RI Series

Maintenance manual

Range 15 kg d = 5g
Range 6 kg d = 2g

OHAUS®

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1. Introduction

This document is intended for After Sales Support technicians working on the versions of RI Series and Atoll scales.

This manual gives details of the product codes of the parts and the make up of sub-assemblies. It describes the maintenance operations most commonly performed on the scales. All questions relating to the software are not treated in this manual but in the **tutorial file "HeliosEng.chm"**

This manual also lists the spare parts and sub-assemblies available as standard from OHAUS in the appendix (see page 99). These spare parts and sub-assemblies are used to perform the main maintenance operations described in the manual. You can order them by EDI, giving their respective MTCIMF codes.

If you want to make any comments on or correct the contents of this manual, ask the MT-F Technical Support team to contact the MTVIRY Design Department.

2. General characteristics

RI Series is ticket printing scale that works in stand-alone or wired network mode.

Its main characteristics are:

- Three possible power sources:
- 90 to 264VAC / 47 to 440 Hz mains power supply.
- Cordless mode powered by an internal pack battery. The battery unit's charger is integrated into the scales.
- 12 V or 24 V external battery power supply (car or truck battery).
- Base with quick adjustment large clearance feet.
- Large back-lit graphics screen with two levels light regulator, and four sizes of fonts.
- The keyboard is clear and readable, the keys can be assigned by programming and customised according to the customer's wishes, numbers of sellers, PLU, functions, weights, etc. and can be labelled.
- Simplified loading of the roll of paper.
- Networking Interconnection by cable for use in "guided selling" mode.
- Scrolling programming menus, for very simple use.

2.1 Metrological characteristics:

Only the weighing base is sealed.
an internal cable connects the sealed compartment to the main board.

- Maximum range: 15kg / Minimum scale: 5g / Maximum tare: 9.9995kg
or
(Maximum range: 6kg / Minimum scale: 2g / Maximum tare: 6.000kg

- Cummulative semi-automatic tare with subtractive effect.
- Predetermined tare (Numbered from 1 to 9) or associated with a PLU

- Unit price scale: 0.01€ (maximum unit price: 9999,99€)
- Price to pay scale: 0.01€ (maximum price to pay: 9999.99€)

2.2 Electrical characteristics:

The priority order in case of several supply at the same time is:

1- External battery 24 volts
2- Mains
3- External battery 12 volts
4- Internal battery pack

- Operating temperature range from -10°C to +40°C.
- Mains power consumption about between 10 to 50VA.
- Power supply voltage: 90 to 264VAC 47 to 440 Hz.
- Internal battery pack (11 x NI-MH elements): 13.2 V / 3Ah on RI Series,13.2 V / 3.8 Ah on Atoll time life between 8 and 40 hours depending use of back-lit and printing.
- 12v or 24v external battery
- Up to 10 scales can be networked. A network can combine the multi-user and direct sales (DS) modes.

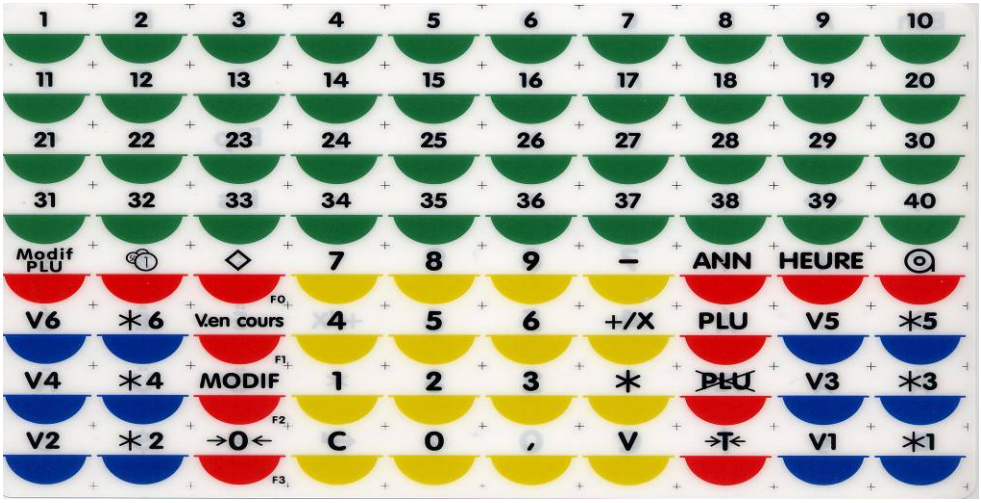
2.3 RI Series keyboard:

The keyboard has 80 keys, 4 configurations are available, numerical keys are situated at the centre for keyboards type 1, 2 and 4 and on the right for type 3 and 5.
Keyboards type 4 and 5 are entirely definable by the user excepted for the following 20 keys which have fixed location.

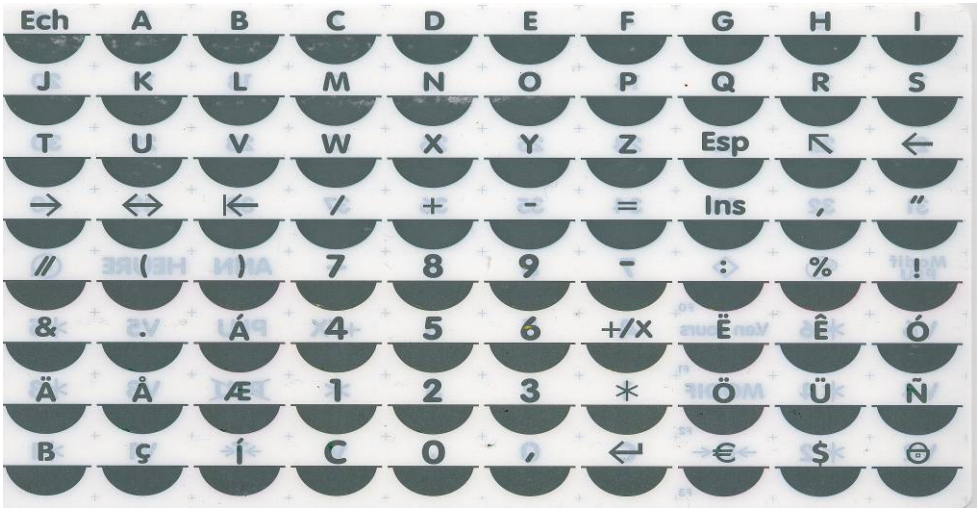
-10 numerical keys
-1 "V" key : Record seller or validate the functions
-1 "*" key : Total request
-1 "+/x" key : Record or multiply non weighed articles.
-1 "_" key : Subtract
-1 "T" key : Tare request
-1 "ANN" key : Cancel an entry
-1 "PLU" key : Switch to PLU mode (numerical inputs call up a PLU)
-1 "~~PLU~~" key : Switch to "Non PLU" mode (the numerical input enters a unit price)
-1 "C" key : Reset to zero or cancel an operation
-1 "," key : Decimal point.

- Keyboard number 1 and 2 :

6 direct users, up to 30 indirect users, 40 direct PLUs, 8 function keys.
The direct PLU keys (from 1 to 40) can be labelled. Blank labels supplied with the scales fit into the areas delimited by the keys.



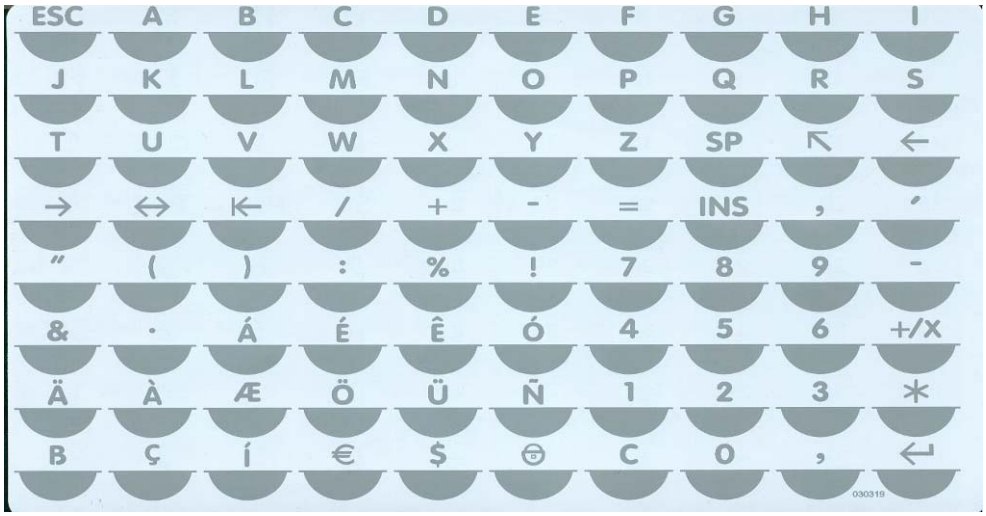
Programming keyboard on the opposite side of the working key board.
This side of the keyboard is used to program all the machine's functions.



- Keyboard 3:

up to 30 indirect users, 48 directs PLUs, 12 function keys.
The direct PLU keys (from 1 to 48) can be labelled. Blank labels supplied with the scales fit into the areas delimited by the keys.

Programming keyboard on the opposite side of the working key board.
This side of the keyboard is used to program all the machine's functions.



- Keyboard 4:
  the 20 location fixed keys have the same location as keyboard 1, all the other keys are definable by the user depending of his wishes.

- Keyboard 5:
  the 20 location fixed keys have the same location as keyboard 3, all the other keys are definable by the user depending of his wishes.

3. Installation

1) Place the scales on a flat surface.

2) Set the scales level using the feet.

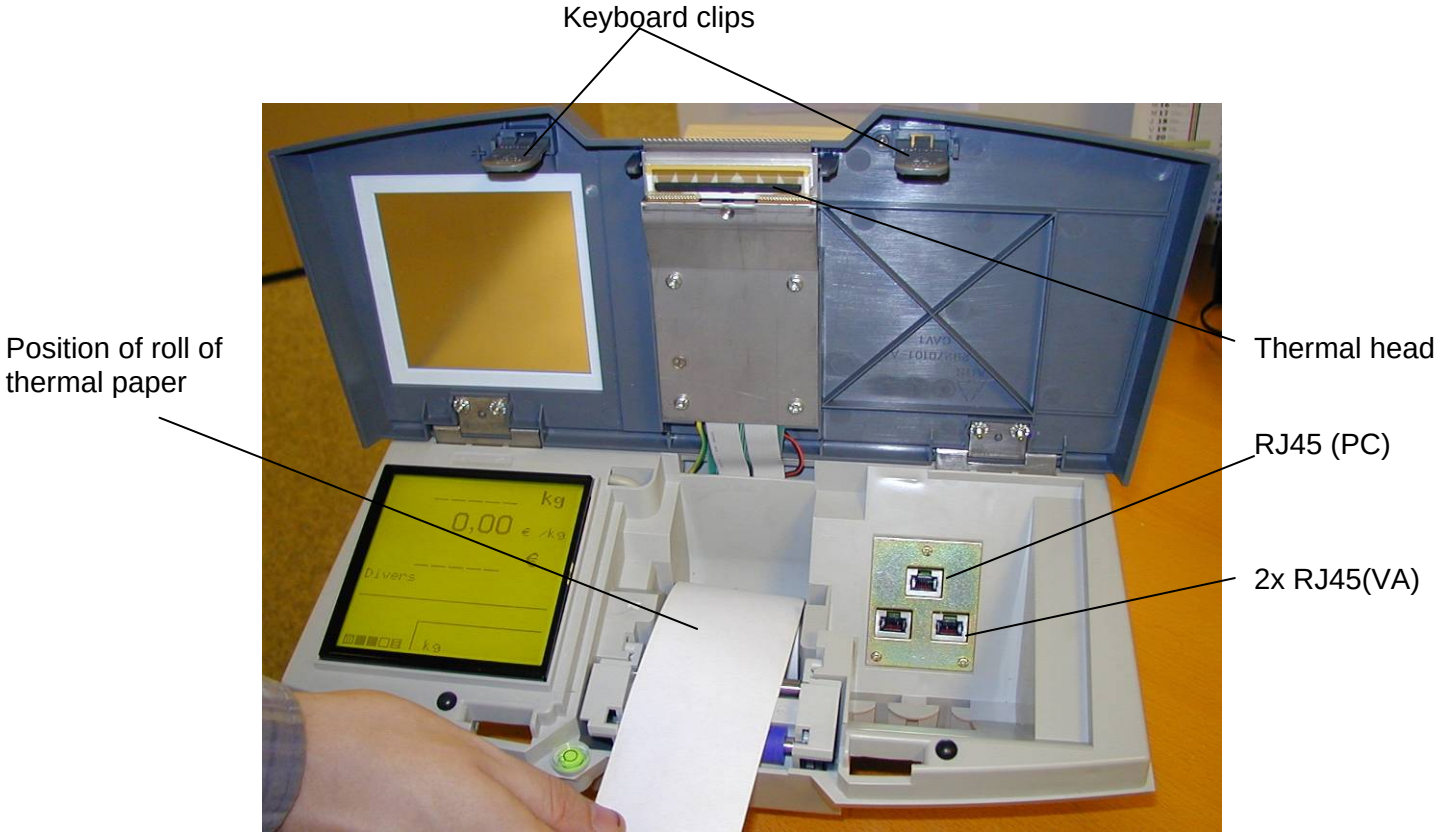
3) Plug the scales into a 230V mains socket or connect to an external battery.

4) Check that there is a roll of thermal paper in the printer. To do this, swing the keyboard backwards. Lift the keyboard assembly vertically and insert a roll of paper if necessary (be careful about the direction it unwinds in).

5) Close the keyboard until it clicks into place and press the switch (*On/Off*).

Maintenance:

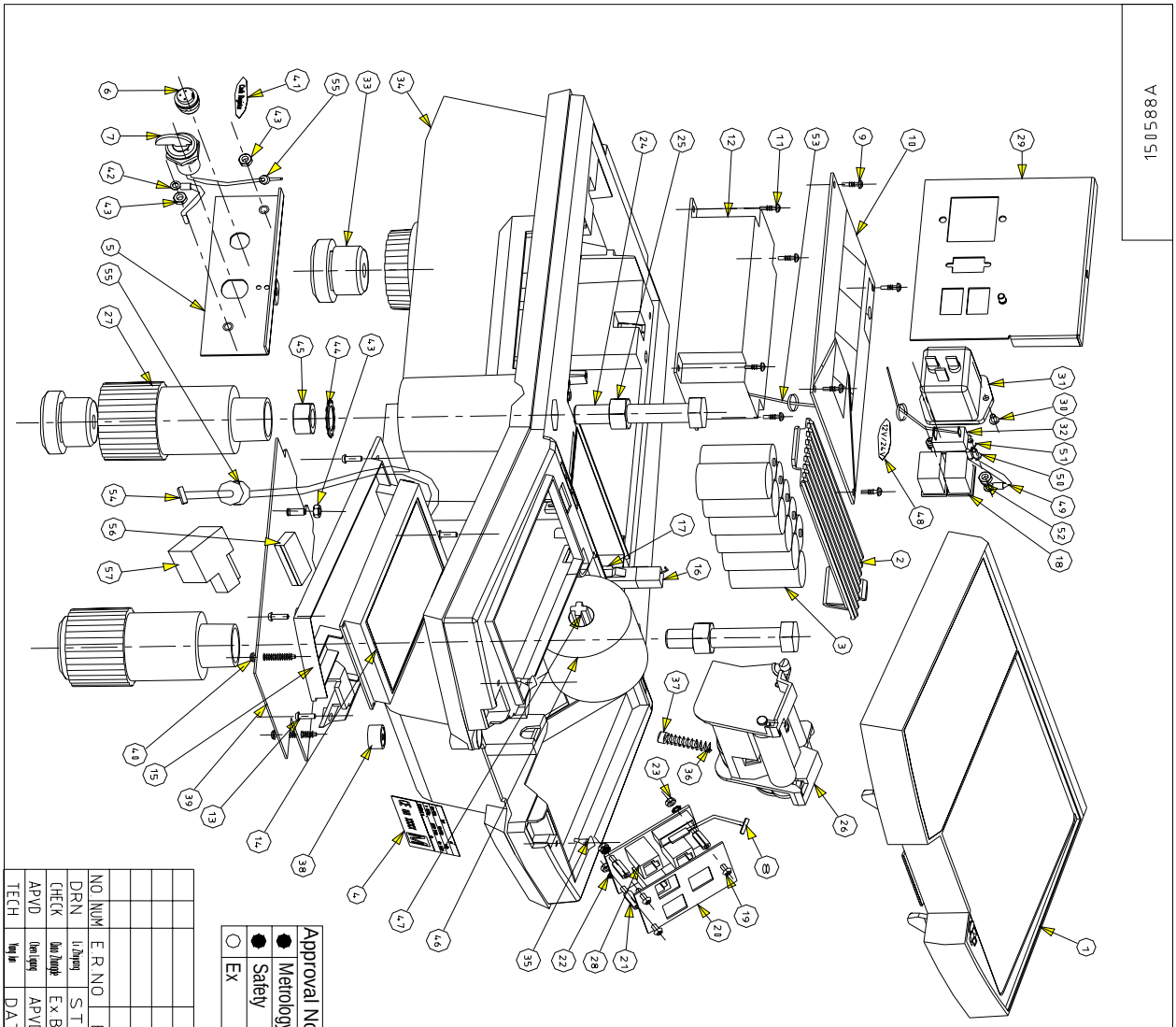
1) Use the cleaning liquid to maintain the printer. Pour a few drops on some tissue and rub on the ceramic part of the thermal print head. Only use the cleaning liquid supplied with the scales (isopropyl alcohol). Any other product may cause premature wear of the printer.



2) The keyboard membrane, the keyboard grid, the plate, the casing and the display scales can be cleaned using a moist sponge and soap (take care to switch off the machine before cleaning, remove the mains plug). Do not use a scouring pad.

4. RI Series exploded views

4.1 Main shell equipped



INDEX	REF	DESIGNATION	QTY	NOTE
1	158567	KEYBOARD EQUIPPED	1	
2	158586	ENERGY PACK DOOR	1	
3	152944	ENERGY PACK	1	
4	151541	NAMEPLATE STICKER	1	
5	158526	SHEET DIALOG PLUGS SUPPORT	1	
6	153238	CASHBOX PLUG	1	
7	153246	ELECTRONIC LOCK	1	
8	153229	CABLE COMMUNICATION, BI	1	
9	145152	SCREW ST2.9X12	4	
10	180361	MAIN BOARD EQUIPPED	1	
11	145152	SCREW ST2.9X12	4	
12	149423	POWER BOARD EQUIPPED	1	
13	145152	SCREW ST2.9X12	4	
14	149425	DISPLAY LCD	1	
15	158585	FRONT DISPLAY BOTTOM SHELL	1	
16	153243	CABLE BATTERY PACK	1	
17	153237	CABLE BATTERY TO MAINBOARD	1	
18	149427	POWER SWITCH	2	
19	133245	SCREW M3X6	3	
20	158524	FRONT CONNECTOR SHEET	1	
21	151543	BOLT M3	3	
22	151545	GASKET 3	3	
23	102619	NUT M3	3	
24	158561	BOLT M12X84	2	
25	158568	NUT M12	2	
26	158578	MOTOR SUPPORT EQUIPPED	1	
27	158510	ADJUSTABLE FOOT SHELL, BI	2	
28	153257	COMMUNICATION BOARD EQUIPPED	1	
29	158518	SHEET POWER PLUGS SUPPORT	1	
30	133245	SCREW M3X6	2	
31	149426	POWER FILTER	1	
32	153242	12V POWER PLUG	1	
33	158619	RUBBER FOOT	3	
34	158511	MAIN SHELL	1	
35	151542	PRINTER RUBBER MAT DX	2	
36	158537	MOTOR SUPPORT SPRING	1	
37	158552	SCREW GB71 M5X16	1	
38	158531	BUBBLE	1	
39	158519	FRONT BOTTOM SHEET	1	
40	115842	SCREW ST3.5X19	2	
41	155522	STICKER CASHBOX	1	
42	153245	CABLE GROUNDING	1	
43	102628	NUT GB6171 M4-ZND	3	
44	158551	GASKET T2.BOSSARD	2	
45	158568	NUT GB6170 M12	2	
46	155077	PRINTER PAPER	1	
47	155078	PRINTER PAPER SUPPORT ROLL BI	1	
48	155523	STICKER AUTO PLUG	1	
49	153245	CABLE GROUNDING	1	
50	102536	SCREW GB67 M2X8-ZND	2	
51	102618	NUT GB6171-1986 M2	2	
52	102620	NUT GB6171 M4-ZND	1	
53	153233	CABLE SWITCH TO MAINBOARD,BI	1	
54	153239	CABLE FRONT DISPLAY,BI	1	
55	155787	FERRITE CORE,BI	2	
56	153243	FERRITE CORE FOR FRONT BOTTOM SHEET,BI	1	
57	169198	STEM FOR FERRITE CORE,BI	1	

Approval Notice	
●	Metrology
●	Safety
○	Ex

NO.	NUM	E.R.NO.	STD	BY	DATE
DRN	Li Zhanpeng		Ex BY		
CHECK	Qian Zhongjie		APVD2		
APVD	Chen Liqiang				
TECH	Yang Jie		DATE		03-04-04

MAIN SHELL EQUIPPED
150568

STAGE	WEIGHT	SCALE
		1:1

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FINAL ASSEMBLY, BI

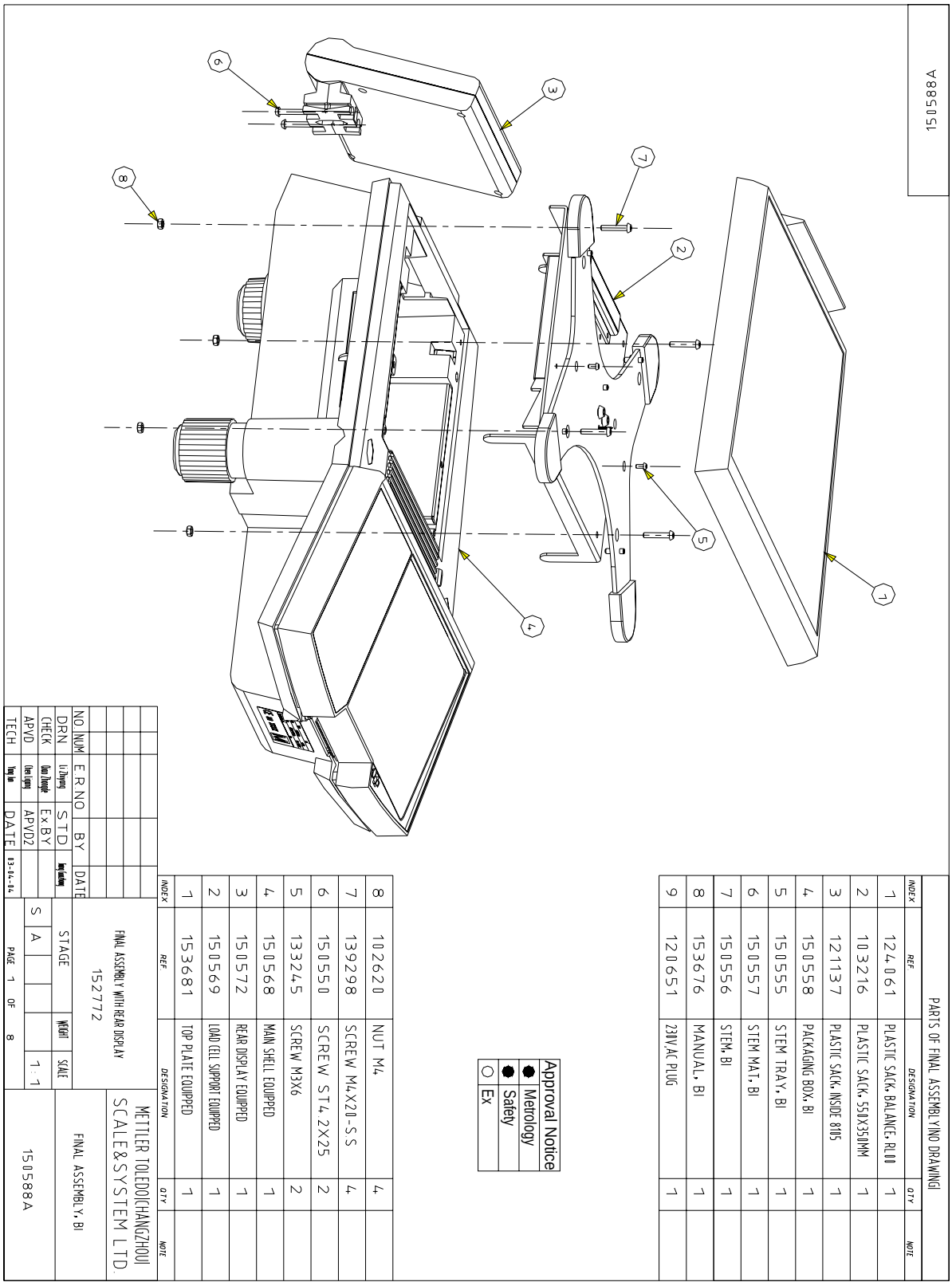
METTLER TOLEDO(HANGZHOU)
SCALE&SYSTEM LTD.

150588A

4.2 Main shell equipped continued (29270000)

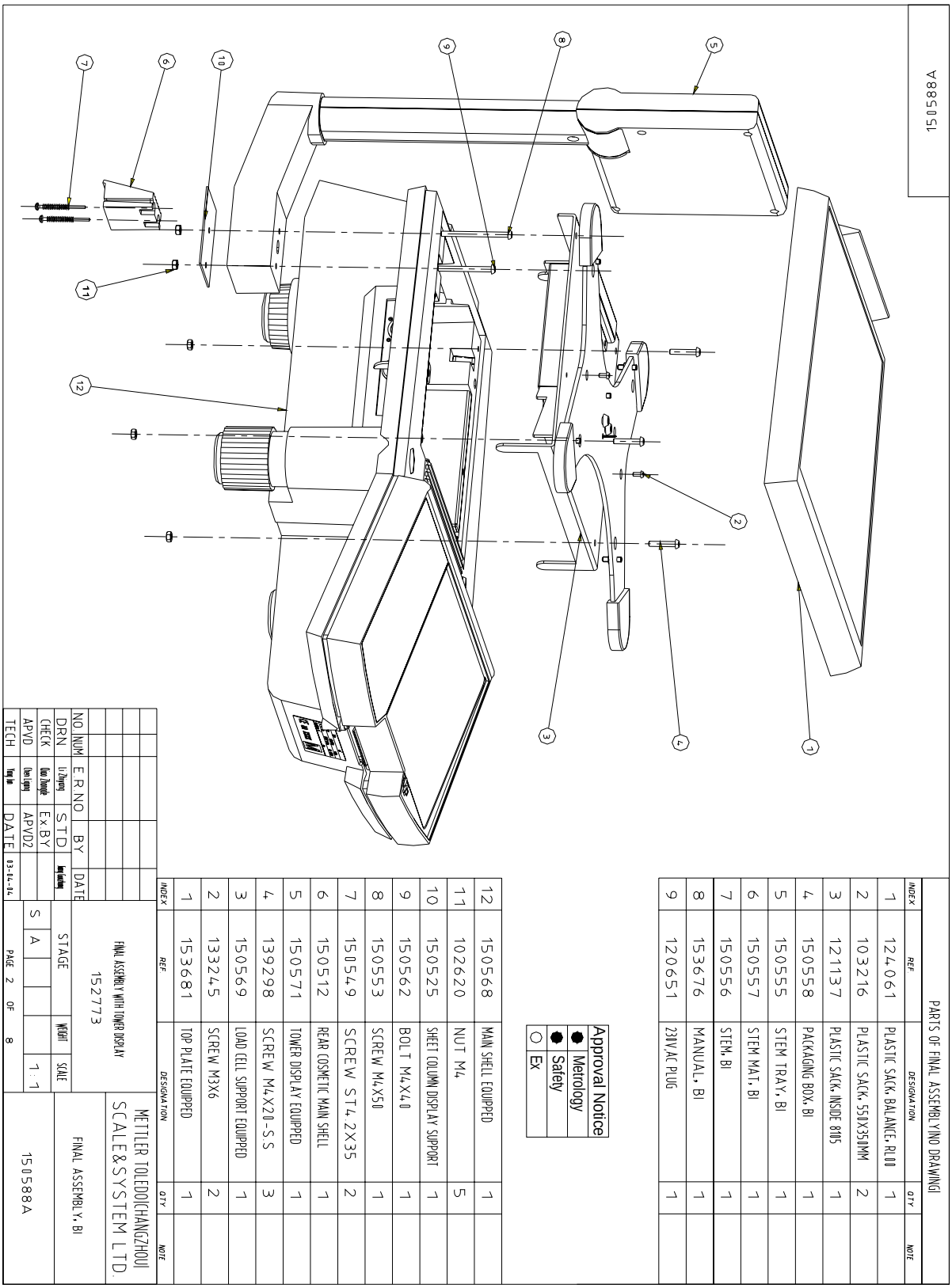
Marker	Designation	Article number
3	**Battery pack (Saft)**	**71207297**
8	**Cable main board to com board**	**71208130**
10	**Main board**	**71207283**
12	**Switching power supply**	**71207286**
14	**Display LCD**	**71207313**
17	**Cable battery pack to main board**	**71208144**
18	**Power switch**	**71208127**
26	**Complete printing mechanism**	**71208137**
28	**Communication board**	**71207284**
31	**Power filter**	**71207310**
53	**Cable switching power supply to main board**	**71208132**
54	**Cable front or rear display**	**71207314**

