

Metor 300 Portable
MAINTENANCE MANUAL

9100777 REV. 02

Rapiscan[®]
s y s t e m s

An OSI Systems Company

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Approved	Date 15.01.2009	Document
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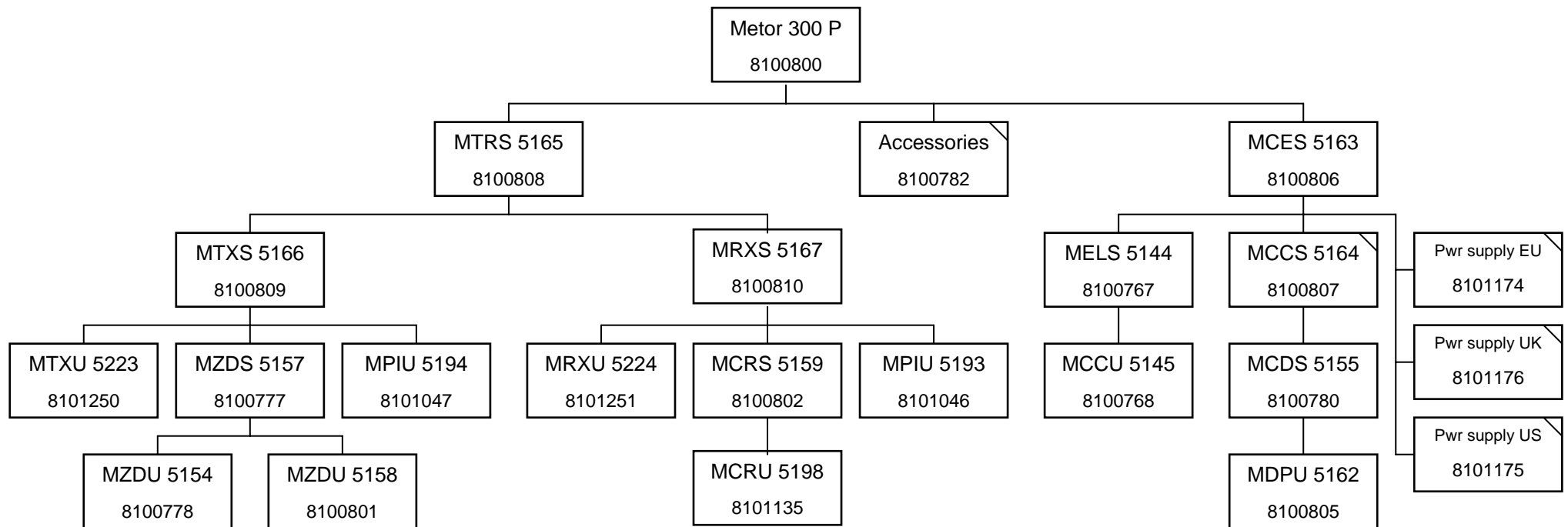
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Metor 300 Portable

Author T. Virtanen	Rev. 06	Code 9100532
Approved	Date 17.12.2008	Document
Product Metor 300 Portable		Archives
Title PRODUCT STRUCTURE Metor 300 Portable		



Depends on customer



SINGLE LEVEL

Last.revision: 02

Revision updated: 23.09.2008

Version: PLANNING

Accept:

8100800 4OE METOR 300 P 55

1,000 KPL

02

L. Line	Item	Dty	Description	Qty	U/M	Feat.	Rev
1	10	8100806 4OE	MCES 5163 M300 P CROSS PIECE AND ELECTRONICS SET	1,000	KPL		03
1	20	8100808 4OE	MTRS 5165 M300 P TX/RX COIL PANEL SET	1,000	KPL		01
1	200	8100782 4OE	ACCESSORIES M300 P	1,000	KPL		01

Related Drawings

9000	9100532 3QE	PRODUCT STRUCTURE METOR 300 P 55	0,000	KPL		05
9001	9100772 4QE	ORDER AND SHIPPING STRUCTURE METOR 300 P	0,000	KPL		1.10
9002	9100792 4VE	OPERATIONAL DESCRIPTION METOR 300 P	0,000	KPL		1.00
9003	9100794 1JE	WIRING DIAGRAM METOR 300 P	0,000	KPL		02
9004	9100669 4QE	DOCUMENT LIST M300 P 55	0,000	KPL		

Author M. Loikkanen	Rev. 1.00	Code 9100 792-4VE
Approved	Date 27.3.2008	Document
Product Metor 300 P		Archives Metor 300 P
Title OPERATIONAL DESCRIPTION METOR 300 P		

METAL DETECTOR GATE, METOR 300 PORTABLE

1 GENERAL

Metor 300 Portable metal detector is designed to give an alarm when a metal object larger than allowed by calibration is taken through the gate. Due to multiple vertical zones the detector discriminates weapons from several small innocuous objects and indicates the height where the weapon is taken through the gate.

The Metor 300 Portable metal detector gate consists of the following main modules:

- Crosspiece, MCCA 5164
- Receiver coil panel, MRXS 5167
- Transmitter coil panel, MTXS 5166
- Electronics set, MELS 5144
- Display set, MCDS 5155

In the following is a description how to service the M300 Portable main modules. Separate documents describe more in-depth the functions of these modules.

2 TECHNICAL DATA

2.1 Power Supply

Mains voltage, nominal:	100 – 240VAC
Mains voltage, max:	90 – 264VAC
Mains frequency:	50 / 60Hz
Battery voltage (optional):	12VDC

2.2 Operating Conditions

Ambient temperature:	-10...55°C
Storage temperature:	-20...55°C
Humidity:	0 – 95%, no condensation
Protection class:	IP55

2.3 Power Consumption

This is the power consumption of the complete metal detector including the Display Unit, two Zone Displays and Traffic Light.

State	DC +13.2V	AC (line)
Standby (transmitters off)	9W	18W
Normal (transmitters on, no alarm)	31W	45W
Startup (all lights on)	49W	68W

3 CROSSPIECE

The crosspiece consists of:

- Frame, made of extruded aluminum profile
- Lid
- Front plates for Traffic Light and Display Unit. The front plate for the Display Unit includes a membrane keyboard.

The crosspiece is symmetrical and can be installed either way.

4 ELECTRONICS

The MELS is the main electronics unit in M300 Portable. It includes a single printed circuit board.

4.1 Replacing the MELS

- Disconnect all cables from the MELS.
- Loosen, do not remove, the two screws at the TX end of the MELS.
- Support the MELS and remove the other two screws at the opposite end.
- Withdraw the MELS from the crosspiece.

5 DISPLAY UNIT

The Display Unit has an alphanumeric display for user interface, Red (alarm), yellow (wait) and green (ready) lamps and a buzzer for alarm sound. Also, a keyboard located on the front plate is connected to the Display Unit. The unit is mounted inside the crosspiece by six M4 screws.

6 COIL PANELS

The Receiver coil panel and Transmitter coil panel are externally identical except that the transmitter side has a serial port connector next to the power input. RX and TX stickers are placed on the panels to better distinguish between them.

Two Zone Displays are mounted on the transmitter panel. The Zone Displays include traffic counter transmitters. Traffic counter receivers are located on the receiver panel.

6.1 Replacing the Zone Display

To Replace the Zone Display follow the procedure described in the Installation and Operating Manual.

6.2 Replacing the MTXU or MRXU

- Disconnect the coil cable from inside the crosspiece.
- Separate the coil panel from the crosspiece.
- Remove the four screws around the coil cable connector (Centronics).

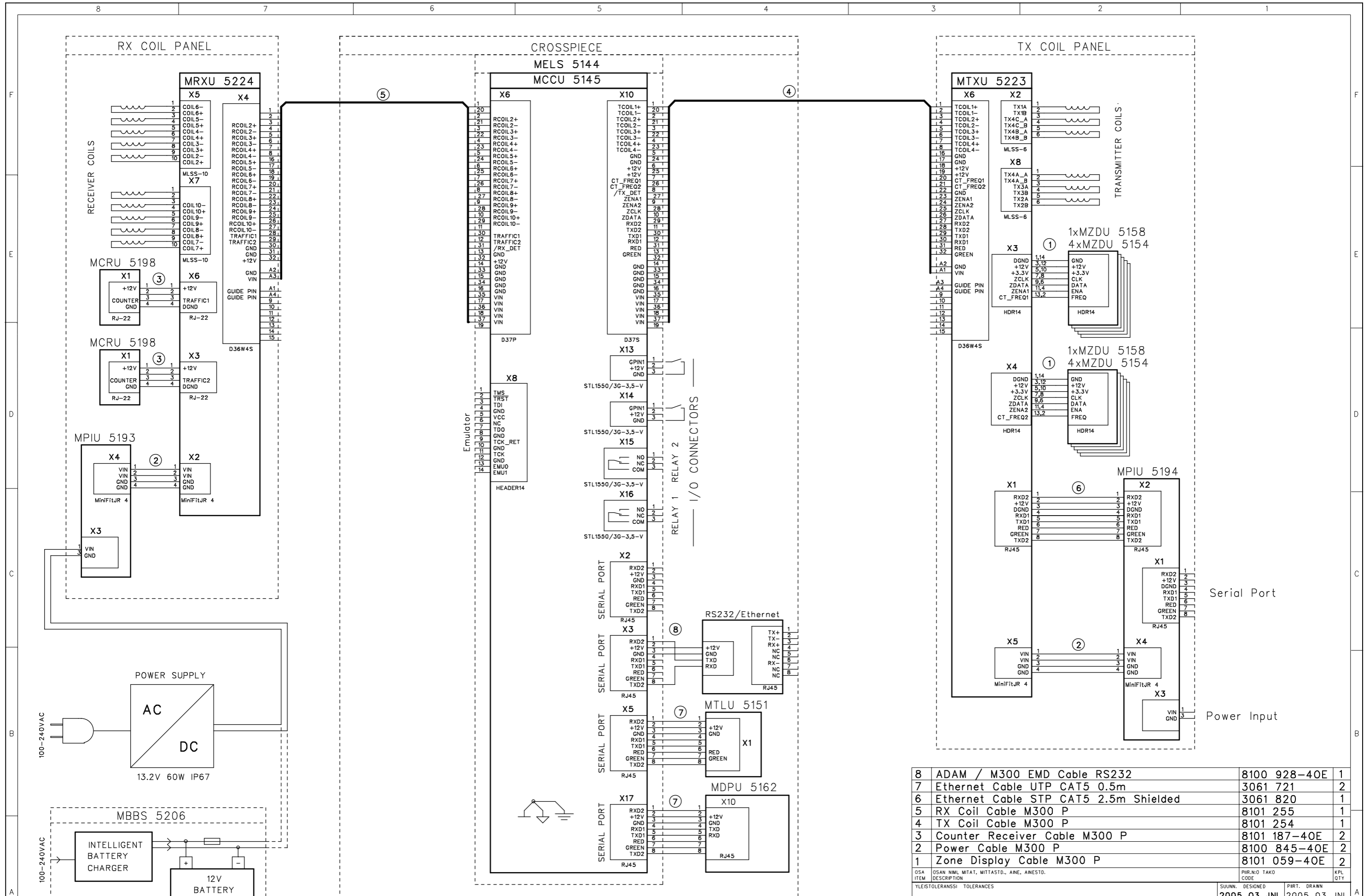
- Remove the top cover of the coil panel.
- Disconnect all cables.
- Remove the four panhead screws holding the PCB in place.
- Slide the PCB out from the coil cable connector opening.
- Installation is reverse to removing

6.3 Testing Coils

Nominal coil resistances of the RX and TX coils are listed in the following. When measuring the resistance disconnect the cable from the PCB.

TX	TX1	TX2	TX3	TX4a	TX4b	TX4c
Pins	X2: 1-2	X8: 5-6	X8: 3-4	X8: 1-2	X2: 5-6	X2: 3-4
R(ohm)	7.5	5.4	4.7	2.1	0.4	2.5

RX	RX2	RX3	RX4	RX5	RX6	RX7
Pins	X5: 9-10	X5: 7-8	X5: 5-6	X5: 3-4	X5: 1-2	X7: 9-10
R(ohm)	5.4	4.7	2.1	2.5	2.8	3.5
	RX8	RX9	RX10			
Pins	X7: 7-8	X7: 5-6	X7: 3-4			
R(ohm)	3.6	3.6	3.0			



8	ADAM / M300 EMD Cable RS232	8100 928-40E	1
7	Ethernet Cable UTP CAT5 0.5m	3061 721	2
6	Ethernet Cable STP CAT5 2.5m Shielded	3061 820	1
5	RX Coil Cable M300 P	8101 255	1
4	TX Coil Cable M300 P	8101 254	1
3	Counter Receiver Cable M300 P	8101 187-40E	2
2	Power Cable M300 P	8100 845-40E	2
1	Zone Display Cable M300 P	8101 059-40E	2

OSÄ ITEM	OSAN NML MITAT, MITTASTO., ANE, ANESTO.	PIIR.NÖ TAKO CODE	KPL QTY
YLEISTOLERANSSI	TOLERANCES	SUUNN. DESIGNED	PIIRT. DRAWN
		2005 03 JNI	2005 03 JNI
		TARK. CHECKED	HYV. APPROVED
		x	x
		TUOTE PRODUCT	
		Metor 300 Portable	
		OSAL.NÖ PART LIST	REV. 03
		PIIR.NÖ CODE	9100 794

03	Centronics replaced by Combo D-connectors	2008 11	JNI
02	Minor corrections. Label on MZDU: +5V -> +3.3V.	2008 04	MTL
REV.	MUUTOKSET REVISIONS	PVM DATE	PIIRT. DRAWN HYV. APPR.



MCES 5163 Cross Piece and Electronics Set

Last.revision: 04

Revision updated: 12.11.2008

Version: PLANNING

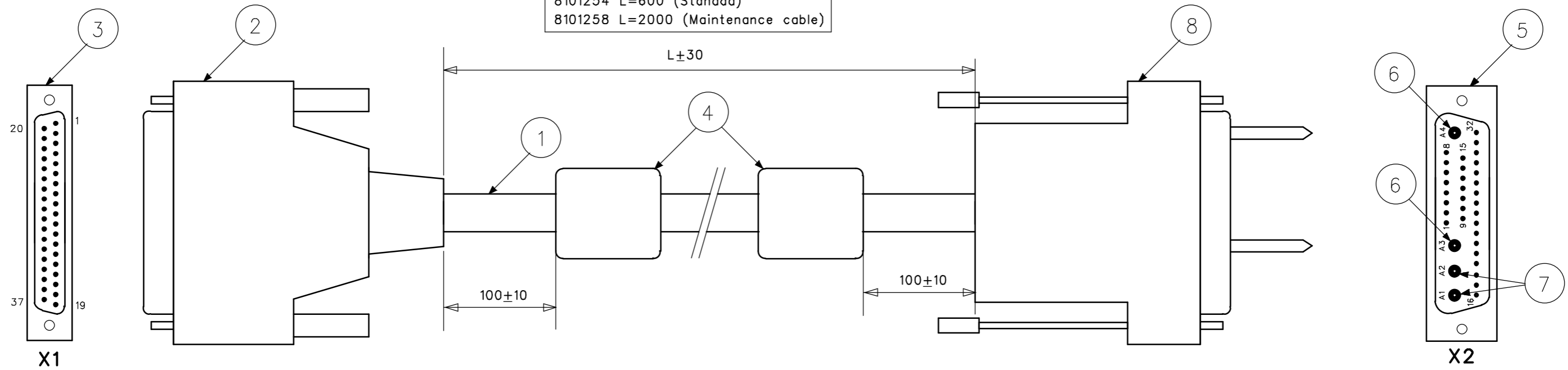
Accept:

L. Line	Item	Dty	Description	Qty	U/M	Feat.
	8100806		MCES 5163 M300 P CROSS PIECE AND ELECTRONICS SET	1,000	KPL	
1	10	8100767	4OE MELS 5144 M300 P ELECTRONICS SET	1,000	KPL	
1	20	8100807	4OE MCSS 5164 M300 P CROSS PIECE SET	1,000	KPL	
1	40	8100780	4OE MCDS 5155 M300 P CONTROL AND DISPLAY SET	1,000	KPL	
1	50	8101174	4OE POWER SUPPLY M300 P EURO PLUG 100-240VAC / 13.2VDC 4.5A IP67	1,000	kpl	F1
1	60	8101175	4OE POWER SUPPLY M300 P USA PLUG 100-240VAC / 13.2VDC 4.5A IP67	1,000	kpl	F1
1	70	8101176	4OE POWER SUPPLY M300 P UK PLUG 100-240VAC / 13.2VDC 4.5A IP67	1,000	kpl	F1
1	80	8101254	TX COIL CABLE M300 P	1,000	KPL	
1	90	8101255	RX COIL CABLE M300 P	1,000	KPL	
1	200	9100622	4VE INSTALLATION AND OPERATING MANUAL M300 P	1,000	KPL	

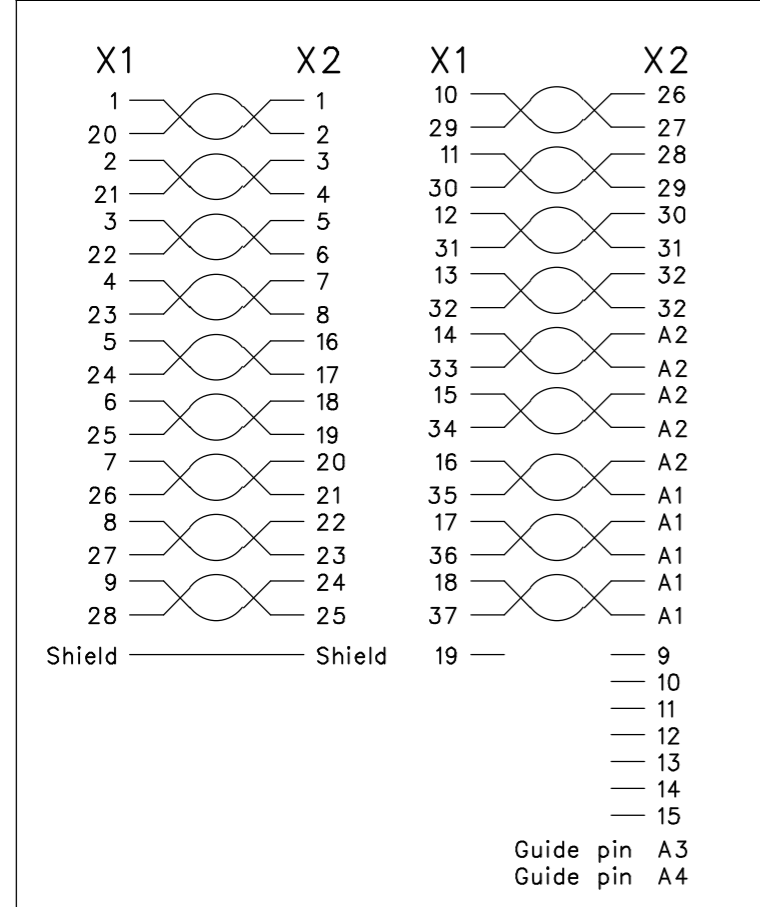
Related Installation components

8000	3061818		HAND SCREW M10x100 TN62	4,000	KPL	
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8101254 L=600 (Standad)
8101258 L=2000 (Maintenance cable)



