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SW: WP 5.1 WIN

TMS50 AND TMS600 DOCUMENT INTERPRETING

1. GENERAL

The TMS50 and TMS600 control panel documentation is divided in three files called

**MACHINE ROOM
SERVICE
ERECTION SITE**

Machine room file is used as a control panel document in the machine room.

Service file is used as a control panel document used by the service personel.

Erection site file is used during installing the control panel and it is delivered inside the panel.

Each of these files are divided in several interleafs as can be seen at the first page of each file. The following chapters provide a short description of the each interleaf contents.

2. DRAWING LIST

Drawing list includes four basic sections. These are

**OPTIONS
CIRCUIT DIAGRAMS
POSITION NUMBER TABLE
ELECTRIFICATION DOCUMENTS (LWS)
INSTRUCTIONS**

OPTIONS section includes information of the control panel, such as panel type, group size and included options.

CIRCUIT DIAGRAM section includes a list of circuit diagrams, shaft vane diagram and panel layout diagram.

POSITION NUMBER section includes information of used component position numbers.

ELECTRICATION DOCUMENTS section includes a list of electrification documents.

INSTRUCTIONS section includes a list of instructions.

Before document number there is a code number indicating which files include the specified document. The principle in the code is

Number	Reference to file
--------	-------------------

1	Machine room
2	Service
3	Erection site

For example if there is a document specified

Name	Pos.	Type
DRIVE MODULE	123	473883E04

This is a circuit diagram of the drive module and it is included in all three files. If the Pos. code was for example 1.. the document is included only in the Machine room file.

3. PART LIST

The control panel part list includes the names, position numbers, types and material numbers of components used in the control panel.

4. CIRCUIT DIAGRAMS

TMS50 and TMS600 circuit diagrams include many cross-references between pictures and feature dependent connections. This causes that diagrams must be interpreted correctly according to existing features. This instruction describes used markings.

4.1 CIRCUIT DIAGRAM CROSS-REFERENCES

Cross-references in circuit diagrams are made so that when there is a following symbol

1A6
↑

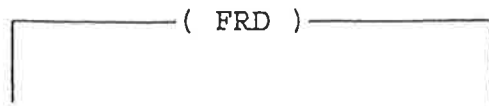
it is a reference to page 1 of the drawings and there to area A6.

Areas in the drawings are marked in margins so that vertical areas are marked with numbers and horizontal areas with letters.

4.2 OPTIONAL CONNECTIONS IN CIRCUIT DIAGRAMS

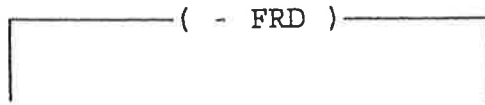
Optional connections are marked with a code in brackets in middle of connection line. This method is used because it makes it possible to use the same drawings with different elevators without any alternations. Otherwise the connections should be drawn to every drawing separately and it would increase drawing time.

If the connection is marked as follows



this indicates that if FRD option is in use this connection is made.

If the connection is marked as follows



this indicates that if the FRD option is in use this connection does not exist.

Used main feature names and their codes are listed in "Elevator Control Features". Also the function of these features and their availability is explained in the "Elevator Control Features".

5. I/O LIST

The I/O list includes information of signals used by the software.

6. JUMPERING DIAGRAMS

Jumpering diagrams include information of the control panel pc-board jumpering.

7. ELECTRIFICATION DOCUMENTS (LWS)

This interleaf includes information of the electrification. If the electrification is done locally this interleaf is left empty at the factory.

8. DRIVE DOCUMENTS

The drive module documents are provided separately to the control panel factory and they are placed in an own interleaf in these files.

9. INSTRUCTIONS

This interleaf includes the instructions specified by the drawing list instruction section.

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TMS50a INSTALLATION AND COMMISSIONING INSTRUCTION

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1 INTRODUCTION

The TMS50a controller is made to satisfy the low range area of Canada and USA modernization markets. That means low range rope elevator (max. car speed 1,0 m/s) mostly in residential buildings (max 16 floors).

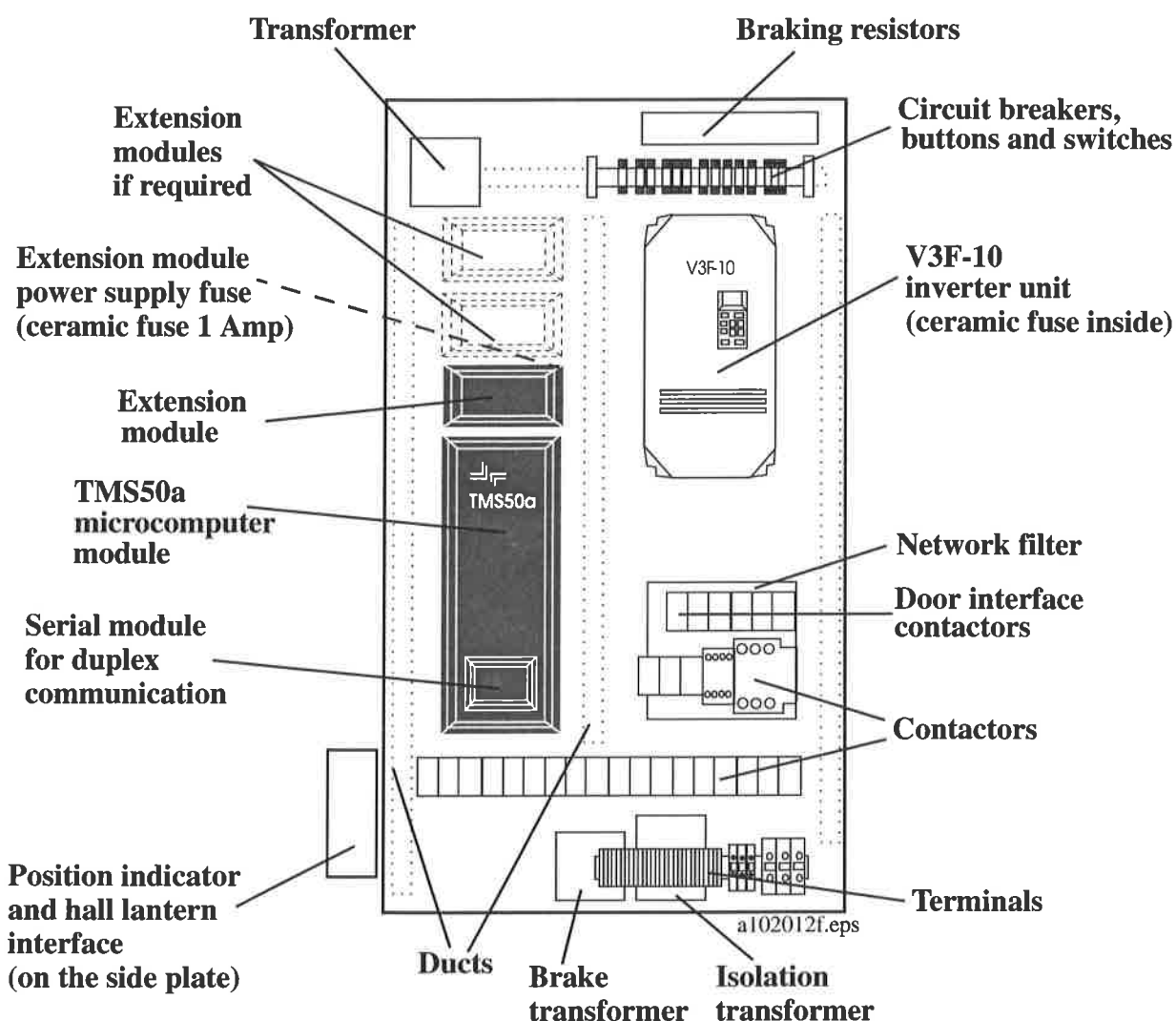
The controller consists of two main parts:

- TMS50a
- V3F-10 inverter unit.

TMS50a includes

- High degree of protection for mechanical and electrical mistreatments.
- Service friendly by LED indicator for each input and output.
- Multifunction display for car position, error codes and built-in maintenance tools.
- Integrated supplies and junctions for car and shaft to panel and machine room.

V3F-10 is a very compact commercial frequency inverter. It has special advantages when renewing old installations. It reduces motor noise and heating (so the motor lifetime is increased). Also the starting current is low.

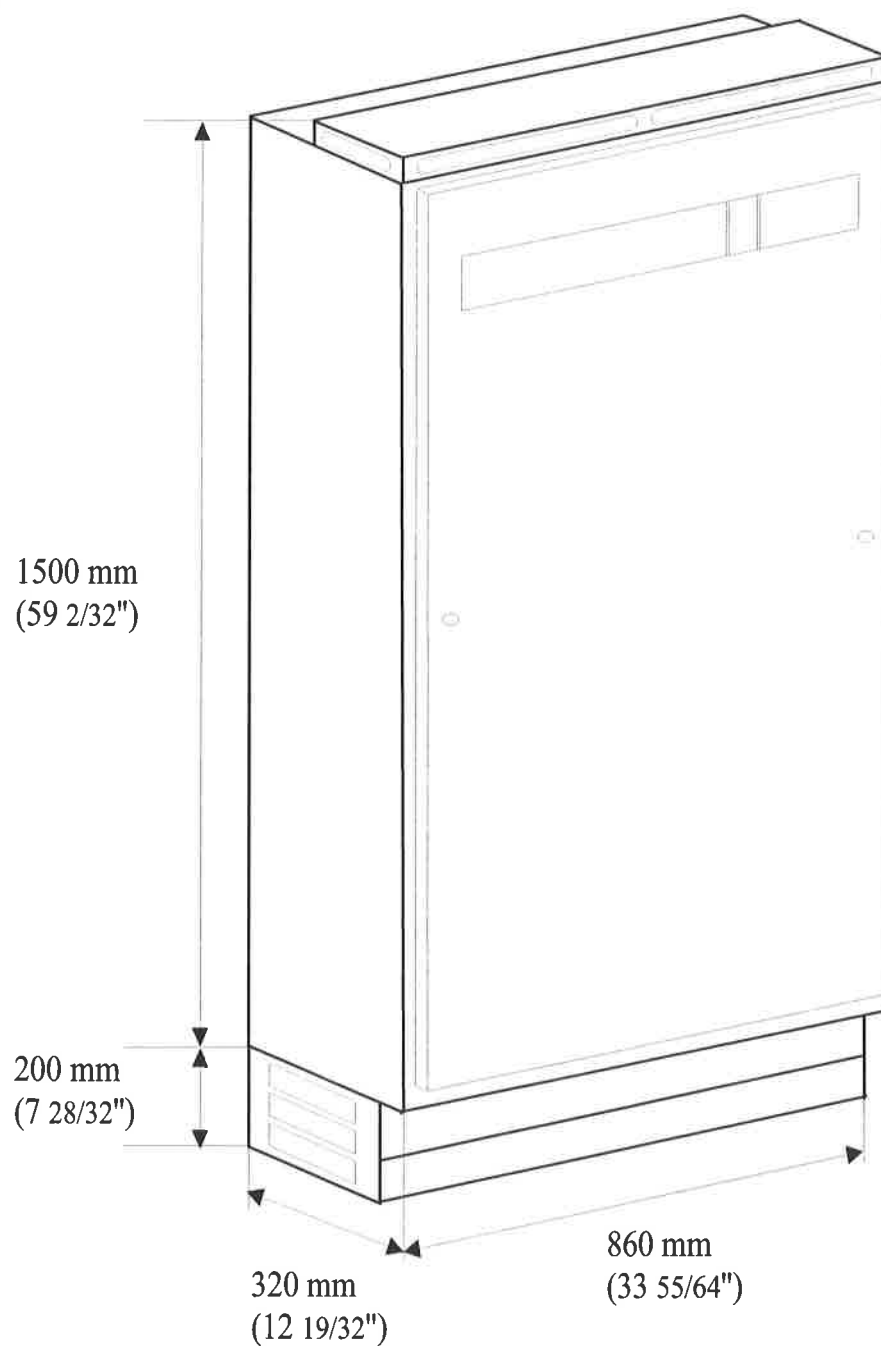


•Fig 1: TMS50a control panel

2 INSTALLING THE CONTROL PANEL

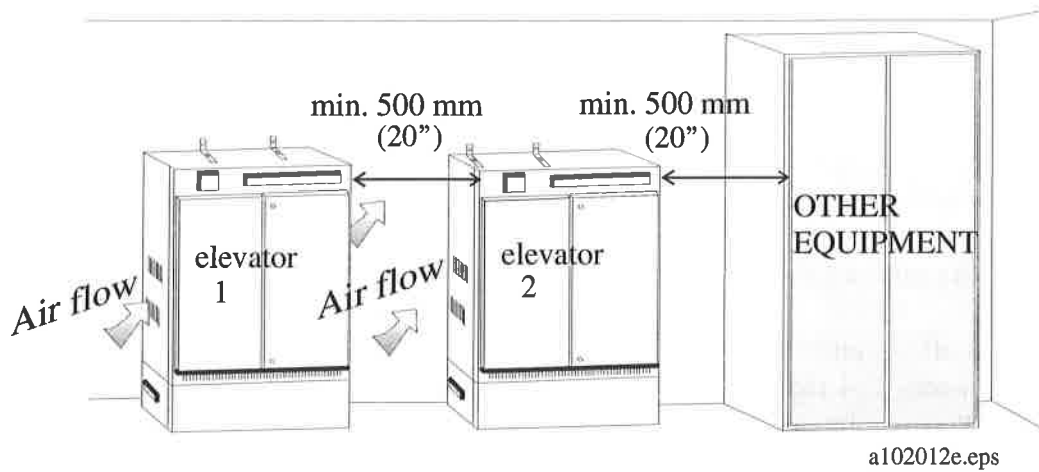
2.1 The size of the control panel

Max. weight is 140 kg
(~310 lbs).



