

Metor 6M

MAINTENANCE MANUAL

P/N 92102928 REV. 6

Rapiscan[®]
s y s t e m s

An OSI Systems Company

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Title MAINTENANCE MANUAL, METOR 6M		

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1. INTRODUCTION

Metor 6M is a walk-through metal detector designed to detect metal objects people are carrying with them. Due to the multizone principle used Metor 6M can indicate the height where alarming object was taken through the unit.

The unit is available with two cross piece lengths, 76 cm and 81 cm. Part numbers are:

- 76 cm: METOR 6M-30
- 81 cm: METOR 6M-32

The product structures of both configurations showing main modules and their submodules are included into the appendices. The modules are:

Level	Type	Description
1	MCES 5207	Cross Piece and Electronics Set
2	MELS 5208	Electronics Set
3	MCCU 5209	Control and Communication Unit
2	MCDS 5155-6M	Control and Display Set, Metor 6M
3	MDPU 5162	Display Unit
2	MCSS 5210	Cross Piece Set
1	MTRS 5211	TX/RX Coil Panel Set
2	MTXS 5212	Transmitter Panel Set
3	MZDS 5214	Zone Display Set
4	MZDU 5217	Zone Display Unit
4	MZDU 5218	Zone Display and Counter Unit
4	MZDU 5232	Zone Display and Power Indicator Unit
3	MCTS 5215	Counter Transmitter Set
4	MCTU 5219	Counter Transmitter Unit
2	MRXS 5213	Receiver Panel Set
3	MCRS 5216	Counter Receiver Set
4	MCRU 5220	Counter Receiver Unit

1.1. Technical Data

Ratings of recommended external power supply:

- Voltage, nominal 100 – 240 VAC
- Voltage, absolute limits 90 – 264 VAC
- Frequency, nominal 50/60 Hz
- Power consumption, maximum 50 W (12 VDC)

Recommended operating conditions:

- Ambient temperature -20 – +60 °C / -4 – +140 °F
-15 – +45 °C / +5 – +113 °F,
when battery back-up is in use
- Storage temperature -30 – +70 °C / -22 – +158 °F
- Relative humidity 0 – 95 %, no condensation
- Protection IP 55 (IEC 60529),
excluding external power supply

1.2. Function of Main Modules

MCES 5207 Cross Piece and Electronics Set

MCES consists of the cross piece and the electronics modules inside the cross piece.

The cardboard box of MCES also includes the external power supply, AC power cables, mounting screws, cardboard mounting jig, and installation and operating manual.

MELS 5208 Electronics Set

MELS is the main electronics module of Metor 6M. MELS contains a single printed circuit board, MCCU 5209.

MELS handles the magnetic field generation, detection of receiver signals, digital signal processing, and controls other modules. For connections to other modules see the wiring diagram in the appendices.

MELS is powered by an external 12 VDC power supply.

MCDS 5155-6M Control and Display Set

MCDS is the visual and audio interface of the Metor 6M having a LCD display, status LEDs and a buzzer. MCDS contains a single printed circuit board, MDPU 5162. Keyboard film on cross piece is connected to MDPU.

MCDS is powered by MELS. It is connected to MELS by a standard Ethernet cable.

MCSS 5210 Cross Piece Set

MCSS is made of aluminum and has a MDF hatch with a lock for access to the electronics modules. Keyboard film is attached to the MCSS.

MTRS 5211 TX/RX Coil Panel Set

MTRS consists of coil panels. They are packed into a separate cardboard box from MCES.

MTXS 5212 Transmitter Panel Set

MTXS is the transmitter coil panel housing the magnetic field generating coils. In the PVC profiles at the panel edges are zone display LED units and IR transmitters used for passenger counting.

MZDS 5214 Zone Display Set

MZDS consists of zone display LED units and of the PVC housing profile. There three different zone display units, MZDU 5217 with just LEDs in it, MZDU 5218 with also IR transmitter for passenger counting, and MZDU 5232 with additional green LEDs for power on indication. Assembly of the MZDS is shown in the appendices.

MCTS 5215 Counter Transmitter Set

MCTS consists of IR transmitter unit and of the PVC housing profile. Assembly of the MCTS is shown in the appendices.

MRXS 5213 Receiver Panel Set

MRXS is the receiver coil panel housing the magnetic field sensing coils. In the PVC profiles at the panel edges are IR receivers used for passenger counting.

MCRS 5216 Counter Receiver Set

MCRS consists of IR receiver unit and of the PVC housing profile. Assembly of the MCRS is shown in the appendices.

1.3. User Interface

Structure and operation of user interface is explained in the Installation and Operating Manual. There is also explained how to reset passwords, if needed.

Functions in submenu “6 DIAGNOSTICS” may be of use during troubleshooting.

Function “6-1 NOISE MEASUREMENTS” can be helpful when trying to determine the cause of external interference.

Function “6-2 DIRECTIONAL DATA” shows number of passengers (P1 and P2) and number of alarms (A1 and A2) in directions 1 and 2. In direction 1 people pass through the unit with TX panel on their right side. Also these counters are cleared when statistics is cleared in normal user interface.

Function “6-3 OPERATING TIME” shows total time unit has been on not counting standby state.

Function “6-4 CELL1/CELL2” shows state of the IR transmitter/receiver pairs. State is 0 when nothing is blocking the IR beam and 1 when beam is cut. CELL1 is the transmitter/receiver pair closer to you when you are standing in front of the unit with TX panel to your right.

Function “6-5 RUN LIGHT TEST” turn all lights of the unit on for ten seconds.

1.4. Useful Key Combinations

There are two useful key combinations available:

- Pressing simultaneously keys <0> and <5> shows unit’s software versions.
- Pressing simultaneously keys <7> and <9> starts keyboard test. If keyboard is working properly display recognizes each key when pressed. To exit test mode press keys <7> and <9> again.

2. INSTALLATION

Installation is explained in the Installation and Operating Manual.

Some useful tips:

- Before assembling the unit check where the wall socket is as power supply connection is only available through TX panel.
- Power supply should always be placed as far from the unit as possible to minimize possible interference.
- Note that DC power cord of the power supply can be also brought through the top of the cross piece. If the power supply has to be placed on the cross piece place it near the TX panel.
- Contrary to the Metor 300 and Metor 300 EMD the panel power cord hatch is removed/replaced by a 90 degrees counterclockwise/clockwise turn of the locking stud. No force is needed.
- Before assembly check whether the zone display is on the correct (exit) side. It is easier to change the side of the zone display while the unit is unassembled.
- You may find it easier to make connections to the electronics while the unit is lying down.
- Flat areas under the panel boots can be used to tape or glue the unit to the floor.
- It is recommended to have two persons when lifting up the unit.

Tools needed in installation:

- 4 mm hex socket key
- power drill (if unit is fixed to the floor) and suitable screws

To check to operation of the unit after installation follow the instructions of document 04102925 Income Inspection, Metor 6M, see appendices. Note that standard configuration does not include the remote control.

2.1. Product Identification

Master serial number label of the Metor 6M is placed onto the cross piece, figure 2.1.

Serial number labels of TX and RX coil panels can be found under the cable hatches near the bottom of the panels.

Serial number labels of MELS and MCDS are placed onto the enclosures.



Figure 2.1.

2.2. Changing Zone Display to Other Side or Adding a Second Zone Display

Depending on which side TX panel will be placed relative to passenger direction you may have to change the side of the zone display to have on exit side. It is easiest to do the changing while unit is disassembled. The steps are as follows:

- Remove the hat.
- Disconnect MZDS and MCTS from the red and green Ethernet cables. Do not remove the cables nor switch their sides.
- Pull the MZDS and MCTS tubes out in a straight line and install back into opposite sides.
- Connect the green and red Ethernet cables to MZDS and MCTS.
- Replace the hat. Observe correct orientation of the hat. There is a notch on one side of the hat for cross piece. Do not over tighten hat screws as they are threaded into MDF.

When adding a second zone display simply remove MCTS and replace it with a second MZDS. Same Ethernet cable is connected to MZDS as to MCTS.

After changing zone display side or adding a second zone display they need to be enabled from the user interface. Go to menu “2-41 ZONES” and select correct parameter value. When zone display is on left edge when you look to the TX panel standing between panel corresponding parameter value is “DIR1”. Respectively, is zone display is on right edge parameter value is “DIR2”. If you have installed a second zone display and want both displays enabled correct parameter value is “BOTH”.

3. PERIODIC MAINTENANCE

Metor 6M is virtually maintenance-free. However, component failures are possible and therefore the operation of the unit should be checked regularly.

It is recommended that detection is tested daily using a suitable test object.

Recommended monthly maintenance is:

- Visual inspection to check the condition of all parts.
- Check that coil panels are parallel using the mounting jig or a tape measure.
- Check the tightness of cross piece mounting screws.

Recommended yearly maintenance is:

- Clean electronics of possible dust.
- Check operation of the display, status LEDs and zone display LEDs.
- Check operation of the keyboard and buzzer.
- Check operation of passenger counters.
- Check power supply cables for possible wear.

