MTS Systemtechnik

Modular switching unit
Series KRE-4000

MTS Modular switching unit - Series KRE-4000:

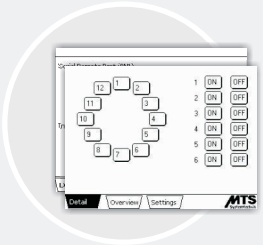
Application

- Switching unit for RF-generators, amplifiers and antennas at EMC test laboratories
- RF matrix
- Filter, diplexer, attenuator etc. selection unit
- Any automated routing of measurement equipment at test benches.
- Emulation of air interfaces, equipped with programmable attenuators
- Step attenuator unit
- Extended noise measurement equipment
- Customized solutions available

Description

The switching unit, series KRE-4000 is for the switching of almost every kind of signals. Due to the modular design, the electrical characteristics of the switches can be adapted to versatile demands. In combination with attenuators, splitters and other modules the usability can be extended. The KRE-4000 can be controlled by the touch panel display or by different remote interfaces like RS232 (standard), USB, LAN and IEC-Bus. Extensive measurement procedures and scripts can be generated by the user and stored on the device as an option.

Control via PC or optional touch screen



The optional manual control is realized via a 5,7 inch full colour display (320 x 240 Pixel resolution) with touch screen

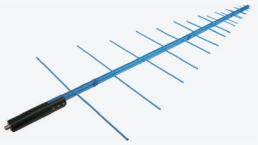
Shielding Boxes

Different Systems

LISN Systems

Amplifiers

Antennas



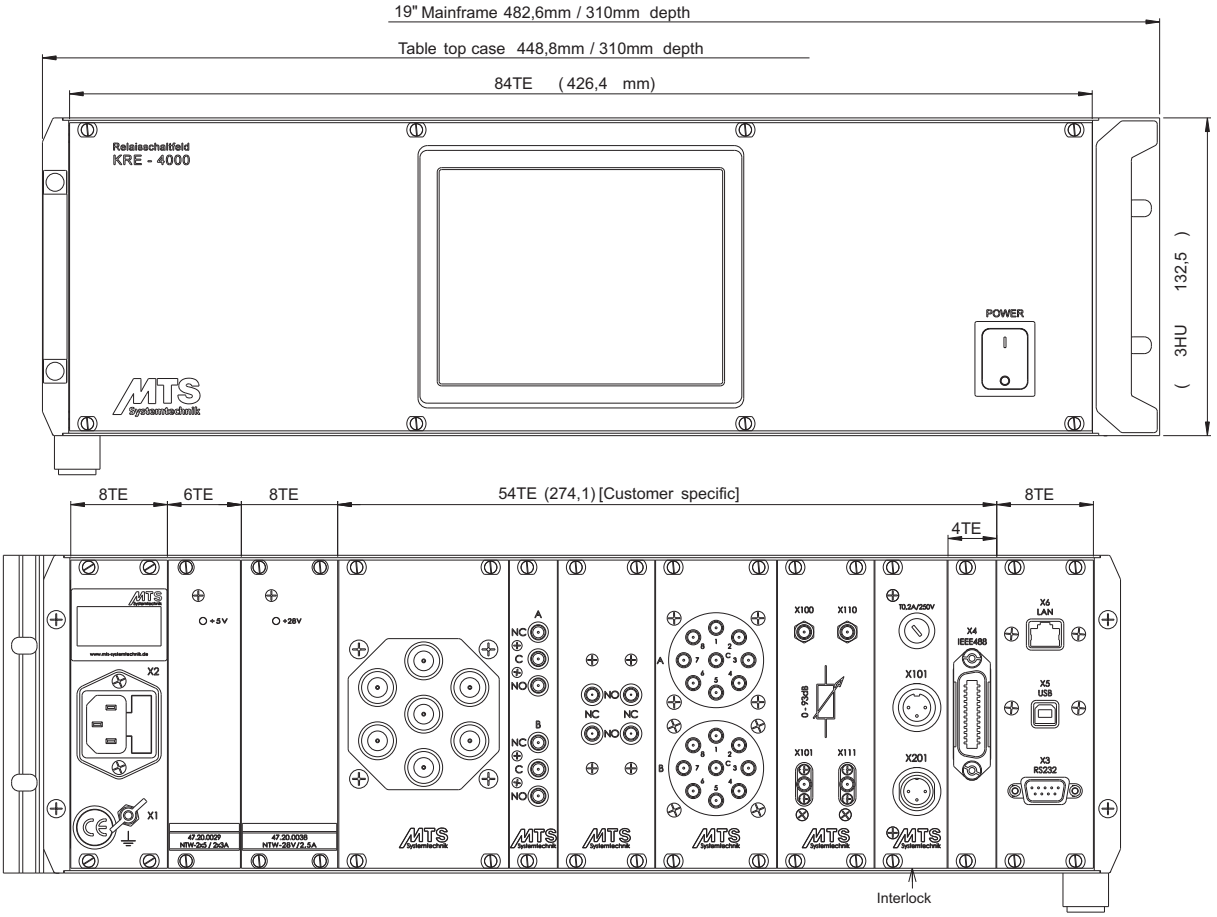
Our control programs are also for Microsoft Vista!

Characteristics:

- Various switch applications from DC to 40 GHz with electromechanical or solid state relays.
- Numerous RF components (like switches, attenuators, splitters, filters, amplifiers, etc.) can be placed on the front and/or rear panel. Internal cabling is possible. Also non-MTS components can be built-in.
- Many possible interfaces, like e.g. RS232 (standard), LAN, USB, IEC-Bus, fibre optic cable ...
- Advantages of the manual control (as option): user-oriented and customized menus, graphs and tables can be integrated, more opportunities with the optical display.
- Integrated power supply 100-240 V.
- Table top units (84TE) or 19” rack mount cases with 3 HU or with other dimensions are available. Special components can be built-in into a 1 HU case. Also cases with 42-TE are deliverable.
- Low-priced variant: all modules and connectors are mounted on the rear panel of the case with RS232 interface.
- Windows control programs can be offered.
- Opportunity for upgrades.
- Customized solutions, also with hardware interlock.

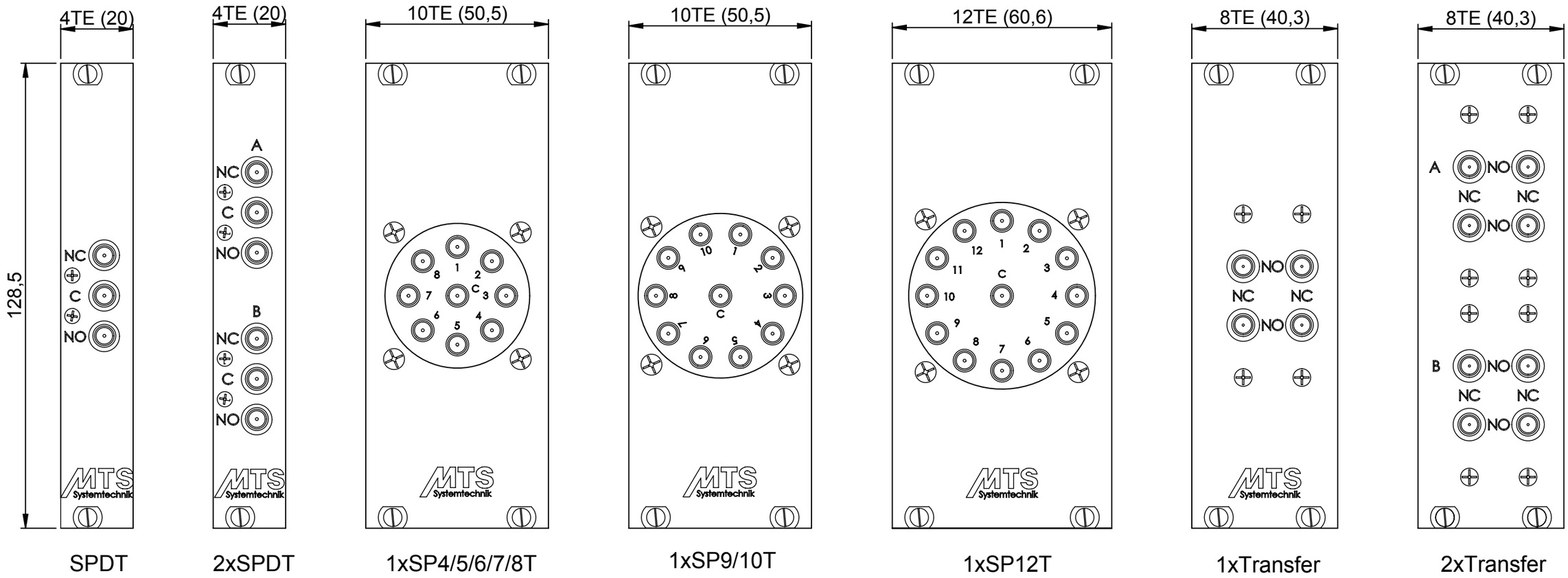
Now available with calibrated attenuators for a higher accuracy!

