RUN NOW

E X C I T E +

Technical Service guide

REV. 6.2

TECHNOGYM®
The Wellness Company

The information contained in this manual is intended for QUALIFIED TECHNICIANS who have completed a specific TECHNOGYM training course and are authorized to perform machine start-up and adjustment procedures as well as extraordinary maintenance or repairs which require a thorough knowledge of the machine, its operation, its safety devices and working procedures.

CAREFULLY READ THE INFORMATION CONTAINED IN THIS MANUAL BEFORE PERFORMING ANY MAINTENANCE PROCEDURES ON THE MACHINE

DANGEROUS VOLTAGES PRESENT

NOTE:

The information contained in this document is subject to change without notice.

Technogym does not guarantee this documentation in any way. Technogym shall not be held responsible for any errors contained in this manual and declines all liability for accidents or damages resulting from the supply, characteristics or use of this manual.

Contents

1. GENERAL NOTICES

1.1. INTRODUCTION

This document is reserved for Technogym Service technicians, and is intended to provide authorized personnel with the necessary information to correctly carry out repairs and maintenance. A thorough knowledge of the technical information contained in this manual is essential for completing the professional training of the operator.

In order to facilitate consultation, the paragraphs are accompanied by schematic drawings which illustrate the procedure being described.

This manual contains notices and symbols which have a specific meanings:

WARNING: non observance may result in accident or injury.

ATTENTION: non observance may cause damage to the machine.

Information about the operation in progress.

Observation about the operation in progress.

1.2. RECOMMENDATIONS

Technogym recommends the following steps for planning repair procedures:

- Carefully evaluate the customer's description of the machine malfunction and ask all the necessary questions to clarify the symptoms of the problem.
- Clearly diagnose the causes of the problem. This manual provides the fundamental theoretical basis, which must then be integrated by personal experience and attendance at the training courses periodically offered by Technogym.
- Rationally plan the repair procedure so as to minimize the downtime necessary for procuring spare parts, preparing tools, etc.
- Access the component to be repaired, avoiding any unnecessary operations. In this regard it will be useful to refer to the disassembling sequence described in this manual.

1.3. GENERAL RULES FOR REPAIR PROCEDURES

1. Always mark any parts or positions which may be confused with each other at the time of reassembly.

2. Use original Technogym spare parts and lubricants of the recommended brands.

3. Use special tools where specified.

4. Consult the Technical Newsletters, which may contain more up-to-date information on adjusts and maintenance than those contained in this manual.

5. Before starting the repair procedure, make sure that the recommended tools are available and in good condition.

6. For the procedures described in this manual, use only the specified tools.

☞ **The tool sizes quoted in this manual are expressed in mm.**

2. TECHNICAL CHARACTERISTICS

2.1. PRODUCT CODES

The machine codes take into account all the possible variants and options available for the products.
The machine code, which does not include the Serial Number, consists of 16 alphanumeric characters arranged as follows:

Characters	***Description***	***Key to values***
1,2,	*Line type*	**DA** = Excite +
3,	*Machine type*	**K** = RUN Now
4,	*Model,*	**6** = 500 **8** = 700 **9** = 900
5,	*Type of power supply*	**1** = 100-120V – MET CE **2** = 200-240V – MET CE **E** = 200-240V – CE **U** = 90 - 265V – AT-UL **M** = Medical Device - CE
6,	*Type of Display*	**L** = LED **Y** = VISIO WEB **V** = UNITY
7,	*Integrated accessories*	**N** = None **T** = Wellness System **I** = iPod + USB **A** = iPod + USB + WS
8, 9,	*Colour of the frame*	**AL** = Silver **AN** = Antracite
10, 11,	*Colour of upholstery*	**00** = None **AG** = Grigio **K0** = Blu **M0** = Bordeaux **NA** = Nero **Z0** = Marrone
12,	*Guards colour*	**G** = Flint grey **R** = Renault grey
13,	*TV standard*	**0** = nulla **C** = DVB-T/C HD **A** = ATSC / QAM-B **I** = ISDB-T **N** = IP-TV

Characters	*Description*	*Key to values*
14,15,	*Language,*	**00** = Multi-language **BR** = Portuguese **CN** = Chinese **DA** = Danish **DE** = German **ES** = Spanish **FR** = French **IT** = Italian **JP** = Japanese **NL** = Dutch **RU** = Russian **TR** = Turkish **UK** = British English **US** = American English
16.	*Type of packing.*	**A, B, C, D, E, F, G, H, I, J, K, S, U** ☞ **See the table below.**

DAK81WAAN00RD00E

☞ **all of the Excite + line machines will be shipped with the specific power cable for the destination country. In particular this means a cable with the standard plug used in the installation country.**

This implementation also means a change in the product code. Specifically the last character of the product code will be characterised based on the options shown in the table below:

16th Character Product code	Main country of use	Plug standard	Type of packaging
A	Australia	A S/NZS 3112	Overseas
B	Brazil	NBR 14136	Overseas
C	China	CPC S-CCC	Overseas
D	South Africa	SANS 164-2	Overseas
E	Europe (EC)	EEC 7/16	European
F	USA (UL 250 V)	NEMA 5-15/ NEMA 5-20	Overseas
G	Great Britain	BS1363	European
H	Argentina	IRAM 2073	Overseas
I	Italy	EEC 7/16	Italy
J	Japan	JIS 8303	Overseas
K	Great Britain	BS1363	Overseas
S	Europe (EC)	EEC 7/16	Overseas
U	USA (UL 110 V)	NEMA 6-15/ NEMA 6-20	Overseas

As shown in the table above, the 16th character also identifies the type of packaging depending on the destination country, i.e. DAK81WAAN00RD00**E**.

2.2. SERIAL NUMBER STRUCTURE

The *Serial Number*, consists of 14 alphanumeric characters arranged as follows:

Characters	*Description*	*Key to values*
1,2,3,4,5,6,	*Product type,*	**DAK** = RUN Now Excite +
		6 = 500 **8** = 700 **9** = 900
		1 = 100-120V – MET CE **2** = 200-240V – MET CE **E** = 200-240V – CE **U** = 90 - 265V – AT-UL **M** = Medical Device - CE
		0 = nulla **C** = DVB-T/C HD **A** = ATSC / QAM-B **I** = ISDB-T
7,8,	*Year of production,*	**10** = 2010
9,10,11,12,13,14.	*Progressive.*	**000001**

For example, a possible product code would be:

DAK81W10000001

2.3. COLOUR OPTIONS

2.4. POWER REQUIREMET

Code	Power supply caracteristics
1 = ALE MET	*100-120V +/- 10% (50-60Hz)* *(It is advisable* **20A 125V** *dedicated socket each machine)* **Only UK**: *(Recommended 3x treadmills per ring main with 32 amp Type C MCB)*
2 = ALE MET	*200-240V +/- 10% (50-60Hz)* *(It is advisable* **20A 250V** *dedicated socket each machine)*
U = AT-UL	*100-240V +/- 10% (50-60Hz)* *(It is advisable* **20A 125V** *or* **20A 250V** *dedicated socket each machine)*
E = ALEWIN **(Europe)**	*200-240V +/- 10% (50-60Hz)* *(It is advisable* **16A 250V** *dedicated socket each machine)*
A = ALEWIN **(Extended Range)**	*100-240V +/- 10% (50-60Hz)* *(It is advisable***20A 125V** *or* **20A 250V** *dedicated socket each machine)*

2.5. MODELS SPECIFICATION

2.5.1. EXCITE CHARACTERISTICS

	500 LED	***700 LED***	***700 VISIO***	***900 LED***	***900 VISIO***
Power engine:	*8HP (AC)*				
Energy consumption:	*1800Watt*	*2200Watt*		*2500Watt*	
Consumption equipment ON but NOT in use: LED + *(ALE MET CE 200-240V)*	*34,6Watt*		-	*34,6Watt*	-
Consumption equipment ON but NOT in use: LED + *(ALE MET CE 100-120V):*	*40,9Watt*			*40,9Watt*	
Consumption equipment ON but NOT in use: VISIO + *(ALE MET CE 200-240V):*	-		*81,4Watt*	-	*81,4Watt*
Consumption equipment ON but NOT in use: VISIO + *(ALE MET CE 100-120V):*			*87,7Watt*		*87,7Watt*
Speed *(220V)*:	*0,8-**20**km/h (220Vac)*	*0,8-**25**km/h (220Vac)*		*0,8-**27**km/h (220Vac)*	
Speed *(110V-90V)*:	*0,8-**20**km/h (110Vac - 90Vac)*	*0,8-**22**km/h (110Vac)* *0,8-**20**km/h (90Vac)*		*0,8-**22**km/h (110Vac)* *0,8-**20**km/h (90Vac)*	
Max user weight (Kg – lbs):	*220kg – 485lbs*				
Incline:	*0 - 15 % (± 1%)*			*0 - 18 % (± 1%)*	
HR monitoring	*Hand sensor, Telemetry*				
Fast Track Control con Visual Setup:	*NO*	*SI*			
Runner detection system:	*SI*				
InMotion - Safety System:	*SI*				
Integrated adjustable fan::	*NO*	*SI*			
Calorie Coach:	*SI*				

	500 LED	***700 LED***	***700 VISIO***	***900 LED***	***900 VISIO***
Total number of program:	***11*** *Quick Start, Goals (Tempo; Distance; Calorie), CPR, Profile (6)*	***23*** *Quick Start, Goals (Tempo; Distance; Calorie), CPR, Profile (6 default, 9 custom), Custom, Training Zone, Weight Loss*	***23*** *Quick Start, Goals (Tempo; Distance; Calorie), CPR, Profile (6 default, 9 custom), Custom Speed, Training Zone, Weight Loss*	***23*** *Quick Start, Goals (Tempo; Distance; Calorie), CPR, Profile (6 default, 9 custom), Custom, Training Zone, Weight Loss*	***25*** *Quick Start, Goals (Tempo; Distance; Calorie), CPR, Profile (6 default, 9 custom), Custom Speed, Custom Pace, Interval, Training Zone, Weight Loss*
Sub-maximal test:	*Fitness test*			***3*** *Fitness Test, Single stage, Multistage*	
Maximal test:	*NO*			***8*** *Technogym Maximal Test, custom Maximal Test, Bruce, custom Bruce, Naughton, Balke e Ware, custom Astrand, Costill e Fox*	
Military Test (US Army):	*NO*			***7*** *Gerkin Protocol, Air Force PRT, Navy PRT, Army PFT, Marine Corps PFT, Federal Law Enforcement PEB*	
Language available:	***13*** *UK English, USA English, Italian, German, Spanish, French, Dutch, Portuguese, Japanese, Chinese, Russian, Turkish, Danish*				
Plug & Play System:	*SI*				
Wellness System:	*Optional*				

2.5.2. DISPLAY COMPARISON

For all specifications, refer to the manual VISIO/VISIOWEB and/or UNITY.

	500 LED	700 LED	700 VISIO	900 LED	900 VISIO
Power engine (peak):	8HP (AC)				
Energy consumption:	1800Watt	2200Watt		2500Watt	
Consumption equipment ON but NOT in use: LED + *(ALE MET CE 200-240V)*	34,6Watt		-	34,6Watt	-
Consumption equipment ON but NOT in use: LED + *(ALE MET CE 100-120V):*	40,9Watt			40,9Watt	
Consumption equipment ON but NOT in use: VISIO + *(ALE MET CE 200-240V):*	-		81,4Watt	-	81,4Watt
Consumption equipment ON but NOT in use: VISIO + *(ALE MET CE 100-120V):*			87,7Watt		87,7Watt

	UNITY (700)	UNITY (900)
Power supply:	100÷240Vac ±10% 50/60Hz	100÷240Vac ±10% 50/60Hz
Energy consumption:	(n.a.)	(n.a.)
Consumption equipment ON but NOT in use: UNITY + ALE WIN	(n.a.)	(n.a.)
Consumption equipment ON but NOT in use: UNITY + ALE MET (220)	(n.a.)	(n.a.)
Consumption equipment ON but NOT in use: UNITY + ALE MET (110)	(n.a.)	(n.a.)
Plug & Play System:	(n.a.)	(n.a.)

2.5.3. MONITOR & COMMANDS

	UNITY (700/900)	VISIOWEB (700)	LED (700)	LED (500)
LCD dimensions	*15,6" LCD - WIDE 16:9*		*Led*	*Led*
Android OS	*X*	*X*	-	-
Capacitive Touch Screen	*X*	*X*	-	-
Gesture interaction	*X*	-	-	-
Classic keypad	-	-	-	*X*

2.5.4. TRAINING CONTENTS

	UNITY (700/900)	VISIOWEB (700)	LED (700)	LED (500)
Guide Me	*X*	***X***	-	-
Embedded Workout Programmes:	*25*	*25*	*22*	*11*
Languages	***18**: (US English, UK English, Spanish, Portuguese, French, German, Dutch, Chinese, Japanese, Russian, Turkish, Danish, Italian, Arabic, Korean, Norvegian, Swedish, Finnish)*	***15**: (US English, UK English, Spanish, Portuguese, French, German, Dutch, Chinese, Japanese, Russian, Turkish, Danish, Italian, Arabic, Korean)*	***13**: (US English, UK English, Spanish, Portuguese, French, German, Dutch, Chinese, Japanese, Russian, Danish, Italian, Turkish)*	

2.5.5. USER CONNECTIVITY OPTIONS / MYWELLNESS CLOUD ACCESS

	UNITY (700)	VISIOWEB (700)	LED (700)	LED (500)
TGS reader and Mywellness Key	*X*	*Optional*	*Optional*	*Optional*
QR code	*X*	*X*	-	-
NFC reader (RFID)	*X*	-	-	-
Login with username and PW	*X*	*X*	-	-

2.5.6. USER PERSONAL PROFILE

	UNITY (700/900)	*VISIOWEB (700)*	*LED (700)*	*LED (500)*
MY TRAINING PROGRAM	*X*	*X*	*X*	*X*
MY WEATHER	*X*	*X*	-	-
MY CHALLENGES	*X*	*X*	-	-
FAVORITE TV CHANNELS	*X*	-	-	-
FAVORITE WEB BOOKMARKS	*X*	*X*	-	-
USERCONTENT SYNC	*X*	-	-	-

2.5.7. CONNECTIVITY

	UNITY (700)	*VISIOWEB (700)*	*LED (700)*	*LED (500)*
LAN	*X*	*X*	-	-
WiFi	*Wi-Fi IEEE 802.11b/g/n 2.4GHZ ISM Band; SECURITY: WPA/WPA2, 64,128,152-bit WEP, WPS*	*IEEE 802.11 b/g*	-	-
Csafe	*X*	*X*	*X*	*X*

2.5.8. ENTERTAINMENT AND MULTIMEDIAL CONTENTS

	UNITY (700/900)	VISIOWEB (700)	LED (700)	LED (500)
TV	***Analogue***: *PAL: (BG, DK, I, BH, M, N), SECAM: (L, L1, DK, H, BG) NTSC:(NTSC M, NTSC4.43 M)* ***Digital***: *DVB-T HD, DVB-C HD, ATSC+QAM B, ISDB-T*		-	
IPTV	***SD, HD***: *MPEG-2 Standard Definition.; MPEG -4 pt10 AVC/H.264 Standard Definition & HD; PROTOCOLS: UDP/RTP RTSP*	***SD***: *mpeg2, mpeg4 TS SD - UDP, RTP, multicast & unicast protocols*	-	
Radio	*X*	*X*	-	
Free WEB browsing	*X*	*X*	-	
Games	*YES (Technogym App store)*	*Four-in-a-row, TG Math, Backgammon, Mah-Jong, TG pairs, TG cards*	-	
Integrated WebCam	*X*	-	-	
USB Media: Audio	*MP3, AAC, WAV (uncompressed)*	*mp3, wav*	-	
USB Media: Video	*Video codec: XVID, MPEG4, H264 - Audio codec: MP3, AC3*	*MPEG2, MPEG4, DivX*	-	
USB Media: Pictures and documents reader	*JPEG, BMP, GIF, PNG*	*PDF, jpg*	-	
iPod /iPhone Audio **	*X*	*X*	-	
iPod/iPhone Video **	*X*	*X*	-	
iPod (support & charge) **	*X*	*X*	-	
iPad (holder &battery charge)	*X*	-	-	
Nike + iPod	*X*	*X*	-	
Virtual training	*X*	-	-	
Netpulse multimendia content	*X*	*X*	-	
Netpulse Virtual Active Video	*X*	*X*	-	

2.5.9. SUPPORTED PROFESSIONAL APPS

	UNITY (700/900)	*VISIOWEB (700)*	*LED (700)*	*LED (500)*
Communicator – Messagges	*X*	*X*	*X*	-
Communicator – Club area	*X*	*X*	-	-
Asset Management	*X*	*X*	-	-
Technogym App store	*X*	-	-	-
Prescribe	*X*	*X*	*X*	*X*
Self	*X*	*X*	*X*	*X*
Challenge	*X*	*X*	*X*	*X*

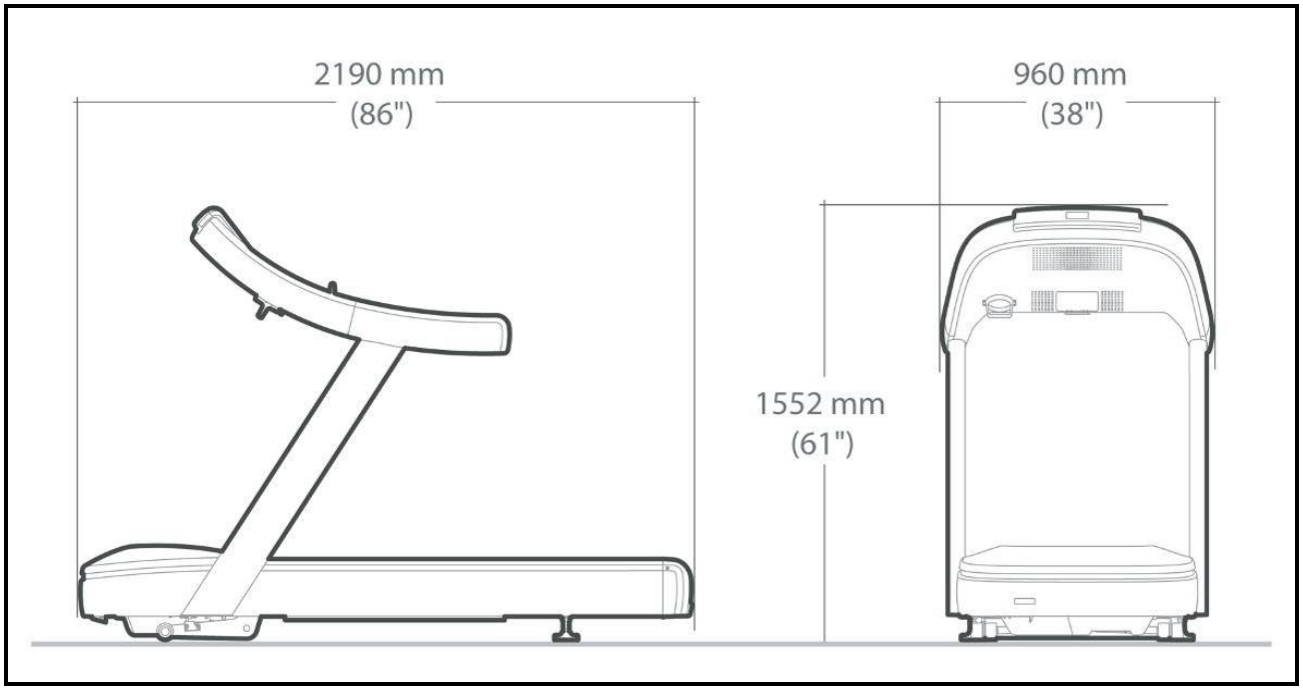
(*) The total number of workouts could change.
(**) Only iPod dock connector (up to iPhone 4S – 30 pins).

WARNING: Some of the above options, tests or features could not be present but coming soon.

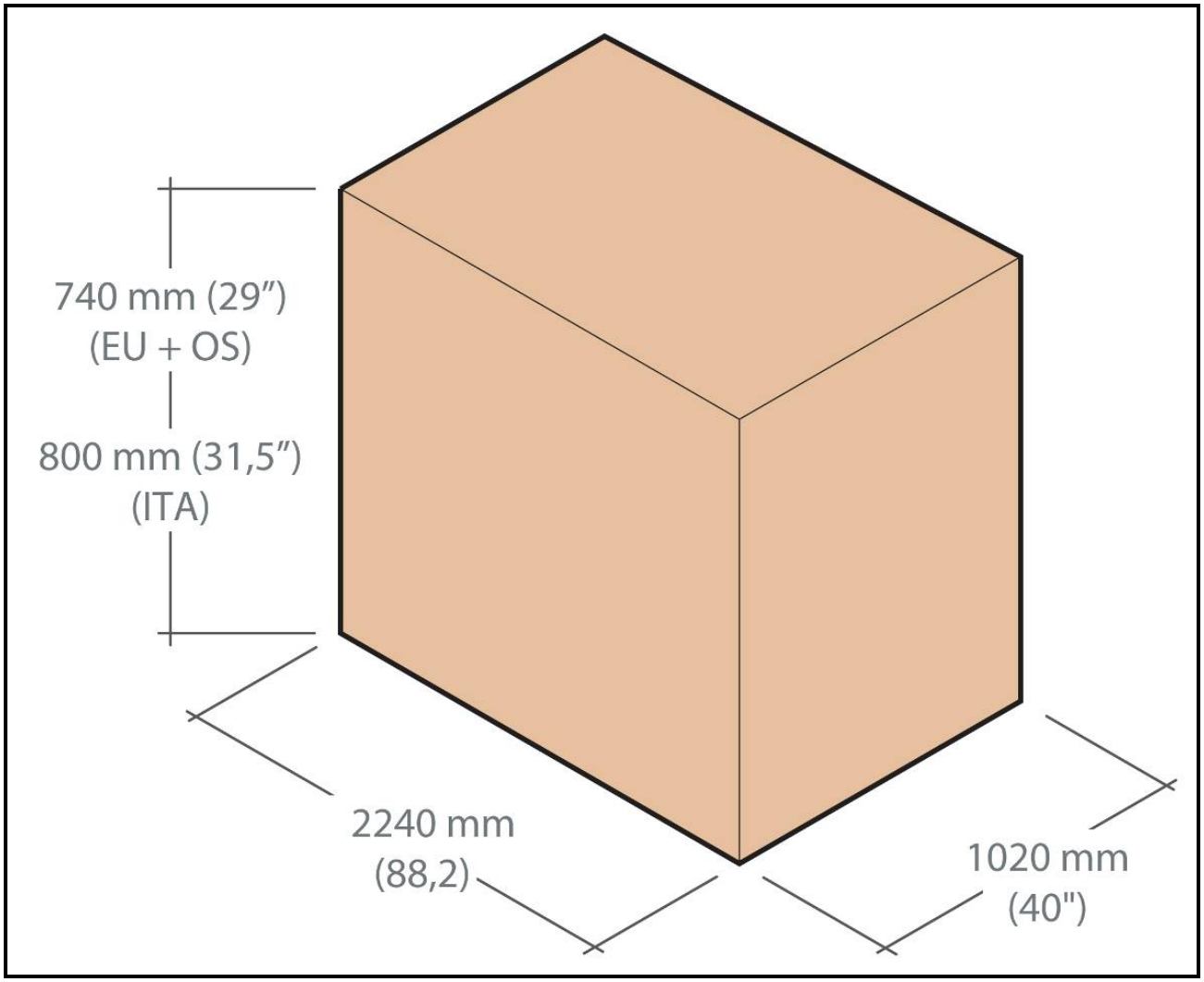
2.6. MECHANICAL CHARACTERISTICS

MECHANICAL CHARACTERISTICS	
Length (mm – in)	*2190mm – 86,2”*
Width (mm – in)	*960mm – 38”*
Height (mm – in)	*1552mm – 61”*
Weight (Kg – lbs)	*195Kg – 430lbs*
Running surface (Width.) mm - in	*520mm – 20,5”*
Running surface (depth.) mm - in	*1520mm – 60”*
Running surface Height from ground	*280mm – 11”*

2.6.1. OVERALL DIMENSIONS



2.6.2. EUROPEAN AND OVERSEAS PACKING DIMENSIONS



2.7. AMBIENT SPECIFICATIONS

Temperature	*Operating*	*from 10° to 25° C*
	Storage	*from -10 to 70° C*
Humidity	*Operating*	*from 20% to 90% non-condensing*
	Storage	*from 20% to 90% non-condensing*

2.8. CONFORMITY TO REGULATIONS

	EUROPE	*Europe MD*	*USA MET*	*USA*
EMI regulations	*EN61000 – 6 – 1 (2001)* *EN55022 (2000) class A* *EN61000 – 3 – 2 (2002)* *EN61000 – 3 – 3 (1997)*	*EN60601-1* *EN60601-1-2* *EN957-1* *EN957-6* *class SB*	*FCC15*	*FCC15*
Electrical safety regulations	*EN60335 – 1 (2008)*	-	*UL1647*	*UL60601 - 1*
Mechanical safety regulations	*EN957 – 1 (2006)* *EN957 – 6 (2003) class SB*	-	-	-
Directives	*2006/42/CE* *2004/108/CE* *2006/95/CE*	-	-	-

Moreover:

- *Risk category under 93/42/CEE:* ***Class IIa*** *(only for MD models),*
- *Electrical isolation class of the EN60601-1:* ***Class I****,*
- *Applied parts:* ***Type B*** *(only for MD models),*
- *Applied parts of the heart rate monitor transmitter:* ***Type BF*** *(only for MD models),*
- *Protection rating:* ***IP20****.*

2.9. WIRING DIAGRAMS

2.9.1. CONNESSIONE KIT ALTO E KIT BASSO

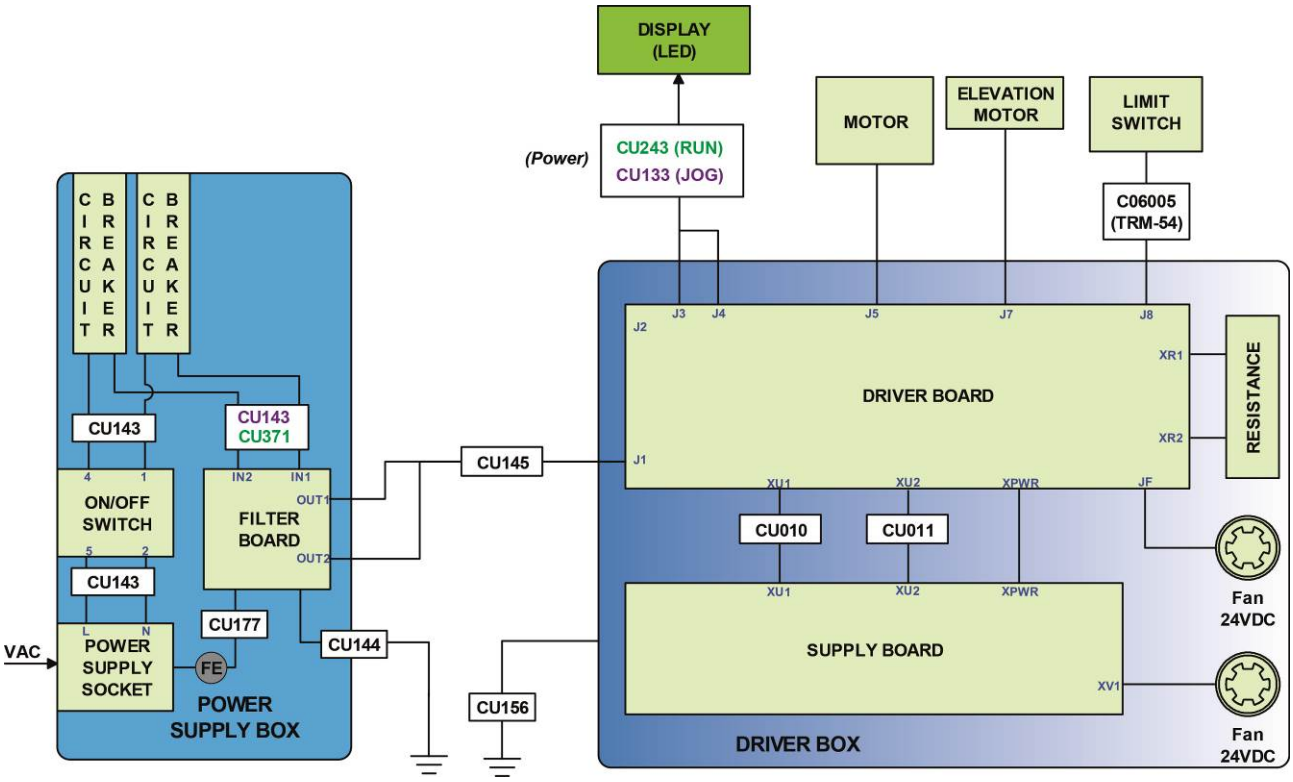
The machine consists of 2 assemblies witch are connected together (HK and LK); depending on the model these 2 parties accept the various configurations, described below.

Driver / Low Kit		***Old Driver***			***New Driver***	
		EUROPA USA	*USA* ***(with Auto-transformer)***	*USA*	*EUROPA*	*USA*
		ALE MET CE (200-240V)	***ALE MET CE (100-120V)***	***AT UL (100-240V)***	***ALEWin CE Europe (200-240V)***	***ALEWin Extended Range (100-240V)***
Display	**LED**	*X*	*X*	*X*	*X*	*X*
	VISIO/ VISIO-WEB	*X*	*X*	*X*	*X*	*X*
	UNITY	*X*	*X*	*NO*	*X*	*X*

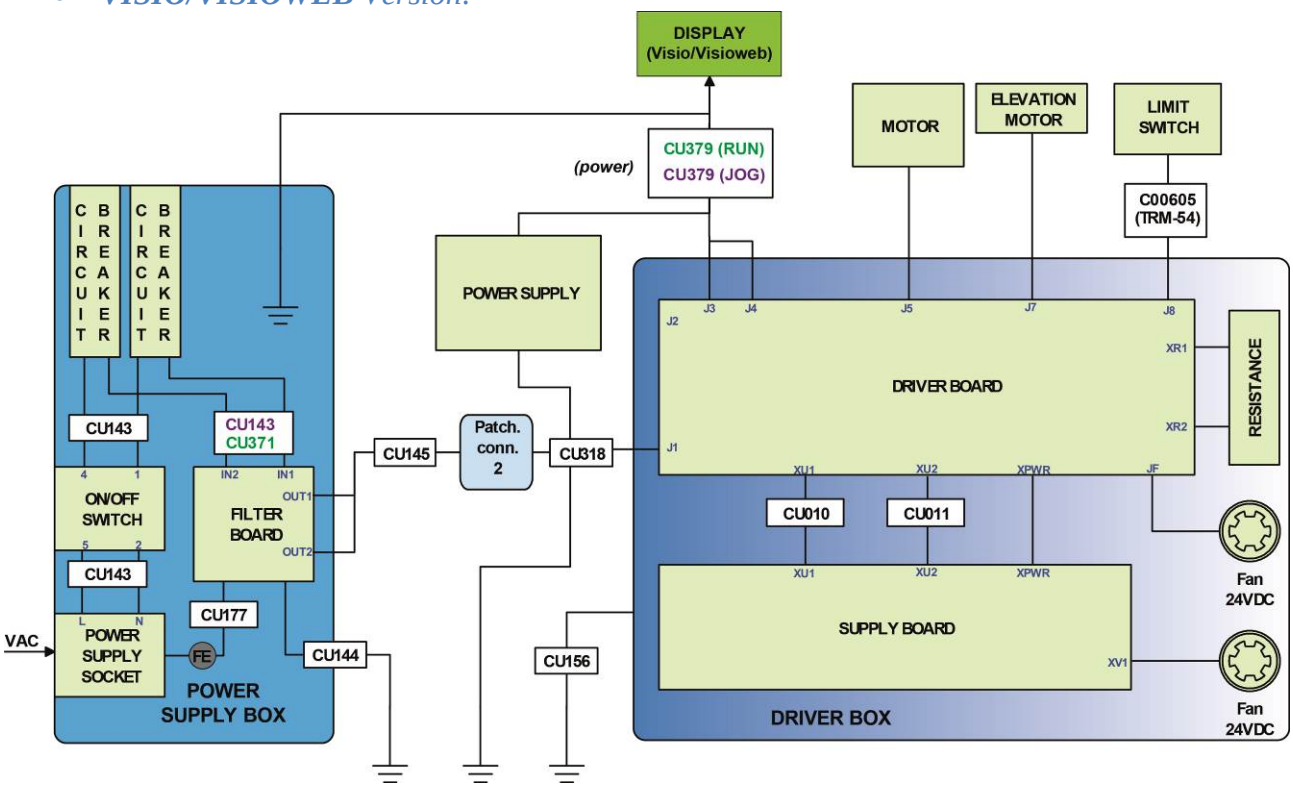
2.9.2. LOW KIT WIRING DIAGRAMS

2.9.2.1. AT-UL Extended Range: (100 - 240V)

- *LED Version:*

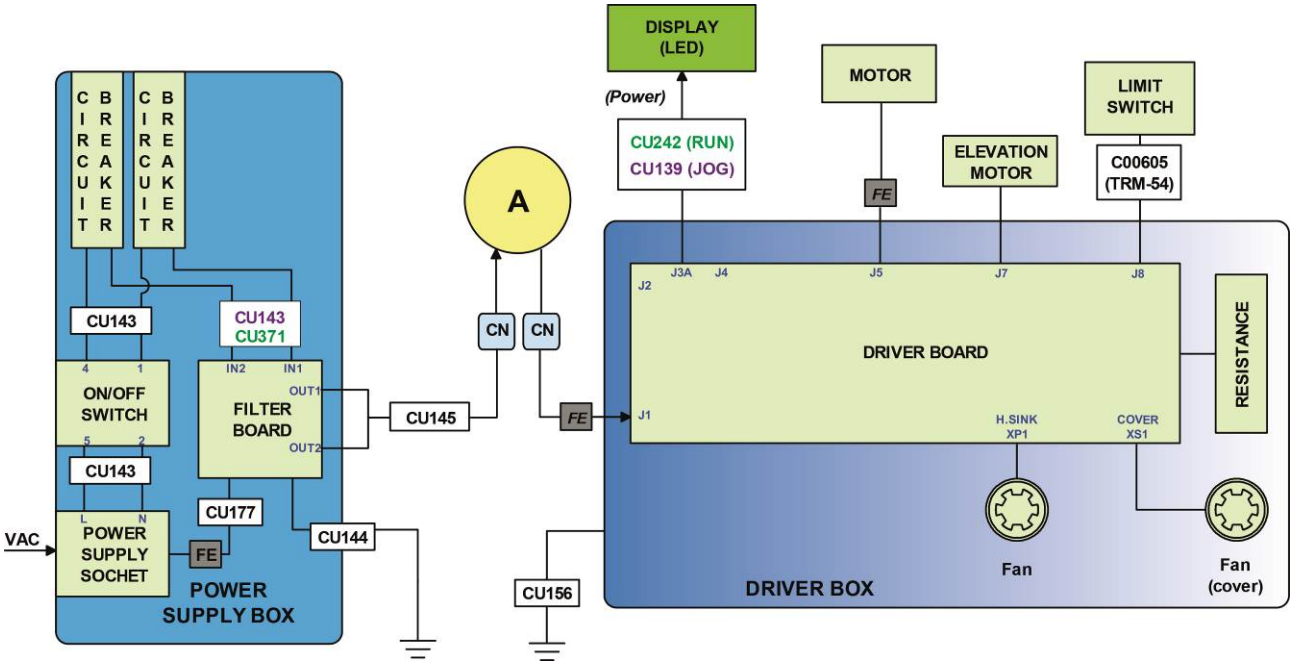


- *VISIO/VISIOWEB Version:*

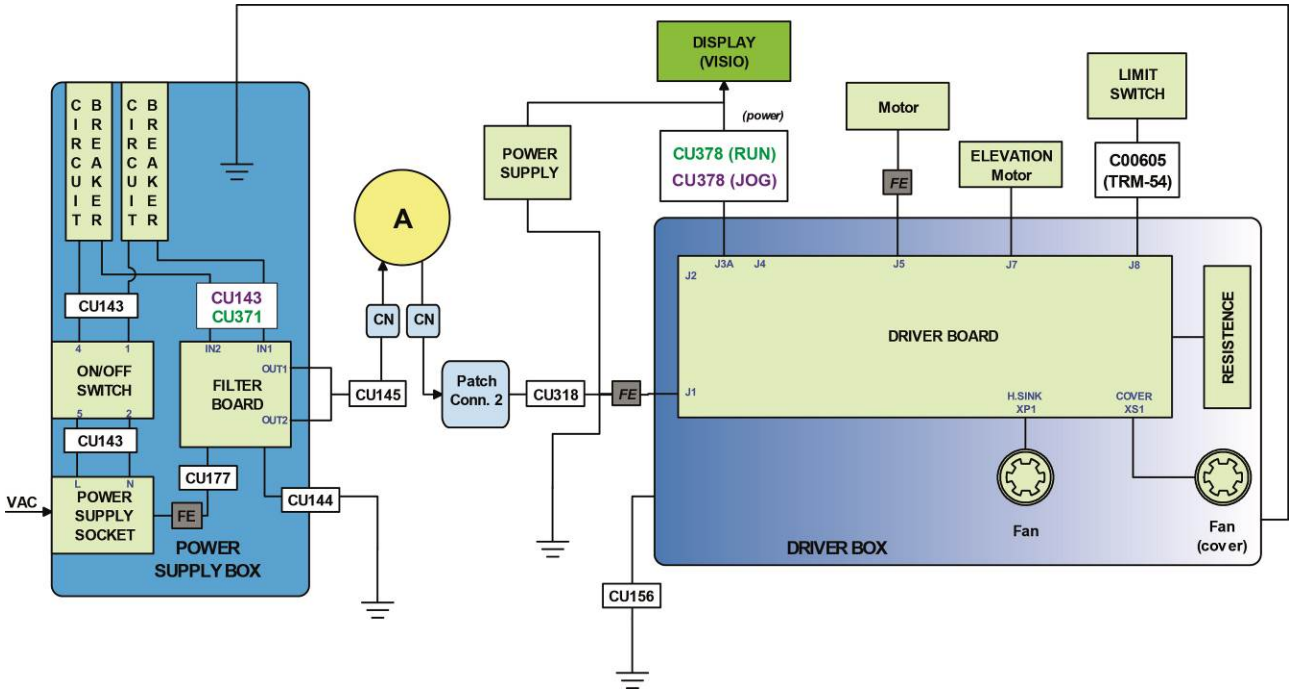


2.9.2.2. ALE MET CE: (100 - 120V)

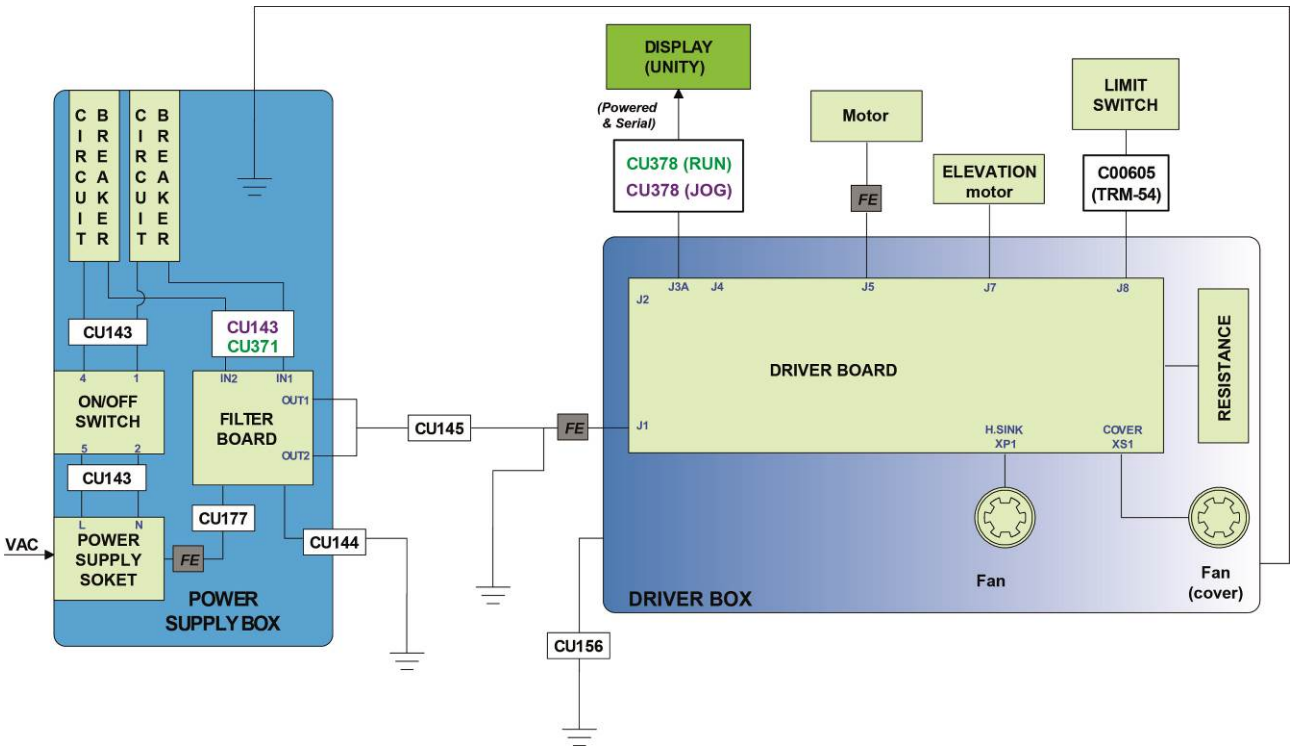
- ***LED** Version:*



- ***VISIO / VISIOWEB** Version:*

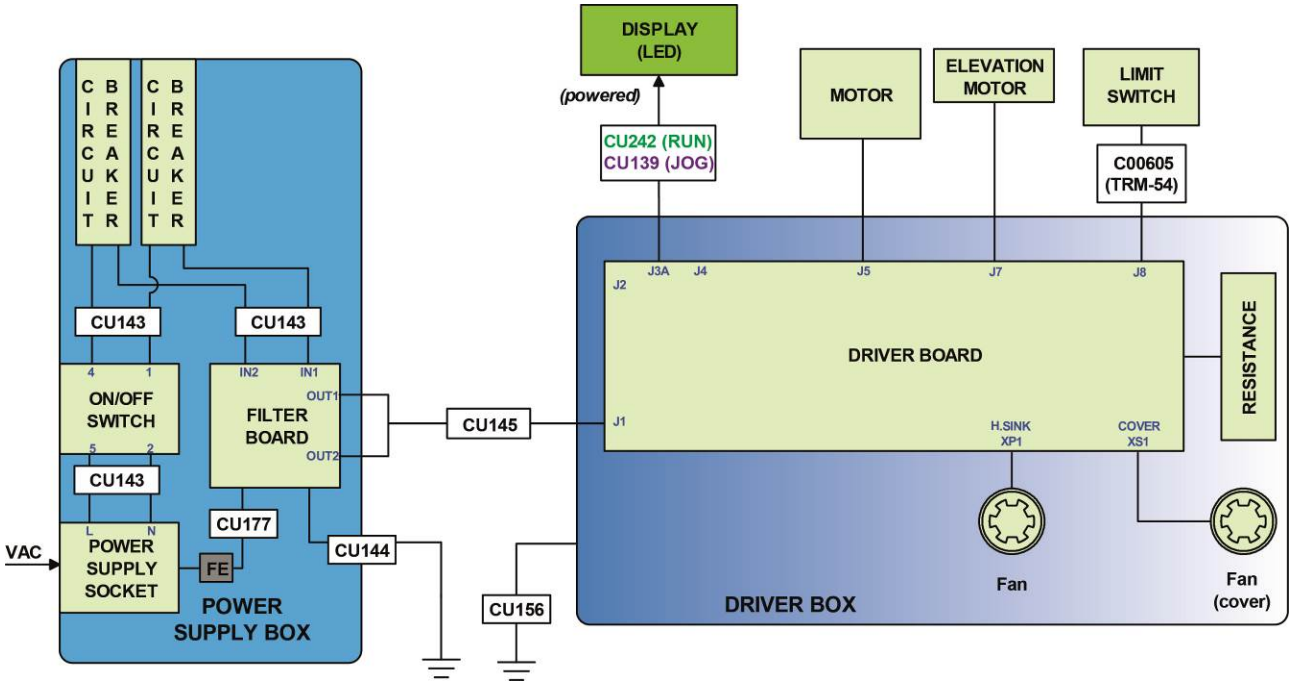


- ***UNITY** Version:*

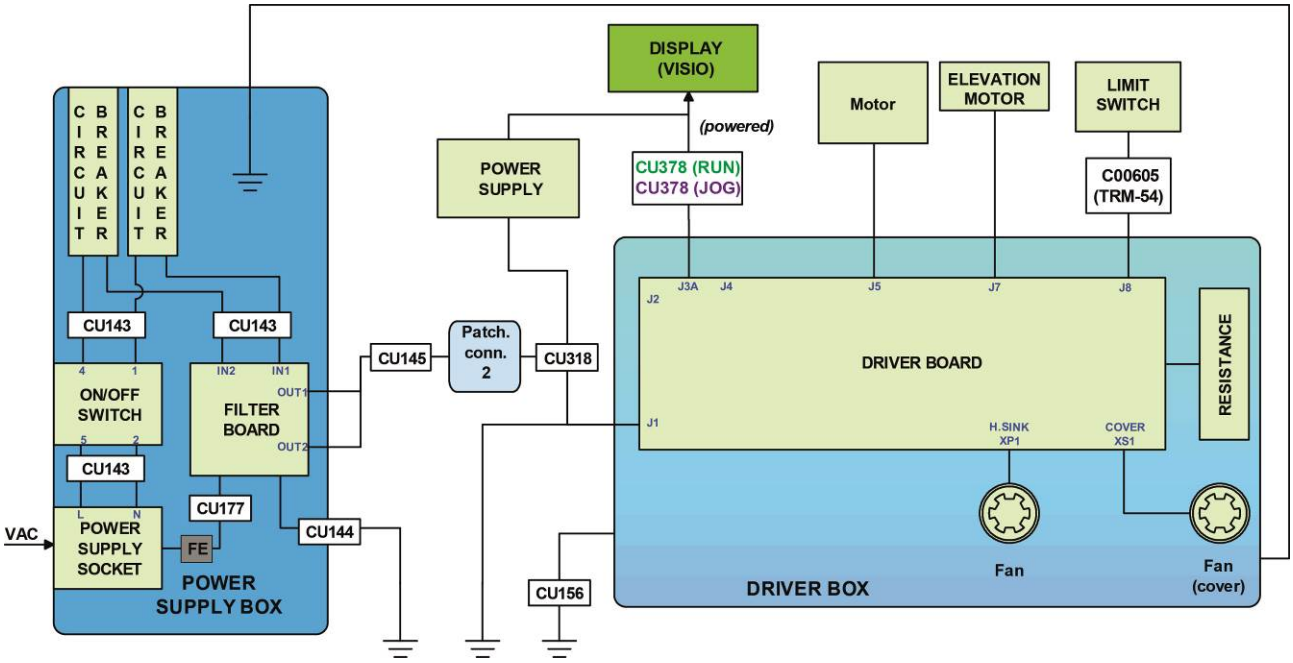


2.9.2.3. ALE MET CE: (200 - 240V)

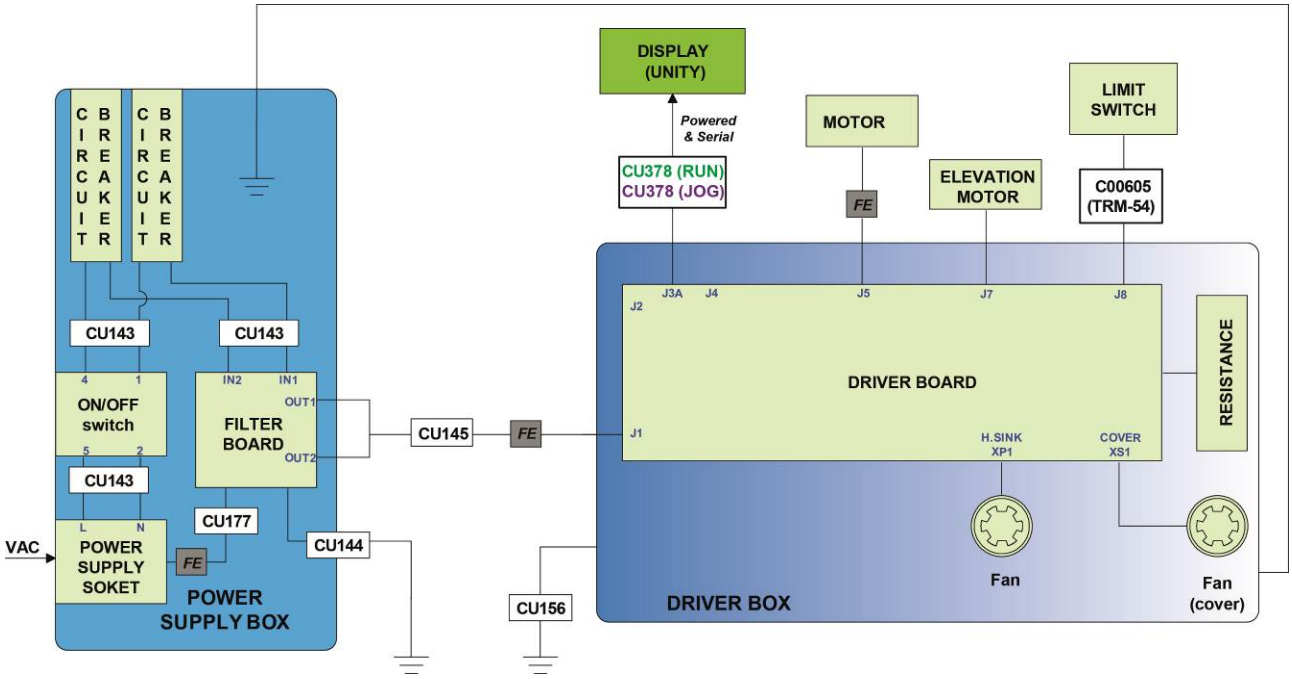
- ***LED** Version:*



- ***VISIO / VISIOWEB** Version:*



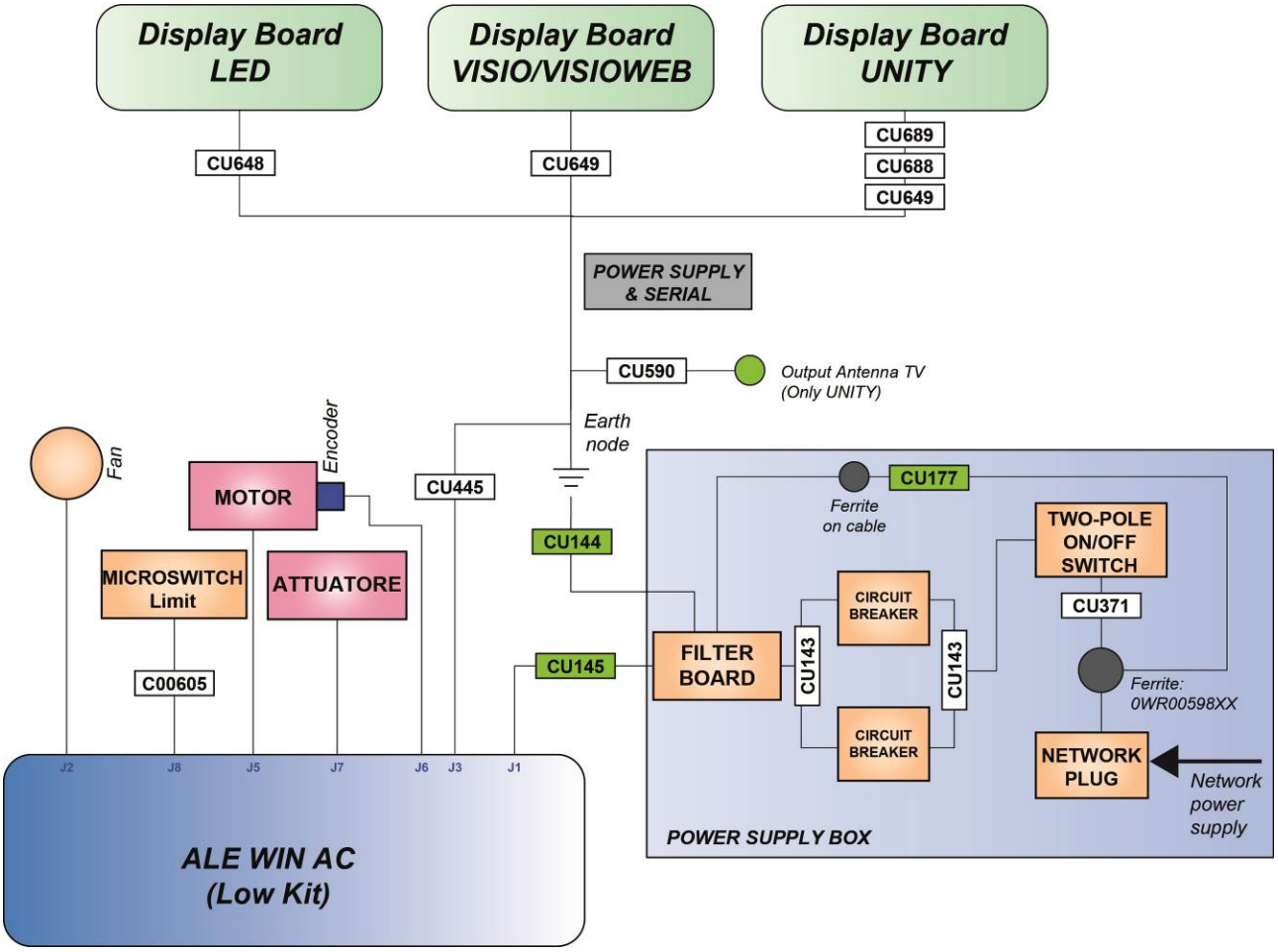
- ***UNITY** Version:*



2.9.2.4. ALEWin Extended Range: (100 - 240V)

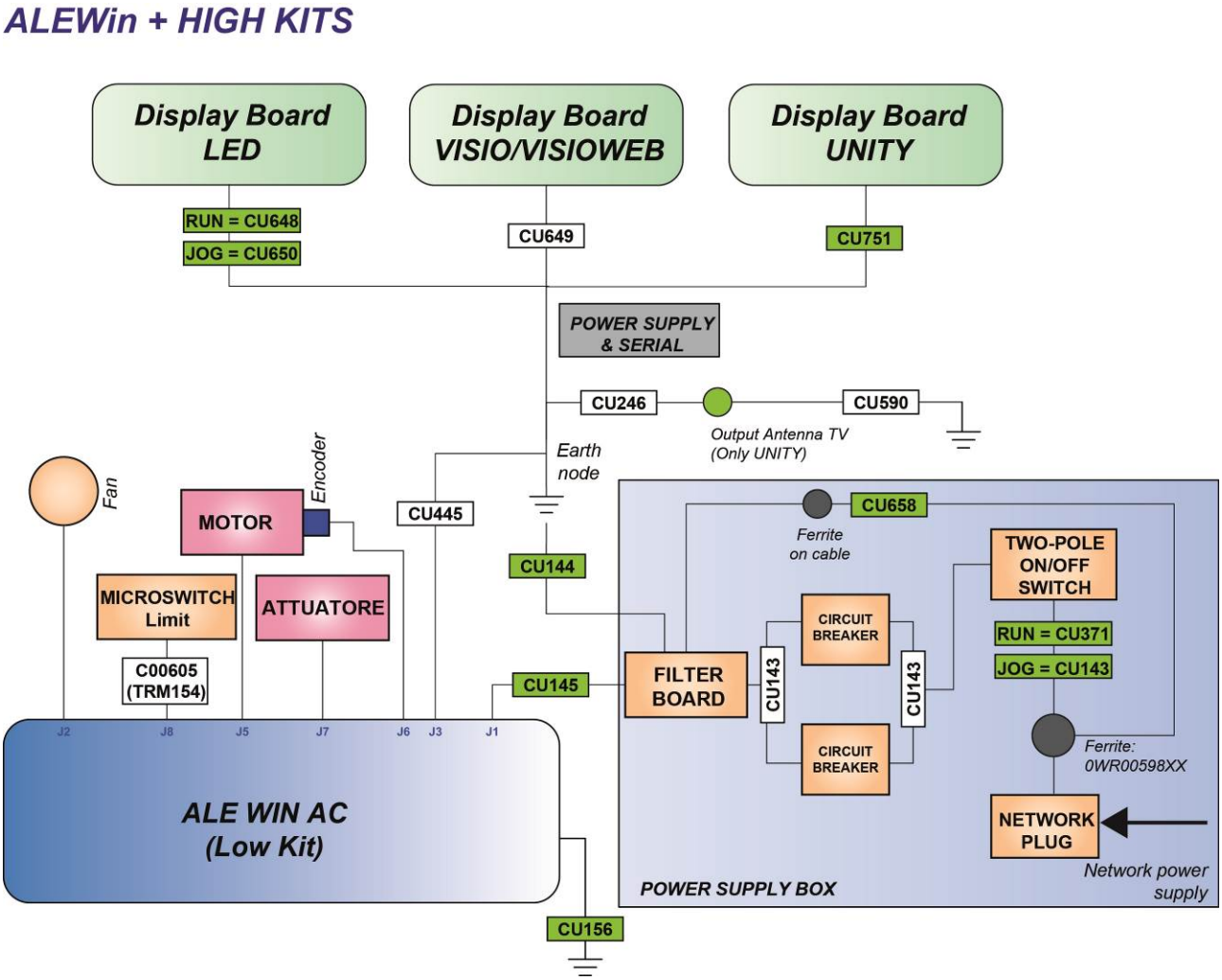
A. Electrical **ADAPTER** cables

- ***LED – VISIO/VISIOWEB – UNITY** Version*



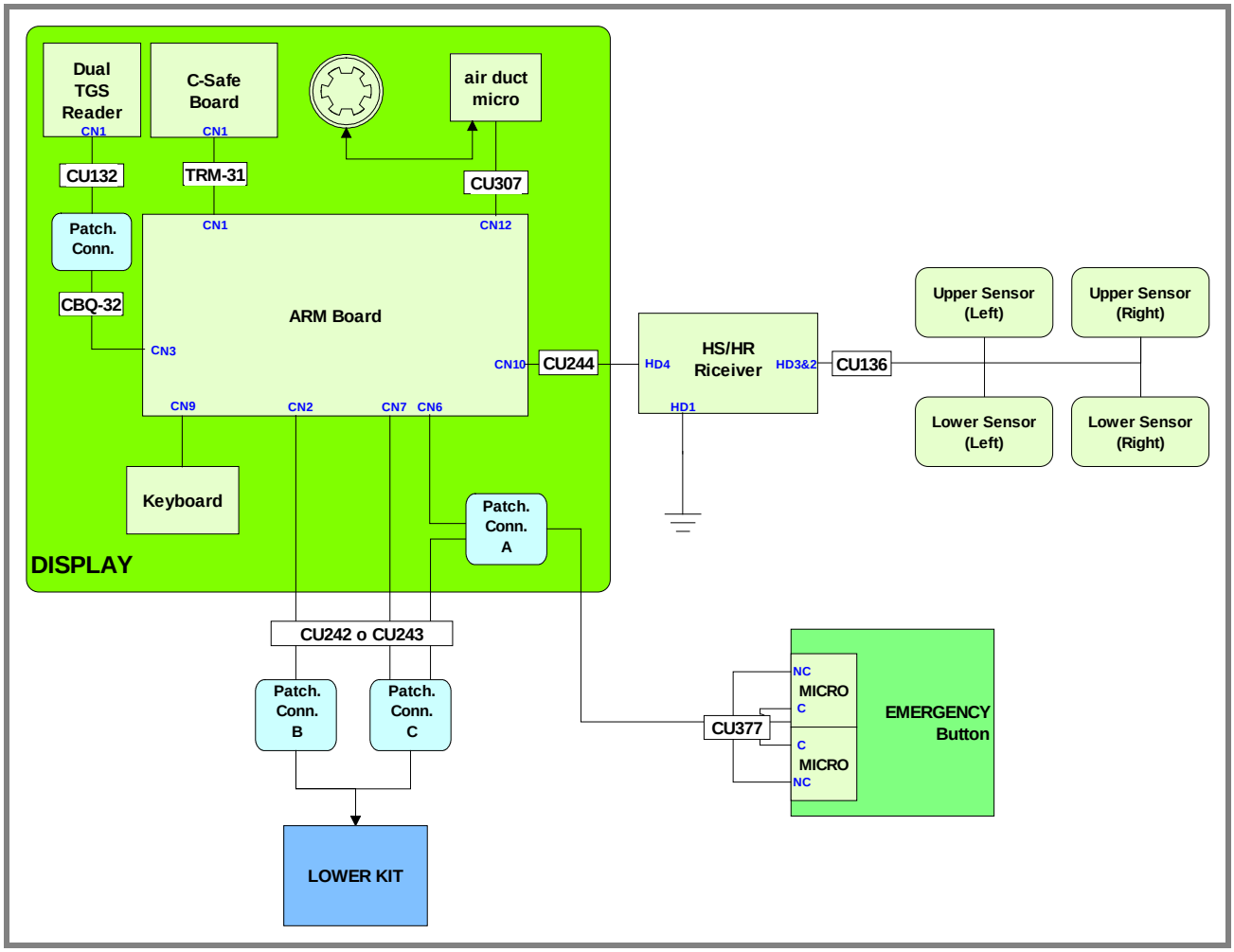
B. Electrical **FINAL** cables

- ***LED – VISIO/VISIOWEB – UNITY** Version*

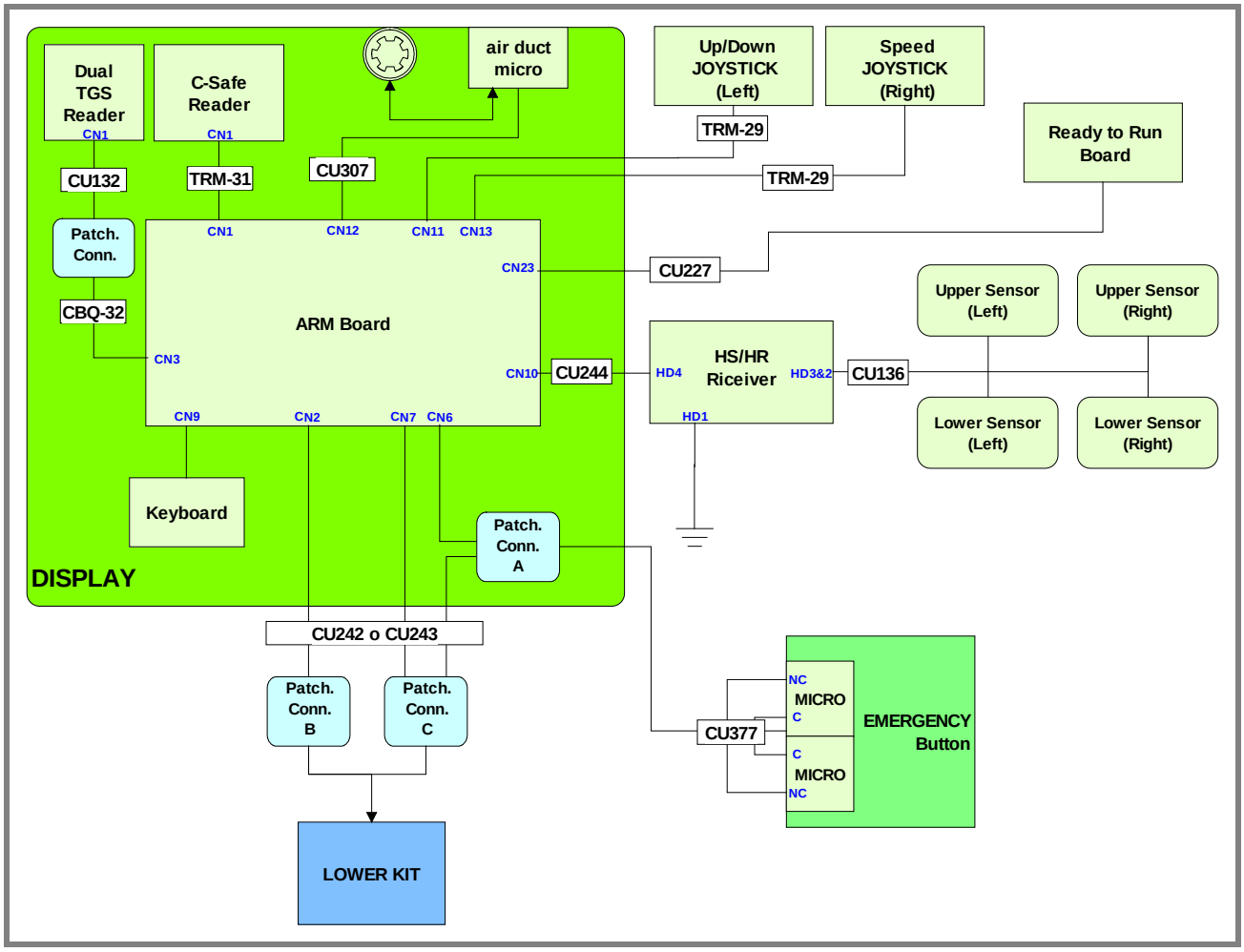


2.9.3. HIGH KIT

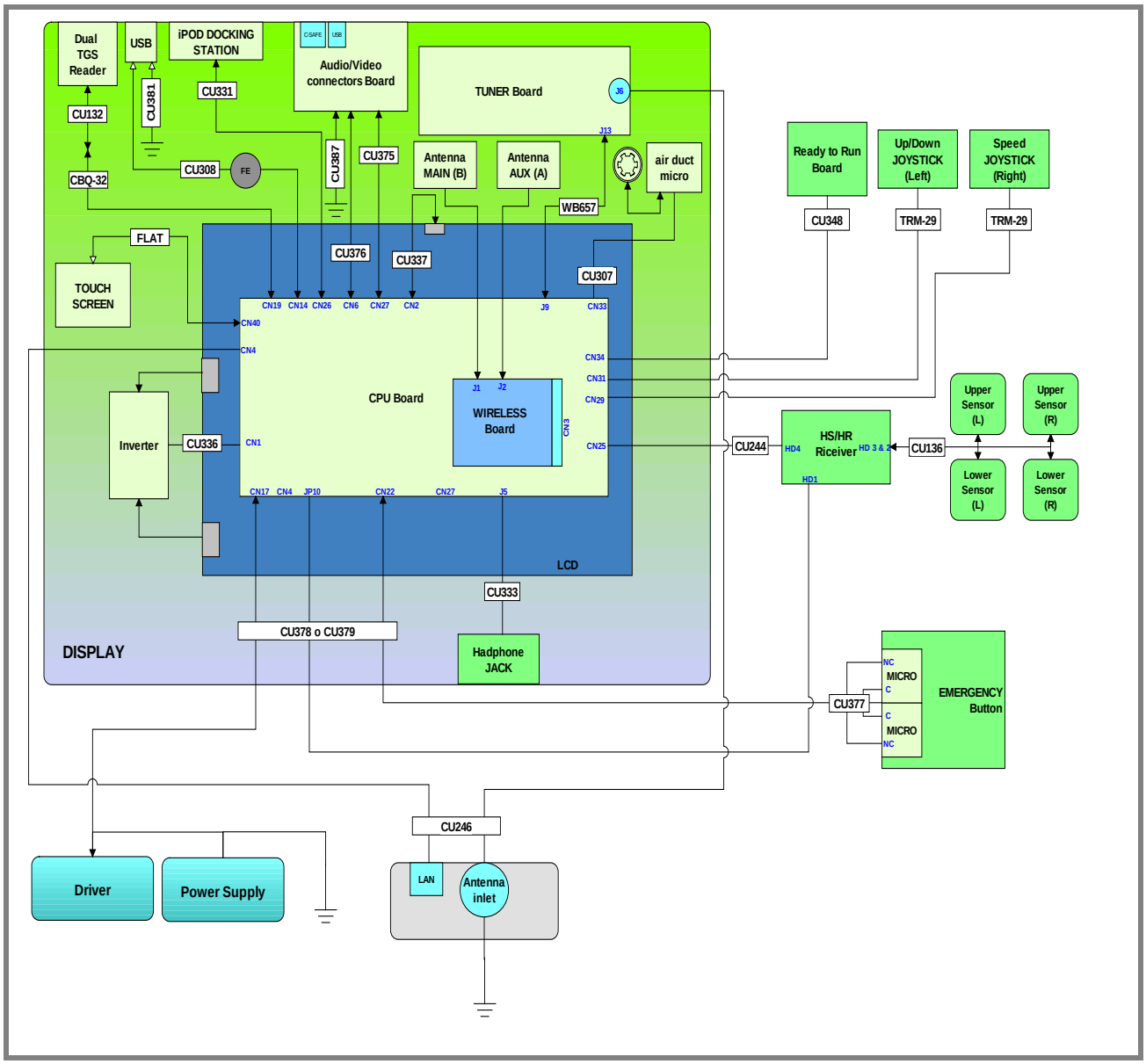
2.9.3.1. 500 LED powered models (ARM Board)