4. TROUBLESHOOTING

A document listing error messages and error numbers, 04103527 Fault Tracing and Error Messages, is added into appendices. The document also includes some fault tracing advice.

4.1. Random Alarming

Intermittent alarms that are not caused passing a metal object through the unit are called false alarms. False alarms are caused either by internal malfunctioning or external interference. External interference can be either electromagnetic in nature or caused by moving metallic structures.

Best way to rule out internal malfunctioning is to replace the unit by another one. If new unit also experiences false alarms the cause is external. In opposite case faulty part can be found out by replacing parts of the malfunctioning unit with the parts of the new unit one by one.

To find out the cause of false alarms user interface menu functions “6-11 EM NOISE” and “6-12 TOTAL NOISE” can be used. When “6-11 EM NOISE” is started TX coil currents are turned off and only RX coil sensing is in operation. Now moving metal structures or malfunctioning of TX driver circuitry can not produce a signal. Only external electromagnetic interferences (or malfunctioning RX circuitry – but this is very unlikely) can produce a signal. Using function “6-12 TOTAL NOISE” normal metal detection is in operation.

If both noise measurements give similar results the reason of false alarms is most likely external electromagnetic interference.

If only “TOTAL NOISE” shows noise the reason of false alarms is either moving metal structures in the vicinity of the unit or internal malfunctioning. Note that moving metal structures can be also above or under the unit and that for example a glass wall with steel or aluminum frames is effectively equal to a metal sheet of size of the frame.

Most common cause of false alarms is electromagnetic interference. First check that the cause is not another metal detector. As usually the cause of the interference, cable ducts, fuse boards, transformers, electric motors, etc., can not be moved, one is left to try to select a operating frequency that is least affected and try to move RX coil panel to a position least affected by the interference.

4.2. Passenger Counting Not Working

First check that zone display and counter cables are correctly connected, i.e. as color codes indicate, and that “4-21 COUNT DIRECTION” is correctly selected and is not “OFF”.

If counting still does not work either IR transmitters in MZDU 5218 and MCTU 5219, or IR receivers in MCRU 5220, or counter cables, or MELS is malfunctioning.

To check on which side of panels the failure is use function “6-4 CELL1/CELL2”. If status of cell is 1 while nothing is blocking the IR beam or the status does not change to 1 when beam is blocked, that side has the failure.

The height of IR transmitters and receivers is ca. 73 cm from floor.

Operation of IR transmitter can be tested with commercial IR remote control tester. Also digital camera can be used check if IR transmitters are emitting by placing the camera lens in contact with side profile.

Once problematic side is found out, try switching the left and right side MCRS modules. If faulty side changes MCRU or its cable is malfunctioning. Replace MCRU or cable, as needed.

If faulty side remains the same switch MZDS and MCTS. Again, if faulty side changes corresponding unit or cable is malfunctioning. Replace faulty item.

If faulty side still remains the same either counter cables or MELS is malfunctioning. Replace counter cables with temporary Ethernet cables to check the cables. Temporary cables can be connected directly between counter modules and MELS, figure 4.1.

In case replacing cables does not help MELS must be malfunctioning.



Figure 4.1.

4.3. Zone Display Not Working

First check that zone display is enabled, “2-41 ZONES:” is not “OFF”.

Next check that selected direction and the side zone display is mounted correspond to each other. When “DIR1” is selected zone display must be on left side of TX panel when looking at it standing between the panels. Or alternatively select mode “BOTH”.

Turn zone display on using function “6-5 RUN LIGHT TEST”. Note which LEDs or segments do not light. Replace faulty zone display units.

Note that if all segments from specific height downwards do not light not all corresponding units need to be malfunctioning as signal to lower units goes through the upper units.

If the whole zone display remains unlit either connecting cable or MELS is faulty. Test cable using a temporary Ethernet cable as in paragraph 4.2.

5. PART REPLACEMENT

5.1. Replacing MELS

- Open cross piece hatch.
- Turn off the MELS.
- Disconnect all cables.
- Remove transportation securing screws, figure 5.1., if they are still attached.
- Loosen the four screws fixing the MELS to the cross piece. DO NOT remove the screws.
- Slide MELS sideways to remove it.
- Install a new MELS in reverse order.

Tools needed:

- Cross piece hatch key
- Torx screwdriver size T15

5.2. Replacing MCDS

- Even though MCDS can in principle be replaced with Metor 6M assembled it is much easier to replace with cross piece on a table.
- Remove MELS to get extra space.
- Remove the six screws fixing MCDS to the cross piece but do not let the MCDS drop off as it is still connected to the keyboard, figure 5.2.
- Unlock the keyboard connection strip connector and pull out the strip.
- Before installing the new MCDS remove the plastic display protection film.
- Push keyboard connection strip in the connector and lock the connector, figure 5.3.
- Fasten the screws. You may need to push the buzzer end slightly to get the screws on the threads. Do not over tighten the screws.
- Install and connect the MELS.
- Before assembling coil panels test that MCDS powers up connecting power supply directly to the MELS. Note that you will get an error message as coils are not connected.
- Assemble the Metor.
- Test the operation of the keyboard.

Tools needed:

- Cross piece hatch key
- Allen key size 4mm
- Torx screwdriver size T15
- Phillips screwdriver size PH2, preferably with short blade

5.3. Replacing Keyboard

- Remove MELS and MCDS, see paragraphs 5.1. and 5.2.
- Keyboard film is attached to the cross piece with adhesive tape. To remove the film push it through display or LED opening in the cross piece and then rip it off, figure 5.4.
- Remove possible tape residues from the cross piece.
- When installing new keyboard film start from keyboard end. Put the connection strip of the keyboard through the hole in the cross piece.
- Place the right end of the film in flush with the end of the cross piece.
- Ensure that the film is straight before attaching it.
- Rub the film gently but thoroughly to ensure that the adhesive sticks to the cross piece.

- Install MCDS and MELS.

Tools needed:

- Cross piece hatch key
- Allen key size 4mm
- Torx screwdriver size T15
- Phillips screwdriver size PH2, preferably with short blade
- Solvent for glue residues

5.4. Replacing MZDS/MCTS/MCRS

- Lay the Meteor 6M down with a support under the cross piece so that top parts of panels do not touch floor, figure 5.5. It is recommended two persons do this phase due to the weight of the product. Note that you need about 2 m of working space behind the cross piece.
- Remove the hat.
- Disconnect the module to be replaced from the red or green connection cable.
- Pull the zone display profile out in a straight line.
- Install new module in reverse order. Do not over tighten hat screws as they are threaded into MDF. Observe correct orientation of the hat. There is a notch on one side of the hat for cross piece, figure 5.6.

Tools needed:

- Torx screwdriver size T25

5.5. Replacing MZDU

- Remove MZDS as explained in paragraph 5.4.
- Unfasten the five MZDU locking screws.
- Pull the MZDU unit out of the zone display profile. When a unit is out of the profile disconnect it from the next one. Note the order in which different MZDU units are in the profile.
- Replace the MZDU.
- Push the units back into the profile in correct order. Connect next one before fully inserting a unit.
- When all units are back in the profile adjust them so that screw holes in the profile are in line with the broaching nuts in the MZDU units.
- Fasten the screws.
- Replace MZDS and assemble.

Tools needed:

- Torx screwdriver size T25
- Torx screwdriver size T20

5.6. Replacing MCTU/MCRU/Extension Cable

- Remove MCTS or MRCS as explained in paragraph 5.4.
- Unfasten MCTU/MCRU locking screw.
- Pull the unit out from the profile using the extension cable.
- Replace unit or cable.
- Using a draw cord pull the end of the extension cable through the profile. Be careful not to pull the MCTU/MCRU unit over its correct position. Observe the correct orientation of the profile.

- Align profile MCTU/MCRU screw hole and the unit's broaching nut using the extension cable.
- Fasten the screw.
- Replace MCTS/MCRS and assemble.

Tools needed:

- Torx screwdriver size T25
- Torx screwdriver size T20
- Draw cord

5.7. Replacing Zone Display/Counter Ethernet Cables

- Although the cables can be replaced Metor 6M assembled the procedure is easier with the coil panel on a table.
- Remove the hat from the coil panel, figure 5.7.
- Disconnect the cable to be replaced and remove it from the cable clamps.
- With the coil and connection cables lying on the panel cut the cable tie keeping the ferrite in place and remove the ferrite, figure 5.8.
- Cut the cable tie fixing the cables to the side of cable opening, figure 5.9.
- Pull the cable to be replaced free from the slit harness wrap.
- Put the new cable into the harness wrap.
- Adjust the length of the MELS end as in figure 5.8.
- Replace the ferrite and the cable ties.
- Connect the cable to MZDS/MCTS/MCRS and fasten the cable with the cable clamps.
- Replace the hat and assemble the Metor.

Tools needed:

- Cross piece hatch key
- Allen key size 4mm
- Torx screwdriver size T15
- Torx screwdriver size T25
- Side cutters
- Cable ties

5.8. Replacing DC Power Cable

- Cut the cable tie fixing slit harness wrap and power cable to TX panel cable opening.
- Connect new cable to old cable at lower cable opening and temporarily fix the connectors with tape. Observe that the end with the ferrite is the upper end.
- Using old cable pull the new cable through the panel.
- Adjust the lower cable end as in figure 5.10.
- Fix the cable and harness wrap with a cable tie.

