upon 2 seconds.

The following is the meaning of signs



Manual operation LED32

The door is at a standstill, the leaf is released and can be moved manually.



Keep open LED 16

The door opens and remains.



Full open (Automatic) LED8

The door is not locked. When it is actuated, the door will be opened automatically.



Partial open (Automatic) LED4

When the door is actuated, the open width reduced; the others remain as the "Full open" please refers to the settings.



One-way in/out

One-way traffic. The door is locked (Standard), only the inside sensor will effectively actuate the door to open.



Night LED1

The door is locked. Only the switch lock can effectively actuate the signal to open the door. The inside sensor is effective when only the door doesn't close.

Setting the half open:

1. Select the partial open LED4. Upon 2 seconds, the required function can be set in the following position:

Keep open	LED16	The door is half open.
One-way in/out	LED2	The door is half open under the inner sensor influence
Lock-up	LED1	The door is half- open by the switch lock

2. Select the full open LED8 to restore the full open.

Other program switch refers to 5.4

5.2.2 Setting functions (Second Level)

The abbreviation of the setting functions is displayed under the LED of the PSA panel. Press ~ ← button or → button to select the related function. Press the SET button to actuate the related function. The flashing frequency is an indication of the regulated value (High frequency=high speed/short keep –open time)

The ← button or → button is also used to modify the set value (← means quicker or longer, → means slower or shorter)

Press the button SET or more than 1minute on the PSA without any operation, the system resumes the 1st level.

***Rst(reset)** LED 32

The door is started and set up (Chapter 4.2), when pressing RESET button under the battery-powered mode, the drive unit stops and the control unit is shut off.

***So** LED 16

Set the opening speed. The standard velocity is 100%(it is set when diagnosing), the velocity adjustable range is: 40-100% of standard velocity

***Sc** LED 8

Set the closing speed. The max speed is 66% of the standard velocity. The velocity adjustable range is: 25-66% of the standard velocity

***W** LED4

Set the width of half open. The standard width is 65% of full opening width. It is adjustable within 25-90% of full opening width.

***Ht** LED2

Set the hold- open time. The standard hold time is 2 seconds. The adjustable range is 0-10 seconds. It is selected via the inside/outside opening contacts, the infrared light detectors LS1/LS2 and is independent of the program switch position.

***Nt LED1**

Set the night keep-open time. The standard hold time is 7 seconds. The adjustable range is 0-30 seconds. It is selected via switch lock and is independent of the program switch.

Notice:

1. The standard settings are validated upon the first commission of the door.
2. If the reset is made after adjustments have been changed on the 2nd level, the speed of open and close and the keep open time will be reset to the standard value.
3. If after a RESET, the speed of open and close and opening width will be reset. The soft switch should be set to ON position (Refer to 5.2.3, the 3rd level)

5.2.3 Programming function

The control unit through PSA can set the special functions under different occasions. The setting value remains unchanged under the reset or power failure.

Programming process : (How to select?)

1. When the Program/Selection button turns to the lock-up (LED1), press the SET button more than 2 seconds until the LED light is red.
2. Input ← ← ← → → ← ← ←, access the 3rd level (If the time of the fault code or time beyond 10 seconds, PSA will returns to the 1st level. If want to set, please repeat it.
3. After LED ERROR switch off, display the soft switch 1.
4. Press ← button or → button to select the required soft switch number. The soft switch numbers are displayed on the PSA control panel by 1/2/4/8/16. The status of this switch is displayed

Example: LED16/4/1 are lit → 16+4+1 → soft switch number 21

5. Switch over the status of the soft switch by pressing the key simultaneously or the button SET.
LED ON soft switch on
LED OFF soft switch off
6. With → & ← button, reset the soft switch to 0 (No LED is lit)
7. Return to the 1st level by pressing the SET button (Return to level 1 automatically if the PSA is not operated)

Switch No.	Function	LED32	Remark
0	Exit from level 3 to level 1		
1	One-way mode, the door is lock; One-way mode, the door is unlock	ON	
2	Light output on terminal 24; Alarm output on terminal 24	ON	
3	Gong on terminal 23; Inter-lock on terminal 23	ON	*
4	The control unit is passive locked; The control unit is active locked	ON	*
5	Emergency close terminal 12; Emergency open terminal12	ON	
6	Full function battery-powered mode	ON	

	Only one open or close		
7	Power failure open only, Power failure close only	ON	
8	Standard reduced distance About 180mm reduced distance on opening position	ON	
9	PSA code lock off PSA code lock on	ON	
10	Keep open time (standard) Keep open time direct closure	ON	
11	Winter/ Summer actuation off Winter/Summer actuation on	ON	
12	Drive unit 1 (Rotation direction normal) Drive unit 1 (Anti-rotation direction normal)	ON	R
13	Drive unit2 (Rotation direction normal) Drive unit2 (Anti-direction normal)	NO	R
14	Adaptor connected to batteries Adaptor connected to the emergency power	ON	
15	All switch restores to default Retain changed values	ON	R
16	Interlock, impulse the memorized Interlock, impulse the non- memorized	ON	
17	Test program off Test program on	ON	→
18	After reset retain set value (level 2)	ON	
21	The batteries mode off at lock position The batteries mode on at lock position	ON	
22	Last battery-action mode on "OFF" at lock position. Last battery-action mode on" ON" at lock position	ON	
27	Standard brake distance When the door opens, the brake distance is 150mm	ON	
28	Floor lock not applied Floor lock applied	ON	
30	Emergency-input terminal 12 standard mode Emergency-input terminal 12 emergency- stop	ON	

31	Closing hindrance standard Closing hindrance special	ON	
----	---	----	--

Default, corresponds to the standard setting, LED32 not lit.

