BRU3 Mechanical Design

Contents

1 Hardware Description

1.1 Introduction

This section describes the hardware units included in the Base Radio Unit BRU3.

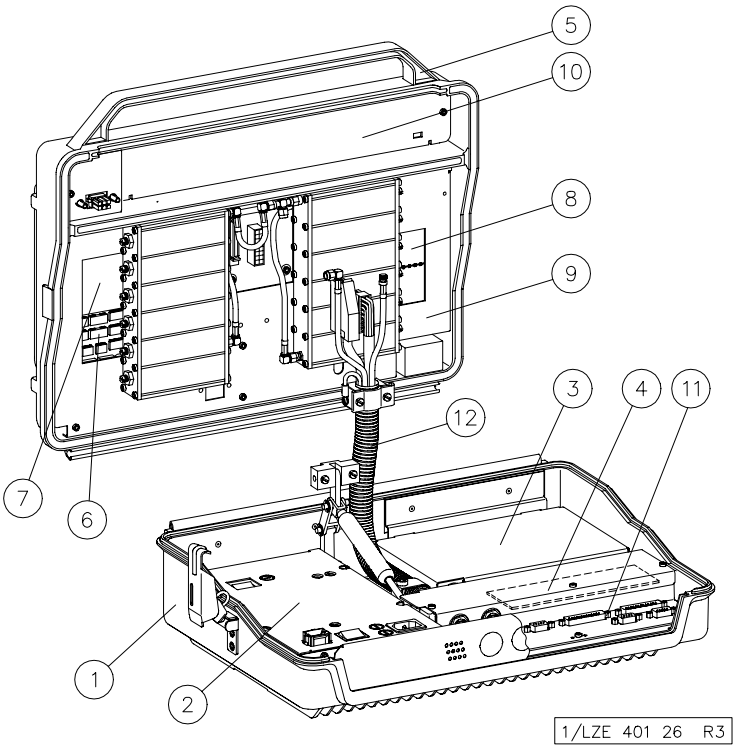
The section is not intended to be used as a service handbook, but it gives the user a good knowledge of the hardware structure of the Base Radio Unit.

2 Base Radio Unit 3 - BRU3

Designation	Frequency band
BRU39xx	900 MHz
BRU38xx	800 MHz
BRU34xx	400 MHz

For a list of all frequency bands, please refer to the *Introduction and Product Specification* section in the *BRU3 - General* module.

Design



Pos	Included unit	Art.No.		
		39xx	38xx	34xx
The BRU3 consists of two main mechanical parts:				
(1)	FBF - FE Case Bottom Frame	SXKA 138 0054/2	SXKA 138 0054/2	SXKA 138 0054
(5)	FTF - FE Case Top Frame	SXKA 138 0053/2	SXKA 138 0053/2	SXKA 138 0053
The FBF includes:				
(11)	FNB - FE Connection Board	ROAA 219 713	ROAA 219 713	ROAA 219 713
(2)	FPU - FE Power Supply Unit	BMKA 071 003/3	BMKA 071 003/3	BMKA 071 003/1
(3)	FBU - FE Battery Unit	BKBA 071 001/1	BKBA 071 001/1	BKBA 071 001/1
(4)	FAB - FE Adaptation Board	ROAA 219 714/1	ROAA 219 714/6	ROAA 219 714/n
n: Please refer to respective variant under *2.6 FE Adaptation Board - FAB* in this section.				
The FTF is hinged to the bottom part and includes:				
(6)	FCB - FE Computer Board	ROAA 219 711	ROAA 219 711	ROAA 219 711
(7)	FMB - FE Modem Board	ROAA 219 712	ROAA 219 712	ROAA 219 712
(8)	FRB - FE Radio Board	ROA 117 2005 or ROA 117 9842/1	ROA 117 9842/3	ROA 117 2015/n
(9)	FFM - FE Filter Module	KRF 201 xxx/m	KRF 201 xxx/m	KRF 201 xxx/m
(10)	FHU - FE Heating Unit	BPCA 801 01/1	BPCA 801 01/1	BPC 105 03/1
(11)	FCS - FE Cable Set	TSRA 909 0105	TSRA 909 0105	TSRA 909 0105
n: Please refer to respective variant under *2.7 FE Radio Board - FRB* in this section				
m: Please refer to respective variant under *2.8 FE Filter Module - FFM* in this section.				

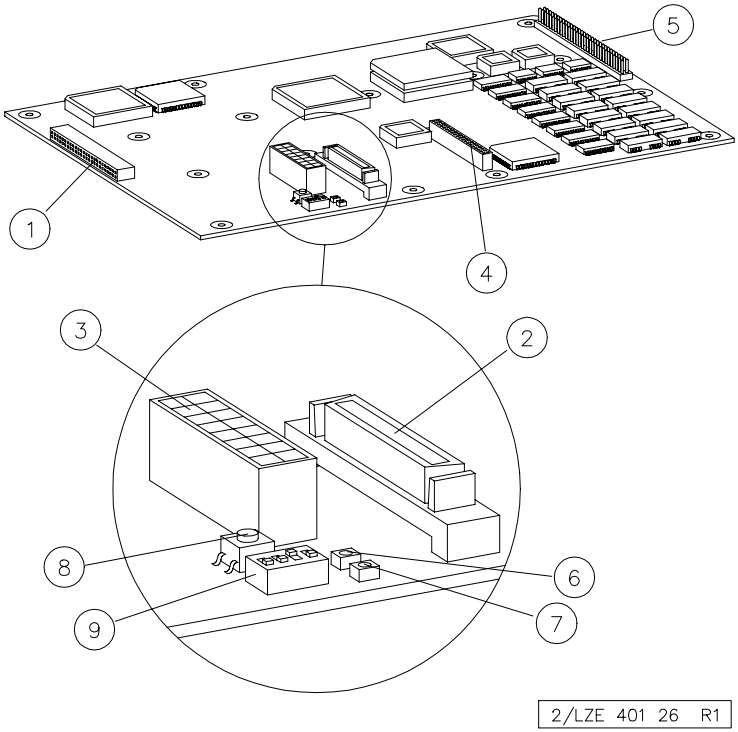
Dimensions	38xx and 39xx	34xx
Width:	472 mm	472 mm
Height:	345 mm	345 mm
Depth:	202 mm	202 mm
Weight:	18 kg	19 kg

Note! For technical data on the BRU3, please refer to the *Introduction and Product Specification* section in the *BRU3 - General* module.

2.1 FE Computer Board - FCB

Designation			**Article number**
FE Computer Board, FCB			ROAA 219 711
Connectors			
Pos.	**Connector**		**Connection**
(1)	P1		Radio Connector
(2)	P2		Connection Board Connector
(3)	P3		Power Connector
(4)	P4		Modem Connector
(5)	P5		Expansion Connector
LEDs			
Pos.	**LED**	**Colour**	**Function**
(6)	Watchdog alarm	Red	Lit when the Watchdog is released
(7)	Status indicator	Yellow	Lit when the processor is operating OK
Switches			
Pos.	**Type**		**Function**
(8)	SW 1, Press button		Reset button
(9)	SW 2, DIP-Switch, 4-pole		Selection between telephone modem (not applicable in some BRU3 variants), balanced serial interface and unbalanced serial interface

Design



2.2 FE Power Supply Unit - FPU

Pos.	Designation	Article number
	34xx: FE Power Supply Unit; FPU	BMKA 071 003/1
	38xx: FE Power Supply Unit; FPU	BMKA 071 003/3
	39xx: FE Power Supply Unit; FPU	BMKA 071 002/3
(1)	34xx: FE Power Supply Board, FPB	ROAA 117 2165
(1)	38xx: FE Power Supply Board, FPB	ROAA 117 2165
(1)	39xx: FE Power Supply Board, FPB	ROAA 219 710

Connections

Pos.	Connector	Connection
(2)	J1, Mains input connector	120/230 V AC input to the FPU
(3)	J2, Power output connector	120/230 V AC power output to the FHU
(4)	J3, Output connector	Power output to the FBU

Switches

Pos.	Switch	Function
(5)	S1, Main Switch	AC Power supply ON/OFF switch
(6)	S2, Battery Switch	Battery backup power supply ON/OFF switch

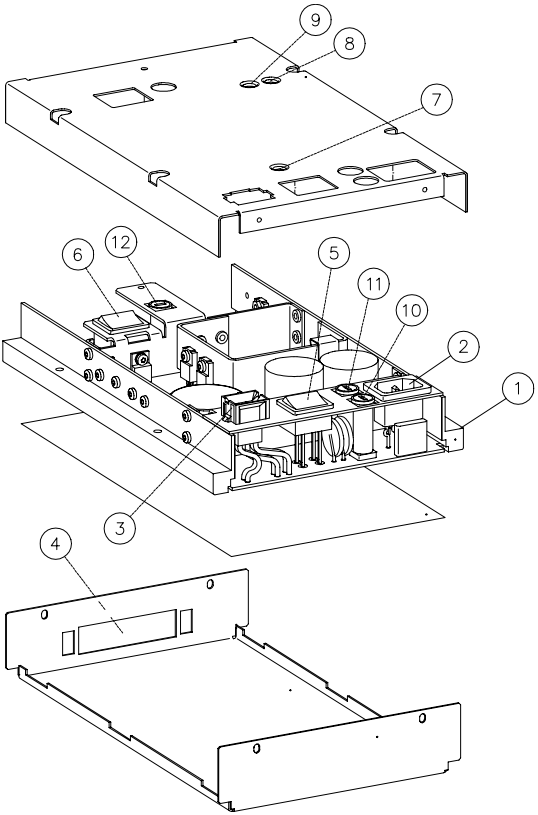
LEDs

Pos.	LED	Colour	Function
(7)	L1, Mains	Yellow	Incoming 120/230 AC OK
(8)	L2, +14V	Yellow	+14 V DC to the radio unit and DC/DC modules OK
(9)	L3, Error	Red	Sum alarm, unspecified power failure in FPU

Fuses

Pos.	Fuse	Type	Function
(10)	F1	6.3AT, Glass fuse, 5*20 mm	Power to FHU
(11)	F2	6.3AT, Glass fuse, 5*20 mm	Power to FHU and FPB
(12)	F3	6.3AF, Glass fuse, 5*20 mm	Power to/from FBU

Design



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2.3 FE Battery Unit 4Ah - FBU

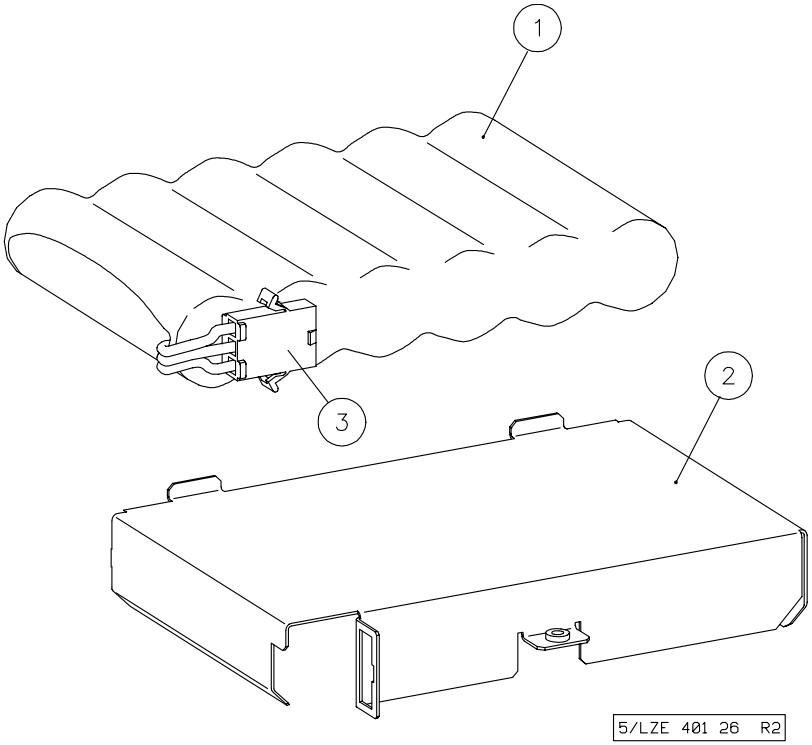
Designation	**Article number**
FBU - FE Battery Unit	BKBA 071 001/1

Included units		**Article number**
Pos.	**Designation**	
(1)	FE Battery Packet	BKCA 509 0001/01
(2)	Battery cassette	SXAA 138 0426

Connections

Pos.	**Connector**	**Type**	**Connection**
(3)	Power supply	Molex	Power Connection

Design



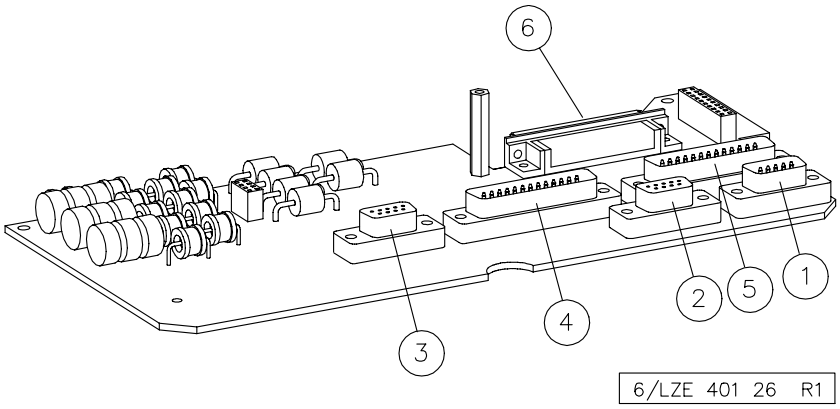
2.4 FE Connection Board - FNB

Designation	**Article number**
FNB - FE Connection Board	ROAA 219 713

Connections

Pos.	**Connector**	**Type**
(1)	P1, CONSOLE Port	9-pole, DSUB Male
(2)	P2, ALARM Port	9-pole, DSUB Female
(3)	P3, TEL Connection	9-pole, DSUB Female
(4)	P4, RS232-MOX Port	25-pole, DSUB Male
(5)	P5, RS422-MOX Port	25-pole, DSUB Male
(6)	P6, Connection FNB - FCB	

Design



Pin ID

P1, CONSOLE Port

Pin	Signal	Interface/function
1	GND	Chassis GND
2	RXB	RS232 / Receive data to FNB
3	TXB	RS232 / Transmit data from FNB
4	“+12V”	RS232 / “high” signal
5	SGND	12ohm rel. chassis GND / Signal GND
6	-	
7	BOOT	RS232 / State signal to FNB
8	-	
9	-	

P2, ALARM Port

Pin	Signal	Interface/function
1	VCC_EXT	+12V, Max. 40mA, serial res. 100ohm / Port 1
2	AL1+	Max. 10mA, serial resistance 8kohm / Port 1
3	AL1-	Max. 10mA, serial resistance 8kohm / Port 1
4	GND_EXT	0V, serial resistance 100ohm / Port 1
5	GND	Chassis GND
6	VCC_EXT	+12V, max. 40mA, serial resistance 100ohm / Port 2
7	AL2+	Max. 10mA, serial resistance 8kohm / Port 2
8	AL2-	Max. 10mA, serial resistance 8kohm / Port 2
9	GND_EXT	0V, serial resistance 100ohm / Port 2

P3, TEL Connection

Pin	Signal	Interface/function
1	LRA	4-wire leased line Rx part A
2	LRB	4-wire leased line Rx part B
3	LT/2WA	4-wire leased line Tx part A or 2-wire part A
4	LT/2WB	4-wire leased line Tx part B or 2-wire part B
5	-	

Pin	Signal	Interface/function
6	SWA	2-wire switched line part A
7	SWB	2-wire switched line part B
8	-	
9	-	

P4, RS232-MOX Port

Pin	Signal	Interface/function
1	GND	Chassis GND
2	TXA	RS232 / Transmit data from FNB
3	RXA	RS232 / Receive data to FNB
4	RTS	RS232 / Request to send from FNB
5	-	
6	-	
7	SGND	12ohm rel. chassis GND / Signal GND
8	DCD	RS232 / Data carrier to FNB
9	-	
10	-	
11	-	
12	-	
13	-	
14	-	
15	TC	RS232 / Transmit clock 114 to FNB
16	-	
17	RC	RS232 / Receive clock to FNB
18	-	
19	-	
20	DTR	RS232 / Data terminal ready form FNB
21	-	
22	-	
23	-	
24	ETC	RS232 / Transmit clock 113 from FNB
25	-	

P5, RS422-MOX Port

Pin	Signal	Interface/function
1	GND	Chassis GN
2	TX_A	RS422 / Transmit data inverted from FNB
3	RX_A	RS422 / Receive data inverted to FNB
4	RTS_A	RS422 / Request to send inverted from FNB
5	-	
6	-	
7	SGND	12ohm rel. chassis GND / signal GND
8	DCD_A	RS422 / Data carrier detect inverted to FNB
9	DCD_B	RS422 / Data carrier detect not inverted to FNB
10	-	
11	TX_B	RS422 / Transmit data not inverted from FNB
12	RX_B	RS422 / Receive data not inverted to FNB
13	RTS_B	RS422 / Request to send not inverted from FNB
14	TC_B	RS422 / Transmit clock 114 not inverted to FNB
15	TC_A	RS422 / Transmit clock 114 inverted to FNB
16	-	
17	RC_A	RS422 / Receive clock inverted to FNB
18	-	
19	RC_B	RS422 / Receive clock not inverted to FNB
20	DTR_A	RS422 / Data terminal ready inverted from FNB
21	-	
22	DTR_B	RS422 / Data terminal ready not inverted
23	ETC_B	RS422 / Transmit clock 113 not inverted to FNB
24	ETC_A	RS422 / Transmit clock 113 inverted to FNB
25	-	

2.5 FE Modem Board - FMB

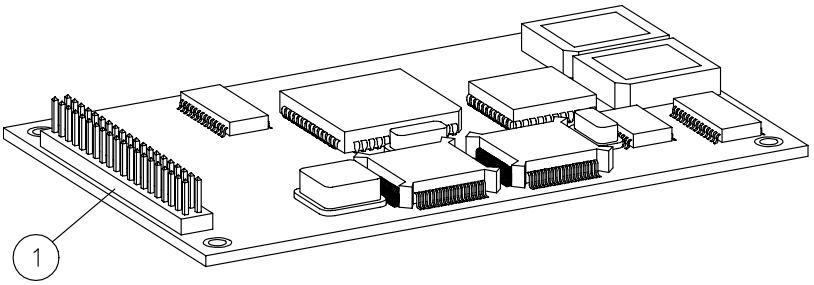
The modem equipment consists of two separate boards:

Designation	**Article number**
FMB - FE Modem Board	ROAA 219 712

Connections

Pos.	**Connector**	**Connection**
(1)	P1, FMB interface Connector	FMB interface towards the FAB

Design



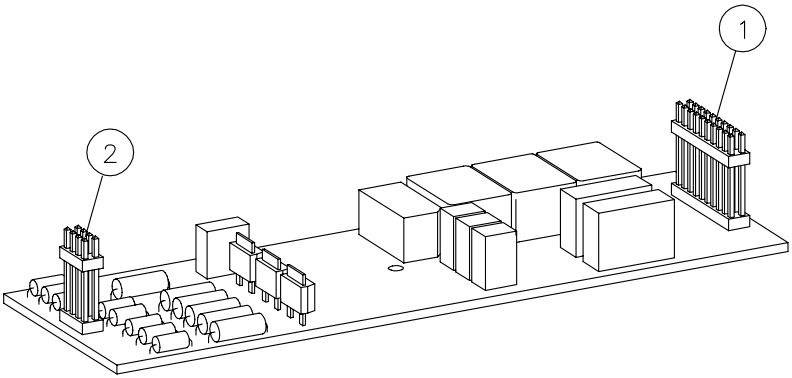
2.6 FE Adaptation Board - FAB

Designation		Article Number
FAB - FE Adaptation Board	39xx	ROAA 219 714/1
	38xx	ROAA 219 714/6
	34xx	ROAA 219 714/2
	34xx	ROAA 219 714/3
	34xx	ROAA 219 714/5

Connections

Pos.	Connector	Connection
(1)	P1, Modem connector	Modem connection to FMB
(2)	P2, Telephone connector	Telephone connection

Design



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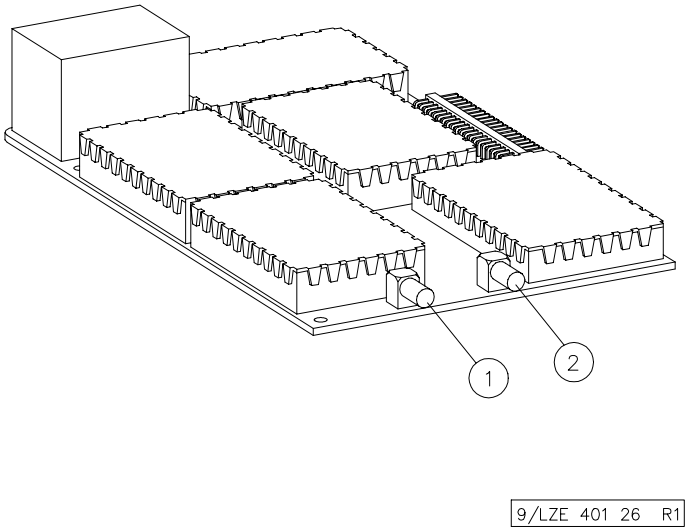
2.7 FE Radio Board - FRB

Designation		Article Number
FRB - FE Radio Board	39xx	ROA 117 2005
	39xx	ROA 117 9842/1
	38xx	ROA 117 9842/3
	34xx	ROA 117 2015/1
	34xx	ROA 117 2015/2
	34xx	ROA 117 2015/3

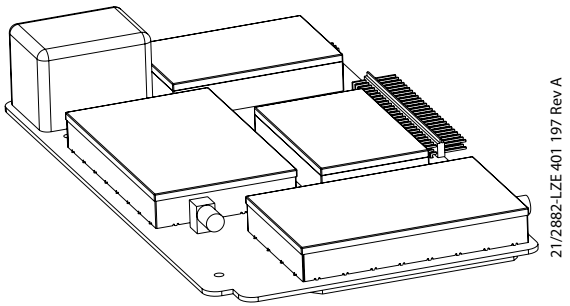
Connections

Pos.	Connector	Type	Connection
(1)	RX	Coax	Antenna input
(2)	TX	Coax	Antenna output

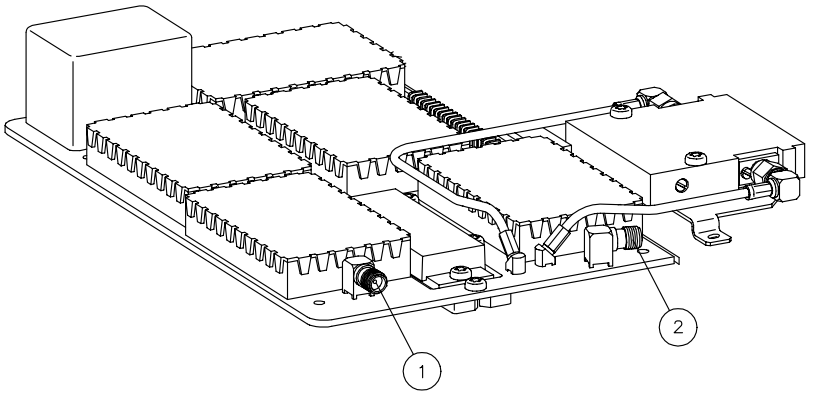
Design, 39xx ROA 117 2005



Design, 38xx ROA 117 9842/3, 39xx ROA 117 9842/1



Design, 34xx ROA 117 2015/2



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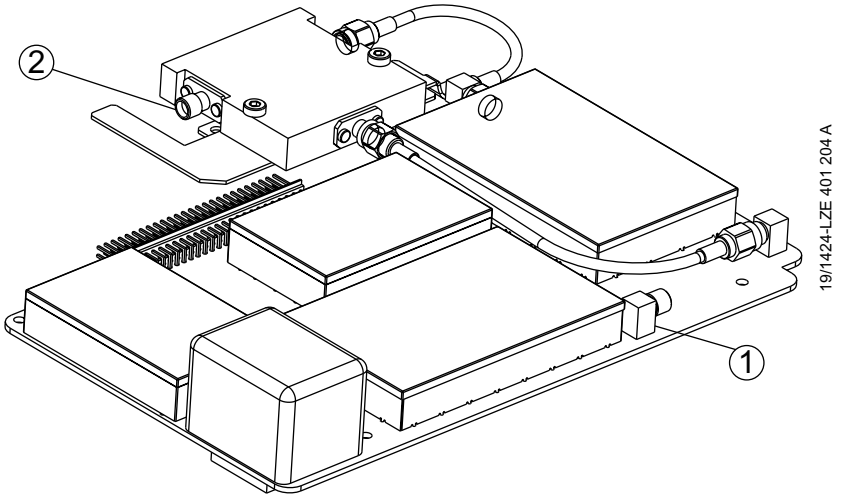
Design, 34xx ROA 117 8896



19/1424-LZE 401 204 A

2.8 FE Filter Module - FFM

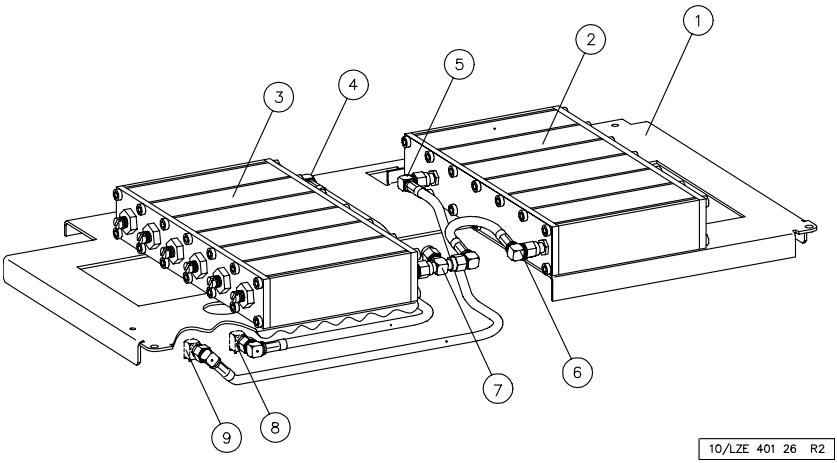
Designation		Article Number
FFM - FE Filter Module	39xx-D	KRF 201 129/1
	39xx-T	KRF 201 165/1
	38xx-D	KRF 102 137/1
	34xx-T	KRF 201 124/1
	34xx-T	KRF 201 124/2
	34xx-T	KRF 201 124/3
	34xx-T	KRF 201 124/4
	34xx-T	KRF 201 124/5
	34xx-T	KRF 201 124/7
	34xx-D	KRF 201 164/1
	34xx-D	KRF 201 164/2
	34xx-D	KRF 201 164/3
	34xx-D	KRF 201 164/4
	34xx-D	KRF 201 164/5
	34xx-D	KRF 201 164/7

Included Units

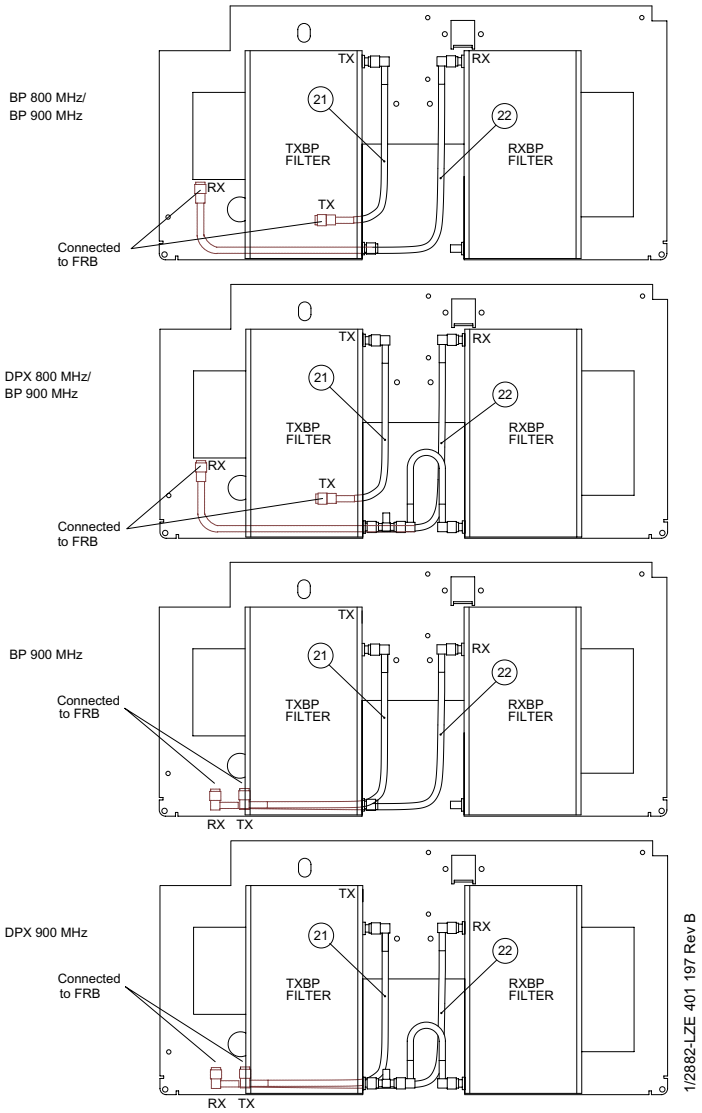
Pos.	Designation
(1)	Mounting plate
(2)	RXBP-Filter (Duplex)
(3)	TXBP-Filter (Duplex)

Pos.	Connector	Type	Connection
(4)	RX	Coax	Antenna input to FRB
(5)	TX	Coax	Antenna output to FRB
(6)	RX	Coax	Antenna output
(7)	RX/TX	Coax	Antenna connector

Design

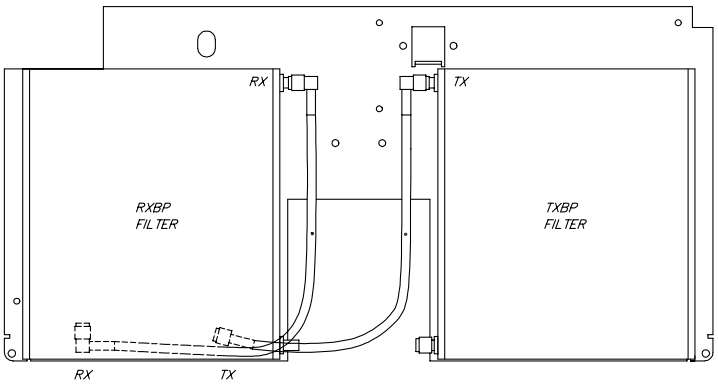


Design

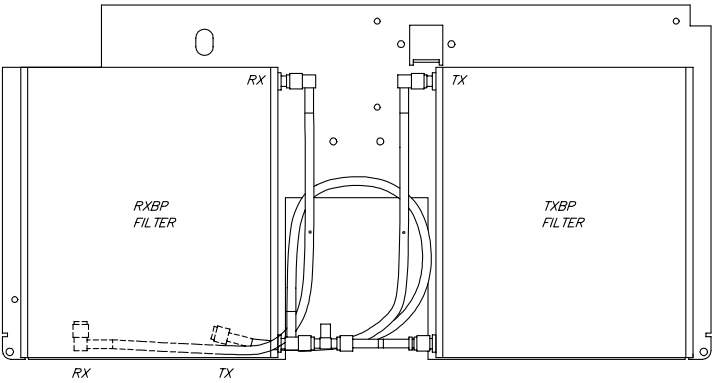

BP 800 MHz/
BP 900 MHz
TX
RX
21
22
TXBP
FILTER
RXBP
FILTER
RX
TX
Connected
to FRB
DPX 800 MHz/
BP 900 MHz
TX
RX
21
22
TXBP
FILTER
RXBP
FILTER
RX
TX
Connected
to FRB
BP 900 MHz
TX
RX
21
22
Connected
to FRB
TXBP
FILTER
RXBP
FILTER
RX TX
DPX 900 MHz
TX
RX
21
22
Connected
to FRB
TXBP
FILTER
RXBP
FILTER
RX TX
1/2882-LZE 401 197 Rev B

Design

BP 400 MHz



DPX 400 MHz



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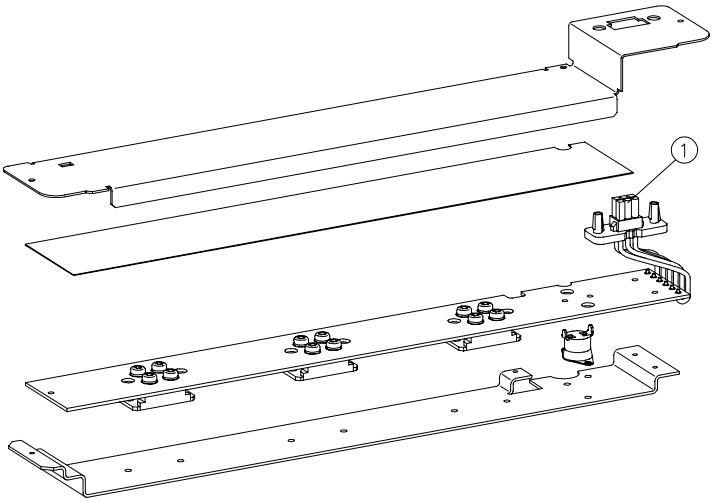
2.9 FE Heating Unit - FHU

Designation	Article number
FE Heating Unit, FHU	BPCA 801 01/1 (120/230 V AC, 300 W) BPC 105 02 (120/230 V AC,600 W) BPC 105 03/1 (230 V AC,600 W) BPC 105 03/2 (120 V AC,600 W)

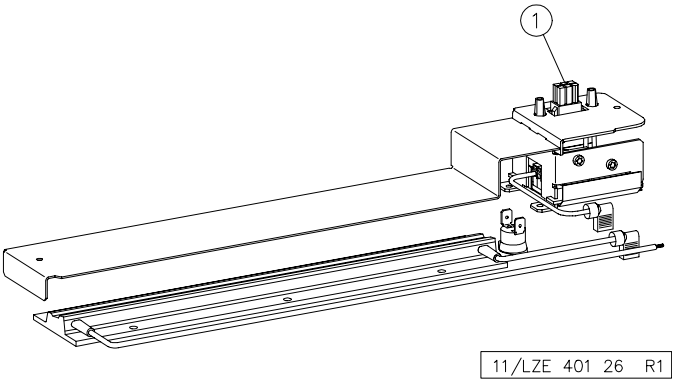
Connector

Pos.	Designation
(1)	Input Connector for Heater

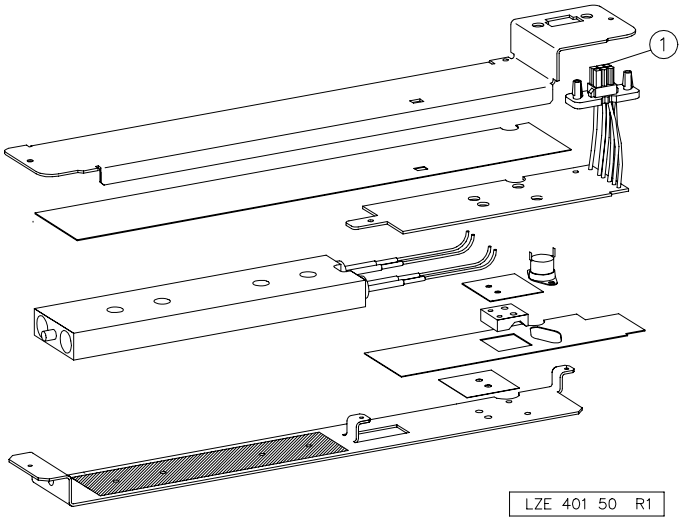
Design FHB - BPC 105 02



Design FHB - BPCA 801 01/1



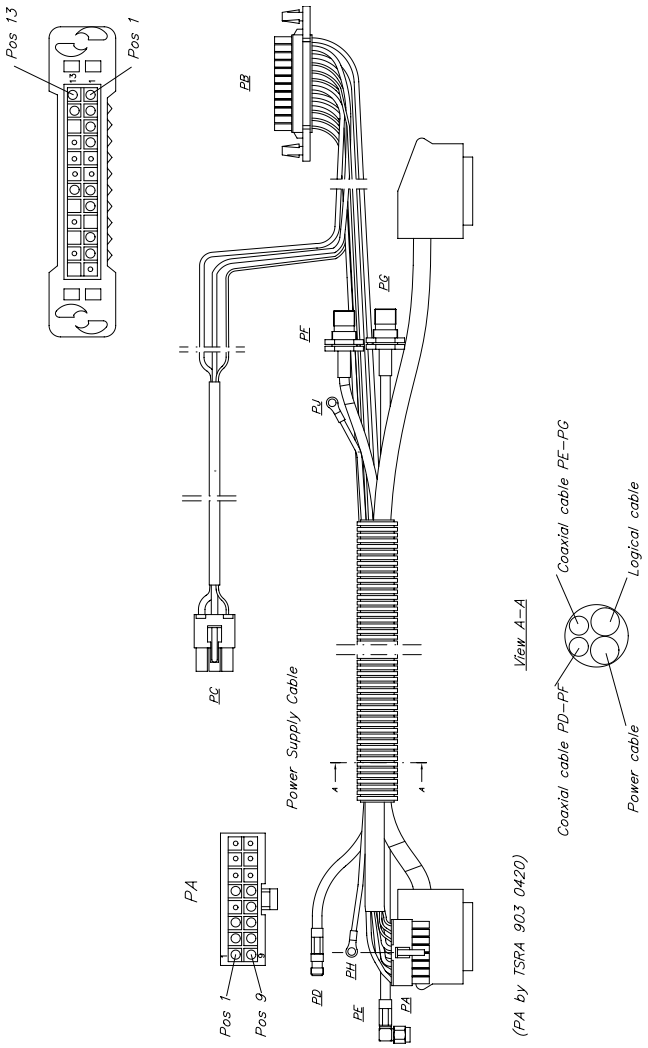
Design FHB - BPC 105 03/1 and /2



2.10 Cables

2.10.1 FE Cable Set - FCS, TSRA 909 0105

FE Computer Board, FCB - FE Power Supply Board, FPB - FE Battery Unit, FBU



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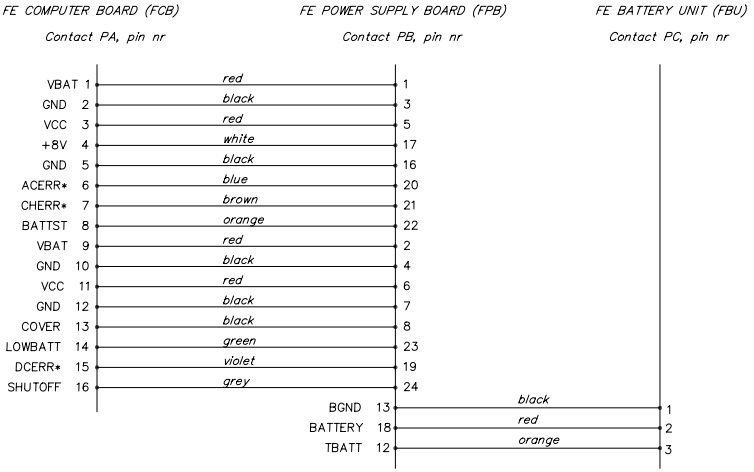

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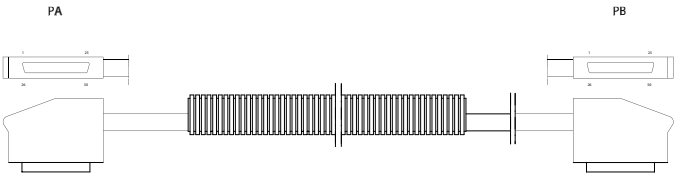
2.10.2 FE Logic Cable, TSRA 903 0420

FE Computer Board, FCB - FE Connection Board, FNB



FE COMPUTER BOARD (FCB)

Contact PA, pin nr		Contact PB, pin nr
	white	
SWT/RA 1	brown	1
SWT/RB 2	green	2
LLTX/2WA 3	yellow	3
LLTX/SWB 4	grey	4
LLRXA 5	pink	5
LLRXB 6	blue	6
RLC1 7	red	7
RLC2 8	black	8
GND 9	violet	9
GND 10	grey-pink	10
D_TXD 11	red-blue	11
D_RXD 12	white-green	12
D_RTS* 13	brown-green	13
D_DCD* 14	white-yellow	14
RS232_EN* 15	yellow-brown	15
RS422_EN* 16	white-grey	16
VCC 17	grey-brown	17
VCC 18	white-pink	18
CND 19	pink-brown	19
GND 20	white-blue	20
VCC 21	brown-blue	21
BOOT* 22	white-red	22
TXDB 23	brown-red	23
RXDB 24	white-black	24
GND 25		25

FE CONNECTION BOARD (FNB)

Contact PA, pin nr		Contact PB, pin nr
	grey-green	
AGND 26	yellow-grey	26
AGND 27	pink-green	27
CL 28	yellow-pink	28
CC1 29	green-blue	29
AGND 30	yellow-blue	30
AGND 31	green-red	31
RLC3 32	yellow-red	32
RING 33	green-black	33
VCC 34	yellow-black	34
VCC 35	grey-blue	35
D_TC113 36	pink-blue	36
GND 37	grey-red	37
D_TC114 38	pink-red	38
GND 39	grey-black	39
D_RC 40	pink-black	40
GND 41	blue-black	41
GND 42	red-black	42
VCC 43	white	43
VCC 44	brown	44
VCC 45	green	45
GND 46	yellow	46
GND 47	grey	47
EXT_ALM1* 48	pink	48
EXT_ALM2* 49	brown-black	49
GND 50		50

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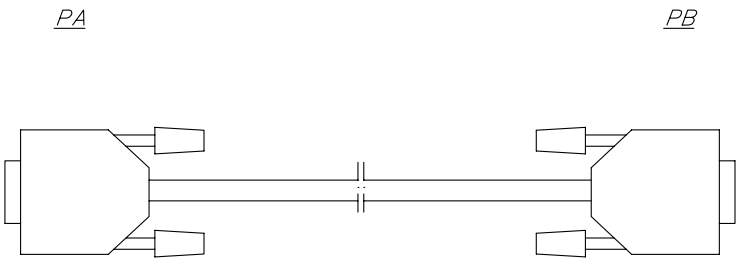
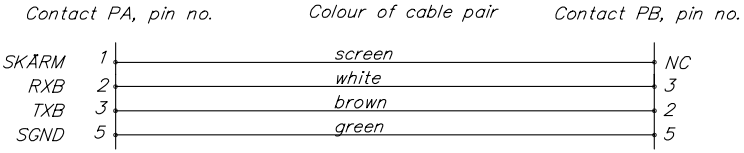
2.10.3 FE Console Cable, TSRA 902 0190



Connection Circuit



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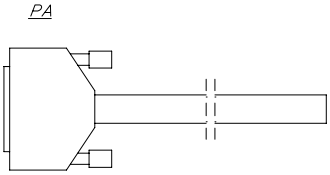
2.10.4 FE Modem Connection Cable RS 232, TSRA 904 63



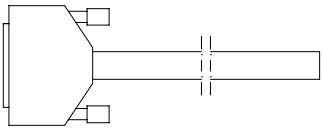
Connection Circuit

Contact PA, pin no.		Colour of cable pair
SCREEN	1	screen
TXA	2	brown
SGND	7	black
RXA	3	red
NC		black
RTS	4	orange
DCD	8	black
TC	15	yellow
NC		black
RC	17	green
NC		black
DTR	20	blue
ETC	24	black

17/LZE 401 26 R2

2.10.5 FE Modem Connection Cable RS 422, TSRA 904 64

PA



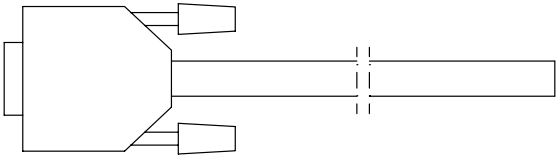
Connection Circuit

Contact	PA, pin no.	Colour of cable pair
SKÄRM	1	screen
TX−	2	brown
TX+	11	black
RX−	3	red
RX+	12	black
RTS−	4	orange
RTS+	13	black
DCD−	8	yellow
DCD+	9	black
TC+	14	green
TC−	15	black
RC−	17	blue
RC+	19	black
DTR−	20	violet
DTR+	22	black
ETC+	23	grey
ETC−	24	black
SGND	7	white
	NC	black

18/LZE 401 26 R4

2.10.6 FE Alarm Cable, TSRA 905 44

PA



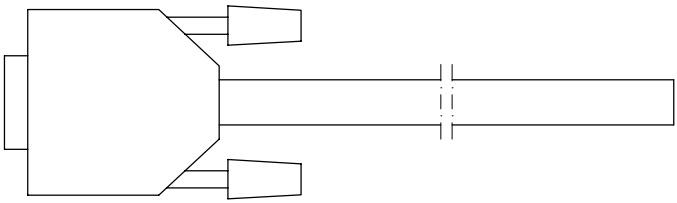
Connection Circuit

Contact PA, pin no.		Colour of cable pair
VCC_EXT	1	brown
AL1+	2	black
AL1−	3	red
GND_EXT	4	black
SKÄRM	5	screen
VCC_EXT	6	orange
AL2+	7	black
AL2−	8	yellow
GND_EXT	9	black

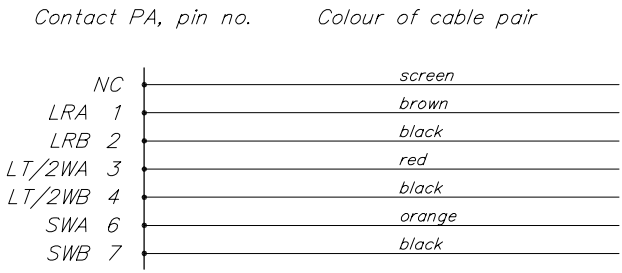
22/LZE 401 26 R1

2.10.7 FE Telephone Line Connection Cable, TSRA 905 45

PA



Connection Circuit



21/LZE 401 26 R2