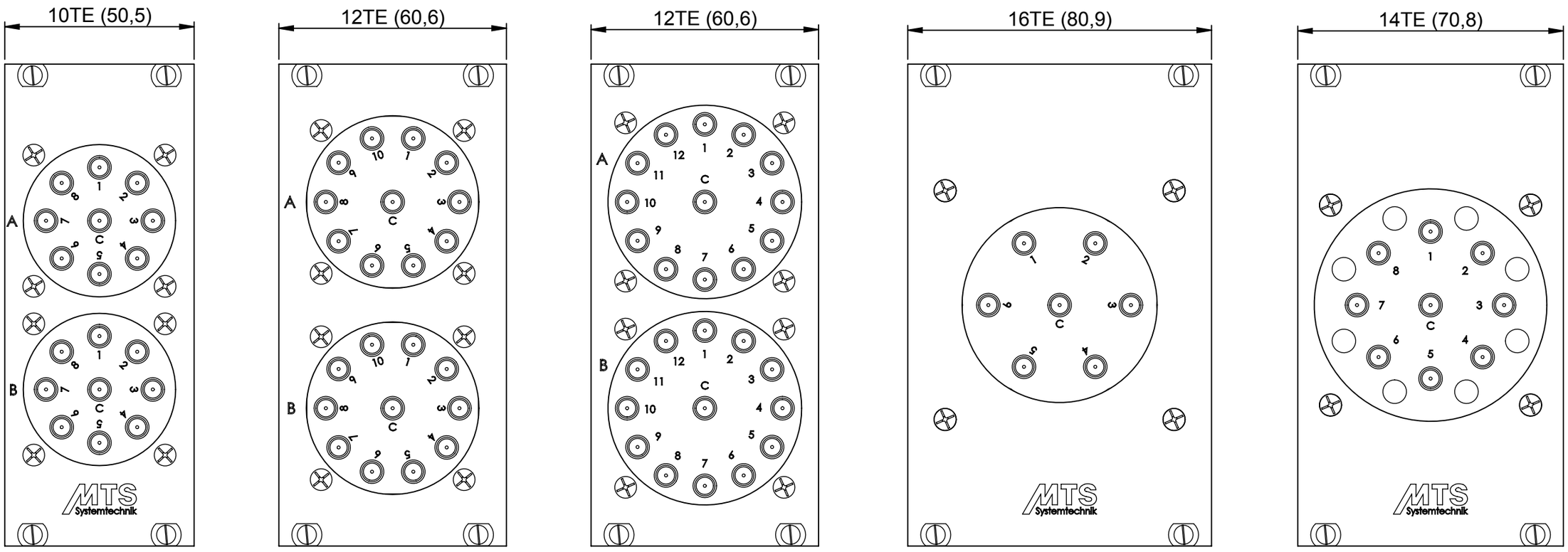
Dimensions:



Module examples for integration

Relay modules type Dow-Key, DC to 18GHz, with SMA-connectors





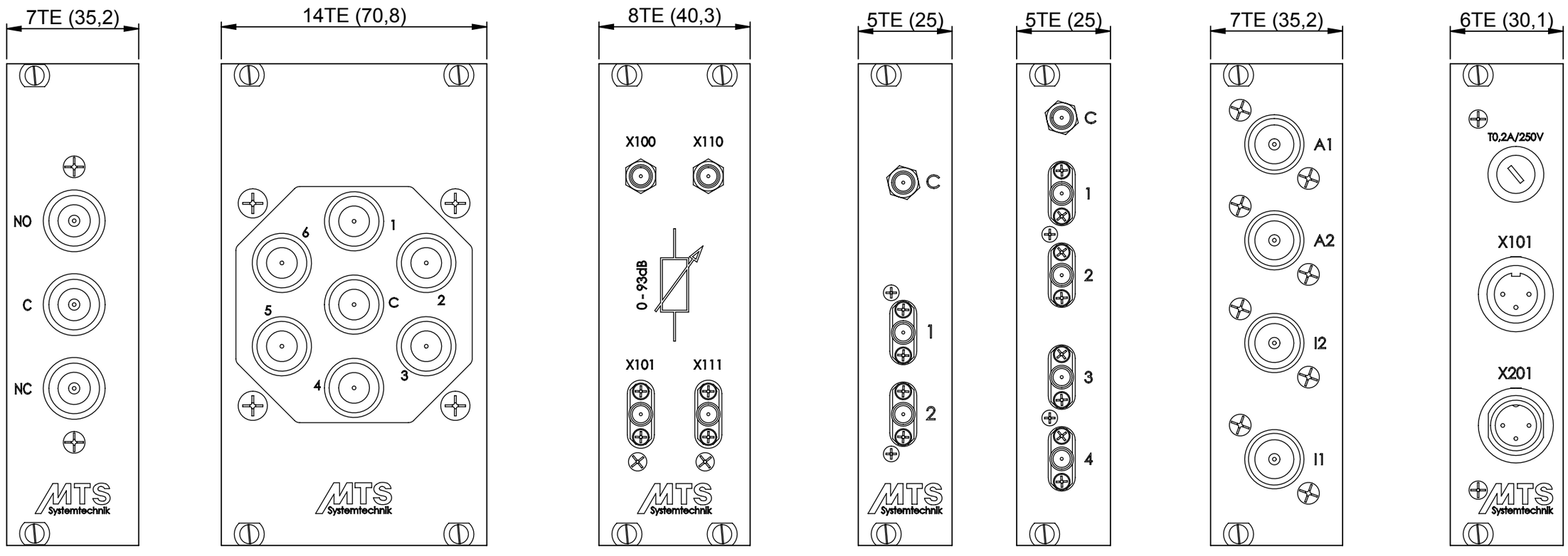
Relay modules, DC to 12,4GHz, with N-connectors

Programmable attenuator module

Powersplitter modules 1 to 2 / 1 to 4

Hybridcoupler module

Interlock module



Specifications and other modules on request!

E-mail or fax to MTS Systemtechnik GmbH,
Gewerbepark Ost 8, D-86690 Mertingen, Germany
info@mts-systemtechnik.de Phone: +49 9078/91294-0 Fax: +49 9078/91294-70

Checklist for modular switching unit inquiries, series KRE:

Company: _____ **Place:** _____

Name: _____ **Phone:** _____

E-mail: _____ **Date:** _____

	Relay 1	Relay 2	Relay 3	Attenuator	Other
Quantity:					
In-/Outputs:					
Frequency range:					
Impedance:					
RF-connector:					
RF-power:					
Isolation (*):					
VSWR (*):					
Insertion loss (*):					
Special function (**):					

(*) only if required
(**) e.g. terminated, with indicator outputs, latching etc. As a standard, 1/2-relays (SPDT) and transfer relays (DPDT) have the function 'failsafe' and multi position relays (SP3T - SP14T) have the function 'normally open'.

Control:
- ☐ IEEE-488 interface: bus-address: _____
- ☒ RS-232 (standard) 115 kbps, 8-N-1
- ☐ LAN interface IP-address: _____ Port: _____
- ☐ USB
- ☐ others: _____

Manual control:
- ☐ with touch panel

RF-connectors:
- ☐ SMA
- ☐ N
- ☐ TNC
- ☐ BNC
- ☐ others: _____

Power supply:
- ☐ 100-240 V, 50-60 Hz
- ☐ others: _____

Mechanic:
- ☐ 84 TE table top case
- ☐ 19" rack-mount
- ☐ others: _____

Rack Unit:
- ☐ 3 HU (standard)
- ☐ others: _____

Connectors:
- ☐ front panel
- ☐ rear panel (standard)

Special wishes:
- ☐ interlock
- ☐ software control
- ☐ control output for external components
- ☐ other display views

Environment:
- ☐ RoHS-conform
- ☐ others: _____

Quantity: _____ pieces

MTS Systemtechnik

RF-systems and -units

EMC / Antenna Technology

Mechanical products

Certified with DIN ISO 9001:2000

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Further information

Do not hesitate and order our free brochures and catalogues in German or English today. In our catalogue for mechanical parts you will find a large selection of standard enclosures mostly ex stock and deliverable at short notice.
Please visit our website to get an overview about our product range.

Further information

Series KRM

Cassettes of the type “KRM” can be used to switch various signals and represent a low cost alternative to relay switching units series KRE. The built-in relay is controlled via IEEE-488- and/or RS-232-C-interface. The IEEE-488-device-address can be adjusted internally via a DIP-switch. A lower priced alternative is controlled only via RS-232-C-interface. A LED at the front panel shows the status of the cassette. Three different standard types of relays are available (others on request). Mostly, standard types are deliverable at short term.