4.3 Final assembly with rear display



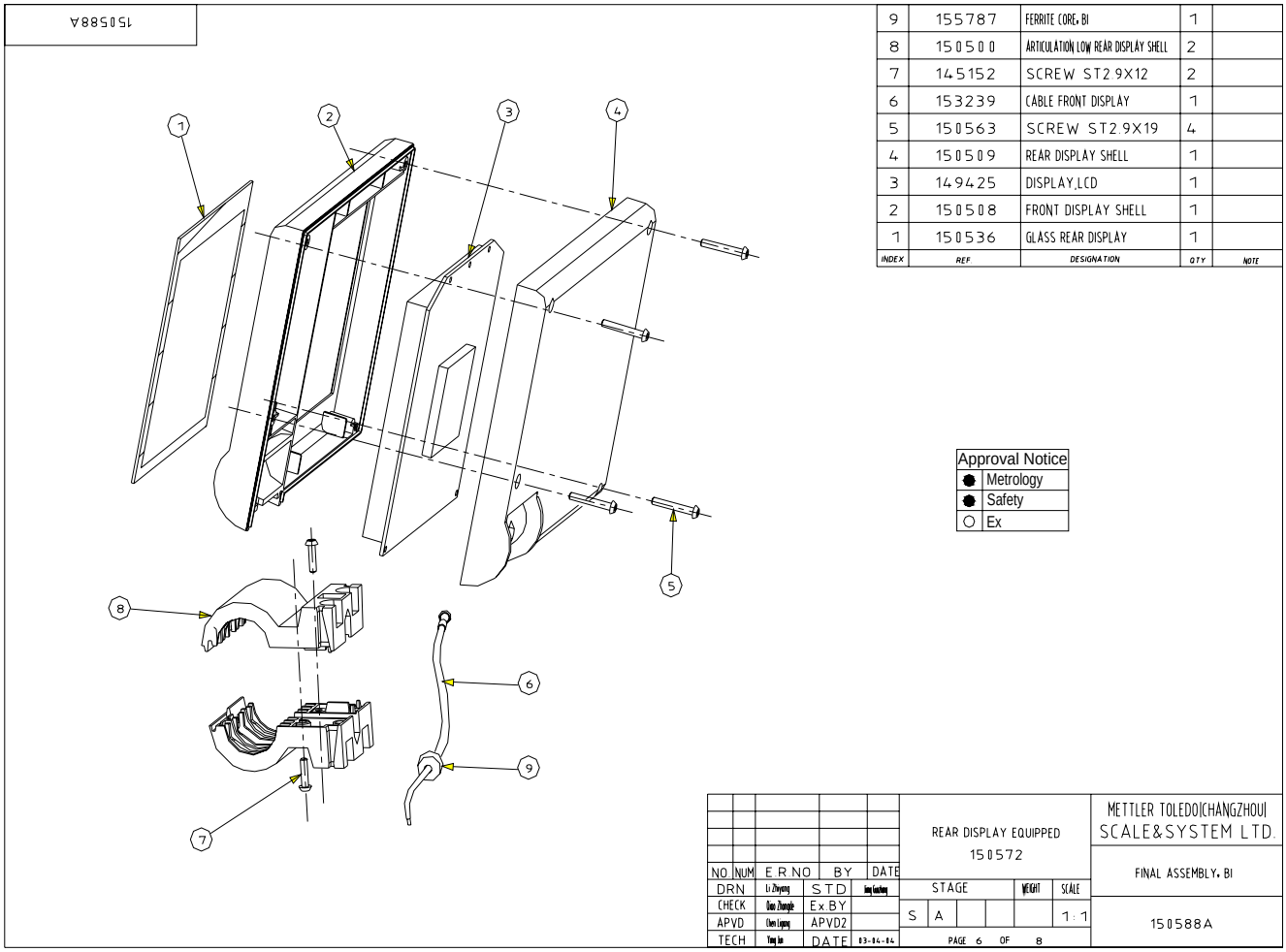
Marker	Designation	Article number
1	**Top plate equipped**	**71207281**

4.4 Final assembly with tower display



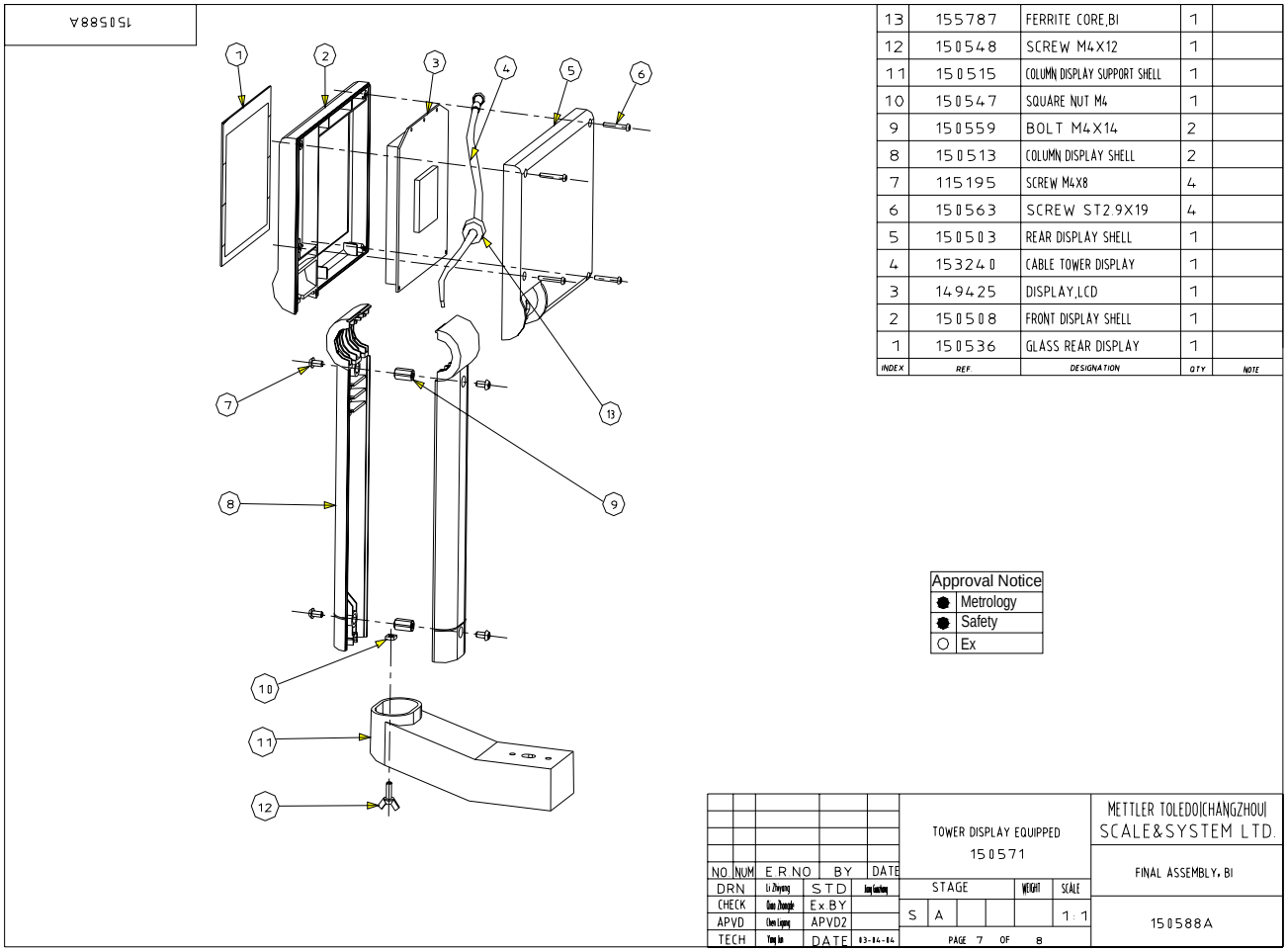
Marker	Designation	Article number
1	**Top plate equipped**	**71207281**

4.5 Fitted main shell



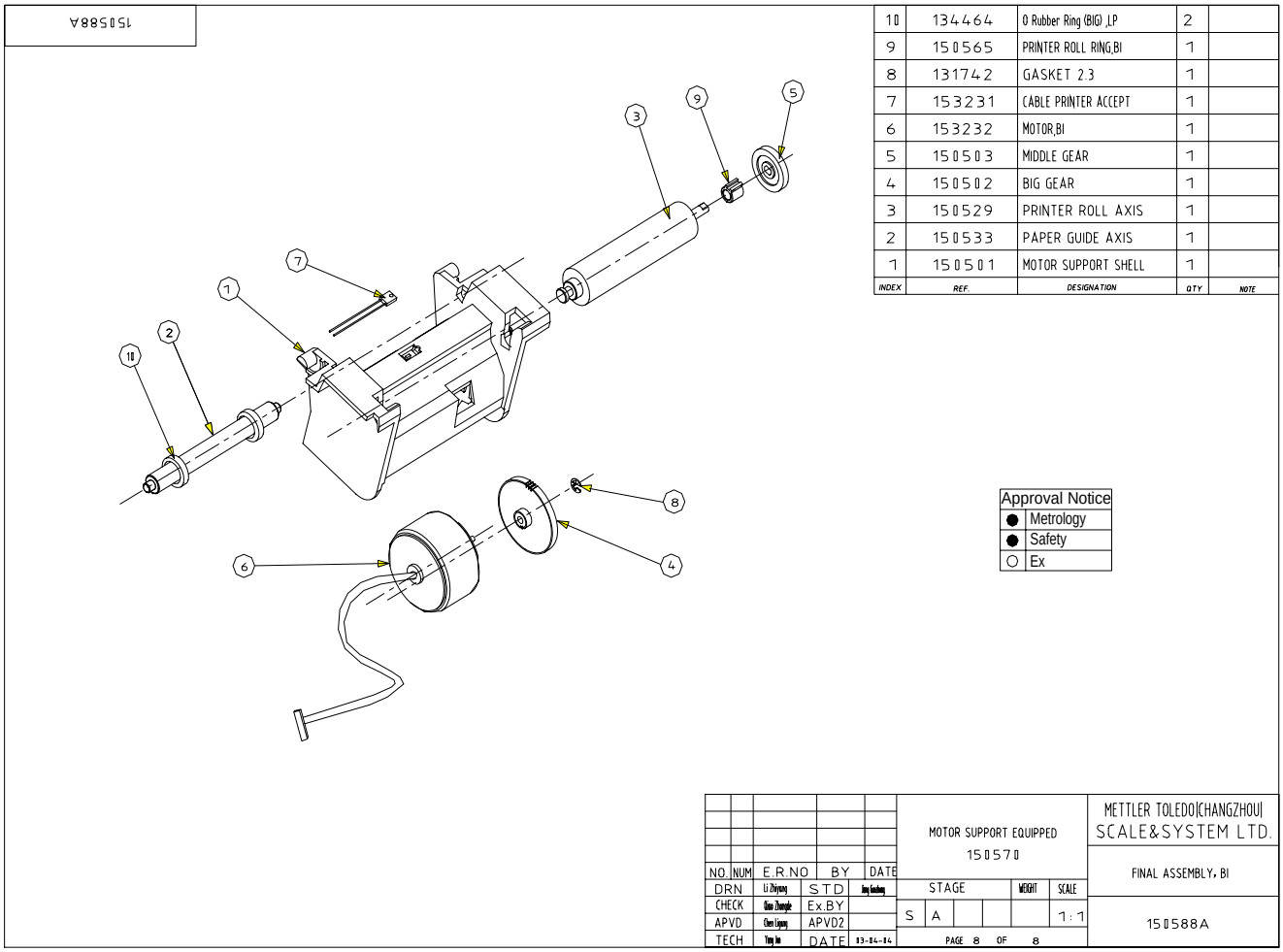
Marker	Designation	Article number
1	**Glass rear display Ohaus**	**72191975**
3	**128 x 128 LCD display**	**71207313**
6	**Cable front or rear display**	**71207314**

4.6 Fitted display column



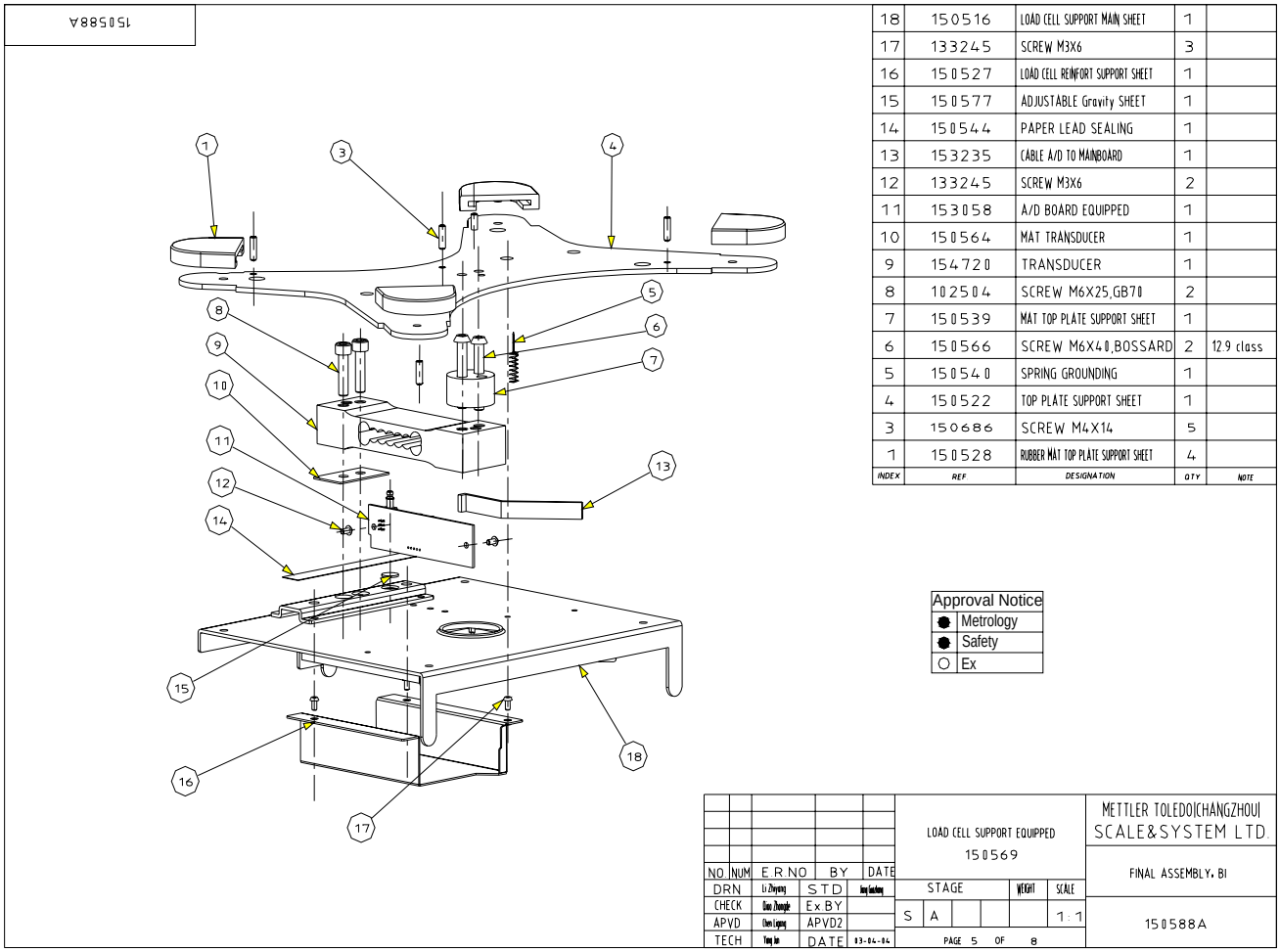
Marker	Designation	Article number
1	**Glass rear display Ohaus**	**72191975**
3	**128 x 128 LCD display**	**71207313**
4	**Cable tower display**	**71208142**

4.7 Motor support equipped



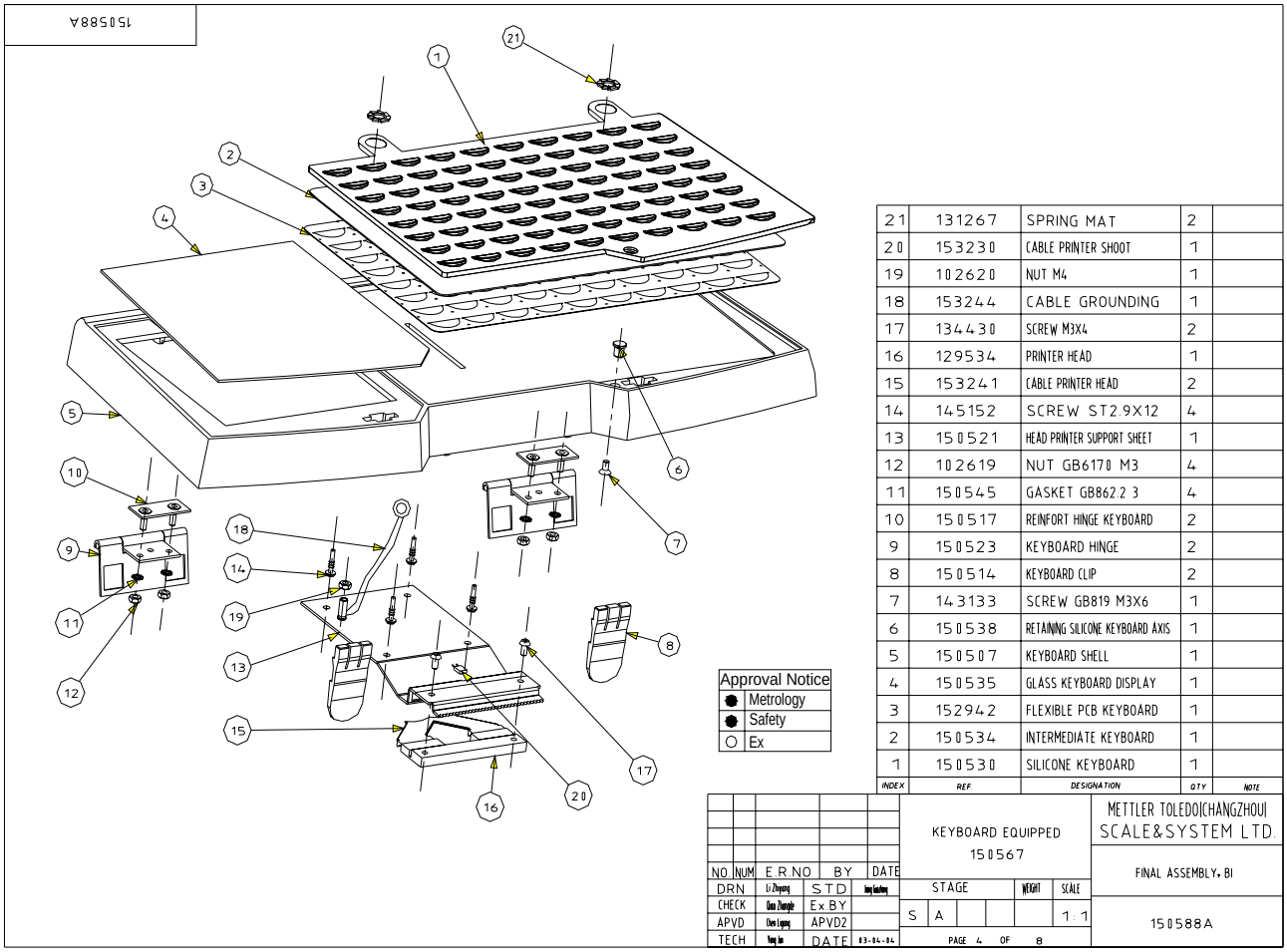
Marker	Designation	Article number
3	**Silicone roll**	**71208138**
7	**Paper IR sensor with cable**	**71208129**
10	**Rubber roll ring**	**71208140**

4.8 Load cell support equipped



Marker	Designation	Article number
1	Equipped load cell support panel	
2	Fitted load cell cross-piece	
3	Shim between load cell and plate support	
4	Washer DEC M6	
5	Screw TBHC M 6x40	
6	**Spring ground contact with the pan**	**71208135**
7	Unalterable label	

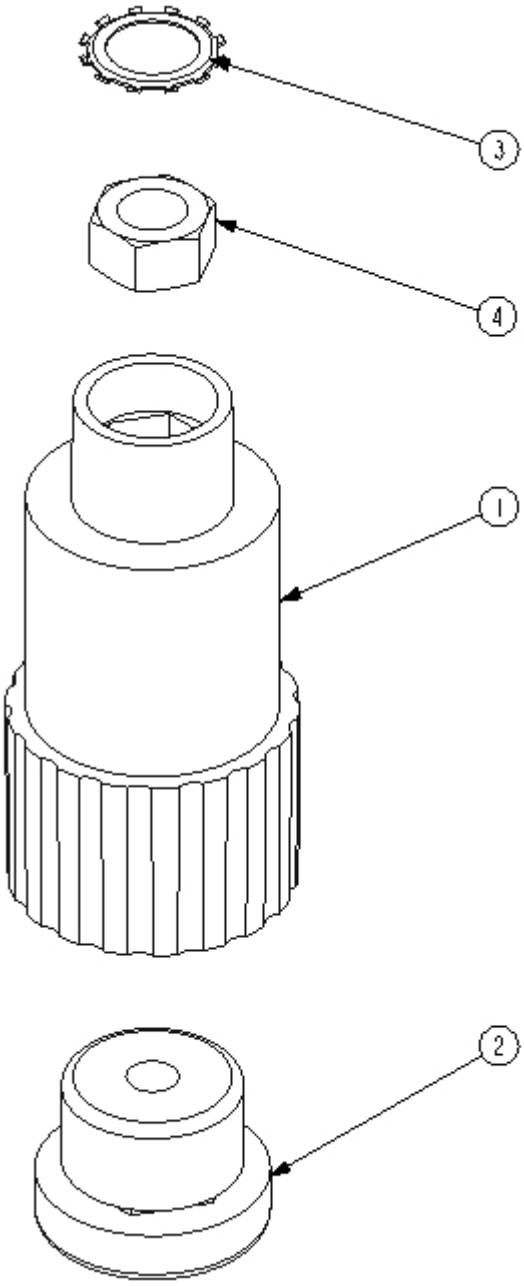
4.9 Fitted keyboard assembly



INDEX	REF.	DESIGNATION	QTY	NOTE
21	131267	SPRING MAT	2	
20	153230	CABLE PRINTER SHOOT	1	
19	102620	NUT M4	1	
18	153244	CABLE GROUNDING	1	
17	134430	SCREW M3X4	2	
16	129534	PRINTER HEAD	1	
15	153241	CABLE PRINTER HEAD	2	
14	145152	SCREW ST2.9X12	4	
13	150521	HEAD PRINTER SUPPORT SHEET	1	
12	102619	NUT GB6170 M3	4	
11	150545	GASKET GB862.2 3	4	
10	150517	REINFORT HINGE KEYBOARD	2	
9	150523	KEYBOARD HINGE	2	
8	150514	KEYBOARD CLIP	2	
7	143133	SCREW GB819 M3X6	1	
6	150538	RETAINING SILICONE KEYBOARD AXIS	1	
5	150507	KEYBOARD SHELL	1	
4	150535	GLASS KEYBOARD DISPLAY	1	
3	152942	FLEXIBLE PCB KEYBOARD	1	
2	150534	INTERMEDIATE KEYBOARD	1	
1	150530	SILICONE KEYBOARD	1	

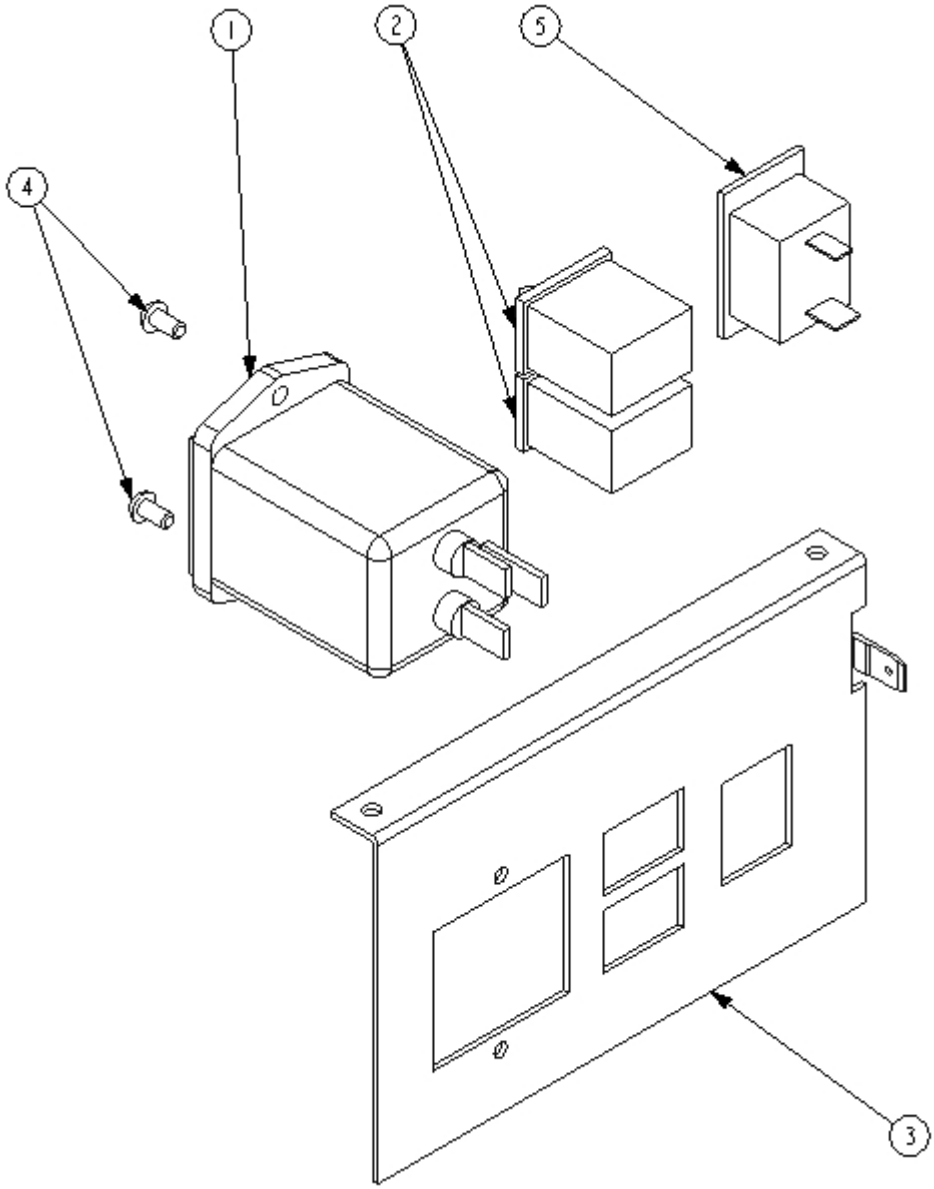
Marker	Designation	Article number
1	**Keyboard silicone membrane**	**71207300**
2	**Intermediate sheet for keyboard nbr 1**	**71207302**
2	**Intermediate sheet for keyboard nbr 3**	**71208103**
3	**Foil film keyboard**	**71207301**
4	**Glass keyboard display "Ohaus" brand**	**72191976**
15	**Cable print head**	**71208146**
16	**Print head**	**71207282**

4.10 Fitted adjustable foot



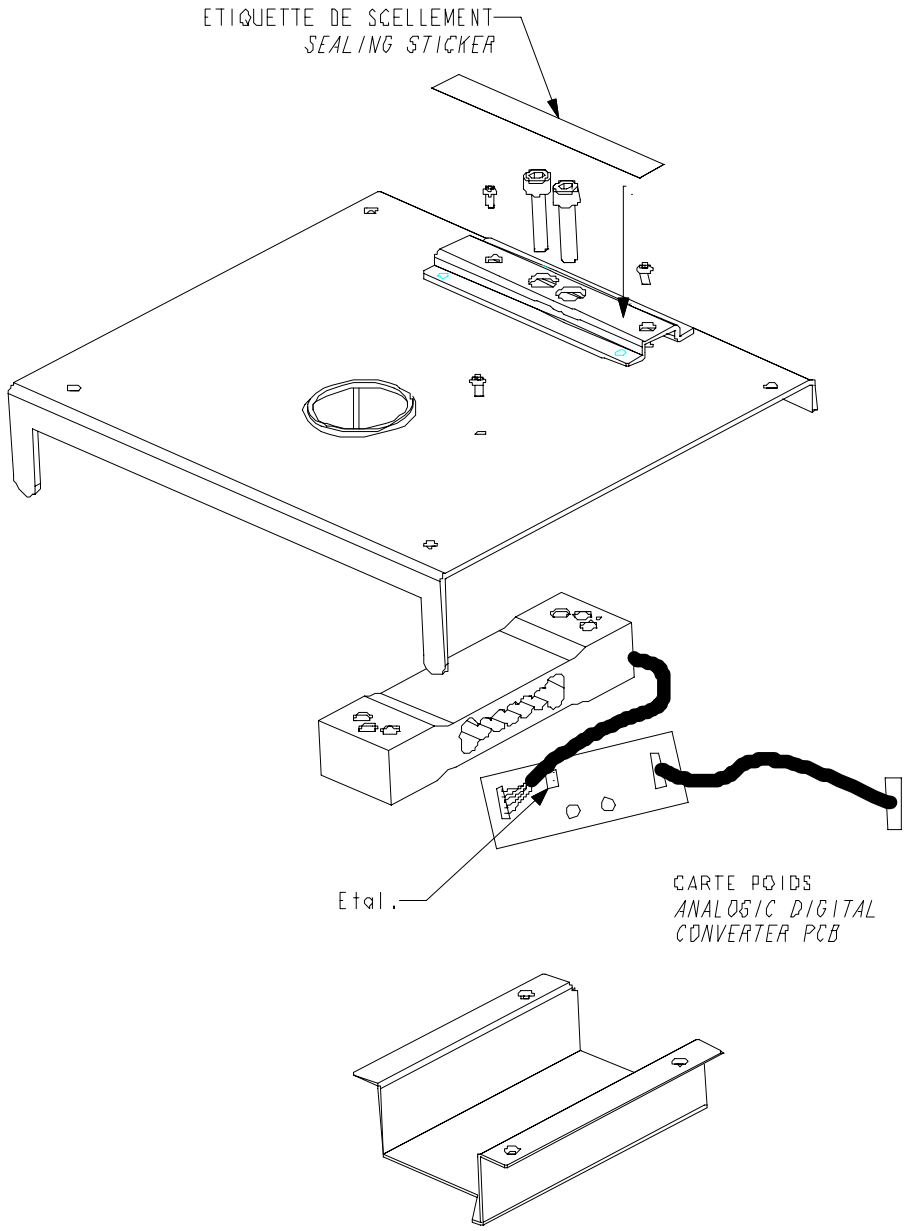
Marker	Designation	Article number
1	**Adjustable foot**	**71207299**
2	Rubber pad	
3	Self-locking ring DIA22	
4	Nut HM12	

4.11 Fitted electrical socket panel

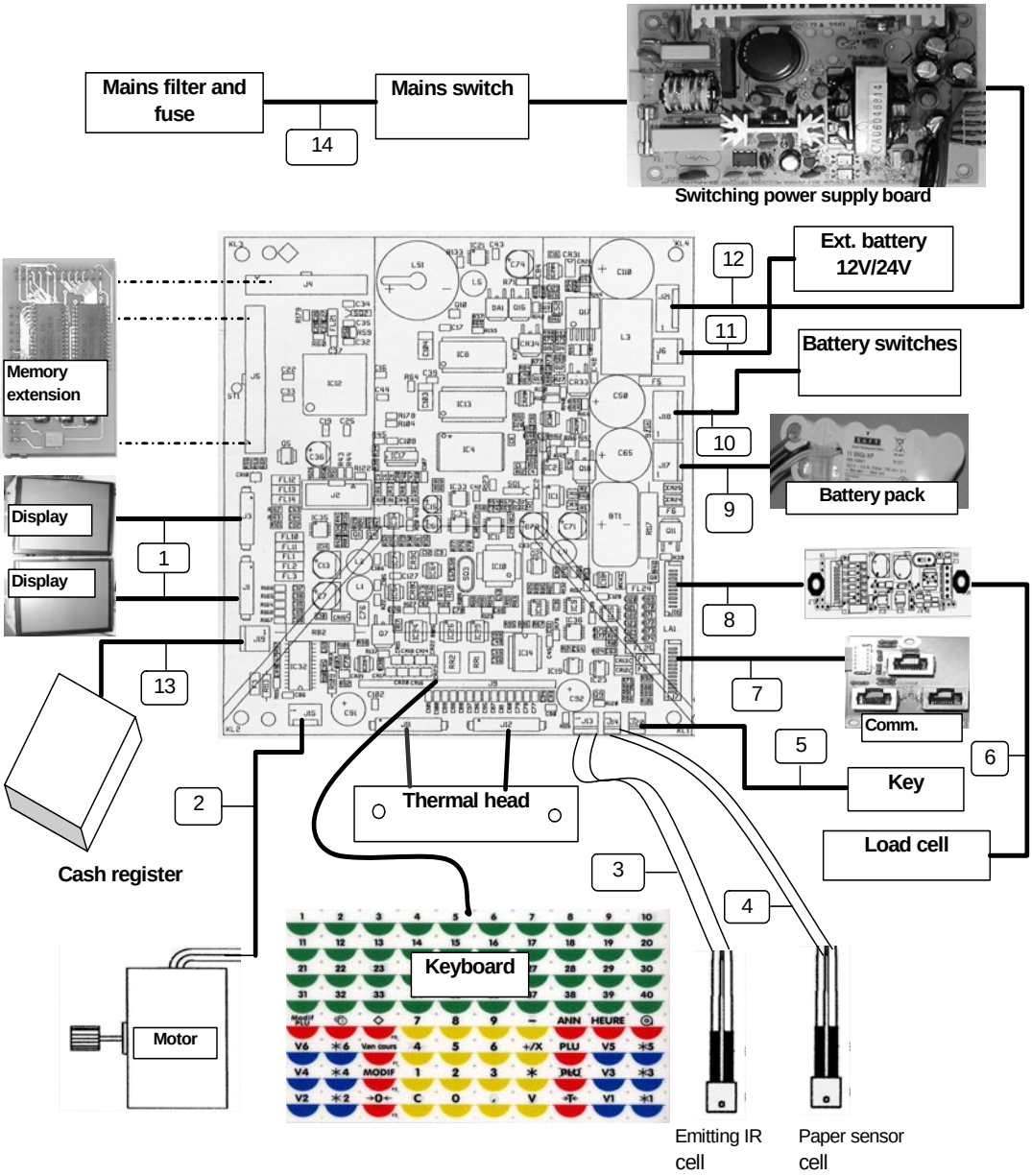


Marker	Designation	Article number
1	Mains filter	
2	Bipolar switch	
3	Electricity supply socket support panel	
4	Screw TBHC M3X6	
5	External battery (12v/24v) female socket	

5. Seal


ETIQUETTE DE SCELLEMENT
SEALING STICKER
Etal.
CARTE POIDS
ANALOGIC DIGITAL
CONVERTER PCB

6. Structure diagram



Marker	Designation	Article number
1	**CPU board/ front and rear display cable**	**71207314**
2	**Motor cable**	**71208131**
3	**IR emitting cell cable**	**71208141**
4	**IR sensor cell cable**	**71208129**
5	**Wired key**	**71207312**
6	Load cell cable	
7	**CPU board / Sockets cable**	**71208130**
8	**A/D board / CPU board cable**	**71208134**
9	**CPU board / Internal battery cable**	**71208147**
10	**Battery switch cable**	**71208133**
11	**External battery socket cable**	**71208147**
12	**Power supply / CPU board cable**	**71208132**
31	**Cash register cable**	**71208145**
14	**Mains filter cable**	**71208143**

7. Diagnostic and analysis of failures

The purpose of this chapter is to enable you to solve any problems you may encounter when powering up or using RI Series.