—> This setting is reset after a RESET (standard)

* The selection applies to the standard lock.

R Only active after RESET

No.1 One-way operation

In the lock-up position, the door is locked.

In the lock-up position, the door is unlocked.

No.2 Light output on terminal 24

In the position lock-up of the program switch, all the control elements trigger an impulse during 60 seconds on this output.

Alarm output on terminal 24

This output is actuated if an error is detected (Refer to chapter 5.2.4), The output is activated until the error has been eliminated.

No.3 Gong on terminal 23

If the infrared light detector LS1 is cut, this output is actuated for an impulse lasting for 1 second at the interval of 0.5 second.

Interlock input/output on the terminal 23

For standard interlock refer to chapter 5.5

No.4 Standard interlock

Master lock: When require interlocking, one sliding door(normally the inside one) has to be defined as master control system. Under this circumstance, the two soft switch No. 3 has to be set to ON.

No.5 Emergency- open instead of emergency-close

The setting is ON, the signal input of terminal 12 makes the sliding door emergency opened. The order makes the door leaf open the door at the set speed at any position & program/selection position. Emergency-open has the highest priority. i.e., higher than switch lock, manual emergency unlocking and interlock.

No.6 Full battery-powered emergency mode (OFF)

As soon as mains power failure occurs, the sliding door is automatically and without interruption switched to battery-powered emergency operation or to the back-up power network. The sliding functions have any restriction until the exhaustive discharge limit of the emergency battery has been reached. For the last action, please refer to the soft switch no.7.

Only open or close action (ON)

When the sliding door has been switched over to the emergency battery mode, one last opening or closing movement is carried out, depending on the soft switch No.7.

NO.7 Open or close in the event of a power failure (See soft switch No. ON)

OFF

The sliding door is closed and locked at the lock-up position. The door is open at any other position. If the one-way in/out lock has been selected, and the door is open, the lock remains released.

ON

Door closes in all program switch positions, the control panel power is shut. Opening via wake-up. After each wake-up the door is closed. If the door is not yet closed, the above function applies after the exhaustive discharge limit the emergency battery has been reached.

No.8 Sliding distance

OFF

Standard sliding distance

ON

When the open width is up to 180mm, the velocity will slow.

No.9 Active the PSA code lock, refer to chapter 5.1

ON PSA code lock is effective, instead of the switch lock.

No.10 Keep open time

OFF

Keep- open time starts at the moment that the door reaches the open position and all start signal don't come into use.

ON

Keep- open time starts at the moment that the start signal deactivates. Example, in an interlock application, the door may reverse or close when fail to reach the opening position, after the person has left the door area and provided that a short keep time. Under this circumstance, it is necessary to use direction-sensitive radars.

No.11 Winter/Summer

Winter/Summer actuation ON only makes sense for the sliding door, which is equipped with direction-sensitive radars. The reduced opening width is canceled when bi-directional traffic. (i.e. radars inside and outside activated at the same time)

NO.12 Changing the direction of rotation of the drive unit 1

NO.13 Changing the direction of rotation of the drive unit 2.

No.14 Battery –powered mode

Refer to option (Battery instruction)

Battery-powered emergency mode

By means of soft switch No. 14, a fixed direct current (21-30V) powers the input (X13). The soft switch switches the charging electronics off, in order to prevent the current from flowing back into the power network. Differing from the battery mode, the operation is not interrupted in the Night of the program switch (No wake-up). However, the operation is interrupted if the voltage drops below 19.5V during the standstill respectively below 16.5V when the door is moving.

No.15 Reset function

Strictly speaking, the soft switch 15 is not a real soft switch, but to set the reset function to the soft switch lacking the default. If LED 32 is lit, which means that at least one soft switch No. (1....31) is set. Press the button at the same time, all the soft switch value is neglected, so the function has a general effect, it should be followed by a RESET.

No.16 Interlock impulse is memorized (Shut)

If the soft switch is ON, the start signal is memorized (That is to say, only the opposite door has been closed, the above command will be memorized)

No.17 Test program

Start the test program (The control unit generates automatically open command), all the start signal is superior to the inner command. The reset operation will cause this function to be deleted.

No.18 After reset: value of 2nd level

If the soft switch is OFF, the velocity and the partial width will restore to the standard value (Refer to 5.2.2)

If the soft switch is ON, the set value will be retained.

No.21 Battery mode in the lock-up position**OFF**

No emergency operation in the Lock-up position (the main power is switch off), except opening via key-operated switch Wake-up.

ON (soft switch no.6 OFF)

Battery powered emergency operate in the lock-up position to realize the emergency operation.

No.22 Lock function setting in the battery mode**OFF**

Standard lock function

ON

During the battery mode and in the lock-up position, if the soft switch is set to ON, the door will open when the battery power is exhausted (Last action)

In the battery mode and in the one-way lock position, the door will open and keep open(Uses as the last action)

No.27 Setting**OFF**

Standard reduced sliding distance

ON

Increase the sliding distance to around 150mm, applied to the heavy leaf and/or the small distance of the two walls.

No.28 Floor lock function**ON**

When the Program/Selection switch from the lock-up position to full open(Automatic), if the start signal exist at the same time, the door will open at a low speed within the range of 100mm, upon which the door continues to open normally.

When in the Program/Selection switch position Lock-up, a switch lock signal is given, the door will open at the slow speed and with reduced force within the first 100mm.

No.30. Emergency functions on terminal 12**OFF**

The emergency open or emergency close depends on the soft switch 5.

ON

When the terminal 12 stops, the soft switch 5 lose its function. As soon as the emergency signal is actuated, the door will stop.