The company MTS would like to introduce itself:

The MTS Systemtechnik GmbH is a flexible and middle-sized company, which was founded in 1980 as a development and production company. Since then the MTS´s special field is the distribution and modification of RF-signals. Nowadays we manufacture products and systems for the mobile radio, laboratory, satellite communication and video respectively audio field.
Following you can find our product range in extracts:

Product overview

Systems and Units
- Antenna- / Signal distribution units
- Remote controlled switching units
- Filter units
- Ventilation units
- Matrices
- Coupling units
- Air field emulations serie AIAD
- Shielding boxes serie MSB

Components
- Coaxial relays
- Multi channel switches
- Videorelays
- Feedthrough terminations
- DC-blocks
- Fixed attenuators
- Terminations
- Semiconductor -switches & - attenuators
- Coaxial short circuits, bias tees
- Power attenuators and power terminations
- Signal dividers, power splitters, combiners and directional couplers
- Programmable step attenuators
- Coaxial cable assemblies
- Impedance matching modules
- PC controlled components
- Amplifiers

Mechanical Modules
- RF shielded enclosures
- Structural enclosures
- Customer specified enclosures
- Milled components
- Milled cassettes
- Cassette enclosures
- 19"-racks

Data Technology
- Controller cards and accessories for operators in electronic
- Development of firm- and software according to customer’s wishes

EMC / Antenna Technology
- LISN - Line Impedance Stabilisation Network
- EMC Components
- Antennas and accessories
- Wireless LAN Sets

Services
- CAD development and customer specified CNC milled modules
- Mounting of components to and testing of RF printed circuit boards
- Engineering service
- Programming service

Distribution for IMS Connector Systems GmbH
- Coaxial connectors
- Terminations
- Coaxial adapters
- Coaxial cable assemblies

Technical subject to change.

Illustrations similar

January 2008

Relay Switching Unit KRE-3050-ESCU

MTS-No.: R63.11.3050

Application

The Relay Switching Unit series KRE-3000 can be used for several applications, f.e.:

- Switching Unit for RF-generators, amplifiers and antennas at EMC test laboratories
- RF matrix
- Filter, diplexer attenuator etc. selection unit
- Any automated routing of measurement equipment at test benches

Description

The Relay Switching Unit, series KRE-3000 is for the switching of almost every kind of signals. Due to the modular design, the electrical characteristics of the switches can be adapted to versatile demands. In combination with attenuators, splitters and other modules the usability can be extended.

Characteristics

- Configuration:
  5x SP6T relays Dow-Key 565-5308, with 4 pcs. cable RG223 switched to a 6/18 blocking matrix
- Can be extended to a 6/24, 6/30 or 6/36 blocking matrix
- Remote control by RS-232 and IEEE488
- Integrated power supply 100-240 V
- Manual control (touch panel display)
- 19” rack mount case with 3 HU
- Windows control software can be offered
- Opportunity for upgrades
- Relay Switching Units can be designed according to customer’s individual requirements

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Relay Switching Unit KRE-3050-ESCU

MTS-No.: R63.11.3050

Configuration:

5x SP6T relays Dow-Key 565-5308, with 4 pcs. cable RG223 switched to a 6/18 blocking matrix)

Technical data:

1 RF-specifications:

1.1	Relay type (relays 1 – 5)	SP6T (565-5308 Dow-Key) normally open	
	Impedance	50 Ω	
	RF-power throughput power	200 W CW @ 3 GHz	
	Frequency range	DC – 18,0 GHz	
	RF-connections	SMA-female	
	Switching time max.	20 ms	
	Operating life min.	1 000 000 cycles	
	VSWR max.	DC – 4,0 GHz 4,0 – 8,0 GHz 8,0 – 18,0 GHz	1,20 : 1 1,30 : 1 1,50 : 1
	Isolation min.	DC – 4,0 GHz 4,0 – 8,0 GHz 8,0 – 18,0 GHz	70 dB 65 dB 60 dB
	Insertion loss max.	DC – 4,0 GHz 4,0 – 8,0 GHz 8,0 – 18,0 GHz	0,20 dB 0,30 dB 0,50 dB

2 Connections:

2.1	Front side	Power supply switch with integrated control lamp Display with touch panel
2.2	Rear side	RF-connections Power supply Control card Appliance plug with the integrated fuses F1 and F2 Ground connector Control interfaces

3 General specifications:

3.1	Power supply	100 V – 240 V 50 Hz / 60 Hz
3.2	Internal voltage	5 V DC 28 V DC
3.3	Control displays	Control lamp in power switch Control LED for 5 V DC and 28 V DC at the power supply unit
3.4	Control interfaces	IEEE488 RS-232
3.5	Power consumtion primarily	70 mA max. @ 230 V (no relay switched) 130 mA max. @ 230 V (all relays switched)
3.6	Voltage supply	Standard rubber connector
3.7	Operating temperature	0 °C – +50 °C
3.8	Reference temperature for specifications	+25 °C
3.9	Dimensions	19''-unit x 3 HU x 310 mm (dimensions without handles and connections)
3.10	Colour	Front side colourless anodized Rear side colourless anodized
3.11	Weight	6,2 kg

4 Delivered parts:

KRE-3050-ESCU
Power cable
4 pcs. cables RG223-55-18
Operating manual (on CD)

5 Comments:

Warranty	12 months
RoHS-compliant	Yes

6 Recommended accessories:

RF-cables
Terminations
Attenuators

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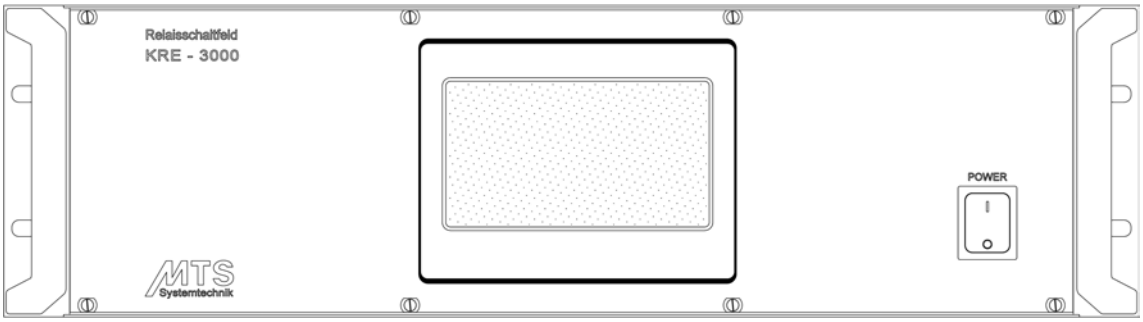
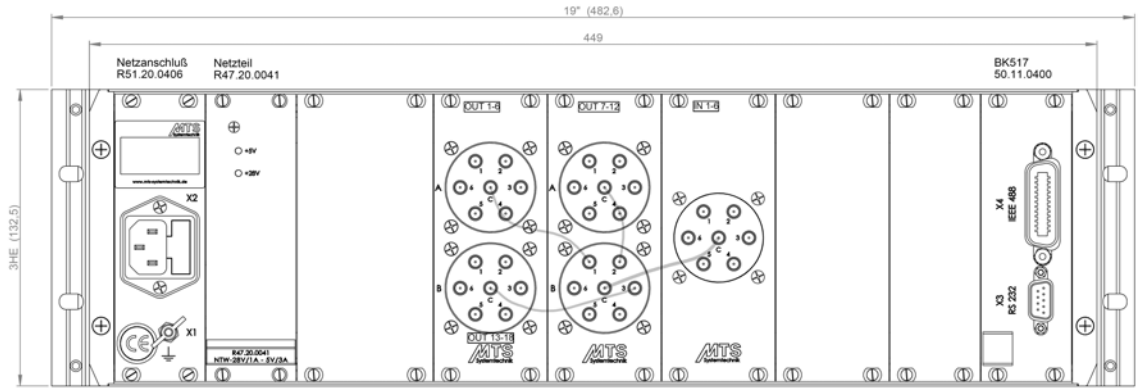
Relay Switching Unit KRE-3050-ESCU

MTS-No.: R63.11.3050

Views:





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Relay Switching Unit KRE-3042-ESCU

MTS-No.: R63.11.3042

Application

The Relay Switching Unit series KRE-3000 can be used for several applications, f.e.:

- Switching Unit for RF-generators, amplifiers and antennas at EMC test laboratories
- RF matrix
- Filter, diplexer attenuator etc. selection unit
- Any automated routing of measurement equipment at test benches

Description

The Relay Switching Unit, series KRE-3000 is for the switching of almost every kind of signals. Due to the modular design, the electrical characteristics of the switches can be adapted to versatile demands. In combination with attenuators, splitters and other modules the usability can be extended.

