



# CDN AF SERIES COUPLING / DECOUPLING NETWORK (CDN) CDN AF TYPE, CDN CAN



CDN A201A

- Coupling networks designed for IEC / EN 61000-4-6
- Used for unshielded, unbalanced lines
- Models with 4 mm banana sockets or D-Sub 25 pins
- Models with frequency range 10 kHz to 80 MHz, 150 kHz to 230 MHz or up to 300 MHz

IEC / EN 61000-4-6 specifies the design and performance of a range of coupling/decoupling networks (CDNs). Each CDN is specific to the type of cable and the intended signal carried on the cable. TeSEQ offers an extensive range of CDNs which fully comply with the requirements of the standard and provide a simple and reliable method of injecting RF energy into the equipment under test (EUT).

### Product range 10 kHz to 80 MHz

CDN type	Product name	Line type	Application	Connector EUT port	Connector AE port
AF2	CDN A201-10	2 lines	2 lines application	4 mm safety banana	4 mm safety banana
AF3	CDN A301-10	3 lines	3 lines application	4 mm safety banana	4 mm safety banana
AF4	CDN A401-10	4 lines	4 lines application	4 mm safety banana	4 mm safety banana
CAN	CDN CAN-U4-10	4 lines	4 lines application for unshielded CAN bus	D-Sub 9 pins (Pin 2, 3, 7, 9)	D-Sub 9 pins (Pin 2, 3, 7, 9)
AF5	CDN A501-10	5 lines	5 lines application	4 mm safety banana	4 mm safety banana
AF8	CDN A800-10	8 lines	8 lines application	D-Sub 25 pins (Pin 1 to 8)	D-Sub 25 pins (Pin 1 to 8)
AF8	CDN A801-10	8 lines	8 lines application	4 mm banana	4 mm banana

### Product range 150 kHz to 230 (300) MHz

CDN type	Product name	Line type	Application	Connector EUT port	Connector AE port
AF2	CDN A201A	2 lines	2 lines application	4 mm safety banana	4 mm safety banana
AF2	CDN A201A-50V	2 lines	2 lines application*)	4 mm safety banana	4 mm safety banana
AF3	CDN A301A	3 lines	3 lines application	4 mm safety banana	4 mm safety banana
AF3	CDN A301A-50V	3 lines	3 lines application*)	4 mm safety banana	4 mm safety banana

# CDN AF SERIES

## COUPLING / DECOUPLING NETWORK (CDN)

### CDN AF TYPE, CDN CAN



CDN A501, view to the EUT port



CDN A801, view to the EUT port

#### Product range 150 kHz to 230 (300) MHz (continued)

CDN type	Product name	Line type	Application	Connector EUT port	Connector AE port
AF4	CDN A401A	4 lines	4 lines application	4 mm safety banana	4 mm safety banana
AF4	CDN A401A-50V	4 lines	4 lines application*)	4 mm safety banana	4 mm safety banana
CAN	CDN CAN-U4	4 lines	4 lines application for unscreened CAN bus	D-Sub 9 pins (Pin 2, 3, 7, 9)	D-Sub 9 pins (Pin 2, 3, 7, 9)
AF5	CDN A501	5 lines	5 lines application	4 mm safety banana	4 mm safety banana
CAN	CDN CAN-U5	5 lines	5 lines application for unscreened CAN bus, additional ground line	D-Sub 9 pins (Pin 2, 3, 6, 7, 9)	D-Sub 9 pins (Pin 2, 3, 6, 7, 9)
AF7	CDN A701	7 lines	7 lines application	4 mm banana	4 mm banana
AF8	CDN A800	8 lines	8 lines application	D-Sub 25 pins (Pin 1 to 8)	D-Sub 25 pins (Pin 1 to 8)
AF8	CDN A801	8 lines	8 lines application	4 mm banana	4 mm banana
AF12	CDN A120	12 lines	12 lines application	D-Sub 25 pins (Pin 1 to 12)	D-Sub 25 pins (Pin 1 to 12)
AF15	CDN A150	15 lines	15 lines application	D-Sub 25 pins (Pin 1 to 15)	D-Sub 25 pins (Pin 1 to 15)

\*) The 50 Volts version is made for applications, which require a high impedance against ground. The CDN has no discharging resistors on the Y capacitors. It limits the maximum EUT supply voltage to 50 V because of safety reasons.