No.31 Closing hindrance standard

As soon as the leaf(s) meets any obstacle during the closing the motion, it(they) will be reversed. The movement is repeated until the obstacle has been removed and the leaf(s) are completely closed.

Closing hindrance special

The first four closing attempt is the same as the standard. When in the fifth attempt, the door switches to the open position. The fault code 31 will be displayed on the PSA. This situation will be corrected by the switch lock, emergency terminal 12 or PSA manually.

5.2.4. Malfunction indication (4th level)

In the event of a fault, the normal program position display is interrupted every 2 seconds for a duration of 1 second to display a red error code (LED ERR lights up together with error number the fault code).

LED1/2/4/8/16) The error number will be obtained by adding the number of the red lit by LED light.

Example:

2 seconds: LED 8 is lit= Full open automatic

1 second: red LED ERROR lights up together with LED8/4 → 8+4 = 12 → fault code 12

If the last fault have been deleted, press the button SET, it can be displayed in the program/selection (Automatic) position (LED8).

The next actuation of the ← button and → button or without operation within 1 minute on the PSA, the PSA will resume to the 1st level.

Fault code	Fault		Warning
1	Drive unit 1 defective	F	YES
2	Incorrectly connected plug to adaptor X4	F	YES
3	Drive unit 1 is obstructed during the learning path smaller than 230mm	FE	YES
4	The learning path on the drive unit 1 greater than 9800mm	FE	YES
5	Excessive friction on the drive unit1 to cause the large travel resistance force.	FE	YES
6	Drive unit 2 defective	F	YES
7	Drive unit 2 is obstructed during the learning path smaller than 230mm	FE	YES
8	The learning path on the drive unit 2 greater than 9800mm	FE	YES
9	Excessive friction on the drive unit 2 to cause the large travel resistance force.	FE	YES
10	Control unit is defective	F	YES
11	Short circuit 24V(External connection or control unit)	K*	NO
12	Lock monitor problem, the path smaller than 38mm/lock monitor	F	YES
13	Lock fault	K	YES
14	Error infrared light detector(connection or	K	YES

	barrier)		
15	Power interrupt, (emergency battery mode)	K	NO
16	Emergency battery is not operative	K	YES
17	Close position error	K	NO
18	Floor lock		YES
20	Jumper on power-print not plugged	E	YES
31	Closing hindrance special	F	YES

* The 24v power supply is switched off.

E The error is only identified during the setting-up procedure

F Fatal fault(The system is switched to manual)

K Error message remain as long as the mode error is pending.

NO.1-10 Basic kinds (Fatal fault) will cause the system interrupt.

No.11 It will cause the fatal fault during the adjusting. If occur the fault, the power is switched off for 10 seconds and switched on for 0.6 second to check if voltage is normal, if not, repeat the former action.

No.12 Without the inside position and lock position monitor: three attempts with reset, then display the error.

With lock position monitor: The error will display as soon as it is checked.

No.13 Error can be checked only equipped with the inside position monitor and lock program position

No.14

Error can be checked in the open position. If in the lock program position, the door will close at slow speed upon 8 seconds, even if the fault remains.

No.15 Under the emergency battery-powered, the display will keep until the battery is exhausted. (Example: lock-up program position)

No.16 Fault exists in adaptor, cable, safe and battery.

No.17 Display the door to be pushed off the closing position. For example, the installation center seam is sealed, and checks the vehicle or the adjustment of the net width.

No.18 The floor lock fails to open.

No.31 Closing hindrance special

Eliminate the hindrance by pressing the emergency button, the switch lock or manual mode.

If there are several errors, the error first detected is the one displayed. The warning refers to the warning output and is activated according to the error table(YES)

The LEDs on the electronic PCB 's indicate additional status and error displays which complement the information supplied via PSA.

- ◆ Supply voltages
 - Internal electronics 5V(ON)
 - External voltage 24V(ON)
 - Motor power supply POWER(ON)

- ◆ Infrared light detectors LS1/LS2 (ON)
- ◆ Emergency stop STOP (OFF)
- ◆ Emergency battery charge CHARGED(ON) “ blinking”

The status displayed between brackets indicates if the control unit is operative.

5.3 Safety elements and functions

Infrared light detectors LS1 and LS2

- If the infrared light detectors are cut off, the drive unit is reversed. In the open position the hold-open time is reset.
- If the door is not closed, the infrared light detector LS1 activates the gong (impulse duration 1 second).
- Prior to a closing motion the infrared light detectors are tested.
- If only one infrared light detector is connected, a bridge must be inserted on the second input.

Reversing and stopping mechanism:

- Limits the static force to max. 150N;
- Reversing for the closing movement and stopping for the opening movement. After the next impulse, the movement is continued at slow speed in the same sense of travel ($V = 0.18\text{m/s}$).

5.4 The main outputs and inputs of control unit

outputs

All the outputs (with the exception of battery check, power supply) are electronic outputs (not potential free) with a maximum load of 24 V, 300MA. These outputs are to be used for an external application via a relay.

- Power supply 24V, 0 V terminal = 2/5/6/8/16/20
24V terminal = 1/7/13/15/19

This power supply is short-circuit-proof (chapter 5.2.4) and designed for a maximum load of 2 A.

- Terminals 29, 30 and 31 output BATT CHECK.
This output is used for indicating the emergency battery status. See option (0633-999/16). It is the only relay output and has a maximum load capacity of 24VDC/1A.
- Connector X 15 output locking
The electro-mechanical lock is bi-stable, i.e. prior to an opening the locking mechanism is shortly actuated in order to shift the locking hook to the unlocked position. After the wings have reached the CLOSED position. They are again locked.