Pin Assignment



Note 1) Code 3061886 Conn D36W4P Conec 13-501471 includes items 5,6 and 7 assembled

8	Hood, Conec 165X03349A	3061894	1
7	Power pin, Conec 131C10029X	Note 1)	2
6	Guide pin, Conec 160X11279X	Note 1)	2
5	D36W4P Conec 3036W4PCM99A10X	Note 1)	1
4	FERRITE WURTH 742 712 22	3061895	1
3	D37P Conec 163B11099X	3061890	1
2	Hood, MH-Connectors MHDTPPK37	3061525	1
1	CABLE LIYCY-TP 18x2x0.14mm2 + SHIELD	3061896	

OSÄ ITEM	OSAN NML MITÄT, MITTÄSTÖ, ÄNE, ANESTÖ.	PIIRINÖ TAKO CODE	KPL QTY
YLEISTOLERANSSI TOLERANCES		SUUNN. DESIGNED	PIIRT. DRAWN
		2008 11 JNI	2008 11 JNI
		TARK. CHECKED	HYV. APPROVED
		x	x
		TUOTE PRODUCT	
		Metor 300 P	
		OSALINÖ PART LIST	REV. 01
		PIIRINÖ CODE	
		8101254	



TX Coil Cable M300 P

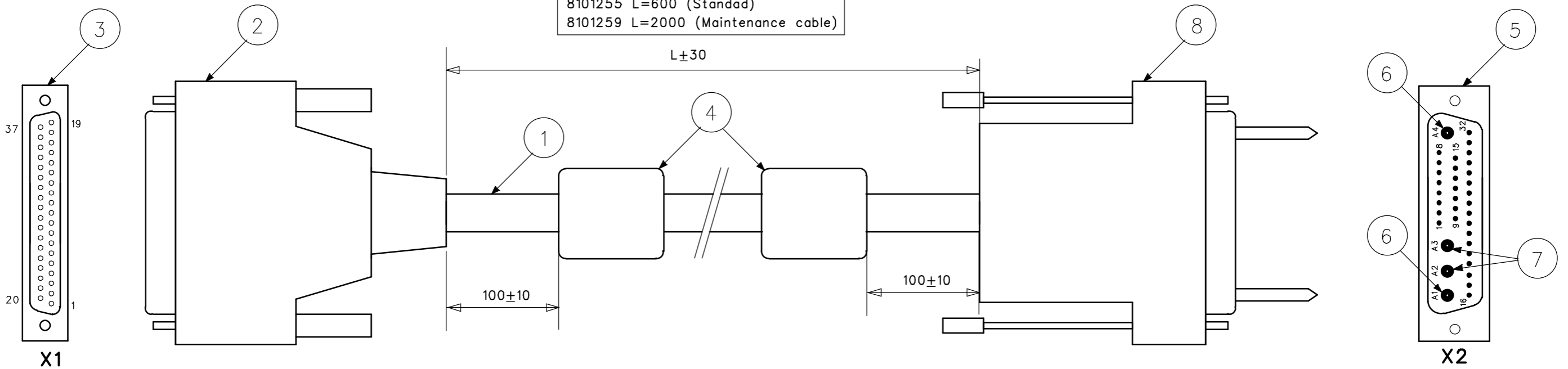
REV.	MUUTOKSET REVISIONS	PVM DATE	PIIRT. DRAWN	HYV. APPR.

8101255 L=600 (Standad)
8101259 L=2000 (Maintenance cable)

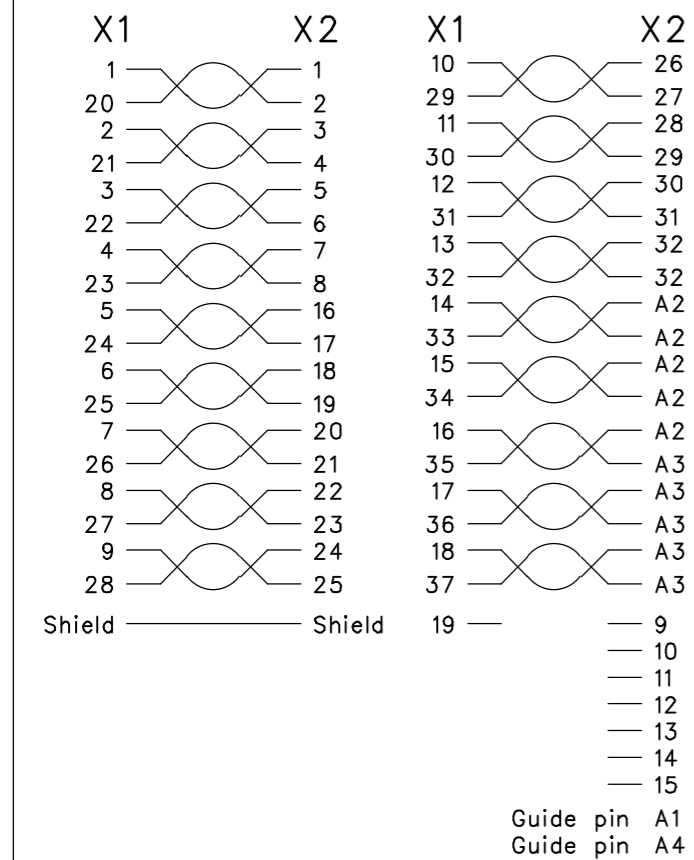
L±30

100±10

100±10



Pin Assignment



Note 1) Code 3061887 Conn D36W4P Conec 13-501461 includes items 5,6 and 7 assembled

OSA ITEM	DESCRIPTION	PIR.NO TAKO CODE	KPL QTY
8	Hood, Conec 165X03349A	3061894	1
7	Power pin, Conec 131C10029X	Note 1)	2
6	Guide pin, Conec 160X11279X	Note 1)	2
5	D36W4P Conec 3036W4PCM99A10X	Note 1)	1
4	FERRITE WURTH 742 712 22	3061895	2
3	D37S Conec 164B10049X	3061890	1
2	Hood, MH-Connectors MHDTPPK37	3061525	1
1	CABLE LIYCY-TP 18x2x0.14mm2 + SHIELD	3061896	

SUUNN. DESIGNED 2008 11 JNI		PIRT. DRAWN 2008 11 JNI	
LITTYN NEXT ASSY Metor 300 P		TARK. CHECKED x	
TUOTE PRODUCT Metor 300 P		HYV. APPROVED x	
OSALNO PART LIST		REV. 01	
PIR.NO CODE 8101255			

Rapiscan systems
RX Coil Cable M300 P

REV.	MUUTOKSET REVISIONS	PVM DATE	PIRT. DRAWN	HYV. APPR.

MELS 5144 Electronics Set

SINGLE LEVEL

Last.revision: 03

Revision updated: 22.5.2008

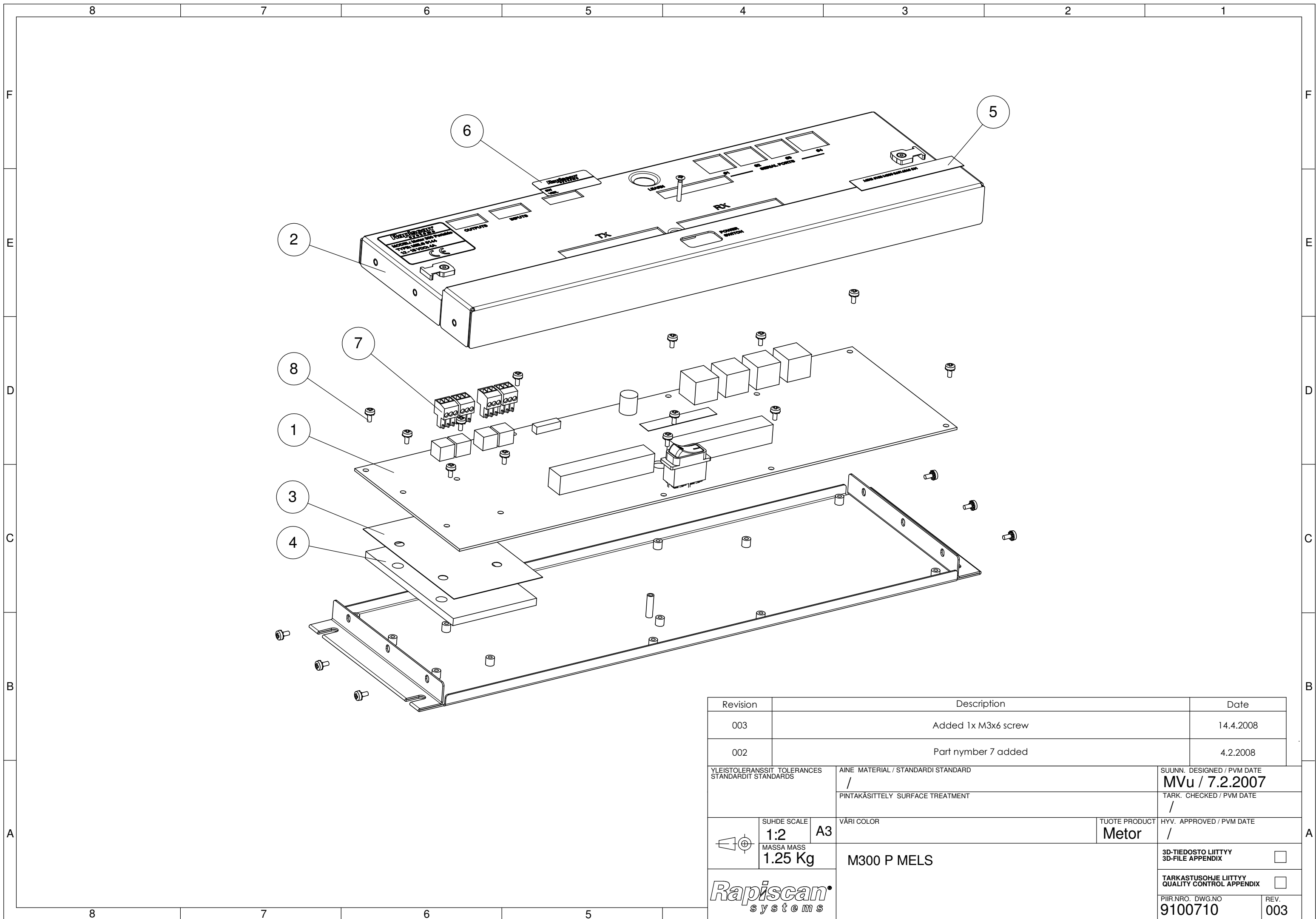
Version: PLANNING

Accept:

L. Line	Item	Dty	Description	Qty	U/M	Feat.	Rev
	8100767	4OE	MELS 5144 M300 P ELECTRONICS SET	1,000	KPL		03
1	10	8100768	4OE MCCU 5145 M300 P CONTROL AND COMMUNICATION UNIT *1	1,000	KPL		09
1	20	8101057	4OE ELECTRONICS BOX M300 P *2	1,000	KPL		01
1	30	8101060	4ME GAP PAD M300 P *3	1,000	kpl		001
1	40	8100860	4ME ELECTRONICS COOLING PLATE M300 P *4	1,000	KPL		002
1	50	8100631	4PE S/N LABEL BASE 14x76 *5	1,000	KPL		A
1	60	8101044	4PE SW STICKER 20x40 *6	1,000	KPL		01
1	70	3060549	CONNECTOR AK1550/3-3,5-B-GREEN PRINTING N:o 1-3 or MC1.5/3-ST-3.5 1840379 PHOENIX *7	4,000	KPL		
1	100	3061740	PAN HEAD SCREW M3x6 A2 WITH STAR WASHER DIN6900-4 *8	13,000	KPL		

Related Drawings

9000	9100710	3KE	ELECTRONICS SET MELS 5144 M300 P	0,000	KPL		003
9001	9100675	4VE	OPERATIONAL DESCRIPTION MELS 5144 M300 P	0,000	KPL		1.00
9002	9100676	4XE	TEST SPESIFICATION MELS 5144 M300 P	0,000	KPL		1.40
9003	9100789	4XE	INCOME INSPECTION MELS/MDPU/MRCS M300 P	0,000	KPL		1.00



Revision	Description		Date
003	Added 1x M3x6 screw		14.4.2008
002	Part number 7 added		4.2.2008
YLEISTOLERANSSIT / TOLERANCES STANDARDIT / STANDARDS		AINE MATERIAL / STANDARDI STANDARD / PINTAKÄSITTELY / SURFACE TREATMENT	SUUNN. DESIGNED / PVM DATE MVu / 7.2.2007 TARK. CHECKED / PVM DATE /
SUHDE SCALE 1:2 MASSA MASS 1.25 Kg		VÄRI COLOR M300 P MELS	TUOTE PRODUCT Metor HYV. APPROVED / PVM DATE /
		<input type="checkbox"/> 3D-TIEDOSTO LIITTYY 3D-FILE APPENDIX	
		<input type="checkbox"/> TARKASTUSOHJE LIITTYY QUALITY CONTROL APPENDIX	
		PIIR.NRO. DWG.NO 9100710	REV. 003

Author M. Loikkanen	Rev. 1.00	Code 9100 675-4VE
Approved	Date 26.3.2008	Document
Product M 300 P		Archives M 300 P
Title OPERATIONAL DESCRIPTION MELS 5144		

ELECTRONICS SET, MELS 5144

1 GENERAL

The only module in the electronics set is the Control and Communication Unit (MCCU 5145).

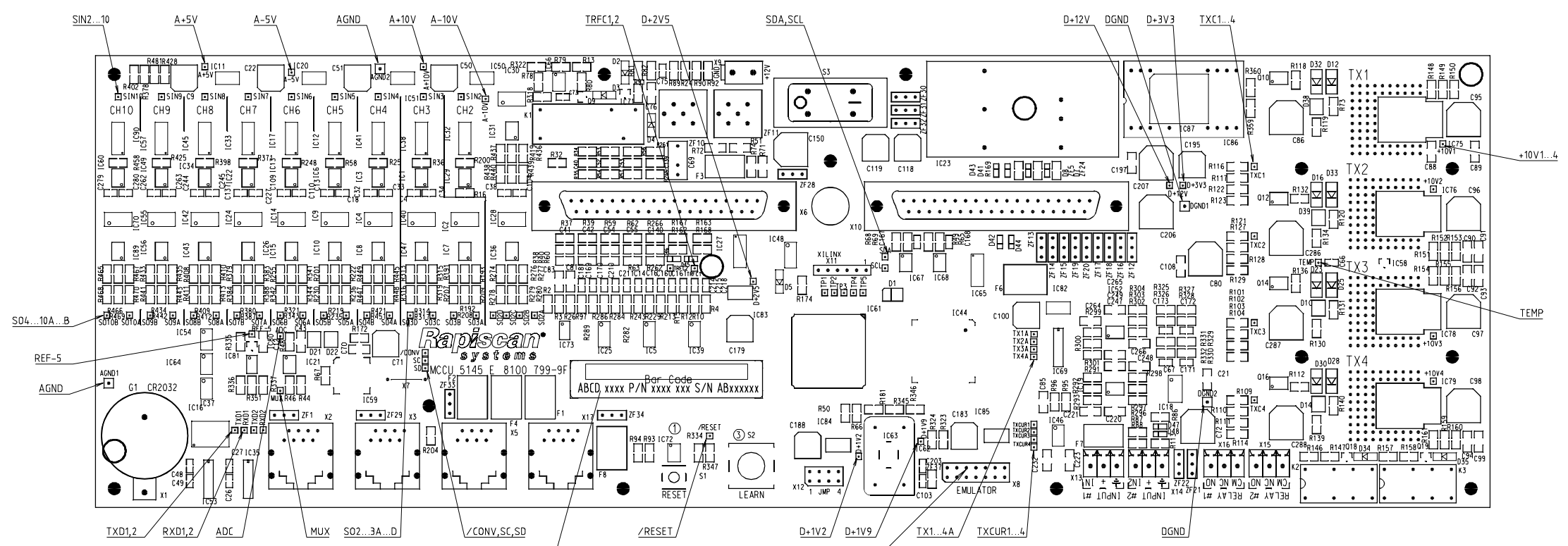
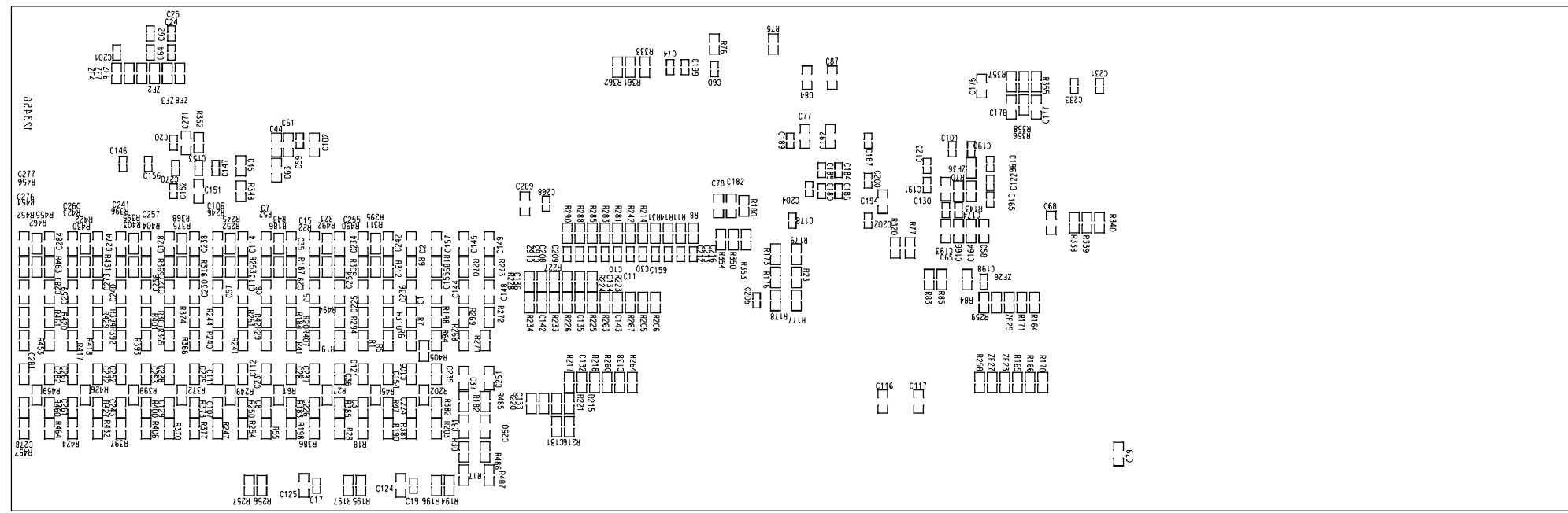
2 DISASSEMBLY

- Disconnect all cables from the MELS and remove it from the crosspiece.
- Remove the M3 panhead (PZ1) screws on the sides and one on top that hold the MELS cover in place and remove the cover.
- Remove the 13 panhead screws (PZ1, M3x8) holding the MCCU in place.
- Withdraw the MCCU from the MELS
- Remove the aluminum plate from the bottom of the MCCU.

