Digital Position System
Installation Manual

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Contents

1.0 - System description

The Digital positioning system basically consists of the following three components.

[1- Encoder]
This is a multi-turn incremental encoder (500ppr for most applications) with the addition of a purpose designed microprocessor module that takes the raw output signals of the encoder and converts them to messages that are made available to the lift controller via the car communications network, all data acquired during the setup operation is stored in this device, it essentially becomes an absolute encoder after a shaft setup.
This device also has a single input designated to read the state of the Door zone (Magnet zone) proximity switch. See **[2- Door zone switch]** below.
The Encoder may be driven a number of ways dependant on travel distance and speed of lift.
The most popular are :-

- Over Speed Governor mounting.
- Purpose designed shaft pulley system.

See Section 3.0 System components.
See Section 5.0 Encoder installation.

[2- Door zone switch]
This device is a Bi-stable magnetic proximity switch that provides the signal used for identifying floor positions during the setup operation, and used for door zone conformation and position correction after the system is setup.
This signal is connected directly to the Encoder and to the controller.
The switch is activated by a pair of magnets placed at a set distance apart with two opposing poles for each floor level. The switch is On when in between the magnets.
See Section 4.0 Proximity switch and magnet installation

[3- Reset switch] (Calibration or Index correction position)
This is another Bi-stable magnetic proximity switch that provides the signal for identifying the Pre-designated reset position (usually mid shaft and set as a user parameter), it is used during the setup operation and also to reset the position when the encoder is lost (count not Valid) after power loss or re-boot.
A single magnet is used to activate this switch, this magnet must not overlap with the door zone magnets.
The signal from this switch is fed directly to the controller only, the system expects the switch to be on (Activated) when the lift car travels past the magnet in the Up direction and remains on while the lift is above the magnet.
The switch will turn off only when the lift car travels past the magnet in the Down direction and remains off while the car is below the magnet.
See Section 4.0 Proximity switch and magnet installation
The switch state is sent to the Encoder via the car communications network.

[4- Terminal floor switch] (TFS - Backup slowing for terminal floors)
Another Bi-stable magnetic proximity switch that provides backup slowing if the lift is approaching a terminal floor at high speed. The signal from the switch is on when the lift is on terminal floor side of the magnet. **This switch should not be connected until after a shaft learn has been completed and the floor levels trimmed.**

Operation
In addition to the Magnets and proximity switches the Digital positioning system requires a small amount of information specific to the site, in the form of user parameters, before a setup operation is possible.
Some of these parameters are also duplicated in the controller.
See Section 6.0 Table 6.0

These parameters are entered with the Handheld MMI device provided.
After these parameters have been entered and saved the lift controller can be turned to Automatic operation and a complete setup operation performed. See Section 7.0

The system is responsible for determining the travel speeds, slowing and stopping positions for the lift car this information is transferred via the car communications network. This is relayed to the drive system from the controller.
The positioning information is only valid after the encoder has received confirmation of the physical shaft position of the lift car, which is derived from passing the mid-shaft reset switch position.

If the Digital positioning system is lost due to power loss or a re-boot the controller detects that the encoder position has become not valid and the following operation is performed:-

- On Automatic operation the controller will request a dive, the direction of which is determined by the current state of the reset switch, the direction is set so that the car passes the reset switch and it changes state. The dive speed is always V1.

- On Inspection when the encoder is not valid the lift car is only allowed to travel in the direction that will cause a change of state of the reset switch.

After the encoder position has become valid, normal operation is allowed and movement in both directions on Inspection is possible.

The system is a tightly closed loop, which continuously monitors the travel speed, magnet positions and communication integrity. If any of these factors are found to be out of tolerance the relevant error is generated and lift movement is stopped immediately. It is therefore important that all these factors are correct and are not changed after the setup operation.

If the lift controller has a Direct To Floor system for the motor drive this should be disabled before a shaft setup is started - e.g. ***Engineers Tools – Disable Direct to Floor – DTF Disable = ON :***

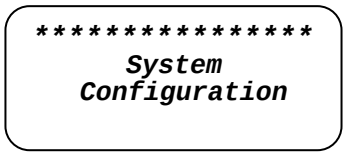
2.0 - Getting Started

Note:
Text that appears as ***Bold Italics*** refers to text that can be seen on the MMI LCD displays.

The Digital positioning system is in constant communication with the lift controller by the means of an Exist message, if for any reason this communication ceases the lift controller will not allow movement of the lift car.

During the installation when the encoder is not fitted and movement of the lift or platform is required on Inspection the controller must have the following parameter set.
From Handheld MMI or Controller MMI :-

1.

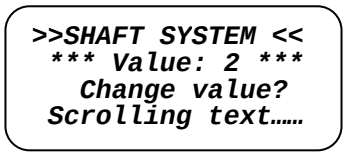


Enter

2.

Enter

3.



Set the ***SHAFT SYSTEM*** **value to 2**, this tells the controller there is no encoder fitted.

Enter

Warning: This setting must be saved or it will be lost if the system is turned off.

The controller will now allow movement of the lift car under Inspection control and Emergency Operation (EMOP pendant when fitted). Providing the safety circuit signals are present.

Warning: Do not switch the Controller to Automatic.

Installation of the shaft components may now begin, it is important to familiarize yourself with the relevant components in Section 3.0 and adhere to the fitting instructions. Any deviation or modifications to the following instructions, components or circuits may result in problems during the setup operation.

Please Note: If the Bi-stable magnet switch has a captive cable (Schmersal BN325-r-1275) then the magnet polarities shown in this manual may be reversed.

3.0 - System components

Kit Contents

Three (3) Bi- stable proximity switches.	Part No.	-	822-0193
Four (6) Brackets for proximity switches.	Part No.	-	800-1213
Magnets equal the number of stops of lift x 2 plus three. e.g. On a fifteen (15) stop lift you should have received thirty one (33) magnets.	Part No.	-	402-0009

One (1) Encoder :-			
6mm Shaft type	Part No.	-	811-0044
Or			
10mm Shaft type	Part No.	-	811-0037
One (1) Encoder loom (10M).			
Custom size Encoder loom	Part No.	-	907-0223

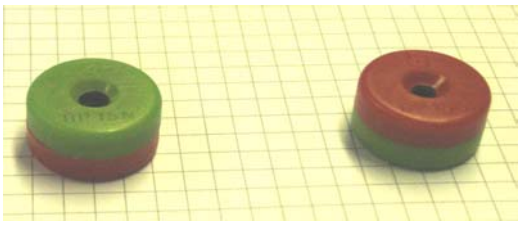
One (1) pulley Kit :-			
Type 14A	Part No.	-	811-0054
Toothed Belt/Meter	Part No.	-	811-0055
Or			
Type 15A	Part No.	-	811-0040
Cord/Meter	Part No.	-	811-0041
Or			
One (1) Over Speed Governor	(Specification as per contract)		

One (1) Hand Held MMI (Per Contract)	Part No.	-	970-6002
One (1) Hand Held MMI cable (Per Contract)	Part No.	-	801-0271

For spares or replacement parts please call Sales at Lifteknic on +44(0)1352 707470 and quote the Contract No. and our Part No.

3.1 – Identifying System components

800-1213 Mounting Brackets fig 3.1

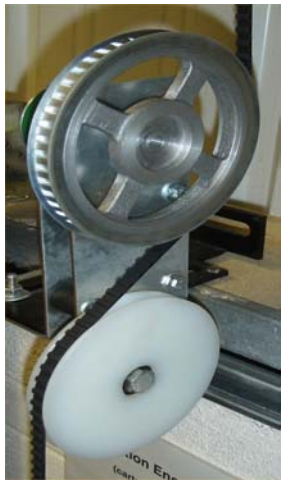


402-0009 Button Magnets fig 3.0

811-0044 Encoder 6mm Shaft (OSG)
811-0037 Encoder 10mm Shaft fig 3.2

822-0193 Bi-Stable Proximity Switch (Brackets also shown) fig3.3

811-0040 Type15A Pulley (10mm Shaft encoder) fig 3.4



811-0054 Type14A Pulley (10mm Shaft encoder) fig 3.5

3.1 System components – Continued

970-6002 Handheld MMI

fig 3.6

Overspeed Governor with Encoder Mounting (6mm Shaft Encoder)

fig 3.7

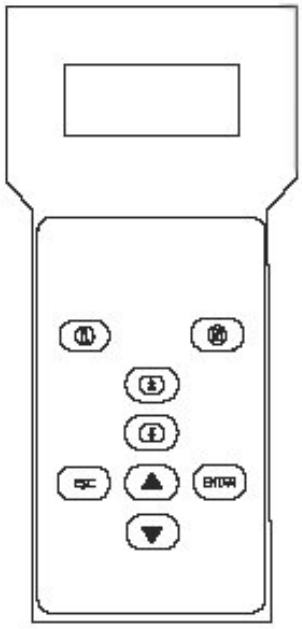
3.2 Using Handheld MMI

The handheld MMI supplied provides:

- Access to the same features available on the Controller MMI.
- Adjustment of parameters.
- The means to setup the positioning system.
- Remote access to all above (May be used in car or, on car top)

It is provided with a plug-in cable connector, connections for the device can be found:

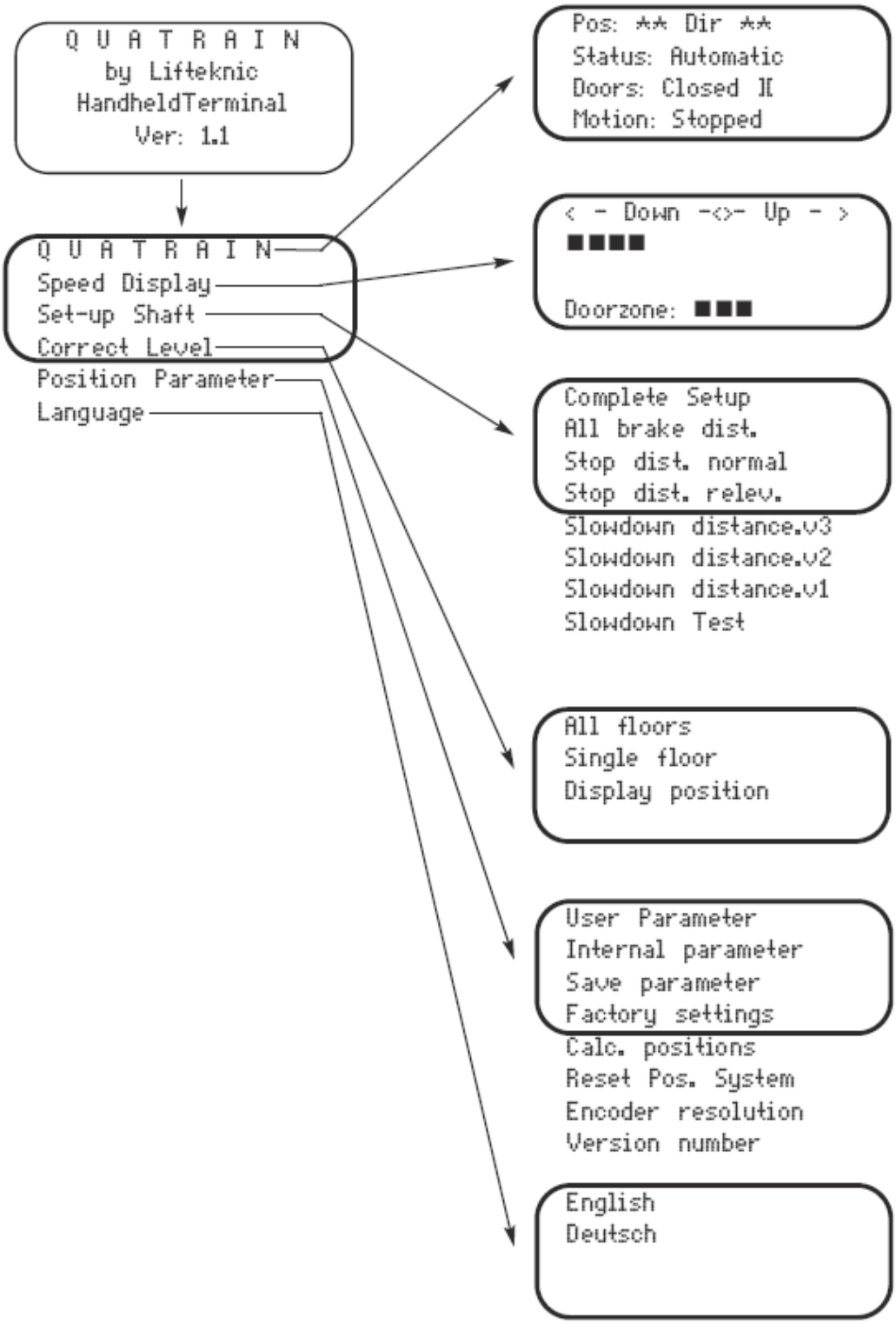
- Inside the controller cabinet.
- On top of lift car in Car top unit (when fitted).
- In car C.O.P. using position indicator connection (when fitted).
- Flying lead in car from car top unit (when fitted).
- Emergency Operating Panel (MRL Only).



Functions of keys on Handheld MMI

ENTER	select the required function or apply the edited value
ESC	quit the selected function or return to the previous menu
▲	select the next menu item up or to increase values when editing settings
▼	select the next menu item down or to decrease values when editing settings
▲▲	scroll upwards through the content of a screen or to move the decimal place values when editing settings
▼▼	scroll downwards through the content of a screen or to move the decimal place values when editing settings

Handheld MMI Menu structure



Complete HMMI menu options

```
Quatrain            Pos:  1 Dir: <>
                    Status: HandWind
                    Doors : Undef
                    Off Dz  M/s 0.00

                    <-Down-< >--Up--
Speed display       >
                    ▓▓▓▓▓▓▓▓
                    Doorzone:▓▓▓▓▓▓▓▓

Set-up shaft        Complete Setup
                    All brake dist.
                    Stop dist.normal
                    Stop dist.relev.
                    Slowdown dist.v3
                    Slowdown dist.v2
                    Slowdown dist.v1
                    Slowdown Test

Correct level       All floors
                    Single floor
                    Display position   Fl. 2 Spd.     0
                                       Actpos.  1000000
                                       Setpos.        0
                                       Differ.  1000000

Position param.     User parameter     Top floor      4
                                       Bottom floor   1
                                       v nom (v3)  1000
                                       v red.(v2)   800
                                       v red.(v1)   500
                                       v adv.door   800
                                       v re-level   300
                                       v Test(vI)   620
                                       Resolution/cm 10
                                       Reset floor    2
                                       Doorzone     300
                                       Levelzone     40

                    Internal param.    General paramet.   Setup ready   NO
                                                          Correct.Min.   0
                                                          Correct.Max. 100
                                                          Dir.check    200
                                                          Check move     1
                                                          Check start    3
                                                          Encoder dir.   0
                                                          Resetp.  1000000
```

Position param.	Internal param.	General distanc.	Dist.v3	0
			Dist.v2	0
			Dist.v1	0
		Setup parameter	Average no.	7
			Constant no.	40
			Delay no.	8
		Floor positions	Fl. 4	0
			Fl. 3	0
			Fl. 2	0
			Fl. 1	0
		Magnet positions	Fl. 4 abv.	---
			Fl. 4 bel.	0
			same for all floors	
			Fl. 1 abv.	0
			Fl. 1 bel.	---
		Corr. Magnets	Fl. 4 abv.	---
			Fl. 4 bel.	YES
			same for all floors	
			Fl. 1 abv.	YES
			Fl. 1 bel.	---
		Display position	Fl. 4 abv.	---
			Fl. 4 bel.	0
			same for all floors	
			Fl. 1 abv.	0
			Fl. 1 bel.	---
		Door zones	Fl. 4 abv.	0
			Fl. 4 bel.	0
			same for all floors	
			Fl. 1 abv.	0
			Fl. 1 bel.	0
		Re-level zones	Fl. 4 abv.	0
			Fl. 4 bel.	0
			same for all floors	
			Fl. 1 abv.	0
			Fl. 1 bel.	0
		Brakedistance v3	Fl. 4 abv.	---
			Fl. 4 bel.	0
			same for all floors	
			Fl. 1 abv.	0
			Fl. 1 bel.	---

Position param.	Internal param.	Brakedistance v2	Fl. 4 abv.	---
			Fl. 4 bel.	0
			same for all floors	
			Fl. 1 abv.	0
			Fl. 1 bel.	---
		Brakedistance v1	Fl. 4 abv.	---
			Fl. 4 bel.	0
			same for all floors	
			Fl. 1 abv.	0
			Fl. 1 bel.	---
		Stop distance v0	Fl. 4 abv.	0
			Fl. 4 bel.	0
			same for all floors	
			Fl. 1 abv.	0
			Fl. 1 bel.	0
		Stop dist.Relev.	Fl. 4 abv.	0
			Fl. 4 bel.	0
			same for all floors	
			Fl. 1 abv.	0
			Fl. 1 bel.	0
		Slow dist. Test	vT1 abv.	0
			vT2 abv.	0
			vT2 bel.	0
			vT1 bel.	0
	Save parameter	*saves all parameters currently set in PSE*		
	Factory settings	*changes all settings to factory default values & saves*		
	Calc. positions	Calculate all		
		Door zones		
		Re-level zones		
		Brakedistance v3		
		Brakedistance v2		
		Brakedistance v1		
		Stop distance v0		
		Stop dist.Relev.		
		Slow dist. Test		
	Reset Pos.system	*sends reset signal to PSE*		
	Encoder resolut.	PPR	500	
	Version number	Version	1.02	
Language	English			
	Deutsch			

4.0 - Proximity switches and magnets

Three Bi-stable magnetic proximity switches that are provided must be fitted on the top of the lift car.
The brackets for the switches are designed so that the two magnet channels may be fixed directly to the guide rail.