Inputs

- Program switch without PSA

Program position	Terminal 21	Terminal 22
Locking the door		
EXIT	Switched to 0 V	
Automatic full open		Switched to 0 V
Automatic half open	Switched to 0 V via 2 diodes	

* Program switch with PSA (position AUTOMATIC)

Program position	Terminal 21	Terminal 22

Locking the door		Switched to 0 V
EXIT	Switched to 0 V	
Automatic full open		
Automatic half open	Switched to 0 V via 2 diodes	

- Terminals 25 and 26
By short-circuiting the PSA connection during 2 seconds (terminals 25 and 26), a RESET can be carried out with or without PSA.
- Terminal 27
Stop (emergency stop 1)
If this input is interrupted:
 - * The motor speed is immediately reduced.
 - * The 5 V and 24 V supply is switched off ----- The sliding door is stopped.
 If this input is closed:
 - * The sliding door closes slowly, and then will operate normally according to the program switch position.
 - * The door reached the CLOSED position with PSA, LED32 flashing, and then it continues to function normally according to the program switch position.
- Emergency stop (X4 on drive unit)
If this input is cut off, the motor is immediately stopped and stands still. The door wings can be moved by hand.

5.5 Interlock operation

Principles

- Both installations must be plugged into respectively the same power supply;
- Interlock function in program switch position Night and Exit (locked);
- In order to guarantee the interlock function, both program switches must be in the same position;
- However, the communication via the interlock connection functions in any position of the program switch. This means that doors, which are not in a locked program switch position, are capable of blocking other doors, which are in a locked program switch position. Conversely, the pending signal is not taken into account.
- Opening commands are memorized.
- Memorization of the opening impulses can be suppressed by softswitch no. 16.
- The EMERGENCY OPEN or EMERGENCY CLOSE function has priority.
- If a door remains hooked in the locking mechanism, the other door is released after a short delay time has expired.
- Double openings are prevented by a special timing order arrangement, even if two opening commands exist at the same time.

Procedure

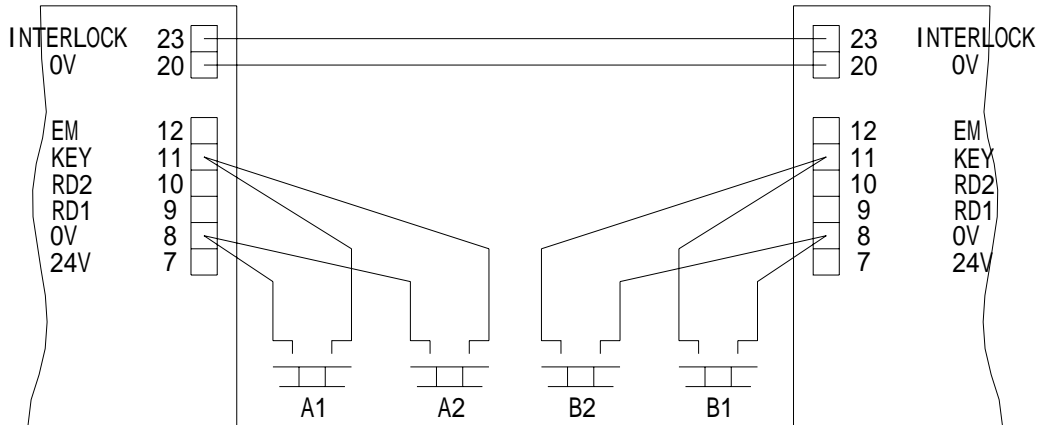
Both doors are closed. The MASTER supplies a signal, which must be answered by the SLAVE; otherwise the signal is repeated by the MASTER. If in the reverse case the MASTER fails to respond, the SLAVE will repeat the request. If one of the doors is not CLOSED, it transmits a 0 V signal to its interlock output. After a RESET or a mains failure the synchronization is always made by the MASTER. This ensures that the setting-up procedure is carried out in accordance

with the requirements of the interlock.

- The interlock can also be combined with KS1000 sliding door, folding door.

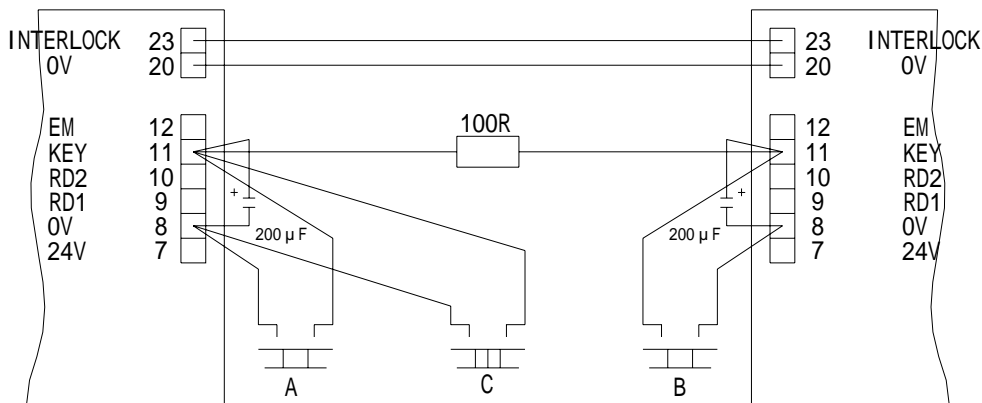
Safety interlock

- Four opening elem. (e.g. push-buttons) are required.
- After an opening element (A1) or (B1) has been actuated. The respective door is opened and closed again after the hold-open time has expired. In order to open the second door, another opening element (A2) or (B2) must be operated within the interlock.



Hospital interlock

- Only two opening elements are required.
- Softswitch no. 16 must be positioned on OFF.
- After an opening element (A) or (B) has been activated, the respective door is opened and closed again after the hold-open time has expired; then the second door is opened without any actuation of an opening element.
- For safety reasons at least one opening element (C) must nevertheless be installed within the interlock area.