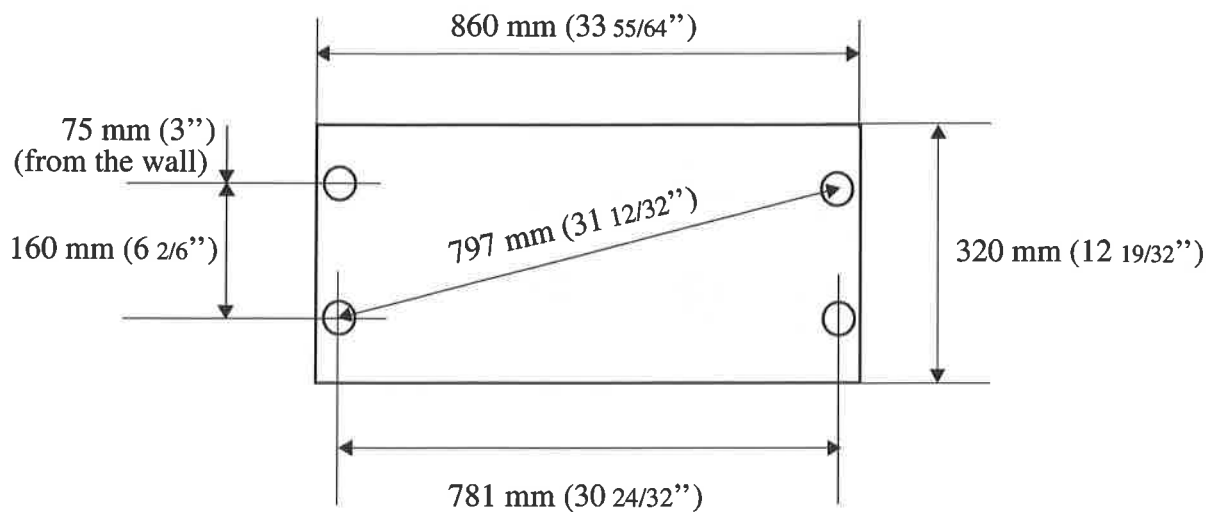
2.2 Mounting the control panel

2.2.1 Minimum mounting distances



2.2.2 Drilling distances

The panel is fixed to the machine room floor using masonry fixings. The drilling distances are shown below:



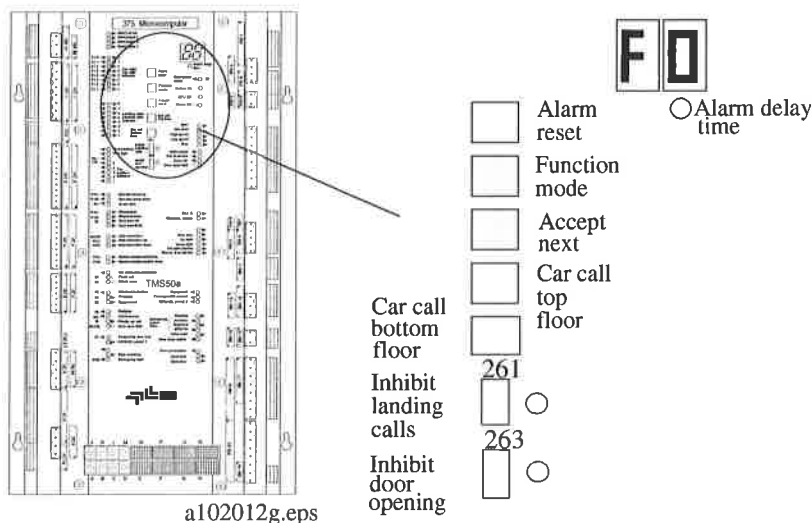
3 INSPECTION DRIVE DURING INSTALLATION PHASE

For safety reasons do the following things:

1. Make sure the car can move freely in the shaft (visual inspection).
2. Check that the mains line supply wires are correctly connected.
3. Be sure all needed plugs and wires are connected.
4. Check the correct operation of the safety circuit and safety circuit devices according to principle diagrams. E.g. overspeed governor, safety gear, stop-button.

Switching the power ON:

1. Turn all circuit breakers to OFF-position. Turn ON the mains line supply switch (20). Then turn ON the control panel main circuit breaker (286). Then turn on the circuit breakers one by one (e.g. 287:2, 289, 287:1).
2. Turn OFF the main circuit breaker (286). Press Function Mode -button and keep it pressed. Turn the power ON. Wait until F0 is shown on the display. Release the button and press Accept Next. This is required to clear the memory of counters and stored error codes.



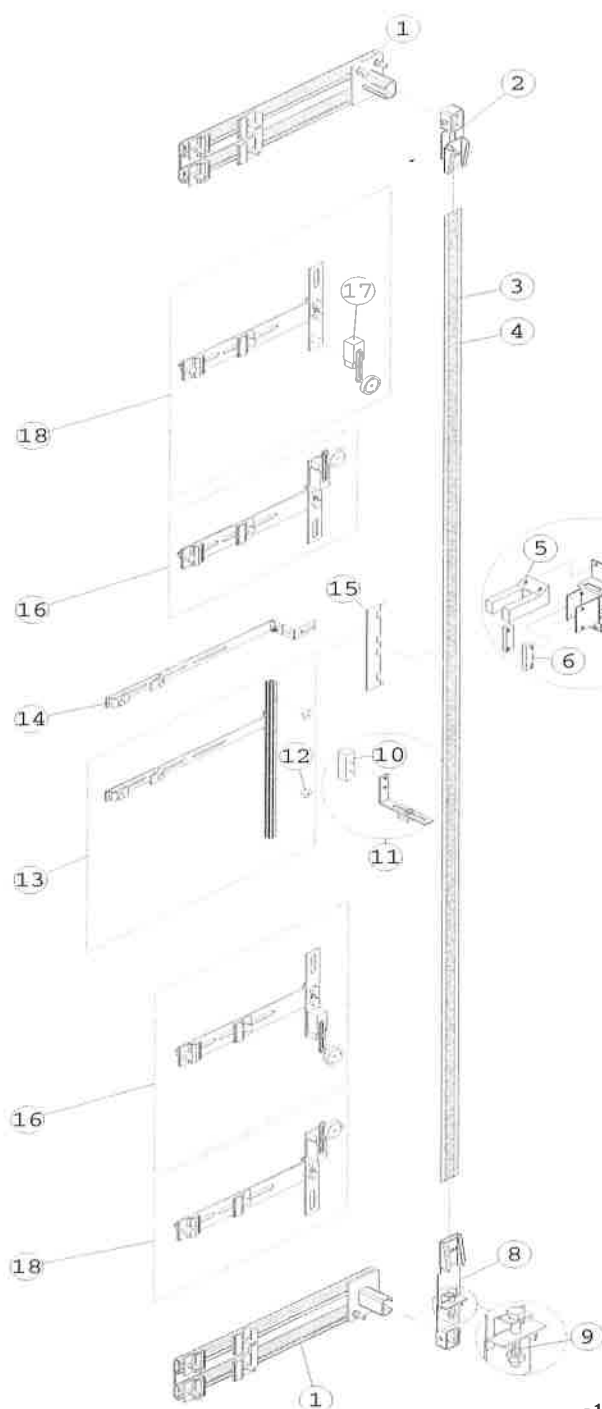
3. Check that the motor rated current (An-01) and motor rated RPM (An-02) in V3F-10 are corresponding to the motor plate values. If not, preset the parameters. Ensure that the service speed (bn-02) is ≤ 12 Hz. Ensure also the number of motor poles (bn-22) is correct. More information in Appendix 1 "V3F-10 function buttons and parameter settings".
4. Press Inspection drive up -button (265:U) and check that 421:U, 434, 201 and 209 are energized and the motor rotates in up-direction. If the rotation direction is wrong, change two-phases of the motor.

4 BAR (Band Reader) INSTALLATION

4.1 Mechanical installation

In modernization case it is important to minimize the elevator down time.
Utilize the old elevator control system to install BAR mechanical equipment.

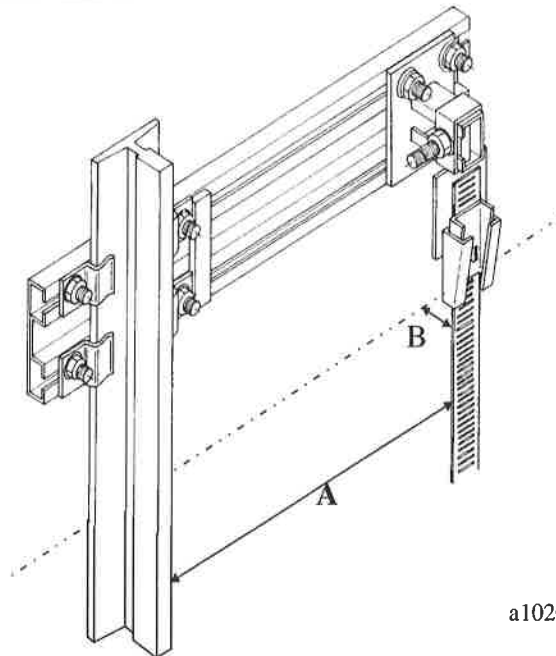
4.1.1 Glossary



- | | |
|----|--------------------------------|
| 1 | Bracket |
| 2 | Upper fastener |
| 3 | Band |
| 4 | Magnet |
| 5 | Optical reader |
| 6 | Synchronization switches |
| 7 | Reader and 77:U/N assembly |
| 8 | Lower fastener |
| 9 | Spring |
| 10 | Rear door zone bistable switch |
| 11 | Rear door switch assembly |
| 12 | Magnet for rear door switch |
| 13 | Rear door magnet assembly |
| 14 | Intermediate bracket |
| 15 | Door zone flag |
| 16 | 135 switch assembly |
| 17 | Limit switch |
| 18 | 151 switch assembly |

4.1.2 Installing the upper bracket

- Place the car to the topmost level. Install the upper bracket as close as possible to top of shaft.
- Put the upper fastener on its bracket.
- Unroll approx. 1-2 meters (3-6 feet) of the band from the box.
- Slip the band into the wedge housing.
- Slip the wedge and the band together in down direction.
- Measure the distances A and B and write them down.
(A= distance between the band and T-guide
B= depth from the band to the T-guide back)

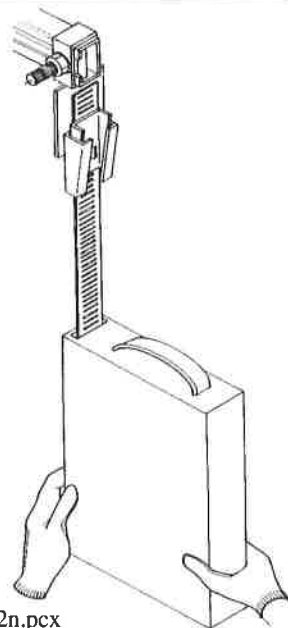


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4.1.3 Unrolling and tensioning the band

ATTENTION: During operation the box must not be attach to the car, to prevent any damage to the band in case if it is stuck inside the box.

- Drive the elevator in down direction.
- If by its own weight the band does not unroll itself, stop every 1-2 m (3-6 ft) to unroll the band by holding the box and pulling it to down.

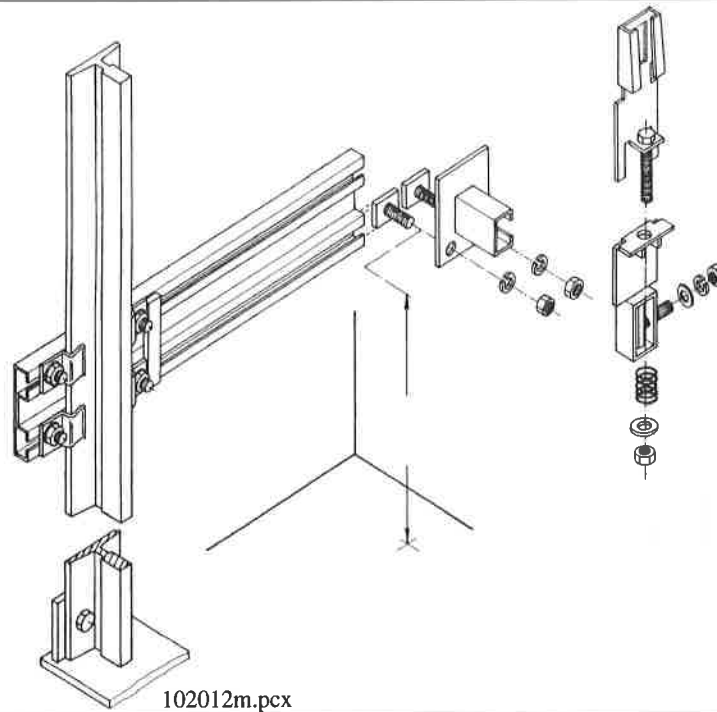


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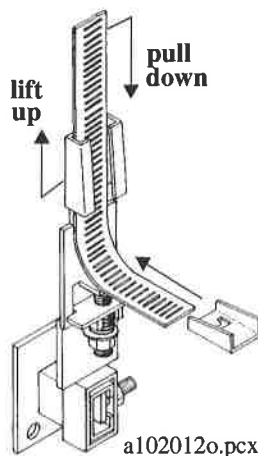
ATTENTION: During operation be careful to keep the box in a right position to prevent the band from twisting. After arriving at the second lowest floor drop the box down to the pit.