# **CDN AF SERIES**

## **COUPLING / DECOUPLING NETWORK (CDN)**

### **CDN AF TYPE, CDN CAN**

#### **Electrical specification CDN A201A-10, A301A-10, A401A-10, A501-10 and A801-10**

Frequency range:	10 kHz to 80 MHz
Line parameters:	unscreened, unbalanced
Power rating (EUT- and AE port)	
AC max. voltage (line to ground):	250 V (160 V for CDN A501-10 , A801-10)
DC max. voltage (line to ground):	300 V (250 V for CDN A501-10, A801-10)
Current max :	4 A, (2A for CDN 801-10)
Test voltage:	1 kV DC, 2 sec (400 V for CDN A801-10)
Common mode impedance (EUT port)	
10 kHz to 26 MHz:	150 $\Omega$ $\pm$ 20 $\Omega$
26 MHz to 80 MHz:	150 $\Omega$ +60 $\Omega$ / -45 $\Omega$
Coupling path (In/Out port/EUT)	
Connection:	BNC 50 $\Omega$
RF voltage:	<30 V, refers to 50 V test level in 300 $\Omega$
Voltage division factor (RF input to EUT port)	
10 kHz to 80 MHz:	10 dB $\pm$ 1 dB
Transmission bandwidth (wanted signal) EUT/AE B3 dB:	> 20 kHz sin.
Decoupling of CM disturbance (RF port/AE)	
10 kHz:	>10 dB
150 kHz:	>35 dB
26 MHz:	>45 dB
80 MHz:	>25 dB

#### **Electrical specification CDN A800-10**

Frequency range:	10 kHz to 80 MHz
Line parameters:	unscreened, unbalanced
Power rating (EUT- and AE port)	
AC max. voltage (line to ground):	63 V
DC max. voltage (line to ground):	100 V
Current max :	200 mA
Test voltage:	250 V DC, 2 sec
Common mode impedance (EUT port)	
10 kHz to 26 MHz:	150 $\Omega$ $\pm$ 20 $\Omega$
26 MHz to 80 MHz:	150 $\Omega$ +60 $\Omega$ / -45 $\Omega$
Coupling path (In/Out port/EUT)	
Connection:	BNC 50 $\Omega$
RF voltage:	<15 V, refers to 25 V test level in 300 $\Omega$
Voltage division factor (RF input to EUT port)	
10 kHz to 80 MHz:	10 dB $\pm$ 1 dB

# CDN AF SERIES

## COUPLING / DECOUPLING NETWORK (CDN) CDN AF TYPE, CDN CAN

### Electrical specification CDN A800-10 (continued)

Transmission bandwidth (wanted signal) EUT / AE B3 dB:	> 20 kHz sin.
Decoupling of CM disturbance (RF port / AE)	
10 kHz / 150 kHz:	>10 dB / >35 dB
26 MHz / 80 MHz:	>45 dB / >25 dB