5.6 Particular instructions for the users

5.7 Infrared light detectors fault

If the installation is open when the premises close, because the infrared light detectors are interrupted, the door will close nonetheless at slow speed when the system is switched to the program position NIGHT, in spite of the fault.

Emergency battery “wake-up”.

The emergency battery set allows unrestricted operation for approx. 30 minutes.

6. MAINTENANCE AND TROUBLESHOOTING

6.1 Security and warranty

Regular maintenance and checking at least once a year is absolutely required in order to guarantee a long life span and safe operation of the KS1000 sliding door .

Maintenance must be carried out by specifically trained personnel, see chapter 6.2

If the maintenance is neglected or carried out by unauthorized personnel, the manufacturer respectively the distributor cannot be held responsible for any damages that might occur and their consequences.

Any subsequent intervention or modification of the KS1000 sliding door shall only be carried out by specially trained personnel.

Warning:

Before working on live elements, always pull out the power plugs and the emergency battery plug!

6.2 Maintenance

Check the function of different elements (as far as KS1000 sliding door are included in the installation) according to the operating instructions.

To avoid jeopardizing the safety of the door users, any defective safety elements may not be disconnected in order to continue the operation of the door.

In order to guarantee the availability of the installation, a preventive replacement of any elements showing signs of wear is strongly recommended.

Attention:

Don't use floating water to wash machine box. Do not use any corrosive detergent.

Installation	check	clean	grease	Adjust
General installation condition	V			
Manually make the door move freely	V			V
Door guides/guide way rail	V	V		V
Sealing joints	V	V		V
Side panels/protection wings	V	V		
Coverings/Hinge type cover	V	V		
Check tight fitting of the screws	V			

and the nuts				
Clean the installation	V	V		

Drive unit

Drive unit	V	V		V
Holding power in closed position	V			
Transmission elements: such as: toothed belt, flat belt, cables, rods, and chains	V	V		V
Carrying- and counter pressure rollers/ traveling carriages	V	V		V
Carrier rails	V	V	V	
Open/ close positions	V			V

Control unit

Electrical connections	V			
Control functions	V			V
Program switch (Check all the positions)	V			
Emergency battery	V			

Control Elements

All the control elements: such as: sensor, radar, key operated switch , contact carpet.	V	V		V
---	---	---	--	---

Safety elements

Reversing /stopping mechanism	V	V		V
Door locking/ manual unlocking mechanism	V	V	V	V
Mechanical emergency opening	V			V
Monitoring switch	V	V		V
Light barrier	V	V		V
Additional safety elements	V	V		V

Miscellaneous

Stickers/rating plates	V	V		
------------------------	---	---	--	--

6.3 Troubleshooting:



Warning :

Before doing any check and other work on the control unit , always pull out the power plug

Malfunctions	Visual checking	Reason	Corrective/ solution
Door is blocked in any position	Emergency stop (X4 control unit), Emergency stop terminals 27.28)No LED light on control unit.	No wire link or defective connection PSA on manual NO power or fuse fine-wire defect	Make a bridge connection Check PSA on automatic

Door is blocked in open position	Program switch Emergency opening Light barrier LS1/LS2 connected. Opening element	PSA on open or manual Light barrier cut, defective or wrong connections	PSA on automatic Check connection and the light barriersLS1/LS2
Door remains closed	Program switch (PSA) Emergency closing	PSA on lock, one way, manual position. Emergency close activated	PSA on automatic Check the connections or element.“
Door keeps on short opening and closing movement	Door movement	Stopping mechanism active Defective control unit	Check the mechanical part(traveling carriage, guide ways , wings, etc) Replace the control unit.
During the closing motion , the door suddenly reopens automatically	Door movement	Reversing Mechanism active Defective control unit	Check the mechanical part(traveling carriage, guide ways , wings, etc) Replace the control unit.
The locking is not energized in the program switch position NIGHT	Door attempts to open but remains locked	Defective locking magnet Defective locking PCB Defective control unit	Check the connection Measure the magnet Replace the locking PCB Replace the control unit



Warning

Should it not be possible to eliminate any potential dangerous malfunction immediately. If necessary, the door should stop operating, and shall be repaired as soon as possible. Every maintenance and troubleshooting which has been carried out should be fully noted in the check book