Characteristics

- Configuration:
  3x SPDT relays Dow-Key 402-2301 and
  2x 9pol. SUB-D for the control of 2 external relays (28 V, 0,5 A)
- Remote control by RS-232 and IEEE488
- Integrated power supply 100-240 V
- Manual control (touch panel display)
- 19” rack mount case with 3 HU
- Windows control software can be offered
- Opportunity for upgrades
- Relay Switching Units can be designed according to customer’s individual requirements

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Relay Switching Unit KRE-3042-ESCU

MTS-No.: R63.11.3042

Configuration:

3x SPDT relays Dow-Key model 402-2301 and 2x SUB-D 9pol. for the control of 2 external relays (28 V, 0,5 A)

Technical data:

1 RF-specifications:

1.1	Relay type (relays 1 – 3)	SPDT (402-2301 Dow-Key) failsafe	
	Impedance	50 Ω	
	RF-power throughput power	300 W CW @ 4 GHz	
	Frequency range	DC – 12,4 GHz	
	RF-connections	N female	
	Switching time max.	20 ms	
	Operating life min.	1 000 000 cycles	
	VSWR max.	DC – 4,0 GHz 4,0 – 8,0 GHz 8,0 - 12,4 GHz	1,25 : 1 1,45 : 1 1,50 : 1
	Isolation min.	DC – 4,0 GHz 4,0 – 8,0 GHz 8,0 – 12,4 GHz	70 dB 60 dB 60 dB
	Insertion loss max.	DC – 4,0 GHz 4,0 – 8,0 GHz 8,0 – 12,4 GHz	0,25 dB 0,40 dB 0,50 dB

2 Connections:

2.1	Front side	Power supply switch with integrated control lamp Display with touch panel
2.2	Rear side	RF-connections Power supply Control card Appliance plug with the integrated fuses F1 and F2 Ground connector Control interfaces Connections for control of 2 external RF relays

3 General specifications:

3.1	Relay type (4 – 5)	Control relays (PTF22024 TYKO)
3.2	Power supply	100 V – 240 V 50 Hz / 60 Hz
3.3	Internal voltage	5 V DC
3.4	Control displays	Control lamp in power switch Control LED for 5 V DC and 28 V DC at the power supply unit
3.5	Control interfaces	IEEE488 RS-232
3.6	Power consumtion primarily	3,15 A max. @ 230 V Depending on the respective external connection
3.7	Voltage supply	Standard rubber connector
3.8	Operating temperature	0 °C – +50 °C
3.9	Reference temperature for specifications	+25 °C
3.10	Dimensions	19''-unit x 3 HU x 310 mm (dimensions without handles and connections)
3.11	Colour	Front side colourless anodized Rear side colourless anodized
3.12	Weight	7,2 kg

4 Delivered parts:

KRE-3042-ESCU
Power cable
Operating manual (on CD)

5 Comments:

Warranty	12 months
RoHS-compliant	Yes

6 Recommended accessories:

RF-cables
Terminations
Attenuators

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Relay Switching Unit KRE-3042-ESCU

MTS-No.: R63.11.3042

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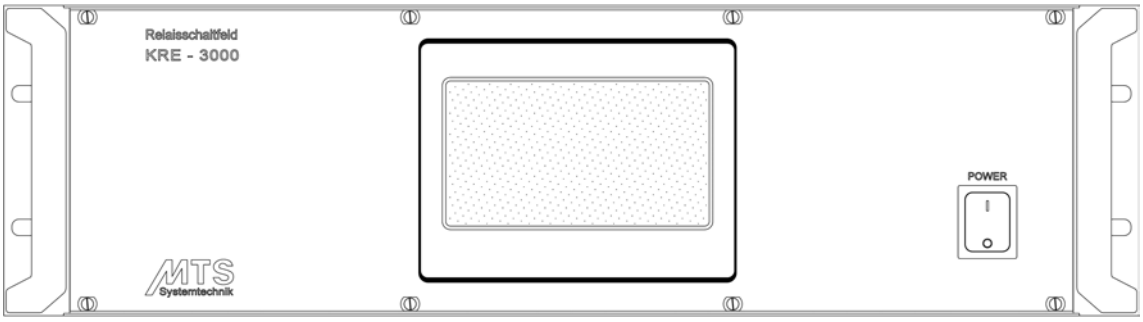

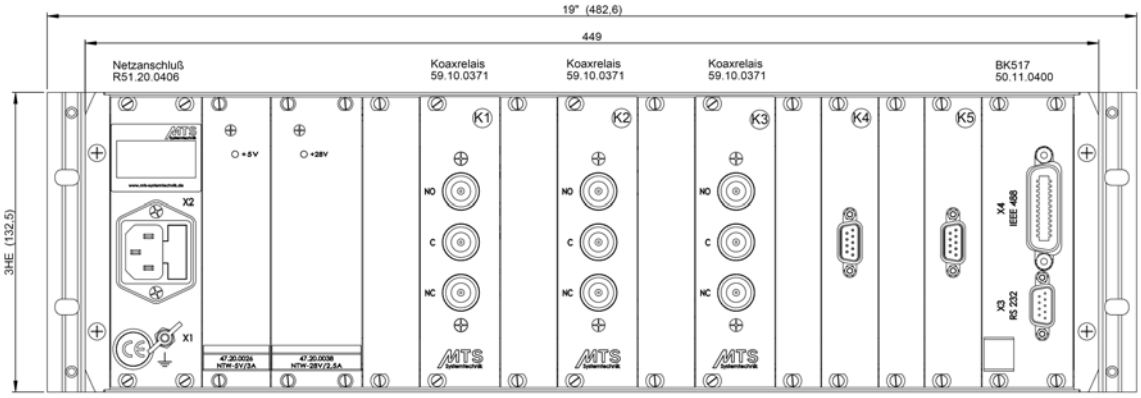

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Relay Switching Unit KRE-3049-ESCU

MTS-No.: R63.11.3049

Application

The Relay Switching Unit series KRE-3000 can be used for several applications, f.e.:

- Switching Unit for RF-generators, amplifiers and antennas at EMC test laboratories
- RF matrix
- Filter, diplexer attenuator etc. selection unit
- Any automated routing of measurement equipment at test benches

Description

The Relay Switching Unit, series KRE-3000 is for the switching of almost every kind of signals. Due to the modular design, the electrical characteristics of the switches can be adapted to versatile demands. In combination with attenuators, splitters and other modules the usability can be extended.

Characteristics

- Configuration:
  6x SPDT relays Dow-Key 402-2301
- Remote control by RS-232 and IEEE488
- Integrated power supply 100-240 V
- Manual control (touch panel display)
- 19” rack mount case with 3 HU
- Windows control software can be offered
- Opportunity for upgrades
- Relay Switching Units can be designed according to customer’s individual requirements

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Relay Switching Unit KRE-3049-ESCU

MTS-No.: R63.11.3049

Configuration:

6x SPDT relays Dow-Key model 402-2301

Technical data:

1 RF-specifications:

1.1	Relay type (relays 1 – 6)	SPDT (402-2301 Dow-Key) failsafe	
	Impedance	50 Ω	
	RF-power throughput power	300 W CW @ 4 GHz	
	Frequency range	DC – 12,4 GHz	
	RF-connections	N female	
	Switching time max.	20 ms	
	Operating life min.	1 000 000 cycles	
	VSWR max.	DC – 4,0 GHz 4,0 – 8,0 GHz 8,0 - 12,4 GHz	1,25 : 1 1,45 : 1 1,50 : 1
	Isolation min.	DC – 4,0 GHz 4,0 – 8,0 GHz 8,0 – 12,4 GHz	70 dB 60 dB 60 dB
	Insertion loss max.	DC – 4,0 GHz 4,0 – 8,0 GHz 8,0 – 12,4 GHz	0,25 dB 0,40 dB 0,50 dB

2 Connections:

2.1	Front side	Power supply switch with integrated control lamp
		Display with touch panel
2.2	Rear side	RF-connections
		Power supply
		Control card
		Appliance plug with the integrated fuses F1 and F2
		Ground connector
		Control interfaces

3 General specifications:

3.1	Power supply	100 V – 240 V 50 Hz / 60 Hz
3.2	Internal voltage	5 V DC 28 V DC
3.3	Control displays	Control lamp in power switch
		Control LED for 5 V DC and 28 V DC at the power supply unit
3.4	Control interfaces	IEEE488 RS-232
3.5	Power consumtion primarily	100 mA max. @ 230 V (no relay switched)
		200 mA max. @ 230 V (all relays switched)
3.6	Voltage supply	Standard rubber connector
3.7	Operating temperature	0 °C – +50 °C
3.8	Reference temperature for specifications	+25 °C
3.9	Dimensions	19''-unit x 3 HU x 310 mm (dimensions without handles and connections)
3.10	Colour	Front side colourless anodized
		Rear side colourless anodized
3.11	Weight	6,6 kg