Before you can use RI Series, you must first wait the end of starting procedure, this one includes a series of tests and the memorisation of the null weighing reference.

The purpose of the tests series is to check the working of display, printing devices and to verify data stored in the scales.
During these test procedure error messages may be displayed for a while, or depending of seriousness stopping the scales from working.
Messages interpretation allows making a diagnostic in order to find the problem cause.

Start with the Check-list below to check the main points.

Check-list
There are two possible cases:

- The scales beep but nothing appears on the screen:

beeps after switching on the scales means the microprocessor starts the test procedure and works normally, in this case the cause issue is probably to search around display, their driving signals or the 5 Volts supply .

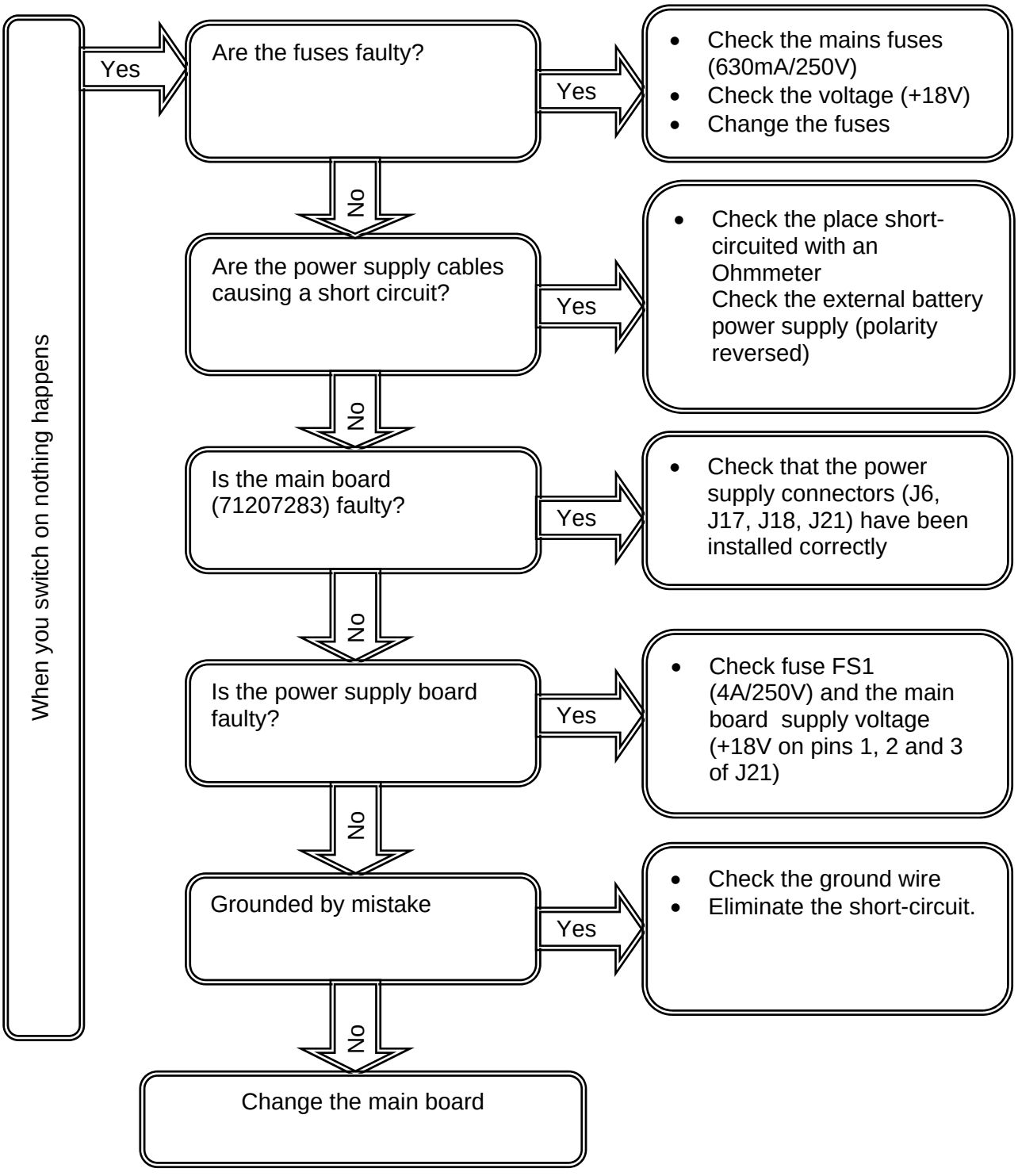
- The scales do not light up at all:

1. Working on mains:
   -Check presence of the mains voltage
   -Check the mains cable and its plugging
   -Check the On/Off mains switch (the bottom one) is in the correct position, both switches can be activated simultaneously
   -Check the fuse FS1 of the switching power supply (4A/250 V)

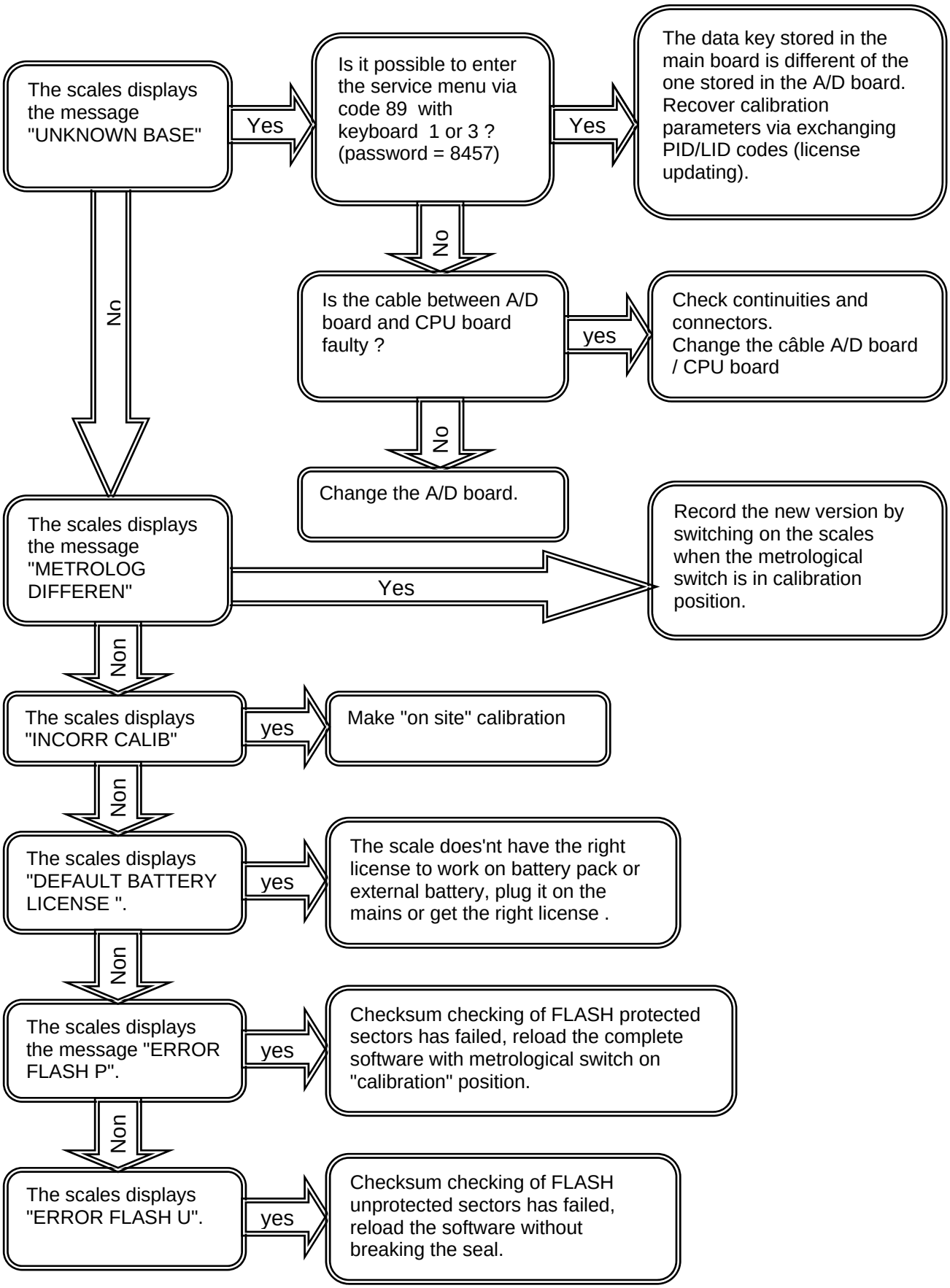
2. Working on battery:
   -Check the external battery voltage or the presence of internal battery pack.
   -Check the battery cable and its plugging.
   -Check the On/Off battery switch (the top one) is in the correct position.

In case of unsuccessful result, check voltages following flowcharts below.

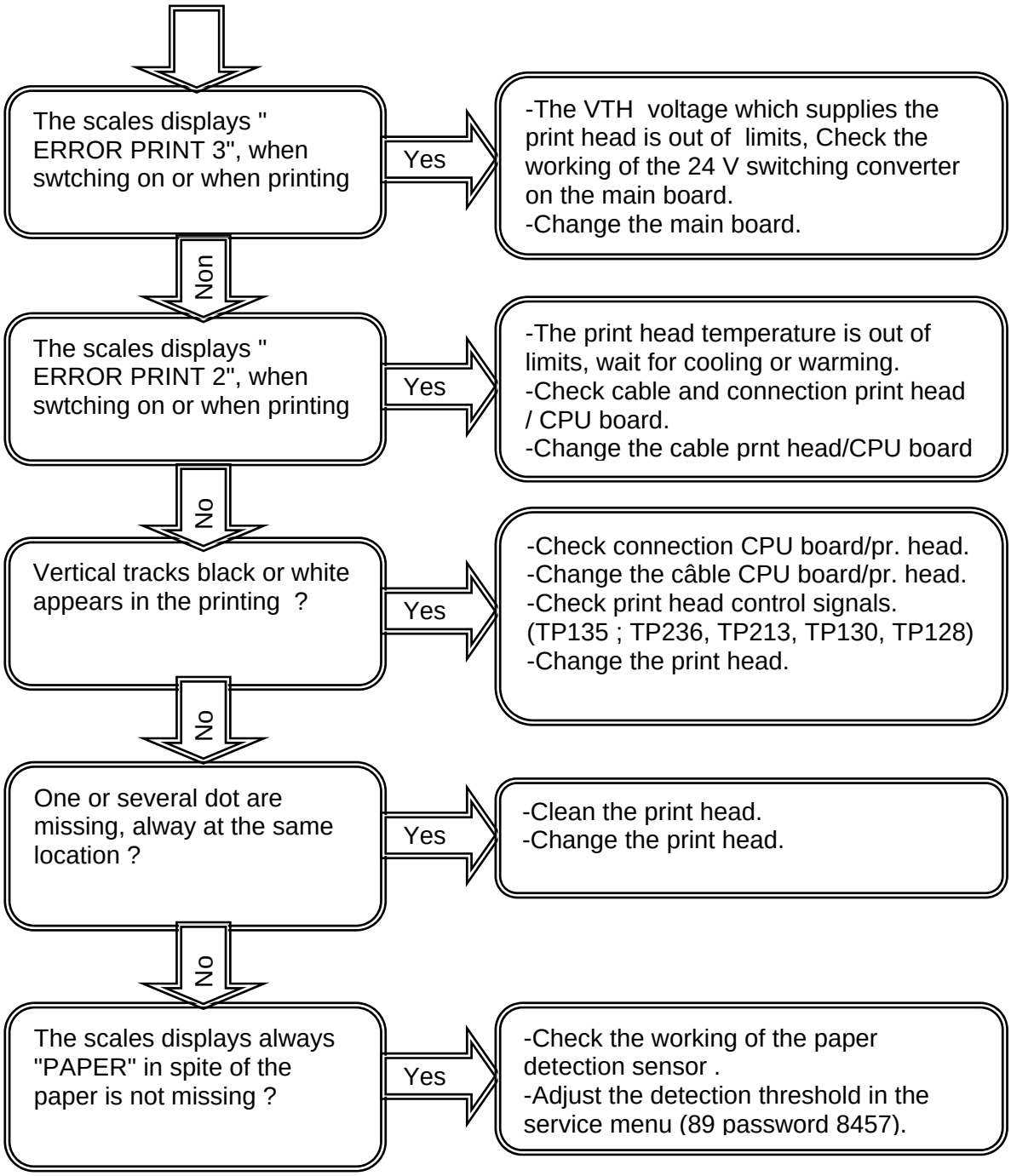
7.1 Nothing happens when switching on the scales



7.2 Error message displaying:



7.3 Printing problems:



8 Replacements:

Before you open the scales and handle the electronic components, cables, switches, etc., remove the electricity supply cable from the mains socket and the battery pack or external battery cable.

Note that certain components, in particular the power supply unit remain charged with electricity for a certain time, even after the scales have been unplugged.

Before you touch an electronic component, you must discharge the static electricity from your body.
To do this, touch something metallic connected to ground.

Organising the dismantling and reassembly

Carefully draw up the list of all the components and peripherals that you will need and check, point by point, that everything is there.

Check-lists:

Equipment needed:

- A flat screwdriver, width 2-2.5 mm,
-.A N° 1-3 posidrive screwdriver,
- A N°15 Torx spanner,
- A N°5 six-sided spanner,
- A N°5.5 flat spanner,
- A N°7 flat spanner,
- A 10kg weight (Calibration),
- A PC equipped with the "FLASH LOADER" software.

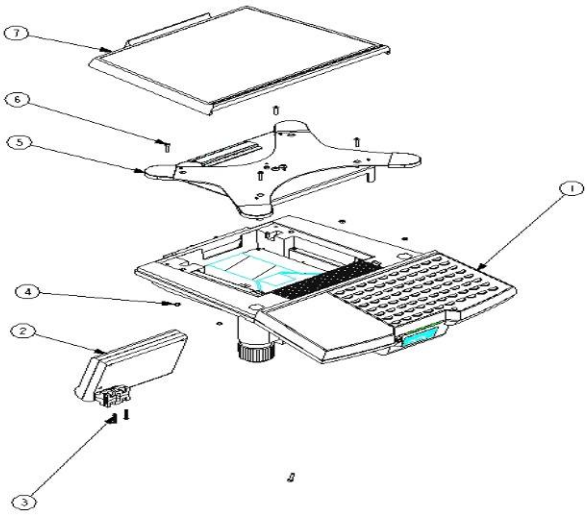
8.1 Replacing the A/D board and load cell assembly on RI Series

Dismantling: see drawings 29270001, 29270077 and 29270054.

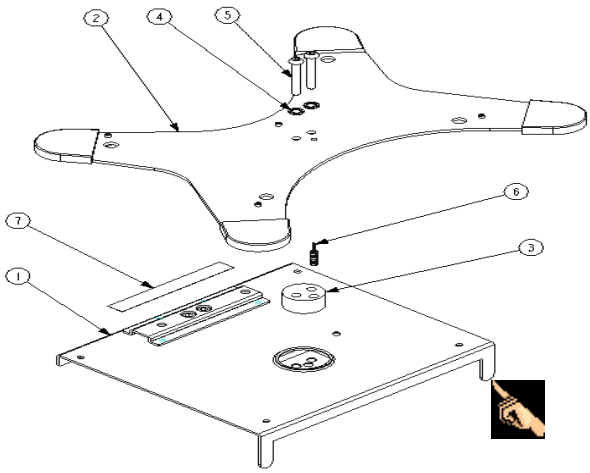
- Switch off the scales, unplug the mains plug / external battery plug.
- Remove the internal battery.
- Remove the fitted plate (7 see drawing 29270001)- Remove the 2 rubbers that are located behind the plate support cross-piece (2 see drawing 29270077).

- Unscrew the four TBHC M4X20 screws (6 see drawing:29270001).
- Unscrew the three screws which ground the load cell support and fitted cross-piece to the main shell.
- Push the 2 load cell support feet (1 see drawing 29270077) upwards as indicated below.
- Pull the load cell support and fitted cross-piece assembly (5 see drawing 29270001) upwards and place it delicately to one side.

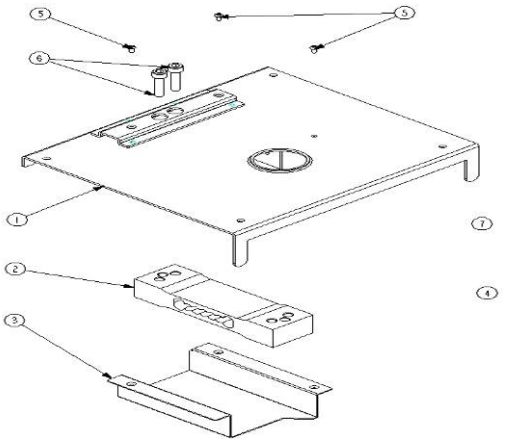
- Disconnect the cable that connects the main board and the A/D board.
- Remove the load cell support (1 see drawing 29270077) and fitted cross-piece (2 in drawing 29270077) assembly.
- Unscrew the two TBHC M6X40 screws (5 see drawing 29270077) that retain the plate support cross-piece (5 see drawing 29270077).
- Remove the plate support cross-piece (2 see drawing 29270077) and the shim (3 see drawing 29270077) and the earth contact (6 see drawing 29270077. **Take care: with the earth contact.**



29270001



29270077



29270054

- Remove the unalterable label .
- Unscrew the three TBHC M3X6 screws (5 see drawing 29270054.
- Remove the load cell / A/D board protector (3 see drawing 29270054).
- Unscrew the two CHC M6X25 screws (6 see drawing 29270054), using the n°5 six-sided spanner.
- Unscrew the two screws that hold the A/D board onto the load cell support (1), using the posidrive screwdriver.
- Unsolder the load cell's five wires that connect the A/D board. N.B.: note the colours of the wires.)

Assembly:

- Solder the gauge's 5 wires onto the A/D board respecting the colours of the wires.

Ex. SOLDER:
- the black wire to A-
- the red wire to Z-
- the white wire to Z+
- the green wire to A+
- the yellow/green wire to GND

- Tighten the 2 M6X25 screws (6 see drawing 29270054), using the n°5 six-sided spanner. The tightening torque is 1.5m dN or 1.5m kg.

CAUTION: the correct behaviour of the weight depends on the tightening of these screws.
- Tighten the 2 screws that hold the A/D board onto the load cell support, using the posidrive screwdriver.
- Replace the load cell / A/D board protector (3 see drawing 29270054).
- Tighten the three TBHC M3X6 screws (5), using the n°2.5 six-sided spanner.
- Replace the plate support cross-piece (2 see drawing 29270077) and the shim (3 see drawing 29270077) and the earth contact on the sensor.
- Tighten the two TBHC M6X40 screws (5 see drawing 29270077), using the n°5 six-sided spanner. The tightening torque is 1.5m dN or 1.5m kg.

CAUTION: the optimum working of the weight depends on the tightening of these screws.

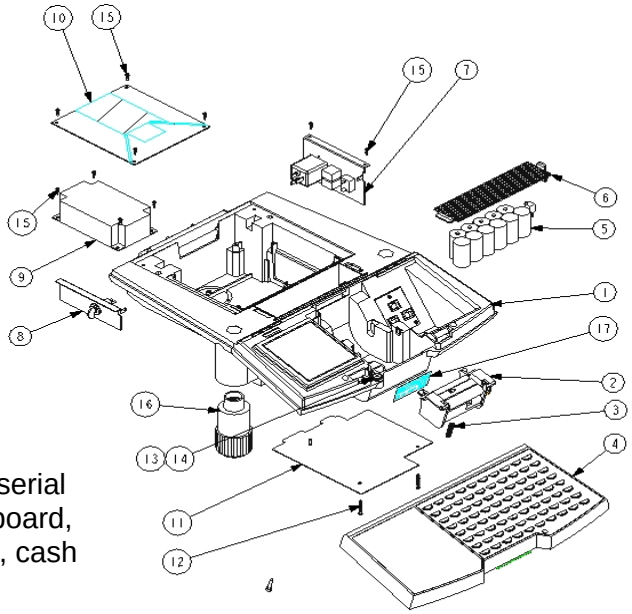
- Replace the load cell support and fitted cross-piece assembly (5 see drawing 29270001).
- Plug the CPU board/ A/D board cable on the main board.
- Reconnect the ground wire and tighten the screw using the n°7.5 flat spanner.
- Replace the load cell support and fitted cross-piece assembly (5 see drawing 29270001).
- Tighten the four TBHC M4X20 screws (6 in drawing:29270001), using the n°3 six-sided spanner.
- Replace the 2 rubbers that are located behind the plate support cross-piece (2 in drawing 29270077).
- Plug the mains cable in again.
- Calibrate the scales according to the procedure on pages 38 and 39.
- Stick the unalterable label (7 see drawing 29270077) back on.
- Replace the fitted plate (7 see drawing 29270001)
- Test for correct working.

8.2 Replacing the main board on RI Series

Dismantling: see drawings 29270001 and 29270077.

- Switch off the scales, unplug the mains and external battery, remove internal battery.
- Remove the load cell support and fitted cross-piece assembly as indicated in paragraph 8.1
- Unplug all the cables that connect the main board.

CAUTION: carefully unplug the connectors and label them (especially the connectors for the thermal print head).
- Unscrew the four EJOT PT K30X10 screws, using the n°15 Torx spanner.
- Remove the main board.



Assembly:

- Install the new main board
-Tighten the four EJOT K30X10 screws.
- Plug in all the connectors (print head, key, serial output, paper presence sensors, motor, keyboard, displays, power supply, internal battery pack, cash register).

- Replace the load cell support and fitted cross-piece assembly (5 see drawing 29270001).
- Plug the main board /A/D board cable in on the main board.
- Replace the sensor support and fitted cross-piece assembly (5 see drawing 29270001).
- Tighten the four TBHC M4X20 screws (6 see drawing 29270001).
- Tighten the three screws which ground the load cell support to the main shell.
- Replace the 2 rubbers that are located behind the plate support cross-piece.
- Replace the fitted plate
- Plug the mains cable in again.

WARNING : recovering calibration parameters by license updating avoid the lost of "GEO code" . Calibration on site is however possible by following calibration procedure page 53 and 54 .

- Test for correct working.

8.3 Replacing the switching power supply unit on RI Series

Dismantling: see drawings 29270001 and 29270077.

- Switch off the scales, unplug the mains plug.
- Remove the load cell support and fitted cross-piece assembly as indicated in paragraph 8.1
- Unplug all the cables that connect the main board.

CAUTION: carefully unplug the connectors and label them (especially the connectors for the thermal print head).
- Unscrew the four EJOT PT K30X10 screws.
- Remove the main board.
- Unscrew the four EJOT PT WN1412 K30X10) screws.
- Disconnect the Power supply / main board cable and the mains cable
- Remove the switching power supply unit.

Assembly:

- Install the new power supply unit .
- Tighten the four EJOT PT WN1412 K30X10 screws.
- Plug in the Power supply / CPU board câble, and the mains cable
- Install the CPU board.
- Tighten the four EJOT PT WN1412 K30X10 screws.
- Plug in all the connectors (thermal print head, key, serial output, paper presence sensor, motor, keyboard, display units, power supply, internal battery, cash register).
- Replace the load cell support and fitted cross-piece assembly (5 see drawing 29270001).
- Plug the main board/ A/D board cable on the mainU board.
- Replace the load cell support and fitted cross-piece assembly (5 see drawing 29270001).
- Tighten the four TBHC M4X20 screws (6 in drawing:29270001).
- Tighten the three screws which ground the load cell support to the main shell.
- Replace the 2 rubbers that are located behind the plate support cross-piece (2 see drawing 29270077).
- Plug the mains cable in again.
- Replace the fitted plate (7 see drawing 29270001)
- Test for correct working.

8.4 Replacing the flexible keyboard on RI Series

Dismantling: see drawings 29270001, 29270077 and 29270055.

- Switch off the scales, unplug the mains plug.
- Remove the fitted plate (7 see drawing 29270001)
- Remove the load cell support and fitted cross-piece assembly as indicated in paragraph 8.1 and place it delicately not to the side but to the rear on the same axis on the edge of the scales.
- Disconnect the keyboard from connector J9 of the main board.
- Unstick the flexible keyboard (4 see drawing 29270055).
- Pull forwards on the two clips (7 see drawing 29270055), as indicated above.
- Swing the fitted keyboard assembly upwards.
- Unscrew the four EJOT PT WN1412 K30X10 (13 see drawing 29270055) screws.
- Lower the fitted printer head support (6 see drawing 29270055).
- Lean the scales on their left side.
- Unscrew the two EJOT PT WN1412 K40X25 screws (12 see drawing 29270000) that retain the lower enclosing panel (11 see drawing 29270000).
- Remove the lower enclosing panel (11 see drawing 29270000).
- Disconnect the keyboard membrane and remove it (4 see drawing 29270055).

Assembly:

- Clean the place for the flexible keyboard.
- Carefully stick the new flexible keyboard (4 see drawing 29270055) onto the keyboard shell (1 see drawing 29270055).
- Plug the keyboard into connector J9 of the CPU board (shifting to the left).
- Install the lower enclosing panel (11).
- Tighten the four EJOT PT WN1412 K40X25 screws, using the n°15 Torx spanner.
- Pull forwards on the two clips (7 see drawing 29270055), as indicated above.
- Swing the fitted keyboard assembly upwards.
- Put in place the fitted printer head support (6 see drawing 29270055).
- Tighten the four EJOT PT WN1412 K30X10 (13 see drawing 29270055) screws.

- **CAUTION**: make sure that the paper presence cell (14 see drawing 29270055) is in the correct position.
- Swing the fitted keyboard assembly (1 see drawing 2927055) downwards until you hear the noise of the clips engaging.
- Replace the load cell support and fitted cross-piece assembly (5 see drawing 29270001).
- Tighten the four TBHC M4X20 screws (6 in drawing:29270001).
- Replace the two rubbers.
- Replace the fitted plate (7 see drawing 29270001).
- Plug the mains cable in again.
- Test for correct working.

8.5 Replacing the thermal print head on RI Series

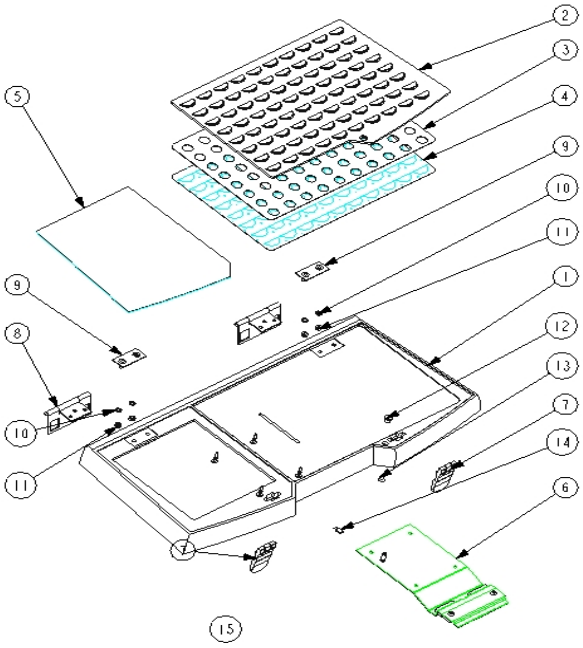
Dismantling: see drawings 29270055 and 29270063.