Tools needed:

- Cross piece hatch key
- Allen key size 4mm
- Side cutters
- Cable tie



Figure 5.1.



Figure 5.2.

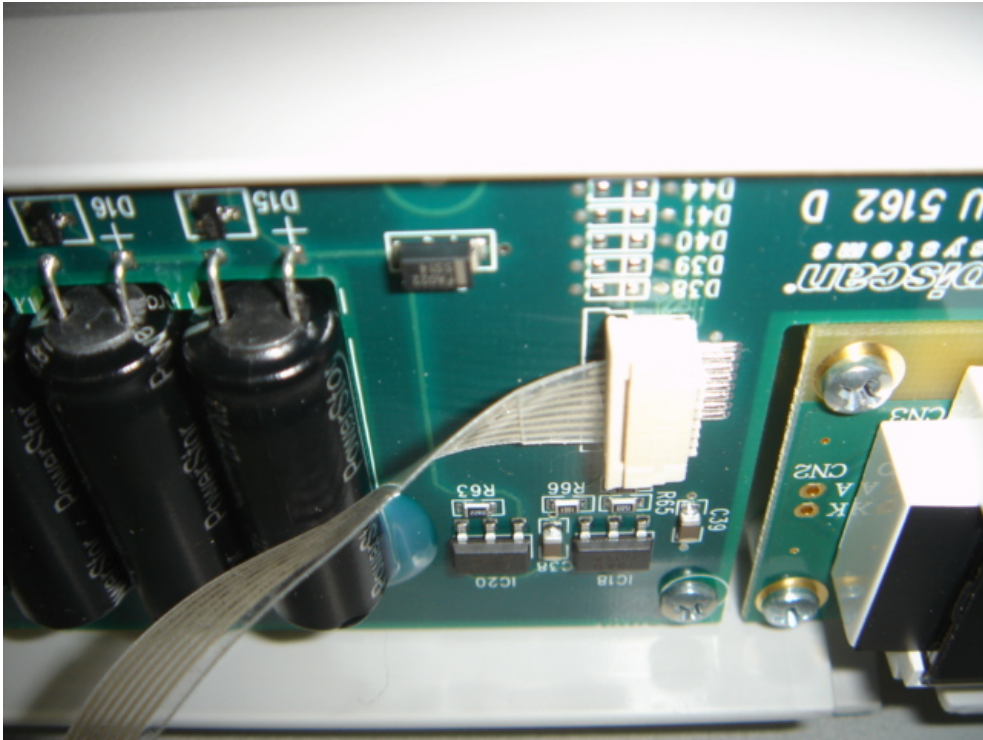


Figure 5.3.



Figure 5.4.



Figure 5.5.

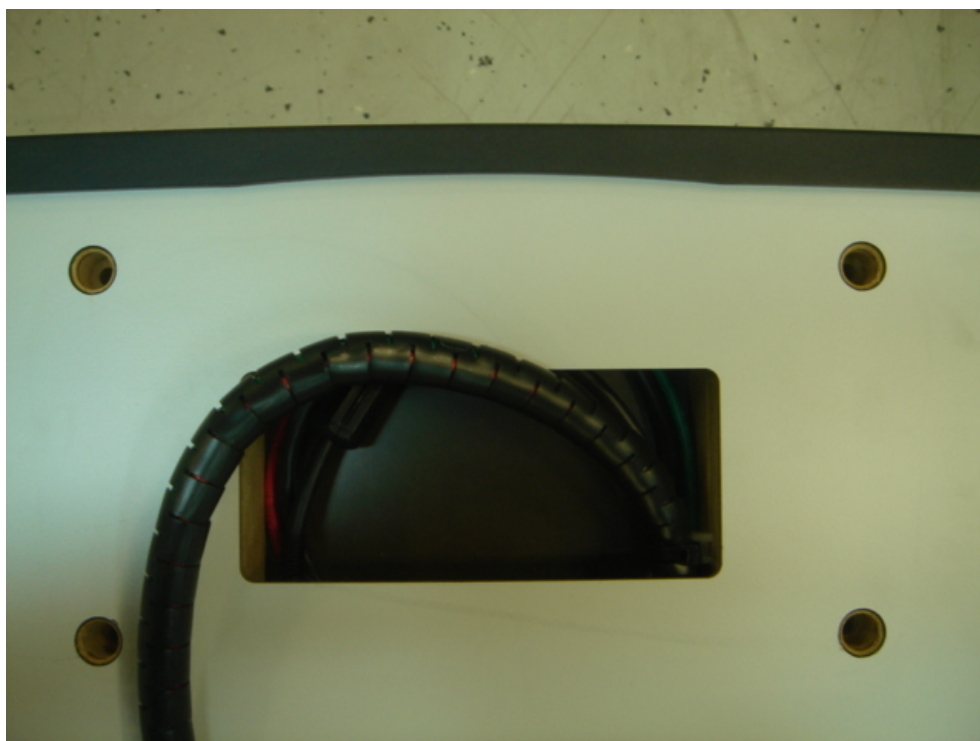


Figure 5.6.

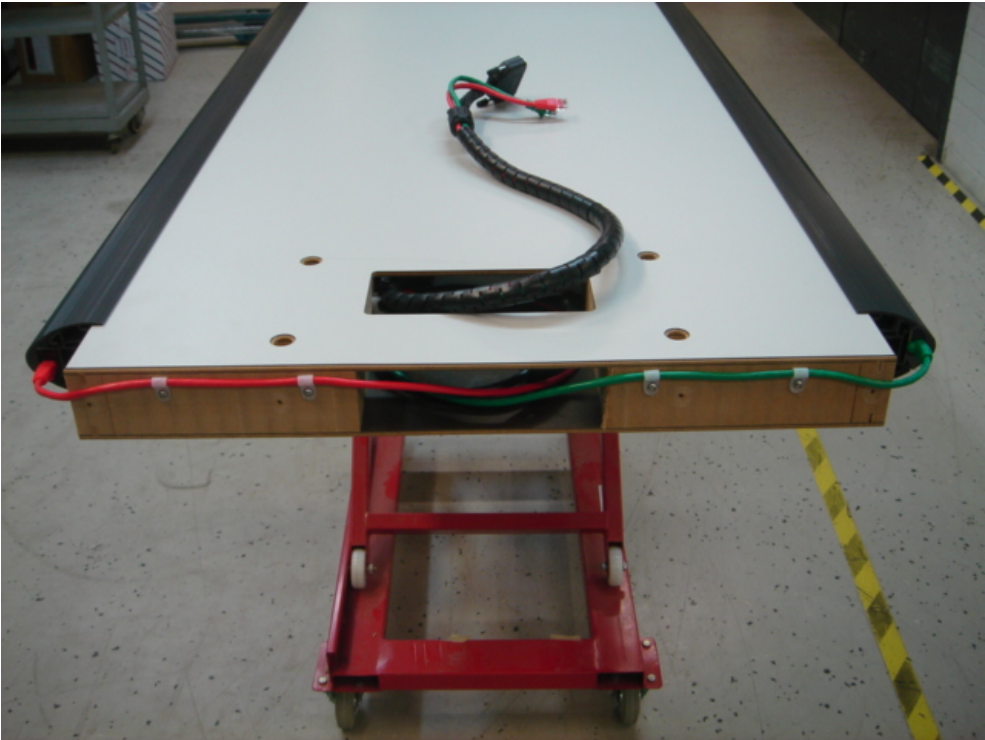


Figure 5.7.

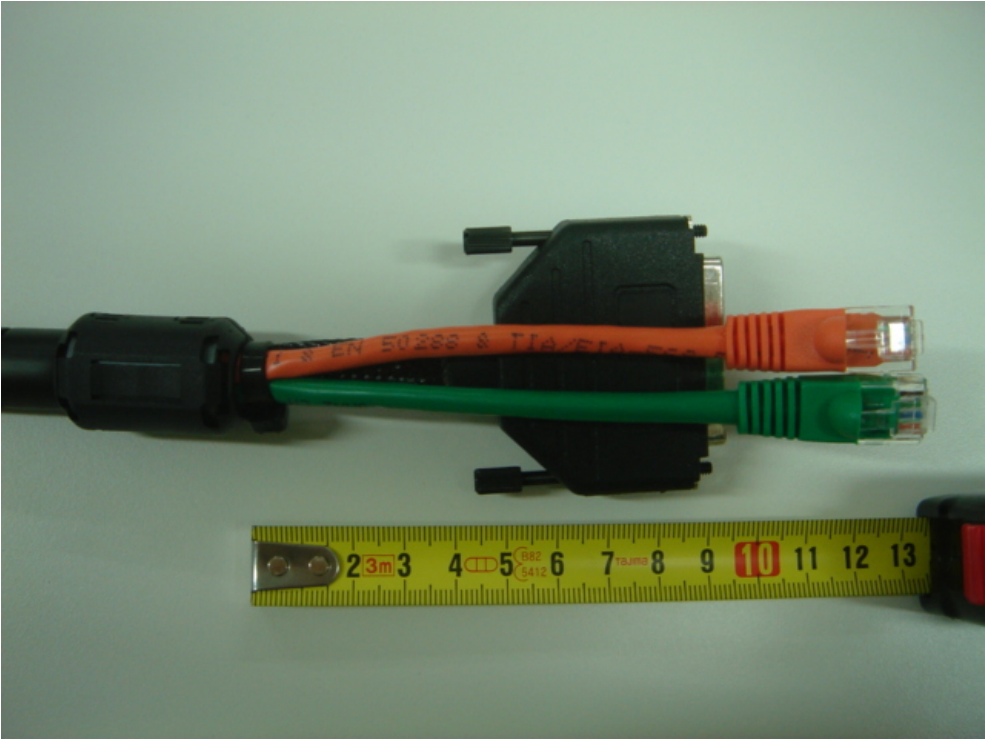


Figure 5.8.



