



CDN T2x

CDN IEC 61000-4-6

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. AMETEK CTS with its brand TESEQ offers an extensive range of CDNs that 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). In this datasheet, CDN used with unscreened data communication cables applications starting from 10 kHz, as required by NAMUR NE21, as well as from 150 kHz is presented.

The CDN T2x Series is used to inject common mode disturbance signal to single pair cables of balanced data communication as in Telephone line. Different frequency ranges are available; from 10 kHz to 80 MHz and from 150 kHz to 80 MHz.

MAIN FEATURES

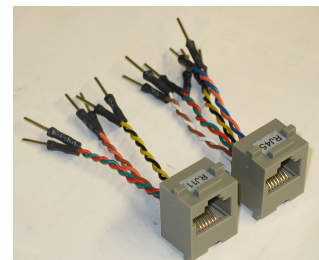
- Coupling networks designed for IEC/EN 61000-4-6
- T series for unscreened balanced one pairs
- 1 mm banana sockets for CDN T2A-10
- 4 mm banana sockets for CDN T202-10
- D Sub 25 adapters to RJ45 sockets for CDN T246A
- Optional adapter AD RJ11 and AD RJ45 for CDN T2A-10

The CDN T246A consists of one basic network (CDN T200A) with D-Sub-25-connectors. The connection to a different pin configuration of the modular RJ45 connectors in use is carried out via adapters. The adapter set of ADR T246, which consists of two identical adapters for EUT and AE side, is included. The optional available adapter AD RJ11 and AD RJ45 provide the connection between the CDN T2A-10 with RJ11 or RJ45 plug.

Verification results are provided with each unit. Traceable and accredited calibration according to ISO17025 are available upon request. The CDN can be ordered alone or as a kit, which includes the necessary adapters for verification. Please refer to the set order information for more details.



CDN T202A-10

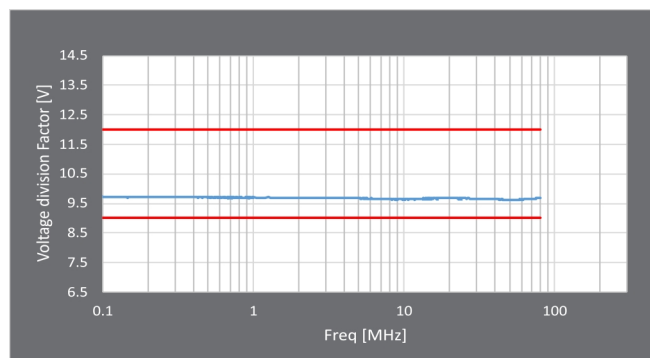
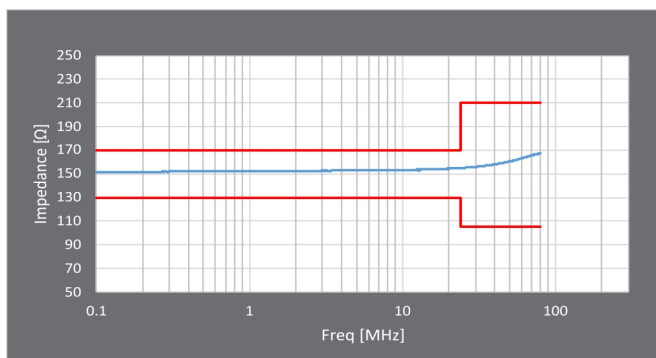


Option: Adapter AD RJ45 or AD RJ11

Electrical Specifications

	CDN T202-10	CDN T2A-10	CDN T246A
Frequency Range	10 kHz to 80 MHz		150 kHz to 80 MHz
Connector EUT Port	4 mm banana	1 mm banana	D-Sub 25 pins
Connector AE Port			
Line Parameters	1 pair		
Application Configuration	Telecom, UP0		Siemens UPN (UP0)
AC max. voltage (L-GND)	63 V		
DC max. voltage (L-GND)	100 V		
Current Max	2 A (line)	600 mA (line)	
Test Voltage, 2 sec.	200 VDC		
Common Mode Impedance (EUT Port)	10 kHz to 150 kHz: 150 Ω ±20 Ω 150 kHz to 24 MHz: 150 Ω ±20 Ω 24 MHz to 80 MHz: 150 Ω +60 Ω/-45 Ω		- 150 Ω ±20 Ω 150 Ω +60 Ω/-45 Ω

Typical Performance for Common Mode Impedance and Voltage Division Factor



RF to EUT/AE Specifications

	CDN T202-10	CDN T2A-10	CDN T246A
RF Port	BNC 50 Ω		
RF Voltage	< 33 V ¹		< 22 V ¹
Voltage division factor (RF input to EUT port)	10 kHz to 80 MHz: 10.5 dB ±1.5 dB		9.5 dB ±1 dB
Transmission bandwidth EUT / AE:	>100 MHz sin. ²		
LCL (EUT)	150 kHz to 30 MHz: >40 dB	150 kHz: >75 dB 1.5 MHz: >75 dB 30 MHz: >55 dB	150 kHz: >75 dB 1.5 MHz: >75 dB 30 MHz: >50 dB
CM decoupling (RF to AE)	10 kHz: >20 dB 1.5 MHz: >55 dB 30 MHz: >55 dB 80 MHz: >45 dB		150 kHz: >35 dB 1.5 MHz: >55 dB 30 MHz: >55 dB 80 MHz: >40 dB
Footnote	¹ : In 300 Ω loop for 80% AM signal ² : 3 dB bandwidth, all balanced parameters in relation to a symmetrical load of 100 Ω		

General Specifications

	CDN T202-10	CDN T2A-10	CDN T246A
Net Weight	approx. 1.5 kg	approx. 0.5 kg	
Operating Environment	Indoor use only		
Operating Temperature	+5°C to +40°C		
Humidity	up to 80%		

Application & adapter

Adapter Name	Connector	Applications	Pair 1	Pair 2	Pair 3	Pair 4
ADR T246	D-Sub 25/RJ45	Siemens UPN (U _{P0})	3,4	5,6		

Available Models

Product	Description	Item #
CDN T202-10	Coupling/Decoupling Network according IEC 61000-4-6 for telecommunication 1 pair, max 2 A, and from 10 kHz to 80 MHz (AE and EUT 4 mm banana)	257915
CDN T2A-10	Coupling/Decoupling Network according IEC 61000-4-6 for telecommunication 1 pair, max 600 mA, and from 10 kHz to 80 MHz (AE and EUT 1 mm banana)	257864
CDN T246A	Coupling/Decoupling Network according IEC 61000-4-6 for telecommunication 1 pair, max 600 mA, and from 150 kHz to 80 MHz (AE and EUT D-Sub 25) with adapter to RJ 45 (ADR T246).	254624

Set Information

Set Name Order Nr.	CAL U100B 247825	CAL U100M 257138	SAR T801 242430	SAR T2X0 248717	SAR M116 239915	A 50-N 257521
CDN T2A-10S 257865	2	-	-	2	1	1
CDN T246AS 254625	1	1	2	-	1	1

Product	Description	Item #
CDN Txxx-TC	Traceable calibration (ISO17025) for IEC 61000-4-6 requirements, order only with device CDN T type	97-241924
CDN-DAkkS	DAkkS accredited calibration (ISO17025) for impedance and VDF in the frequency range of the CDN	98-231024
CAL U100X-TC	Traceable calibration (ISO17025), order only with CAL U100x device	97-247825
CAL U100XDAkkS	DAkkS accredited calibration (ISO17025), order only with CAL U100x device	98-247825
IMA U100	Universal impedance measuring adapter (0 Ω)	239902
IMA U100M	Universal impedance measuring adapter (0 Ω)	257137
AD RJ11	two Adapters for 1 mm banana to RJ11	257981
AD RJ45	two Adapters for 1 mm banana to RJ45	248694
ADR T2X0	Arranging adapter set for CDN T200A with 1 mm banana to RJ11 and RJ45	242030
SAR MA21	Common mode adapter for CDN A2, M2, T202, 4 mm banana 247827	247827



MAIN FEATURES

- Coupling networks designed for IEC/EN 61000-4-6
- T series for unscreened balanced one and two pairs
- 1 mm banana sockets for CDN T4A-10
- 4 mm banana sockets for CDN T402-10
- D Sub 25 adapters to RJ45 sockets for CDN T44xA
- Optional adapter AD RJ11 and AD RJ45 for CDN T4A-10

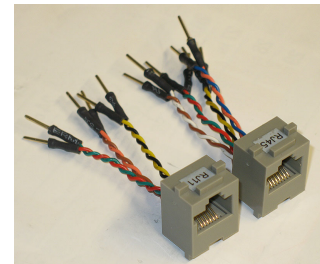
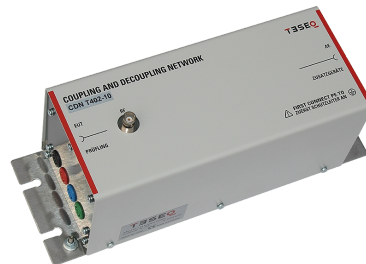
CDN T4x CDN IEC 61000-4-6

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

The CDN T4x Series is used to inject common mode disturbance signal to up to two pair cables of balanced data communication as in telephone line. Different frequency ranges are available; from 10 kHz to 80 MHz and from 150 kHz to 80 MHz.