4.1.4 Installing the lower bracket

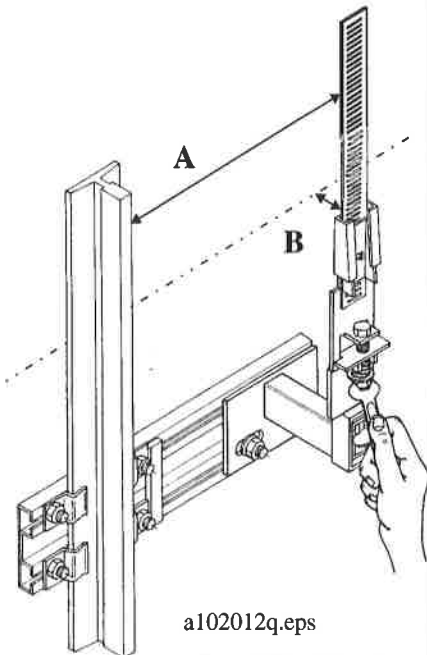
- Place the car near the second level.
- Install the lower bracket so that the car can never hit the lower fastener even if the buffer is fully compressed.



- Put the lower fastener on its bracket and lock the nuts.
- Check that the band is not twisted.
- Unroll the rest of the band from the box.
- Slip the band into the wedge housing.
- Unscrew the nut up to the end of the screw and lift up the wedge housing. Then slip the wedge into the wedge housing.

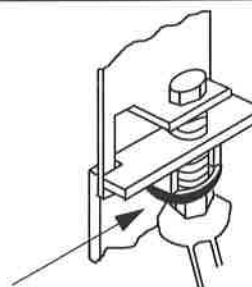


- Tension the band using the nut.
- Cut the excess band. Be careful with the cut band edge, it may be sharp!
- Measure the distances A and B. Adjust them corresponding the top bracket values.



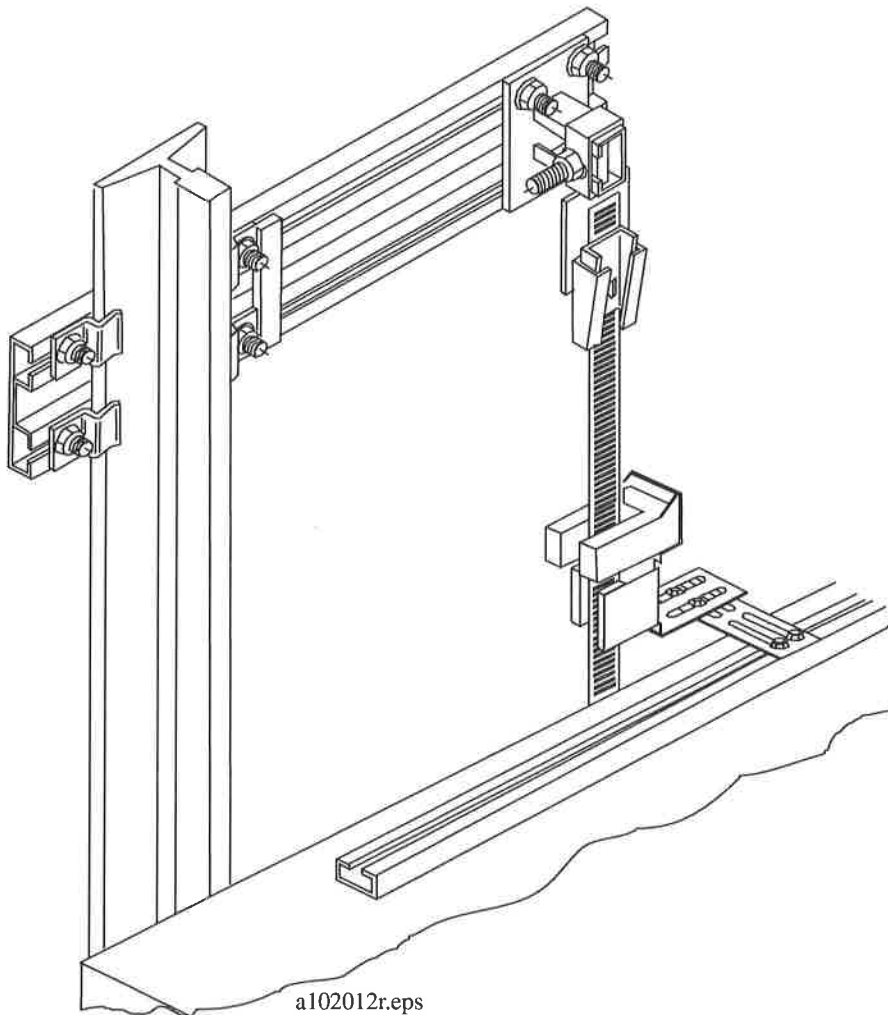
ATTENTION:

The band is correctly tensioned when the spring is fully compressed.

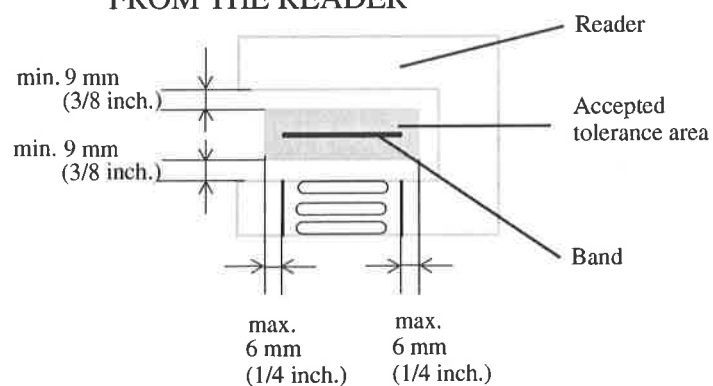


4.1.5 Installing the reader

- Attach the reader to the unit-strut on the car top.
- Move the car in inspection drive from the bottom to the top of the shaft to check if the band is correctly positioned in the middle of the fork of the reader.

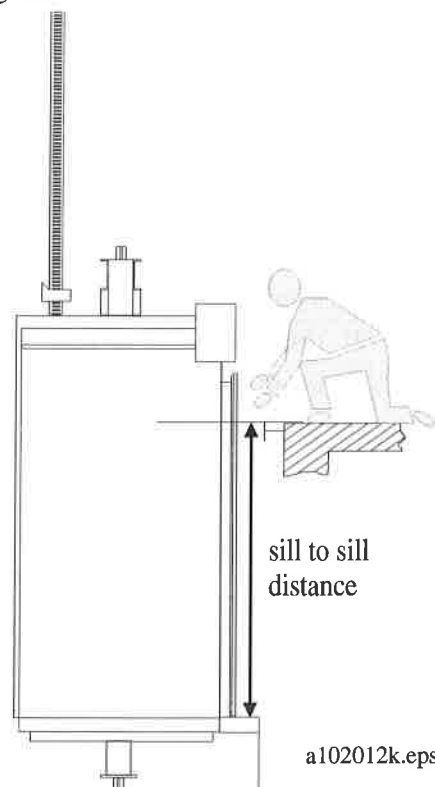


THE BAND'S MINIMUM DISTANCES FROM THE READER

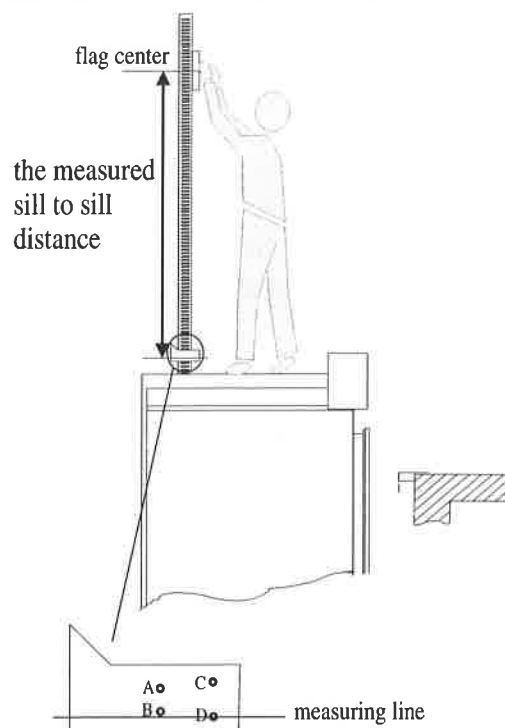


4.1.6 Installing the flag using the sill to sill method.

- Run the car 150 - 180 cm (5 -6 ft) below floor.
- Measure the distance from the car sill to the landing sill.

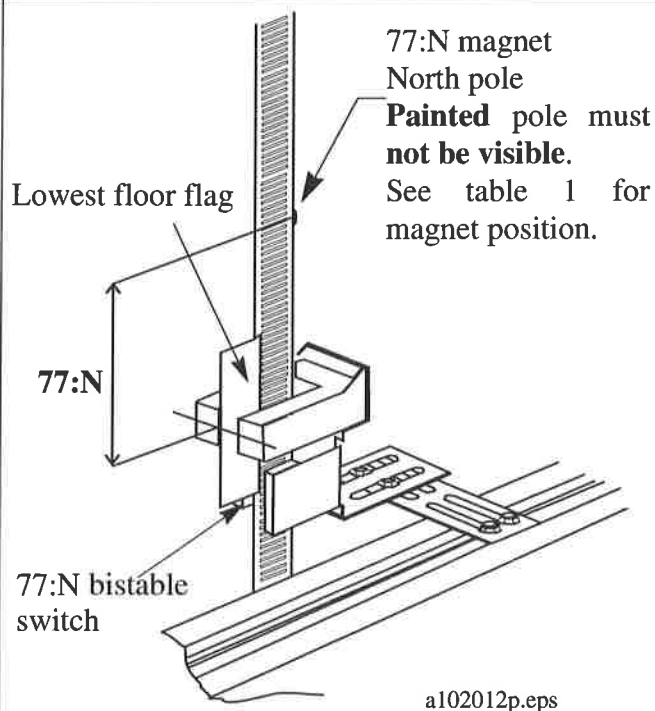


- Step on the car top and install the flag to measured distance above the reader.



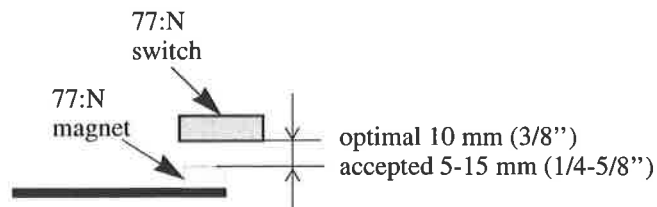
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4.1.7 Installing the 77:N magnet

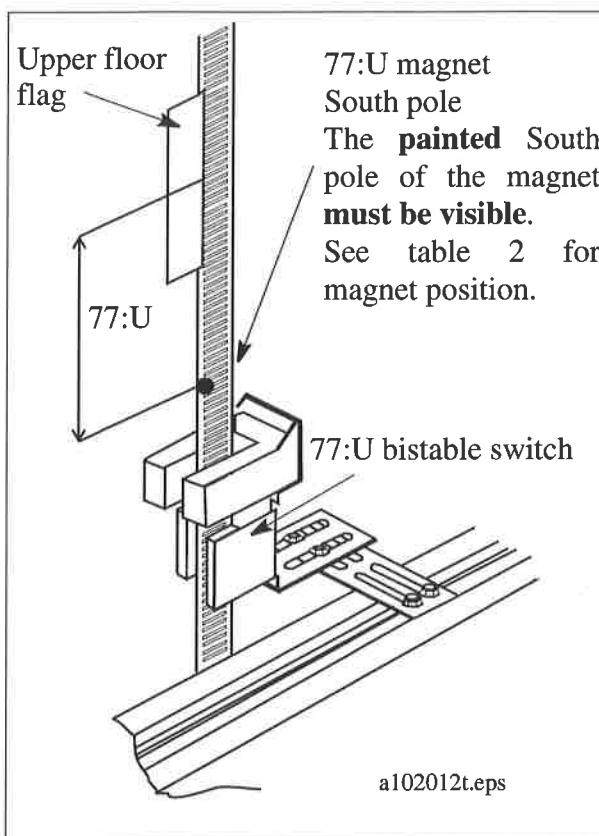


Contract speed	77:N
0.2 m/s = 40 ft/min	200 = 7 28/32"
0.3 m/s = 60 ft/min	300 = 11 26/32"
0.4 m/s = 80 ft/min	400 = 15 24/32"
0.5 m/s = 100 ft/min	500 = 19 22/32"
0.6 m/s = 120 ft/min	600 = 23 20/32"
0.7 m/s = 140 ft/min	700 = 27 18/32"
0.8 m/s = 160 ft/min	900 = 35 14/32"
0.9 m/s = 180 ft/min	1100 = 43 10/32"
1.0 m/s = 200 ft/min	1200 = 47 16/32"

Table 1: 77:N initial magnets positions



4.1.8 Installing the 77:U magnet



Upper floor flag

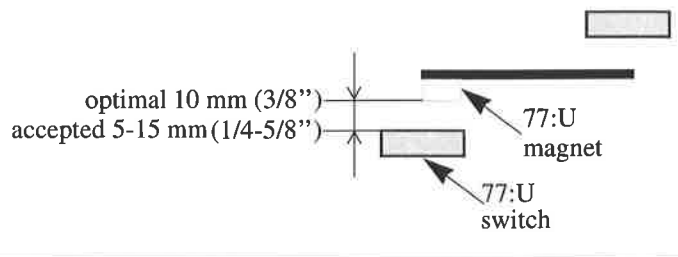
77:U magnet
South pole
The **painted** South pole of the magnet **must be visible**.
See table 2 for magnet position.