Figure 5.9.



Figure 5.10.

6. ACCESSORIES AND SPARE PARTS

Check for up to date accessory and spare part lists from Rapiscan Systems.

6.1. Accessories

P/N	Description
20102926	ON-SITE KIT, METOR 6M
20102927	MAINTENANCE KIT, METOR 6M
8100577	MRCS 5116 REMOTE CONTROL SET
20106468	MRCS 5116 WITH HOLDER
8100774	MTLS 5169 TRAFFIC LIGHT SET
20102858	MBBS 5238 BATTERY BACK-UP SET
20106433	MRDS 5259 REMOTE DISPLAY SET
92102928	MAINTENANCE MANUAL., METOR 6M

6.2. Individual Spare parts

P/N	Description
8101220	MELS 5208 ELECTRONICS SET
8100780-6M	MCDS 5155-6M CONTROL AND DISPLAY SET, METOR 6M
8101222-30	MCSS 5210-30 CROSS PIECE SET 76CM/30"
8101222-32	MCSS 5210-32 CROSS PIECE SET 81CM/32"
8101224	MTXS 5212 TRANSMITTER PANEL SET
8101225	MRXS 5213 RECEIVER PANEL SET
8101226	MZDS 5214 ZONE DISPLAY SET
8101227	MCTS 5215 COUNTER TRANSMITTER SET
8101228	MCRS 5216 COUNTER RECEIVER SET
56104256	POWER SUPPLY, CLASS I AC/DC, 12.5VOUT
8101304	KEYBOARD FILM 76CM, METOR 6M
8101312	KEYBOARD FILM 81CM, METOR 6M
2459857	POWER CORD, EU
3061066	POWER CORD, UK
3058291	POWER CORD, US

7. REVISION HISTORY

Rev. 6, 2012-01-24 / TV

- Added paragraph 2.2. and updated accessory list.
- ECN 03895.

Rev. 5, 2011-06-16 / TV

- Figure 5.1. and note on transportation securing screws added.
- ECN 03748.

Rev. 4, 2011-06-14 / TV

- Accessories added.
- Contents of individual spare parts, on-site kit and maintenance kit updated.
- ECN 03720.

Rev. 3, 2011-01-31 / TV

- ECN 03609.
- MCDS 5155, P/N 8100780, replaced with MCDS 5155-6M, P/N 8100780-6M.

Rev. 2, 2010-11-23 / TV

- ECN 03547.
- Technical data updated.
- Chapter 4.6. added.
- Maintenance kit contents updated.

Rev. 1, 2010-08-17 / TV

- Document created.

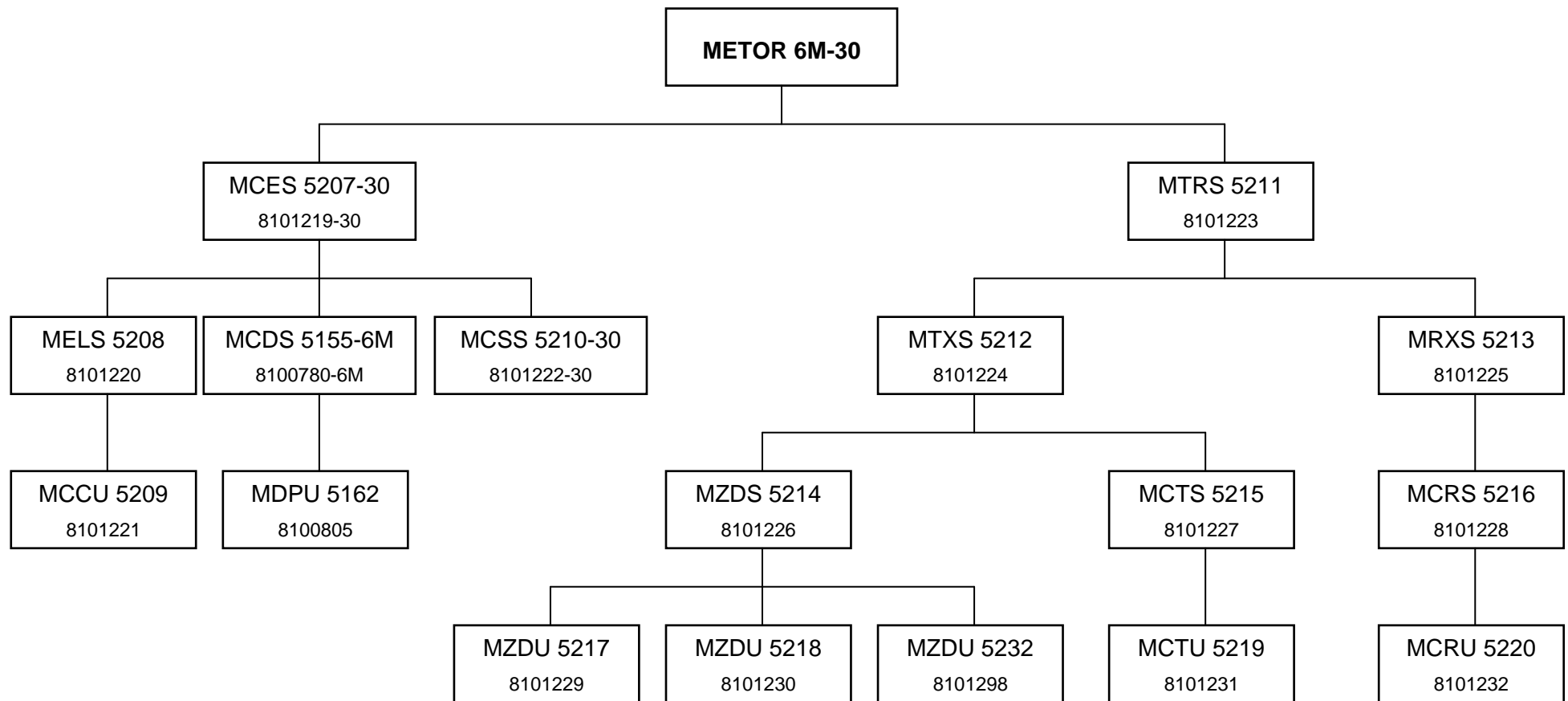
8. APPENDICES

No.	P/N	Description
1	9100802-30	PRODUCT STRUCTURE, METOR 6M-30
2	9100802-32	PRODUCT STRUCTURE, METOR 6M-32
3	04102857	WIRING DIAGRAM, METOR 6M
4	04102917	ASSEMBLY DRAWING, MZDS 5214
5	04102918	ASSEMBLY DRAWING, MCTS 5215
6	04102930	ASSEMBLY DRAWING, MCRS 5218
7	04102925	INCOME INSPECTION, METOR 6M
8	04103527	FAULT TRACING AND ERROR MESSAGES


Author T. Virtanen	Rev. 3	Code 9100802-30
Approved Veli-Matti Pisilä	Date 2011-05-06	Document
Product Metor 6M with 76cm/30" Cross Piece		Archives
Title PRODUCT STRUCTURE, METOR 6M-30		