4 Delivered parts:

KRE-3049-ESCU
Power cable
Operating manual (on CD)

5 Comments:

Warranty	12 months
RoHS-compliant	Yes

6 Recommended accessories:

RF-cables
Terminations
Attenuators

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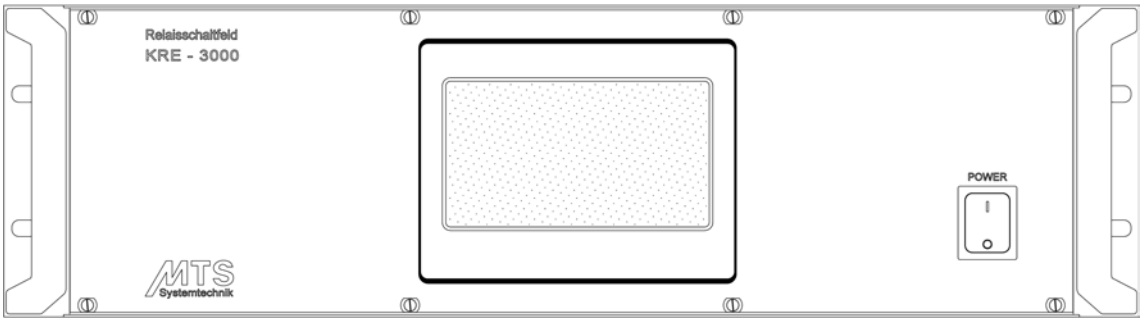
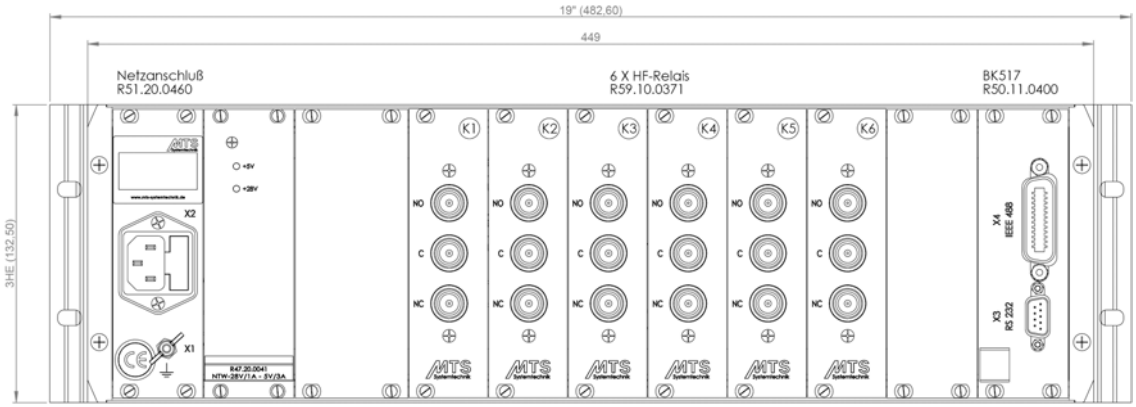
Relay Switching Unit KRE-3049-ESCU

MTS-No.: R63.11.3049

Views:





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Relay Switching Unit KRE-3053-TFCU

MTS-No.: R63.11.3053

Application

The Relay Switching Unit series KRE-3000 can be used for several applications, f.e.:

- Switching Unit for RF-generators, amplifiers and antennas at EMC test laboratories
- RF matrix
- Filter, diplexer attenuator etc. selection unit
- Any automated routing of measurement equipment at test benches

Description

The Relay Switching Unit, series KRE-3000 is for the switching of almost every kind of signals. Due to the modular design, the electrical characteristics of the switches can be adapted to versatile demands. In combination with attenuators, splitters and other modules the usability can be extended.

Characteristics

- Configuration:
  6x SPDT relays Dow-Key model 402-2301
  on front panel
- Remote control by RS-232 and IEEE488
- Integrated power supply 100-240 V
- Manual control (touch panel display)
- 84 TE desktop case with 3 HU
- Windows control software can be offered
- Opportunity for upgrades
- Relay Switching Units can be designed according to customer's individual requirements

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Relay Switching Unit KRE-3053-TFCU

MTS-No.: R63.11.3053

Configuration:

6x SPDT relays Dow-Key model 402-2301

Technical data:

1 RF-specifications:

1.1	Relay type (relays 1 – 6)	SPDT (402-2301 Dow-Key) failsafe	
	Impedance	50 Ω	
	RF-power throughput power	300 W CW @ 4 GHz	
	Frequency range	DC – 12,4 GHz	
	RF-connections	N female	
	Switching time max.	20 ms	
	Operating life min.	1 000 000 cycles	
	VSWR max.	DC – 4,0 GHz 4,0 – 8,0 GHz 8,0 - 12,4 GHz	1,25 : 1 1,45 : 1 1,50 : 1
	Isolation min.	DC – 4,0 GHz 4,0 – 8,0 GHz 8,0 – 12,4 GHz	70 dB 60 dB 60 dB
	Insertion loss max.	DC – 4,0 GHz 4,0 – 8,0 GHz 8,0 – 12,4 GHz	0,25 dB 0,40 dB 0,50 dB

2 Connections:

2.1	Front side	Power supply switch with integrated control lamp
		Display with touch panel
2.2	Rear side	RF-connections
		Power supply
		Control card
		Appliance plug with the integrated fuses F1 and F2
		Ground connector
		Control interfaces

3 General specifications:

3.1	Power supply	100 V – 240 V 50 Hz / 60 Hz
3.2	Internal voltage	5 V DC 28 V DC
3.3	Control displays	Control lamp in power switch
		Control LED for 5 V DC and 28 V DC at the power supply unit
3.4	Control interfaces	IEEE488 RS-232
3.5	Power consumption primarily	80 mA max. @ 230 V (no relay switched)
		200 mA max. @ 230 V (all relays switched)
3.6	Voltage supply	Standard rubber connector
3.7	Operating temperature	0 °C – +50 °C
3.8	Reference temperature for specifications	+25 °C
3.9	Dimensions	Desktop unit 84TE x 3 HU x 310 mm (dimensions without handles and connections)
3.10	Colour	Front side colourless anodized
		Rear side colourless anodized
3.11	Weight	6,8 kg

4 Delivered parts:

KRE-3053-TFCU
Power cable
Operating manual (on CD)

5 Comments:

Warranty	12 months
RoHS-compliant	Yes

6 Recommended accessories:

RF-cables
Terminations
Attenuators

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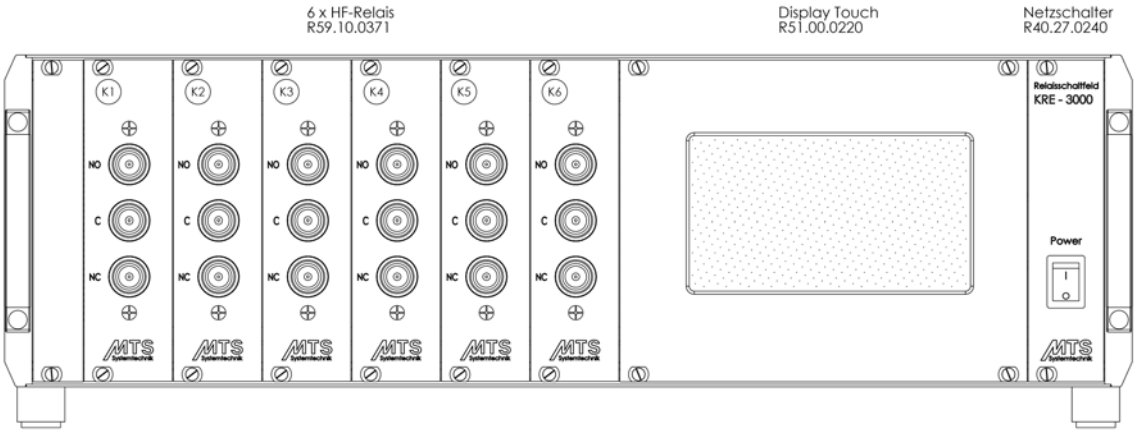
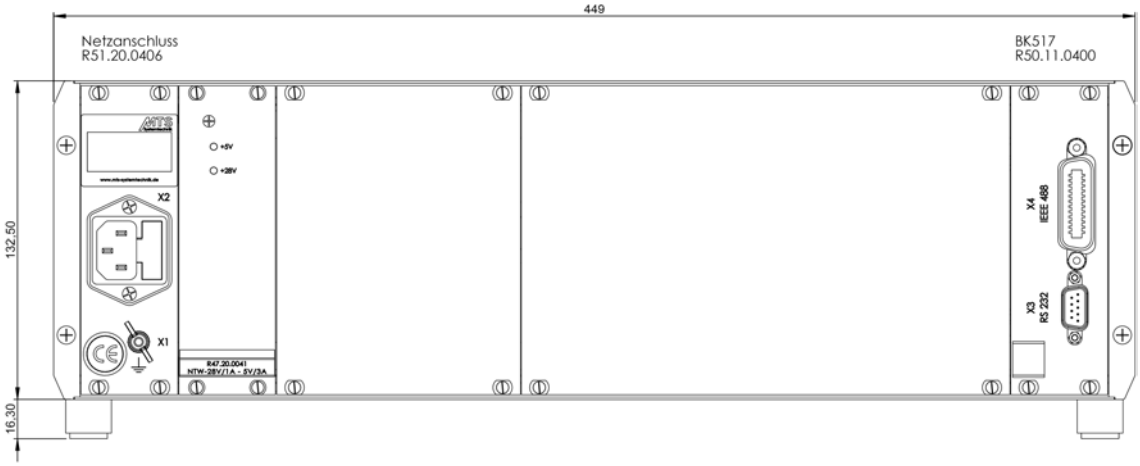
Relay Switching Unit KRE-3053-TFCU