### Electrical specification CDN A201A, A201A-50V, A301A, A301A-50V, A401A, A401A-50V, A501, A701 and A801

Frequency range:	150 kHz to 300 MHz <sup>1)</sup>
Line parameters:	unscreened, unbalanced
Power rating (EUT- and AE port)	
AC max. voltage (line to ground):	250 V (160 V for CDN A501, A701, A801) 50 V for CDN A201A-50V, A301A-50V and A401A-50V
DC max. voltage (line to ground):	300 V (250 V for CDN A501, A701, A801) 50 V for CDN A201A-50V, A301A-50V and A401A-50V
Current max:	4 A (2 A for CDN A 701 and A801)
Test voltage:	1 kV DC, 2 sec (400 V for CDN A701 and CDN A801)
Common mode impedance (EUT port)	
150 kHz to 26 MHz:	150 Ω ±20 Ω
26 MHz to 230 MHz:	150 Ω +60 Ω / -45 Ω
230 MHz to 300 MHz: <sup>1)</sup>	150 Ω +60 Ω / -60 Ω
Coupling path (In / Out port / EUT)	
Connection:	BNC 50 Ω
RF voltage:	<30 V, refers to 50 V test level in 300 Ω
Voltage division factor (RF input to EUT port)	
150 kHz to 80 MHz:	10 dB ±1 dB
80 MHz to 300 MHz: <sup>1)</sup>	10 dB ±2 dB (for CDN A501, A701, A801: 10 dB +3 dB / -2 dB)
Transmission bandwidth (wanted signal) EUT / AE B3 dB:	> 20 kHz sin.
Decoupling of CM disturbance (RF port / AE)	
150 kHz / 1.5 MHz:	>30 dB / >60 dB
30 MHz / 230 MHz:	>50 dB / >25 dB

<sup>1)</sup> The classification for the range 230 to 300 MHz can be selected as option.

## **CDN AF SERIES**

# **COUPLING / DECOUPLING NETWORK (CDN)**

### **CDN AF TYPE, CDN CAN**

#### **Electrical specification CDN A800, A120 and A150**

Frequency range:	150 kHz to 300 <sup>1)</sup> MHz
Line parameters:	unscreened, unbalanced
Power rating (EUT- and AE port)	
AC max. voltage (line to ground):	63 V
DC max. voltage (line to ground):	100 V
Current max :	200 mA
Test voltage:	250 V DC, 2 sec
Common mode impedance (EUT port)	
150 kHz to 26 MHz:	150 $\Omega$ $\pm$ 20 $\Omega$
26 MHz to 230 MHz:	150 $\Omega$ +60 $\Omega$ / -45 $\Omega$
230 MHz to 300 MHz: <sup>1)</sup>	150 $\Omega$ +60 $\Omega$ / -60 $\Omega$
Coupling path (In/Out port/EUT)	
Connection:	BNC 50 $\Omega$
RF voltage:	<15 V, refers to 25 V test level in 300 $\Omega$
Voltage division factor (RF input to EUT port)	
150 kHz to 80 MHz:	9.5 dB $\pm$ 1 dB
80 MHz to 300 MHz: <sup>1)</sup>	9.5 dB +3 dB / -2 dB
Transmission bandwidth (wanted signal) EUT / AE B3 dB:	> 20 kHz sin.
Decoupling of CM disturbance (RF port / AE)	
150 kHz:	>30 dB
1.5 MHz:	>60 dB
30 MHz:	>50 dB
230 MHz:	>35 dB

<sup>1)</sup> The classification for the range 230 to 300 MHz can be selected as option.