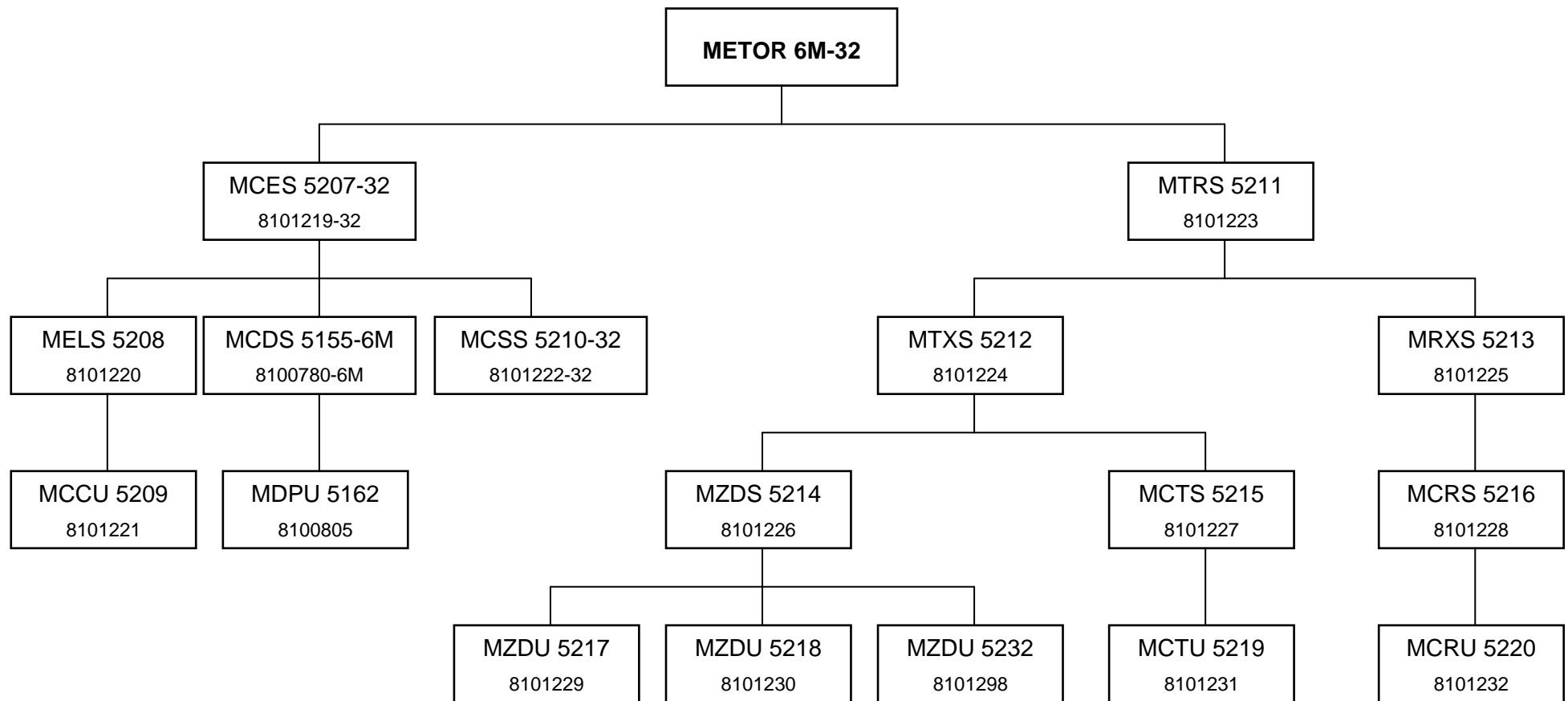


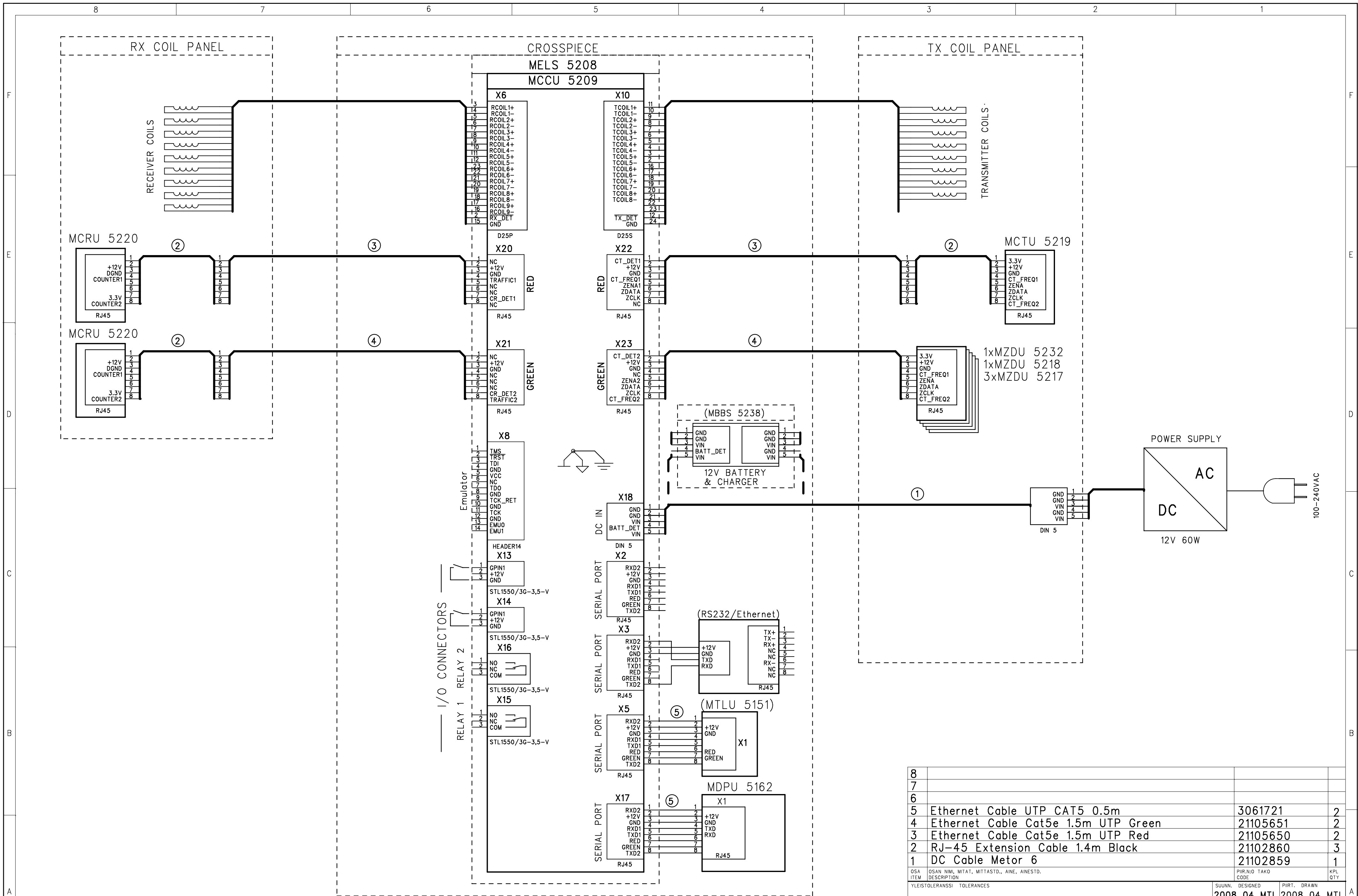
Depends on customer



Author T. Virtanen	Rev. 2	Code 9100802-32
Approved Veli-Matti Pisilä	Date 2011-05-06	Document
Product Metor 6M with 81cm/32" Cross Piece		Archives
Title PRODUCT STRUCTURE, METOR 6M-32		


Depends on customer





(Optional parts are in parenthesis)

2	Conn. NOs fixed, (4)&(5)=>1.5m, ECN 03811	2011 11	JNI		
REV.	MUUTOKSET REVISIONS	PVM DATE	PIIRT. DRAWN	HYV. APPR.	

8			
7			
6			
5	Ethernet Cable UTP CAT5 0.5m	3061721	2
4	Ethernet Cable Cat5e 1.5m UTP Green	21105651	2
3	Ethernet Cable Cat5e 1.5m UTP Red	21105650	2
2	RJ-45 Extension Cable 1.4m Black	21102860	3
1	DC Cable Metor 6	21102859	1

YLEISTOLERANSSI TOLERANCES		SUUNN. DESIGNED	PIIRT. DRAWN
		2008 04 MTL	2008 04 MTL
SHUDE SCALE		LITTTY NEXT ASSY	TARK. CHECKED
		Metor 6M	HYV. APPROVED
TUOTE PRODUCT		Metor 6M	
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PIIRT. NO CODE		04102857	



Wiring diagram

APPENDIX 4

Assembly Drawing, MZDS 5214

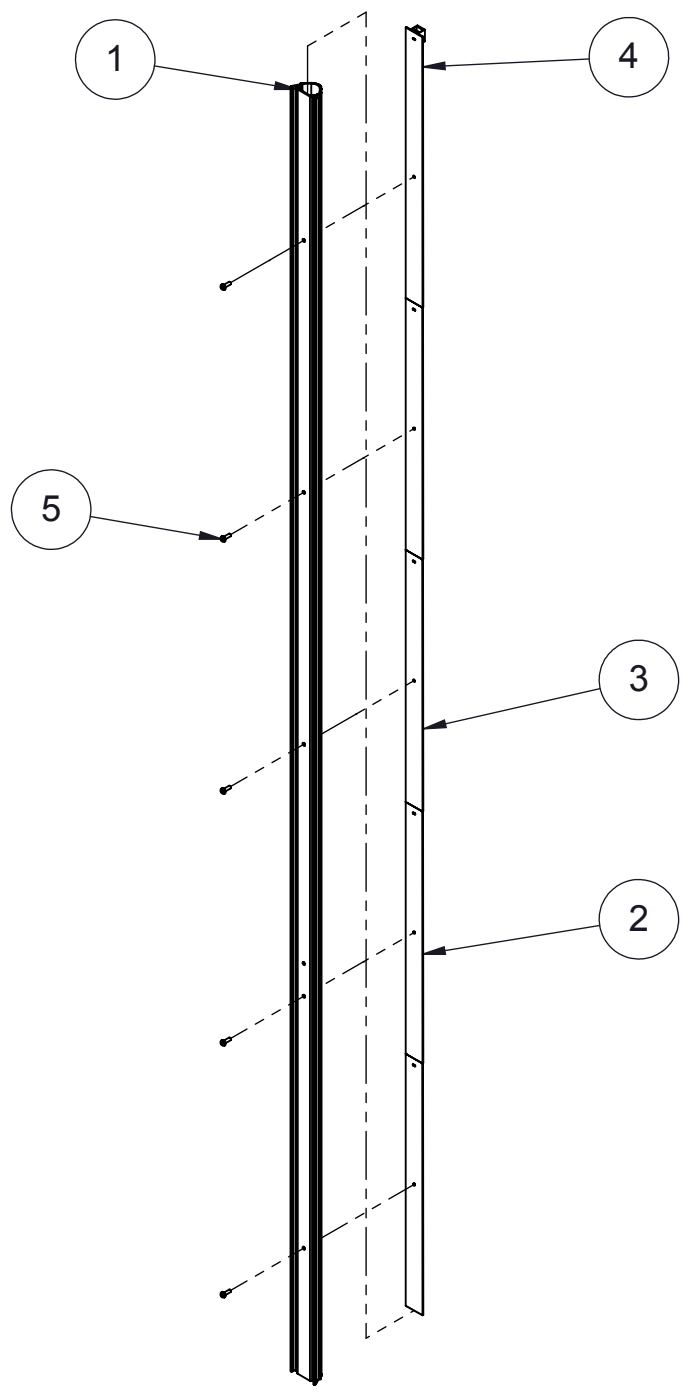
Parts in the drawing next page are:

Item no.	P/N	Description
1	8101214	ZONE DISPLAY PROFILE, METOR 6
2	8101230	MZDU 5218 ZONE DISPLAY AND COUNTER UNIT
3	8101229	MZDU 5217 ZONE DISPLAY UNIT
4	8101298	MZDU 5232 ZONE DISPLAY AND POWER INDICATOR UNIT
5	85102919	SCREW, M4X12, TX20

4	3	2	1
Revision	Description		Date
001	Initial approval.		29.10.2009

E
D
C
B
A

E
D
C
B
A



YLEISTOLERANSSIT TOLERANCES STANDARDIT STANDARDS		AINE MATERIAL / STANDARDI STANDARD /		TUOTE PRODUCT Metor 6		SUUNN. DESIGNED / PVM DATE MVA / 27.10.2009	
		PINTAKÄSITTELY SURFACE TREATMENT		VÄRI COLOR		3D-TIEDOSTO LIITTYY 3D-FILE APPENDIX <input type="checkbox"/>	
	SUHDE SCALE 1:10	A4	MZDS 5214 Assembly Drawing			TARKASTUSOHJE LIITTYY QUALITY CONTROL APPENDIX <input type="checkbox"/>	
MASSA MASS 0.76 Kg					PIIR.NRO. DWG.NO 04102917	REV. 001	

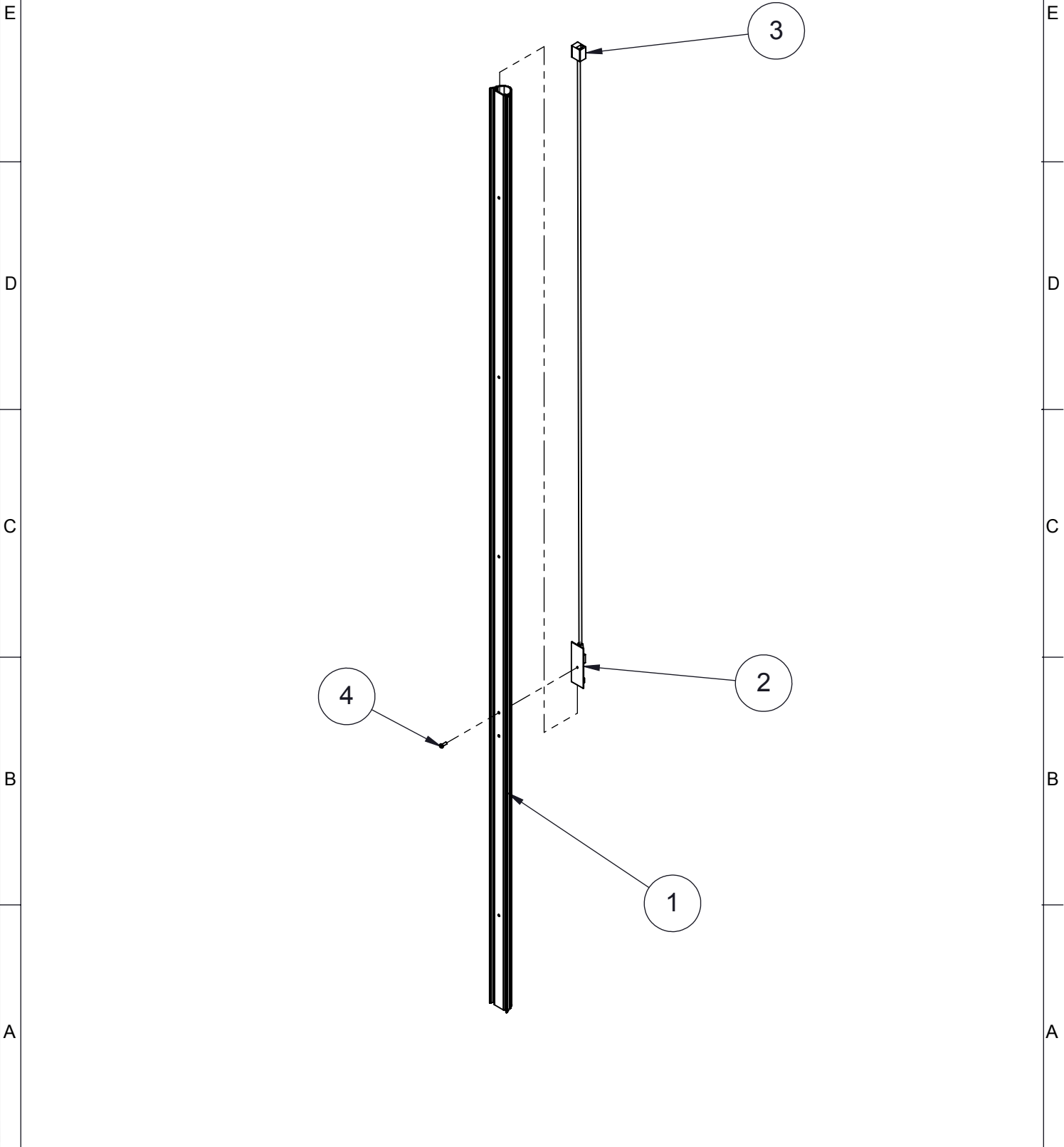
APPENDIX 5

Assembly Drawing, MCTS 5215

Parts in the drawing next page are:

Item no.	P/N	Description
1	8101214	ZONE DISPLAY PROFILE, METOR 6
2	8101231	MCTU 5219 COUNTER TRANSMITTER UNIT
3	21102860	EXTENSION CABLE, RJ-45, 1.4M, BLACK
4	85102919	SCREW, M4X12, TX20

4	3	2	1
Revision	Description		Date
001	Initial approval.		29.10.2009



YLEISTOLERANSSIT TOLERANCES STANDARDIT STANDARDS		AINE MATERIAL / STANDARDI STANDARD /	
		PINTAKÄSITTELY SURFACE TREATMENT	
	SUHDE SCALE 1:10	VÄRI COLOR A4	TUOTE PRODUCT Metor 6
MASSA MASS 0.69 Kg	SUUNN. DESIGNED / PVM DATE MVA / 27.10.2009		<input type="checkbox"/> 3D-TIEDOSTO LIITTYY 3D-FILE APPENDIX
		<input type="checkbox"/> TARKASTUSOHJE LIITTYY QUALITY CONTROL APPENDIX	
		MCTS 5215 Assembly Drawing	PIIR.NRO. DWG.NO 04102918
			REV. 001