3 OPERATIONAL DESCRIPTION

The MCCU is the main electronics board. It contains the main processor, signal detectors and transmitters. All the external units i.e. coil cables, Display Unit, Traffic Lights, Remote Display and MeteorNet (with RS232 -> Ethernet converter) are connected to the MCCU. For more in-depth description, see the MCCU 5145 Operational Description.

MCCU 5145 Control and Communication Unit



2 CUT PIN 6

REV.	MUUTOKSET REVISIONS	PVM DATE	PIIRT. DRAWN	HYV. APPR.

OSA ITEM DESCRIPTION	OSAN NIMI, MITAT, MITTASTD., AINE, AINESTD.	PIIR.N:O TAKO CODE	KPL QTY
YLEISTOLERANSSI TOLERANCES		SUUNN. DESIGNED 2007 12 MTL	PIIRT. DRAWN 2007 12 IJ
		TARK. CHECKED	HYV. APPROVED
SUHDE SCALE 1:1		LIIITYY NEXT ASSY MELS 5144	
		MCCU 5145 Control and Communication unit	
TUOTE PRODUCT Metor 300 P		REV. 03	
OSAL.N:O PART LIST 8100 768-40		PIIR.N:O CODE 9100 677-2KE	

Author M. Loikkanen	Rev. 1.00	Code 9100 682-4VE
Approved	Date 26.3.2008	Document
Product M 300 P		Archives M 300 P
Title OPERATIONAL DESCRIPTION MCCU 5145		

CONTROL AND COMMUNICATIONS UNIT, MCCU 5145

1 GENERAL

The main components located on the MCCU are: a Digital Signal Processor, a 16-bit serial A/D converter, four 8-channel analog multiplexers, a real time clock (RTC), 32 Kbytes serial EEPROM, a Field Programmable Gate Array (FPGA), eleven signal detector channels, four transmitters, two relay outputs, two digital inputs and four serial ports. All the external units i.e. coil cables, display unit, remote display etc. are connected to the MCCU.

2 OPERATIONAL DESCRIPTION

2.1 Signal Chain

Signal from receiver channel is first amplified by an instrumentation amplifier (INA163). Then an analog switch (ADG1334) is used to reject other transmitter frequencies and to split the signal to real and imaginary components. Next the DC offset is nulled with filtered PWM signals from the FPGA.

Metal signals from detector channels are demultiplexed and then fed to an A/D converter. The FPGA reads conversion results from the A/D converter and removes noise by digital filtering. Finally the processor reads data from the FPGA and calculates the amount of metal.

2.2 Power Supplies

The M300 Portable is powered by an external 12V (13.2V to be exact) power supply. The MCCU has four separate linear low drop regulators, one for each transmitter channel, to regulate the transmitter voltages (9.4V). $\pm 5V$ and $\pm 10V$ for the analog circuitry are created by a DC/DC converter and regulators. Digital 3.3V power is generated by a DC/DC converter. 1.2V, 1.9V and 2.5V for the digital parts are regulated from the 3.3V supply. Analog 3.3V for the DSP is regulated from the 12V supply.

An external battery back-up can be used instead of the 12V power supply. To prevent deep discharge of the battery, logic on the MCCU cuts the power feed when the voltage drops below 9.8V. Power is switched back on when the voltage rises above 11.5V. At 15.5V power is switched off again.

The 12V power supply is connected to MRXU, MTXU and serial ports via resettable fuses located next to each connector on the MCCU.

2.3 Real Time Clock

The MCCU is equipped with a Real Time Clock circuit. This circuit is powered from a lithium battery (CR2032) when power is turned off the gate. Lifetime of the battery is over ten years and is limited by its self-discharge current.

*CAUTION:
RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.*

2.4 EEPROM

There are two 16kByte serial EEPROMs on the MCCU that are connected via I2C bus to the microcontroller. These memories are used to store all the adjustable parameters.

2.5 Reset

A reset circuit monitors the 3.3V power line and resets the microcontroller and the FPGA when the 3.3V line drops below 2.93V.

2.6 Oscillator

A 30MHz clock oscillator is connected to the DSP and the FPGA. The DSP contains a PLL that multiplies its internal clock by five to 150MHz.

2.7 Serial Ports

There are four RJ45 serial ports on the MCCU for Display Unit, Remote Display, Traffic Light and MeteorNet. All connectors share the same signals and pinout. The serial port signals are buffered by two ESD tolerant buffer ICs.

2.8 Self Diagnosis

The self-diagnostic circuitry has the following features:

- Built in A/D converter in the DSP is used to monitor all supply voltages.
- Signals /RX_DET and /TX_DET have pull-up's and are grounded at the MRXU and MTXU boards, respectively. These signals are used to verify that the RX and TX cables are connected.
- Transmitter currents are measured and monitored by software.
- A temperature sensor is used to monitor the MCCU temperature. Sensor output is 500mV+10mV per degrees Celsius.
- The /FPGA_OK signal goes LOW when the FPGA is configured properly. This signal controls the red LED on the MCCU.

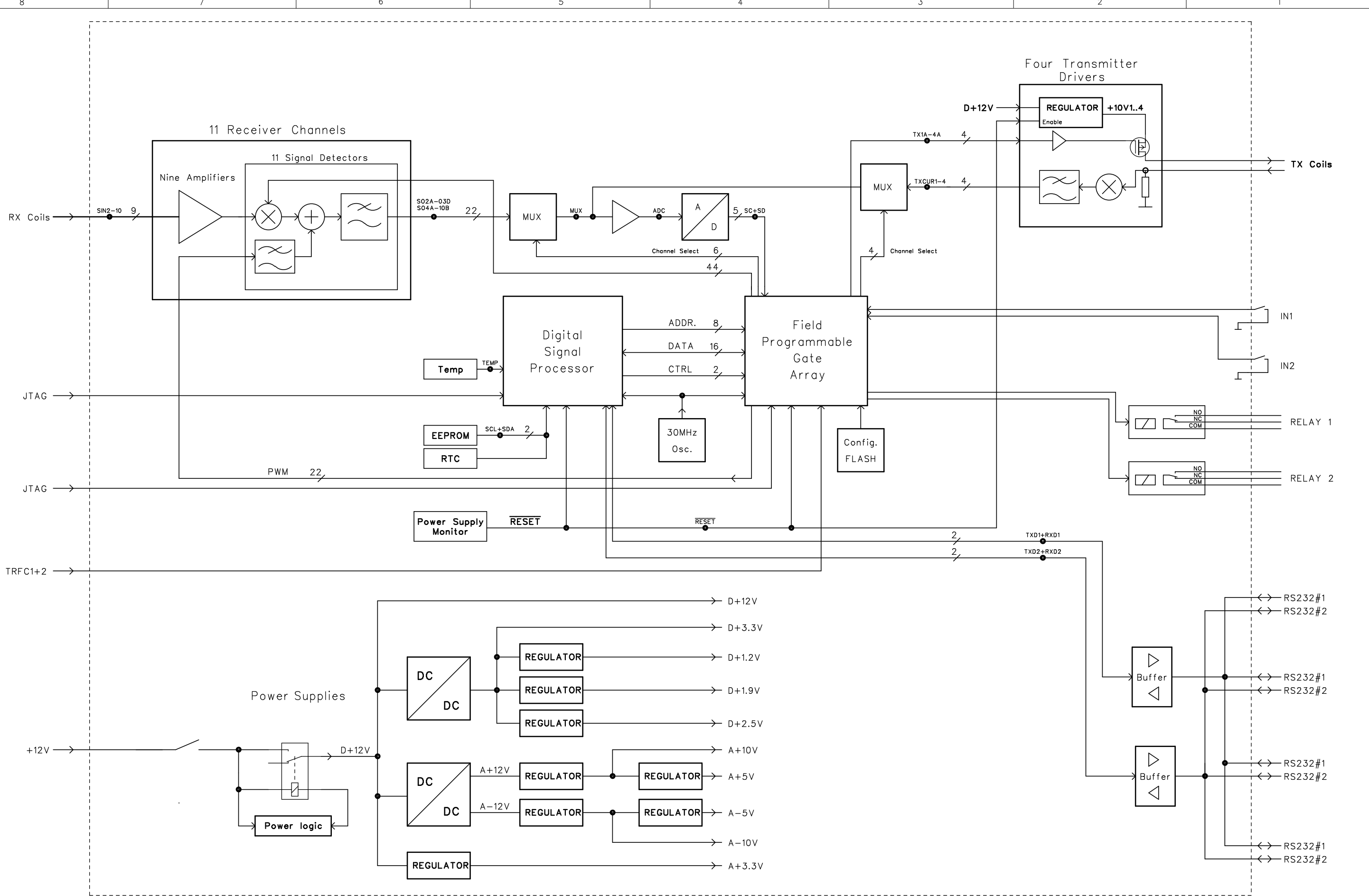
3 TEST POINT SIGNALS

DC voltages at relevant testpoints are listed in the following table:

Testpoint	Low limit	Nominal Voltage	High Limit
TEMP		500mV+10mV/°C	
Ref-5V	-5.1V	-5.0V	-4.9V
D+3.3V	3.14V	3.3V	3.45V
D+2.5V	2.375V	2.5V	2.625V
D+1.9V	1.81V	1.9V	2.0V
D+1.2V	1.14V	1.2V	1.26V
D+12V	12.0V 9.8V (on battery)	12.8V	13.5V 15.0V (on battery)
A+5V	4.5V	5.0V	5.5V
A-5V	-5.5V	-5.0V	-4.5V
A+10V	9.5V	10.0V	10.5V
A-10V	-10.5V	-10.0V	-9.5V
+10V1...4	9.2V	9.4V	9.6V

Testpoints used for diagnostics are listed in the following table:

Testpoint	Description
TXD1	Transmit data to Display and Remote Display Unit
RXD1	Receive data from Display Unit
TXD2	Transmit data to MetorNet
RXD2	Receive data from MetorNet
MUX	All signal detector channels multiplexed, ±5V span
ADC	All signal detector channels multiplexed, ±2.5V span
SCL	I2C clock to real time clock and EEPROM memory
SDA	I2C data to real time clock and EEPROM memory
SD	A/D –converter data
SC	A/D –converter clock
SIN2...10	Amplified signal from receiver coil 2...10
SO2A...10A, SO2C...3C	RX signal detector channel output, in phase signal
SO2B...10B, SO2D...3D	RX signal detector channel output, out of phase signal
TX1...4	Transmitter driver control
TXC1...4	TX current AC. $I = TXC (V) / 0.25$
TXCUR1...4	TX current DC. Output of signal detector. Switches between in phase and out of phase signals.
TRFC1	Traffic counter 1, no pulse on walkthrough
TRFC2	Traffic counter 2, no pulse on walkthrough
/RESET	Low resets the DSP and the FPGA



REV.	MUUTOKSET	REVISIONS	PVM DATE	PIRT. DRAWN	HYV. APPR.

OSA ITEM	OSAN NIMI, MITAT, MITASTD., AINE, AINESTD.	PIRT. NO TAKO CODE	KPL QTY
YLEISTOLERANSSI TOLERANCES		SUUNN. DESIGNED	PIRT. DRAWN
SUHDE SCALE		2008 03 MTL	2008 03 MTL
LIITYY NEXT ASSY		TARK. CHECKED	HYV. APPROVED
MCCU 5145		TUOTE PRODUCT	
MCCU 5145		Metor 300 P	
Rapiscan systems		OSAL. NO PART LIST	REV.
Block diagram		8100 768-40E	01
page 1/1		PIRT. NO CODE	9100 679-3LE

100679-3LE_01.sch-1 - Med Mar 26 15:14:51 2008

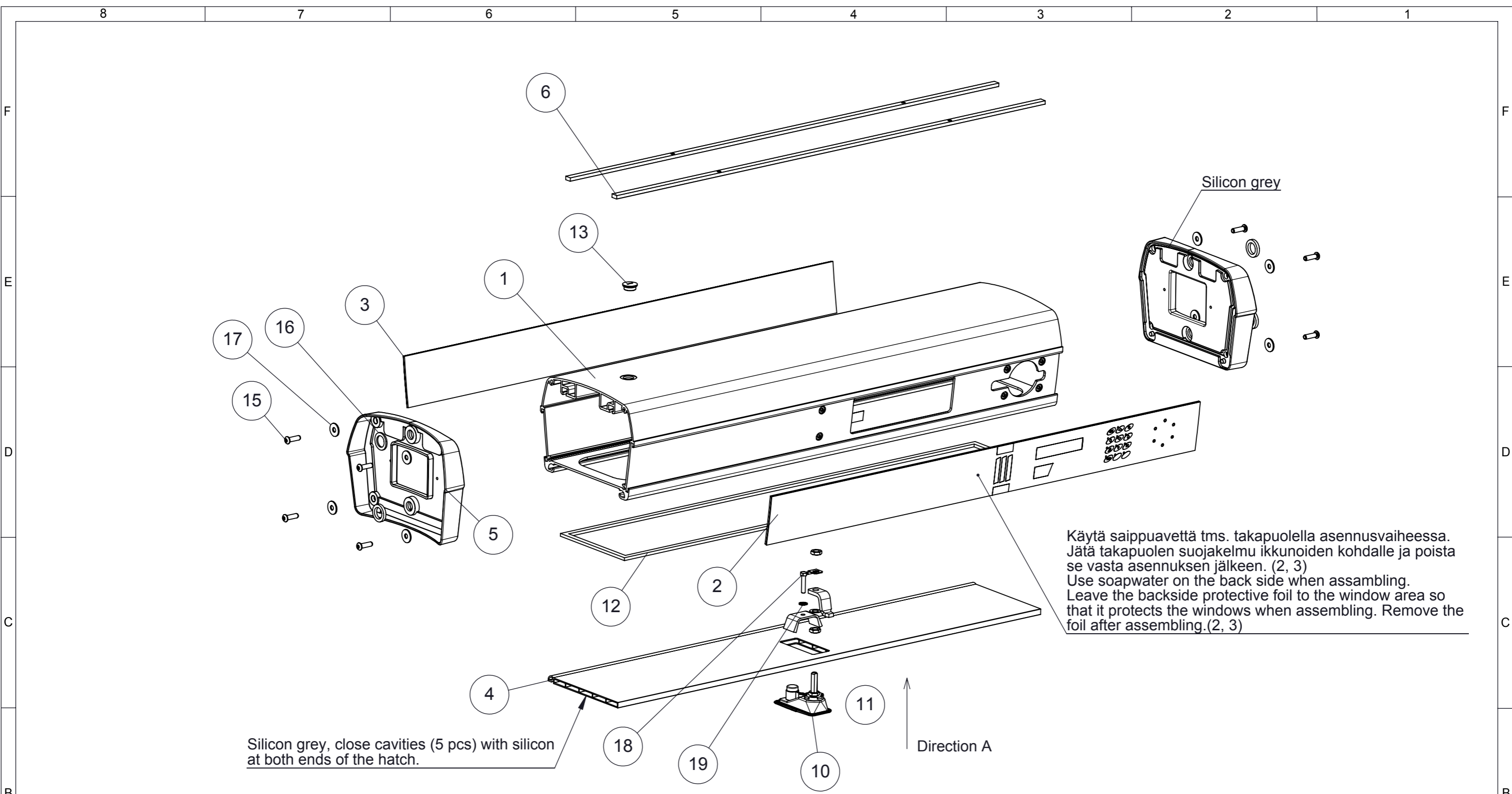
MCSS 5164 Cross Piece Set

Last.revision: 07
Revision updated: 07.01.2009
Version: PLANNING
Accept:

L. Line	Item	Dty	Description	Qty	U/M	Feat.
	8100807		MCSS 5164 M300 P CROSS PIECE SET	1,000	KPL	
1	10	8100812 2ME	CROSS PIECE PROFILE M300 P *1	1,000	kpl	
1	20	8100932 3PE	CROSS PIECE FRONT PLATE M300 P *2	1,000	KPL	
1	30	8100933 3PE	TRAFFIC LIGHT FRONT PLATE M300 P *3	1,000	KPL	
1	40	8101027 3ME	CROSS PIECE HATCH M300 P IP55 *4	1,000	KPL	
1	50	8100813 3ME	CROSS PIECE FLANGE M300 P *5	2,000	KPL	
1	60	8100861 3ME	FASTENING BAR M300 P *6	2,000	KPL	
1	100	3061765	COMPRESSION LATCH SOUTHCO 62-42-151-3 *10	1,000	KPL	
1	110	3061766	CUP SEALING GASKET FOR COMPRESSION LATCH SOUTCO 62-973-431 *11	1,000	KPL	
1	120	3157070	SEALING TAPE FLEXOPAD W 4X8 *12	1,710	M	
1	130	3061829	SEALING PLUG/O-RING VP M16-MS65 WAIDMULLER NO 1777730000 *13	1,000	KPL	
1	150	3061821	HEX SOCKET SCREW M6x20 A2 DIN 7380 *15	8,000	KPL	
1	160	8101190 4ME	SLEEVE GASKET M300 P *16	4,000	kpl	
1	170	3061877	WASHER MUDGUARD M6 A2 DIN 9021 *17	8,000	KPL	
1	180	3061860	HEX SCREW M5x25 ZN ISO 4017 *18	1,000	KPL	
1	190	2554723	LOCK WASHER A-5,3-FE/AlJ DIN 6798 *19	1,000	KPL	
1	200	8101185 4OE	CROSS PIECE PACKING M300P 980x310x240	1,000	KPL	

L. Line	Item	Dty	Description	Qty	U/M	Feat.
	8100807		MCSS 5164 M300 P CROSS PIECE SET	1,000	KPL	

	Related Installation components					
8000	3061751		HEXAGON SOCKET HEAD SCREW M5x10-A2	4,000	KPL	
	Related Drawings					
9000	9100711	3KE	CROSS PIECE SET MCSS 5164 M300 P	0,000	KPL	
9001	9100790	4XE	KEYBOARD TESTING M300 P	0,000	KPL	
9002	9100804	4XE	ASSEMBLY INSTRUCTIONS MCSS 5164	0,000	kpl	



Revision	Description	Date
A 004	Removed items 8,7 and 14. Changed silicon color, added instructions how to add silicon to hatch.	29.12.2008
003	Removed part number 9, added part numbers 17, 18, 19.	5.10.2008
002	Part # 16 added. Silicon added.	20.12.2007

YLEISTOLERANSSIT TOLERANCES STANDARDIT STANDARDS		AINE MATERIAL / STANDARDI STANDARD /	
		PINTAKÄSITTELY SURFACE TREATMENT	
SUHDE SCALE 1:5		VÄRI COLOR	
MASSA MASS 7.04 Kg		TUOTE PRODUCT Metor	
		SUUNN. DESIGNED / PVM DATE MVu / 24.10.2007	
		3D-TIEDOSTO LIITTYY 3D-FILE APPENDIX <input type="checkbox"/>	
		TARKASTUSOHJE LIITTYY QUALITY CONTROL APPENDIX <input type="checkbox"/>	
		PIIR.NRO. DWG.NO 9100711	
		REV. 004	

Last.revision: 06
Revision updated: 07.01.2009
Version: PLANNING
Accept:

L. Line	Item	Dty	Description	Qty	U/M	Feat.
	8101171		MCSS 5164.1 28"/710mm M300 P CROSS PIECE SET	1,000	KPL	
1	10	8101082	4ME CROSS PIECE PROFILE 710mm M300 P *1	1,000	kpl	
1	20	8101052	4PE CROSS PIECE FRONT PLATE 710mm M300 P *2	1,000	KPL	
1	30	8101067	4PE TRAFFIC LIGHT FRONT PLATE 710mm M300 P *3	1,000	KPL	
1	40	8101133	4ME CROSS PIECE HATCH 710mm M300 P *4	1,000	KPL	
1	50	8100813	3ME CROSS PIECE FLANGE M300 P *5	2,000	KPL	
1	60	8101077	4ME FASTENING BAR 710mm M300 P *6	2,000	KPL	
1	100	3061765	COMPRESSION LATCH SOUTHCO 62-42-151-3 *10	1,000	KPL	
1	110	3061766	CUP SEALING GASKET FOR COMPRESSION LATCH SOUTCO 62-973-431 *11	1,000	KPL	
1	120	3157070	SEALING TAPE FLEXOPAD W 4X8 *12	1,710	M	
1	130	3061829	SEALING PLUG/O-RING VP M16-MS65 WAIDMULLER NO 1777730000 *13	1,000	KPL	
1	150	3061821	HEX SOCKET SCREW M6x20 A2 DIN 7380 *15	8,000	KPL	
1	160	8101190	4ME SLEEVE GASKET M300 P *16	4,000	kpl	
1	170	3061877	WASHER MUDGUARD M6 A2 DIN 9021 *17	8,000	KPL	
1	180	3061860	HEX SCREW M5x25 ZN ISO 4017 *18	1,000	KPL	
1	190	2554723	LOCK WASHER A-5,3-FE/AlJ DIN 6798 *19	1,000	KPL	
1	200	8101185	4OE CROSS PIECE PACKING M300P 980x310x240	0,000	KPL	

L. Line	Item	Dty	Description	Qty	U/M	Feat.
	8101171		MCSS 5164.1 28"/710mm M300 P CROSS PIECE SET	1,000	KPL	

Related Installation components						
8000	3061751		HEXAGON SOCKET HEAD SCREW M5x10-A2	4,000	KPL	
Related Drawings						
9000	9100711	3KE	CROSS PIECE SET MCSS 5164 M300 P	0,000	KPL	
9001	9100790	4XE	KEYBOARD TESTING M300 P	0,000	KPL	
9002	9100804	4XE	ASSEMBLY INSTRUCTIONS MCSS 5164	0,000	kpl	

Last.revision: 06
Revision updated: 07.01.2009
Version: PLANNING
Accept:

L. Line	Item	Dty	Description	Qty	U/M	Feat.
	8101172		MCSS 5164.2 32"/810mm M300 P CROSS PIECE SET	1,000	KPL	
1	10	8101083	4ME CROSS PIECE PROFILE 810mm M300 P *1	1,000	kpl	
1	20	8101053	4PE CROSS PIECE FRONT PLATE 810mm M300 P *2	1,000	KPL	
1	30	8101068	4PE TRAFFIC LIGHT FRONT PLATE 810mm M300 P *3	1,000	KPL	
1	40	8101134	4ME CROSS PIECE HATCH 810mm M300 P *4	1,000	KPL	
1	50	8100813	3ME CROSS PIECE FLANGE M300 P *5	2,000	KPL	
1	60	8101078	4ME FASTENING BAR 810mm M300 P *6	2,000	KPL	
1	100	3061765	COMPRESSION LATCH SOUTHCO 62-42-151-3 *10	1,000	KPL	
1	110	3061766	CUP SEALING GASKET FOR COMPRESSION LATCH SOUTCO 62-973-431 *11	1,000	KPL	
1	120	3157070	SEALING TAPE FLEXOPAD W 4X8 *12	1,710	M	
1	130	3061829	SEALING PLUG/O-RING VP M16-MS65 WAIDMULLER NO 1777730000 *13	1,000	KPL	
1	150	3061821	HEX SOCKET SCREW M6x20 A2 DIN 7380 *15	8,000	KPL	
1	160	8101190	4ME SLEEVE GASKET M300 P *16	4,000	kpl	
1	170	3061877	WASHER MUDGUARD M6 A2 DIN 9021 *17	8,000	KPL	
1	180	3061860	HEX SCREW M5x25 ZN ISO 4017 *18	1,000	KPL	
1	190	2554723	LOCK WASHER A-5,3-FE/AlJ DIN 6798 *19	1,000	KPL	
1	200	8101185	4OE CROSS PIECE PACKING M300P 980x310x240	1,000	KPL	

L. Line	Item	Dty	Description	Qty	U/M	Feat.
	8101172		MCSS 5164.2 32"/810mm M300 P CROSS PIECE SET	1,000	KPL	

Related Installation components						
8000	3061751		HEXAGON SOCKET HEAD SCREW M5x10-A2	4,000	KPL	
Related Drawings						
9000	9100711	3KE	CROSS PIECE SET MCSS 5164 M300 P	0,000	KPL	
9001	9100790	4XE	KEYBOARD TESTING M300 P	0,000	KPL	
9002	9100804	4XE	ASSEMBLY INSTRUCTIONS MCSS 5164	0,000	kpl	

MCDS 5155 Control and Display Set

SINGLE LEVEL

Last.revision: 04

Revision updated: 11.09.2008

Version: PLANNING

Accept:

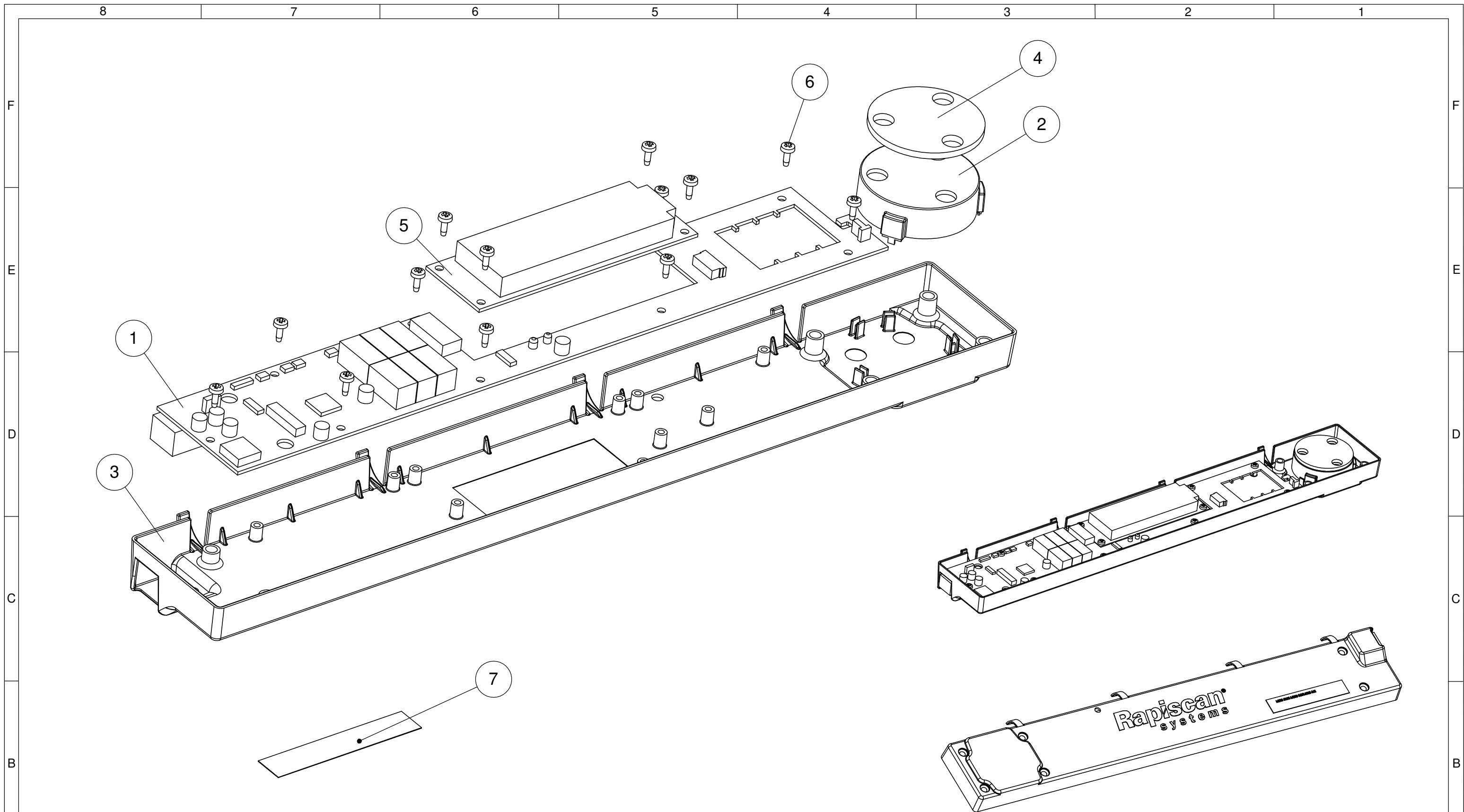
L. Line	Item	Dty	Description	Qty	U/M	Feat.	Rev
	8100780	4OE	MCDS 5155 M300 P CONTROL AND DISPLAY SET	1,000	KPL		04
1	10	8100805	4OE MDPU 5162 M300 P DISPLAY UNIT *1	1,000	KPL		04
1	20	8101169	4OE BUZZER WITH CABLE M300 P *2	1,000	KPL		01
1	30	8100833	3ME BACK COVER M300 P, EMD *3	1,000	KPL		005
1	40	8101081	4ME SPEAKER GASKET M300 P *4	1,000	KPL		002
1	45	8100631	4PE S/N LABEL BASE 14x76 *7	1,000	KPL		A
1	50	3061542	LCD-DISPLY 2x20 CHAR OPTREX C-51505NFQJ-LW-AD *5	1,000	KPL		
1	60	3061712	THERMOPLASTICS SCREW TP WN 1412 3x8 ZN *6	13,000	KPL		

Related Installation components

8000	1520253	COUNTERSUNK FLAT HEAD SCREW UK M4x16-8.8-Z-FE/A1J I	6,000	KPL		
8001	3061721	ETHERNET CABLE CAT-5 RJ45 0.5m UTP GREY OR BEIGE	1,000	KPL		

Related Drawings

9001	9100716	3KE CONTROL AND DISPLAY SET MCDS 5155 M300 P	0,000	KPL		002
9002	9100774	4XE TEST SPESIFICATION MCDS 5155 M300 P	0,000	KPL		1.00
9003	9100773	4VE OPERATIONAL DESCRIPTION MCDS 5155 M 300 P	0,000	KPL		1.00



YLEISTOLERANSSIT TOLERANCES STANDARDIT STANDARDS		AINE MATERIAL / STANDARDI STANDARD /		SUUNN. DESIGNED / PVM DATE MVu / 23.2.2007	
		PINTAKÄSITTELY SURFACE TREATMENT /		TARK. CHECKED / PVM DATE /	
SUHDE SCALE 1:1.5 A3		VÄRI COLOR		TUOTE PRODUCT Metor	
MASSA MASS 0.16 Kg		Control and display set MCDS 5155		HYV. APPROVED / PVM DATE /	
				3D-TIEDOSTO LIITTYY 3D-FILE APPENDIX <input type="checkbox"/>	
				TARKASTUSOHJE LIITTYY QUALITY CONTROL APPENDIX <input type="checkbox"/>	
				PIIR.NRO. DWG.NO 9100716	
				REV. 002	

Revision	Description	Date
002	Added sticker 8100631.	10.4.2008

8 7 6 5

MTLS 5169 Traffic Light Set

SINGLE LEVEL

Last.revision: 01

Revision updated: 28.12.2004

Version: PLANNING

Accept:

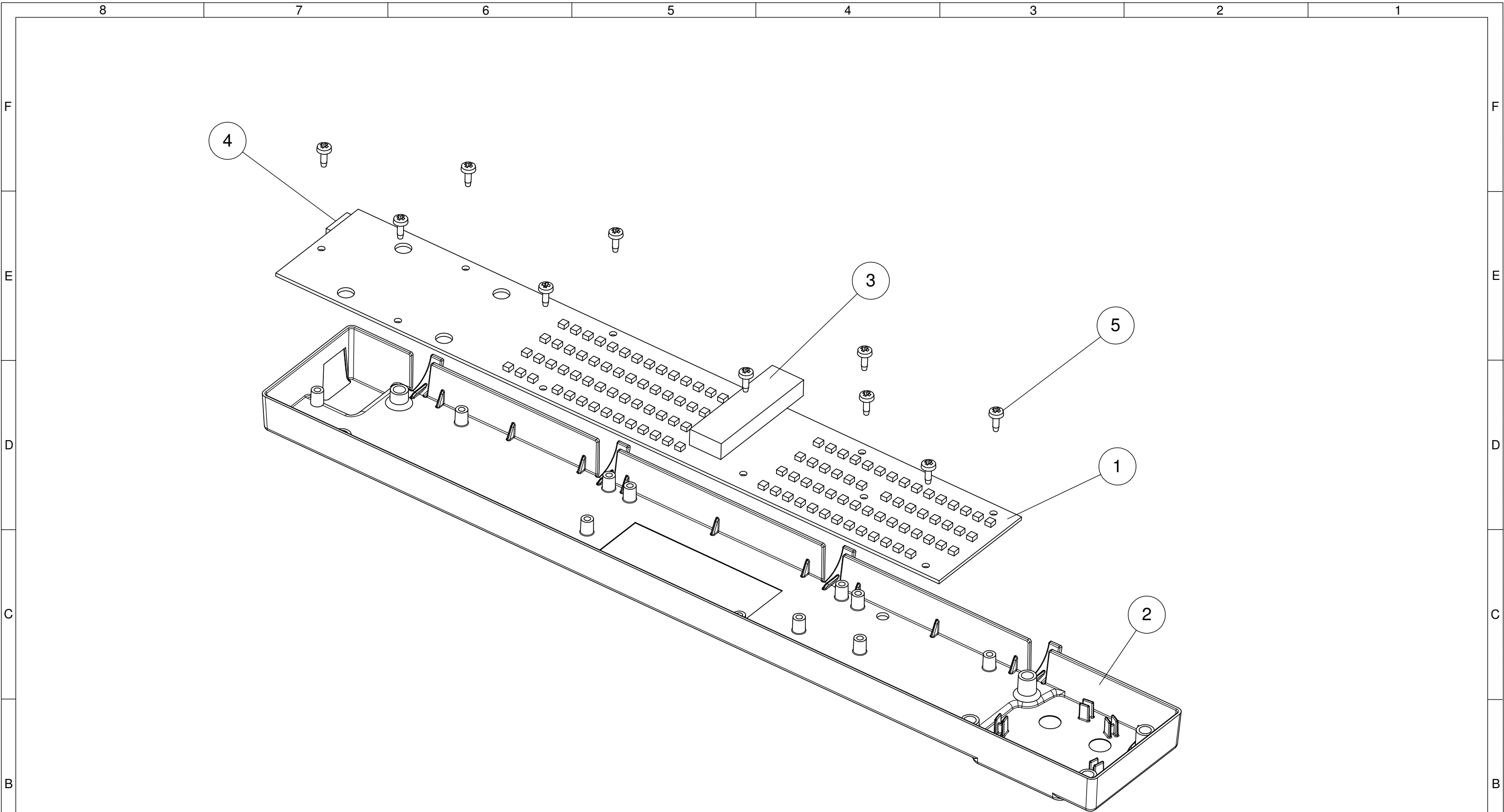
L. Line	Item	Dty	Description	Qty	U/M	Feat.	Rev
	8100774	4OE	MTLS 5169 M300 P, EMD TRAFFIC LIGHT SET	1,000	KPL		01
1	10	8100775	4OE MTLU 5151 M300 P, EMD TRAFFIC LIGHT UNIT *1	1,000	KPL		03
1	20	8100833	3ME BACK COVER M300 P, EMD *2	1,000	KPL		005
1	30	3025939	SEALING TAPE FLEXOPAD W 8X15 *3	0,056	M		
1	40	3061721	ETHERNET CABLE CAT-5 RJ45 0.5m UTP GREY OR BEIGE *4	1,000	KPL		
1	50	3061712	THERMOPLASTICS SCREW TP WN 1412 3x8 ZN *5	10,000	KPL		