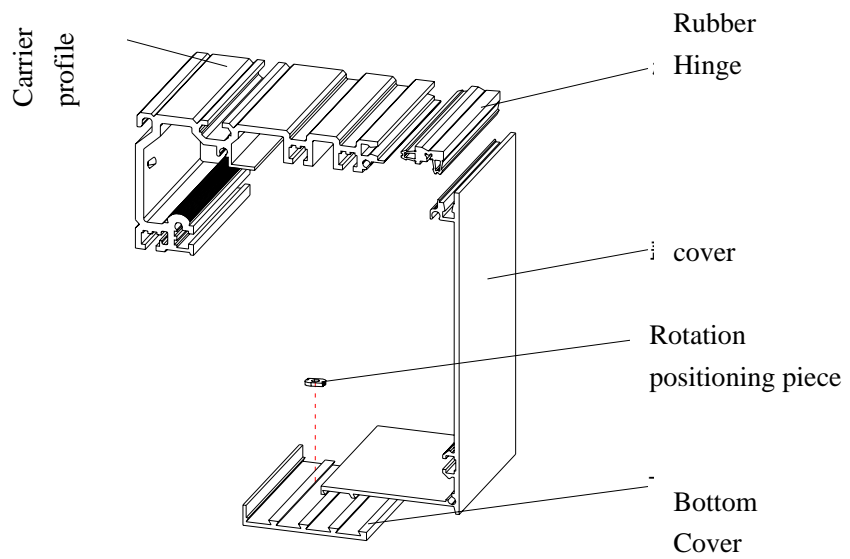
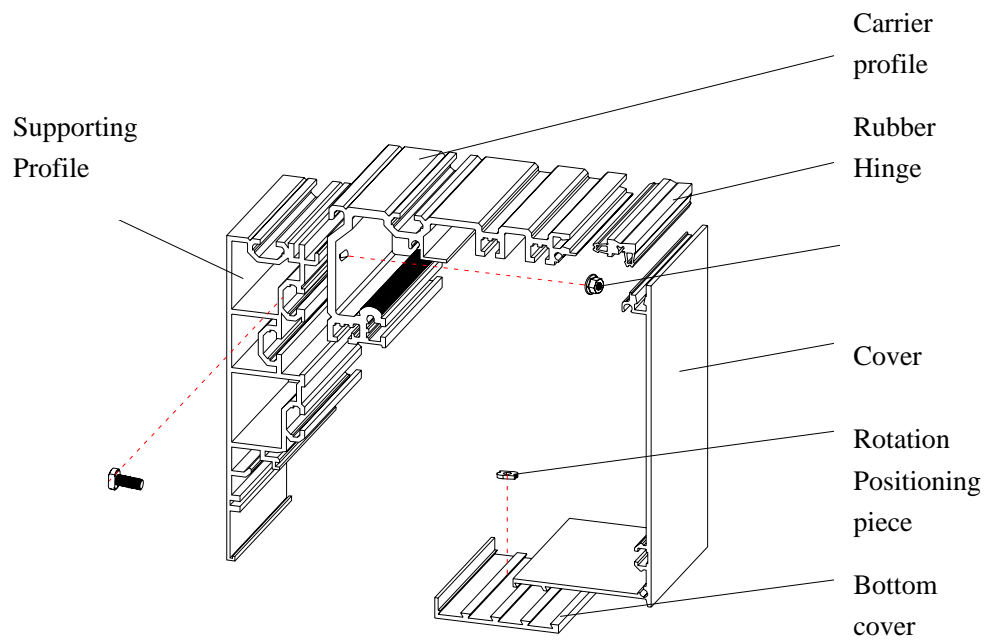
6 . 4 KS1000 spare parts

	Name	Part number
Essential		
	Carrier Profile	
	Control unit (KSM)	PN01231054
	Drive Unit(KSD)	PN01231055

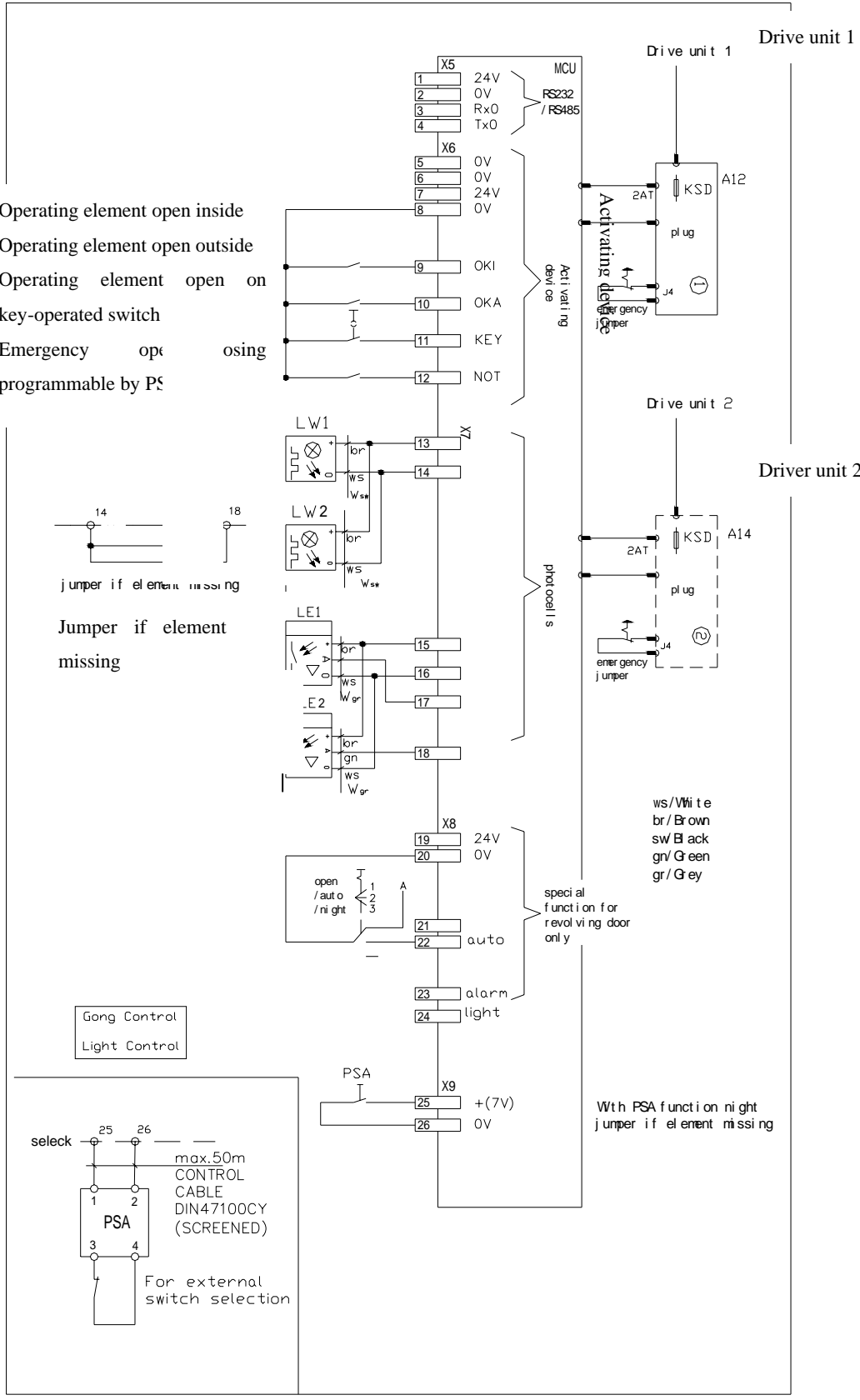
	Mobile-wing running carriage set	PN01231058
	(PSA)	PN01231063
	Mechanism elements	
	Electronic elements	
Optional		
	Operator cover	
	Fixed elements of operator cover	
	Bottom baffle	
	Side cover	
	Batteries set (KSB)	PN01231056
	Electro-mechanical lock	PN01231059