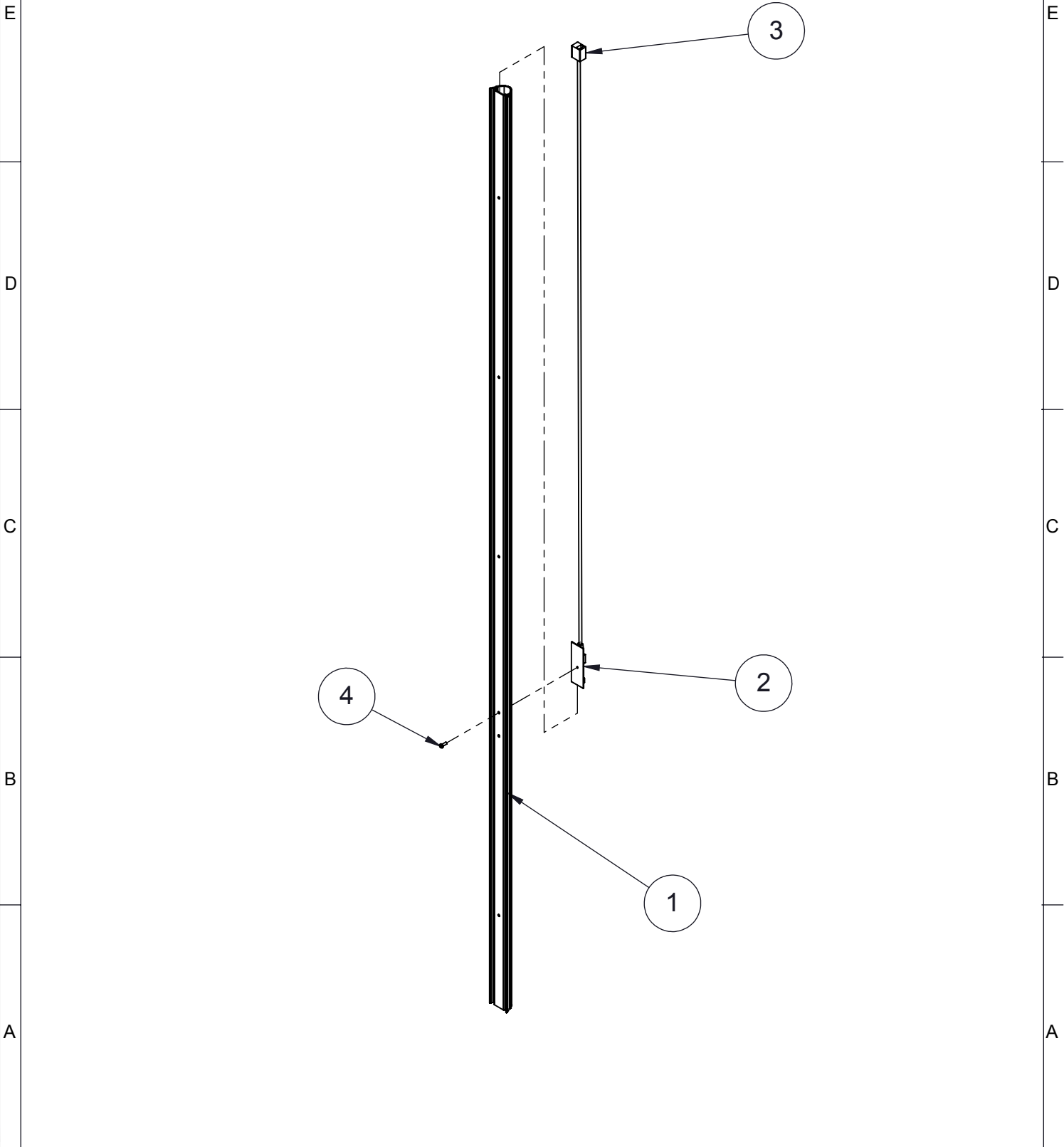
APPENDIX 6

Assembly Drawing, MCRS 5216

Parts in the drawing next page are:

Item no.	P/N	Description
1	8101214	ZONE DISPLAY PROFILE, METOR 6
2	8101232	MCRU 5220 COUNTER RECEIVER UNIT
3	21102860	EXTENSION CABLE, RJ-45, 1.4M, BLACK
4	85102919	SCREW, M4X12, TX20

4	3	2	1
Revision	Description		Date
001	Initial approval.		29.10.2009



YLEISTOLERANSSIT TOLERANCES STANDARDIT STANDARDS		AINE MATERIAL / STANDARDI STANDARD /	
		PINTAKÄSITTELY SURFACE TREATMENT	
	SUHDE SCALE 1:10	VÄRI COLOR A4	TUOTE PRODUCT Metor 6
MASSA MASS 0.69 Kg	SUUNN. DESIGNED / PVM DATE MVA / 29.10.2009		<input type="checkbox"/> 3D-TIEDOSTO LIITTYY 3D-FILE APPENDIX
		<input type="checkbox"/> TARKASTUSOHJE LIITTYY QUALITY CONTROL APPENDIX	
		MCRS 5216 Assembly Drawing	PIIR.NRO. DWG.NO 04102930
			REV. 001

Author Tapio Virtanen	Rev. 2	Code 04102925
Approved	Date 2010-09-03	Document
Product Metor 6M	Archives	
Title INCOME INSPECTION, METOR 6M		

1. INTRODUCTION

The document is intended for company internal use when stocked units need to be checked after reconfiguration or because of other reasons.

2. TEST SETUP

Following parts and test items are needed in inspection:

1. MRCS 5116 Remote Control Set, P/N 8100577
2. Metor Test Object Set, P/N 4100862

3. TEST PROCEDURE

3.1. Inspection of Packages and Parts

1. Check that packages are undamaged and contain all required parts and test reports.
2. Check that all parts are undamaged.

3.2. Start-up

1. Assemble the unit and connect it to mains supply.
2. Turn on the unit.
3. Check that SW versions are correct.
4. Check that "METOR 6M SELF CHECK OK" message appears to the display.
5. Ensure that no alarm messages appear.
6. Enter SUPER USER menu.
7. Run function "1-6 RESTORE FACTORY SETTINGS".
8. Exit the menu by pressing <C> twice.

3.3. Keyboard test

1. Press keys <7> and <9> simultaneously to enter key test mode. If successful the display shows text "TEST KEYS:".
2. Press each key in turn. If the keyboard is working properly display recognizes each key when pressed. Exit the test mode by again pressing keys <7> and <9> simultaneously.

3.4. Light test

1. Test the zone display LEDs and display LEDs with the "LIGHT TEST" function in service menu.
2. Enter SUPER USER menu.
3. Enter function "6-5 RUN LIGHT TEST".
4. Check that all LEDs in the zone display and the LED bars in the cross piece display light up.
5. Exit the menu by pressing <C> twice.

3.5. Buzzer test

1. Press key <4> to enter volume control.
2. Select loudest volume and check that the buzzer sound is clear.
3. Reset the volume to 2 and leave the menu by pressing <C>.

3.6. Remote control test

1. Teach the remote control to the unit using the instructions in the operating manual.
2. Using the remote control enter SUPER USER menu.
3. Go to menu "1-5 COPY PARAMETERS".
4. Select "1-51 COPY FROM METOR => REMOTE" check that the function operates correctly.
5. Select "1-52 COPY FROM REMOTE => METOR" check that the function operates correctly.
6. Go to function "3-21 REMOVE ALL VALID REMOTES" and remove the remote control from the unit's memory.

3.7. Detection test

1. Remove all metal items, like watch, belt, keys, etc.
2. With 76 cm/30" cross piece use sensitivity parameter value SE = 50 and with 81 cm/32" cross piece value SE = 70.
3. Take 45 mm Fe cylinder through the unit at the height of 100 cm and check that it does produce an alarm.
4. Check that zone display shows correct location.
5. Take 35 mm Fe cylinder through the unit at the height of 100 cm and ensure that it does not produce an alarm.

3.8. Counter test

1. Enter SUPER USER menu.
2. Run function "4-3 CLEAR STATISTICS" to clear counter values.
3. Enter function "4-11 PAX/ALM" and check that counter values are zero.
4. Walk through the unit keeping TX panel to your right and check that PAX counter value changes to one.
5. Run function "4-3 CLEAR STATISTICS" again to clear counter values.
6. Exit the menu by pressing <C> twice.
7. Turn off the unit.

4. REVISION HISTORY

Rev. 2, 2010-09-03 / TV

- Menu numbering changed to reflect new UI.
- Added detection test on 81 cm cross piece.

Rev. 1, 2009-11-05 / TV

- Document created.

Author Toni Akkala	Rev. 3	Code 04103527
Approved Tapio Virtanen	Date 2011-05-06	Document
Product Metor 6M		Archives
Title FAULT TRACING AND ERROR MESSAGES, METOR 6M		

1 FAULT TRACING

Here is listed some possible failures.

Symptom	Possible cause	Corrective action
Random alarming	External electromagnetic interference	Change operating frequency, relocate detector
No power to electronics	Power cable loose Power supply has failed Power cable inside TX panel has failed	Check power cable Replace power supply Check by connecting power supply directly to MELS Change power cable
Zone display segment does not light up	Zone display defective	Replace zone display
Traffic counter does not work, traffic lights are always red	Counter cables misconnected or faulty IR transmitter or receiver faulty	Check cable connections Replace faulty cable Refer to maintenance manual for troubleshooting Replace faulty IR unit

2 ERROR MESSAGES

In the following are explained errors that are shown on the Display Unit.