- Switch off the scales, unplug the mains plug.
- Pull forwards on the two clips (7 see drawing 29270055), as indicated above.
- Swing the fitted keyboard assembly upwards.
- Unscrew the four EJOT PT WN1412 K30X10 (13 see drawing 29270055) screws.
- Lower the fitted printer head support (6 see drawing 29270055).
- Unscrew the two TBHC M3X6 screws (3 see drawing 29270063).
- Remove the two cables that connect the thermal print head to the CPU board (label them before you disconnect them).
- Remove the thermal print head (2 see drawing 29270063)

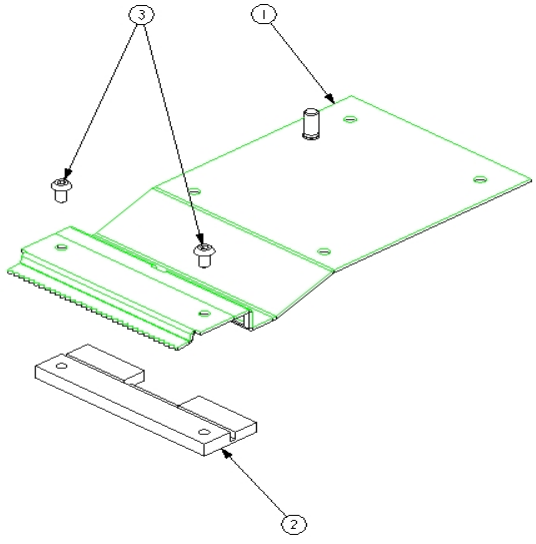
Assembly:

- Install the new thermal print head (2 see drawing 29270063).
- Plug in the two cables connecting the thermal print head to the CPU board according to the labelling.
- Tighten the two TBHC M3X6 screws (3 see drawing 29270063).
- Install the fitted printer print head support (6 see drawing 29270055).
- Tighten the four EJOT PT WN1412 K30X10 (13 see drawing 29270055) screws.

- **CAUTION**: make sure that the paper presence cell (14 see drawing 29270055) is in the correct position.
- Swing the fitted keyboard assembly (1 see drawing 2927055) downwards until you hear the noise of the clips engaging.
- Plug the mains cable in again.
- Test for correct working.



29270055



29270063

8.6 Replacing the fitted motor unit on RI Series

Dismantling: see drawings 29270000 and 29270052.

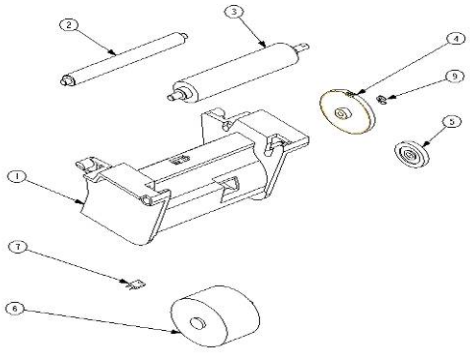
- Switch off the scales, unplug the mains plug.
- Lean the scales on their left side.
- Unscrew the two EJOT PT WN1412 K40X25 screws (12 see drawing 29270000) that retain the lower enclosing panel.
- Remove the lower enclosing panel (11 see drawing 29270000).
- Set the scales back on their feet.
- Remove the fitted plate (7 see drawing 29270001)
- Remove the 2 rubbers that are located behind the plate support cross-piece (2 see drawing 29270077).
- Unscrew the four TBHC M4X20 screws (6 see drawing 29270001).
- Push on the 2 load cell support feet (1 see drawing 29270077) as indicated above.
- Pull the load cell support and fitted cross-piece (5 see drawing 29270001) upwards and place it delicately not to the side but to the rear on the same axis on the edge of the scales.
- Disconnect the motor cable and the emitting cell cable from the CPU board (J11 and J15).
- Remove the motor's power supply cable and the emitting cell cable.
- Pull forwards on the two clips (7 see drawing 29270055), as indicated above.
- Swing the fitted keyboard assembly upwards.

29270063

- Insert the flat screwdriver between the motor support and the main shell .
- Remove the motor support unit (2) upwards by swinging the flat screwdriver towards the inside of the scales.

Assembly:

- Put the spring (3 see drawing 29270000) in its place.
- Install the motor support unit (2) using the flat screwdriver.
- Swing the fitted keyboard assembly (1 see drawing 2927055) downwards until you hear the noise of the clips engaging.
- Plug the motor cable and the paper presence emitting cell cable in on the main board (J11 and J15).
- Replace the load cell support and fitted cross-piece assembly (5 see drawing 29270001).
- Tighten the four TBHC M4X20 screws (6 in drawing:29270001).
- Replace the two rubbers.
- Replace the fitted plate (7 see drawing 29270001).
- Put the scales to their side.
- Install the lower enclosing panel (11).
- Tighten the four EJOT PT WN1412 K40X25 screws.
- Plug in the mains cable and test for correct working.



29270052

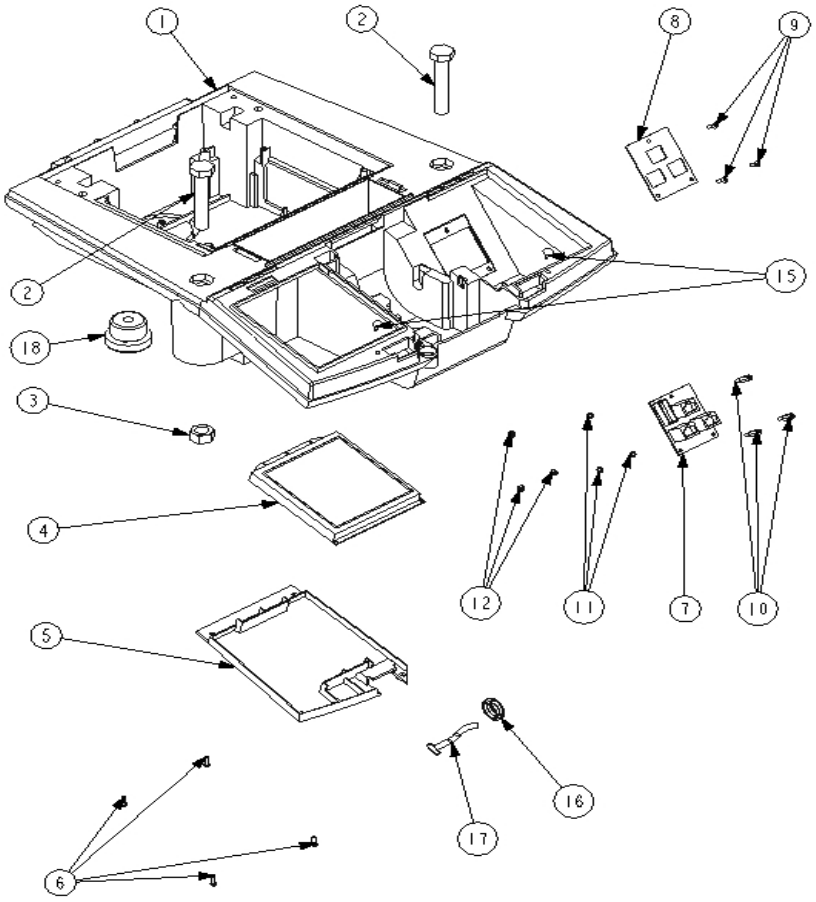
8.7 Replacing the front display unit on RI Series

Dismantling: see drawing 29270051.

- Switch off the scales, unplug the mains plug.
- Lean the scales to their right side.
- Unscrew the four TBHC M3X10 screws (6 see drawing 29270051) that retain the display unit door (5 see drawing 29270051).
- Disconnect the Display unit / main board connecting cable.

Assembly:

- Plug the Display unit/CPU board connecting cable into the new display unit.
- Install the new display unit and the display unit door (5 see drawing 29270051).
- Tighten the four TBHC M3X10 screws (6 see drawing 29270051) that retain the display unit door (5 see drawing 29270051).
- Set the scales back on their feet.
- Plug the mains cable in again.
- Test for correct working.



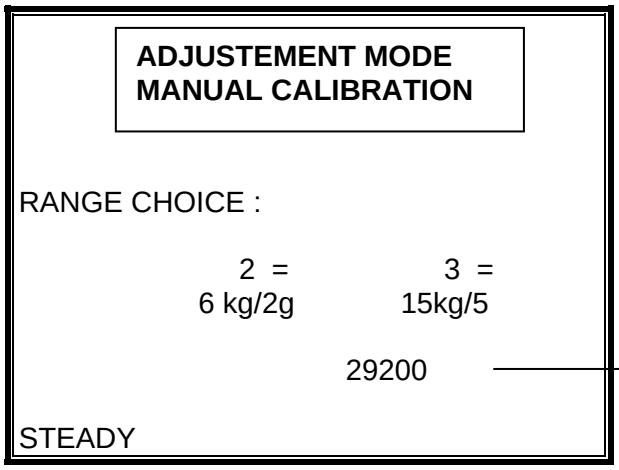
29270051

9. On site calibration procedure:

Warning: On site calibration will have as consequence **the lost of "GEO code** ", so in case of main board replacement it is preferable to recover calibration parameters by license updating (**see tutorial file HeliosEng.chm) .**

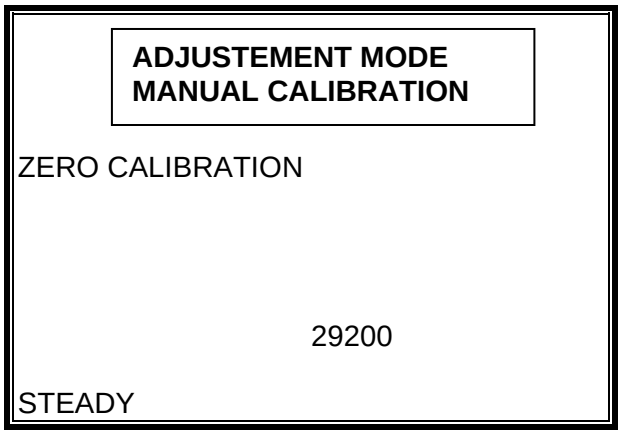
- Set the scales level.
- Remove the fitted plate (7 see drawing 29270001)
- Remove the sealing label (7 in drawing 29270077)
- Insert a straightened paper clip (or a pointed object) into the hole provided for calibration.
- Press the Toggle Switch once in order to get the top position.
- Install the fitted plate.
- Switch on the scales.

The scales self-test and after choosing menu "1 -> CALIBRATION" display:



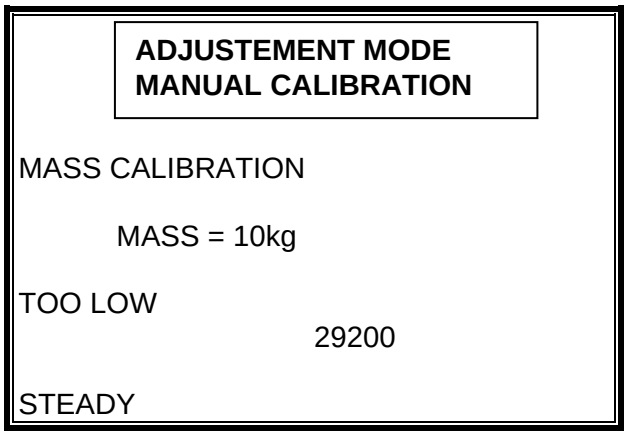
Press the 2 or 3 key to select the range you want:
Ex.: press the 3 key to select the 15kg/5g range.

The scales display:



As soon as the message "STEADY" is displayed,press the V key to validate.

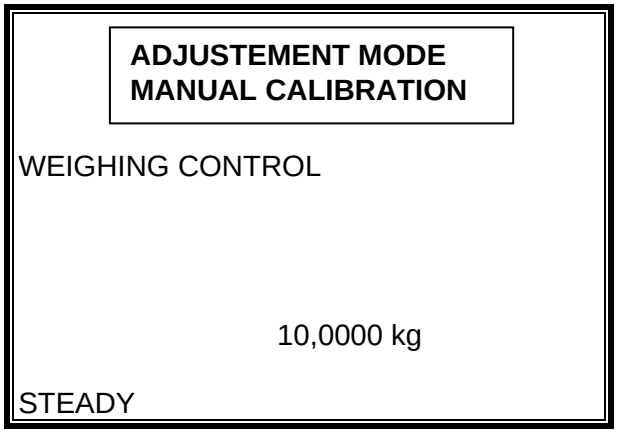
The increment number of the zero zone for this range is between 8000 and 100000.
The scales display:



Put the calibration weight requested on the pan.
As soon as the message "STEADY" is displayed, press the V key to validate

If the weighing does' nt exceed limits, the calibration is then over.

The scales display:

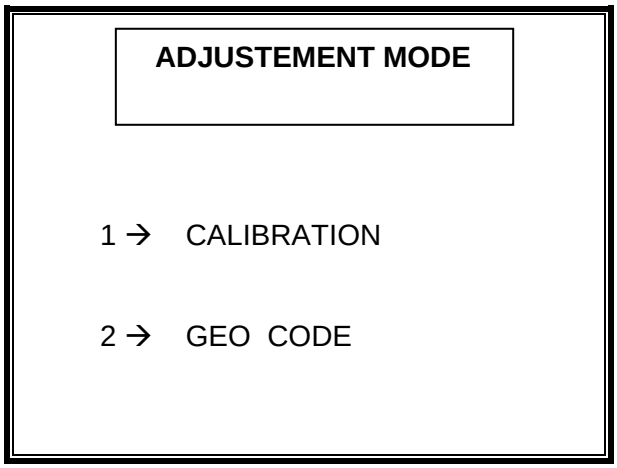


- Switch off the scales.
- Remove the fitted plate (7 see drawing 29270001)
- Press in the hole provided for calibration with the straightened paper clip once more in order to get the bottom position.
- Stick on the sealing label (7 in drawing 29270077)
- Install the fitted plate (7 see drawing 29270001)
- The scales are ready to work.

9.1 "GEO" code modification:

- Remove the fitted plate (7 see drawing 29270001)
- Remove the sealing label (7 in drawing 29270077)
- Insert a straightened paper clip (or a pointed object) into the hole provided for calibration.
- Press the Toggle Switch once in order to get the top position.
- Install the fitted plate (7 see drawing 29270001)
- Switch on the scales.

The scales self-test and display:



Choose "2 -> GEO CODE" and then key the new GEO code according to the new destination of the scales, validate by V key.
NB: when GEO code is equal to zero, it is impossible to modify it, because the gravity reference where the scales has been calibrated by robot has been lost.

- Remove the fitted plate (7 see drawing 29270001)
- Press in the hole provided for calibration with the straightened paper clip once more in order to get the bottom position.
- Stick on the sealing label (7 in drawing 29270077)
- Install the fitted plate (7 see drawing 29270001)
- The scales are ready to work.

10. Technical data Test points / Settings:

10.1 Electrical characteristics:

The scales can be powered from three different sources :

1- Mains (90 à 264 Volts AC / 47 à 440Hz).
A switching power supply unit converts the mains supply voltage to 18 Volts DC /3 A which is used by the main board.

2-External battery of car (12 volts) or truck (24 volts).

3-Internal battery pack 13.2 Volts/3Ah.

When several supply are present at the same time the priority is the following:

1) External truck battery 24 Volts.
2) Mains.
3) External car battery 12 Volts.
4) Internal battery pack.

The internal battery pack is only used when there is no other supply source at the same time.
When there is an other supply source this last one is detected by control signals: P_Sect et P_Bat_Ext , The battery pack is insulated by an electronic switch in order to save its energy.

Non interruptible power supply :
In case mains failure scales is automatically powered by the internal battery pack without any interruption at the condition that both switches are "ON" at the same time .

Internal voltages :
A unique DC voltage between 11 et 30 Volts supplies the main board where internal voltages are produced:

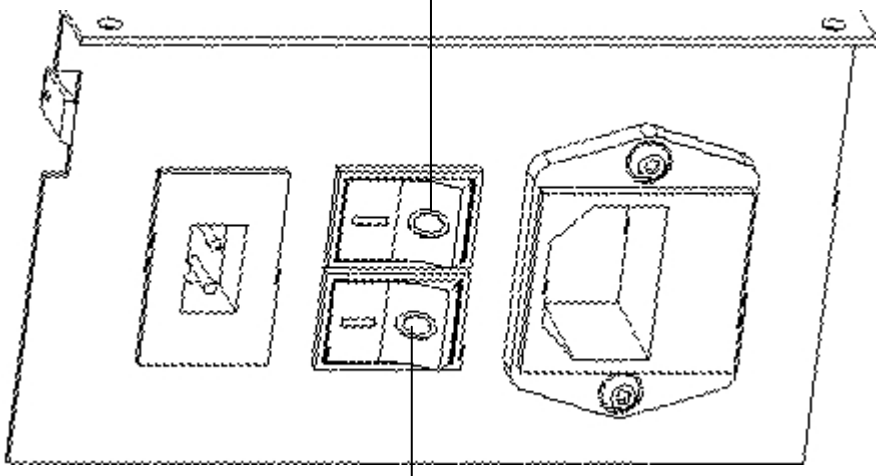
a) +3,3V (VCC to supply the µP and logical circuits and components).
b) +5V (motor interface, displays, thermal print head, serial port etc..)
c) +6,5V alimentation +3,3V, +5V, and + 5V dedicated to the load cell.
d) +24V / 5A by pulse for the printing.

RI Series and scales are fitted with two switches :

- Battery switch (at the top) allows to turn off external and internal battery pack .
- Mains switch (at the bottom) allows to turn off mains supply (diagram below)

NB: both switches can be activated at the same time .

On/Off switch for internal and external batteries

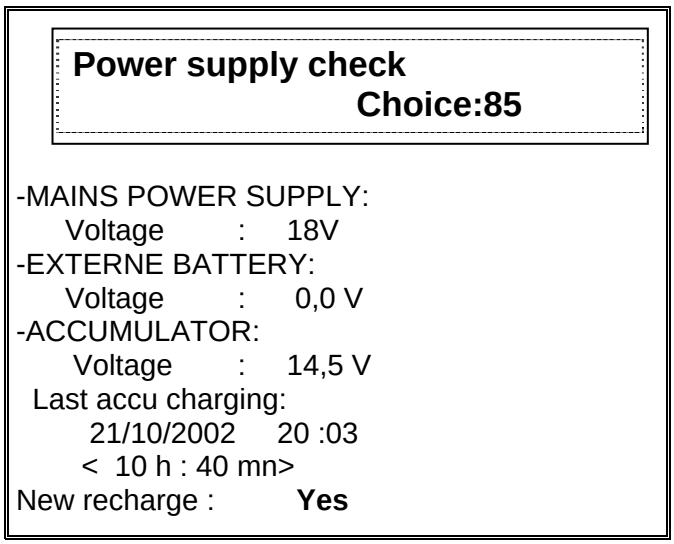


On/Off switch for mains

Battery pack recharge

CAUTION: In order for the internal battery to charge:

- the scales must be supplied by the mains,
- the "New charge" option (code 85) must be "*YES"*. (See below)



If the scales are supplied by the mains and the "New recharge" option is *YES* and the batteries switch is in the "ON" position, the internal battery pack recharges and the "New recharge" message changes to "Recharge in progress".

If the batteries switch is in the "OFF" position and the scales are supplied by the mains, the internal batteries go onto trickle recharge mode. (by the BR1 diode)

When the scales are working on the external battery, the internal battery does'nt recharge.

N.B.: If you use the internal battery for a minimum of 5 minutes, the "New recharge" option automatically switches to ***Yes***.

10.2 The switching power supply unit (71207286)

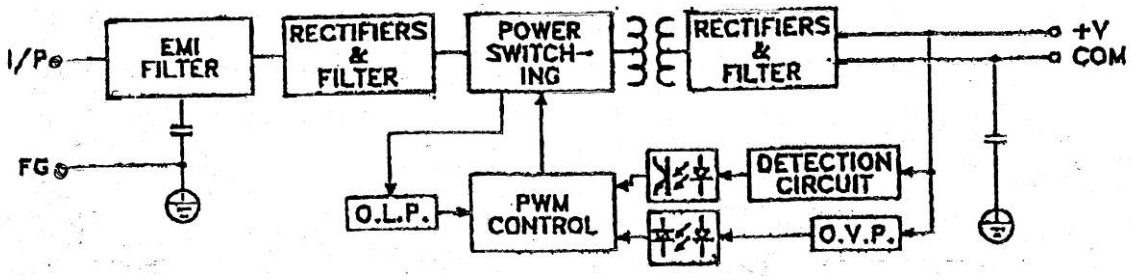
The power supply used is switching type (PS-65-15).

Its main characteristics are:

-Input voltage……. 90 – 264VAC
- AC current……..1.5A/115VAC ; 0.9A/230VAC
- Frequency……. 47 – 440Hz
- EMI filter
- Protection against: short circuits, surges, overloads.
- Output voltage……..15 – 20V (by the SVR1 potentiometer)
-Output current……..3A

The output voltage can be adjusted by the power supply board's potentiometer (SVR1).

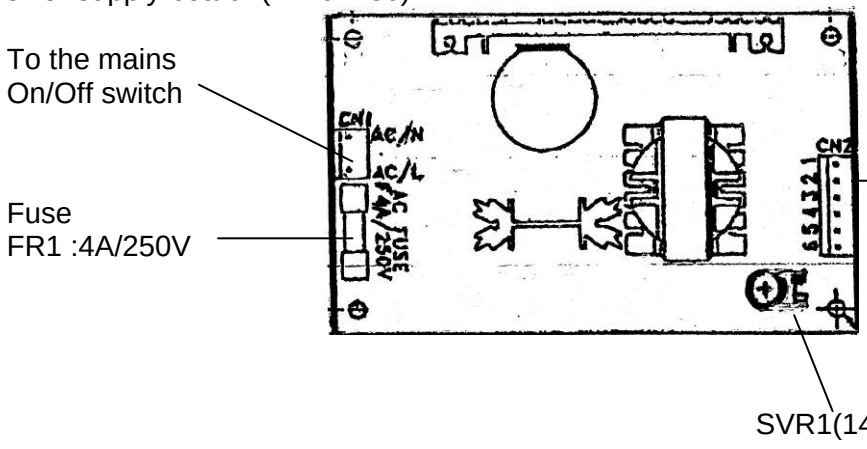
Block-diagram:



To the CPU board

Test points (in DC) :
CN1 :
1=> 18V
2=> 18V
3=> 18V
4=> 0V
5=> 0V
6=> 0V (GND)

Power supply board: (71207286)



10.3 Analogue/digital board

The A/D board conversion principle used is "Delta-Sigma".

The A/D board board includes:

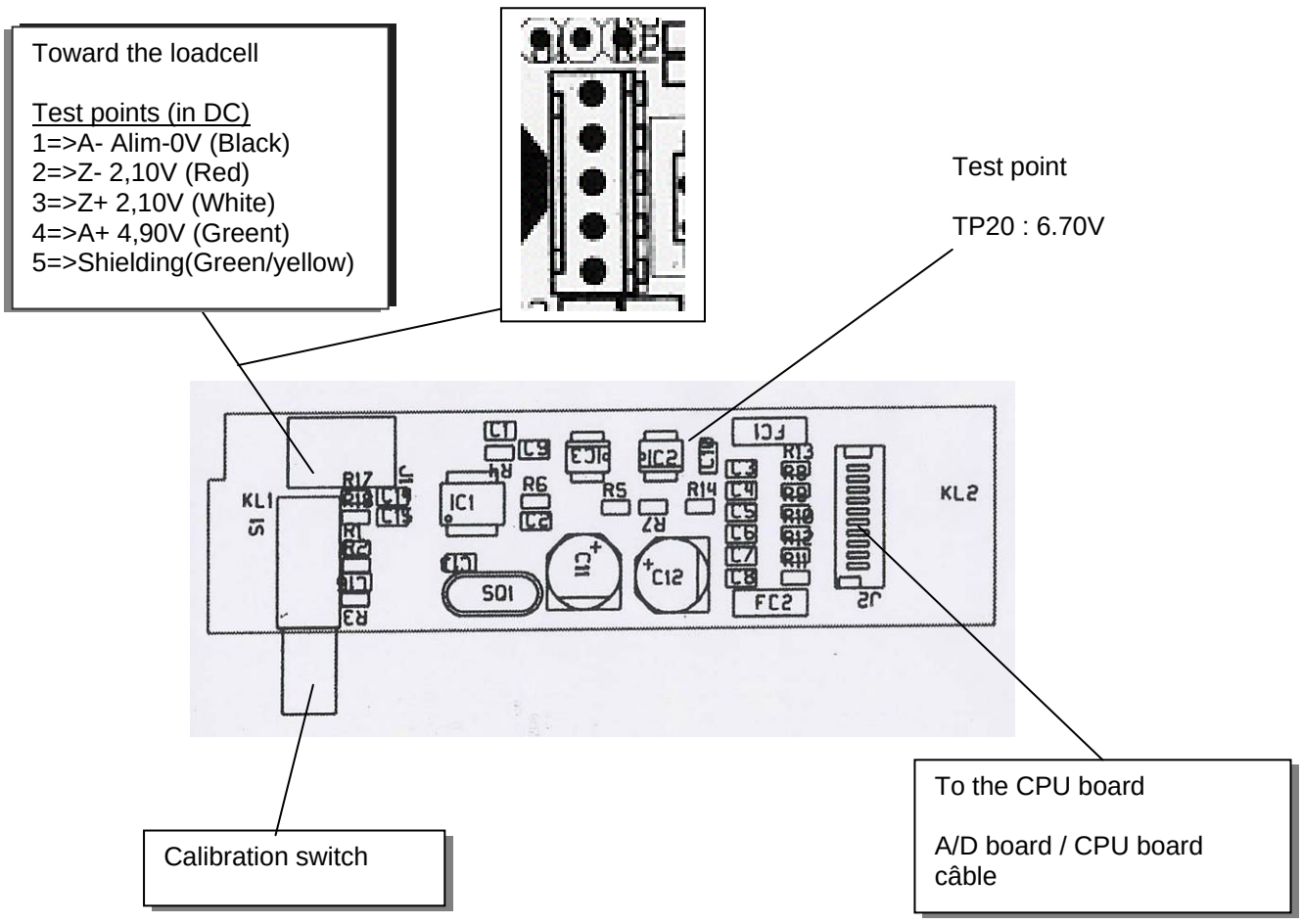
- Analogue/digital converter [IC1 (CS5532 CYRRUS LOGIC)=delta-sigma with integrated amplifier]
- +5V load cell power supply voltage regulator (IC2=LM293IM-5)
- EEPROM [IC3 (25LC40)], containing the weight calibration parameters, the gravity correction factor, the metrological version of the software release used during calibration.
- ST1 calibration switch (calibration and updating of the protected sectors of the FLASH memory.

The A/D board and the CPU board communicate using the SPI bus (synchronous serial interface).

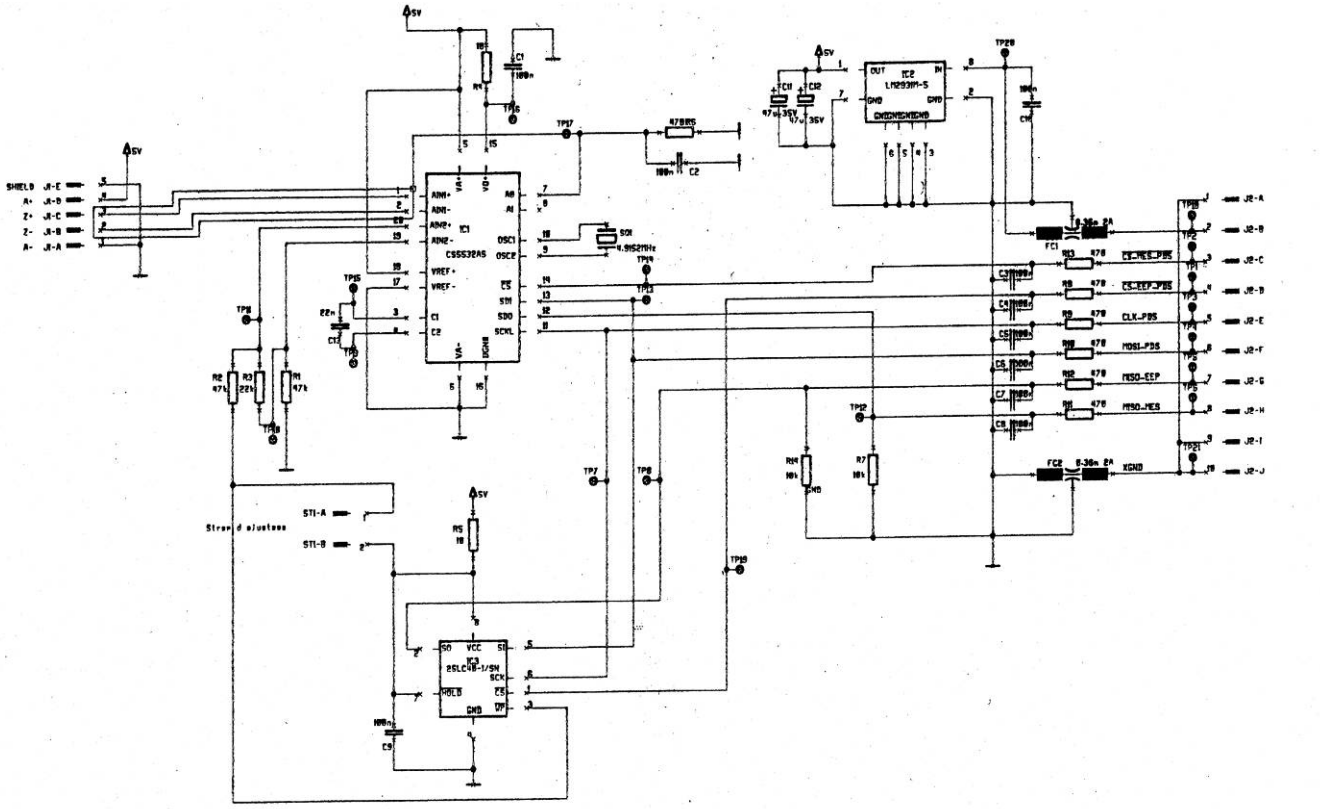
Only the weighing base is sealed.

The digital sealing takes effect when the scales are calibrated and makes the sealed weighing base and the main board an **inseparable pair** for the working of the scales.

10.3.1 Test points



10.3.2 Electrical diagram (29120154)



10.4 RI Series CPU board (main board)

The CPU board is divided into 5 parts:

- The microprocessor part and interfaces,
- The printer part,
- The display part,
- The communication part,
- The power supply part.