6 . 5 Environment protection treatment

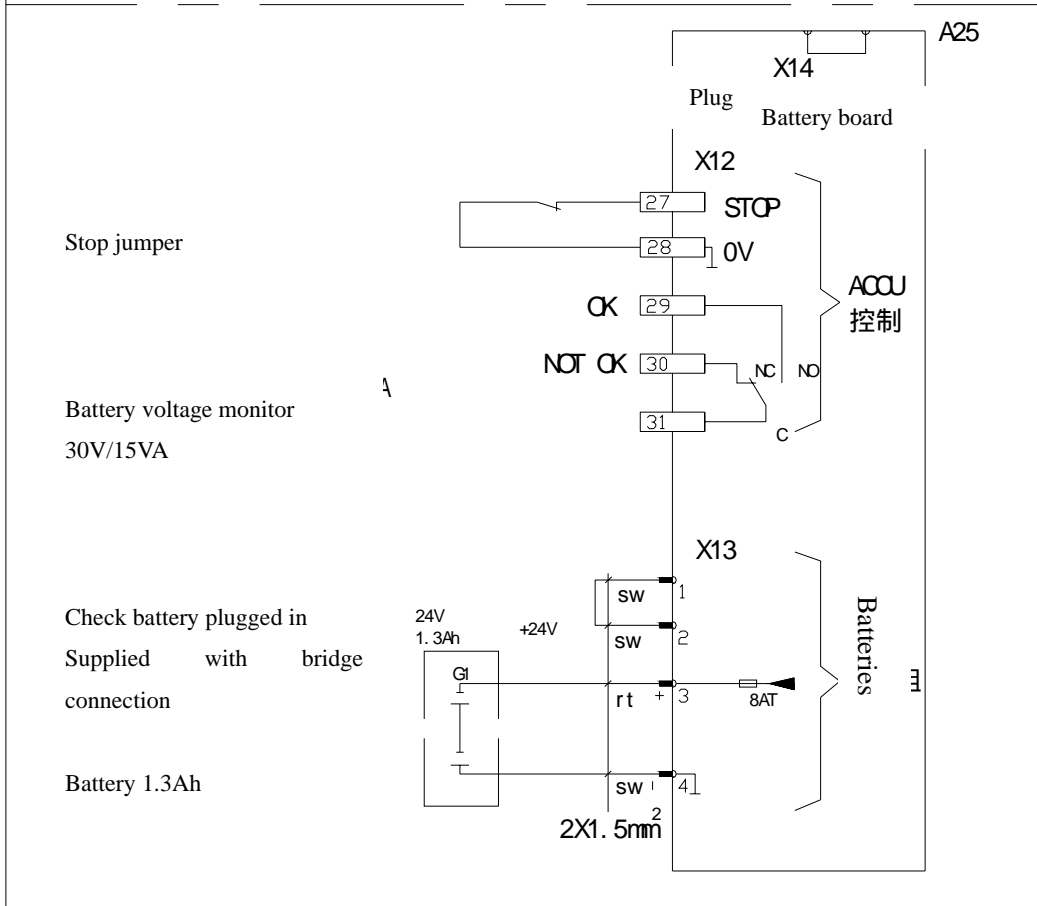
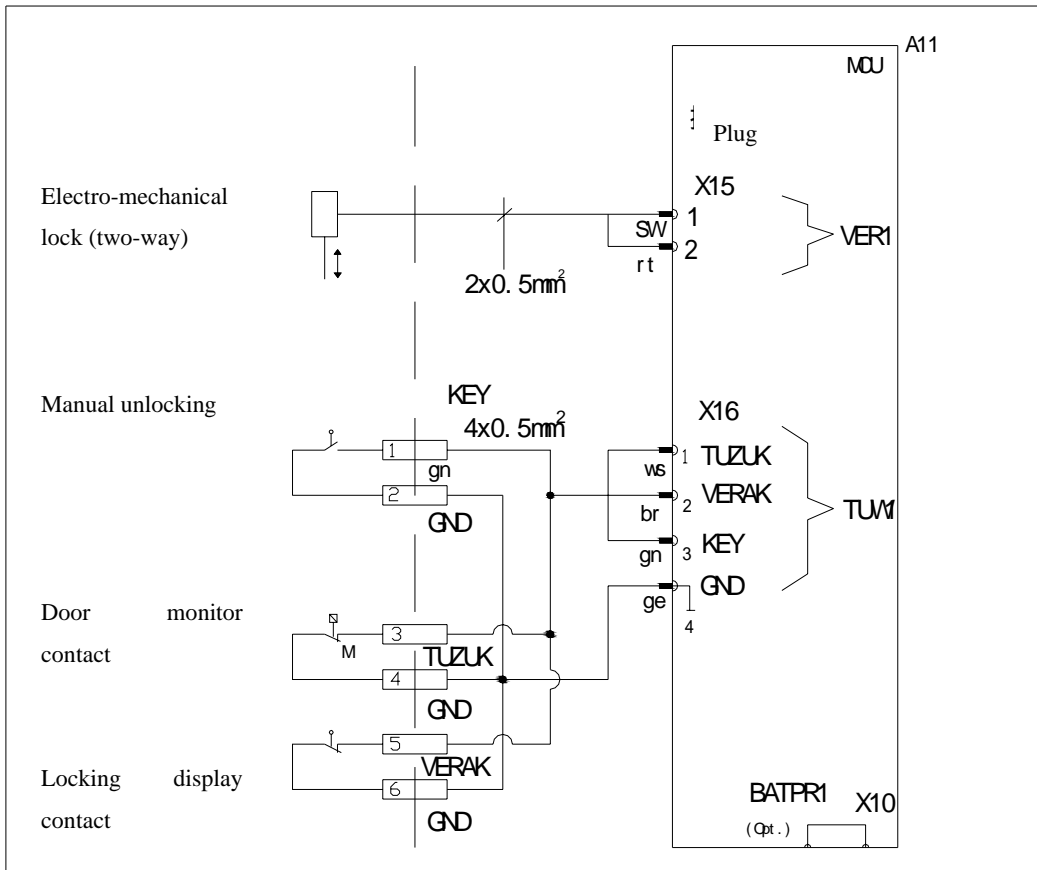
An ecological acceptable disposal of the sliding door is possible, by separating and recycling the individual materials. No particular inspection is required for the environment protection