77:U

77:U bistable switch

Contract speed	77:U
0.2 m/s = 40 ft/min	200 = 7 28/32"
0.3 m/s = 60 ft/min	300 = 11 26/32"
0.4 m/s = 80 ft/min	400 = 15 24/32"
0.5 m/s = 100 ft/min	500 = 19 22/32"
0.6 m/s = 120 ft/min	600 = 23 20/32"
0.7 m/s = 140 ft/min	700 = 27 18/32"
0.8 m/s = 160 ft/min	900 = 35 14/32"
0.9 m/s = 180 ft/min	1100 = 43 10/32"
1.0 m/s = 200 ft/min	1200 = 47 16/32"

Table 2: 77:U initial magnets positions



optimal 10 mm (3/8")
accepted 5-15 mm (1/4-5/8")

77:U magnet

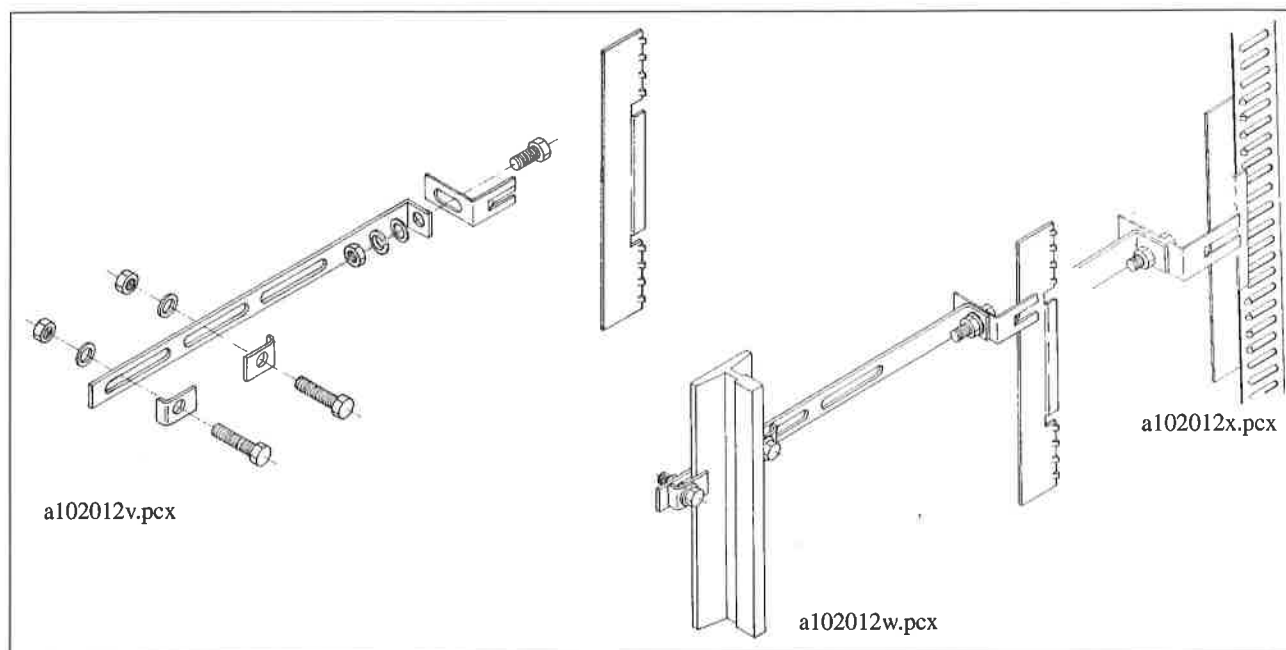
77:U switch

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4.1.9 Installing the intermediate bracket

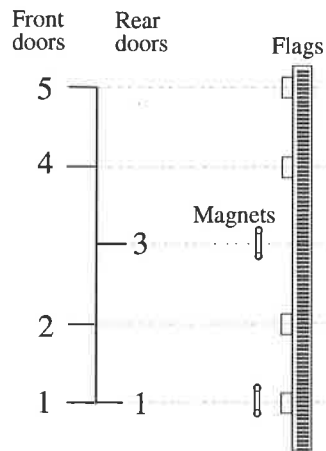
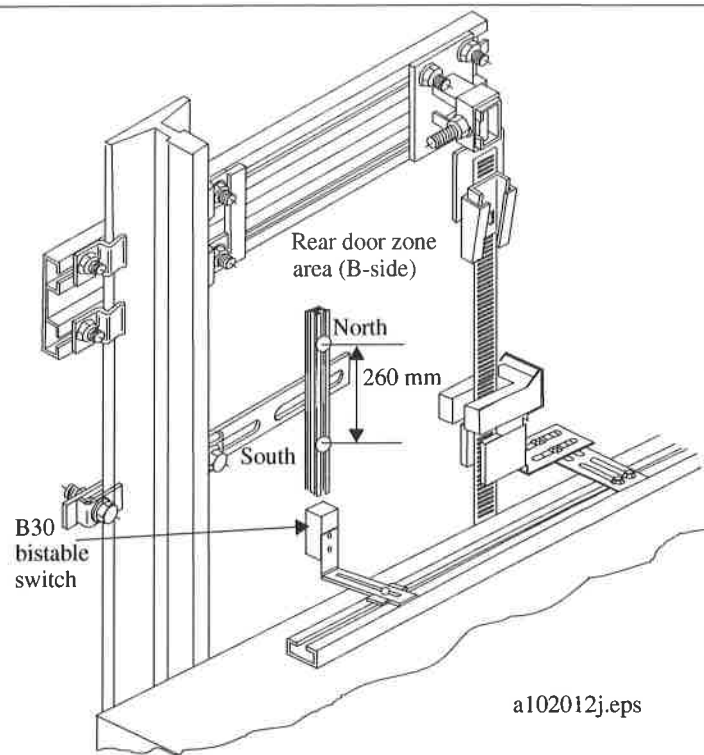
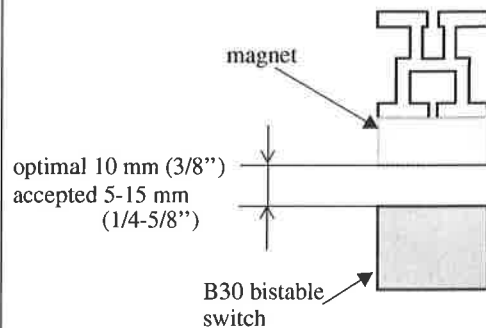
The max. length of the band without intermediate bracket is 15 m (50 ft).

Set the intermediate bracket in front of a door zone flag, if possible.



4.1.10 Installing the rear-side door zone switch

- The painted south polarity must be visible on the lower magnet.
- Distance between magnet axes must be 260 mm (10 15/64 inch.); the floor level referring is at 130 mm (5 1/8 inch.) from magnet.

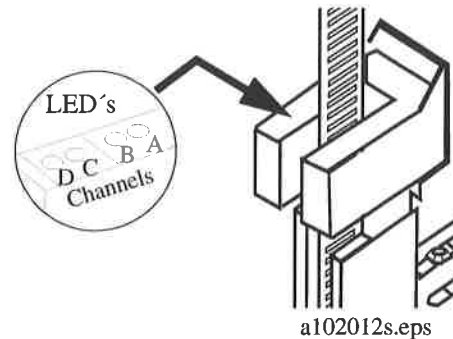
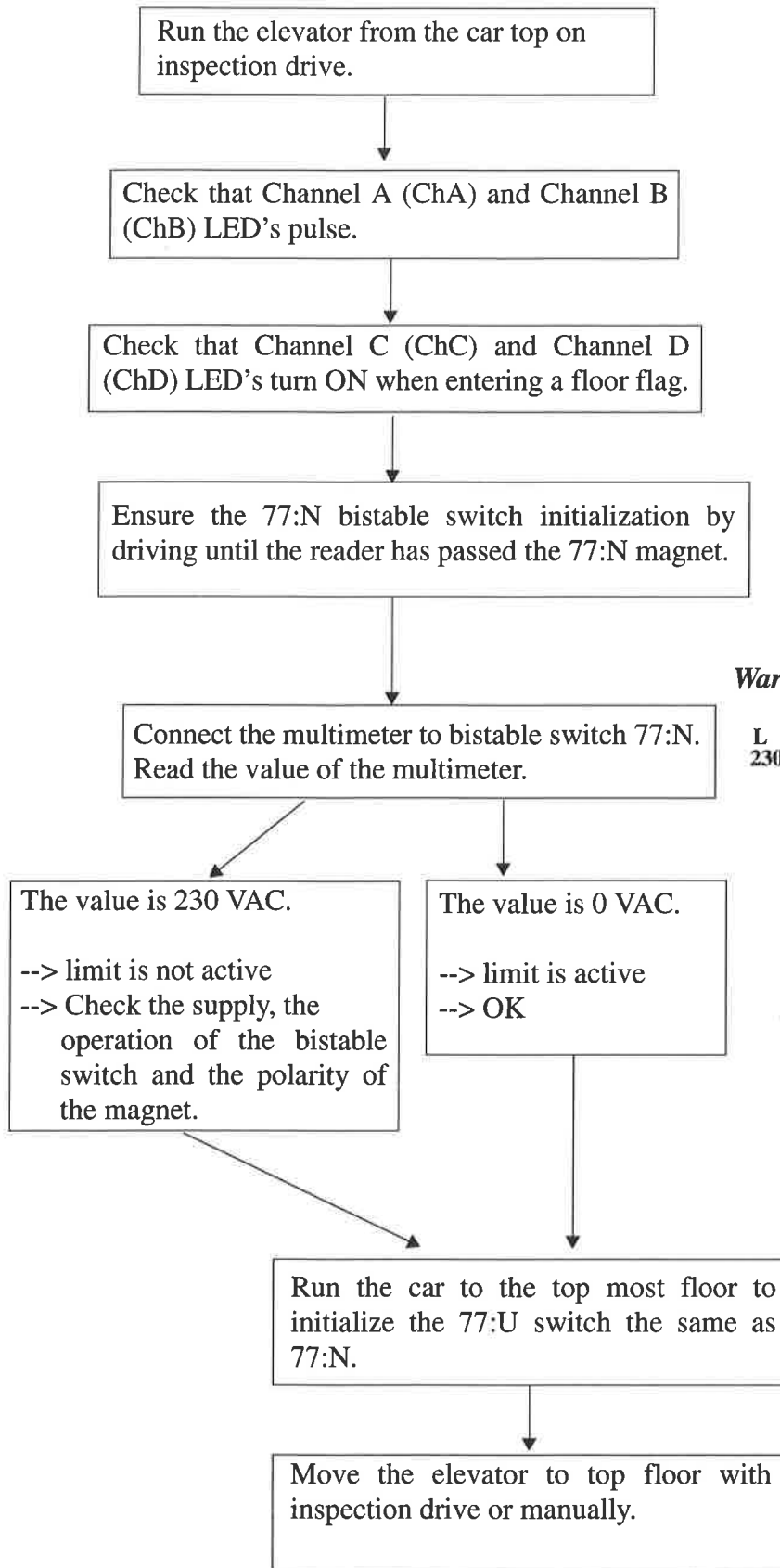
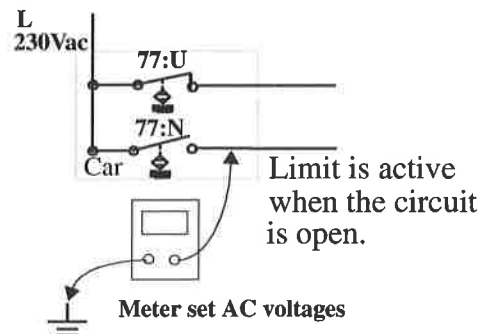


Front door zone flags only at levels where is front door

Rear door zone magnets only at levels where is rear door

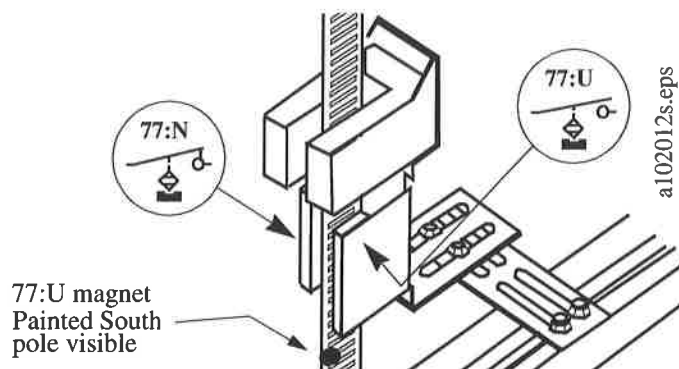
4.2 Electrical installation

- Turn OFF the mains line supply switch.
- Connect the reader according to field wiring documents and control panel circuit diagrams (drawing E07).
- Turn ON the mains line supply switch.

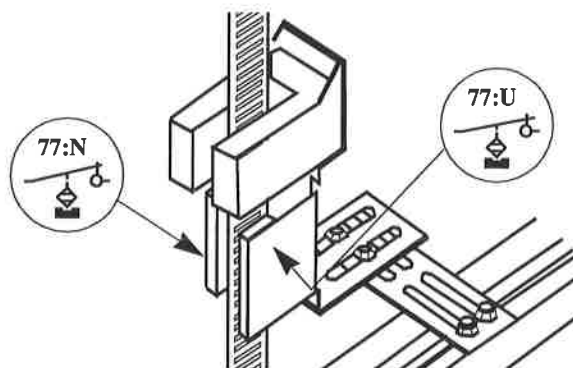
Ensuring the correct operation of the reader and bistable switches**Warning! High voltage**

•Fig 2: 77 Bistable Synchronization Switch Operation.

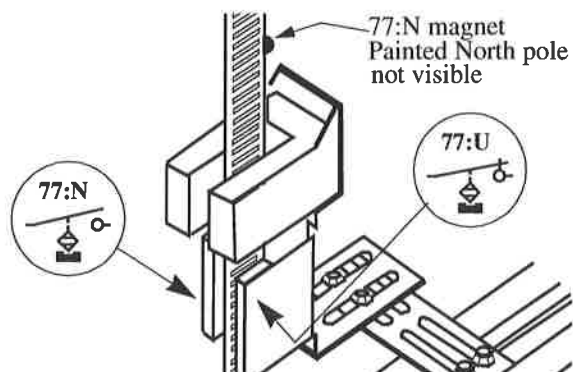
- Elevator *above* 77:U magnet



- Elevator *between* 77 magnets



- Elevator *below* 77:N magnet



5 WIRING TO THE ELEVATOR

Try to minimize the old elevator down time. In some of the items (1-6) it is possible to utilize the old elevator control system.