# CDN AF SERIES

## COUPLING / DECOUPLING NETWORK (CDN)

### CDN AF TYPE, CDN CAN

#### Electrical specification of CDN CAN-U4, CDN CAN-U4-10 and CAN-U5

Frequency range:	150 kHz to 230 MHz (CDN CAN-U4-10: 10 kHz to 80 MHz)
Line parameters:	CAN bus
Power rating (EUT- and AE Port)	
AC max. voltage:	48 V
DC max. voltage:	48 V
Current max :	3 A (pin 3 + 9, all other 0.5 A)
Test voltage:	200 VDC, 2 sec
Common mode impedance (EUT port)	
150 kHz to 26 MHz:	150 $\Omega$ $\pm$ 20 $\Omega$ (CDN CAN-U4-10 from 10 kHz)
26 MHz to 230 MHz:	150 $\Omega$ +60 $\Omega$ / -45 $\Omega$ (CDN CAN-U4-10 up to 80 MHz)
Coupling path (In/ Out-port/EUT)	
Connection:	BNC 50 $\Omega$
RF voltage:	<20 V, refers to 33 V test level in 300 $\Omega$
Voltage division factor (RF input to EUT port)	
150 kHz to 80 MHz:	9.5 dB $\pm$ 1 dB (CDN CAN-U4, CDN CAN-U5)
80 MHz to 230 MHz:	9.5 dB +3/-2 dB (CDN CAN-U4, CDN CAN-U5)
10 kHz to 80 MHz:	10 dB $\pm$ 1 dB (CDN CAN-U4-10)
Transmission bandwidth EUT / AE B3 dB	
Symmetrical pair (pin 2 + 7):	>30 MHz sin.
all other lines:	>20 kHz sin.
Decoupling of CM disturbance (In-port / AE)	
150 kHz:	>30 dB (CDN CAN-U4, CDN CAN-U5)
1.5 MHz:	>60 dB (CDN CAN-U4, CDN CAN-U5)
30 MHz:	>50 dB (CDN CAN-U4, CDN CAN-U5)
230 MHz:	>30 dB (CDN CAN-U4, CDN CAN-U5)
10 kHz:	>10 dB (CDN CAN-U4-10)
1.5 MHz:	>35 dB (CDN CAN-U4-10)
26 MHz:	>45 dB (CDN CAN-U4-10)
80 MHz:	>25 dB (CDN CAN-U4-10)

#### Mechanical specification

Size (W x H x D):	100 mm x 100 mm x 240 mm
Weight:	approx. 1.5 kg



Advanced Test Solutions for EMC

# CDN AF SERIES

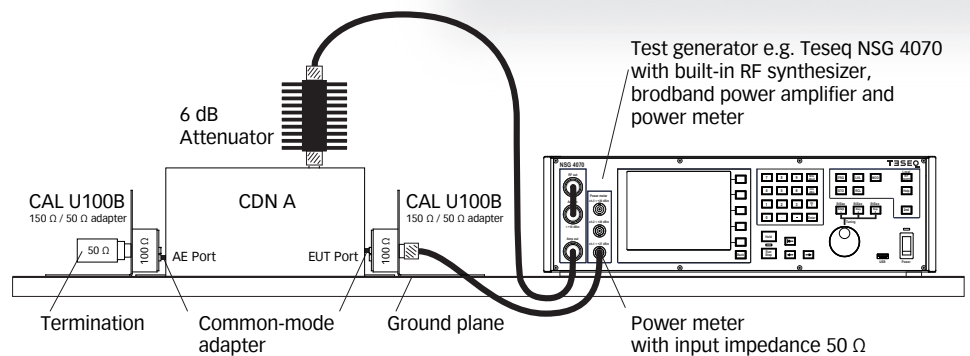
## COUPLING / DECOUPLING NETWORK (CDN)

### CDN AF TYPE, CDN CAN

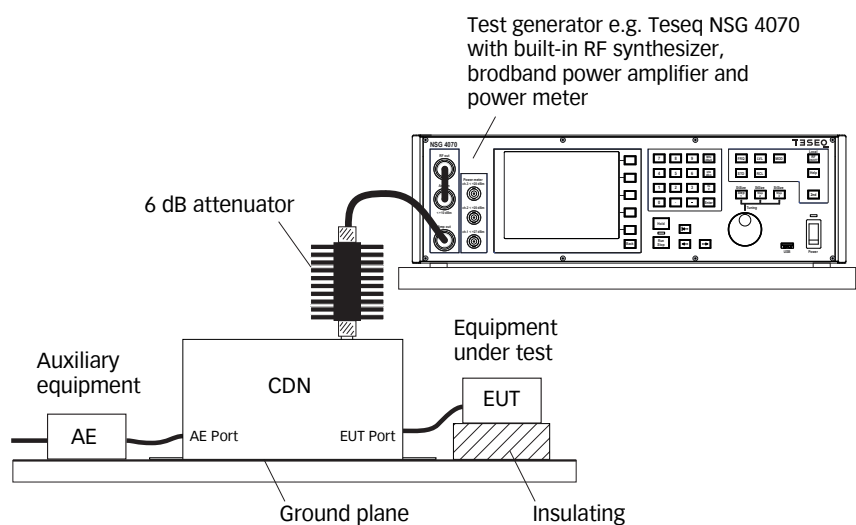
#### Environmental conditions

Classification:	Indoor use only
Operating temperature:	+5°C to +40 °C
Relative humidity:	up to 80%

#### Example of test set-up calibration



#### Example of EUT test set-up



## **CDN AF SERIES**

# **COUPLING / DECOUPLING NETWORK (CDN)**

## **CDN AF TYPE, CDN CAN**

### **Model No. and options**

Product	Description	Order code
CDN A120	Coupling Decoupling Network for IEC 61000-4-6, type AF12, 230 MHz (D-sub)	247870
CDN A120S	Coupling Decoupling Network for IEC 61000-4-6, type AF12, 230 MHz (D-sub) with calibration adapter in storage case, includes CAL U100M, CAL U100B, 2x SAR A250, SAR M116, A 50-N	247871
CDN A150	Coupling Decoupling Network for IEC 61000-4-6, type AF15, 230 (300) MHz with sub-D	243012
CDN A150S	Coupling Decoupling Network for IEC 61000-4-6, type AF15, 230 (300) MHz with sub-D with calibration adapter set in storage case, includes CAL U100M, CAL U100B, 2x SAR A250, SAR M116, A 50-N	244126
CDN A201A	Coupling Decoupling Network for IEC 61000-4-6, type AF2, 230 (300) MHz, 4 A, (banana)	256650
CDN A201AS	Coupling Decoupling Network for IEC 61000-4-6, type AF2, 230 (300) MHz, 4 A, (banana) with calibration adapter set in storage case, includes 2x CAL U100B, 2x SAR MA21, SAR M116, A 50-N	256651
CDN A201A-50V	Coupling Decoupling Network for IEC 61000-4-6, type AF2, 230 (300) MHz, 4 A, max. 50 V, (banana)	256768
CDN A201A-50VS	Coupling Decoupling Network for IEC 61000-4-6, type AF2, 230 (300) MHz, 4 A, max. 50 V, (banana) with calibration adapter set in storage case, includes 2x CAL U100B, 2x SAR MA21, SAR M116, A 50-N	256769
CDN A201A-10	Coupling Decoupling Network for IEC 61000-4-6, type AF2, 10 kHz to 80 MHz, 4 A, (banana)	256661
CDN A201A-10S	Coupling Decoupling Network for IEC 61000-4-6, type AF2, 10 kHz to 80 MHz, 4 A, (banana) with calibration adapter set in storage case, includes 2x CAL U100B, 2x SAR MA21, SAR M116, A 50-N	256662
CDN A301A	Coupling Decoupling Network for IEC 61000-4-6, type AF3, 230 (300) MHz, 4 A, (banana)	256652
CDN A301AS	Coupling Decoupling Network for IEC 61000-4-6, type AF3, 230 (300) MHz, 4 A, (banana) with calibration adapter set in storage case, includes 2x CAL U100B, 2x SAR MA31, SAR M116, A 50-N	256653
CDN A301A-50V	Coupling Decoupling Network for IEC 61000-4-6, type AF3, 230 (300) MHz, 4 A, max. 50 V, (banana)	256770
CDN A301A-50VS	Coupling Decoupling Network for IEC 61000-4-6, type AF3, 230 (300) MHz, 4 A, max. 50 V, (banana) with calibration adapter set in storage case, includes 2x CAL U100B, 2x SAR MA31, SAR M116, A 50-N	256771
CDN A301A-10	Coupling Decoupling Network for IEC 61000-4-6, type AF3, 10 kHz to 80 MHz, 4 A, (banana)	256663
CDN A301A-10S	Coupling Decoupling Network for IEC 61000-4-6, type AF3, 10 kHz to 80 MHz, 4 A, (banana) with calibration adapter set in storage case, includes 2x CAL U100B, 2x SAR MA31, SAR M116, A 50-N	256664
CDN A401A	Coupling Decoupling Network for IEC 61000-4-6, type AF4, 230 (300) MHz, 4 A, (banana)	256654
CDN A401AS	Coupling Decoupling Network for IEC 61000-4-6, type AF4, 230 (300) MHz, 4 A, (banana) with calibration adapter set in storage case, includes 2x CAL U100B, 2x SAR MA41, SAR M116, A 50-N	256655
CDN A401A-50V	Coupling Decoupling Network for IEC 61000-4-6, type AF4, 230 (300) MHz, 4 A, max. 50 V, (banana)	256772
CDN A401A-50VS	Coupling Decoupling Network for IEC 61000-4-6, type AF4, 230 (300) MHz, 4 A, max. 50 V, (banana) with calibration adapter set in storage case, includes 2x CAL U100B, 2x SAR MA41, SAR M116, A 50-N	256773
CDN A401A-10	Coupling Decoupling Network for IEC 61000-4-6, type AF4, 10 kHz to 80 MHz, 4 A, (banana)	256665
CDN A401A-10S	Coupling Decoupling Network for IEC 61000-4-6, type AF4, 10 kHz to 80 MHz, 4 A, (banana) with calibration adapter set in storage case, includes 2x CAL U100B, 2x SAR MA41, SAR M116, A 50-N	256666