Error Message	Possible cause	Corrective action
SYSTEM MESSAGE: ERROR CODE XXX	Depends on error number; see next table	Cycle power on the unit, if reappears contact service
SYSTEM MESSAGE: MDPU Vcc TOO LOW	Display unit connection cable faulty Internal failure	Replace cable Replace MCDS or MELS
SYSTEM MESSAGE: MDPU TEMP TOO LOW	Ambient temperature is too low	Wait for the unit to warm up
SYSTEM MESSAGE: MDPU TEMP TOO HIGH	Ambient temperature is too high, direct sunlight to unit	Move the unit to shadow
SYSTEM MESSAGE: MDPU EEPROM INIT.	Memory was corrupted	Cycle power on the unit; verify that all parameters are correct!
SYSTEM MESSAGE: ACCESS CODES INIT.	Memory was corrupted	Cycle power Verify access codes
BATTERIES OF REMOTE CONTROL ARE EMPTY!	Empty batteries on remote control	Replace batteries
LOW REMOTE CONTROL BATTERY LEVEL!	Almost empty batteries on remote control	Replace batteries soon

SYSTEM MESSAGE: MCCU Vcc TOO LOW	Battery empty Power supply failure MCCU failure	Recharge battery Replace power supply Replace MELS
SYSTEM MESSAGE: MCCU TEMP TOO LOW	Ambient temperature is too low	Wait for the unit to warm up
SYSTEM MESSAGE: MCCU TEMP TOO HIGH	Ambient temperature is too high Electrical failure	Move the unit to cooler place Replace MELS
SYSTEM MESSAGE: MCCU EEPROM INIT	Memory was corrupted	Cycle power on the unit; verify that all parameters are correct!
SYSTEM MESSAGE: RX-CABLE FAILURE!	RX-cable is loose or disconnected	Check RX-cable connection
SYSTEM MESSAGE: TX-CABLE FAILURE!	TX-cable is loose or disconnected	Check TX-cable connection
SYSTEM MESSAGE: RECEIVER FAILURE X! (X is channel #)	RX Coil failure RX Cable failure Electrical failure	Check RX coil resistances Replace MRXS Check RX cable connector Replace MRXS Replace MELS
SYSTEM MESSAGE: TX X FAILURE! (X is channel #)	TX Coil failure TX Cable failure Electrical failure	Check TX coil resistances Replace MTXS Check TX cable connector Replace MTXS Replace MELS
SYSTEM FPGA INTERRUPT FAIL!	Electronics failure	Cycle power, Replace MELS
OPERATION FAILED: NO REPLY FROM MCCU	Display unit cannot communicate with electronics, MCCU failure MDPU failure	Verify that display unit cable is connected properly; Replace display unit cable Replace MELS Replace MCDS
MAX COUNT OF REMOTES IS VALIDATED!	No more remote control units can be taught to gate	Remove all remotes and try again. NOTE: This disables ALL previously taught remotes
CUSTOM PARAMS ARE NOT SET!	No custom parameters are saved	Save parameters before loading them
NO METAL DATA FROM MCCU	The MDPU does not get metal signal from the MCCU MCCU failure MDPU failure	Check display unit cable, cycle power Replace MELS Replace MCDS
MCCU PARAMS CORRUPTED!	MCCU parameters are corrupted MCCU failure	Cycle power on the unit; verify that all parameters are correct! Replace display unit cable Replace MELS
NO REPLY FROM MDPU!	Display unit cannot communicate with electronics, MCCU failure MDPU failure	Verify that display unit cable is connected properly; Replace display unit cable Replace MELS Replace MCDS
WARNING! POWER LOSS!	Power cord disconnected or unit switched OFF (Power Guard was ON)	Press 'C' to clear warning or reconnect power

SYSTEM MESSAGE: CTX-CABLE FAILURE! (X is counter transmitter #)	Zone display/counter cable not connected or faulty	Check cable connections Replace cable
SYSTEM MESSAGE: CRX-CABLE FAILURE! (X is counter receiver #)	Counter cable not connected or faulty	Check cable connections Replace cable
SYSTEM MESSAGE: UI IS MISSING	UI is missing	Update UI
SYSTEM MESSAGE: INVALID UI VERSION	UI version is incompatible	Update UI version
INCOMPATIBLE SW VERSIONS!	MCCU and MDPU versions are incompatible	Update MCCU or MDPU to correct version

ERROR NUMBERS

In the following are explained error numbers that are shown on the Display Unit as
 “SYSTEM MESSAGE: ERROR CODE XXX”

Code	Error	Possible cause
128	Not in use	
129	Not in use	
130	Not in use	
131	Not in use	
132	Not in use	
133	Not in use	
134	Not in use	
135	Not in use	
136	Not in use	
137	Not in use	
138	Not in use	
139	Not in use	
140	Not in use	
141	Not in use	
142	Not in use	
143	Not in use	
144	Data packet checksum	RS232 communication error in MCCU
145	Invalid USART command	RS232 communication error in MCCU
146	Unexpected error during saving the packet	MRCU failed to save data to EEPROM
147	Unexpected error during loading the packet	MRCU failed to load data from EEPROM
148	There is not enough memory in the EEPROM	MRCU error trying to save multiple pages
149	EEPROM is totally full	MRCU error
150	Error during page write	There was errors while writing to internal memory
151	Error during page read	There was errors while reading from internal memory
152	Tried to save data with illegal ID (0xFF)	MRCU error
153	Error in writing FAT entry	MRCU error
154	Error in writing Info-page	MRCU error
155	Error during packet write	MRCU error
156	Error during packet read	MRCU error
157	Wanted ID-type of data was not found from the EEPROM	MRCU error
158	Data with wanted index was not found from the EEPROM	MRCU error
159	Can not load the packet, because EEPROM is empty	MRCU error
160	FAT-page loading failed	MRCU error
161	Raw Read/Write-operation is pointed to invalid EEPROM	MDPU or MRCU error
162	Raw Read/Write-operation is pointed to illegal page	MRCU error
163	Info-page loading failed	MRCU error
164	Page checksum error	Checksum error within memory page

165	LCD-timeout, no response	MDPU alphanumeric display failure
166	Invalid parameter value	Zone number
167	Invalid parameter value	Program number
168	Invalid parameter value	Sensitivity setting
169	Invalid parameter value	Frequency number
170	Invalid parameter value	HP –filter setting
171	Invalid parameter value	LP -filter setting
172	Invalid parameter value	Alarm delay setting
173	Invalid parameter value	Count direction setting
174	Invalid parameter value	Decrement mode setting
175	Invalid parameter value	Volume setting
176	Invalid parameter value	Volume min. setting
177	Invalid parameter value	Tone number
178	Invalid parameter ID	No such parameter number
179	MDPU job overflow	There was overflow in the MDPU job queue
180	Invalid parameter value	Display Mode
181	Invalid parameter value	Zone on/off
182	Invalid parameter value	Traffic light on/off
183	Invalid parameter value	Red on delay
184	Invalid parameter value	Zone on delay
185	No reply from Metor	No reply from Metor (MetorNet)
186	MRCU EEPROM init	MRCU EEPROM initialiazed
187	MDPU EEPROM cleared	MDPU has cleared EEPROM
188	Parameter index illegal	Parameter index was not recognized
189	NVRAM address illegal	Non-volatile memory address was illegal
190	MCCU job overflow	There was overflow in the MCCU job queue
191	Error I/O failed	Production test: I/O-test failed. Requires loopback connector to I/O.
192	MetorNet port failed	Production test: MetorNet port has failed. Requires loopback connector to MetorNet port.
193	NVRAM test failed	Non-volatile RAM failed (RTC chip)
194	Not in use	
195	Not in use	
196	Alive query not responded	MDPU didn't response to MCCU alive queries within 5 seconds
197	MetorNet address illegal value	Illegal value for parameter
198	MetorNet read only illegal value	Illegal value for parameter
199	Invalid parameter value	Tamper
200	Invalid parameter value	Login type (alpha, numeric)
201	Invalid parameter value	Random rate
202	Invalid parameter value	Random tone
203	Invalid parameter value	Random volume
204	Invalid parameter value	Random display
205	Invalid parameter value	Key Volume
206	Invalid parameter value	Power indication
207	Invalid parameter value	Standby mode
208	MCCU is in standby mode	Operation can not be executed because MCCU is in standby mode
209	Not in use	
210	Invalid parameter value	Frequency search
211	Invalid parameter value	Parameter guard

212	Invalid parameter value	Power Guard
213	Invalid parameter value	MetorNet Read-only
214	Invalid parameter value	Fast data mode
215	MetorNet READ-ONLY	Mode was set ON and MetorNet was tried to use to adjust parameter
216	Invalid parameter value	Fast data mode
217	Invalid parameter value	Keypad disable
218	Not in use	
219	Invalid parameter value	Ready state violation
220	SD card operation failed	Currently executed operation for the SD card failed
221	Invalid parameter value	I/O
222	MFS initialization failed	Metor file system could not be initialized properly
223	Not in use	
224	Not in use	
225	Invalid parameter value	Random alarms for alarming passengers

3 REVISION HISTORY

Rev. 3, 2011-05-06 / TIA

- Correction to 'ACCESS CODES INIT.' Cause.
- Added battery empty cause to 'MCCU Vcc TOO LOW'.
- Removed error codes 140 to 143.
- Added error codes 222 to 225.
- ECN 03713.

Rev. 2, 12.11.2009 / TIA

- Added error messages for incompatible or missing software versions.

Rev. 1, 12.11.2009 / TIA&TV

- Modified from Metor 300 Portable document.