Be sure that

- **the mains line supply**
- **the car light supply**
- **the fuses**

are switched OFF during the wiring work.

Be sure that there is no voltage in primary side of the control panel main switch (e.g. by measuring).

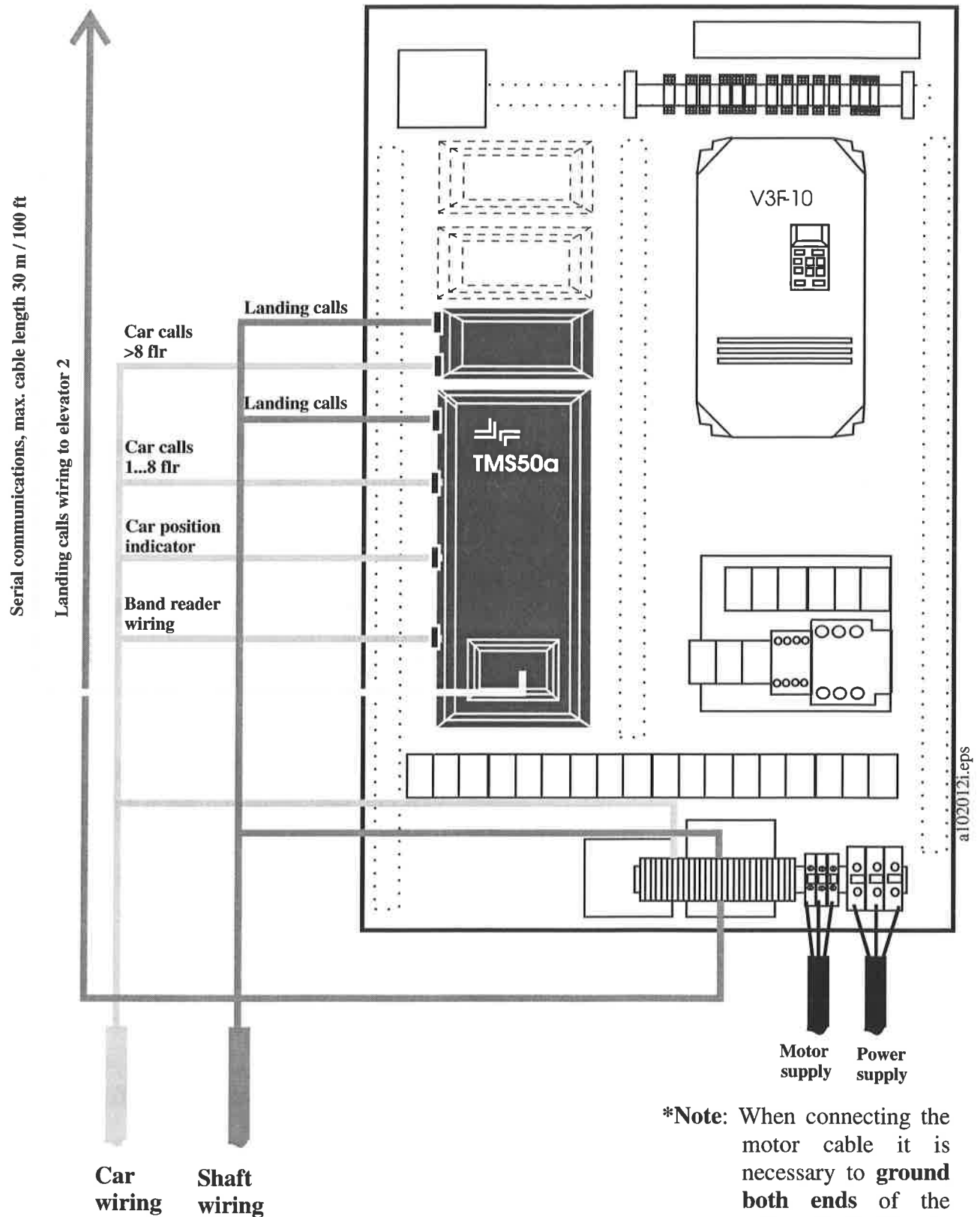
1. **Install the new travelling cables**
according to field wiring documents (Installation folder, chapter 10) and control panel circuit diagrams (Installation folder, chapter 4).
2. **Connect the inspection station**
according to field wiring documents and control panel circuit diagrams (drawing E05, E06 1/2).
3. **Connect the needed car equipment (door, car position indicator etc.)**
according to field wiring documents and control panel circuit diagrams (drawings E09, E11, E21, E23).
4. **Connect the safety circuit**
according to field wiring documents and control panel circuit diagrams (drawing E05).
5. **Connect the hoisting motor supply cable**
according to field wiring documents and control panel circuit diagrams (drawing E04 2/2).

***Note: Motor cable must be shielded to minimize electrical disturbances.**
When connecting the motor cable it is necessary to **ground both ends** of the cable shield. Try to keep the stripped part as short as possible.

6. **Connect the mains power supply**
according to field wiring documents and control panel circuit diagrams (drawing E04 1/2).

•Fig 3: Wiring

Elevator 2



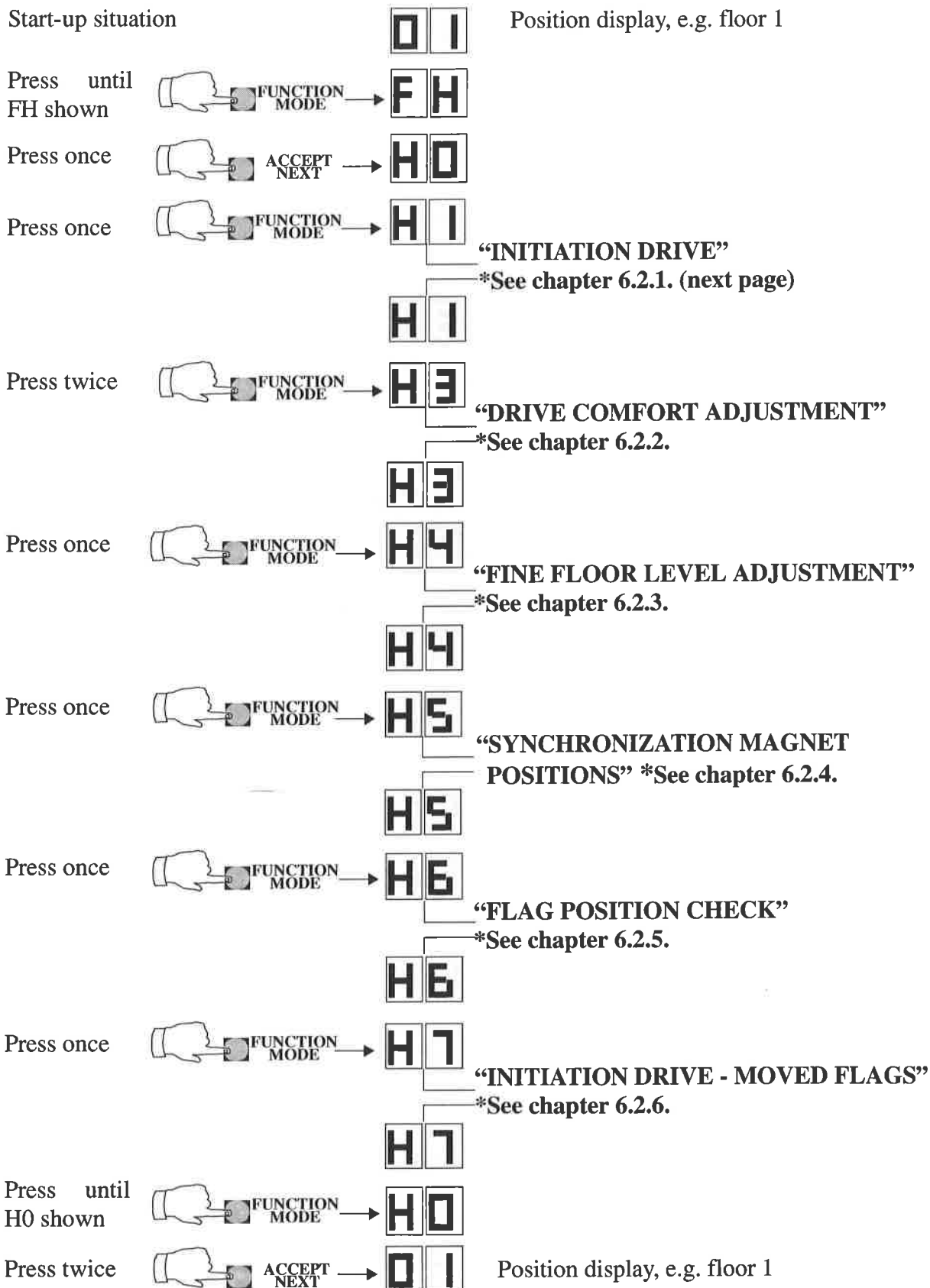
***Note:** With one elevator the landing calls are connected directly to plugs.

***Note:** When connecting the motor cable it is necessary to **ground both ends** of the cable shield. Try to keep the stripped part or visible cables as short as possible.

6 SETUP PROCEDURE TO NORMAL OPERATION

6.1 BAR set-up

- The setup procedure always uses BAR functions H1 to H6.
- Function H7 is used when one or more flags have been moved as a result of H6.



6.2 Detailed function information

The meaning of the boxes used:

6.2.1 Function H1 - Initiation drive

**Action
required**

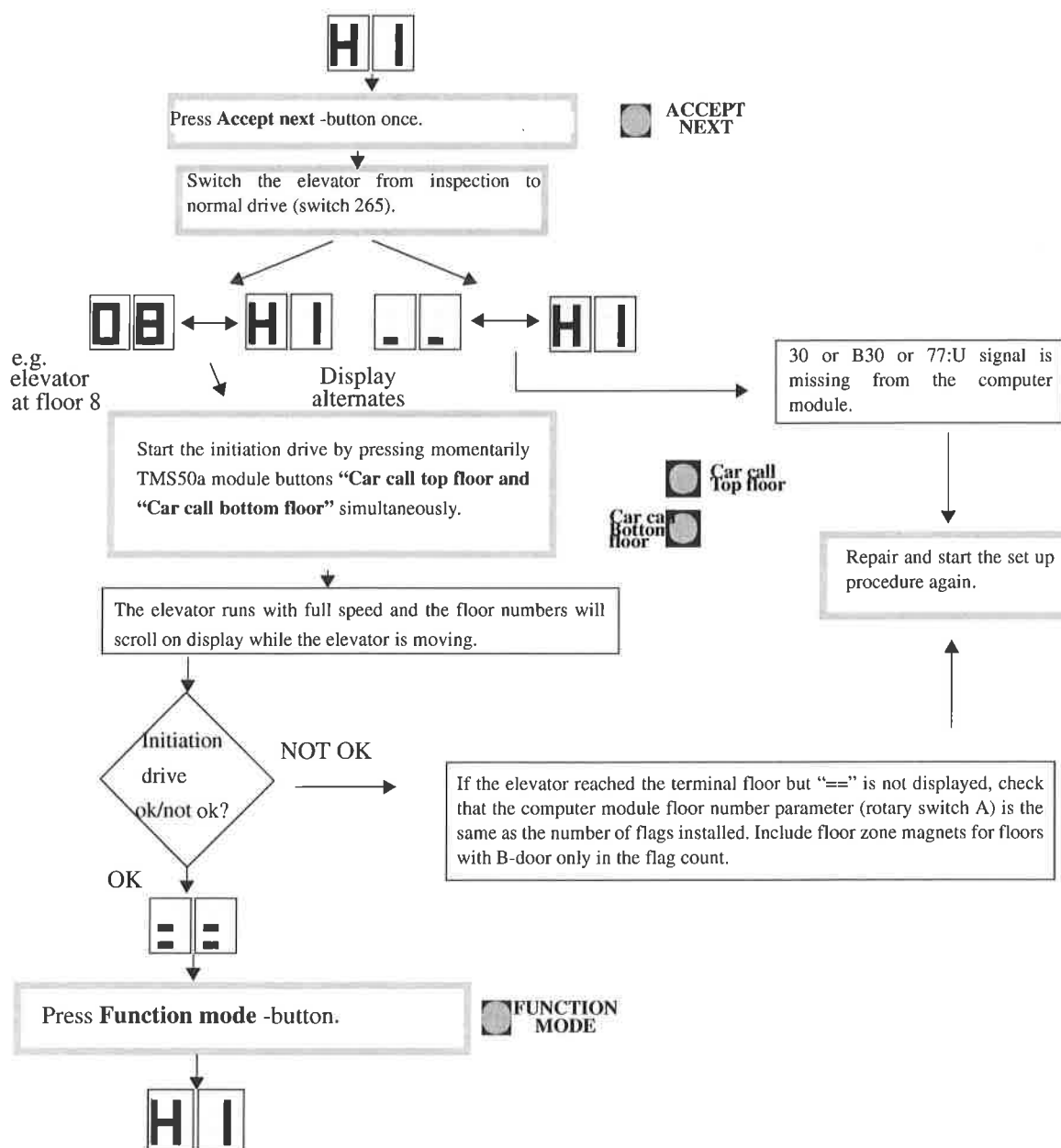
**Information
only**

This function learns the position of the flags.

Move the elevator to the top floor with inspection drive or manually. Check that LED “30 door zone” or “B30 rear door zone” and the 77:U LED are ON on TMS50a.