2.9.3.2. 700 and 900 LED powered models (ARM Board)

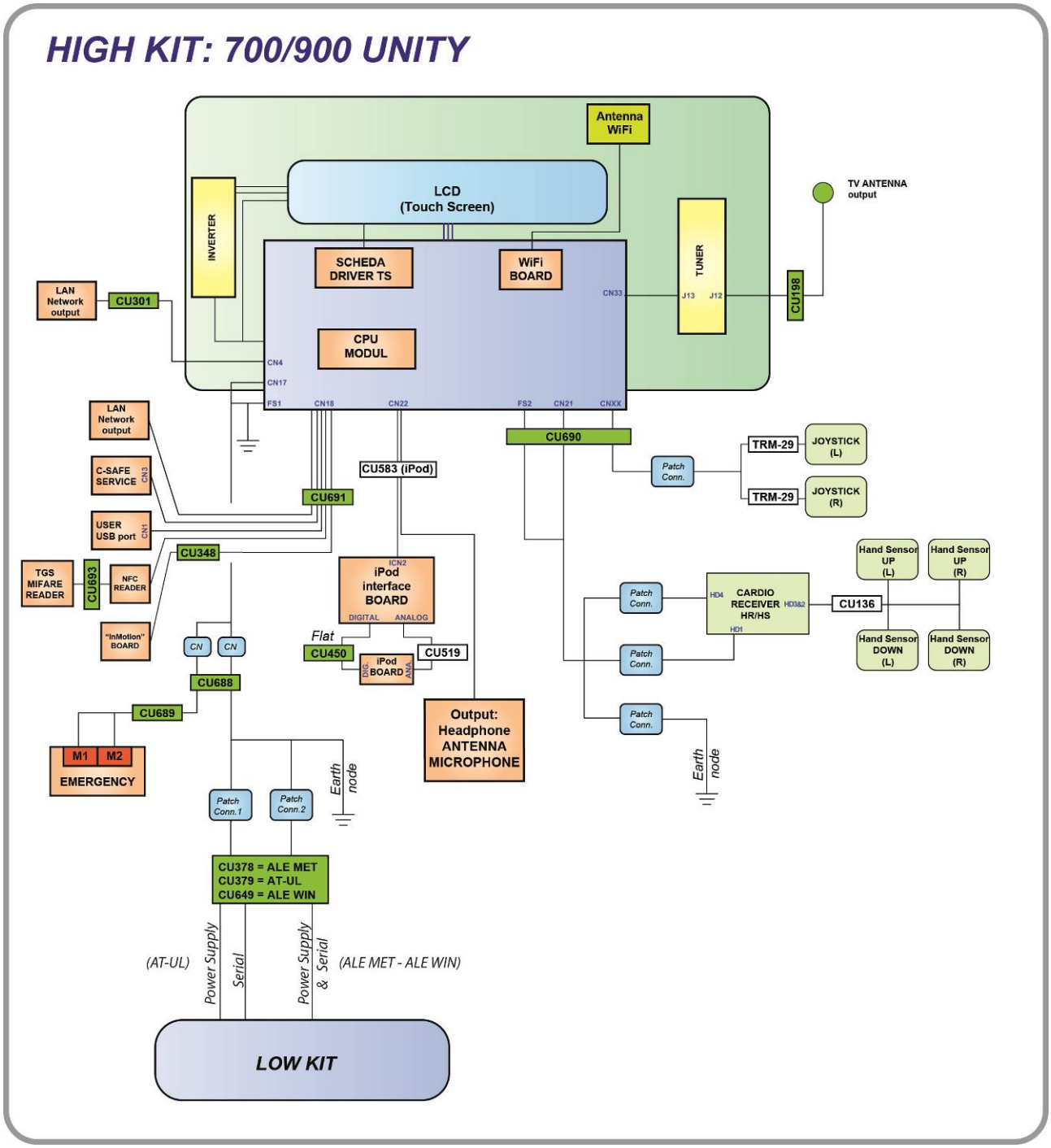


2.9.3.3. 700 and 900 VISIOWEB powered models (CPU Board)

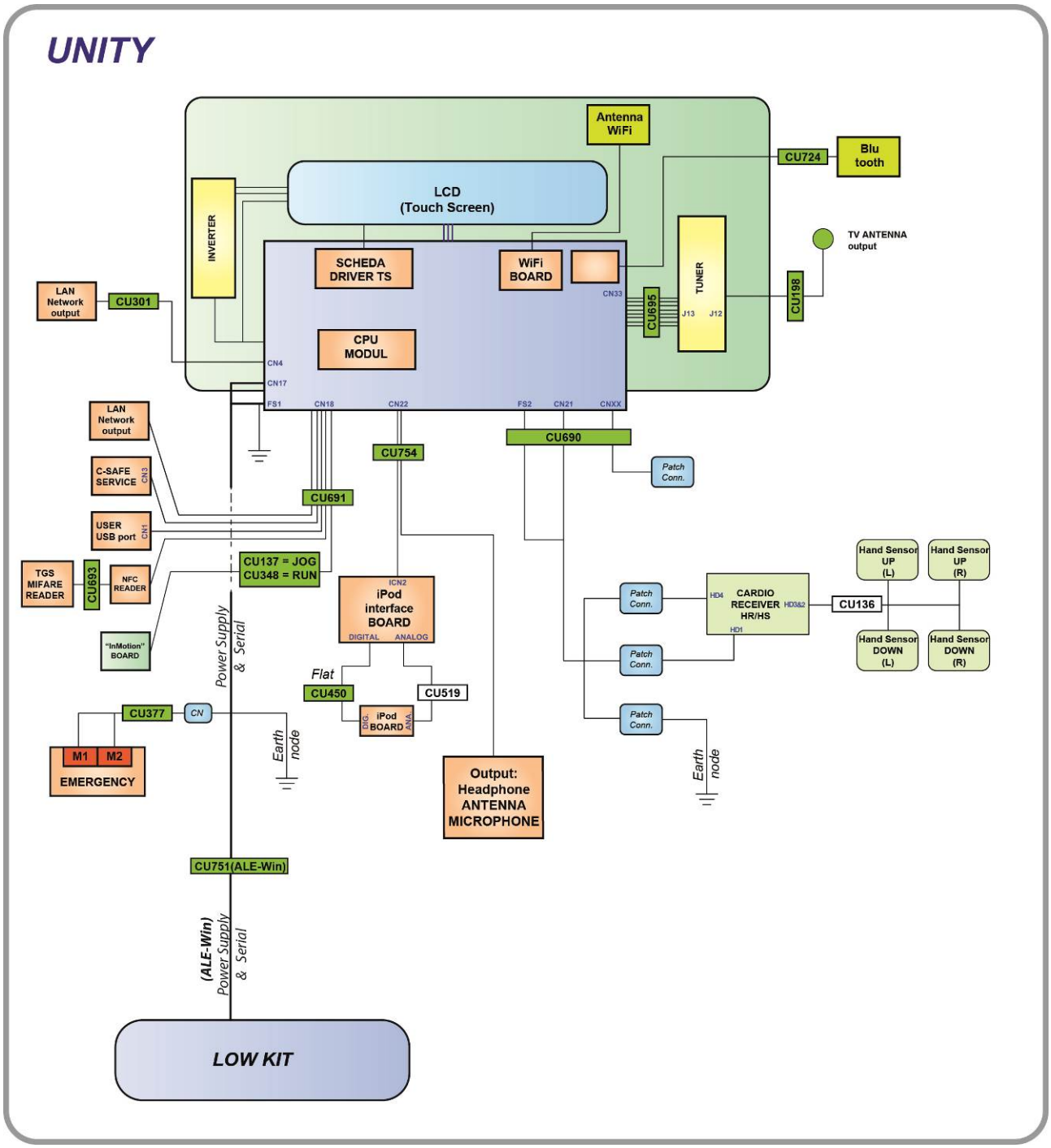


2.9.3.1. Powered models 700 UNITY

A. Electrical **ADAPTER** cables



A. Electrical **FINAL** cables



2.10. CABLES

The colour of the cables can be changed, refer in particular to the Pin Out.

2.10.1. CBQ CABLES

CBQ32: TGS cable (Patch conn. – CPU / ARM Board)				
ARM Board CN4	**CPU Board CN19**	**Signal**	**Colour**	**Patch Conn.**
1		*+12Vdc power supply*	*Red*	*8*
3		*RX*	*Brown*	*1*
5		*TX*	*Blue*	*2*
9		*GND*	*Black*	*6*

2.10.2. AUTOTRANSFORMER CABLE

AUTOTRANSFORMER cable (Autotransformer – Power supply box – ALE Driver)			
Autotransformer	**Signal**	**Power Supply box**	**ALE Driver: J1**
Cable internally connected	*(PHASE) 110Vac Power Supply*	***1***	
	(NEUTRAL) 110Vac Power Supply	***2***	
	(PHASE) 220Vac Power Supply		***1***
	(NEUTRAL) 220Vac Power Supply		***2***

2.10.3. TRM CABLES

TRM-31: C-Safe Signal cable (LED only) (ARM Board – C-Safe Board)			
ARM Board CN1	**Signal**	**Colour**	**C-Safe Board CN1**
1	*Digital #1*	*Flat cable*	*1*
…	…	…	…
14	*Digital #14*	*Flat cable*	*14*

TRM-54: Limit Switch cable (ALE/AT UL Driver – Limit Switch)			
ALE/AT UL driver J8	**Signal**	**Colour**	**Limit Switch**
3	*Contact*	*White*	*Fast-on*
8	*Reference*	*Brown*	*Fast-on*

TRM-29: Up-Down and Speed Joystick cable (CPU / ARM Board– Joystick)				
Boards CPU: CN16/17 ARM: CN11/13	**Signal**	**Colour**	**Micro Joystick**	
			Up	**Down**
1	*Reference -*	*White*	*-*	*Faston (C)*
2	*Grade -*	*Brown*	*-*	*Faston (NA)*
3	*Reference +*	*Green*	*Faston (C)*	*-*
4	*Grade +*	*Yellow*	*Faston (NA)*	*-*

2.10.4. CAVI CU

CU132: TGS Signal cable (Patch Conn.– Dual TGS reader)			
Patch Conn.	**Signal**	**Colour**	**Dual TGS reader CN1**
8	*+12Vdc power supply*	*Black*	*2*
1	*RX*	*Green*	*1*
2	*TX*	*Black*	*4*
6	*GND*	*Black*	*5*

CU136: Hand Sensor Signal cable (Cardio Receiver– Hand Sensor L / R)						
Cardio Receiver HD3&2	**Signal**	**Colour**	**Hand Sensor (L)**		**Hand Sensor (R)**	
			Up	***Down***	***Up***	***Down***
1	*Right hand signal input*	*Black*	-	-	***faston***	-
2	*Right hand contact ref*	*Black*	-	-	-	***faston***
3	*Shield GND*	*Black*	-	-	-	-
4	*Left hand signal input*	*Black*	***faston***	-	-	-
5	*Left hand contact ref*	*Black*	-	***faston***	-	-

CU145: Power Supply cable (Filter Board / Patch conn.)			
Filter Board OUT1/OUT2	**Signal**	**Colour**	**Patch Conn. 2**
Fast-on	*Phase*	*Black*	*1*
Fast-on	*Neutral*	*Black*	*2*

CU227: Ready to Run cable (“InMotion”) (InMotion Board – ARM/CPU Board)			
InMotion Board	**Signal**	**Colour**	**ARM Board: CN23 CPU Board: CN34**
1	*Vcc +5*	*Brown*	*1*
2	*En Light*	*Green*	*4*
3	*GND +5*	*White*	*8*

CU242: Connecting cable ALE Driver and LED Display (ALE Driver –LED Display)						
ALE Driver J3A	**Signal**	**Colour**	**LED Display**			**Patch Conn. A**
			CN2	**CN7**	**CN6**	
1	*485 TXD+ RXD+*	*Brown/White*	***7***	-	-	-
2	*GND +12Vdc*	*Grey*	-	***2***	-	-
3	*GND +5Vdc*	*Black*	-	***3***	-	-
4	*n.c.*	-	-	-	-	-
5	*485 TXD- RXD-*	*Brown*	***8***	-	-	-
6	*+12Vdc*	*Orange*	-	***6***	-	-
7	*+5Vdc*	*Red*	-	***7***	-	-
8	*n.c.*	-	-	-	-	-
9	*EXT Emergency*	*White*	-	-	***4***	-
10	*Emergency restoration*	*Blue*	-	-	***5***	-
11	*n.c.*	-	-	-	-	-
12	*n.c.*	-	-	-	-	-
-	*HW Emergency*	*Grey*	-	-	***2***	***3***
-	*SW Emergency*	*Grey*	-	-	***3***	***1***
-	*GND +12Vdc ISO*	*Black*	-	-	***6***	***2***
Receiver HD1	**Signal**	**Colour**	**FRAME**			
Fast-on	*GND*	*Yellow / Green*	*Fast-on*			

CU243: Connecting cable AT-UL Driver and LED Display (AT-UL Driver– ARM Board)

AT-UL CN01	AT-UL CN08	Signal	Colour	ARM Board			Patch Conn. A
				CN2	CN7	CN6	
2	-	GND +12Vdc	Grey	-	2	-	-
3	-	GND +5Vdc	Black	-	3	-	-
4		- sensing +5Vdc	Brown	-	4	-	-
6	-	+12Vdc	Orange	-	6	-	-
7	-	+5Vdc	Red	-	7	-	-
8	-	+ sensing 5Vdc	Yellow	-	8	-	-
9	-	EXT Emergency	White	-	-	4	-
10	-	Emergency restoration	Blue	-	-	5	-
11 6	-	+12Vdc	Orange	-	-	-	-
12 4	-	- sensing +5Vdc	Brown	-	-	-	-
-	1	NC	Green/ White	1	-	-	-
-	2	NC	Green	2	-	-	-
-	4	Download	Blu	4	-	-	-
-	5	Reset	Blue/ White	5	-	-	-
-	6	GND Digital	Orange	6	-	-	-
-	7	485 TXD+ RXD+	Brown / White	7	-	-	-
-	8	485 TXD- RXD-	Brown	8	-	-	-
-	-	HW Emergency	Grey	-	-	2	3
-	-	SW Emergency	Grey	-	-	3	1
-	-	GND +12Vdc ISO	Black	-	-	6	2
Receiver HD1		**Signal**	**Colour**	**FRAME**			
Fast-on		GND	Yellow / Green	Fast-on			

CU244: Cardio receiver cable (ARM/CPU Board – Receiver Board)

ARM Board: CN10 CPU Board: CN25	Signal	Colour	Cardio Receiver Board
4	n.c.		
3	Pulse Signal	White	5
2	+5V cardio.2	Brown	1
1	GND - Card	Green	6

CU246: Antenna cable+ LAN (VISIO only) (CPU Board– Front lower frame)			
CPU Board: CN4	**Signal**	**Colour**	**Anterior lower frame**
1	*LAN Signal*	*White / Green*	*1*
2	*LAN Signal*	*Green*	*2*
3	*LAN Signal*	*White / Orange*	*3*
4	*LAN Signal*	*Blue*	*4*
5	*LAN Signal*	*White/Blue*	*5*
6	*LAN Signal*	*Orange*	*6*
7	*LAN Signal*	*White / Brown*	*7*
8	*LAN Signal*	*Brown*	*8*
TUNER Board J6	**Signal**	**Colour**	**Anterior lower frame**
1	*Antenna signal*	*Black*	*1*

CU307: Fan ON/OFF cable (ARM/CPU Board– Fan Micro-switch)				
ARM Board: CN12 CPU Board: CN33	**Fan cable**	**Signal**	**Colour**	**Fan micro-switch**
2	-	*GND +12V*	-	*Fast-on*
1	***1***	*+12V*	*Red*	-
-	***2***	*GND +12V*	-	*Fast-on*

CU308: User USB port cable (VISIO only) (CPU Board–USB Port)			
CPU Board CN14	**Signal**	**Colour**	**USB Port**
1	*+5Vdc*	*Red*	*1*
2	*USB-*	*White*	*2*
3	*USB+*	*Black*	*3*
4	*GND*	*Green*	*4*
5	*Shield*	*Blue*	*5*

CU318: Signal cable (VISIO only) (Power Supply – Driver)				
Patch conn. 2	**Signal**	**Colour**	**Driver J1**	**Power Supply**
1	*PHASE*	*Brown*	-	*Socket*
			1	-
2	*NEUTRAL*	*blue*	-	*Socket*
			2	-
Patch conn.2	**Signal**	**Colour**	**Frame**	
Fast-on	*GND*	*Yellow / Green*	*Fast-on*	-
Fast-on	*GND*	*Yellow / Green*	-	*eyelet*

CU331: iPod signal cable (VISIO only) (CPU Board– Docking Station)			
CPU Board CN26	**Signal**	**Colour**	**Docking Station**
1	*+V bus USB*	*Black*	*14*
2	*GND bus USB*	*Black*	*13*
3	*TX - RX*	*Black*	*11*
4	*RX – TX*	*Black*	*12*
5	*CTS*	*Black*	*10*
6	*+5Vdc*	*Black*	*9*
7	*GND*	*Black*	*8*
8	*GND*	*Black*	*7*
9	*Video Gnd*	*Black*	*6*
10	*Video signal*	*Black*	*5*
11	*Audio L gnd*	*Black*	*4*
12	*Audio L signal*	*Black*	*3*
13	*Audio R signal*	*Black*	*2*
14	*Audio R gnd*	*Black*	*1*

CU333: Headphone Jack cable (VISIO only) (CPU Board– Headphone Jack)			
CPU Board J5	**Signal**	**Colour**	**Headphone Jack**
2	*Out_R*	*Green*	*4*
4	*Schield*	*Yellow*	*5*
1	*GND*	*Red*	*2*
3	*Out_L*	*Black*	*1*

CU336: LCD Inverter Frontek cable (VISIO only) (CPU Board – LCD Inverter)			
CPU Board CN1	**Signal**	**Colour**	**LCD Inverter CN1**
1	*+12Vdc entry Power Supply*	*Black*	*11*
2 (*)	*GND*	*Black*	*1*
3	*ON - OFF*	*Black*	*4*
4	*GND*	*Black*	*3*
5 (*)	*+12Vdc*	*Black*	*12*
6	*Save - lamp*	*Black*	*2*
7	*n.c.*	*Black*	*-*

(*) =Apply two wires on the same contact.

CU337: LCD Power Supply (VISIO only) (CPU Board– LCD)			
CPU Board CN2	**Signal**	**Colour**	**LCD**
1	Vcc LCD		5
2	Vcc LCD		6
3	Vcc LCD		11
7	Shield		17
8	RxE3+		20
9	RxE3-		22
10	RxEc+		26
11	ExEc-		28
12	RxE2+		14
13	RxE2-		16
14	GND		23
15	RxE1+		8
16	RxE1-		10
17	GND		24
18	RxE0+		2
19	RxE0-		4
20	Rx03+		19
21	Rx03-		21
22	Rx0c+		25
13	Rx0c-		27
24	GND		29
25	Rx02+		13
26	Rx02-		15
27	Rx01+		7
28	Rx01-		9
29	Rx00+		1
30	Rx00-		3

CU348: Ready to Run cable (“InMotion”) (VISIO only) (InMotion Board –CPU Board)			
InMotion Board	**Signal**	**Colour**	**CPU Board: CN34**
1	Vcc +5Vdc	Brown	1
2	Em. Ligth	Green	2
3	GND +5Vdc	White	4

CU371: Cavo alimentazione alta tensione (Spina di rete – Interruttore ON/OFF)			
Soket Wall	**Signal**	**Colour**	**Int.re ON/OFF**
Faston	Phase	-	Faston
Faston	Neutral	-	Faston

CU375: AUDIO / VIDEO signal cable (VISIO only) (CPU Board –AUDIO / VIDEO Connectors Board)			
CPU Board: CN27	**Signal**	**Colour**	**AUDIO / VIDEO Connector Board**
1	*n. c.*	*-*	*1*
2	*In L*	*White*	*2*
3	*GND in L*	***Sheath***	*3*
4	*In R*	*Red*	*4*
5	*GND in R*	***Sheath***	*5*
6	*In VIDEO*	*Yellow*	*6*
7	*GND in VIDEO*	***Sheath***	*7*
8	*n. c.*	*-*	*8*

CU376: USB / C-Safe Connectors Board cable (VISIO only) (CPU Board – USB / C-Safe Connectors Board)			
CPU Board: CN6	**Signal**	**Colour**	**USB / C-Safe Connectors Board**
1	*Vcc*	*Oragne*	*1*
2	*Vcc*	*Oragne*	*2*
3	*USB -*	*White*	*3*
4	*USB +*	*Brown*	*4*
5	*GND Shield*	*Black*	*5*
6	*GND*	*Black*	*6*
7	*GND*	*Nero*	*7*
8	*Af_+bvdc_csafe*	*Blue*	*8*
9	*Af_+bvdc_csafe*	*Blue*	*9*
10	*Rxd1_in*	*Red*	*10*
11	*Rxd1_in*	*Yellow*	*11*
12	*Cts1_in*	*Grey*	*12*
13	*GND*	*Black*	*13*
14	*GND*	*Black*	*14*

CU377: Emergency cable (VISIO - UNITY) (Display Board / CV – Micro 1 (Hardware)/ Micro 2 (Software)						
CPU: CN22	**ARM: CN8**	**UNITY patch Con.**	**Signal**	**Colour**	**Micro 1 (HW)**	**Micro 2 (SW)**
1			*Emergency _SW*	*White*	*CN02*	*-*
2			*GND_DIG*	*Brown*	*-*	*CN05*
3			*Emergency _HW*	*Green*	*CN02*	*-*
-			*GND*	*Black*	*CN03*	*CN04*

CU378: Connecting cable VISIO Display and ALE Driver (CPU Board–ALE Driver)				
CPU Board CN17	**Signal**	**Colour**	**ALE Driver J3A**	**External Power Supply**
1	*n.c*	*-*	*-*	*-*
2	*GND +12Vdc*	*Grey*	***2***	*-*
3	*n.c.*	*-*	*-*	*-*
4	*EXT Emergency*	*White*	***9***	*-*
5	*GND +12Vdc EST Power Supply*	*Black*	*-*	***1***
6	*485 TXD – RXD -*	*White*	***5***	*-*
7	*+12Vdc*	*Orange*	***6***	*-*
8	*n.c.*	*-*	*-*	*-*
9	*+12Vdc EST Power Supply*	*Red*	*-*	***2***
10	*Restore*	*Blue*	***10***	*-*
11	*n.c.*	*-*	*-*	*-*
12	*485 TXD + RXD +*	*Brown*	***1***	*-*
Display Ground JP10	**Signal**	**Colour**	**Receiver Ground HD1**	**Frame Ground**
Fast-on	*GND*	*Yellow/Green*	*Fast-on*	*Fast-on*

CU379: Connecting cable VISIO Display and AT-UL Driver (CPU Board – AT-UL Driver)					
CPU Board CN17	**Signal**	**Colour**	**AT-UL Driver**		**External Power Supply**
			J3	**J4**	
1	*n.c.*	*-*	*-*	*-*	*-*
2	*GND +12V*	*Grey*	***2***	*-*	*-*
3	*n.c.*	*-*	*-*	*-*	*-*
4	*EXT Emergency*	*White*	***9***	*-*	*-*
5	*GND +12V EST*	*Black*	*-*	*-*	***1***
6	*485 TXD – RXD -*	*Brown*	*-*	***8***	*-*
7	*+12V*	*Orange*	***6***	*-*	*-*
8	*n.c.*	*-*	*-*	*-*	*-*
9	*+12 EST*	*Red*	*-*	*-*	***2***
10	*Restoring*	*Blue*	***10***	*-*	*-*
11	*n.c.*	*-*	*-*	*-*	*-*
12	*485 TXD + RXD +*	*White / Brown*	*-*	***7***	*-*
Display Ground JP10	**Signal**	**Colour**	**Receiver Ground HD1**		**Frame Ground**
Fast-on	*GND*	*Yellow/Green*	*Fast-on*		*Fast-on*

CU450: FLAT iPod interface cable (UNITY) DIGITAL SIGNAL (iPod Interface Board / iPod board)			
iPod interface board	**Signal**	**Colour**	**iPod board**
1	GND Shield	FLAT	1
2			2
3	VCC5V0_Main		3
4			4
5			5
6			6
7			7
8			8
9	nIPOD_Detect_IN		9
10	TX_OUT		10
11	ACC_PWR_OUT		11
12	RX_IN		12
13	ACC_DETECT_IN		13
14	GND		14
15			15
16			16
17			17
18			18
19	GND Shield		19
20			20

CU519: FLAT iPod interface cable (UNITY) ANALOGUE SIGNAL (iPod Interface Board / iPod board)			
iPod interface board	**signal**	**Colour**	**iPod board**
1	*Remote sense*	*Brown*	***1***
2	*Remote sense*	*White*	***2***
3	*Video CVBS*	*White*	***3***
4	*A/V return*	*Shield*	***4***
5	*n.c.*	*-*	***5***
6			***6***
7			***7***
8			***8***
9	*A/V return*	*Green*	***9***
10	*A/V return*	*Yellow*	***10***
11	*AUDIO LEFT*	*White*	***11***
12	*A/V return*	*Shield*	***12***
13	*AUDIO RIGHT*	*White*	***13***
14	*A/V return*	*Shield*	***14***
15	*GND_ Shield*	*Black*	***15***
16	*GND_ Shield*	*Pink*	***16***

CU574: Headphone / Mic – iPod (UNITY) (Display Board / Headphone –Mic - iPod)				
Display Board	**Signal**	**Colour**	**iPod**	**Headphone Mic**
1	*iPod power (+12Vdc)*	*Red*	*3*	-
2			*4*	
3	*iPod GND*	*Black*	*5*	
4			*6*	
5	*iPod_rx*	*Brown*	*8*	
6	*iPod_tx*	*White*	*7*	
7	*iPod_cts*	*Yellow*	*10*	
8	*iPod_rts*	*Green*	*9*	
9	*iPod_agnd (VIDEO)*	*Shield*	*11*	
10	*iPod_con_video (VIDEO)*	*White*	*12*	
15	*iPod_agnd (VIDEO)*	*Shield*	*17*	
16	*iPod_lineout R (VIDEO)*	*White*	*18*	
17	*iPod_agnd (VIDEO)*	*Shield*	*19*	
18	*iPod_lineout L (VIDEO)*	*White*	*20*	
20	*gnd_guaina*	*Grey*	*23*	
21	*mic_input (AUDIO)*	*White*	-	*5*
22	*Audio HP L (AUDIO)*	*Yellow*		*3*
23	*agnd_ext*	*Black*		*2*
24	*agnd_ext (AUDIO)*	*Shield*		*4*
25	*antphone fn (AUDIO)*	*Shield*		*6*
26	*Audio HP R (AUDIO)*	*White*		*1*
28	*hphone detect*	*Blue*		*9*

CU648: HK - ALEWin power supply cable (LED) (ALEWin Driver- Display Board)						
ALEWin Driver	**Signal**	**Colour**	**Display Board**			**Emergency**
			RJ 45	**CN Mini Fit**	**CN Micro Fit**	**MICRO**
1	*485 TXD+ RXD+*	*Brown/ White*	***7***	*-*	*-*	*-*
2	*GND +12V*	*Grey*	*-*	***2***	*-*	
3	*GND +5V*	*Black*	*-*	***3***	*-*	
4	*Bridge with **PIN8** and **PIN6** (+12V) of Driver*	*Orange*	*-*	***6***	*-*	
5	*485 TXD- RXD-*	*Brown*	***8***	*-*	*-*	
6	*+12V*	*Orange*	*-*	***6***	*-*	
7	*+5V*	*Red*	*-*	***7***	*-*	
8	*Bridge with **PIN4** of Driver*	*-*	*-*			
9	*Emergency EXT*	*White*	*-*	*-*	***4***	
10	*Recovery*	*Blue*	*-*	*-*	***5***	
11	*n.c.*	*-*	*-*			*-*
12	*n.c.*	*-*	*-*			*-*
-	*Emergency HW*	*-*	*-*	*-*	***2***	***3***
-	*Emergency SW*	*Grey*	*-*	*-*	***3***	***1***
-	*GND +12V ISO*	*Black*	*-*	*-*	***6***	***2***
Frame GND	**Signal**	**Colour**	**Receiver**			
Faston	*GND*	*Yellow/ Green*	***Faston***			

CU649: HK - ALEWin power supply cable (VISIO) (ALEWin Driver- Display Board)				
ALEWin Driver	**Signal**	**Colour**	**Display Board**	
1	*485 TXD+ RXD+*	*TWIST*	***12***	
2	*GND +12V*	*Grey*	***2***	
3	*n.c.*	-	-	
4	*Bridge with **PIN8** and **PIN6** (+12V) of Driver*	-	-	
5	*485 TXD- RXD-*	*TWIST*	***6***	
6	*+12V*	*Orange*	***7***	
7	*n.c.*	-	-	
8	*Bridge with **PIN4** of Driver*	-	-	
9	*Emergency 1 / Emergency 2*	*White*	***4***	
10	*Recovery*	*Blue*	***10***	
11	*+12V*	*Red*	***9***	
12	*GND +12V*	*Black*	***5***	
Frame GND	**Signal**	**Colour**	**Display Board**	**Receiver**
Faston	*GND*	*Yellow/Green*	***Faston***	-
-			***Faston***	***Faston***

CU688: Display power supply cable + EMERGENCY (CU689) (Driver –Display Board– CU689)				
Display board	**Signal**	**Colour**	**Patch Conn. 1**	**CU689**
3	*GND +12V*	*Black*	***2***	-
4	*GND +12V*	*Black*		-
5	*485 TXD (–) RXD (-)*	*Twisted*	***6***	-
6	*GND +12V*	*Nero*	-	***3***
7	*Recovery*	*Blue*	***10***	-
9	*+12V*	*Red*	***7***	-
10	*+12V*	*Red*		
13	*485 TXD (+) RXD (+)*	*Twisted*	***12***	-
14	*+12V*	*Red*	-	***4***
15	*EMERGENCY 1 (Driver.)*	*White or Violet*	-	***2***
-	*EMERGENCY 2*	*Grey*	***4***	***1***

CU689: Display power supply cable + EMERGENCY (CU688) (CU688 –Emergency button)									
CU688	Signal	Colour	Emergency button						
			Micro 1			Micro 2			
			White	Red	Black	White	Red	Black	
1	EMERGENCY 2	Blue	-	-	-	x	-	-	
2	EMERGENCY 1 (Azion.)	White/ Violet	-	x	-	-	-	-	
3	GND	White / Violet	-	-	x	-		-	
4	+12V (+ resistance) short circuit on pin 2	Black	-						
-	-	Green	x	short circuit				x	
-	-	White / Violet	-	x	short circuit		x	-	

CU690: Joystick adapter cable- Receiver) (UNITY) (Display Board – Joystick –Cardio Receiver)					
Display Board	Signal	Colour	JOYSTICK		Cardio receiver
			(R)	(L)	
3	in keyrow 0 (INCLINE +)	White	-	4	-
5	in keyrow 0 (INCLINE -)	Brown	-	2	
8	in keyrow 2 (SPEED +)	Grey	4	-	
10	in keyrow 2 (SPEED -)	Yellow	2	-	
13	Out joy LEFT /GND/ in keyrow 0	Green	-	1	
14	Out joy RIGHT/GND/ in keyrow 0	Pink	1	-	
20	Dgnd ch1	White	-		1
22	In cardio ch1	Green			3
24	+5vdc cardio ch1	Brown			2
Display GND	Signal	Colour	-		Receiver GND
Faston	GND	-	-		faston

CU691: Devices ADAPTER cable (Display Board– Csafe – USB – NFC – InMotion)							
Display Board: CN17	**Signal**	**Colour**	**Fan**	**In Motion**	**NFC (TGS)**	**CSafe**	**USB**
1	*Out_fan*	*Red*	***1***	-	-	-	-
2	*Dgnd*	*Black*	***2***	-	-	-	-
3	*Out_ semaphore*	*Red*	-	***1***	-	-	-
4	*Dgnd*	*Black*	-	***4***	-	-	-
5	*IN_KEY_STOP*	*Yellow*	***short circuit***				
6	*IN_KEY_STOP*	*Yellow*					
9	*Rs232_RFID_rts*	*Green*	-	-	***5***	-	-
10	*Rs232_RFID_cts*	*Yellow*	-	-	***4***	-	-
11	*Rs232_RFID_tx*	*White*	-	-	***3***	-	-
12	*Rs232_RFID_rx*	*Brown*	-	-	***2***	-	-
13	*Rs232_RFID_dgnd*	*Nero*	-	-	***8***	-	-
14	*+12Vdc_rfid*	*Red*	-	-	***1***	-	-
15	*Dgnd*	*Black*	-	-	-	***7***	-
20	*Rs232_CSAFE_cts*	*Yellow*	-	-	-	***4***	-
21	*Rs232_CSAFE_tx*	*White*	-	-	-	***2***	-
22	*Rs232_CSAFE_rx*	*Brown*	-	-	-	***3***	-
23	*Dgnd*	*Black*	-	-	-	***5***	-
24	*+ VDC_ CSAFE*	*Red*	-	-	-	***1***	-
26	*Gnd_ shield*	*Shield*	-	-	-	***6***	-
31	*Dm_USB 2_ USER*	*Green*	-	-	-	-	***2***
32	*Dgnd_USB 2_ USER*	*Brown*	-	-	-	-	***4***
33	*Dp_USB 2_ USER*	*Yellow*	-	-	-	-	***3***
34	*+V bus_USB2_USER*	*White*	-	-	-	-	***1***
36	*Gnd_ shield*	*Shield*	-	-	-	-	***5***

CU693: New TGS – NFC cable (New TGS – NFC)			
New TGS	**Signal**	**Colour**	**NFC**
1	*+12Vdc RFID*	*Red*	***1***
2	*Dgnd*	*Black*	***2***
3	*Rs232_RFID TX*	*White*	***3***
4	*Rs232_RFID RX*	*Brown*	***4***

CU751: High Kit powered cable – Low Kit and EMERGENCY (UNITY) (UNITY Display - ALEWin / EMERGENCY)				
UNITY Display	**Signal**	**Colour**	**ALEWin**	**EMERGENCY**
1	*n.c*	-	-	-
2	*+12 V*	*Red*	**6**	
3	*+12V GND*	*Black*	**2**	
4	*+12V GND*	*Black*		
5	*485 TXD- RXD-*	-	**5**	
6	*+12V GND*	*Black*	**12**	
7	*RECOVERY*	*Blue*	**10**	
8	*n.c (KEY STOP OUT)*	-	-	
9	*+12V*	*Red*	**11**	
10	*+12V*	*Red*		
11	*n.c.*	-	-	
12	*n.c.*	-	-	
13	*485 TXD+ RXD+*	-	**1**	
14	*+12V*	-	-	**2**
15	*Emergency 2*	-		**1**
16	*Emergency 2 – Emergency 1*	*Grey*	**8**	**3**

3. PRINCIPLES OF OPERATION

3.1. LED DISPLAY

Wiring Diagram refer to Chapter 2.

3.1.1. ARM BOARD: 500 AND 700 MODELS

The display contains only one board which comprises the CPU, an ARM microprocessor, its logic circuits and a FLASH EPROM containing the operating program for the machine moreover, acts as the interconnection hub for all the components of the display and serves as the point of connection with the low kit driver.

The main functions of the board are:

- Manages and process signals from:
  - *Keyboard;*
  - *HR Receiver (500 LED);*
  - *HS/HR receiver (700 LED);*
  - *C-safe board;*
  - *Emergency button.*

Optional:

  - *Dual TGS reader.*

- Distributes the voltages received from the low kit driver;
- Exchanges, over the RS-485 serial link to the driver box, commands for controlling the belt and elevation motors;
- Exchanges, over the RS-485 serial link to the driver box, commands for controlling emergency signals;
- Controls the LEDs and the 7-segment displays which provide feedback about the exercise session.

The board includes the following indicator LEDs:

LED mane	Colour	Description
LED1	**Yellow**	*if ON the +12Vdc supply provided by the Driver box, correctly reaches the board.*
LED2	**Green**	*if ON the +5Vdc supply provided by the Driver box, correctly reaches the board.*

3.2. VISIO/VISIOWEB DISPLAY

Wiring Diagram refer to Chapter 2.

3.2.1. CPU BOARD: 700VISIO MODELS

The Circuit Board includes: a microprocessor, its control logic, a first FLASH EPROM (containing the Operating System), a second FLASH EPROM, partitioned in two sections (HD1 and HD2) the first used for the training program of the machine, for storing video and other information/support material, the second partition for saving messages coming from the COMMUNICATOR and a third FLASH EPROM (HD3) used for a back-up process.
It is the Circuit Board that connects all components of the display and acts as point of connection to the driver.

The main functions of the board are:

- Manages and process signals from:
  - *LCD;*
  - *LCD Inverter;*
  - *Touch Screen;*
  - *Digital /Analogue tuner Board;*
  - *LAN network board (integrated);*
  - *Wireless network Board;*
  - *Emergency button;*
  - *HS/HR Cardio Receiver;*
  - *Audio/Video external device Connectors Board;*
  - *Headphone Jack;*
  - *C-Safe (integrated);*
  - *Service USB port (integrated).*

Optional:

  - *Dual TGS Reader;*
  - *User USB port;*
  - *iPod docking station.*

- Distributes the voltages received from the low kit driver;
- Exchanges, over the RS-485 serial link to the driver box, commands for controlling the belt and elevation motors;
- Exchanges, over the RS-485 serial link to the driver box, commands for controlling emergency signals;
- Controls the LEDs and the 7-segment displays which provide feedback about the exercise session.

The board includes the following indicator LED:

LED mane	Colour	Description
LED 1	**GREEN**	*if ON, the +12 Vdc power supply from the Driver correctly reaches the board.*

3.2.1.1. Backup battery

The CPU board has a battery that act to maintain powered the internal clock when the machine is not connected to a power source.

3.3. LCD INVERTER

This device powers the LCD Display lamps. It receives DC power supplies (12 Vdc supply and 3.3Vdc enable signal) from the CPU Board, and generates the AC voltage (380 Vac) needed to power the LCD.

3.4. DIGITAL/ANALOGUE TUNER BOARD

This is the board for receiving and managing the **Audio/Video** signal incoming from the antenna; it receives both digital and analogue signals.
It is directly connected to the antenna cable, whose signal is then amplified, split between a video and audio channel, encoded by the decoder and processed by a tuner that permits searching and tuning of both TV and radio channels.
The data is then sent to the **CPU Board** where it is processed and managed in order to correctly display it on the LCD Display.

LED name	Colour	Description
D4	**RED**	***ON*** *if the power supply reaches the board.* ***OFF*** *if the power supply does not reach the board.* ***FLASHING****:* ▪ *if loading/starting the SW in the first seconds after it switch on;* ▪ *During the firmware upload;* ▪ *In case of HW/SW malfunctioning (and it continue to blink).*

3.5. INTEGRATED LAN NETWORK BOARD (WIRED)

The CPU board integrate a **LAN** *network (Local Area Network)* which can be used to connect the VISIO device in a local network. The connection should be realised through a UTP cable, with RJ45 connectors cat.5e/6.
VISIO device is compatible with LAN networks, which have a max. transmission speed between 10 and 100 Mbps.

The integrated network is obligatory in case of use for receiving IPTV stream

3.6. WIRELESS NETWORK BOARD (WITHOUT CABLES)

This is a board connected directly to the CPU, which enables the VISIO device to connect to a **WLAN** (wireless local area network) as an alternative to a wired network.
The VISIO device has been constructed to be compatible with **Wi-Fi** technology (and in particular with the IEEE 802.11b/g standard), which offers a theoretical bandwidth capacity of up to 54Mbps over distances dependent on the characteristics of the setting where it is installed.

The typical indoor range is 30 m (open space):

- *Standard:* ***IEEE 802. 11b/g***
- *Frequency band:* ***2.4GHz***
- *Security protocol:* ***WPA/WPA2*** *or also less recent ones (e.g.* ***WEP****).*

The WLAN connection may not guarantee the same performance as a wired network. The advantage of Wi-Fi is the absence of cables, but this is also a limitation in terms of protection against interference/disturbance, performance (*the stability of service and bandwidth may be intermittent*) and security (*vulnerability to attacks by hackers)*. Where possible, it is in any case preferable to use the wired network. The possibility of using Wi Fi also depends greatly on the type of service/application that is to be used in VISIO.

In particular:

- **Technogym Communicator: usable with suitable Wi-Fi network**

- **IPTV: NOT usable with Wi-Fi network; for this application, use of a wired network is essential.**

There are 2 different models of Wi-Fi network board used by Technogym, one produced by *VIA* and the other by *Billionton*. The 2 boards, are physically different as shown below:

VIA model

Billionton model

Whenever you replace the board with another that is not the same model, you always have to carry out the "*System recovery*" procedure using the Recovery USB sticks.

3.7. AUDIO/VIDEO EXTERNAL DEVICE CONNECTOR BOARD

The board is positioned on the rear of the display of the equipment and makes available some connectors for connecting Audio / Video source and the external display on the base-band of LCD.

3.8. HEADPHONE JACK

The machine display has one jack for connecting headphones. The jack is connected on a stereo output of the CPU Board.

3.9. C-SAFE BOARD (INTEGRATED):

It 'a function that allows the connection using an appropriate cable for connecting other devices, such as: external PC suitably, programmed to control the machine (speed, level of difficulty, etc ...)

3.10. SERVICE USB PORT (INTEGRATED):

It is used to connect USB keys for updates: High Kit, Low Kit, Digital TV Board, Dual TGS reader and the transfer of Radio and TV channels, from one VISIO device to another.

3.11. OPTIONAL

3.11.1. IPOD DOCKING STATION

For the following menu, please refer to the VISIO/VISIOWEB and UNITY manuals.

3.11.1.1. Client USB port

This is an additional port which can be installed on the VISIO Display, and makes available a USB port for connecting to external devices. The user can connect USB devices for playing a vast range of multimedia files, including: *mp3, wma, wav, wmv, MPEG2, MPEG4, DivX, XVID jpg*.

3.11.1.2. Dual TGS reader

It’s the device which allows the machine to interact with the Wellness System.
This board enables the machine to read the user's TGS key for performing workouts programmed with the proper SW of the Wellness System.
With Dual TGS reader it is possible to use both the Botom and the Mifare TGS keys.

3.12. DISPLAY UNITY

 **Schema a Blocchi fare riferimento al capitolo 2.**

3.12.1. MAIN BOARD (MIDDELBOAR)

Main board (Middleboard): this is the control board for the cardio receiver and the interface board for all the peripheral devices. In fact, all the electrical wiring and connections of the equipment are hooked up to this board. It also includes a microcontroller, the software of which can be updated (middleboard update) using a USB flash drive or Asset management tools.

3.12.2. CPU MODULE

This is a module (standard Q7 format) which contains the equipment's “heart” and intelligence. It has an eMMC memory where the operating system and the software version of the application that can be updated by USB flash drive or asset manager reside.

3.12.3. WI-FI MODULE:

2.4 GHz 802.11b/g/n Wi-Fi module

3.12.4. CONTROLLER TS

TS control board to which the flat cables of the TS are connected.

3.12.5. BLUETOOTH MODULE

Bluetooth v.4.0 module board, dual mode compliant (classic & low energy master mode) controls:

- *Bluetooth Heart Rate Band*
- *Bluetooth wireless headphones*
- *Connection to Apple devices (iPhone 5/ iPod) and Android devices.*

This module permits surfing of smartphone contents using the Touch Screen of UNITY.

3.12.6. THE FUNCTION OF THE MAIN BOARD IS TO CONTROL...

- *RS-485 series line to the LOW KIT;*
- *CPU Module;*
- *The LCD Display;*
- *The TV Tuner;*
- *FM Radio;*
- *The signals related to heartbeat measurement (reception from Chest Band and Hand Sensor);*
- *Fast Track Sensors;*
- *iPod/iPhone docking station (audio and video contents and battery charger);*
- *iPad battery charger (USB type socket);*
- *Keyboard;*
- *Stand-by LED;*
- *Headphone jacks with microphone;*
- *NFC reader to exchange data with smartphone devices;*
- *TGS reader to exchange data with TGS pen drive and MyWellness Key;*
- *C-Safe devices;*
- *WiFi and LAN network connections;*
- *USB port (audio, video and photo contents);*
- *Webcam (NOT enabled)*
- *Bluetooth Module;*
- *"Ready to run" device and fan (only Run).*

3.13. UNITY DEVICE

3.13.1. HEADPHONE AND MICROPHONE JACK

Earphones with microphone (For iPhone and/or Blackberry).

3.13.2. C-SAFE BOARD

This board provides a connector for communication between the outside world and compatible C-Safe devices, for example: Cardio Theater players. This connector is located on the back of the display.
This connector can be interfaced with an external PC to program the FLASH memory, using a special cable.

3.13.3. NFC BOARD (PROXIMITY SENSOR)

The NFC board is located on the back of the keyboard for Minimal and U-TV, or on the back of the front protection panel for UNITY, next to the related NFC / Wellness Cloud logo.
With this device it is possible to interface with smartphones equipped with NFC technology.

3.13.4. TV TUNER

This board receives and controls both digital and analogue Audio/Video signals arriving from the aerial.
The aerial cable is connected directly to it, and the signal from the aerial is then amplified, divided between the video and audio channels, coded by the decoder and processed by a tuner which makes it possible to search for and tune into TV and Radio channels. The data are then sent to the Display Board which processes them and controls them for correct viewing.

3.13.5. TGS READER

This device permits interaction of the equipment with the Wellness System.
It reads TGS and MyWellness Keys used by users to perform their workouts, by means of the special Wellness System programmes.
The dual reader makes it possible to read both Botom and Mifare keys.

3.13.6. USB PORT

This is used for connection of USB devices for updates of: High Kit, Low Kit, TUNER board, TGS reader and for transfer of network and RADIO and TV channel configurations from one interface to another.

3.13.7. STAND-BY LED

This LED flashes when the equipment is started during the boot-up and whenever the LCD display is switched of to reduce energy consumption.
When the LCD display is switched on, the LED is always switched off.

3.13.8. BACK-UP BATTERY

There is a battery on the Main Board which powers the internal clock when the equipment is not connected to a power outlet.

3.13.9. DOCKING STATION E CARICA BATTERIA PER IPAD

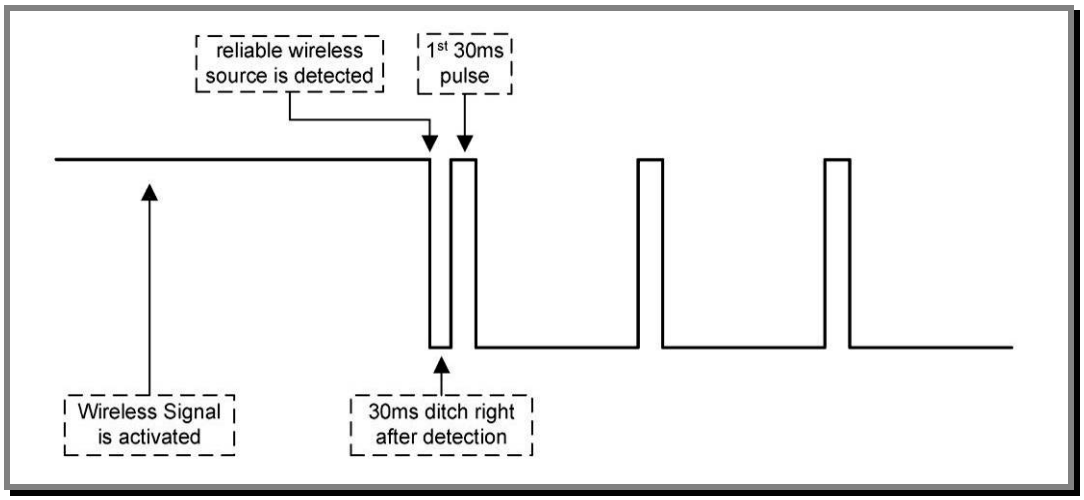
For the following menu, please refer to the VISIO/VISIOWEB and UNITY manuals.

3.14. CARDIO RECEIVER BOARD

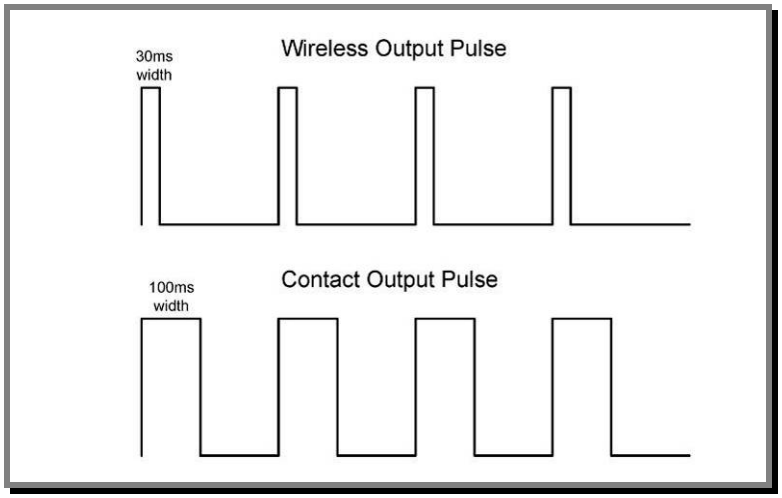
3.14.1. HR/HS (CHEST BELT/HAND SENSOR)

The receiver reception area is approximately a circle with a 90cm radius. If there is electromagnetic noise produced by high voltage lines, radio transmitters, monitors, motors ecc… within this area, the receiver becomes saturated and no longer receives any signal.

This board manages the signals received from the Telemetric Transmitter (*Chest Belt*) and from the Hand Sensors, used by the user when exercising. The Board receives the +5Vdc power supply, from the Display Board.
The Receiver Board, communicate with the Display Board in a ***positive logic*** mode. When the Board is in stand-by, the signal is +5Vdc; as soon the Board receives a reliable source of heart rate signal change to 0Vdc and then, for each heartbeat detected, generates a pulse going back to +5Vdc.



The Display Board, can recognize if the signal is generated by the Chest Belt transmitter (*wireless signal*) or by the Hand Sensor (*contact signal*) from the width of the signal.
In particular: if the width signal is 30msec, comes from the Chest Belt (*wireless*); if the signal is 100msec comes from the Hand Sensor (*contact*).



3.15. EMERGENCY BUTTON

This is a safety device which allows the user to stop the machine in an emergency situation. It consists of 2 microswitchs fixed to the machine display, which form a NC contact when the emergency stop device is correctly positioned on the control panel during exercise.
If a user is in difficulty and press the emergency device from the control panel or pull the emergency rope, the NC contact is opened then the Display board shows the message:

- ***LED display: "PRESSA KEY"***
- ***VISIOWEB / UNITY display: "TOUCH THE SCREEN"***

Moreover the CPU/ARM board sends a signal to the Drive which cuts off the power supply to the tread belt motor, halting the machine.

3.16. C-SAFE BOARD

This board makes available a communication port, on 1 externally accessible connector, which can be used for interfacing compatible C-Safe devices such as the Cardio Theater readers.
This connector is situated on the back of the display.
These connectors can also be interfaced, using a special cable, to an external PC for programming the FLASH EEPROM.

3.17. BELT MOTOR

An asynchronous three-phase motor which, by means of a pulley and poly-v belt, turns the driving roller of the tread belt. Is equipped with a normally-closed thermal cutout which opens when the temperature exceeds a preset threshold, in order to safeguard the integrity of the motor. The thermal signal reaches the driver as a NC external input signal. When this contact opens, the driver generates an alarm.
It is equipped with a high inertia flywheel, to permit more gradual deceleration of the tread belt in the event of a power outage or emergency stop.

ATTENTION: dangerous voltages are present at the motor and flywheel.

Potenza motore vedi paragrafo: 2.4. "Power requiremet".

3.18. ELEVATION MOTOR

This is a linear actuator equipped with 24Vdc motor, integral reduction gear and a rod that is pushed backward and forward by the motor. This rod acts upon a frame connected to the front wheels of the machine: when the rod moves so does the frame, thereby lowering raising the machine.
The actuator has a built-in Hall effect sensor which acts as an encoder, generating pulses when the motor moves. This furnishes a feedback signal on the motor movements, which is used for tracking the position of the rod and hence the elevation of the machine.

3.19. JOYSTICK

These joysticks are used to adjust the speed and the elevation during the exercise. Each time they are pressed, forward or backward, they send a signal to the CPU board to change the speed or the elevation according to the joystick used.

3.20. LIMIT SWITCH

This is a NC micro switch which defines the zero-reference position for the elevation mechanism: the switch is positioned so that it is pressed by the machine during the reset procedure, thereby defining the reference position.

3.21. LOW KIT

3.21.1. ALE MET CE DRIVER

This is the electronic device that receives the line voltage and, through a PFC module, it rectifies the voltage to the 400Vdc used to generate the 3 phase voltage for the belt motor. It generates the DC voltages to power up all the other devices of the machine.
It's the device that acts as an interconnection hub for the main components of the lower assembly, and serves as the point of connection with the display. In fact:

- *it supplies the +12Vdc voltages to the display;*
- *it supplies the tread belt motor with a variable-frequency sinusoidal voltage: varying the frequency varies the speed of rotation of the motor, and consequently the speed of the tread belt;*
- *it exchanges, over the RS-485 serial link to the Display Board, the commands for controlling the tread belt and elevation motors;*
- *it exchanges, over the RS-485 serial link to the Display Board, the commands for viewing and configuring the inverter parameters;*
- *it exchanges, over the RS-485 serial link to the Display Board the commands for viewing the errors logged by the inverter.*

From the outside the following indicator LEDs are visible:

LED NAME	COLOUR	DESCRIPTION
H6	**GREEN**	*+5Vdc (if ON proper functioning)*
H3	**GREEN**	*+12Vdc (if ON proper functioning)*
H4	**GREEN**	*+24Vdc (if ON proper functioning)*
H5	**BLUE**	*400Vdc (if ON proper functioning)*

The board includes the following indicator LEDs visible when the driver cover is removed:

LED NAME	COLOUR	DESCRIPTION
ALARM	**RED**	*If ON indicates that the Driver has detected an error (EdC) when it was moving the elevation motor. This LED stay ON for about 1 second and then goes OFF.*
EN_UP	**GREEN**	*if ON indicates that the motor has received the supply voltage for movement in the upward direction*
EN_DOWN	**RED**	*if ON indicates that the motor has received the supply voltage for movement in the downward direction*
TACHO	**GREEN**	*functioning of elevation motor encoder: if blinking, indicates that the board is receiving the pulses from the encoder*
DWN_SW	**GREEN**	*status of Limit switch contact: if ON indicates that the microswitch is pressed*

3.21.2. ALE POWER SUPPLY BOX

This is a box which contains:

- *The machine's power inlet socket.*
- *The on-off switch.*
- *2 resettable THERMAL CUTOUTS which monitor overloads on the phase and neutral.*
- *An inductor*
- *Filter Board*

This power supply box manages the power circuits of the machine: in particular, the input *high voltage*, which is then sent to the Drive, controlled through a second on-off switch.

3.21.3. SUPPLEMENTARY POWER SUPPLY

This provides a supplementary +12V line required for operation of the VISIO, which in particular uses it for powering the lights of the LCD.

ATTENTION If the LCD lights fail to illuminate, one reason could be that this supplementary power supply is not supplied or is not working, and thus in its turn fails to supply the LCD.

3.22. AUTOTRANSFORMER

Only for 110Vac version.

It is a toroid Autotransformer, placed on a plate fixed to the frame in the bottom of the machine under the running deck. The Autotransformer is connected in series to the power supply of the equipment and allows using the 110Vac power supply. It receives the 110Vac power supply and provides an output voltage of 220Vac for the Driver.

3.22.1. AT-UL DRIVER

It's the device that acts as an interconnection hub for the main components of the lower assembly, and serves as the point of connection with the display. In fact:

- *it exchanges, over the RS-485 serial link to the CPU/ARM board, the commands for controlling the tread belt and elevation motors;*
- *it supplies the tread belt motor with a variable-frequency sinusoidal voltage: varying the frequency varies the speed of rotation of the motor, and consequently the speed of the tread belt;*
- *it supplies the elevation motor with a 24Vdc;*
- *it exchanges, over the RS-485 serial link to the CPU/ARM board, the error signals pertaining to the tread belt and elevation motors;*
- *it exchanges, over the RS-485 serial link to the CPU/ARM board, the commands for viewing and configuring the inverter parameters;*
- *it exchanges, over the RS-485 serial link to the CPU/ARM board, the commands for viewing the errors logged by the inverter.*
- *Receives the mains voltage at its inputs and outputs the DC supply voltages for the machine circuit boards listed below:*

Supply voltage	Connector	Description
+24Vdc	**XU1**	Power supply for the fans of the electrical box
+5Vdc	**XU1**	Power supply for belt and elevation motor encoders
+5Vdc +12Vdc	**XU2**	Power supply for display

From the outside the following indicator LEDs are visible:

LED name	Colour	Description
H2	**GREEN**	+5Vdc
H3	**GREEN**	+12Vdc
H4	**GREEN**	+24Vdc
H5	**RED**	400Vdc

It contains:

- *The AT driver board*
- *The AT power supply board*
- *2 fans*
- *A breaking resistor*

3.22.2. AT-UL DRIVER BOX

It is the upper board of the assembly and it is the heart of the driver: it does everything was described above for the AT driver except the function of the AT power supply board described below. In details:

- *It receives the line voltage and, through a PFC module, it rectifies the voltage to the 400 Vdc used to generate the 3 phase voltage for the belt motor and to power up the AT power supply board.*
- *Internally it houses an inverter to control the belt motor;*
- *Internally it houses a DC driver to control the elevation motor.*

The board includes the following indicator LEDs visible when the AT driver cover is removed:

LED name	Colour	Description
ALARM	**ROSSO**	*If ON indicates that the AT driver has detected an error (EdC) when it was moving the elevation motor. This LED stay ON for about 1 second and then goes OFF.*
EN_UP	**VERDE**	*if ON indicates that the motor has received the supply voltage for movement in the upward direction*
EN_DOWN	**ROSSO**	*if ON indicates that the motor has received the supply voltage for movement in the downward direction*
TACHO	**VERDE**	*functioning of elevation motor encoder: if blinking, indicates that the board is receiving the pulses from the encoder*
DWN_SW	**VERDE**	*status of Limit switch contact: if ON indicates that the microswitch is pressed*

3.22.3. AT-UL POWER SUPPLY BOARD

It is the lower board of the assembly and it receives the 400 Vdc from the AT driver board and outputs to the AT driver board the low voltages used by the machine.

3.22.4. FANS

There are 2 fans powered with 24 Vdc used to cool down the AT driver.

3.22.5. BREAKING RESISTOR

It is a 150 Ohm used by the AT driver board to dissipate the energy produced by the motor when it is working as a generator.

3.22.6. POWER SUPPLY BOX

It is a box that contains:

- *Power entry socket;*
- *ON-OFF switch;*
- *2 circuit breakers that check the overload on line and neutral;*
- *A mutual inductance.*

3.22.7. ALEWIN DRIVER LOW KIT

The ALEWin (ALE Wide Input) device generates direct voltages to power the equipment's devices. It acts as a connection hub for the components of the low kit and a connection point with the display.
The ALEWin driver can be configured and updated via RS485.
The battery charger output is protected against overload by fuses and by an electronic circuit against short circuit.

The main functions of this device are:

- Operating and controlling all the actuators and sensors used to manage the Treadmill's moving parts;
- Provide the necessary power supplies to support all the electronic devices inside the Treadmill

It controls:

The Tread Belt Motor,
The Gradient Actuator,
It powers the High Kit.

The device is available in two versions:

1. UL ALEWin: **Device for the UL market**;
2. EC ALEWin: **Device for the EC market**.

3.22.7.1. ALEWin power supply box

It is a box containing:

- The power supply socket for the equipment;
- The ON/OFF switch;
- 2 resettable THERMO-SWITCHES that control overloads on phase and neutral;
- An ’inductance;
- A filter board.

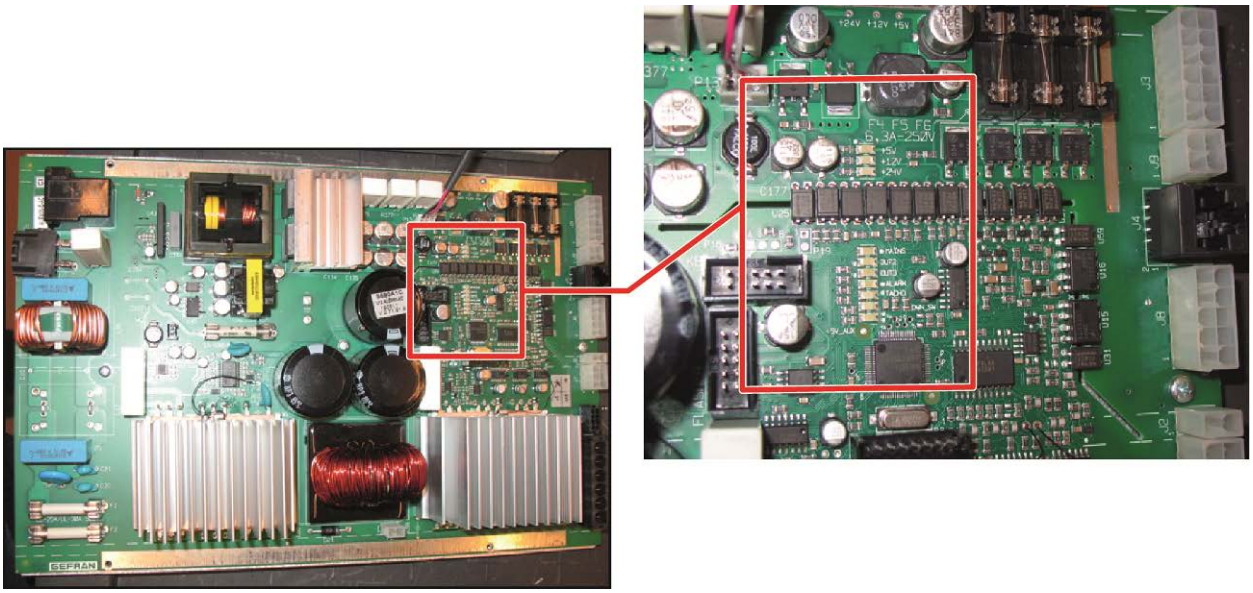
This power supply box controls the power part of the equipment: in particular, the high input voltage which is then sent to the Driver, controlling it by means of a second ON/OFF switch.

The device is available in two versions:

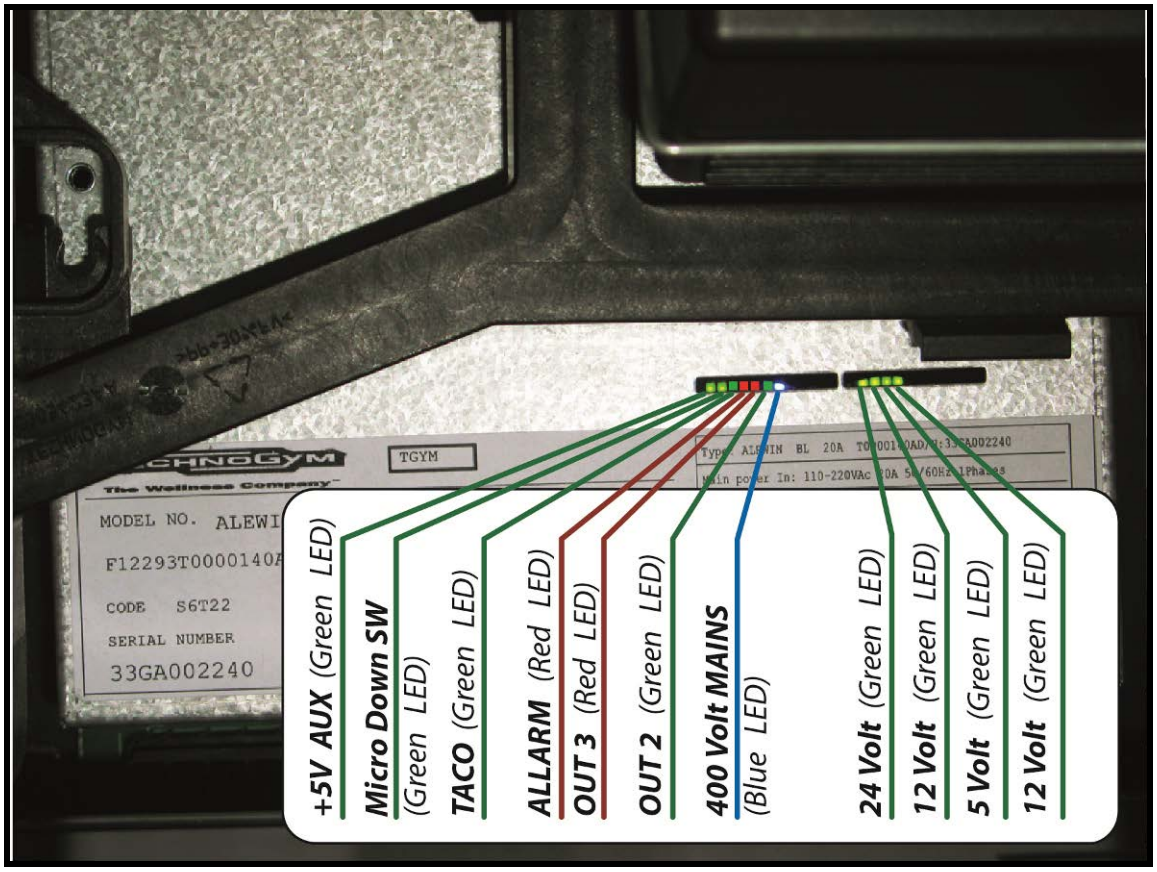
1. UL ALEWin: **Device for the UL market**;
2. EC ALEWin: **Device for the EC market**.

3.22.7.2. LEDs

ALEWin



Example.....



The LED statuses are described below ...

LED	COLOUR	STATUS
+5V_AUX	**Green**	**ON**: *Internal power supply to the DRIVE is correct.* **OFF**: *in the event of a failure.* **FLASHING**: *NO.*
Micro Down SW (END STOP)	**Green**	**ON**: *End stop pressed.* **OFF**: *in all other cases.* **FLASHING**: *NO.*
TACO	**Green**	**ON/OFF (steady)**: *Up/Down motor Encoder idle* **FLASHING**: *YES (flashes during movement of the actuator to indicated that the Encoder works).*
ALARM	**Red**	**ON**: *On if there is a fault.* **OFF**: *Condition cleared + MB16 command. This command is given by the high kit in four cases:* *Power on,* *Emergency reset,* *Exit from the service menus,* *In the ARTIS line with an on-screen button, absent in Excite.* **FLASHING**: *NO.*
OUT 3	**Red**	**ON**: *Active when the actuator goes up.* **OFF**: *At all other times.* **FLASHING**: *NO.*
OUT 2	**Green**	**ON**: *Active when the actuator goes down.* **OFF**: *At all other times.* **FLASHING**: *NO.*
400Volt MAINS	**Blue**	**ON**: *DC-Link 400V active.* **OFF**: *DC Link not active or DRIVE not powered.* **FLASHING**: *NO.*
+24	**Green**	**ON**: *the 24V used for the DC motor works.* **OFF**: *in the event of a failure.* **FLASHING**: *NO.*
+12	**Green**	**ON**: *the +12VDC power supply is correctly provided by the Driver.* **OFF**: *in the event of a failure.* **FLASHING**: *NO.*
+5	**Green**	**ON**: *the +5VDC power supply is correctly provided by the Driver* **OFF** *in the event of a failure.* **FLASHING**: *NO.*

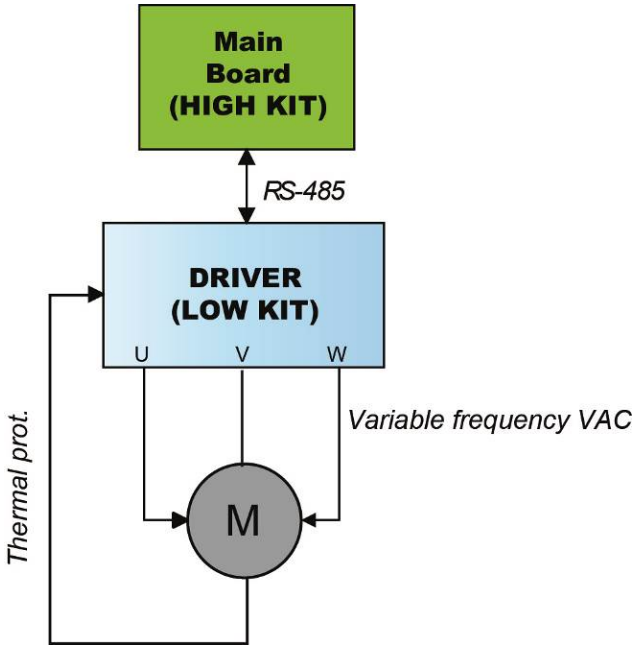
3.23. TREAD BELT MOTOR DRIVE

3.23.1. MECHANICS

The tread belt is actuated by the motor through a linkage consisting of the motor pulley, the driving roller and the belt which connects them. In this way, a given belt motor speed corresponds to a predetermined linear tread belt speed.

3.23.2. CONTROLS

The control block diagram is as follows:



To actuate the motor, the CPU board communicates with the driver via the RS-485 serial link. Based on the commands received, the Driver drives the motor by applying a variable frequency sinusoidal voltage: the frequency determines the speed of rotation of the motor and hence the linear tread belt speed.

During its movement, the driver continually checks the motor by monitoring its current draw as well. If any problems are detected (low voltage, overcurrent, SW or HW inverter, etc....) it halts the motor and sends an alarm signal to the CPU board, which displays a “THE EQUIPMENT IS BLOCKED” which may lead to different error codes stored by the driver.

In addition, to protect the motor from overheating, each motor phase has a thermal cut-out connected in series. If the temperature exceeds the threshold value, the thermal cut-outs open and interrupt the circuit. The driver detects this condition as the opening of a NC external contact. In such a case the driver halts the motor and outputs an alarm signal to the CPU board which displays the "THE EQUIPMENT IS BLOCKED" message.

3.23.3. THE SIGNALS INVOLVED

- **RS-485 Signal**
  This is a digital signal exchanged between the driver and the CPU board.

- **VAC Signal with variable frequency:**
  This is the variable alternating-voltage signal output by the driver (connector J5) to supply the motor. Increasing the frequency of this signal increases the motor speed. The frequency of the sinusoidal supply voltage sent by the driver to the motor can be viewed on the display using the inverter manual test described at the paragraph: 6.2.2.2 "Man. Inverter Test".

- **Cut-Out signal:**
  Each motor phase is equipped with a normally-closed thermal cut-out which opens when the temperature exceeds a preset threshold. When this input signal is an open contact, the driver detects the alarm, halts the motor and sends an alarm signal over the RS-485 line to the CPU board.

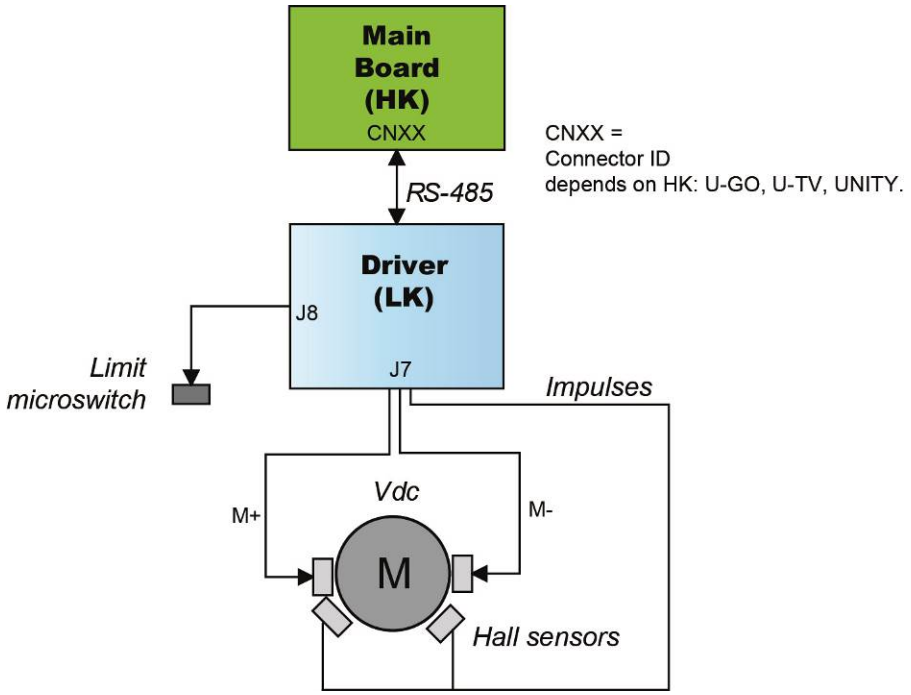
3.24. ELEVATION MOTOR DRIVE

3.24.1. MECHANICS

The machine incline is varied by moving a frame connected to the front wheels by means of the elevation motor rod. The motor movement is detected by a hall sensor which provides the motor motion control signal: each motor revolution generates a predetermined number of pulses and produces a known displacement of the rod and hence of the machine incline. The direction of rotation of the motor determines whether the machine moves up or down.

3.24.2. CONTROL

The control block diagram is as follows:



To actuate the motor, the CPU Board communicates via the RS-485 serial link with the ALE Drive. Depending on the commands received, the Drive sends a +24 or -24Vdc power supply to the Up-Down motor, and in this way determines whether the actuator rod moves in our out. When the motor receives the voltage it begins to move.

To control the elevation position, the Drive uses the following input signals:

- *A travel limit micro switch which defines a zero-reference position, acquired by the machine during its power-on reset procedure and whenever the micro switch is pressed. The travel limit micro switch outputs a normally closed signal which becomes open when the micro switch is pressed.*

ATTENTION: when the travel limit micro switch outputs an open contact signal (pressed, micro switch broken or cable interrupted), the downward movement of the machine is disabled.

If the Drive detects problems with these signals during operation of the elevation motor, i.e.:

- *If it has not received any pulses during a previously defined time interval.*
- *If, when the travel limit micro switch outputs an open contact signal, this contact does not switch to closed when the elevation motor moves upward by a distance of 2%.*

Then:

- *The drive stops functioning with error code "EdC"*
- *The machine displays the "ELEVATION ERROR" message, and interrupts the exercise.*
- *The parameter Par 07 is switched to 1 to disable the elevation function.*

At this point the machine will only allow movements of the tread belt motor, but not of the elevation motor. To re-instate operation of the elevation motor, the machine must be turned off and on again, so as to automatically reset Par 07 to 0.
If the problem persists, the machine will again show the elevation error on the Display.

3.24.3. RESET PROCEDURE

On power-up, the machine performs a reset procedure in order to determine the zero-reference position for the elevation movements. The machine makes a downward movement until the travel limit micro switch is pressed, and then moves upward by the number of pulses (100 pulses) defined in the elevation table to reach the reference "horizontal position". All the movements for reaching different elevations will be variations relative to this reference.

3.24.4. THE SIGNALS INVOLVED

The machine uses the following control signals:

- **RS-485 Signal**
  This is a digital signal exchanged between the driver and the CPU board.

- **Motor voltage signal (Vdc)**
  This is the DC voltage generated by the driver (*pins 2 and 1 of connector J7*) for supplying the elevation motor. Its absolute value is 24Vdc and, depending on its polarity, it causes the motor to rotate in either a clockwise or anticlockwise direction. The incline of the machine will increase or decrease accordingly.

- **Pulse signal**
  This is a square wave signal with frequency 50 Hz (T=20 msec) and 50% duty cycle generated by the Hall sensor when the elevation motor moves. This signal enters the driver (*pins 6 and 4 of connector J7*) and provides the feedback of the motor movement.

  This signal alternates between a low value of 0Vdc and a high value of 5Vdc. When measured with a multimeter, this signal is at either 0 or 5Vdc when the motor is stopped, while during motor movements it is approximately 2.5Vdc.

  In order to function correctly, the Hall sensor requires a +5Vdc supply voltage which it receives from the elevation board (*pins 5 and 4 of connector J7*).

- **Limit switch signal**
  The limit switch is a NC contact entering the /AT UL driver (*pins 3 and 8 of connector J8*), which opens when the machine pressed it during the power-on reset procedure.

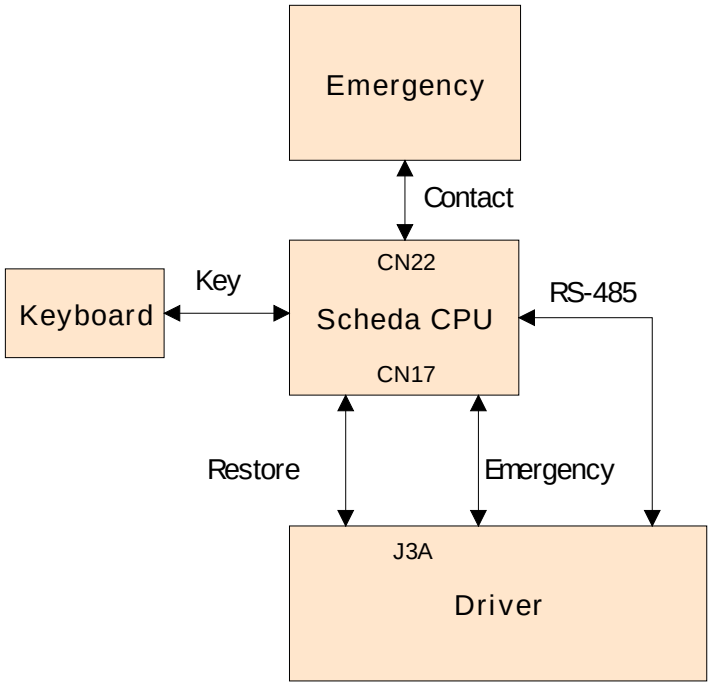
3.25. EMERGENCY STOP SIGNAL MANAGEMENT

3.25.1. LED – VISIO/VISIOWEB

The device consists of a button fitted below the display of the machine, which is composed by 2 NC micro switches connected in series. On the same button is connected a rope: if pulled act exactly as when you press the button.
If a user is in difficulty and press the emergency device from the control panel or pull the emergency rope, the NC contact is opened then the CPU/ARM board realize about the emergency status.

3.25.1.1. Control logic

The control block diagram is as follows:



When the user press the emergency stop device, the NC contacts is opened, changing the state of the two signals output by them to the CPU. Each of the two micro switch outputs a distinct signal, interpreted as follows: one is an "*SW Emergency*" signal, and one is an "*HW Emergency*" signal.

The two signals are managed as follows:

- ***SW Emergency:*** *The CPU board detects the emergency condition and signals it by displaying the message "Reposition the emergency stop device and touch the screen" and sends the information to the drive over the 485 serial link to halt the motors..*
- ***HW Emergency:*** *The CPU board sends the emergency signal directly to the drive to halt the motors.*

To reinstate the machine's operation, it is necessary to reposition the emergency stop device on the control panel and press any key on the display, as prompted.

The two micro switch connected in series, act for a double safety device because if one is damaged the others will stop the machine.

ATTENTION: The message "*Reposition the emergency stop device and touch the screen*" appears on the display also if the serial communication between the high and low kit is interrupted.

Pressing a key initiates the procedure for reinstating operation of the Drive, which receives a reset signal from the CPU board. After this, the Drive attempts to re-establish serial communications with the Display, and then repeats the reset procedure again.

If serial communication cannot be established, the machine will make a number of attempts. Each failed connection attempt is recorded in the COM FAULT parameter, which can be viewed as described in relevant paragraph: of the Service menu. After approximately 30 seconds, it stops and displays the error message "MACHINE BLOCKED (COM)".

3.25.1.2. The signals involved

The machine uses the following control signals:

- **Emergency contact:**
  This is the NC contact provided by the 2 micro switch actuated when the emergency stop button is pressed. This contact becomes open when the emergency stop device is detached.
  The signal enters the CPU Board through connector CN22 *(pins 1 and 2)*.

- **RS-485 Signal:**
  This is a digital signal exchanged between the Drive and the CPU board.

- **Emergency signal:**
  This is the signal generated by the CPU board (*pins 1 and 4 of connector CN17*) and sent to the Drive (*J3A).*
  This signal is 0Vdc under normal conditions, and goes to 11.9 Vdc in the emergency condition.

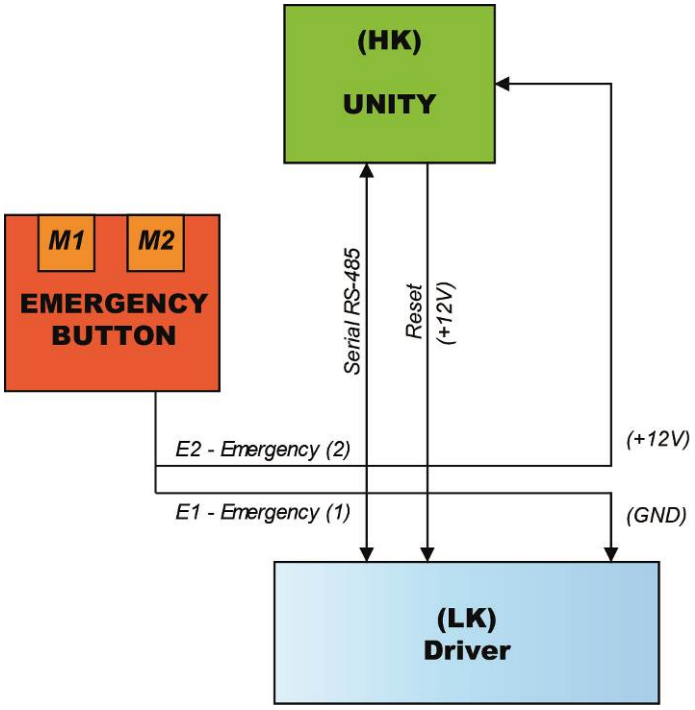
- **Reset signal:**
  This is the signal generated by the CPU board (*pins 1 and 10 of connector CN17*) and sent to the Drive *(J3A)* to signal to the low kit that normal operation has been reinstated after an emergency condition. This signal is 0Vdc under normal conditions and goes to approximately 8Vdc for a few seconds when the user presses a key.

When this happens, the CPU Board resets the Emergency signal to 0 Vdc, thus allowing the Drive to return to the normal operating condition.

3.25.2. UNITY + ALE MET / ALEWIN (WITH ADAPTER CABLES)

3.25.2.1. The control

The control block diagram is as follows:



E2 = UNITY (HK) receives the **Emergency 2** signal.

- When the system is NOT in emergency the signal is +12V.
- When you press the EMERGENCY signal goes to GND.

E1 = ALE-MET (LK) receives the **Emergency 1** signal.

- When the system is NOT in emergency the signal is on GND.
- When you press the EMERGENCY signal goes to +12V.

E1 = ALEWin (LK) receives the **Emergency 1** signal.

- When the system is NOT in emergency the signal is GND (pin 9).
- W When you press the EMERGENCY signal goes to +12V.

Driver Note (Low Kit):

- **ALE MET and ALEWin: Until the two drivers will coexist, the ALEWin driver will behave as the ALE-MET. Active Emergency low level (GND).**

The two signals are handled at the same time:

- *The EMERGENCY signal generated: is sent to the LK to immediately block it, while the HK only reads the status of the LK.*

To restore operation of the equipment, the user must press any key on the KEYBOARD or on the Touch Screen.
Pressing a key causes the Driver unlocking procedure to start, and the Driver receives the reset signal from the Main Board (HK). Following this, the Driver performs the reset procedure. If the serial communication cannot be successfully established, the equipment will make several attempts to reset. Every failed connection attempt is recorded in the COM FAULT parameter which can be displayed as indicated in the paragraph regarding the Service menu. After about 30 seconds it will interrupt and display the error message on the Display.

3.25.2.2. The signals involved

The following signals are involved in the control:

Emergency 2 signal:

- *HK: (Pin 15 on CN17).*

Emergency 1 signal (With ADAPTER cable):

- *LK – ALE-MET (Pin 9 on J3);*
- *LK – ALEWin (Pin 9 on J3).*

RS-485 signal*: is a digital signal exchanged by HK and LK.*

- *LK: (Pin 1-5 on J3)*
- *HK: (Pin 5-13 on CN17)*

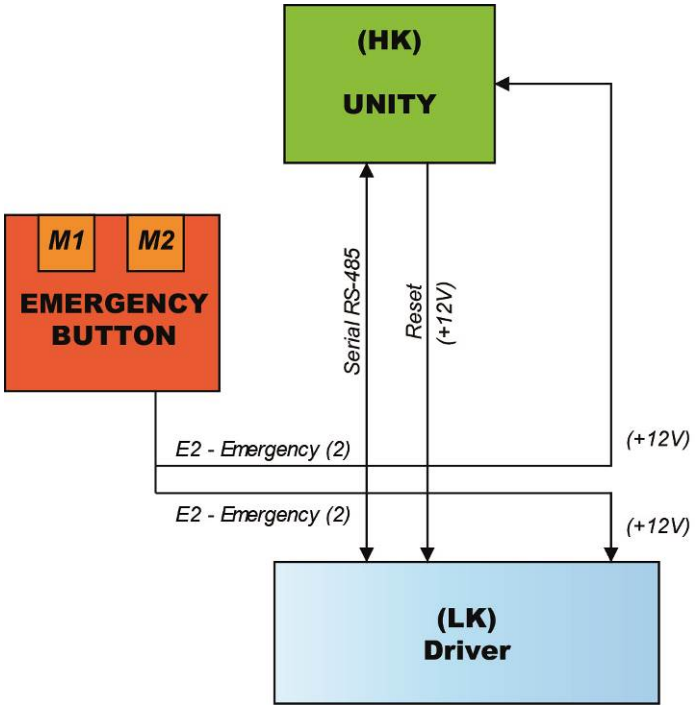
RESET Signal: *This is the signal generated by HK, sent to the LK to signal restoring of normal status after an emergency condition. This signal is 0 VDC in normal conditions and becomes 12 VDC for a few seconds when the user presses a key:*

- *LK: (Pin 10 su J3);*
- *HK: (Pin 7 su CN17).*

3.25.3. UNITY + ALEWIN (WITH FINAL CABLES)

3.25.3.1. The control

The control block diagram is as follows:



E2 = UNITY (HK) receives the **Emergency 2** signal.

- When the system is NOT in emergency the signal is +12V.
- When you press the EMERGENCY signal goes to GND.

E2 = ALEWin (LK) receives the **Emergency 1** signal.

- When the system is NOT in emergency the signal is +12V (pin 8).
- W When you press the EMERGENCY signal goes to GND.

The two signals are handled at the same time:

- *The EMERGENCY signal generated: is sent to the LK to immediately block it, while the HK only reads the status of the LK.*

To restore operation of the equipment, the user must press any key on the KEYBOARD or on the Touch Screen.
Pressing a key causes the Driver unlocking procedure to start, and the Driver receives the reset signal from the Main Board (HK). Following this, the Driver performs the reset procedure. If the serial communication cannot be successfully established, the equipment will make several attempts to reset. Every failed connection attempt is recorded in the COM FAULT parameter which can be displayed as indicated in the paragraph regarding the Service menu. After about 30 seconds it will interrupt and display the error message on the Display.

3.25.3.2. The signals involved

The following signals are involved in the control:

Emergency 2 signal:

- *HK: (Pin 15 on CN17).*

Emergency 1 signal (With ADAPTER cable):

- *LK – ALEWin (Pin 8 on J3).*

RS-485 signal*: is a digital signal exchanged by HK and LK.*

- *LK: (Pin 1-5 on J3)*
- *HK: (Pin 5-13 on CN17)*

RESET Signal: *This is the signal generated by HK, sent to the LK to signal restoring of normal status after an emergency condition. This signal is 0 VDC in normal conditions and becomes 12 VDC for a few seconds when the user presses a key:*

- *LK: (Pin 10 su J3);*
- *HK: (Pin 7 su CN17).*

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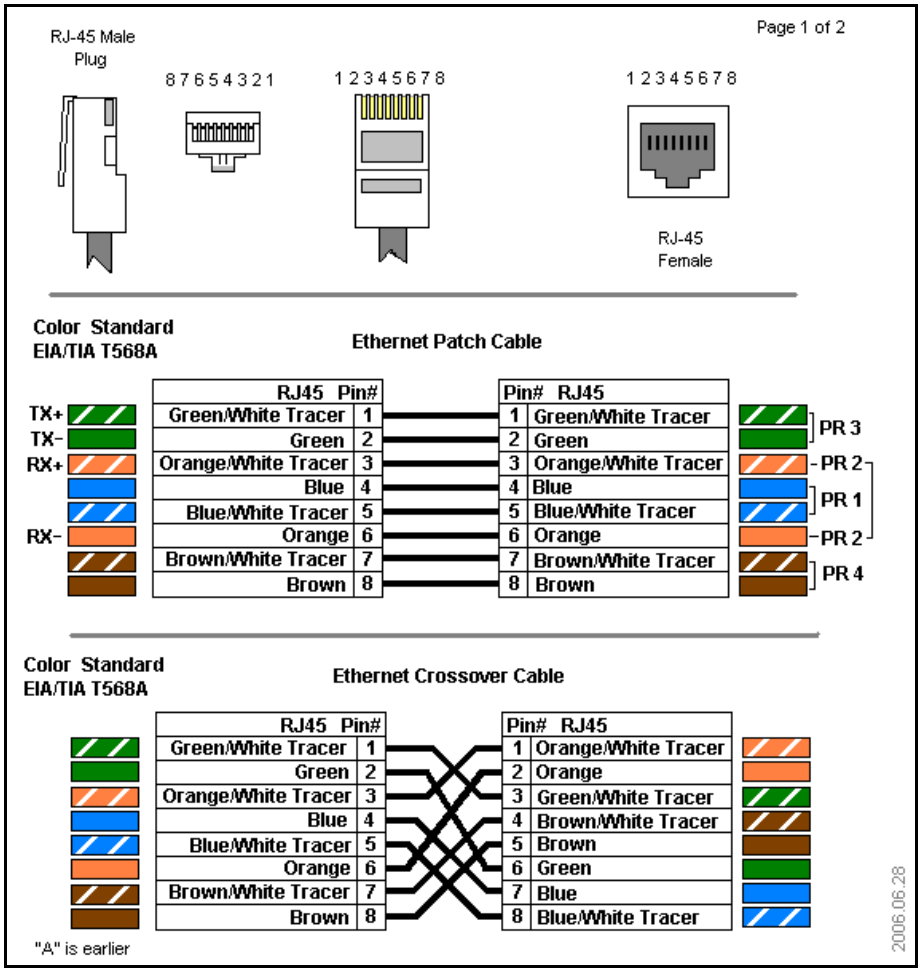
4. ACCESSORIES

4.1. CARDIO THEATER CONNECTION

The machine can be connected to the Cardio Theater by means of the **RJ45** connector on the C-Safe board. The Cardio Theater unit must be provided with a power cable having the following pin-out:

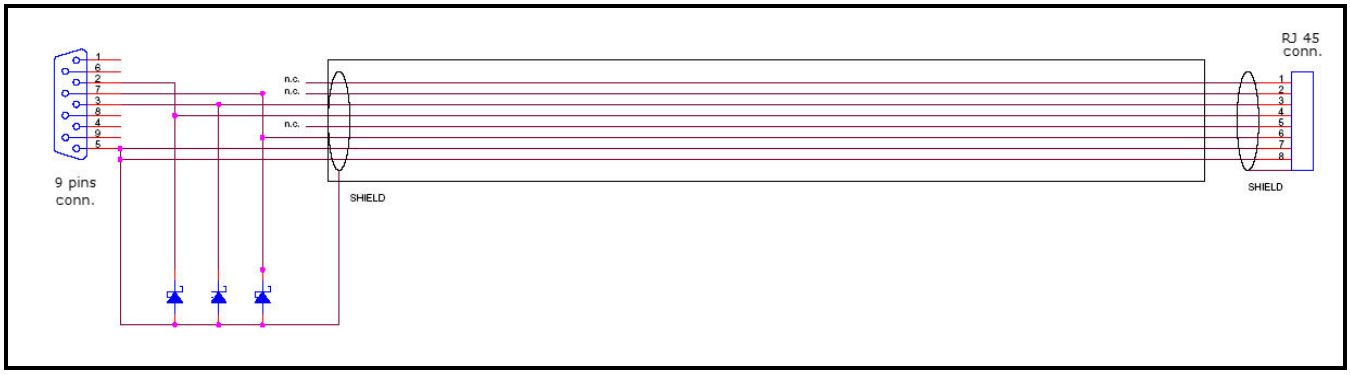
RJ45 Connector	Signal
5	+5Vdc
7	Ground

ATTENTION: for the numbering of the pins, on RJ45 connector, please refer to the diagram below:

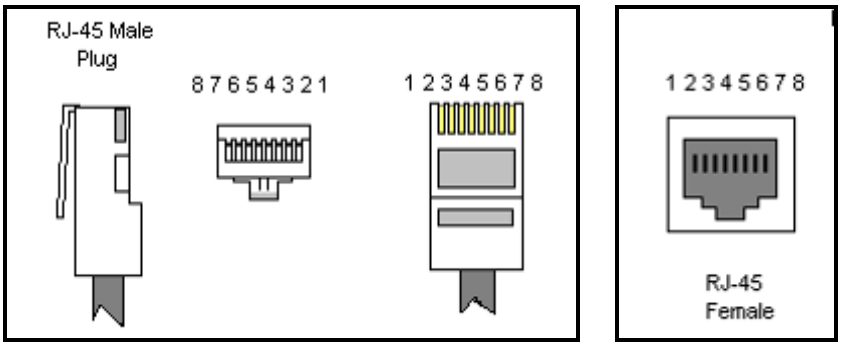


4.2. PC LINK FOR PROGRAMMING

The machine can be connected to a PC for programming by means of the RJ45 connector on the C-Safe board.
The cable to use must be wired as follows:

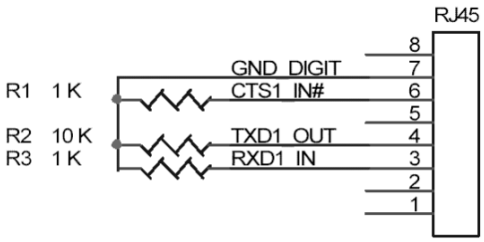


ATTENTION: for the numbering of the pins, on RJ45 connector, please refer to the diagram below:



When programming the machine sometimes it is necessary to fit plug into the free RJ-45 port on the back of the display, to avoid any type of interference during the operation.

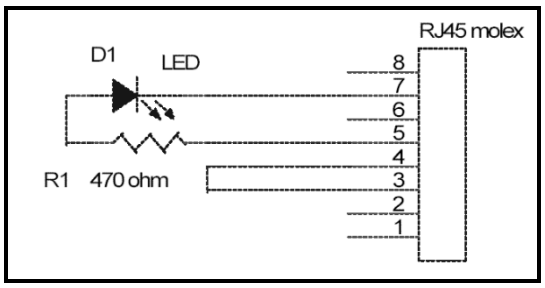
The wiring diagram of the RJ-45 plug is as follows:



*Programming cable and plug can be ordered using the code **R0002534AC**.*

4.3. MONITOR PLUG FOR C-SAFE PORT

When the plug code **0WC00639AA** is fitted into any one of the C-Safe ports on the machine, the corresponding LED should illuminate to indicate the presence of the 5Vdc supply on the port.
During the C-Safe port test function, the plug connects the transmit channel directly to the receive channel, thereby producing a positive test outcome if the port is functioning correctly.



4.4. VISIOWEB UPGRADE

4.4.1. VISIO vs VISIOWEB

The 2 product versions differ mainly for 2 reasons, one it's about its functionality while the second it's about a technical characteristic... They are briefly detailed below:

1. *On machines with **VISIOWEB** display it is possible for the user browsing and use internet services during the training session;*

2. ***VISIOWEB** has been developed on Linux instead of Windows CE used for **VISIO**. This difference can not be noticed by the final user because on both the product versions there is the same user interface and just few steps of the net configuration are different.*

4.4.2. VISIOWEB UPGRADE FOR VISIO MODELS

It is possible to upgrade equipment from VISIO to VISIOWEB through a specific SW upgrade procedure, using the proper *USB recovery* stick and a correct configuration for internet service (if the infrastructure has been properly arranged).
The code to be used for this upgrade **ATS600**

CAUTION: this procedure must mandatory be done by a TECHNOGYM qualified engineer.

4.4.3. UPGRADE FROM LED TO VISIOWEB

There are upgrade kits available for converting Excite + machines from the version with traditional ***LED Display*** to the ***VISIO Display***.

The kit includes all components needed to install the kit and installation instructions.
The table below gives the codes of the kits, to be chosen according to the TV standard used in the installation country:

VISIO UPGRADE KIT	Vers. 700 CODES	Vers. 900 CODES
RUN Now DVB-T	A0000527-D	A0000528-D
RUN Now ATSC	A0000527-A	A0000528-A
RUN Now ISDB-T	A0000527-I	A0000528-I

Table 4-1

CAUTION: At the end of the Upgrade steps of Standard Setting, as described in the relevant paragraph of the Service menu.

4.5. ACCESSORISE

ACCESSORISE	CODE
Dual TGS Reader15"	A0000481
iPod Docking Station 15"	A0000484
USB port 15"	A0000485

Table 4-2

5. INSTALLATION INSTRUCTIONS

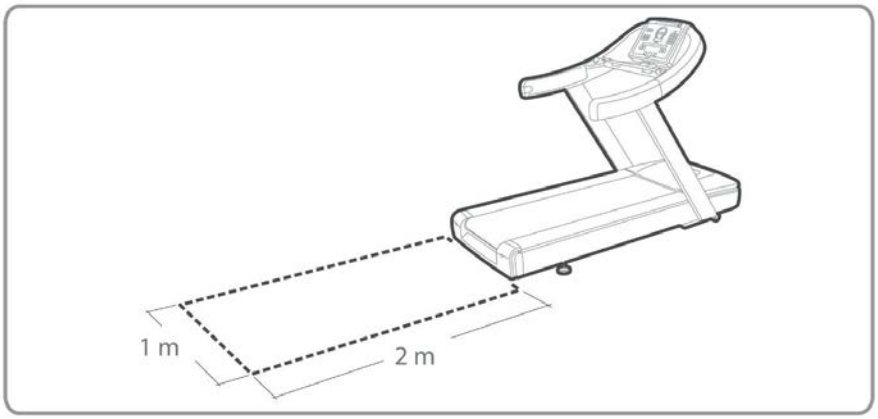
5.1. SPECIFICATIONS AND REQUIREMENTS

We recommend the use of a dedicated power line to equipment

The power supply socket must be "earthed".

For correct machine installation, make sure that:

1. The machine is installed on a level surface that is free of vibrations and has sufficient carrying capacity for the combined weight of the machine and user.
2. The place of installation is free of dust and sand.
3. The place of installation meets the operating temperature and humidity conditions specified in paragraph: **2.7. "Ambient specifications".**
4. The machine is not positioned close to sources of heat, sources of electromagnetic noise (television sets, electrical motors, antennas, high voltage lines, household appliances, etc...) or medical equipment. Each machine must have a dedicated supply line.
5. Position the mains lead of the machine where it will not be underfoot.
6. There is plenty of free space around each item of equipment and a free space of 2x1meter min front of the machine as shown in the picture:

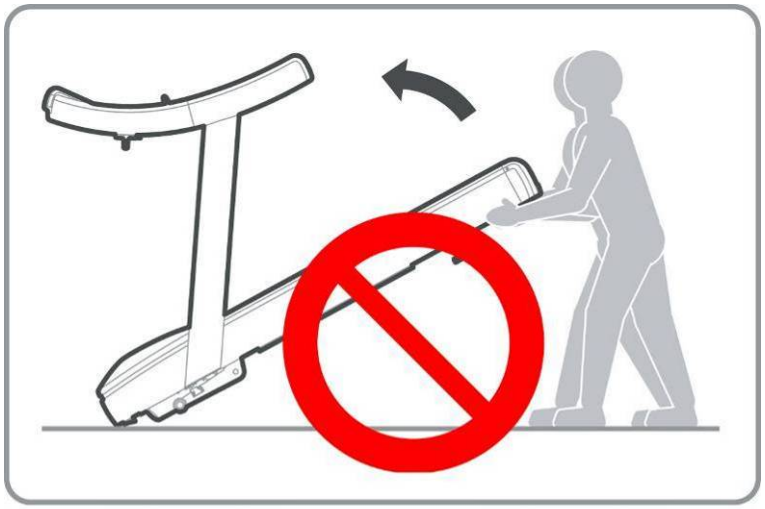


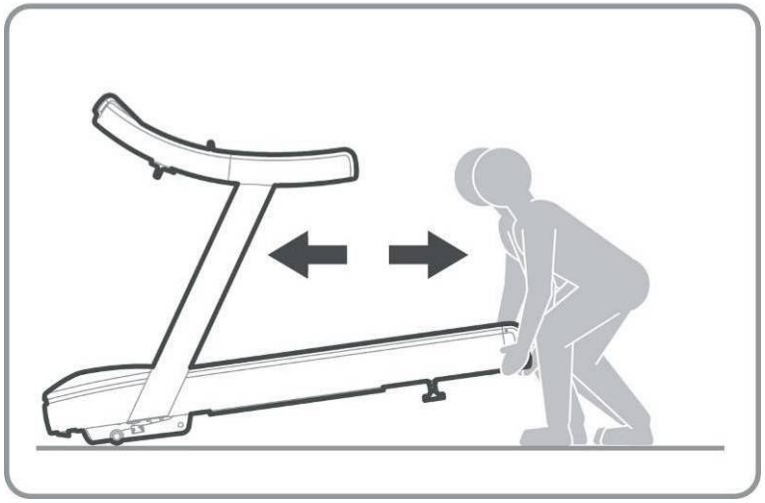
7. To eliminate any interference with the cardio receiver, no transmitters should be placed from the display, as indicated in **Figure 6-1.**

5.2. MOVING

The equipment has two fixed front wheels.
To move the equipment, lift it up slightly, as shown in the illustration, and push it forwards and backwards. It is recommended not to raise the equipment, so as not to damage the anterior guard

Given the weight of the equipment, we recommend 2 person be involved in lifting it.





ATTENTION: For moving it is recommended to grab the frame and not the lateral guards.

After every moving, check if the equipment is on flat, adjust the left foot, as indicated at the paragraph: 8.5. “The machine is not flat”.

5.3. INSTALLATION

To correctly install the machine, proceed as follows:

1. Ensure that the specifications and requirements for installation have been met, see paragraph: 5.1. “Specifications and requirements”.
1. Position the machine as specified above, on a level surface that is free of vibrations and has sufficient carrying capacity for the combined weight of the machine and user.
2. The machine is shipped partially assembled and packed in a carton fixed to a wooden pallet. Follow the assembly procedure described in the “Operating and Service Instructions” supplied with each machine.
   Follow the assembly operations described in the instruction sheets supplied with the machines.
3. Connect the mains lead to the power inlet socket on the machine.
4. Place the on/off switch in the “0” position.
2. Plug the mains lead into the wall outlet.

5.4. FIRST POWER-ON

After completing the installation procedure, the machine is ready to be powered up. To turn on the machine, simply toggle the on/off switch from the “0” position to the “1” position.

During power-up the machine resets the incline. After completing the power-on reset, the machine goes into standby, awaiting a keyboard command.

5.5. TO CHECK THE CORRECT OPERATION OF THE MACHINE

1. Get on the machine;
2. Press the “Quick Start” key to begin exercising and check that the tread belt motor starts;
3. Press the “+” and “-” keys on the keyboard and check that the tread belt speed varies accordingly;
4. Press the “↑” and “↓” keys and check that the incline varies accordingly;
5. Press the emergency button and check that the tread belt stops;
6. Put on the heart rate meter and check that the machine correctly reads the heart rate value;
7. Grasp the sensors and check that the machine correctly reads the heart rate value
8. Check the properly operation of *Speed Joystick* and *Up-Down Joystick* (only for 700 and 900 models).

5.6. SPECIFICATIONS AND MINIMUM AERIAL SIGNAL REQUIREMENTS

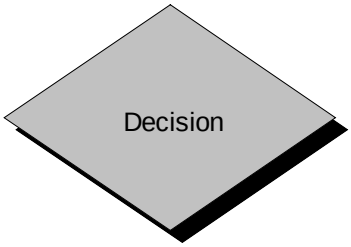
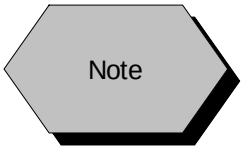
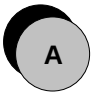
All the information about the minimum requirements concerning the antenna signal are detailed in the proper manual:

- **For VISIOWEB: *"ELECTRICAL and ANTENNA Requirements" manual;***
- **For UNITY: *"ARTIS Installation Requirements".***

These documents are located in the TG DIRECT in section: MISCELLANEOUS DOCUMENTATIONS.

6. TROUBLESHOOTING

The troubleshooting procedures are illustrated by means of flow diagrams. To facilitate interpretation of these diagrams, the following standard box shapes are used:

	This type of box is the START point of the troubleshooting procedure. It typically contains a description of the problem or malfunction.
	This type of box represents a decision point in the troubleshooting procedure. It typically contains a description of the CHECK to be made, with an outcome that is either a positive (YES) or negative (NO) response.
	This type of box is a step in the troubleshooting procedure where an ACTION must be carried out. It typically contains a description of the ACTION necessary to resolve the problem Therefore, after executing the specified ACTION: 1. *Check whether the problem has been resolved;* 2. *If the problem persists, it is recommended to resume the troubleshooting procedure from the point before the action was carried out.*
	Clarification of the operation in progress or that will be below
	A *circled number* (such as that shown on the left) next to a box of the troubleshooting procedure indicates that more detailed instructions for performing that particular check or action are provided below the flowchart.
	A *circled letter* (such as that shown on the left) is used to mark a point in the procedure. Typically, this indicator is used in page changes.

The connectors indicated in the following pages, refer to 700 powered models Boards, unless otherwise indicated.

6.1. TROUBLESHOOTING MENU SERVICE: 500LED MODELS

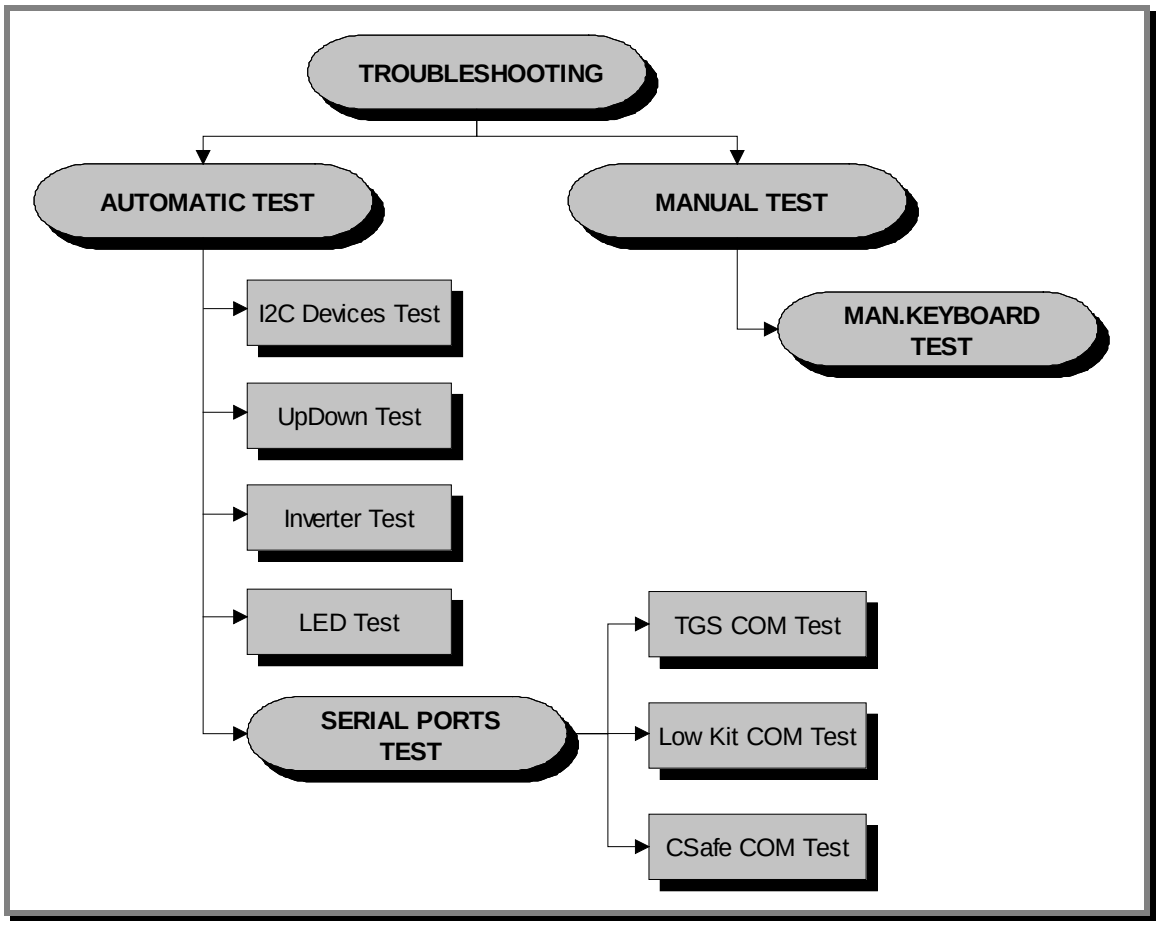
This section can be used to test the operation of some machine components (AC/DC Motors, LED display, keyboard, serial ports, and inverter). It is invoked, when the machine is in standby mode, by simultaneously pressing the keys **ENTER**, ↑, **CLEAR**. The following prompt appears on the LED display:

ENTER LA PASSWORD:

To access the procedure, insert the password **2501** which protects against unauthorized access and press **ENTER** to confirm. To enter the password without the numeric keypad, enter one digit at a time using the ↑ and ↓ keys to change the value and the **+/- GOAL** keys to scroll to the next character. At this point there are two options available:

↑ = Tech Config
↓ = Troubleshooting

Press ↓ to access the troubleshooting menu, which is structured as shown in the figure below.



To scroll through the list of available functions, press the + or – speed keys to display the next or the preceding item; confirm the choice by pressing ENTER. To cancel the operation, press the CLEAR key for a few seconds.

The tests are divided into two groups: Automatic and Manual. The machine prompts for a choice immediately upon accessing the troubleshooting menu.

6.1.1. AUTOMATIC TESTS

The tests grouped under this section conduct checks on the machine's operation in a fully automatic manner. After selecting the desired test using the + and – speed keys, press **ENTER** to initiate the test and then await the result. Press **ENTER** again to continue, or press the **CLEAR** key for a few seconds to return to the higher menu level. The various tests are described below.

6.1.1.1. I2C Device Test

The I2C Device test checks the communication following the 32K and 256K memories. The test can have two outcomes:

- ***"Test Successful, press Enter to continue":*** *Signifies that data packets were successfully transmitted and received toward the display board.*
- ***"EEPROM Error, press Enter to continue":*** *Signifies that the display board has communication problems with the memories.*

6.1.1.2. UpDown Test

The UpDown test checks whether the number of pulses output by the encoder corresponds to the values of the UpDown table stored in the low kit. During the test, the machine incline is moved from 0 to 15% and then back to 0. Each incline position is converted into a number of pulses and compared with the value in the UpDown table.

Two messages appear during the test:

- ***"Incline =15%": This message appears during the upward movement, when the machine incline reaches 15%.***
- ***"Incline =3%": This message appears during the downward movement, when the machine incline reaches 3%.***

The test can have two outcomes:

- ***"DC Error (Up/Down), press Enter to continue":*** *The message indicates that the values do not correspond. The specific message (Up or Down) indicates whether the error occurred during the upward (Up) or downward (Down) movement of the test.*
- ***"Test Successful, press Enter to continue":*** *This message indicates that the test was completed without errors.*

6.1.1.3. Inverter Test

The inverter test checks the condition of the AT driver. The test can have two outcomes:

- ***"Test Successful, press Enter to continue":*** *This means that the test was completed successfully and the inverter is not in an error condition.*
- ***"Inverter Error, press Enter to continue":*** *This means that the test was not completed successfully, i.e. that the serial link is inactive and/or the inverter is in an error condition.*

6.1.1.4. LED Test

The LED test checks the functioning of the display by lighting all the LEDs in the matrix. It also tests the buzzer, varying the frequency to produce different tones of sound.

The test does not produce a result message, so the user must visually check the outcome.

6.1.1.5. Serial Ports Test

The serial ports test checks the following communication ports:

- C-Safe COM test;
- Low Kit COM test;
- TGS COM test.

Using the + and – speed keys, select the desired test item and confirm by pressing **ENTER**. The test can have two outcomes:

- ***"Test Successful, press Enter to continue":*** *This means that the test was completed successfully, i.e. that serial communications on the selected port are correct.*
- ***"COMx Error, press Enter to continue":*** *This means that the outcome of the test was negative: the message will specify COM1 in the case of the C-Safe COM test, COM2 in the case of communications with the low kit, or COM3 in the case of the TGS COM test.*

The "TGS COM test" done on machine not provided with the key reader gives a fail outcome. The same if the "C-Safe COM test" is done on a machine which C-Safe port is not plugged with the monitor plug described at paragraph: 4.3. "Monitor plug for C-Safe port".

6.1.2. MANUAL TEST

This section groups together tests for manually checking the operation of certain peripheral devices. After selecting the desired test item using the **+** and – speed keys, press **ENTER** to access the tests. To exit test mode, hold down the **CLEAR** key for a few seconds.

The various manual tests are described below.

6.1.2.1. Man. Keyboard Test

The manual keyboard test checks the functioning of all the keys on the keyboard. After accessing the test by pressing **ENTER**, the message "**Press all buttons (beep=OK)**" appears on the display. Pressing each key will produce an audible signal; if a key does not produce the "beep" it means it is not working properly.

6.2. TROUBLESHOOTING MENU: 700 – 900 LED MODELS

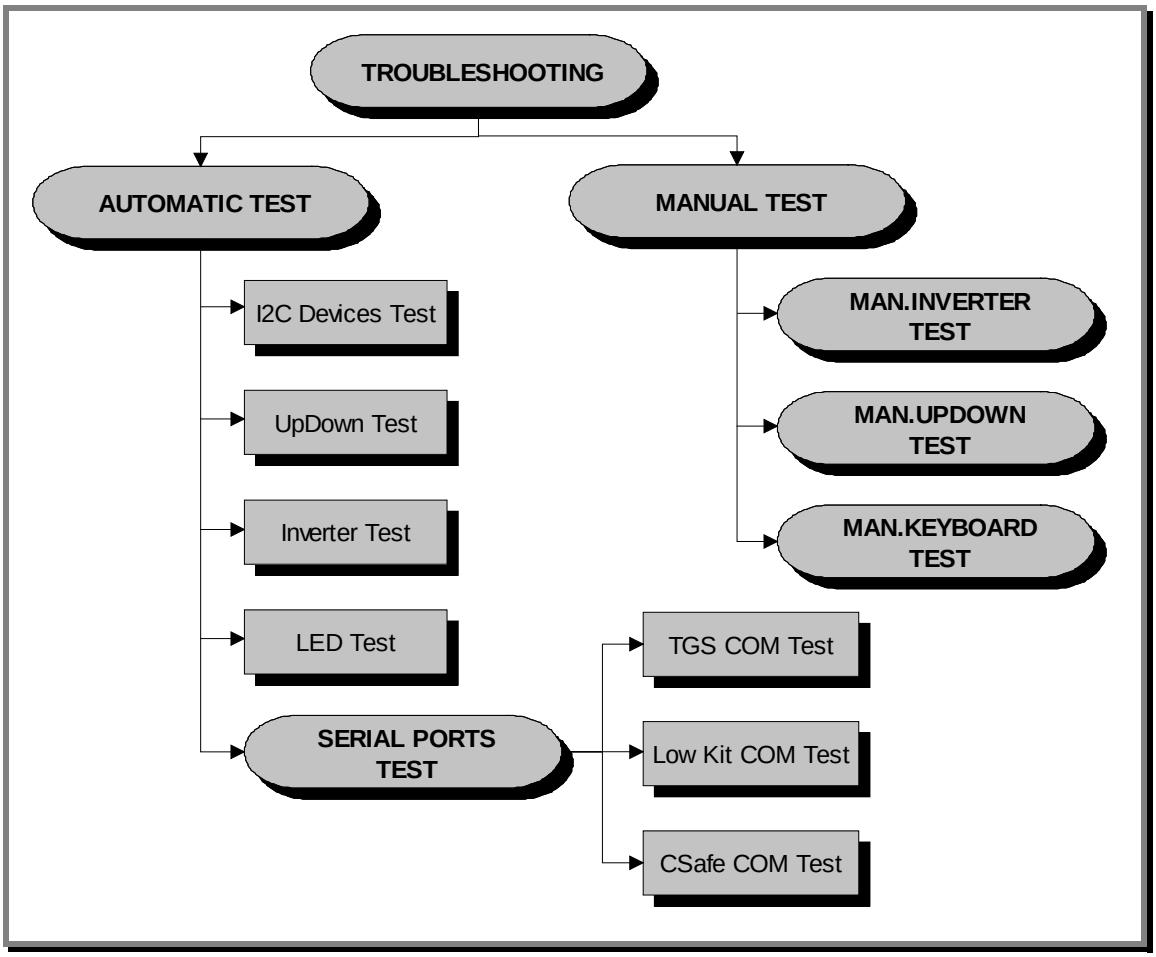
This section can be used to test the operation of certain machine components (AC/DC Motors, LED display, keyboard, serial ports, Low Kit). It is invoked, when the machine is in standby mode, simultaneously press the keys **369** for 700 models. The following prompt appears on the display:

ENTER PASSWORD:

To access the procedure, type in the password **2501** which protects against unauthorized access and press the "Enter" key to confirm. At this point there are two options available:

1 = Tech Config
2 = Troubleshooting

Press numeric key **2** to access the menu for configuring technical parameters; the machine display will begin showing the current configuration, structured as in the diagram below:



To scroll through the list of available functions, press the + or – speed keys to display the next or the preceding item; confirm the choice by pressing ENTER. To cancel the operation, press the CLEAR key for a few seconds.

The tests are divided into two groups: ***Automatic*** *and* ***Manual****, and the prompt for a choice appears immediately on accessing the troubleshooting menu.*

6.2.1. AUTOMATIC TEST

The tests grouped under this section conduct checks on the machine's operation in a fully automatic manner. After selecting the desired test using the + and – effort level keys, press **ENTER** to initiate the test and then await the result. Press **ENTER** again to continue, and use the **CLEAR** key to return to the higher menu level, holding it down for a few seconds. The various tests are described below.

6.2.1.1. I2C Devices Test

The I2C Devices test checks the communication following the 32K and 256K. The test can have outcomes:

- ***"Test Successful, press Enter to continue"****: Signifies that the transmission and reception of data packets between the I2C devices and the display board was completed successfully.*
- ***"EEPROM Error, press Enter to continue"****: Signifies that the display board is having problems communicating with its memories.*

6.2.1.2. Up-Down Test

The Up-Down test checks whether the number of pulses output by the encoder corresponds to the values of the Up-Down table stored in the low kit. During the test, the machine incline is moved from 0 to 15% (*for 700 models*) and from 0 to 18% (*for 900 models*) and then back to 0. Each incline position is converted into a number of pulses and compared with the value in the Up-Down table.

Two messages appear during the test:

- ***"Incline =15%": This message appears during the upward movement, when the machine incline reaches 15%.***
- ***"Incline =3%": This message appears during the downward movement, when the machine incline reaches 3%.***

The test can have two outcomes:

- ***"DC Error (Up/Down), press Enter to continue":*** *The message indicates that the values do not correspond. The specific message (Up or Down) indicates whether the error occurred during the upward (Up) or downward (Down) movement of the test.*
- ***"Test Successful, press Enter to continue":*** *This message indicates that the test was completed without errors.*

6.2.1.3. Inverter Test

The inverter test checks the condition of theAT UL driver. The test can have two outcomes:

- ***"Test Successful, press Enter to continue":*** *This means that the test was completed successfully and the inverter is not in an error condition.*
- ***"Inverter Error, press Enter to continue":*** *This means that the test was not completed successfully, i.e. that the serial link is inactive and/or the inverter is in an error condition.*

6.2.1.4. LED Test

The LED test checks the functioning of the display by lighting all the LEDs in the matrix. It also tests the buzzer, varying the frequency to produce different tones of sound.

The test does not produce a result message, so the user must visually check the outcome.

6.2.1.5. Serial Ports Test

The serial ports test checks the following communication ports:

- *C-Safe COM test;*
- *Low Kit COM test;*
- *TGS COM test.*

Using the + and – speed keys, select the desired test item and confirm by pressing **ENTER**. The test can have two outcomes:

- ***"Test Successful, press Enter to continue":*** *This means that the test was completed successfully, i.e. that serial communications on the selected port are correct.*
- ***"COMx Error, press Enter to continue":*** *This means that the outcome of the test was negative: the message will specify COM1 in the case of the C-Safe COM test, COM2 in the case of communications with the low kit, or COM3 in the case of the TGS COM test.*

The "TGS COM test" done on machine not provided with the key reader gives a fail outcome. The same if the "C-Safe COM test" is done on a machine which C-Safe port is not plugged with the monitor plug described at paragraph: 4.3. "Monitor plug for C-Safe port".

6.2.2. MANUAL TEST

The tests grouped under this section conduct checks on the machine's operation in a fully automatic manner. After selecting the desired test using the + and – effort level keys, press **ENTER** to initiate the test and then await the result. To exit test mode, press and hold down the **CLEAR** key for a few seconds.

6.2.2.1. Man. Keyboard Test

The manual keyboard test checks the functioning of all the keys on the keyboard. After accessing the test by pressing **ENTER**, the message "**Press all buttons (beep=OK)**" appears on the display. Pressing each key will produce an audible signal; if a key does not produce the beep it means it is not working properly.

6.2.2.2. Man. Inverter Test

The manual inverter test displays the values output by the inverter drive during movements of the tread belt motor. The values displayed are:

- *Tread belt motor drive frequency (x100);*
- *Current (x10);*
- *Voltage.*

During the test it is possible to change the speed using the + and – speed keys, to see the change in the values of frequency, current and voltage.

6.2.2.3. Man. UpDown Test

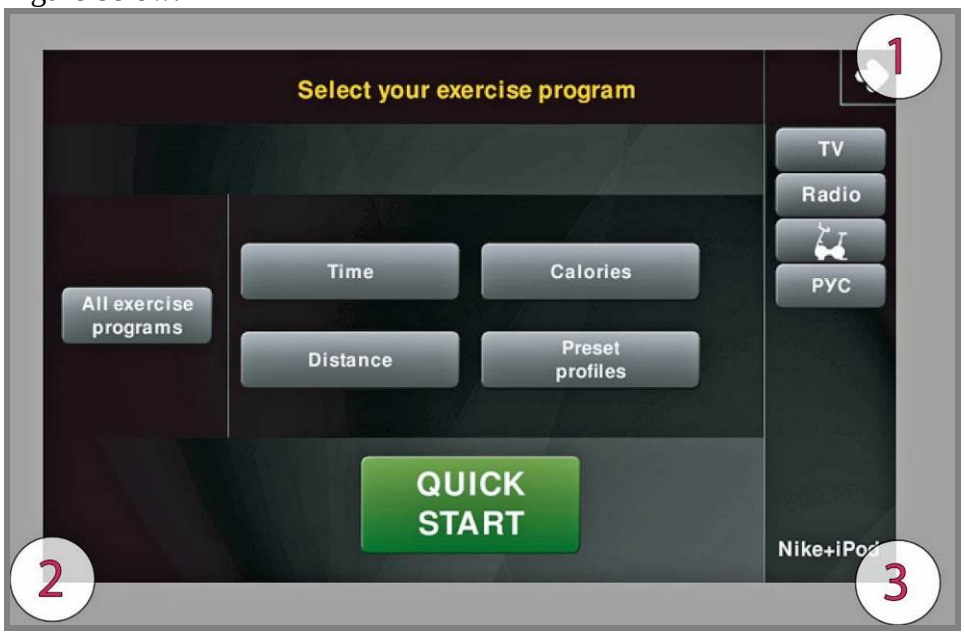
The manual UpDown test displays the values output by the elevation motor drive during machine incline movements. The values displayed are:

- *Machine incline position;*
- *Number of pulses generated by the elevation motor encoder;*
- *State of limit switch: if it is pressed, "MIN" is shown, nothing in the other condition.*

During the test it is possible to vary the incline using the ↑ and ↓ elevation keys, to check that the values vary accordingly

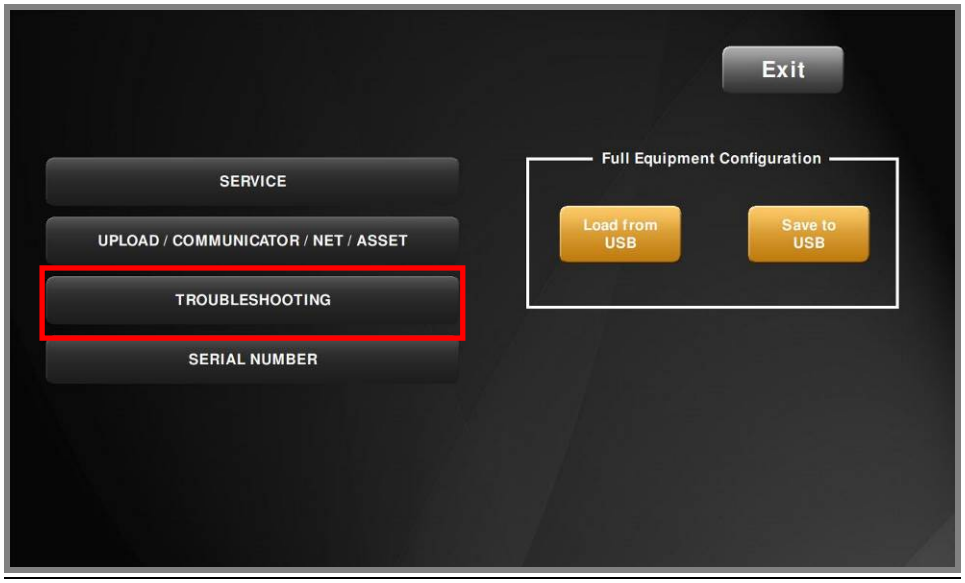
6.3. TROUBLESHOOTING MENU: VISIO/VISIOWEB MODELS

The procedure is activated by pressing the top right-hand corner, the bottom left-hand corner and the bottom right-hand corner of the screen in that sequence when the equipment is in Stand-By, as shown in the figure below.



A new display will appear from which you can gain access to the various configuration menus, by entering the password on the number keyboard:
Enter the password **2501** and press the **ENTER** key to confirm or **EXIT** to quit.

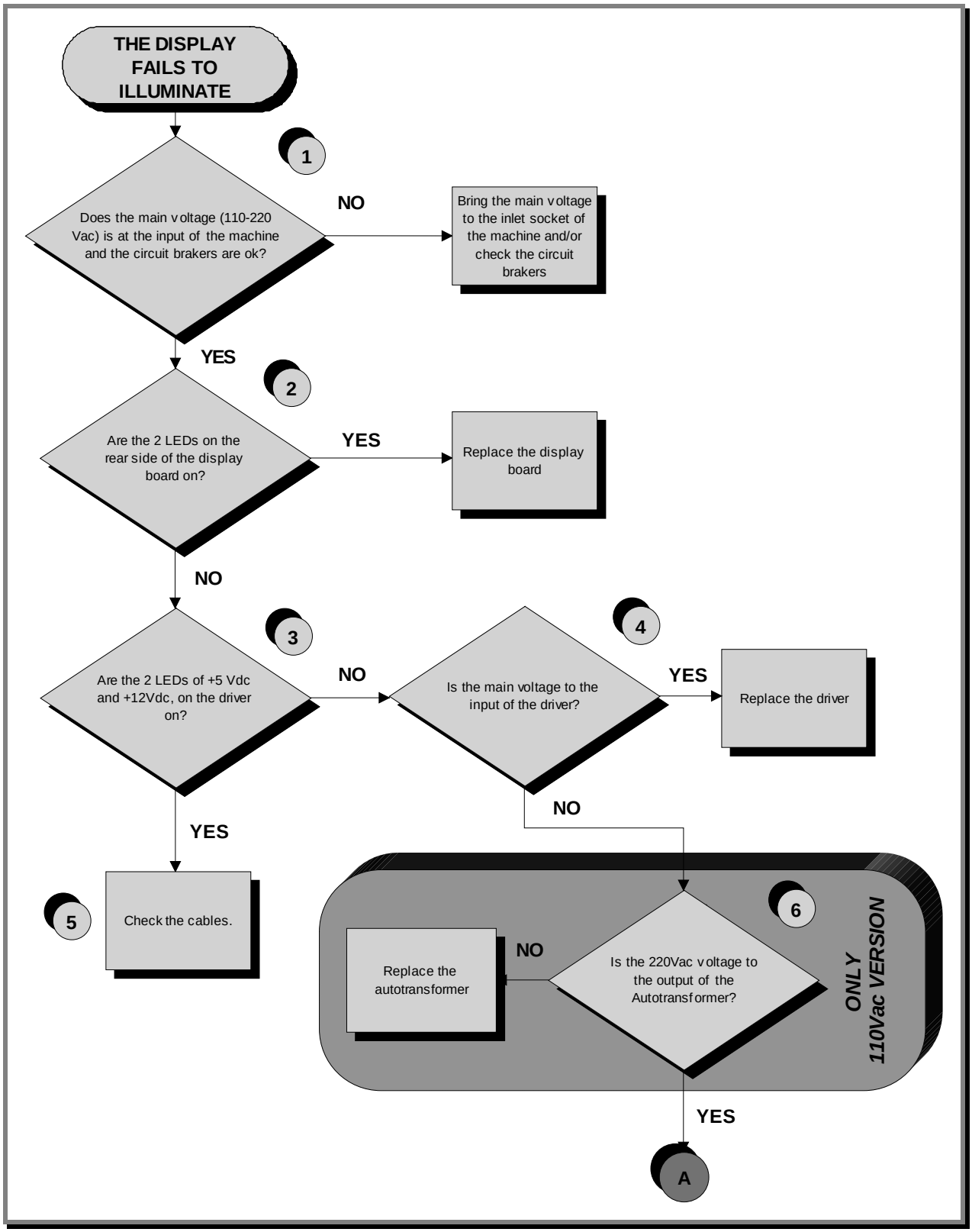
*By selecting the key which is highlighted in red, you will gain access to the **TROUBLESHOOTING** menu:*



For the following menu, please refer to the relevant chapter in the VISIO manual.

6.4. THE DISPLAY FAILS TO ILLUMINATE

6.4.1. LED MODELS



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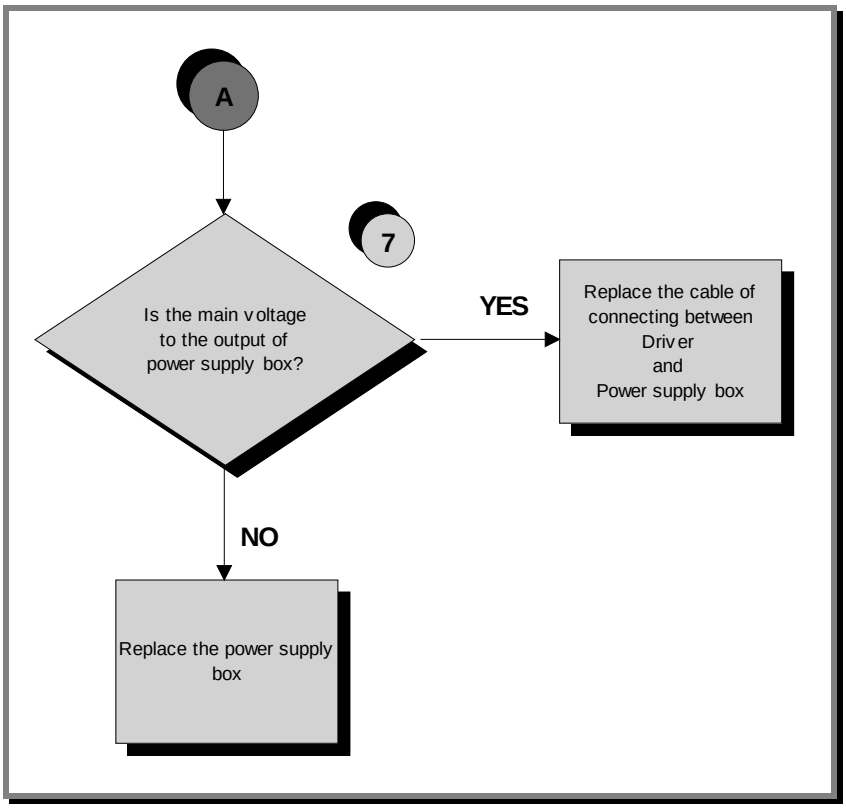


Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

To speed up the troubleshooting procedure, check the state of the power indicator LEDs on the various circuit boards.

(1) Slightly lift the Fast-on connectors on the machine power inlet socket. Place the tester probes across the live and neutral pins on the same connector. The measured voltage should be approximately 220Vac/110Vac.

(2) Check if **LED 1** and **2** (+5Vdc and +12Vdc), on the ARM board are on.

(3) Check if **LED H6** and **H3** +5Vdc and +12Vdc (*ALE driver*), or **LED H2** and **H3** (*AT UL driver*), are on.

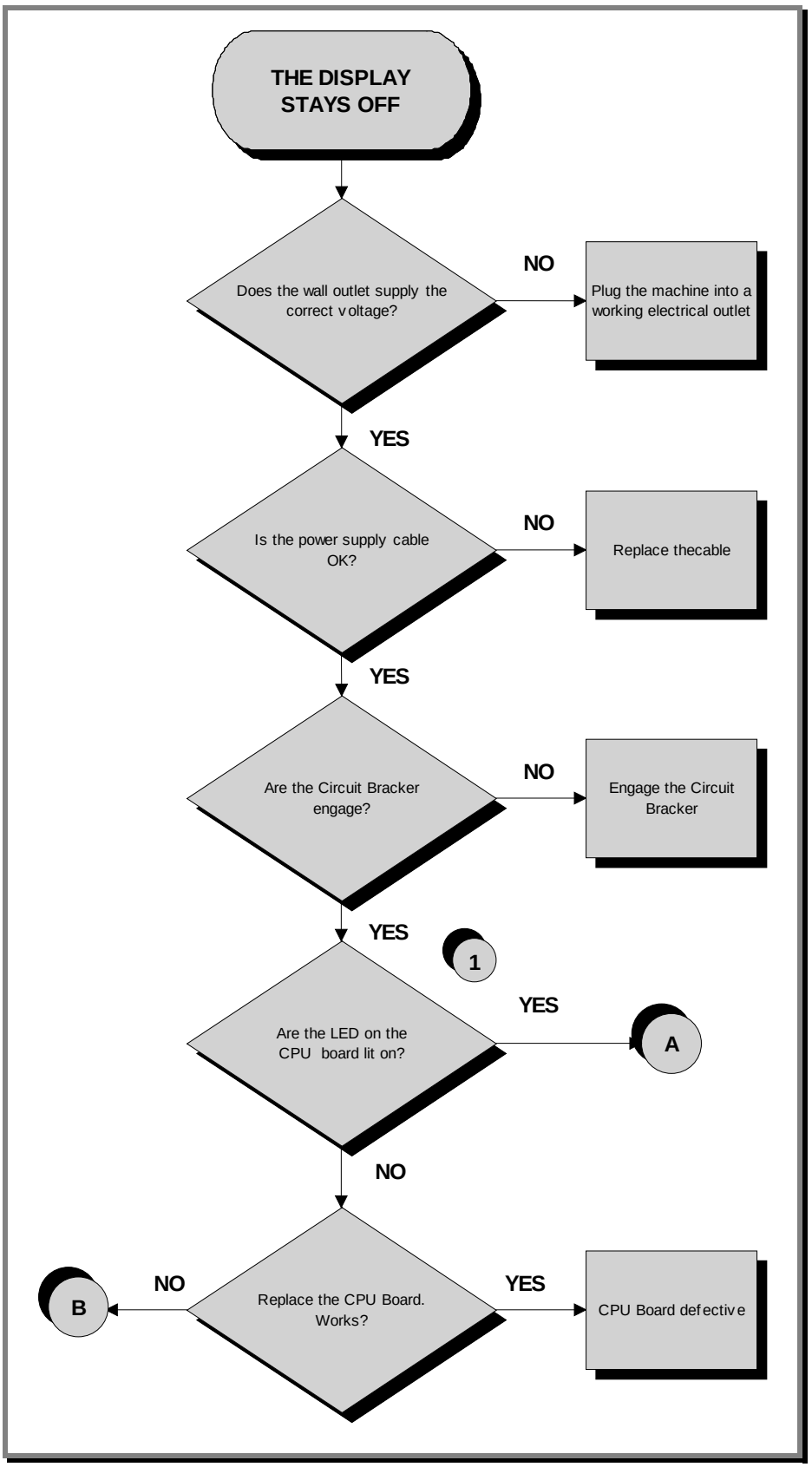
(4) Check if on connector J1, there is approximately 220Vac/110Vac, between pin 1 and 2 of the driver box.

(5) Check the continuity of the power supply signals on the **CU242** cables between pin **1** and **5** *(AT-UL driver)* or on the **CU243** cables between pin **1** and **5** *(ALE driver)*, by referring to paragraph: 2.10. “Cables” and replace what’s defective.

(6) Check if at the output to the Autotransformer there are the 220Vac, on the **J1** connector.

(7) Check if the main voltage 220Vac/110Vac is present and the continuity of the on the **CU145** cable, pins **1** and **2**.

6.4.2. VISIO/VISIOWEB MODELS



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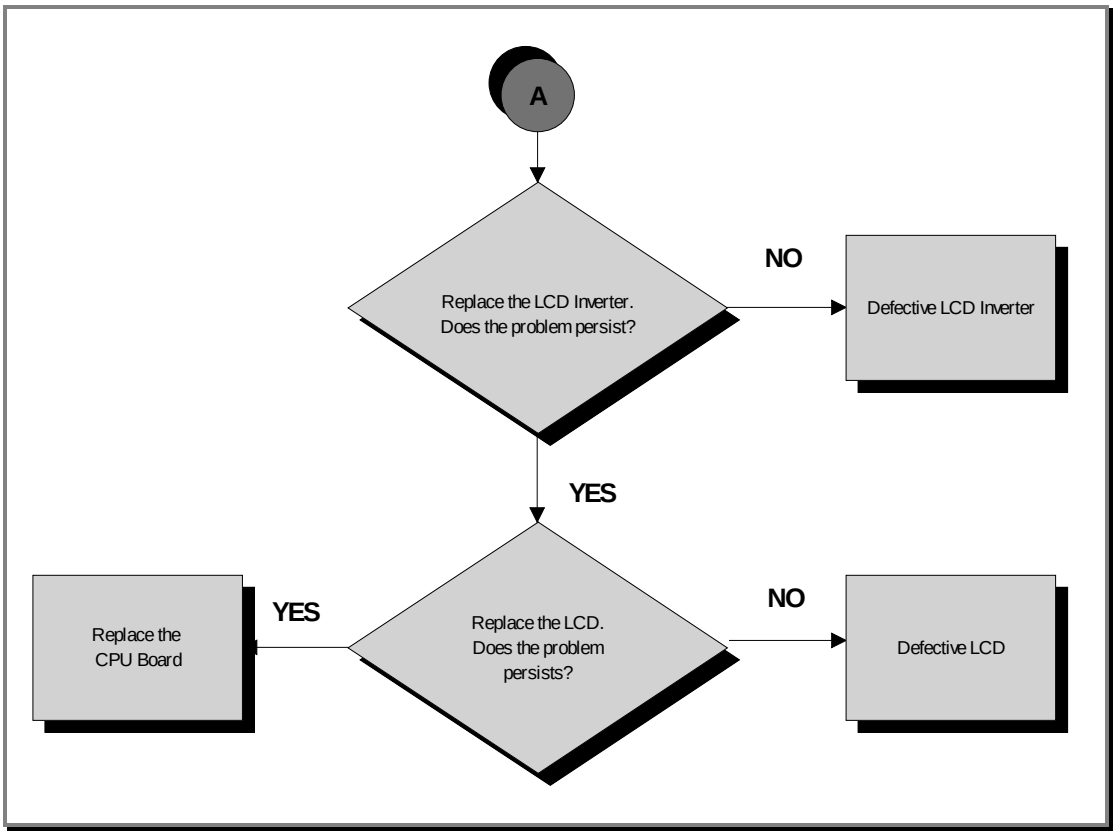

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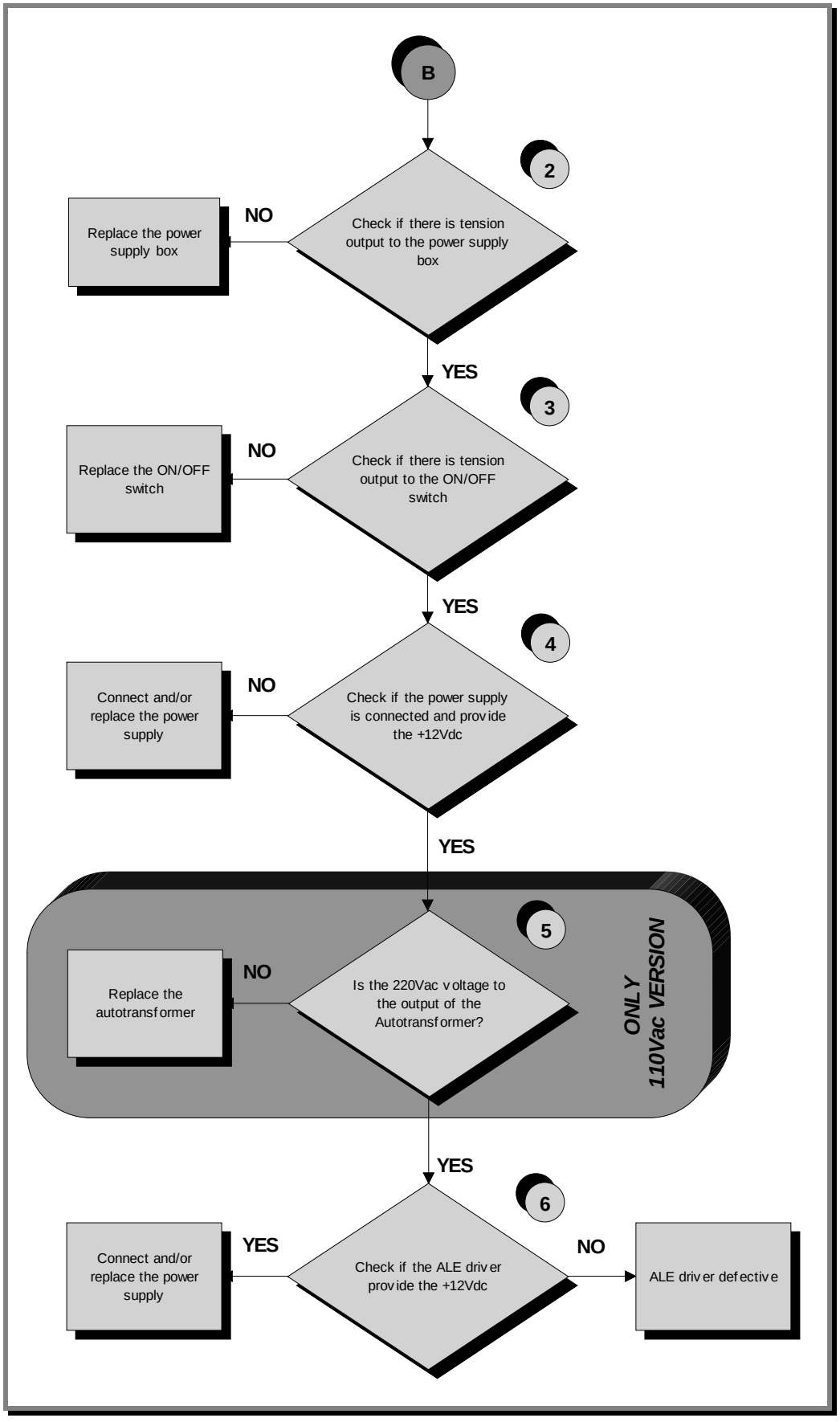

B
2
Check if there is tension output to the power supply box
NO
Replace the power supply box
YES
3
Check if there is tension output to the ON/OFF switch
NO
Replace the ON/OFF switch
YES
4
Check if the power supply is connected and provide the +12Vdc
NO
Connect and/or replace the power supply
YES
ONLY 110Vac VERSION
5
Is the 220Vac voltage to the output of the Autotransformer?
NO
Replace the autotransformer
YES
6
Check if the ALE driver provide the +12Vdc
YES
Connect and/or replace the power supply
NO
ALE driver defective

Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

(1) Check the **LED 1** (*green*) of the CPU Board, is correctly lit on.

(2) Check on the switch ON button's faston, connected to the cable output to power supply box, if there is the 220Vac voltage.

(3) Check if the power supply voltages are at the output of the Power supply board and the continuity of the **CU145** and **CU318** cables by referring to paragraph: **2.10. "Cables"** and replace what's defective.

(4) Check if there is the +12Vdc voltage at the input of the driver box on **J1** connector.

(5) Check if the 220Vac, are at the output of autotransformer, in direction of the Driver on **J1** connector**.**

(6) Check if there is the +12Vdc voltage at the output of the driver box on pin **2** and **7** of **CU378** cable *(ALE driver)* or **CU379** cable *(AT-UL driver)*.

If you replace CPU Board and/or Driver, check that its SW version is updated, otherwise install the last version.

TV channels and RADIO, are only stored in a file in the fixed memory of the board. So the channels will be re-stored in case of replacing of the CPU Board.

6.4.1. UNITY MODELS

For the following menu, please refer to the UNITY Manual (User Interfaces) and at the wiring diagrams: 2.9.2.4 "ALEWin Extended Range: (100 - 240V)" and 2.9.3.1 "Powered models 700 UNITY".

6.5. TOUCH SCREEN NEEDS CALIBRATING /DOES NOT WORK

Only for VISIO/VISIOWEB and UNITY models.

For the following menu, please refer to the VISIO/VISIOWEB and UNITY manuals.

6.6. YOU CANNOT HEAR THE AUDIO

Only for VISIO/VISIOWEB and UNITY models.

For the following menu, please refer to the VISIO/VISIOWEB and UNITY manuals.

6.7. YOU CANNOT SEE THE TV

Only for VISIO/VISIOWEB and UNITY models.

For the following menu, please refer to the VISIO/VISIOWEB and UNITY manuals.

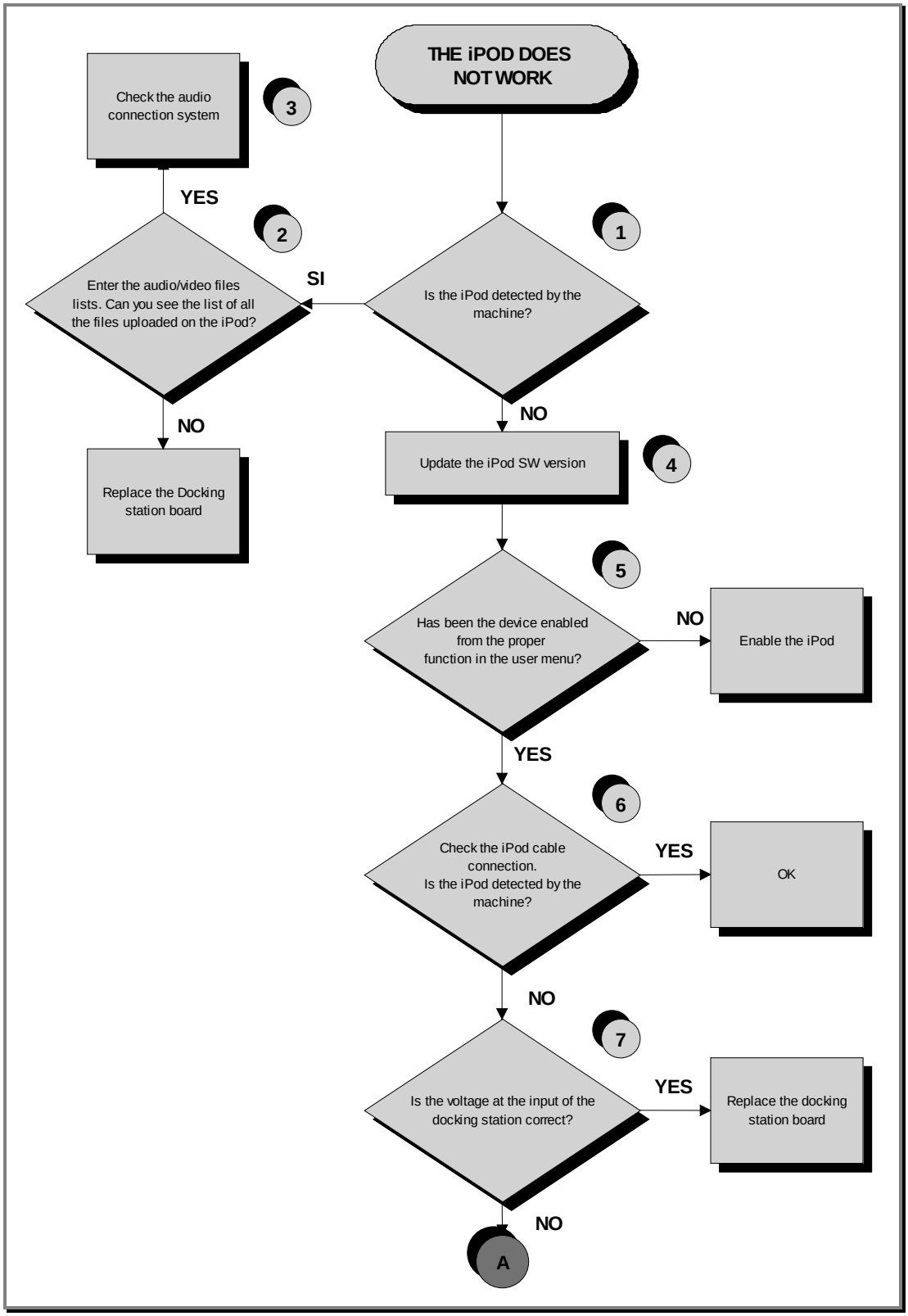
6.8. YOU CANNOT HEAR THE RADIO

Only for VISIO/VISIOWEB and UNITY models.

For the following menu, please refer to the VISIO/VISIOWEB and UNITY manuals.

6.9. THE IPOD DOES NOT WORK

6.9.1. VISIO/VISIOWEB MODELS



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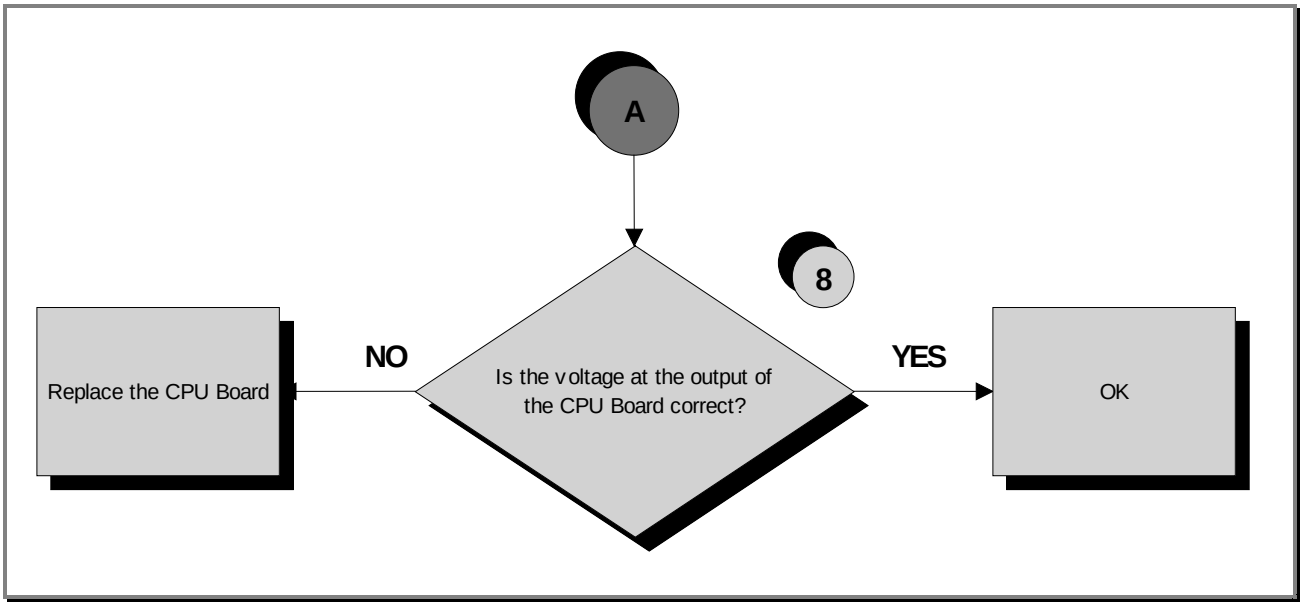


Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

(1) Switch on the machine, connect the iPod on the docking station and check that the device is correctly detected by the machine.
(2) Check that the audio/video files uploaded in the iPod are visible and selectable through the VISIO interface.
(3) Carry out the troubleshooting procedure: **6.6. "You cannot hear the audio".**
(4) To update the iPod SW you just need to connect to iTunes and it automatically upgrades to the last version.
(5) Enable the iPod control as detailed in the relevant paragraph of the User menu.
(6) The **CU331** cable has identical connectors on either end then it can sometimes be connected the wrong way round.
(7) Place the tester probes across pins **8** and **9** of the connector on the docking station board where the **CU331** cable is connected. The measured value should be 5Vdc.
(8) As for step **(7)** but across pins **6** and **7** of the connector on the CPU board where **CU331** is connected.

If you replace CPU Board, check that its SW version is updated, otherwise install the last version.

6.9.1. UNITY MODELS

For the following menu, please refer to the UNITY Manual (User Interfaces) and at the wiring diagrams: 2.9.2.4 "ALEWin Extended Range: (100 - 240V)" and 2.9.3.1 "Powered models 700 UNITY".

6.10. THE DISPLAY SHOWS “PRESS A KEYS / TOUCH THE SCREEN”

This error message can be caused by:

- *loss of communication between the lower and upper assemblies;*
- *the user has pressed the emergency button;*
- *defective emergency button: the micro switch is opened.*

To In order to reinstate normal operation, simply press any key. If communication between the upper and lower assemblies is not immediately re-established, the message will remain on the display while the machine continues trying for 30 seconds, after which the “THE EQUIPMENT IS BLOCKED” message will appear.

The machine keeps count of the attempts to reinstate communication by incrementing the COM.FAULT parameter, which can be viewed using the procedure described in the relevant paragraph of the Service menu.

6.11. "THE EQUIPMENT IS LOCKED (COM)" MESSAGE ON DISPLAY

In case of the machine stops with error "The equipment is locked" check the cause of the problem, reported between parentheses:

- *(COM), related to serial communication errors;*
- *(EMER), related to emergency button errors;*
- *(cod. error), related to Low Kit errors.*

This error message can be caused by:

- *Loss of communication between the lower and upper assemblies; (COM)*
- *The driver has detected an error condition, causing it to generate an alarm and store the error code in memory (cod. Error).*
- *Problem on the emergency button (EMER) or (COM).*

To optimize the troubleshooting procedure, follow the steps below:

1. Access the item "**TROUBLESHOOTING→AUTOMATIC TEST→ SERIAL PORTS TEST→Low Kit COM Test**". If the outcome of the test is negative, check the components of the link between the upper and lower kit, in particular:

   - *Check that the wiring of the various cables is not damaged, in particular the cables of the "emergency signal" and of the "reset" by referring to paragraph: 2.10. "Cables"; try replacing each of the circuit boards in turn (CPU/ARM board and driver box) and check whether the communication works.*

   If the outcome of the test is OK move on to step 2.

2. Access the item check the error code stored in the "**ERRORS LOG**" and perform the corresponding troubleshooting procedure, if the outcome is OK advance to step 3.

3. The machine lockout problem has to do with the handling of the emergency signal:

   - *Check that the emergency button is not pressed;*
   - *Check that the cord, linked to the emergency button, is not to taut so that it keep the emergency button contact open;*
   - *Check that all the cables linked to the emergency device management are properly connected and in a good state of wear.*

WARNING: if the CPU/ARM board detects an error condition during the tread belt motor movement, it displays the error message and turns off the AC motor by the driver.

6.12. DRIVER ERRORS

6.12.1. ALE MET

When the Driver detects an error, it stops and interrupts the power supply to the tread belt and elevation motor and an error code identifying the fault condition is saved in the error history log. In addition, it sends an error status signal to the CPU/ARM board via the serial link. Upon receiving this error signal, the CPU/ARM board halts the exercise and shows the "THE EQUIPMENT IS BLOCKED" message on the display.
The errors logged by the inverter can also be viewed as described in the relevant paragraph of the Service menu.

The following table provides the correspondence between error codes, meaning and possible solutions:

Error code	***Error***	***Description***	***Possible solution***
01	**1/OH**	OVERHEATING of the heat sinks of the low kit driver and of the PFC.	• *Check the running belt;* • *Check the running deck;* • *Check the fans;* • *low kit driver;* • (*).
02	**2/OC**	OVERCURRENT, even if only temporary, on the inverter output.	• *Check the running deck;* • *low kit driver;* • *Check P409 (torque) = 100-115;* • (*).
03	**3/UU**	UNDERVOLTAGE condition, due to an even temporary drop in line voltage.	• *Bad power distribution line of 110/220 Vac;* • *Voltage NOT constant;* • (*).
04	**4/OU**	OVERVOLTAGE	• *Voltage NOT constant;* • *Braking resistor.*
05	**5/ST**	SERIAL TIMEOUT, there is no signals exchange between high kit and low kit	• *Check the serial communication.*
06	**6/PE**	EEPROM error: is generated when there is an error detected in the data stored on the Eprom.	• *low kit Driver.*
07	**7/EdC1**	ELEVATION MOTOR ENCODER error.	• *Check Up/Down Troubleshooting.*
08	**8/EdA**	BELT MOTOR ENCODER error.	• *Encoder;* • *low kit Driver;* • *Check P409 (torque) = 100-115.*
09	**9/OtM**	BELT MOTOR THERMAL CUT-OUT open.	• *Update driver SW;* • *Check motor casing fan;* • *Check the running belt;* • *Check the belt motor.*
10	**10/Oli**	Inverter overload caused by a DC current exceeding, for the maximum allowed time (I2t), the maximum permissible threshold for the inverter.	• (*).

Error code	Error	Description	Possible solution
11	**11/OLm**	Motor overload caused by a DC current exceeding, for the maximum allowed time (I2t), the maximum permissible threshold for the motor in question.	-
12	**12/OLr**	Braking resistor overload.	• *Check the resistor=150 Ω;* • *low kit Driver.*
19	**19/EM**	EMERGENCY. Is generated when low kit drive receives a software emergency signal that is not accompanied by a hardware emergency signal	-
20	**20/SFAn**	LOW KIT DRIVER COVER PLATE FAN. This error is generated if there is a malfunction on the fan mounted on the driver's cover plate, for at least 5 sec.	• *low kit driver cover plate fan.*
21	**21/PFAn**	LOW KIT DRIVER INTERNAL FAN. This error is generated if there is a malfunction on the internal low kit driver fan, for at least 5 sec	• *low kit driver internal fan.*
22	**22/IMV**	INVERTER POWER SUPPLY: This error is generated if a voltage <156 VAC for at least 1 sec. when the AC motor is working or for at least 10 sec. when AC motor is not working.	-
23	**23/SHC**	SHORT CIRCUIT. Is generated in the event of a short circuit between a motor phase and earth.	• *Check the belt motor.*
24	**24/OHS**	OVERHEATING of the dissipater sensor: This error is generated if a malfunction of the dissipater sensor last more than 1 sec.	• *low kit driver;* • (*).

Note (*): In case of errors related to high current consumption (such as E01), we recommend performing a test that consists of walking on the treadmill at a pre-established speed and checking the current consumption, according to the table below.

USER WEIGHT	FREQUENCY/SPEED	CURRENT DRAW
60Kg	1500Hz / 5Km/h	5A
70Kg	1500Hz / 5Km/h	5.3A
80Kg	1500Hz / 5Km/h	5.6A

On models not equipped with an encoder, in which the speed readout is always "0", use the frequency value given in the table as a reference.

6.12.2. ALEWIN

When the Driver board detects an error, it shuts down interrupting the power supply to the tread belt motor and to the gradient motor and memorises a numerical code that identifies the detected error. It also sends an error state signal to the Main Board, via serial interface. When the Main Board receives this signal, it interrupts operation and shows the "EQUIPMENT BLOCKED" message on the display.

Code	Error	Description	Solution
01	**1/OH**	OVER-TEMPERATURE detected on the dissipators inside the Driver and the PFC.	Check the condition of the treadmill; Check the condition of the treadmill deck; Check the operation of the fan; Check the Driver; (*).
02	**2/OC**	OVERCURRENT, including instantaneous ones, on the driver.	Check the condition of the treadmill; Check the condition of the treadmill deck; Check the contacts of the P9 Encoder connector on the motor side. These must be "regular" and not loose or jagged. If they are, replace the motor; (*).
03	**3/UU**	LOW VOLTAGE, due to a line voltage that drops significantly, even instantaneously.	Check the condition of the treadmill; Check the condition of the treadmill deck; Possible input overload; False contact in the cable; Input voltage not constant; Poor distribution in the electrical system (shared neutral, lines too long) or it may be due to a low voltage transient on the electricity network; (*).
04	**4/OU**	OVERVOLTAGE	Braking resistance 150 ohms.
05	**5/ST**	SERIAL TIMEOUT, no data exchange between High Kit and Low Kit	Check the serial communication.
06	**6/PE**	EEPROM ERROR, this is generated when errors are detected in the data stored in the EEprom.	Check the operation of the Driver.
07	**7/EdC1**	GRADIENT Motor Error.	Check Up/Down Troubleshooting; Check the limit switch.

Code	Error	Description	Solution
08	**8/EdA**	SPEED Error: The Driver is unable to operate the belt at the set speed.	Check that contacting is good on the ENCODER cable, motor side; After visual inspection, check the IPA35 and/or IPA36 parameters by manually moving the belt and at the same time performing “Read from Low Kit”; Check the state of the materials; If points 1 and 2 are OK, replace the Driver and the motor in sequence.
09	**9/OtM**	THERMAL PROTECTION of tread belt MOTOR interrupted.	Check the state of the treadmill; Check the state of the treadmill deck; Check the Tread Belt Motor; If the materials are in a good state of repair and Er09 occurs frequently, replace the motor; (*).
10	**10/Oli**	DRIVER OVERLOAD, due to a direct current that exceeds the maximum threshold permitted for the inverter in the maximum permitted time (I2t).	Check the state of the materials; Check the usage conditions: a heavy user (> 100 Kg) at high speed (> 16 kmh) for several minutes (>= 4) may generate the condition; Check the state of the motor contacts on the ENCODER side; If the Encoder connector is OK, the materials are OK and the usage conditions far from the extremes, replace the Driver; (*).
11	**11/OLm**	MOTOR OVERLOAD, due to a direct current that exceeds the maximum threshold permitted for the motor in the maximum permitted time (I2t).	Check the conditions of the equipment; Check error 9.
12	**12/OLr**	BRAKING RESISTANCE OVERLOAD.	Check resistance = 150Ω (this can be checked only inside the Driver); Check the Driver.
13	**13/SMPS**	Defective power supply to High Kit (HK).	If the error persists for some time, replace the Driver.
14	**14/PH**	ENCODER TIMING Error: This occurs when the Driver reveals a reverse movement, and may also arise after the initial timing.	If the error persists for some time: check the contacts on the motor side of the ENCODER cable or replace the motor. **In case of the error does not resets, turn off for a prolonged time the equipment (approximately 10 min).**

Code	Error	Description	Solution
19	**19/EM**	EMERGENCY. This is generated if the Driver receives an emergency signal regarding the software but not the hardware.	Check the emergency wiring.
20	**20/SFAn**	Driver COVER FAN. This alarm is generated when a malfunction of the fan installed on the Driver cover is detected for at least 5 seconds.	Check the Driver cover fan.
22	**22/IMV**	INVERTER POWER SUPPLY: This alarm is generated when a voltage lower than the specification settings (<156 VAC) is detected for at least 1 sec. with the AC motor in operation or 10 sec. with the AC motor idle.	-
23	**23/SHC**	SHORT CIRCUIT: Generated when there is a short circuit between the motor phase and earth.	Check the Tread Belt Motor. Check the conductive path between the motor phases and the housing or earth.
24	**24/OHS**	DISSIPATOR SENSOR OVER-TEMPERATURE: This trips when a malfunction is detected in the linear sensor installed on the power dissipator; the malfunction must last at least 1 second before being signalled	Check the Driver; (*).

Note (*): In the event of errors due to high absorption: Er01, Er02, Er03, Er09 e Er010, the following table can be taken into account to check the wear of the materials:

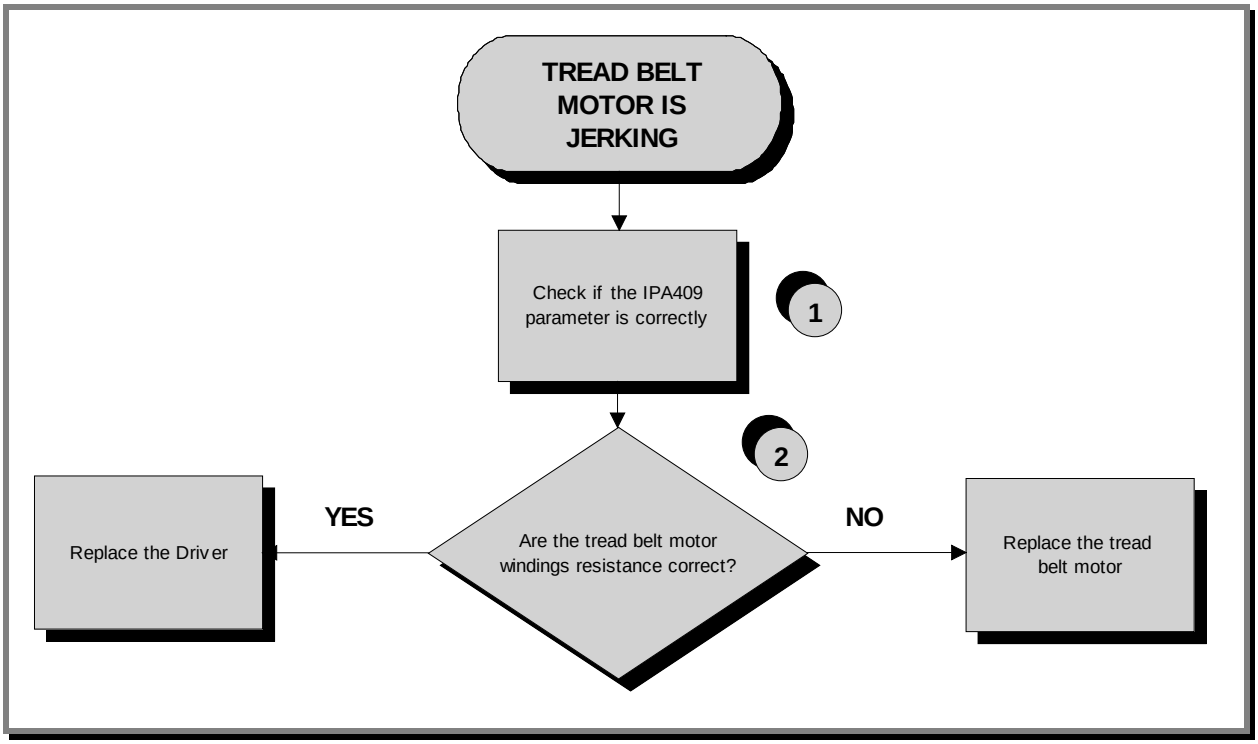
User Weight: 92 kg	Absorption Rms A	Power VA
0.8	0.66	149.45
2	0.85	193.05
4	1.19	271.14
6	1.58	359.38
8	1.94	439.09
10	2.34	528.44
12	2.78	629.21
14	3.18	717.3

The data refers to absorption from an electricity network supplying power at 230 VAC.

Absorption in VA serves as a reference for power supplies at 120 VAC.

6.13. TREAD BELT MOTOR IS JERKING

The probable cause is a disconnected phase either at the Driver board output or on the motor;



Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

(1) Check parameter **IPA409** as detailed in the table at the paragraph: **9.5.3. "Inverter".**

(2) Disconnect the cable from the motor and place a tester across its terminals U-V, U-W and V-W. The measured value of the resistance should be 1.9 Ohm.

6.14. “GRADIENT NOT WORKING” MESSAGE ON THE DISPLAY

If the elevation does not work and there is no error message on the display, the elevation movement may have been disabled in the configuration menu. For further details, refer to the relevant paragraph of the Service menu.

Check parameter PAR 09 is set *15 (1,5 Sec.).*

This parameter defines the time window within which the inverter expects to receive a sufficient number of pulses from the elevation motor, before generating an error condition.

1. *This error message indicates that the machine is unable to control the elevation motor. The error is produced when the inverter does not receive any pulses from the motor encoder after having enabled it. After this, the machine continues to function with the elevation motor disabled and parameter PAR 07 set to 1.*

2. *The error message may be caused by a malfunction of the travel limit microswitch If the microswitch breaks during use, the machine will enable an upward elevation movement, in an attempt to open the microswitch contact. If the microswitch fails to open after a predefined number of pulses, the machine generates an elevation error and halts the movement.*

3. *The error message may be caused by a misalignment of the "HALL" effect sensor, if it is not correctly aligned with its magnet. In fact, if the encoder of the elevation motor is not correctly positioned, the motor will fail to output any pulses. At this point, the elevation movement will be disabled, and parameter PAR 07 set to 1.*

When the machine is switched on again, the parameter PAR 07 is automatically reset to 0 and the machine performs the reset procedure. If the error does not happen anymore, supposing it was generated by a noise, the machine restarts to work properly.

It might also be helpful to refer to the theoretical explanation of the elevation control, provided in paragraph: 3.24. “Elevation motor drive”.

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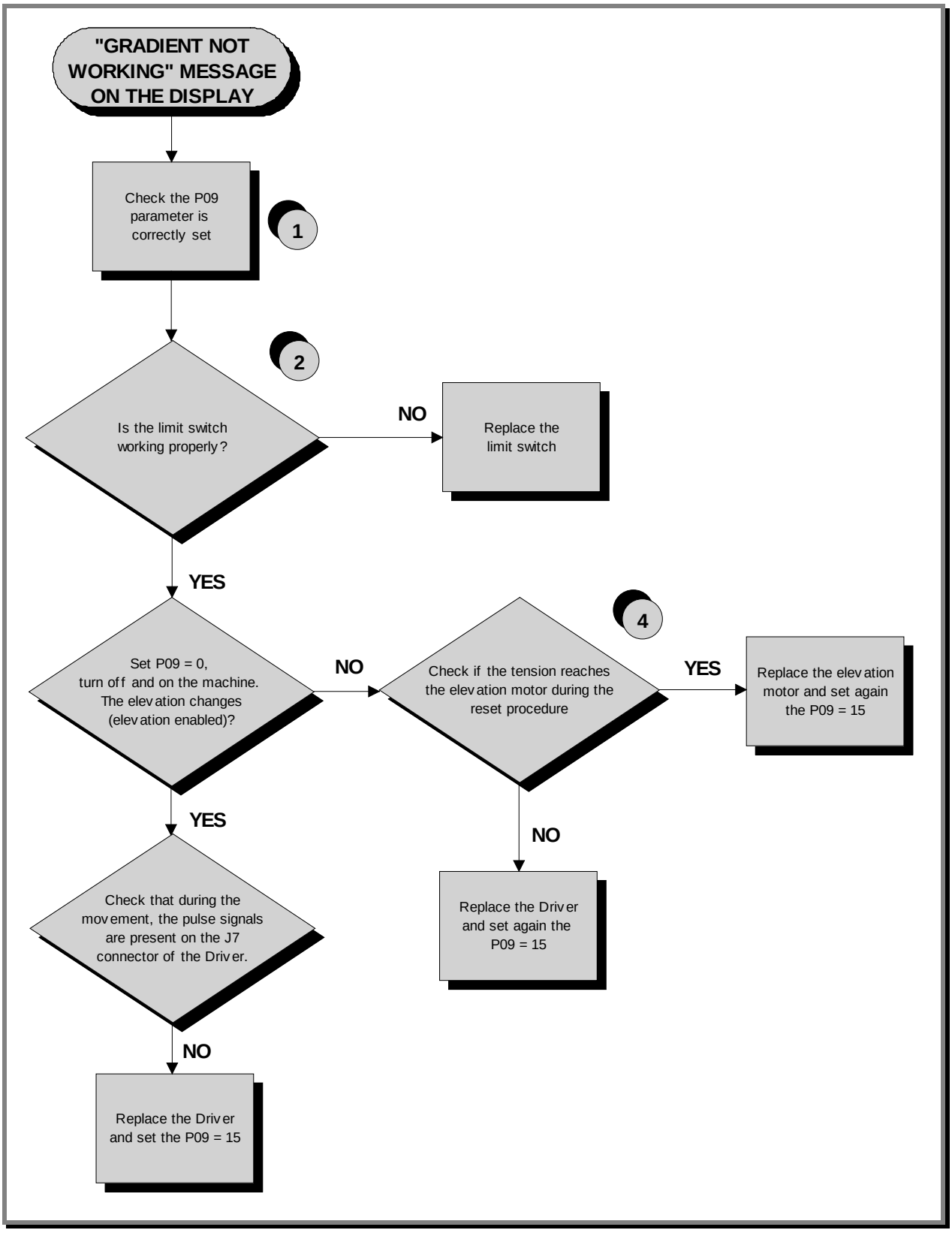

"GRADIENT NOT WORKING" MESSAGE ON THE DISPLAY
Check the P09 parameter is correctly set
1
2
Is the limit switch working properly?
NO
Replace the limit switch
YES
Set P09 = 0, turn off and on the machine. The elevation changes (elevation enabled)?
NO
4
Check if the tension reaches the elevation motor during the reset procedure
YES
Replace the elevation motor and set again the P09 = 15
YES
Check that during the movement, the pulse signals are present on the J7 connector of the Driver.
NO
Replace the Driver and set again the P09 = 15
NO
Replace the Driver and set the P09 = 15

Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

(1) Check the parameter setting as detailed in the relevant paragraph of the Service menu, is enabling.

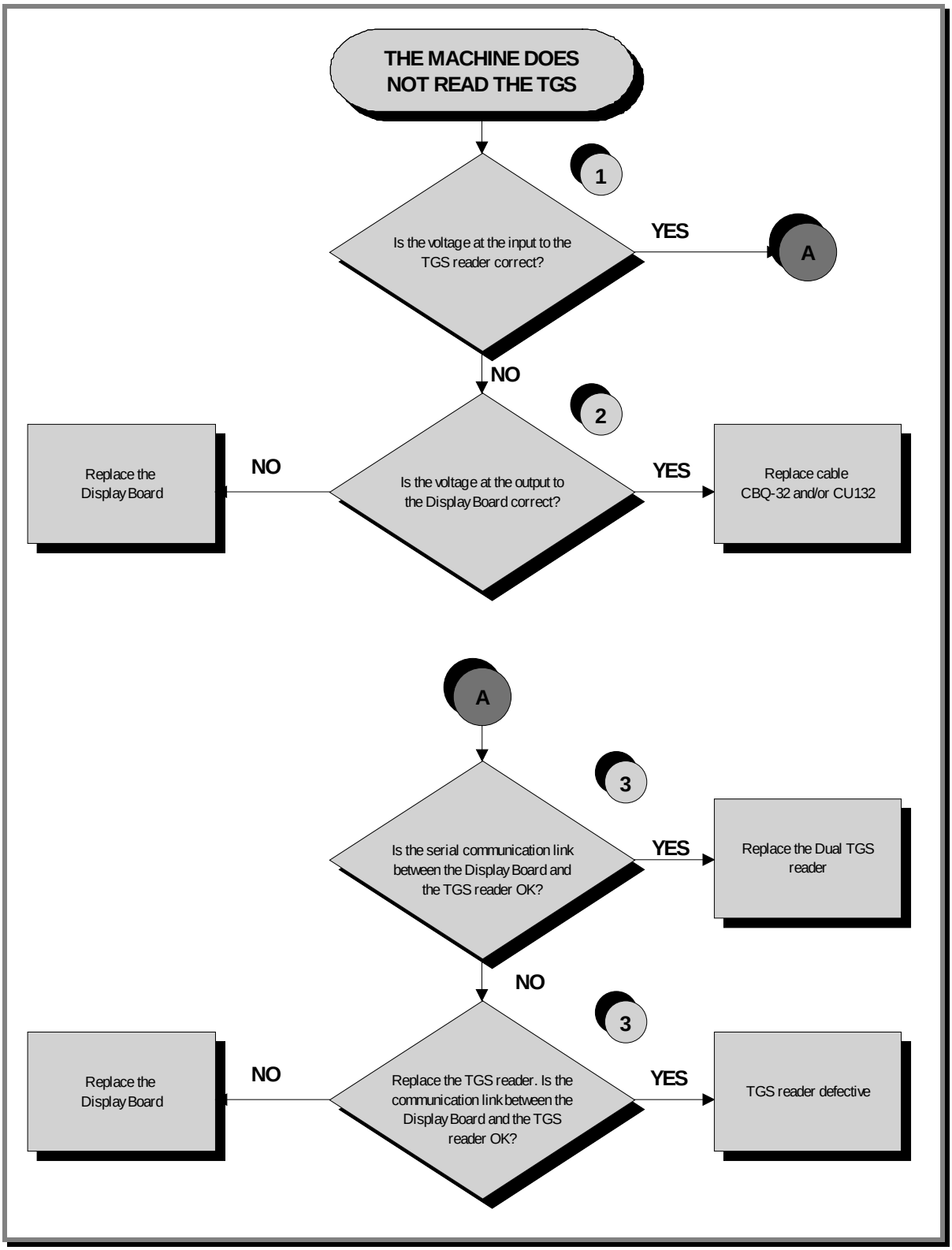
(2) Open the Driver cover plate and press manually the limit switch. When the limit switch is pressed, **DWN-SW** has to be ON while has to be OFF if released.

(3) Place the tester probes across pins **6** and **4** of connector **J7** on Driver board. The measured value should be approximately 2.5Vdc. If an oscilloscope is available, it is possible to view the pulses produced by the encoder itself.

6.15. THE MACHINE DOES NOT READ THE TGS

6.15.1. VISIO/VISIOWEB MODELS

The machine displays this error if the TGS reader is not working properly, or if it is not supplied by the CPU/ARM Board.



Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

(1) In Place the tester probes across pins **1** and **3** of connector **CN1** of the TGS reader. The measured value should be +12Vdc.

(2) As for step **(1)** but across pins **1** and **8** of connector **CN19** (CPU Board) or on the **CN7** connector (ARM Board).

(3) Use the serial communications test described at paragraph: **6.2.1.5 "Serial Ports Test"**.

If you replace ARM/CPU Board, check that its SW version is updated, otherwise install the last version.

6.15.2. UNITY MODELS

For the following menu, please refer to the UNITY Manual (User Interfaces) and at the wiring diagrams: 2.9.2.4 "ALEWin Extended Range: (100 - 240V)" and 2.9.3.1 "Powered models 700 UNITY".

6.16. THERE IS NO HEART RATE SIGNAL

6.16.1. HR/HS RECEIVER (HAND SENSOR)

All models.

HUMAN BODY "CONTINUITY": it's well known that for somebody it's very difficult, nearly impossible, to measure their HR using the hand sensors. This due to a lot of possible causes which could fake the "quality" of the contact between the human skin and the HS plates, as: hands only just washed or particularly dry, acidity of the skin and/or a particular body fat mass index. For these people it's suggested to wear the chest belt transmitter.

HS CORRECT USE: Grasp both the upper and lower plate avoiding clenching them too hardly. Avoid washing the hands using soaps that can dry the skin too much.

The machine displays this error if the **HR/HS Receiver** does not work or is not powered by the Display Board.

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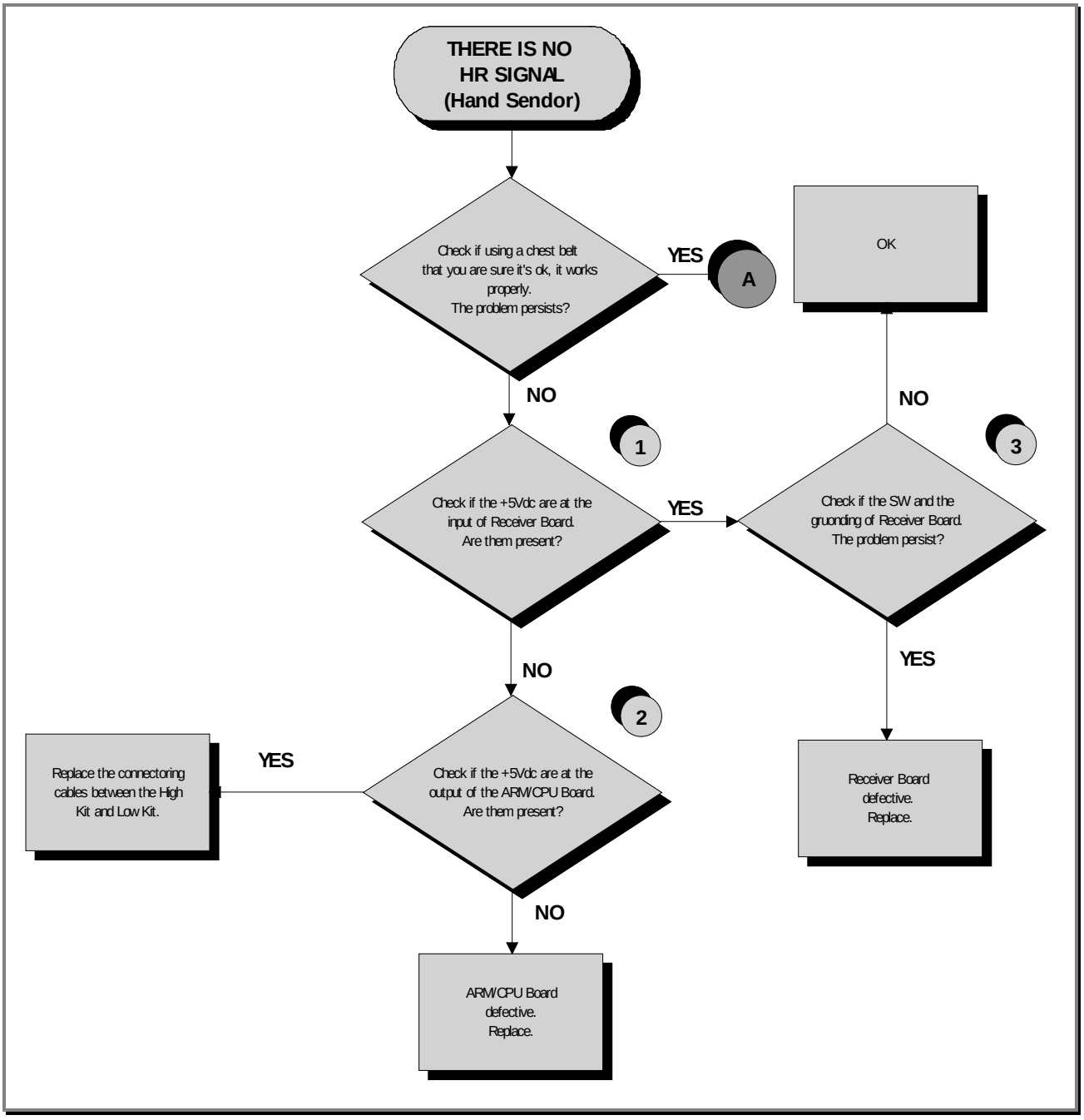

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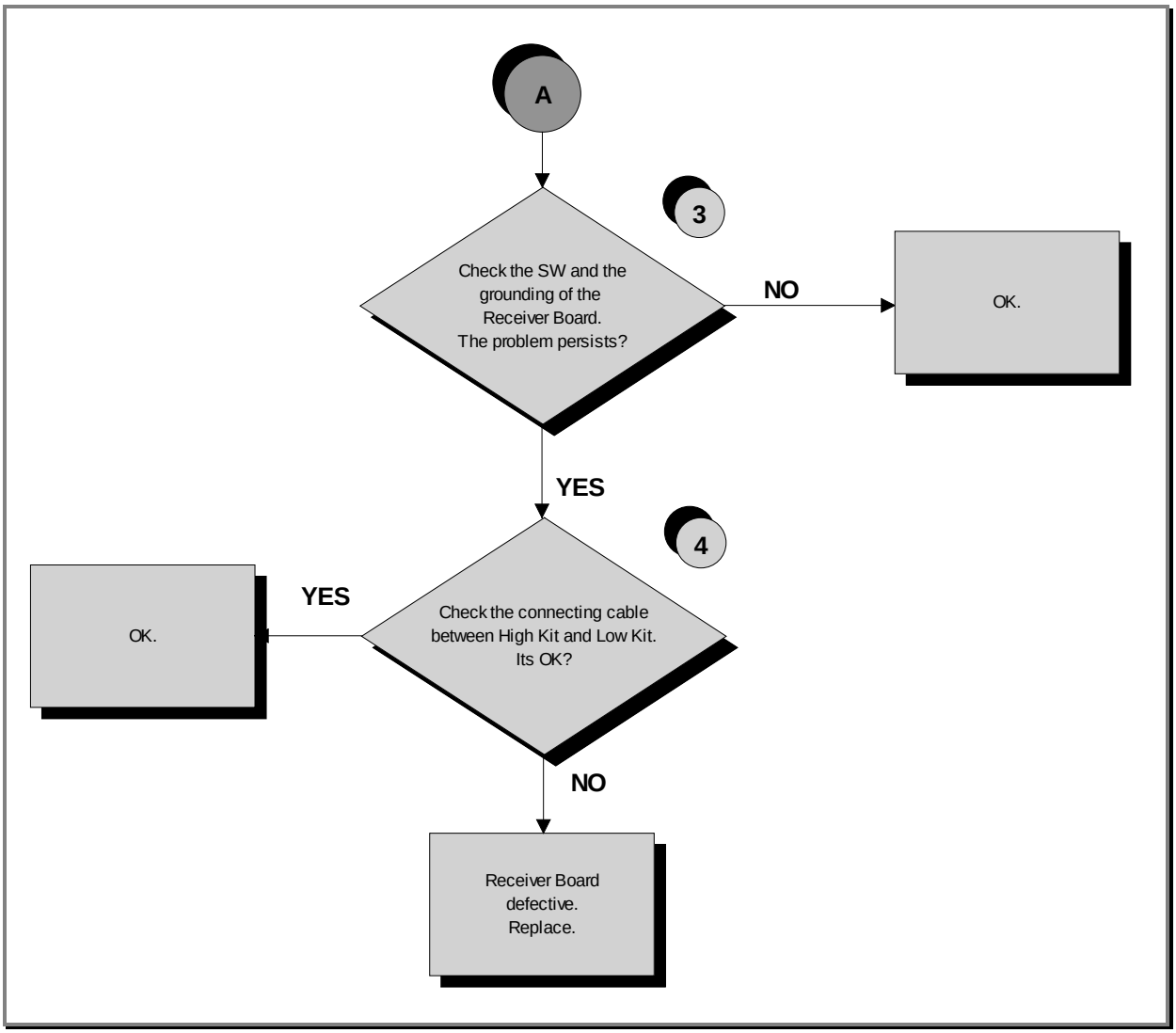

A
3
Check the SW and the grounding of the Receiver Board. The problem persists?
NO
OK.
YES
4
Check the connecting cable between High Kit and Low Kit. Its OK?
YES
OK.
NO
Receiver Board defective. Replace.

Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

(1) Place the tester probes across pins **1** and **2** on the connector **HD4** of receiver. The measured value should be +5Vdc.

(2) As for step **(1)** but across pins **1** and **5** of connector **CN10** (*ARM Board*) and on the **CN25** connector (*CPU Board*); of **CU244** cable.

(3) Check the correct display SW version, according to the "EXCITE SW SMART TABLE" you can find in **TG Direct** ,"NEWS" section.

Check the grounding of the **HR/HS Receiver Board**, measuring the resistance value between:

- *The fast-on on the **HR/HS Receiver Board** and the ground node on the power entry module;*
- *The ground node of the power entry module and the main wall socket.*

The measured value should be approximately lower than 1Ω (Ohm).
Check finally the grounding of the main wall socket, measuring that the following voltages are present:

P – N *(phase – neutral)* = 220Vac / 110Vac
P – G *(phase – ground)* = 220Vac / 110Vac
N – G *(neutral – ground)* = 0Vac

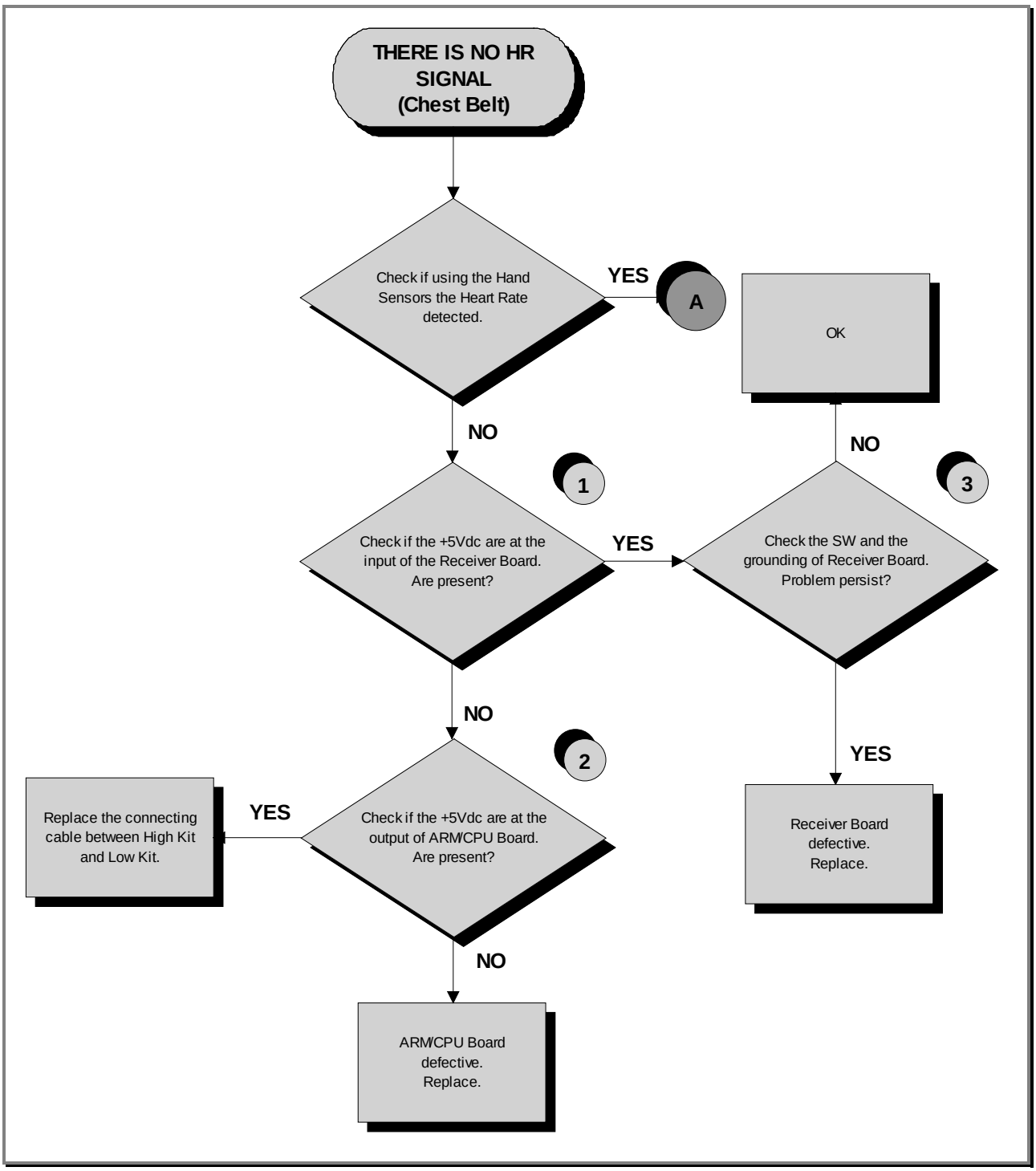
(4) Check that:

- *The fast on of the cable are well connected to the Hand Sensor plates;*
- *The continuity of the signal between the Hand Sensor plates and the relevant pin on HD3&2 connector of the receiver, referring to the paragraph: **2.10. "Cables";***
- *There is NO continuity between the HS plates and the ground fast on the receiver (otherwise the signals are grounded).*

6.16.2. HR/HS RECEIVER (CHEST BELT)

All models.

CORRECT USE OF THE CHEST BELT: Wear the chest belt take care the area of contact with the body is humid in order to guarantee it proper works.



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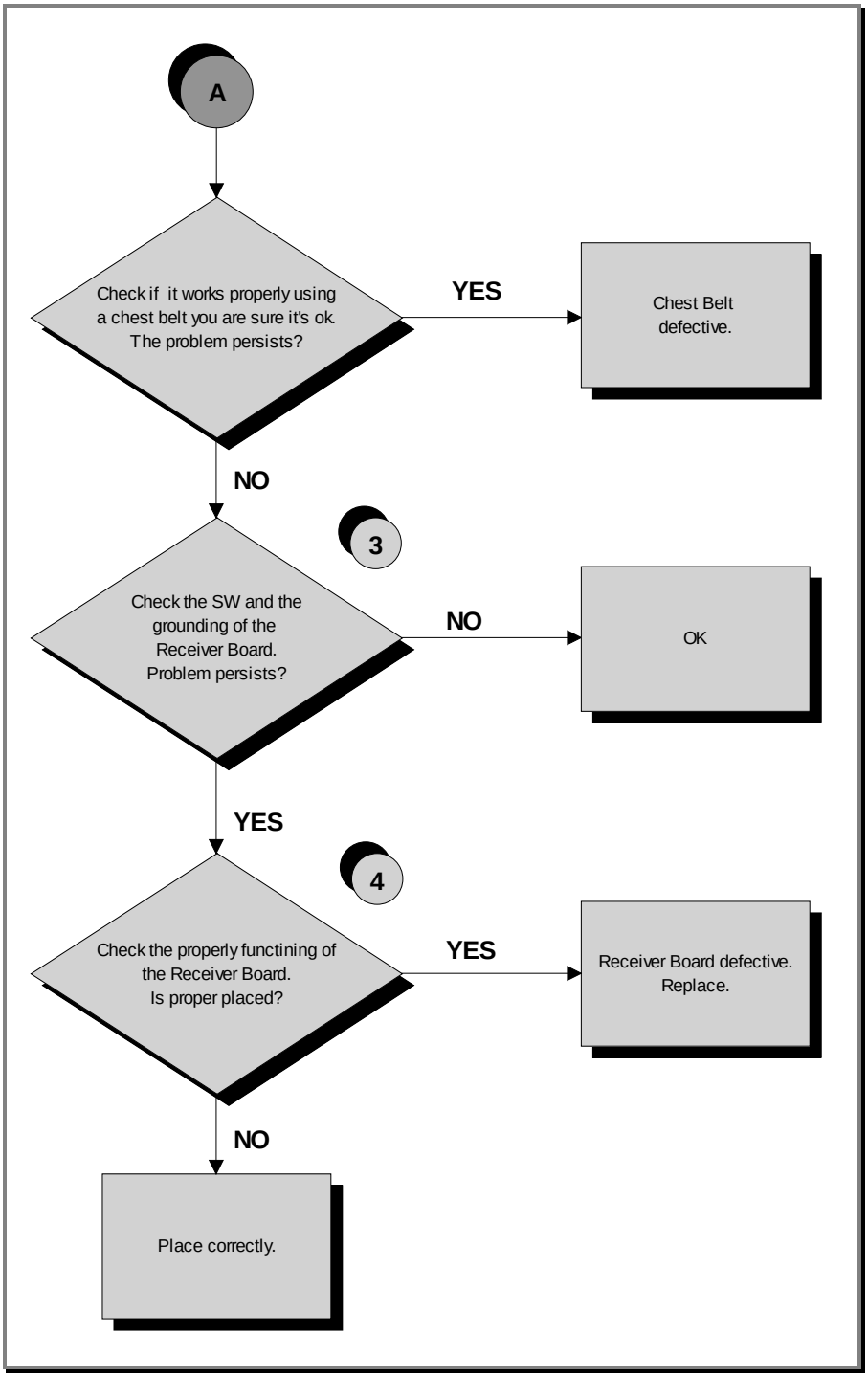

A
Check if it works properly using a chest belt you are sure it's ok. The problem persists?
YES
Chest Belt defective.
NO
3
Check the SW and the grounding of the Receiver Board. Problem persists?
NO
OK
YES
4
Check the properly functining of the Receiver Board. Is proper placed?
YES
Receiver Board defective. Replace.
NO
Place correctly.

Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

(1) Place the tester probes across pins **1** and **2** on the connector **HD4** of the receiver. The measured value should be +5Vdc.

(2) As at step **(1)** but on pins **1** e **5** on **CN9** connector (*ARM Board*) or on **CN31** connector (*CPU Board*); of the **CU135** cable**.**

(3) Check the correct display SW version, according to the "EXCITE SW SMART TABLE" you can find in **TG Direct** ,"NEWS" section.
Check the grounding of the **HR/HS Receiver Board**, measuring the resistance value between:

1. *The ground fast on of **HR/HS Receiver Board** and the ground node on the Power supply box of the machine;*
2. *The ground node of the power entry module and the main wall socket.*

The measured value should be approximately lower than 1Ω (Ohm).
Check finally the grounding of the main wall socket, measuring that the following voltages are present:

P – N *(phase – neutral)* = 220Vac / 110Vac
P – G *(phase – ground)* = 220Vac / 110Vac
N – G *(neutral – ground)* = 0Vac

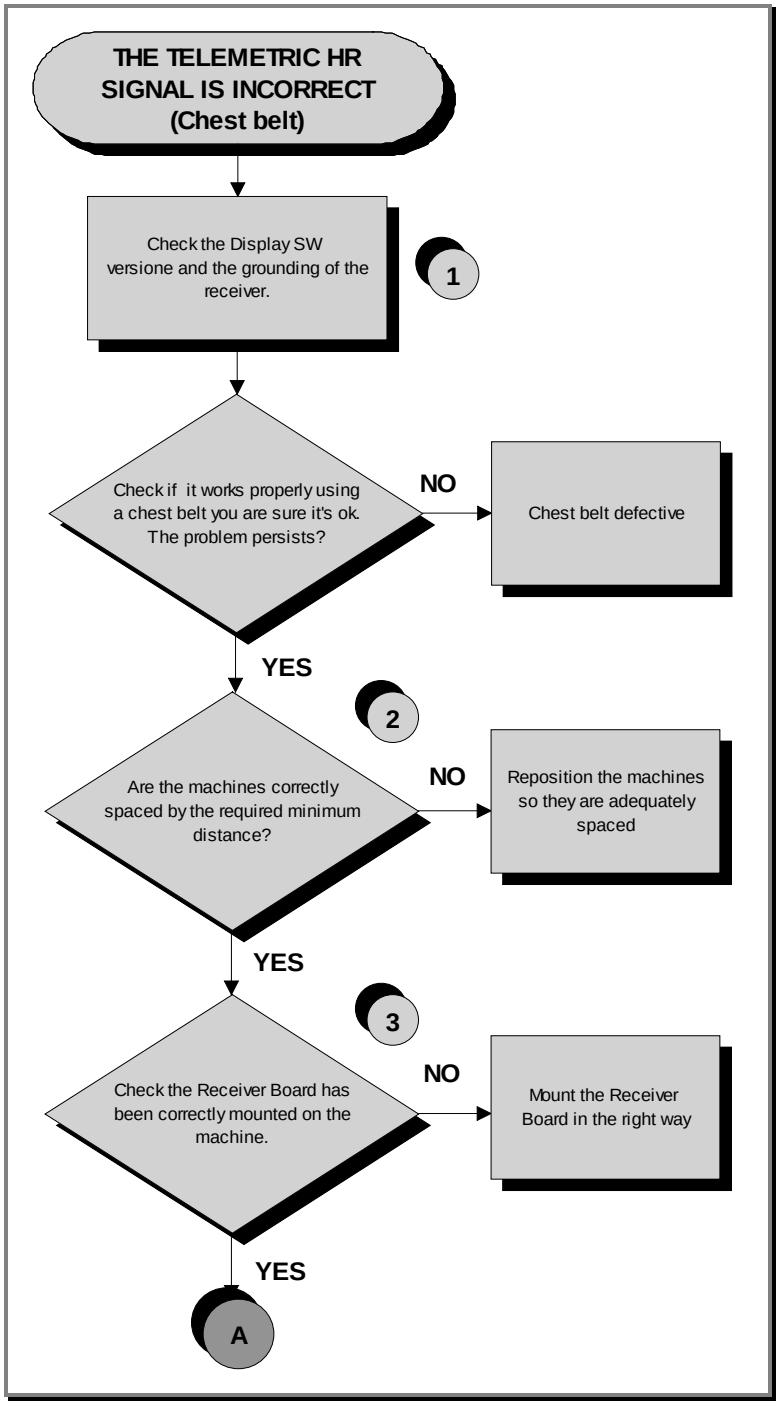
(4) Check if the receiver has been correctly mounted on the machine, as detail at paragraph: 7.6. "Disassembling the HS/HR cardio receiver".

If you replace CPU/ARM Board, check that its SW version is updated, otherwise install the last version.

6.17. THE TELEMETRIC HEART RATE SIGNAL IS INCORRECT

6.17.1. CHEST BELT

CORRECT USE OF THE CHEST BELT: Wear the chest belt take care the area of contact with the body is humid in order to guarantee it proper works.



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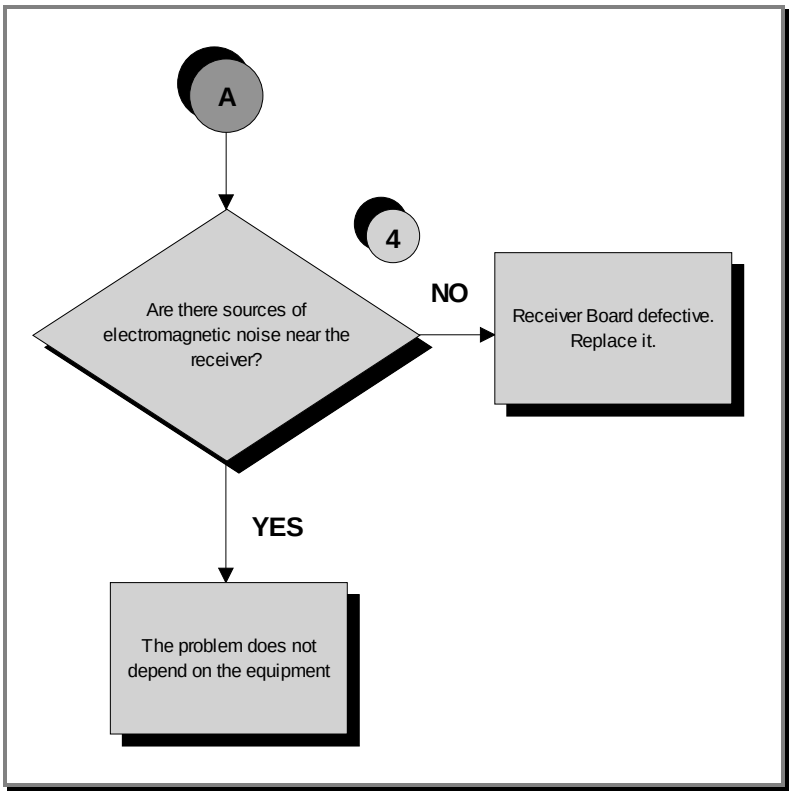


Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

(1) Check the correct display SW version, according to the "EXCITE SW SMART TABLE" you can find in **TG Direct** section.
Check the grounding of the **HR/HS Receiver Board**, measuring the resistance value between:

a. *The ground fast on of **HR/HS Receiver Board** and the ground node on the Power supply box of the machine;*
b. *The ground node on the Power supply box of the machine and the main wall socket.*

The measured value should be approximately lower than 1Ω (Ohm).
Check finally the grounding of the main wall socket, measuring that the following voltages are present:

P – N *(phase – neutral)* = 220Vac / 110 Vac
P – G *(phase – ground)* = 220Vac / 110 Vac
N – G *(neutral – ground)* = 0 Vac

Continued on following page....

(2) Take care of the following diagram to correctly position the machines:

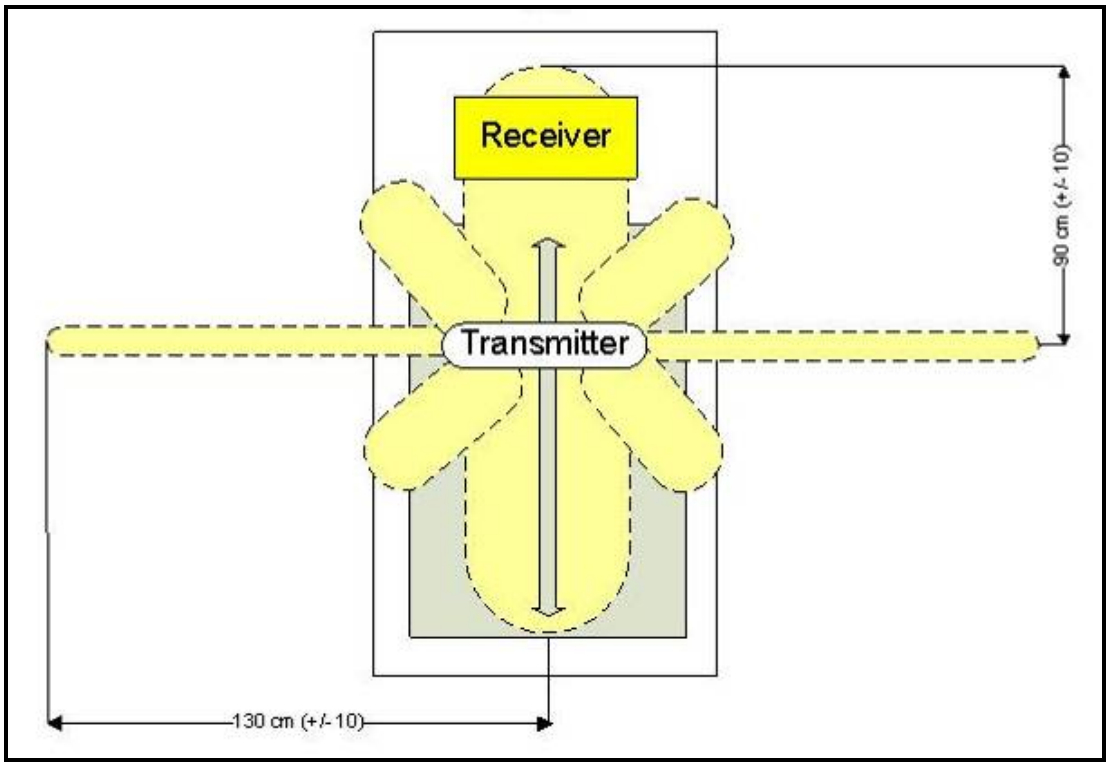


Figure 6-1

The active area of the transmitter is wider on the lateral side (130cm) instead of the front or the back side (90cm). Take care of the following diagram:

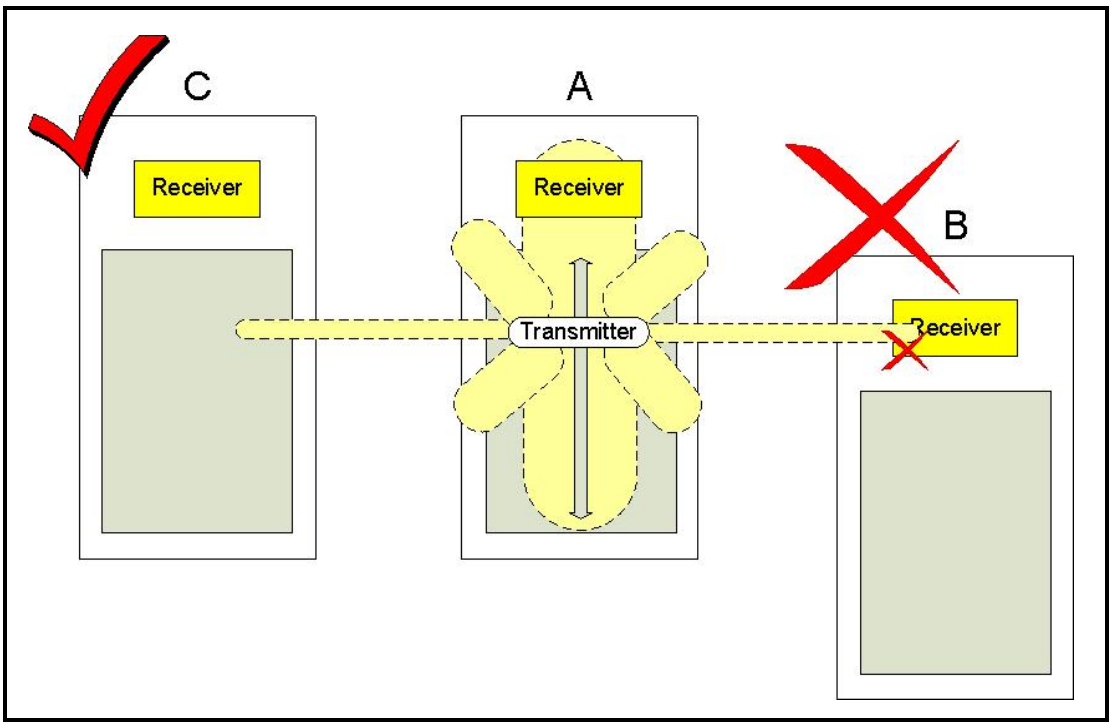
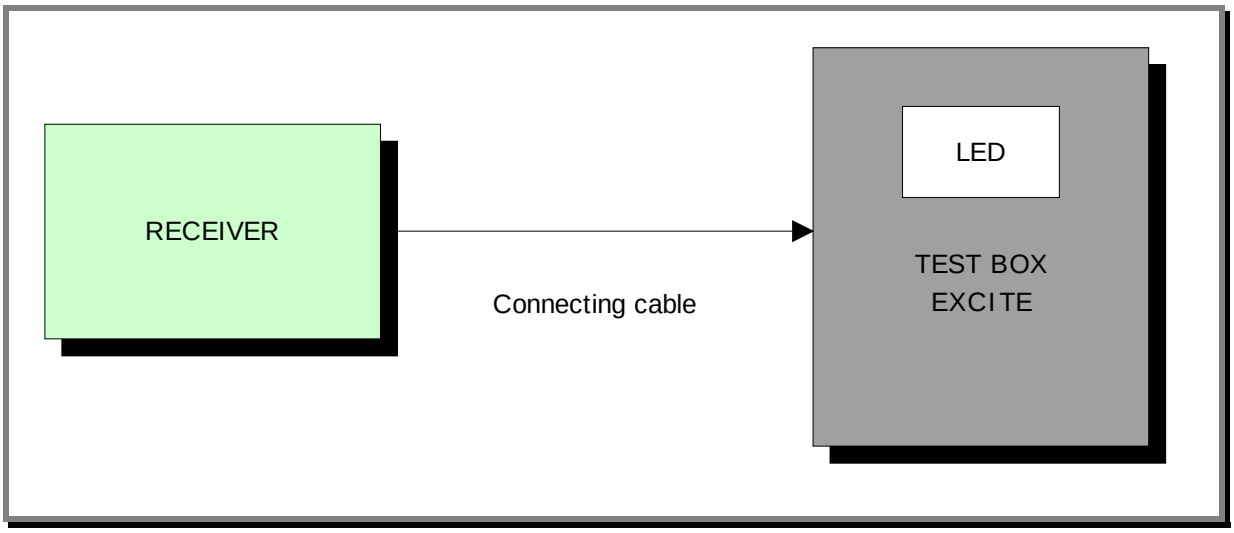


Figure 6-2

(3) Check if the receiver has been correctly mounted on the machine, as detail at paragraph: 7.6. “Disassembling the HS/HR cardio receiver (Chest Belt / Hand Sensor)”.

(4) To check for electromagnetic noise near the machine, use Test Box Excite as detailed here below. You can use one of the following cables **ELT-16** (0WC00518AB), **CBQ-28** (0WC00390AC) or **TRM-28** (0WC00336AC) as connection cable.



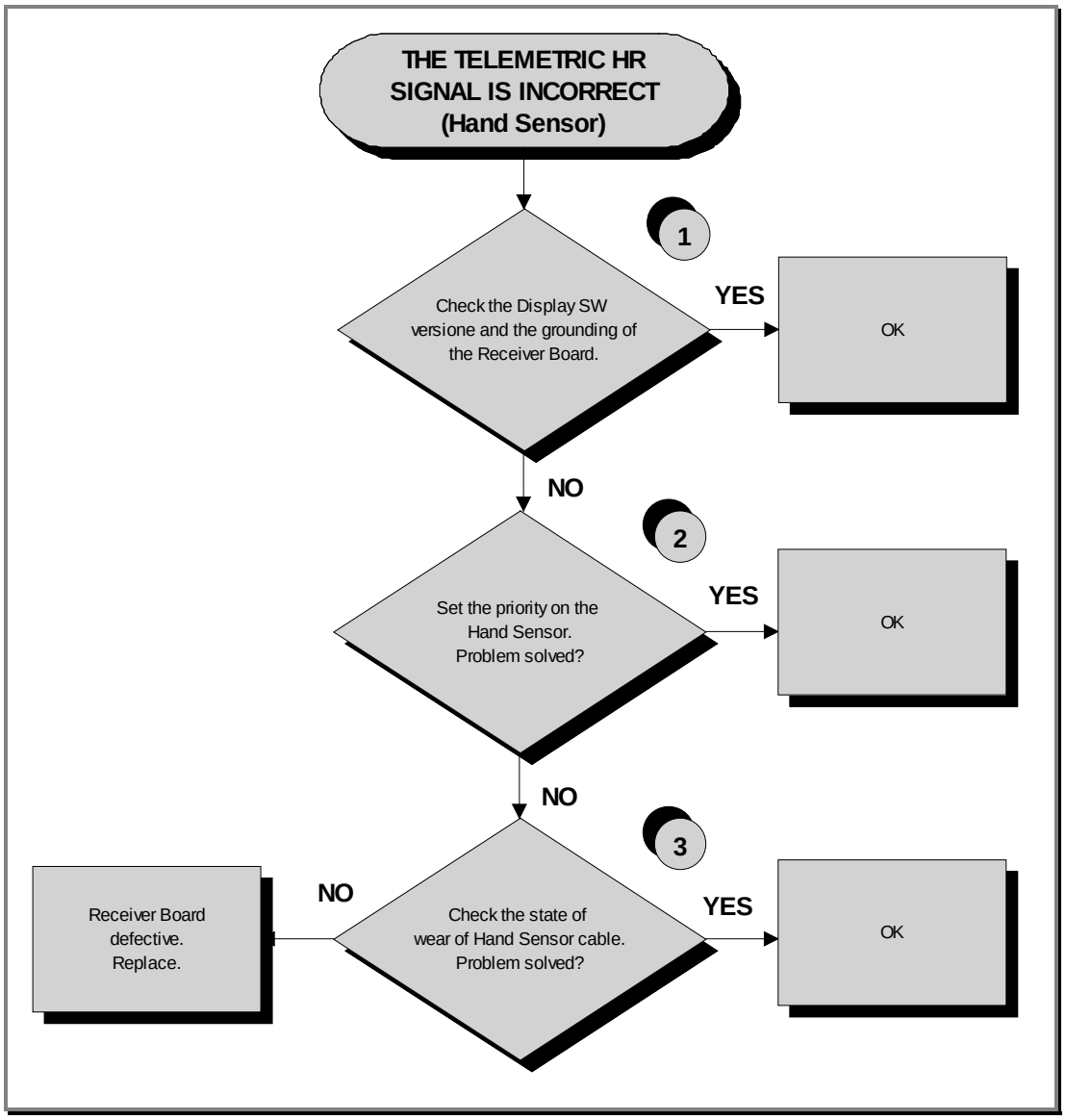
The circuit lights the LED for each heart beat and/or disturbance received: in this way it is possible to determine whether there is any interference, and identify its sources.

Do not keep the Test Box Excite too close to the display, to avoid the electric interference.

6.17.2. HAND SENSOR

HUMAN BODY "CONTINUITY": it's well known that for somebody it's very difficult, nearly impossible, to measure their HR using the hand sensors. This due to a lot of possible causes which could fake the "quality" of the contact between the human skin and the HS plates, as: hands only just washed or particularly dry, acidity of the skin and/or a particular body fat mass index. For these people it's suggested to wear the chest belt transmitter.

HS CORRECT USE: Grasp both the upper and lower plate avoiding clenching them too hardly. Avoid washing the hands using soaps that can dry the skin too much.



Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

(1) Check the correct display SW version, according to the "EXCITE SW SMART TABLE" you can find in **TG Direct** , section.
Check the grounding of the **HR/HS Receiver Board**, measuring the resistance value between:

*a. The ground fast on of **HR/HS Receiver Board** and the ground node on the Power supply box of the machine;*
b. The ground node on the Power entry module and the main wall socket.

The measured value should be approximately lower than 1Ω (Ohm).
Check finally the grounding of the main wall socket, measuring that the following voltages are present:

P – N *(phase – neutral)* = 220Vac / 110 Vac
P – G *(phase – ground)* = 220Vac / 110 Vac
N – G *(neutral – ground)* = 0 Vac

(2) Set the HR priority on the receiver board on "Hand Sensor", by positioning the jumper (**JP1**) on the receiver itself:

- ***JP1 CLOSED** = Chest strap priority*
- ***JP1 OPENED** = Hand Sensor priority*

The standard configuration of the receiver is with chest strap priority.

(3) Check that:

c. The fast on of the cable are well connected to the HS plates;
*d. The continuity of the signal between the Hand Sensor plates and the relevant pin on HD3&2 connectors of the Receiver, referring to the paragraph: **2.10. "Cables";***
a. There is NO continuity between the HS plates and the ground fast on the receiver (otherwise the signals are grounded).

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7. PART DISASSEMBLY

7.1. DISASSEMBLING THE DISPLAY

7.1.1. LED DISPLAY

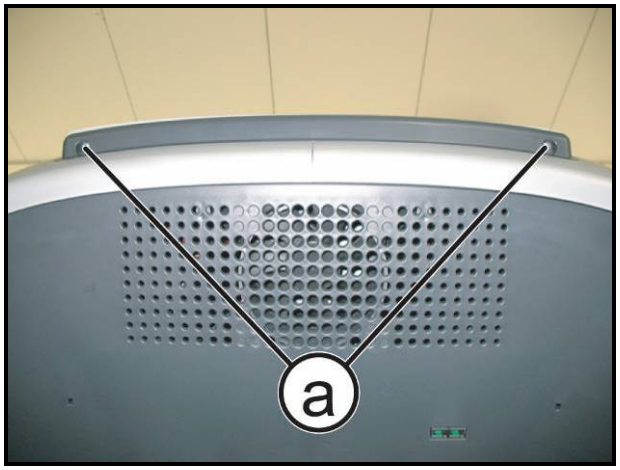

Figure 7-1

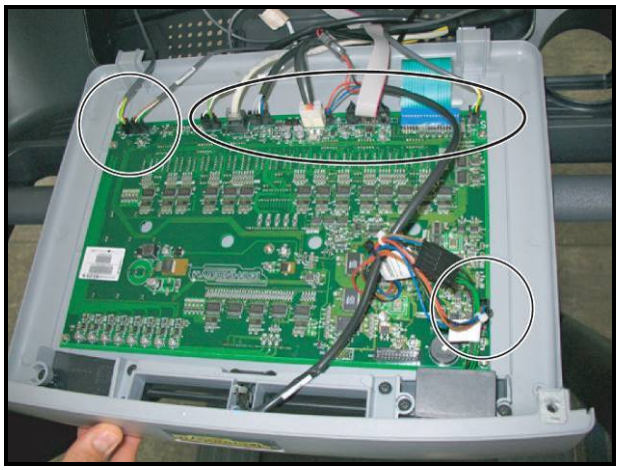

Figure 7-2

<u>Turn off the machine and unplug the mains lead from the wall outlet.</u>

1. Back off the 2 screws **(a)** using a 4mm hexagonal wrench.

2. Open the Display, support it as indicated in the picture.

3. Disconnect the connectors highlight in the figure at the side.

4. Remove the Display.

To reassembly the Display, follows the above steps in the reverse order.

7.1.2. VISIO DISPLAY

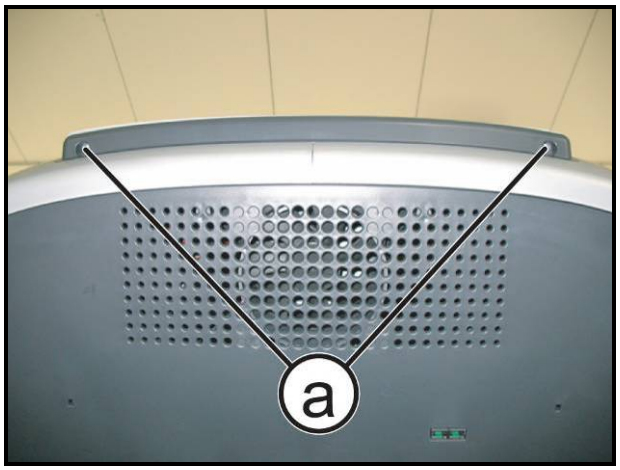

Figure 7-3

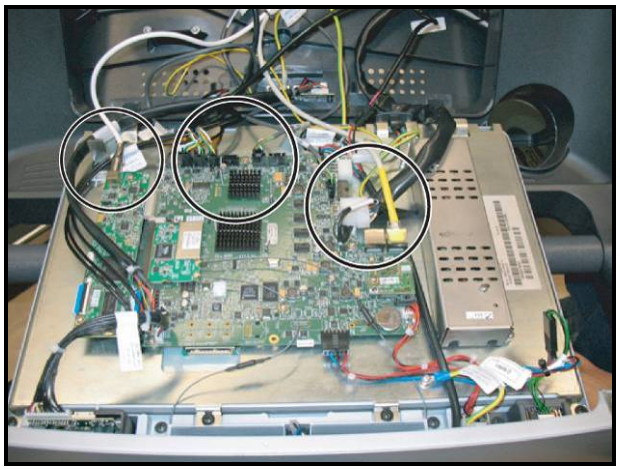

Figure 7-4

<u>Turn off the machine and unplug the mains lead from the wall outlet.</u>

1. Back off the 2 screws **(a)** using a 4mm hexagonal wrench.

2. Disconnect the connectors highlighted in the figure at the side.

3. Remove the Display.

To reassembly the Display, follows the above steps in the reverse order.

7.2. DISASSEMBLING BOARDS AND COMPONENTS

7.2.1. LED DISPLAY (ARM BOARD)

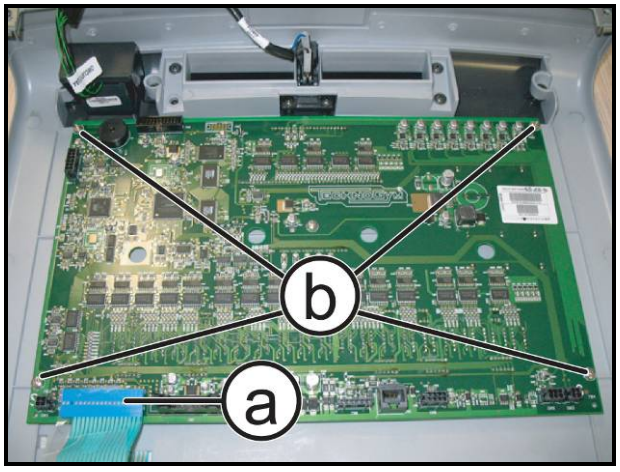

Figure 7-5

Carry out the procedure described in paragraph: 7.1.1. "LED Display".

Place the Display on a work bench:

1. Disconnect the connector **(a)**.
2. Back off the 4 screws **(b)** using a medium Phillips screwdriver.
3. Remove the ARM Board.

To reassembly the ARM Board, follows the above steps in the reverse order.

After the reassembling of the Board, remember to fix the keyboard connector (a) using a drop of hot glue.

7.2.2. VISIO 19" DISPLAY

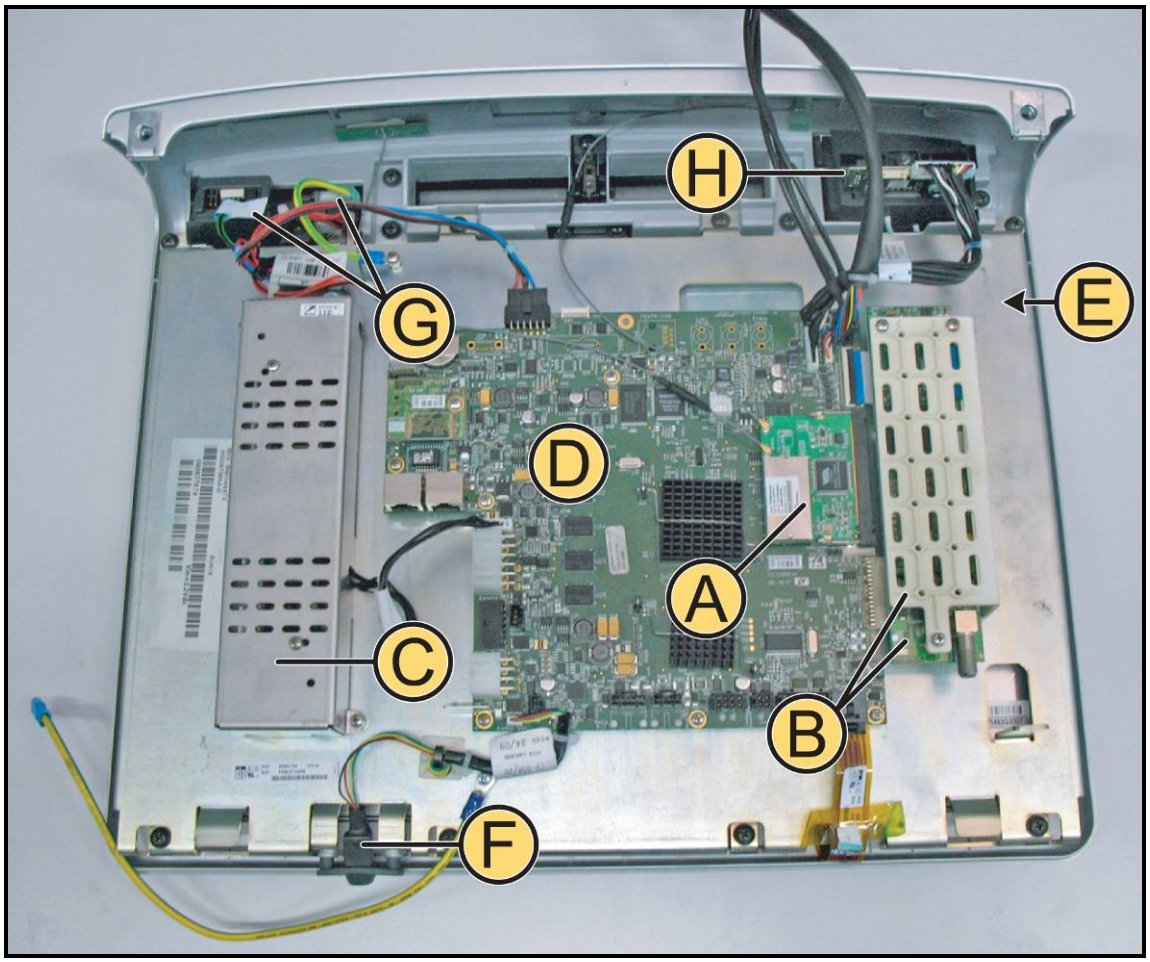

Figure 7-6

Carry out the procedure described in paragraph: 7.1.2. "VISIO Display".

Place the display on a work bench.

It is now possible to remove the following components:

- *Wireless Board **(A)**;*
- *TUNER Board**(B)**;*
- *LCD Inverter **(C)**;*
- *CPU Board **(D);***
- *LCD + Touch Screen **(E)**;*
- *Headphone Jack **(F)**;*
- *Dual TGS Reader + USB port **(G)**;*
- *iPod Docking Station **(H)**;*
- *Ventilation duct frontal plug;*
- *TGS + USB frontal plug.*

7.2.2.1. Wireless board (A)

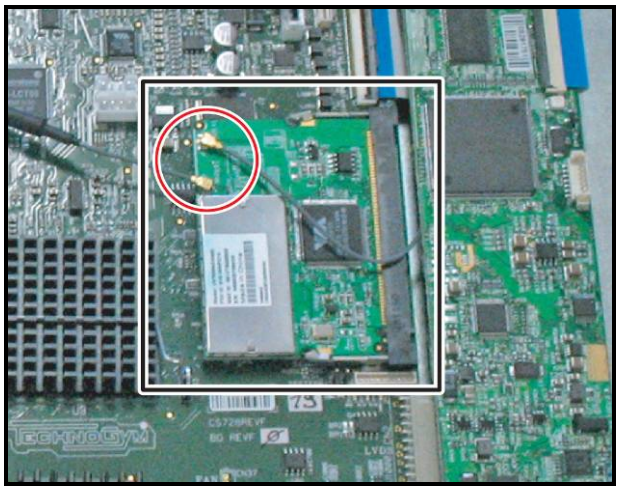

Figure 7.2-7

1. Unplug the 2 antenna connectors of the wireless board, highlighted in the figure.

CAUTION: Pay particular attention to the wireless antenna cables and connectors, because extremely sensitive, moreover in case of disassembly, it is important to follow the cable routing as shown in Figure 7.2-10.

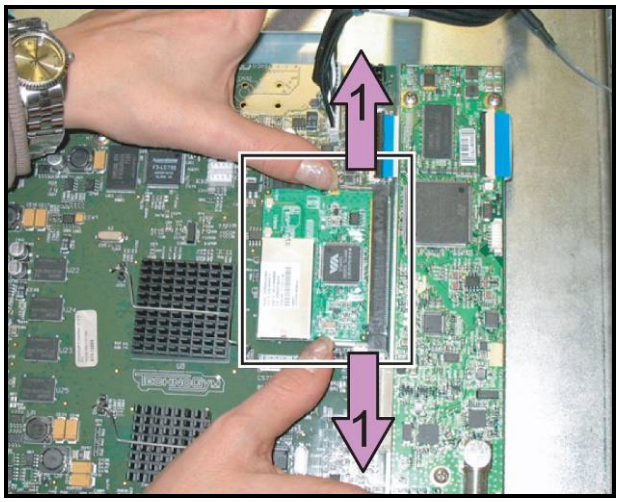

Figure 7.2-8

2. Push simultaneously the 2 side tabs outward, in the direction of the purple arrows **(1)**. The Wireless Board will automatically lift up

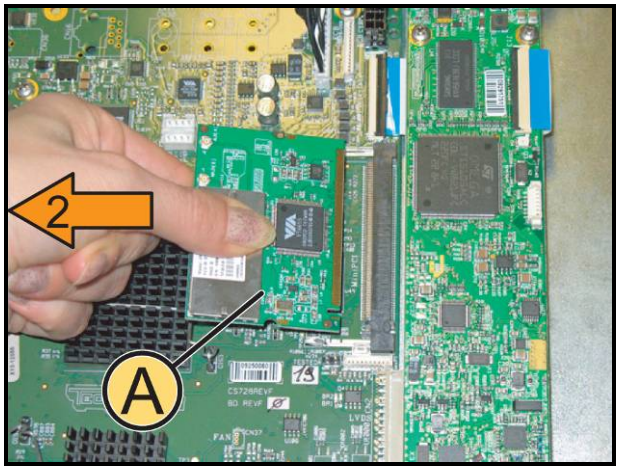

Figure 7.2-9

3. Remove the Wireless Board **(A)** in the direction of the orange arrow **(2)**, as shown in the figure at the side.

CAUTION: During the reassembly, mount the antennas of Figure 7.2-7 on Wireless Board and after the Board in its housing; so not press on the CPU circuits.

To reassemble the Wireless Board, follows the above steps in the reverse order.

To reassemble the antenna cables (X) and (Y), follow the routing shown below.

The Dissipater (Z) is only on the ATSC and ISDB-T version.

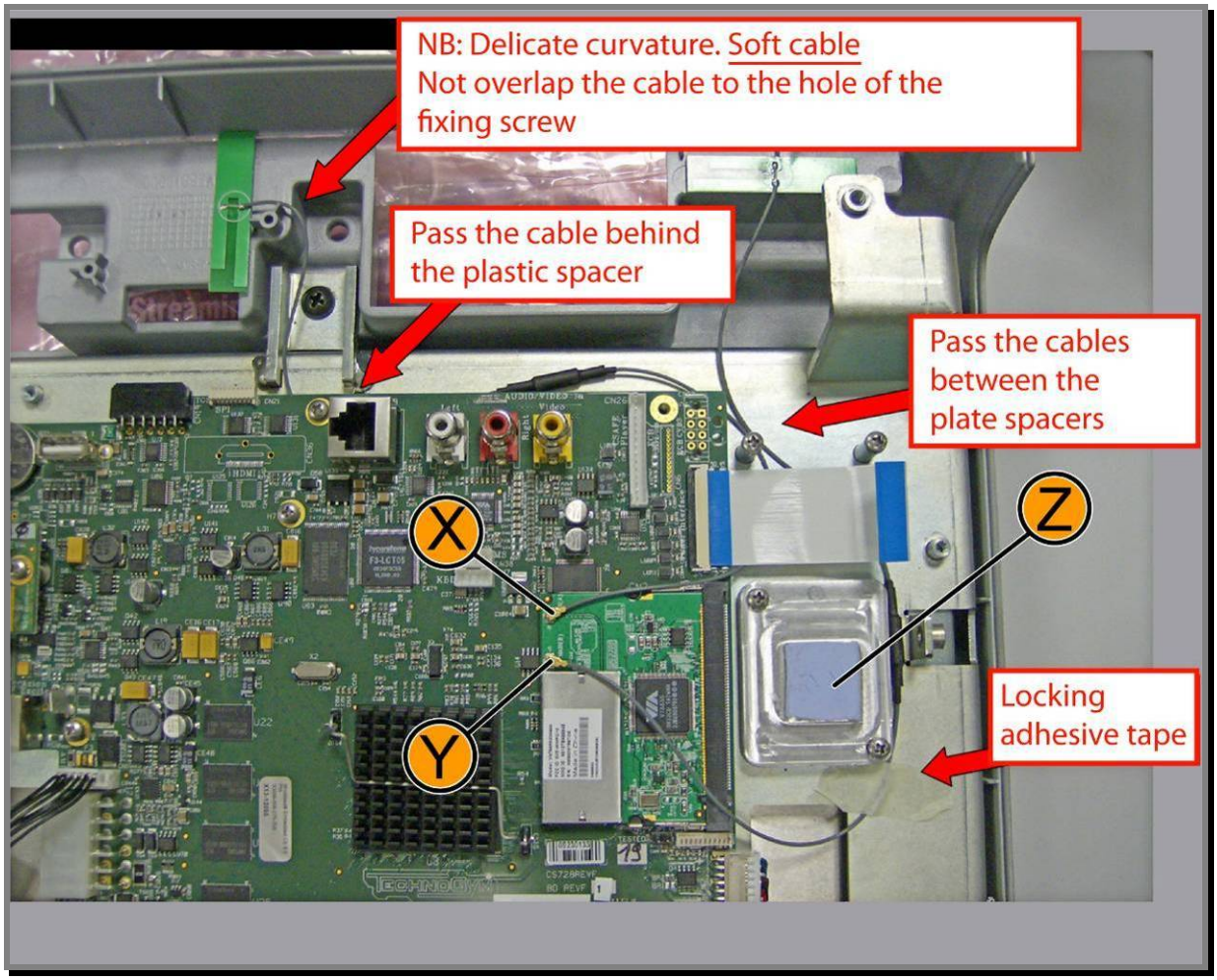

Figure 7.2-10

7.2.2.2. DVB-T Tuner Board (B)

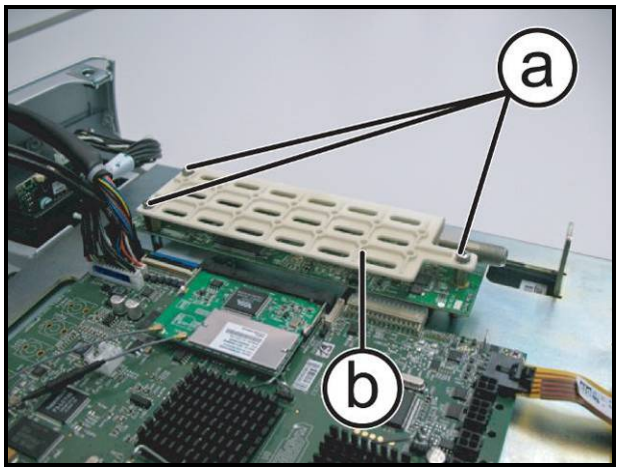

Figure 7-11

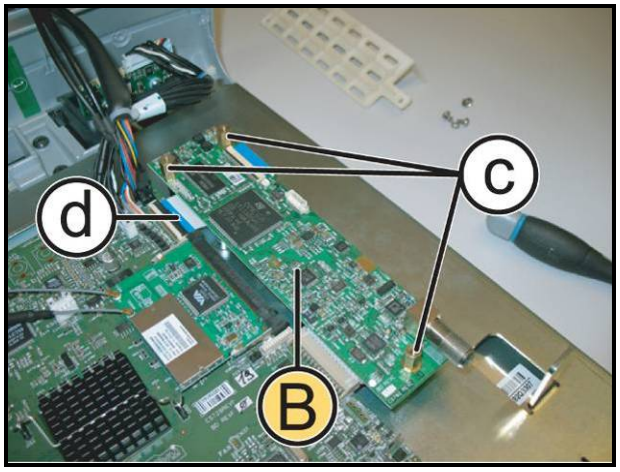

Figure 7-12

1. Back off the 3 screws **(a)** using a medium Phillips screwdriver.
2. Remove the Tuner board protection guard **(b)**.
3. Back off the 3 hex spacers **(c)**.
4. Lift up the black tab and disconnect the flat cable **(d)**.
5. Remove the Tuner Board **(B)**.

To reassembly the Tuner Board, follows the above steps in the reverse order.

7.2.2.3. Tuner board ATSC (B1) and ISDB-T (B2)

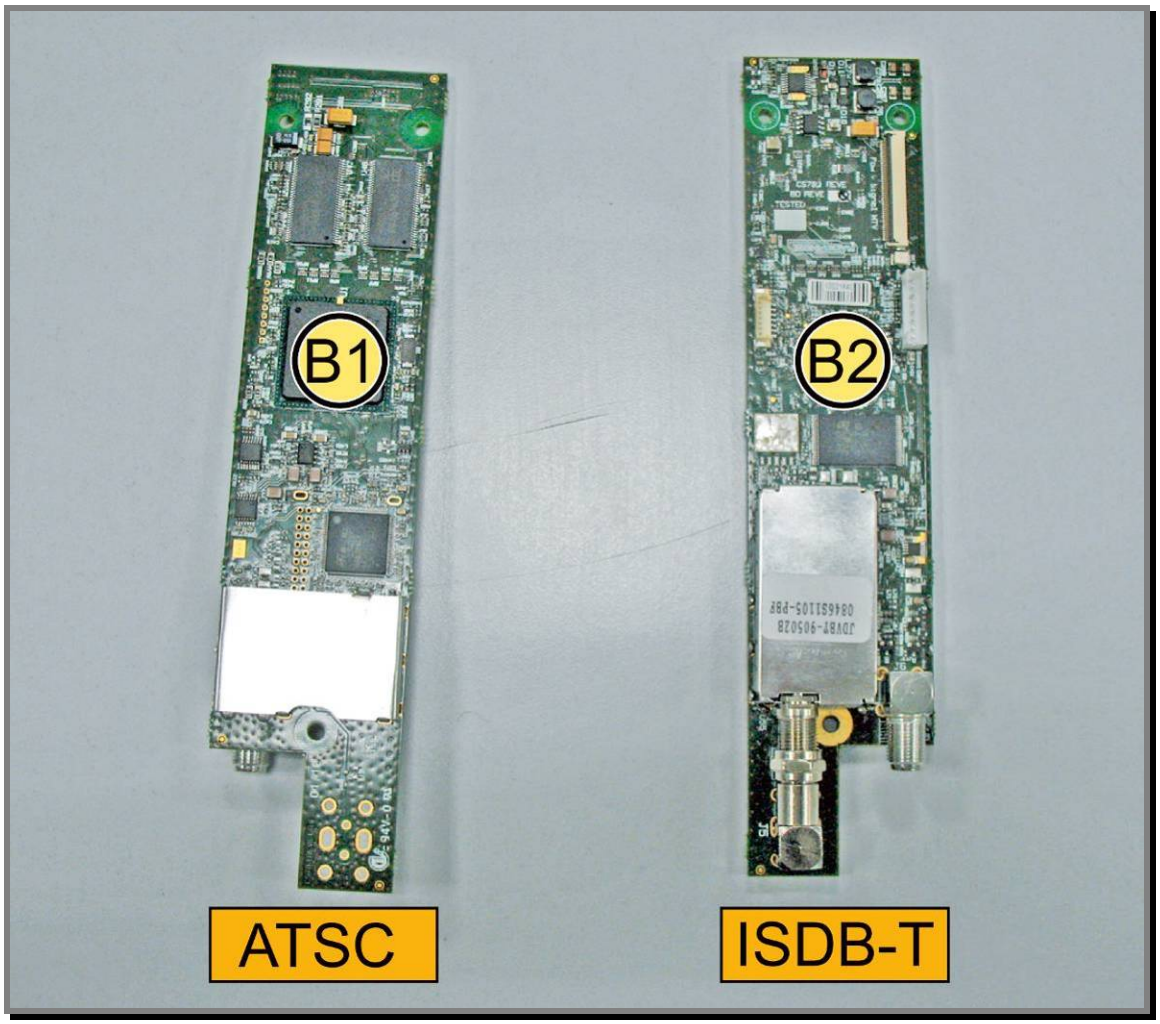

Figure 7.2-13

*Carry out the procedure described in paragraph: 7.2.2.2 "DVB-T Tuner Board (B)" at step **(4)**.*

1. Remove the Tuner board ver. ATSC **(B1)**, or ver. ISDB-T **(B2)**.

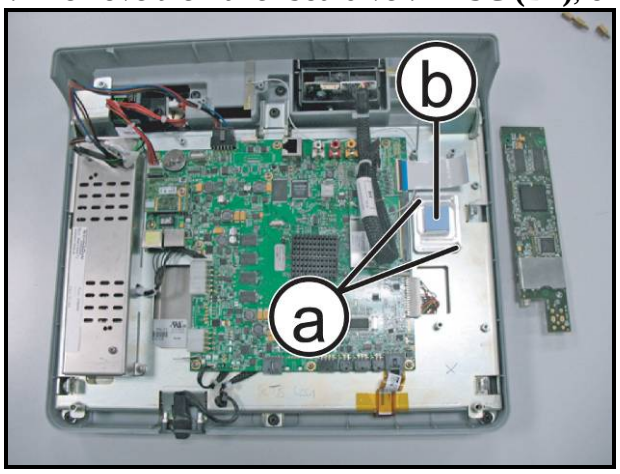

Figure 7.2-14

2. Back off the 2 screws **(a)**, using a medium Phillips Screwdriver.
3. Remove the dissipater **(b)**.

To reassemble the Tuner Boards, follows the above steps in the reverse order.

7.2.2.4. LCD Inverter (C)

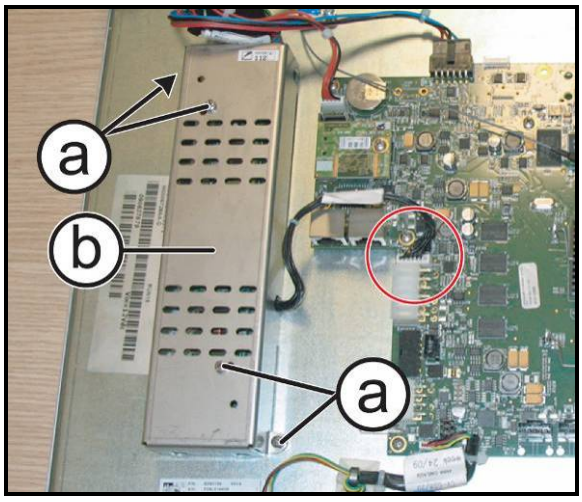

Figure 7-15

1. Disconnect the connector highlighted in the figure from the CPU.
2. Back off the 4 screws **(a)** using a medium Phillips screwdriver.
3. Remove the inverter guard **(b)**.

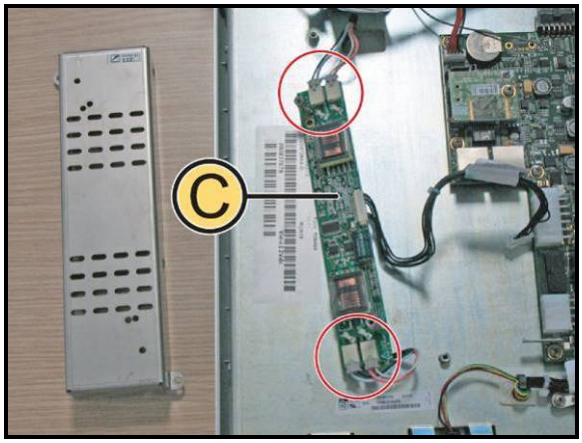

Figure 7-16

4. Unplug the 4 connectors highlighted in the figure.
5. Remove the Inverter Board **(C)**.

To reassembly the Inverter Board, follows the above steps in the reverse order.

7.2.2.5. CPU Board (D)

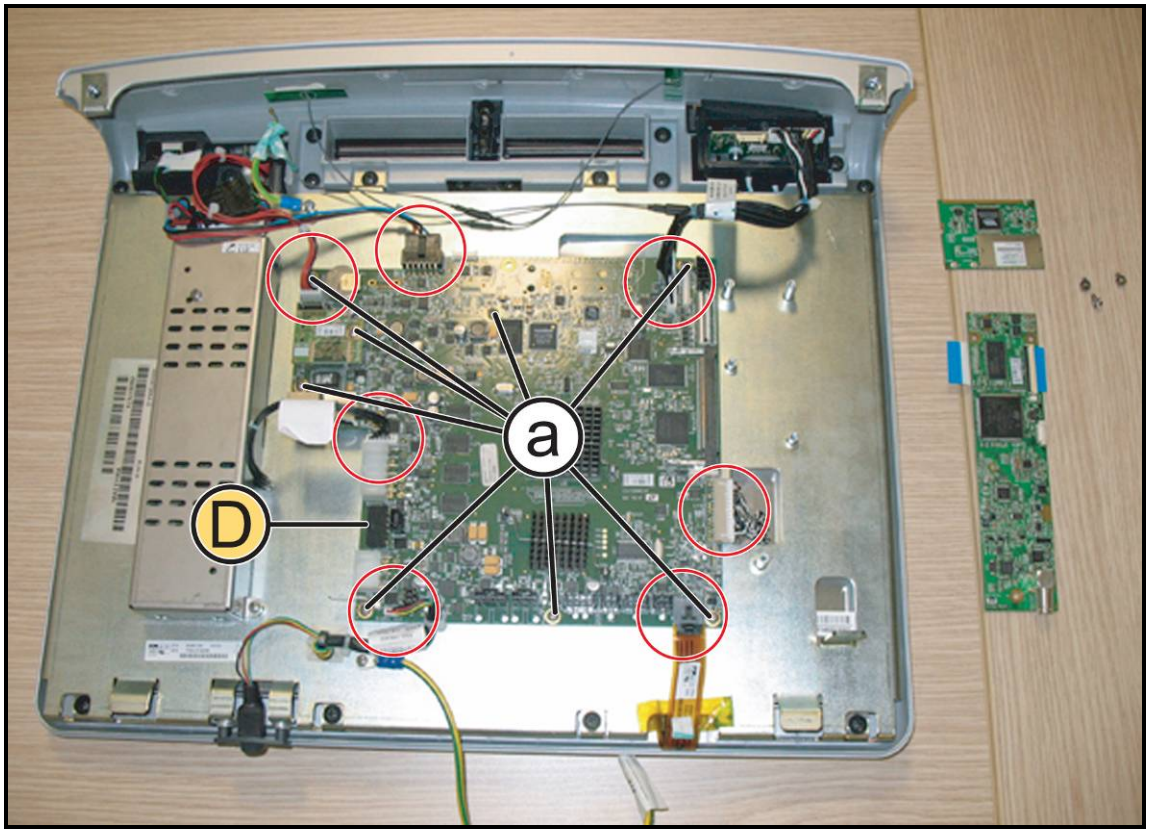

Figure 7-17

Carry out the procedure described in paragraph: 7.2.2.1 "Wireless board (A)" and 7.2.2.2 "DVB-T Tuner Board (B)*".*

1. Disconnect the connectors highlighted in the figure.
2. Back off the 8 screws **(a)** using a medium Phillips screwdriver.
3. Remove the CPU Board **(D)**.

To reassembly the CPU Board,
follows the above steps in the reverse order.

7.2.2.6. LCD (E) + Touch Screen

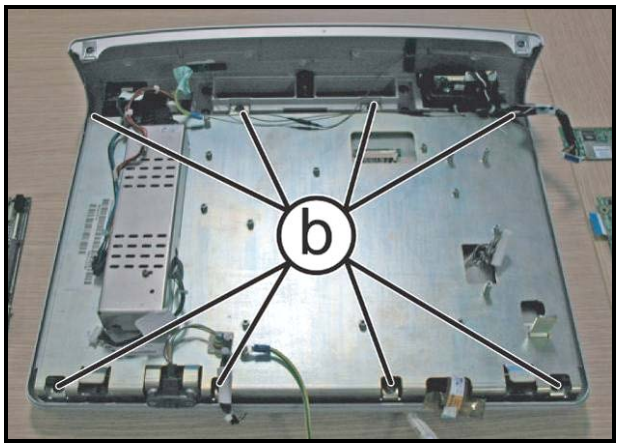

Figure 7-18

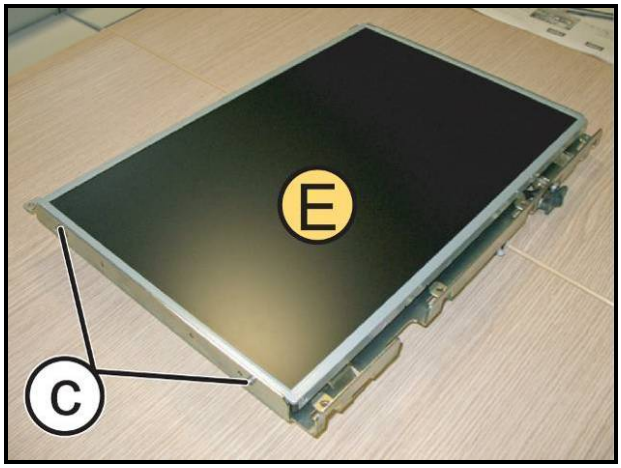

Figure 7-19

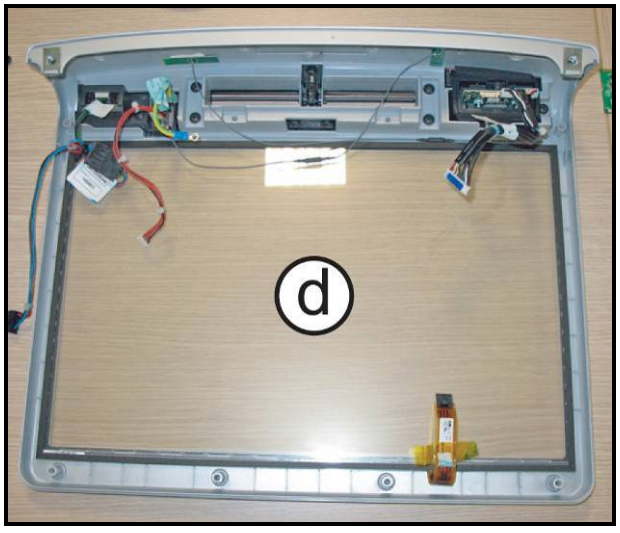

Figure 7-20

*Carry out the procedure described in paragraph: 7.2.2.4 "*LCD Inverter (C)*" e 7.2.2.5 "CPU Board (D)".*

1. Back off the 6 screws **(b)** using a medium Phillips screwdriver.
2. Remove the LCD group.
3. Carefully overturn the LCD group.
4. Back off the 2 screws **(c)** on both sides, using a medium Phillips screwdriver.
5. Remove the LCD **(E)** from its support plate.
6. Carefully remove the Touch Screen **(d)** and replace if it is necessary.

To reassembly the LCD and Touch Screen, follows the above steps in the reverse order.

7.2.2.7. Headphone Jack (F)

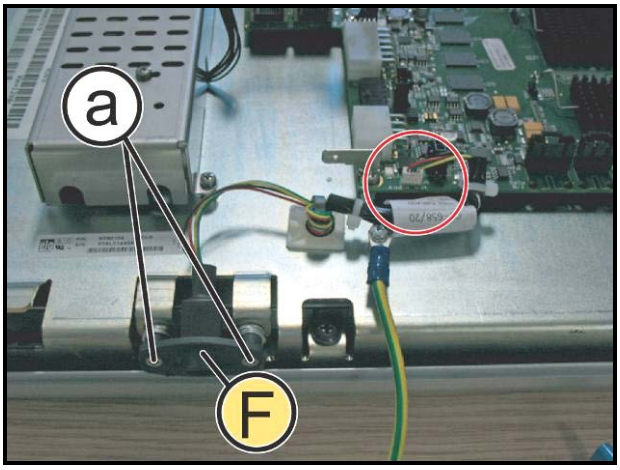

Figure 7-21

1. Unplug the connector highlighted in the figure.
2. Back off the 2 screws **(a)** using a small Phillips screwdriver.
3. Remove the Headphone Jack **(F).**

To reassembly the Headphone Jack, follows the above steps in the reverse order.

7.2.2.8. Dual TGS Reader + USB port (G)

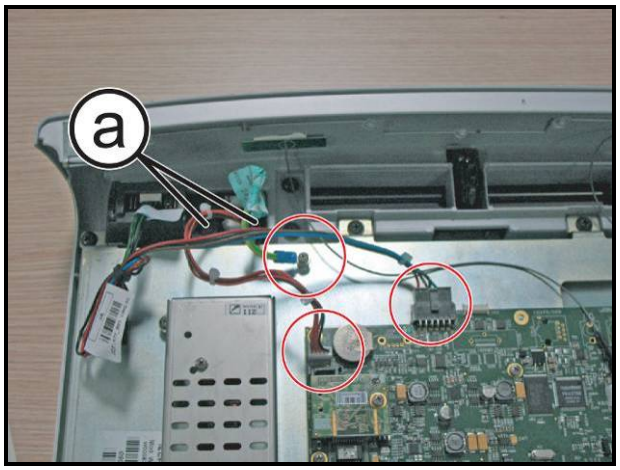

Figure 7-22

1. Unplug the cables highlighted in the figure.
2. Back off the 2 screws **(a)** using a medium Phillips screwdriver.

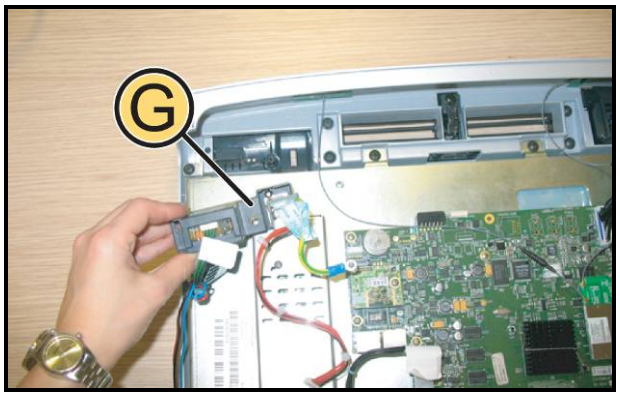

Figure 7-23

3. Remove the TGS group and the USB port, as shown in the figure at the side.

To reassembly the Dual TGS Reader and the USB port, follows the above steps in the reverse order.

7.2.2.9. iPod Docking Station (H)

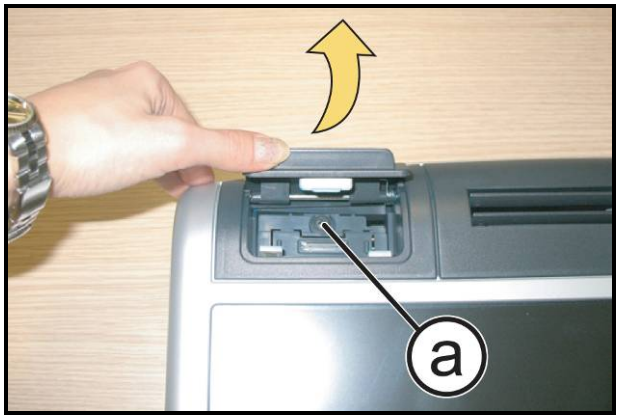

Figure 7-24

1. Lift the Docking Station covering cap up and back off the screw **(a)** using a medium Phillips screwdriver..

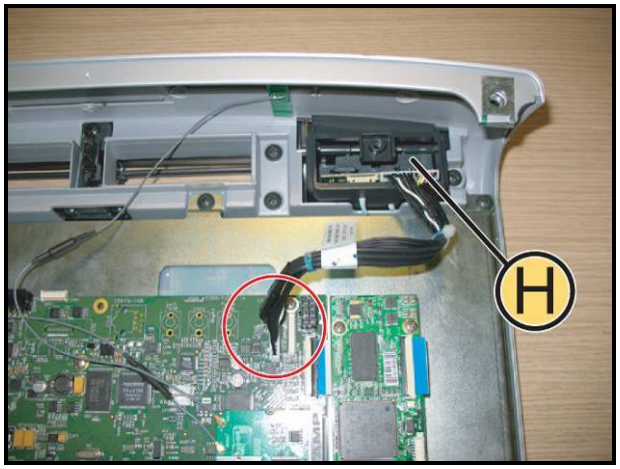

Figure 7-25

2. Unplug the cable highlighted in the figure at the side and remove the iPod Docking Station **(H)**.

To reassembly the iPod docking station, follows the above steps in the reverse order..

7.2.2.10. Ventilation duct frontal plug

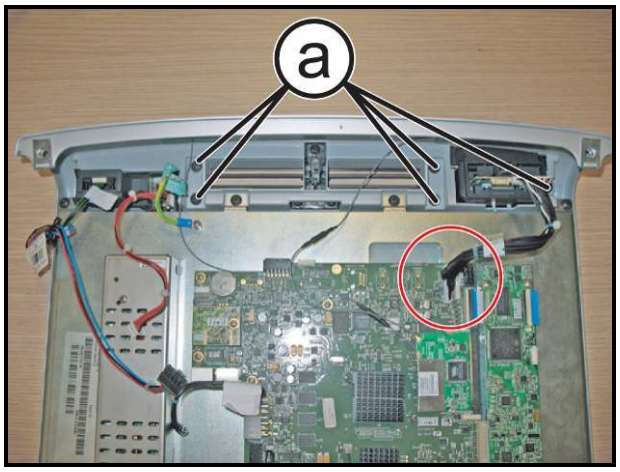

Figure 7-26

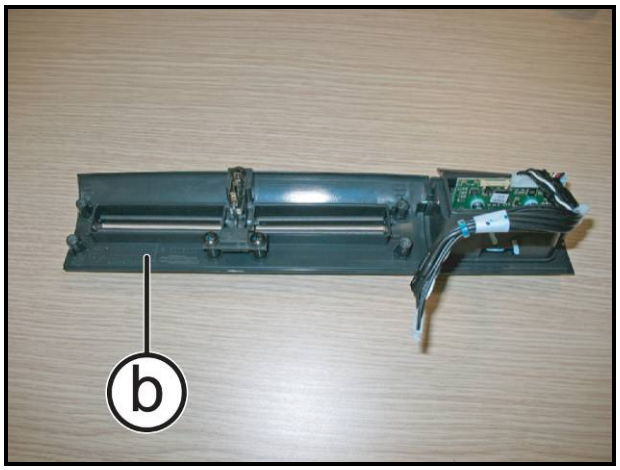

Figure 7-27

1. Back off the 5 screws **(a)** using a medium Phillips screwdriver.

2. Remove the ventilation duct group **(b)**.

To reassembly the ventilation duct frontal plug, follows the above steps in the reverse order.

7.2.2.11. TGS + USB frontal plug

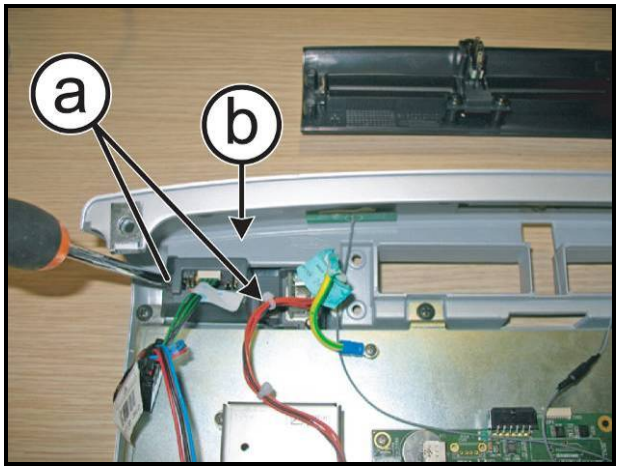

Figure 7-28

1. Back off the 2 screws **(a)** using a medium Phillips screwdriver.
2. Remove the TGS+USB group **(b)** from the front side.

To reassembly the TGS and USB frontal plug, follows the above steps in the reverse order.

7.3. AUDIO / VIDEO EXTERNAL CONNECTORS BOARD

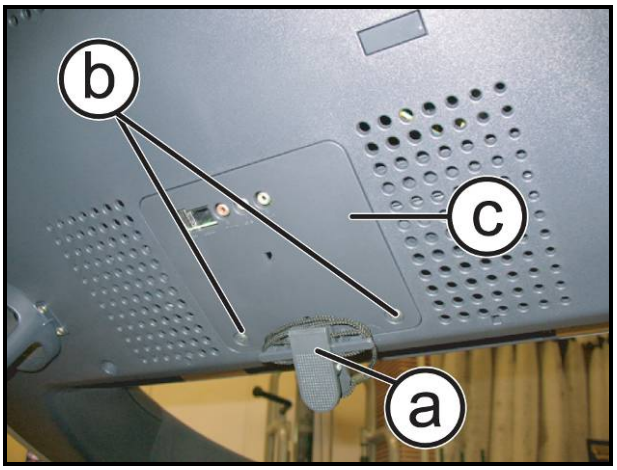

Figure 7-29

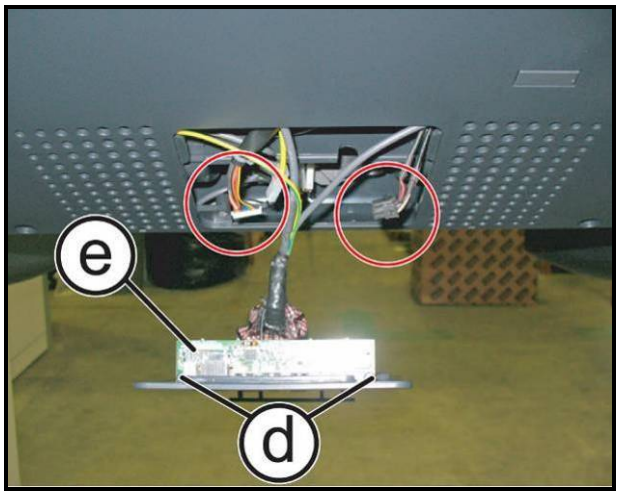

Figure 7-30

1. Release the emergency cable **(a)** from its housing.
2. Back off the 2 screws **(b)** using a medium Phillips screwdriver.
3. Remove the inspection plug **(c)**.
4. Disconnect the connectors highlighted in the figure.
5. Back off the 2 screws **(d)** using a medium Phillips screwdriver.
6. Remove the Connectors Board **(e).**

To reassembly the Connectors Board, follows the above steps in the reverse order.

7.4. DISASSEMBLING THE KEYBOARD / TOUCH SCREEN

7.4.1. LED KEYBOARD

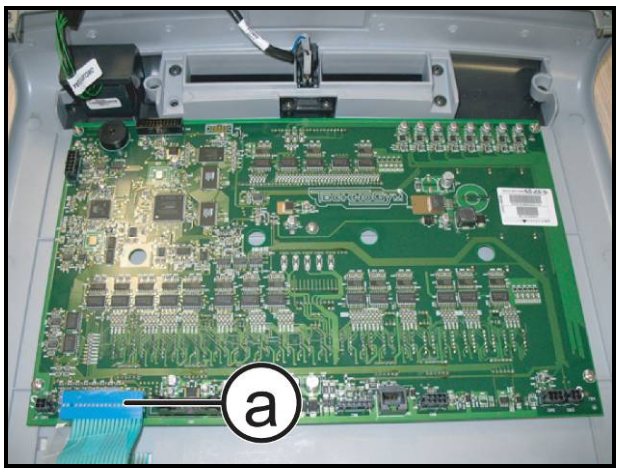

Figure 7-31

Carry out the procedure described in paragraph: 7.1. "Disassembling the display".

Place the display assembly on a work bench:

1. Unplug the connector **(a)**.

After the reassembling of the board, remember to fix the keyboard connector using a drop of hot glue.

500LED

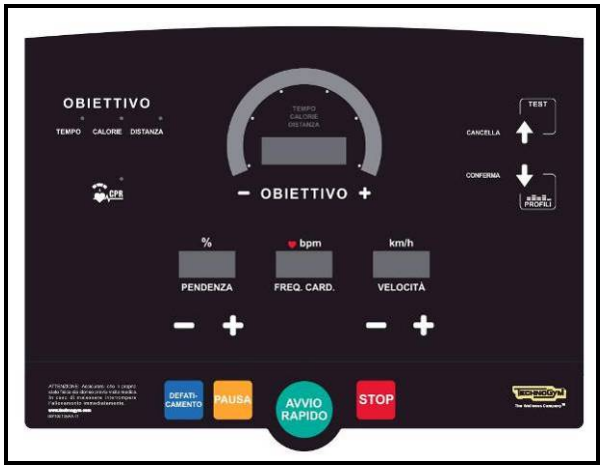

Figure 7-32

700LED and 900LED

Figure 7-33

2. Use a sharp tool to lift up and detach a corner of the keyboard then remove the keyboard.

To assemble a new keyboard:

1. Remove the backing film which protects the adhesive.
2. Insert the connector in the special slot on the display and connect it to the ARM Board.
3. Apply the adhesive part, starting from the left and working toward the right, without bending the keyboard.
4. Remove the protective film.

Continued on following page…→

The keyboard assembly procedure can only be carried out once, because disassembly damages the tracks and keys.

When reassembling the keyboard, make sure that none of the keys are bent or remain pushed in.

After reassembly the Display, check the proper functioning of new keyboard, as described at the paragraph: 6.1.2.1 “Man. Keyboard Test”.

7.4.2. VISIO TOUCH SCREEN

For the Touch Screen disassembly, refer to the Display Board disassembling procedure described at the paragraph: 7.2.2. “VISIO 19””.

7.5. DISASSEMBLING THE EMERGENCY BUTTON

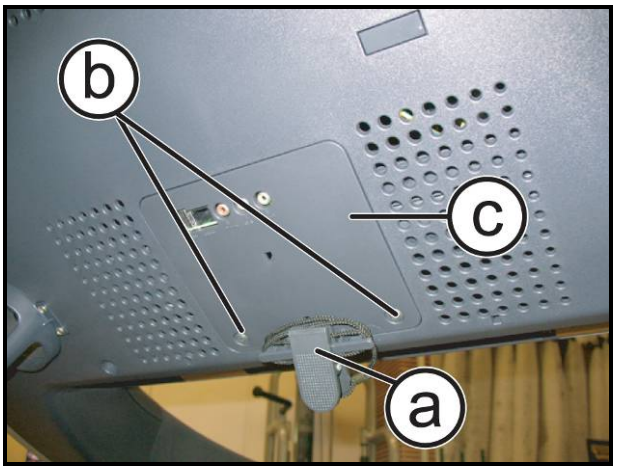

Figure 7-34

1. Release the emergency cable **(a)** from its housing.
2. Back off the 2 screws **(b)** using a medium Phillips screwdriver.
3. Remove the inspection plug **(c)**.

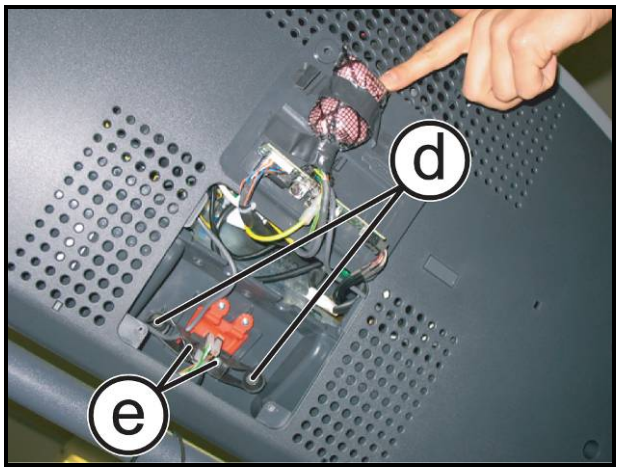

Figure 7-35

4. Back off the 2 screws **(d)** using a medium Phillips screwdriver.
5. Back off the 2 screws **(e)** using a small Phillips screwdriver.
6. Remove the emergency button.

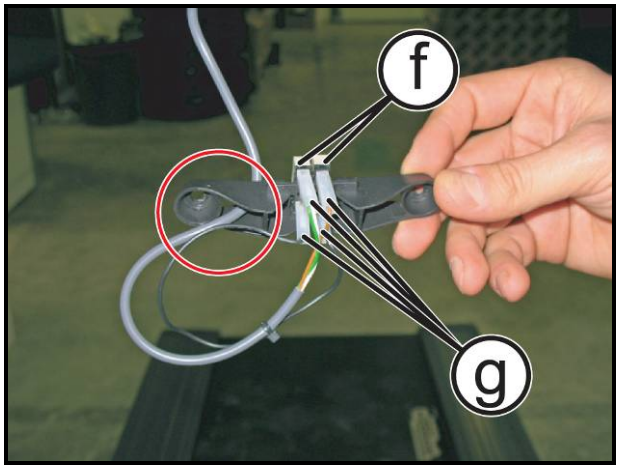

Figure 7-36

7. Now it's possible to act on the micro switch **(f)** or on the faston **(g)**.

During the reassembly, respect the cables routing, as shown in the figure.

To reassemble the Emergency Button, carry out the above steps in reverse order.

7.6. DISASSEMBLING THE HS/HR CARDIO RECEIVER (CHEST BELT / HAND SENSOR)

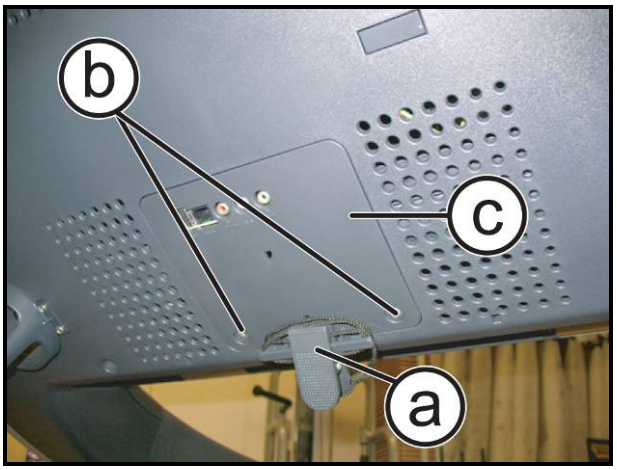

Figure 7-37

1. Release the emergency cable **(a)** from its housing.
2. Back off the 2 screws **(b)** using a medium Phillips screwdriver.
3. Remove the inspection plug **(c)**.

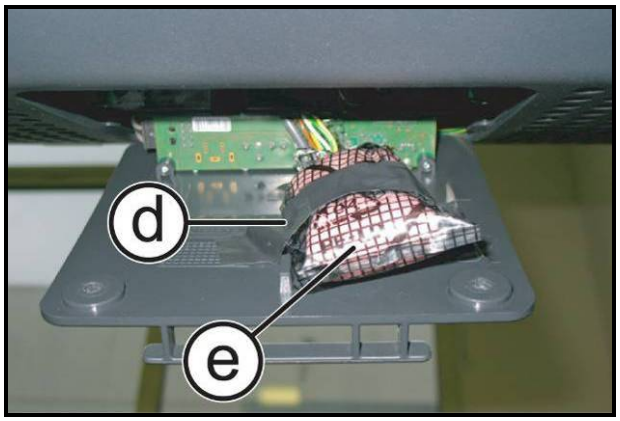

Figure 7-38

4. Remove the adhesive tape (or the cable tie) **(d)** and the nylon bag **(e)**.
5. Remove the sponge **(f)**.
6. Unplug the connector and the fast-on, highlighted in the figure.

To reassemble the HS/HR Receiver, carry out the above steps in reverse order.

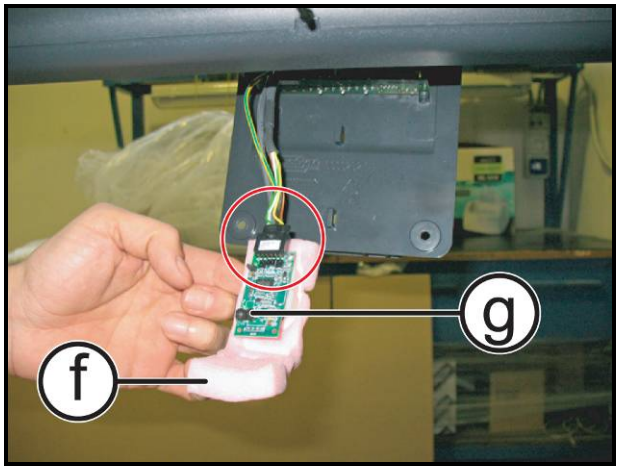

Figure 7-39

CAUTION: During the reassembly: place the coil (g), <u>upwards</u> oriented and <u>toward</u> the user.

CAUTION: During the reassembly: fold the sponge on the Board: carefully and without pressing.

7.7. DISASSEMBLING THE FAN

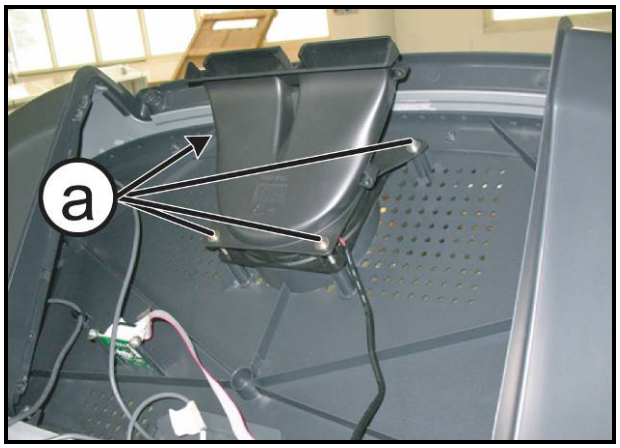

Figure 7-40

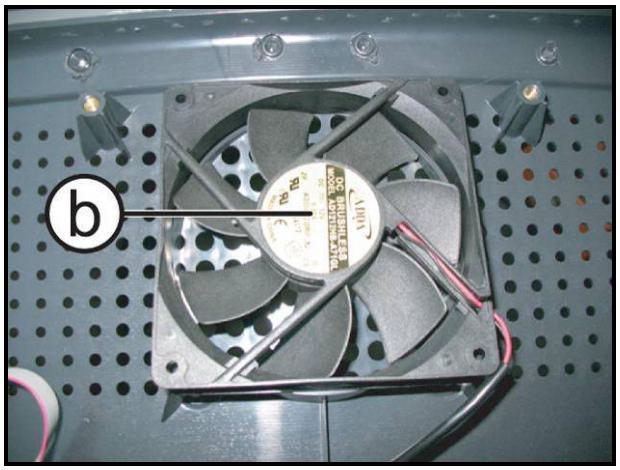

Figure 7-41

Carry out the procedure described in paragraph: 7.1. "Disassembling the display".

1. Back off the 4 screws **(a)** using a 3mm hexagonal wrench.
2. Remove the fan guard.
3. Remove the fan from its fixing housing.

To reassemble the Fan,
carry out the above steps in reverse order so.

7.8. DISASSEMBLING THE HAND SENSOR

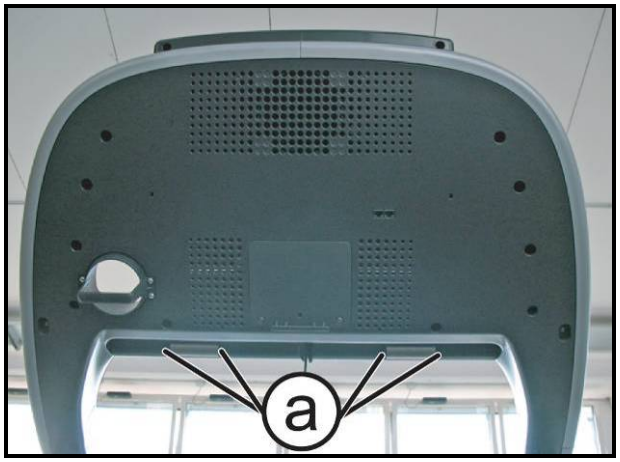

Figure 7-42

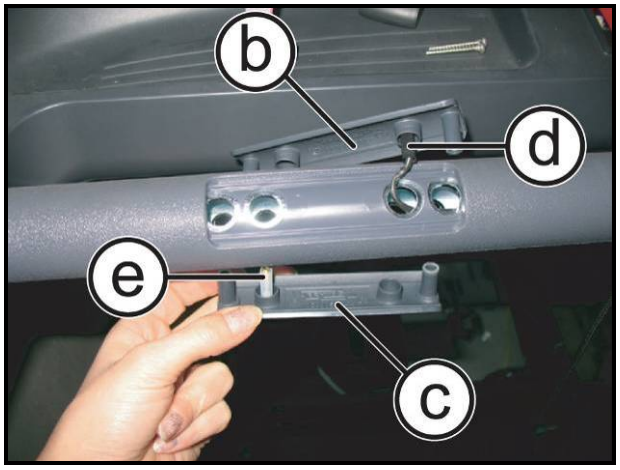

Figure 7-43

Turn off the machine and unplug the mains lead from the wall outlet.

For each sensor:

1. Back off the 2 screws **(a)** using a small Phillips screwdriver.

2. Remove the upper sensor **(b)** and the lower one **(c)** from the handlebar. Unplug the 2 faston **(d)** and **(e)**.

3. Remove the 2 sensors.

During the reassembly: be careful to not press the cables with the two guides highlighted in the figure on the side.

To reassemble the sensors, carry out the above steps in reverse order.

7.9. DISASSEMBLING THE LATERAL HANDLEBAR

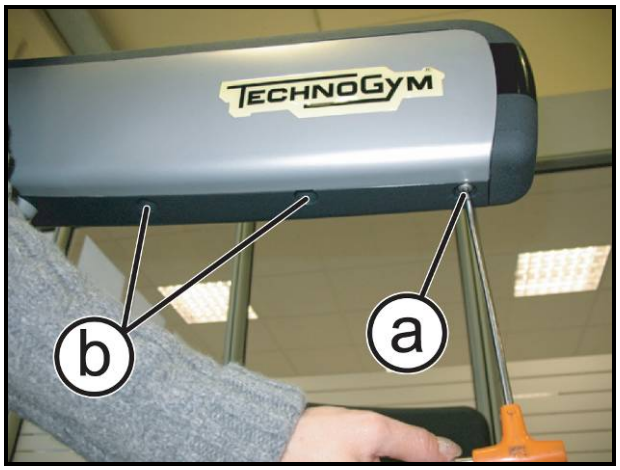

Figure 7-44

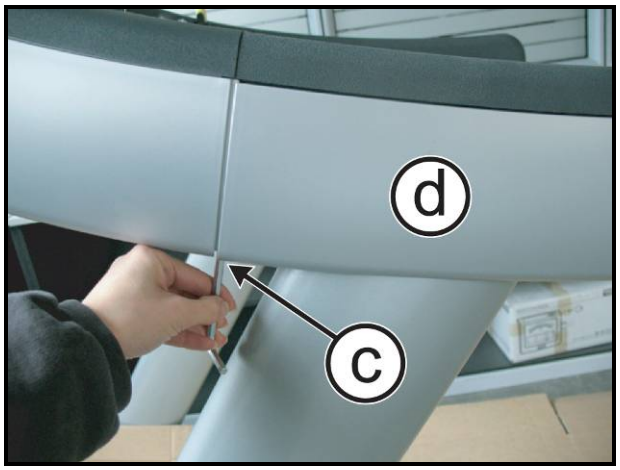

Figure 7-45

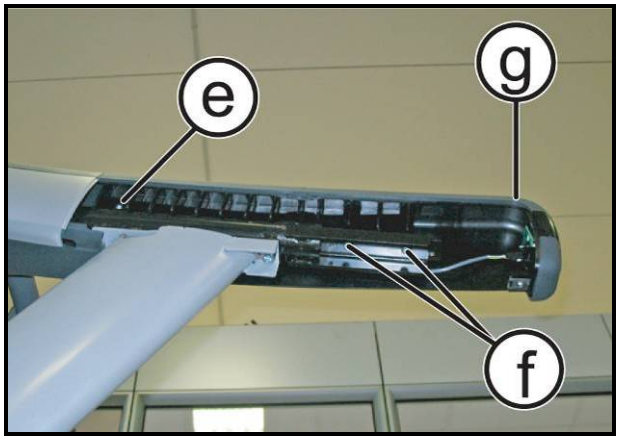

Figure 7-46

<u>For each handlebar:</u>

1. Back off the screw **(a)** using a 4mm hexagonal wrench.
2. Back off the 2 screws **(b)** using a 5mm hexagonal wrench.
3. Back off the screw **(c)** using a 5mm hexagonal wrench.
4. Remove the guards **(d)**.
5. Back off the screw **(e)** and the 2 screws **(f)** using a 5mm hexagonal wrench.
6. Remove the upper guard **(g)** if necessary.

To reassembly the Handlebar, carry out the above steps in the reverse order.

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7.10. DISASSEMBLING THE INMOTION – (READY TO RUN) BOARD

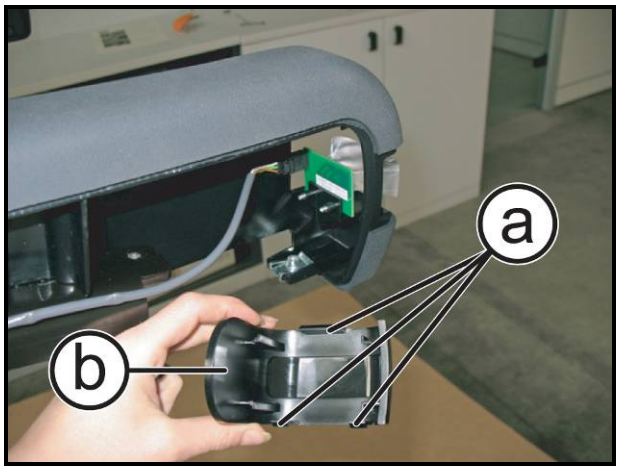

Figure 7-47

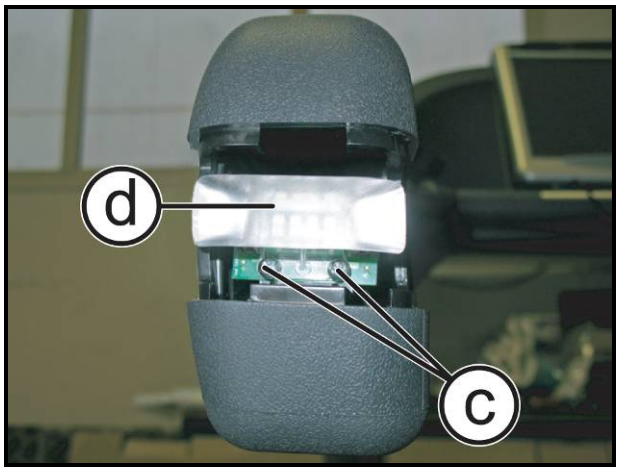

Figure 7-48

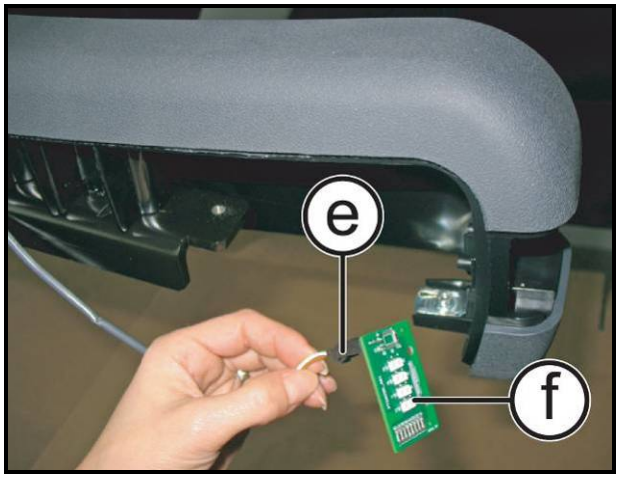

Figure 7-49

Carry out the procedure described in paragraph: 7.9. "Disassembling the lateral handlebar".

1. Press on the tabs **(a)** of the *InMotion* front guard **(b)** and remove it from the handlebar.

2. Back off the 2 screws **(c)** using a medium Phillips screwdriver.

3. Remove the light convector **(d)**.

4. Unplug the connector **(e)** and remove the InMotion board **(f)**.

To reassemble the InMotion Board, carry out the above steps in reverse order

7.11. DISASSEMBLING THE UPPER DASHBOARD GUARD, CENTRAL HANDLEBAR AND THE JOYSTICKS

7.11.1. DISASSEMBLING THE UPPER DASHBOARD GUARD

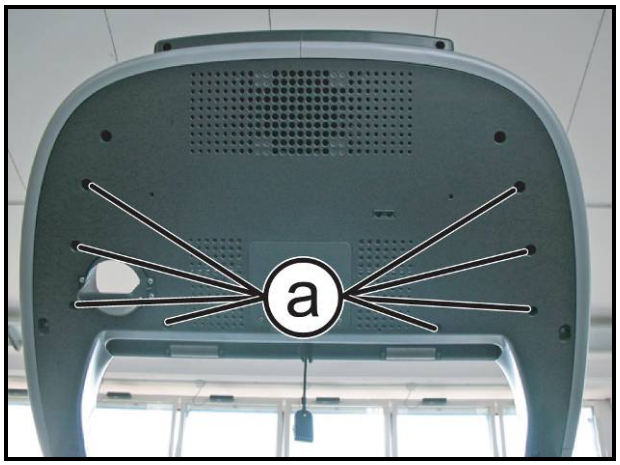

Figure 7-50

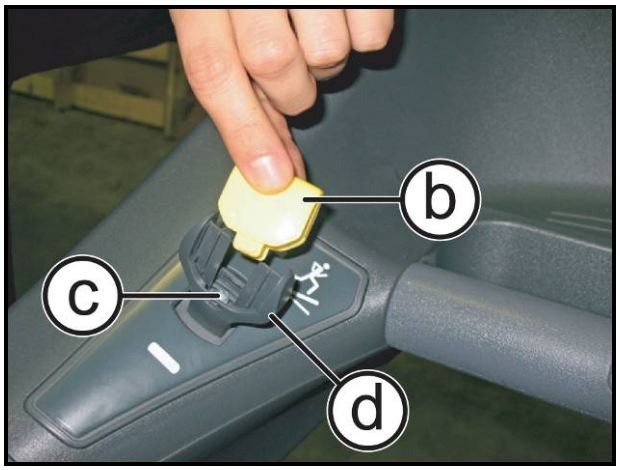

Figure 7-51

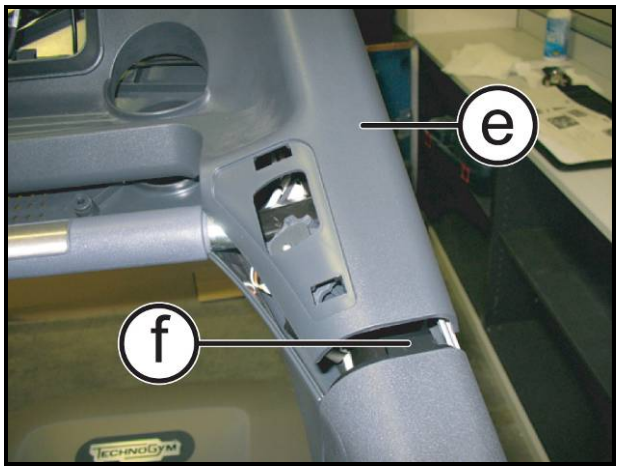

Figure 7-52

Carry out the procedure described in paragraph: 7.1. "Disassembling the display".

1. Back off the 8 screws **(a)** using a medium Phillips screwdriver.

2. Remove the Joystick plug **(b)** pressing on both sides and using a small Flat screwdriver.

3. Back off the screw **(c)** using a medium Phillips screwdriver and remove the Joystick **(d)**.

4. Remove the upper dashboard **(e)**.

During the reassembly: be careful to re-insert correctly the tabs (f), in the handlebar.

To reassemble the upper dashboard, carry out the above steps in reverse order.

7.11.2. DISASSEMBLING THE CENTRAL HANDLEBAR

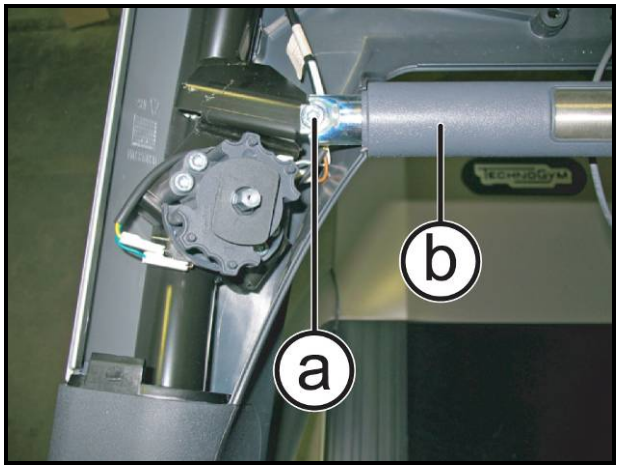

Figure 7-53

Carry out the procedure described in paragraph: 7.11.1. "Disassembling the upper dashboard".

1. Back off the 2 screws **(a)** using a 6mm hexagonal wrench.

2. Remove the central handlebar **(b)**.

CAUTION: During the reassembly lock down the screws (a) using a torque wrench set for 30Nm.

To reassemble the Handlebar, carry out the above steps in reverse order.

7.11.3. DISASSEMBLING THE JOYSTICK

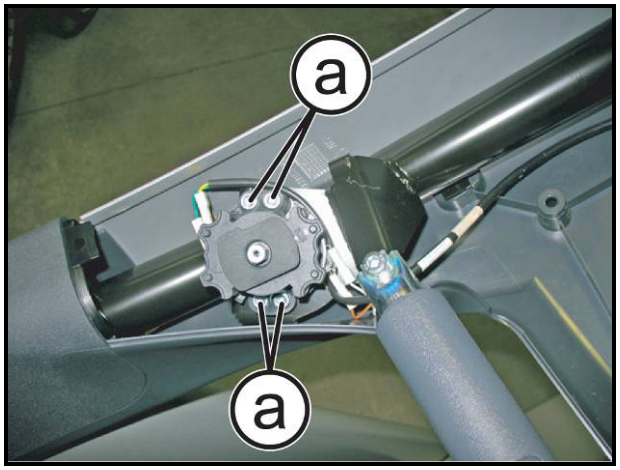

Figure 7-54

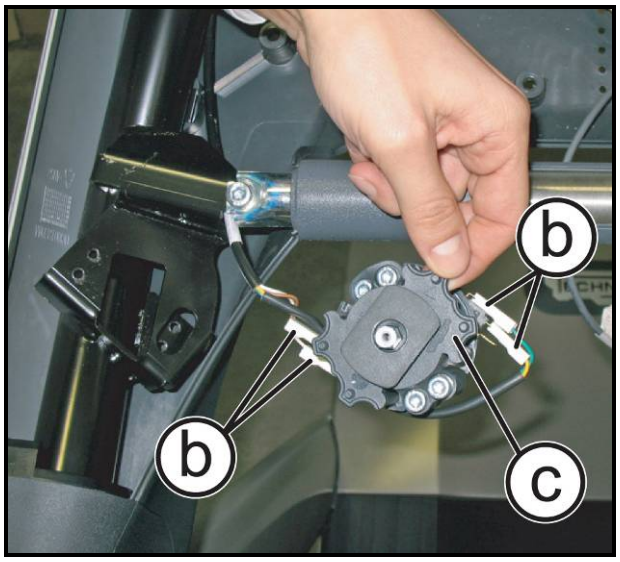

Figure 7-55

Carry out the procedure described in paragraph: 7.11.1. "Disassembling the upper dashboard".

1. Back off the 4 screws **(a)** using a 5mm hexagonal wrench.

2. Unplug the 4 faston **(b)**.

3. Remove the Joystick group **(c)**.

To reassemble the Joystick group, carry out the above steps in reverse order.

7.12. DISASSEMBLING THE LOWER DASHBOARD GUARD

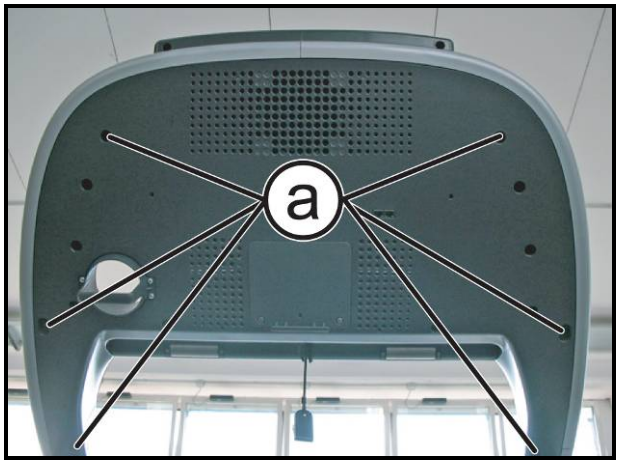

Figure 7-56

Carry out the procedure described in paragraph: 7.11.1. "Disassembling the upper dashboard guard".

1. Back off the 6 screws **(a)** using a 4mm hexagonal wrench.
2. Remove the lower dashboard guard.

To reassemble the Lower Dashboard guard, carry out the above steps in reverse order.

7.13. DISASSEMBLING THE LATERAL UPRIGHTS

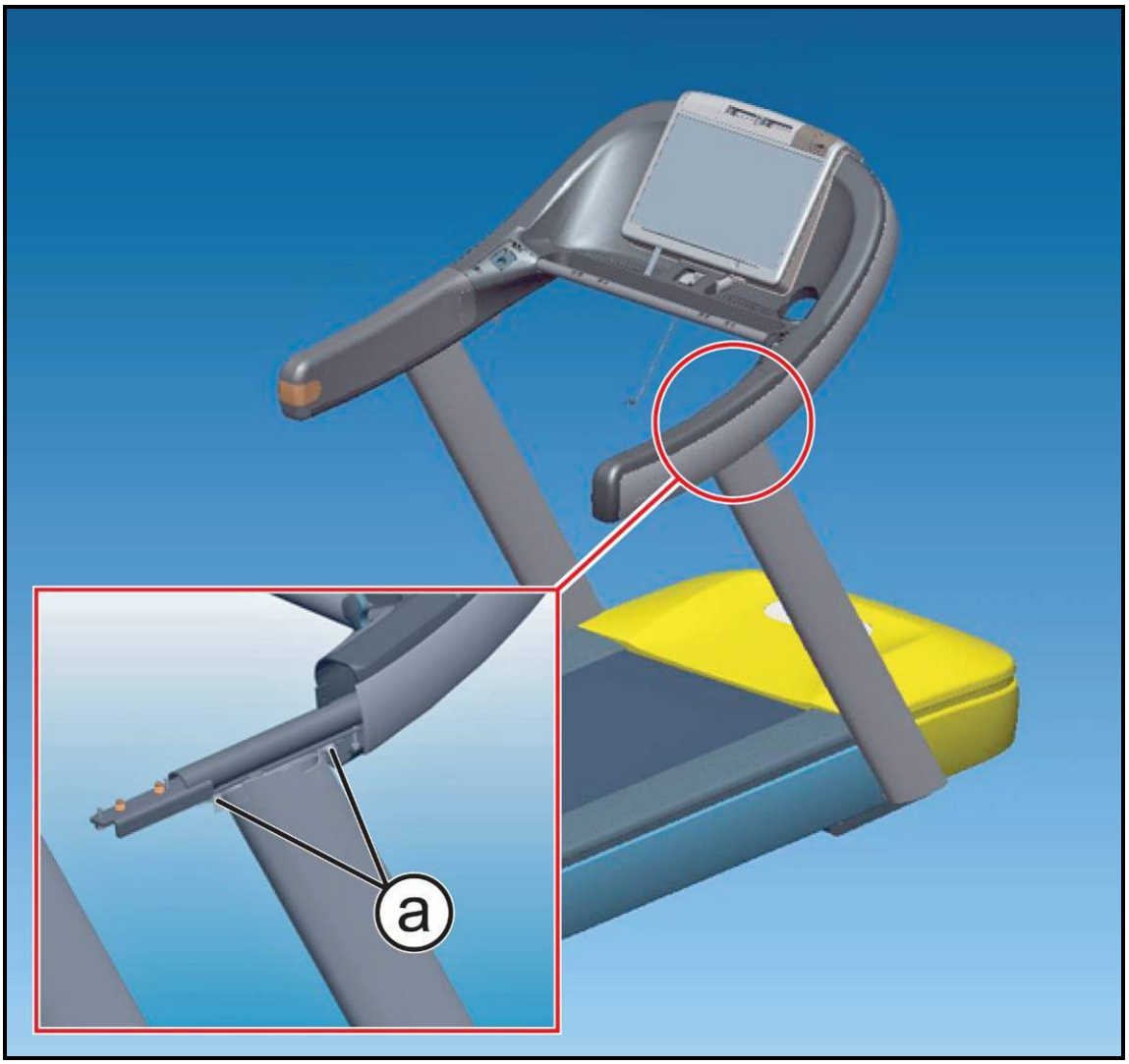

Figure 7-57

Carry out the procedure described in paragraph: 7.9. "Disassembling the lateral handlebar".

1. Back off the 2 screws **(a)** using a 8mm hexagonal wrench, on both side

CAUTION: During the reassembly lock down the screws (a) using a torque wrench set for 30Nm

2. Remove completely the dashboard group from the equipment.

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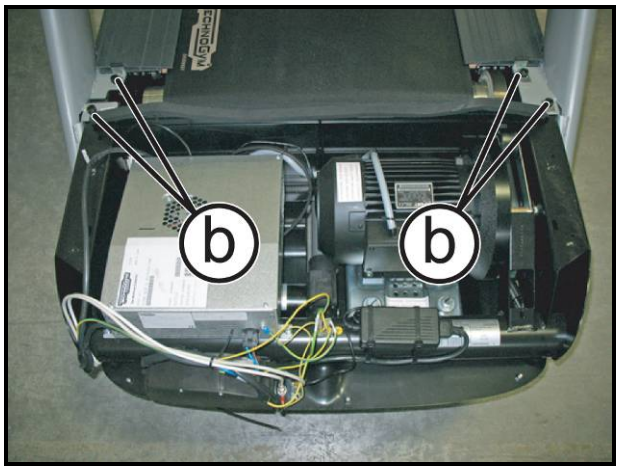

Figure 7-58

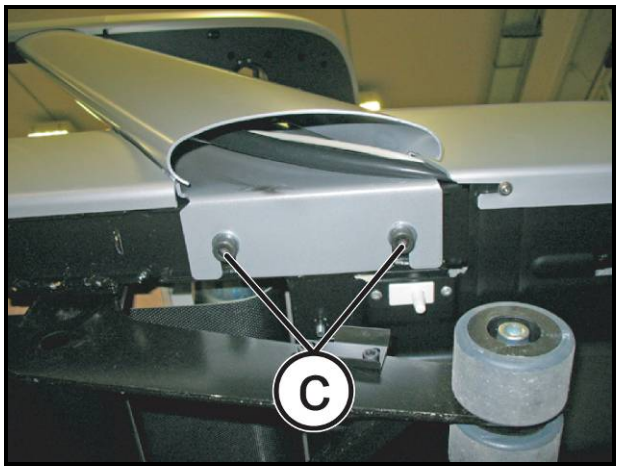

Figure 7-59

Carry out the procedure described in paragraph: 7.14.1. "Disassembling the upper guard".

3. Back off the 4 screws **(b)** using a 8mm hexagonal wrench.

4. Back off the 2 screws **(c)** using a 8mm hexagonal wrench.

CAUTION: During the reassembly lock down the screws (c) using a torque wrench set for 30Nm.

7.14. DISASSEMBLING THE LOWER KIT GUARD

7.14.1. DISASSEMBLING THE UPPER GUARD

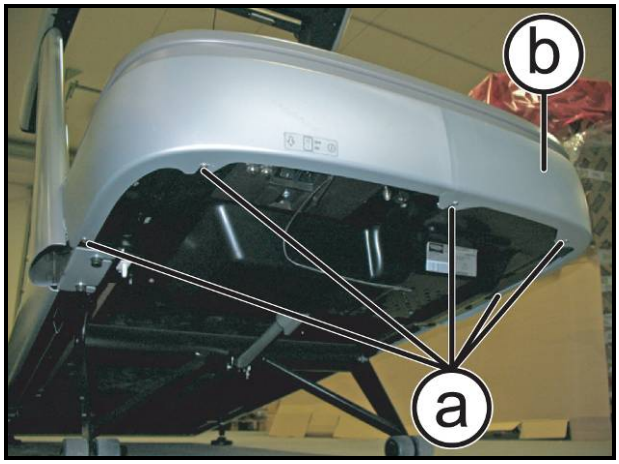

Figure 7-60

Lift up the machine at the elevation of 10%, to make the procedure easier and turn off the machine. Unplug the mains lead from the wall outlet.

1. Loosen the 5 screws **(a)** using a 4mm hexagonal wrench.

2. Remove the upper guard **(b)** pulling it out from the front side of the machine.

To reassemble the Upper Guard, carry out the above steps in reverse order.

7.14.2. DISASSEMBLING THE LOWER GUARD

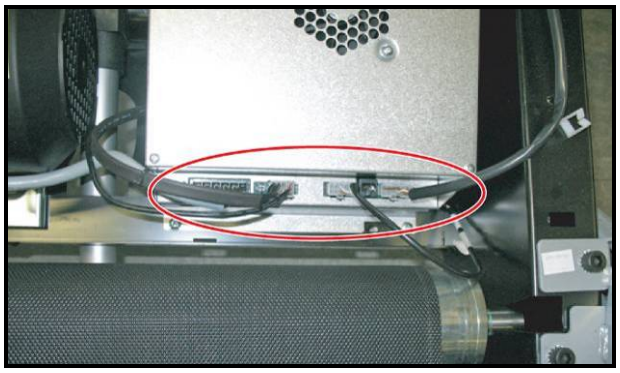

Figure 7-61

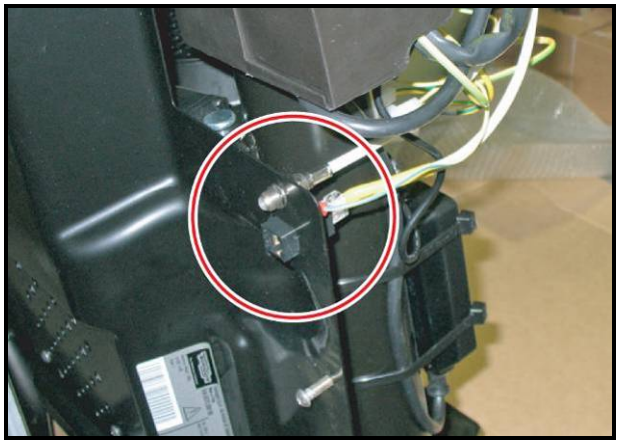

Figure 7-62

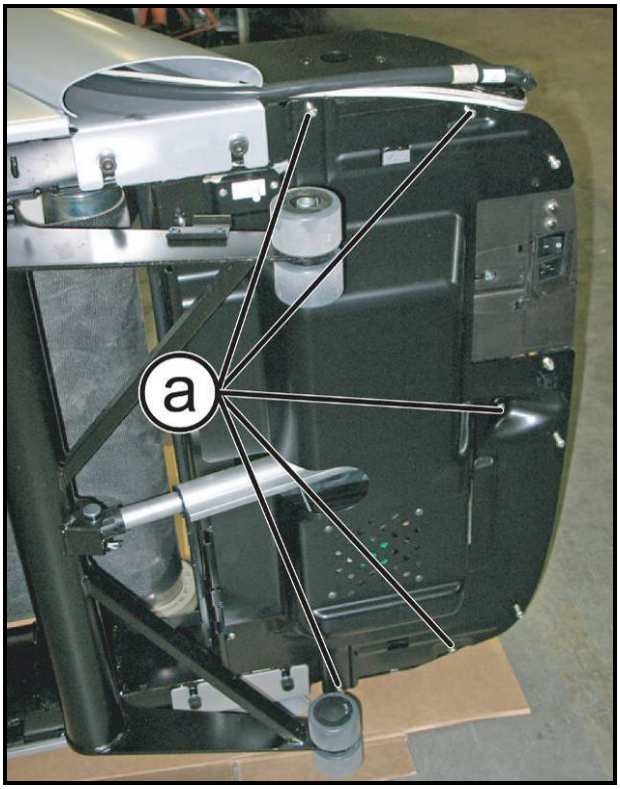

Figure 7-63

<u>Turn off the machine and unplug the mains lead from the wall outlet.</u>

Carry out the procedure described in paragraph: 7.14.1. "Disassembling the upper guard".

1. Unplug the micro connector and the Fan connector highlighted at the side from the Driver box.

2. To make the procedure easier, turn the machine over on one side.

3. Unplug the cables highlighted in the figure, using a 11mm wrench for the antenna cable.

4. Back off the 5 screws **(a)** using a 4mm hexagonal wrench.

5. Remove the lower guard.

To reassemble the Lower Guard, carry out the above steps in reverse order.

7.15. DISASSEMBLING THE LOWER KIT

7.15.1. DISASSEMBLING THE ALE DRIVER

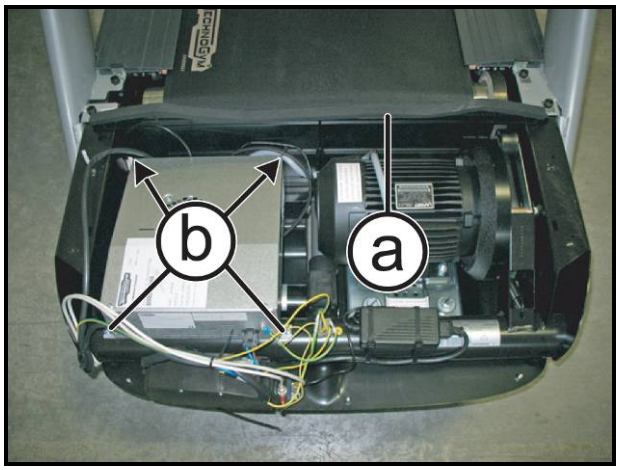

Figure 7-64

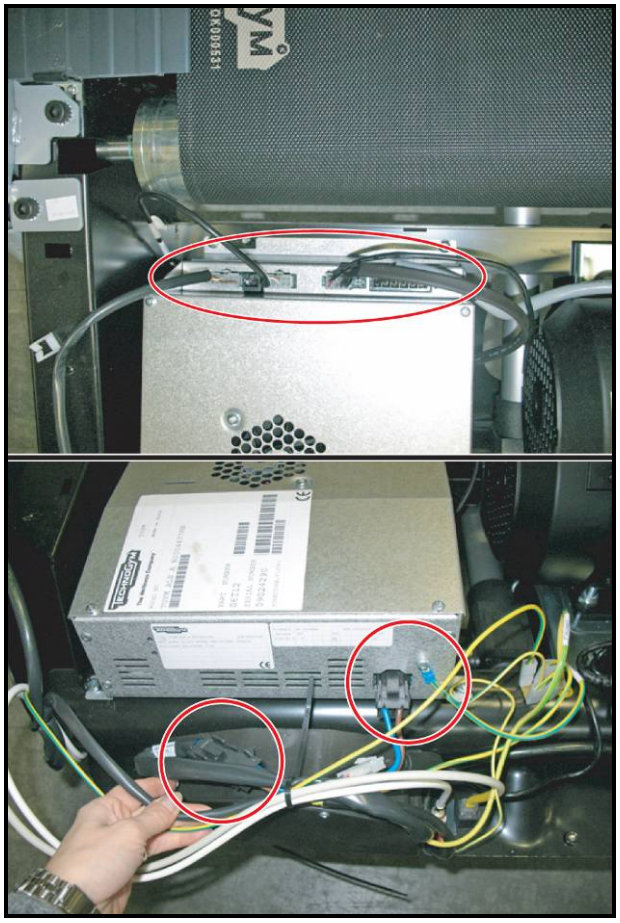

Figure 7-65

<u>Turn off the machine and unplug the mains lead from the wall outlet.</u>

Carry out the procedure described in paragraph: 7.14.1. "Disassembling the upper guard".

1. Remove the dust protection **(a)**.
2. Back off the 4 screws **(b)** using a medium Phillips screwdriver.
3. Unplug the connectors highlighted in the figure:
   - *Power Supply cable;*
   - *Cable connecting High Kit – Lower Kit;*
   - *Limit switch cable;*
   - *Fan cable;*
   - *Ground connection cable;*
   - *Tread belt motor cable;*
   - *Up-Down motor cable.*
4. Remove the Driver Box.

To reassemble the Lower Kit, carry out the above steps in reverse order.

7.15.2. DISASSEMBLING THE AT-UL DRIVER

Turn off the machine and unplug the mains lead from the wall outlet.

Carry out the procedure described in paragraph: 7.14.1. "Disassembling the upper guard".

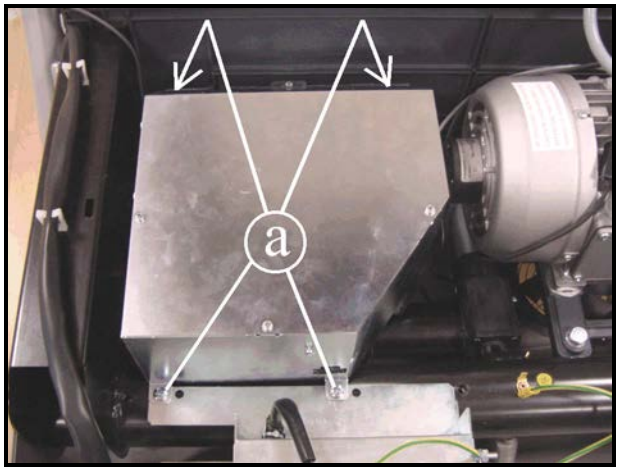

Figure 7-66

1. Disconnect the cables entering the Driver box:
   - *Power Supply cable,*
   - *Cable connecting High Kit – Lower Kit,*
   - *Limit switch cable;*
   - *Fan cable;*
   - *Ground connection cable,*
   - *Tread belt motor cable,*
   - *Up-Down motor cable.*
2. Back off the 4 screws **(a)** using a medium Phillips Screwdriver.
5. Remove the Driver box.

To reassemble the Lower Kit, carry out the above steps in reverse order.

7.16. DISASSEMBLING THE POWER SUPPLY BOX

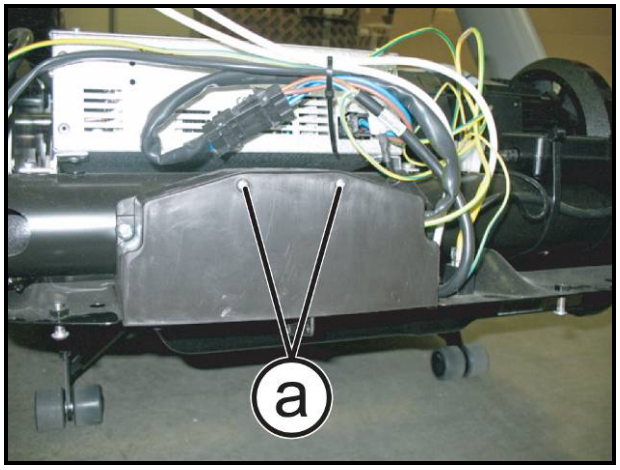

Figure 7-67

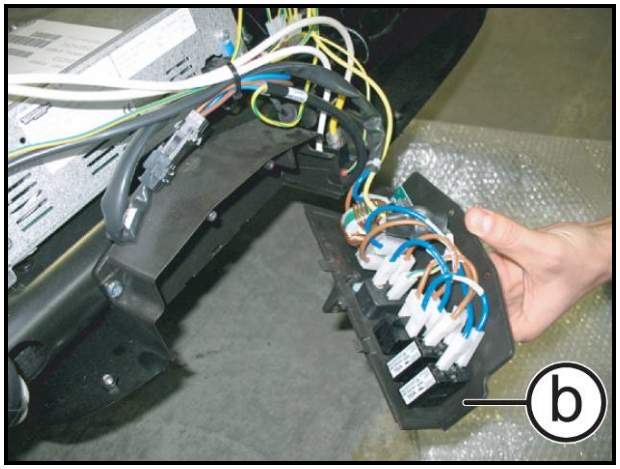

Figure 7-68

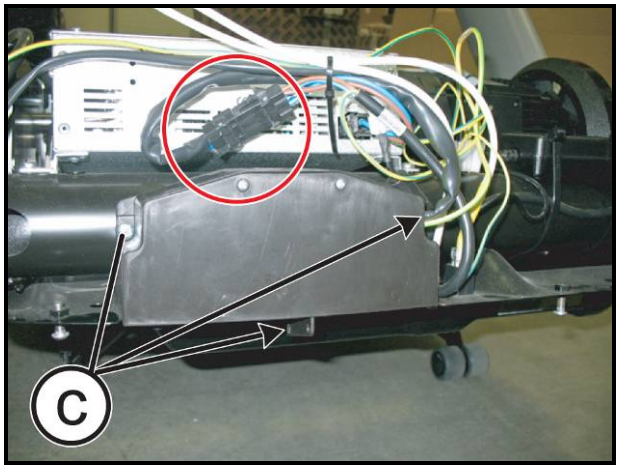

Figure 7-69

Turn off the machine and unplug the mains lead from the wall outlet.

Carry out the procedure described in paragraph: 7.14.1. "Disassembling the upper guard".

1. Back off the 2 screws **(a)** using a medium Phillips screwdriver.

2. Remove the cover of power supply box **(b)** and unplug the faston if necessary.

To completely remove the Power Supply Box: unplug the cable highlighted in the figure and back off the 3 screws (c), using a medium Phillips screwdriver.

To reassemble the Power Supply Box, carry out the above steps in reverse order.

7.17. DISASSEMBLING THE BELT MOTOR

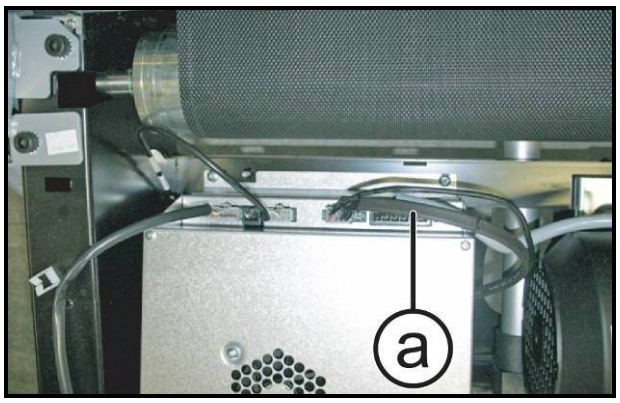

Figure 7-70

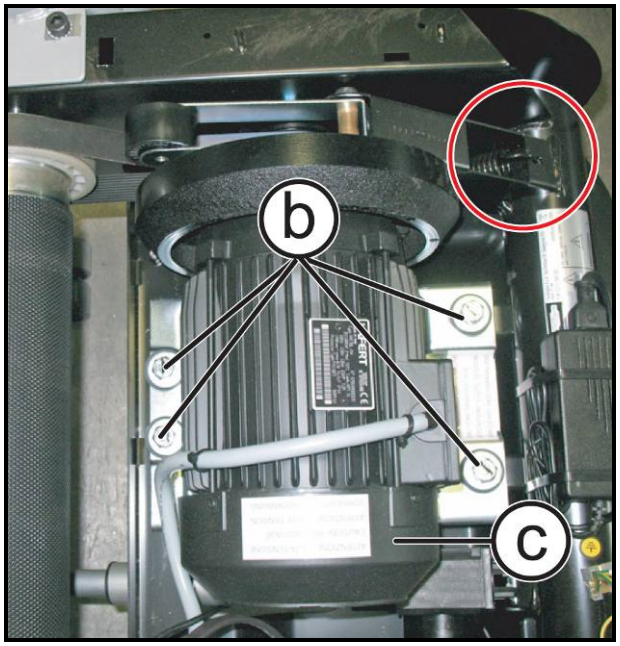

Figure 7-71

Turn off the machine and unplug the mains lead from the wall outlet.

Carry out the procedure described in paragraph: 7.14.1. "Disassembling the upper guard".

1. Unplug the connector **(a)** of motor belt highlighted in the figure.

2. Release the belt tensioner spring highlighted in the figure.

3. Back off the 4 screws **(b)** that fix the tread belt motor to the equipment frame, using a 17mm socket wrench.

4. Remove the support plate and the tread belt motor **(c)**.

To reassemble the belt motor, carry out the above steps in reverse order.

CAUTION: During the reassembly lock down the screws (b) using a torque wrench set for 15Nm.

CAUTION: At the end of the procedure, check the tension and alignment of the tread belt as detailed at paragraphs: 8.4. "Aligning the tread-belt motor drive-belt".

7.18. DISASSEMBLING THE ELEVATION MOTOR

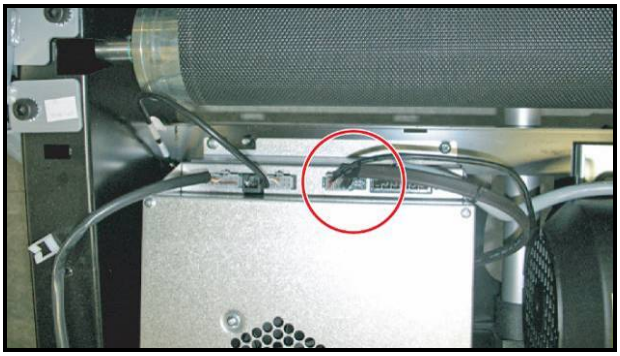

Figure 7-72

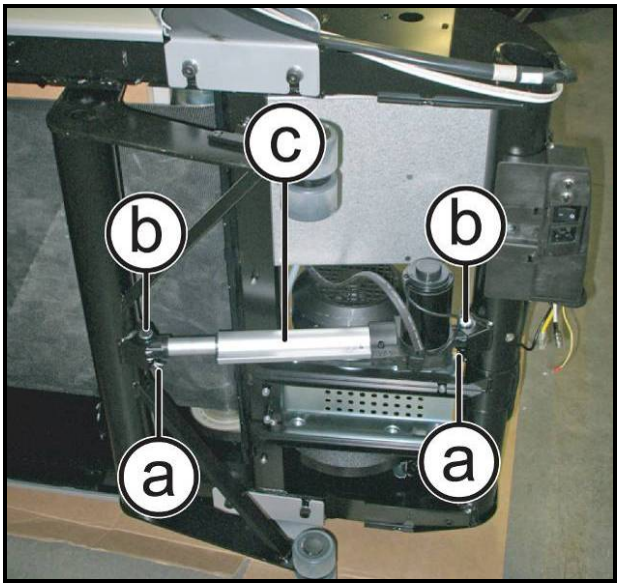

Figure 7-73

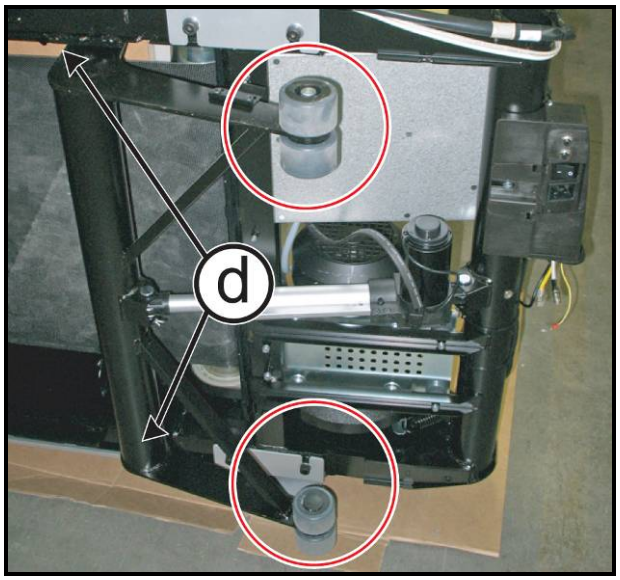

Figure 7-74

<u>Turn off the machine and unplug the mains lead from the wall outlet.</u>

Carry out the procedure described in paragraph: 7.14.2. "Disassembling the lower guard".

1. Unplug the elevation motor connector from the Driver.

<u>Turn the machine over on one side:</u>

2. Remove the 2 split pins **(a)** and remove the pin **(b)** that fix the elevation motor to the frame.
3. Remove the elevation motor **(c)**.

To reassemble the Elevation Motor, carry out the above steps in reverse order.

CAUTION: In case of elevation carriage disassembly, during the reassembly lock down the screws (d) using a torque wrench set for 90Nm; and the carriage wheels fixing screws, highlighted in the figure, using a torque wrench set for 40Nm.

7.19. DISASSEMBLING THE LIMIT SWITCH

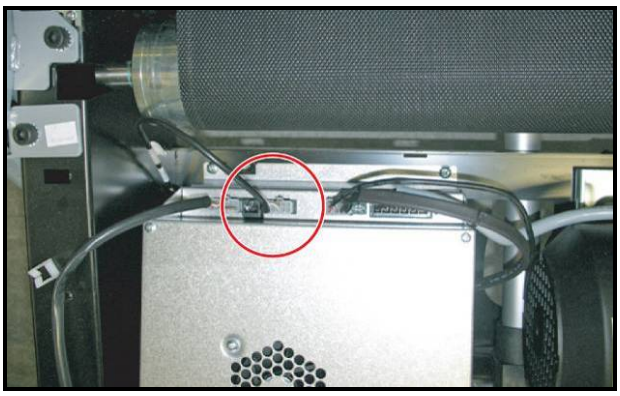

Figure 7-75

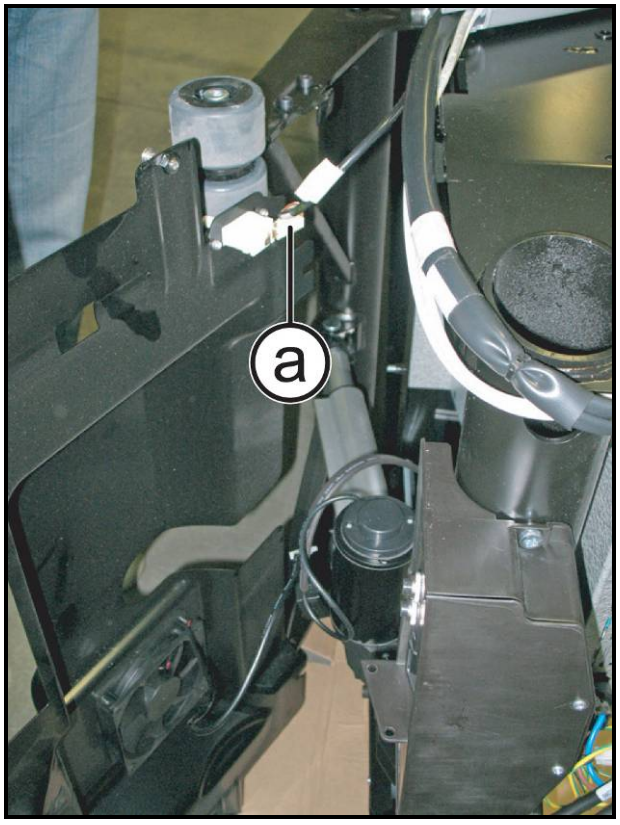

Figure 7-76

Turn off the machine and unplug the mains lead from the wall outlet.

Carry out the procedure described in paragraph: 7.14. "Disassembling the Lower Kit guard".

1. Unplug the connector highlighted in the figure, of the limit switch cable from the Driver box.

2. Press on both the sides of the limit switch and pull it out from the lower side of the guard.

3. Unplug the faston **(a)** if necessary.

To reassemble the Limit Switch, carry out the above steps in reverse order.

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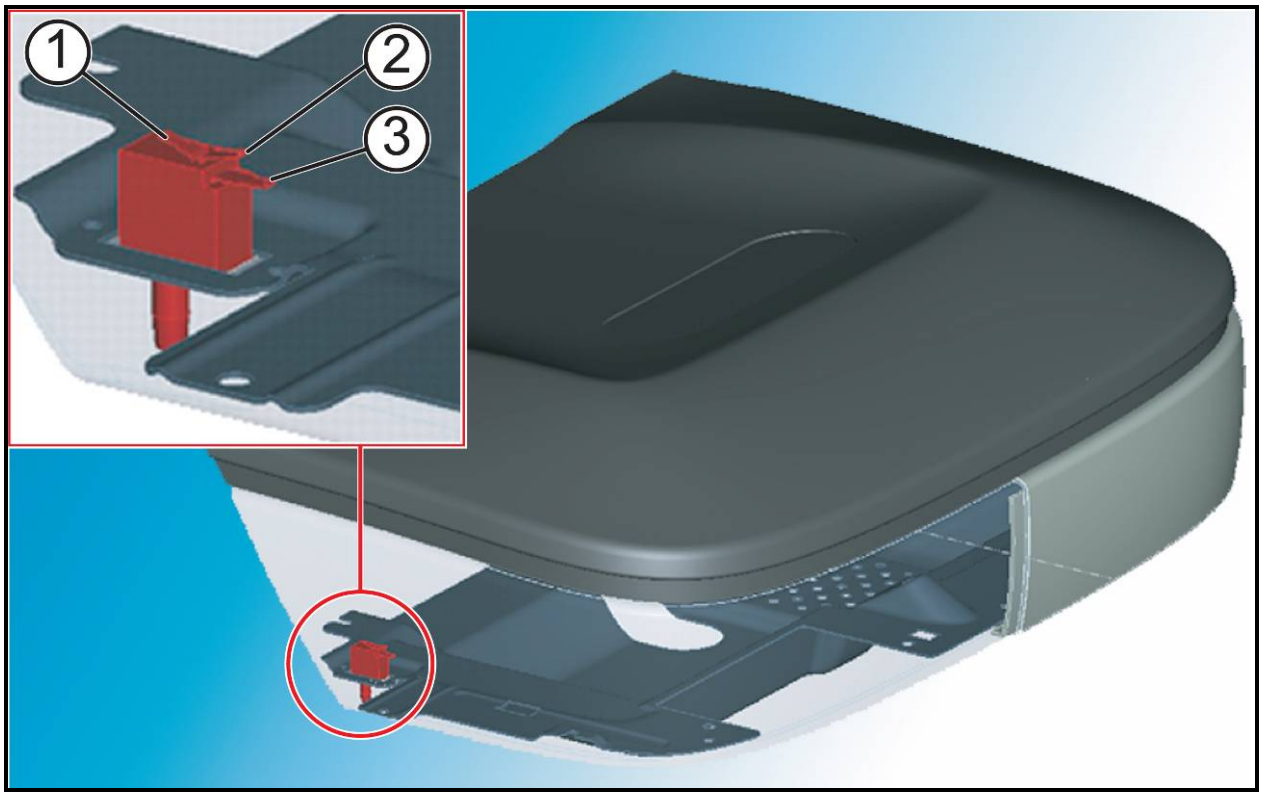

Figure 7-77

CAUTION: It is important to respect the orientation of the limit switch during the reassembly. The fast on (1) has to be oriented toward the REAR SIDE of the machine, and the faston (2) and (3) have to face the FRONT SIDE of the machine, as shown in the figure above.

CAUTION: During the reassembly check the adjust of the limit micro switch, as detailed at paragraphs: 8.3. "Adjusting the limit micro switch".

7.20. DISASSEMBLING THE EXTRA POWER SUPPLY

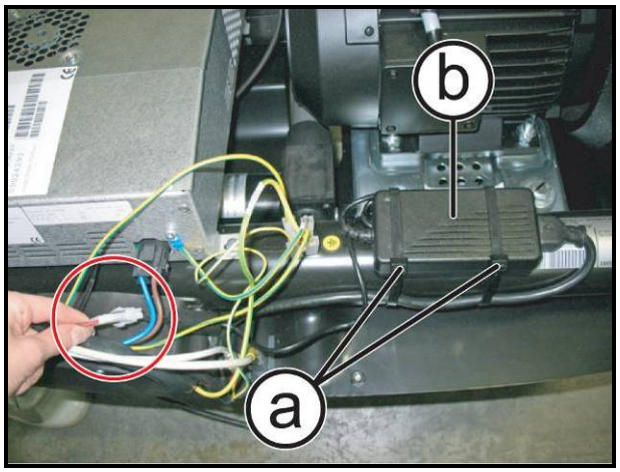

Figure 7-78

Turn off the machine and unplug the mains lead from the wall outlet.

Carry out the procedure described in paragraph: 7.14.1. "Disassembling the upper guard".

1. Unplug the connector highlighted in the figure.
2. Cut the 2 cable tie **(a)**.
3. Remove the Power Supply **(b)**.

It's necessary to put the cable tie (a) again, during the reassembly. If you don't have a new one do not cut it but remove using a small flat screwdriver to open the engaging tooth.

To reassemble the Extra Power Supply, carry out the above steps in reverse order.

7.21. DISASSEMBLING THE AUTOTRANSFORMER (V. 110V)

CAUTION: On machines produced <u>WITHOUT autotransformer</u>, not exist any upgrade kit and it is not possible to upgrade with Autotransformer for reasons of certification, standards and safety. The machines burn with Autotransformer with this typology from the production from Technogym ®.

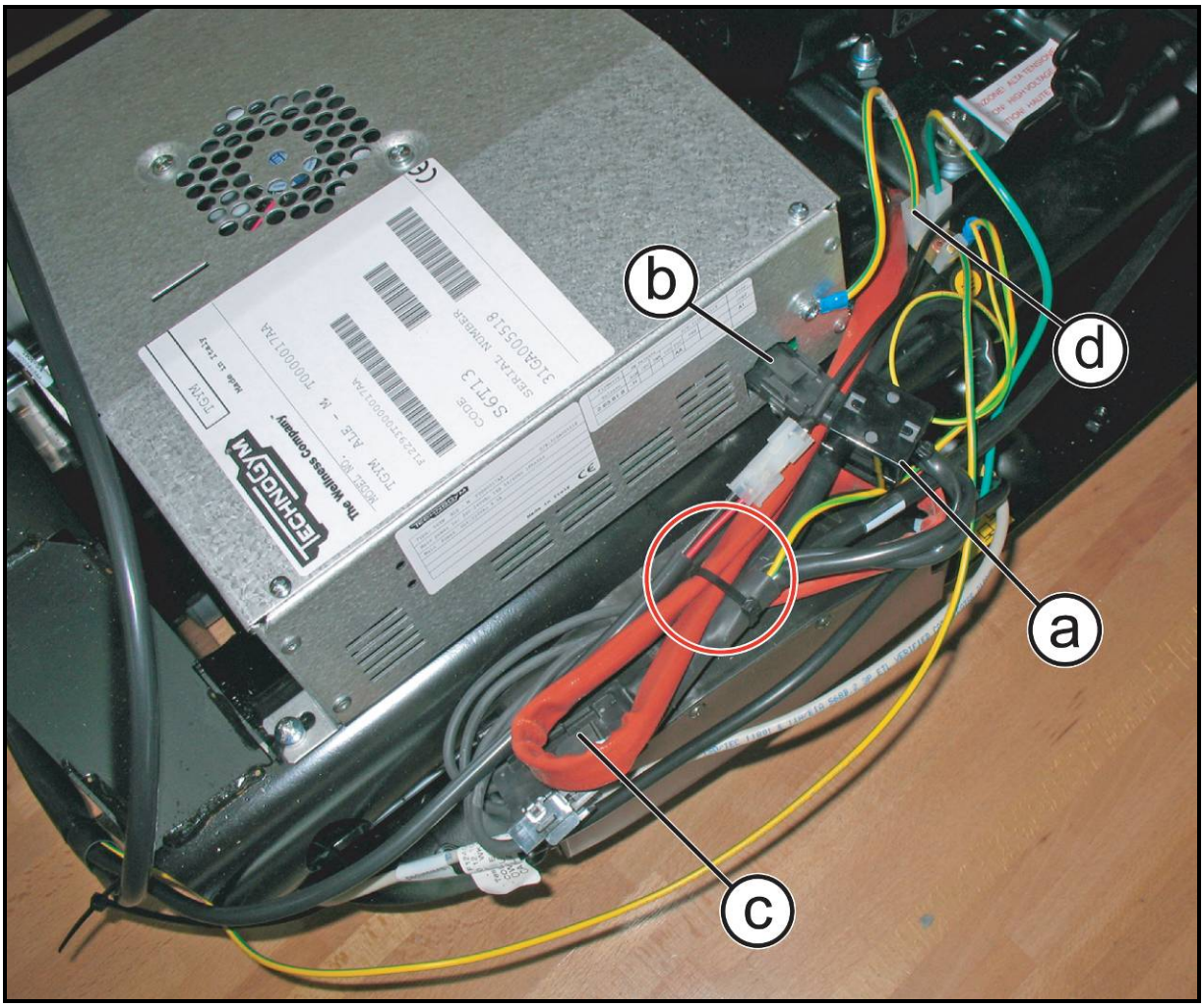

Figure 7.21-1

<u>Turn off the machine and unplug the mains lead from the wall outlet.</u>

Carry out the procedure described in paragraph: 7.14.1. "Disassembling the upper guard".

1. Cut the cable-tie that fixes the power cables and ground, as highlight in the figure at the side.

2. Remove the ferrite **(a)** and disconnect the male connector **(b)** and the female connector **(c)** of autotransformer.

3. Disconnect the ground cable **(d)**.

Continued on following page…

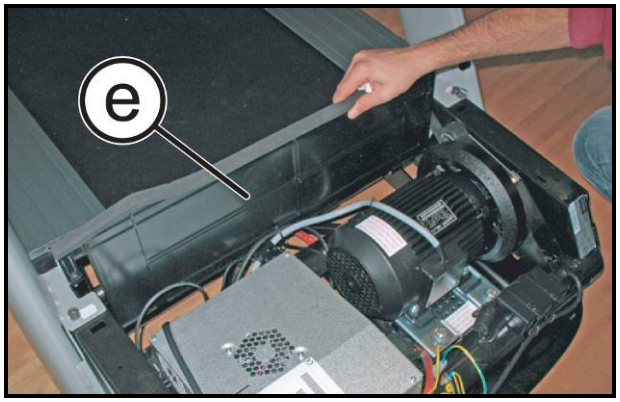

Figure 7.21-2

4. Remove the dust-guard **(e)**.

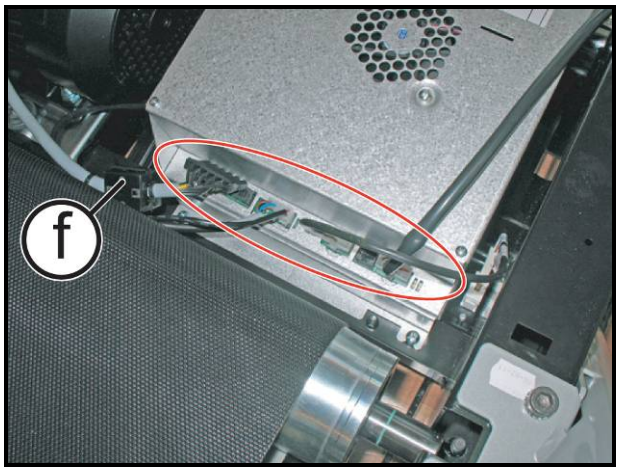

Figure 7.21-3

5. Remove the ferrite **(f)** from the motor cable and disconnect the other cables, highlight in the figure, from the autotransformer.

Carry out the procedure described in paragraph: 7.15. "Disassembling the Lower Kit".

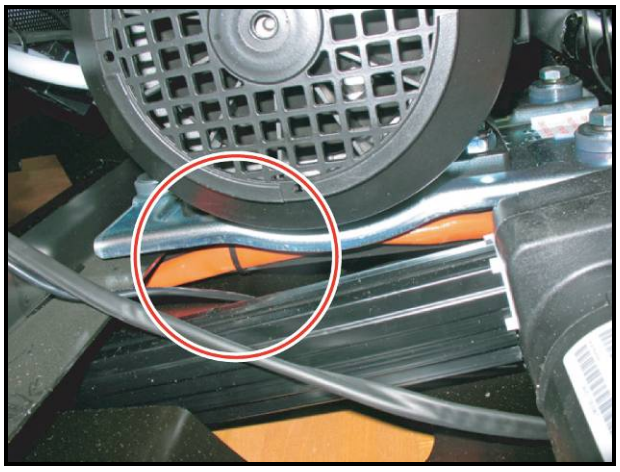

Figure 7.21-4

6. Cut the cable-tie highlight in the figure at the side, paying attention to not damage the autotransformer cable.

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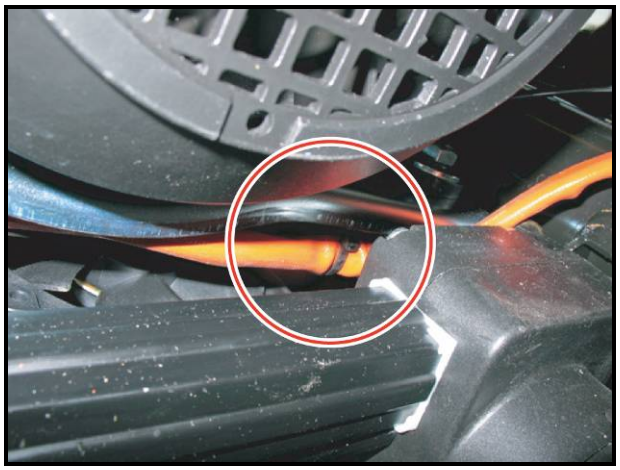

Figure 7.21-5

7. Cut the cable-tie highlight in the figure at the side, paying attention to not damage the autotransformer cable.

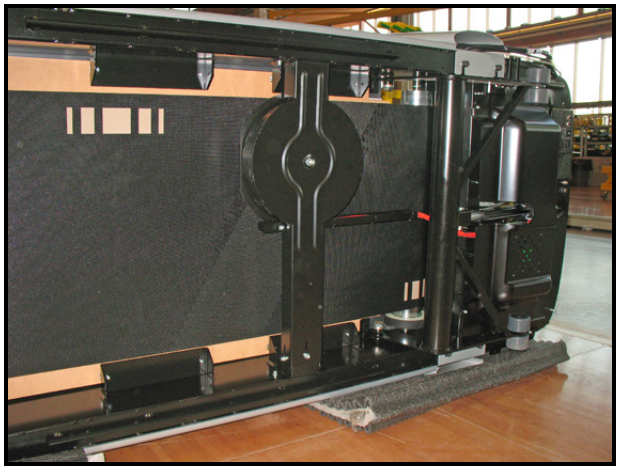

Figure 7.21-6

CAUTION: Incline the machine on the left side with caution and protecting it from the floor.

To make safer the machine in this position, it is suggested to place some weight on the handlebar closer on the floor.

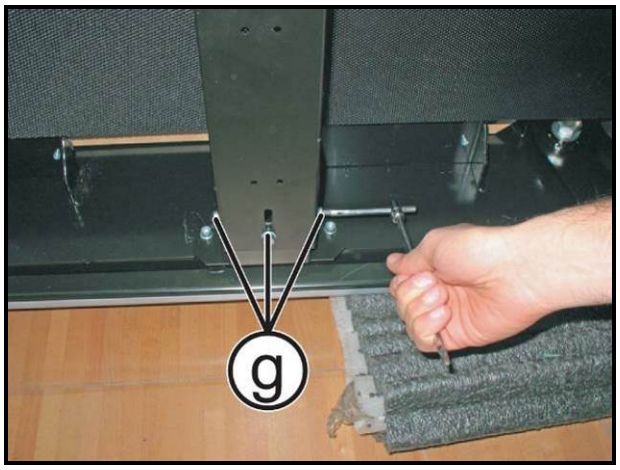

Figure 7.21-7

8. Back off the 3 screw **(g)** using a 5mm hexagonal wrench.

Continued on following page…

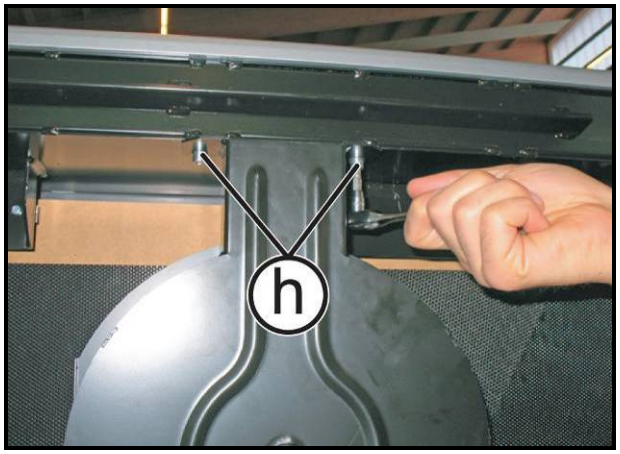

Figure 7.21-8

9. Back off the 2 screws **(h)** using a 5mm hexagonal wrench.

For reasons of space, for the 2 (h) screws is recommended to use a ratchet wrench.

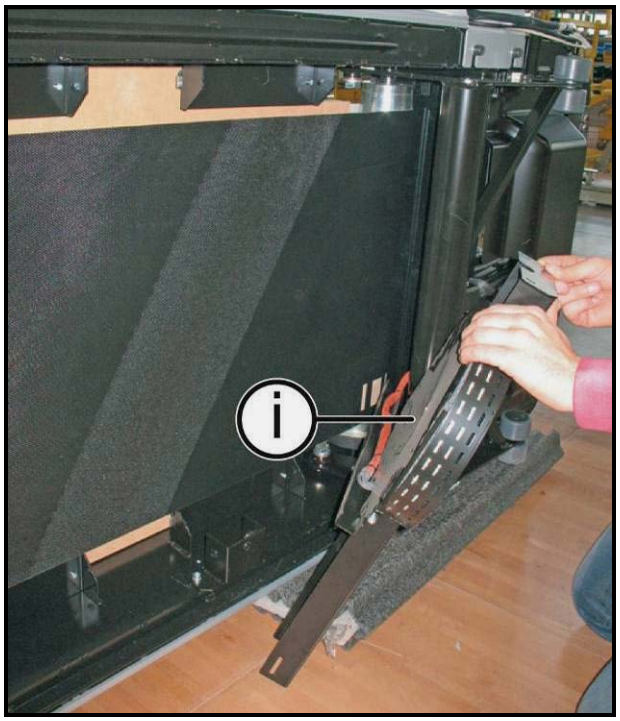

Figure 7.21-9

10. Remove the autotransformer **(i)** with careful.

ATTENZIONE: Prestare particolare attenzione durante la movimentazione dell'autotrasformatore, poiché essendo estremamente fragile, anche un piccolo urto potrebbe danneggiarlo.

To reassemble the autotransformer, carry out the above steps in reverse order; following the note reported above:

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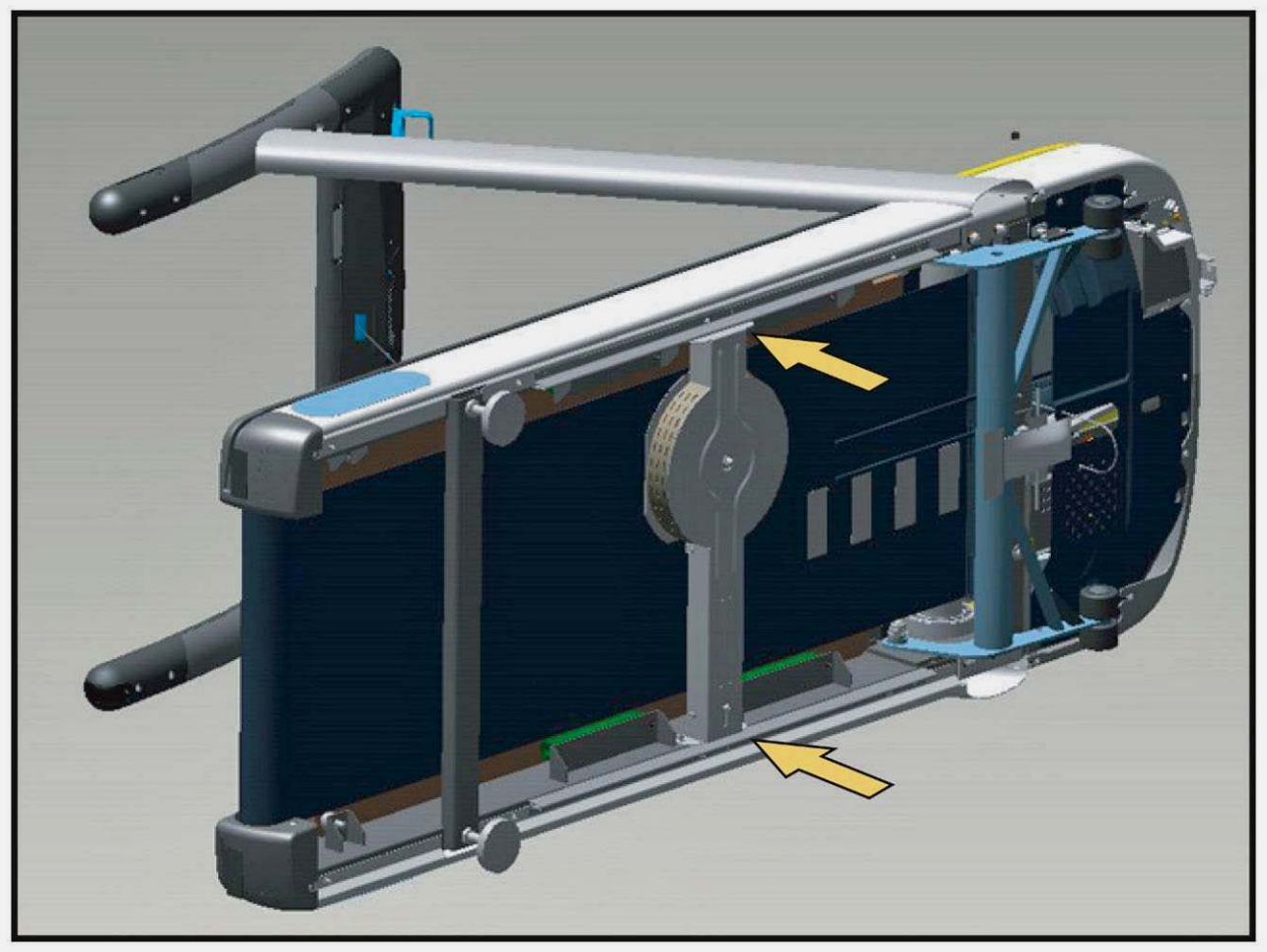

Figure 7.21-10

1. Fix the Autotransformer at the frame using the 4 fixing screws, without locking down.

2. Push the Autotransformer completely forward in the direction of the yellow arrows, as shown in the figure above.

3. At the end, lock down, the 4 screws using a 5mm hexagonal wrench.

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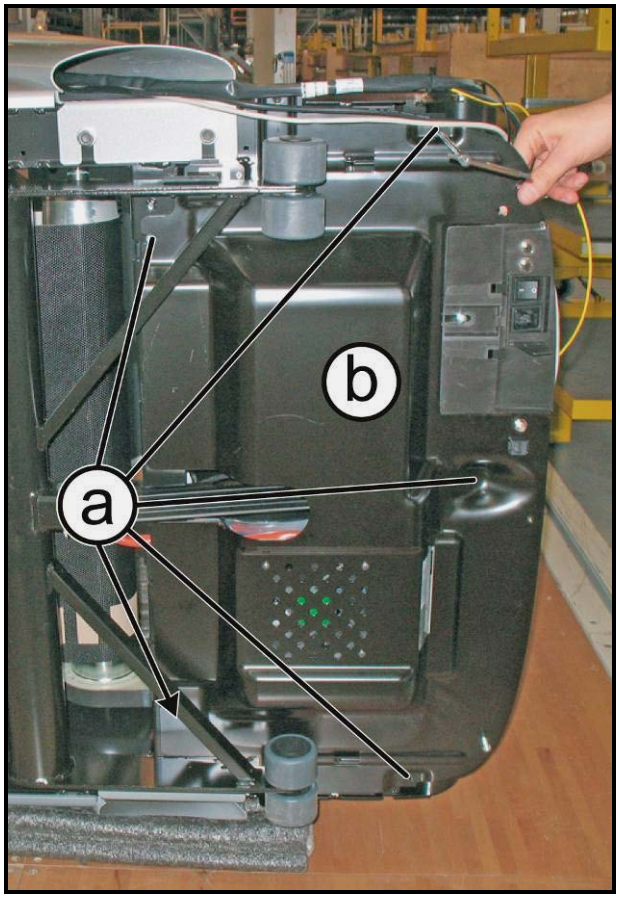

Figure 7.21-11

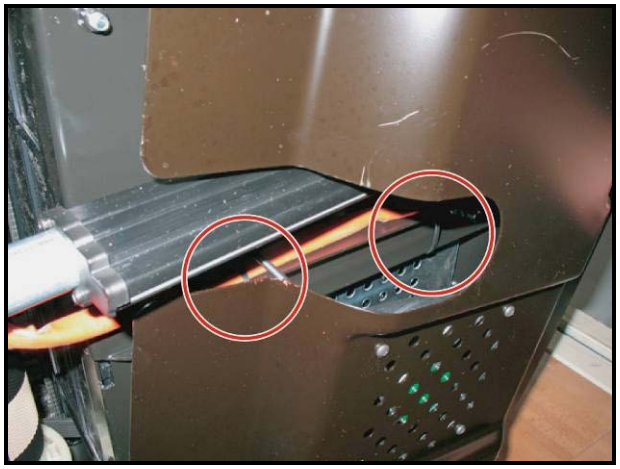

Figure 7.21-12

To replace the cable-tie that fix the autotransformer cable, under the motor, is necessary proceed as follow:

1. Back off the 5 screw **(a)** with a 4mm hexagonal wrench.
2. Remove the lower guard **(b)**.
3. Replace the cable-tie making sure the autotransformer at the frame, as shown in the figure at the side.

7.22. DISASSEMBLING THE RUNNING DECK AND ITS COMPONENTS

In order to carry out these operations, it is necessary to slacken the tread-belt tension. If the belt has to be used again, follow the instructions given in paragraph: 8.1.2. "Tensioning a USED tread belt".

7.22.1. DISASSEMBLING THE FOOTREST

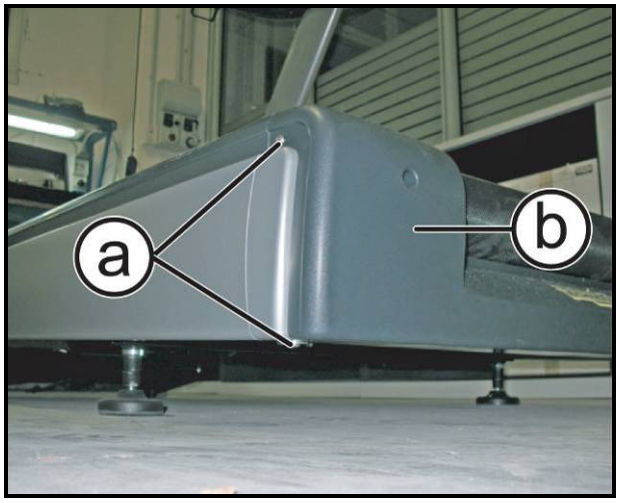

Figure 7-13

1. Back off 2 screws **(a)** using a 4mm hexagonal wrench on both side.
2. Remove the rear guard **(b)**.

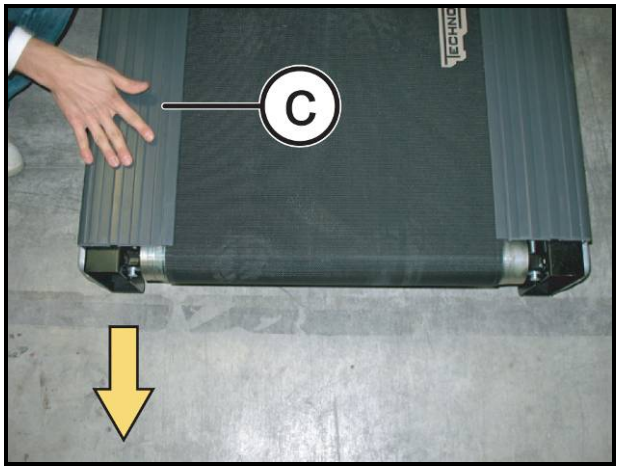

Figure 7-14

3. Remove the footboard **(c)** by pulling it out backward.

Continued on following page…

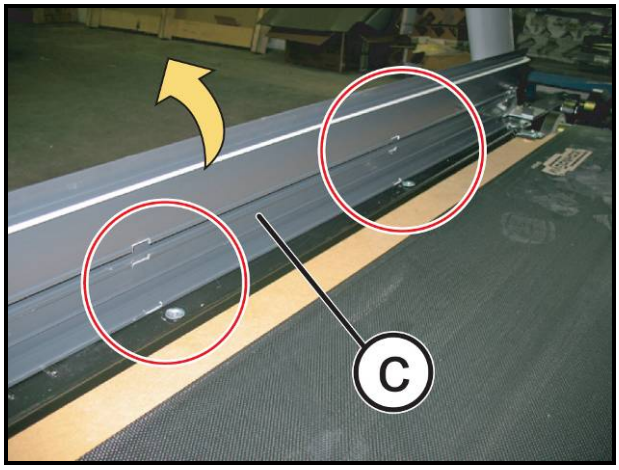

Figure 7-15

4. Find the correct point where the slots on the lower side of the footboard are matching with the head of the screws on the frame. See picture on the side.

5. Remove the footrest **(c)**.

To reassemble the Footrest, carry out the above steps in reverse order.

7.22.2. DISASSEMBLY THE DRIVEN ROLLER

In order to carry out these operations, it is necessary to slacken the tread-belt tension. If the belt has to be used again, follow the instructions given in paragraph: 8.1.2. "Tensioning a USED tread belt".

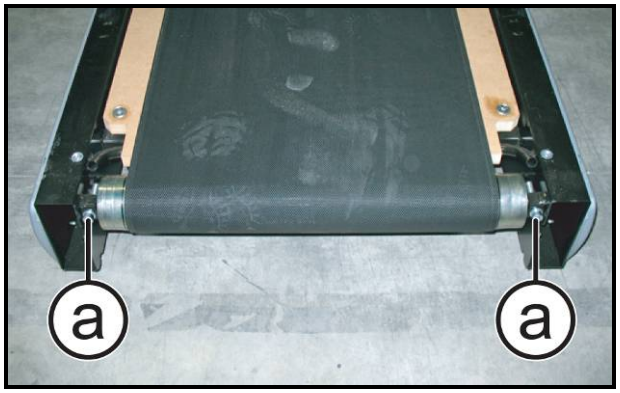

Figure 7-16

Carry out the procedure described in paragraph: 7.22.1. "Disassembling the footrest".

1. Back off the 2 screws **(a)**, on the rear roller of the machine, using a 8mm hexagonal wrench.

CAUTION: Loosen the screws acting by turns on both the sides of the machine so that the rear roller is always parallel to the front one and to avoid to damage the roller bearings.

2. Remove the roller.

To reassemble the Driven Roller, carry out the above steps in reverse order.

7.22.3. DISASSEMBLING THE TRANSMISSION BELT AND MOTOR ROLLER

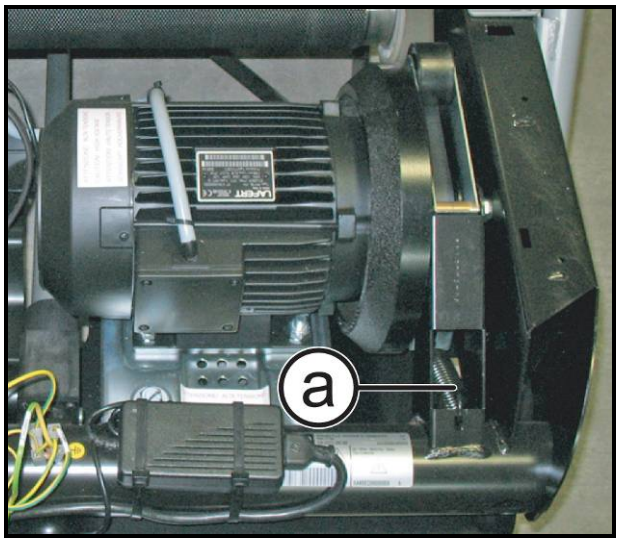

Figure 7-17

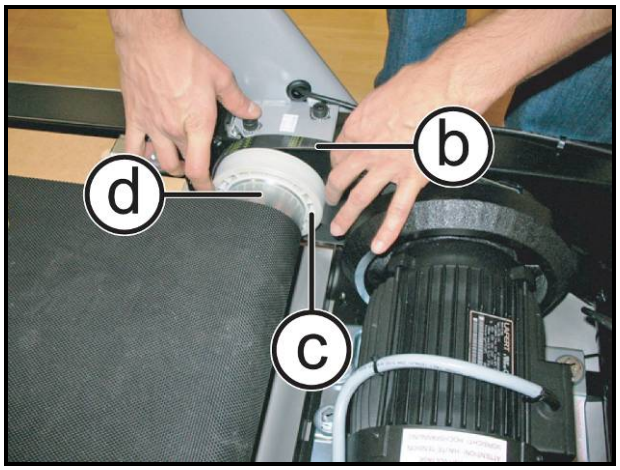

Figure 7-18

Carry out the procedure described in paragraph: "Disassembling the upper guard" and 7.22.1. "Disassembling the footrest".

1. Release the belt tensioner spring **(a)**.

2. Remove the belt **(b)** from its pulley **(c)** and place it on the front roller.

3. Remove the motor roller **(d)** upwards. First on the right side and then axially on left.

4. Remove the transmission belt **(b)** if necessary.

To reassemble the Motor Roller, carry out the above steps in reverse order.

7.22.4. DISASSEMBLING THE RUNNING DECK AND BELT

In order to carry out these operations, it is necessary to slacken the tread-belt tension. If the belt has to be used again, follow the instructions given in paragraph: 8.1.2. "Tensioning a USED tread belt".

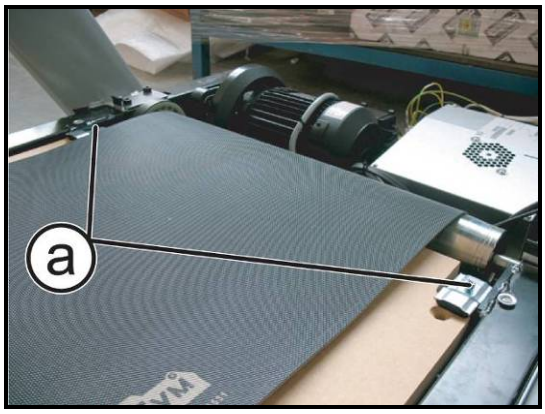

Figure 7-19

Carry out the procedure described in paragraph: 7.14.1. "Disassembling the upper guard" and 7.22.1. "Disassembling the footrest".

1. Loosen the 2 screws **(a)** which fix the stoppers to the frame of the machine, using a 4mm hexagonal wrench.

7.22.4.1. A Typology

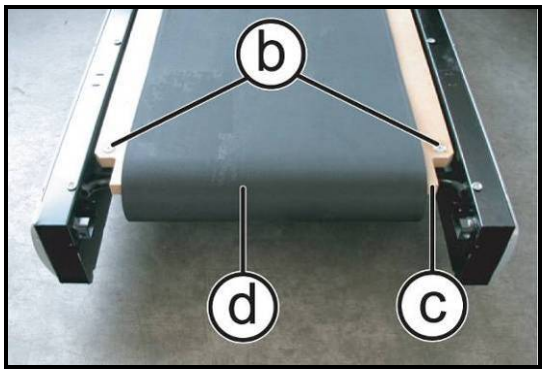

Figure 7-20

2. Back off the 2 screws **(b)** which fix the running deck to the frame, using a 6mm hexagonal wrench.
3. Remove the running deck **(c)**.
4. Remove the belt **(d)**.

CAUTION: During the reassembly lock down the screws using a torque wrench set for 30Nm.

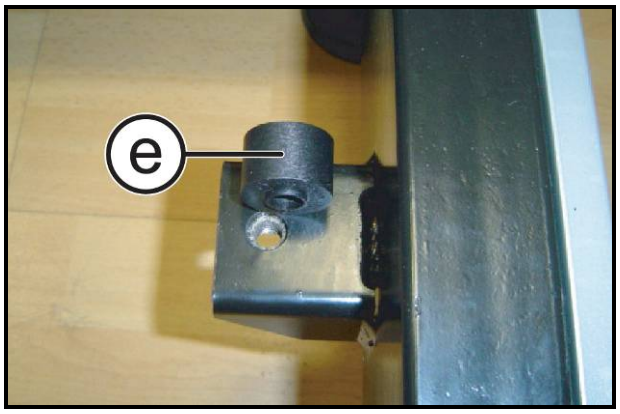

Figure 7-21

5. Remove the spacer **(e)**.

During reassembly take care to correctly insert the spacer (e) on the rear supports, as shown in the figure at the side.

To reassemble the Running Deck and Belt, carry out the above steps in reverse order.

7.22.4.2. B Typology

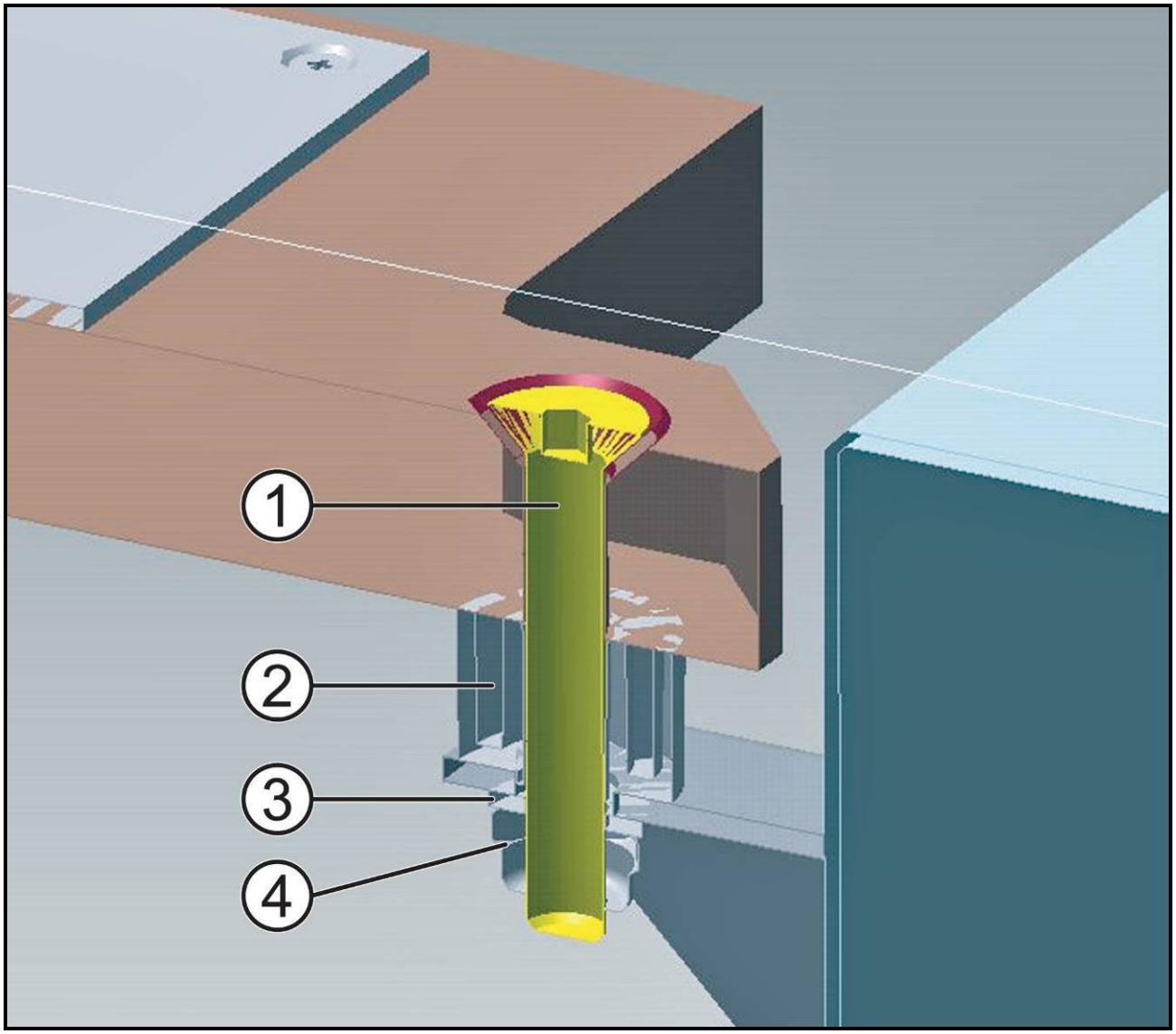

Figure 7.22-22

1. Back off the 2 screws **(1)** that fixing the running deck at the frame, using a 10mm hexagonal wrench, locking down the nut on the opposite side using a 17mm wrench.

2. Remove the running deck and the belt.

During the reassembly respect the sequence indicated in the figure.

CAUTION: During the reassembly lock down the screw (1) using a torque wrench settings on 30Nm.

7.22.5. DISASSEMBLING THE SHOCK ABSORBER

Carry out the procedure described in paragraph: 7.22.4. "Disassembling the running deck and belt".

7.22.5.1. A Typology

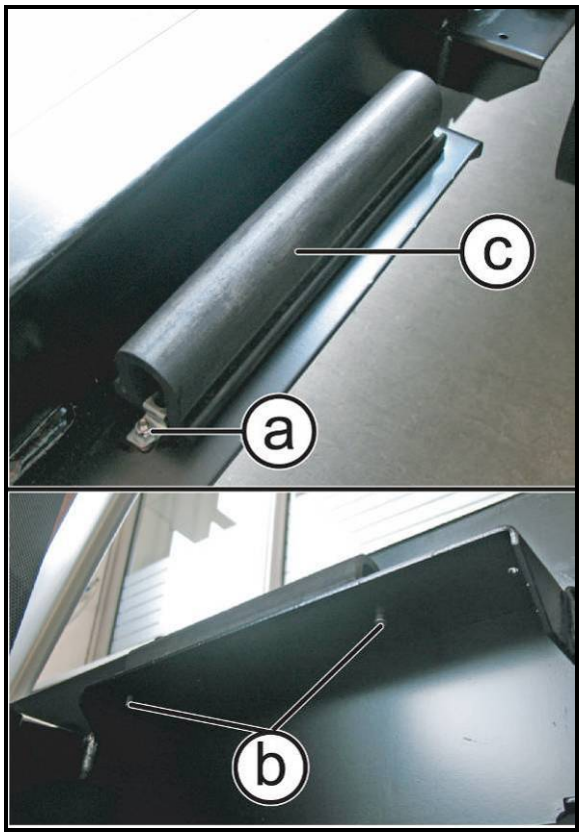

Figure 7-23

1. Block the nut **(a)** using a 7mm wrench and back off the 2 screws **(b)** using a 3mm wrench.

2. Remove the shock absorber **(c)**.

To reassemble the Shock absorber, carry out the above steps in reverse order.

CAUTION: During the reassembly lock down the screws (b) using a torque wrench set for 3Nm.

CAUTION: At the end of the procedure, check the tension and alignment of the tread belt as detailed at paragraphs: 8.1. "Tensioning the tread belt" and in the paragraph: 8.2. "Centring the tread belt".

7.22.5.2. B Typology

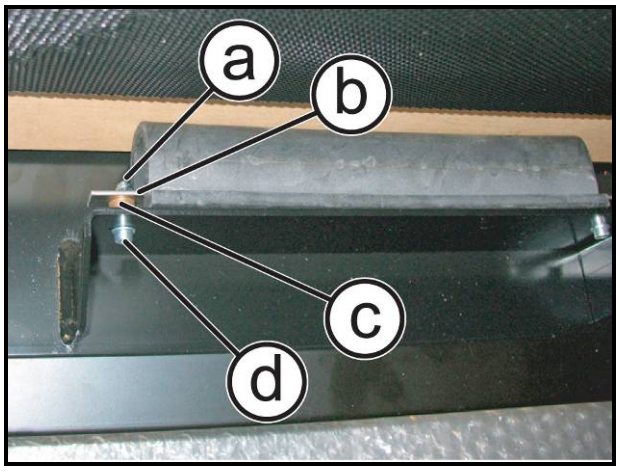

Figure 7.22-24

1. Back off the 2 screws **(n)** using a 3mm hexagonal wrench, docking down the nut **(q)** on the opposite side.

During the reassembling follows the sequence indicated:

- ***Screw (d),***
- ***Bush (c),***
- ***Plate (b),***
- ***Locking nut (a).***

To reassemble the various components, carry out the above steps in reverse order.

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8. ADJUSTMENTS

8.1. TENSIONING THE TREAD BELT

8.1.1. TENSIONING A NEW TREAD BELT

Figure 8-1

1. After replacing the tread belt, place a tape measure along the centre of the tread belt and use a pen to make two reference marks spaced exactly **1m** apart.

Do not measure the tread belt on the junction area, in order to keep the correct value.

2. Screw alternately the 2 screws **(a)** until the distance between the reference marks increases by **6mm**.

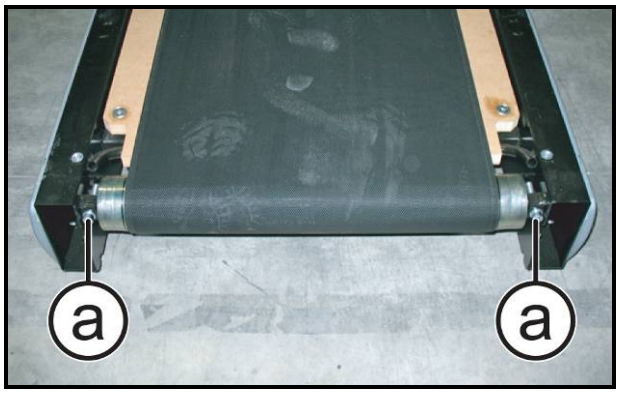


Figure 8-2

Take care that the roller is always approximately parallel with the one on the front, to counteract the tension exerted by the belt on the roller bearings.

CAUTION: After completing this procedure, check the centring of the tread belt as instructed in paragraph: 8.2. "Centring the tread belt".

8.1.2. TENSIONING A USED TREAD BELT

Figure 8-3

1. Before slackening a used tread belt that needs to be re-tensioned, place a tape measure along the centre of the tread belt and use a pen to make two reference marks spaced exactly **1m** apart.

2. After reassembling the used tread belt, lock down by turns the 2 screws **(a)** until the distance between the two reference marks made previously on the tread belt are once again spaced **1m** apart.

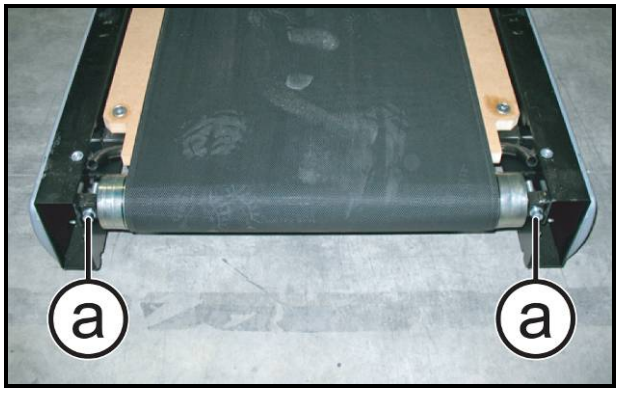


Figure 8-4

Take care that the roller is always approximately parallel with the one on the front, to counteract the tension exerted by the belt on the roller bearings.

This procedure is normally carried out after replacing the rear or driving roller, or in cases where a used tread belt needs to be reassembled.

CAUTION: After completing this procedure, check the centring of the tread belt as instructed in paragraph: 8.2. "Centring the tread belt".

8.2. CENTRING THE TREAD BELT

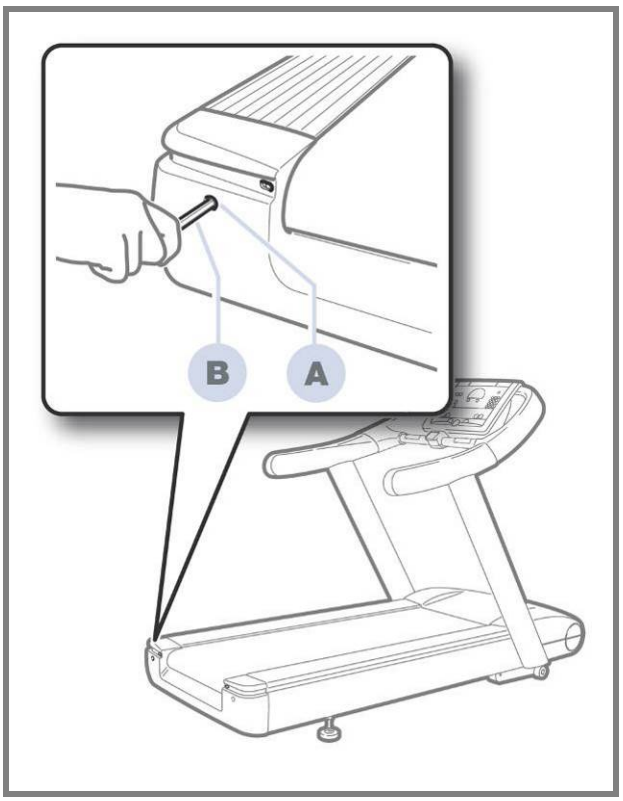


Figure 8.2-1

1. Start the machine at a speed of **10km/h**.
2. Observe the movement of the tread belt, correcting any tendency to shift to the right or left exclusively by adjusting the left tension screw **(a)**
3. Locking down this screw favours shifting of the belt to the right and vice versa.

The treadmill realigns slowly after some rotation: screw (or unscrew) the bolt ¼ or ½ a turn and then check the result before turning it again.

4. Gradually increase the speed to **16km/h,** making any small adjustments that are necessary until the tread belt is perfectly centred.

8.3. ADJUSTING THE LIMIT MICRO SWITCH

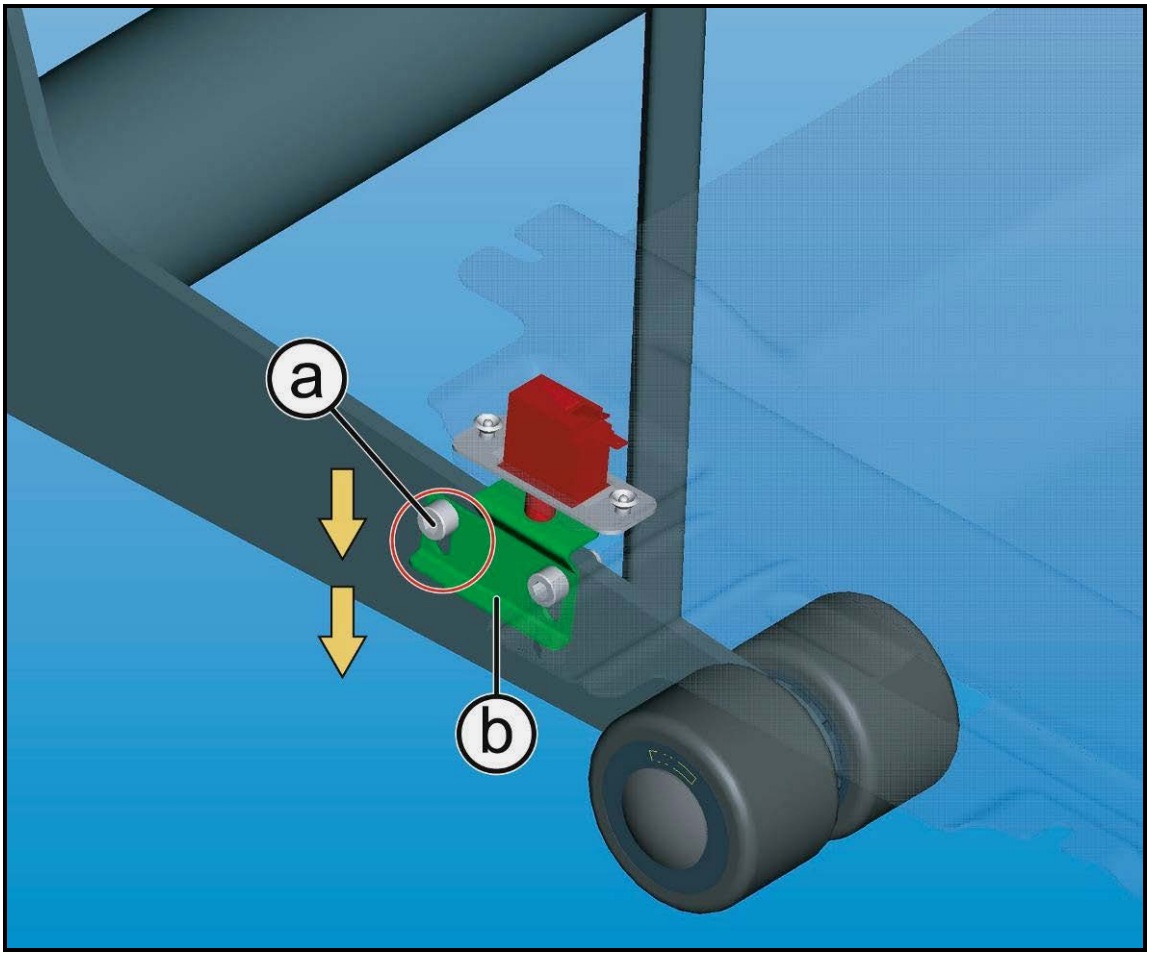


Figure 8-2

1. Loosen the 2 screws **(a)** that fixing the limit switch stop plate.
2. Adjust the position of the plate **(b)** completely **down**, as indicated by the yellow arrows above.
3. Finally, lock down the 2 screws **(a)** previously loosened.

CAUTION: During the reassembly lock down the screws (a) using a torque wrench set for 14Nm.

8.4. ALIGNING THE TREAD-BELT MOTOR DRIVE-BELT

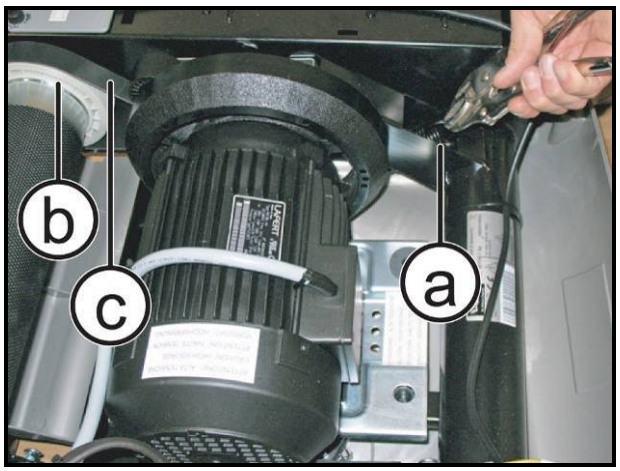


Figure 8-3

Carry out the procedure described in paragraph: 7.14.1. "Disassembling the upper guard".

1. Remove the dust guard.
2. Release the spring **(a)** of the belt tensioning mechanism.
3. Use a straight reference rod, resting it on the pulley **(b)** of the motor roller to align the belt **(c)** by shifting it within the races of the two pulleys.
4. At the end, reassembly the tension spring **(a)**.

8.5. THE MACHINE IS NOT FLAT

This problem may be due to the positioning of the machines on a not flat surface.
To level the machine, you may adjust the height of the levelling foot.

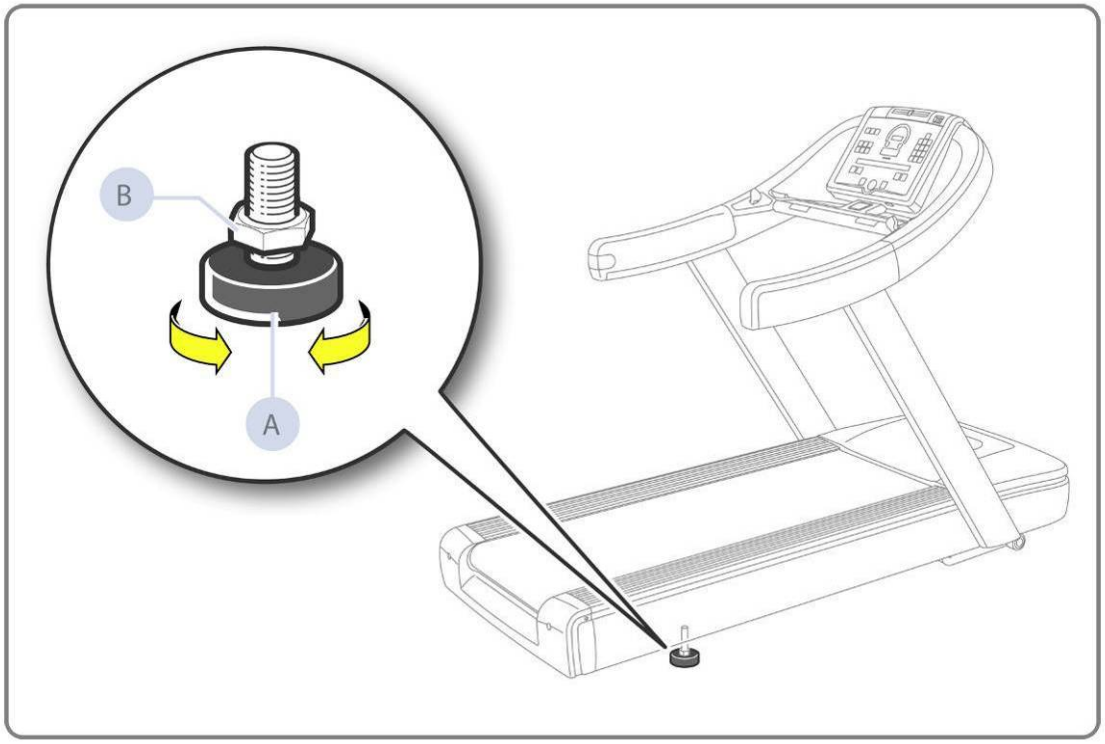


Figure 8-4

For the levelling adjustment, carry out the operation on the rear RIGHT foot, as shown in figure:

1. Screw or unscrew the foot **(a)** to bring the frame in a flat and stable position.
2. At adjustment made, lock down the nut **(b)**.

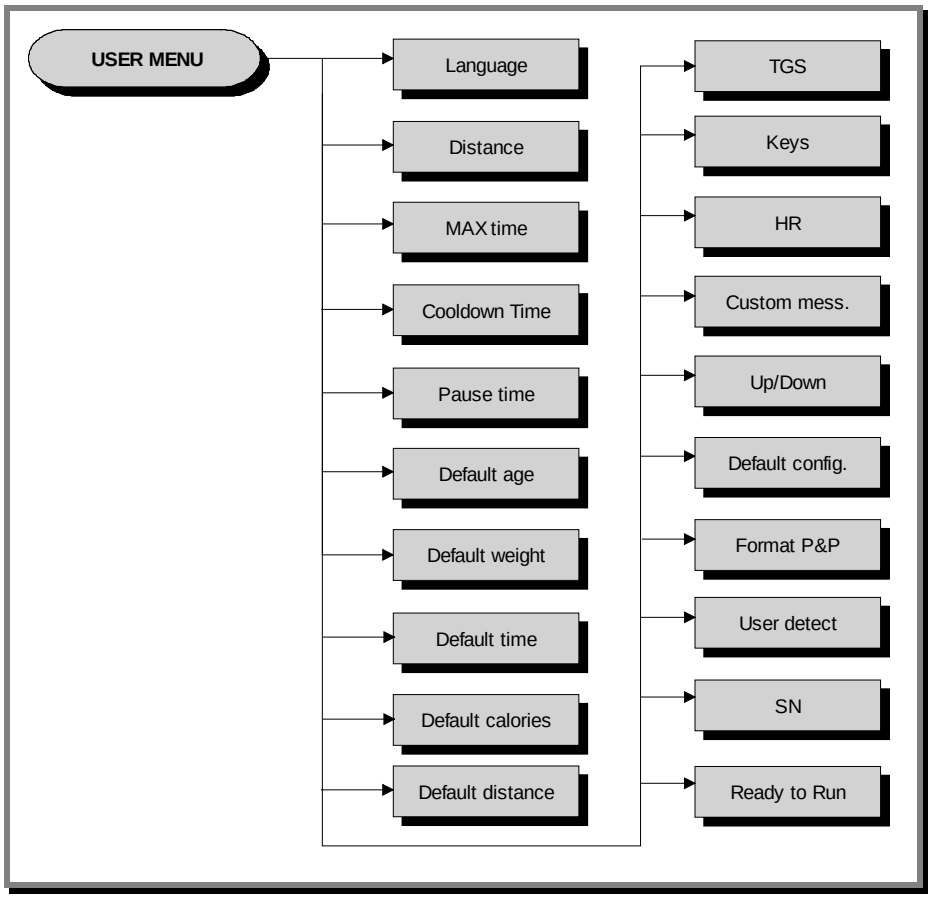
9. MACHINE CONFIGURATION

9.1. USER MENU: 500 LED MODELS

The machine configuration procedure is invoked by simultaneously pressing the keys **ENTER**, ↑, **CLEAR** when the machine is in standby mode. The following prompt appears on the LED display:

ENTER PASSWORD:

To access the procedure, insert the password **2406** and press **ENTER** to confirm. To enter the password without the numeric keypad, enter one digit at a time using the ↑ and ↓ keys to change the value and the **+/- GOAL** keys to scroll to the next character.
At this point the machine display begins showing the current configuration, structured as in the diagram below:



Press ENTER to scroll the parameters saving the settings otherwise press the + or - SPEED keys to scroll the parameters without saving. Press CLEAR to cancel or keep it pressed for few seconds to esc.

9.1.1. LANGUAGE

After selecting a language from the list of those available, all messages subsequently displayed by the machine will be in the chosen language. To change the selection, when the LED matrix shows the current setting:

LANGUAGE : xxx

Press the +/- **GOAL** keys to select the desired language from the options available.

9.1.2. DISTANCE

It is possible to choose between EUROPEAN units (Kg e Km) or IMPERIAL units (lbs e ml).
To change the selection, when the LED matrix shows the current setting:

DISTANCE: xxx

Press the **+/- GOAL** keys to select the desired unit of measurement from the options listed in the table below:

DISTANCE	
KM	*<default>*
MI	

9.1.3. MAXIMUM EXERCISE TIME

It is possible to set a maximum duration for the exercise in minutes, with values ranging from 1 to 9999. To change the setting, when the Display shows:

MAX TIME: xxx

Press the **ENTER** key to modify the parameter: when the current value of the parameter starts to blink, press the **CLEAR** key to erase the current value and then enter one digit at a time using the ↑ and ↓ keys to change the value and the +/- **GOAL** keys to scroll to the next character.

The default value of this parameter is 9999.

9.1.4. COOLDOWN TIME

It is possible to set the cooldown time for each exercise, ranging from 5 to 180 seconds. To change the setting, when the display shows the currently selected maximum time:

COOLDOWN TIME xxx

Press the **ENTER** key to change the value: The current parameter value starts to blink on the display; use the ↑ and ↓ keys to increase or decrease the value, or use the **+/- GOAL** keys to scroll through and modify the individual digits.

The default value of this parameter is 60.

If you are exercising with a TGS key, the cooldown will be stopped if you extract the key.

9.1.5. PAUSE TIME

It is possible to set a maximum duration of the pause for every exercise in seconds, with values ranging from 10 to 999. To change the setting, when the Display shows:

PAUSE TIME: xxx

Press the **ENTER** key to change the parameter: the current value of the parameter will start to blink, at this point press the **CLEAR** key to erase the current value and then enter one digit at a time using the ↑ and ↓ keys to change the value and the +/- **GOAL** keys to scroll to the next character.

The default value of this parameter is 60.

In case you are exercising using a TGS key, the exercise is stopped if you remove the TGS key

9.1.6. DEFAULT AGE

It is possible to set the default age for a generic user, with values ranging from 10 to 99. To change the setting, when the LED matrix shows the current setting:

DEFAULT AGE: xx

Press the **ENTER** key to change the parameter: the current value of the parameter will start to blink, at this point press the **CLEAR** key to erase the current value and then enter one digit at a time using the ↑ and ↓ keys to change the value and the +/- **GOAL** keys to scroll to the next character.

The default value of this parameter is 30.

9.1.7. DEFAULT WEIGHT

It is possible to set the default weight of a generic user in KG, with values ranging from 10 to 999. To change the setting, when the LED matrix shows the current setting:

DEFAULT WEIGHT: KG xx

Press the **ENTER** key to change the parameter: the current value of the parameter will start to blink, at this point press the **CLEAR** key to erase the current value and then enter one digit at a time using the ↑ and ↓ keys to change the value and the +/- **GOAL** keys to scroll to the next character.

The default value of this parameter is 70.

9.1.8. DEFAULT TIME

It is possible to set the default duration of the exercise in minutes, with values ranging from 10 to 999. To change the setting, when the LED matrix shows the current time:

DEFAULT TIME: MIN. xxx

Press the **ENTER** key to change the parameter: the current value of the parameter will start to blink, at this point press the **CLEAR** key to erase the current value and then enter one digit at a time using the ↑ and ↓ keys to change the value and the +/- **GOAL** keys to scroll to the next character.

The default value of this parameter is 15.

9.1.9. DEFAULT CALORIES

It is possible to set the calories for every exercise, with values ranging from 10 to 999. To change the setting, when the LED matrix shows the current setting:

DEFAULT CALORIES: xxx

Press the **ENTER** key to change the parameter: the current value of the parameter will start to blink, at this point press the **CLEAR** key to erase the current value and then enter one digit at a time using the ↑ and ↓ keys to change the value and the +/- **GOAL** keys to scroll to the next character.

The default value of this parameter is 300.

9.1.10. DEFAULT DISTANCE

It is possible to set the distance for every exercise in Km, with values ranging from 1 to 999. To change the setting, when the LED matrix shows the current setting:

DEFAULT DISTANCE: KM xxx

Press the **ENTER** key to change the parameter: the current value of the parameter will start to blink, at this point press the **CLEAR** key to erase the current value and then enter one digit at a time using the ↑ and ↓ keys to change the value and the +/- **GOAL** keys to scroll to the next character.

The default value of this parameter is 10.

9.1.11. ENABLE TGS

It is possible to enable or disable the use of the TGS reader. To change the selection, when the LED matrix shows the current setting:

TGS: xxx

Press the **+/- GOAL** keys to select the desired option from those listed in the table below:

TGS	
ENABLED	<*default*>
DISABLED	

9.1.12. ENABLE KEYBOARD

It is possible to disable the keyboard so that the machine can only be used with the TGS. To change the setting, when the LED matrix shows the current one:

KEYS: xxx

Press the **+/- GOAL** keys to select the desired option out of those listed in the table below:

KEYS	
ENABLED	<*default*>
DISABLED	

9.1.13. MODIFIABLE TARGET HEART RATE

It is possible to enable or disable modification of the target heart rate during a constant heart rate exercise. To change the selection, when the LED matrix shows the current value:

HR: xxx

Press the **+/- GOAL** number keys to select the desired option out of those listed in the table below:

HR
MODIFIABLE <*default*>
NOT MODIFIABLE

9.1.14. ENABLE CUSTOM MESSAGES

It is possible to configure whether a custom message is displayed when the machine is in the standby state. To change the selection, when the LED matrix shows the current setting:

CUSTOM MESS.: xxx

Press the **+/- GOAL** number keys to select the desired option out of those listed in the table below:

CUSTOM MESS.	
YES	<*default*>
NO	

9.1.15. ENABLE UP-DOWN MOTOR

This parameter enables or disables use of the machine incline. To change the selection, when the LED matrix shows the current setting:

UP - DOWN: xxx

Press the **+/- GOAL** number keys to select the desired option out of those listed in the table below:

UP - DOWN	
ENABLED	<*default*>
DISABLED	

9.1.16. RESETTING PARAMETERS TO DEFAULT VALUES

It is possible to reset the user menu parameters to their default values. To select the function, when the display shows:

DEFAULT CONFIG.

Press **ENTER** to confirm the operation, use the + or – effort level keys to move to the next or preceding parameter. If the **ENTER** key is pressed the display will show:

CONFIRM ?

press **ENTER** to confirm, or cancel by pressing the **CLEAR** key for a few seconds.

9.1.17. FORMAT P&P KEY

This function formats a TGS key for Plug&Play mode operation. To select the function, when the display shows:

FORMAT P&P

Press **ENTER** to confirm. At the end of the formatting procedure, hold down the **CLEAR** key for a few seconds to exit. The **CLEAR** key can be pressed at any time to interrupt the procedure and revert to standby mode.

9.1.18. USER DETECT

This function is able to detect the presence of a user running on the tread belt during an exercise session. It is possible to configure a minimum speed at which the machine will determine that the user has stopped running on the treadmill, and interrupt the exercise session if the condition persists for one minute. To change the setting, when the LED matrix shows the current duration:

USER DETECT: XXX

Press the **ENTER** key to change the parameter: when the current parameter value starts to blink, press the **CLEAR** key to erase the current value and then use the number keys to enter the desired new value.

The default value of this parameter is 5.0 km/h

The minimum threshold speed for the user detect function is 3.0 km/h. Entering any value lower than this will have the effect of disabling the user-detect function.

If the unit of measurement is setted to IMPERIAL units (miles / pound), the default value for this parameter is 3 mph while the minimum speed is 2 mph.

At the end of the format procedure, hold down the **CLEAR** key for a few seconds to exit. The **CLEAR** key can be pressed at any time to interrupt the procedure and revert to standby mode.

9.1.19. SERIAL NUMBER

This parameter shows the serial number of the machine.

SN:XXXXX

9.1.20. INMOTION – (READY TO RUN)

It is possible to set how many time (in minutes) before the end of the exercise, the RED light on the handlebar, should starts blinking to indicate the soon end of the exercise. InMotion function is managed in minutes, with values ranging from 0 to 5.
To change the setting, when the LED matrix shows the current time:

INMOTION (MIN): X

Press the **ENTER** key to change the parameter: the current value of the parameter will start to blink, at this point press the **CLEAR** key to erase the current value and then enter one digit at a time using the ↑ and ↓ keys to change the value and the +/- **GOAL** keys to scroll to the next character.

The default value of this parameter is 1.

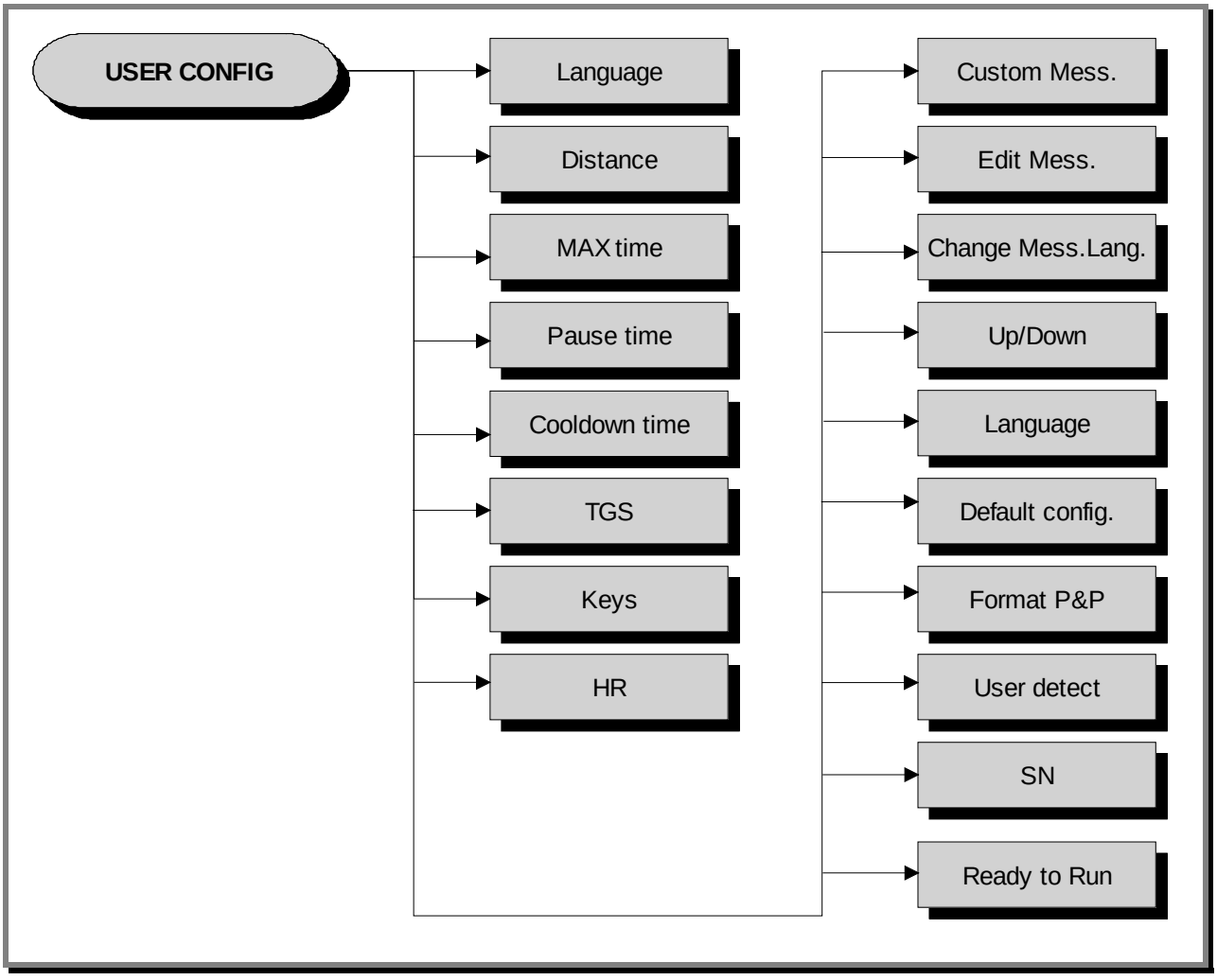
Setting "0" this parameter will have the effect of disabling the function.

9.2. USER MENU: 700 - 900 LED MODELS

The machine configuration procedure is invoked, when the machine is in standby mode, by simultaneously pressing the keys **369**, whereas on 700 Wellness TV models the keys **0369** must be pressed one after the other. The following prompt appears on the display:

ENTER PASSWORD:

To access the procedure, type in the password **2406** and press **ENTER** to confirm. At this point the machine display begins showing the current configuration, structured as in the diagram below:



9.2.1. LANGUAGE

After selecting a language from the list of those available, all messages subsequently displayed by the machine will be in the chosen language. To change the selection, when the LED matrix shows the current setting:

LANGUAGE : xxx

Press the +/- **GOAL** keys to select the desired language from the options available. Press **ENTER** to confirm the choice, use the + or – speed keys to move to the next or previous parameter.

9.2.2. DISTANCE

It is possible to choose between EUROPEAN units (kg and km) or IMPERIAL units (pounds and miles). To change the selection, when the LED matrix shows the current setting:

DISTANCE : xxx

Press the **+/- GOAL** keys to select the desired unit of measurement from the options listed in the table below:

DISTANCE	
KM	*<default>*
MLS	

9.2.3. MAXIMUM EXERCISE TIME

It is possible to set a maximum duration for the exercise in minutes, with values ranging from 1 to 9999. To change the setting, when the LED matrix shows the current maximum time limit:

MAX TIME: xxx

Press the **ENTER** key to modify the parameter: when the current value of the parameter starts to blink, press the **CLEAR** key to erase the current value and then use the number keys to enter the desired value.

The default value of this parameter is 9999.

9.2.4. PAUSE TIME

It is possible to set a maximum duration of the pause for every exercise in seconds, with values ranging from 10 to 999. To change the setting, when the LED matrix shows the current maximum pause time:

PAUSE TIME : xxx

Press the **ENTER** key to change the parameter: the current value of the parameter will start to blink, at this point press the **CLEAR** key to erase the current value and then use the number keys to enter the desired new value.

The default value of this parameter is 60.

9.2.5. COOLDOWN TIME

It is possible to set the cooldown time for each exercise, ranging from 5 to 180 seconds. To change the setting, when the display shows the currently selected maximum time:

COOLDOWN TIME xxx

Press the **ENTER** key to change the parameter: the current value of the parameter will start to blink, at this point press the **CLEAR** key to erase the current value and then use the number keys to enter the desired new value.

The default value of this parameter is 60.

If you are exercising with a TGS key, the cooldown will be stopped if you extract the key.

9.2.6. ENABLE TGS

It is possible to enable or disable the use of the TGS reader. To change the selection, when the display shows the current setting:

TGS : xxx

Press the **+/- GOAL** keys to select the desired option out of those listed in the table below:

TGS	
ENABLED	<*default*>
DISABLED	

9.2.7. ENABLE KEYBOARD

It is possible to disable the keyboard so that the machine can only be used with the TGS. To change the selection, when the display shows the current setting:

KEYS : xxx

Press the **+/- GOAL** keys to select the desired option out of those listed in the table below:

KEYS	
ENABLED	<*default*>
DISABLED	

9.2.8. MODIFIABLE TARGET HEART RATE

It is possible to enable or disable modification of the target heart rate during a constant heart rate exercise. To change the selection, when the display shows the current setting:

HR : xxx

Press the **+/- GOAL** number keys to select the desired option out of those listed in the table below:

HR
MODIFIABLE <*default*>
NOT MODIFIABLE

9.2.9. ENABLE CUSTOM MESSAGES

It is possible to configure whether a custom message is displayed when the machine is in the standby state. To change the selection, when the LED matrix shows the current setting:

CUSTOM MESS. : xxx

Press the **+/- GOAL** number keys to select the desired option out of those listed in the table below:

CUSTOM MESS.	
YES	<*default*>
NO	

9.2.10. EDIT MESSAGES

It is possible to modify the custom messages; press **ENTER** to invoke a submenu which displays the first custom message, then use the +/- speed keys to move to the other messages. Press the **ENTER** key again to begin editing a message, or hold down the **CLEAR** key for a few seconds to return to the upper menu level. While editing a message, move the cursor using **+/- GOAL**, select the desired letter using the +/- speed keys and use **CLEAR** to enter a blank space character. Press **ENTER** to save the modified message, or hold down the **CLEAR** key to cancel and return to the upper menu level.

9.2.11. CHANGE MESSAGGES LANGUAGES

It is also possible to display the custom standby messages in the language selected with the preceding parameter. To extend the language setting to the predefined custom standby messages, when the LED display is showing the current selection:

CHANGE MESS. LANGUAGE

9.2.12. ENABLE UP-DOWN MOTOR

This parameter enables or disables use of the machine incline. To change the selection, when the LED matrix shows the current setting:

UP-DOWN: xxx

Press the +/- **GOAL** keys to select the desired option out of those listed in the table below:

UP-DOWN	
ENABLED	<*default*>
DISABLED	

9.2.13. ENABLE MULTI-LANGUAGE MODE

The machine can be configured to allow selection of the language at each session. To change the selection, when the LED matrix shows the current setting:

LANGUAGE : xxx

Press the +/- **GOAL** number keys to select the desired option out of those listed in the table below:

LANGUAGE	
FIXED	<*default*>
OPTIONAL	

9.2.14. RESETTING PARAMETERS TO DEFAULT VALUES

It is possible to reset the user menu parameters to their default values. To select the function, when the LED matrix shows:

DEFAULT CONFIG.

Press **ENTER** to confirm the operation, use the + or – speed keys to move to the next or preceding parameter. If the **ENTER** key is pressed the LED matrix will show:

CONFIRM ?

press **ENTER** to confirm, or cancel by pressing the **CLEAR** key for a few seconds.

9.2.15. FORMAT P&P

This function formats a TGS key for Plug&Play mode operation. To select the function, when the LED matrix shows:

FORMAT P&P

press **ENTER** to confirm. At the end of the format procedure, hold down the **CLEAR** key for a few seconds to exit. The **CLEAR** key can be pressed at any time to interrupt the procedure and revert to standby mode.

9.2.16. USER DETECT

This function is able to detect the presence of a user running on the tread belt during an exercise session. It is possible to configure a minimum speed at which the machine will determine that the user has stopped running on the treadmill, and interrupt the exercise session if the condition persists for one minute. To change the setting, when the LED matrix shows the current duration:

USER DETECT: xxx

Press the **ENTER** key to change the parameter: when the current parameter value starts to blink, press the **CLEAR** key to erase the current value and then use the number keys to enter the desired new value.

The default value of this parameter is 5.0 km/h

The minimum threshold speed for the user detect function is 3.0 km/h. Entering any value lower than this will have the effect of disabling the user-detect function.

If the unit of measurement is setted to IMPERIAL units (miles / pound), the default value for this parameter is 3 mph while the minimum speed is 2 mph.

At the end of the format procedure, hold down the **CLEAR** key for a few seconds to exit. The **CLEAR** key can be pressed at any time to interrupt the procedure and revert to standby mode.

9.2.17. SERIAL NUMBER

This parameter shows the serial number of the machine.

SN:xxxx

9.2.18. INMOTION – (READY TO RUN)

It is possible to set how many time (in minutes) before the end of the exercise, the RED light on the handlebar, should starts blinking to indicate the soon end of the exercise. InMotion function is managed in minutes, with values ranging from 0 to 5.
To change the setting, when the LED matrix shows the current time:

INMOTION (MIN): X

Press the **ENTER** key to change the parameter: when the current parameter value starts to blink, press the **CLEAR** key to erase the current value and then use the number keys to enter the desired new value.

The default value of this parameter is 1.

Setting "0" this parameter will have the effect of disabling the function.

9.3. SERVICE MENU CONFIGURATION: LED MODELS

The configuration procedure is invoked when the machine is in standby mode, using a different procedure for the 500, 700 or 900 models.

9.3.1. ACCESSING CONFIGURATION OF 500 MODELS

Simultaneously press the **ENTER**, ↑, **CLEAR** keys. The following prompt appears on the display:

ENTER PASSWORD:

To access the procedure, type in the password **2501** which protects against unauthorized access and press "Enter" to confirm. To enter the password, increase or decrease the displayed value using the ↑ and ↓ keys, or use the **+/- GOAL** keys to scroll through and modify the individual digits.
At this point there are two options available:

↑ = Tech Config
↓ = Troubleshooting

Press numeric key ↑ to access the menu for configuring technical parameters; the machine display will begin showing the current configuration, structured as in the diagram below:

9.3.2. ACCESSING CONFIGURATION OF 700 AND 900 MODELS

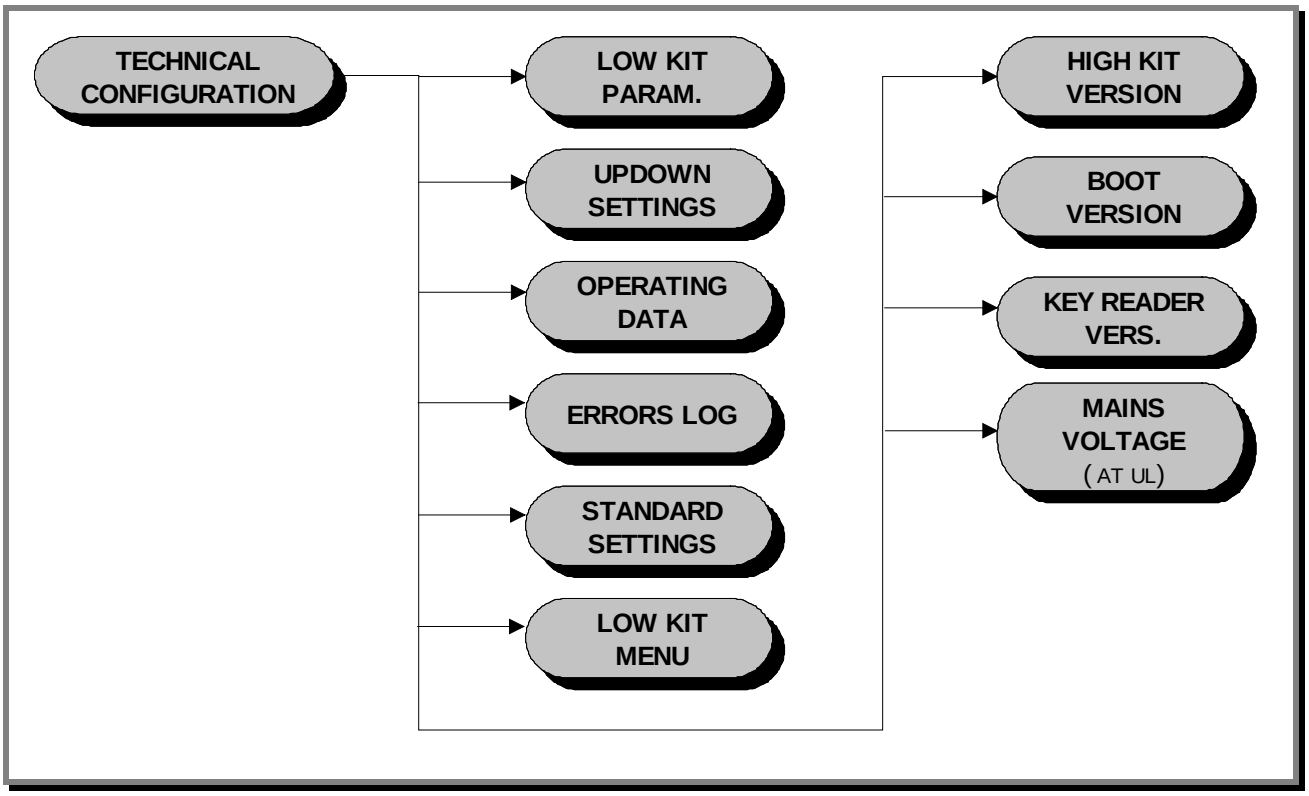
Simultaneously press the keys **369** for 700 models, whereas on 700 Wellness TV models the keys **0369** must be pressed one after the other. The following prompt appears on the display:

ENTER PASSWORD:

To access the procedure, type in the password **2501** which protects against unauthorized access and press the "Enter" key to confirm. At this point there are two options available:

1 = Tech Config
2 = Troubleshooting

Press numeric key **1** to access the menu for configuring technical parameters; the machine display will begin showing the current configuration, structured as in the diagram below:



To scroll through the list of parameters, press the + or – effort level keys to display the next or the preceding item.

To modify a parameter value, it is necessary to press the **ENTER** key: when the current parameter value starts to blink, press the **CLEAR** key to erase the current value and then use the number keys to enter the desired new value. Save the changes made by pressing the **ENTER** key.

To cancel the operation, press the **CLEAR** key for a few seconds.

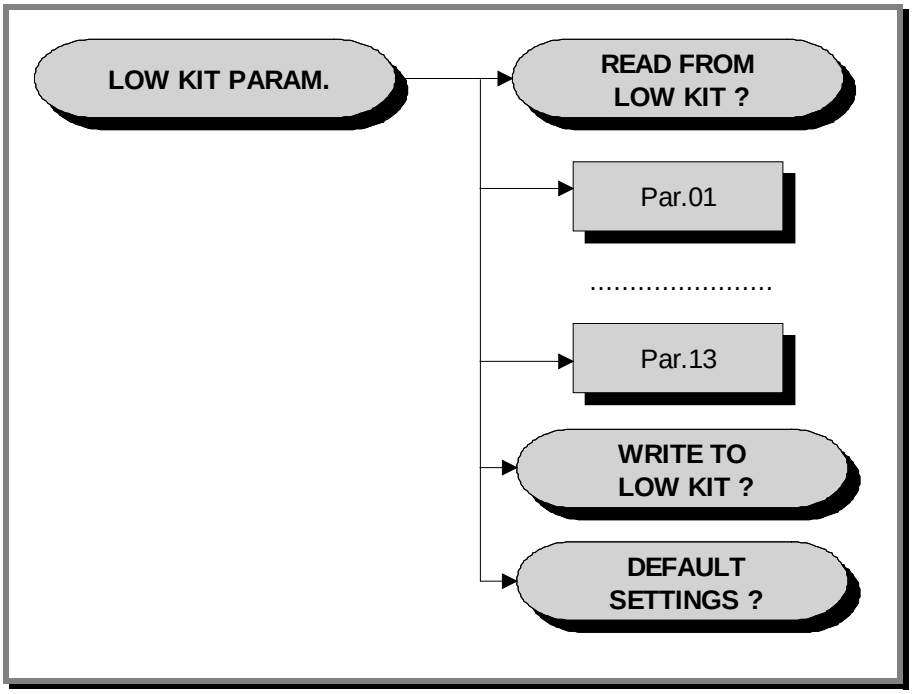
The various parameters are described below.

9.3.3. LOW KIT PARAMETER

This function provides access to parameters used for modifying certain settings of the lower assembly. To access this menu, when the display shows:

LOW KIT PARAM.

press **ENTER**. This function is structured as follows:



In addition to the 13 configuration parameters, this function also includes the 3 sub-functions described below:

9.3.3.1. Read from low kit

To read the parameter values from the low kit memory and view them on the display, scroll using the +/- keys until the display shows:

READ FROM LOW KIT ?

press **ENTER** to read the errors from the low kit, and return to the upper menu level by pressing **CLEAR** for a few seconds.

9.3.3.2. Write to low kit

To write the values of the currently displayed parameters to the low kit, scroll using the +/- keys until the display shows:

WRITE TO LOW KIT ?

press **ENTER** to write the parameters to the low kit, and return to the upper menu level by pressing **CLEAR** for a few seconds.

9.3.3.3. Default Setting

To load the default parameter values, scroll using the +/- effort level keys until the display shows:

DEFAULT SETTING ?

press **ENTER** to write the default values to the low kit, and return to the upper menu level by pressing **CLEAR** for a few seconds.

To write these parameters to the low kit, use the "Write to low kit" function.

9.3.3.4. Table of configuration parameters (LED):

Display parameter	*Unit of measure*	*Description*	*LED* *Default values*
P01	*Kmh*10*	*Default linear speed*	***8***
P02	*(Kmh*100)/sec*	*Default acceleration and deceleration*	***100***
P03	*%*2*	*default slope set point*	***0***
P04	*Numerical Constant*	*PID proportional gain*	***7***
P05	*Numerical Constant*	*PID Integral gain*	***150***
P06	*Numerical constant*	*S Ramp Type*	***0***
P07	*on/off*	*Flag DC motor encoder signal alarm action*	***0***
P08	*10msec*	*Watchdog serial communication*	***0***
P09	*1msec*	*DC motor encoder error timeout 1 cnt = 100 msec*	***15***
P10	*on/off*	*Flag signal receiving Sw Emergency and not receiving Emergency Hw*	***0***
P11	*mm*	*roll diameter*	***91***
P12	*Numerical constant*100*	*roller diameter*	***200***
P13	*on/off*	*Flag posting warning signal AC motor encoder*	***0***

I.e.

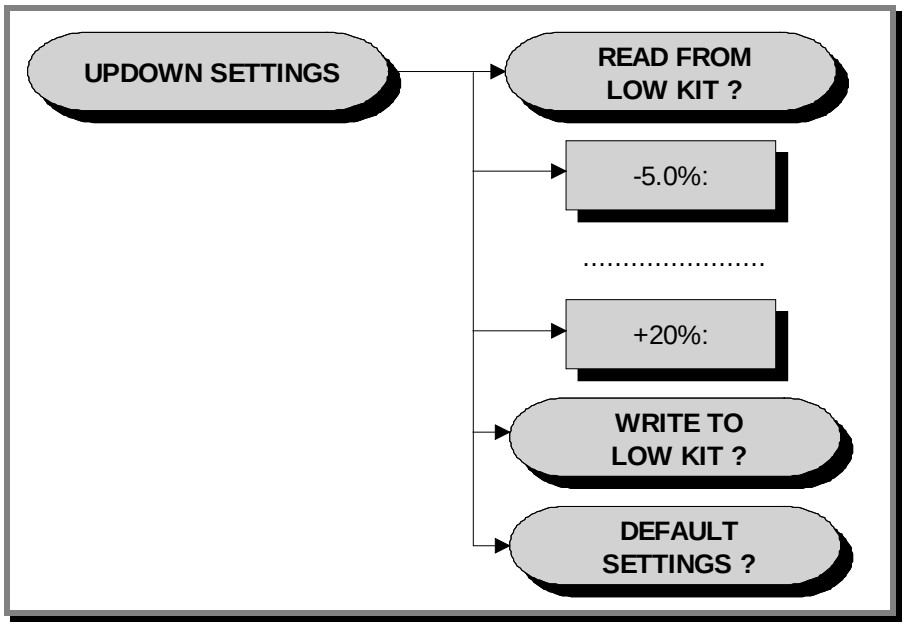
- *P01 = kmh = 8 / 10 is the 0.8kmh of start, (as if the unit was hundreds of meters times).*
- *P02 = 100 means the acceleration expressed in kmh/sec is 100 / 100 = 1 where the 100 is the value of the numerator and the denominator is the default 100 of formula. (cents of kmh/sec)*
- *P03moltiplication by two is to take steps of 0.5%, this basically 2 means 1%.*
- *Numerical Constant: P04-P05-P06 is a pure numbers, multiplicative constants used by the firmware.*
- *P07, P10, P13 is a Boolean flag, yes or not.*
- *P08 is expressed in tens of msec: if P08 = 100 will be a second.*
- *P12 = 211 means that the transmission ratios is 2.11.*

9.3.4. UPDOWN SETTINGS

This function allows access to the parameters in the UpDown table which define the number of encoder pulses that correspond to different machine incline positions. To access this menu, when the LED display shows:

UPDOWN SETTINGS

press **ENTER**. This function is structured as follows:



In addition to the 50 configuration parameters, this function also includes the 3 sub-functions described below:

9.3.4.1. Read from low kit

To read the parameter values from the low kit memory to view them on the display, scroll using the +/- keys until the LED display shows

READ FROM LOW KIT ?

press **ENTER** to read the parameters from the low kit, then return to the upper menu level by pressing **CLEAR** for a few seconds.

9.3.4.2. Write to low kit

To write the values of the currently displayed parameters to the low kit, scroll using the +/- keys until the LED display shows:

WRITE TO LOW KIT ?

press **ENTER** to write the parameters to the low kit, and return to the upper menu level by pressing **CLEAR** for a few seconds.

9.3.4.3. Default setting

To load the default parameter values to the display, scroll using the +/- keys until the LED display shows:

DEFAULT SETTING ?

press **ENTER** to load the default parameter values, and return to the upper menu level by pressing **CLEAR** for a few seconds.

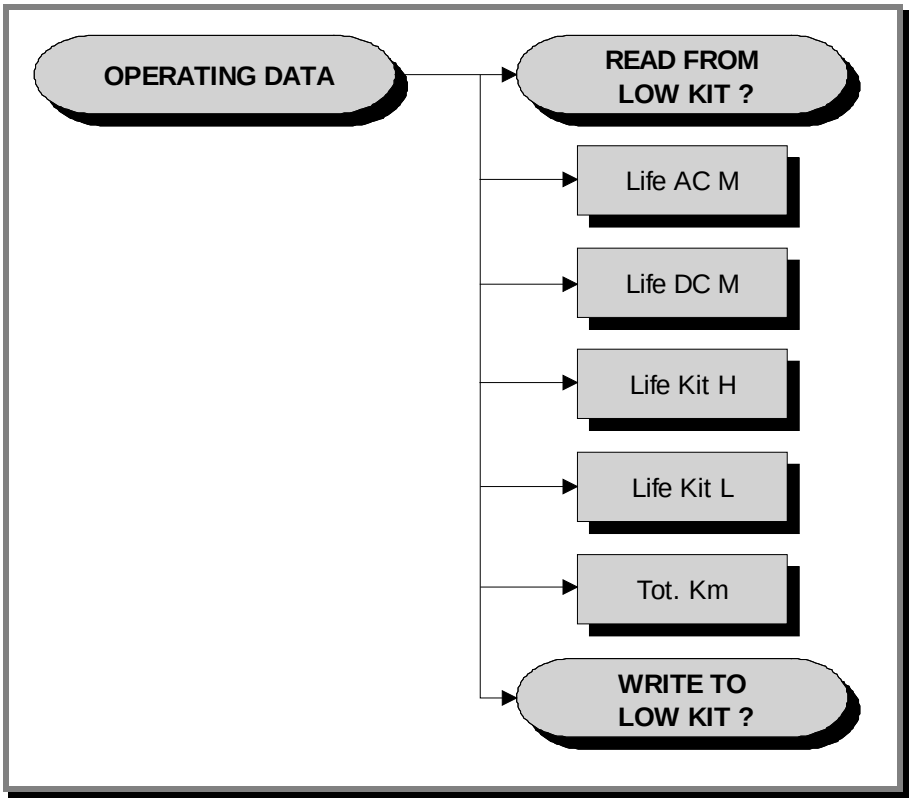
To write these parameters to the low kit, use the "Write to low kit" function.

9.3.5. OPERATING DATA

This function makes it possible to access the machine usage data stored in the low kit. To access this menu, when the display shows:

OPERATING DATA

press **ENTER**. This function is structured as follows:



In addition to the machine usage data, this function also includes the 2 sub-functions described below:

9.3.5.1. Read from low kit

To read the parameter values from the low kit memory and view them on the display, scroll using the +/- keys until the display shows:

READ FROM LOW KIT ?

press **ENTER** to read the errors from the low kit, and return to the upper menu level by pressing **CLEAR** for a few seconds.

9.3.5.2. Write to low kit

To write the values of the currently displayed parameters to the low kit, scroll using the +/- keys until the display shows:

WRITE TO LOW KIT ?

press **ENTER** to write the new data to the low kit, and return to the upper menu level by pressing **CLEAR** for a few seconds.

9.3.5.3. Machine usage data

The machine usage data on the display is updated every 10 minutes. This means that, whenever the machine is switched off, any data modified after the last memory update will be lost.

MESSAGE ON DISPLAY	DESCRIPTION
Life AC M:	*Minutes x 10 of tread belt motor operation*
Life DC M:	*Minutes of elevation motor operation*
High Kit Life:	*Minutes x 10 of operation of the upper assembly*
Low Kit Life:	*Minutes x 10 of operation of the lower assembly*
Tot. Km:	*Total km travelled*

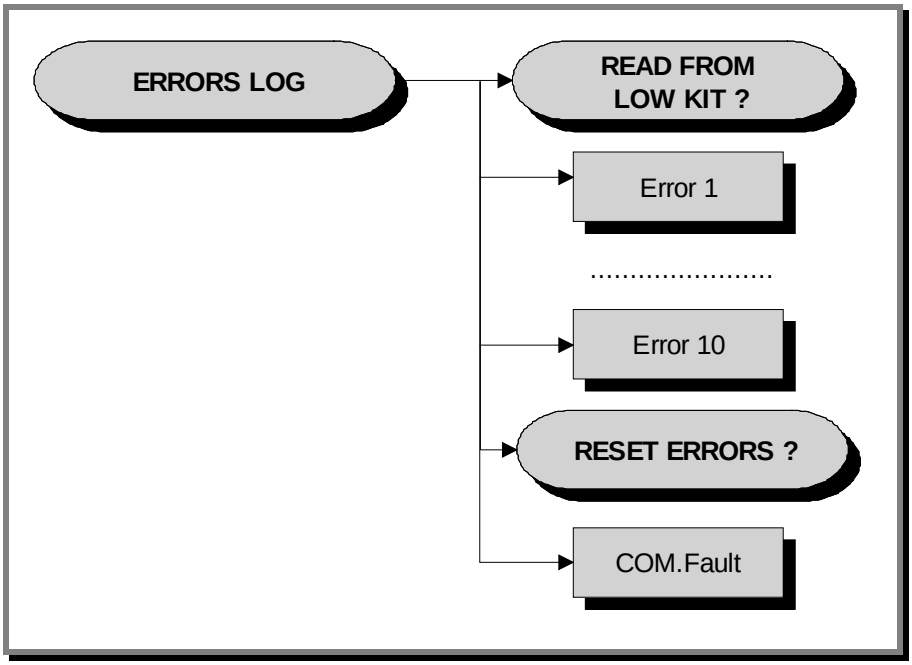
By selecting one of the items in the above table it is possible to modify its content, but only after having cleared its value. When the **ENTER** key is pressed the message "Reset life..." appears, followed by the name of the selected item; pressing **ENTER** again resets the value of the selected item, while pressing **CLEAR** reverts to the preceding value.

9.3.6. ERRORS LOG

This function accesses the machine's error history log. To access this menu, when the display shows:

ERRORS LOG

press **ENTER**. This function is structured as follows:



In addition to the error history log, this function also includes the 2 sub-functions described below:

9.3.6.1. Read from low kit

To read the errors stored in low kit memory and view them on the display, scroll using the +/- keys until the display shows:

READ FROM LOW KIT ?

press **ENTER** to read the errors from the low kit, and return to the upper menu level by pressing **CLEAR** for a few seconds.

9.3.6.2. Reset Errors

To clear the error history in both the low and high kit memory, scroll using the +/- keys until the display shows:

RESET ERRORS ?

press **ENTER** to clear the error history logs, and return to the upper menu level by pressing **CLEAR** for a few seconds.

9.3.6.3. COM.Fault

This is a counter that display the number of errors in serial communication between the upper and the lower kit. This counter increase each time a communication fault is detected. Scroll using the +/- keys until the display shows:

COM.FAULT X

To reset it press **ENTER**, the LED display shows:

RESET COM.FAULT?

press **ENTER** to reset and return to the upper menu level by pressing **CLEAR** for a few seconds.

9.3.6.4. View Errors

For every error generated by the machine, the error history log records the information in the table below:

- *Error number;*
- *Error code;*
- *Tension at the error moment;*
- *Current (*10)when the error occurred*
- *Speed at the error moment Km/h.*

The correspondence between error codes and descriptions is given at paragraph : 6.12. “driver errors” of this manual.

Use the + effort level key to advance to the next error, otherwise the message with the details of the current error will continue to reappear.

9.3.7. STANDARD SETTINGS

This function simultaneously resets the User menu, low kit, UpDown table parameters to their default values and the operating data of the machine. To access this menu, when the LED display shows:

STANDARD SETTING

press **ENTER**, the following message appears:

CONFIRM ?

Press **ENTER** again to reset all parameters to their default values, or return to the upper menu level by pressing **CLEAR** for a few seconds.

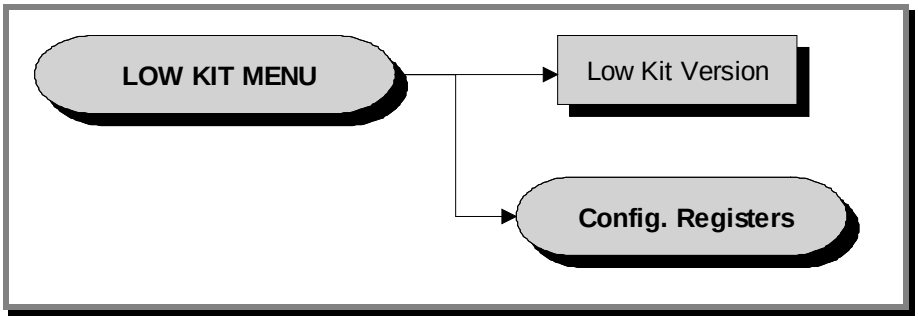
This function does not alter the language and the TV standard setting.

9.3.8. LOW KIT MENU

This function directly accesses the firmware of the inverter. To access this menu, when the LED display shows:

LOW KIT MENU

press **ENTER**. This function is structured as follows:



9.3.8.1. Low kit version

This function displays the inverter firmware version. To access this menu, when the LED display shows:

LOW KIT VERSION

press **ENTER**, the following message appears:

H:x L:x B:x

Which identifies the firmware version.

9.3.8.2. Config. registers

This function displays the parameter values of type b, C, D, F, P, H and S. To access this menu, when the LED display shows:

CONFIG REGISTERS

press **ENTER**, the following message appears:

ADDRESS: X

where X is the address identifying anAT UL driver parameter, as detailed in the tables at the end of the paragraph.

Press **ENTER** to change the address and select a different parameter, or press + to read the value of the currently selected parameter, the following message will appear:

READ FROM LOW KIT ?

press **ENTER** to load the parameter value, the following message will appear:

VALUE: Y

press **ENTER** to begin editing the parameter value. When finished, press + and the following message will appear:

WRITE TO LOW KIT ?

press **ENTER** to confirm writing the changes to the low kit; at the end of this operation the following message reappears:

ADDRESS: X

Although the changes made to the parameters come into effect immediately, they are not automatically stored in permanent memory; this requires a specific write operation effected using the command C-0: at address 800 write the value "1", following the detailed instructions provided in paragraph 9.3.8.2 "Config. registers".

To return to the upper menu level press **CLEAR** for a few seconds.

The inverter parameters are listed at paragraph: 9.5.3. "Inverter".

9.3.9. HIGH KIT VERSION

This function displays the SW version of the display. To do this, when the LED display shows:

HIGH KIT VERSION

press **ENTER**, the message that identifies the SW version, will appear.

9.3.10. BOOT VERSION

This function displays the BOOT version. To do this, when the display shows:

BOOT VERSION

press **ENTER** to display the message which identifies the BOOT version.

9.3.11. KEY READER VERSION

This function displays the SW version of the TGS reader. To do this, when the LED display shows:

KEY READER VERS.

press **ENTER**, the message that identifies the SW version, will appear.

9.3.12. MAINS VOLTAGE

This function allows the user to choose the proper power supply voltage for the machine. To change the selection when the LED matrix shows the current setting:

MAINS VOLTAGE: XXX

Press the +/- **GOAL** keys to select the desired voltage setting from the options available. Press **ENTER** to confirm the choice, use the + or – speed keys to move to the next or previous parameter. The alternatives are:

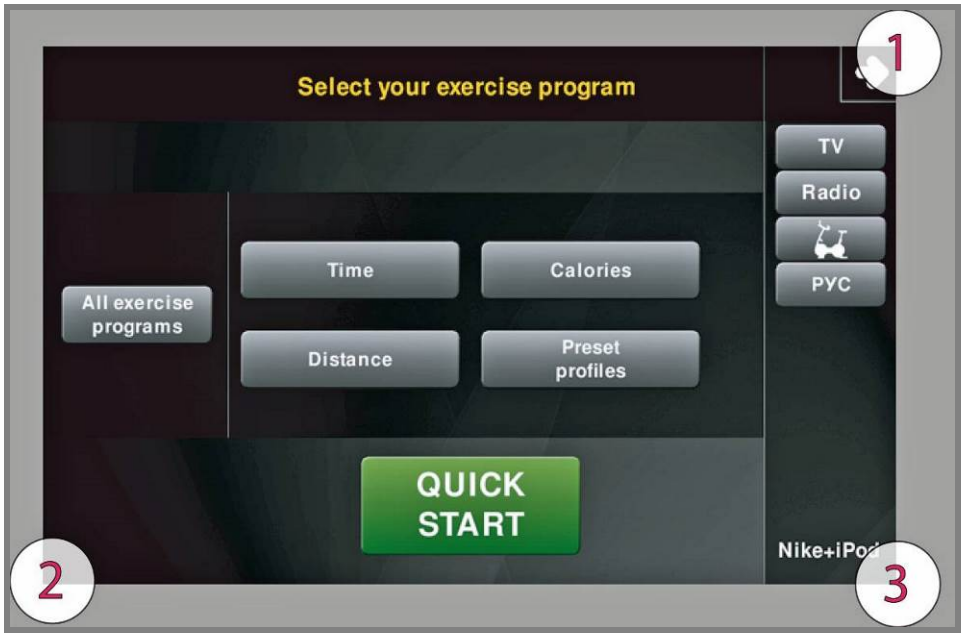
Mains Voltage
NO SET
100Vac
120Vac
230Vac

Choosing “NO SET” value, when the machine is switched on it is necessary to insert the power supply voltage provided by the electrical mains line.

☞ **Remember to properly set the parameter each time you replace the Display.**

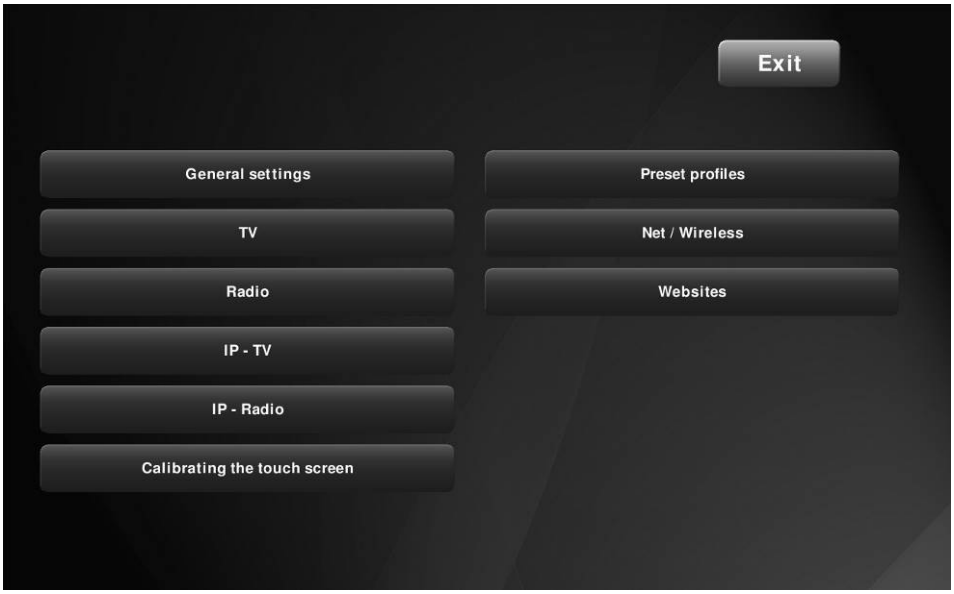
9.4. USER MENÙ: VISIO/VISIOWEB

The procedure is activated by pressing the top right-hand corner, the bottom left-hand corner and the bottom right-hand corner of the screen in that sequence, in Stand-By, as shown in the figure below:



A new display will appear from which you can gain access to the various configuration menus, by entering the password on the number keyboard:
Enter the password **2406** and press the **ENTER** key to confirm or **EXIT** to quit.

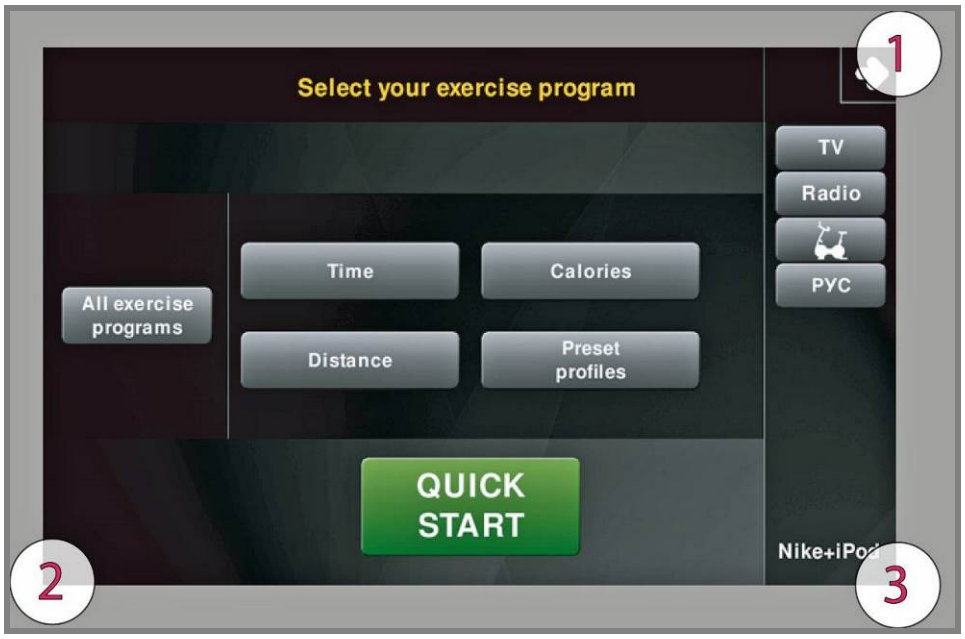
A menu will then appear which will provide access to the following sub-menus:



For the following menu, please refer to the relevant chapter in the VISIO manual.

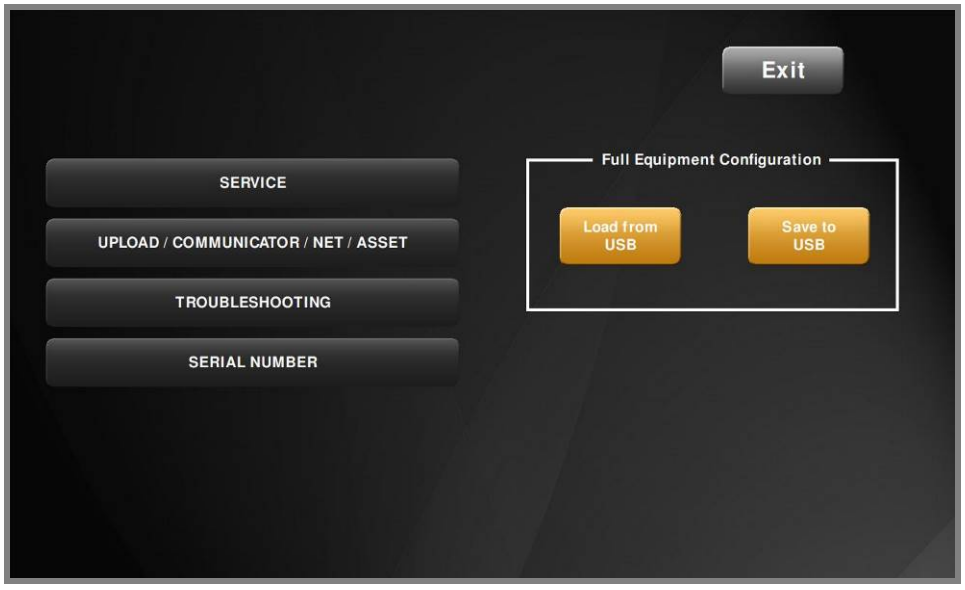
9.5. SERVICE MENU: VISIO/VISIOWEB

The procedure is activated by pressing the top right-hand corner, the bottom left-hand corner and the bottom right-hand corner of the screen in that sequence, in Stand-By, as shown in the figure below:



A new display will appear from which you can gain access to the various configuration menus, by entering the password on the number keyboard:
Enter the password **2501** and press the **ENTER** key to confirm or **EXIT** to quit.

A menu will then appear which will provide access to the following sub-menus:



For the following menu, please refer to the relevant chapter in the VISIO manual.

9.5.1.1. Table of configuration parameters (VISIO):

To correctly display the parameter values, you need to load them from the low kit, using the "Read from low kit" function.

After any changes to the parameter values, you need to save them in the low kit using the "Write to low kit" function.

Display parameter	*Unit of measure*	*Description*	*VISIO*
			Default values
P01	*Kmh*10*	*Default linear speed*	***8***
P02	*(Kmh*100)/sec*	*Default acceleration and deceleration*	***100***
P03	*%*2*	*default slope set point*	***0***
P04	*Numerical Constant*	*PID proportional gain*	***7***
P05	*Numerical Constant*	*PID Integral gain*	***150***
P06	*Numerical Constant*	*S Ramp Type*	***0***
P07	*on/off*	*Flag DC motor encoder signal alarm action*	***0***
P08	*10msec*	*Watchdog serial communication*	***0***
P09	*1msec*	*DC motor encoder error timeout 1 cnt = 100 msec*	***15***
P10	*on/off*	*Flag signal receiving Sw Emergency and not receiving Emergency Hw*	***0***
P11	*mm*	*roll diameter*	***91***
P12	*Numerical constant*100*	*roller diameter*	***200***
P13	*on/off*	*Flag posting warning signal AC motor encoder*	***0***

I.e.

- *P01 = kmh = 8 / 10 is the 0.8kmh of start, (as if the unit was hundreds of meters times).*
- *P02 = 100 means the acceleration expressed in kmh/sec is 100 / 100 = 1 where the 100 is the value of the numerator and the denominator is the default 100 of formula. (cents of kmh/sec)*
- *P03moltiplication by two is to take steps to 0.5%, this basically 2 means 1%.*
- *Numerical Constant: P04-P05-P06 is a pure number, multiplicative constant used by the firmware.*
- *P07, P10, P13 is a Boolean flag, yes or not.*
- *P08 is expressed in tens of msec: if P08 = 100 will be a second.*
- *P12 = 211 means that the transmission ratios is 2.11.*

9.5.2. REGISTER ADDR.

This button allows selecting a specific parameter of the inverter, which then can be read using the function described below: “Read from low kit”.

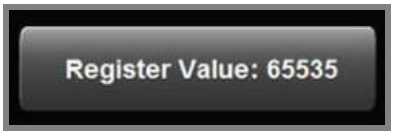
On the Display will appear a Numeric Keypad which allows entering and/or modifying the numerical value of the parameter. Press CLEAR to delete the old value and insert the new one, then press CONFIRM to save it.

9.5.2.1. Read from low kit

This button allows reading from Low Kit the value of the parameter set previously and displayed in the display.

9.5.2.2. Register Value

This button allows modifying the value of the parameters. Press the button:



On the Display will appear a Numeric Keypad which allows entering and/or modifying the numerical value of the parameter. Press CLEAR to delete the old value and insert the new one, then press CONFIRM to save it.

After any changes to the parameter values, you need to save them in the low kit using the “Write to low kit” function.

9.5.2.3. Write to low kit.

To write the values of the currently displayed parameters to the low kit, press the button:

Allows writing on the ALE inverter register, in case you have changed the data.

9.5.3. INVERTER PARAMETERS

MENU –A–							
Par.	*Address*	*Description*	*Value*	*Par.*	*Address*	*Description*	*Value*
A-0	1200	PID mode (700/900)	1	A-59	1218	PID min neg err	50
		PID mode (500)	0	A-100	1219	Set Linear speed	0
A-1	1201	PID ref sel	5	A-101	1220	Set Acc Dec	100
A-2	1202	PID fbk sel	4	A-102	1221	Set Incline ref	0
A-3	1203	PID digital ref	0	A-105	1222	Def Linear speed	8
A-4	1204	PID activat mode	0	A-106	1223	Def Acc Dec	100
A-5	1205	PID-Encoder sync	1	A-107	1224	Def Incline ref	0
A-6	1206	PID err sign rev	0	A-110	1225	Pulley Ratio	200
A-7	1207	PID Integ init en	0	A-111	1226	Roller Diameter	91
A-8	1208	PID update time	0	A-115	1227	DCMot EncTimeout	250
A-50	1209	PID Prop gain 1	7			DCMot EncTimeout	15
A-51	1210	PID Int tconst 1	150	A-116	1228	Fan command dly	3
A-52	1211	PID Deriv gain 1	0	A-117	1229	ACMot EncToller	50
A-53	1212	PID Prop gain 2	0				0(OFF)
A-54	1213	PID Int tconst 2	9999	A-118	1230	Check RunnerBand	10
A-55	1214	PID Deriv gain 2	0	A-119	1231	Check RunnerSpd	50
A-56	1215	PID high limit	80	A-120	1232	Curr clamp thr	200
A-57	1216	PID low limit	-80	A-121	1233	Check RunnerDly	60
A-58	1217	PID max pos err	50				

Table 9-1

MENU –C–							
Par.	*Address*	*Description*	*Value*	*Par.*	*Address*	*Description*	*Value*
C-0	800	Save parameters	0	C-41	805	Save pars to key	0
C-1	801	Recall param	0	C-100	806	Measure stator R	0
C-2	802	Load default	0	C-200	807	Reset AC Flag	0
C-20	803	Alarm clear	0	C-201	808	Reset DC Flag	0
C-40	804	Recall key prog	0				

Table 9-2

MENU –D–							
Par.	***Address***	***Description***	***Value***	***Par.***	***Address***	***Description***	***Value***
D-0	1	Output frequency	0	D-200	26	An in 1 cnf mon	0
D-1	2	Frequency ref	0	D-201	27	An in 1 monitor	0
D-2	3	Output current	0	D-202	28	An in 1 term mon	0
D-3	4	Output voltage	0	D-210	29	An in 2 cnf mon	0
D-4	5	DC link voltage	400	D-211	30	An in 2 monitor	0
D-5	6	Power factor	100	D-212	31	An in 2 term mon	0
D-6	7	Power [kW]	0	D-220	32	An in 3 cnf mon	0
D-7	8	Output speed	0	D-221	33	An in 3 monitor	0
D-8	9	Speed ref	0	D-222	34	An in 3 term mon	0
D-20	57	Actual speed	0	D-300	35	EncPulse/Sample	0
D-21	58	Actual incline user	0	D-301	36	Encoder freq	0
D-22	59	Actual ENC1 pos	0	D-302	37	Encoder speed	0
D-23	60	Crossed distance	0	D-350	38	Option 1 state	0
D-24	61	Reserved	-	D-351	39	Option 2 state	0
D-25	62	Flag status	0	D-352	40	Par port state	0
D-26	63	Actual ENC2 pos	0	D-400	41	PID reference	0
D-27	64	Actual speed from Fenc	0	D-401	42	PID feedback	0
D-30	70	Reserved	-	D-402	43	PID error	0
D-50	10	Heatsink temp	0	D-403	44	PID integr comp	0
D-51	11	Drive OL	0	D-404	45	PID output	0
D-52	12	Motor OL	0	D-800	46	Error 1	0
D-53	13	Brake res OL	0	D-801	47	Error 2	0
D-100	14	Dig inp status	0	D-802	48	Error 3	0
D-101	15	Term inp status	0	D-803	49	Error 4	0
D-102	16	Vir dig inp stat	0	D-950	50	Drive rated cur	100
D-120	17	Exp dig inp stat	0	D-951	51	SW version 1\2	200h
D-121	18	Exp term inp	0	D-952	52	SW version 1\2	80h
D-122	19	Exp Vir dig inp stat	0	D-953	53	power ident code	0h
D-150	20	Dig out status	0	D-954	54	param ident code	0h
D-151	21	Drv dig out sta	0	D-955	55	regul ident code	3/8h
D-152	22	Vir dig out sta	0	D-956	56	Startup id code	0h
D-170	23	Exp Dig out status	0	D-957	71	Drive type	2
D-171	24	Exp Drv dig out sta	0	D-999	99	Display test	-
D-172	25	Exp Vir dig out sta	0				

Table 9-3

MENU –F–							
Par.	*Address*	*Description*	*Value*	*Par.*	*Address*	*Description*	*Value*
F-0	300	Motorpot ref	0	F-110	321	Frequency ref 10	0
F-10	301	Acc/Dec time mp	50	F-111	322	Frequency ref 11	0
F-11	302	Motorpot offset	0	F-112	323	Frequency ref 12	0
F-12	303	Mp output mode	0	F-113	324	Frequency ref 13	0
F-13	304	Mp auto save	1	F-114	325	Frequency ref 14	0
F-20	305	Max ref freq	1150	F-115	326	Frequency ref 15	0
F-21	306	Min ref freq	0	F-116	327	Jog frequency	10
F-50	307	Ref 1 channel	8	F-200	328	Ramp resolution	0
F-51	308	Ref 2 channel	0	F-201	329	Acc time 1	3000
F-60	309	MltFrq channel 1	3	F-202	330	Dec time 1	3000
F-61	310	MltFrq channel 2	3	F-203	331	Acc time 2	50
F-100	311	Frequency ref 0	0	F-204	332	Dec time 2	50
F-101	312	Frequency ref 1	0	F-205	333	Acc time 3	50
F-102	313	Frequency ref 2	0	F-206	334	Dec time 3 / FS	50
F-103	314	Frequency ref 3	0	F-207	335	Acc time 4 / Jog	50
F-104	315	Frequency ref 4	0	F-208	336	Dec time 4 / Jog	50
F-105	316	Frequency ref 5	0	F-250	337	Ramp S-shape	0
F-106	317	Frequency ref 6	0	F-260	338	Ramp extens src	0
F-107	318	Frequency ref 7	0	F-270	339	Jump amplitude	0
F-108	319	Frequency ref 8	0	F-271	340	Jump frequency 1	0
F-109	320	Frequency ref 9	0	F-272	341	Jump frequency 2	0

Table 9-4

MENU –I–							
Par.	***Address***	***Description***	***Value***	***Par.***	***Address***	***Description***	***Value***
I-0	100	Dig input 1 cfg	1	I-313	140	An out 2 filter	0
I-1	101	Dig input 2 cfg	0	I-350	141	Exp an out 1 cfg	0
I-2	102	Dig input 3 cfg	0	I-351	142	Exp AnOut 1 offs	0
I-3	103	Dig input 4 cfg	0	I-352	143	Exp AnOut 1 gain	100
I-4	104	Dig input 5 cfg	0	I-353	144	Exp AnOut 1 filt	0
I-5	105	Dig input 6 cfg	0	I-400	145	Inp by serial en	0
I-6	106	Dig input 7 cfg	0	I-410	146	Exp in by ser en	0
I-7	107	Dig input 8 cfg	0	I-420	147	Out by serial en	0
I-50	108	Exp dig in 1 cfg	0	I-430	148	Exp OutBySer en	0
I-51	109	Exp dig in 2 cfg	0	I-450	149	An out by ser en	0
I-52	110	Exp dig in 3 cfg	0	I-500	150	Encoder enable	1
I-53	111	Exp dig in 4 cfg	0	I-501	151	Encoder ppr	720
I-100	112	Dig output 1 cfg	48	I-502	152	Enc channels cfg	1
I-101	113	Dig output 2 cfg	48	I-503	153	Enc spd mul fact	100
I-102	114	Dig output 3 cfg	48	I-504	154	Enc update time	0
I-103	115	Dig output 4 cfg	48	I-600	155	Serial link cfg	6
I-150	116	Exp DigOut 1 cfg	48	I-601	156	Serial link bps	4
I-151	117	Exp DigOut 2 cfg	48	I-602	157	Device address	1
I-200	118	An in 1 Type	1	I-603	158	Ser answer delay	1
I-201	119	An in 1 offset	0	I-604	159	Serial timeout	0
I-202	120	An in 1 gain	100	I-605	160	En timeout alm	1
I-203	121	An in 1 minimum	0	I-700	161	Option 1 type	0
I-204	122	An in 1 filter	1	I-701	162	Option 2 type	0
I-210	123	An in 2 Type	1	I-750	163	SBI address	3
I-211	124	An in 2 offset	0	I-751	164	CAN baudrate	0
I-212	125	An in 2 gain	100	I-752	165	SBI Profibus mod	2
I-213	126	An in 2 minimum	0	I-753	166	SBI CAN mode	0
I-214	127	An in 2 filter	1	I-760	167	SBI to Drv W 0	0
I-220	128	An in 3 Type	1	I-761	168	SBI to Drv W 1	0
I-221	129	An in 3 offset	0	I-762	169	SBI to Drv W 2	0
I-222	130	An in 3 gain	100	I-763	170	SBI to Drv W 3	0
I-223	131	An in 3 minimum	0	I-764	171	SBI to Drv W 4	0
I-224	132	An in 3 filter	1	I-765	172	SBI to Drv W 5	0
I-300	133	Analog out 1 cfg	0	I-770	173	Drv to SBI W 0	1
I-301	134	An out 1 offset	0	I-771	174	Drv to SBI W 1	2
I-302	135	An out 1 gain	100	I-772	175	Drv to SBI W 2	3
I-303	136	An out 1 filter	0	I-773	176	Drv to SBI W 3	4
I-310	137	Analog out 2 cfg	2	I-774	177	Drv to SBI W 4	5
I-311	138	An out 2 offset	0	I-775	178	Drv to SBI W 5	6
I-312	139	An out 2 gain	100				

Table 9-5

MENU –P–							
Par.	*Address*	*Description*	*Value*	*Par.*	*Address*	*Description*	*Value*
P-0	400	Cmd source sel	3	P-281	446	Brake res value	150
P-1	401	RUN input config	0	P-282	447	Brake res power	5
P-2	402	Reversal enable	1	P-283	448	Br res thermal K	160
P-3	403	Safety	1	P-300	449	DC braking level	0
P-20	404	Mains voltage	220	P-301	450	DCB lev fac src	0
P-21	405	Mains frequency	60	P-302	451	DC braking freq	0
P-40	406	Motor rated curr	70	P-303	452	DC braking start	0
P-41	407	Motor pole pairs	2	P-304	453	DC braking stop	0
P-42	408	Motor power fact	78	P-320	454	Autocapture mode	0
P-43	409	Motor stator R	100	P-321	456	Autocapture Ilim	120
P-44	410	Motor cooling	1	P-322	457	Demagnetiz time	8
P-45	411	Motor thermal K	30	P-323	458	Autocap f scan	10
P-60	412	V/f shape	1	P-324	459	Autocap V scan	2
P-61	413	Max out voltage	230	P-325	460	Enc for FlyRes	0
P-62	414	Base frequency	600	P-326	461	Fre for FlyRes	0
P-63	415	V/f interm volt	115	P-340	462	Undervoltage thr	50
P-64	416	V/f interm freq	300	P-341	463	Max pwrloss time	0
P-80	417	Max output freq	100	P-342	464	UV alarm storage	1
P-81	418	Min output freq	0	P-360	465	OV prevention	0
P-100	419	Slip compensate	90	P-380	466	Autoreset attmps	0
P-101	420	Slip comp filter	3	P-381	467	Autoreset clear	10
P-120	421	Manual boost [%]	30	P-382	468	Autoreset delay	50
P-121	422	Boost factor src	0	P-383	469	Autores flt rly	1
P-122	423	Auto boost en	1	P-400	470	Ext fault mode	0
P-140	424	Magn curr gain	30	P-420	471	Volt reduc mode	0
P-160	425	Osc damping gain	10	P-421	472	V reduction fact	100
P-180	426	SW clamp enable	1	P-422	473	V fact mult src	0
P-200	427	Ramp CurLim mode	0	P-440	474	Frequency thr 1	0
P-201	428	Curr lim in ramp	170	P-441	475	Freq prog 1 hyst	5
P-202	429	En lim in steady	0	P-442	476	Frequency thr 2	0
P-203	430	Curr lim steady		P-443	477	Freq prog 2 hyst	5
P-204	431	Curr ctrl P-gain		P-460	478	Const speed tol	5
P-205	432	Curr ctrl I-gain		P-461	479	Const speed dl	1
P-206	433	Curr ctr feedfwd		P-480	480	Heatsnk temp lev	70
P-220	434	En DC link ctrl		P-481	481	Heatsnk temp hys	5
P-221	435	DC-lnk ctr Pgain		P-500	482	Switching freq	9
P-222	436	DC-lnk ctr Igain		P-501	483	Sw freq reduc en	0
P-223	437	DC-link ctr FF		P-520	484	Overmod max lev	0
P-240	438	OverTorque mode		P-540	485	Out Vlt auto adj	0
P-241	439	OT curr lim thr		P-560	486	Deadtime cmp lev	9
P-242	440	OT level fac src		P-561	487	Deadtime cmp slp	50
P-243	441	OT signal delay		P-580	488	Startup display	1
P-260	444	Motor OL prot en		P-600	489	Speed dsply fact	100
P-280	445	Brake res OL en		P-999	490	Param prot code	0

Table 9-6

9.1. UNITY CONFIGURATION

For the following menu, please refer to the UNITY Manual (User Interfaces).

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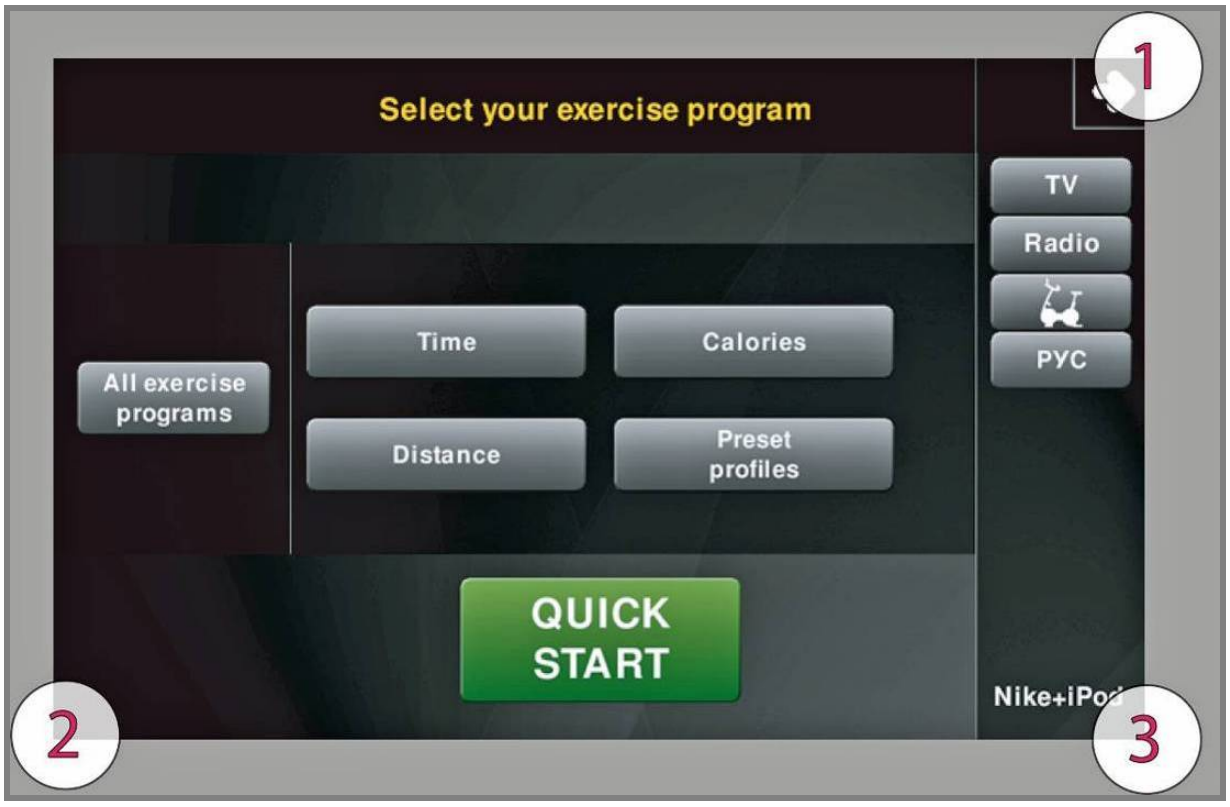
10. AGGIORNAMENTO DEL SW

10.1. VISIO – VISIOWEB

For the following menu, please refer to the relevant chapter in the VISIO/VISIOWEB manual.

The procedure is activated by pressing the top right-hand corner, the bottom left-hand corner and the bottom right-hand corner of the screen in that sequence when the equipment is in Stand-By, as shown in the figure below.



A new display will appear from which you can gain access to the various configuration menus, by entering the password on the number keyboard:

In order to access the menu, enter the password **2502** and press the **ENTER** key in order to confirm, **ESCI** in order to quit.

10.2. UNITY

 **For the following menu, please refer to the UNITY Manual (User Interfaces).**

11. PLANNED MAINTENANCE

To keep the equipment perfectly efficient, planned maintenance work must be periodically performed to prevent possible problems.

The operations can be divided essentially according to the type of work and to the staff who must do it:

ROUTINE maintenance to be carried out during the operations of preventive maintenance.	***MAJOR maintenance***
ROUTINE *maintenance operations can be performed by the* ***owner of the machine and do not require any particular technical expertise****; they are simple operations regarding external cleaning, for the purposes of observing good hygiene practices.* *The maintenance operations must be carried out also by the* ***ROUTINE*** *technical Technogym during scheduled maintenance.*	***MAJOR*** *maintenance means operations that can only be performed by a* ***Qualified Technician specially trained by Technogym****; authorised to carry out fine tuning and start-up of the equipment, maintenance and repair work, testing of operation and wear of the mechanical parts in order to ensure perfect and safe operation of the equipment.*
Refer to the USER manual.	**Refer to the PLANNED MAINTENANCE manual, that can be visible from TG DIRECT.**
ROUTINE MAINTENANCE: No specialisation.	**MAJOR MAINTENANCE:** Qualified Technician authorised by Technogym and maintenance envisaged in the preventive maintenance contract.

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12. APPENDIX

12.1. TABLE OF PASSWORDS TO ACCESS THE MENUS

The following configuration menus are available together with their respective access passwords:

PASSWORD LIST			INTERFACCIA
Service Menu	**2501**	*Technical configuration;*	*LED VISIO UNITY*
		Upload/ Network page;	*VISIO UNITY*
		Write Serial Number;	*VISIO UNITY*
		Access to Windows environment; Windows screen;	*VISIO UNITY*
		Equipment type selection;	*VISIO UNITY*
		Troubleshooting;	*LED VISIO UNITY*
User Menu	**2406**	*IP-TV Configuration;*	*VISIO UNITY*
		IP-Radio Configuration;	*VISIO UNITY*
		User configuration + Serial Number reading;	*LED VISIO UNITY*
		Analog and Digital TV channels tuning;	*VISIO UNITY*
		Analog and Digital Radio channels tuning;	*VISIO UNITY*
		Touch Screen Calibration;	*VISIO UNITY*
		Menu for customizing user profile; Training profile menu (to add and customize personal profiles);	*LED VISIO UNITY*
		Network configuration;	*VISIO UNITY*
		VISIOWEB Bookmarks configuration;	*VISIO UNITY*

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13. TOOLS

To make each disassembly operation, adjustment and maintenance on the machines need the tools shown in the TG SERVICE TOOLS BOX LIST, available in TG DIRECT.

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