10.4.1 The micro processor part

The system is structured around a Motorola MC68CK331 (IC12) microprocessor.
This is made up of:

a 32 bit CPU,
7 programmable interface ports,
8 16 bit timers and an events counter (PAI),
.Watch dog,
SPI (thermal head address, time stamp, EEPROM, batteries voltage),
.SCI (RS232 serial output),
.12 chips selects.

The 8 channel CAD manages the state of charge of the battery pack, measures and controls the voltages and the parameters necessary for the correct working of the machine (battery voltage, power supply and temperature of the printing head, mains power supply, external 12 volt power supply etc.).

- IC8 and IC13 are 1 Megabyte 16 bit RAMs for the data. The battery (BT1 +2.4) is used to save the data.
  - The data items stored are customer totals, Plu, families, header texts, two level running totals (Plu running totals, family running totals, seller running totals, VAT running totals).

-IC4 (AM29LV800, 512Kbytes X 16) is the FLASH memory structured into 19 sectors.

Sectors 1, 2 and 3 are protected. This means that these sectors can only be written to or erased when the sealed part is open and the metrological switch is at top position.

Sector 1 is protected and contains the following programs:

- Table of vectors,
- Start-up module,
- Flash loader module.

Sectors 2 and 3 are protected and contain the following programs:
- Identification of the base and reading the parameters recorded in it,
- Reading the Delta-sigma A/D converter,
- Calculating the weight with all the sub programs (tare, stability, adjustment, manual adjustment, weight display, tare display, etc.),
- Reading / writing in Flash memory,
- Synchronous serial communication using the SPI protocol,
- All the functions and utilities that enable the programs contained in sectors 1, 2 and 3 to work without calling on C library that is contained in the unprotected sectors,
- Complemented 16 bit global check-sum of these 3 protected sectors.

Sector 4 does not contain program code but is used to store non volatile data such as the currencies used, the messages for the language downloaded, the language selected, the keyboard selected, the parameters for communication with the PC, the sealed part recognition code (digital seal), etc.

Sectors 5 to 19 are unprotected and contain the following programs:

- Main loop, running totals management, user functions, keyboard decoding, printing, real time clock, checking of voltages and parameters, PC communications, network communication, various utilities, messages in the three basic languages, fonts, table of vectors, C library, etc.
- Complemented 16 bit global check-sum of these 15 sectors.

IC1 (DS1305E) is a real time clock.

IC17 (MCP 300B) is a 10 bit Analogue/Digital converter (ADC). The processor (IC12 68CK331) uses it, via the SPI interface to continuously measure and know:

- CELL_PAP (paper present)
- M_PACK (mesure the pack's voltage)
-THERM (Temperature of the thermal head)
- CONTROL_VTETE (voltage of the thermal head)
- NTC_BAT (Temperature of the battery pack)
- TP24 (not used)
- P_SECT (mains voltage present)
- P_BAT_EXT (external battery voltage present)

IC24, IC26 and IC29 manage the keys on the keyboard.

All the logic circuits are supplied with a +3.3V voltage.

10.4.2 The printer part

The ROHM KF2002 GD10 thermal printer head is used in RI Series and Atoll scales.
The processor controls the loading of the printer head (LATCH, SCK, MOSI).

The print head heating duration and signals control are calculated and produced by the processor (IC12) .

Data as thermal head temperature (THERM), head's power supply voltage (VTH and CONTROL_VTETE), paper detection (CELL_PAP) are supervised by the ADC (IC17 MCP 300B) .

Motor phases control and current regulation for each phase are achieved by power driver L6219 (IC32) .

10.4.3 The display part:

RI Series and Atoll scales are equipped of two brand of LCD display POWERTIP and TRULY the Powertip has contrast compensation over temperature up to about 45/50 °C, the Truly one has liquid crystal stable up to 65/70 °C and does’nt need any contrast compensation device.
It has 128 x 128 pitch graphic resolution (1 pitch = 0.70mm).
The back-lighting is of the "AREA" type, using light emitting diodes (LEDs).
It has a synchronous serial interface (microprocessor port).

Different information fields can be displayed on the two display units.

IC6 (LM358) is use as switching power supply for back-lighting the front and rear display units (seller/customer).

IC3 (LM 358) supplies and regulates the contrast of the seller and customer display units via PWMA (seller) and PWMB (customer) signals. Presence detection of display has also been designed .

10.4.4 The communication part

RI Series scales have three serial communication channels:

a/ The full duplex RS232 serial port (IC14 LTC1384) for communication with a PC (IP7 KHEOPS, IMPORT protocol or Flash loader) is provided directly by the IC12 processor (Motorola 68CK331).

b/ The two RS 485 communication channels are based on a DUART (IC10=SC28L92A1B). Channel A (IC19=MAX485) of the RS 485 serial port is reserved to the scales network. Channel B (IC23=MAX485) of the RS 485 serial port is for communications with a PC over a network (master scales).

10.4.5 The power supply part

The power supply is divided into six distinct parts:

1) The internal battery is recharged by the signal (PULSECHARGE from IC12), Q8 (BSS123), Q11 (MTD20P06). The recharging of the battery pack (Ni/MH) is managed by the software signal transmitted by the IC12 processor (PULSECHARGE). The average charging time is about 10 hours (SAFT 11 elements 13.2V/2.8Ah). The average charging current is 300mA. (R117=4.7Ohm)
   The flashing of the icon reserved for the pack indicates that it is recharging.
   The stand-alone life of the battery depends on the one hand on the use of the printer and on the other, and very importantly, on the lighting of the displays. It is between 8 and 40 hours, depending on the use of the printer and lighting.

2) The signal (P_BAT_EXT) allows to detect external battery presence when Q12, Q13, Q14, Q15 and Q16 protect against heavy discharging of the internal battery.

3) The +24V (VTH) voltage of the thermal print head.

   The +24V voltage supplies the thermal print head (ROHM KF2002 GD10). The peak voltage delivered by VTH is +24V / 5A. The principle is pulse modulation on the L3 FST 231/ 100µH coil. The modulation is controlled by a hybrid circuit LT1171CQ (Q17). Q18 (IRFRS305) is a power switch. The switching frequency is set at 40 kHz, internal to the hybrid circuit.

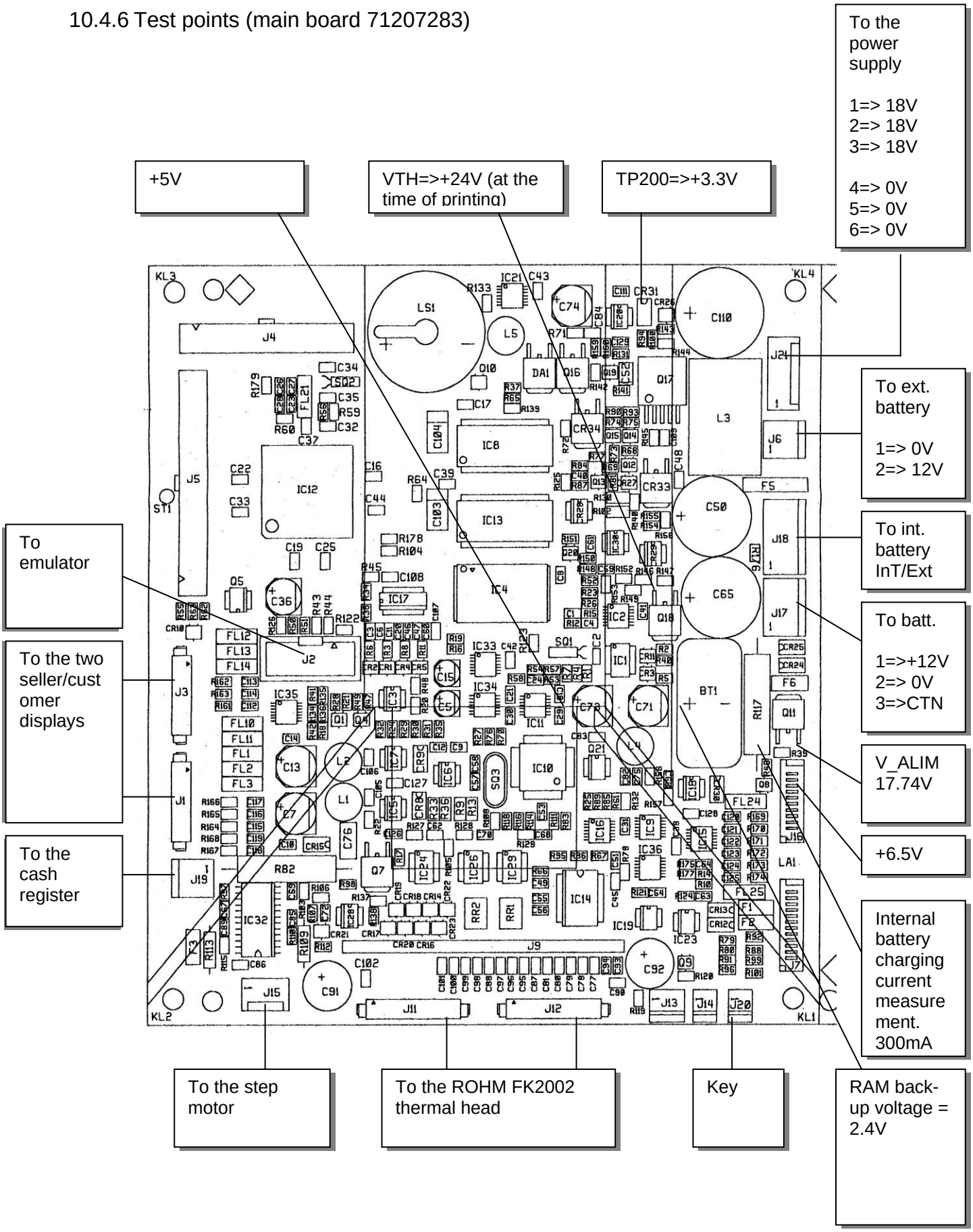
4) The +6.5V voltage

   The +6.5V voltage supplies the +5V and +3.3V regulators. It is supplied by a switching converter mounted as a voltage reducer. This voltage is created by IC18 (LM2674) associated with the external components. The L4 self (100µH), the CR30 diode for the transfer of the power. The cut-out frequency is set at 260KHz.

5) The +5V voltage
The +5V supplies several electronic components (serial output, motor control, etc.). It is created by the Q21 5V regulator (LM2931).

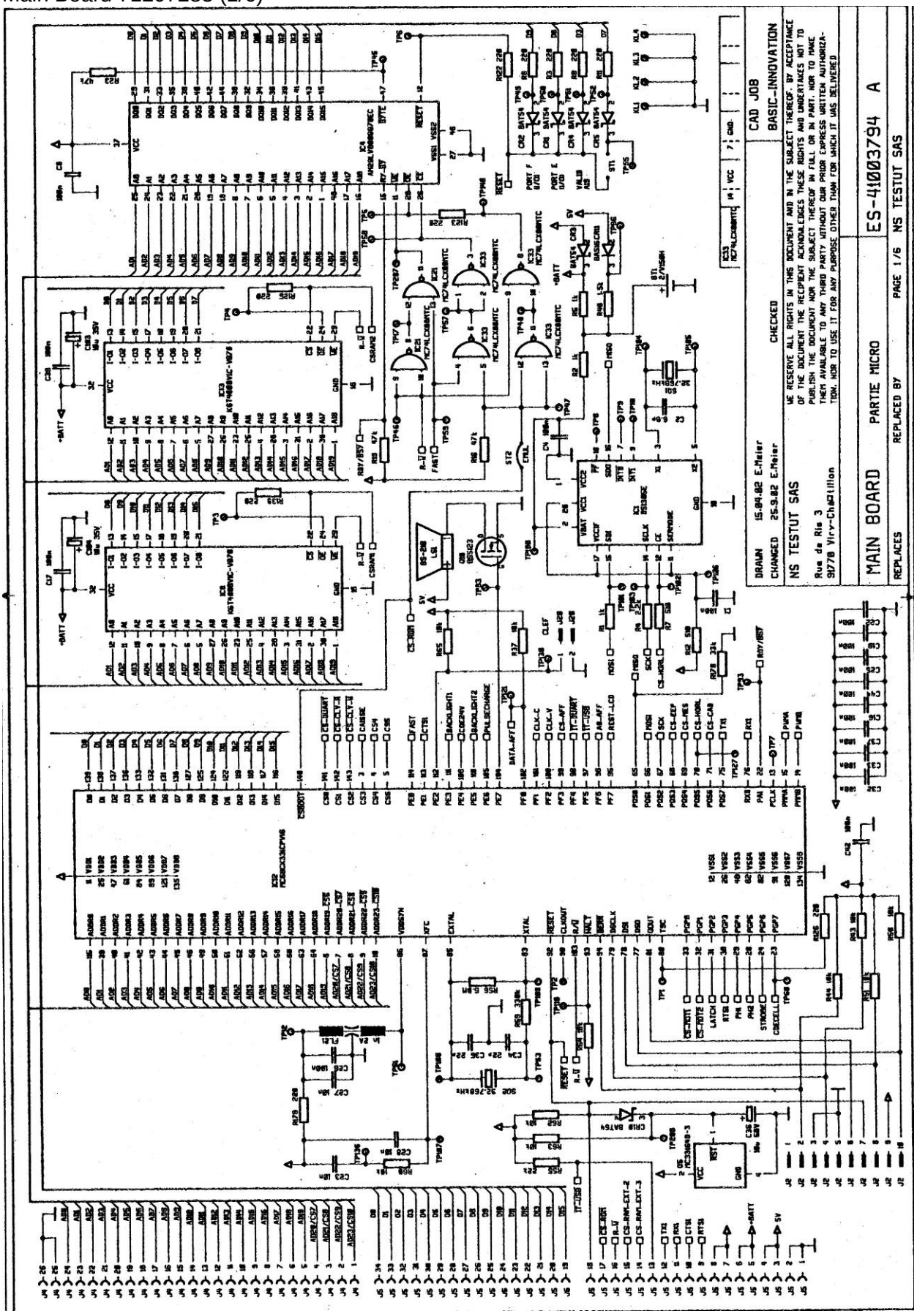
6) The +3.3V voltage (VCC):
The 3.3V voltage supplies most of the microprocessor's logic circuits. It is created by the IC20 switching regulator (LM2674).

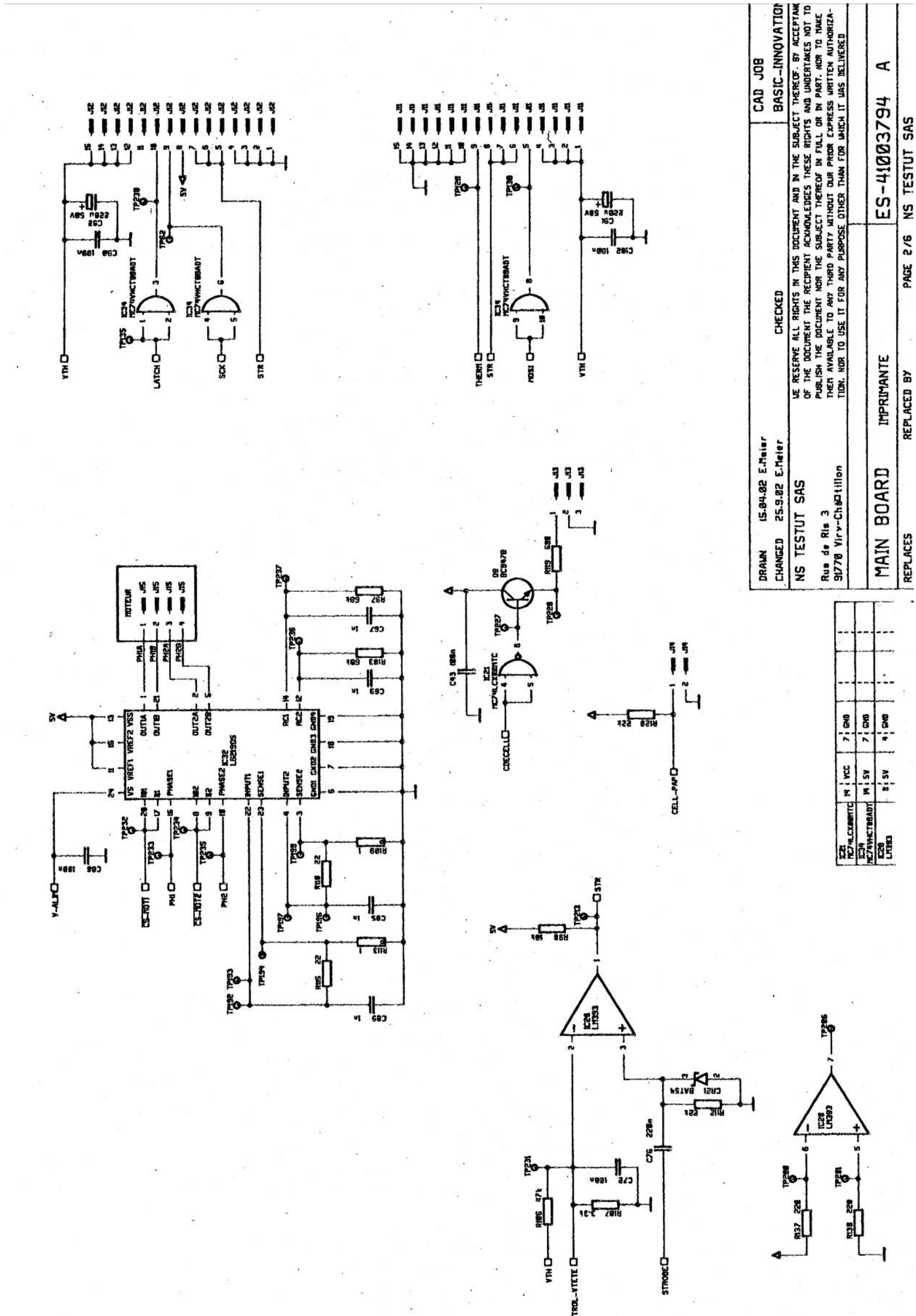
10.4.6 Test points (main board 71207283)



10.4.7 Diagrams

Main Board 71207283 (1/6)

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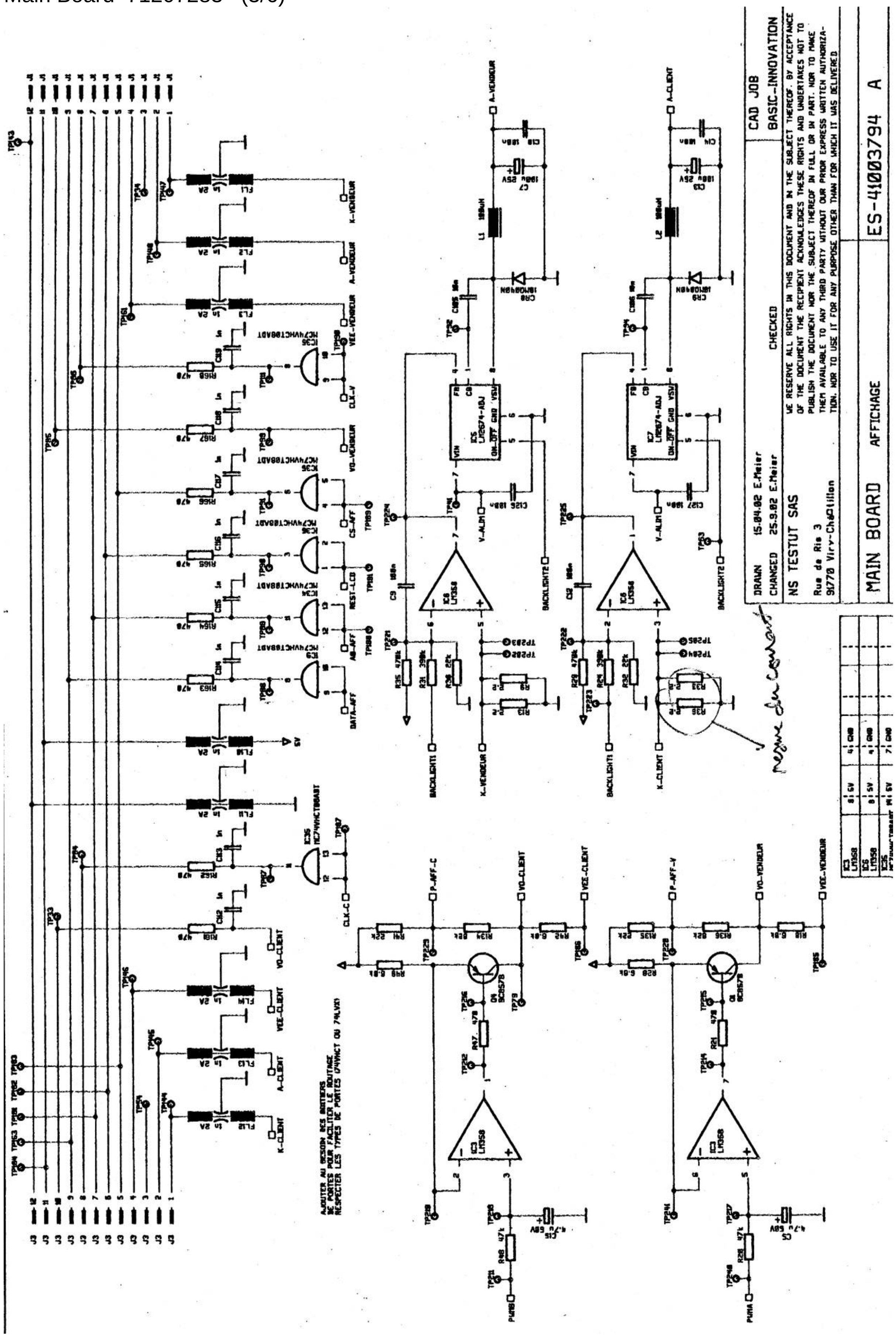
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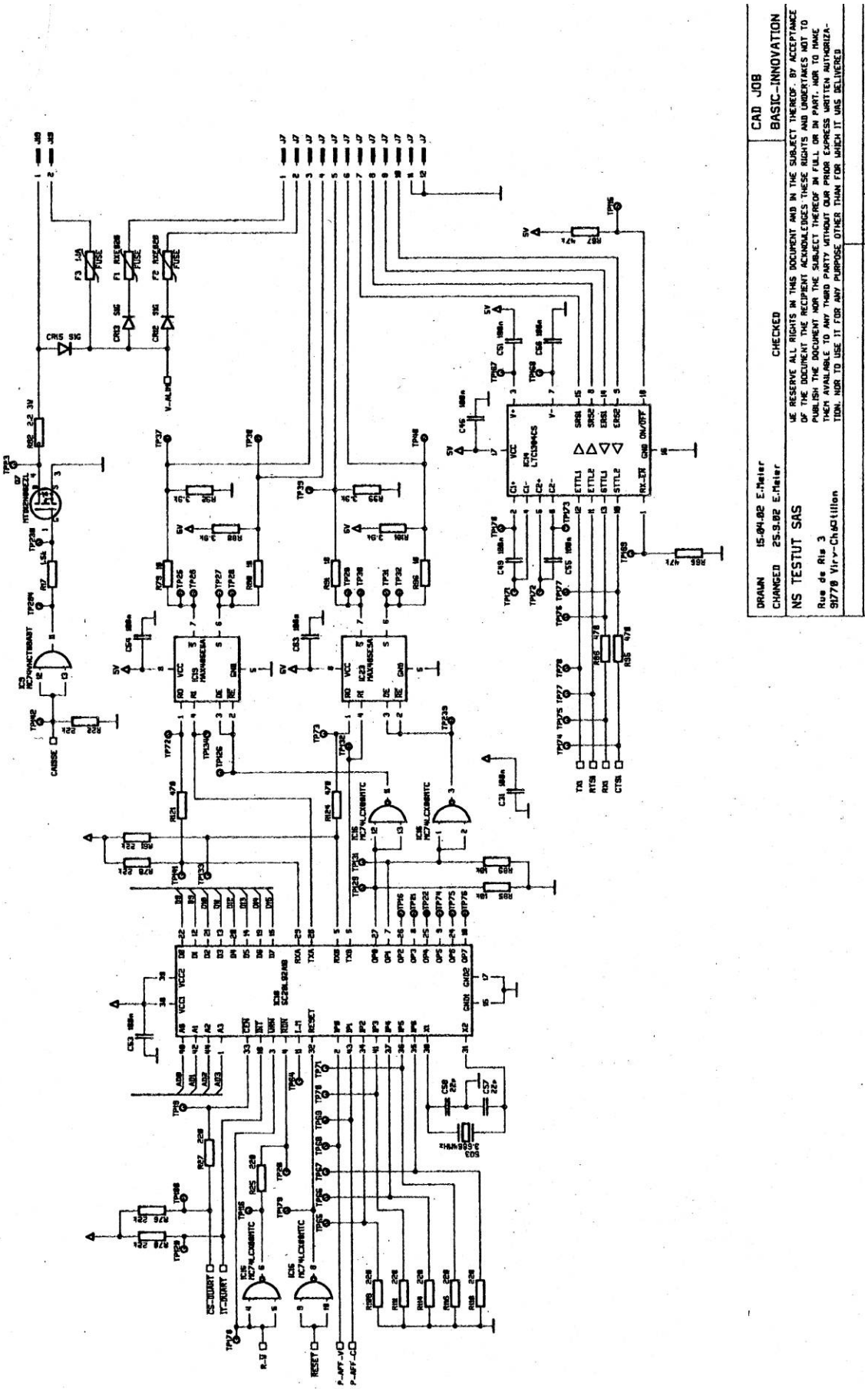
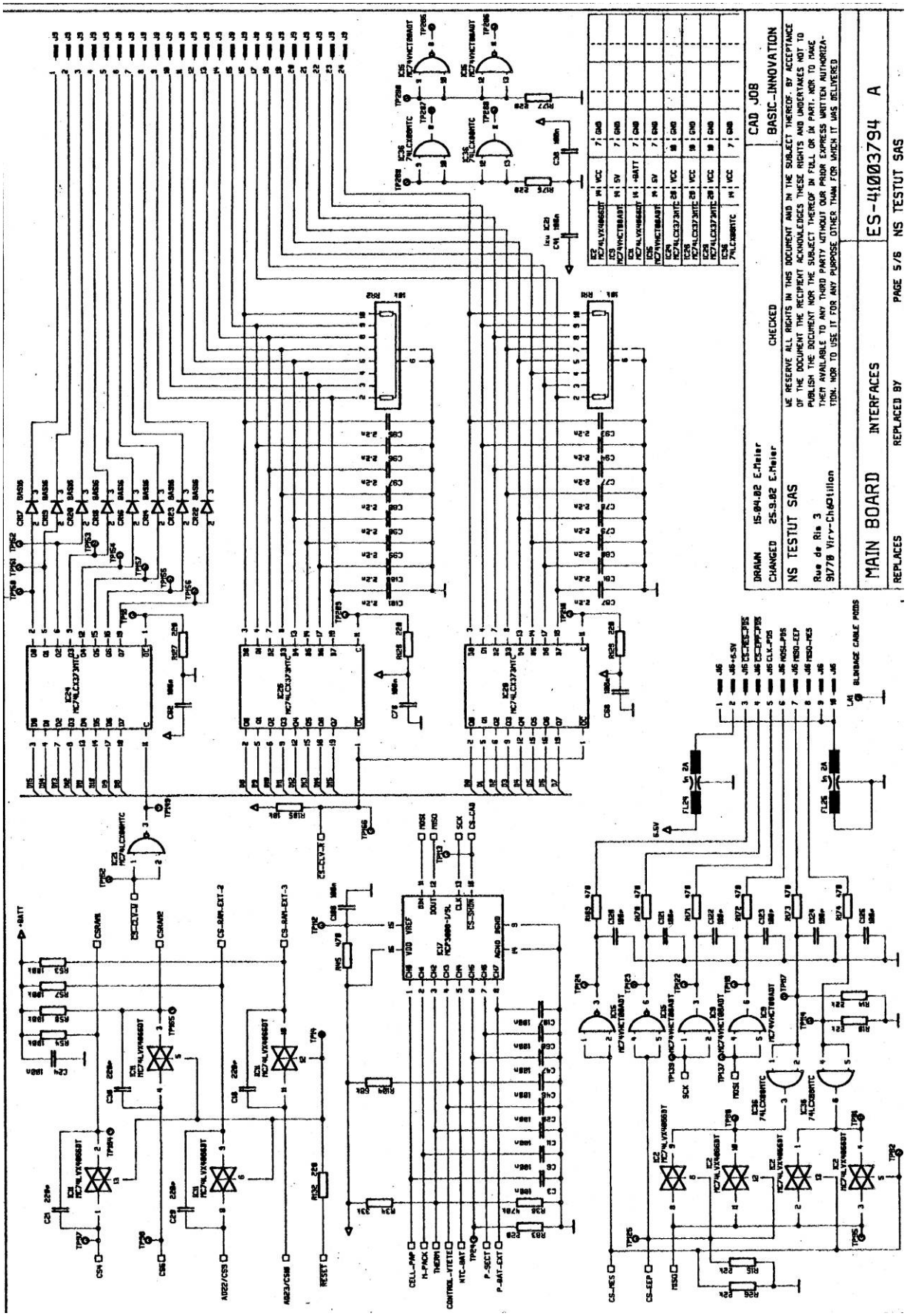
Main Board 71207283 (4/6)