Turn OFF the main circuit breaker (286). Press Function Mode -button and keep it pressed. Turn the power ON. Wait until F0 is shown on the display. Release the button and press Accept Next. This is required to clear the memory of counters and stored error codes. In addition latched phases of special options are cleared from the memory.

***Note:** Every time when function H1 is used, functions H3-H5 must also be performed.



6.2.2 Function H3 - Drive comfort adjustment

This function measures and optimises deceleration and stopping distances to ensure good deceleration curve.

Press Function Mode until H3 is displayed.

H3

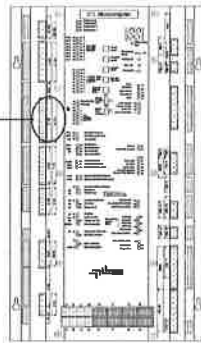
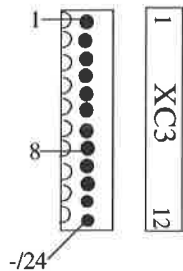
Press **Accept next** -button once.



01 ↔ H3

Display alternates between floor number where elevator is standing and "H3". every 2 seconds (e.g. floor 1).

Car call inputs

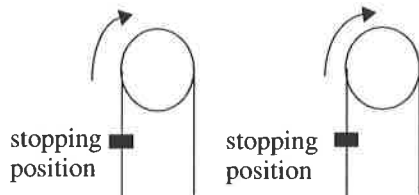


Run the elevator (2 runs at least) in both directions. The runs must be done preferably between two floors in the middle of the shaft. Elevator must reach top speed. (The frequency of V3F-10 multifunction display must be 50.0 Hz at least for 1 second.)
Car calls can be given to XC3 with a wire that is connected to -/24 V.

Do not consider stopping accuracy as the elevator will stop at the centre of the flag which may not be exactly floor level.

IMPORTANT!

Learning is O.K when the elevator stops at the same point for up and down runs to the same floor. (Can be checked using an approximate floor level mark on ropes.)



Learning drive ok/not ok?

NOT OK

OK

Press **Function mode** -button .



H3

6.2.3 Function H4 - Fine floor level adjustment

This function allows the final stopping position of the elevator to be adjusted from inside the car.

The elevator should be on Normal operation and at the floor nearest to the machine room.

Press Function Mode until
H4 is displayed.

H4

Press **Accept next** -button once.

ACCEPT
NEXT

01 ↔ H4

Display alternates between floor number
where elevator is standing and "H4". every 2
seconds (e.g. floor 1).

Landing calls are ignored and the elevator only
answers car calls one at a time.

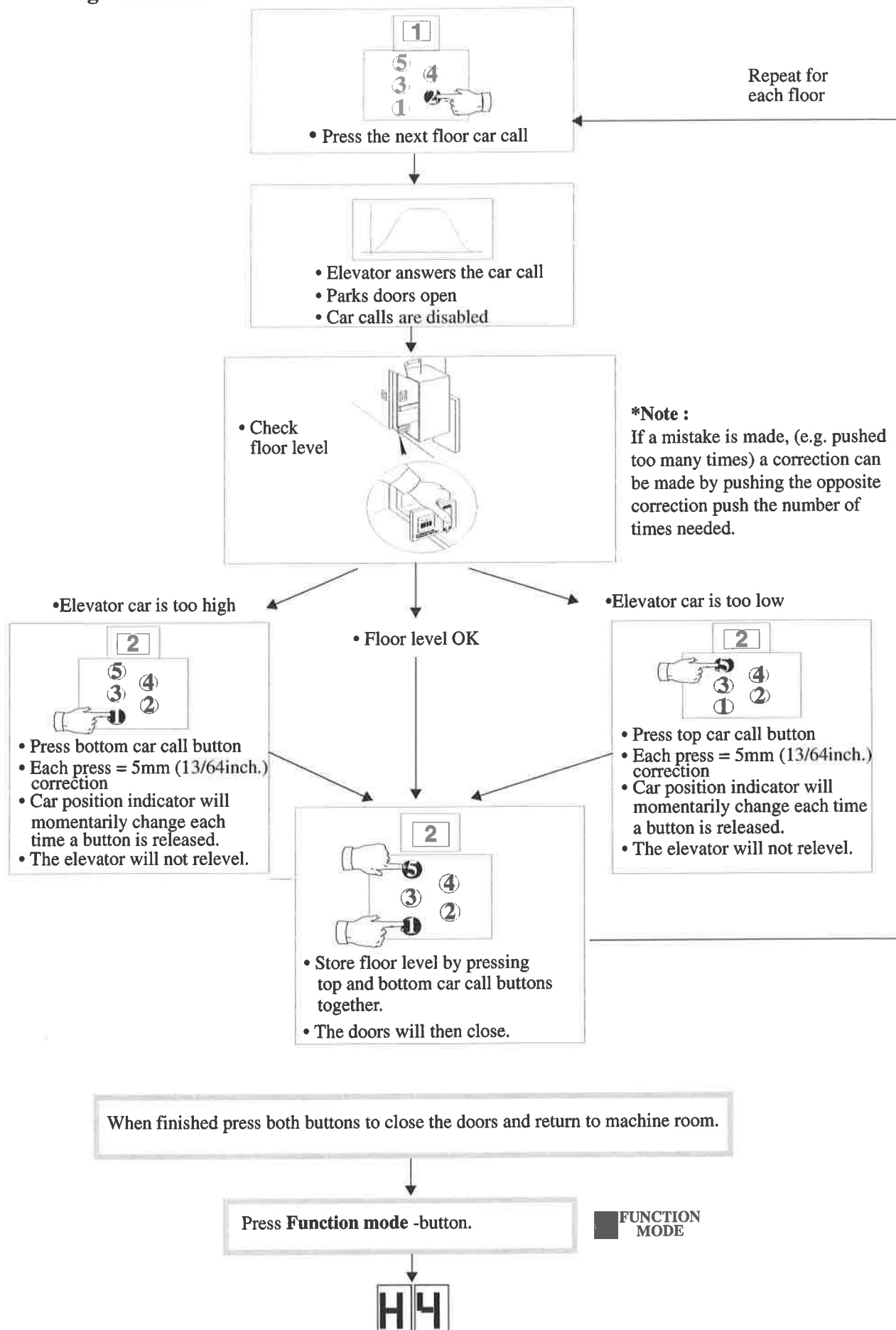
The elevator will park with its doors open.

Go inside the car.

Set the fine floor level as shown on the next page.

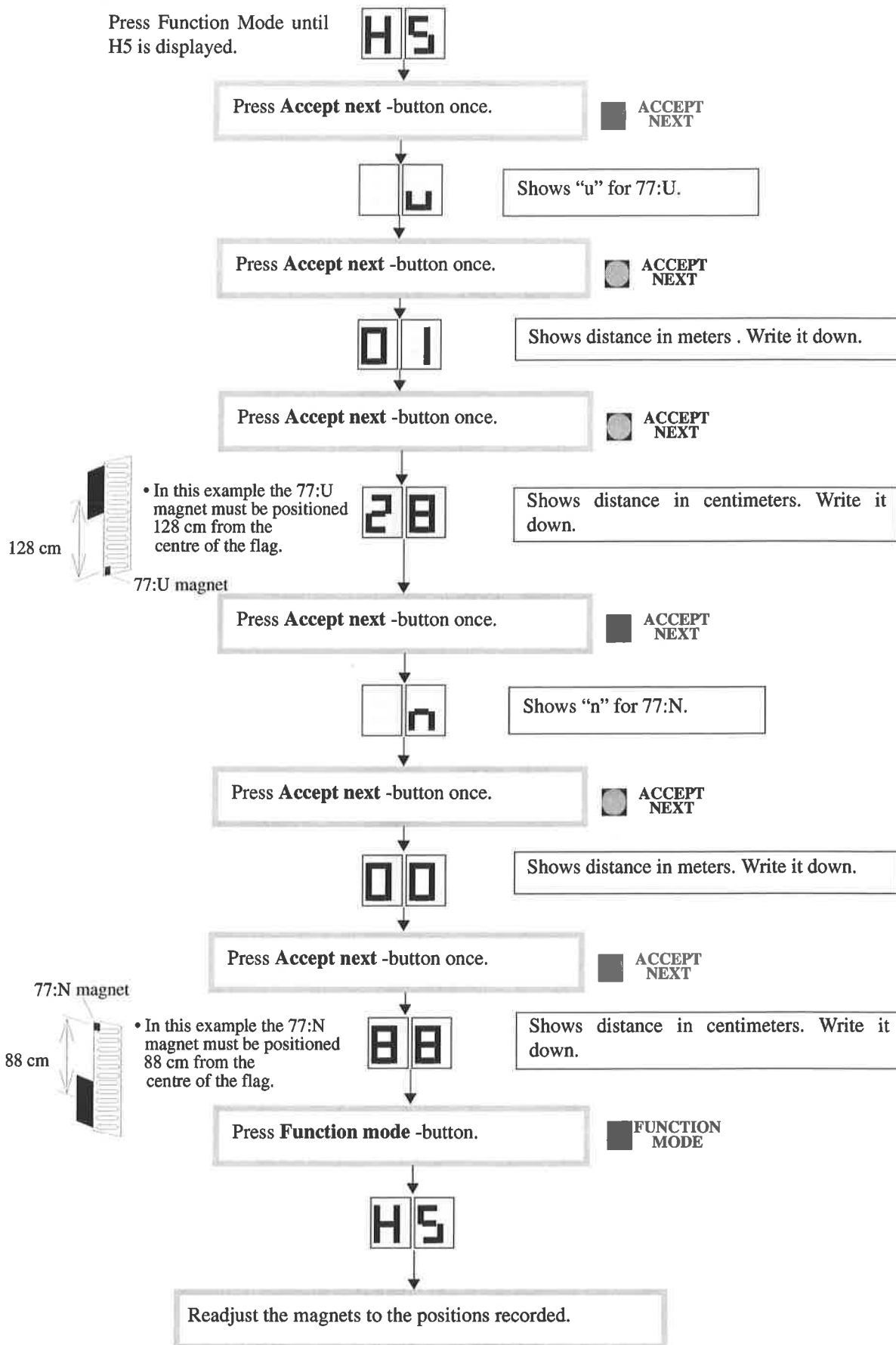
Only one drive direction to each floor is needed.

•Fig 4: Fine floor level



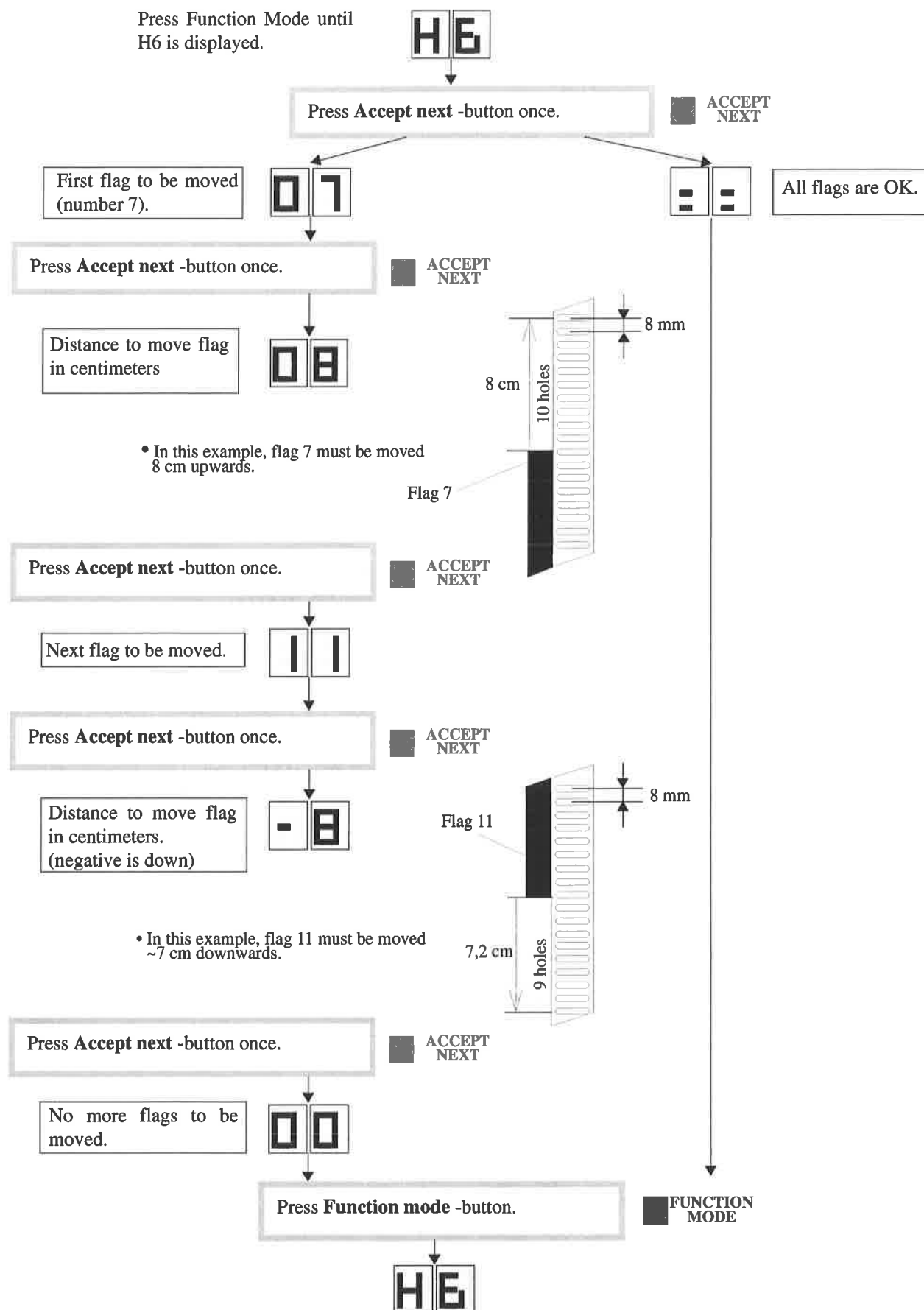
6.2.4 Function H5 - Synchronization magnet positions

This function displays where the 77 synchronization magnets must be positioned. The distances displayed are from the centre of each terminal floor flag.