Related Installation components

8000	1520253		COUNTERSUNK FLAT HEAD SCREW UK M4x16-8.8-Z-FE/AlJ I	6,000	KPL		
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Related Drawings

9001	9100648	3KE	TRAFFIC LIGHT SET MTL5 5169 M300 P, EMD	0,000	KPL		003
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YLEISTOLERANSSIT / TOLERANCES STANDARDIT / STANDARDS		AINE / MATERIAL / STANDARDI / STANDARD /		SUUNN. / DESIGNED / PVM DATE MVu / 29.6.2006	
		PINTAKÄSITTELY / SURFACE TREATMENT /		TARK. / CHECKED / PVM DATE /	
SUHDE / SCALE 1:1.5		VÄRI / COLOR /		TUOTE / PRODUCT Metor	
MASSA / MASS 0.11 Kg		MTLS 5169		HYV. / APPROVED / PVM DATE /	
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				PIIR.NRO. / DWG.NO 9100648	
				REV. 003	

MTRS 5165 TX/RX Coil Panel Set

SINGLE LEVEL

Last.revision: 01

Revision updated: 28.1.2005

Version: PLANNING

Accept:

8100808 40E MTRS 5165 M300 P TX/RX COIL PANEL SET

1,000 KPL

01

L. Line	Item	Dty	Description	Qty	U/M	Feat.	Rev
1	10	8100809	40E MTXS 5166 M300 P TRANSMITTER PANEL SET	1,000	KPL		02
1	20	8100810	40E MRXS 5167 M300 RECEIVER PANEL SET	1,000	KPL		02
1	50	8101186	40E COIL PACKING M300 P	1,000	KPL		01

Related Drawings

9000 9100780 4XE MT/RX COIL AND MTRS TESTING INSTRUCTIONS M300 P

0,000 KPL

1.00

MTXS 5166 Transmitter Panel Set

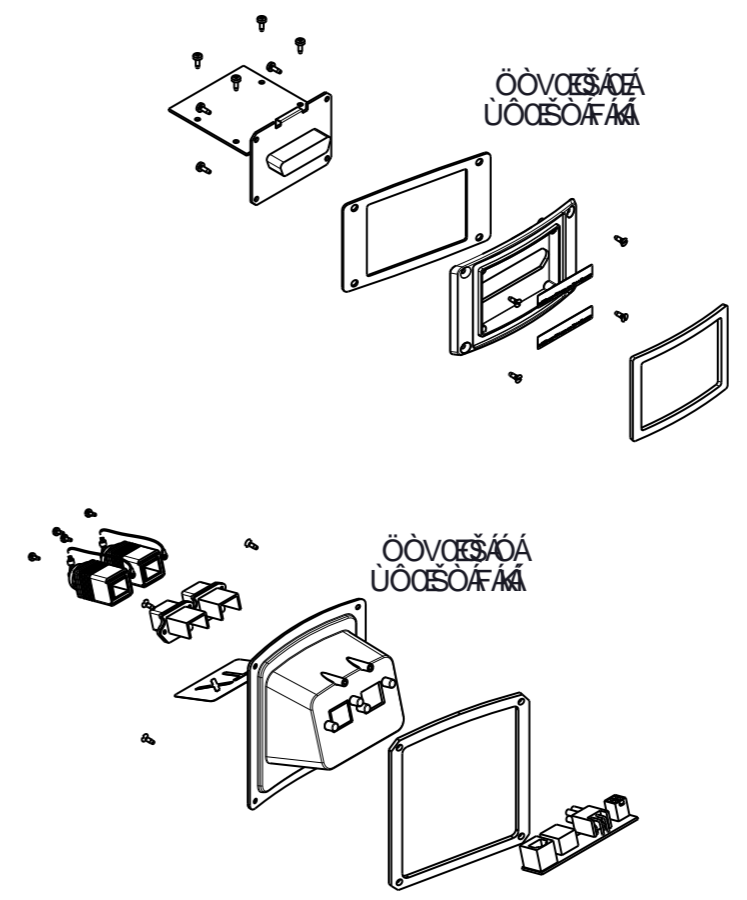
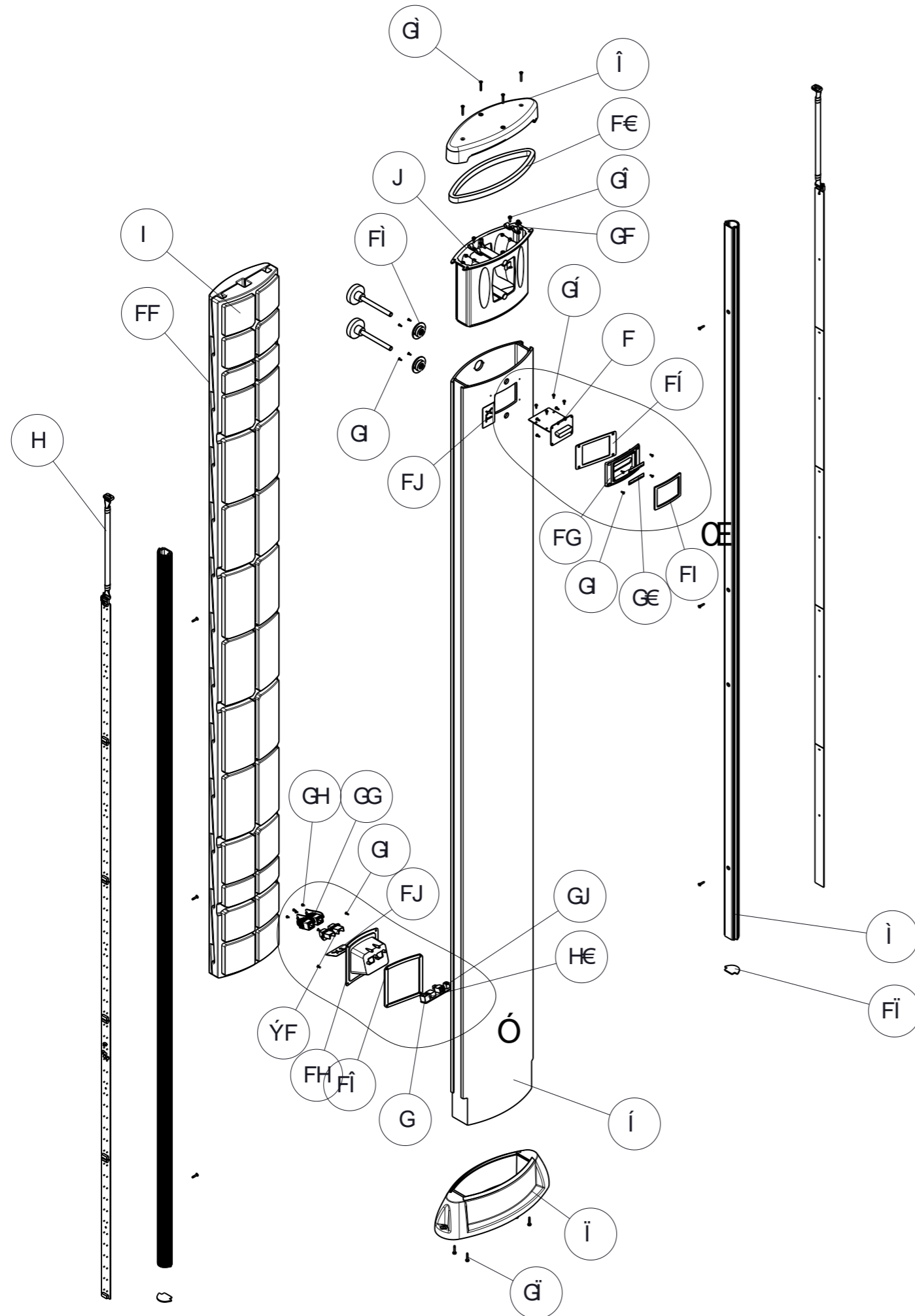
Last.revision: 07
Revision updated: 12.11.2008
Version: PLANNING
Accept:

L. Line	Item	Dty	Description	Qty	U/M	Feat.
	8100809		MTXS 5166 M300 P TRANSMITTER PANEL SET	1,000	KPL	
1	10		MTXU 5223 TRANSMITTER UNIT *1	1,000	KPL	
1	20	4OE	MPIU 5194 POWER INPUT UNIT M300 P *2	1,000	KPL	
1	30	4OE	MZDS 5157 ZONE DISPLAY SET M300 P *3	2,000	KPL	
1	40	4OE	TX COIL M300 P *4	1,000	KPL	
1	45	4OE	POWER CABLE M300 P *29	1,000	KPL	
1	47		ETHERNET CABLE CAT5RJ45 2.5mFTP/STP SHIELDED MOLEX / FARNEL 108-2856 *30	1,000	KPL	
1	50	2ME	COIL FRAME PROFILE M300 P *5	1,000	kpl	
1	60	3ME	HAT M300 P *6	1,000	KPL	
1	70	3ME	BOOT M300 P *7	1,000	KPL	
1	80	3ME	ZONE DISPLAY PROFILE M300 P *8	2,000	kpl	
1	90	3ME	COIL BODY PLUG M300 P *9	1,000	KPL	
1	100	3ME	HAT GASKET M300 P *10	1,000	KPL	
1	110	3ME	COIL BED WEDGE M300 P *11	1,000	kpl	
1	120	3ME	CONNECTOR CUP UPPER M300 P *12	1,000	KPL	
1	130	3ME	CONNECTOR CUP LOWER M300 P *13	1,000	KPL	
1	140	4ME	UPPER CONNECTOR CUP FRONT GASKET M300 P *14	1,000	KPL	

8100809 MTXS 5166 M300 P TRANSMITTER PANEL SET				1,000	KPL
L. Line	Item	Dty	Description	Qty	U/M Feat.
1	150	8101130	4ME UPPER CONNECTOR CUP BACK GASKET M300 P *15	1,000	KPL
1	160	8101049	4ME CONNECTOR CUP LOWER GASKET M300 P *16	1,000	KPL
1	170	8101061	4ME ZONE PROFILE GASKET M300 P *17	2,000	KPL
1	180	8100834	4ME HAND SCREW WASHER M300 P *18	2,000	KPL
1	190	8101166	4PE TX INDICATOR LABEL M300 P *19	2,000	KPL
1	200	8100630	4PE S/N LABEL BASE 10x51 *20	2,000	KPL
1	210	3061807	MODULAR CONN. HOUSING RJ45 HARTING 09 45 545 0021 *X1	1,000	KPL
1	220	3061015	CABLE CLIP 7,9MM NATURAL P-TYPE *21	4,000	KPL
1	230	3061832	DUST CAP SOCKET SIDE HARTING 09 45 845 004 *22	2,000	KPL
1	240	3061817	THERMOPLASTICS SCREW TP WN 1412 2.5x8 A2 *23	4,000	KPL
1	250	3061814	THERMOPLASTICS SCREW TP WN 1413 3x8 A2 BLACK *24	12,000	KPL
1	260	3061712	THERMOPLASTICS SCREW TP WN 1412 3x8 ZN *25	8,000	KPL
1	270	3061815	THERMOPLASTICS SCREW TP WN 1412 4x12 A2 *26	8,000	KPL
1	280	3061816	THERMOPLASTICS SCREW TP WN 1412 4x20 A2 *27	4,000	KPL
1	290	3061813	COUNTERSUNK HEAD X-SLOT SCREW M4x25 A2 *28	4,000	KPL
1	320	3061819	STRUCTURAL PLASTIC ADHESIVE DP8010 3M	0,017	l

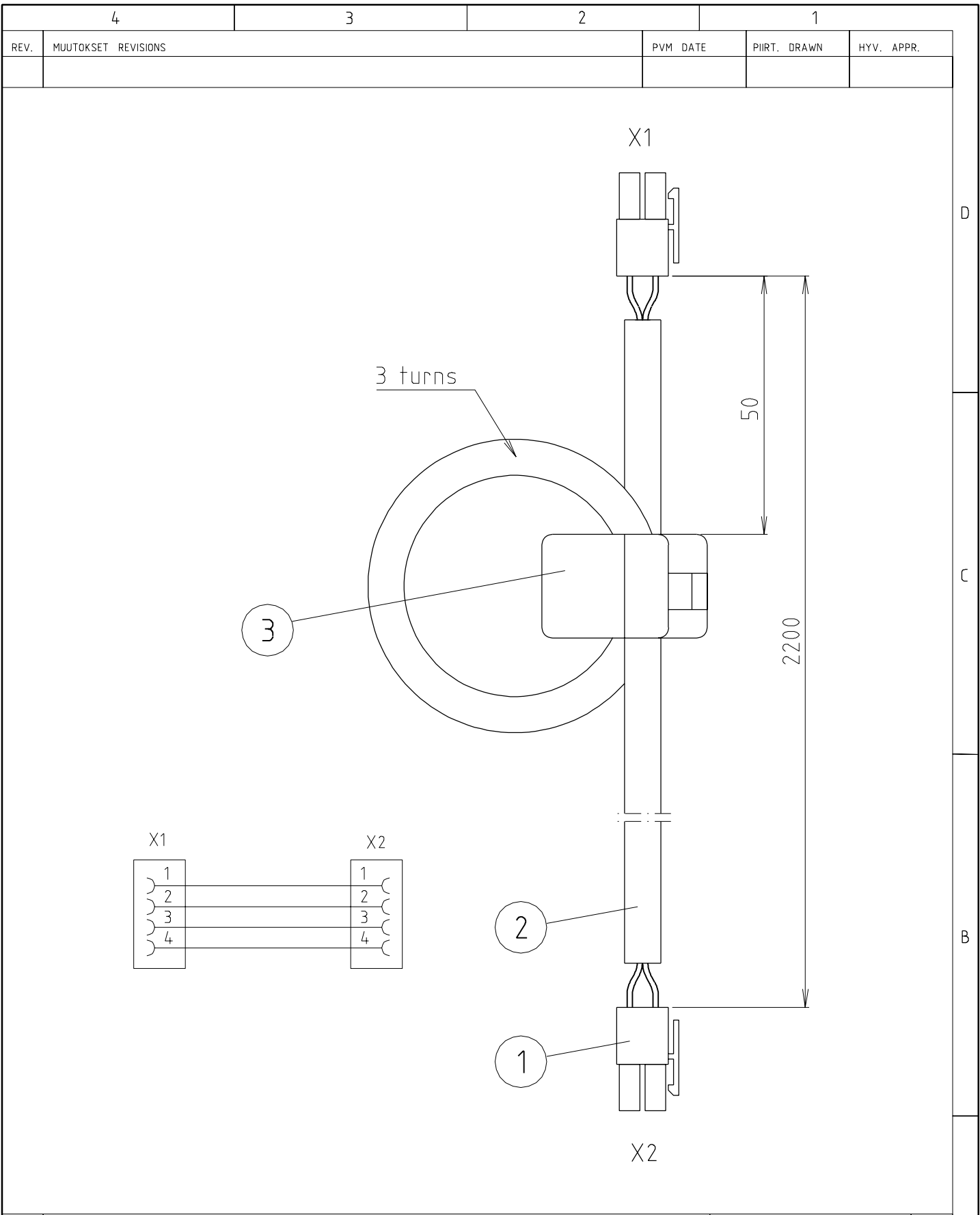
Related Drawings

9000	9100745	3KE	TRANSMITTER PANEL SET MTXS 5166 M300 P	0,000	KPL
9001	9100805	4XE	ASSEMBLY INSTRUCTIONS MTXS 5166	0,000	kpl



FYj lgc b	8YgWfdhcb	8UH'
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OSA ITEM OSAN NIMI, MITAT, MITTASTD., AINE, AINESTD. DESCRIPTION		PIIR.N:O TAKO CODE		KPL QTY
YLEISTOLERANSSI TOLERANCES		SUUNN. DESIGNED 2008 05 MTL	PIIRT. DRAWN 2008 05 IJ	
	SUHDE SCALE 1:1	LIITTYÄ NEXT ASSY MTXS, MRXS		TARK. CHECKED
			TUOTE PRODUCT Metor 300 P	
Power cable		OSAL.N:O PART LIST 8101 204-40		REV. 01
		PIIR.N:O CODE 9100 797-4KE		

MTXU 5223 Transmitter Unit

8 7 6 5 4 3 2 1

F F

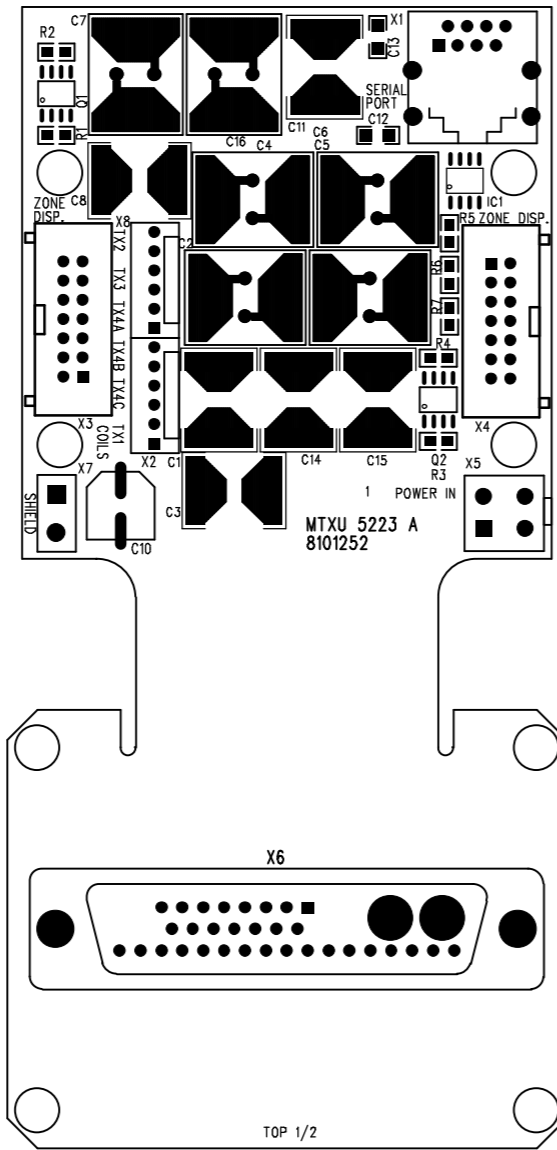
E E

D D

C C

B B


A A



Rapiscan Systems Oy
 MTXU 5223 A
 8101 252
 2008 11 JNI

VIEW: COMPONENT SIDE
 ASSEMBLY DRAWING, TOP SIDE

REV.	MUUTOKSET	REVISIONS	PVM	DATE	PIIRT.	DRAWN	HYV.	APPR.

OSA ITEM	OSAN NIMI, MITAT, MITASTO., AINE, AINESTO. DESCRIPTION	PIIR.N:O TAKO CODE	KPL QTY
YLEISTOLERANSSI TOLERANCES		SUUNN. DESIGNED 2008 11 JNI	PIIRT. DRAWN 2008 11 JNI
SUHDE SCALE		TARK. CHECKED	HYV. APPROVED
LITTYY NEXT ASSY MTXS		TUOTE PRODUCT Metor 300 P	
 An OSI Systems Company		OSAL.N:O PART LIST 8101 250	REV. 01
MTXU 5223 Assembly Drawing		PIIR.N:O CODE 9100 817	

Author M. Loikkanen	Rev. 1.10	Code 9100694
Approved	Date 10.11.2008	Document
Product M 300 P	Archives	
Title OPERATIONAL DESCRIPTION MTXU 5223		

TRANSMITTER SIDE COIL ADAPTER UNIT, MTXU 5223

1 GENERAL

The MTXU consists of coil adapter capacitors, switches for enabling zone displays and connectors for TX coil cable, transmitter coils, zone displays (includes traffic counter transmitters), electric shield and DC power input.

2 OPERATIONAL DESCRIPTION

Each transmitter channel has capacitor(s) to create a resonance circuit with the coil.

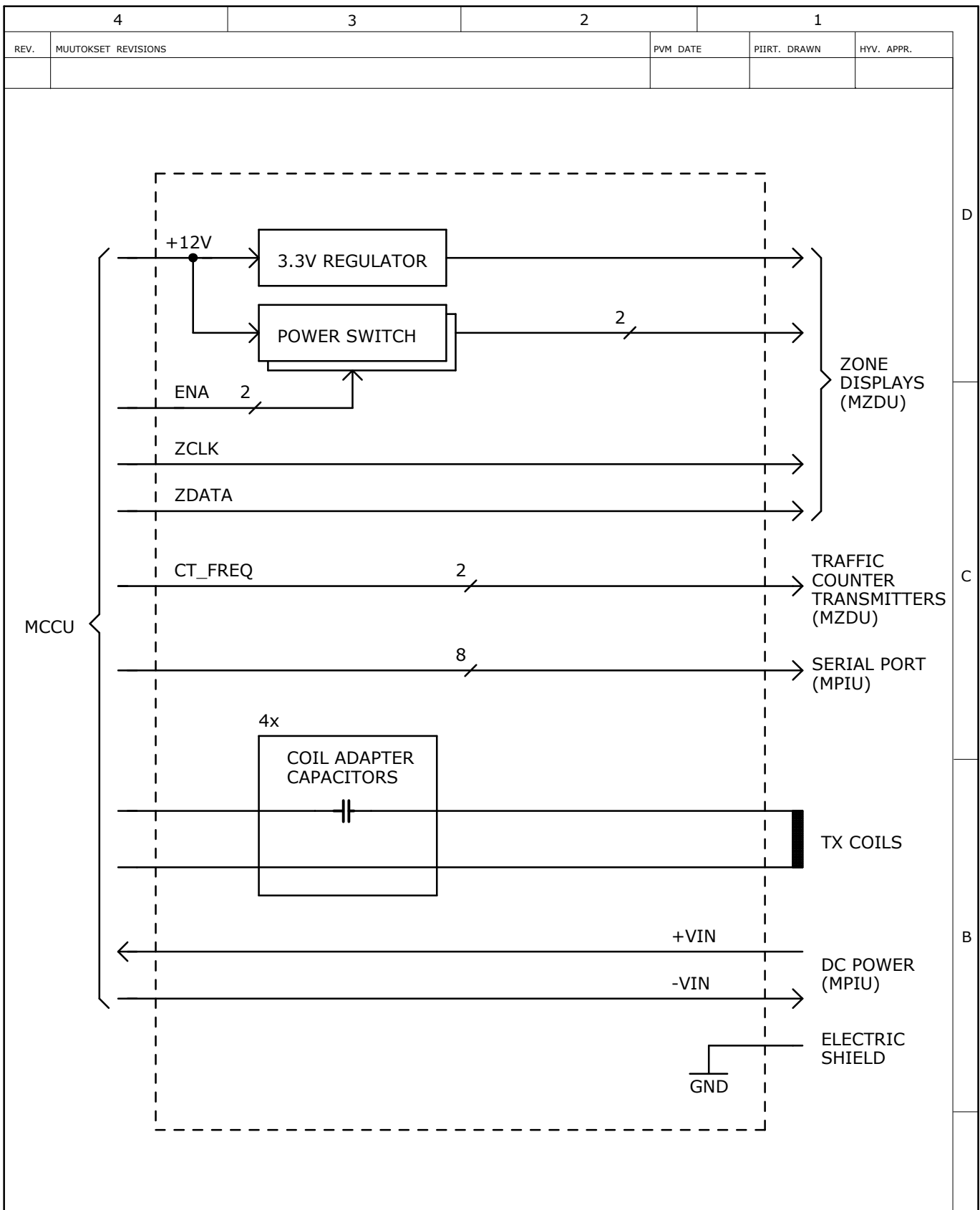
Two FET switches, controlled by the MCCU, turn power on to the zone displays LEDs.


The flexible part of the PCB is susceptible to tearing. The gate should alarm TX-failure if it has been torn. But note that this alarm may also indicate a disconnected or broken coil cable.

3 REVISION HISTORY

Rev. 1.10, 10.11.2008 / TV

- Replaced MTXU 5152 with MTXU 5223.



OSA ITEM		OSAN NIMI, MITAT, MITTASTD., AINE, AINESTD.		PIIR.N:O TAKO CODE		KPL QTY	
YLEISTOLERANSSI TOLERANCES				SUUNN. DESIGNED 2008 03 MTL		PIIRT. DRAWN 2008 03 MTL	
SUHDE SCALE		LIITTY NEXT ASSY MTXU 5152		TARK. CHECKED		HYV. APPROVED	
		MTXU 5152 Block Diagram		TUOTE PRODUCT Metor 300 Portable			
				OSAL.N:O PART LIST 8100 776-40		REV. 01	
				PIIR.N:O CODE 9100 691-4LE			
				Page 1/1			

MZDS 5157 Zone Display Set

SINGLE LEVEL

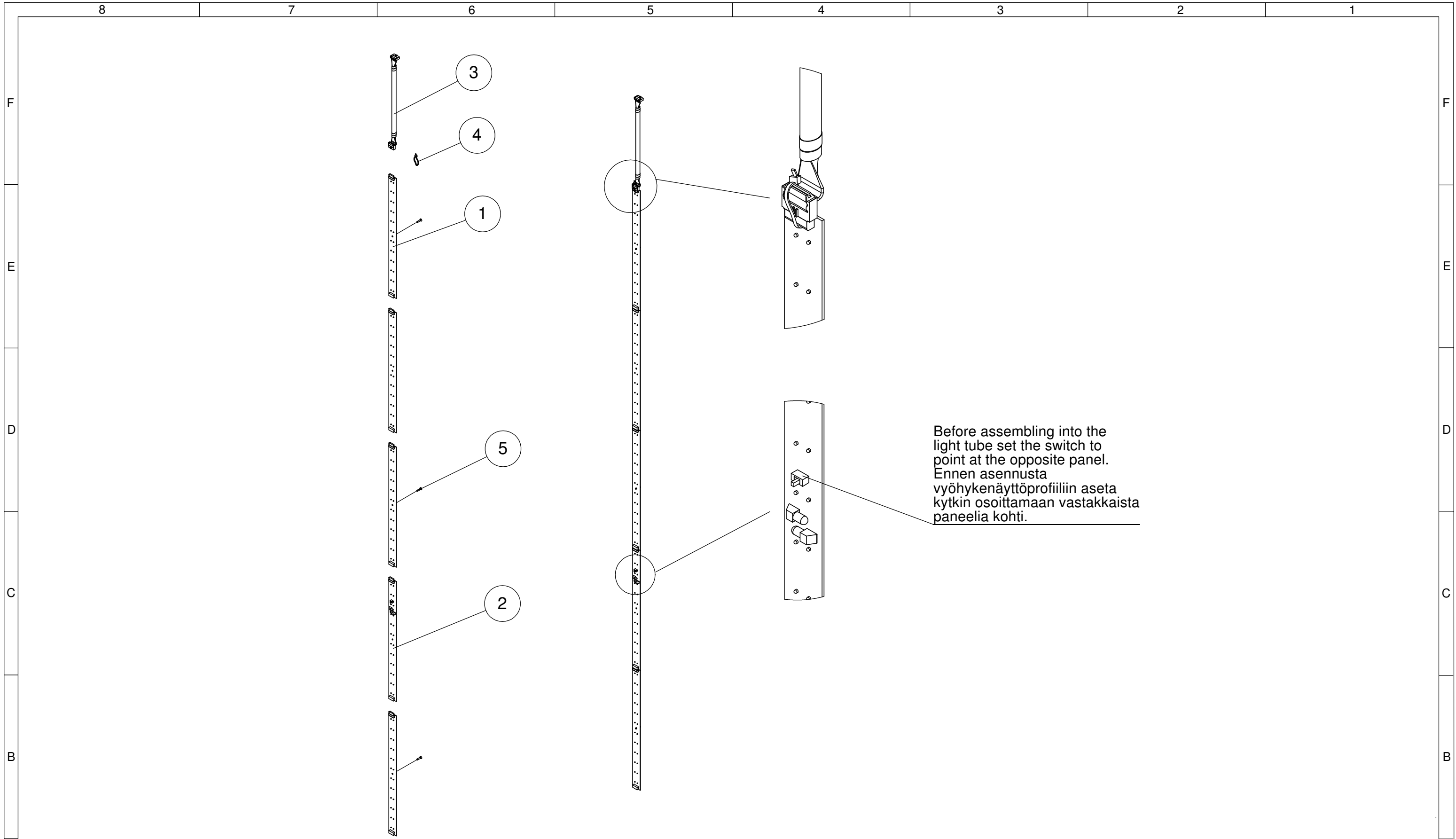
Last.revision: 01

Revision updated: 28.12.2004

Version: PLANNING

Accept:

8100777 4OE MZDS 5157 ZONE DISPLAY SET M300 P								1,000 KPL	01
L. Line	Item	Dty	Description	Qty	U/M	Feat.	Rev		
1	10	8100778 4OE	MZDU 5154 M300 P ZONE DISPLAY UNIT *1	4,000	KPL		07		
1	20	8100801 4OE	MZDU 5158 M300 P ZONE DISPLAY UNIT *2	1,000	KPL		04		
1	30	8101059 4OE	ZONE DISPLAY CABLE M300 P *3	1,000	KPL		01		
1	40	3061599	CABLE TIE PANDUIT PLT1M-M20 *4	1,000	KPL				
1	50	3061600	THIN PLATE SCREW CH 4,2x16 ZN PZ *5	3,000	KPL				
Related Drawings									
9001	9100747 3AE		ZONE DISPLAY INSTALLATION M300 P	0,000	KPL		003		



Before assembling into the light tube set the switch to point at the opposite panel. Ennen asennusta vyöhykenäyttöprofiiliin aseta kytkin osoittamaan vastakkaista paneelia kohti.

Revision	Description	Date
003	Part number corrected	23.10.2007
002	Note for the switch added.	19.10.2007

YLEISTOLERANSSIT TOLERANCES STANDARDIT STANDARDS		AINE MATERIAL / STANDARDI STANDARD /	
		PINTAKÄSITTELY SURFACE TREATMENT	
SUHDE SCALE 1:10 MASSA MASS	A3	VÄRI COLOR	TUOTE PRODUCT Metor
		SUUNN. DESIGNED / PVM DATE MVu /	
		MZDS 5157 Zone display set	
		3D-TIEDOSTO LIITTYY 3D-FILE APPENDIX <input type="checkbox"/>	
		TARKASTUSOHJE LIITTYY QUALITY CONTROL APPENDIX <input type="checkbox"/>	
		PIIR.NRO. DWG.NO 9100747	REV. 003

Author M. Loikkanen	Rev. 1.00	Code 9100 688-4VE
Approved	Date 25.3.2008	Document
Product M 300 P	Archives M 300 P	
Title OPERATIONAL DESCRIPTION MZDU 5154,5158		

ZONE DISPLAY UNIT, MZDU 5154,5158

1 GENERAL

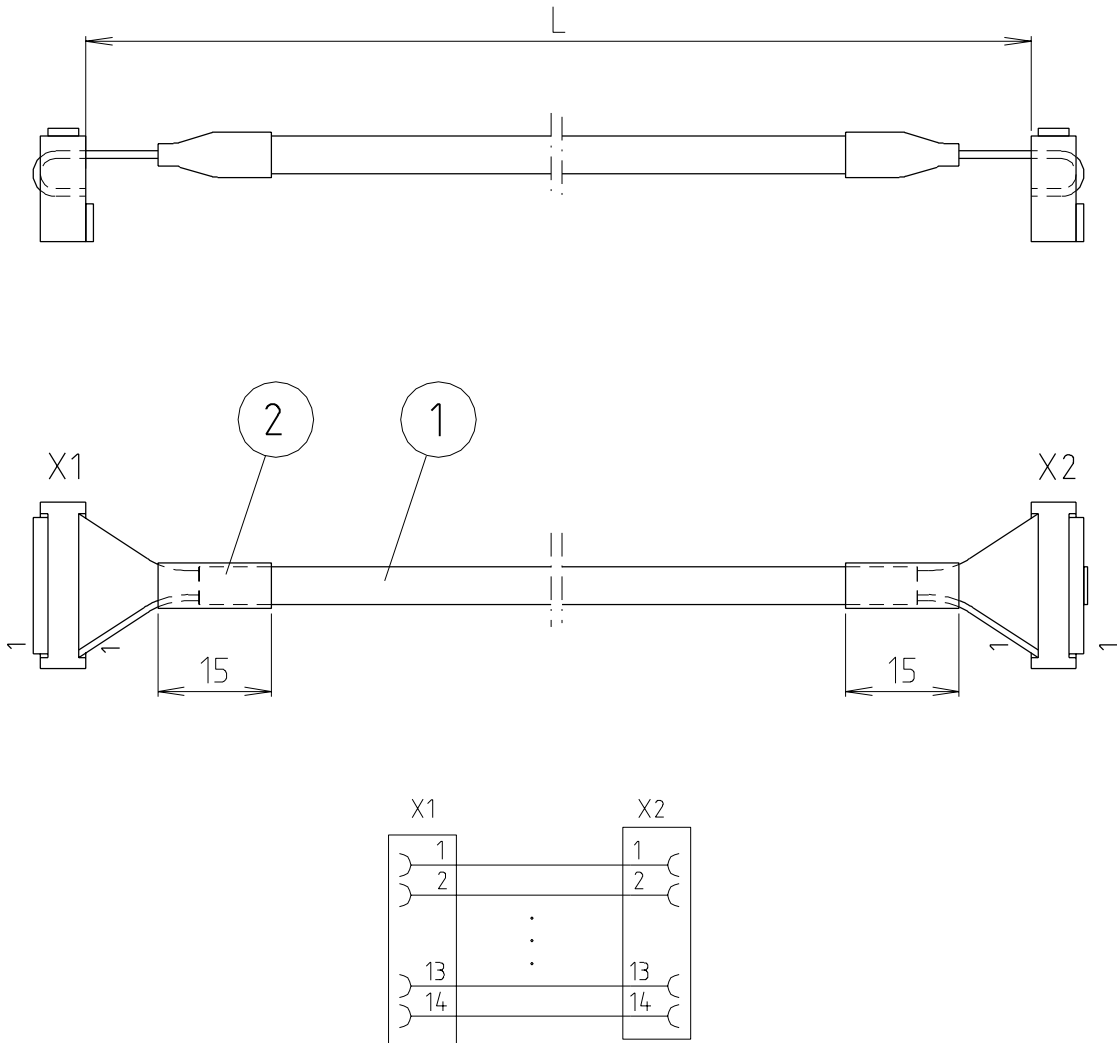
The MZDU 5154 consists of connectors at both ends and zone display LEDs with associated circuitry. The MZDU 5158 also has traffic counter transmitters (IR LEDs).

2 OPERATIONAL DESCRIPTION

The MZDU board has four zones that consist of three rows of evenly placed LEDs controlled by a two-line serial connection from the MCCU.

MZDU 5158 has two infrared LEDs pointing at opposite directions. The LED to be used is selected with a switch.

4		3		2		1	
REV.	MUUTOKSET REVISIONS			PVM DATE	PIIRT. DRAWN	HYV. APPR.	
02	Mitta poistettu / Delete dimension			2005 11	IJ	ORA	



OSA ITEM	OSAN NIMI, MITAT, MITTASTD., AINE, AINESTD. DESCRIPTION	PIIR.N:O TAKO CODE	KPL QTY
YLEISTOLERANSSI TOLERANCES		SUUNN. DESIGNED 2004 11 JN1	PIIRT. DRAWN 2004 11 IJ
 SUHDE SCALE 1:1	LIITTYY NEXT ASSY MRXS, MTXS	TARK. CHECKED 2005 06 JLA	HYV. APPROVED 2005 06 ORA
	 Zone display cable	TUOTE PRODUCT Metor 300, EMD	OSAL.N:O PART LIST
		PIIR.N:O CODE 9100 512-4KE	REV. 02

MRXS 5167 Receiver Panel Set

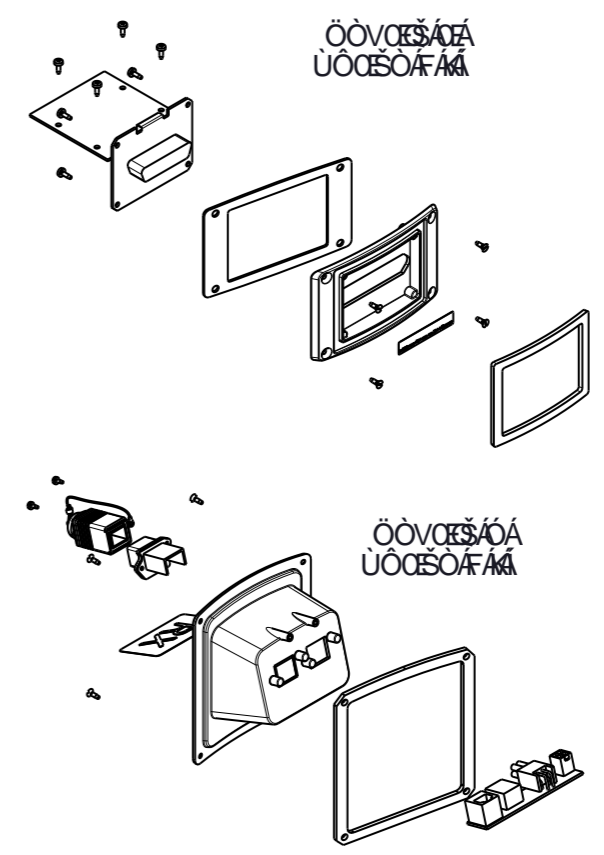
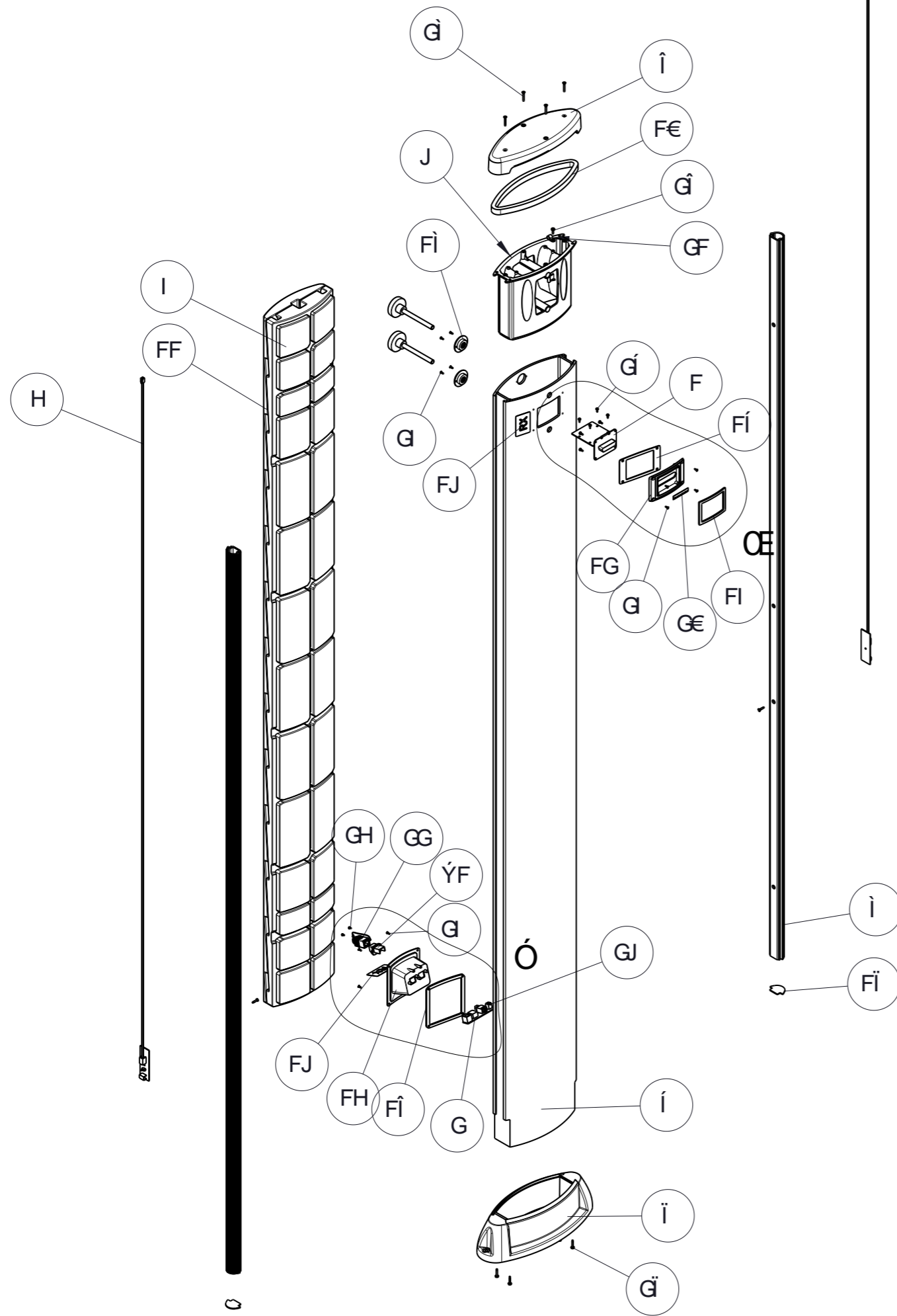
Last.revision: 07
Revision updated: 12.11.2008
Version: PLANNING
Accept:

L. Line	Item	Dty	Description	Qty	U/M	Feat.
	8100810		MRXS 5167 M300 P RECEIVER PANEL SET	1,000	KPL	
1	10		MRXU 5224 RECEIVER UNIT *1	1,000	KPL	
1	20	4OE	MPIU 5193 POWER INPUT UNIT M300 P *2	1,000	KPL	
1	30	4OE	MCRS 5159 M300 P COUNTER RESEIVER SET *3	2,000	KPL	
1	40	4OE	RX COIL M300 P *4	1,000	KPL	
1	45	4OE	POWER CABLE M300 P *29	1,000	KPL	
1	50	2ME	COIL FRAME PROFILE M300 P *5	1,000	kpl	
1	60	3ME	HAT M300 P *6	1,000	KPL	
1	70	3ME	BOOT M300 P *7	1,000	KPL	
1	80	3ME	ZONE DISPLAY PROFILE M300 P *8	2,000	kpl	
1	90	3ME	COIL BODY PLUG M300 P *9	1,000	KPL	
1	100	3ME	HAT GASKET M300 P *10	1,000	KPL	
1	110	3ME	COIL BED WEDGE M300 P *11	1,000	kpl	
1	120	3ME	CONNECTOR CUP UPPER M300 P *12	1,000	KPL	
1	130	3ME	CONNECTOR CUP LOWER M300 P *13	1,000	KPL	
1	140	4ME	UPPER CONNECTOR CUP FRONT GASKET M300 P *14	1,000	KPL	
1	150	4ME	UPPER CONNECTOR CUP BACK GASKET M300 P *15	1,000	KPL	


8100810 MRXS 5167 M300 P RECEIVER PANEL SET				1,000 KPL
L. Line	Item	Dty	Description	Qty U/M Feat.
1	160	8101049	4ME CONNECTOR CUP LOWER GASKET M300 P *16	1,000 KPL
1	170	8101061	4ME ZONE PROFILE GASKET M300 P *17	2,000 KPL
1	180	8100834	4ME HAND SCREW WASHER M300 P *18	2,000 KPL
1	190	8101167	4PE RX INDICATOR LABEL M300 P *19	2,000 KPL
1	200	8100630	4PE S/N LABEL BASE 10x51 *20	1,000 KPL
1	220	3061015	CABLE CLIP 7,9MM NATURAL P-TYPE *21	3,000 KPL
1	230	3061832	DUST CAP SOCKET SIDE HARTING 09 45 845 004 *22	1,000 KPL
1	240	3061817	THERMOPLASTICS SCREW TP WN 1412 2.5x8 A2 *23	2,000 KPL
1	250	3061814	THERMOPLASTICS SCREW TP WN 1413 3x8 A2 BLACK *24	12,000 KPL
1	260	3061712	THERMOPLASTICS SCREW TP WN 1412 3x8 ZN *25	8,000 KPL
1	270	3061815	THERMOPLASTICS SCREW TP WN 1412 4x12 A2 *26	7,000 KPL
1	280	3061816	THERMOPLASTICS SCREW TP WN 1412 4x20 A2 *27	4,000 KPL
1	290	3061813	COUNTERSUNK HEAD X-SLOT SCREW M4x25 A2 *28	4,000 KPL
1	320	3061819	STRUCTURAL PLASTIC ADHESIVE DP8010 3M	0,017 l

Related Drawings

9000	9100746	3KE	RECEIVER PANEL SET MRXS 5167 M300 P	0,000 KPL
9001	9100806	4XE	ASSEMBLY INSTRUCTIONS MRXS 5167	0,000 kpl



FYj ljb	8YgWfd hcb	8UH
\$\$*	FYa cj YX`&dWjg/U`b[`gYYj Y , %%% - fVU`ccb` , " \$E"	% , "&\$\$,
\$\$)	I dXUHX`6CA `VU`ccbg`	%\$(" &\$\$,
\$\$(<	DUfh , " \$ UXXYX"	&\$"%&"&\$\$+
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FKG OEH
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 VMUVOAUU OVOV
 T^q!
TX` AJJE ECEI


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* 8!H98 CGHC` @HMM
 * 8! : @ 5 DD9B8 L A

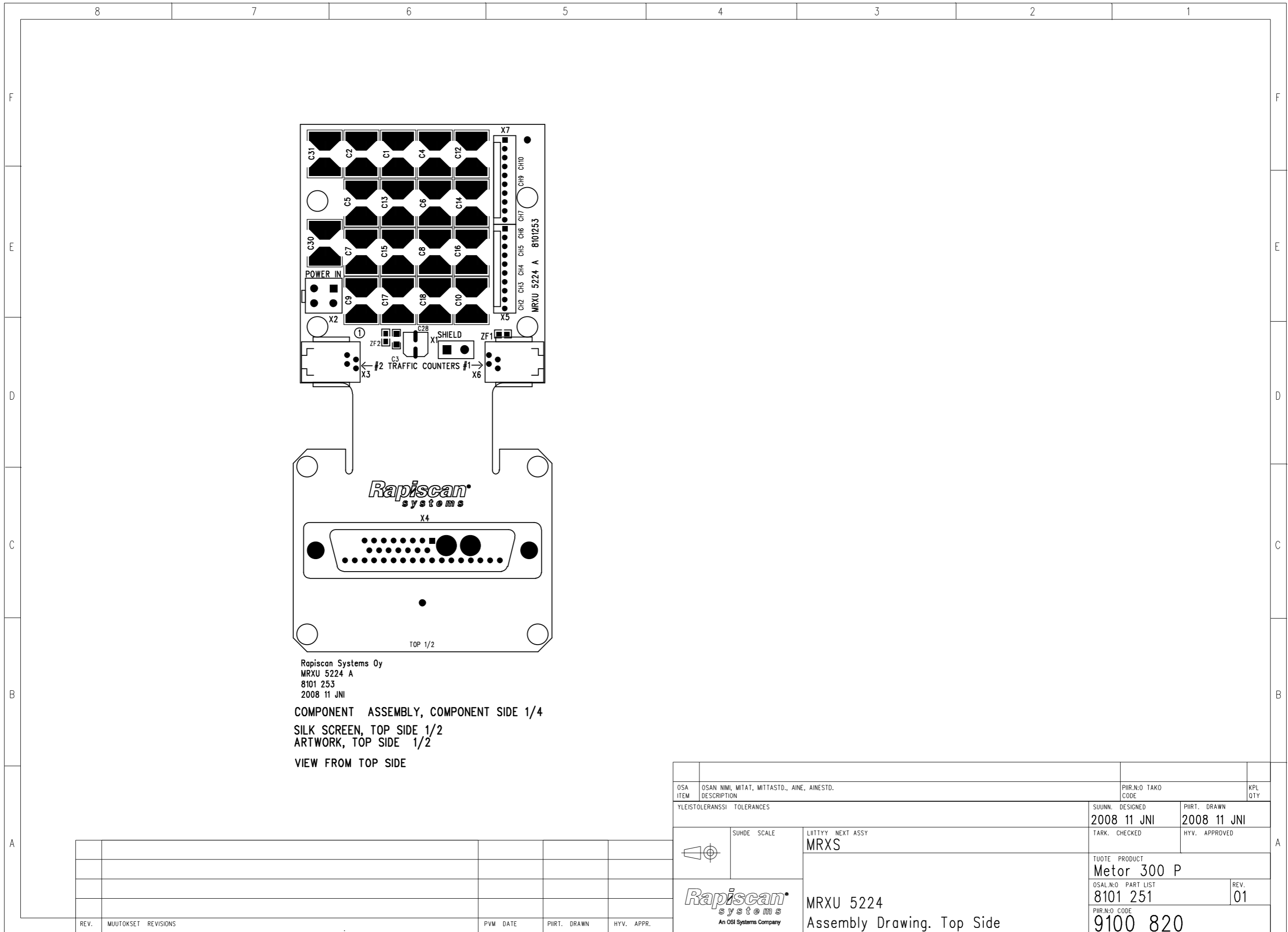
H5 F?5 GH GC<>9` @HMM
 E1 5 @HM7 CBHC @S DD9B8 L A

U@B-UU@Y OBU
JFEEI I

UOXE
EE



MRXU 5224 Receiver Unit



Rapiscan Systems Oy
 MRXU 5224 A
 8101 253
 2008 11 JN1
 COMPONENT ASSEMBLY, COMPONENT SIDE 1/4
 SILK SCREEN, TOP SIDE 1/2
 ARTWORK, TOP SIDE 1/2
 VIEW FROM TOP SIDE

REV.	MUUTOKSET REVISIONS	PVM DATE	PIIRT. DRAWN	HYV. APPR.

OSA ITEM	OSAN NIMI, MITAT, MITTASTO., AINE, AINESTO. DESCRIPTION	PIIR.N:O TAKO CODE	KPL QTY
YLEISTOLERANSSI TOLERANCES		SUUNN. DESIGNED 2008 11 JN1	PIIRT. DRAWN 2008 11 JN1
SUHDE SCALE		TARK. CHECKED	HYV. APPROVED
LITTYY NEXT ASSY MRXS		TUOTE PRODUCT Metor 300 P	
Rapiscan systems An OSI Systems Company		OSAL.N:O PART LIST 8101 251	REV. 01
MRXU 5224 Assembly Drawing. Top Side		PIIR.N:O CODE 9100 820	

8 7 6 5 4 3 2 1

F

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D

D

C

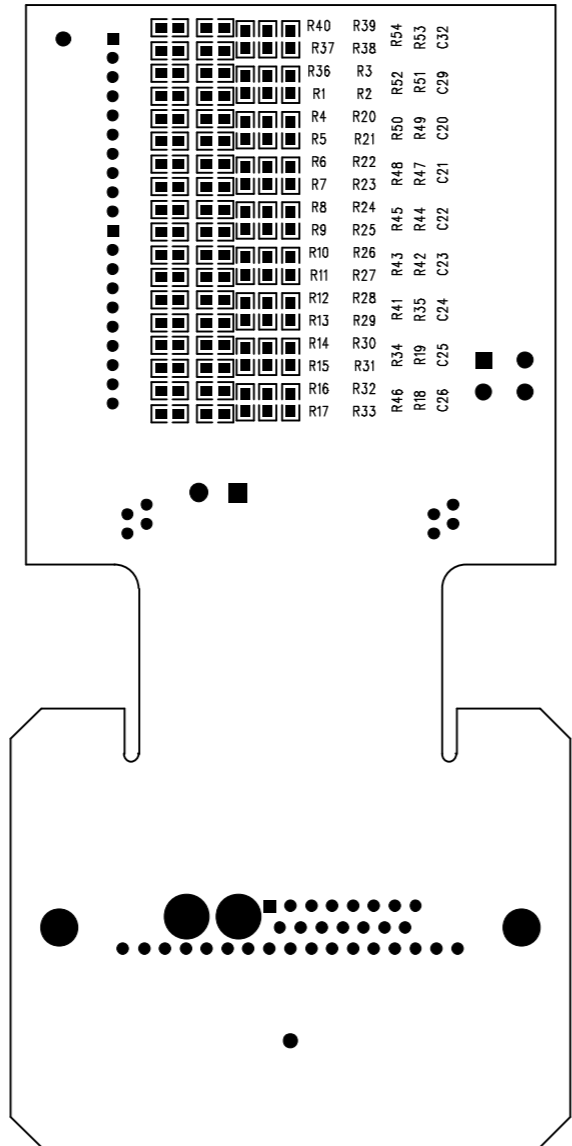
C

B

B

A

A



Rapiscan Systems Oy
MRXU 5224 A
8101 251
2008 11 11
COMPONENT ASSEMBLY, SOLDER SIDE 4/4

VIEW FROM TOP SIDE

REV.	MUUTOKSET REVISIONS	PVM DATE	PIIRT. DRAWN	HYV. APPR.