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CHANGED 25.3.82 E.Meier
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NS TESTUT SAS
Rue de Ris 3
91770 Virry-Châtillon
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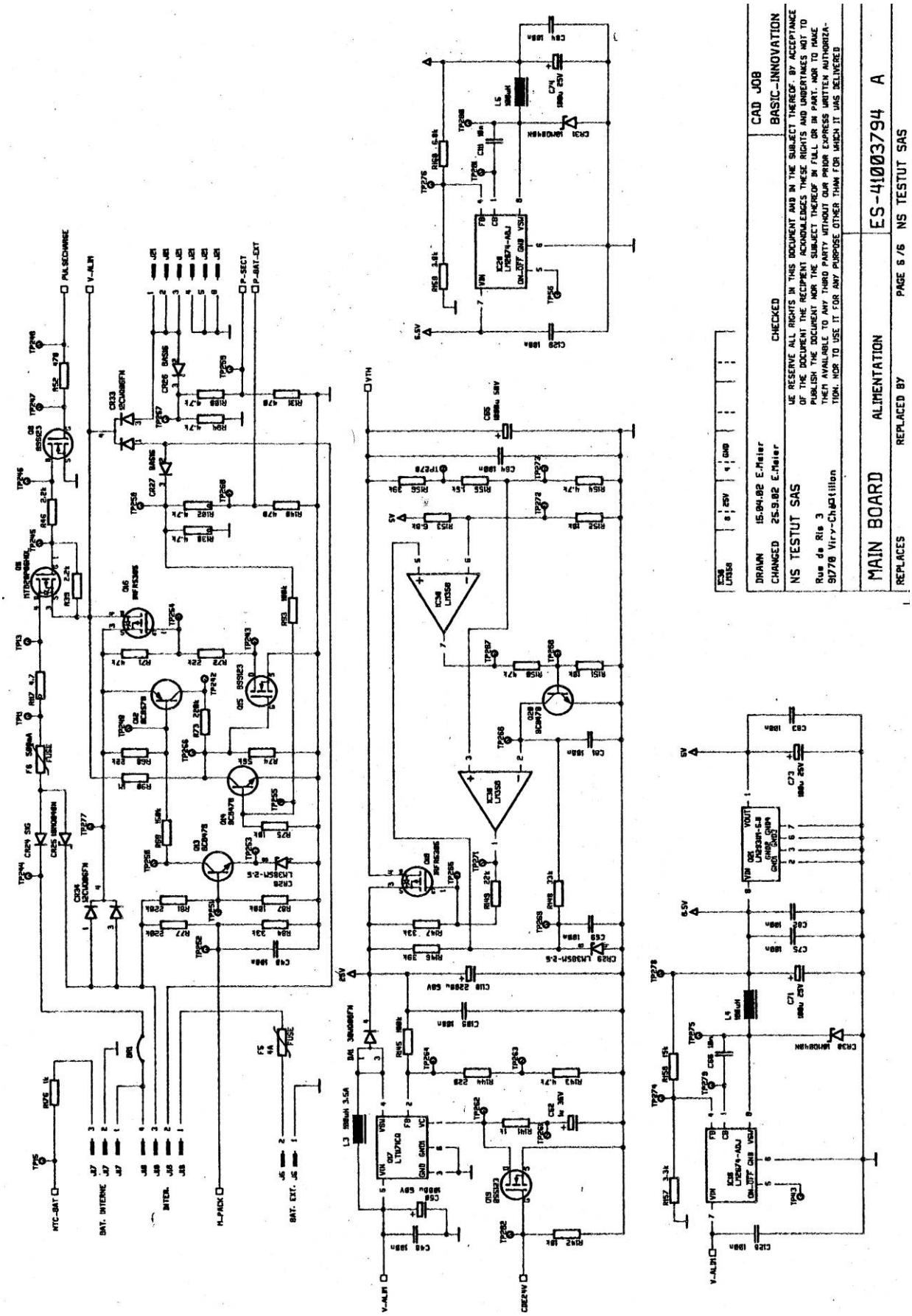
REPLACED BY
PAGE 5/6 NS TESTUT SAS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91770 Viry-Châtillon
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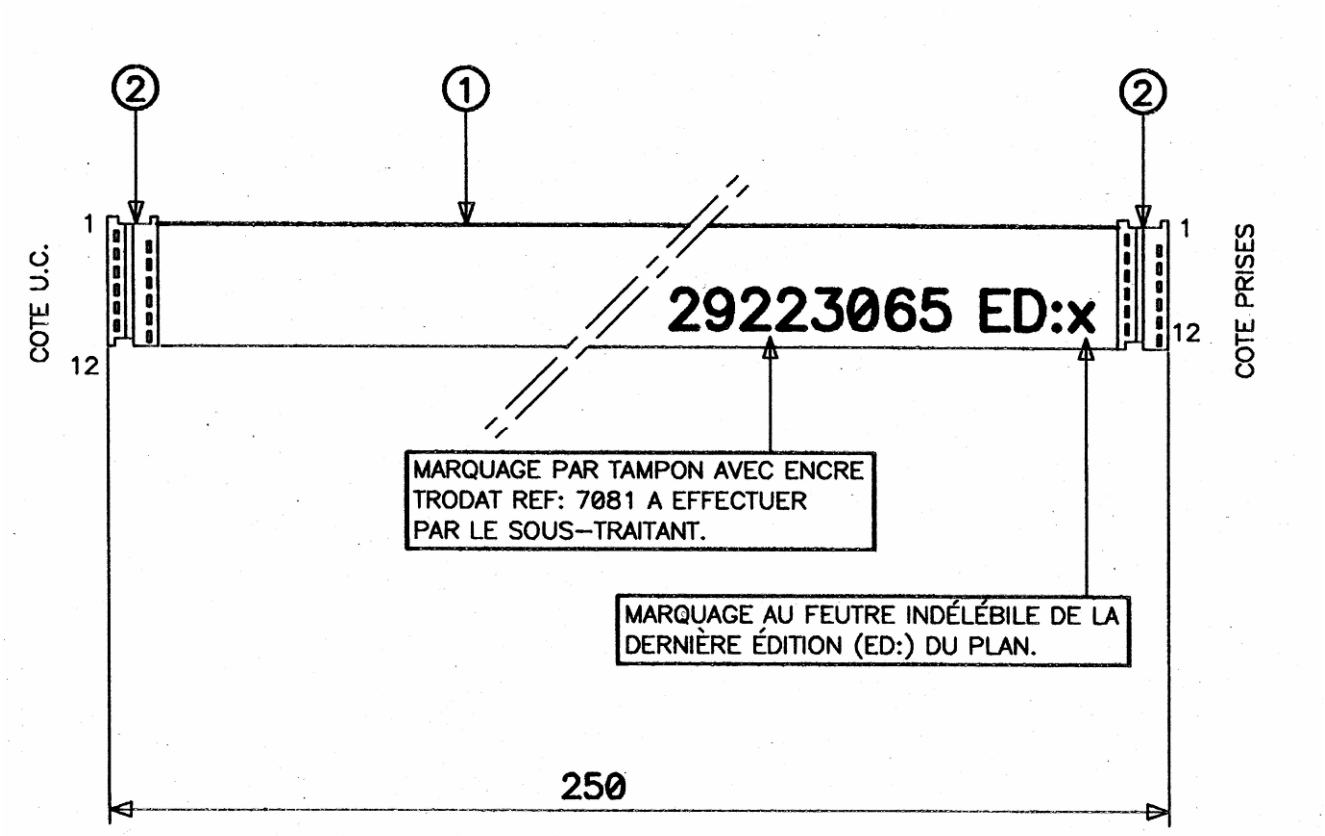
PAGE 6/6 NS TESTUT SAS

11. Cables

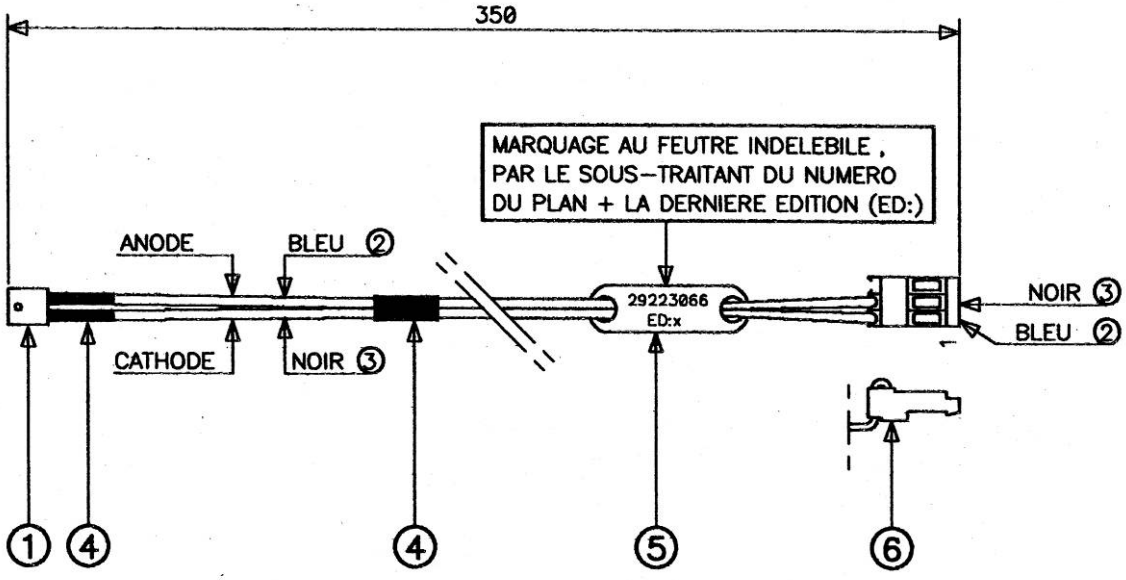
11.1 CPU board / Communication board (ref 71208130)



Coté U.C. = CPU board side
Coté prises = Communication sockets side
Marquage par tampon avec encre Trodat Réf. : 7081 à effectuer par le sous-traitant. = To be marked by the sub-contractor using a stamp with Trodat ink Ref.: 7081
Marquage au feutre indélébile de la dernière édition (ED:) du plan. = Latest edition (ED:) of the drawings marked with indelible felt-tip.

Marker	Designation
1	16 conductor ribbon cable
2	PICOFLEX 12 pin connector

11.2 Infra-red LED cable (Emitting cell) ref 71208141

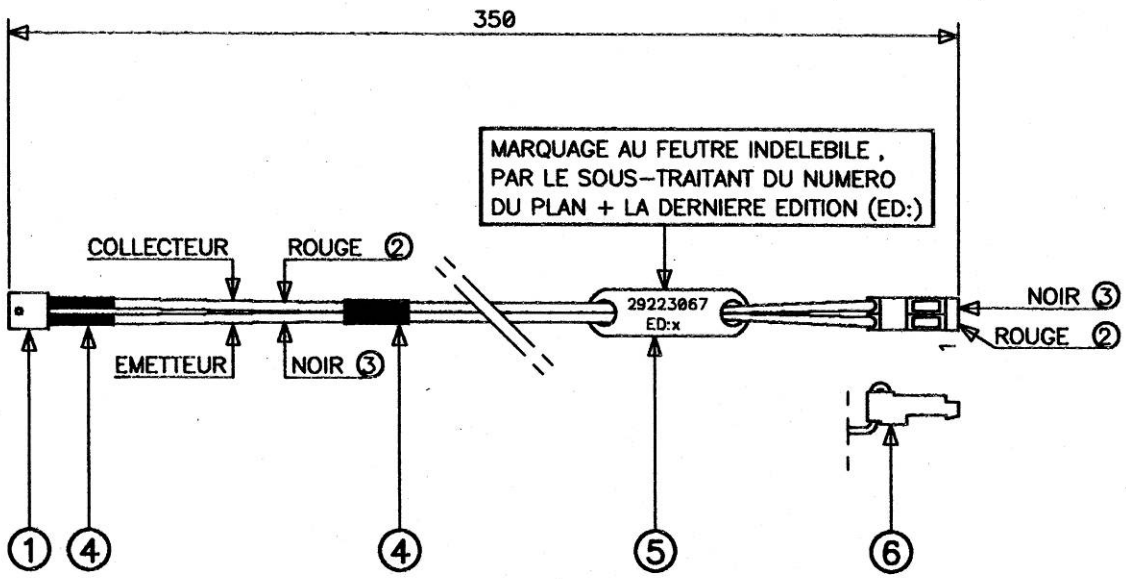


Marquage au feutre indélébile, par le sous-traitant du numéro du plan + la dernière édition (ED☺ = Number and latest edition (ED☺ of the drawings marked by the sub-contractor with indelible felt-tip

Anode = Anode
Bleu = Blue
Cathode = Cathode
Noir = Black

Marker	Designation
1	Infra-red LED
2	0.22 mm2 blue wire
3	0.22 mm2 black wire
4	R1 type thermal casing
5	BF2 type identifying collar
6	Black 3 pin F connector

11.3 Infra-red sensor cable (Receiving cell) ref 71208129

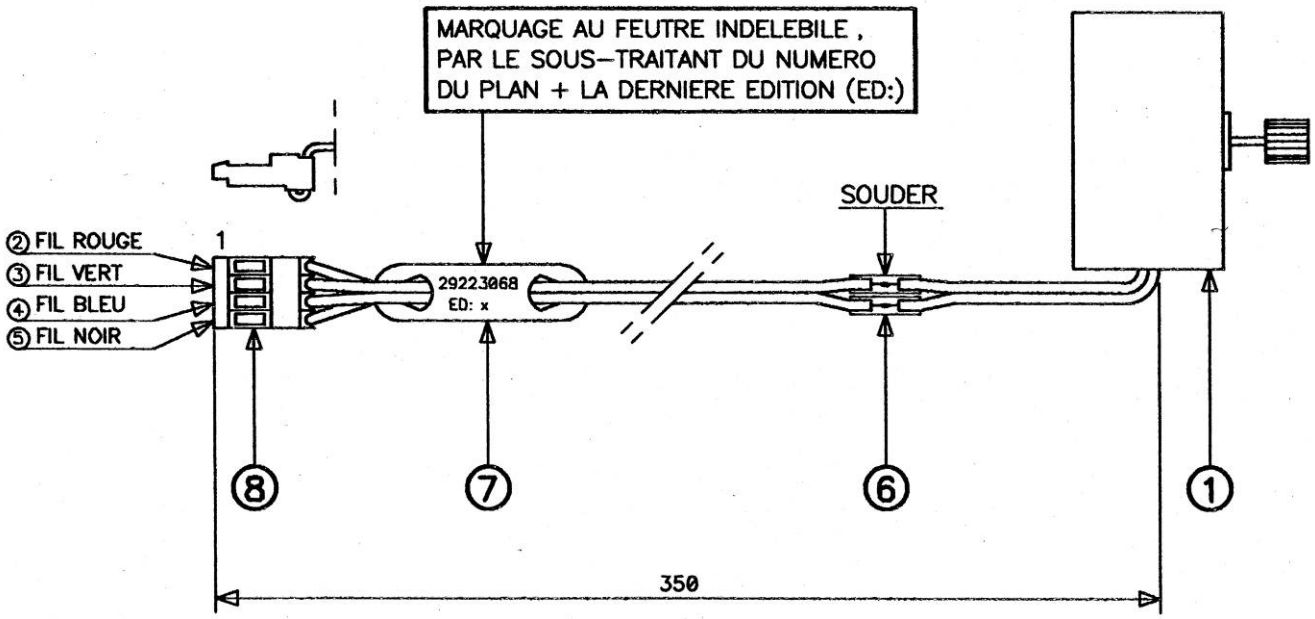


Marquage au feutre indélébile, par le sous-traitant du numéro du plan + la dernière édition (ED:) = Number and latest edition (ED:) of the drawings marked by the sub-contractor with indelible felt-tip

Collecteur = Collector
Rouge = Red
Emetteur = Emitter
Noir = Black

Marker	Designation
1	Phototransistor
2	0.22 mm2 blue wire
3	0.22 mm2 black wire
4	R1 type thermal casing
5	BF2 type identifying collar
6	Black 2 pin F connector

11.4 Motor cable (ref 71208131)

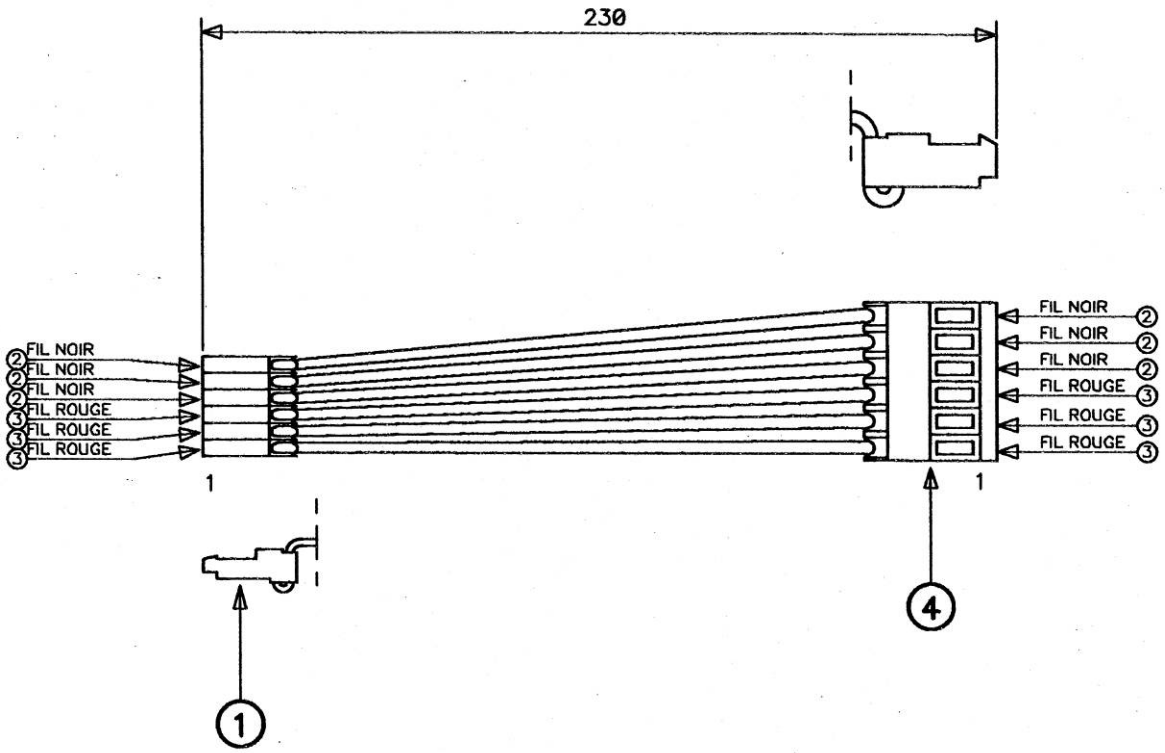


Marquage au feutre indélébile, par le sous-traitant du numéro du plan + la dernière édition (ED:) = Number and latest edition (ED:) of the drawings marked by the sub-contractor with indelible felt-tip

Souder = Solder
Fil rouge = Red wire
Fil vert = Green wire
Fil bleu = Blue wire
Fil noir = Black wire

Marker	Designation
1	Motor
7	BF2 type identifying collar
8	2.54 pitch 4 pin F connector

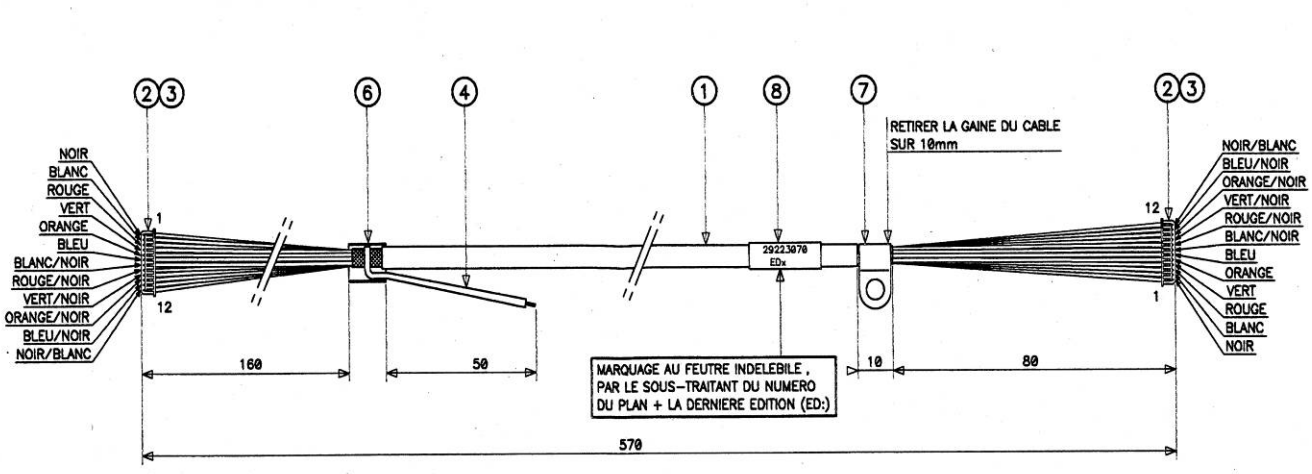
11.5 CPU board / Power supply cable (ref 71208132)



Fil noir = Black wire
Fil rouge = Red wire

Marker	Designation
1	2.54 pitch 6 pin connector
2	0.34mm black wire
3	0.34mm red wire
4	3.96 pitch 6 pin connector

11.6 CPU/front and rear displays cable (ref 71207314)



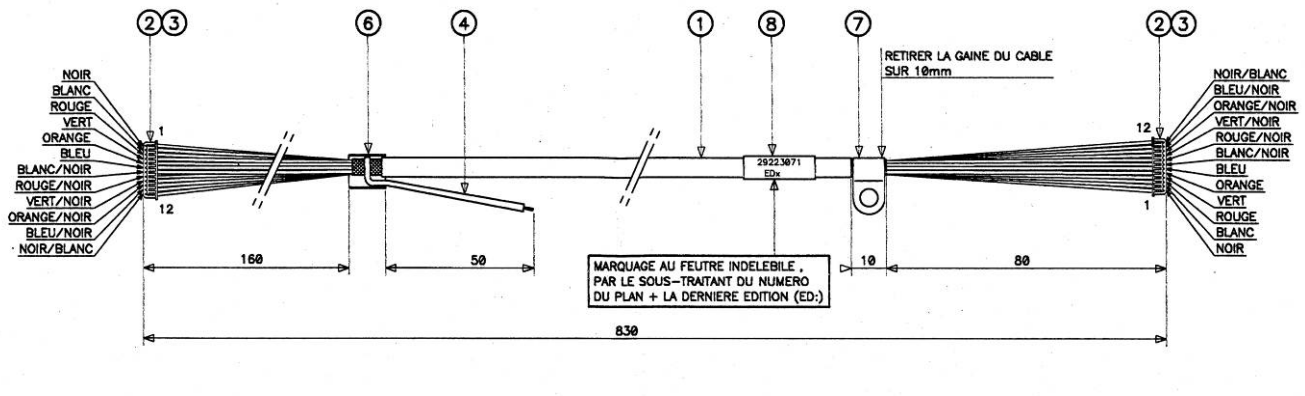
Retirer la gaine du câble sur 10 mm = Strip 10 mm. of covering from the cable

Marquage au feutre indélébile, par le sous-traitant du numéro du plan + la dernière édition (ED:) = Number and latest edition (ED:) of the drawings marked by the sub-contractor with indelible felt-tip

Noir = Black
Blanc = White
Rouge = Red
Vert = Green
Orange = Orange
Bleu = Blue

Marker	Designation
1	12 connector shielded cable
2	1.25 pitch 12 pin connector
3	AWG28 female contact
4	1mm2 green / yellow wire
6	R4 type thermal casing
7	Shielding connecting strap
8	25x75 adhesive label

11.7 CPU board / column display cable (ref 71208142)



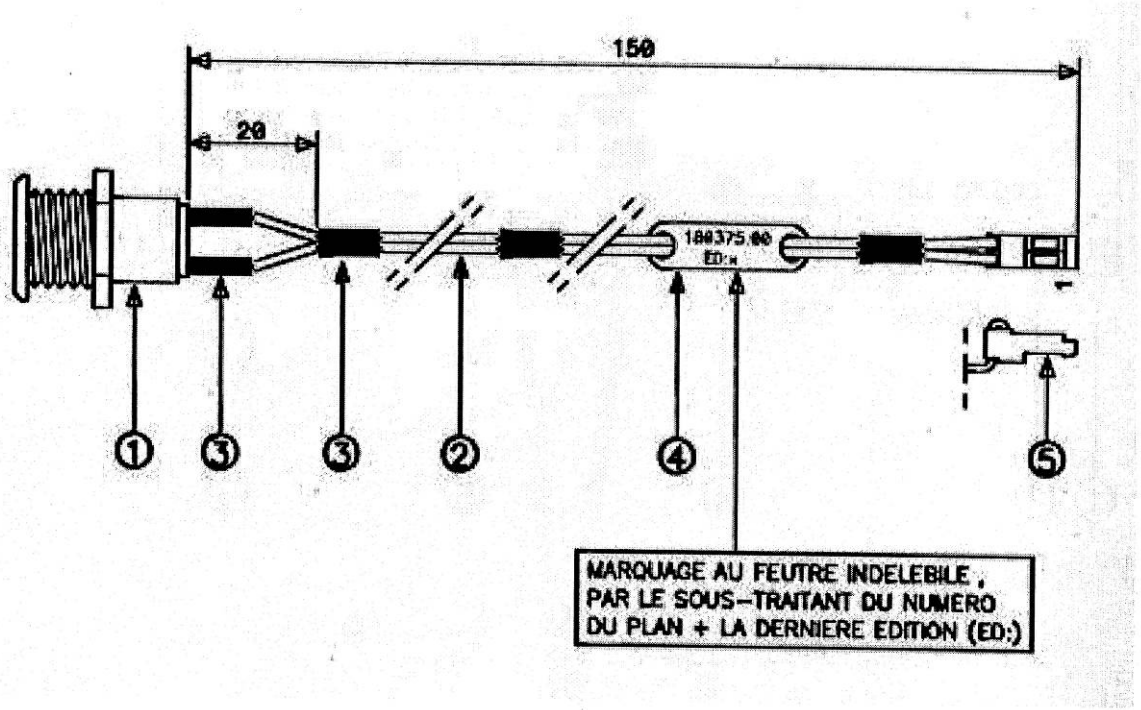
Retirer la gaine du câble sur 10 mm = Strip 10 mm. of covering from the cable

Marquage au feutre indélébile, par le sous-traitant du numéro du plan + la dernière édition (ED:) = Number and latest edition (ED:) of the drawings marked by the sub-contractor with indelible felt-tip

Noir = Black
Blanc = White
Rouge = Red
Vert = Green
Orange = Orange
Bleu = Blue

Marker	Designation
1	12 pin shielded cable
2	1.25 pitch 12 pin connector
3	AWG28 female contact
4	1mm2 green / yellow wire
6	R4 type thermal casing
7	Shielding connecting strap
8	25x75 adhesive label

11.8 Wired key cable (ref 71207312)



Repère	Réference	Désignation
1	000370630	Interrupteur à clef IG-270S
2	000109650	Fil noir 0,22 mm²
3	901496.00	Gaine thermo type R1
4	903170.00	Collier de repérage type BF2
5	903070.00	Connecteur F. 2pts Noir

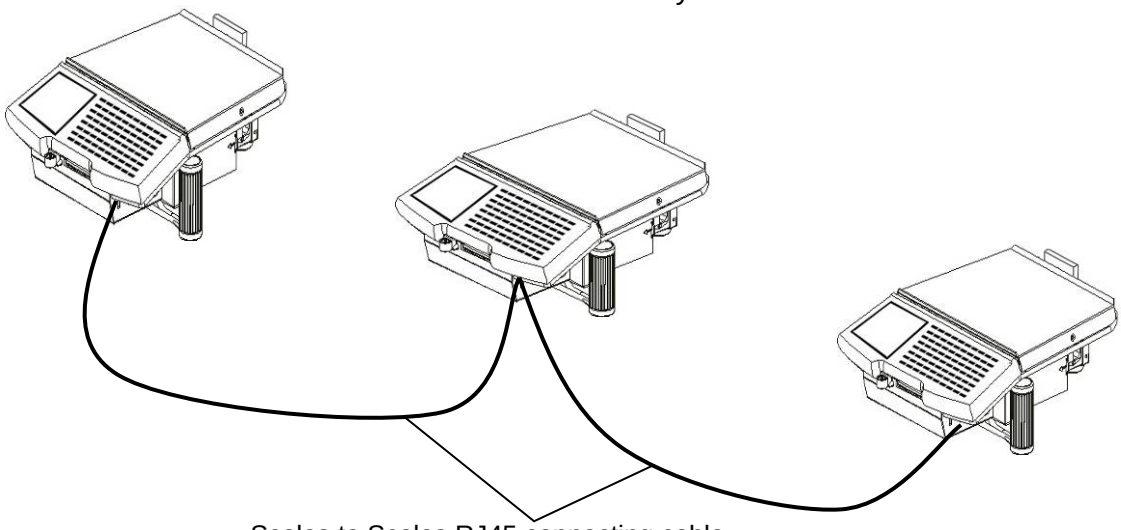
Marquage au feutre indélébile, par le sous-traitant du numéro du plan + la dernière édition (ED:) = Number and latest edition (ED:) of the drawings marked by the sub-contractor with indelible felt-tip

Repère = Marked Réference = Reference Désignation = Name

Interrupteur à clef = Key switch
Fil noir = Black wire
Gaine thermo type R1 = R1 type heat-proof cover
Collier de repérage type BF2 = BF2 type labelling collar
Connecteur F.2pts Noir = Black 2 pin F connector

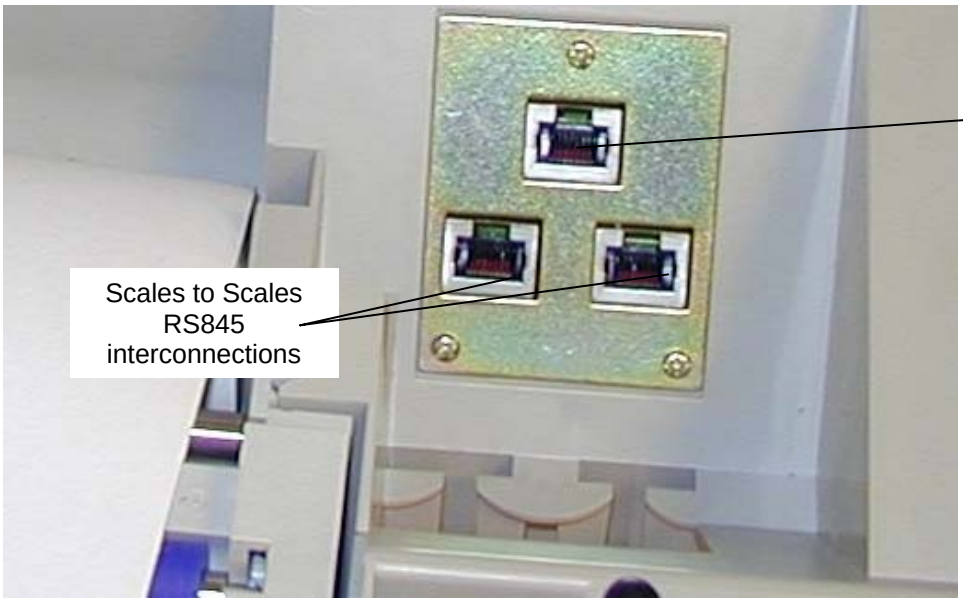
12. Networking

Networking by cable.
Connect the scales to each other via the RJ45 sockets using the Scales/Scales connecting cable 96100391 (see diagram below).
A maximum of ten sets of scales can be connected in this way.



Scales to Scales RJ45 connecting cable (96100391)

Connection sockets



Simplified procedure for networking RI Series and Atoll scales

- Pull on the two keyboard clips on the front of the scales.
- Swing the fitted keyboard upwards.
- Connect the scales to each other via one of the two RJ45 sockets (at the bottom) using the Scales/Scales connecting cable (96100391), up to a maximum of ten sets of scales.
- Declare one set of scales the "Master" by programming the code 09 (all the sets of scales can be master of the network).
- Assign each set of scales a network address (from 0 to 9, programming code 46).

N.B.: Only the scales configured in VD or MV mode can be networked. In 1 seller mode, the scales work in stand-alone mode.