6.2.5 Function H6 - Flag position check

This function checks that the centre of each flag is within ± 30 mm (± 1 inch.) from physical floor level.



6.2.6 Function H7 - Initiation drive - Moved flags

Only use this function if any flags have been moved as a result of function H6.

Call the elevator to top floor. LED "30 door zone" or "B30 rear door zone" and the corresponding "77:N synch" LED must be illuminated.

During this function, door operation, car calls and landing calls are automatically disabled by software.

Press Function Mode until
H7 is displayed.

H7

Press **Accept next** -button once.

ACCEPT
NEXT

08 ↔ H7

Display alternates between floor number and
H7.

Start the new initiation drive by pressing
momentarily TMS50a module buttons "Car call
top floor" and "Car call bottom floor"
simultaneously.

Car call
Top floor
Car call
Bottom
floor

The floor numbers will scroll
while the elevator is moving.

New
initiation
drive
ok/not ok ?

NOT OK

- -

Repeat functions H6 and H7.
Start again from H1 if not ok
after two tries.

Flag is not at acceptable
distance.

OK

- -

Press **Function mode** -button.

FUNCTION
MODE

H7

7 FINAL CHECKING

7.1 Functional inspection

Check:

- all elevator's delivery based features are correct as required by job specification and code. If problems emerge, see AS-10.20.3 for detailed information.
- mechanic check list (before calling adjustor)
- adjustor check list (before calling inspector)

7.2 Inspection of Synchronization switches 77:U and 77:N

- Run the car to the second floor on Normal mode.
- Turn the power OFF.
- Move the elevator manually upwards off the flag 300 - 500 mm (12 - 20 inch.). Move elevator downwards if second floor is the top floor.
- Ensure the synchronisation drive direction DIP switch Q7 is in down position.
- Turn the power ON.
- The elevator starts looking for the position information on the bottom terminal level.
- As the car arrives at the 77:N switch, the 77:N SYNCHRONIZATION SWITCH DOWN input LED turns ON in TMS50a.
- Elevator should decelerate and stop at bottom terminal floor level within 10 mm (1/2 inch.) accuracy.
- Switch the power OFF.
- Turn DIP switch Q7 in upwards.
- Move the elevator manually upwards off the flag 300 - 500 mm (12 - 20 inch.).
- Turn the power ON.
- The elevator starts looking for the position information on the top terminal level.
- Elevator should decelerate and stop at terminal floor level within 10 mm (1/2 inch.) accuracy.
- Switch the power OFF.
- Turn DIP switch Q7 downwards.

7.3 Inspection of function point of the final limit switch 151:N

- Drive the car to the bottom floor in Normal mode.
- Turn the power OFF.
- Mark floor level to the ropes.
- Install jumper across terminals C4/10 and M4/10.
- Turn Inspection ON.
- Turn the power ON.
- Press inspection down 265:N button until the elevator stops and the SAFETY CIRCUIT LED illuminates RED indicating 151:N opens
- Turn the power OFF
- Measure overtravel distance from rope markings. It should be about 100 - 150 mm (4 - 6 inch.). Adjust if needed.
- Install jumper across terminals H4/1 - H4/2.
- Turn the power ON.
- Press inspection up 265:U button until the 77:U LED is ON indicating car is at the level.
- Turn the power OFF.
- **Remove jumper across terminals H4/1 - H4/2.**
- **Remove jumper across terminals C4/10 - M4/10.**

7.4 Inspection of function point of the final limit switch 151:U

- Turn the power ON.
- Turn Inspection OFF.
- Drive the car to the top floor in Normal mode.
- Turn the power OFF.
- Mark floor level to the ropes.
- Install jumper across terminals C4/10 and M4/10.
- Turn Inspection ON.
- Turn the power ON.
- Press inspection up 265:U button until the elevator stops and the SAFETY CIRCUIT LED illuminates RED indicating 151:U opens.
- Turn the power OFF.
- Measure overtravel distance from rope markings. It should be about 100 - 150 mm (4 - 6 inch.). Adjust if needed.
- Install jumper across terminals H4/1 - H4/2.
- Turn the power ON.
- Press inspection down 265:N button until the 77:N LED is ON indicating car is at the level.
- Turn the power OFF.
- **Remove jumper across terminals H4/1 - H4/2.**
- **Remove jumper across terminals C4/10 - M4/10.**

7.5 Final limit switch 151:N and 151:U test on inspection speed

- Switch the elevator in inspection drive mode.
- Drive the car next floor up from bottom floor.
- Turn the power OFF.
- Install jumper across terminals C4/10 and M4/10.
- Turn the power ON.
- Drive the elevator downwards by inspection drive until the SAFETY CIRCUIT LED illuminates RED in TMS50a.
- Turn the power OFF.
- Install jumper across terminals H4/1 - H4/2.
- Turn the power ON.
- Press inspection up 265:U button until the SAFETY CIRCUIT LED is GREEN indicating that the safety circuit is closed.
- Turn the power OFF.
- **Remove jumper at terminals H4/1 - H4/2.**
- Drive the car up in inspection speed to the top final limit 151:U. It will disconnect the safety circuit and the SAFETY CIRCUIT LED should be RED in TMS50a.
- Turn the power OFF.
- Install jumper across terminals H4/1 - H4/2.
- Turn the power ON.
- Press inspection down 265:N button until the SAFETY CIRCUIT LED is GREEN indicating the safety circuit is closed.
- Turn the power OFF.
- **Remove jumper at terminals H4/1 - H4/2.**
- **Remove jumper at terminals C4/10 and M4/10.**

7.6 Inspection of down direction limit 135:N

- Drive the car to the bottom floor in Normal mode.
- Turn the power OFF.
- Turn the DIP switch H3 upwards.
- Turn Inspection ON.
- Turn the power ON.
- Drive the elevator downwards with 265:N button.
- The elevator moves up until switch 135:N opens.
- Turn the power OFF.
- Measure that 135:N switch opened with the ohmmeter from terminals H4/4 - M4/10.
- Measure overtravel distance. It should be 30 mm (1 1/4 inch.). Adjust if needed.
- Turn the DIP switch H3 downwards.
- Turn the power ON.
- Turn Inspection OFF.

7.7 Inspection of up direction limit 135:U

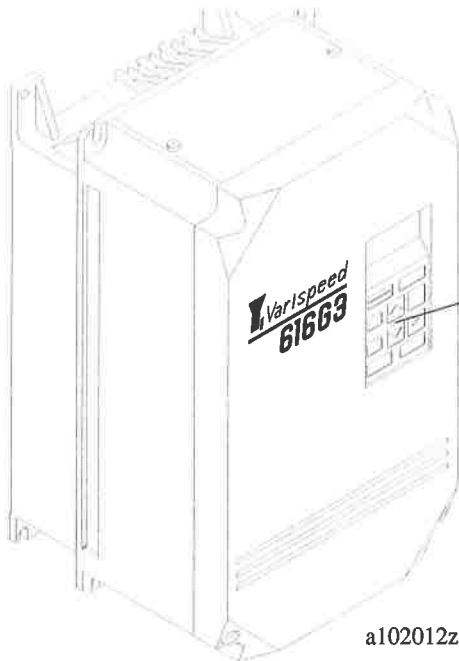
- Drive the car to the top floor in Normal mode.
- Turn the power OFF.
- Turn the DIP switch H3 upwards.
- Turn Inspection ON.
- Turn the power ON.
- Drive the elevator upwards with 265:U button.
- The elevator moves up until switch 135:U opens.
- Turn the power OFF.
- Measure that 135:U switch opened with the ohmmeter from terminals H4/3 - M4/10.
- Measure overtravel distance. It should be 30 mm (1 1/4 inch.). Adjust if needed.
- Turn the DIP switch H3 downwards.
- Turn the power ON.
- Turn Inspection OFF and check that it functions normally.

APPENDIX 1: V3F-10 FUNCTION BUTTONS AND PARAMETER SETTINGS

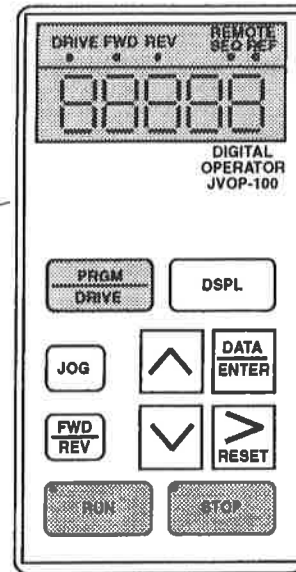
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1 BUTTONS AND SWITCHES



a102012z.eps



a102012y.wmf



Program / Drive button



Scroll button for selecting parameter block



or



Scroll button for selecting parameter or changing the value of parameter



Button for accepting the parameter



Button for selecting numbers



Not in use



Not in use

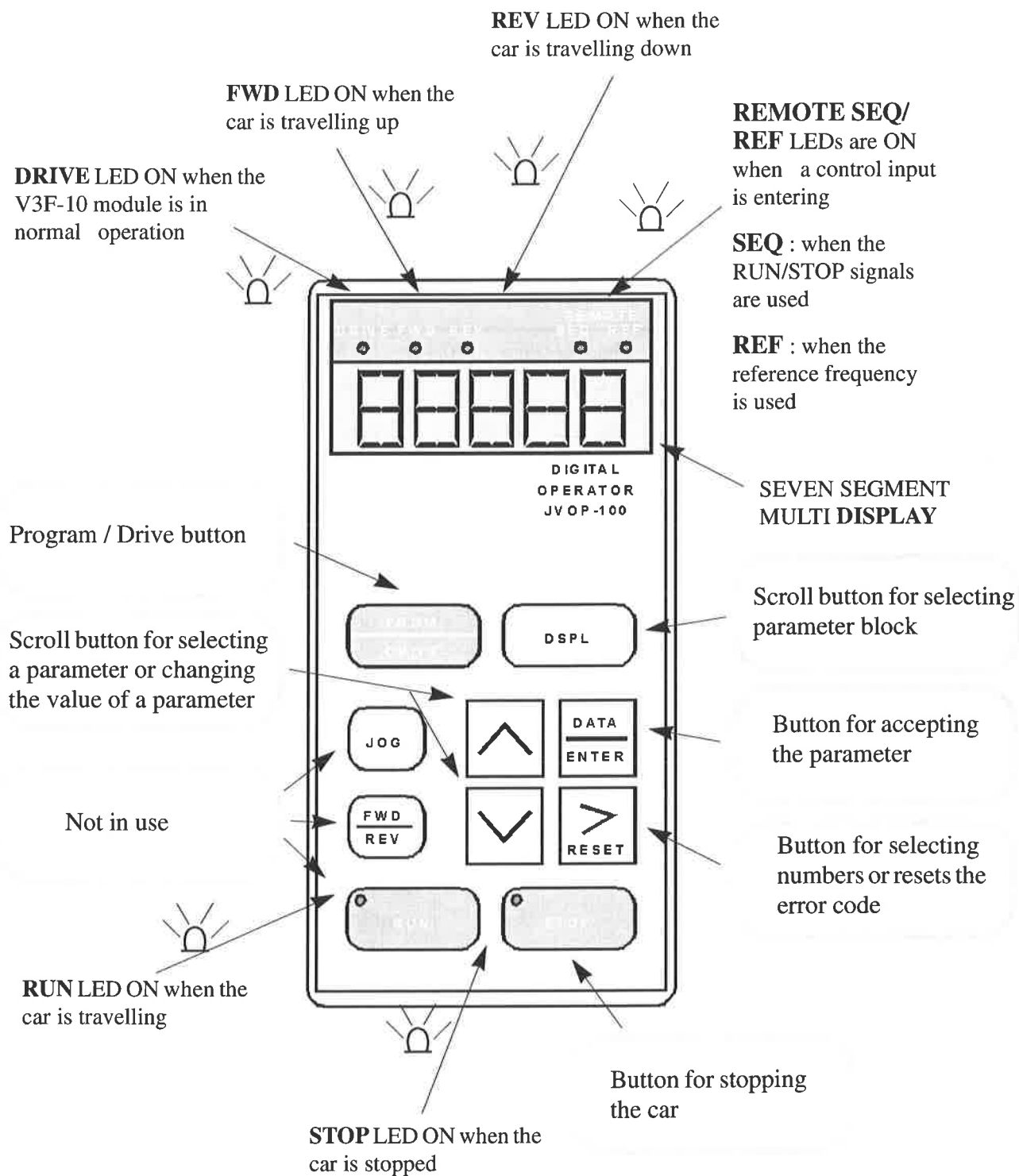


Button for stopping the car



Not in use

2 DISPLAY AND FUNCTIONS



2.1 The basic V3F-10 parameters (KONE factory setting differs from OEM setting)

- The setting of different parameters is controlled by parameter An-04 (Key word). The initial value of An-04 is 00.
- Check parameters An-01 and An-02.