MTS-No.: R63.11.3053

Views:





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Relay Switching Unit KRE-3054-TFCU

MTS-No.: R63.11.3054

Application

The Relay Switching Unit series KRE-3000 can be used for several applications, f.e.:

- Switching Unit for RF-generators, amplifiers and antennas at EMC test laboratories
- RF matrix
- Filter, diplexer attenuator etc. selection unit
- Any automated routing of measurement equipment at test benches

Description

The Relay Switching Unit, series KRE-3000 is for the switching of almost every kind of signals. Due to the modular design, the electrical characteristics of the switches can be adapted to versatile demands. In combination with attenuators, splitters and other modules the usability can be extended.

Characteristics

- Configuration:
  8x SP6T relays Dow-Key model 565-5308
  and 2x SPDT relays Dow-Key model
  401-2308 on front panel
- Remote control by RS-232 and IEEE488
- Integrated power supply 100-240 V
- Manual control (touch panel display)
- 84 TE desktop case with 3 HU
- Windows control software can be offered
- Opportunity for upgrades
- Relay Switching Units can be designed according to customer's individual requirements

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Relay Switching Unit KRE-3054-TFCU

MTS-No.: R63.11.3054

Configuration:

8x SP6T relays Dow-Key model 565-5308 and 2x SPDT relays Dow-Key model 401-2308

Technical data:

1 RF-specifications:

1.1	Relay type (relays 1-8)	SP6T (565-5308 Dow-Key) normally open
	Impedance	50 Ω
	RF-power throughput power	200 W CW @ 3 GHz
	Frequency range	DC – 18,0 GHz
	RF-connections	SMA female
	Switching time max.	20 ms
	Operating life min.	1 000 000 cycles
	VSWR max.	DC – 4,0 GHz 1,20 : 1 4,0 – 8,0 GHz 1,30 : 1 8,0 – 18,0 GHz 1,50 : 1
	Isolation min.	DC – 4,0 GHz 70 dB 4,0 – 8,0 GHz 65 dB 8,0 – 18,0 GHz 60 dB
	Insertion loss max.	DC – 4,0 GHz 0,20 dB 4,0 – 8,0 GHz 0,30 dB 8,0 – 18,0 GHz 0,50 dB
1.2	Relay type (relays 9-10)	SPDT (401-2308 Dow-Key) failsafe
	Impedance	50 Ω
	RF-Power throughput power	150 W CW @ 3 GHz
	Frequency range	DC – 18,0 GHz
	RF-connections	SMA female
	Switching time max.	20 ms
	Operating life min.	1 000 000 cycles
	VSWR max.	DC – 4,0 GHz 1,15 : 1 4,0 – 8,0 GHz 1,20 : 1 8,0 – 18,0 GHz 1,35 : 1
	Isolation min.	DC – 4,0 GHz 80 dB 4,0 – 8,0 GHz 70 dB 8,0 – 18,0 GHz 60 dB
	Insertion loss max.	DC – 4,0 GHz 0,15 dB 4,0 – 8,0 GHz 0,20 dB 8,0 – 18,0 GHz 0,35 dB

2 Connections:

2.1	Front side	Power supply switch with integrated control lamp RF-connections Display with touch panel
2.2	Rear side	RF-connections Power supply Control card Appliance plug with the integrated fuses F1 and F2 Ground connector Control interfaces

3 General specifications:

3.1	Power supply	100 V – 240 V 50 Hz / 60 Hz
3.2	Internal voltage	5 V DC 28 V DC
3.3	Control displays	Control lamp in power switch Control LED for 5 V DC and 28 V DC at the power supply unit
3.4	Control interfaces	IEEE488 RS-232
3.5	Power consumtion primarily	80 mA max. @ 230 V (no relay switched) 250 mA max. @ 230 V (all relays switched)
3.6	Voltage supply	Standard rubber connector
3.7	Operating temperature	0 °C – +50 °C
3.8	Reference temperature for specifications	+25 °C
3.9	Dimensions	Desktop unit 84TE x 3 HU x 310 mm (dimensions without handles and connections)
3.10	Colour	Front side colourless anodized Rear side colourless anodized
3.11	Weight	6,5 kg

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Relay Switching Unit KRE-3054-TFCU

MTS-No.: R63.11.3054

Technical data:

4 Delivered parts:

KRE-3054-TFCU
Power cable
Operating manual (on CD)

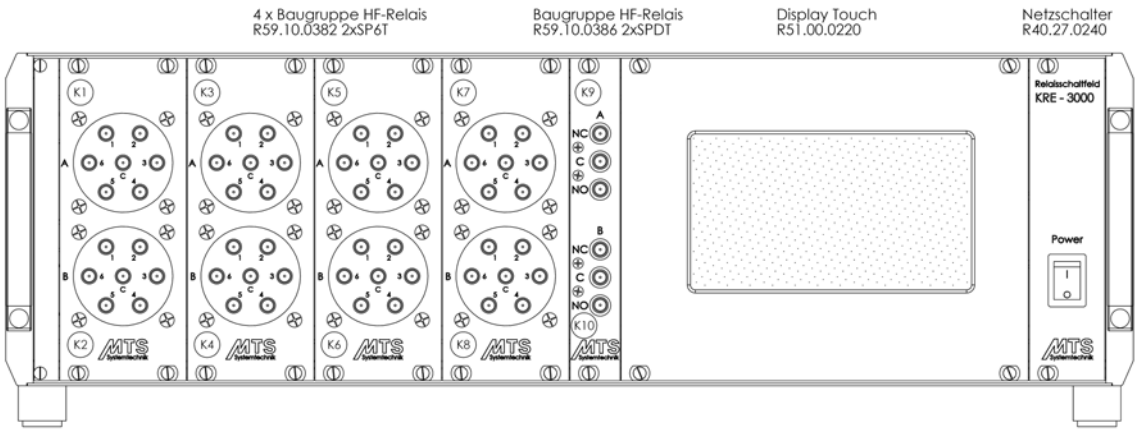
5 Comments:

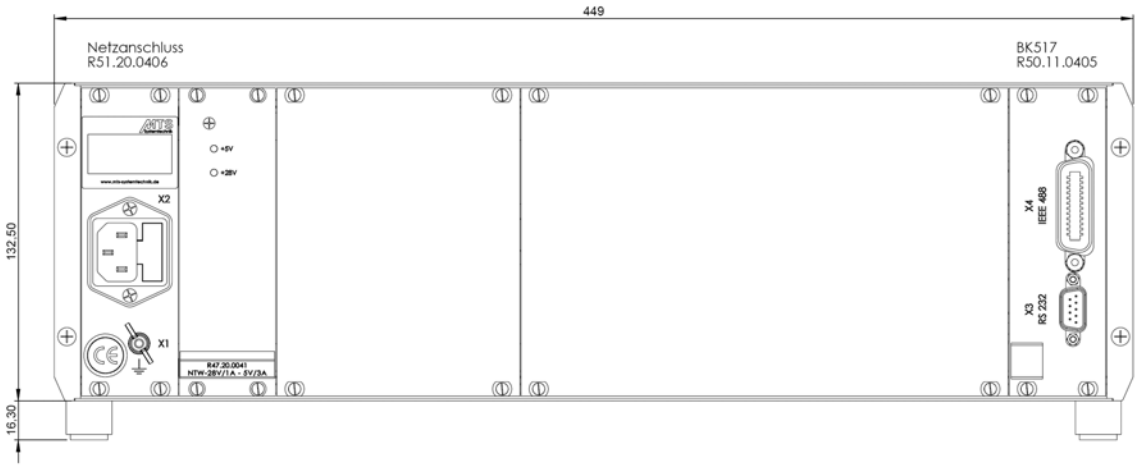
Warranty	12 months
RoHS-compliant	Yes

6 Recommended accessories:

RF-cables
Terminations
Attenuators

Views:





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Relay Switching Unit KRE-3058-ESCU

MTS-No.: 63.11.3058

Application

The Relay Switching Unit series KRE-3000 can be used for several applications, f.e.:

- Switching Unit for RF-generators, amplifiers and antennas at EMC test laboratories
- RF matrix
- Filter, diplexer attenuator etc. selection unit
- Any automated routing of measurement equipment at test benches

Description

The Relay Switching Unit, series KRE-3000 is for the switching of almost every kind of signals. Due to the modular design, the electrical characteristics of the switches can be adapted to versatile demands. In combination with attenuators, splitters and other modules the usability can be extended.