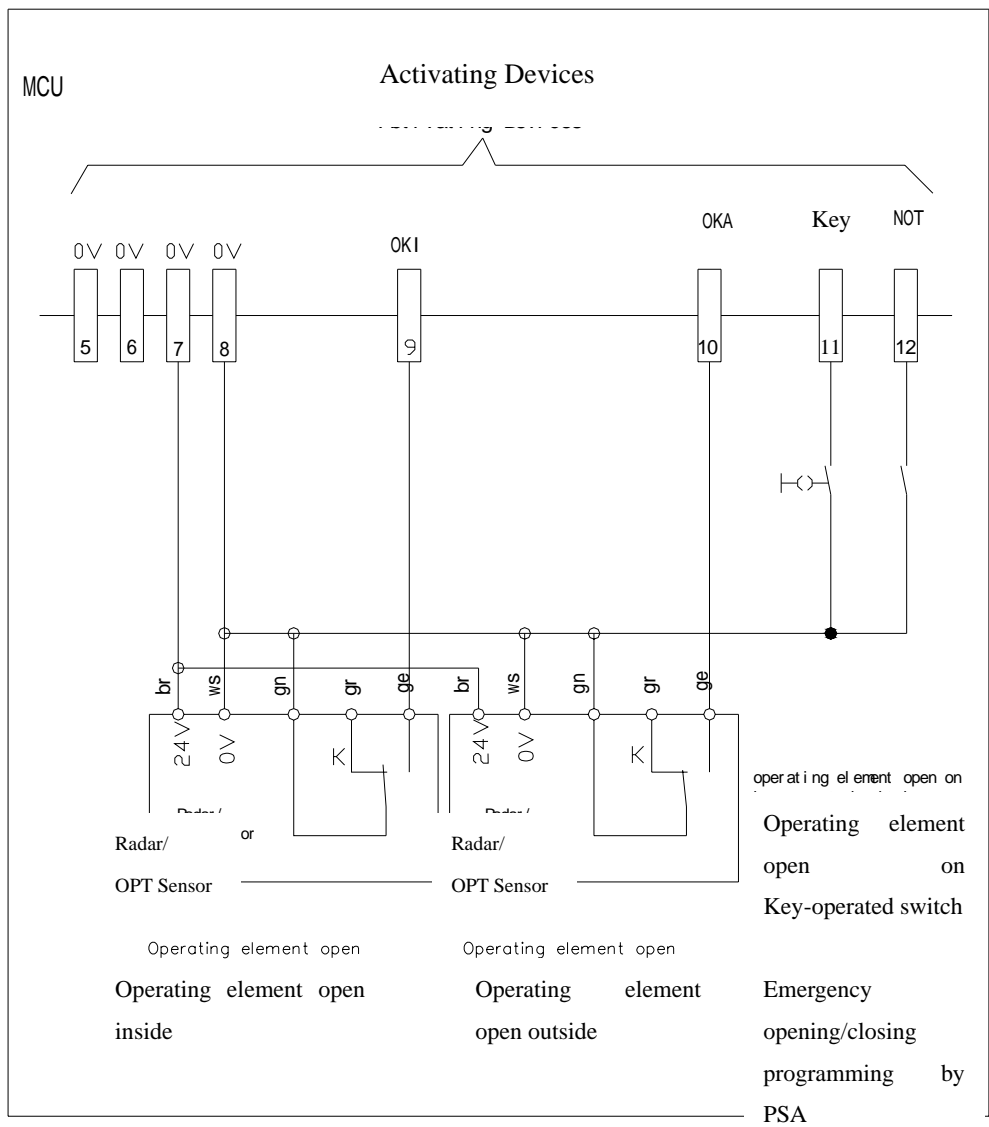
Appendix 1: Drawing of Cover installation



Appendix 5: Wiring diagram of control unit



Appendix 6: Wiring diagram of battery & Electro-mechanical lock



Appendix7: wiring diagram of starting-up signal

ООО "Автоматика"

Изготовление, монтаж и сервисное обслуживание автоматических дверей всех видов.

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