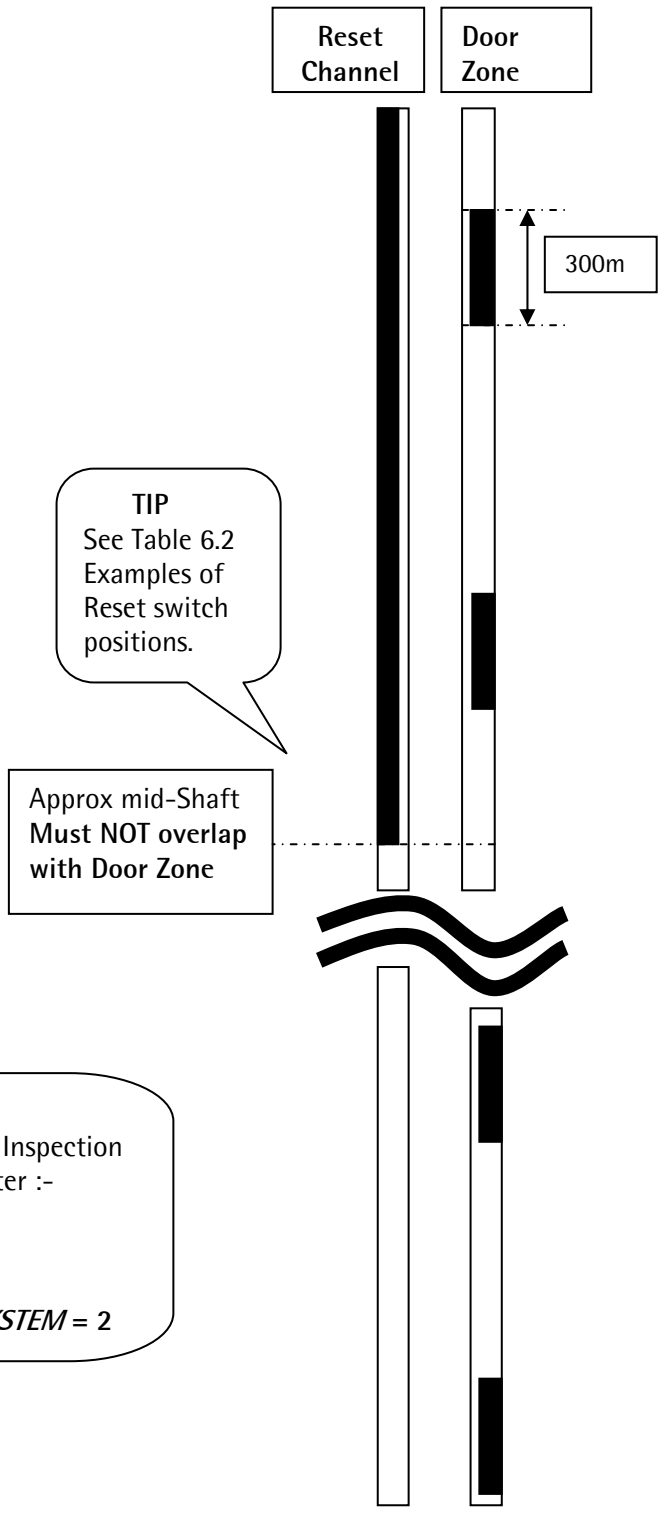
The minimum and maximum sensing distance must always be observed.
See Fig 4.1 – 4.5

Rule of thumb:-

If Proximity switches are mounted with captive cable at top:

Top door zone magnets should be Red facing out and **Bottom door zone magnets** should be Green facing out.

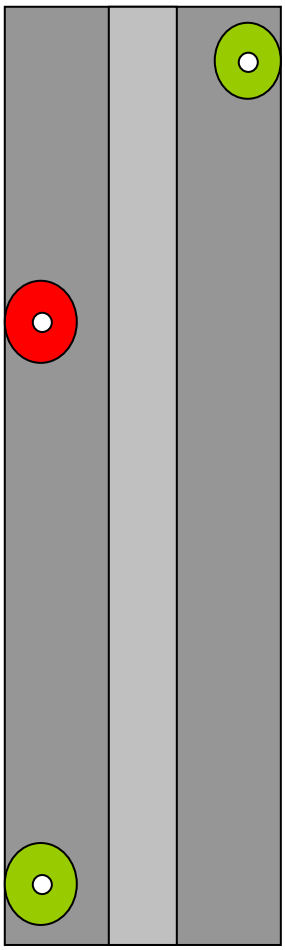
Fig 4.0 Overview of Magnet positions

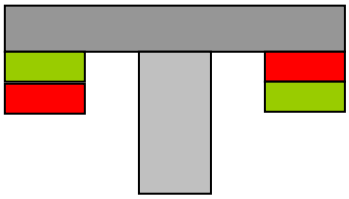


TIP
To enable movement of the lift on Inspection with no encoder fitted set Parameter :-
Quatrain
System Configuration -
Contract -
***SHAFT SYSTEM* = 2**

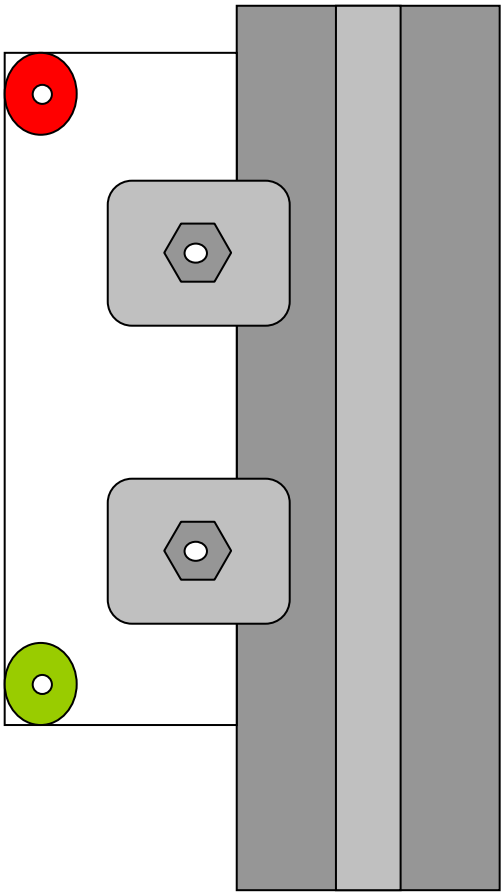
Fig 4.1 Example Fixing Methods for Magnets

Magnets mounted on guide rail
Front View
DZ Reset





Magnets mounted on guide rail
Top View
DZ Reset



TIP
Make sure guide is clean and grease free. Glue or fix magnet with screw. Mark around magnet with Paint / Liqiud paper so its position can be easily located if accidentally moved.

Example of Magnets mounted on Bracket fixed to guide rail with guide clips (not provided)
Front View

Fig 4.2 Door Zone for INTERMEDIATE Floors

Note: The more accurate the placement of the magnets with car sill being level with the landing sill will result in less adjustment after the setup process is completed.
Non colour coded magnets have an S to indicate south pole. You should establish switch polarity before fitting all magnets as switches supplied may vary.