Characteristics

- Configuration:
  3x SPDT relays Dow-Key model 401-2308,
  1x SP10T relay Dow-Key model 5A1-5308,
  1x SP3T relay Dow-Key model 535-5308
  and 1x transfer relay Dow-Key model 411C-2308
- Remote control by RS-232 and IEEE488
- With integrated RS-232/USB converter
- Integrated power supply 100-240 V
- Manual control (touch panel display)
- 19” rack mount case with 3 HU
- Windows control software can be offered
- Opportunity for upgrades
- Relay Switching Units can be designed according to customer’s individual requirements

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Relay Switching Unit KRE-3058-ESCU MTS-No.: 63.11.3058

Configuration:

3x SPDT relays Dow-Key model 401-2308, 1x SP10T relay Dow-Key model 5A1-5308), 1x SP3T relay Dow-Key model 535-5308 and 1x transfer relay Dow-Key model 411C-2308

Technical Data:

1 RF-specifications:

1.1 Relay type (relays 1 – 3): SPDT (Dow-Key 401-2308) failsafe

Impedance	50 Ω
RF-power throughput power	150 W CW @ 3 GHz
Frequency range	DC – 18 GHz
RF-connections	SMA female
Switching time max.	15 ms
Operating life min.	1 000 000 cycles
VSWR max.	DC – 4,0 GHz 1,15 : 1 4,0 – 8,0 GHz 1,20 : 1 8,0 – 18,0 GHz 1,35 : 1
Isolation min.	DC – 4,0 GHz 80 dB 4,0 – 8,0 GHz 70 dB 8,0 – 18,0 GHz 60 dB
Insertion loss max.	DC – 4,0 GHz 0,15 dB 4,0 – 8,0 GHz 0,20 dB 8,0 – 18,0 GHz 0,35 dB

1.2 Relay type (relay 4): SP10T (Dow-Key 5A1-5308) normally open

Impedance	50 Ω
RF-power throughput power	150 W CW @ 3 GHz
Frequency range	DC – 18 GHz
RF-connections	SMA female
Switching time max.	20 ms
Operating life min.	1 000 000 cycles
VSWR max.	DC – 4,0 GHz 1,20 : 1 4,0 – 8,0 GHz 1,30 : 1 8,0 – 18,0 GHz 1,60 : 1
Isolation min.	DC – 4,0 GHz 70 dB 4,0 – 8,0 GHz 65 dB 8,0 – 18,0 GHz 55 dB
Insertion loss max.	DC – 4,0 GHz 0,20 dB 4,0 – 8,0 GHz 0,30 dB 8,0 – 18,0 GHz 0,60 dB

1.3 Relay type (relay 5): SP3T (Dow-Key 535-5308) normally open

Impedance	50 Ω
RF-power throughput power	150 W CW @ 3 GHz
Frequency range	DC – 18 GHz
RF-connections	SMA female
Switching time max.	20 ms
Operating life min.	1 000 000 cycles
VSWR max.	DC – 4,0 GHz 1,20 : 1 4,0 – 8,0 GHz 1,30 : 1 8,0 – 18,0 GHz 1,50 : 1
Isolation min.	DC – 4,0 GHz 70 dB 4,0 – 8,0 GHz 65 dB 8,0 – 18,0 GHz 60 dB
Insertion loss max.	DC – 4,0 GHz 0,20 dB 4,0 – 8,0 GHz 0,30 dB 8,0 – 18,0 GHz 0,50 dB

1.4 Relay type (relay 6): DPDT (Dow-Key 411C-2308) failsafe

Impedance	50 Ω
RF-power throughput power	150 W CW @ 3 GHz
Frequency range	DC – 18 GHz
RF-connections	SMA female
Switching time max.	20 ms
Operating life min.	1 000 000 cycles
VSWR max.	DC – 4,0 GHz 1,20 : 1 4,0 – 8,0 GHz 1,30 : 1 8,0 – 18,0 GHz 1,50 : 1
Isolation min.	DC – 4,0 GHz 80 dB 4,0 – 8,0 GHz 70 dB 8,0 – 18,0 GHz 60 dB
Insertion loss max.	DC – 4,0 GHz 0,20 dB 4,0 – 8,0 GHz 0,30 dB 8,0 – 18,0 GHz 0,50 dB

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Relay Switching Unit KRE-3058-ESCU

MTS-No.: 63.11.3058

Technical data:

2 Connections:

2.1	Front side	Power supply switch with integrated control lamp
		Display with touch panel
2.2	Rear side	Power supply
		Control card
		Appliance plug with the integrated fuses F1 and F2
		Ground connector
		RF-connections
		Control interfaces

3 General specifications:

3.1	Power supply	100 V – 240 V 50 Hz / 60 Hz
3.2	Internal voltage	5 V DC 28 V DC
3.3	Control displays	Control lamp in power switch
		Control LED for 5 V DC and 28 V DC at the power supply unit
3.4	Control interfaces	IEEE488 RS-232 USB
3.5	Power consumption primarily	70 mA max. @ 230 V (no relay switched)
		140 mA max. @ 230 V (all relays switched)
3.6	Voltage supply	Standard rubber connector
3.7	Operating temperature	0 °C – +50 °C
3.8	Reference temperature for specifications	+25 °C
3.9	Dimensions	19''-unit x 3 HU x 310 mm (dimensions without handles and connections)
3.10	Colour	Front side colourless anodized
		Rear side colourless anodized
3.11	Weight	6,5 kg

4 Delivered parts:

KRE-3058-ESCU
Power cable
Zero modem cable (external)
Operating manual (on CD)

5 Comments:

Warranty	12 months
RoHS-compliant	No

6 Recommended accessories:

RF-cables
Terminations
Attenuators

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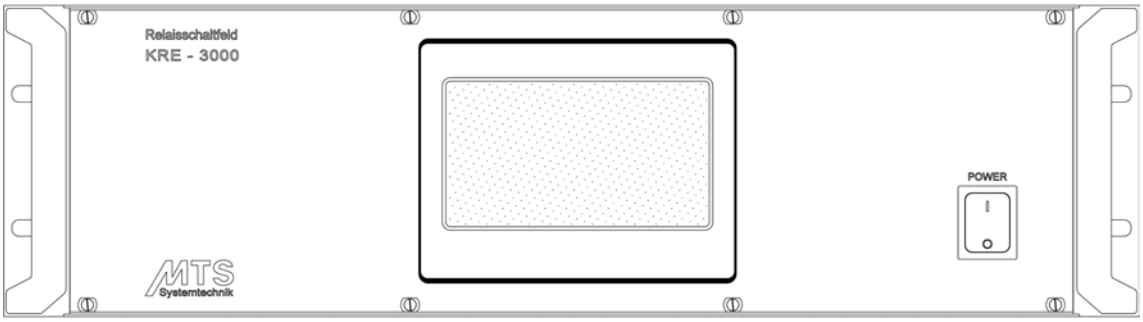
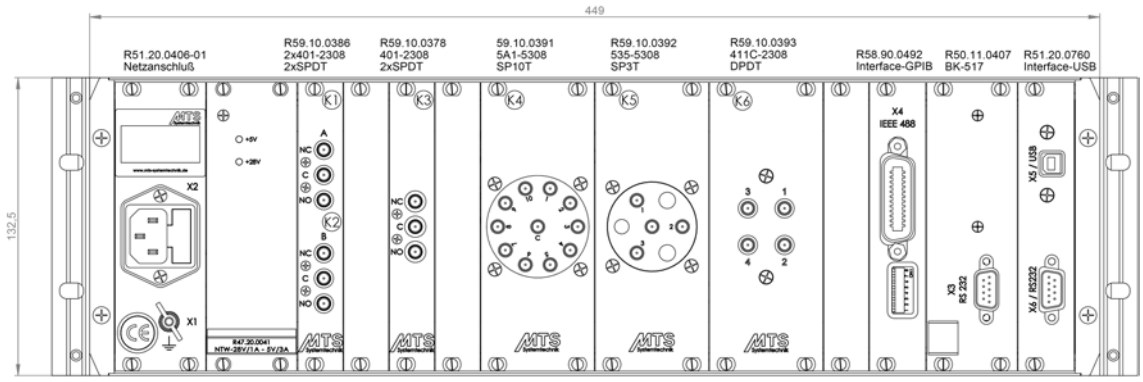
Relay Switching Unit KRE-3058-ESCU

MTS-No.: 63.11.3058

Views:





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Coaxial relay modules with IEEE-488- and RS-232-C-interface

Series KRM

Cassettes of the type "KRM" can be used to switch various signals and represent a cheap alternative to relay switching units (KRE). The mounted relay is controlled via the IEEE-488- and/or the RS-232-C-interface. The IEEE-488-device-address must be adjusted internally via a DIP-switch. A lower priced alternative is the type which is controlled only via a RS-232-C-interface. A LED at the front panel shows the status of the cassette. Three different standard types of relays are available (others on request). Mostly all the standard types are deliverable at short notice.