## **CDN AF SERIES**

# **COUPLING / DECOUPLING NETWORK (CDN)**

## **CDN AF TYPE, CDN CAN**

### Model No. and options (continued)

Product	Description	Order code
CDN A501	Coupling Decoupling Network for IEC 61000-4-6, type AF5, 230 MHz (banana)	243950
CDN A501S	Coupling Decoupling Network for IEC 61000-4-6, type AF5, 230 MHz (banana) with calibration adapter set in storage case, includes 2x CAL U100B, 2x SAR MA51, SAR M116, A 50-N	243951
CDN A501-10	Coupling Decoupling Network for IEC 61000-4-6, type AF5, 10 kHz to 80 MHz (banana)	243865
CDN A501-10S	Coupling Decoupling Network for IEC 61000-4-6, type AF5, 10 kHz to 80 MHz (banana) with calibration adapter set in storage case, includes 2x CAL U100B, 2x SAR MA51, SAR M116, A 50-N	243866
CDN A701	Coupling Decoupling Network for IEC 61000-4-6, type AF7, 230 (300) MHz (banana)	247868
CDN A701S	Coupling Decoupling Network for IEC 61000-4-6, type AF7, 230 (300) MHz (banana) with calibration adapter set in storage case, includes 2x CAL U100B, SAR A71, SAR M116, A 50-N	247869
CDN A800	Coupling Decoupling Network for IEC 61000-4-6, type AF8, 230 (300) MHz with sub-D	243010
CDN A800S	Coupling Decoupling Network for IEC 61000-4-6, type AF8, 230 (300) MHz with sub-D with calibration adapter set in storage case includes CAL U100M, CAL U100B, 2x SAR A250, SAR M116, A 50-N	244124
CDN A800-10	Coupling Decoupling Network for IEC 61000-4-6, type AF8, 10 kHz to 80 MHz with sub-D	243014
CDN A800-10S	Coupling Decoupling Network for IEC 61000-4-6, type AF8, 10 kHz to 80 MHz with sub-D with calibration adapter set in storage case, includes CAL U100M, CAL U100B, 2x SAR A250, SAR M116, A 50-N	243015
CDN A801	Coupling Decoupling Network for IEC 61000-4-6, type AF8, 230 (300) MHz (banana)	243036
CDN A801S	Coupling Decoupling Network for IEC 61000-4-6, type AF8, 230 (300) MHz (banana) with calibration adapter set in storage case, includes 2x CAL U100B, 2x SAR A81, SAR M116, A 50-N	243037
CDN A801-10	Coupling Decoupling Network for IEC 61000-4-6, type AF8, 10 kHz to 80 MHz (banana)	243018
CDN A801-10S	Coupling Decoupling Network for IEC 61000-4-6, type AF8, 10 kHz to 80 MHz (banana) with calibration adapter set in storage case, includes 2x CAL U100B, 2x SAR A81, SAR M116, A 50-N	243957
CDN CAN-U4	Coupling Decoupling Network for IEC 61000-4-6, type for CAN Bus, unscreened 4 lines	243005
CDN CAN-U4S	Coupling Decoupling Network for IEC 61000-4-6, type for CAN Bus, unscreened 4 lines with calibration adapter set in storage case, includes CAL U100M, CAL U100B, 2x SAR CAN, SAR M116, A 50-N	243001
CDN CAN-U4-10	Coupling Decoupling Network for IEC 61000-4-6, type for CAN Bus, unscreened 4 lines, 10 kHz to 80 MHz	256656
CDN CAN-U4-10S	Coupling Decoupling Network for IEC 61000-4-6, type for CAN Bus, unscreened 4 lines, 10 kHz to 80 MHz, with calibration adapter set in storage case includes CAL U100M, CAL U100B, 2x SAR CAN, SAR M116, A 50-N	256657
CDN CAN-U5	Coupling Decoupling Network for IEC 61000-4-6, type for CAN Bus, unscreened 5 lines	243006
CDN CAN-U5S	Coupling Decoupling Network for IEC 61000-4-6, type for CAN Bus, unscreened 5 lines with calibration adapter set in storage case, includes CAL U100M, CAL U100B, 2x SAR CAN, SAR M116, A 50-N	243002
CDN-TC	Traceable calibration (ISO17025) for IEC 61000-4-6 requirements, order only with device CDN M, AF or S type	97-231024

# **CDN AF SERIES**

## **COUPLING / DECOUPLING NETWORK (CDN)**

### **CDN AF TYPE, CDN CAN**

#### **Model No. and options (continued)**

Product	Description	Order code
CDN-DAkKS	DAkKS accredited calibration (ISO17025) for impedance and VDF in the frequency range of the CDN, order only with the device	98-231024
CDN CISPR15-TC	Traceable calibration (ISO17025) for CISPR15 (300 MHz) and IEC 61000-4-6, order only with device CDN M or AF type	97-237504
CAL U100B	Universal calibration unit (150 $\Omega$ / 50 $\Omega$ adapter)	247825
CAL U100M	Universal calibration unit (150 $\Omega$ / 50 $\Omega$ adapter)	257138
IMA U100	Universal impedance measuring adapter (0 $\Omega$ )	239902
SAR A250	Common mode adapter for CDN A150 / A800	243050
SAR A71	Common mode adapter for CDN A701, 4 mm banana	247829
SAR A81	Common mode adapter for CDN A801, 4 mm banana	247834
SAR CAN	Common mode adapter for CDN CAN	243689
SAR M116	Adapter 4 mm banana	239915
SAR MA21	Common mode adapter for CDN A2, M2, 4 mm banana	247827
SAR MA31	Common mode adapter for CDN A3, M3, 4 mm banana	247828
SAR MA41	Common mode adapter for CDN A4, M4, 4 mm banana	247831
SAR MA51	Common mode adapter for CDN A5, M5, 4 mm banana	243873
A 50-BNC	Termination 50 Ohms, BNC type, male	257520
A 50-N	Termination 50 Ohms, N type, male, 1 Watt, 2.5 GHz	257521
CDN case1	Storage case for CDN (size 1) for e.g. CDN M316 and similar	257100

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