OSA ITEM		OSAN NIMI, MITAT, MITTASTO., AINE, AINESTO.		PIIR.N:O TAKO CODE		KPL QTY	
YLEISTOLERANSSI TOLERANCES				SUUNN. DESIGNED		PIIRT. DRAWN	
				2008 11 JNI		2008 11 JNI	
				TARK. CHECKED		HYV. APPROVED	
				TUOTE PRODUCT			
				Metor 300 P			
				OSAL.N:O PART LIST		REV.	
				8101 251		01	
				PIIR.N:O CODE			
				9100 820			
SUHDE SCALE		LITTYY NEXT ASSY					
		MRXS					
		MRXU 5224					
		Assembly Drawing, Bottom Side					

Author M. Loikkanen	Rev. 1.10	Code 9100699
Approved	Date 11.11.2008	Document
Product Metor 300 Portable	Archives	
Title OPERATIONAL DESCRIPTION MRXU 5224		

RECEIVER SIDE COIL ADAPTER UNIT, MRXU 5224

1 GENERAL

The MRXU consists of coil adapters (capacitors and resistors) and connectors for RX coil cable, receiver coils, counter receivers, electric shield and DC power input.

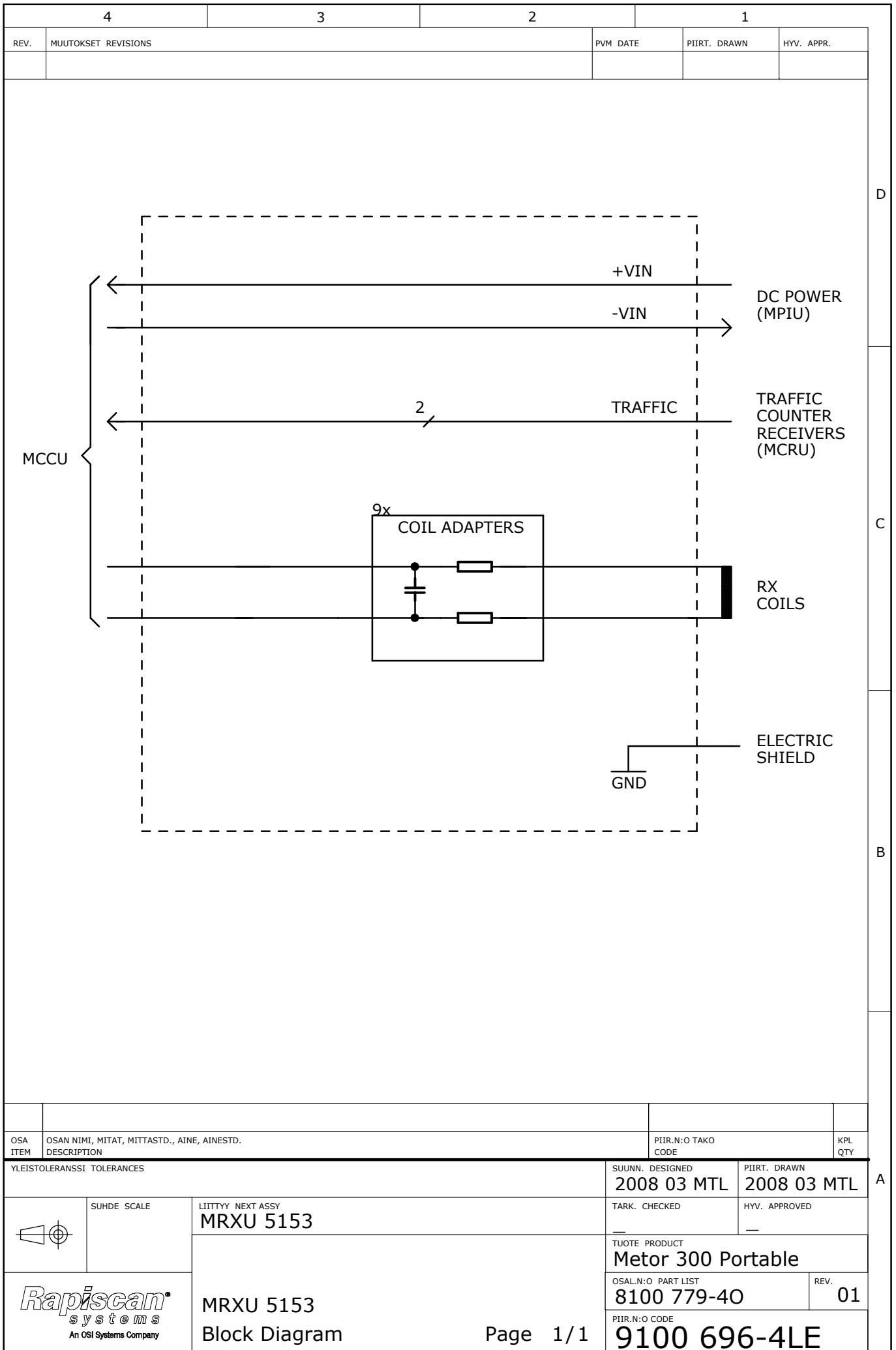
2 OPERATIONAL DESCRIPTION

Each channel has capacitors and resistors to create a balanced low-pass RC filter.

3 REVISION HISTORY

Rev. 1.10, 11.11.2008 / TV

- Replaced MRXU 5153 with MRXU 5224.



	OSA ITEM DESCRIPTION	PIIR.N:O TAKO CODE	KPL QTY
	OSAN NIMI, MITAT, MITASTD., AINE, AINESTD.		

YLEISTOLERANSSI TOLERANCES	SUUNN. DESIGNED 2008 03 MTL	PIIRT. DRAWN 2008 03 MTL
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	SUHDE SCALE	LIITTYV. NEXT ASSY MRXU 5153	TARK. CHECKED	HYV. APPROVED
--	-------------	--	---------------	---------------

<p>Rapiscan systems An OSI Systems Company</p>	MRXU 5153 Block Diagram	TUOTE PRODUCT Metor 300 Portable	
		OSAL.N:O PART LIST 8100 779-40	REV. 01
		PIIR.N:O CODE 9100 696-4LE	

MCRS 5169 Counter Receiver Set

SINGLE LEVEL

Last.revision: 02

Revision updated: 13.12.2007

Version: PLANNING

Accept:

L. Line	Item	Dty	Description	Qty	U/M	Feat.	Rev

	8100802	40E	MCRS 5159 M300 P COUNTER RESEIVER SET	1,000	KPL		02
1	10	8101135	40E MCRU 5198 M300 P COUNTER RECEIVER UNIT *1	1,000	KPL		02
1	20	8101187	40E COUNTER RECEIVER CABLE M300 P *2	1,000	KPL		01
1	30	3061600	THIN PLATE SCREW CH 4,2x16 ZN PZ *3	1,000	KPL		
Related Drawings							
9001	9100748	4AE	COUNTER RECEIVWR INSTALLATION M300 P	0,000	KPL		001

4

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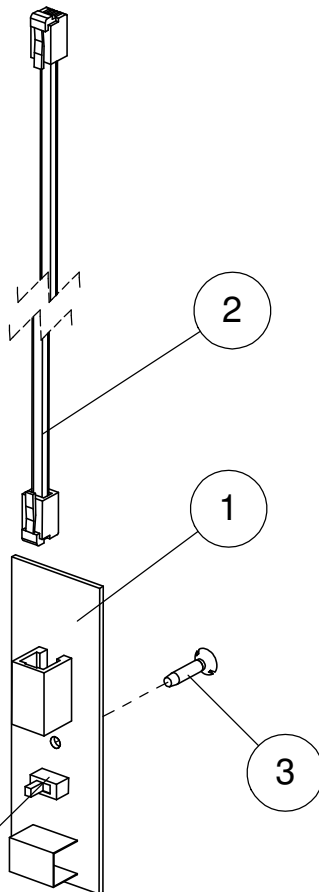
C

B

B

A

A



Before assembling into the light tube set the switch to point at the opposite panel.
Ennen asennusta vyöhykenäyttöprofiiliin aseta kytkin osoittamaan vastakkaista paneelia kohti.

YLEISTOLERANSSIT TOLERANCES
STANDARDIT STANDARDS

AINE MATERIAL / STANDARDI STANDARD

/

PINTAKÄSITTELY SURFACE TREATMENT



SUHDE SCALE

1:2

A4

MASSA MASS

VÄRI COLOR

TUOTE PRODUCT

Metor

SUUNN. DESIGNED / PVM DATE

MVu / 8.10.2007

MCRS 5159 Counter receiver set

3D-TIEDOSTO LIITTYY
3D-FILE APPENDIX



TARKASTUSOHJE LIITTYY
QUALITY CONTROL APPENDIX



PIIR.NRO. DWG.NO

9100748

REV.

001

Rapiscan
systems

Author M. Loikkanen	Rev. 1.00	Code 9100 705-4VE
Approved	Date 25.3.2008	Document
Product M 300 P		Archives M 300 P
Title OPERATIONAL DESCRIPTION MCRU 5198		

COUNTER RECEIVER UNIT, MCRU 5198

1 GENERAL

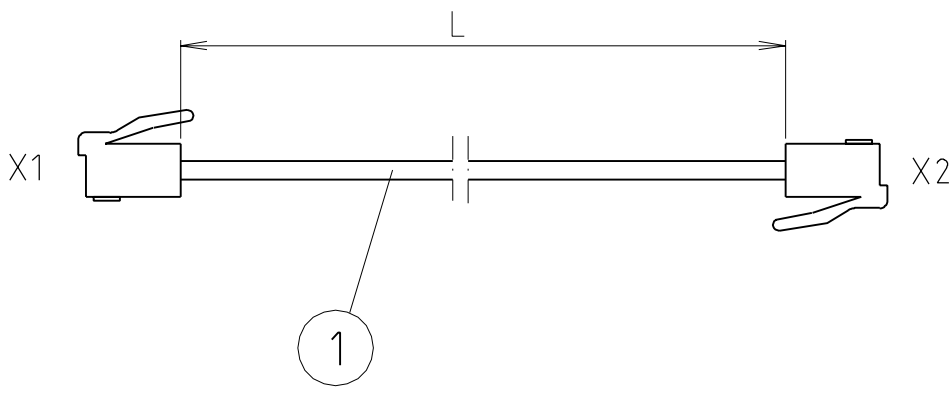
The MCRU consists of two infrared receivers, IR shield, switch, buffer and voltage regulator.

2 OPERATIONAL DESCRIPTION

The receivers point to opposite directions. The one to be used can be selected with a switch to enable assembly on each side of the RX coil panel.

Receivers are covered by a grounded metal shield to prevent stray light and EMI from disturbing their operation.

4		3		2		1	
REV.	MUUTOKSET REVISIONS			PVM DATE	PIIRT. DRAWN	HYV. APPR.	



X1		X2	
1		1	
2		2	
3		3	
4		4	

OSA ITEM		OSAN NIMI, MITAT, MITTASTD., AINE, AINESTD. DESCRIPTION		PIIR.N:O TAKO CODE		KPL QTY	
YLEISTOLERANSSI TOLERANCES				SUUNN. DESIGNED	PIIRT. DRAWN		
SUHDE SCALE		LIITTY NEXT ASSY		TARK. CHECKED	HYV. APPROVED		
1:1		MCRS 5159		TUOTE PRODUCT			
		Counter Receiver cable		Metor 300 P			
				OSAL.N:O PART LIST		REV.	
				8101 187-40		01	
				PIIR.N:O CODE			
				9100 536-4KE			

Accessories and Spare Parts

Last.revision: 02

Revision updated: 14.11.2008

Version: PLANNING

Accept:

8100782 ACCESSORIES M300 P				1,000 KPL		
L. Line	Item	Dty	Description	Qty	U/M	Feat.
1	10		M300 P Battery Back-Up EU	1,000	KPL	
1	11		M300 P Battery Back-Up UK	1,000	KPL	
1	12		M300 P Battery Back-Up US	1,000	KPL	
1	20		Stabilizer Set Metor 300 Portable	1,000	kpl	
1	30	4OE	MTLS 5169 M300 P, EMD TRAFFIC LIGHT SET	1,000	KPL	
1	40	4OE	MRC5 5116 M300 REMOTE CONTROL SET	1,000	KPL	
1	50		ON-SITE KIT METOR 300 PORTABLE	1,000	KPL	
1	60		MAINTENANCE KIT METOR 300 PORTABLE	1,000	KPL	
1	70		TX MAINTENANCE COIL CABLE M300 P	1,000	KPL	
1	80		RX MAINTENANCE COIL CABLE M300 P	1,000	KPL	
1	120	4VE	MAINTENANCE MANUAL METOR 300 P	1,000	KPL	

Last.revision: 01

Revision updated: 14.11.2008

Version: PLANNING

Accept:

8101236 ON-SITE KIT METOR 300 PORTABLE				1,000 KPL		
L. Line	Item	Dty	Description	Qty	U/M	Feat.
1	10		TX COIL CABLE M300 P	1,000	KPL	
1	20		RX COIL CABLE M300 P	1,000	KPL	
1	30		ETHERNET CABLE CAT-5 RJ45 0.5m UTP GREY OR BEIGE	1,000	KPL	
1	40		HAND SCREW M10x100 TN62	4,000	KPL	
1	50		COMPRESSION LATCH SOUTHCO 62-42-151-3	1,000	KPL	
1	60	4ME	SLEEVE GASKET M300 P	4,000	kpl	
1	70	4ME	UPPER CONNECTOR CUP FRONT GASKET M300 P	2,000	KPL	

Last.revision: 01

Revision updated: 14.11.2008

Version: PLANNING

Accept:

8101237 MAINTENANCE KIT METOR 300 PORTABLE				1,000 KPL		
L. Line	Item	Dty	Description	Qty	U/M	Feat.
1	10		ON-SITE KIT METOR 300 PORTABLE	1,000	KPL	
1	20	8100767 4OE	MELS 5144 M300 P ELECTRONICS SET	1,000	KPL	
1	30	8100780 4OE	MCDS 5155 M300 P CONTROL AND DISPLAY SET	1,000	KPL	
1	40	8100777 4OE	MZDS 5157 ZONE DISPLAY SET M300 P	1,000	KPL	
1	50	8100802 4OE	MCRS 5159 M300 P COUNTER RESEIVER SET	1,000	KPL	
1	60	8101250	MTXU 5223 TRANSMITTER UNIT	1,000	KPL	
1	70	8101251	MRXU 5224 RECEIVER UNIT	1,000	KPL	

Error Messages and Troubleshooting

Author J Niemi / J.Tykkyläinen	Rev. 01	Code 9100824
Approved	Date 15.1.2009	Document
Product Metor 300 Portable	Archives	
Title FAULT TRACING AND ERROR MESSAGES		

1 FAULT TRACING

Here is listed some possible failures.

Symptom	Possible cause	Corrective action
No power to RX or TX panel	Resetable fuse F1 or F6 tripped or failed	Cycle power; check MTXU/MRXU for short circuit; replace fuse;
Traffic counter does not work, traffic lights are always red	Coil panels are not aligned vertically Photocell mounted incorrectly	Adjust distance between coil panels at bottom Rotate photocell 180 degrees
No power to MELS; fuses in the power entry module are OK	Fuse located in the power supply PCB has failed	Replace fuse with equivalent rating
Random alarming	External electromagnetic interference	Change operating frequency, relocate detector

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 extension cable is too long, Power supply failure	Try shorter extension cable Replace MDPS or MELS
SYSTEM MESSAGE: MDPU TEMP TOO LOW	Ambient temperature is too low	Wait for the Display unit to warm up
SYSTEM MESSAGE: MDPU TEMP TOO HIGH	Ambient temperature is too high, direct sunlight to display unit	Move display 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.	The Learn –button was pressed for more than five seconds	Re-set all 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	Power supply failure MCCU failure	Replace power supply Replace MCCU

SYSTEM MESSAGE: MCCU TEMP TOO LOW	Ambient temperature is too low	Wait for the electronics to warm up.
SYSTEM MESSAGE: MCCU TEMP TOO HIGH	Ambient temperature is too high. Electrical failure	Move gate to cooler place Replace MCCU.
SYSTEM MESSAGE: MCCU EEPROM INIT	Memory was corrupted.	Cycle power on the unit; verify that all parameters are correct!
SYSTEM MESSAGE: RX-CABLE FAILURE! (CABLE)	RX –cable is loose or disconnected.	Connect cable to RX –panel, replace cable
SYSTEM MESSAGE: TX-CABLE FAILURE!	TX –cable is loose or disconnected.	Connect cable to TX –panel, Replace cable
SYSTEM MESSAGE: RECEIVER FAILURE X! (X is channel #)	RX Coil failure RX Cable failure Electrical failure	Check RX coil resistancies Replace RX 1 or 2 cable Replace MSDU, MCCU or MRXU
SYSTEM MESSAGE: TX X FAILURE! (X is channel #)	TX Coil failure TX Cable failure Electrical failure	Check TX coil resistancies Replace TX cable Replace MCCU or MTXU
SYSTEM FPGA NOT RESPONDING!	Electronics failure	Cycle power, Replace MCCU
OPERATION FAILED: NO REPLY FROM MCCU	Display unit cannot communicate with electronics, MCCU failure MDPS failure	Verify that display unit cable is connected properly; Replace Display Unit cable Replace MCCU Replace MDPS
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 MELS MCCU failure MDPS failure	Check MDPU cable, cycle power, Replace MCCU Replace MDPS
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 MCCU
NO REPLY FROM MDPU!	Display unit cannot communicate with electronics, MCCU failure MDPS failure	Verify that display unit cable is connected properly; Replace Display Unit cable Replace MCCU Replace MDPS
WARNING!: POWER LOSS!	Power cord disconnected or unit switched OFF (Power Guard was ON)	Press ‘C’ to shutdown or connect power cord to AC.

3 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	<i>Calibration value was too low</i>	
137	<i>Calibration value was too high</i>	
138	Not in use	
139	Not in use	
140	I2C bus collision	A component connected to I2C has failed
141	No ACK from I2C bus	A component connected to I2C has failed
142	I2C timeout error	A component connected to I2C has failed
143	Invalid command from I2C	A component connected to I2C has failed
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!	MRCU error
151	Error during page read!	MRCU error
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!	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!	MRCU error

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	Not in use	
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	Not in use	
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!	MDPS didn't response to MCCU alive queries within 5 seconds
197	MetorNet address illegal value	Illegal value for parameter
198	MetorNet readonly 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	Invalid parameter value	MCCU standby mode
209	Invalid parameter value	Compensate value
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

Revision History

REVISION HISTORY

Rev. 02, 15.01.009 / TV

- Chapter "Error Messages and Troubleshooting" added.
- Document revisions updated.

Rev. 01, 24.11.2008

- First revision.