Enclosure dimensions

Desktop unit: W = 105 mm, D = 170 mm, H = 69,7 mm

19"-slot-cassette: 3 HU, 14 TE, 168,5 mm deep, fitting at standard 19"-frames according to DIN 41 494

Options Mains adaptor 1 A, 12 V
Windows-control-software

Construction of model designation

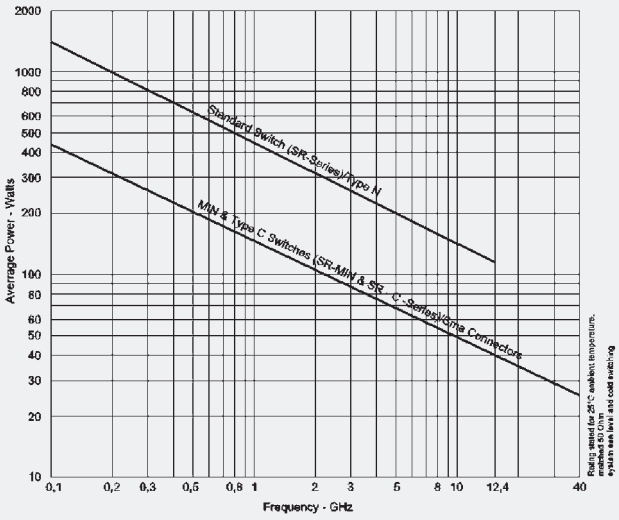
KRM 6 - 5 4 1 1 - T

- *Enlosure style*
  T = desktop unit
  E = 14 TE-slot-cassette
- *Interfaces*
  1 = IEEE-488 and RS232
  2 = RS232
- *Power supply*
  1 = 12V DC
- *HF-connectors*
  4 = SMA female
  (at SPDT and SP6T)
  8 = N female
  (only at SPDT)
- *Impedance*
  5 = 50 Ω
- *Type of switch*
  2 = SPDT
  6 = SP6T
- *KRM-series*

Technical data (guaranteed values at +25 °C)

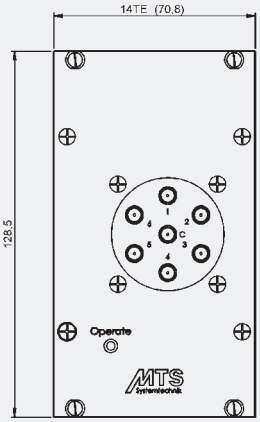
Model	SR-6C-H	SR-2 MIN-H	SR-2-N-H
Configuration	SP6T (6-way)	SPDT (2-way)	SPDT (2-way)
Frequency range	DC-18 GHz	DC-18 GHz	DC-12,4 GHz
RF-connectors	SMA female	SMA female	N female
Insolation (min.)	60 dB min. (18 GHz)	60 dB min. (18 GHz)	55 dB min. (12,4 GHz)
Insertion loss (max.)	DC – 4 GHz 0,2 dB 4 – 12,4 GHz 0,3 dB 12,4 – 18 GHz 0,5 dB	DC – 4 GHz 0,1 dB 4 – 12,4 GHz 0,2 dB 12,4 – 18 GHz 0,3 dB	DC – 7 GHz 0,3 dB 7 – 12,4 GHz 0,6 dB
VSWR (max.)	DC – 4 GHZ 1,25 : 1 4 – 12,4 GHz 1,40 : 1 12,4 – 18 GHz 1,50 : 1	DC – 4 GHz 1,2 : 1 4 – 12,4 GHz 1,3 : 1 12,4 – 18 GHz 1,5 : 1	DC – 7 GHz 1,25 : 1 7 – 12,4 GHz 1,60 : 1
Impedance	50 Ω	50 Ω	50 Ω
Switching time	15 ms max.	15 ms max.	20 ms max.
Life cycles	10^6 cycles	10^6 cycles	10^6 cycles
Power consumption	530 mA	380 mA	705 mA
Maximum RF-power	35 W CW at 18 GHz	35 W CW at 18 GHz	120 W CW at 12,4 GHz

Power rating

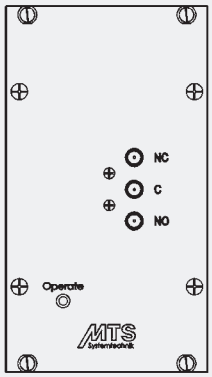


Enclosure dimensions, series KRM

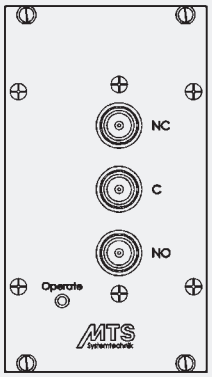
14 TE-slot-cassette



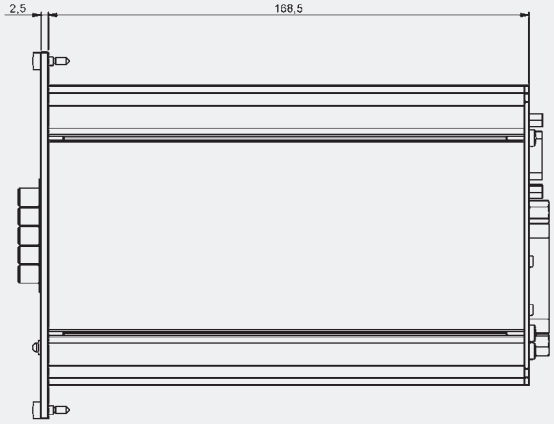
SR-6C-H

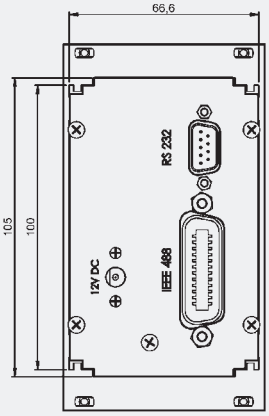


SR-2-MIN-H

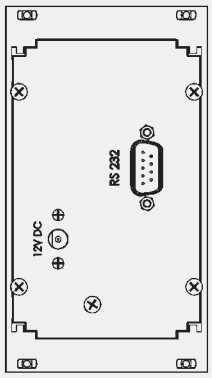


SR-2-N-H



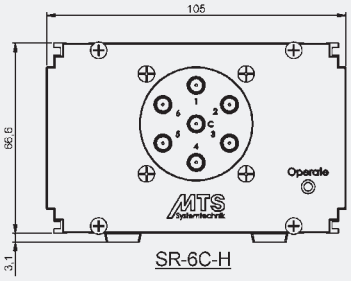


Controller card
BK517

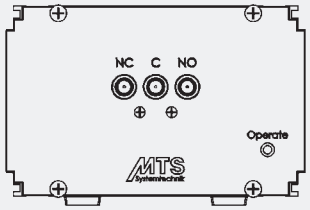


Relays card
RS232

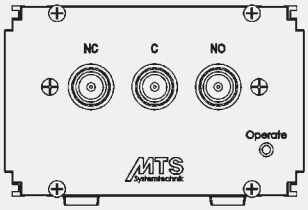
Desktop unit



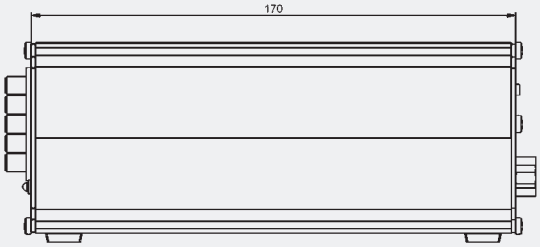
SR-6C-H

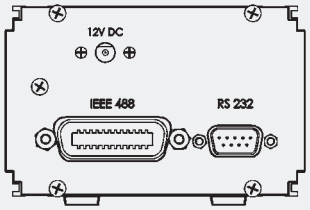


SR-2-MIN-H

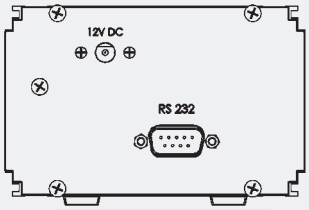


SR-2-N-H





Controller card
BK517



Relays card
RS232

All dimensions in mm