Table 3: An-parameters

Symbol	Data name	KONE factory setting for TMS50a	Setting unit	Setting range	OEM setting
An-01	Motor rated current	Motor plate value	0.1A	30 to 112% of inverter rating	14 ... 48 A 7 ... 24 A)
An-02	Motor rated rpm	Motor plate value	1rpm	300 to 1800rpm	1380rpm
An-03	Motor flywheel size 1 = light 2 = medium 3 = heavy 4 = set bn-04, bn-05	4	1	1 to 4	1
An-04	Key word (hexadecimal code)	bc	1	00 to FF	00

An-04=Ab ->
setting and reading An and bn
is possible

An-04=bc ->
setting and reading An, bn,
Cn and on -parameters is pos-
sible

An-04=FF ->
parameter initialization is per-
formed (excl. bn-23)

An-04=other than above ->
setting and reading An is pos-
sible

*) Depends on the type of the module

Table 4: bn-parameters

Symbol	Data name	KONE factory setting for TMS50a	Setting unit	Setting range	OEM setting
bn-01	High speed	60.0Hz	0.1Hz	2.5 to 90.0Hz	50.0Hz
bn-02	Service speed	12.0Hz	0.1Hz	2.5 to 90.0Hz	30.0Hz
bn-03	Low speed	2.5Hz (1.0m/s) (200ft/s) 5.0Hz (0.5m/s) (100ft/s)	0.1Hz	2.5 to 10.0Hz	4.0Hz
bn-04	Acceleration time	1.0s (0.5m/s) (100ft/s) 1.5s (1.0m/s) (200ft/s)	0.1s	00 to 10.0s	1.5s
bn-05	Deceleration time	1.2s (0.5m/s) (100ft/s) 1.3s (1.0m/s) (200ft/s)	0.1s	00 to 10.0s	1.5s
bn-06	Motor no-load current **) Current when balance load recorded	60%	1%	30 to 80%	50...66% 50...66% *)
bn-07	Compensation of low speed. Set same low speed, empty car up and down	0.0	0.1	0.0 to 1.5	0.7
bn-08	Compensation of low speed time. Set same time of low speed, empty car up and down	0.0	0.1	0.0 to 4.0	2.0
bn-09	Torque compensation gain	1.0	0.1	00 to 1.2	1.0
bn-10	Maximum frequency	60.0Hz	0.1Hz	50.0 to 90.0Hz	50.0Hz

Table 4: bn-parameters

Symbol	Data name	KONE factory setting for TMS50a	Setting unit	Setting range	OEM setting
bn-11	Voltage 1 value on the motor ID plate	180 ... 255V 360 ... 510V	0.1V	180.0 to 255.0V 360.0 to 510.0V	220.0V 380.0V)
bn-12	Freq. 1	60.0Hz	0.1Hz	50.0 to 60.0Hz	50.0Hz
bn-13	Freq. 2	3.0...5.0Hz	0.1Hz	2.5 to 10.0Hz	4.0Hz
bn-14	Voltage 2	30V (bn-11=200...230V) 50V (bn-11=380...460V)	0.1V	10.0 to 40.0V 20.0 to 80.0V	23...31V 40...54V)
bn-15	Freq. 3	0.3Hz	0.1Hz	0.3 to 2.5Hz	0.3Hz
bn-16	Voltage 3	15.0V (bn-11=200...230V) 25.0V (bn-11=380...460V)	0.1V	5.0 to 20.0V 10.0 to 40.0V	11.5V 20.0V)
bn-17	Frequency, when DC braking starts at the end of the run	1.0Hz	0.1Hz	0.3 to 2.5Hz	1.5Hz
bn-18	DC braking current **)	90%	1%	60 to 90%	80%
bn-19	DC braking time at the start of the run	0.3s	0.1s	0.0 to 0.3s	0.3s
bn-20	DC braking time at the end of the run	0.4s	0.1s	0.3 to 0.5s	0.5s
bn-21	Control delay of the mech. brake at the end of the run	0.0s	0.1s	0.0 to 0.3s	0.1s
bn-22	Number of motor poles 4 = 1800rpm 6 = 1200rpm 8 = 900rpm 12 = 600rpm	4 or 6P	1	4 to 16P	4P
bn-23	kVA selection, see Table 6 and Table 7	04...08 24...28)	- - -	- - -	04...08 24...28)

*) Depends on the type of the module

**) Motor rated current becomes 100%

Table 5: Cn-parameters

Symbol	Data name	KONE factory setting for TMS50a	Setting unit	Setting range	OEM setting
Cn-02	Lower limit of frequency reference	5%	1%	1 to 10%	2%
Cn-04	Low speed period at start of the run	0s	0.1s	0.0 to 0.5s	0.3s
Cn-05	Rounding at the start of acceleration	0.8s	0.1s	0.0 to 1.0s	0.5s
Cn-09	Current when acceleration reference starts to decrease **)	220%	1%	30 to 220%	120...198% 120...198% *)
Cn-10	Current when acceleration reference is zero **)	240%	1%	30 to 240%	160...218% 160...218% *)
Cn-11	Motor phase-to-phase resistance	2.2ohm	0.001 ohm	0.000 to 65.535 ohm	0.73...1.03 2.2...3.1 ohm *)
Cn-12	Motor iron loss	72W	1W	0 to 65535	60...170W 60...145W *)
Cn-13	Torque compensation limit	50V	1V	0 to 100V	50V 100V *)
Cn-14	Carrier frequency	15.0kHz	0.1kHz	0.4 to 15.0kHz	15.0kHz

*) Depends on the type of the module

**) Motor rated current becomes 100 %

Table 6: Inverter kVA data 200 - 230V

Inverter kVA (kW)	6.9 (3.7)	10.3 (5.5)	13.7 (7.5)	20.6 (11)	27.4 (15)
bn-23 Setting data	04	05	06	07	08

Table 7: Inverter kVA data 380 - 460V

Inverter kVA (kW)	6.9 (3.7)	10.3 (5.5)	13.7 (7.5)	20.6 (11)	27.4 (15)
bn-23 Setting data	24	25	26	27	28

2.2 Additional parameters (KONE factory setting = OEM setting)

Table 8: Cn-parameters

Symbol	Data name	KONE factory setting for TMS50a	Setting unit	Setting range	OEM setting
Cn-01	Full speed period needed for slip compensation	0.5s	0.1s	0.0 to 2.0s	0.5s
Cn-03	Minimum current needed to open mechanical brake **)	50%	1%	0 to 100%	50%
Cn-06	Rounding at the end of acceleration	0.5s	0.1s	0.0 to 1.0s	0.5s
Cn-07	Rounding at the start of deceleration	0.5s	0.1s	0.0 to 1.0s	0.5s
Cn-08	Rounding at the end of deceleration	0.5s	0.1s	0.0 to 1.0s	0.5s
Cn-15	Fault detection time, in witch motor current must reach value set by Cn-03. Controller must cancel commands in 2 seconds, otherwise elevator will be blocked	1.0s	0.1s	0.5 to 1.5s	1.0s
Cn-16	Fault detection level of too low motor phase current	5%	1%	0 to 200%	5%
Cn-17	Fault detection time of too low motor phase current	0.2s	0.1s	0 to 2.0s	0.2s
Cn-18	Fault detection level of overtorque	160%	1%	30 to 200%	160%
Cn-19	Fault detection time of overtorque	4.0s	0.1s	0.0 to 5.0s	4.0s
Cn-20 ***)	Fault detection level of over speed	20%	1%	10 to 50%	20%
Cn-21 ***)	Fault detection time of over speed	3.0s	0.1s	0.0 to 5.0s	3.0s
Cn-22 ***)	P gain at 0 Hz	0.2	0.01	0.00 to 0.50	0.2
Cn-23 ***)	Integral time at 0 Hz	0.5s	0.1s	0.1 to 2.0s	0.5s

Table 8: Cn-parameters

Symbol	Data name	KONE factory setting for TMS50a	Setting unit	Setting range	OEM setting
Cn-24 ***)	P gain at maximum frequency	0.1	0.01	0.00 to 0.50	0.1
Cn-25 ***)	Integral time at maximum frequency	0.5s	0.1s	0.1 to 2.0s	0.5s
Cn-26 ***)	Speed detection scaling	1.0	0.001	0.000 to 2.500	1.000
Cn-27	Motoring slip compensation gain at motor low temperature	1.0	0.1	0.0 to 1.0	1.0
Cn-28	Motoring slip compensation gain at motor high temperature	1.0	0.1	0.0 to 1.0	1.0
Cn-29	Regen. slip compensation gain at motor low temp.	0.5	0.1	0.0 to 1.0	0.5
Cn-30	Regen. slip compensation gain at motor high temp.	0.5	0.1	0.0 to 1.0	0.5
Cn-31	Motor temp. time constant	60 min	1 min	30 to 60 min	60 min
Cn-32	Motor temp. rise width	20 °C	1 °C	0 to 50 °C	20 °C
Cn-33		60	0,1		60

**) Motor rated current becomes 100 %

***) Additional Cn-parameters if tachometer is used

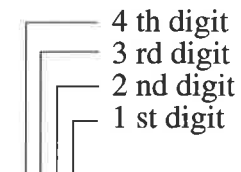


Table 9: on-parameters (KONE factory setting 0010, OEM setting 0010)

Symbol	Digit	Data name
on-01	1st digit	0: Short-floor operation is effective 1: Short-floor operation is not effective
	2nd digit	0: Fault detection of UP, DOWN, HIGH, SERVICE and LOW input signals 1: Fault detection of UP and DOWN input signals
	3rd digit	0: TG speed control is effective when AI-14B is installed 1: TG speed control is not effective even when AI-14B is installed. (Slip compensation is standard.)
	4th digit	0: Switching frequency during DC injection is 4kHz. 1: Switching frequency during DC injection is 6kHz

***Note:** Do not change other on-constants. It may cause damage to inverter.

2.3 How to change the parameters

2.3.1 Changing the An-parameters

E.g. To change the motor rated current value from 48 A to 38 A, the value of An-01 must be readjusted to 38. Key operation for the digital operator is then as follows:



Press until the led DRIVE is off.



Press until the letters An- and any two numbers are shown on the display.



or



Press until "An-01" is on the display.



Press once. The current setting "48" appears on the display.



Press until the digit "4" flashes on the display.



Press until the digit "3" flashes on the display.



Press once. The word "End" is displayed for a moment.



Press once. The led DRIVE will turn on.

E.g. To change the motor rated rpm value from 1380 to 1350, the value of An-02 must be readjusted to 1350. Key operation for the digital operator is then as follows:



Press until the led DRIVE is off.



Press until the letters An- and any two numbers are shown on the display.



or



Press until "An-02" is on the display.



Press once. The current setting "1380" appears on the display.



Press until the digit "8" flashes on the display.



Press until the digit "5" flashes on the display.



Press once. The word "End" is displayed for a moment.



Press once. The led DRIVE will turn on.

2.3.2 Changing the bn-parameters (change An-04 first, if the value is not bc)

E.g. To change the deceleration time from the value 1.8s to 1.5s, the value of bn-05 must be readjusted to 1.5. Key operation for the digital operator is then as follows:



Press until the led DRIVE is off.



Press until the letters bn- and any two numbers are shown on the display.



or



Press until "bn-05" is on the display.



Press once. The current setting "1.8" appears on the display.



RESET

Press until the digit "8" flashes on the display.



Press until the digit "5" flashes on the display.



Press once. The word "End" is displayed for a moment.



Press once. The led DRIVE will turn on.

***Note:** The parameter bn-23 is not adjustable.

2.3.3 Changing the Cn-parameters (change An-04 first, if the value is not bc)

E.g. To change carrier frequency from the value 15 kHz to 13 kHz, which means that the value of Cn-14 must be readjusted to be 13.0. Key operation for the digital operator is then as follows:



Press until the led DRIVE is off.



Press until the letters Cn- and any two numbers are shown on the display.



or



Press until "Cn-14" is on the display.



Press once. The current setting "15" appears on the display.



RESET

Press until the digit "5" flashes on the display.



Press until the digit "3" flashes on the display.



Press once. The word "End" is displayed for a moment.



Press once. The led DRIVE will turn on.

2.3.4 Changing the on-parameters (change An-04 first if the value is not bc)

E.g. To allow the TMS50a to decide whether the short-floor operation is in use or not the on-01 must be readjusted to 0011. Key operation for the digital operator is then as follows:



Press until the led DRIVE is off.



Press until the letters on- and any two numbers are shown on the display.



or



Press until "on-01" is on the display.



Press once. The current setting appears on the display.



Press until the first digit "0" from the right flashes on the display.



Press once. The digit "1" flashes on the display.



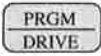
Press once. The word "End" is displayed for a moment.



Press once. The led DRIVE will turn on.

2.3.5 Monitor function

By means of a series of operations to be carried out in DRIVE MODE, with the elevator travelling as well as stopped, it is possible to display information such as reference frequency and output current; in particular, Un- parameter records a series of numbers concerning V3F-10 functioning.



LED DRIVE must be on, being the normal drive, and the reference frequency value is displayed.



Output current value is displayed (0.0 A with the elevator stopped).



The Un-01 parameter is displayed " monitor function " (*Note).



The value in reference frequency available at output is displayed.



Return to V3F-10 drive frequency display.

***Note:** to display, during the function of the device, the information of Un- parameters, it is necessary to carry out the following operations:



The Un-01 parameter is displayed.



Data recorder in the parameter are displayed.



Back to Un-01 parameter.



Un-02 parameter is displayed.



Data recorder in the Un-02 parameter are displayed.



Back to Un-02 parameter.



Un-03 parameter is displayed.

At the end of the displaying of all the data of the 13 Un parameters available, by pressing the key **DSPL** the normal drive frequency of V3F-10 is displayed again.

3 ADJUSTMENT INSTRUCTIONS FOR MOTOR EXCITATION

The motor excitation has to be adjusted if the elevator does not start for a valid drive command, or if the speed of the elevator is very low in case when it should be running on a normal speed.

Wrong excitation may also cause driving problems on a creeping speed. If there is problems in the excitation the V3F-10 will indicate it with an "oL" error code.

The motor excitation is corrected with proper V3F-10 parameters by using the method described on the next page.

The excitation can be adjusted as follows:

