Service Manual Instrument

Extension Unit

R&S® ZVAX24

1311.2509k05

ROHDE&SCHWARZ
Test and Measurement

Dear Customer,

The following abbreviations are used throughout this manual: R&S®ZVAX24 is abbreviated as R&S ZVAX24

Tabbed Divider Overview

Index

Contents of the Manuals for the R&S ZVAX24 Extension Unit

Service manual - instrument

This service manual for the instrument contains information on checking specs, instrument alignment, repairs and troubleshooting. The service manual – instrument contains all the information you will need to repair the instrument by means of board replacement.

The service manual has four chapters and an annex (Chapter 5) which contains the instrument documentation:

Chapter 1 Contains all the information you will need to check specs and lists the test equipment required.

Chapter 2 Describes the manual alignment of the frequency and DC measurement accuracy, automatic alignment after board replacement and also system error calibration.

Chapter 3 Describes the instrument design and simple repair and troubleshooting strategies. Board replacement plays a key role.

Chapter 4 Contains information on expansions and modifications achieved by updating instrument software and by retrofitting options.

Chapter 5 Describes how to return the instrument and order spare parts. It also contains spare parts lists and exploded diagrams of the instrument.

Operating manual

The operating manual contains all the information you will need about the technical characteristics of the instrument, putting the instrument into operation, the basic operating procedures, controls and displays, menu operation and remote control.

By way of an introduction, typical measurement tasks are explained using menu screen-shots and program examples.

The operating manual also contains notes on maintenance and explains how to troubleshoot faults using the warnings and error messages output by the instrument.

Table of Contents - Chapter 1 "Performance Test"

1 Performance Test

Test Instructions

To ensure that rated specifications are maintained, the following preparations must be made prior to checking the rated characteristics:

- Unless otherwise specified it is assumed that the R&S ZVAX24 is connected to the R&S ZVA24 USB cable and Cascade (RJ 45) cable.
- Rated specifications of the R&S ZVAX24 are tested after a warm-up time of at least 1 hour of R&S ZVA24 and R&S ZVAX24.
- S-Parameters are measured after performing calibrations of the R&S ZVA with test cables at test ports 1 and 2. This calibration is done with the following settings:

  - [**PRESET**]
  - [**START** : 10 MHz]
  - [**STOP** : 24 GHz]
  - [**POWER BW AVG** : Meas Bandwidth : 1 kHz]

  If test port 2 is female, connect adapter 3.5 mm f-f (item item 4) to the male cable connector

Calibration cal 1 for port 1 source path (If option R&S ZVAX-B211, -B251, -B271 or -B291 is installed)				
R&S ZVAX-B211 installed	Y		N	
R&S ZVAX-B291 installed	Y	N	Y	N
Required calibration for test ports 1, 2	m-f, m-m	m-m	m-f, m-m	m-m

Calibration cal 3 for port 3 source path (If option R&S ZVAX-B253 or -B273 is installed)	
Required calibration for test ports 1 and 2	m-m

Calibration cal 2 for port 2 test receiver path (If option R&S ZVAX-B210, -B252, -B272 or -B292 is installed)		
R&S ZVAX-B292 installed	Y	N
Required calibration for test ports 1 and 2	m-f, m-m	m-m

  Multiple use of calibrations is possible, cal 1, 2 and 3 may be identical.In the worst case two different calibrations must be performed (m-m + m-f).

  Save calibrations in the cal pool [**MODE** : Cal Manager…].
- Additional uncertainties introduced by the measurement equipment must be taken into account when checking the rated values
- Values specified in data sheet are guaranteed limits
- Instrument settings required for the measurements are given as follows:

  [**<KEY>**] Press a key on the front panel, e.g. **[SPAN]**
  [<SOFTKEY>] Press a softkey, e.g. [MARKER -> PEAK]
  [<nn unit>] Enter a value and terminate by entering the unit, e.g. [12 kHz]
  Successive entries are separated by [:], e.g. [**BW** : MANUAL RES BW : 3 kHz]

Test Equipment and Accessories

Item	Type of equipment	Recommended characteristics or features	Recommended model	R&S Order No.	Application
1.	VNA	10 MHz to 24 GHz	R&S ZVA24 (required!) **In order to make the pulse gene-rator of the R&S ZVA24 (option R&S ZVA-K27) operational, it must have a new motherboard, order # 1305.6470.02. For older R&S ZVAs there is an upgrade kit available, order # 1305.6558.02**	1145.1110.2x	All tests
		with option Pulsed Measurements	R&S R&S ZVA-K7	1164.1511.02	
		with option Internal Pulse Generators	R&S R&S ZVA-K27	1164.1892.02	
2.	2 test cables 3.5 mm male	low loss, good match, high phase stability	R&S ZV-Z193	1306.4520.xx	All tests
3.	Calibration kit 3.5 mm or calibration unit 3.5 mm		R&S ZV-Z32 or R&S ZV-Z52	1128.3501.02 or 1164.0521.30	All tests
4.	Adapter 3.5 mm female-female (if item 3. is a cal kit, then the adapter from the kit can be used)	10 MHz to 24 GHz, low loss, good match			All tests on source path of port 1, if option R&S ZVAX-B291 is installed, or on receiver path of port 2, if option R&S ZVAX-B292 is installed
5.	2 Termination 3.5 mm male	Match > 16 dB 10 MHz to 24 GHz		5201.1262.00	Test of option R&S ZVAX-B210, all tests on source path of port 1, if option R&S ZVAX-B291 is installed, or on receiver path of port 2, if option R&S ZVAX-B292 is installed
6.	Termination 3.5 mm female	Match > 16 dB 10 MHz to 24 GHz			Test of option R&S ZVAX-B211, if option R&S ZVAX-B291 is installed, test of option R&S ZVAX-B291 and R&S ZVAX-B292

Checking the through path transmission loss of PORT 1 source path

Only with Option R&S ZVAX-B211, -B251, -B271 or -B291

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- Only with option R&S ZVAX-B291: Adapter 3.5 mm f-f (item 4)
- Only with option R&S ZVAX-B291: Terminations 3.5 mm (item 5)

Test setup: Connect VNA test port 1 to Port 1 SOURCE IN and test port 2 to Port 1 SOURCE OUT, if option R&S ZVAX-B291 is not installed
R&S ZVAX24 Test Port 1, if option R&S ZVAX-B291 is installed
Terminate Port 1 MEAS OUT and Port 1 REF OUT, if option R&S ZVAX-B291 is installed

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 1 from cal pool*)]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 10 MHz to 8 GHz, 8 GHz to 24 GHz, 201 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21

Limits: See Performance Test Report

Uncertainty: See Performance Test Report

Checking the through path transmission loss of PORT 3 SOURCE IN to PORT 3 SOURCE OUT

Only with Option R&S ZVAX-B211, -B253 or -B273

Test equipment:
- VNA (item 1)
- Test cables (item 2)

Test setup: Connect VNA test cables to Port 3 SOURCE IN and Port 3 SOURCE OUT

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 3 from cal pool*)]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 10 MHz to 8 GHz, 8 GHz to 24 GHz, 201 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Checking the through path transmission loss of PORT 2 receiver path

Only with Option R&S ZVAX-B210, -B252, -B272 or -B292

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- Only with option R&S ZVAX-B292: Adapter 3.5 mm f-f (item 4)
- Only with option R&S ZVAX-B292: Terminations 3.5 mm m (item 5)

Test setup: Connect VNA test port 1 to Port 2 MEAS OUT and test port 2 to Port 2 MEAS IN, if option R&S ZVAX-B292 is not installed
R&S ZVAX24 Test Port 2, if option R&S ZVAX-B292 is installed
Terminate Port 1 MEAS OUT and Port 1 REF OUT, if option R&S ZVAX-B291 is installed

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 2 from cal pool*)]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 10 MHz (500 MHz) to 2 GHz, 2 GHz to 24 GHz, 201 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B210 (Port 2 Monitor): Checking the transmission loss

Only with Option R&S ZVAX-B210

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- Only with option R&S ZVAX-B292: adapter 3.5 mm f-f (item 4)
- Termination 3.5 mm m (item 5)

Test setup: Connect VNA test port 1 to Port 2 Monitor and test port 2 to Port 2 MEAS IN, if option R&S ZVAX-B292 is not installed
R&S ZVAX24 Test Port 2, if option R&S ZVAX-B292 is installed

Terminate Port 2 MEAS OUT
Terminate Port 2 SOURCE IN and Port 2 REF OUT, if option R&S ZVAX-B292 is installed

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 2 from cal pool*)]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2]
- [**Marker Funct** : Min Search]
- [**Marker** : Marker 3 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 500 MHz (700 MHz) to 8 GHz, 8 GHz to 24 GHz, 201 points

Measurement: Marker 1, Marker 2 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B211 (Combiner): Checking transmission loss and isolation

Only with Option R&S ZVAX-B211

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- Only with option R&S ZVAX-B291: adapter 3.5 mm f-f (item 4)
- Only with option R&S ZVAX-B291: Terminations 3.5 mm m (item 5)
- Only with option R&S ZVAX-B291: Termination 3.5 mm f (item 5)

Test setup: Connect VNA test port 1 to Port 1 SOURCE IN, test port 2 to
Port 1 SOURCE OUT, if option R&S ZVAX-B291 is not installed
R&S ZVAX24 Test Port 1, if option R&S ZVAX-B291 is installed
Terminate Port 3 SOURCE IN
Terminate Port 1 MEAS OUT and Port 1 REF OUT, if option R&S ZVAX-B291 is installed

Measure S21

Connect VNA test port 1 to Port 3 SOURCE IN, test port 2 to
Port 1 SOURCE OUT, if option R&S ZVAX-B291 is not installed
R&S ZVAX24 Test Port 1, if option R&S ZVAX-B291 is installed
Terminate Port 1 SOURCE IN
Terminate Port 1 MEAS OUT and Port 1 REF OUT, if option R&S ZVAX-B291 is installed

Measure S21

Connect VNA test port 1 to Port 1 SOURCE IN and test port 2 to Port 3 SOURCE IN

Terminate Port 1 Src Out, if option R&S ZVAX-B291 is not installed
Terminate R&S ZVAX24 Test Port 1, Port 1 MEAS OUT and Port 1 REF OUT, if option R&S ZVAX-B291 is installed

Measure S21 (isolation)

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 1 from cal pool*)]
- [**Mode** : R&S ZVAX Path Config : Combiner]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: Transmission loss:10 MHz to 8 GHz, 8 GHz to 24 GHz, 201 points
Isolation: 500 MHz to 24 GHz, 201 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21
(in case of isolation measurement : positive values)

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S R&S ZVAX-B211 (Combiner): Checking the reflection loss of PORT 3

Only with Option R&S ZVAX-B211

Test equipment: - VNA (item 1)
- Test cables (item 2)

Test setup: Connect VNA test port 1 to Port 3 SOURCE OUT

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 3 from cal pool*)]
- [**Mode** : R&S ZVAX Path Config : Combiner]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 10 MHz to 8 GHz, 8 GHz to 24 GHz, 201 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read return loss S11 (positive values)

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B251 (Harmonic Filter Source Port 1): Checking the transmission loss

Only with Option R&S ZVAX-B251

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- Only with option R&S ZVAX-B291: Adapter 3.5 mm f-f (item 4)
- Only with option R&S ZVAX-B291: Terminations 3.5 mm m (item 5)

Test setup: Connect VNA test port 1 to Port 1 SOURCE IN and test port 2 to Port 1 SOURCE OUT, if option R&S ZVAX-B291 is not installed
R&S ZVAX24 Test Port 1, if option R&S ZVAX-B291 is installed

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 1 from cal pool*)]
- [**Mode** : R&S ZVAX Path Config : Src 1 Harmonic Filter]
- [**Start**: 1 GHz (8 GHz)]
- [**Stop**: 8 GHz (24 GHz)]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 1 GHz to 8 GHz, 8 GHz to 24 GHz, 201 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B251 (Harmonic Filter Source Port 1): Checking the harmonic suppression

Only with Option R&S ZVAX-B251

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- Only with option R&S ZVAX-B291: adapter 3.5 mm f-f (item 4)
- Only with option R&S ZVAX-B291: Terminations 3.5 mm m (item 5)

Test setup: Connect VNA test port 1 to Port 1 SOURCE IN and test port 2
Port 1 SOURCE OUT, if option R&S ZVAX-B291 is not installed
R&S ZVAX24 Test Port 1, if option R&S ZVAX-B291 is installed
Terminate Port 1 MEAS OUT and Port 1 REF OUT, if option R&S ZVAX-B291 is installed

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 1 from cal pool*)]
- [**Mode** : R&S ZVAX Path Config : Src 1 Harmonic Filter]
- [**Start**: 2 GHz]
- [**Stop**: 24 GHz]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Trace** : Trace Funct: Data -> Mem : Math = Data/Mem]
- [**Trace** : Trace Select : Trace Manager… : (*Switch memory trace off*)]
- [**System Config** : Service Function… : Enter Password: (*Enter password for service level 3*): 1.1.2.10.1.0,5]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 2 GHz…24 GHz, 201 points

Measurement: Read transmission loss S21 (with active Trace Math)

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B253 (Harmonic Filter Source Port 3): Checking the transmission loss

Only with Option R&S ZVAX-B253

Test equipment:
- VNA (item 1)
- Test cables (item 2)

Test setup: Connect VNA test port 1 to Port 3 SOURCE IN and test port 2 to Port 3 SOURCE OUT

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 3 from cal pool*)]
- [**Mode** : ZVAX Path Config : Src 3 Harmonic Filter]
- [**Start**: 1 GHz (8 GHz)]
- [**Stop**: 8 GHz (24 GHz)]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 1 GHz to 8 GHz, 8 GHz to 24 GHz, 201 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B253 (Harmonic Filter Source Port 3): Checking the harmonic suppression

Only with Option R&S ZVAX-B253

Test equipment:
- VNA (item 1)
- Test cables (item 2)

Test setup: Connect VNA test port 1 to Port 3 SOURCE IN and test port 2 to Port 3 SOURCE OUT

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 3 from cal pool*)]
- [**Mode** : ZVAX Path Config : Src 3 Harmonic Filter]
- [**Start**: 2 GHz]
- [**Stop**: 24 GHz]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Trace** : Trace Funct: Data -> Mem : Math = Data/Mem]
- [**Trace** : Trace Select : Trace Manager… : (*Switch memory trace off*)]
- [**System Config** : Service Function… : Enter Password: (*Enter password for service level 3*): 1.1.2.10.3.0,5]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)

Test points: 2 GHz…24 GHz, 201 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read wave b2 (with active User Trace Math)

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B252 (Harmonic Filter Receiver Port 2): Checking the transmission loss

Only with Option R&S ZVAX-B252

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- Only with option R&S ZVAX-B292: adapter 3.5 mm f-f (item 4)
- Only with option R&S ZVAX-B292: Terminations 3.5 mm m (item 5)

Test setup: Connect VNA test port 1 to Port 2 MEAS OUT and test port 2 to Port 2 MEAS IN, if option R&S ZVAX-B292 is not installed
R&S ZVAX24 Test Port 2, if option R&S ZVAX-B292 is installed
Terminate Port 1 MEAS OUT and Port 1 REF OUT, if option R&S ZVAX-B291 is installed

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 2 from cal pool*)]
- [**Mode** : ZVAX Path Config : Rec 2 Harmonic Filter]
- [**Start**: 1 GHz (8 GHz)]
- [**Stop**: 8 GHz (24 GHz)]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 1 GHz to 8 GHz, 8 GHz to 24 GHz, 201 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B252 (Harmonic Filter Receiver Port 2): Checking the fundamental suppression

Only with Option R&S ZVAX-B252

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- Only with option R&S ZVAX-B292: adapter 3.5 mm f-f (item 4)
- Only with option R&S ZVAX-B292: Terminations 3.5 mm m (item 5)

Test setup: Connect VNA test port 1 to Port 2 MEAS IN, if option ZVAX-B292 is not installed, to R&S ZVAX24 Test Port 2, if option R&S ZVAX-B292 is installed
and test port 2 to Port 2 MEAS OUT
Terminate Port 2 SOURCE IN and Port 2 REF OUT, if option R&S ZVAX-B292 is installed

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 2 from cal pool*)]
- [**Mode** : ZVAX Path Config : Rec 2 Harmonic Filter]
- [**Start**: 1 GHz (4 GHz)]
- [**Stop**: 4 GHz (12 GHz)]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Trace** : Trace Funct: Data -> Mem : Math = Data/Mem:Show Mem *off*]
- [**System Config** : Service Function… : Enter Password: (*Enter password for service level 3*): 1.1.2.10.2.2]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 1 GHz to 4 GHz, 4 GHz to 12 GHz, 201 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read S21 (with active Trace Math)

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B271 (Pulse Modulator Source Port 1): Checking the transmission loss

Only with Option R&S ZVAX-B271

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- Only with option R&S ZVAX-B291: adapter 3.5 mm f-f (item 4)
- Only with option R&S ZVAX-B291: Terminations 3.5 mm m (item 5)

Test setup: Connect VNA test port 1 to Port 1 SOURCE IN and test port 2 to
Port 1 SOURCE OUT, if option R&S ZVAX-B291 is not installed
R&S ZVAX24 Test Port 1, if option R&S ZVAX-B291 is installed
Terminate Port 1 Meas Out and Port 1 Ref Out, if option R&S ZVAX-B291 is installed

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 1 from cal pool*)]
- [**Mode** : ZVAX Path Config : Src 1 Pulse Modulator]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Sweep** : Sweep Type : Def Pulse Generator… : Pulse Type = Constant High]
- [**Sweep** : Sweep Type : Pulse Generator]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 10 MHz to 24 GHz, 201 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B271 (Pulse Modulator Source Port 1): Checking the pulse modulator function

Only with Option R&S ZVAX-B271

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- Calibration kit or unit (item item 4)
- Only with option R&S ZVAX-B291: adapter 3.5 mm f-f (item 4)
- Only with option R&S ZVAX-B291: Terminations 3.5 mm m (item 5)

Test setup: Connect VNA test port 1 to Port 1 SOURCE IN and test port 2 to Port 1 SOURCE OUT, if option ZVAX-B291 is not installed
R&S ZVAX24 Test Port 1, if option R&S ZVAX-B291 is installed
Terminate Port 1 MEAS OUT and Port 1 REF OUT, if option R&S ZVAX-B291 is installed

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager… : (*Apply cal 1 from cal pool*)]
- [**Pwr BW AVG** : Average Factor = 100 : Average On]
- [**Mode** : ZVAX Path Config… : Src 1 Pulse Modulator]
- [**Sweep** : Sweep Type : Def Pulse Generator… : Pulse Width = 500 ns, Pulse Period = 1 µs]
- [**Sweep** : Sweep Type : Pulse Generator]
- [**Sweep** : Sweep Type : Define Pulse Profile… : Start: 0 ns; Stop: 1 µs; Bandwidth: 30 MHz; Center Freq: 24 GHz; No of Points: 80]
- [**Sweep** : Sweep Type : Pulse Profile]
- [**Sweep** : Trigger : Pulse Gen…]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 0 s…1 µs, 80 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21 (positive values)

Limit: See Performance Test Report

Uncertainty: 2 dB

Option R&S ZVAX-B273 (Pulse Modulator Source Port 3): Checking the transmission loss

Only with Option R&S ZVAX-B273

Test equipment:
- VNA (item 1)
- Test cables (item 2)

Test setup: Connect VNA test port 1 to Port 3 SOURCE IN and test port 2 to Port 3 SOURCE OUT

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 3 from cal pool*)]
- [**Mode** : ZVAX Path Config : Src 3 Pulse Modulator]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Sweep** : Sweep Type : Def Pulse Generator… : Pulse Type = Constant High]
- [**Sweep** : Sweep Type : Pulse Generator]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 10 MHz…24 GHz, 201 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B273 (Pulse Modulator Source Port 3): Checking the pulse modulator function

Only with Option R&S ZVAX-B273

Test equipment:
- VNA (item 1)
- Test cables (item 2)

Test setup: Connect VNA test port 1 to Port 3 SOURCE IN and test port 2 to Port 3 SOURCE OUT

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager… : (*Apply cal 1 from cal pool*)]
- [**Pwr BW AVG** : Average Factor = 100 : Average On]
- [**Mode** : ZVAX Path Config… : Src 3 Pulse Modulator]
- [**Sweep** : Sweep Type : Def Pulse Generator… : Pulse Width = 500 ns, Pulse Period = 1 μs]
- [**Sweep** : Sweep Type : Pulse Generator]
- [**Sweep** : Sweep Type : Define Pulse Profile… : Start: 0 ns; Stop: 1 μs; Bandwidth: 30 MHz; Center Freq: 24 GHz; No of Points: 80]
- [**Sweep** : Sweep Type : Pulse Profile]
- [**Sweep** : Trigger : Pulse Gen…]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 0 s…1 μs, 80 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21 (positive values)

Limit: See Performance Test Report

2 dB

Option R&S ZVAX-B272 (Pulse Modulator Receiver Port 2): Checking the transmission loss

Only with Option R&S ZVAX-B272

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- Only with option R&S ZVAX-B292: adapter 3.5 mm f-f (item 4)
- Only with option R&S ZVAX-B292: Terminations 3.5 mm m (item 5)

Test setup: Connect VNA test port 1 to Port 2 MEAS OUT and test port 2 to Port 2 MEAS IN, if option R&S ZVAX-B292 is not installed
R&S ZVAX24 Test Port 2, if option R&S ZVAX-B292 is installed
Terminate PORT 2 SOURCE IN and PORT 2 REF OUT, if option R&S ZVAX-B292 is installed

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 1 from cal pool*)]
- [**Mode** : ZVAX Path Config : Src 1 Pulse Modulator]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Sweep** : Sweep Type : Def Pulse Generator… : Pulse Type = Constant High]
- [**Sweep** : Sweep Type : Pulse Generator]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 10 MHz…24 GHz, 201 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B272 (Pulse Modulator Receiver Port 2): Checking the pulse modulator function

Only with Option R&S ZVAX-B272

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- Only with option R&S ZVAX-B292: adapter 3.5 mm f-f (item 4)
- Only with option R&S ZVAX-B292: Terminations 3.5 mm m (item 5)

Test setup: Connect VNA test port 1 to Port 2 MEAS OUT and test port 2 to PORT 2 MEAS IN, if option R&S ZVAX-B292 is not installed
R&S ZVAX24 Test Port 2, if option ZVAX-B292 is installed
Terminate PORT 2 SOURCE IN and PORT 2 REF OUT, if option R&S ZVAX-B292 is installed

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager… : (*Apply cal 1 from cal pool*)]
- [**Pwr BW AVG** : Average Factor = 100 : Average On]
- [**Mode** : ZVAX Path Config… : Src 2 Pulse Modulator]
- [**Sweep** : Sweep Type : Def Pulse Generator… : Pulse Width = 500 ns, Pulse Period = 1 µs]
- [**Sweep** : Sweep Type : Pulse Generator]
- [**Sweep** : Sweep Type : Define Pulse Profile… : Start: 0 ns; Stop: 1 µs; Bandwidth: 30 MHz; Center Freq: 24 GHz; No of Points: 80]
- [**Sweep** : Sweep Type : Pulse Profile]
- [**Sweep** : Trigger : Pulse Gen…]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 0 s to 1 µs, 80 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21 (positive values)

Limit: See Performance Test Report

Uncertainty: 2 dB

Option R&S ZVAX-B291 (High Power Coupler Port 1): Checking the reference channel coupling loss

Only with Option R&S ZVAX-B291

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- adapter 3.5 mm f-f (item 4)
- termination 3.5 mm m (item 5)
- termination 3.5 mm f (item))

Test setup: Connect VNA test port 1 to PORT 1 SOURCE IN
and test port 2 to PORT 1 REF OUT

Terminate R&S ZVAX Port 1 and PORT 1 MEAS OUT

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 1 from cal pool*)]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2]
- [**Marker Funct** : Min Search]
- [**Marker** : Marker 3 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 10 MHz…24 GHz, 201 points

Measurement: Marker 1, Marker 2 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B291 (High Power Coupler Port 1): Checking the reference channel isolation

Only with Option R&S ZVAX-B291

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- adapter 3.5 mm f-f (item 4)
- termination 3.5 mm m (item 5)
- termination 3.5 mm f (item 6))

Test setup: Connect VNA test port 1 to PORT 1 and
test port 2 to PORT 1 REF OUT
Terminate PORT 1 SOURCE IN and PORT 1 MEAS OUT

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 1 from cal pool*)]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 10 MHz…24 GHz, 201 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S32

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B291 (High Power Coupler Port 1): Checking the measurement channel coupling loss

Only with Option R&S ZVAX-B291

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- adapter 3.5 mm f-f (item 4)
- termination 3.5 mm m (item 5)
- termination 3.5 mm f (item 6))

Test setup: Connect VNA test port 1 to PORT 1 SOURCE IN and
test port 2 to PORT 1 MEAS OUT
Terminate PORT 1 and PORT 1 REF OUT

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 1 from cal pool*)]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2]
- [**Marker Funct** : Min Search]
- [**Marker** : Marker 3 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 10 MHz to 24 GHz, 201 points

Measurement: Marker 1, Marker 2 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S32

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B291 (High Power Coupler Port 1): Checking the measurement channel isolation

Only with Option R&S ZVAX-B291

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- adapter 3.5 mm f-f (item 4)
- termination 3.5 mm m (item 5)
- termination 3.5 mm f (item 6))

Test setup: Connect VNA test port 1 to PORT 1 and
test port 2 to PORT 1 MEAS OUT
Terminate PORT 1 SOURCE IN and PORT 1 REF OUT

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 1 from cal pool*)]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 10 MHz…24 GHz, 201 points

Measurement: Marker 1 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B292 (High Power Coupler Port 2): Checking the transmission loss

Only with Option R&S ZVAX-B292

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- adapter 3.5 mm f-f (item 4)
- termination 3.5 mm m (item 5)
- termination 3.5 mm f (item 6))

Test setup: Connect VNA test port 1 to PORT 2 SOURCE IN and test port 2 to PORT 2
Terminate PORT 2 MEAS OUT and PORT 2 REF OUT

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 1 from cal pool*)]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2]
- [**Marker Funct** : Min Search]
- [**Marker** : Marker 3 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 10 MHz to 24 GHz, 201 points

Measurement: Marker 1, Marker 2 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B292 (High Power Coupler Port 2): Checking the reference channel coupling loss

Only with Option R&S ZVAX-B292

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- adapter 3.5 mm f-f (item 4)
- termination 3.5 mm m (item 5)
- termination 3.5 mm f (item 6)

Test setup: Connect VNA test port 1 to PORT 2 SOURCE IN
and test port 2 to PORT 2 REF OUT

Terminate R&S ZVAX PORT 2 and PORT 2 MEAS OUT

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 1 from cal pool*)]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2]
- [**Marker Funct** : Min Search]
- [**Marker** : Marker 3 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 10 MHz to 24 GHz, 201 points

Measurement: Marker 1, Marker 2 : Read marker frequency
Marker 1 to Marker 8 : Read transmission loss S21

Limit: See Performance Test Report

Uncertainty: See Performance Test Report

Option R&S ZVAX-B292 (High Power Coupler Port 2): Checking the reference channel isolation

Only with Option R&S ZVAX-B292

Test equipment:
- VNA (item 1)
- Test cables (item 2)
- adapter 3.5 mm f-f (item 4)
- termination 3.5 mm m (item 5)
- termination 3.5 mm f (item 6)

Test setup: Connect VNA test port 1 to PORT 2 and
test port 2 to PORT 2 REF OUT
Terminate PORT 2 SOURCE IN and PORT 2 MEAS OUT

VNA settings:
- [**Preset**]
- [**Cal** : Cal Manager : (*Apply cal 1 from cal pool*)]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Marker** : Marker 1]
- [**Marker Funct** : Max Search]
- [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)]

Test points: 10 MHz to 24 GHz, 201 points

Measurement:	Marker 1 : Read marker frequency Marker 1 to Marker 8 : Read isolation S21
Limit:	See Performance Test Report
Uncertainty:	See Performance Test Report

Option R&S ZVAX-B292 (High Power Coupler Port 2): Checking the measurement channel isolation

Only with Option R&S ZVAX-B292

Test equipment:	- VNA (item 1) - Test cables (item 2) - adapter 3.5 mm f-f (item 4) - termination 3.5 mm m (item 5) - termination 3.5 mm f (item 6)
Test setup:	Connect VNA test port 1 to PORT 2 SOURCE IN and test port 2 to PORT 2 MEAS OUT Terminate PORT 2 and PORT 2 REF OUT
VNA settings:	- [**Preset**] - [**Pwr BW AVG** : Meas Bandwidth : 1 kHz] - [**Meas** : S21] - [**Marker** : Marker 1] - [**Marker Funct** : Max Search] - [**Marker** : Marker 2 to Marker 8 : Marker Frequency : (*see Test Report*)] - [**Cal** : Cal Manager : (*Apply cal 1 from cal pool*)]
Test points:	10 MHz…24 GHz, 201 points
Measurement:	Marker 1 : Read marker frequency Marker 1 to Marker 8 : Read isolation S21
Limit:	See Performance Test Report
Uncertainty:	See Performance Test Report

Performance Test Report

Table 1-1: Performance Test Report

ROHDE&SCHWARZ	**Extension Unit R&S ZVAX24**	**1311.2509K02**
Serial number:		
Date:		
Person responsible:		
Signature:		

Parameter	**Reference**	**Min. value**	**Actual value**	**Max. value**	**Unit**	**Measurement uncertainty**
Through path transmission loss of PORT1 SOURCE IN to PORT1 SOURCE OUT w/o Option ZVAX-B291	Page 1.5				dB	dB
Test frequency:						
Range to 8 GHz						
M1: ….. GHz			_____	4		1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz			_____	4		1.0
M3: 0.1 GHz			_____	4		0.2
M4: 0.5 GHz			_____	4		0.2
M5: 1.0 GHz			_____	4		0.1
M6: 2.0 GHz			_____	4		0.1
M7: 4.0 GHz			_____	4		0.1
M8: 8.0 GHz			_____	4		0.1
Range 8 GHz to 24GHz						
M1: ….. GHz			_____	7		0.1
M2: 9 GHz			_____	7		0.1
M3: 10 GHz			_____	7		0.1
M4: 12 GHz			_____	7		0.1
M5: 14 GHz			_____	7		0.1
M6: 16 GHz			_____	7		0.1
M7: 20 GHz			_____	7		0.1
M8: 24 GHz			_____	7		0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Through path transmission loss of PORT1 SOURCE IN to PORT1 w. Option ZVAX-B291	Page 1.5				dB	dB
Test frequency:						
Range to 8 GHz						
M1: ….. GHz			_____	6		1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz			_____	6		1.0
M3: 0.1 GHz			_____	6		0.2
M4: 0.5 GHz			_____	6		0.2
M5: 1.0 GHz			_____	6		0.1
M6: 2.0 GHz			_____	6		0.1
M7: 4.0 GHz			_____	6		0.1
M8: 8.0 GHz			_____	6		0.1
Range 8 GHz to 24GHz						
M1: ….. GHz			_____	10		0.1
M2: 9 GHz			_____	10		0.1
M3: 10 GHz			_____	10		0.1
M4: 12 GHz			_____	10		0.1
M5: 14 GHz			_____	10		0.1
M6: 16 GHz			_____	10		0.1
M7: 20 GHz			_____	10		0.1
M8: 24 GHz			_____	10		0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Through path transmission loss of PORT3 SOURCE IN to PORT3 SOURCE OUT	Page 1.5				dB	dB
Test frequency:						
Range to 8 GHz						
M1: ….. GHz			_____	5		1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz			_____	5		1.0
M3: 0.1 GHz			_____	5		0.2
M4: 0.5 GHz			_____	5		0.2
M5: 1.0 GHz			_____	5		0.1
M6: 2.0 GHz			_____	5		0.1
M7: 4.0 GHz			_____	5		0.1
M8: 8.0 GHz			_____	5		0.1
Range 8 GHz to 24GHz						
M1: ….. GHz			_____	8		0.1
M2: 9 GHz			_____	8		0.1
M3: 10 GHz			_____	8		0.1
M4: 12 GHz			_____	8		0.1
M5: 14 GHz			_____	8		0.1
M6: 16 GHz			_____	8		0.1
M7: 20 GHz			_____	8		0.1
M8: 24 GHz			_____	8		0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Through path transmission loss of PORT2 MEAS IN to PORT2 MEAS OUT w/o Option ZVAX-B292	**Page 1.6**				**dB**	**dB**
Test frequency:						
Range to 2GHz						
M1: ….. GHz			_____	**4**		**1.0 (f<50 MHz)**
						0.2 (f=50 to 700 MHz)
M2: 0.01 GHz			_____	**4**		**0.1 (f≥700 MHz)**
M3: 0.05 GHz			_____	**4**		**1.0**
M4: 0.1 GHz			_____	**4**		**0.2**
M5: 0.5 GHz			_____	**4**		**0.2**
M6: 1.0 GHz			_____	**4**		**0.2**
M7: 1.5 GHz			_____	**4**		**0.1**
M8: 2.0 GHz			_____	**4**		**0.1**
						0.1
Range 2 GHz to 24GHz						
M1: ….. GHz			_____	**7**		
M2: 2.5 GHz			_____	**7**		**0.1**
M3: 4 GHz			_____	**7**		**0.1**
M4: 8 GHz			_____	**7**		**0.1**
M5: 12 GHz			_____	**7**		**0.1**
M6: 16 GHz			_____	**7**		**0.1**
M7: 20 GHz			_____	**7**		**0.1**
M8: 24 GHz			_____	**7**		**0.1**
						0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Through path transmission loss of PORT2 to PORT2 MEAS OUT w. Option ZVAX-B292	Page 1.6				dB	dB
Test frequency:						
Range 0.5 GHz to 8GHz						
M1: ….. GHz			_____	16		0.2 (f=500 to 700MHz) 0.1 (f≥700MHz)
M2: 0.5 GHz			_____	16		0.2
M3: 1.0 GHz			_____	16		0.1
M4: 2.0 GHz			_____	16		0.1
M5: 3.0 GHz			_____	16		0.1
M6: 4.0 GHz			_____	16		0.1
M7: 6.0 GHz			_____	16		0.1
M8: 8.0 GHz			_____	16		0.1
Range 8 GHz to 24GHz						
M1: ….. GHz			_____	19		0.1
M2: 9 GHz			_____	19		0.1
M3: 10 GHz			_____	19		0.1
M4: 12 GHz			_____	19		0.1
M5: 14 GHz			_____	19		0.1
M6: 16 GHz			_____	19		0.1
M7: 20 GHz			_____	19		0.1
M8: 24 GHz			_____	19		0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B210 transmission loss w/o OptionZVAX-B292	Page 1.6				dB	dB
Test frequency:						
Range 0.5 GHz to 8 GHz						
M1: ….. GHz		6	_____	16		0.2 (f=500 to 700MHz) 0.1 (f≥700MHz)
M2: 0.5 GHz		6	_____	16		0.2
M3: 1.0 GHz		6	_____	16		0.1
M4: 2.0 GHz		6	_____	16		0.1
M5: 3.0 GHz		6	_____	16		0.1
M6: 4.0 GHz		6	_____	16		0.1
M7: 6.0 GHz		6	_____	16		0.1
M8: 8.0 GHz		6	_____	16		0.1
Range 8 GHz to 24 GHz						
M1: ….. GHz		10 (12, f>22GHz)	_____	20 (22, f>22GHz)		0.1
M2: 9 GHz		10	_____	20		0.1
M3: 10 GHz		10	_____	20		0.1
M4: 12 GHz		10	_____	20		0.1
M5: 14 GHz		10	_____	20		0.1
M6: 16 GHz		10	_____	20		0.1
M7: 20 GHz		10	_____	20		0.1
M8: 22 GHz		10	_____	20		0.1
M9: 24 GHz		12	_____	22		0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B210 transmission loss w. OptionZVAX-B292	Page 1.6				dB	dB
Test frequency:						
Range 0.7 GHz to 8 GHz						
M1: … .. GHz		16	_____	26		0.1
M2: 0.7 GHz		16	_____	26		0.1
M3: 1.0 GHz		16	_____	26		0.1
M4: 2.0 GHz		16	_____	26		0.1
M5: 3.0 GHz		16	_____	26		0.1
M6: 4.0 GHz		16	_____	26		0.1
M7: 6.0 GHz		16	_____	26		0.1
M8: 8.0 GHz		16	_____	26		0.1
Range 8.GHz to 24.GHz						
M1: ….. GHz		21 (23, f>22GHz)	_____	31 (33, f>22GHz)		0.1
M2: 9 GHz		21	_____	31		0.1
M3: 10 GHz		21	_____	31		0.1
M4: 12 GHz		21	_____	31		0.1
M5: 14 GHz		21	_____	31		0.1
M6: 16 GHz		21	_____	31		0.1
M7: 20 GHz		21	_____	31		0.1
M8: 22 GHz		21	_____	31		0.1
M9: 24 GHz		23	_____	33		0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option ZVAX-B211 transmission loss PORT1 SOURCE IN to PORT1 SOURCE OUT w/o Option ZVX-B291	Page 1.7				dB	dB
Test frequency:						
Range to 8 GHz						
M1: ….. GHz			_____	9		1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz			_____	9		1.0
M3: 0.1 GHz			_____	9		0.2
M4: 0.5 GHz			_____	9		0.2
M5: 1.0 GHz			_____	9		0.1
M6: 2.0 GHz			_____	9		0.1
M7: 4.0GHz			_____	9		0.1
M8: 8.0 GHz			_____	9		0.1
Range 8GHz to 24GHz						
M1: ….. GHz			_____	14		0.1
M2: 9 GHz			_____	14		0.1
M3: 10 GHz			_____	14		0.1
M4: 12 GHz			_____	14		0.1
M5: 14 GHz			_____	14		0.1
M6: 16 GHz			_____	14		0.1
M7: 20 GHz			_____	14		0.1
M8: 24 GHz			_____	14		0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B211 transmission loss PORT1 SOURCE IN to PORT1 w. Option R&S ZVX-B291	Page 1.7				dB	dB
Test frequency: Range to 8 GHz						
M1: ….. GHz			_____	10		1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz			_____	10		1.0
M3: 0.1 GHz			_____	10		0.2
M4: 0.5 GHz			_____	10		0.2
M5: 1.0 GHz			_____	10		0.1
M6: 2.0 GHz			_____	10		0.1
M7: 4.0 GHz			_____	10		0.1
M8: 8.0 GHz			_____	10		0.1
Range 8 GHz to 24 GHz						
M1: ….. GHz			_____	16		0.1
M2: 9 GHz			_____	16		0.1
M3: 10 GHz			_____	16		0.1
M4: 12 GHz			_____	16		0.1
M5: 14 GHz			_____	16		0.1
M6: 16 GHz			_____	16		0.1
M7: 20 GHz			_____	16		0.1
M8: 24 GHz			_____	16		0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option ZVAX-B211 transmission loss PORT3 SOURCE IN to PORT1 SOURCE OUT w/o Option ZVX-B291	Page 1.7				dB	dB
Test frequency: Range to 8GHz						
M1: ….. GHz			_____	9		1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz			_____	9		1.0
M3: 0.1G Hz			_____	9		0.2
M4: 0.5 GHz			_____	9		0.2
M5: 1.0 GHz			_____	9		0.1
M6: 2.0 GHz			_____	9		0.1
M7: 4.0 GHz			_____	9		0.1
M8: 8.0 GHz			_____	9		0.1
Range 8 GHz to 24 GHz						
M1: ….. GHz			_____	14		0.1
M2: 9 GHz			_____	14		0.1
M3: 10 GHz			_____	14		0.1
M4: 12 GHz			_____	14		0.1
M5: 14 GHz			_____	14		0.1
M6: 16 GHz			_____	14		0.1
M7: 20 GHz			_____	14		0.1
M8: 24 GHz			_____	14		0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option ZVAX-B211 transmission loss PORT3 SOURCE IN to PORT1 w. Option ZVX-B291	Page 1.7				dB	dB
Test frequency: Range to 8GHz						
M1: ….. GHz			_____	10		1.0 (f<50MHz)
						0.2 (f=50 to 700MHz)
						0.1 (f≥700MHz)
M2: 0.01 GHz			_____	10		1.0
M3: 0.1 GHz			_____	10		0.2
M4: 0.5 GHz			_____	10		0.2
M5: 1.0 GHz			_____	10		0.1
M6: 2.0 GHz			_____	10		0.1
M7: 4.0 GHz			_____	10		0.1
M8: 8.0 GHz			_____	10		0.1
Range 8 GHz to 24GHz						
M1: ….. GHz			_____	16		0.1
M2: 9 GHz			_____	16		0.1
M3: 10 GHz			_____	16		0.1
M4: 12 GHz			_____	16		0.1
M5: 14 GHz			_____	16		0.1
M6: 16 GHz			_____	16		0.1
M7: 20 GHz			_____	16		0.1
M8: 24 GHz			_____	16		0.1
Option R&S ZVAX-B211 isolation PORT1 SOURCE IN to PORT3 SOURCE IN	Page 1.7				dB	dB
Test frequency: Range 0.5 GHz to 24GHz						
M1: ….. GHz						
		20	_____			0.2 (f=500 to 700MHz)
M2: 0.5 GHz						0.1 (f≥700MHz)
M3: 4 GHz		20	_____			0.2
M4: 8 GHz		20	_____			0.1
M5: 12 GHz		20	_____			0.1
M6: 16 GHz		20	_____			0.1
M7: 20 GHz		20	_____			0.1
M8: 24 GHz		20	_____			0.1
		20	_____			0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B211	Page 1.8				dB	dB
Reflection loss PORT3						
Test frequency:						
Range to 8GHz						
M1: ….. GHz		20	_____			3.0 (f<50MHz)
						1.0 (f≥50MHz)
M2: 0.01 GHz		20	_____			3.0
M3: 0.1 GHz		20	_____			1.0
M4: 0.5 GHz		20	_____			1.0
M5: 1.0 GHz		20	_____			1.0
M6: 2.0 GHz		20	_____			1.0
M7: 4.0 GHz		20	_____			1.0
M8: 8.0 GHz		20	_____			1.0
Range 8GHz to 24GHz						
M1: ….. GHz		13	_____			0.1
M2: 9 GHz		13	_____			0.1
M3: 10 GHz		13	_____			0.1
M4: 12 GHz		13	_____			0.1
M5: 14 GHz		13	_____			0.1
M6: 16 GHz		13	_____			0.1
M7: 20 GHz		13	_____			0.1
M8: 24 GHz		13	_____			0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B251 transmission loss PORT1 SOURCE IN to PORT1 SOURCE OUT w/o Option ZVX-B291	Page 1.9				dB	dB
Test frequency:						
Range 1 GHz to 8 GHz						
M1: ….. GHz			_____	11		0.1
M2: 1 GHz			_____	11		0.1
M3: 2 GHz			_____	11		0.1
M4: 3 GHz			_____	11		0.1
M5: 4 GHz			_____	11		0.1
M6: 5 GHz			_____	11		0.1
M7: 6 GHz			_____	11		0.1
M8: 8 GHz			_____	11		0.1
Range 8 GHz to 23 GHz						
M1: ….. GHz			_____	16 (19, f>20GHz)		0.1
M2: 9 GHz			_____	16		0.1
M3: 10 GHz			_____	16		0.1
M4: 12 GHz			_____	16		0.1
M5: 16 GHz			_____	16		0.1
M6: 20 GHz			_____	16		0.1
M7: 22 GHz			_____	19		0.1
M8: 23 GHz			_____	19		0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B251 transmission loss PORT1 SOURCE IN to PORT1 w. Option ZVX-B291	Page 1.9				dB	dB
Test frequency:						
Range 1 GHz to 8 GHz						
M1: ….. GHz			_____	12		0.1
M2: 1 GHz			_____	12		0.1
M3: 2 GHz			_____	12		0.1
M4: 3 GHz			_____	12		0.1
M5: 4 GHz			_____	12		0.1
M6: 5 GHz			_____	12		0.1
M7: 6 GHz			_____	12		0.1
M8: 8 GHz			_____	12		0.1
Range 8 GHz to 23 GHz						
M1: ….. GHz			_____	17 (20, f>20GHz)		0.1
M2: 9 GHz			_____	17		0.1
M3: 10 GHz			_____	17		0.1
M4: 12 GHz			_____	17		0.1
M5: 16 GHz			_____	17		0.1
M6: 20 GHz			_____	17		0.1
M7: 22 GHz			_____	20		0.1
M8: 23 GHz			_____	20		0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B251	Page 1.9				dB	dB
Harmonic Suppression						
PORT1 SOURCE IN to						
PORT1 SOURCE OUT						
w/o Option ZVX-B291						
Test frequency:						
Range 1 GHz to 8 GHz						
Fund. frq						
M1: ….. GHz ..GHz		45	_____			0.1
M2: 2 GHz 1 GHz		45	_____			0.1
M3: 4 GHz 2 GHz		45	_____			0.1
M4: 6 GHz 3 GHz		45	_____			0.1
M5: 8 GHz 4 GHz		45	_____			0.1
M6: 10 GHz 5 GHz		45	_____			0.1
M7: 12 GHz 6 GHz		45	_____			0.1
M8: 16 GHz 8 GHz		45	_____			0.1
Range 8GHz to 12GHz						
Fund. frq						
M1: ….. GHz ..GHz		35	_____			0.1
M2: 18 GHz 9 GHz		35	_____			0.1
M3: 20 GHz 10 GHz		35	_____			0.1
M4: 22 GHz 11 GHz		35	_____			0.1
M5: 24 GHz 12 GHz		35	_____			0.1
Option R&S ZVAX-B251	Page 1.9				dB	dB
Harmonic Suppression						
PORT1 SOURCE IN to						
PORT1						
with Option ZVX-B291						
Test frequency:						
Range 1GHz to 8GHz						
Fund. frq						
M1: ….. GHz ..GHz		45	_____			0.1
M2: 2 GHz 1 GHz		45	_____			0.1
M3: 4 GHz 2 GHz		45	_____			0.1
M4: 6 GHz 3 GHz		45	_____			0.1
M5: 8 GHz 4 GHz		45	_____			0.1
M6: 10 GHz 5 GHz		45	_____			0.1
M7: 12 GHz 6 GHz		45	_____			0.1
M8: 16 GHz 8 GHz		45	_____			0.1
Range 8GHz to 12 GHz						
Fund. frq						
M1: ….. GHz ..GHz		35	_____			0.1
M2: 18 GHz 9 GHz		35	_____			0.1
M3: 20 GHz 10 GHz		35	_____			0.1
M4: 22 GHz 11 GHz		35	_____			0.1
M5: 24 GHz 12 GHz		35	_____			0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B253 transmission loss PORT3 SOURCE IN to PORT3 SOURCE OUT	Page 1.10				dB	dB
Test frequency:						
Range 1GHz to 8GHz						
M1: ….. GHz						
M2: 1 GHz			_____	11		0.1
M3: 2 GHz			_____	11		0.1
M4: 3 GHz			_____	11		0.1
M5: 4 GHz			_____	11		0.1
M6: 5 GHz			_____	11		0.1
M7: 6 GHz			_____	11		0.1
M8: 8 GHz			_____	11		0.1
			_____	11		0.1
Range 8 GHz to 24 GHz						
M1: ….. GHz						
			_____	16		0.1
M2: 9 GHz				(19, f>20GHz)		
M3: 10 GHz			_____	16		0.1
M4: 12 GHz			_____	16		0.1
M5: 16 GHz			_____	16		0.1
M6: 20 GHz			_____	16		0.1
M7: 22 GHz			_____	16		0.1
M8: 23 GHz			_____	19		0.1
			_____	19		0.1
Option R&S R&S ZVAX-B253 Harmonic Suppression PORT1 SOURCE IN to PORT1 SOURCE OUT	Page 1.11				dB	dB
Test frequency:						
Range 1 GHz to 8GHz						
Fund. frq		45	_____			0.1
M1: ….. GHz . .GHz		45	_____			0.1
M2: 2 GHz 1 GHz		45	_____			0.1
M3: 4 GHz 2 GHz		45	_____			0.1
M4: 6 GHz 3 GHz		45	_____			0.1
M5: 8 GHz 4 GHz		45	_____			0.1
M6: 10 GHz 5 GHz		45	_____			0.1
M7: 12 GHz 6 GHz		45	_____			0.1
M8: 16 GHz 8 GHz						
Range 8 GHz to 12 GHz						
Fund. frq		35	_____			0.1
M1: ….. GHz ..GHz		35	_____			0.1
M2: 18 GHz 9 GHz		35	_____			0.1
M3: 20 GHz 10 GHz		35	_____			0.1
M4: 22 GHz 11 GHz		35	_____			0.1
M5: 24 GHz 12 GHz						

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S R&S ZVAX-B252 **transmission loss** **PORT2 MEAS IN to** **PORT2 MEAS OUT** **w/o Option ZVX-B292**	Page 1.11				dB	dB
Test frequency:						
Range 1 GHz to 8 GHz			_____	11		0.1
M1: ….. GHz			_____	11		0.1
M2: 1 GHz			_____	11		0.1
M3: 2 GHz			_____	11		0.1
M4: 3 GHz			_____	11		0.1
M5: 4 GHz			_____	11		0.1
M6: 5 GHz			_____	11		0.1
M7: 6 GHz			_____	11		0.1
M8: 8 GHz						
Range 8 GHz to 24 GHz			_____	16		0.1
M1: ….. GHz				(19, f>20GHz)		
			_____	16		0.1
M2: 9 GHz			_____	16		0.1
M3: 10 GHz			_____	16		0.1
M4: 12 GHz			_____	16		0.1
M5: 16 GHz			_____	16		0.1
M6: 20 GHz			_____	19		0.1
M7: 22 GHz			_____	19		0.1
M8: 23 GHz						

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B252 transmission loss PORT2 MEAS IN to PORT2 MEAS OUT w. Option ZVX-B292	Page 1.11				dB	dB
Test frequency: Range 1GHz to 8GHz						
M1: ….. GHz			_____	22		0.1
M2: 1 GHz			_____	22		0.1
M3: 2 GHz			_____	22		0.1
M4: 3 GHz			_____	22		0.1
M5: 4 GHz			_____	22		0.1
M6: 5 GHz			_____	22		0.1
M7: 6 GHz			_____	22		0.1
M8: 8 GHz			_____	22		0.1
Range 8 GHz to 24 GHz						
M1: ….. GHz			_____	27 (30, f>20GHz)		0.1
M2: 9 GHz			_____	27		0.1
M3: 10 GHz			_____	27		0.1
M4: 12 GHz			_____	27		0.1
M5: 16 GHz			_____	27		0.1
M6: 20 GHz			_____	27		0.1
M7: 22 GHz			_____	30		0.1
M8: 23 GHz			_____	30		0.1
Option R&S ZVAX-B252 Fundamental Suppression PORT2 MEAS IN to PORT2 MEAS OUT w/o Option ZVAX-B292	Page 1.12				dB	dB
Test frequency: Range 1GHz to 4GHz						
M1: ….. GHz		30	_____			0.1
M2: 1.0 GHz		30	_____			0.1
M3: 1.5 GHz		30	_____			0.1
M4: 2.0 GHz		30	_____			0.1
M5: 2.5 GHz		30	_____			0.1
M6: 3.0 GHz		30	_____			0.1
M7: 3.5 GHz		30	_____			0.1
M8: 4.0 GHz		30	_____			0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B252 Fundamental Suppression PORT2 to PORT2 MEAS OUT with Option ZVAX-B292	Page 1.12				dB	dB
Test frequency: Range 4 GHz to 12 GHz						
M1: ….. GHz		40	_____			0.1
M2: 4.1 GHz		40	_____			0.1
M3: 5 GHz		40	_____			0.1
M4: 6 GHz		40	_____			0.1
M5: 7 GHz		40	_____			0.1
M6: 8 GHz		40	_____			0.1
M7: 10 GHz		40	_____			0.1
M8: 12 GHz		40	_____			0.1
Option R&S ZVAX-B271 transmission loss modulator on PORT1 SOURCE IN to PORT1 SOURCE OUT w/o Option ZVX-B291	Page 1.13				dB	dB
Test frequency: Range to 8 GHz						
M1: ….. GHz			_____	9		1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz			_____	9		1.0
M3: 0.1 GHz			_____	9		0.2
M4: 0.5 GHz			_____	9		0.2
M5: 1.0 GHz			_____	9		0.1
M6: 2.0 GHz			_____	9		0.1
M7: 4.0 GHz			_____	9		0.1
M8: 8.0 GHz			_____	9		0.1
Range 8 GHz to 24 GHz						
M1: ….. GHz			_____	14 (17, f>20GHz)		0.1
M2: 9 GHz			_____	14		0.1
M3: 10 GHz			_____	14		0.1
M4: 12 GHz			_____	14		0.1
M5: 14 GHz			_____	14		0.1
M6: 16 GHz			_____	14		0.1
M7: 20 GHz			_____	14		0.1
M8: 24 GHz			_____	17		0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B271 transmission loss modulator on PORT1 SOURCE IN to PORT1 with Option ZVX-B291	Page 1.13				dB	dB
Test frequency:						
Range to 8 GHz						
M1: ….. GHz			_____	11		1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz			_____	11		1.0
M3: 0.1 GHz			_____	11		0.2
M4: 0.5 GHz			_____	11		0.2
M5: 1.0 GHz			_____	11		0.1
M6: 2.0 GHz			_____	11		0.1
M7: 4.0 GHz			_____	11		0.1
M8: 8.0 GHz			_____	11		0.1
Range 8 GHz to 24 GHz						
M1: ….. GHz			_____	16 (19, f>20GHz)		0.1
M2: 9 GHz			_____	16		0.1
M3: 10 GHz			_____	16		0.1
M4: 12 GHz			_____	16		0.1
M5: 14 GHz			_____	16		0.1
M6: 16 GHz			_____	16		0.1
M7: 20 GHz			_____	16		0.1
M8: 24 GHz			_____	19		0.1
Option R&S ZVAX-B271 transmission loss modulator off PORT1 SOURCE IN to PORT1 SOURCE OUT w/o Option ZVX-B291	Page 1.13				dB	1 dB
Test frequency:						
M1: …..GHz		70	_____			
M2: 0.01 GHz		70	_____			
M3: 1 GHz		70	_____			
M4: 3 GHz		70	_____			
M5: 6 GHz		70	_____			
M6: 12 GHz		70	_____			
M7: 18 GHz		70	_____			
M8: 24 GHz		70	_____			

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B271 transmission loss modulator off PORT1 SOURCE IN to PORT1 with Option ZVX-B291 **Test frequency:** **M1: …..GHz** **M2: 0.01 GHz** **M3: 1 GHz** **M4: 3 GHz** **M5: 6 GHz** **M6: 12 GHz** **M7: 18 GHz** **M8: 24 GHz**	Page 1.13	 70 70 70 70 70 70 70 70	 _____ _____ _____ _____ _____ _____ _____ _____		dB	1 dB
Option R&S ZVAX-B271 modulator Function **Test points:** **M1: …. Ns** **M2: 50 ns** **M3: 100 ns** **M4: 200 ns** **M5: 400 ns** **M6: 650 ns** **M7: 750 ns** **M8: 1000 ns**	Page 1.13	 40 (25, 100 to 650 ns) 40 40 25 25 25 40 40	 _____ _____ _____ _____ _____ _____ _____ _____		dB	2 dB

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option ZVAX-B273 transmission loss modulator on PORT3 SOURCE IN to PORT3 SOURCE OUT	Page 1.14				dB	dB
Test frequency:						
Range to 8 GHz						
M1: ….. GHz			_____	9		1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01GHz			_____	9		1.0
M3: 0.1GHz			_____	9		0.2
M4: 0.5GHz			_____	9		0.2
M5: 1.0GHz			_____	9		0.1
M6: 2.0GHz			_____	9		0.1
M7: 4.0GHz			_____	9		0.1
M8: 8.0GHz			_____	9		0.1
Range 8 GHz to 24GHz						
M1: ….. GHz			_____	14 (17, f>20GHz)		0.1
M2: 9 GHz			_____	14		0.1
M3: 10 GHz			_____	14		0.1
M4: 12 GHz			_____	14		0.1
M5: 14 GHz			_____	14		0.1
M6: 16 GHz			_____	14		0.1
M7: 20 GHz			_____	14		0.1
M8: 24 GHz			_____	17		0.1
Option ZVAX-B273 transmission loss modulator off PORT3 SOURCE IN to PORT3 SOURCE OUT	Page 1.14				dB	1 dB
Test frequency:						
M1: …..GHz		70	_____			
M2: 0.01 GHz		70	_____			
M3: 1 GHz		70	_____			
M4: 3 GHz		70	_____			
M5: 6 GHz		70	_____			
M6: 12 GHz		70	_____			
M7: 18 GHz		70	_____			
M8: 24 GHz		70	_____			

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B273 modulator Function **Test points:** **M1: …. ns** **M2: 50 ns** **M3: 100 ns** **M4: 200 ns** **M5: 400 ns** **M6: 650 ns** **M7: 750 ns** **M8: 1000 ns**	Page 1.15	 40 (25, 100 to 650 ns) 40 40 25 25 25 40 40	 _____ _____ _____ _____ _____ _____ _____ _____		dB	2 dB
Option R&S VAX-B272 transmission loss modulator on PORT2 MEAS IN to PORT2 MEAS OUT w/o Option ZVX-B292 **Test frequency:** **Range to 8 GHz** **M1: ….. GHz** **M2: 0.01 GHz** **M3: 0.1 GHz** **M4: 0.5 GHz** **M5: 1.0 GHz** **M6: 2.0 GHz** **M7: 4.0 GHz** **M8: 8.0 GHz** **Range 8 GHz to 24 GHz** **M1: ….. GHz** **M2: 9 GHz** **M3: 10 GHz** **M4: 12 GHz** **M5: 14 GHz** **M6: 16 GHz** **M7: 20 GHz** **M8: 24 GHz**	Page 1.15		 _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	 9 9 9 9 9 9 9 9 14 14 14 14 14 14 14 14	dB	dB 1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz) 1.0 0.2 0.2 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B272 transmission loss modulator on PORT2 MEAS IN to PORT2 MEAS OUT w. Option R&S ZVX-B292	Page 1.15				dB	dB
Test frequency:						
Range 0.5GHz to 8GHz						
M1: ….. GHz			_____	20		0.2 (f=500 to 700MHz) 0.1 (f≥700MHz)
M2: 0.5 GHz			_____	20		0.2
M3: 1 GHz			_____	20		0.1
M4: 2 GHz			_____	20		0.1
M5: 3 GHz			_____	20		0.1
M6: 4 GHz			_____	20		0.1
M7: 6 GHz			_____	20		0.1
M8: 8 GHz			_____	20		0.1
Range 8 GHz to 24 GHz						
M1: ….. GHz			_____	27		0.1
M2: 9 GHz			_____	27		0.1
M3: 10 GHz			_____	27		0.1
M4: 12 GHz			_____	27		0.1
M5: 14 GHz			_____	27		0.1
M6: 16 GHz			_____	27		0.1
M7: 20 GHz			_____	27		0.1
M8: 24 GHz			_____	27		0.1
Option R&S ZVAX-B272 transmission loss modulator off PORT2 MEAS IN to PORT2 MEAS OUT w/o Option ZVX-B292	Page 1.15				dB	1 dB
Test frequency:						
M1: …..GHz		70	_____			
M2: 0.01 GHz		70	_____			
M3: 1 GHz		70	_____			
M4: 3 GHz		70	_____			
M5: 6 GHz		70	_____			
M6: 12 GHz		70	_____			
M7: 18 GHz		70	_____			
M8: 24 GHz		70	_____			

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B272 transmission loss modulator off PORT2 MEAS IN to PORT2 with Option ZVX-B292	Page 1.15				dB	1 dB
Test frequency:						
M1: …..GHz		70	_____			
M2: 0.01 GHz		70	_____			
M3: 1 GHz		70	_____			
M4: 3 GHz		70	_____			
M5: 6 GHz		70	_____			
M6: 12 GHz		70	_____			
M7: 18GHz		70	_____			
M8: 24 GHz		70	_____			
Option R&S ZVAX-B272 modulator function	Page 1.16				dB	2 dB
Test points:						
M1: …. ns		40 (25, 100 to 650 ns)	_____			
M2: 50 ns		40	_____			
M3: 100 ns		40	_____			
M4: 200 ns		25	_____			
M5: 400 ns		25	_____			
M6: 650 ns		25	_____			
M7: 750 ns		40	_____			
M8: 1000 ns		40	_____			

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B291 **Ref. channel coupling loss** **PORT1 SOURCE IN to PORT1 REF OUT** **Test frequency:** **Range 0.5 GHz to 8 GHz**	Page 1.17				dB	dB
M1: ….. GHz		17	_____	27		0.2 (f=500 to 700MHz) 0.1 (f≥700MHz)
M2: 0.5 GHz		17	_____	27		0.2
M3: 1 GHz		17	_____	27		0.1
M4: 2 GHz		17	_____	27		0.1
M5: 3 GHz		17	_____	27		0.1
M6: 4 GHz		17	_____	27		0.1
M7: 6 GHz		17	_____	27		0.1
M8: 8 GHz		17	_____	27		0.1
Range 8GHz to 24GHz						
M1: ….. GHz		22	_____	32		0.1
M2: 9 GHz		22	_____	32		0.1
M3: 10 GHz		22	_____	32		0.1
M4: 12 GHz		22	_____	32		0.1
M5: 14 GHz		22	_____	32		0.1
M6: 16 GHz		22	_____	32		0.1
M7: 20 GHz		22	_____	32		0.1
M8: 24 GHz		22	_____	32		0.1
Option ZVAX-B291 **Ref. channel isolation** **PORT1 to PORT1 REF OUT** **Test frequency:**	Page 1.18				dB	dB
M1: …..GHz		30	_____			1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz		30	_____			1.0
M3: 1 GHz		30	_____			0.1
M4: 3 GHz		30	_____			0.1
M5: 6 GHz		30	_____			0.1
M6: 12 GHz		30	_____			0.1
M7: 18 GHz		30	_____			0.1
M8: 24 GHz		30	_____			0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZRVAX-B291 **Meas. channel coupling loss** **PORT1 to** **PORT1 MEAS OUT** **Test frequency:** **0.5 GHz to 24 GHz**	Page 1.18				dBm	dB
M1: …..GHz		5	_____	15		0.2 (f=500 to 700MHz) 0.1 (f≥700MHz)
M2: 0.5 GHz		5	_____	15		0.2
M3: 4 GHz		5	_____	15		0.1
M4: 8 GHz		5	_____	15		0.1
M5: 12 GHz		5	_____	15		0.1
M6: 16 GHz		5	_____	15		0.1
M7: 20 GHz		5	_____	15		0.1
M8: 24 GHz		5	_____	15		0.1
Option R&S ZVAX-B291 **Meas. channel isolation** **PORT1SOURCE IN to** **PORT1 MEAS OUT** **Test frequency:**	Page 1.19				dB	dB
M1: …..GHz		25	_____			1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz		25	_____			1.0
M3: 1 GHz		25	_____			0.1
M4: 3 GHz		25	_____			0.1
M5: 6 GHz		25	_____			0.1
M6: 12 GHz		25	_____			0.1
M7: 18 GHz		25	_____			0.1
M8: 24 GHz		25	_____			0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B292 transmission loss PORT2 SOURCE IN to PORT2	Page 1.20				dB	dB
Test frequency:						
Range to 8 GHz						
M1: ….. GHz			_____	3		1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz			_____	3		1.0
M3: 0.1 GHz			_____	3		0.2
M4: 0.5 GHz			_____	3		0.2
M5: 1.0 GHz			_____	3		0.1
M6: 2.0 GHz			_____	3		0.1
M7: 4.0 GHz			_____	3		0.1
M8: 8.0 GHz			_____	3		0.1
Range 8 GHz to 24 GHz						
M1: ….. GHz			_____	4 (5, f>20GHz)		0.1
M2: 9GHz			_____	4		0.1
M3: 10GHz			_____	4		0.1
M4: 12GHz			_____	4		0.1
M5: 14GHz			_____	4		0.1
M6: 16GHz			_____	4		0.1
M7: 20GHz			_____	4		0.1
M8: 24GHz			_____	5		0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B292 **Ref. channel coupling loss** **PORT2 SOURCE IN to PORT2 REF OUT** **Test frequency:** **Range 0.5 GHz to 8 GHz**	Page 1.20				dB	dB
M1: ….. GHz		15	_____	25		0.2 (f=500 to 700MHz) 0.1 (f≥700MHz)
M2: 0.5 GHz		15	_____	25		0.2
M3: 1 GHz		15	_____	25		0.1
M4: 2 GHz		15	_____	25		0.1
M5: 3 GHz		15	_____	25		0.1
M6: 4 GHz		15	_____	25		0.1
M7: 6 GHz		15	_____	25		0.1
M8: 8 GHz		15	_____	25		0.1
Range 8 GHz to 24GHz						
M1: ….. GHz		17	_____	27		0.1
M2: 9 GHz		17	_____	27		0.1
M3: 10 GHz		17	_____	27		0.1
M4: 12GHz		17	_____	27		0.1
M5: 14 GHz		17	_____	27		0.1
M6: 16 GHz		17	_____	27		0.1
M7: 20 GHz		17	_____	27		0.1
M8: 24 GHz		17	_____	27		0.1
Option R&S ZVAX-B292 **Ref. channel isolation** **PORT2 to PORT2 REF OUT** **Test frequency:**	Page 1.21				dB	dB
M1: …..GHz		28	_____			1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz		28	_____			1.0
M3: 1 GHz		28	_____			0.1
M4: 3 GHz		28	_____			0.1
M5: 6 GHz		28	_____			0.1
M6: 12 GHz		28	_____			0.1
M7: 18 GHz		28	_____			0.1
M8: 24 GHz		28	_____			0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option ZVAX-B292 **Meas. channel isolation** **PORT2 SOURCE IN to** **PORT2 MEAS OUT**	Page 1.22				dB	dB
Test frequency:						
M1: …..GHz		30	_____			1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz		30	_____			1.0
M3: 1 GHz		30	_____			0.1
M4: 3 GHz		30	_____			0.1
M5: 6 GHz		30	_____			0.1
M6: 12 GHz		30	_____			0.1
M7: 18 GHz		30	_____			0.1
M8: 24 GHz		30	_____			0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B271 transmission loss modulator off PORT1 SOURCE IN to PORT1 with Option ZVX-B291 **Test frequency:** **M1: …..GHz** **M2: 0.01 GHz** **M3: 1 GHz** **M4: 3 GHz** **M5: 6 GHz** **M6: 12 GHz** **M7: 18 GHz** **M8: 24 GHz**	Page 1.13	 70 70 70 70 70 70 70 70	 _____ _____ _____ _____ _____ _____ _____ _____		dB	1 dB
Option R&S ZVAX-B271 modulator Function **Test points:** **M1: …. Ns** **M2: 50 ns** **M3: 100 ns** **M4: 200 ns** **M5: 400 ns** **M6: 650 ns** **M7: 750 ns** **M8: 1000 ns**	Page 1.13	 40 (25, 100 to 650 ns) 40 40 25 25 25 40 40	 _____ _____ _____ _____ _____ _____ _____ _____		dB	2 dB

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option ZVAX-B273 transmission loss modulator on PORT3 SOURCE IN to PORT3 SOURCE OUT	Page 1.14				dB	dB
Test frequency:						
Range to 8 GHz						
M1: ….. GHz			_____	9		1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01GHz			_____	9		1.0
M3: 0.1GHz			_____	9		0.2
M4: 0.5GHz			_____	9		0.2
M5: 1.0GHz			_____	9		0.1
M6: 2.0GHz			_____	9		0.1
M7: 4.0GHz			_____	9		0.1
M8: 8.0GHz			_____	9		0.1
Range 8 GHz to 24GHz						
M1: ….. GHz			_____	14 (17, f>20GHz)		0.1
M2: 9 GHz			_____	14		0.1
M3: 10 GHz			_____	14		0.1
M4: 12 GHz			_____	14		0.1
M5: 14 GHz			_____	14		0.1
M6: 16 GHz			_____	14		0.1
M7: 20 GHz			_____	14		0.1
M8: 24 GHz			_____	17		0.1
Option ZVAX-B273 transmission loss modulator off PORT3 SOURCE IN to PORT3 SOURCE OUT	Page 1.14				dB	1 dB
Test frequency:						
M1: …..GHz		70	_____			
M2: 0.01 GHz		70	_____			
M3: 1 GHz		70	_____			
M4: 3 GHz		70	_____			
M5: 6 GHz		70	_____			
M6: 12 GHz		70	_____			
M7: 18 GHz		70	_____			
M8: 24 GHz		70	_____			

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B273 modulator Function **Test points:** **M1: …. ns** **M2: 50 ns** **M3: 100 ns** **M4: 200 ns** **M5: 400 ns** **M6: 650 ns** **M7: 750 ns** **M8: 1000 ns**	Page 1.15	 40 (25, 100 to 650 ns) 40 40 25 25 25 40 40	 _____ _____ _____ _____ _____ _____ _____ _____		dB	2 dB
Option R&S VAX-B272 transmission loss modulator on PORT2 MEAS IN to PORT2 MEAS OUT w/o Option ZVX-B292 **Test frequency:** **Range to 8 GHz** **M1: ….. GHz** **M2: 0.01 GHz** **M3: 0.1 GHz** **M4: 0.5 GHz** **M5: 1.0 GHz** **M6: 2.0 GHz** **M7: 4.0 GHz** **M8: 8.0 GHz** **Range 8 GHz to 24 GHz** **M1: ….. GHz** **M2: 9 GHz** **M3: 10 GHz** **M4: 12 GHz** **M5: 14 GHz** **M6: 16 GHz** **M7: 20 GHz** **M8: 24 GHz**	Page 1.15		 _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	 9 9 9 9 9 9 9 9 14 14 14 14 14 14 14 14	dB	dB 1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz) 1.0 0.2 0.2 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B272 transmission loss modulator on PORT2 MEAS IN to PORT2 MEAS OUT w. Option R&S ZVX-B292	Page 1.15				dB	dB
Test frequency:						
Range 0.5GHz to 8GHz						
M1: ….. GHz			_____	20		0.2 (f=500 to 700MHz) 0.1 (f≥700MHz)
M2: 0.5 GHz			_____	20		0.2
M3: 1 GHz			_____	20		0.1
M4: 2 GHz			_____	20		0.1
M5: 3 GHz			_____	20		0.1
M6: 4 GHz			_____	20		0.1
M7: 6 GHz			_____	20		0.1
M8: 8 GHz			_____	20		0.1
Range 8 GHz to 24 GHz						
M1: ….. GHz			_____	27		0.1
M2: 9 GHz			_____	27		0.1
M3: 10 GHz			_____	27		0.1
M4: 12 GHz			_____	27		0.1
M5: 14 GHz			_____	27		0.1
M6: 16 GHz			_____	27		0.1
M7: 20 GHz			_____	27		0.1
M8: 24 GHz			_____	27		0.1
Option R&S ZVAX-B272 transmission loss modulator off PORT2 MEAS IN to PORT2 MEAS OUT w/o Option ZVX-B292	Page 1.15				dB	1 dB
Test frequency:						
M1: …..GHz		70	_____			
M2: 0.01 GHz		70	_____			
M3: 1 GHz		70	_____			
M4: 3 GHz		70	_____			
M5: 6 GHz		70	_____			
M6: 12 GHz		70	_____			
M7: 18 GHz		70	_____			
M8: 24 GHz		70	_____			

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B272 transmission loss modulator off PORT2 MEAS IN to PORT2 with Option ZVX-B292 **Test frequency:** **M1: …..GHz** **M2: 0.01 GHz** **M3: 1 GHz** **M4: 3 GHz** **M5: 6 GHz** **M6: 12 GHz** **M7: 18GHz** **M8: 24 GHz**	Page 1.15	 70 70 70 70 70 70 70 70	 _____ _____ _____ _____ _____ _____ _____ _____		dB	1 dB
Option R&S ZVAX-B272 modulator function **Test points:** **M1: …. ns** **M2: 50 ns** **M3: 100 ns** **M4: 200 ns** **M5: 400 ns** **M6: 650 ns** **M7: 750 ns** **M8: 1000 ns**	Page 1.16	 40 (25, 100 to 650 ns) 40 40 25 25 25 40 40	 _____ _____ _____ _____ _____ _____ _____ _____		dB	2 dB

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B291 **Ref. channel coupling loss** **PORT1 SOURCE IN to PORT1 REF OUT** **Test frequency:** **Range 0.5 GHz to 8 GHz**	Page 1.17				dB	dB
M1: ….. GHz		17	_____	27		0.2 (f=500 to 700MHz) 0.1 (f≥700MHz)
M2: 0.5 GHz		17	_____	27		0.2
M3: 1 GHz		17	_____	27		0.1
M4: 2 GHz		17	_____	27		0.1
M5: 3 GHz		17	_____	27		0.1
M6: 4 GHz		17	_____	27		0.1
M7: 6 GHz		17	_____	27		0.1
M8: 8 GHz		17	_____	27		0.1
Range 8GHz to 24GHz						
M1: ….. GHz		22	_____	32		0.1
M2: 9 GHz		22	_____	32		0.1
M3: 10 GHz		22	_____	32		0.1
M4: 12 GHz		22	_____	32		0.1
M5: 14 GHz		22	_____	32		0.1
M6: 16 GHz		22	_____	32		0.1
M7: 20 GHz		22	_____	32		0.1
M8: 24 GHz		22	_____	32		0.1
Option ZVAX-B291 **Ref. channel isolation** **PORT1 to PORT1 REF OUT** **Test frequency:**	Page 1.18				dB	dB
M1: …..GHz		30	_____			1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz		30	_____			1.0
M3: 1 GHz		30	_____			0.1
M4: 3 GHz		30	_____			0.1
M5: 6 GHz		30	_____			0.1
M6: 12 GHz		30	_____			0.1
M7: 18 GHz		30	_____			0.1
M8: 24 GHz		30	_____			0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZRVAX-B291 **Meas. channel coupling loss** **PORT1 to** **PORT1 MEAS OUT** **Test frequency:** **0.5 GHz to 24 GHz**	Page 1.18				dBm	dB
M1: …..GHz		5	_____	15		0.2 (f=500 to 700MHz) 0.1 (f≥700MHz)
M2: 0.5 GHz		5	_____	15		0.2
M3: 4 GHz		5	_____	15		0.1
M4: 8 GHz		5	_____	15		0.1
M5: 12 GHz		5	_____	15		0.1
M6: 16 GHz		5	_____	15		0.1
M7: 20 GHz		5	_____	15		0.1
M8: 24 GHz		5	_____	15		0.1
Option R&S ZVAX-B291 **Meas. channel isolation** **PORT1SOURCE IN to** **PORT1 MEAS OUT** **Test frequency:**	Page 1.19				dB	dB
M1: …..GHz		25	_____			1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz		25	_____			1.0
M3: 1 GHz		25	_____			0.1
M4: 3 GHz		25	_____			0.1
M5: 6 GHz		25	_____			0.1
M6: 12 GHz		25	_____			0.1
M7: 18 GHz		25	_____			0.1
M8: 24 GHz		25	_____			0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B292 transmission loss PORT2 SOURCE IN to PORT2	Page 1.20				dB	dB
Test frequency:						
Range to 8 GHz						
M1: ….. GHz			_____	3		1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz			_____	3		1.0
M3: 0.1 GHz			_____	3		0.2
M4: 0.5 GHz			_____	3		0.2
M5: 1.0 GHz			_____	3		0.1
M6: 2.0 GHz			_____	3		0.1
M7: 4.0 GHz			_____	3		0.1
M8: 8.0 GHz			_____	3		0.1
Range 8 GHz to 24 GHz						
M1: ….. GHz			_____	4 (5, f>20GHz)		0.1
M2: 9GHz			_____	4		0.1
M3: 10GHz			_____	4		0.1
M4: 12GHz			_____	4		0.1
M5: 14GHz			_____	4		0.1
M6: 16GHz			_____	4		0.1
M7: 20GHz			_____	4		0.1
M8: 24GHz			_____	5		0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option R&S ZVAX-B292 **Ref. channel coupling loss** **PORT2 SOURCE IN to PORT2 REF OUT** **Test frequency:** **Range 0.5 GHz to 8 GHz**	Page 1.20				dB	dB
M1: ….. GHz		15	_____	25		0.2 (f=500 to 700MHz) 0.1 (f≥700MHz)
M2: 0.5 GHz		15	_____	25		0.2
M3: 1 GHz		15	_____	25		0.1
M4: 2 GHz		15	_____	25		0.1
M5: 3 GHz		15	_____	25		0.1
M6: 4 GHz		15	_____	25		0.1
M7: 6 GHz		15	_____	25		0.1
M8: 8 GHz		15	_____	25		0.1
Range 8 GHz to 24GHz						
M1: ….. GHz		17	_____	27		0.1
M2: 9 GHz		17	_____	27		0.1
M3: 10 GHz		17	_____	27		0.1
M4: 12GHz		17	_____	27		0.1
M5: 14 GHz		17	_____	27		0.1
M6: 16 GHz		17	_____	27		0.1
M7: 20 GHz		17	_____	27		0.1
M8: 24 GHz		17	_____	27		0.1
Option R&S ZVAX-B292 **Ref. channel isolation** **PORT2 to PORT2 REF OUT** **Test frequency:**	Page 1.21				dB	dB
M1: …..GHz		28	_____			1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz		28	_____			1.0
M3: 1 GHz		28	_____			0.1
M4: 3 GHz		28	_____			0.1
M5: 6 GHz		28	_____			0.1
M6: 12 GHz		28	_____			0.1
M7: 18 GHz		28	_____			0.1
M8: 24 GHz		28	_____			0.1

Parameter	Reference	Min. value	Actual value	Max. value	Unit	Measurement uncertainty
Option ZVAX-B292 **Meas. channel isolation** **PORT2 SOURCE IN to** **PORT2 MEAS OUT**	Page 1.22				dB	dB
Test frequency:						
M1: …..GHz		30	_____			1.0 (f<50MHz) 0.2 (f=50 to 700MHz) 0.1 (f≥700MHz)
M2: 0.01 GHz		30	_____			1.0
M3: 1 GHz		30	_____			0.1
M4: 3 GHz		30	_____			0.1
M5: 6 GHz		30	_____			0.1
M6: 12 GHz		30	_____			0.1
M7: 18 GHz		30	_____			0.1
M8: 24 GHz		30	_____			0.1

Table of Contents - Chapter 2 "Alignment"

2 Alignment

No alignment has to be performed on the R&S ZVAX24 Extension Unit.

Checking the Gauge

Only With Option R&S ZVAX24-B291 or –B292

It is strongly recommended that each test port of the R&S ZVAX24 is gauged prior to its first use. The gauge must be recalibrated whenever the connector adapter is changed and should be checked regularly, using the gauge block, for correct zero between adapter changes.

Connector pin depth tolerances

Connector type	Pin depth / mm	Pos. tolerance / mm	Neg. tolerance / mm
3.5 mm (m)	0.000	0.076	0.000

Procedure

1. Ensure that the appropriate connector adapter is fitted to the dial gauge.
2. Attach the gauge block to the gauge interface and rotate the dial so that the indication reads zero. Lock the dial in position by tightening the screw on the side of the dial. Disconnect the gauge block.
3. Mate the connector to be measured to the gauge and note the indication.
4. The connector is "in gauge" if the indication lies between the limits set by the connector specification (see Table above). For precision type N and 3.5 mm connectors, the calibrated zero indication on the dial corresponds to one extreme, the other being -76 µm (-0.003'') (anti-clockwise on the dial).

NOTICE
Damage to the connector (or the one it is connected to) if the reading is positive.

5. After use, return the gauge set to its box.

Table of Contents - Chapter 3 "Repairs"

3 Repairs

This chapter describes the R&S ZVAX's construction, simple procedures for repairs, troubleshooting and board replacement.

Chapter 4 of this service manual describes the installation of options.

Instrument Construction and Function Description

The R&S ZVAX's construction is shown schematically by the following block diagram and the exploded drawings (see Chapter 5).

The block diagram will help clarify the following function description of the instrument.

Block Diagram

See also Chapter 5, Annex and Drawings.

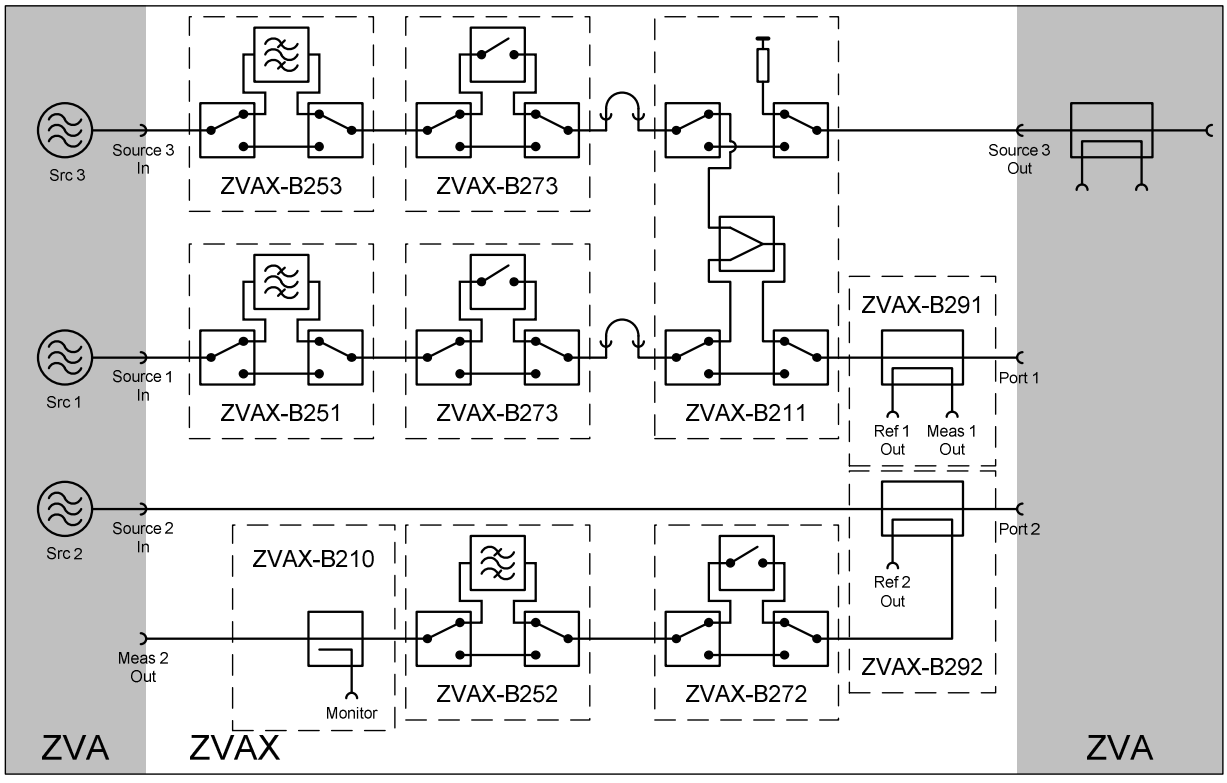

Fig. 3-1 Block diagram of the R&S ZVAX24

Description of the Block Diagram

The R&S ZVAX24 consists of a base unit with cabinet, power supply, interface printed circuit board and fan. It is driven by the R&S ZVA24 via a USB interface. When the R&S ZVAX24 is connected, there is only one unassigned USB interface remaining on the R&S ZVA24 rear panel; therefore, the R&S ZVAX24 has a USB hub with two outputs on the front panel and two on the rear panel.

In order not to have to rely on the slow USB interface when switching over the harmonics filters during the sweep, the filter banks can also be switched via the universal I/O port, a parallel interface that is compatible with Agilent's ENA. However, this interface must also remain usable for other purposes and is therefore available on the rear panel of the R&S ZVAX24 as well. While the 16 out bits of the universal I/O port are being used internally to control the filter bank, they remain available on the rear-panel interface. For this reason, their status originally set by the user must be restored by the R&S ZVAX24. In addition, the interface printed circuit board contains two high-speed differential inputs for driving the pulse modulators. Status LEDs on the front panel indicate the switching status of the options described below. The only RF components already included in the base unit are the SMA female connectors on the front and rear panels and the two connecting cables on the rear panel (an external power amplifier can be looped in instead of the connecting cables).

The base unit can be fitted with the following options, which can be selected independently of one another:

- **R&S ZVAX24-B210: Monitor output, port 2**
  To be able to monitor the spectrum of the DUT output signal during an S-parameter, conversion-loss, intermodulation or noise measurement, the test signal of port 2 is coupled out via an optional coupler and made available at a female connector on the front panel of the R&S ZVAX24.
  A spectrum analyzer, for example, can be connected to this connector.
- **R&S ZVAX24-B211: Combiner, ports 1 and 3**
  The generator signals from ports 1 and 3, which come from different synthesizers and can therefore be set to two different frequencies, are combined into a two-tone signal via a broadband combiner that is looped into the signal paths by means of a transfer switch. This signal is output at port 1, while port 3 is terminated with 50 Ω to ensure a good load match.
- **R&S ZVAX24-B251, -B253: Harmonics filter for generator, ports 1 and 3**
  To achieve the values of 51 dBc with the R&S ZVA – which features harmonic suppression of 20 dBc at 1 GHz, 10 dBm – an optional 1 GHz to 22 GHz filter bank can be looped into each of the generator paths of ports 1 and 3. At port 3, the filter is required for differential measurements and for measurements on mixers (spectral purity of RF and LO signals). To avoid the maximum generator power at the test port being permanently reduced by the transmission loss of the filter bank, the filter bank is looped into the generator signal path by means of a transfer switch.
- **R&S ZVAX24-B252: Harmonics filter for receiver, port 2**
  To prevent a harmonic measurement from being corrupted by a harmonics generated in the receiver itself, the fundamental can be suppressed by a filter bank looped into the signal path of the receiver of port 2. To avoid the dynamic range being permanently reduced by the transmission loss of the filter bank, the filter bank is activated by means of a transfer switch.
- **R&S ZVAX24-B271, -B273: Pulse modulator, ports 1 and 3**
  For unbalanced DUTs that have to be operated only in forward-pulsed mode (e.g. power amplifiers), a pulse modulator for the generator signal at port 1 is sufficient. A second pulse modulator for the generator signal at port 3 is needed for balanced DUTs and for DUTs that also have to be pulsed in the reverse direction (e.g. T/R modules for phased array pulse radar). To avoid the maximum generator power at the test port being reduced by the transmission loss of the activated modulator also in normal mode, the modulator is looped into the generator signal path by means of a transfer switch only in pulsed mode. As a pulse generator, either the R&S ZVA24's FCON gate array can be used, which is connected via the cascade interface, or an external generator whose signal is fed in at one of the EXT PULSE GENERATOR IN connectors on the rear panel of the R&S ZVAX24.

The operating software offers various possible combinations for assigning the pulse generators (max. 2) to the pulse modulators (max. 3). The pulse-generator signal used is also available at the PULSE GENERATOR DUT connectors on the rear panel.

- **R&S ZVAX24-B272: Pulse modulator, port 2**
  To protect the receiver from the high pulse powers of the generator when measuring T/R modules, a pulse modulator can be looped into the measurement channel of port 2 by means of a transfer switch.
- **R&S ZVAX24-B291, -B292: Directional coupler for high powers, ports 1 and 2**
  This option is intended for DUTs to which high power is to be applied or that produce a high output power. Instead of the couplers in the R&S ZVA24 (P_{max} = 27 dBm), edge line couplers can be used in the R&S ZVAX24 for ports 1 and 2. They can be loaded with powers up to 43 dBm (20 W).

Board Replacement

The following section is a detailed description of board replacement. Chapter 5 tells you how to order spare parts. It contains a list of mechanical parts and their order numbers as well as drawings relating to board replacement.

NOTE *The numbers in brackets are the item numbers in the list of mechanical parts in Chapter 5.*

In turn, these item numbers are the same as the item numbers in the drawings relating to board replacements (also in Chapter 5):

1311.2501.01 sheet 1

The terms "left" and "right" always mean left and right as seen looking at the front of the instrument.

Board Overview

Table 3-1 Overview: Board Replacement

Board	Measures taken after replacement
Interface R&S ZVAX24	Functional test
Fan unit	Functional test
Power supply	Check power supply output voltages
Standby board	Functional test
USB board	Test with mouse, keyboard
LED board	Functional test
Front cover	
Options:	Perform relevant performance test
Port2 Receiver Monitor Output	
Combiner	
Harmonic Filter Source Port 1	
Harmonic Filter Receiver Port 2	
Harmonic Filter Source Port 3	
Pulse Modulator Source Port 1	
Pulse Modulator Receiver Port 2	
Pulse Modulator Source Port 3	
High Power Coupler Port 1	
High Power Coupler Port 2	

Replacing the Interface R&S ZVX24 A400

(See Chapter 5, Spare Parts List, Items 150 and drawing 1311.2509.01)

Opening the instrument and removing the board

- Turn off the instrument and disconnect from the mains, screw off the 4 rear-panel feet (580) and pull off the enclosure (570) backwards.
- Remove the Power Supply A200 (see **Replacing Power Supply A200**)
- Remove the coax cables connected to the rear panel
- Disconnect all coax cables and ribbon cables from the interface board
- Remove the 4 hex nuts (180) and lockwashers (170), the 2 screws (190) and the 2 locking screws at the rear panel
- Loosen the 2 screws (260) and 2 screws (270) and take out the interface board.

Installing the board and reassembling the instrument

- Install the new interface board by reversing the removal procedure.
- Reconnect any cables that have been disconnected.
- Slide the enclosure (570) back on and screw the 4 rear-panel feet (580) into position.
- Connect the mains cable, turn on at the mains switch and press the ON key.
- When the instrument has been started, switch on (via R&S ZVA: MODE : ZVAX Path Configuration) all installed options and check the relevant LEDs at the front panel.

Replacing the Front Cover

(See Chapter 5, Spare Parts List, Items 540 and drawing 1311.2509.01)

The front cover is the outermost front panel with lettering.

- Turn off the instrument and disconnect from the mains.
- Remove the 4 screws (560) in the front handles (550), right and left, and take off the front handles
- Remove the front cover (540).
- Fit the new front cover and reassemble the instrument by reversing the disassembly procedure.
- Connect the mains cable, turn on at the mains switch and press the ON key.

Replacing Power Supply A200

(See Chapter 5, Spare Parts List, Items 220 and drawing 1311.2509.01)

The power supply is installed at the rear of the instrument frame.

Removing the power supply

- Turn off the instrument and disconnect from the mains, screw off the 4 rear-panel feet (580) and pull off the enclosure (570) towards the rear.
- Remove the srew (300) and the protection cover (290).
- Disconnect the fuse unit (310) and the input cable from the power supply.
- Remove the 2 screws (260) at the bottom and the 2 screws (270) at the rear panel.
- Remove the power supply.

Installing the new power supply

- Fit the new power supply by reversing the removal procedure
- Connect the mains cable, turn on at the mains switch and press the ON key.
- Check all voltages at the fuse unit (310) using a DC meter.
- Turn off the instrument and disconnect from the mains.
- Push the enclosure (570) back on and screw the 4 rear-panel feet (580) into position.
- Connect the mains cable, turn on at the mains switch and press the ON key.

Replacing Fuse Unit W11

(See Chapter 5, Spare Parts List, Item 310, and drawing 1311.2509.01)

The fuse board is installed on the left-hand side of the power supply.

Removing the fuse board

- Turn off the instrument and disconnect from the mains, screw off the 4 rear-panel feet (580) and pull off the enclosure (570) backwards.
- Disconnect fuse unit cable from power supply and interface board.
- Remove the 2 screws (315) at the rear panel and take out the fuse unit.

Fitting the new fuse board

- Reinstall the fuse unit by reversing the removal procedure.
- Push the enclosure (570) back on and screw the 4 rear-panel feet (580) into position.
- Connect the mains cable, turn on at the mains switch and press the ON key.

Replacing the Fan

(See Chapter 5, Spare Parts List, Item 200 and drawing 1311.2509.01)

The fan is located under the power supply.

Opening the instrument and removing the fan

- Turn off the instrument and disconnect from the mains, screw off the 4 rear-panel feet (580) and pull off the enclosure (570) backwards.
- Remove the srew (300) and the protection cover (290).
- Disconnect the fan cable on the interface board.
- Remove fan unit (200) by undoing the 4 screws (210).

Fitting a new fan and reassembling the instrument

- Install the fan unit using the 4 screws (210).

N.B.: *The arrows on the fan show the installation position. The fan blows air into the instrument. Route the fan cable so that it cannot get caught in the fan.*

- Connect the fan cable on the interface board (X601).
- Refit the power supply
- Connect the mains cable, turn on at the mains switch and press the ON key.
- Check that the fan is operating correctly (fan is blowing air into the instrument).
- Turn off the instrument and disconnect the mains cabling again.
- Push the enclosure (570) back on and screw the 4 rear-panel feet (580) into position.
- Connect the mains cable, turn on at the mains switch and press the ON key.

Replacing Standby Board A70

(See Chapter 5, Spare Parts List, Item 330, and drawing 1311.2509.01)

The standby board is installed behind the mains switch.

Removing the standby board

- Turn off the instrument and disconnect from the mains, screw off the 4 rear-panel feet (580) and pull off the enclosure (570) backwards.
- Remove the front cover (540), see **Replacing the Front Cover**.
- Disconnect cable W80.
- Remove the 2 screws (340) and take out the standby board.

Fitting the new standby board

- Reinstall the standby board by reversing the removal procedure.
- Push the enclosure (570) back on and screw the 4 rear-panel feet (580) into position.
- Connect the mains cable, turn on at the mains switch and press the ON key.

Replacing USB Board A40

(See Chapter 5, Spare Parts List, Item 350, and drawing 1311.2509.01)

The USB board is installed behind the front panel on the left-hand side.

Removing the USB board

- Turn off the instrument and disconnect from the mains, screw off the 4 rear-panel feet (580) and pull off the enclosure (570) backwards.
- Remove the front cover (540), see **Replacing the Front Cover**.
- Disconnect cable W40.
- Remove the 2 screws (360) and take out the USB board.

Fitting the new USB board

- Reinstall the USB board by reversing the removal procedure.
- Push the enclosure (570) back on and screw the 4 rear-panel feet (580) into position.
- Connect the mains cable, turn on at the mains switch and press the ON key.

Replacing LED Board A80, A81, A82

(See Chapter 5, Spare Parts List, Item 470, and drawing 1311.2509.01)

The LED boards are installed behind the front panel.

Removing the LED board

- Turn off the instrument and disconnect from the mains, screw off the 4 rear-panel feet (580) and pull off the enclosure (570) backwards.
- Remove the front cover (540), see **Replacing the Front Cover**.
- Disconnect cable W80.
- Remove the 2 screws (480) and take out the LED board.

Fitting the new LED board

- Reinstall the LED board by reversing the removal procedure.
- Push the enclosure (570) back on and screw the 4 rear-panel feet (580) into position.
- Connect the mains cable, turn on at the mains switch and press the ON key.
- Connect the R&S ZVAX with the R&S ZVA and switch on the installed options.
- Check the corresponding LEDs.

Replacing Options

(See Chapter 5, drawings 1311.2509.01 sheet 5, 1311.2509.01 S and 1311.2521 to 1311.2615)

Removing the Option

- Turn off the instrument and disconnect from the mains, screw off the 4 rear-panel feet (580) and pull off the enclosure (570) backwards.
- Remove the front cover (540), see Replacing the Front Cover.
  (only with option ZVAX-B291, -B292 or if one of the cables mounted on the front pannel has to be replaced)
- Use the relevant drawing to remove the option.

Fitting the new option

- Reinstall the option by reversing the removal procedure.
- Push the enclosure (570) back on and screw the 4 rear-panel feet (580) into position.
- Connect the mains cable, turn on at the mains switch and press the ON key.
- Change the config.ini file (see chapter 4)
- Connect the R&S ZVAX with the R&S ZVA and switch on the option.
- Check the corresponding LED.

Troubleshooting

The instructions in this manual describe troubleshooting down to the board level. Any defective boards can then be replaced and the instrument put back into operation. A selftest which checks the board diagnostic voltages and displays limit violations is provided to facilitate troubleshooting and diagnosis.

We recommend that you return your instrument to the technical specialists at an R&S service facility for board replacement and any further repairs that may be needed (see the address list at the beginning of this manual).

NOTE

Do not insert or remove boards that are still live

Avoid causing shorts when measuring voltages

N.B. *The first thing to do if you encounter any problems is to check if any connection (cables, edge connectors etc.) are damaged or even incorrectly inserted.*

Test Equipment and Accessories

Item	Type of equipment	Recommended characteristics or features	Recommended model	R&S Order No.	Application
1	VNA	10 MHz to 24 GHz	R&S ZVAX24 (required!)	1145.1110.2x	
		with option Pulsed Measurements	R&S ZVA-K7	1164.1511.02	
2	2 Test cables 3.5mm male	low loss, good match, high phase stability	R&S ZV-Z193	1306.4520.xx	
3	Calibration kit 3.5 mm		R&S ZV-Z32	1128.3501.02	
4	Termination 3.5 mm male	Match > 16 dB 10 MHz to 24 GHz		5201.1262.00	
5	DC meter		R&S URE	0350.5315.02	

Determining which Boards are Defective

The table below lists boards that are probably defective based on the faults that occurred during the performance test.

	Defective board	
Problem with:	**Probable**	**Also possible**
Through State Transmission of Port 1 Source Path	R&S X-B251, -B271, -B211, -B291	
Through State Transmission of Port 3 Source Path	R&S ZVAX-B253, -B273, -B211	
Through State Transmission of Port 2 Receiver Path	R&S ZVAX-B252, -B272, (-B203),-B292	
Option R&S ZVAX-B210 (Port 2 Monitor): Checking the Transmission Loss w/o R&S ZVAX-B292	R&S ZVAX-B210	R&S ZVAX-B203, -B252, -B272, -B292
Option R&S ZVAX-B210 (Port 2 Monitor): Checking the Transmission Loss with R&S ZVAX-B292	R&S ZVAX-B210	R&S ZVAX-B203, -B252, -B272
Option R&S ZVAX-B211 (Combiner): Transmission Loss Port1 Src In to Port1 Src Out	R&S ZVAX-B211	R&S ZVAX-B251, -B271
Option R&S ZVAX-B211 (Combiner): Transmission Loss Port3 Src In to Port1 Src Out w/o ZVX-B291	R&S ZVAX-B211	R&S ZVAX-B253, -B273
Option R&S ZVAX-B211 (Combiner): Transmission Loss Port1 Src In to Port1 with ZVX-B291	R&S ZVAX-B211	R&S ZVAX-B251, -B271, -B291
Option R&S ZVAX-B211 (Combiner): Transmission Loss Port3 Src In to Port1 with ZVX-B291	R&S ZVAX-B211	R&S ZVAX-B253, -B273, -B291
Option R&S ZVAX-B211 (Combiner): Isolation Port1 Src In to Port3 Src In	R&S ZVAX-B211	R&S ZVAX-B251, -B271 R&S ZVAX-B253, -B273
Option R&S ZVAX-B211 (Combiner): Reflection Loss of Port 3 (Src Out)	R&S ZVAX-B211	
Option R&S ZVAX-B251 (Harmonic Filter Source Port 1): Transmission Loss Port1 Src In to Port1 Src Out w/o ZVX-B291	R&S ZVAX-B251	R&S ZVAX-B211, -B271
Option R&S ZVAX-B251 (Harmonic Filter Source Port 1): Transmission Loss Port1 Src In to Port1 with ZVX-B291	R&S ZVAX-B251	R&S ZVAX-B211, -B271, -B291
Option R&S ZVAX-B251 (Harmonic Filter Source Port 1): Harmonic Suppression Port1 Src In to Port1 Src Out w/o ZVX-B291	R&S ZVAX-B251	
Option R&S ZVAX-B251 (Harmonic Filter Source Port 1): Harmonic Suppression Port1 Src In to Port1 with ZVX-B291	R&S ZVAX-B251	
Option R&S ZVAX-B253 (Harmonic Filter Source Port 3): Transmission Loss Port3 Src In to Port3 Src Out	R&S ZVAX-B253	R&S ZVAX-B211, -B273
Option R&S ZVAX-B253 (Harmonic Filter Source Port 3): Harmonic Suppression Port1 Src In to Port1 Src Out	R&S ZVAX-B253	
Option R&S ZVAX-B252 (Harmonic Filter Receiver Port 2): Transmission Loss Port2 Meas In to Port2 Meas Out w/o ZVX-B292	R&S ZVAX-B252	R&S ZVAX-B210, -B203, -B272
Option R&S ZVAX-B252 (Harmonic Filter Receiver Port 2): Transmission Loss Port2 to Port2 Meas Out with ZVX-B292	R&S ZVAX-B252	R&S ZVAX-B210, -B203, -B272, -B292

	Defective board	
Problem with:	**Probable**	**Also possible**
Option R&S ZVAX-B252 (Harmonic Filter Source Port 2): Fundamental Suppr. Port2 Meas In to Port2 Meas Out w/o ZVX-B292	R&S ZVAX-B252	
Option R&S ZVAX-B252 (Harmonic Filter Source Port 2): Fundamental Suppr. Port2 to Port2 Meas Out with ZVX-B292	R&S ZVAX-B252	
Option R&S ZVAX-B271 (Pulse Modulator Source Port 1): Transmission Loss Modulator on Port1 Src In to Port1 Src Out w/o ZVX-B291	R&S ZVAX-B271	R&S ZVAX-B211, -B251
Option R&S ZVAX-B271 (Pulse Modulator Source Port 1): Transmission Loss Modulator on Port1 Src In to Port1 with ZVX-B291	R&S ZVAX-B271	R&S ZVAX-B211, -B251, -B291
Option R&S ZVAX-B271 (Pulse Modulator Source Port 1): Transmission Loss Modulator off Port1 Src In to Port1 Src Out w/o ZVX-B291	R&S ZVAX-B271	
Option R&S ZVAX-B271 (Pulse Modulator Source Port 1): Transmission Loss Modulator off Port1 Src In to Port1 with ZVX-B291	R&S ZVAX-B271	
Option R&S ZVAX-B271 (Pulse Modulator Source Port 1): Pulse Modulator Function	R&S ZVAX-B271	
Option R&S ZVAX-B273 (Pulse Modulator Source Port 3): Transmission Loss Modulator on Port3 Src In to Port3 Src Out	R&S ZVAX-B273	R&S ZVAX-B211, -B253
Option R&S ZVAX-B273 (Pulse Modulator Source Port 3): Transmission Loss Modulator off Port3 Src In to Port3 Src Out	R&S ZVAX-B273	
Option R&S ZVAX-B273 (Pulse Modulator Source Port 3): Pulse Modulator Function	R&S ZVAX-B273	
Option R&S ZVAX-B272 (Pulse Modulator Receiver Port 2): Transmission Loss Modulator on Port2 Meas In to Port2 Meas Out w/o ZVX-B292	R&S ZVAX-B272	R&S ZVAX-B210, -B203, -B252
Option R&S ZVAX-B272 (Pulse Modulator Receiver Port 2): Transmission Loss Modulator on Port2 Meas In to Port2 with ZVX-B292	R&S ZVAX-B272	R&S ZVAX-B210, -B203, -B252, -B292
Option R&S ZVAX-B272 (Pulse Modulator Receiver Port 2): Transmission Loss Modulator off Port2 Meas In to Port2 Meas Out w/o ZVX-B292	R&S ZVAX-B272	
Option R&S ZVAX-B272 (Pulse Modulator Receiver Port 2): Transmission Loss Modulator off Port2 Meas In to Port2 with ZVX-B292	R&S ZVAX-B272	
Option R&S ZVAX-B272 (Pulse Modulator Receiver Port 2): Modulator Function	R&S ZVAX-B272	
Option R&S ZVAX-B291 (High Power Coupler Port 1): Maximum Output Power at Port1	R&S ZVAX-B291	R&S ZVAX-B211, -B251, -B271
Option R&S ZVAX-B291 (High Power Coupler Port 1): Reference Channel Coupling Loss Port1 Src In to Port1 Ref Out	R&S ZVAX-B291	R&S ZVAX-B211, -B251, -B271

	Defective board	
Problem with:	**Probable**	**Also possible**
Option R&S ZVAX-B291 (High Power Coupler Port 1): Reference Channel Isolation Port1 to Port1 Ref Out	R&S ZVAX-B291	
Option R&S ZVAX-B291 (High Power Coupler Port 1): Meas. Channel Coupling Loss Port1 Src In to Port1 Meas Out	R&S ZVAX-B291	
Option R&S ZVAX-B291 (High Power Coupler Port 1): Meas. Channel Isolation Port1 to Port1 Meas Out	R&S ZVAX-B291	
Option R&S ZVAX-B292 (High Power Coupler Port 2): Maximum Output Power at Port2	R&S ZVAX-B292	
Option R&S ZVAX-B292 (High Power Coupler Port 2): Transmission Loss Port2 Src In to Port2	R&S ZVAX-B292	
Option R&S ZVAX-B292 (High Power Coupler Port 2): Reference Channel Coupling Loss Port2 Src In to Port2 Ref Out	R&S ZVAX-B292	
Option R&S ZVAX-B292 (High Power Coupler Port 2): Reference Channel Isolation Port2 to Port2 Ref Out	R&S ZVAX-B292	
Option R&S ZVAX-B292 (High Power Coupler Port 2): Meas. Channel Isolation Port2 Src In to Port2 Meas Out	R&S ZVAX-B292	R&S ZVAX-B203, -B210, -B252, -B272

A board test should be performed before the board that has been deduced to be defective is replaced.

Board Test

When boards are being tested, the R&S ZVAX24 must be connected to the R&S ZVA via USB cable.
The R&S ZVA is used for the RF measurements.
If a clear fault is not present, the order of the board tests given below should always be followed.

Opening the instrument

(See Chapter 5, drawing1311.2509.01)

- Turn off the instrument and disconnect from the mains, screw off the 4 rear-panel feet (580) and pull off the enclosure (570) backwards.

Testing the Power Supply

Check voltages using the DC meter (standby switch in power ON position)

Output voltage	Tolerance	J1 pin
13.5 V	± 1.4 V	12
+ 5 V	± 0.05 V	8, 9, 10, 20, 21, 22
+3.3 V	± 0.033 V	3, 4, 15
+ 12 V	± 0.12 V	1
- 12.1 V	+ 0.48 V / - 0.36 V	13
GND		5, 6, 16, 17, 18

Checking standby function (standby switch in power OFF position):

	Voltage	J1 pin
Standby out	+ 13.5 V	12
Standby return	+ 5 V ± 0.5 V	24

Testing the Interface Board

Before testing the interface board check the output voltages of the power supply.

- Disconnect the ribbon cables and the coax cables from the interface board (W11 must be connected to X600).
- Set the R&S ZVA to the functions shown in the table below.
- Check the voltages using the DC meter.

Power Supply connector:

Connect DC meter to		**DC voltage**
X600.1	GND X600.5, 6	+ 12 V ± 0.6 V
X600.8, 9, 10	GND X600.5, 6	+ 5 V ± 0.25 V
X600.20, 21	GND X600.16, 17, 18	+ 5 V ± 0.25 V
X600.3, 4	GND X600.5, 6	+ 3.3 V ± 0.17 V
X600.15	GND X600.16, 17, 18	+ 3.3 V ± 0.17 V
X600.13	GND X600.16, 17, 18	- 12 V ± 0.6 V
X600.12	GND X600.16, 17, 18	+ 13.5 V ± 1.4 V
Power Supply standby: X600.23	GND X600.24	+ 5 V ± 0.5 V
Power Supply on: X600.23	GND X600.24	0 V ± 0.5 V

Supply voltages for the Standby board and the LED board:

Connect DC meter to		**DC voltage**
X611.A3	GND X611.B20	+ 5 V ± 0.5 V
X611.A9	GND X611.B20	+ 5 V ± 0.5 V
X611.A15	GND X611.B20	+ 5 V ± 0.5 V
X611.A20	GND X611.B20	+ 5 V ± 0.5 V
X611.A19	GND X611.B20	+ 13.5 V ± 1.4 V

Control voltages for the LED boards:

R&S ZVA setting	LEDs port 1	LEDs port 2	LEDs port 3
MODE : ZVAX Path Configuration : Src 1 Harm. Filter	Yellow ON		
MODE : ZVAX Path Configuration : Rec 2 Harm. Filter		Yellow ON	
MODE : ZVAX Path Configuration : Src 3 Harm. Filter			Yellow ON
MODE : ZVAX Path Configuration : Src 1 Pulse Modul.	Red ON		
MODE : ZVAX Path Configuration : Rec 2 Pulse Modul.		Red ON	
MODE : ZVAX Path Configuration : Src 3 Pulse Modul.			Red ON
MODE : ZVAX Path Configuration : Src 1 + 3 Combiner	Green ON		Green ON

Supply voltage for the fan:

Connect DC meter to		DC voltage
X601.2, 4	GND X601.1, 3	+ 12 V ± 1.2 V

Supply voltages for the options:

Option		Connect DC meter to		DC voltage
Combiner	R&S ZVAX-B211	X410.B5, B6 X411.B5, B6	GND X410.B4 GND X411.B4	+ 12 V ± 1.2 V + 12 V ± 1.2 V
Harm. Filter Src port1	R&S ZVAX-B251	X403.2, 3, 4 X406.B5, B6 X403.5, 6, 7, 8 X403.21 X403.11, 12	GND X403.9, 10 GND X406.B4 GND X403.9, 10 GND X403.22 GND X403.13, 14	+ 12 V ± 1.2 V + 12 V ± 1.2 V + 5 V ± 0.5 V + 3.3 V ± 0.33 V - 12 V ± 1.2 V
Harm. Filter Rec port2	R&S ZVAX-B252	X404.2, 3, 4 X407.B5, B6 X404.5, 6, 7, 8 X404.21 X404.11, 12	GND X404.9, 10 GND X407.B4 GND X404.9, 10 GND X404.22 GND X404.13, 14	+ 12 V ± 1.2 V + 12 V ± 1.2 V + 5 V ± 0.5 V + 3.3 V ± 0.33 V - 12 V ± 1.2 V
Harm. Filter Src port3	R&S ZVAX-B253	X405.2, 3, 4 X408.B5, B6 X405.5, 6, 7, 8 X405.21 X405.11, 12	GND X405.9, 10 GND X408.B4 GND X405.9, 10 GND X405.22 GND X405.13, 14	+ 12 V ± 1.2 V + 12 V ± 1.2 V + 5 V ± 0.5 V + 3.3 V ± 0.33 V - 12 V ± 1.2 V
Pulse Mod. Src Port1	R&S ZVAX-B271	X412.B5, B6 X602 inner con. X604 inner con.	GND X412.B4 X602 outer con. X604 outer con.	+ 12 V ± 1.2 V - 5 V ± 0.5 V - 5 V ± 0.5 V
Pulse Mod. Rec Port2	R&S ZVAX-B272	X413.B5, B6 X603 inner con. X605 inner con.	GND X413.B4 X603 outer con. X605 outer con.	+ 12 V ± 1.2 V - 5 V ± 0.5 V - 5 V ± 0.5 V
Pulse Mod. Src Port3	R&S ZVAX-B273	X414.B5, B6 X606 inner con. X609 inner con.	GND X414.B4 X606 outer con. X609 outer con.	+ 12 V ± 1.2 V - 5 V ± 0.5 V - 5 V ± 0.5 V

Control voltages for the options:

R&S ZVA setting	Connect DC meter to	DC voltage
MODE : ZVAX Path Configuration : Src 1 Harm. Filter ZVA frequency (CW mode): 1.2 GHz 2.0 GHz 3.5 GHz 14.0 GHz	X406 pin B3 X403 pin 17 18 19 20	3.3 V ± 0.33 V 3.3 V ± 0.33 V 3.3 V ± 0.33 V 3.3 V ± 0.33 V 3.3 V ± 0.33 V
MODE : ZVAX Path Configuration : Src 1 Harm. Filter Through Path	X406 pin B3	0 V
MODE : ZVAX Path Configuration : Rec 2 Harm. Filter ZVA frequency (CW mode): 1.2 GHz 2.0 GHz 3.5 GHz 14.0 GHz	X407 pin B3 X404 pin 17 18 19 20	3.3 V ± 0.33 V 3.3 V ± 0.33 V 3.3 V ± 0.33 V 3.3 V ± 0.33 V 3.3 V ± 0.33 V
MODE : ZVAX Path Configuration : Rec 2 Harm. Filter Through Path	X407 pin B3	0 V
MODE : ZVAX Path Configuration : Src 3 Harm. Filter ZVA frequency (CW mode): 1.2 GHz 2.0 GHz 3.5 GHz 14.0 GHz	X408 pin B3 X405 pin 17 18 19 20	3.3 V ± 0.33 V 3.3 V ± 0.33 V 3.3 V ± 0.33 V 3.3 V ± 0.33 V 3.3 V ± 0.33 V
MODE : ZVAX Path Configuration : Src 3 Harm. Filter Through Path	X408 pin B3	0 V
MODE : ZVAX Path Configuration : Src 1 Pulse Modul. SWEEP : Sweep Type : Def Pulse Generator… : Pulse Type = Constant High SWEEP : Sweep Type : Def Pulse Generator… : Pulse Type = Constant Low	X412 pin B3 X503.1, X506.1 X503.1, X506.1	3.3 V ± 0.33 V -5 V ± 0.5 V 0 V
MODE : ZVAX Path Configuration : Src 1 Pulse Modul. Through Path	X412 pin B3	0 V
MODE : ZVAX Path Configuration : Rec 2 Pulse Modul. SWEEP : Sweep Type : Def Pulse Generator… : Pulse Type = Constant High SWEEP : Sweep Type : Def Pulse Generator… : Pulse Type = Constant Low	X413 pin B3 X504.1, X507.1 X504.1, X507.1	3.3 V ± 0.33 V -5 V ± 0.5 V 0 V
MODE : ZVAX Path Configuration : Rec 2 Pulse Modul. Through Path	X413 pin B3	0 V
MODE : ZVAX Path Configuration : Src 3 Pulse Modul. SWEEP : Sweep Type : Def Pulse Generator… : Pulse Type = Constant High SWEEP : Sweep Type : Def Pulse Generator… : Pulse Type = Constant Low	X414 pin B3 X505.1, X508.1 X505.1, X508.1	3.3 V ± 0.33 V -5 V ± 0.5 V 0 V
MODE : ZVAX Path Configuration : Src 3 Pulse Modul. Through Path	X414 pin B3	0 V
MODE : ZVAX Path Configuration : Src 1 + 3 Combiner	X410 pin B3 X411 pin B3	3.3 V ± 0.33 V 3.3 V ± 0.33 V
MODE : ZVAX Path Configuration : Src 1 + 3 Combiner Through Path	X410 pin B3 X411 pin B3	0 V 0 V

If the voltage values are not within the range listed in the tables the interface board must be replaced.

Testing the Port 2 Receiver Monitor Output (R&S ZVAX-B210

- Disconnect the RF cables (W240, W241, W242) from the coupler.
- Set the R&S ZVA to sweep mode 1 GHz to 22 GHz.
- Connect two test cables to port 1 and port 2 of the R&S ZVA and perform a full 2-port calibration at the end of the cables.
- Set the R&S ZVA to Meas S21.

Testing the insertion loss:

- Connect the test cable from port 1 to the input (W240) of the coupler and the test cable from port 2 to the output (W241).
- Put a male termination (from calibration kit) to the monitor output (W242) of the coupler.
- Read transmission S21.

If the S21 values displayed on the R&S ZVA's screen are not within the range 0 dB to -1.6 dB, the coupler must be replaced.

Testing the coupling:

- Connect the test cable from port 1 to the input (W240) of the coupler and the test cable from port 2 to the monitor output (W242).
- Put the male termination (from calibration kit) to the output (W241) of the coupler.
- Read transmission S21.

If the S21 values displayed on the R&S ZVA's screen are not within the range -9 dB to -11 dB, the coupler must be replaced.

Testing the directivity:

- Connect the test cable from port 1 to the output (W241) of the coupler and the test cable from port 2 to the monitor output (W242).
- Put a male termination (from calibration kit) to the input (W240) of the coupler.
- Read transmission S21.

If the S21 values displayed on the R&S ZVA's screen are not smaller than -15 dB, the coupler must be replaced.

Testing the Combiner (R&S ZVAX-B211)

- Disconnect the RF cables W150 (W101 with option R&S ZVAX-B291), W151, W152 from the combiner.
- Set the R&S ZVA to sweep mode 10 MHz to 24 GHz.
- Connect two test cables to port 1 and port 2 of the R&S ZVA and perform a full 2-port calibration at the end of the cables.

Testing the insertion loss (combiner off) X1 to X2:

- Connect the test cable from port 1 to the input X1 and the test cable from port 2 to the output X2.
- Set the R&S ZVA to Meas S21.
- Read transmission S21.
- Connect the test cables from port 1 and port 2 to X1 and X2 of the second transfer switch and perform the same measurement.

If the S21 values displayed on the R&S ZVA's screen are not within the range 0 dB to -1.5 dB, the corresponding transfer switch must be replaced.

Testing the transmission loss (combiner on) on port 1 side:

- Connect the test cable from R&S ZVA port1 to the input X1 of the port 1 transfer switch and the test cable from R&S ZVA port2 to the output X2 of the port 1 transfer switch.
- Put a male termination (from calibration kit) to input X1 of the port 3 transfer switch.
- Set the R&S ZVA to Meas S21.
- Read transmission S21.

If the S21 values displayed on the R&S ZVA's screen are not within the range shown in the table below, the combiner must be replaced.

Frequency range	Transmission loss
10 MHz to 18 GHz	≤ 3.3 dB
18 GHz to 24 GHz	≤ 4.1 dB

Testing the transmission loss (combiner on) on port 3 side:

- Connect the test cable from R&S ZVA port1 to the input X1 of the port 3 transfer switch and the test cable from R&S ZVA port2 to the output X2 of the port 1 transfer switch.
- Put a male termination (from calibration kit) to input X1 of the port 1 transfer switch.
- Set the R&S ZVA to Meas S21.
- Read transmission S21.

If the S21 values displayed on the R&S ZVA's screen are not within the range shown in the table below, the combiner must be replaced.

Frequency range	Transmission loss
10 MHz to 18 GHz	≤ 3.3 dB
18 GHz to 24 GHz	≤ 4.1 dB

Testing the isolation (combiner on):

- Connect the test cable from R&S ZVA port1 to the input X1 of the port 1 transfer switch and the test cable from R&S ZVA port2 to the input X1 of the port 3 transfer switch.
- Put a male termination (from calibration kit) to output X2 of the port 1 transferswitch.
- Set the R&S ZVA to Meas S21.
- Read transmission S21.

If the S21 values displayed on the R&S ZVA's screen are not within the range shown in the table below, the combiner must be replaced.

Frequency range	Transmission loss
10 MHz to 500 MHz	> 10 dB
500 MHz to 24 GHz	> 20 dB

Testing the match (combiner on):

- Connect the test cable from R&S R&S ZVA port1 to the input X1 of the port 3 transfer switch and the test cable from R&S ZVA port2 to the input X1 of the port 1 transfer switch.
- Put a male termination (from calibration kit) to output X2 of the port 1 transfer switch.
- Set the R&S ZVA to Meas S11.
- Read reflection S11.

If the S11 values displayed on the R&S ZVA's screen are not within the range shown in the table below, the combiner must be replaced.

Frequency range	Reflection loss
10 MHz to 10 GHz	> 11 dB
10 GHz to 18 GHz	> 9 dB
18 GHz to 24 GHz	> 7 dB

Testing the Harmonic Filter (R&S ZVAX-B251 and R&S ZVAX-B253)

- Disconnect the RF cables W120 and W121 (W320 and W321 in case of R&S ZVAX-B253) from the harmonic filter.
- Set the R&S ZVA to sweep mode 10 MHz to 24 GHz.
- Connect two test cables to port 1 and port 2 of the R&S ZVA and perform a full 2-port calibration at the end of the cables.
- Connect the test cable from port 1 to the input X1 and the test cable from port 2 to the output X2.

Testing the insertion loss (filter off):

- Set the R&S ZVA to Meas S21.
- Read transmission S21.

If the S21 values displayed on the R&S ZVA's screen are not within the range 0 dB to -1.5 dB, the transfer switch must be replaced.

Testing the transmission loss (filter on):

- Set the R&S ZVA to Meas S21.
- Read transmission S21.

If the S21 values displayed on the R&S ZVA's screen are not within the range shown in the table below, the harmonic filter must be replaced.

Frequency range	Transmission loss
1 GHz to 1.5 GHz	> - 7.6 dB
1.5 GHz to 2.2 GHz	> - 8.6 dB
2.2 GHz to 3.0 GHz	> - 7.1 dB
3.0 GHz to 4.2 GHz	> - 7.2 dB
4.2 GHz to 6.0 GHz	> - 7.7 dB
6.0 GHz to 8.4 GHz	> - 6.5 dB
8.4 GHz to 12 GHz	> - 7.0 dB
12 GHz to 16 GHz	> - 8.6 dB
16 GHz to 22 GHz	> - 9.0 dB

Testing the stop band transmission loss (filter on)

[**Preset**]
- [**Mode** : ZVAX Path Config : Src 1 Harmonic Filter]
- [**Mode** : Port Config.. : (Set port 1 source and receiver freqs to 2·fb)
- [**Start**: 1 GHz]
- [**Stop**: 12 GHz]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Trace** : Trace Funct: Data -> Mem : Math = Data/Mem]
- [**Trace** : Trace Select : Trace Manager… : (*Switch memory trace off*)]
- [**System Config** : Service Function… : Enter Password: (*Enter password for service level 3*): 1.1.2.10.1.0,5]

If the S21 values displayed on the R&S ZVA's screen are not within the range shown in the table below, the harmonic filter must be replaced.

Frequency range	Transmission loss
1 GHz to 1.5 GHz	> - 37.0 dB
1.5 GHz to 2.2 GHz	> - 38.0 dB
2.2 GHz to 3.0 GHz	> - 36.5 dB
3.0 GHz to 4.2 GHz	> - 36.5 dB
4.2 GHz to 6.0 GHz	> - 37.0 dB
6.0 GHz to 8.4 GHz	> - 35.5 dB
8.4 GHz to 12 GHz	> - 36.0 dB

Testing the Harmonic Filter (R&S ZVAX-B252)

- Disconnect the RF cables W211 and W230 from the harmonic filter.
- Set the R&S ZVA to sweep mode 10 MHz to 24 GHz.
- Connect two test cables to port 1 and port 2 of the R&S ZVA and perform a full 2-port calibration at the end of the cables.
- Connect the test cable from port 1 to the input X1 and the test cable from port 2 to the output X2.

Testing the insertion loss (filter off):

- Set the R&S ZVA to Meas S21.
- Read transmission S21.

If the S21 values displayed on the R&S ZVA's screen are not within the range 0 dB to -1.5 dB, the transfer switch must be replaced.

Testing the transmission loss (filter on):

- Set the R&S ZVA to Meas S21.
- Read transmission S21.

If the S21 values displayed on the R&S ZVA's screen are not within the range shown in the table below, the harmonic filter must be replaced.

Frequency range	Transmission loss
1 GHz to 1.5 GHz	> - 7.6 dB
1.5 GHz to 2.2 GHz	> - 8.6 dB
2.2 GHz to 3.0 GHz	> - 7.1 dB
3.0 GHz to 4.2 GHz	> - 7.2 dB
4.2 GHz to 6.0 GHz	> - 7.7 dB
6.0 GHz to 8.4 GHz	> - 5.5 dB
8.4 GHz to 12 GHz	> - 6.5 dB
12 GHz to 16 GHz	> - 8.6 dB
16 GHz to 22 GHz	> - 9.0 dB

Testing the stop band transmission loss (filter on):

- [**Preset**]
- [**Mode** : ZVAX Path Config : Rec 2 Harmonic Filter]
- [**Start**: 1 GHz]
- [**Stop**: 12 GHz]
- [**Pwr BW AVG** : Meas Bandwidth : 1 kHz]
- [**Meas** : S21]
- [**Trace** : Trace Funct: Data -> Mem : Math = Data/Mem]
- [**Trace** : Trace Select : Trace Manager… : (*Switch memory trace off*)]
- [**System Config** : Service Function… : Enter Password: (*Enter password for service level 3*): 1.1.2.10.2.2]

If the S21 values displayed on the R&S ZVA's screen are not within the range shown in the table below, the harmonic filter must be replaced.

Frequency range	Transmission loss
1 GHz to 4 GHz	> - 30 dB
4 GHz to 12 GHz	> - 40 dB

Testing the Pulse Modulator (R&S ZVAX-B271, R&S ZVAX-B272 and R&S ZVAX-B273)

- Disconnect the RF cables W111 and W121 (W210 / W203 and W211 with option R&S ZVAX-B272, W311 and W321 with option R&S ZVAX-B273) from the pulse modulator.
- Set the R&S ZVA to sweep mode 10 MHz to 24 GHz.
- Connect two test cables to port 1 and port 2 of the R&S ZVA and perform a full 2-port calibration at the end of the cables.

Testing the insertion loss (modulator bypassed) X1 to X2:

- Connect the test cable from port 1 to the input X1 and the test cable from port 2 to the output X2.
- Set the R&S ZVA to Meas S21.
- Read transmission S21.

If the S21 values displayed on the R&S ZVA's screen are not within the range 0 dB to -1.5 dB, the transfer switch must be replaced.

Testing the transmission loss (modulator on):

- Connect the test cable from port1 to the input X1 and the test cable from port2 to the output X2.
- Set the R&S ZVA to Meas S21.
- Read transmission S21.

If the S21 values displayed on the R&S ZVA's screen are not within the range shown in the table below, the pulse modulator must be replaced.

Frequency range	Transmission loss
10 MHz to 15 GHz	> - 6 dB
15 GHz to 24 GHz	> - 8 dB

Testing the transmission loss (modulator off):

- Connect the test cable from port1 to the input X1 and the test cable from port2 to the output X2.
- Set the R&S ZVA to Meas S21.
- Read transmission S21.

If the S21 values displayed on the R&S ZVA's screen are not within the range shown in the table below, the combiner must be replaced.

Frequency range	Transmission loss
10 MHz to 18 GHz	< - 75 dB
18 GHz to 24 GHz	< - 55 dB

Testing the modulator function:

See performance test.

Testing the High Power Coupler (R&SZVAX-B291 and R&SZVAX-B292)

- Disconnect the RF cables W101, W103 and W104 (W201, W203 and W204 with option R&S ZVAX-B292) from the coupler.
- Set the R&S ZVA to sweep mode 10 MHz to 24 GHz.
- Connect two test cables to port 1 and port 2 of the R&S ZVA and perform a full 2-port calibration at the end of the cables.
- Set the R&S ZVA to Meas S21.

Testing the insertion loss:

- Connect the test cable from port 1 to the input X1of the coupler and the test cable from port 2 to the output (port1 or port2).
- Put male terminations to the coupled outputs X3 and X4 of the coupler.
- Read transmission S21.

If the S21 values displayed on the R&S ZVA's screen are not within the range 0 dB to -1.6 dB, the coupler must be replaced.

Testing the meas channel coupling loss:

- Connect the test cable from port 1 to the input (port1 or port2) of the coupler and the test cable from port 2 to the meas output X3.
- Put male terminations to the input X1 and the coupled output X4 of the coupler.
- Read transmission S21.

If the S21 values displayed on the R&S ZVA's screen are not within the range -19 dB to -23 dB, the coupler must be replaced.

If the S21 values displayed on the R&S ZVA's screen are not within the range shown in the table below, the coupler must be replaced.

Frequency	Coupling loss
10 MHz	-45 dB ± 5 dB
100 MHz	-27 dB ± 4 dB
1 GHz to 24 GHz	-11 dB ± 4 dB

Testing the ref channel coupling loss:

- Connect the test cable from port 1 to the input X1 of the coupler and the test cable from port 2 to the ref output X4.
- Put male terminations to the output (port1 or port2) and the coupled output X3 of the coupler.
- Read transmission S21.

If the S21 values displayed on the R&S ZVA's screen are not within the range shown in the table below, the coupler must be replaced.

Frequency	Coupling loss
10 MHz	-55 dB ± 5 dB
100 MHz	-37 dB ± 4 dB
1 GHz to 24 GHz	-22 dB ± 4 dB

Testing the meas channel isolation:

- Connect the test cable from port 1 to the input X1 of the coupler and the test cable from port 2 to the meas output X3.
- Put the male termination from the calibration kit to the output (port1 or port2) of the coupler.
- Put a male termination to the coupled output X4 of the coupler.
- Read transmission S21 in the range 1 GHz to 24 GHz.

If the S21 values displayed on the R&S ZVA's screen are not below - 20 dB, the coupler must be replaced.

Table of Contents- Chapter 4 "Software Update / Installation of Options"

4 Software Update / Installation of Options

Chapter 4 provides information on updating R&S ZVA software, restoring the operating system installation and installing options. Descriptions accompanying the software update or the options can be included in this folder as part of Chapter 4.

Installing new R&S ZVAX24 Software

The R&S ZVAX settings are controlled by the NWA (R&S ZVAX24). Therefore a R&S ZVA firmware version 2.60 or higher is required (a new config.ini file is required, see **Entering new config file)**.
The firmware can be downloaded from the R&S website (www.rohde-schwarz.com). This is a Microsoft Installation file (.MSI). The file name is R&S ZVAB_XX_YY.MSI for a released version and R&S ZVAB_XX_YY_BETAZZ.MSI for a test version. This file must be made available to the instrument via a suitable medium (Memory Stick, USB CD-ROM drive network or Remote Desktop). The instrument firmware is installed when you double click on the file. The instrument is ready for operation after you switch off and then switch back on again.

Installing Options

The following options can be fitted to the R&S ZVAX24:

Port 2 Receiver Monitor Output	R&S ZVAX-B210	1311.2521.02
Combiner	R&S ZVAX-B211	1311.2538.02
Harmonic Filter Source Port 1	R&S ZVAX-B251	1311.2544.02
Harmonic Filter Receiver Port 2	R&S ZVAX-B252	1311.2550.02
Harmonic Filter Source Port 3	R&S ZVAX-B253	1311.2567.02
Pulse Modulator Source Port 1	R&S ZVAX-B271	1311.2573.02
Pulse Modulator Receiver Port 2	R&S ZVAX-B272	1311.2580.02
Pulse Modulator Source Port 3	R&S ZVAX-B273	1311.2596.02
High Power Coupler Port 1	R&S ZVAX-B291	1311.2609.02
High Power Coupler Port 2	R&S ZVAX-B292	1311.2615.02

Install according to the instructions that are supplied with the option.

Installing hardware options:

CAUTION

Risk of shock hazard and instrument damage

Before installing the options, disconnect the mains cable.

Observe the safety instructions at the beginning of this manual.

The boards in the instrument are electrostatically sensitive devices (ESD). The appropriate handling instructions for these devices must be observed (ESD workstation).

- Turn off the instrument and disconnect the mains cable.
- Unscrew the 4 back-panel feet (580) and pull off the enclosure (570) towards the rear.
- Follow the **replacement instructions in Chapter 3**
- When installation has been completed, push the enclosure back into position and refit the back-panel feet.

NOTICE

When replacing the enclosure, ensure that no cables are damaged or pulled out:

- Connect the mains cable and turn on the instrument.

Entering new config file:

Set path:
C:\DocumentsandSettings\AllUsers\Anwendungsdaten\Rohde&Schwarz\Nwa\Data\eeprom\ZVAX\
config.ini

Example with two options (R&S ZVAX-B210 and R&S ZVAX-B211):

```
[HEADER]
PARTNUMBER=1311.2509.02
HWCODE=0
PRODUCTINDEX=xx.xx
SN=xxxxxx
PRODUCTDATE=j j j j-mm-dd
TESTINSTRUCTION=01.00
NAME=ZVAX24
EEPROMSIZE=65536

[VERSION]
VERSION=1.00

[OPTION1]
PARTNUMBER=1311.2521.02
PRODUCTINDEX=xx.xx
SN=xxxxxx
PRODUCTDATE= j j j j-mm-dd
NAME=ZVAX-B210

[OPTION2]
PARTNUMBER=1311.2538.02
PRODUCTINDEX=xx.xx
SN=xxxxxx
PRODUCTDATE= j j j j-mm-dd
NAME=ZVAX-B211
```

Writing file to eeprom:

System : Service Function : Enter Password: (*pwd service level 3*): 1.1.2.6.2

Table of Contents- Chapter 5 "Documents"

5 Documents

This chapter provides information on the ordering of spare parts and contains the spare parts list and the documents for the complete R&S ZVAX24 unit.

Spare Parts

The stock numbers necessary for ordering replacement parts and modules can be found in the component lists further down.

CAUTION **Risk of shock hazard and instrument damage**

When replacing a module please note the safety instructions and the repair instructions given in chapter 3 and at the beginning of this service manual

When shipping a module be careful to provide for sufficient mechanical and antistatical protection.

Available Power Cables

Table 5-1 List of power cables available

Stock No.	Earthed-contact connector	Preferably used in
DS 0006.7013.00	BS1363: 1967' 10 A 250 V complying with IEC 83: 1975 standard B2	Great Britain
DS 0006.7020.00	Type 12 , 10 A 250 V complying with SEV-regulation 1011.1059, standard sheet S 24 507	Switzerland
DS 0006.7036.00	Type 498/13 10 A 250 V complying with US-regulation UL 498, or with IEC 83	USA/Canada
DS 0041.4752.00	GB2099 , GB1002 10 A 250 V approvals CCC	China
DS 0041.6232.00	JIS C 8303 7A 125V AC approvals PSE (JET)	Japan
DS 0006.7107.00	Type SAA3 10 A, 250 V, complying with AS C112-1964 Ap.	Australia
DS 0025.2365.00	DIN 49 441, 10 A, 250 V, **straight** approvals VDE,ÖVE,CEBEC,KEMA,S,D,N,FI,LCIE,IMQ,UCIEE	Europe (except Switzerland)
DS 0086.4400.00	DIN 49 441, 10 A, 250 V, **angular** approvals VDE,ÖVE,CEBEC,KEMA,S,D,N,FI,LCIE,IMQ,UCIEE	

Spare Parts List

Pos.-Nr. *ItemNo*	Menge *Quantity*	ME *Unit*	El.Kennz *Ref.Des.*	Benennung / Bezeichnung *Designation*	Z	Sachnummer *Stock No.*	Ersatzteil *Subst.part*	BA	VH
				ACHTUNG EGB/ATTENTION ESD *VARIANTENERKLAERUNG *EXPLANATION OF MODELS VAR02=GRUNDVARIANTE MOD02=BASIC MODEL					
920	1	S	A240	ER RICHTKOPPLER 1-22GHZ DIRECTIONAL COUPLER		1167.8869.00	X	B	O
930	4	S		VS ZYL4-40UNCX 1/4ZOLL A1 SCREW		0275.5830.00		B	V
940	4	S		VS DIN137-A3-A2 WAVE SPRING WASHER DIN 137-A3		0005.0296.00		B	V
950	1	S	W242	DW HF KABEL W242 MONITOR RF CABLE W242 MONITOR	Z	1311.3586.00	X	M	
960	1	S	W241	DW HF KABEL W241 MEAS OUT RF CABLE W241 MEAS OUT	Z	1311.3570.00	X	M	
970	1	S	W240	DW HF KABEL W240 RF CABLE W240	Z	1311.3592.00	X	M	
980	1	S	W243	DW HF KABEL W243 RF CABLE W243 wird verwendet wenn ZVAX-B203 nicht eingebaut ist will be used if ZVAX-B203 is not mounted	Z	1311.3757.00	X	M	
990	1	S	W244	DW HF KABEL W244 RF CABLE W244 wird verwendet wenn ZVAX-B203 und ZVAX-B252 nicht eingebaut sind will be used if ZVAX-B203 and ZVAX-B252 are not mounted	Z	1311.3786.00	X	M	
1000	1	S	W245	DW HF KABEL W245 RF CABLE W245 wir verwendet wenn ZVAX-B203, ZVAX-B252 und ZVAX-B272 nicht eingebaut sind will be used if ZVAX-B203, ZVAX-B252 and ZVAX-B272 are not mounted	Z	1311.3828.00	X	M	
1010	1	S	W246	DW HF KABEL W246 MEAS IN RF CABLE W246 MEAS IN wird verwendet wenn ZVAX-B203, ZVAX-B252, ZVAX-B272 und ZVAX-B292 nicht eingebaut sind will be used if ZVAX-B203, ZVAX-B252, ZVAX-B272 and ZVAX-B292 are not mounted	Z	1311.3834.00	X	M	

Pos.-Nr. *ItemNo*	Menge *Quantity*	ME *Unit*	El.Kennz *Ref.Des.*	Benennung / Bezeichnung *Designation*	Z	Sachnummer *Stock No.*	Ersatzteil *Subst.part*	BA	VH
				ACHTUNG EGB/ATTENTION ESD *VARIANTENERKLAERUNG *EXPLANATION OF MODELS VAR02=GRUNDVARIANTE MOD02=BASIC MODEL					
1020	1	S		MZ MONTAGEBLECH ZVAX24-B11 FITTING PANEL ZVAX24-B11	Z	1311.2721.00		M	
1030	2	S	A150 A151	ZE TRANSFERSCHALTER 40GHZ TRANSFER SWITCH 40GHZ	Z	1170.0088.02	X	M	
1040	4	S		VS 6900/ISR-M2.5X6-A2 COMBINATION SCREWS		1148.3059.00		B	T
1050	1	S	A152	ER 2WEG-L.TEILER 0.5-26.5 GHZ 3XSMA 2 WAY POWER SPLITTER 0.5-26.5 GHZ		3584.7928.00	X	B	B
1060	4	S		VS HVC/ISR-M2.5X16-A2 COMBINATION SCREWS		0048.8218.00		B	B
1070	6	S		VS 6900/ISR-M2.5X6-A2 COMBINATION SCREWS		1148.3059.00		B	T
1080	1	S	W601	DW HF-KABEL ZVAX24 W601 RF-CABLE ZVAX24 W601	Z	1311.2944.00	X	M	
1090	1	S	W602	DW HF-KABEL ZVAX24 W602 RF-CABLE ZVAX24 W602	Z	1311.2950.00	X	M	
1100	1	S	W603	DW HF-KABEL ZVAX24 W603 RF-CABLE ZVAX24 W603	Z	1311.2967.00	X	M	
1110	1	S	R151	FJ ABSCHLUSSW. 50OHM SMA 1W TERMINATION 50OHMS		5201.1262.00		B	O
1120	1	S	W152	DW HF KABEL W152 SOURCE OUT RF CABLE W152 SOURCE OUT	Z	1311.3440.00		M	
1130	1	S	W153	DW HF KABEL W153 SOURCE IN RF CABLE W153 SOURCE IN	Z	1311.3457.00	X	M	
1140	1	S	W101	DW HF KABEL W101 RF CABLE W101	Z	1311.3505.00	X	M	
1150	1	S	W151	DW HF KABEL W151 SOURCE IN RF CABLE W151 SOURCE IN	Z	1311.3511.00	X	M	
1160	1	S	W150	DW HF KABEL W150 SOURCE OUT RF CABLE W150 SOURCE OUT wird verwendet wenn ZVAX-B291 nicht eingebaut ist will be used if ZVAX-B291 is not mounted	Z	1311.3470.00	X	M	
1170	1	S	W154	DW HF KABEL W154 SOURCE RF CABLE W154 SOURCE wird verwendet wenn ZVAX-B251 und ZVAX-B271 nicht eingebaut sind will be used if ZVAX-B251 and ZVAX-B271 are not mounted	Z	1311.2880.00	X	M	
1180	1	S	W155	DW HF KABEL W155 SOURCE RF CABLE W155 SOURCE wird verwendet wenn ZVAX-B253 und ZVAX-B273 nicht eingebaut sind will be used if ZVAX-B253 and ZVAX-B273 are not mounted	Z	1311.3011.00	X	M	
1190	2	S	W158 W159	DY ATT-CTRL_CABLE GENERATOR 240MM ATT-CTRL_CABLE GENERATOR 240MM	Z	1164.0396.00		M	

Pos.-Nr. *ItemNo*	Menge *Quantity*	ME *Unit*	El.Kennz *Ref.Des.*	Benennung / Bezeichnung *Designation*	Z	Sachnummer *Stock No.*	Ersatzteil *Subst.part*	BA	VH

ROHDE&SCHWARZ

ZVAX24

Benennung/*Designation*
ZVAX-B211 COMBINER
ZVAX-B211 COMBINER

Datum/*Date* 2009-01-21 | Abt./*Dept.* 1ESK | Name/*Name* WN

Sprach./Lang de en | Ä.I. / *C.I* 01.00 | Blatt/Sheet 2 of 2

Dokument Nr. / Document No.
1311.2538.01 *ST*

Pos.-Nr. *ItemNo*	Menge *Quantity*	ME *Unit*	El.Kennz *Ref.Des.*	Benennung / Bezeichnung *Designation*	Z	Sachnummer *Stock No.*	Ersatzteil *Subst.part*	BA	VH
				ACHTUNG EGB/ATTENTION ESD *VARIANTENERKLAERUNG *EXPLANATION OF MODELS VAR02=GRUNDVARIANTE MOD02=BASIC MODEL					
1220	1	S		MZ MONTAGEBLECH ZVAX24-B5X FITTING PANEL ZVAX24-B5X		1311.2738.00		M	
1230	1	S	A120	ZE TRANSFERSCHALTER 40GHZ TRANSFER SWITCH 40GHZ	Z	1170.0088.02	X	M	
1240	2	S		VS 965/ISR-M2.5X6-A4-PA 965/ISR-M2.5X6-A4-PA		1148.3288.00		B	T
1250	1	S	A121	ZE SWITCHED FILTER 22 SWITCHED FILTER 22	Z	1301.6001.02	X	M	
1260	2	S		VS 6900/ISR-M2.5X10-A2 COMBINATION SCREWS		0041.1660.00		B	T
1270	4	S		VS 6900/ISR-M2.5X25-A2 COMBINATION SCREWS		3584.5502.00		B	O
1280	1	S	W503	DW HF-KABEL ZVAX24 W503 RF-CABLE ZVAX24 W503	Z	1311.2915.00	X	M	
1290	1	S	W504	DW HF-KABEL ZVAX24 W504 RF-CABLE ZVAX24 W504	Z	1311.2938.00	X	M	
1300	1	S	W120	DW HF KABEL W120 SOURCE IN RF CABLE W120 SOURCE IN	Z	1311.3463.00		M	
1310	1	S	W121	DW HF KABEL W121 RF CABLE W121	Z	1311.3534.00	X	M	
1320	1	S	W122	DW HF KABEL W122 SOURCE OUT RF CABLE W122 SOURCE OUT wird verwendet wenn ZVAX-B271 nicht eingebaut ist will be used if ZVAX-B271 is not mounted	Z	1311.3928.00	X	M	
1330	1	S	W124	DW HF KABEL W124 SOURCE RF CABLE W124 SOURCE wird verwendet wenn ZVAX-B211, ZVAX-B271 und ZVAX-B291 nicht eingebaut sind will be used if ZVAX-B211, ZVAX-B271 and ZVAX-B291 are not mounted	Z	1311.2873.00	X	M	
1340	1	S	W129	DY ATT-CTRL_CABLE GENERATOR 240MM ATT-CTRL_CABLE GENERATOR 240MM	Z	1164.0396.00		M	
1350	1	S	W128	DY KABEL CABLE	Z	1311.3770.00		M	

Pos.-Nr. *ItemNo*	Menge *Quantity*	ME *Unit*	El.Kennz *Ref.Des.*	Benennung / Bezeichnung *Designation*	Z	Sachnummer *Stock No.*	Ersatzteil *Subst.part*	BA	VH
				ACHTUNG EGB/ATTENTION ESD *VARIANTENERKLAERUNG *EXPLANATION OF MODELS VAR02=GRUNDVARIANTE MOD02=BASIC MODEL					
1420	1	S		MZ MONTAGEBLECH ZVAX24-B5X FITTING PANEL ZVAX24-B5X		1311.2738.00		M	
1430	1	S	A220	ZE TRANSFERSCHALTER 40GHZ TRANSFER SWITCH 40GHZ	Z	1170.0088.02	X	M	
1440	2	S		VS 965/ISR-M2.5X6-A4-PA 965/ISR-M2.5X6-A4-PA		1148.3288.00		B	T
1450	1	S	A221	ZE SWITCHED FILTER 22 SWITCHED FILTER 22	Z	1301.6001.02	X	M	
1460	2	S		VS 6900/ISR-M2.5X10-A2 COMBINATION SCREWS		0041.1660.00		B	T
1470	4	S		VS 6900/ISR-M2.5X25-A2 COMBINATION SCREWS		3584.5502.00		B	O
1480	1	S	W501	DW HF-KABEL ZVAX24 W501 RF-CABLE ZVAX24 W501	Z	1311.2896.00	X	M	
1490	1	S	W502	DW HF-KABEL ZVAX24 W502 RF-CABLE ZVAX24 W502	Z	1311.2909.00	X	M	
1500	1	S	W230	DW HF KABEL W230 RF CABLE W230	Z	1311.3628.00	X	M	
1510	1	S	W211	DW HF KABEL W211 RF CABLE W211	Z	1311.3611.00	X	M	
1520	1	S	W221	DW HF KABEL W221 MEAS OUT RF CABLE W221 MEAS OUT wird verwendet wenn ZVAX-B203 und ZVAX-B210 nicht eingebaut sind will be used if ZVAX-B203 and ZVAX-B210 are not mounted	Z	1311.3863.00	X	M	
1530	1	S	W243	DW HF KABEL W243 RF CABLE W243 wird verwendet wenn ZVAX-B203 nicht eingebaut ist will be used if ZVAX-B203 is not mounted	Z	1311.3757.00	X	M	
1540	1	S	W222	DW HF KABEL W222 RF CABLE W222 wird verwendet wenn ZVAX-B272 nicht eingebaut ist will be used if ZVAX-B272 is not mounted	Z	1311.3870.00	X	M	
1550	1	S	W223	DW HF KABEL W223 MEAS IN RF CABLE W223 MEAS IN wird verwendet wenn ZVAX-B272 und ZVAX-B292 nicht eingebaut sind will be used if ZVAX-B272 and ZVAX-B292 are not mounted	Z	1311.3886.00	X	M	
1560	1	S	W229	DY ATT-CTRL_CABLE 90 ATT-CTRL_CABLE 90	Z	1164.0244.00		M	
1570	1	S	W228	DY KABEL CABLE	Z	1311.3763.00		M	

Pos.-Nr. *ItemNo*	Menge *Quantity*	ME *Unit*	El.Kennz *Ref.Des.*	Benennung / Bezeichnung *Designation*	Z	Sachnummer *Stock No.*	Ersatzteil *Subst.part*	BA	VH
				ACHTUNG EGB/ATTENTION ESD *VARIANTENERKLAERUNG *EXPLANATION OF MODELS VAR02=GRUNDVARIANTE MOD02=BASIC MODEL					
1620	1	S		MZ MONTAGEBLECH ZVAX24-B5X FITTING PANEL ZVAX24-B5X		1311.2738.00		M	
1630	1	S	A320	ZE TRANSFERSCHALTER 40GHZ TRANSFER SWITCH 40GHZ	Z	1170.0088.02	X	M	
1640	2	S		VS 965/ISR-M2.5X6-A4-PA 965/ISR-M2.5X6-A4-PA		1148.3288.00		B	T
1650	1	S	A321	ZE SWITCHED FILTER 22 SWITCHED FILTER 22	Z	1301.6001.02	X	M	
1660	2	S		VS 6900/ISR-M2.5X10-A2 COMBINATION SCREWS		0041.1660.00		B	T
1670	4	S		VS 6900/ISR-M2.5X25-A2 COMBINATION SCREWS		3584.5502.00		B	O
1680	1	S	W501	DW HF-KABEL ZVAX24 W501 RF-CABLE ZVAX24 W501	Z	1311.2896.00	X	M	
1690	1	S	W502	DW HF-KABEL ZVAX24 W502 RF-CABLE ZVAX24 W502	Z	1311.2909.00	X	M	
1700	1	S	W320	DW HF KABEL W320 SOURCE IN RF CABLE W320 SOURCE IN	Z	1311.3411.00		M	
1710	1	S	W321	DW HF KABEL W321 RF CABLE W321	Z	1311.3428.00	X	M	
1720	1	S	W322	DW HF KABEL W322 SOURCE OUT RF CABLE W322 SOURCE OUT wird verwendet wenn ZVAX-B273 nicht eingebaut ist will be used if ZVAX-B273 is not mounted	Z	1311.3957.00	X	M	
1730	1	S	W323	DW HF KABEL W323 SOURCE RF CABLE W323 SOURCE wird verwendet wenn ZVAX-B211und ZVAX-B273 nicht eingebaut sind will be used if ZVAX-B211 and ZVAX-B273 are not mounted	Z	1311.2921.00	X	M	
1740	1	S	W329	DY ATT-CTRL_CABLE GENERATOR 240MM ATT-CTRL_CABLE GENERATOR 240MM	Z	1164.0396.00		M	
1750	1	S	W328	DY KABEL CABLE	Z	1311.3770.00		M	

Pos.-Nr. *ItemNo*	Menge *Quantity*	ME *Unit*	El.Kennz *Ref.Des.*	Benennung / Bezeichnung *Designation*	Z	Sachnummer *Stock No.*	Ersatzteil *Subst.part*	BA	VH
				ACHTUNG EGB/ATTENTION ESD *VARIANTENERKLAERUNG *EXPLANATION OF MODELS VAR02=GRUNDVARIANTE MOD02=BASIC MODEL					
1820	1	S		MZ MONTAGEBLECH ZVAX24-B7X FITTING PANEL ZVAX24-B7X	Z	1311.2744.00		M	
1830	1	S	A110	ZE TRANSFERSCHALTER 40GHZ TRANSFER SWITCH 40GHZ	Z	1170.0088.02	X	M	
1840	2	S		VS 6900/ISR-M2.5X6-A2 COMBINATION SCREWS		1148.3059.00		B	T
1850	1	S	A111	ZE PULSMODULATOR 24 PULSE-MODULATOR 24	Z	1310.7007.02	X	M	
1860	4	S		VS 965/ISR-M2.5X8-A4-PA 965/ISR-M2.5X8-A4-PA		1148.3294.00		B	T
1870	4	S		VS 6900/ISR-M2.5X6-A2 COMBINATION SCREWS		1148.3059.00		B	T
1880	1	S	W303	DW HF-KABEL ZVAX24 W303 RF-CABLE ZVAX24 W303	Z	1311.2980.00	X	M	
1890	1	S	W304	DW HF-KABEL ZVAX24 W304 RF-CABLE ZVAX24 W304	Z	1311.2996.00	X	M	
1900	1	S	W111	DW HF KABEL W111 SOURCE OUT RF CABLE W111 SOURCE OUT	Z	1311.3528.00	X	M	
1910	1	S	W121	DW HF KABEL W121 RF CABLE W121	Z	1311.3534.00	X	M	
1920	1	S	W112	DW HF KABEL W112 SOURCE IN RF CABLE W112 SOURCE IN wird verwendet wenn ZVAX-B251 nicht eingebaut ist will be used if ZVAX-B251 is not mounted	Z	1311.3940.00	X	M	
1930	1	S	W124	DW HF KABEL W124 SOURCE RF CABLE W124 SOURCE wird verwendet wenn ZVAX-B211 und ZVAX-B291 nicht eingebaut sind will be used if ZVAX-B211 and ZVAX-B291 are not mounted	Z	1311.2873.00	X	M	
1940	1	S	W119	DY ATT-CTRL_CABLE GENERATOR 240MM ATT-CTRL_CABLE GENERATOR 240MM	Z	1164.0396.00		M	
1950	1	S	W115	DV HF-Kabel W115 RF-Cable W115	Z	1311.3634.00		M	
1960	1	S	W116	DV HF-Kabel W116 RF-Cable W116	Z	1311.3640.00		M	
1970	1	S	W117	DV HF-Kabel W117 RF-Cable W117	Z	1311.3657.00		M	
1980	1	S	W118	DV HF-Kabel W118 RF-Cable W118	Z	1311.3663.00		M	

Pos.-Nr. *ItemNo*	Menge *Quantity*	ME *Unit*	El.Kennz *Ref.Des.*	Benennung / Bezeichnung *Designation*	Z	Sachnummer *Stock No.*	Ersatzteil *Subst.part*	BA	VH
				ACHTUNG EGB/ATTENTION ESD *VARIANTENERKLAERUNG *EXPLANATION OF MODELS VAR02=GRUNDVARIANTE MOD02=BASIC MODEL					
2020	1	S		MZ MONTAGEBLECH ZVAX24-B7X FITTING PANEL ZVAX24-B7X	Z	1311.2744.00		M	
2030	1	S	A210	ZE TRANSFERSCHALTER 40GHZ TRANSFER SWITCH 40GHZ	Z	1170.0088.02	X	M	
2040	2	S		VS 6900/ISR-M2.5X6-A2 COMBINATION SCREWS		1148.3059.00		B	T
2050	1	S	A211	ZE PULSMODULATOR 24 PULSE-MODULATOR 24	Z	1310.7007.02	X	M	
2060	4	S		VS 965/ISR-M2.5X8-A4-PA 965/ISR-M2.5X8-A4-PA		1148.3294.00		B	T
2070	4	S		VS 6900/ISR-M2.5X6-A2 COMBINATION SCREWS		1148.3059.00		B	T
2080	1	S	W301	DW HF-KABEL ZVAX24 W301 RF-CABLE ZVAX24 W301	Z	1311.2850.00	X	M	
2090	1	S	W302	DW HF-KABEL ZVAX24 W302 RF-CABLE ZVAX24 W302	Z	1311.2867.00	X	M	
2100	1	S	W211	DW HF KABEL W211 RF CABLE W211	Z	1311.3611.00	X	M	
2110	1	S	W203	DW HF KABEL W203 RF CABLE W203	Z	1311.3557.00	X	M	
2120	1	S	W210	DW HF KABEL W210 MEAS IN RF CABLE W210 MEAS IN wird verwendet wenn ZVAX-B292 nicht eingebaut ist will be used if ZVAX-B292 is not mounted	Z	1311.3605.00	X	M	
2130	1	S	W231	DW HF KABEL W231 RF CABLE W231 wird verwendet wenn ZVAX-B252 nicht eingebaut ist will be used if ZVAX-B252 is not mounted	Z	1311.3792.00	X	M	
2140	1	S	W244	DW HF KABEL W244 RF CABLE W244 wird verwendet wenn ZVAX-B203 und ZVAX-B252 nicht eingebaut sind will be used if ZVAX-B203 and ZVAX-B252 are not mounted	Z	1311.3786.00	X	M	
2150	1	S	W212	DW HF KABEL W212 MEAS OUT RF CABLE W212 MEAS OUT wird verwendet wenn ZVAX-B203, ZVAX-B210 und ZVAX-B252 nicht eingebaut sind will be used if ZVAX-B203, ZVAX-B210 and ZVAX-B252 are not mounted	Z	1311.3811.00	X	M	
2160	1	S	W219	DY ATT-CTRL_CABLE GENERATOR 240MM ATT-CTRL_CABLE GENERATOR 240MM	Z	1164.0396.00		M	
2170	1	S	W215	DV HF-Kabel W215 RF-Cable W215	Z	1311.3670.00		M	
2180	1	S	W216	DV HF-Kabel W216 RF-Cable W216	Z	1311.3686.00		M	
2190	1	S	W217	DV HF-Kabel W217	Z	1311.3692.00		M	

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				RF-Cable W217					
2200	1	S	W218	DV HF-Kabel W218 RF-Cable W218	Z	1311.3705.00		M	

Pos.-Nr. *ItemNo*	Menge *Quantity*	ME *Unit*	El.Kennz *Ref.Des.*	Benennung / Bezeichnung *Designation*	Z	Sachnummer *Stock No.*	Ersatzteil *Subst.part*	BA	VH
				ACHTUNG EGB/ATTENTION ESD *VARIANTENERKLAERUNG *EXPLANATION OF MODELS VAR02=GRUNDVARIANTE MOD02=BASIC MODEL					
2220	1	S		MZ MONTAGEBLECH ZVAX24-B7X FITTING PANEL ZVAX24-B7X	Z	1311.2744.00		M	
2230	1	S	A310	ZE TRANSFERSCHALTER 40GHZ TRANSFER SWITCH 40GHZ	Z	1170.0088.02	X	M	
2240	2	S		VS 6900/ISR-M2.5X6-A2 COMBINATION SCREWS		1148.3059.00		B	T
2250	1	S	A311	ZE PULSMODULATOR 24 PULSE-MODULATOR 24	Z	1310.7007.02	X	M	
2260	4	S		VS 965/ISR-M2.5X8-A4-PA 965/ISR-M2.5X8-A4-PA		1148.3294.00		B	T
2270	4	S		VS 6900/ISR-M2.5X6-A2 COMBINATION SCREWS		1148.3059.00		B	T
2280	1	S	W301	DW HF-KABEL ZVAX24 W301 RF-CABLE ZVAX24 W301	Z	1311.2850.00	X	M	
2290	1	S	W302	DW HF-KABEL ZVAX24 W302 RF-CABLE ZVAX24 W302	Z	1311.2867.00	X	M	
2300	1	S	W311	DW HF KABEL W311 SOURCE OUT RF CABLE W311 SOURCE OUT	Z	1311.3434.00	X	M	
2310	1	S	W321	DW HF KABEL W321 RF CABLE W321	Z	1311.3428.00	X	M	
2320	1	S	W312	DW HF KABEL W312 SOURCE IN RF CABLE W312 SOURCE IN wird verwendet wenn ZVAX-B253 nicht eingebaut ist will be used if ZVAX-B253 is not mounted	Z	1311.3963.00	X	M	
2330	1	S	W323	DW HF KABEL W323 SOURCE RF CABLE W323 SOURCE wird verwendet wenn ZVAX-B211 nicht eingebaut ist will be used if ZVAX-B211 is not mounted	Z	1311.2921.00		M	
2340	1	S	W319	DY ATT-CTRL_CABLE GENERATOR 240MM ATT-CTRL_CABLE GENERATOR 240MM	Z	1164.0396.00		M	
2350	1	S	W315	DV HF-Kabel W315 RF-Cable W315	Z	1311.3711.00		M	
2360	1	S	W316	DV HF-Kabel W316 RF-Cable W316	Z	1311.3728.00		M	
2370	1	S	W317	DV HF-Kabel W317 RF-Cable W317	Z	1311.3734.00		M	
2380	1	S	W318	DV HF-Kabel W318 RF-Cable W318	Z	1311.3740.00		M	

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				ACHTUNG EGB/ATTENTION ESD *VARIANTENERKLAERUNG *EXPLANATION OF MODELS VAR02=GRUNDVARIANTE MOD02=BASIC MODEL					
2220	1	S		MZ MONTAGEBLECH ZVAX24-B7X FITTING PANEL ZVAX24-B7X	Z	1311.2744.00		M	
2230	1	S	A310	ZE TRANSFERSCHALTER 40GHZ TRANSFER SWITCH 40GHZ	Z	1170.0088.02	X	M	
2240	2	S		VS 6900/ISR-M2.5X6-A2 COMBINATION SCREWS		1148.3059.00		B	T
2250	1	S	A311	ZE PULSMODULATOR 24 PULSE-MODULATOR 24	Z	1310.7007.02	X	M	
2260	4	S		VS 965/ISR-M2.5X8-A4-PA 965/ISR-M2.5X8-A4-PA		1148.3294.00		B	T
2270	4	S		VS 6900/ISR-M2.5X6-A2 COMBINATION SCREWS		1148.3059.00		B	T
2280	1	S	W301	DW HF-KABEL ZVAX24 W301 RF-CABLE ZVAX24 W301	Z	1311.2850.00	X	M	
2290	1	S	W302	DW HF-KABEL ZVAX24 W302 RF-CABLE ZVAX24 W302	Z	1311.2867.00	X	M	
2300	1	S	W311	DW HF KABEL W311 SOURCE OUT RF CABLE W311 SOURCE OUT	Z	1311.3434.00	X	M	
2310	1	S	W321	DW HF KABEL W321 RF CABLE W321	Z	1311.3428.00	X	M	
2320	1	S	W312	DW HF KABEL W312 SOURCE IN RF CABLE W312 SOURCE IN wird verwendet wenn ZVAX-B253 nicht eingebaut ist will be used if ZVAX-B253 is not mounted	Z	1311.3963.00	X	M	
2330	1	S	W323	DW HF KABEL W323 SOURCE RF CABLE W323 SOURCE wird verwendet wenn ZVAX-B211 nicht eingebaut ist will be used if ZVAX-B211 is not mounted	Z	1311.2921.00		M	
2340	1	S	W319	DY ATT-CTRL_CABLE GENERATOR 240MM ATT-CTRL_CABLE GENERATOR 240MM	Z	1164.0396.00		M	
2350	1	S	W315	DV HF-Kabel W315 RF-Cable W315	Z	1311.3711.00		M	
2360	1	S	W316	DV HF-Kabel W316 RF-Cable W316	Z	1311.3728.00		M	
2370	1	S	W317	DV HF-Kabel W317 RF-Cable W317	Z	1311.3734.00		M	
2380	1	S	W318	DV HF-Kabel W318 RF-Cable W318	Z	1311.3740.00		M	

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				ACHTUNG EGB/ATTENTION ESD *VARIANTENERKLAERUNG *EXPLANATION OF MODELS VAR02=GRUNDVARIANTE MOD02=BASIC MODEL					
2420	1	S	A100	ZE KOPPLER 44 DG COUPLER ATT.	Z	1306.7506.04	X	M	
2430	1	S	W104	DW HF KABEL W104 REF OUT RF CABLE W104 REF OUT	Z	1311.3492.00	X	M	
2440	1	S	W103	DW HF KABEL W103 MEAS OUT RF CABLE W103 MEAS OUT	Z	1311.3486.00	X	M	
2450	1	S	W101	DW HF KABEL W101 RF CABLE W101	Z	1311.3505.00	X	M	
2460	1	S	W105	DW HF KABEL W105 SOURCE IN RF CABLE W105 SOURCE IN wird verwendet wenn ZVAX-B211 nicht eingebaut ist will be used if ZVAX-B211 is not mounted	Z	1311.3934.00	X	M	
2470	1	S	W154	DW HF KABEL W154 SOURCE RF CABLE W154 SOURCE wird verwendet wenn ZVAX-B251 und ZVAX-B271 nicht eingebaut sind will be used if ZVAX-B251 and ZVAX-B271are not mounted	Z	1311.2880.00	X	M	
2480	4	S		VS 965/ISR-M3X10-A4-PA 965/ISR-M3X10-A4-PA		1148.3320.00	X	B	O

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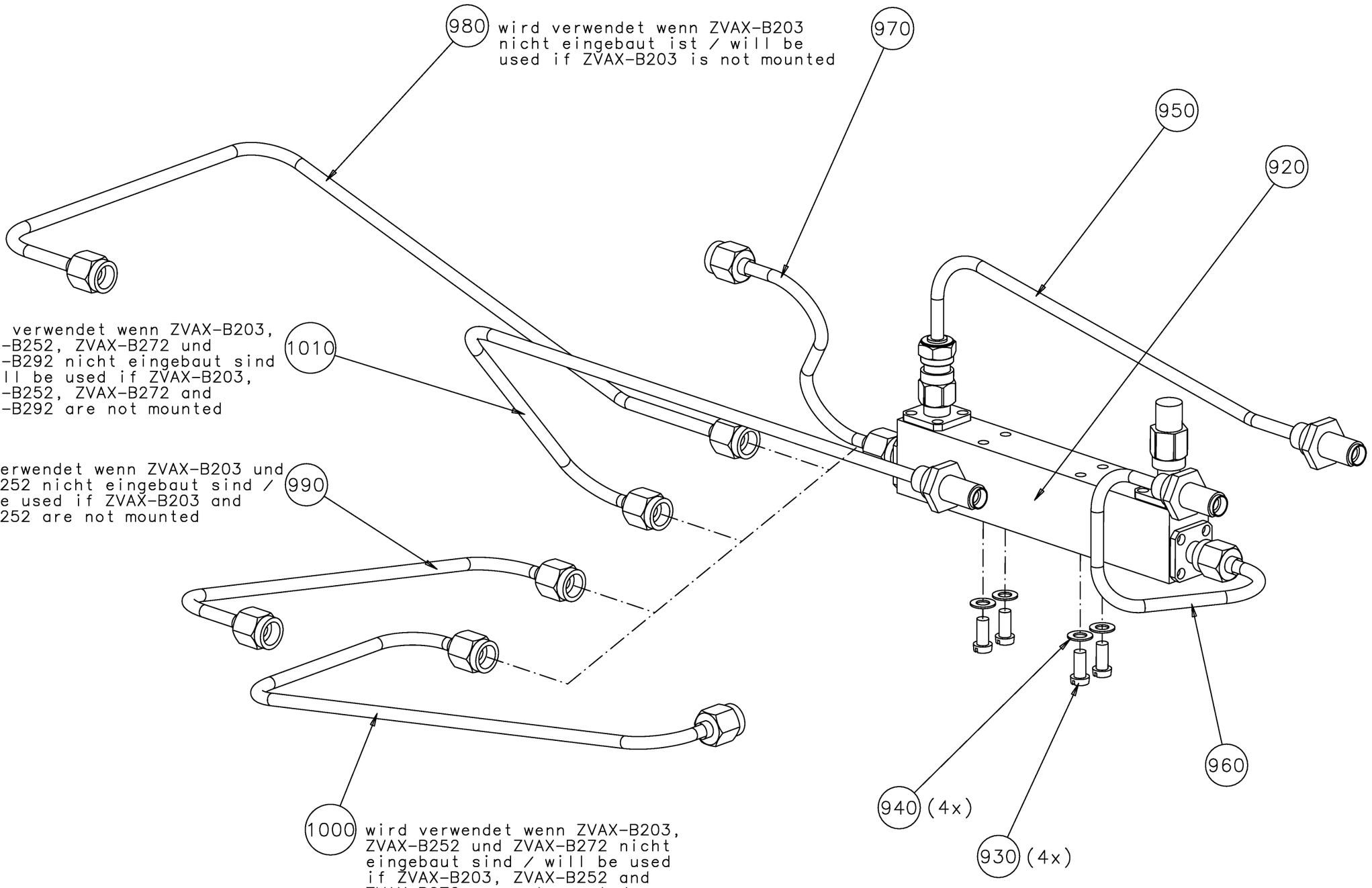
				ACHTUNG EGB/ATTENTION ESD *VARIANTENERKLAERUNG *EXPLANATION OF MODELS VAR02=GRUNDVARIANTE MOD02=BASIC MODEL					
2520	1	S	A200	ZE KOPPLER 44 DG COUPLER ATT.	Z	1306.7506.04	X	M	
2530	1	S	W204	DW HF KABEL W204 REF OUT RF CABLE W204 REF OUT	Z	1311.3563.00	X	M	
2540	1	S	W203	DW HF KABEL W203 RF CABLE W203	Z	1311.3557.00	X	M	
2550	1	S	W201	DW HF KABEL W201 SOURCE IN RF CABLE W201 SOURCE IN	Z	1311.3540.00	X	M	
2560	1	S	W222	DW HF KABEL W222 RF CABLE W222 wird verwendet wenn ZVAX-B272 nicht eingebaut ist will be used if ZVAX-B272 is not mounted	Z	1311.3870.00	X	M	
2570	1	S	W235	DW HF KABEL W235 RF CABLE W235 wird verwendet wenn ZVAX-B252 und ZVAX-B272 nicht eingebaut sind will be used if ZVAX-B252 and ZVAX-B272 are not mounted	Z	1311.3892.00	X	M	
2580	1	S	W245	DW HF KABEL W245 RF CABLE W245 wird verwendet wenn ZVAX-B203, ZVAX-B252 und ZVAX-B272 nicht eingebaut sind will be used if ZVAX-B203, ZVAX-B252 and ZVAX-B272 are not mounted	Z	1311.3828.00	X	M	
2590	1	S	W202	DW HF KABEL W202 MEAS OUT RF CABLE W202 MEAS OUT wird verwendet wenn ZVAX-B203, ZVAX-B210, ZVAX-B252 und ZVAX-B272 nicht eingebaut sind will be used if ZVAX-B203, ZVAX-B210, ZVAX-B252 and ZVAX-B272 are not mounted	Z	1311.3857.00	X	M	
2600	4	S		VS 965/ISR-M3X10-A4-PA 965/ISR-M3X10-A4-PA		1148.3320.00	X	B	O

ROHDE&SCHWARZ

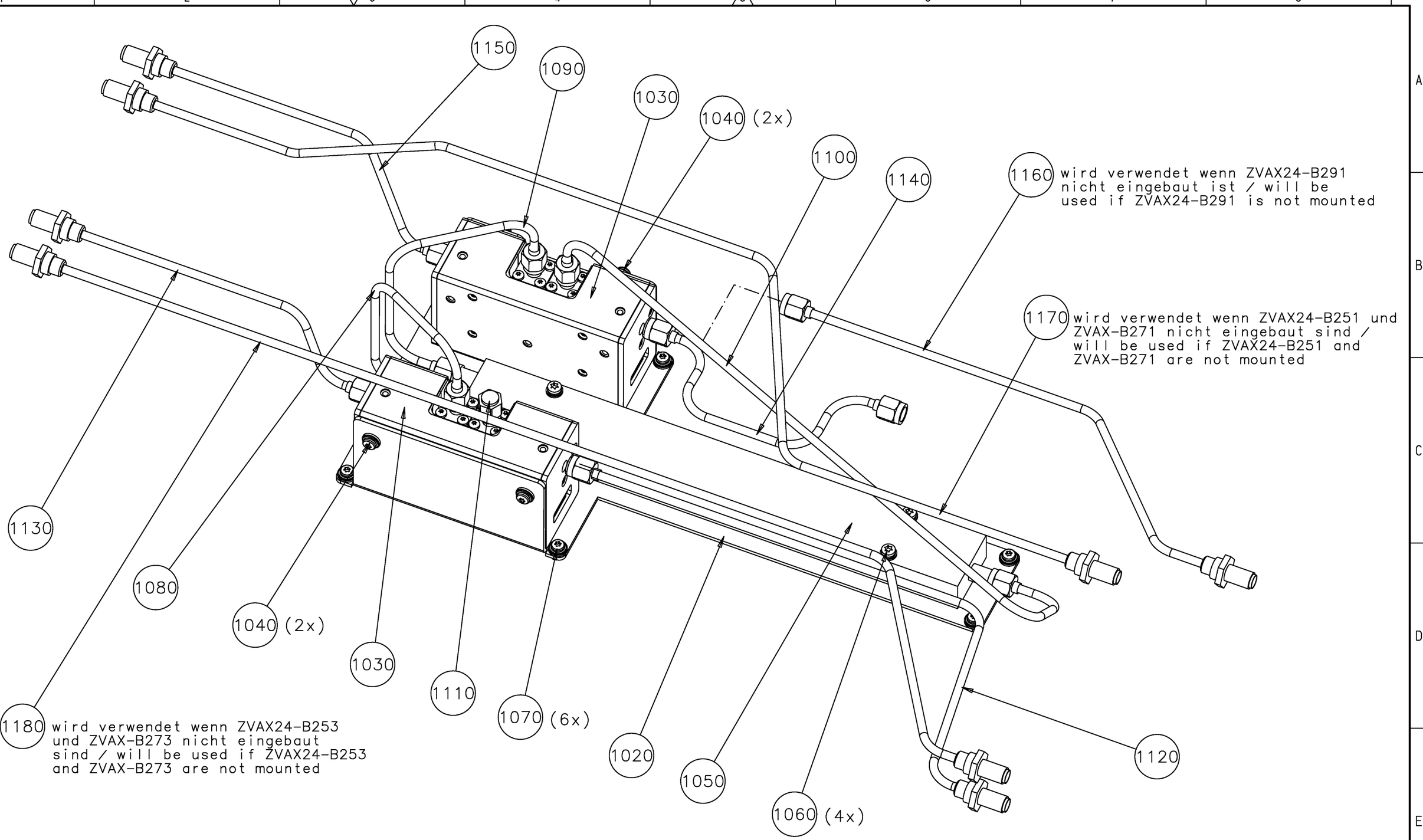
Mechanical Drawings



VARIANTENERKLÄRUNG/VERSIONS
VAR02 = GRUNDAUSFÜHRUNG
MOD02 = BASIC MODEL

Projektions-methode
Projection Method

Maßstab *Scale* 1:1	Toleranz *Tol.* ISO2768-m	Werkstoff *Material*				
ROHDE&SCHWARZ	Benennung / *Designation* ZVAX-B210 MONITORAUSGANG TOR 2 ZVAX-B210 MONITOR OUTPUT PORT 2			Sprache / *Lang.* de en	Aei. / *C.I.* 02.00	Blatt / *Sh.* 1
ZVAX24	Datum *Date* 2009-01-21	Abteilung *Dept.* 1ESK	Name *Name* Wn	Zeichn.Nr. / *Drawing No.* 1311.2521.01		D

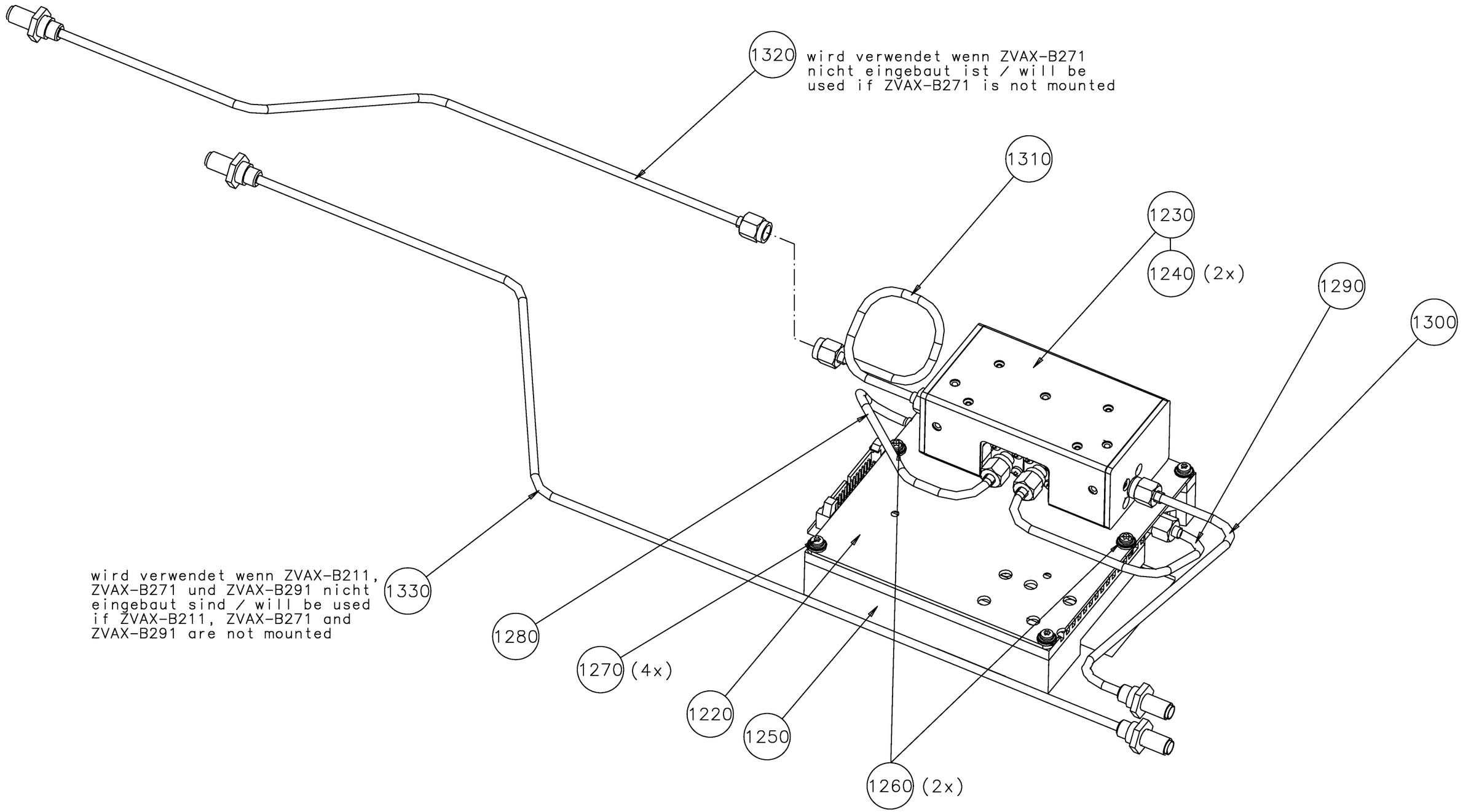


Pos. 1190(2x) nicht dargestellt/
Pos. 1190(2x) not shown

VARIANTENERKLÄRUNG/VERSIONS
VAR02 = GRUNDAUSFÜHRUNG
MOD02 = BASIC MODEL

Projektions-methode
Projection Method

Maßstab *Scale*	Toleranz *Tol.* ISO2768-m	Werkstoff *Material*			
ROHDE&SCHWARZ	Benennung / *Designation* ZVAX-B211 COMBINER ZVAX-B211 COMBINER			Sprache / *Lang.* de en	Aei. / *C.I.* 01.00	Blatt / *Sh.* 1
ZVAX24	Datum *Date* 2009-01-19	Abteilung *Dept.* 1ESK	Name *Name* Wn	Zeichn.Nr. / *Drawing No.* 1311.2538.01		D

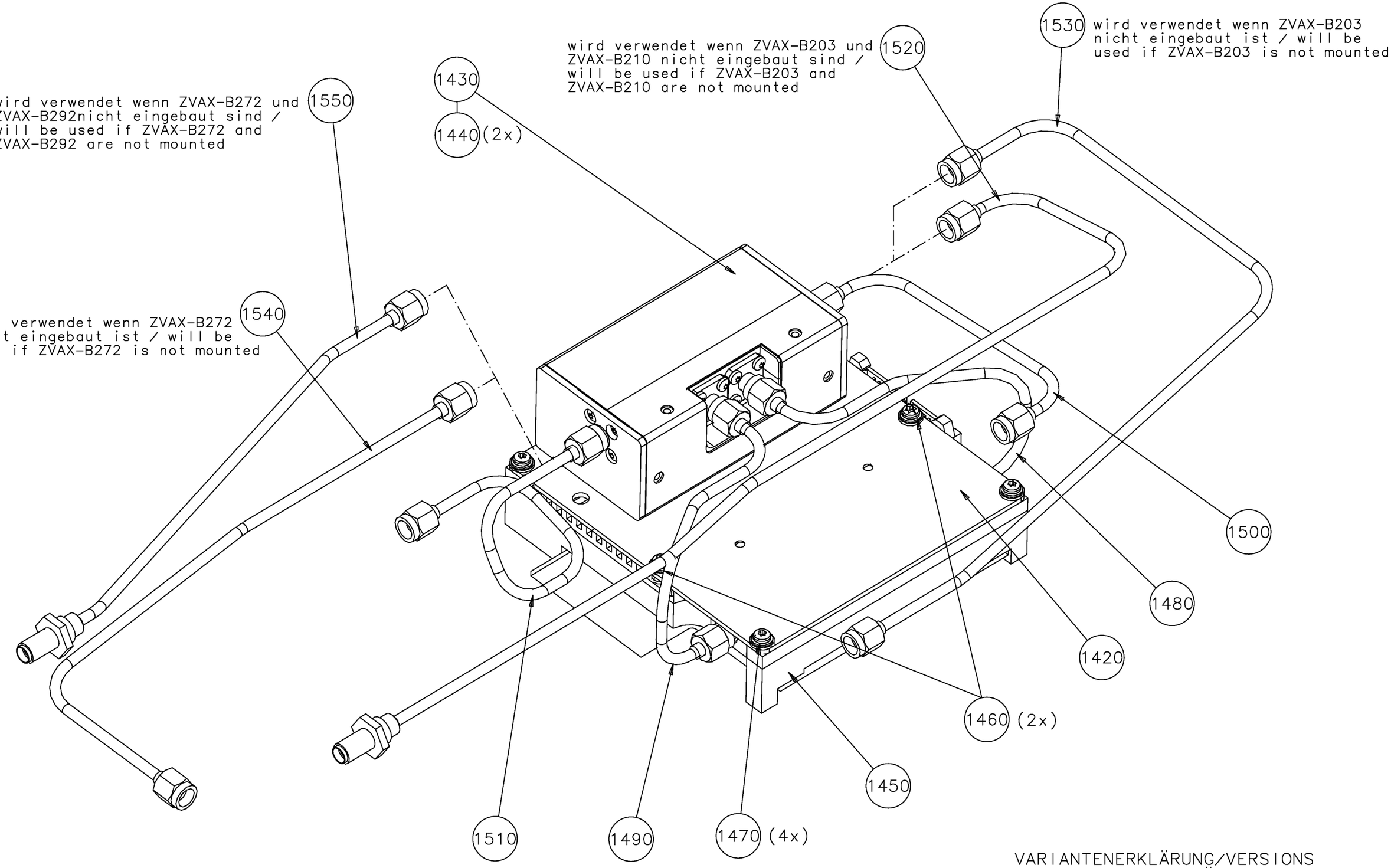


Projektions-methode
Projection Method

VARIANTENERKLÄRUNG/VERSIONS
VAR 02 = GRUNDAUSFÜHRUNG
MOD 02 = BASIC MODEL

Pos. 1340 und 1350 nicht dargestellt/
Pos. 1340 and 1350 not shown

Maßstab *Scale*	Toleranz *Tol.* ISO2768-m	Werkstoff *Material*		
ROHDE&SCHWARZ	Benennung / *Designation* ZVAX-B251 OBERWELLENFILTER GEN TOR1 ZVAX-B251 HARMONIC FILTER GEN PORT1		Sprache / *Lang.* de en	Aei. / *C.I.* 01.00	Blatt / *Sh.* 1
ZVAX24	Datum *Date* 2009-01-19	Abteilung *Dept.* 1ESK	Name *Name* Wn	Zeichn.Nr. / *Drawing No.* 1311.2544.01	D

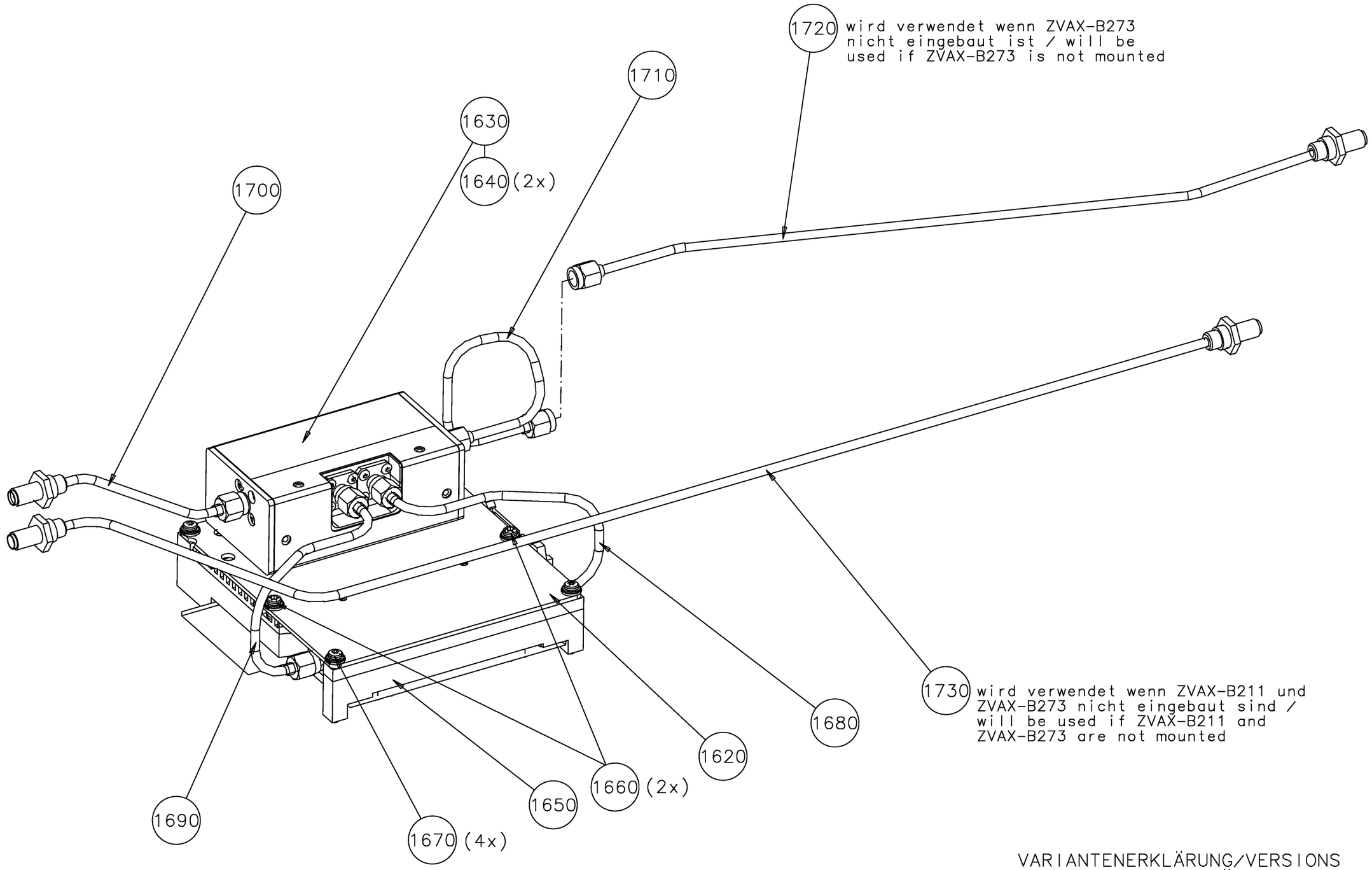


Pos. 1560 und 1570 nicht dargestellt /
Pos. 1560 and 1570 not shown

VARIANTENERKLÄRUNG/VERSIONS
VAR02 = GRUNDAUSFÜHRUNG
MOD02 = BASIC MODEL

Projektions-methode
Projection Method

Maßstab / *Scale*	Toleranz / *Tol.* ISO2768-m	Werkstoff / *Material*				
ROHDE&SCHWARZ	Benennung / *Designation* ZVAX-B252 OBERWELLENFILTER REC TOR2 ZVAX-B252 HARMONIC FILTER REC PORT2			Sprache / *Lang.* de en	Aei. / *C.I.* 02.00	Blatt / *Sh.* 1
ZVAX24	Datum / *Date* 2009-01-08	Abteilung / *Dept.* 1ESK	Name / *Name* Wn	Zeichn.Nr. / *Drawing No.* 1311.2550.01		D

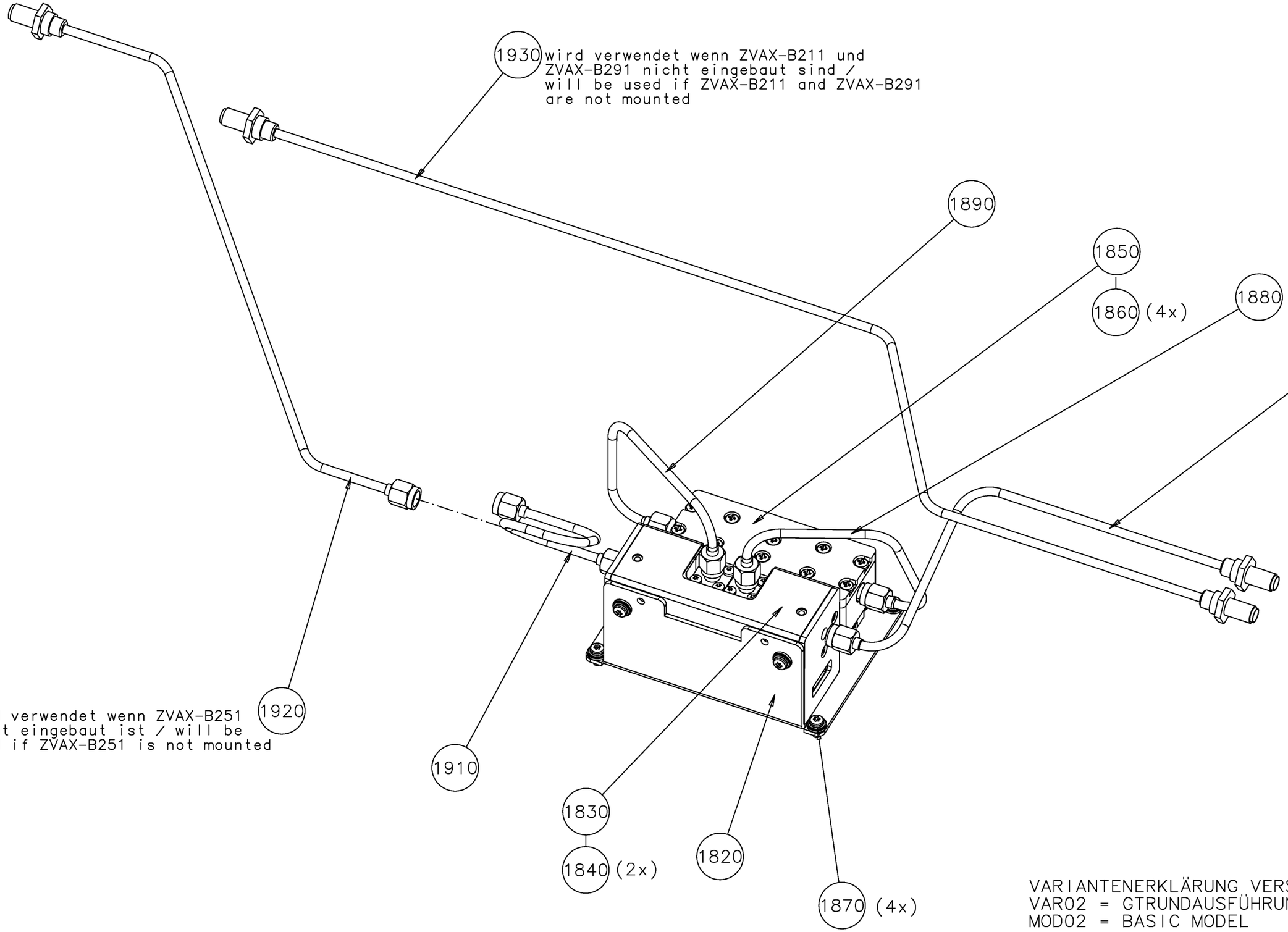


Pos. 1740 und 1750 nicht dargestellt/
Pos. 1740 and 1750 not shown

VARIANTENERKLÄRUNG/VERSIONS
VAR02 = GRUNDAUSFÜHRUNG
MOD02 = BASIC MODEL

Projektions-methode
Projection Method

Maßstab *Scale*	Toleranz *Tol.* ISO2768-m	Werkstoff *Material*			
ROHDE&SCHWARZ	Benennung / *Designation* ZVAX-B253 OBERWELLENFILTER GEN TOR3 ZVAX-B253 HARMONIC FILTER GEN PORT3			Sprache / *Lang.* de en	Aei. / *C.I.* 01.00	Blatt / *Sh.* 1
ZVAX24	Datum *Date* 2009-01-19	Abteilung *Dept.* 1ESK	Name *Name* Wn	Zeichn.Nr. / *Drawing No.* 1311.2567.01		D

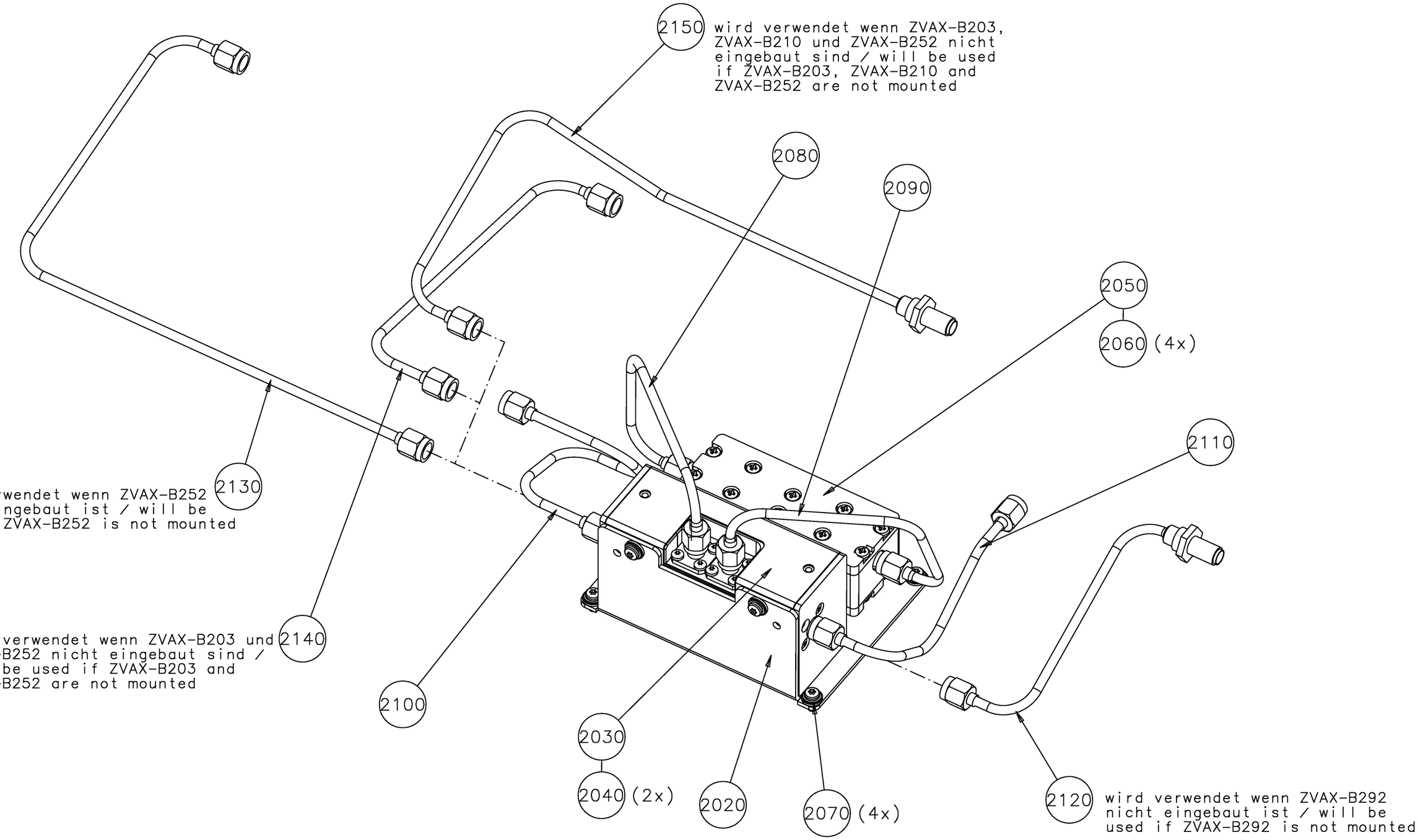


VARIANTENERKLÄRUNG VERSIONS
VAR02 = GTRUNDAUSFÜHRUNG
MOD02 = BASIC MODEL

Pos. 1940, 1950, 1960, 1970 und 1980 nicht dargestellt/
Pos. 1940, 1950, 1960, 1970 and 1980 not shown

Projektions-methode
Projection Method

Maßstab *Scale*	Toleranz *Tol.* ISO2768-m	Werkstoff *Material*			
ROHDE&SCHWARZ	Benennung / *Designation* ZVAX-B271 PULSMODULATOR GEN TOR 1 ZVAX-B271 PULSE MODULATOR GEN PORT 1			Sprache / *Lang.* de en	Aei. / *C.I.* 01.00	Blatt / *Sh.* 1
ZVAX24	Datum *Date* 2009-01-20	Abteilung *Dept.* 1ESK	Name *Name* Wn	Zeichn.Nr. / *Drawing No.* 1311.2573.01		D

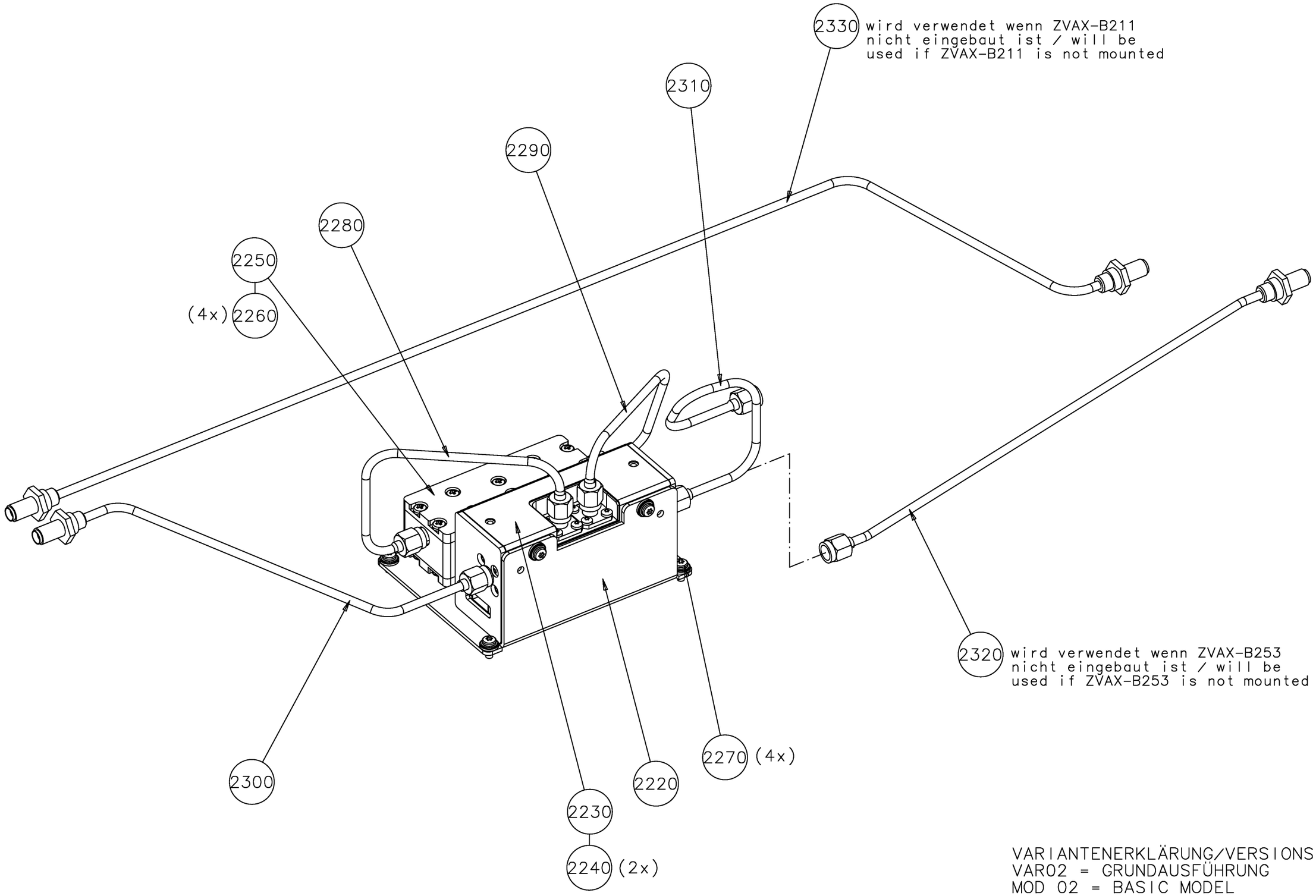


Pos. 2160, 2170, 2180, 2190 und 2200 nicht dargestellt/
Pos. 2160, 2170, 2180, 2190 and 2200 not shown

VARIANTENERKLÄRUNG/VERSIONS
VAR02 = GRUNDAUSFÜHRUNG
MOD02 = BASIC MODEL

Projektions-methode
Projection Method

Maßstab *Scale*	Toleranz *Tol.* ISO2768-m	Werkstoff *Material*			
ROHDE&SCHWARZ	Benennung / *Designation* ZVAX-B272 PULSMODULATOR EMPF TOR 2 ZVAX-B272 PULSE MODULATOR REC PORT2		Sprache / *Lang.* de en	Aei. / *C.I.* 02.00	Blatt / *Sh.* 1
ZVAX24	Datum *Date* 2009-01-21	Abteilung *Dept.* 1ESK	Name *Name* Wn	Zeichn.Nr. / *Drawing No.* 1311.2580.01	D

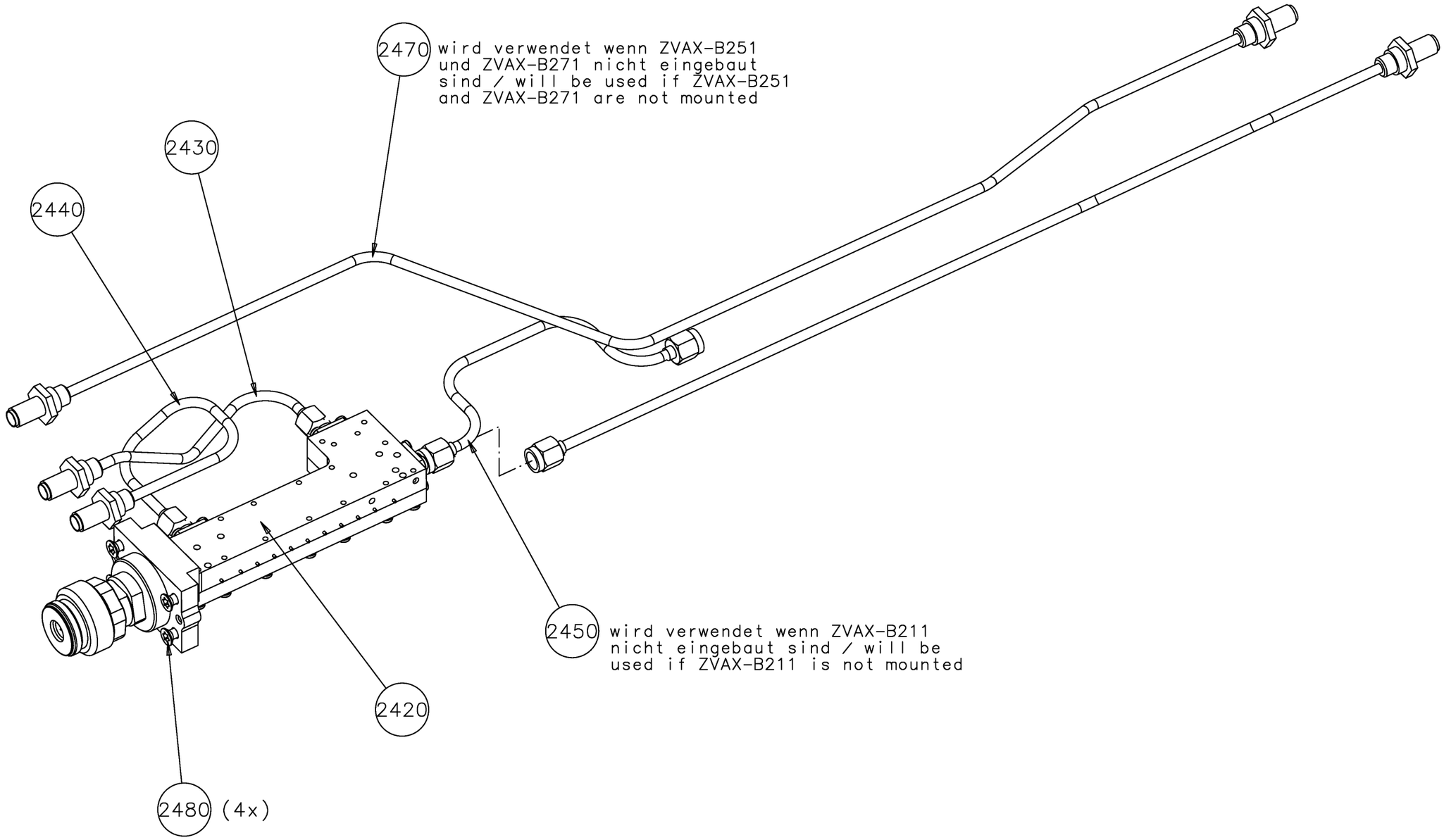


Projektions-methode
Projection Method

VARIANTENERKLÄRUNG/VERSIONS
VAR02 = GRUNDAUSFÜHRUNG
MOD 02 = BASIC MODEL

Pos. 2340, 2350, 2360, 2370 und 2380 nicht dargestellt/
Pos. 2340, 2350, 2360, 2370 and 2380 not shown

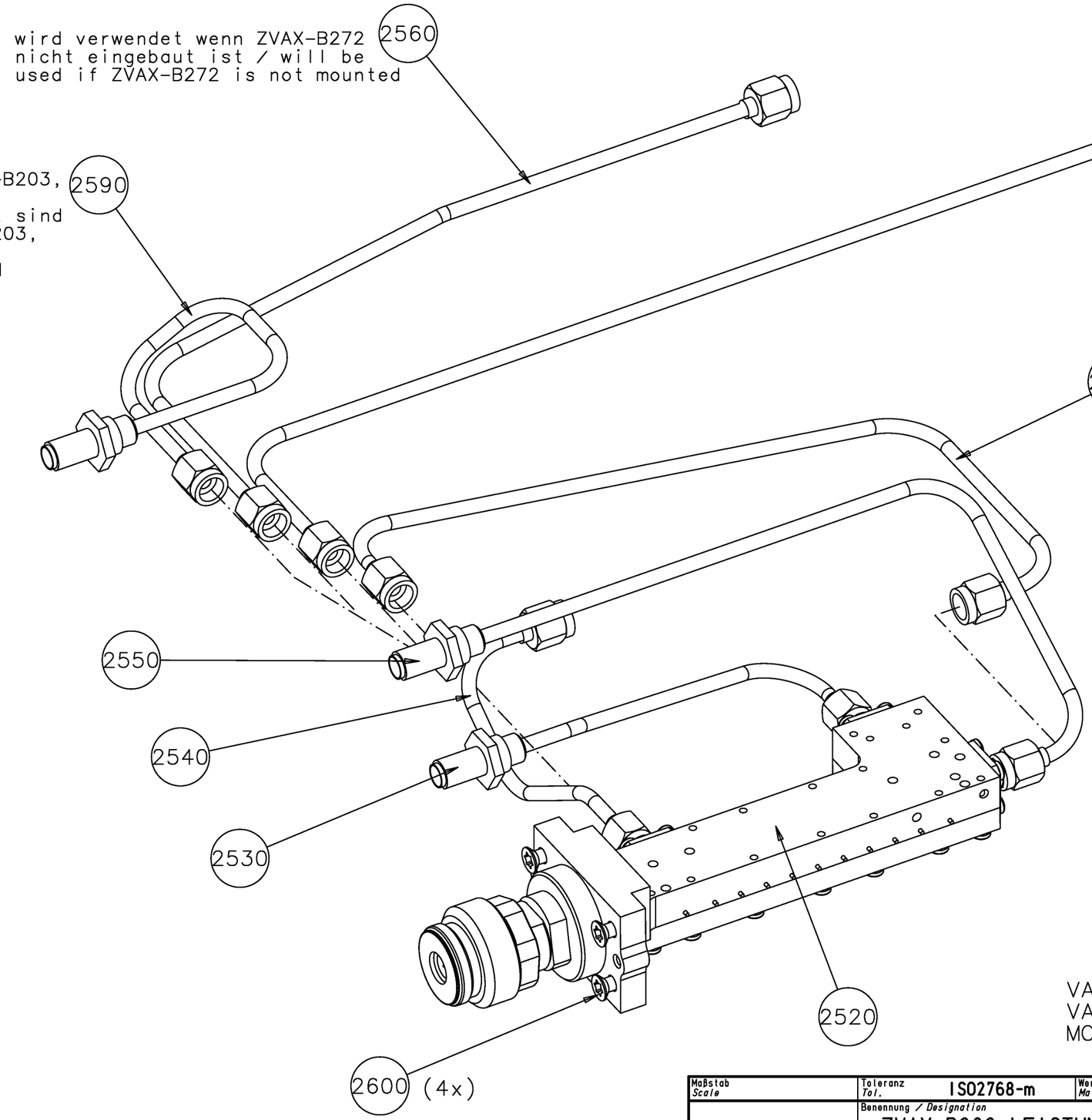
Maßstab *Scale*	Toleranz *Tol.* ISO2768-m	Werkstoff *Material*			
ROHDE&SCHWARZ	Benennung / *Designation* ZVAX-B273 PULSMODULATOR GEN TOR 3 ZVAX-B273 PULSE MODULATOR GEN PORT3			Sprache / *Lang.* de en	Aei. / *C.I.* 01.00	Blatt / *Sh.* 1
ZVAX24	Datum *Date* 2009-01-20	Abteilung *Dept.* 1ESK	Name *Name* Wn	Zeichn.Nr. / *Drawing No.* 1311.2596.01		D



Projektions-methode
Projection Method

VARIANTENERKLÄRUNG/VERSIONS
VAR02 = GRUNDAUSFÜHRUNG
MOD02 = BASIC MODEL

Maßstab *Scale*	Toleranz *Tol.* ISO2768-m	Werkstoff *Material*			
ROHDE&SCHWARZ	Benennung / *Designation* ZVAX-B291 LEISTUNGSKOPPLER TOR 1 ZVAX-B291 HIGH POWER COUPLER PORT 1			Sprache / *Lang.* de en	Aei. / *C.I.* 01.00	Blatt / *Sh.* 1
ZVAX24	Datum *Date* 2009-01-21	Abteilung *Dept.* 1ESK	Name *Name* Wn	Zeichn.Nr. / *Drawing No.* 1311.2609.01		D



VARIANTENERKLÄRUNG/VERSIONS
VAR02 = GRUNDAUSFÜHRUNG
MOD02 = BASIC MODEL

Projektions-methode
Projection Method

Maßstab *Scale*	Toleranz *Tol.* ISO2768-m	Werkstoff *Material*			
ROHDE&SCHWARZ	Benennung / *Designation* ZVAX-B292 LEISTUNGSKOPPLER TOR 2 ZVAX-B292 HIGH POWER COUPLER PORT 2			Sprache / *Lang.* de en	Aei. / *C.I.* 03.00	Blatt / *Sh.* 1
ZVAX24	Datum *Date* 2009-01-21	Abteilung *Dept.* 1ESK	Name *Name* Wn	Zeichn.Nr. / *Drawing No.* 1311.2615.01		D

ROHDE&SCHWARZ

Circuit Diagram

A70 STANDBY BOARD ZVAX24 X1 — 12 — W80

SOURCE PORT3 IN — W320

OUT

A80 LED BOARD ZVAX24 X1 — 12 — W80

HARM FILTER

PULSE MOD

COMBINER

A40 X1 P10 USB 2.0 — 10 — W40

SOURCE IN — W120

OUT

REF OUT — W150

MEAS OUT — W104

W103

OPTION ZVAX-B291

1

A100 COUPLER 44 DG — X1 X2 X3 X4 MEAS_OUT REF_OUT — W101

A81 LED BOARD ZVAX24 X1 — 12 — W80

HARM FILTER

PULSE MOD

COMBINER

A151 TRANSFER SWITCH P12 — W158 — 12 — W153 — X1 X2 X3 X4 — W152 — R151 — W601

SPLITTER A152 IN OUT OUT — W603 — W602

A150 TRANSFER SWITCH P12 — X1 X2 X3 X4 — W151 — 12 — W159

OPTION ZVAX-B211

W329 — A320 TRANSFER SWITCH P12 — W320 — X1 X2 X3 X4 — W321 — W502 — W501.

A321 SWITCHED FILT 22-2 — X781 X782 — W328 — 26

OPTION ZVAX-B253

A310 TRANSFER SWITCH P12 — W319 — X1 X2 X3 X4 — W302 — W301

W318 W318 — X11 X22 — A311 DC1_-5V DIV/OFF2 — X10 X20 — PULSE-MODULATOR 24 DIV/OFF1 DC2_-5V — X12 X21 — W317 W315

OPTION ZVAX-B273

W311 — 50 — W80 — W40

W311 — K OUT — W153 — K IN — PORT3 SOURCE — W411

K OUT — W151 — K IN — PORT1 SOURCE — W401

A400 INTERFACE ZVAX24

P10 X201 — P50 X611 — P12 X409 — P12 X415 — P26 X402

P28 X405 — W328

P12 X408 — W329

W317 — X508 on/off

W316 — X505 on/off

W315 — X606 -5V

W318 — X609 -5V

P12 X414 — W319

P12 X411 — W158

W116 — X506 on/off

W117 — X503 on/off

W118 — X604 -5V

W115 — X602 -5V

P12 X410 — W159

W216 — X507 on/off

W217 — X504 on/off

W218 — X605 -5V

W215 — X603 -5V

P12 X412 — W119

P26 X401

P28 X403 — W128 — 26

P14 X100 JTAG

P12 X406

P12 X413

P12 X407

P12 X416 — X600

P28 X404

X512 BNC — 2 — PULSE GENERATOR 1 OUT — X511 BNC

X502 BNC — 2 — EXT PULSE GENERATOR 1 IN — X501 BNC

X500 RJ45 — CASCADE IN

REAR PANEL

X400 P25 SUB D — FILTER CONTROL IN

X202 USB Typ A — USB

X200 USB Typ B — USB FROM NWA

X601 — E1 — 2 — M

W11 FUSE UNIT — F3 +12V — F4 -12V — F5 +5V — F6 +3.3V — F7 +15V — blk red blu wht yllo

A200 POWER SUPPLY — X201 — GND — W201 — W200

X200 — F1 F2 — LINE IN 100..240V 50 Hz 60 VA

FUSE UNIT see Sheet 5

A121 — W128 — 26 — X781 X782 — SWITCHED FILT 22-2 — W504 W503

X3 X4 — W121 — X1 X2

A120 TRANSFER SWITCH P12 — W129 — 12

OPTION ZVAX-B251

A111 DC1_-5V DIV/OFF2 — X11 X22 — X10 X20 — PULSE-MODULATOR 24 DIV/OFF1 DC2_-5V — X12 X21 — W117 W115 — W304 W303

X3 X4 — W111 — X1 X2

A110 TRANSFER SWITCH P12 — 12

OPTION ZVAX-B271

OPTION ZVAX-B272

SOURCE IN — W201

REF OUT — W204

MEAS IN — W210

OUT — W241

OPTION ZVAX-B292

2

A200 COUPLER 44 DG — X1 X2 X3 X4 MEAS_OUT REF_OUT — W201

A82 LED BOARD ZVAX24 X1 — W80 — 12

HARM FILTER

PULSE MOD

LOW NOISE

MONITOR — W242

OPTION ZVAX-B210 10dB — W242 — W241 OUT — A240 DIR COUPLER — IN W240

A210 TRANSFER SWITCH P12 — W219 — 12 — W203 — X1 X2 X3 X4 — W301 — W302

W218 W216 — X11 X22 — A211 DC1_-5V DIV/OFF2 — X10 X20 — PULSE-MODULATOR 24 DIV/OFF1 DC2_-5V — X12 X21 — W217 W215

A231 AMP — W233 W232 — X4 X3

A230 TRANSFER SWITCH P12 — W240 — X1 X2 — W230 — 12 — W239

OPTION ZVAX-B203

A220 TRANSFER SWITCH P12 — 12 — W229 — X1 X2 X3 X4 — W211 — W502 W501

A221 SWITCHED FILT 22-2 — X781 X782 — W228 — 26

OPTION ZVAX-B252

Legende/ legend

alternative conn

semi rigid cable

flex koax cable

FRONT PANEL

FRONT PANEL TOP VIEW

IN OUT HARM FILTER PULS MOD COMBINER — SOURCE PORT3

IN OUT OUT HARM FILTER PULS MOD COMBINER 1 — SOURCE REF MEAS

IN OUT HARM FILTER PULS MOD LOW NOISE 2 — SOURCE REF MEAS

ROHDE&SCHWARZ	Benennung / Designat.: ZVAX24 ERWEITERUNGSEINHEIT / ZVAX24 EXTENSION UNIT	Spr.:/Lang.: de	Aei:/C.I.: 02.00
			Blatt:/Sh.: 1 +
ZVAX24	Datum: Date: 09-01-21 / Abteilung: Dept.: 1ESK / Name: smolinsk	Zeichn.Nr.:/Drawing No.: 1311.2509.01 S	

A70 STANDBY BOARD ZVAX24 — X1 — 12 — W80

HARM FILTER / PULSE MOD / COMBINER
A80 LED BOARD ZVAX24 — X1 — 12 — W80

A40 USB 2.0 — P10 X1 — 10 — W40

SOURCE IN — W120
REF OUT — W150
MEAS OUT — W104
OUT — W103

OPTION ZVAX-B291

1

A100 COUPLER 44 DG — X1 X2 X3 X4 — MEAS_OUT — REF_OUT — W101

HARM FILTER / PULSE MOD / COMBINER
A81 LED BOARD ZVAX24 — X1 — 12 — W80

2

HARM FILTER / PULSE MOD / LOW NOISE
A82 LED BOARD ZVAX24 — X1 — W80 — 12

A151 TRANSFER SWITCH — P12 — X1 X2 X3 X4
R151
W601
SPLITTER A152 — IN — OUT
W602
W603
A150 TRANSFER SWITCH — P12 — X1 X2 X3 X4 — W151 — W159 — 12

OPTION ZVAX-B211

A121 SWITCHED FILT 22-2 — X781 X782 — W128 — 26
W504 W503
A120 TRANSFER SWITCH — P12 — X1 X2 X3 X4 — W121 — W129 — 12

OPTION ZVAX-B251

A111 PULSE-MODULATOR 24 — X10 X11 X12 X20 X21 X22 — W118 W116 W117 W115 W304 W303
A110 TRANSFER SWITCH — P12 — X1 X2 X3 X4 — W111 — 12

OPTION ZVAX-B271

W40 — 50 — W80

A400 INTERFACE ZVAX24

P10 X201
P28 X405
P12 X408
P12 X414
P12 X411
P12 X410
P12 X412
P26 X403
P12 X406
P12 X413
P12 X407
P12 X416
P26 X404

P50 X611 — P12 X409 — P12 X415 — P26 X402

X508 on/off
X505 on/off
X606 -5V
X609 -5V
X506 on/off
X503 on/off
X604 -5V
X602 -5V
X507 on/off
X504 on/off
X605 -5V
X603 -5V
P26 X401
P14 X100 JTAG

X512 BNC 2 — PULSE GENERATOR
X511 BNC 1 OUT
X502 BNC 2 — EXT PULSE GENERATOR
X501 BNC 1 IN
X500 RJ45 — CASCADE IN
REAR PANEL
X400 P25 SUB D — FILTER CONTROL IN
X202 USB Typ A — USB
X200 USB Typ B — USB FROM NWA
X600
X601

K OUT — W401 — PORT1 SOURCE
W151 K IN

E1 — 2 — M

W11 FUSE UNIT — F3 -12V — F4 -12V — F5 +5V — F6 +3.3V — F7 +13V — blk — red — blu — wht — vio

A200 POWER SUPPLY — X201 GND — W200 — W201

X200 — F1 — F2 — LINE IN 100..240V 50 Hz 60 VA

MONITOR

FRONT PANEL

FRONT PANEL TOP VIEW
IN — OUT — SOURCE PORT3 — HARM FILTER — PULS MOD — COMBINER
IN — OUT OUT — SOURCE REF MEAS — HARM FILTER — PULS MOD — COMBINER — 1
IN — OUT OUT — SOURCE REF MEAS — HARM FILTER — PULS MOD — LOW NOISE — 2

Legende/ legend
alternative conn
semi rigid cable
flex koax cable

ROHDE&SCHWARZ	Benennung / Designat.: ZVAX24 ERWEITERUNGSEINHEIT / ZVAX24 EXTENSION UNIT	Spr.:/Lang.: de	Aei:/C.l.: 02.00	Blatt:/Sh.: 2 +
ZVAX24	Datum: Date: 09-01-21 — Abteilung: Dept.: 1ESK — Name: smolinsk	Zeichn.Nr.:/Drawing No.: 1311.2509.01 S		

SOURCE PORT3

A70 STANDBY BOARD ZVAX24 — X1 — 12 — W80

HARM FILTER
PULSE MOD
COMBINER

A80 LED BOARD ZVAX24 — X1 — 12 — W80

A40 USB 2.0 — X1 P10 — 10 — W40

1

HARM FILTER
PULSE MOD
COMBINER

A81 LED BOARD ZVAX24 — X1 — 12 — W80

SOURCE REF MEAS

IN W201
OUT W204
IN W210
OUT W241

OPTION ZVAX-B292

A200 COUPLER 44 DG — X1 X2 X3 X4 — MEAS_OUT — REF_OUT — W201

2

HARM FILTER
PULSE MOD
LOW NOISE

A82 LED BOARD ZVAX24 — X1 — W80 — 12

MONITOR

W242

OPTION ZVAX-B210 10dB

A240 DIR COUPLER — OUT W241 — IN W240

OPTION ZVAX-B272

A210 TRANSFER SWITCH P12 — W203 — X1 X2 X3 X4 — W219 — 12

W301 W302 W216 W218

A211 PULSE-MODULATOR 24 — DC1_-5V — DC2_-5V — ON/OFF1 — ON/OFF2 — X10 X11 X12 X20 X21 X22 — W215 W217

W240

OPTION ZVAX-B203

A231 AMP

W232 W233

A230 TRANSFER SWITCH P12 — X1 X2 X3 X4 — W230 — 12 — W239

OPTION ZVAX-B252

A220 TRANSFER SWITCH P12 — X1 X2 X3 X4 — W229 — 12 — W211

W501 W502

A221 SWITCHED FILT 22-2 — X781 X782 — W228 — 26

50 — W80 — W40

A400 INTERFACE ZVAX24

P10 X201
P28 X405
P12 X408
P12 X414
P12 X411
P12 X410
P12 X412
P26 X403
P12 X406
P12 X413
P12 X407
P12 X416
P26 X404

P50 X611 — P12 X409 — P12 X415 — P26 X402

W116 X506 on/off
W117 X503 on/off
W118 X604 -5V
W115 X602 -5V
W216 X507 on/off
W217 X504 on/off
W218 X605 -5V
W215 X603 -5V

X508 on/off
X505 on/off
X606 -5V
X609 -5V

X512 BNC 2 — PULSE GENERATOR
X511 BNC 1 OUT
X502 BNC 2 — EXT PULSE GENERATOR
X501 BNC 1 IN
X500 RJ45 — CASCADE IN

REAR PANEL

P26 X401
P14 X100 JTAG
X400 P25 SUB D — FILTER CONTROL IN
X202 USB Typ A — USB
X200 USB Typ B — USB FROM NWA
X600
X601

E1 — M — 2

W11 FUSE UNIT — +12V F3 blk — -12V F4 red — +5V F5 blu — +3.3V F6 wht — -13V F7 vio

A200 POWER SUPPLY — X201 GND — W200 — W201

X200 — F1 F2 — LINE IN 100..240V 50 Hz 60 VA

FRONT PANEL

FRONT PANEL TOP VIEW

SOURCE PORT3: IN, OUT; HARM FILTER, PULS MOD, COMBINER

SOURCE REF MEAS 1: IN; OUT OUT; HARM FILTER, PULS MOD, COMBINER

SOURCE REF MEAS 2: IN; OUT; HARM FILTER, PULS MOD, LOW NOISE

Legende/ legend

alternative conn
semi rigid cable
flex koax cable

ROHDE&SCHWARZ	Benennung / Designat.: ZVAX24 ERWEITERUNGSEINHEIT / ZVAX24 EXTENSION UNIT		Spr.:/Lang.: de	Aei:/C.I.: 02.00	Blatt:/Sh.: 3 +
ZVAX24	Datum: Date: 09-01-21	Abteilung: Dept.: 1ESK	Name: Name: smolinsk	Zeichn.Nr.:/Drawing No.: 1311.2509.01 S	

SOURCE PORT3

A70 STANDBY BOARD ZVAX24 — IN, OUT — 12 — W80

A80 LED BOARD ZVAX24 — HARM FILTER, PULSE MOD, COMBINER — 12 — W80

A40 USB 2.0 — P10 X1 — 10 — W40

1

A81 LED BOARD ZVAX24 — HARM FILTER, PULSE MOD, COMBINER — 12 — W80

2

A82 LED BOARD ZVAX24 — HARM FILTER, PULSE MOD, LOW NOISE — W80 — 12

MONITOR

Legende/ legend

alternative conn
semi rigid cable
flex koax cable

FRONT PANEL

FRONT PANEL TOP VIEW

SOURCE PORT3: IN, OUT; HARM FILTER, PULS MOD, COMBINER

SOURCE REF MEAS 1: IN, OUT, OUT; HARM FILTER, PULS MOD, COMBINER

SOURCE REF MEAS 2: IN, OUT; HARM FILTER, PULS MOD, LOW NOISE

A151 TRANSFER SWITCH — P12 — W158 — 12 — W153 — X1 X2 X3 X4 — W152 — R151 — W601

SPLITTER A152 — IN, OUT, OUT — W603 — W602

A150 TRANSFER SWITCH — P12

OPTION ZVAX-B211

A320 TRANSFER SWITCH — P12 — W329 — W320 — X1 X2 X3 X4 — W502 — W501

A321 SWITCHED FILT 22-2 — X781 X782 — W328

OPTION ZVAX-B253

26

A310 TRANSFER SWITCH — P12 — W319 — W321 — X1 X2 X3 X4 — W302 — W301

A311 PULSE-MODULATOR 24 — DC1_-5V, CH/OFF2, CH/OFF1, DC2_-5V — X10 X11 X12 X20 X21 X22 — W318 — W316 — W317 — W315

OPTION ZVAX-B273

W311 — K OUT — W411 — PORT3 SOURCE

W153 — K IN

50 — W60 — W40

A400 INTERFACE ZVAX24

P10 X201 — P28 X405 — P12 X408 — P12 X414 — P12 X411 — P12 X410 — P12 X412 — P26 X403 — P12 X406 — P12 X413 — P12 X407 — P12 X416 — P26 X404

P50 X611 — P12 X409 — P12 X415 — P26 X402

X508 on/off — X505 on/off — X606 -5V — X609 -5V — X506 on/off — X503 on/off — X604 -5V — X602 -5V — X507 on/off — X504 on/off — X605 -5V — X603 -5V — P26 X401 — P14 X100 JTAG

X512 BNC 2 — PULSE GENERATOR 1 OUT

X511 BNC

X502 BNC 2 — EXT PULSE GENERATOR 1 IN

X501 BNC

X500 RJ45 — CASCADE IN

REAR PANEL

X400 P25 SUB D — FILTER CONTROL IN

X202 USB Typ A — USB

X200 USB Typ B — USB FROM NWA

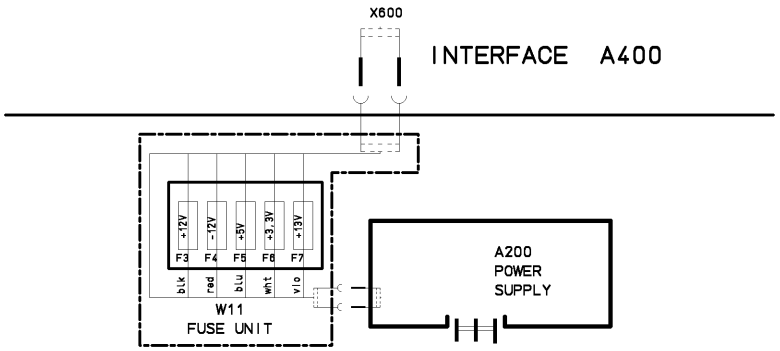
X600 — X601 — E1 — M

W11 FUSE UNIT — F3 +12V, F4 -12V, F5 -5V, F6 +3.3V, F7 +13V — blk, red, blu, wht, vio

A200 POWER SUPPLY — X201 — GND — W200 — W201

X200 — F1, F2 — LINE IN 100..240V 50 Hz 60 VA

ROHDE&SCHWARZ	Benennung / Designat.: ZVAX24 ERWEITERUNGSEINHEIT / ZVAX24 EXTENSION UNIT	Spr.:/Lang.: de	Aei:/C.I.: 02.00	Blatt:/Sh.: 4 +
ZVAX24	Datum: / Date: 09-01-21 — Abteilung: / Dept.: 1ESK — Name: / Name: smolinsk	Zeichn.Nr.:/Drawing No.: 1311.2509.01 S		



to INTERFACE A400

1	blk	F3		+12V blk	1
2	orn			orn	2
3	wht	F6		+3V3 wht	3
4	wht			+3V3 wht	4
5	orn			DGND orn	5
6	orn			DGND orn	6
7	orn			orn	7
8	blu	F5		+5V blu	8
9	blu			+5V blu	9
10	blu			+5V blu	10
11	orn			orn	11
12	vio	F7		perm. +13V5 vio	12
13	red	F4		-12V red	13
14	orn			orn	14
15	wht			+3V3 wht	15
16	orn			DGND orn	16
17	orn			DGND orn	17
18	orn			DGND orn	18
19	orn			orn	19
20	blu			+5V blu	20
21	blu			+5V blu	21
22	orn			orn	22
23	orn			orn	23
24	orn			DGND orn	24

from POWER SUPPLY A200

W11
FUSE UNIT

ROHDE&SCHWARZ	Benennung / Designat.: ZVAX24 ERWEITERUNGSEINHEIT ZVAX24 EXTENSION UNIT	Spr.:/Lang.: de	Aei:/C.I.: 02.00	Blatt:/Sh.: 5 -
			Zeichn.Nr.:/Drawing No.: 1311.2509.01 S	
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