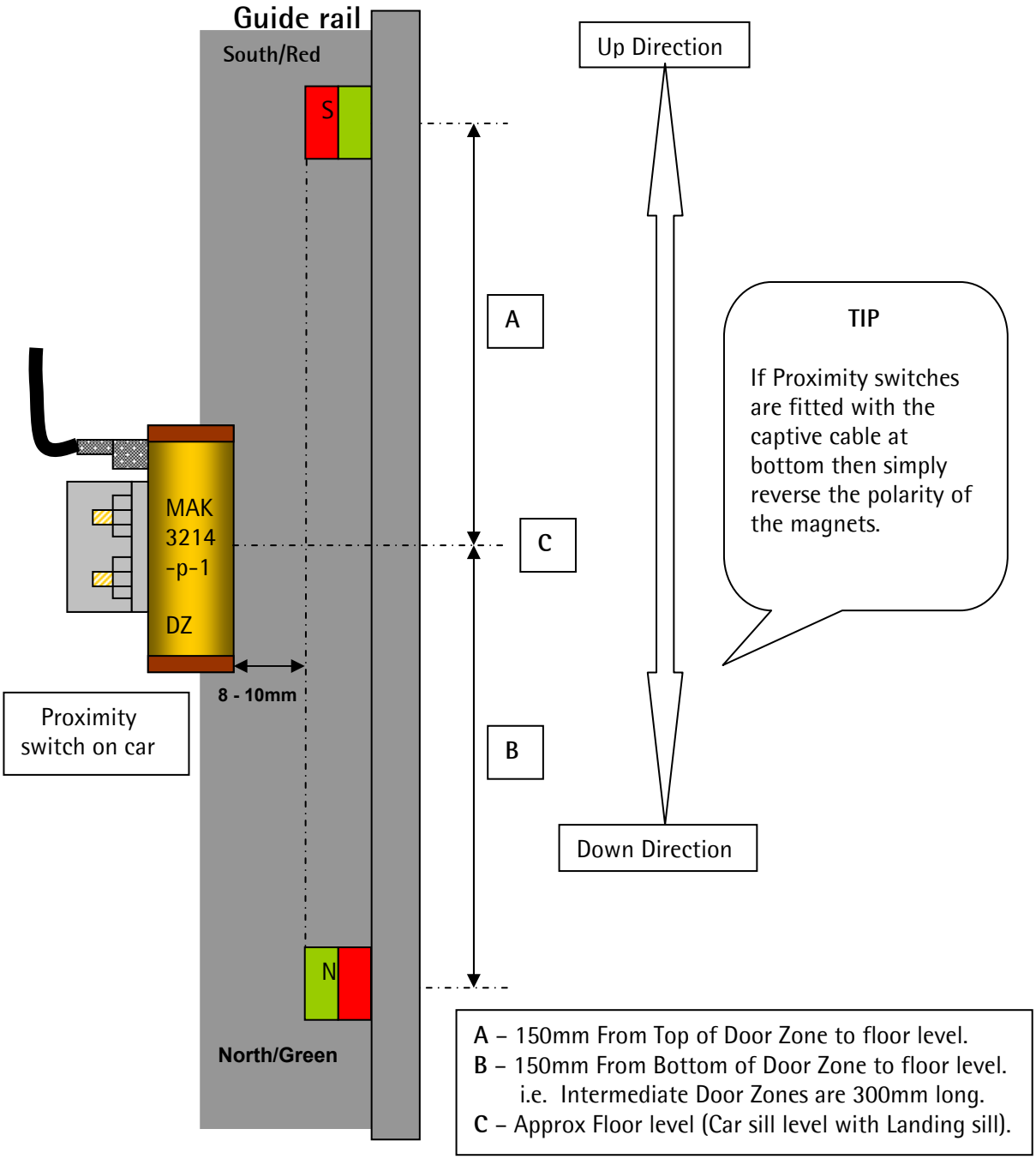


Fig 4.3 Door Zone for TOP Terminal Floor

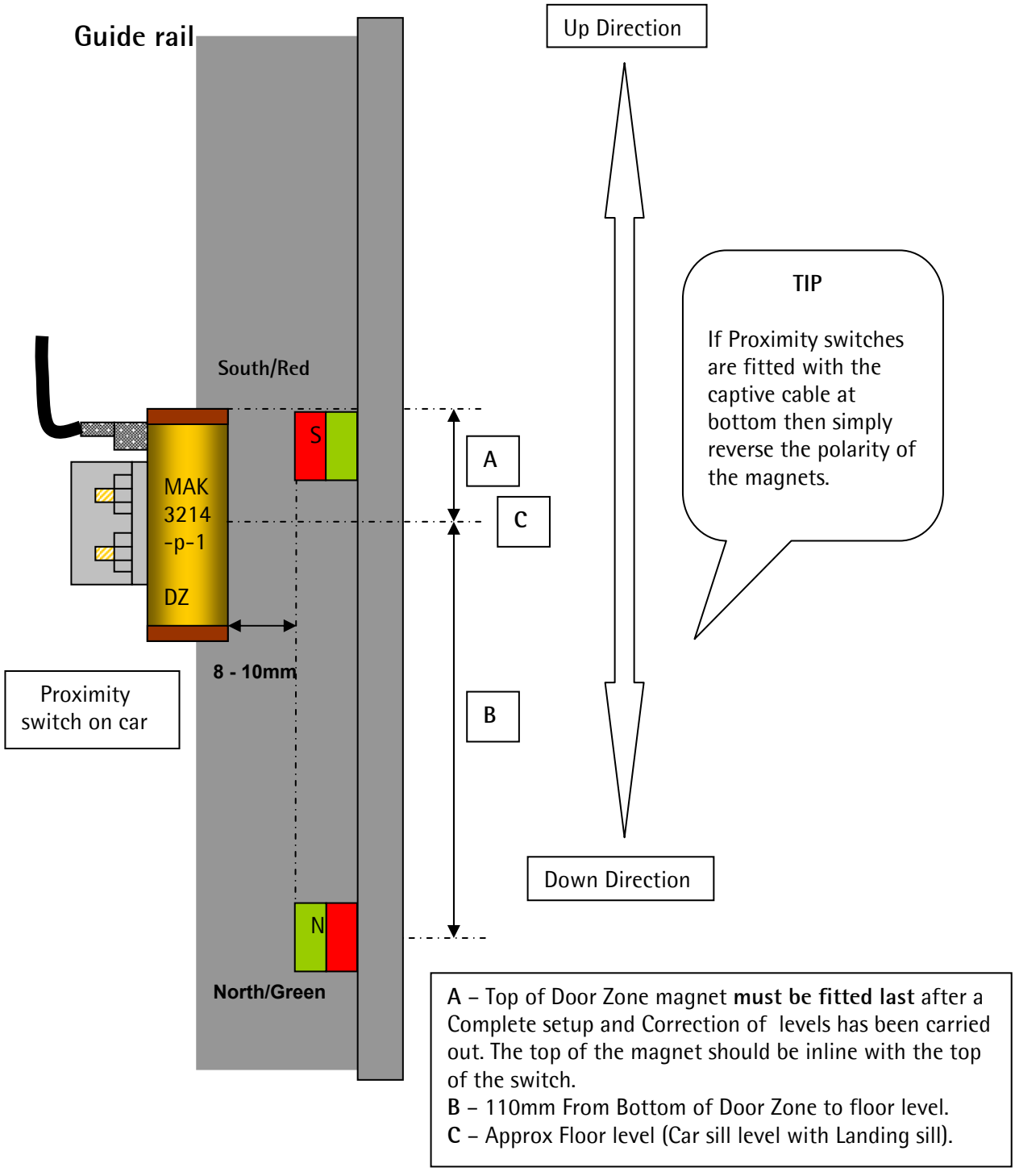
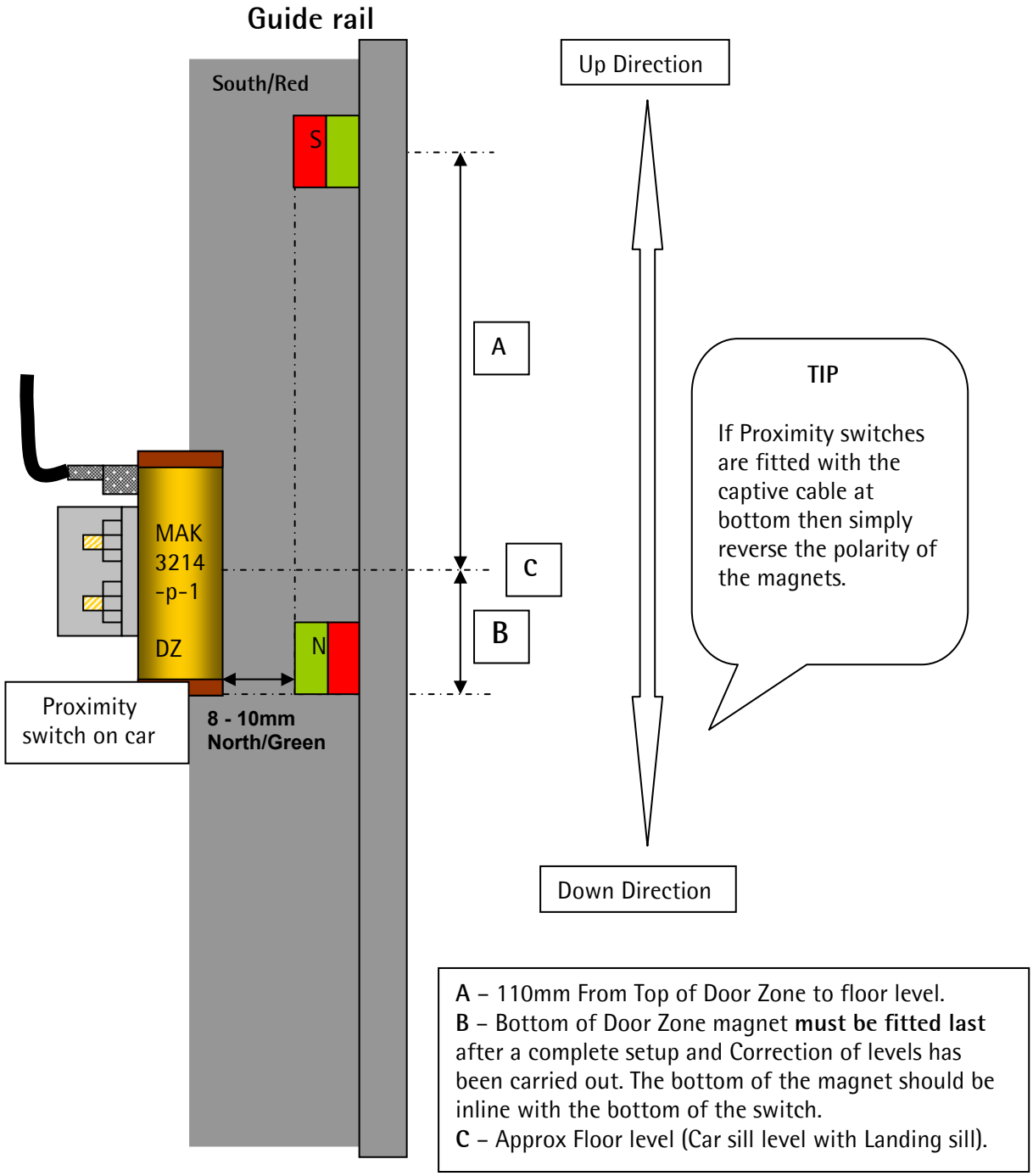
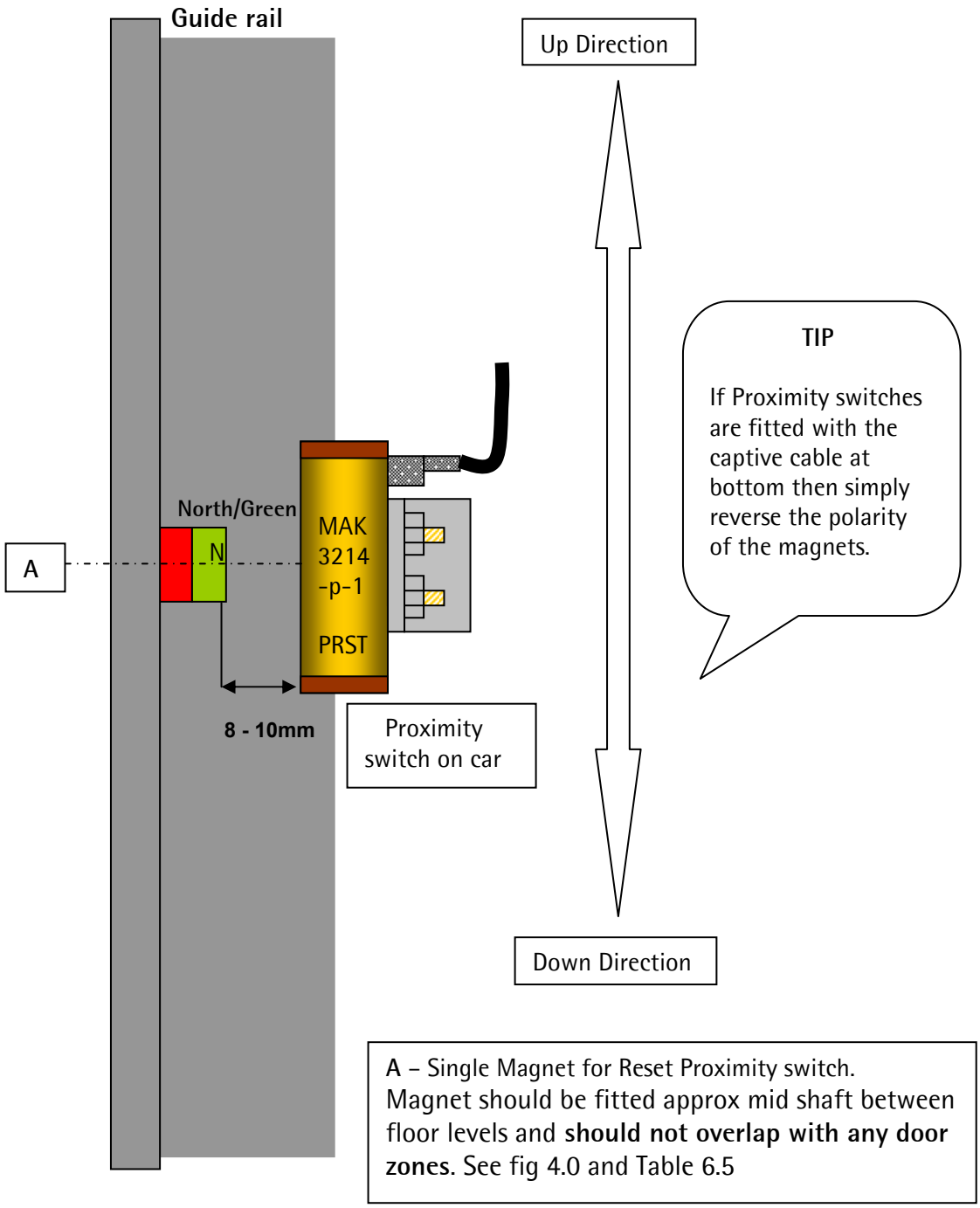


Fig 4.4 Door Zone for BOTTOM Terminal Floor



A – 110mm From Top of Door Zone to floor level.
B – Bottom of Door Zone magnet **must be fitted last** after a complete setup and Correction of levels has been carried out. The bottom of the magnet should be inline with the bottom of the switch.
C – Approx Floor level (Car sill level with Landing sill).

Fig 4.5 Reset Switch mid shaft (Single magnet)



A – Single Magnet for Reset Proximity switch.
Magnet should be fitted approx mid shaft between floor levels and **should not overlap with any door zones**. See fig 4.0 and Table 6.5

5.0 - Encoder Installation

Once the magnetic proximity switches and the magnets have been installed, the encoder must be installed and connected to the network.

Fig 5.0

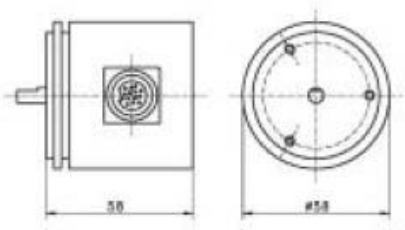
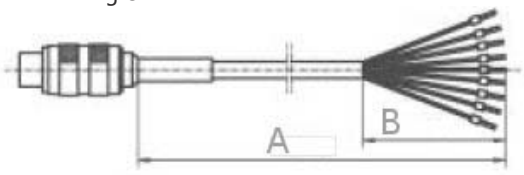


fig 5.1



The encoder is supplied ready assembled with the microprocessor module built in.
For this reason only this encoder and its associated cable may be used.
Great care must be taken when installing the encoder, it is optical device and is extremely sensitive to impact.
The encoder must never be opened as there are no user serviceable parts inside and this will invalidate any warranties.

Mechanical Mounting
If using pulley system Type14A, Type 15A please refer to assembly and fitting instructions supplied with the pulley kit.
If using the overspeed governor please refer to the fitting instructions supplied with the unit.

Connections
The cable supplied should not be modified in any way, it is a multi core screened cable and it carries system critical data, any modification may cause an operating problem.
Longer custom length looms may be ordered from Lifteknic See 3.0 - System components.

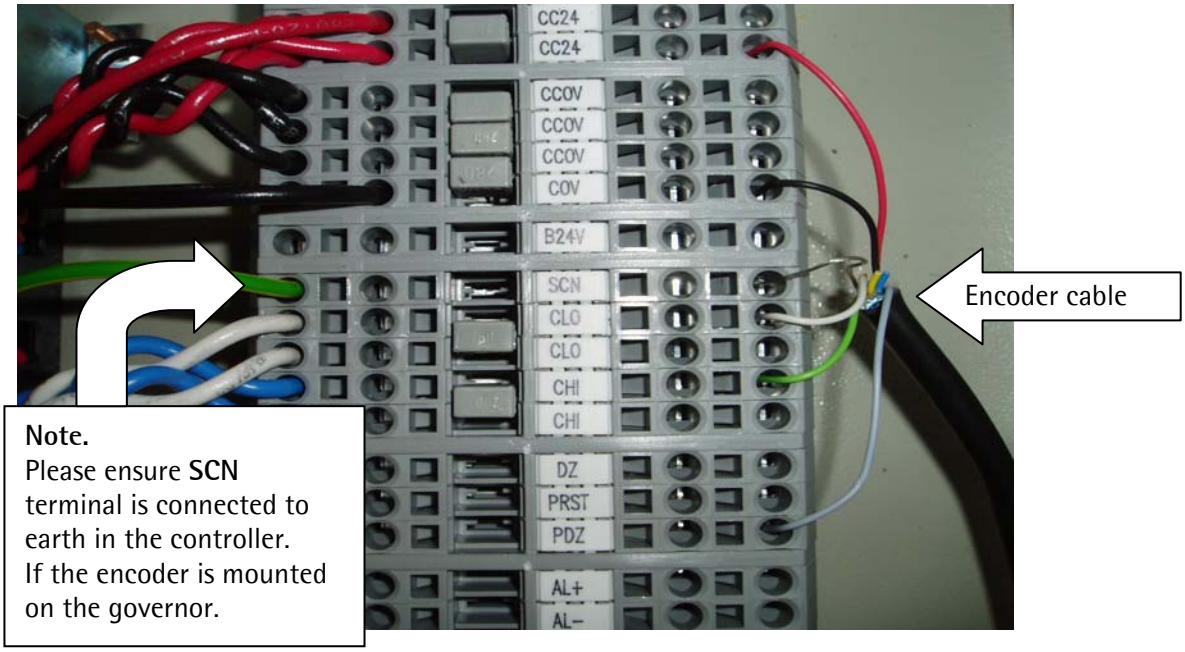
There are **six** connections required:

Description	Terminal reference	Encoder cable colour
+24 vdc Supply	**B24V or C24V**	**RED**
Network data HI	**CHI**	**GREEN**
Network data LOW	**CLO**	**WHITE**
Door zone input	**PDZ**	**GREY**
0 vdc Supply	**C0V**	**BLACK**
Cable screen	SCN	Bare wire

Encoder cable colour	
Yellow	Cut off not used
Orange	Cut off not used
Blue	Cut off not used

The terminals may be found in the controller and/or the car top terminal box dependant on the type of system.

The cable (A) should be brought as close as possible to the terminal rail then the outer sleeving stripped back leaving the screen up to the end, where the individual conductors break out these should be kept as short as possible (B), to enhance the noise immunity of the system. See fig 5.1 and example below.



After all the connections have been completed and checked you may now plug in the encoder noting the locating lug position on the circular connector.

At this point you may notice an error message :
POS SYS CONFLICT
This indicates the controller has detected the presence of an encoder but it is not configured for an encoder. This can be ignored at this stage.
See Section 9.0 Error messages and Trouble shooting

Line loading
The network requires a specific load applied to maintain optimum performance, this can be checked with the **power turned off** using a multimeter.
Measure the resistance across terminals CHI and CLO this should give a reading of approximately 60 ohms.
If this reading is less than <60 ohms

- Check the terminal rail connections for CHI and CLO for a resistor this may have been required prior to installing the encoder but may now be removed.
- If a C.O.P. device is fitted check to see if the Term jumper has been removed.

If this reading is greater than >60 ohms

Check the terminal rail connections for CHI and CLO for continuity between the encoder and the controller motherboard connector JP23/1 (CLO White) and JP23/2 (CHI Blue).

To verify the connections to the encoder use the handheld MMI and select the menu option ***Speed display***

If ***No contact to positioning system*** is displayed re check all above and refer to Section 9.0 Error messages and Trouble shooting.

This display provides information on the direction of rotation of the encoder and the state of the single door zone input.

If the lift is moved on inspection you should see the black bars appear indicating movement.
The direction may not correspond to the direction of the lift, this can be ignored as this is auto configured during the setup process.
Note:
You may see a "!! **Too fast !!"** message - this can be ignored.

To verify the operation of the door zone signal to the encoder (PDZ) note the bars on the ***Doorzone:*** line, these indicate when the door zone proximity switch is operating and thus confirm the encoder is wired correctly.

6.0 - Setting site specific parameters

Using the Handheld MMI :-
Position param
User parameter

TIP
See **10. User forms** to record your settings for future reference.
D.P.S. Parameter record

Table 6.0

Parameter	Description	Typical	Units
Top floor	Number of levels (Number of openings)	--	Integer Tens/Units
Bottom floor	Lowest level served	1	Integer Tens/Units
v nom (v3)	Highest speed possible (contract speed) See Table 6.2	----	mm/Sec
v red (v2)	Reduced speed 2 <= v3 See Table 6.2	----	mm/Sec
v red (v1)	Reduced speed 1 <= v2 See Table 6.2	----	mm/Sec
v adv.door	Speed allowed to pre open doors EN81 Default 800	300	mm/Sec
v re-level	Speed at which to re-level	100	mm/Sec
v Test1	Test Highest speed (if two test speeds) Use Default 620	620	mm/Sec
Resolution/cm	Number of pulses from encoder per 10mm/1cm travel of car. See Table 6.1 **(Set this parameter first)**	--	Pulses/cm
Reset floor	Level of the Position encoder reset switch (Usually mid shaft) See table 6.5 (Floor below reset magnet)	--	Integer Tens/Units
Doorzone	Distance between Magnets at floor in mm Use Default 300	300	mm
Levelzone	Distance of car movement to initiate re-level EN81 Use Default 40	40	mm

Note:
Shaded param's are usually left at their default values

Table 6.1 Resolution/cm for 500ppr encoder

Encoder Mounting	Pulses/cm
Type 14A Toothed-belt pulley	11
Type 15A Cord pulley	32
LK200 Governor	32
LK250 Governor	25
LK300 Governor	21
LK350 Governor	18

Tip
Set the Resolution/cm parameter before the speed parameters

Speed selection parameters.

v nom (v3), v red. (v2), v red. (v1) Refer to the highest speeds possible in the system.
v3 is usually the highest speed (Contract speed of lift car), v2 is a reduced speed when applicable, and v1 is another reduced speed (used for one floor runs or short floors).
v adv.door Refers is a speed the lift must be below to enable preopen.
v re-level Refers to the speed set for accurate re leveling.
v Test (vl) This parameter is only applicable if a high test speed is used.

The speeds entered for these parameters must also be set in the corresponding parameter in the drive system See Table 6.3.

Table 6.2 Examples of Speed parameter values assuming standard 3 Meter floor heights

Contract speed	vnom (v3)	v red. (v2)	v red. (v1)	v adv.door	v re-level	v Test (vl) Only for High speed test op
0.75 M/s	750	750	750	300	100	620 Default
1.0 M/s	1000	1000	1000	300	100	620 Default
1.5 M/s	1500	1500	1000	300	100	620 Default
2.0 M/s	2000	1500	1000	300	100	620 Default
2.5 M/s	2500	1500	1000	300	100	620 Default
3.0 M/s	3000	1630	1000	300	100	620 Default
4.0 M/s	4000	2500	1000	300	100	620 Default

If only one High speed is required it is important to set all of the parameters V3, V2 and V1 See Table 6.2 above.
If two travel speeds are required set both v3 and v2 to highest speed and v1 to the reduced (lowest) See Table 6.2 above.

Note:
The encoder Resolution/cm parameter is used in the speed calculations, it is possible you may experience a problem setting the exact speed values to match the drive. If this is the case enter the nearest value possible, that is slightly higher than the required speed.

Table 6.3 Speed parameters reference for type of Drive system

Speed Reference See Table 6.4	Yaskawa G5	Wittur WVD	Ziel Abeg 2CF	C.T Unidrive SP	C.T Unidrive SP with Lift App Module	C.T Mentor	IPC D1025 Mk2	IPC D1029
Stopped	D1-01	V0	N/A	01.21	N/A	N/A	N/A	N/A
Test LO	D1-02	V1	V_ZE1	01.22	0.15 (0)	01.04	SP2	SP3
v Test (vl)	D1-03	V2	V_ZE2	01.23	0.16 (0)	01.05	N/A	N/A
v re-level	D1-04	V3	V_Z	01.24	0.17 (0)	01.06	SP1	SP1
Leveling	D1-05	V4	V_1	01.25	0.18 (0)	01.07	SP1	SP2
v red (V1)	D1-06	V5	V_2	01.26	0.19 (0)	01.17	SP3	SP4
v red (V2)	D1-07	V6	V_3	01.27	0.20 (0)	01.18	SP4	SP5
v nom (V3)	D1-08	V7	N/A	01.28	0.21 (0)	01.19	HI	HI
Signal Method	Binary	Binary	Discrete	Binary	Binary	Binary	Discrete	Discrete

Table 6.4 Examples of Drive Speed values types

Speeds	Unit M/s	Unit mm/s	**RPM** Based on 1460 rpm motor running 1M/s lift (Closed loop)	**HZ** Based on 50hz motor running 1M/s lift (Open loop)
Test LO	0.3 M/s	300 mm/s	278	15
Re-leveling	0.05 M/s	50 mm/s	46	2.50
Leveling	0.05 M/s	50 mm/s	46	2.50
v red (V1)	1M/s	1000 mm/s	1460	50
v red (V2)	2M/s	2000 mm/s	N/A	N/A

Table 6.5 Reset Switch positions and parameter value.

Top level	Place magnet between levels	Parameter Value
32	16 AND 17	16
31	15 AND 16	15
30	15 AND 16	15
29	14 AND 15	14
28	14 AND 15	14
27	13 AND 14	13
26	13 AND 14	13
25	12 AND 13	12
24	12 AND 13	12
23	11 AND 12	11
22	11 AND 12	11
21	10 AND 11	10
20	10 AND 11	10
19	9 AND 10	9
18	9 AND 10	9
17	8 AND 9	8
16	8 AND 9	8
15	7 AND 8	7
14	7 AND 8	7
13	6 AND 7	6
12	6 AND 7	6
11	5 AND 6	5
10	5 AND 6	5
9	4 AND 5	4
8	4 AND 5	4
7	3 AND 4	3
6	3 AND 4	3
5	2 AND 3	2
4	2 AND 3	2
3	1 AND 2	1
2	1 AND 2	1
1	N/A	N/A

Set the following parameters

From handheld MMI
Position param
User parameter
Reset floor **nn**

From Controller MMI
System Configuration
Contract
PSE RST SWT LEV **nn**

TIP
See **10. User forms** at end of manual to record your settings for future reference.
D.P.S. Parameter record

TIP
Reset magnet **should not** overlap any Door Zone magnets.
See fig 2.0
Also remember the Reset magnet signal should be present when the lift moves past the magnet in up direction and remains on while above it.
The signal is lost when the car moves past the magnet in the down direction and remains off while below the magnet.

Using Handheld MMI or controller MMI :-

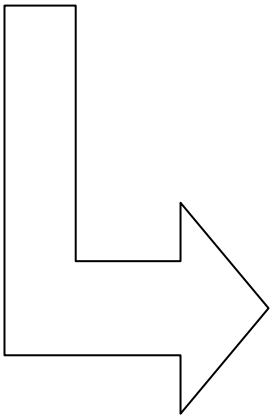
Controller parameters

Before a setup is performed there are a number of controller parameters that need to be checked.
From Handheld MMI or Controller MMI :-

1.

System Configuration -
Contract -
SHAFT SYSTEM

Set to '**3**' to tell the controller there is an encoder fitted this is the preferred value.



Shaft System Parameter	Description of operation
1	Used when no encoder fitted and three magnetic vanes DZ, LU/SU, LD/SD
2	Used when no encoder fitted and five magnetic vanes DZ, LU, SU, LD, SD
3 Default	Encoder system in use in Automatic and on test with backup for over travel and loss of message recovery.
4	As 3 but encoder direction data ignored on test operation.

2.

System Configuration -
Contract -
PSE RST SWT LEV

Set the same as the Reset floor parameter in the encoder (See Table 6.0)

3.

System Configuration -
Contract -
NUMBER OF SPEEDS

Set according to the number of different high speeds V1,V2,V3 (See Table 6.0) Values 1,2,3

4.

System Configuration -
Speeds -
PSE RESOLUTION

Set the same as the Resolution/cm parameter in the encoder (See Table 6.0 and 6.1)

5.

System Configuration -
Speeds -
CONTRACT SPEED

Set the same as the v nom (v3) parameter but Units are cm/sec not mm/sec (See Table 6.0)

Warning: These settings must be saved or it will be lost if the system is turned off.

7.0 - Complete setup and shaft learn

The system is now ready to perform a complete setup process, it is important to check all Magnets and Proximity switches to confirm they are operating correctly. Also check the Drive parameters and parameters specific to the site are correct.
This setup process is an automated procedure that may take up to 15 minutes.

The lift car and landing doors should operate correctly or they must be disabled.
e.g. *Engineers Tools – Door Disable = ON :*

If the control system has Direct to Floor this should be disabled.
e.g. *Engineers Tools – Disable Direct to Floor – DTF Disable = ON :*

The setup operation is performed external to the hoist way there should be no persons in the shaft or on the lift car top !!!!!!!!!

The Digital Position System is now ready to learn the magnet positions and calculate the slowing and stopping distances.

To start the setup process :-
1. Using Handheld MMI.

Set-up shaft –
Complete Setup ENTER

2. Immediately turn the controller to Automatic (Normal).

The controller should display:-
Status : ! Setup This means the system is Not yet setup

The setup will automatically start, during the process the Handheld MMI will display in turn the part of the setup it is performing.
See Chart 6.0 Complete setup process.

If at any time you wish to stop the lift movement you may press the ESC key, when you press this key the screen will display:-

Really want to
Exit setup ?
No *Yes*
<ESC> *<ENTER>*

Pressing the ENTER key will stop the setup process completely.
All calculated values up to this point are deleted.
If you press the ESC key, the message *Press any key to continue* will appear, this will enable the continuation of the process.
Once the movement sequence has been completed, the control system will have calculated all the shaft and movement functions it requires in order to ensure optimum lift travel.
The LCD will display *Process finished – Settings saved*.
The lift can now be put in service providing the leveling accuracy is checked by taking the car to each floor in turn in both directions. See Section 8.0 Correcting levels.

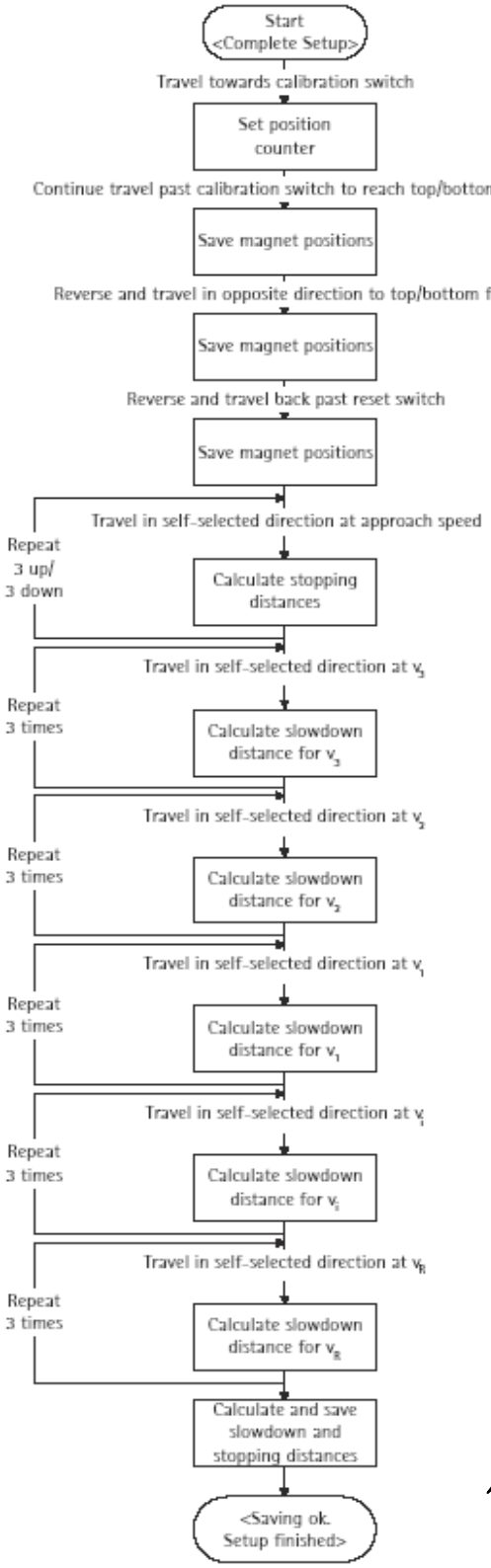
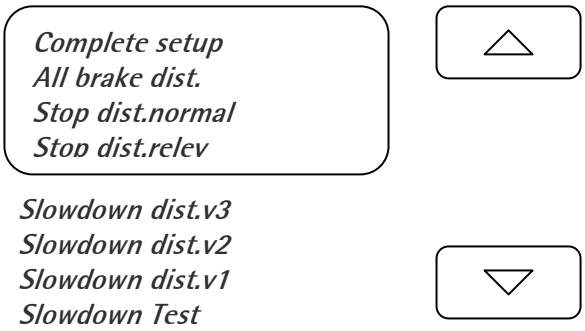


Chart 6.0 Complete setup process

7.1 – Adjustments after setup and shaft learn

After successfully completing the setup, the digital positioning system will have calculated the parameters required for optimum lift performance in relation to the drive settings during the setup.
If you need to change any of the parameters or the drive characteristics, you may do so but it is important to realize this may have a detrimental affect on positioning of the lift car during certain operations such as Slowdown and Stopping.
However these operations can be individually setup without having to perform a complete setup process.

It is for this reason that, in addition to the ***Complete setup*** sequence described in Section 7.0 some parts of the sequence can be individually executed in the ***Set-up shaft*** menu:-



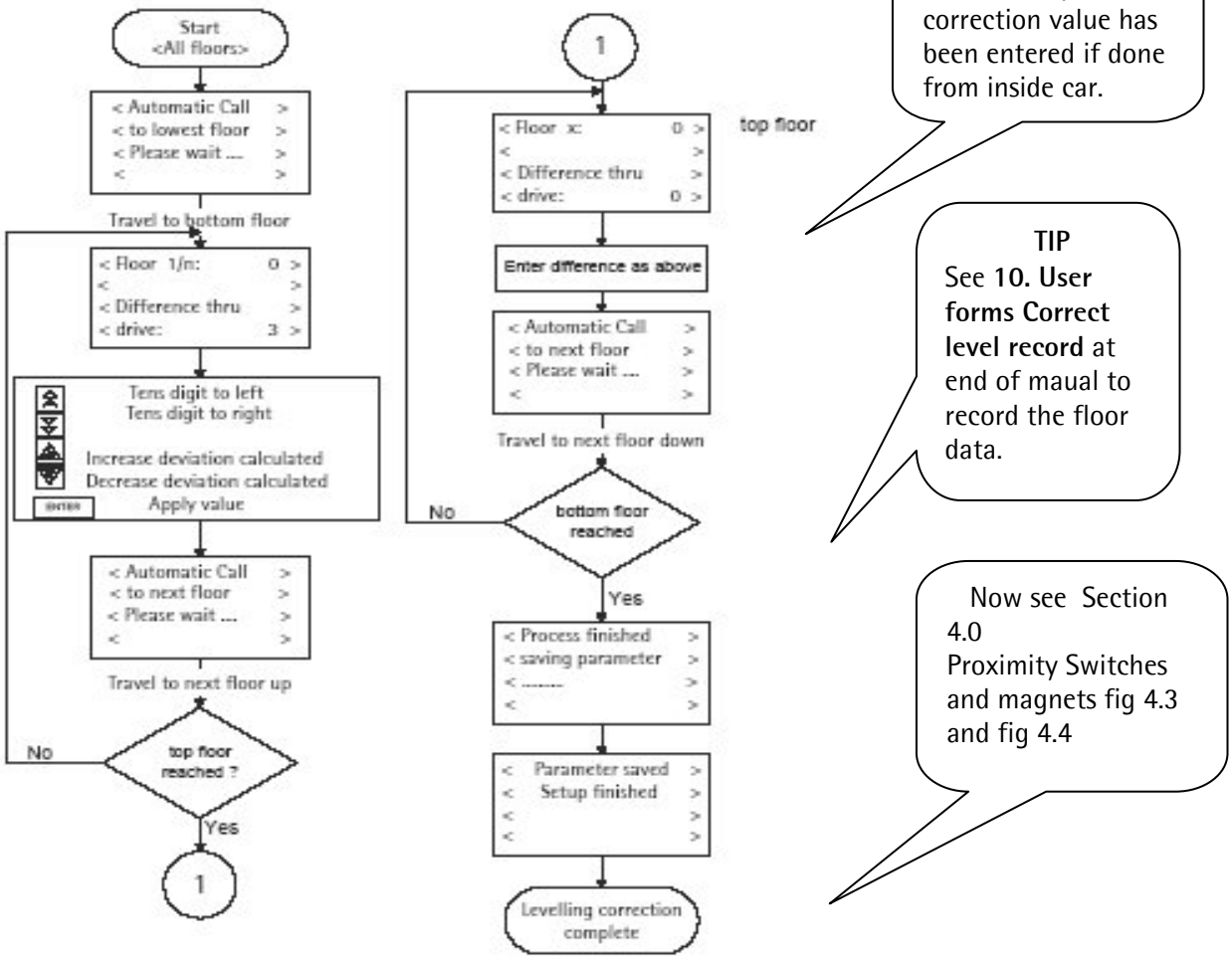
The following table indicates which parameters affect which sequence.

Modification To drive parameter	Setup process required To position system
Speed of travel V3 V nom	*Position param* *User parameter* *v nom(v3)*
Speed of travel V2/V1 ..vn	As above
Deceleration ramp (DECR)	*Set-up shaft* *Slowdown/Stopping dist* ..vn
Approach speed (Levelling)	*Set-up shaft* *Slowdown/Stopping Dist* ..vn
Stop sequence/Ramp (STOPR)	*Set-up shaft* *Stop dist.relev*

8.0 – Correcting levels

The setup process assumes that floor level is at the center of the door zone magnets that correspond to the floor the lift is stopping at.
If the lift car sill is not level with the landing sill because of the inaccurate placement of the magnets the difference may be adjusted to overcome this error.
This is achieved with the menu ***Correct level - All floors***
This provides an automated process for sending the lift car to each floor in turn in both directions, and allows the user to measure the difference and enter this measurement in mm to compensate for the levelling error.
For convenience this process may be performed in the lift car, the Handheld MMI should be plugged into the COP position indicator connection or to the additional loom provided.
The lift follows the sequence below.

Chart 8.0 Correcting levels



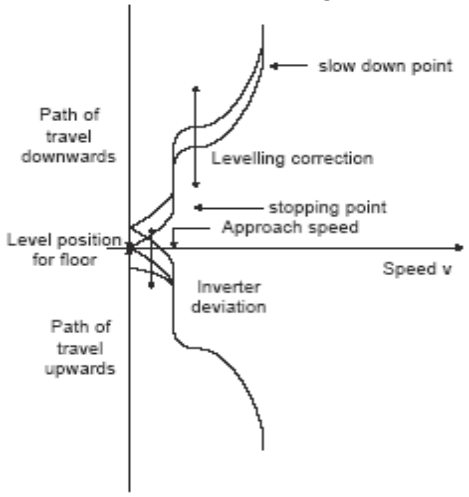
Note: Tell the encoder how high or low the car is in millimeters by :-
If the **car sill is above the landing sill** the deviation **value is positive** (use up key). e.g. 15
If the **car sill is below the landing sill** the deviation **value is negative** (use dn key) e.g. -15

8.1 – Additional correction of levels

If only certain levels have errors or after a correction of all floors and there is still an error, the level/s that are in error may be corrected individually using the menu:
Correct level
Single floor
This performs the same operation as before but only for the level selected.
To check if the positioning system thinks there is an error use the menu:
Correct level
Display position

This gives the user an indication of:
1. Speed of lift in mm/s.
2. Actual position from the encoder.
3. The set position where the floor level is expected.
4. The difference between the Actual position and the set position in mm.

Ideally this difference should only be between 0-2 when the levels have been corrected.
However on older installations where the car guide shoes are worn this error may be greater due to movement of the car.
Another reason for this error is if the slowdown point is too close to the level position, the braking distance will not be sufficient and the car will not reach the approach speed before it reaches the stop.
This will lead to the overrunning of the level position even though the controller sent the slowdown and stopping signal at the correct point.
Braking the inverter too steeply at excessive loads (when the car is at 100% load) can also cause misalignments.
This can be corrected by extending the stopping distance and decreasing the gradient of the inverter's braking ramp.
Problems of the type described above can be localized using the menu line *Difference thru Drive* or the *Display position screen*. Ideally, a 0 should always appear in this line.
If the value indicated is always different, occasional misalignment should be expected.



Profile of end of travel.

9.0 – Error messages and Trouble shooting

The following table lists the error messages used to diagnose faults.
The table lists the device where the messages will be displayed and the reasons and possible conditions for causing the error. Included is a possible remedy to rectify the error where applicable.
A = Handheld and controller LCD (status screen)
B = Handheld MMI only

Message location	Error message	Reason for error
A	*PSE OVERSPEED*	The positioning system measured speed is greater than the speed set in the parameters vn **Remedy** Check handheld parameters against drive parameters. Check the lifts actual speed is correct (use tacho). Check resolution parameter is correct. See Table 6.1
A	*PSE O/SPEED RLEV*	Same as above but for Relevel speed only
A	*PSE MAGNET DIFF*	The positioning system has detected a magnet in a different position than was expected. **Remedy** Check all magnets to see if one has been moved or inverted. Check magnets are perfectly aligned in the vertical plane. Also check for slip on encoder mounting/pulley. See Tip fig 4.1
A	*PSE MAGNET FAULT*	The positioning system has detected that a magnet has been lost. **Remedy** Check if all magnets are still present. Also see *PSE MAGNET DIFF* above.
A	*PSE NO MOVEMENT*	The positioning system has detected that the movement of the lift has stopped without the positioning system STOP message. **Remedy** Check Safety circuit, Door Locks, Drive trips e.t.c.
A	*PSE DIR ROTATION*	The positioning system encoder has detected rotational movement in the opposite direction than expected. **Remedy** Check mounting of encoder, and for excessive rollback
A	*PSE ZERO PULSE*	The positioning system encoder has not received an internal pulse. **Remedy** This could indicate a faulty encoder unit if it persists. Encoder must be replaced (Note Encoder Shaft size)

Message location	Error message	Reason for error
A	*PSE CAN OVERUN*	The positioning system is experiencing problems communicating on the network. **Remedy** Check network connections and network impedance. See Section 5.0 Encoder installation If any devices can be removed from network do so to try and isolate fault. e.g. Position indicator
A	*PSE CAN BUSOFF*	The positioning system is experiencing problems communicating on the network and has shutdown. *See PSE CAN OVERUN*
A	*PSE ACKNOWLEDGE*	The positioning system has not responded to a TARGET message this could indicate extreme interference on the network. **Remedy** If this message is occurring frequently check that all relevant EMC precautions have been adhered e.g. Motor cable screen has been connected at both ends and that no external devices are connected to the system e.g. Zone lock relays utilizing the door zone proximity switches. Also see *PSE CAN OVERUN* If occasionally this message is recorded, it can be ignored as there is an in test and recovery built in.
A	*PSE DIR REPLY*	See *PSE ACKNOWLEDGE*
A	*PSE WRONG DIR*	Make sure TFS switch is not connected check for roll back
A	*PSE SPEED REPLY*	See *PSE ACKNOWLEDGE*
A	*PSE COMMS LOST*	This indicates the communication to the encoder has been interrupted, this can occur during a Setup process when the system is switching communication between the Handheld MMI and the positioning system. Also See *PSE ACKNOWLEDGE* for possible faults
A	*PSE NOT VALID*	This indicates the positioning system requires a dive correction to the reset magnet. This may occur after a powerdown of the encoder or a reboot due to software recovery procedures.
A	*PSE NO STOP MESS*	This indicates that the lift has performed a controlled stop without the encoder STOP message.
A	*POS SYS CONFLICT*	This indicates the controller has detected the presence of an encoder but it is setup as a non encoder system. See *SHAFT SYSTEM* controller parameter

B	*No contact to positioning system*	See *PSE COMMS LOST*
B	*Lift cant start Please check drive and safety circuit*	This message may appear during a Setup process. Remedy See *PSE NO MOVEMENT* error message
B	*Cant measure slowdown dist*	This message may appear during a Setup process. It is usually caused by a diffence in the speed settings made with the Handheld and the drive unit. Remedy Check positioning system speed parameters against the corresponding drive parameters. See Section 6.0 Tables 6.2/6.3

Overtravel Problems encountered during the setup process.

If the lift overtravels in either direction during the door zone measurement phase, it is usually due to the incorrect parameter setting
e.g. *Position param - User parameter - Top floor/ Reset floor,* **or placement of the reset magnet or the Doorzone magnets not being read properly.**

See Section 6.0, Table 6.5 Reset Switch positions and parameter value.
See Speed display Page19

It may also be attributed to a Door zone signal error (Check door zones). Make sure magnets are not fitted too close to switches, 8 - 10mm, as this can cause a false switching.

Problems correcting floor levels after a learn may be caused by having the Direct to Floor system enabled if this is fitted.
e.g. *Engineers Tools – Disable Direct to Floor – DTF Disable = ON :*

This should be disabled before the shaft learn process is started.

9.1 DPS Diagnostic information menu

Using the controller MMI or the Handheld MMI select the "*System Monitor*" menu.
Step through the screens until the following or similar screen is reached.

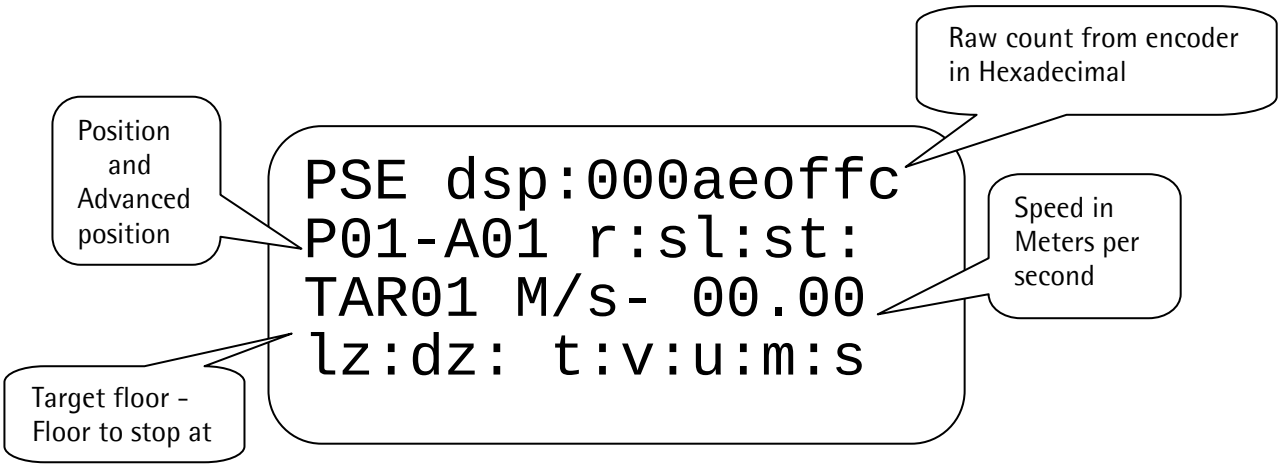
```
PSE dsp:000aeoffc
P01-A01 r:sl:st:
TAR01 M/s- 00.00
lz:dz: t:v:u:m:s:
```

Note: This screen may have a different format on certain versions of Software.

This screen can be use to monitor and identify the data related to the Digital positioning system.
The data has been abbreviated to fit on the display device, generally if the abbreviation appears in lower case the signal it represents is OFF and in upper case the signal it represents is ON.
If a : colon is present at the end of the abbreviation it signifies this type of data
e.g.
dsp: = Door opening speed not reached (OFF)
DSP: = Door opening speed has been reached (ON)

Abbreviations

- dsp: Door speed (speed at which doors may start pre-opening) set via parameter.
- r: Reset switch (State of position reset switch).
- sl: Slowdown - used to initiate a slowdown sequence.
- st: Stop - used to initiate a controlled stop.
- lz: Level zone - used to identify the relevel zone position.
- dz: Door zone - used to identify the calculated door zone position.
- t: Terminal control – used to identify when system is in setup shaft process.
- v: DPS Valid - used to identify when system is valid i.e been passed the reset switch after power up.
- u: or d: Up or Down – used to identify the rotation of encoder.
- m: Magnet zone – used to identify when the encoder is reading the magnets at each floor.
- s: DPS Setup – used to identify if the DPS has been setup (learnt).



10. – User forms

D.P.S. Parameter record

Contract No.	Lift No.
Parameter	**Value**
Top floor	
Bottom floor	
v nom (v3)	
v red (v2)	
v red (v1)	
v adv.door	
v re-level	
v Test1	
Resolution/cm	
Reset floor	
Doorzone	
Levelzone	

Contract No.	Lift No.
Parameter	**Value**
Top floor	
Bottom floor	
v nom (v3)	
v red (v2)	
v red (v1)	
v adv.door	
v re-level	
v Test1	
Resolution/cm	
Reset floor	
Doorzone	
Levelzone	

Contract No.	Lift No.
Parameter	**Value**
Top floor	
Bottom floor	
v nom (v3)	
v red (v2)	
v red (v1)	
v adv.door	
v re-level	
v Test1	
Resolution/cm	
Reset floor	
Doorzone	
Levelzone	

Contract No.	Lift No.
Parameter	**Value**
Top floor	
Bottom floor	
v nom (v3)	
v red (v2)	
v red (v1)	
v adv.door	
v re-level	
v Test1	
Resolution/cm	
Reset floor	
Doorzone	
Levelzone	

10. – User forms

Correct levels record (photo copy as required)

Contract No: **Lift No.**

Floor Name	Level No.	Car Stop in Down		Car Stop in Up	
		mm High	mm low	mm High	mm Low

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