13. Error messages:

After switching on during start-up several functioning test are performed .

a. Display units:
Visual test by the display of smaller and smaller check patterns until maximum resolution.

b. Metrology and its security devices:

1) Metrological switch in lower position (off):
- Recognition of the base, if, when compared, the calibration parameters, the gravity correction factor and the checksum are not identical or if the base is not connected, the machine is blocked on the message: "**UNKNOWN BASE** ".

- Recognition of the metrological version. If the metrological version used is not identical to the one used for adjustment and recorded on the A/D board, the machine remains blocked on the message: **"METROLOG DIFFEREN"**

- Checking the check-sum and the calibration parameters. If the check-sum calculated in not correct, the scales remain blocked on the message: **"INCORR. CALIB."**

2) Metrological switch in upper position (on):

The A/D converter (delta-sigma) has 2 differential inputs.
The first is connected to the load cell, the second to a resistance bridge fed by the metrological switch. The position of the metrological switch is detected by reading the second input and comparing it to a reference range of values.

The metrological switch is also used to enable or disable writes to the A/D board EEPROM by the "Write protect" control input.
If the metrological switch is in the upper position when powering up, the base recognition and metrological version checks are not executed and the machine goes directly to the adjustment menu, or programming menu depending of the position of the programming key .

3) Operation in working mode:

In working mode, the digital key recorded on the A/D board is checked about every two seconds. If it is not identical, the scales are instantly reset. This means that any disconnection or attempt to change the weighing base during operation results in the cases of errors on powering up described in the previous paragraph.

4) On site calibration :

This operation can only be performed by the authorised people when the sealed part is open and the metrological swtich in upper position. During this operation, the gravity correction factor is reset to 1 (elimination of any correction and GEO code = 0) and a new digital sealing code is created and units the sealed part with the main board. Similarly, the metrological version used is recorded on the A/D board.

5) Calibration in the factory:

A secured and reserved proprietary communication protocol is used to adjust and record the gravity correction factor (GEO code) over the RS232 serial port.
After this operation, a new digital sealing code is created and unites the sealed part with the main board. Similarly, the metrological version used is recorded on the A/D board.

6) Updating the weight calculating program:

Sectors 2 and 3 of the FLASH memory, containing the weight calculating program and everything pertaining to it, can only be updated when the sealed part is open and the metrological switch in upper position. When the update is over, the new metrological version is recorded on the A/D board.

c) Currency:
Checking the integrity of the currencies. If there is a fault in the check-sum, the following timed message is displayed: "**CURRENCY DIFFERENT**".

The printer function is disabled. The currencies must be reinitialised.

d) Printer:

The printer head's power supply voltage and temperature are tested. If the control limits are not reached or exceeded or the head is disconnected, a special timed "**DEFAULT PRINT x**" (*PRINTER ERROR x*) message is displayed.

X = 2 indicates temperature limit or head not connected.
X = 3 indicates voltage limit.

The absence of paper also cause the display of a timed message: " **PAPER** ".

e) The PLUs checksums are checked. An error causes the timed display:
*"***PLU ERROR xxxx***"*, PLU xxxx has been found to be inconsistent with its checksum so each time that PLU is called this message will be displayed.

f) If networked operation has been initialised, error messages may be generated in the following cases:

- **"ERROR NET-1"** several master scales
- **"ERROR NET-2"** no master scales
- **"ERROR NET-3"** several identical network addresses
- **"ERROR NET-4"** different currencies

g) Program

If an incorrect checksum is found when the checksums of the protected sectors (metrology) are checked, it causes the display of the "**ERROR FLASH P xxxx**" and blocks the scales. "**xxxx**" represents the checksum calculated by the scales.
If an incorrect checksum is found when the checksums of the unprotected sectors (application) are checked, it causes the display of the "**ERROR FLASH U xxxx**" and blocks the scales.
In the two cases, "**xxxx**" represents the checksum calculated by the scales.

h) Battery pack and external battery

If the voltage of the battery pack or external battery is too low, the following message is displayed: "**DEFAULT BATT**"

14. Flash Loader" PC software:

a. Principle:

The principle consists of reloading the code contained in FLASH memory with the code contained in a Motorola format file (S2/S8).
Only the RS232 serial port can be used for communication with the PC.
After the connection has been recognised, the loader is copied into RAM and the program counter is switched over to the part copied into RAM. This means that the processor no longer needs the FLASH memory to operate. That memory is then completely free for erasing and copying.
This configuration is signalled by the blinking of the back lighting of the displays and, obviously, no other function is available on the scales.

b. Purpose:
The purpose to update the programs for various reasons but in selective ways:
- The application part of the program can be updated without taking the machine apart.
- The metrology or loader part can only be updated after breaking the seal and positioning the metrological switch.

c. Security of loading:
- The transmission of each frame of data is doubly secured by the Motorola format checksum on one hand and the complemented checksum of the encapsulating frame on the other.
- All the code loaded into sectors 1, 2 and 3 is secured by a 16 bit complemented global checksum.
- All the code loaded into sectors 5 to 19 is secured by a 16 bit complemented global checksum.
- The PC program uses the selective identification of the loader, metrology part, application part and position of the metrological switch to manage the compatibilities during downloading.

N.B.: A communication interrupted during the downloading can be restarted:
- In all cases, for the downloading of the unprotected sectors,
- Only if the scales have not been switched off for the downloading of the protected sectors (the start-up module has been erased).

d. Identifying versions
The file to be downloaded is made up of the following elements:

1. The machine's type
2. The version of the internal loader used for the downloading
3. The version of the metrology part
4. The version of the application part
5. The validated factory options.

The file's name has the following structure: (X)_(X)(XX)_(XXXX)_(XX).s2.
Ex.: B_C01_XXX3_04.s2

The first field B is for the product reference.
The second field C for the loader's version.
The third field 01 for the metrology part's version.
The fourth field XXX3 for the application's version.
The fifth field 04 for the validated factory options.
The S2 extension refers to the Motorola file format.

Table of Contents

1 Installation

1. From the installation CD launch "setup.exe"
2. Follow instructions given, and key the path of the folder where to install the software.
3. Copy the short-cut to the windows desktop once installation is over.

2 Description of the program

Flash is used to update the programs for various reasons but in selective ways:
- The application part of the program can be updated without breaking the seal.
- The metrology or "LOADER" part can only be updated after breaking the seal and positioning the metrological switch.

After the connection has been recognised, the loader is copied into RAM and the program counter is switched over to the part copied into RAM. This means that the processor no longer needs the FLASH memory to operate. That memory is then completely free for erasing and copying.
This configuration is signalled by the blinking of the back lighting of the displays and, obviously, no other function is available on the scales.

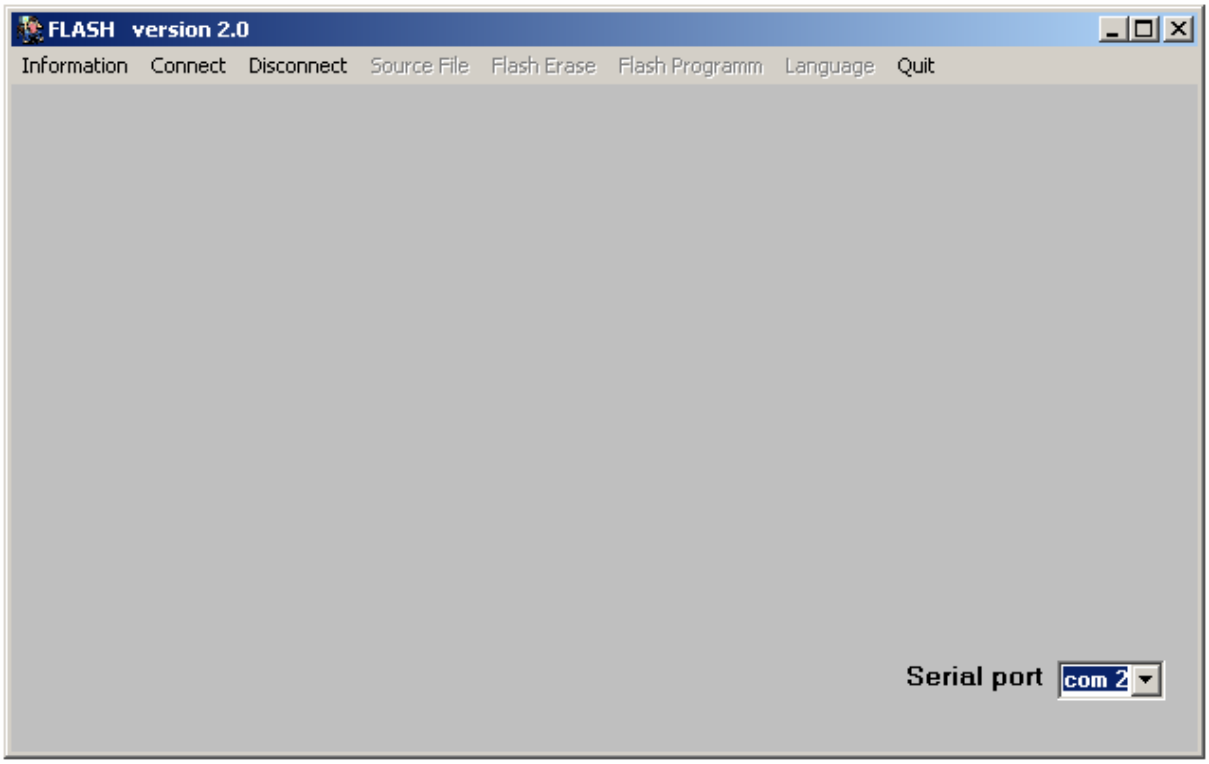
The transmission of each frame of data is doubly secured by the Motorola format checksum on one hand and the complemented checksum of the encapsulating frame on the other.

All the code loaded into sectors 1, 2 and 3 is secured by a 16 bit complemented global checksum.
All the code loaded into sectors 5 to 19 is secured by a 16 bit complemented global checksum.
The PC program uses the selective identification of the loader, metrology part, application part and metrological switch position to manage the compatibilities during downloading.

N.B.: A communication interrupted during the downloading can be restarted:
- In all cases, for the downloading of the unprotected sectors,
- Only if the scales have not been switched off for the downloading of the protected sectors (the start-up module has been erased).

3 User interface

The user interface is made up of the following icons:



- Information: description of the "FLASH" menu .
- Connect: initiate communication between PC and scales, once the scales is connected this state is indicated by back light flashing on the displays and scales are not available for normal functioning.

- Disconnect : scales return to the normal functioning.

- Source file: Choose the .S2 format file which will be downloaded into the scales.

- Flash erase: The content of the memory will be erased, after this operation it will be necessary to download a new software.

- Flash programm: Downloading the selected file as new software.

- Serial port: Select the serial port corresponding to you PC (COM1 to COM4)

- Language: You must at **first choose the language** before doing anything else .

- Quit: Leave "Flash" utility.

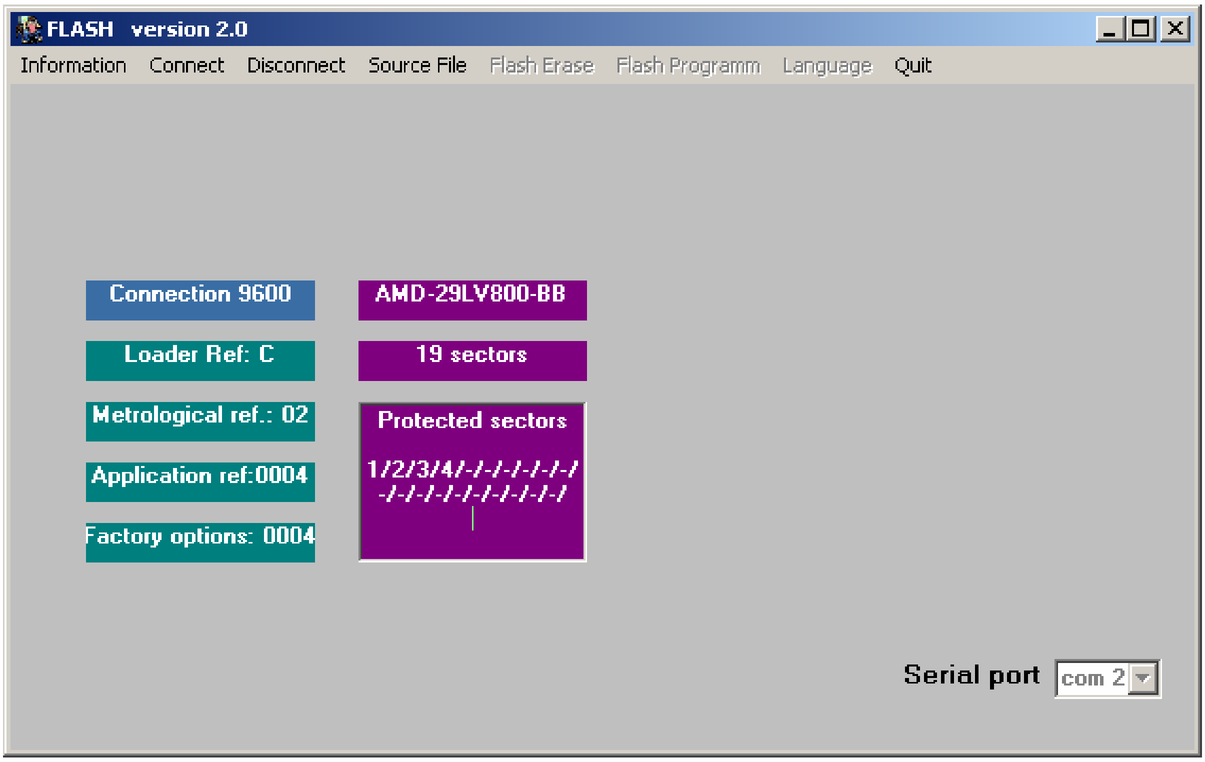
4 Updating an "application" file (without breaking the seal)

4.1 Starting the Flash Loader program

1- Connect the PC to the scales via the RS232 cable (000970540 RJ45/BD9pts F).
2- Start the program by clicking on the FLASH icon.
3- Choose the language at first.
4- Choose the serial port of your PC.

4.2 Connection:

Click on "connect" icon to initiate communication between PC and scales .
Back light display are then flashing.
The PC's screen displays:



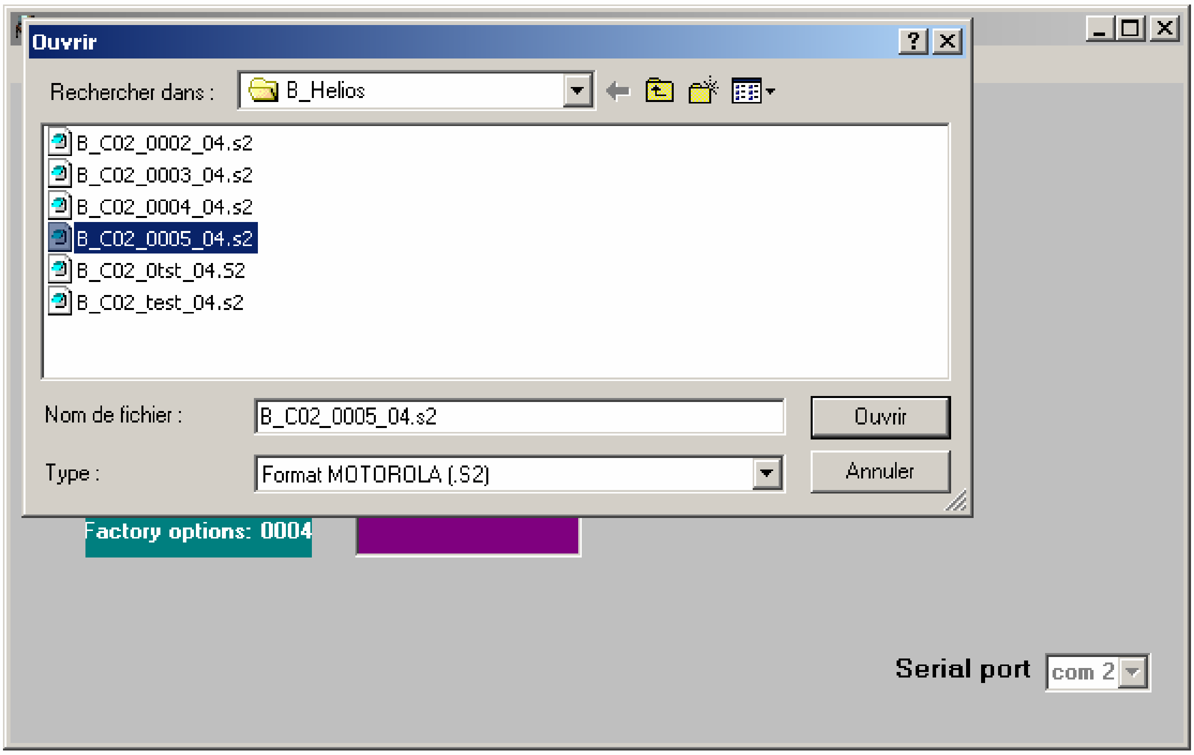
This screen indicate communication set between PC and scales, back light display flashing confirms the connection.

Data displayed are:
- Communication speed.
- Version reference of loader software.
- Version number of metrological software.
- Version number of appication software.
- Flash memory type or reference and number of sectors which can be addressed.
- Protected sectors number which cannot be overwritten.

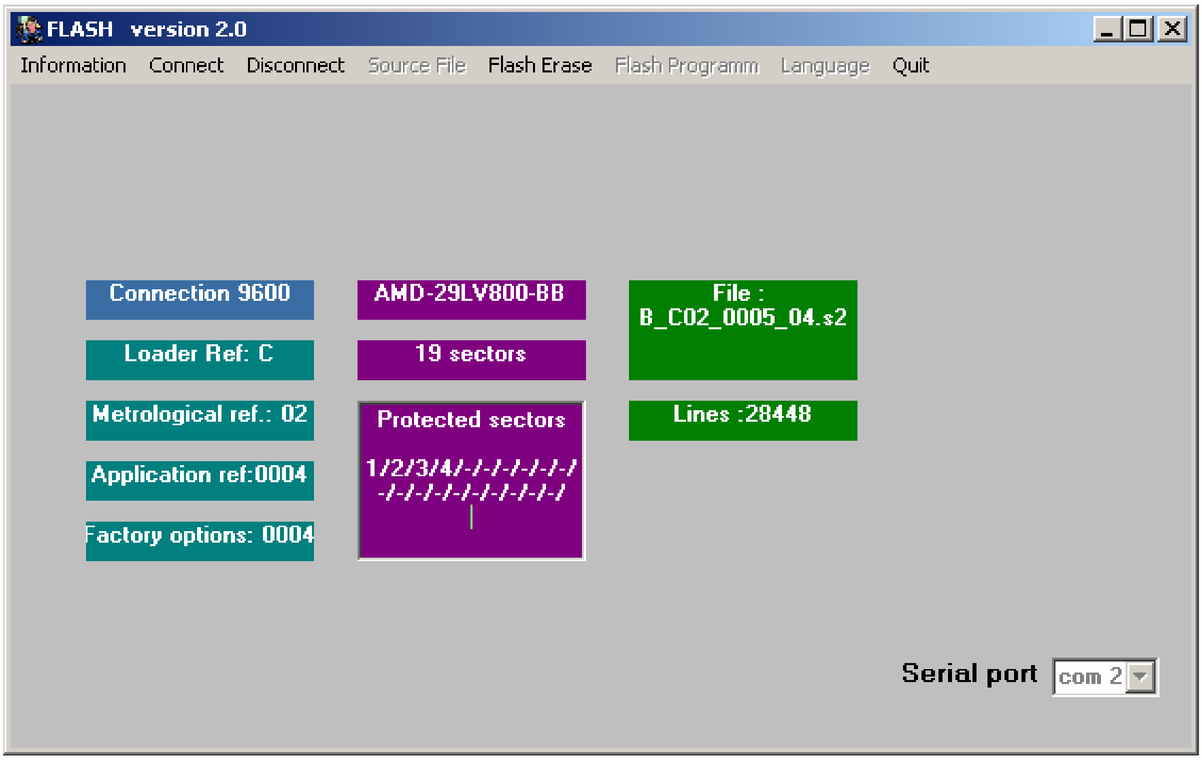
NB: disconnection is still possible in order to recover normal functioning.
A error message appears after 5 seconds in case of connection failure.

4.3 Source file

Use this button to load the .S2 file into the "Ouvrir" (*Open*) dialogue box.
Look in the directory to see that you have stored the .S2 files correctly.

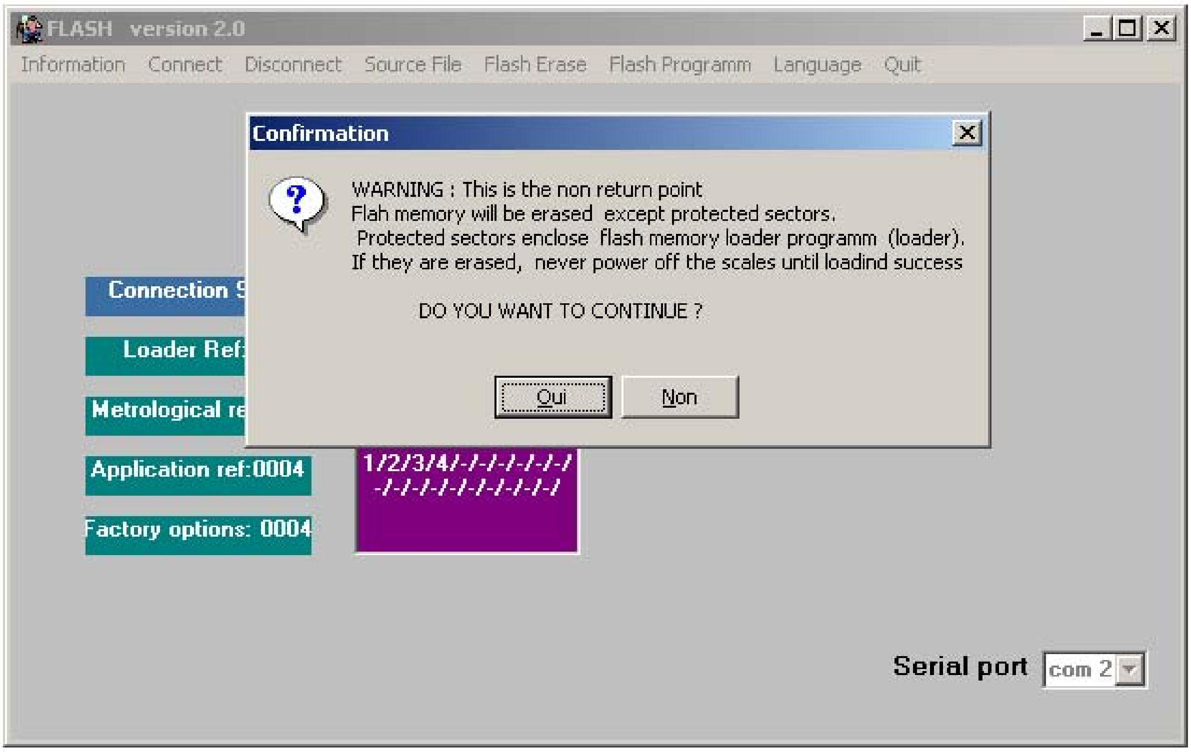


Choose the file that you want to load into the scales. Ex.: B_C_02_0005_04.s2
The PC's screen displays:

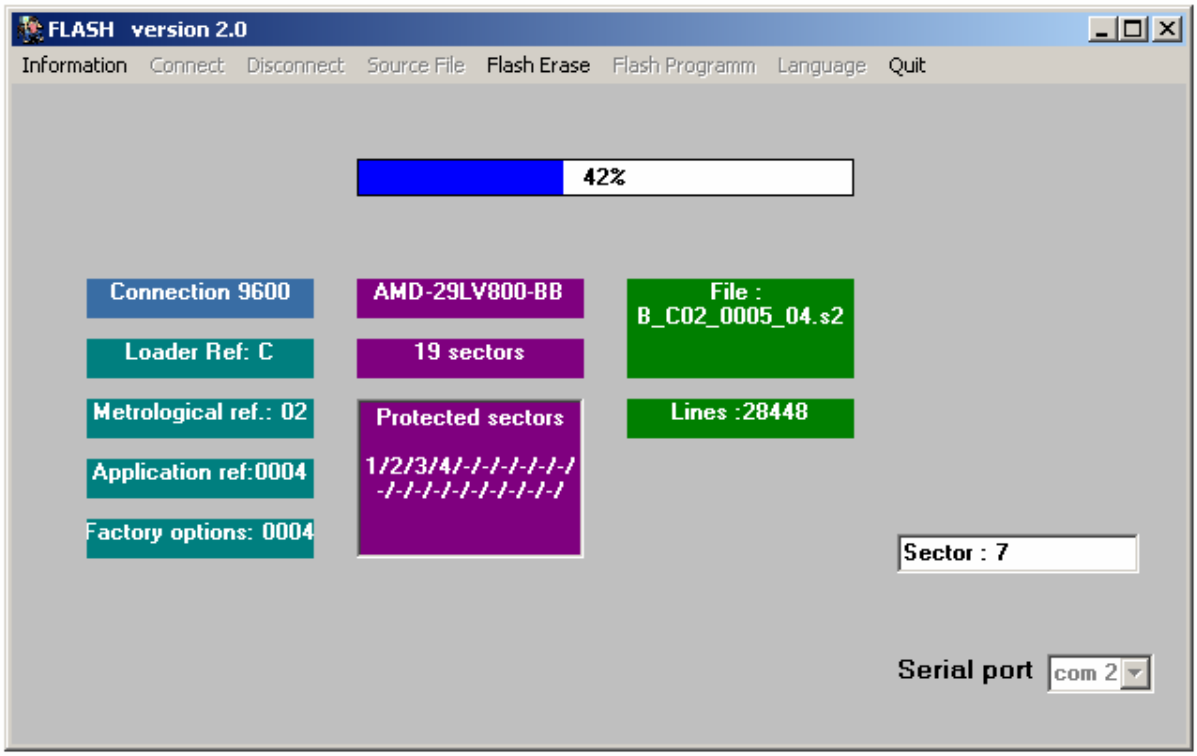


4.4 Flash Erase

Use this button to erase the contents of the Flash memory (application).
Click on the button.
The PC's screen displays:

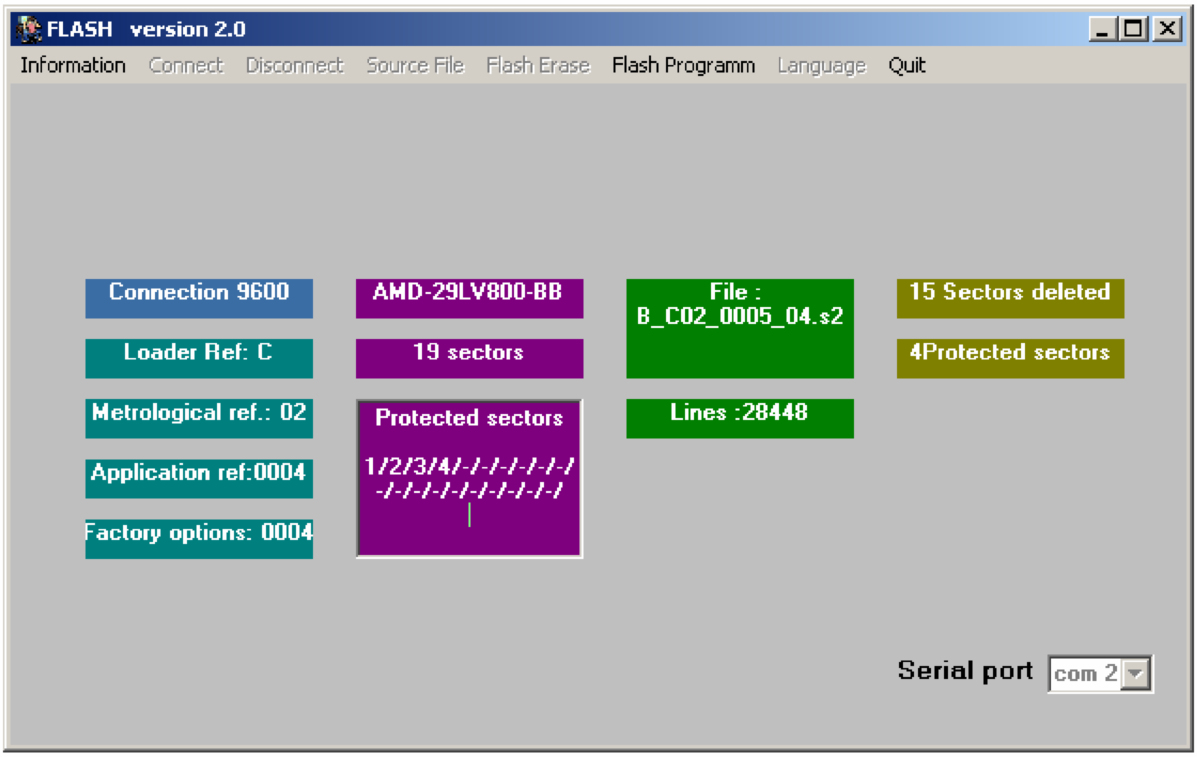


To transfer the "application" file from the PC to the scales, click on the "Yes" button.
The program starts to load.
The PC's screen displays:

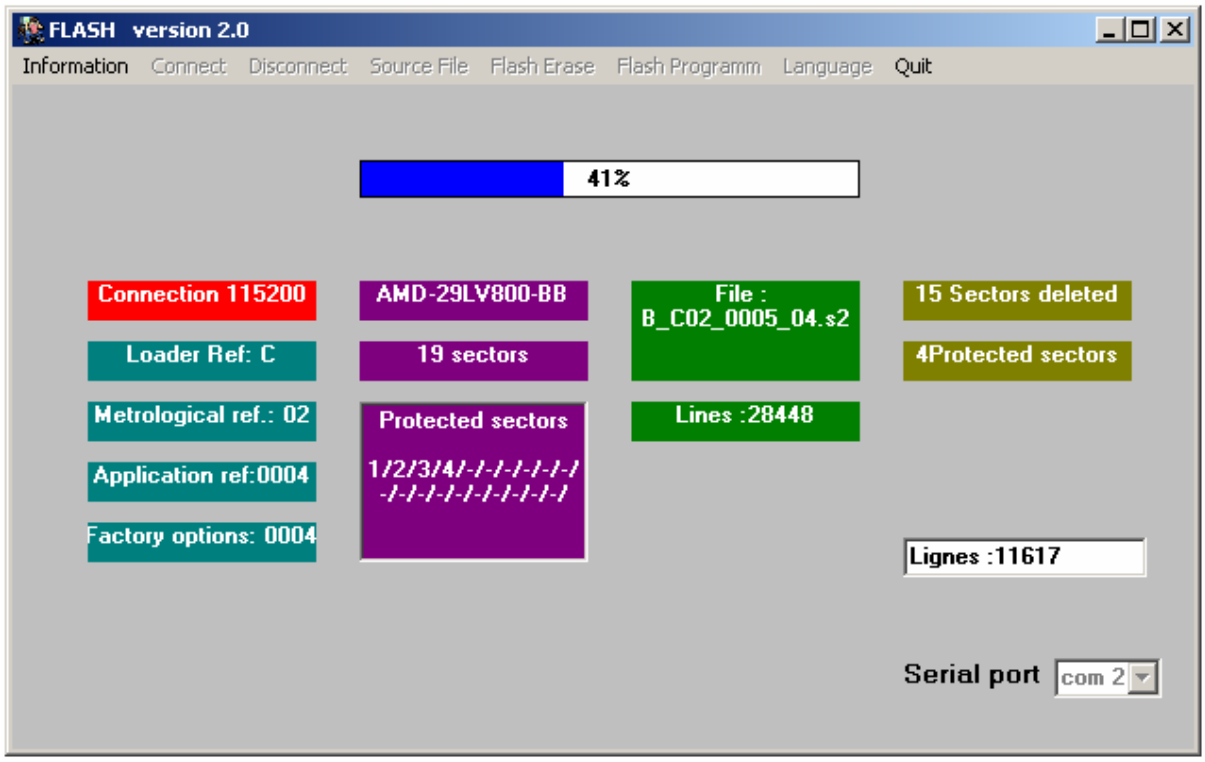

FLASH version 2.0
Information
Connect
Disconnect
Source File
Flash Erase
Flash Programm
Language
Quit
42%
Connection 9600
Loader Ref: C
Metrological ref.: 02
Application ref:0004
Factory options: 0004
AMD-29LV800-BB
19 sectors
Protected sectors
1/2/3/4/-/-/-/-/-/-/-/-/-/-/-/-/-/-/-/-/-/-/-
File :
B_C02_0005_04.s2
Lines :28448
Sector : 7
Serial port
com 2

4.5 Program Flash

When you have erased the Flash memory, the PC's screen displays:

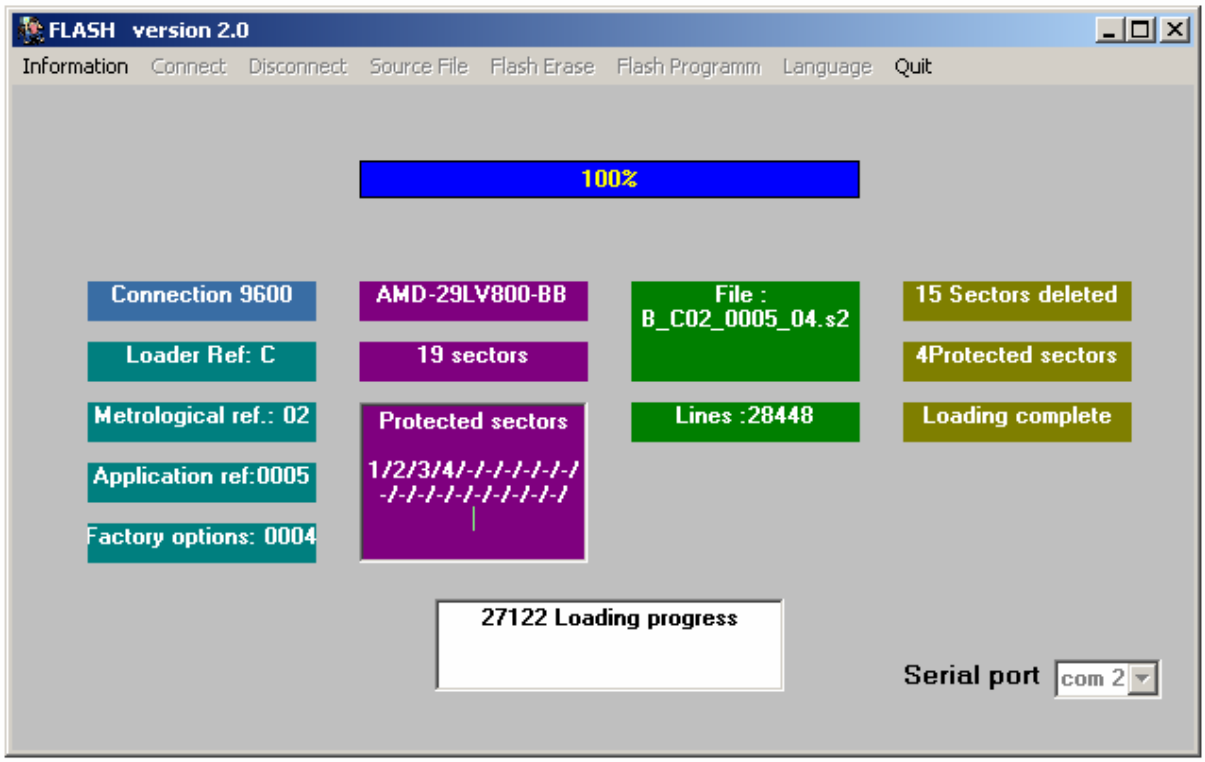


Click on the "**Flash Programm"** button. The program starts downloading and the PC's screen displays:



4.6 Quit

When the program has loaded, the scales reset themselves and start test cycle.
Updating scales data could be necessary depending of the importance of change in the application version.



The PC's screen displays:
Click on the "Quit" icon to leave the "FLASH LOADER" program.

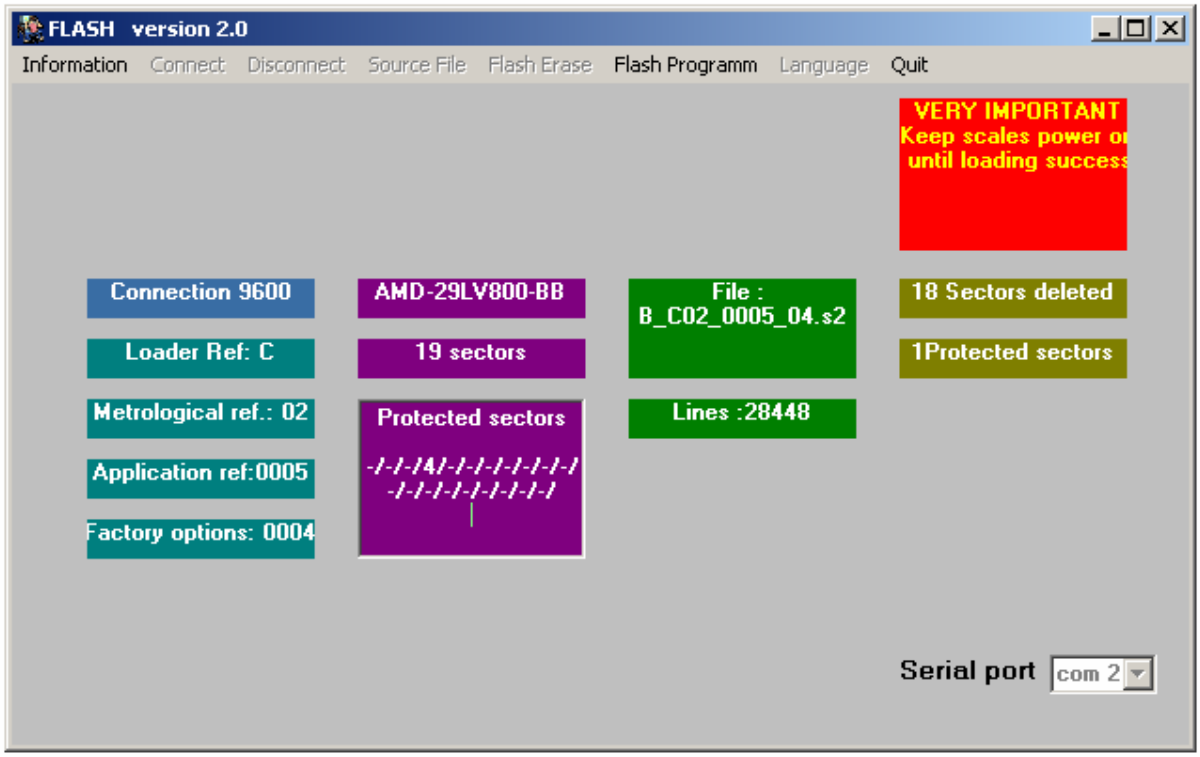
5- Complete updating metrology part and application part
- The metrology or "LOADER" part can only be updated after the machine has been unsealed and the metrological switch is in **top position**.

- Follow paragraph (4.1).

5.1 Connection:
- Follow paragraph (4.1) for the connection.
After connecting you will be able to notice that only sector 4 is protected.

5.2 Source file:
- Follow paragraph (4.3).

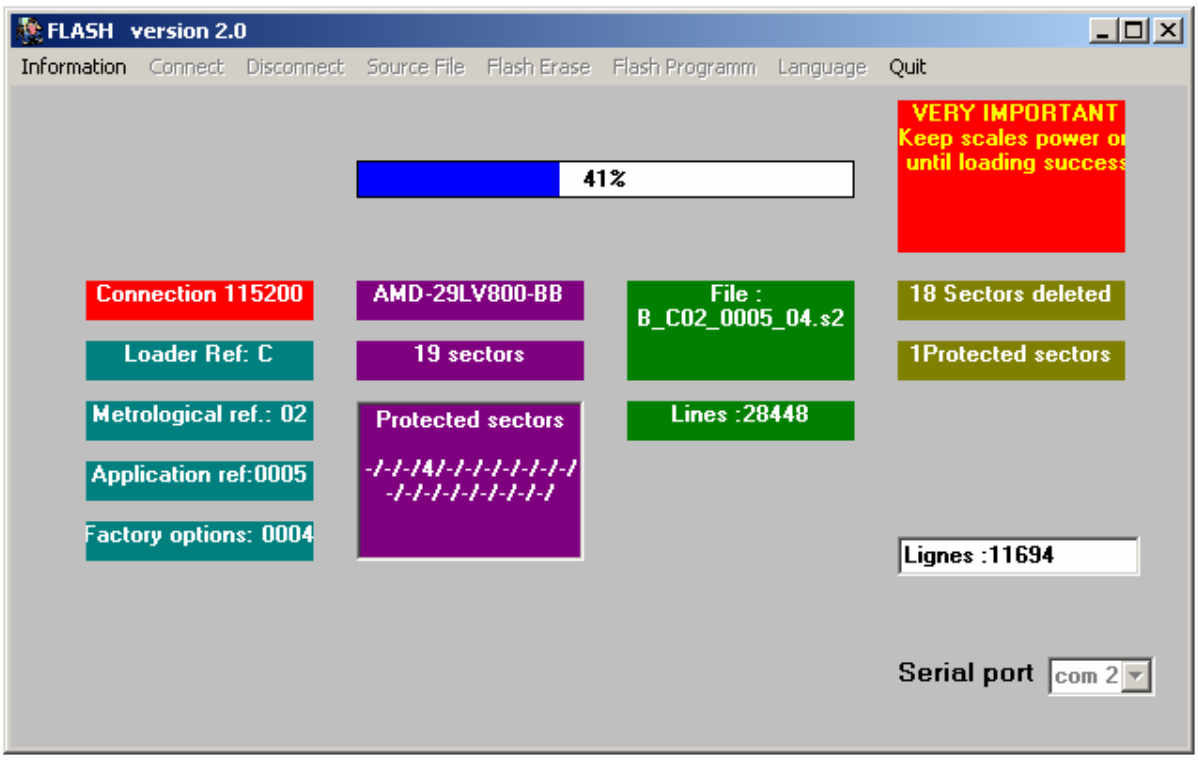
5.3 Erase flash
- Follow paragraph (4.4) , after erasing the PC's screen displays:



You will notice that only one sector has not been erased and the scales must not be switched off before successful downloading, if not this will have as consequences loss of boot sector.

5.4 **Program Flash**

Click on the "Programm" icon. The PC's screen displays:

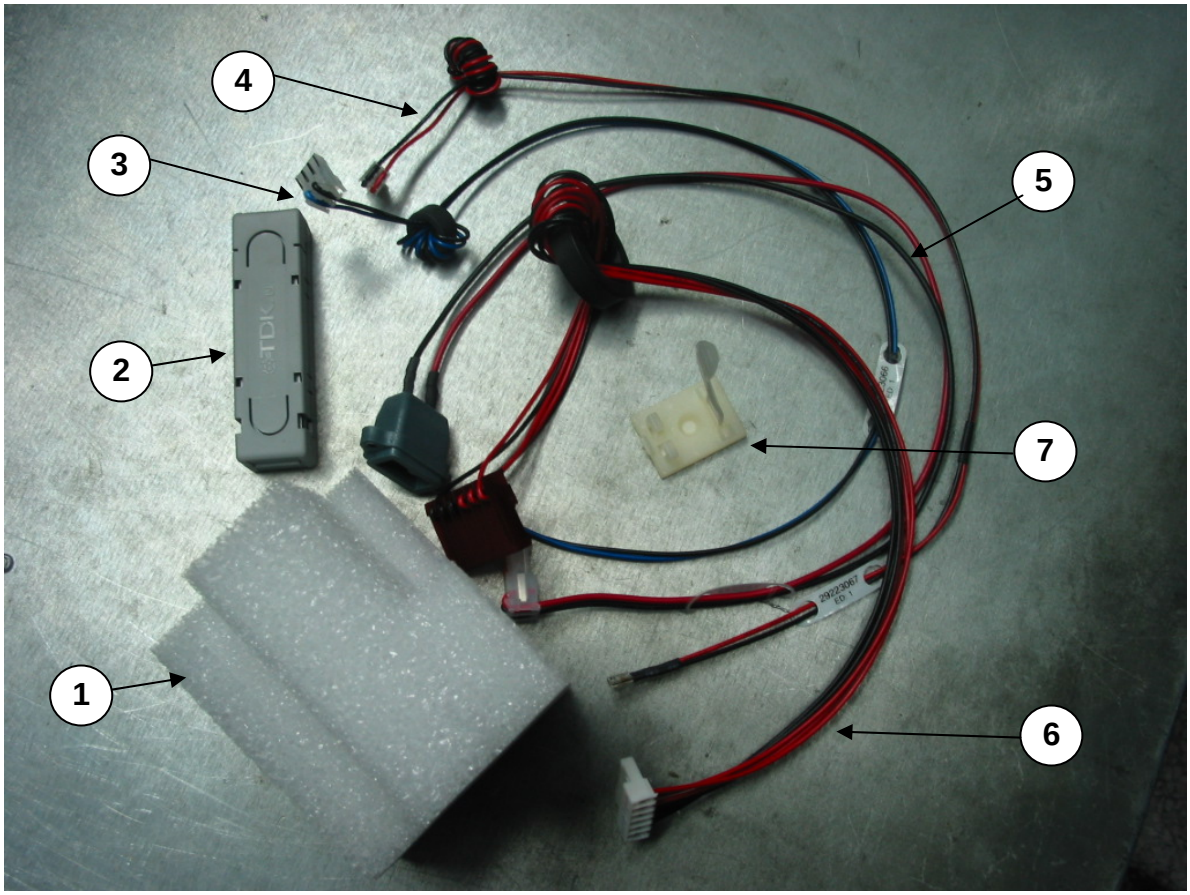


5.5 **Quit** (see paragraph 4.6)

15. RI SERIES protection kit against Electric Static Discharges (ESD)

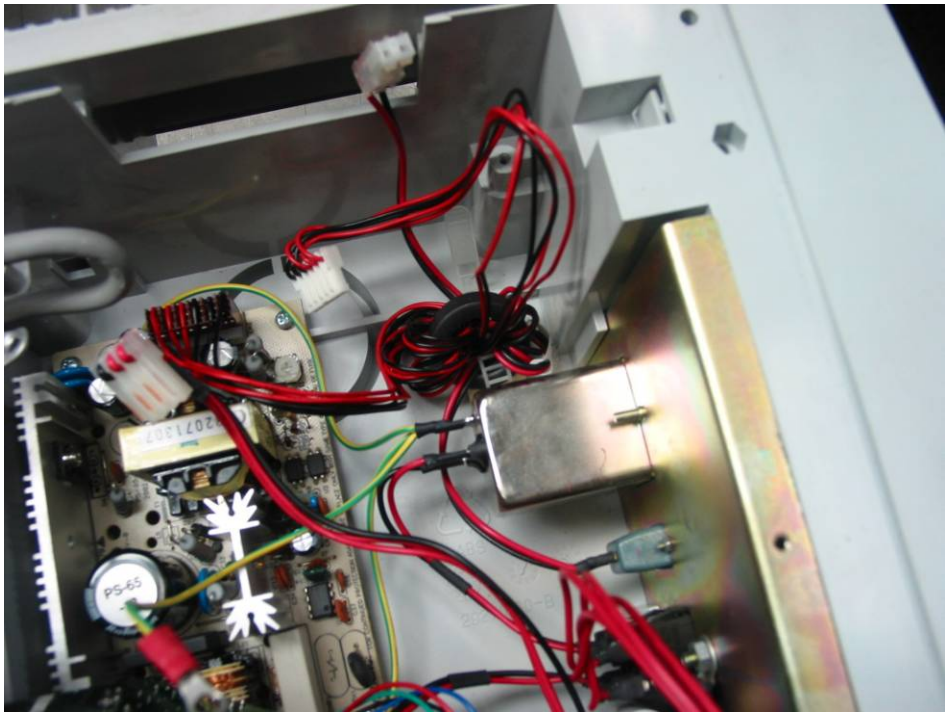
Seven parts for ESD changes**:**

ITEM	MTCN BOM	DESCRIPTION
1	169090	FOAM INSERT
2	168977	FERRITE CLIP
3	153231	CABLE FOR PHOTOTRANSISTOR
4	153230	CABLE FOR INFRARED EMITTING DIODE
5	153242	CABLE FOR 12V/24V BATTERY TO MAIN PCB BOARD
6	153233	CABLE FOR SWITCHING POWER SUPPLY TO MAIN PCB BOARD
7	133412	CONN,CLIP,WIRE FIX

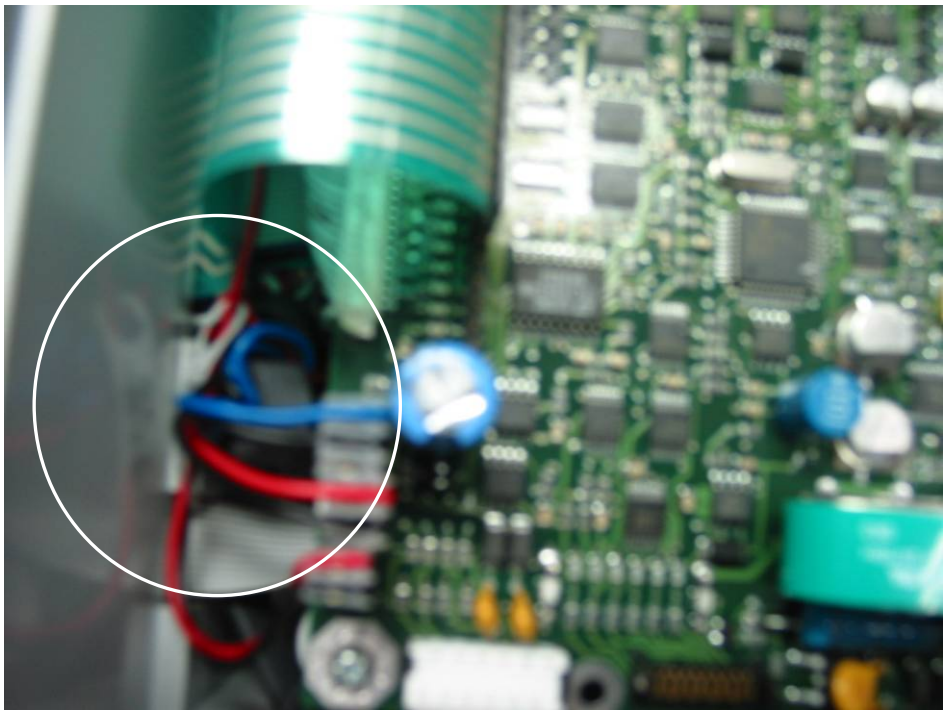


Before installing all the parts above, we need to open the scale. Namely remove the platter and platform and bottom cover. Afterwards, we can start the steps as follows:

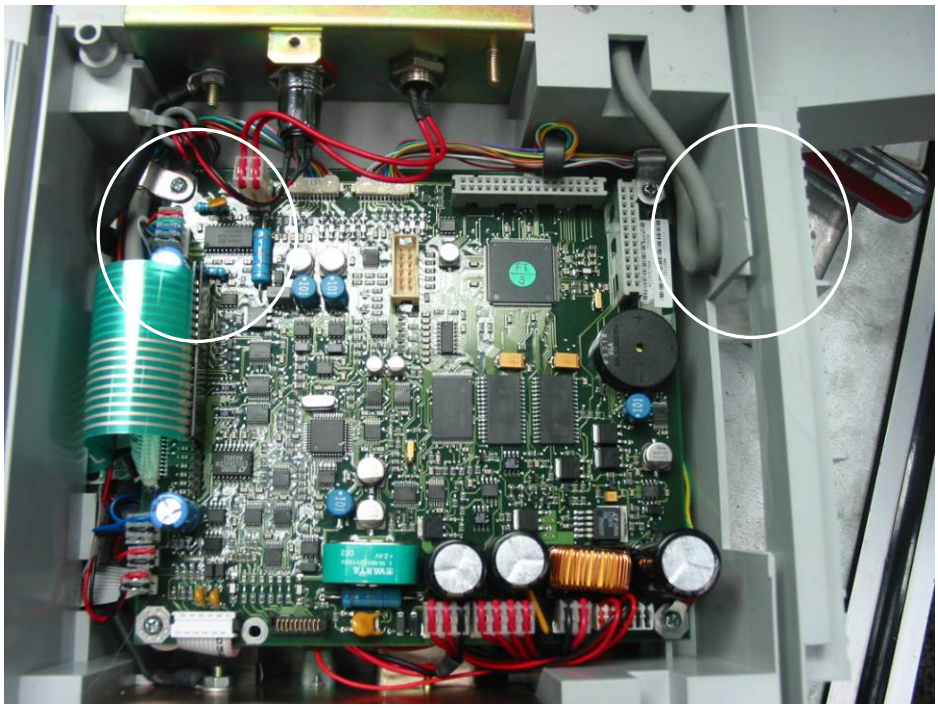
1/, Cable 153242 coils up 4 circles around ferrite on the Cable 153233, then we fix the ferrite on the main housing with 133412 like in the picture below . Replace the previous power supply cable by this new one



2/ Replace LED and sensor cables for paper detection by the ones ferrite equipped.

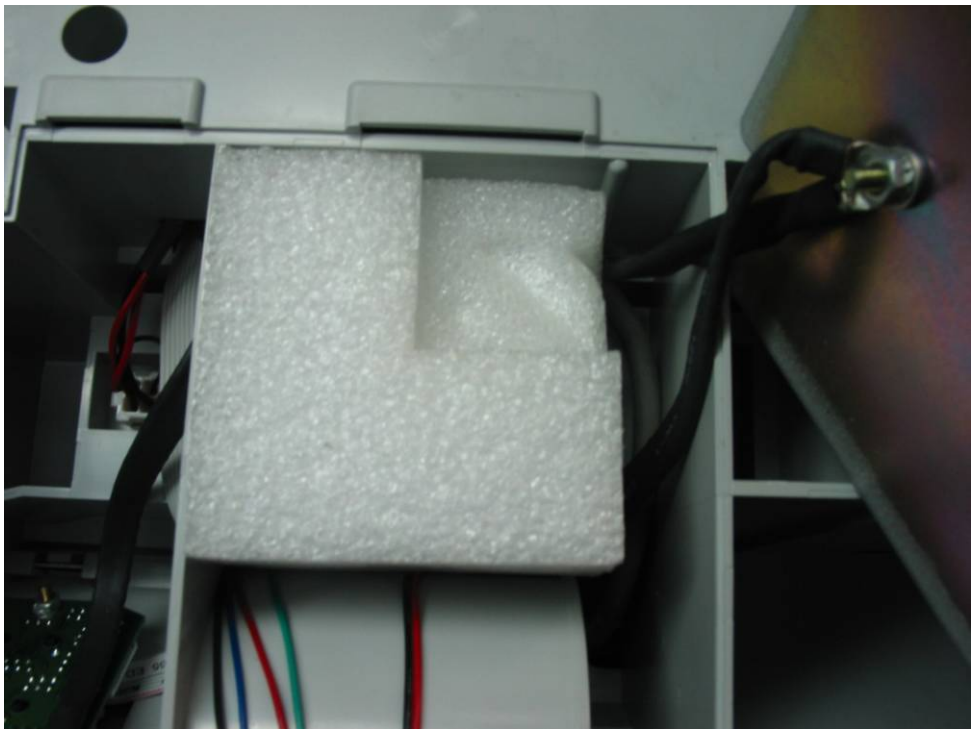


3/ Change the grounding of the two cables marked below, following the picture.

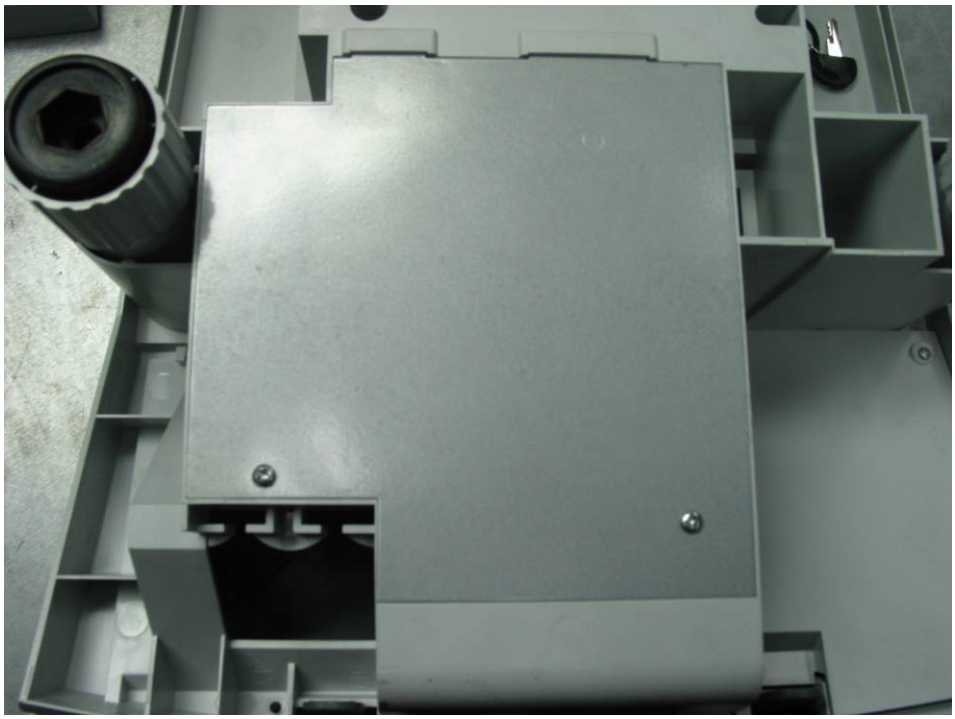


4/ Clip all the cables (except for the display and motor cable) with TDK ferrite. The position of the ferrite should be as shown below.

5/ Put the foam into the plastic cavity as shown below. Be sure the foam and TDK ferrite are placed properly.



6/ Assemble the bottom cover**.**



16. Spare parts list

PIECES DETACHEES RI SERIES SPARE PARTS RI SERIES

PIECES RI SERIES	Article number	RI SERIES PARTS
Serrure + 2 clés	71207312	Lock with 2 keys
Clés seules	71207619	Keys
Interrupteur alimentation balance	71208127	Scales power supply switch
Chargeur pack batterie NIMH	71207296	Battery charger NIMH
Fusible retardé 800 mA, 5x20	71208128	Delayed fuse 800 mA, 5x20
Cellule pesage AMI-30	71207309	Load cell AMI-30
Carte analogique	71207285	A/D board
Carte alimentation	71207286	Switching power supply
Carte communication	71207284	Communication board
Carte mère	71207283	Main board
Afficheur LCD	71207313	Displaying module
Tête thermique RL00	71207282	Print head RL00
Câble av phototransistor pour imprimante	71208129	paper sensor with cable for printer
Nappe liaison carte mére /carte com	71208130	Main board to com board cable
Câble liaison carte mére /moteur	71208131	Main board to stepping motor cable
Câble liaison carte mère / alimentation	71208132	Main board to switching power supply cable
Câble pour alimentation 12v externe	71207316	Car battery to scale cable
Câble pour interrupteur batterie	71208133	Battery switch cable
Nappe liaison carte mère / carte analogique	71208134	Main board to A/D board cable
Filtre Schaffner	71207310	Mains filter
Ferrite TDK	71207311	Ferrite clip
Plateau	71207281	Pan
Ressort liaison plateau/terre	71208135	Spring grounding
Coque principale	71207279	Main shell
Pied réglable	71207299	Adjustable foot
Coque clavier	71207280	Keyboard shell
Clip clavier	71208136	Keyboard clip
Pack batterie NIMH 13,2V 3Ah	71207297	Pack battery NIMH 13,2V 3Ah
Clavier avec nappe	71207301	Foil film keyboard
Membrane clavier (travail/prog) N° 1	71207302	Intermediate keyboard Nr 1
Membrane clavier (travail/prog) N° 3	71208103	Intermediate keyboard Nr 3
Membrane clavier silicone	71207300	Silicone keyboard
Mecanisme d'impression complet	71208137	Complete printing mechanism
Axe silicone imprimante	71208138	Printer roll axis
Axe métal support rouleau papier	71208139	Paper guide axis
Joints torriques guidage papier	71208140	Printer roll ring
Câble avec diode IR pour imprimante	71208141	IR emitter with cable for printer
Nappe liaison afficheurs	71207314	Front or rear display cable
Nappe liaison afficheur colonne	71208142	Tower display cable
Ensemble filtre secteur et interrupteur cablé	71208143	Wired mains switch and mains filter
Câble liaison carte mère / accu	71208144	Main board to internal pack battery cable
Câble liaison carte mère / tiroir-caisse	71208145	Main board to cash drawer connector cable
Nappe carte mère / tête d'impression	71208146	Main board to print head cable
Câble carte mère / conn. batterie externe	71208147	Main board to ext. battery connector cable
Câble de masse	71208148	Grounding harness
Clip de fixation ferrite	71208149	Ferrite clip
Filtre afficheur avant RI Series Ohaus	72191976	Glass front display Ohaus brand RI Series
Filtre afficheur arrière RI Series Ohaus	72191975	Glass rear display Ohaus brand RI Series

Conditional on technical modifications and the availability of accessories

In conformance with the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements.

Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment.

If you have any questions, please contact the responsible authority or the distributor from which you purchased this device.

Should this device be passed on to other parties (for private or professional use), the content of this regulation must also be related.

Thank you for your contribution to environmental protection.

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