The CDN T44xA consists of one basic network (CDN T400A) with D-Sub-25-connectors. The connection to a different pin configuration of the modular RJ45 connectors in use is carried out via adapters. The adapter set of ADR T44x, which consists of two identical adapters for EUT and AE side, is included. The optional available adapter AD RJ11 and AD RJ45 provide the connection between the CDN T4A-10 with RJ11 or RJ45 plug.

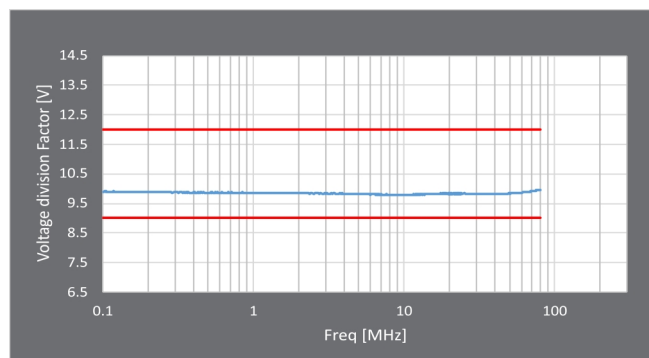
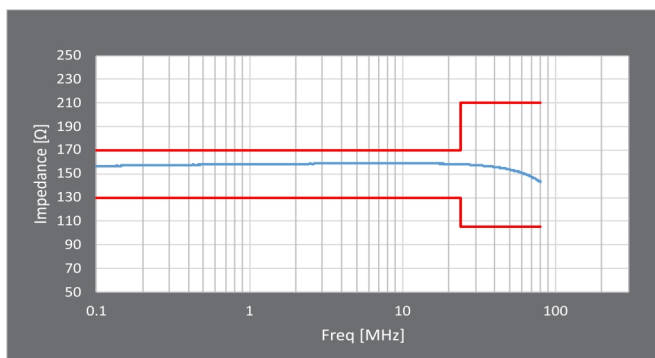
Verification results are provided with each unit. Traceable and accredited calibration according to ISO17025 are available upon request. The CDN can be ordered alone or as a kit, which includes the necessary adapters for verification. Please refer to the set order information for more details.



Electrical Specifications

	CDN T402-10	CDN T4A-10	CDN T442A	CDN T443A	CDN T444A	CDN T445A	CDN T4A
Frequency Range	10 kHz to 80 MHz		150 kHz to 80 MHz				
Connector EUT Port	4 mm banana	1 mm banana	D-Sub 25 pins				
Connector AE Port							
Line Parameters	2 pairs		1 up to 2 pair(s)				
Application Configuration	10/100 BaseT, ISDN, ATM, German Telecom, US standard		ISDN basic rate access	ISDN primary rate access	10BaseT, 100BaseT	ATM, FDDI, TP-PMD	as in CDN T44xA ¹
AC max. voltage (L-GND)	63 V						
DC max. voltage (L-GND)	100 V						
Current Max	2 A (line), 4 A (pair)	600 mA (line), 1.2 A (pair)					
Test Voltage, 2 sec.	200 VDC						
PoE	PoE+						
Common Mode Impedance (EUT Port)	10 kHz to 24 MHz: 150 Ω ±20 Ω 24 MHz to 80 MHz: 150 Ω +60 Ω/-45 Ω		150 kHz to 24 MHz: 150 Ω ±20 Ω 24 MHz to 80 MHz: 150 Ω +60 Ω/-45 Ω				
Footnote	¹ : Depends on Adapter						

Typical Performance for Common Mode Impedance and Voltage Division Factor



RF to EUT/AE Specifications

	CDN T402-10	CDN T4A-10	CDN T442A	CDN T443A	CDN T444A	CDN T445A	CDN T4A
RF Port	BNC 50 Ω						
RF Voltage	< 33 V ¹		< 22 V ¹				
Voltage division factor (RF input to EUT port)	10 dB ±1.5 dB		9.5 dB ±1 dB				
Transmission bandwidth EUT / AE:	>100 MHz sin. ²						
Crosstalk (EUT and AE port)	1 MHz to 100 MHz:≥ 61 dB to ≥21 dB						
LCL (EUT)	150 kHz to 30 MHz: >40 dB	150 kHz: >75 dB 1.5 MHz: >75 dB 30 MHz: >55 dB	>75 dB >75 dB >50 dB				
CM decoupling (RF to AE)	10 kHz: >20 dB 1.5 MHz: >55 dB 30 MHz: >55 dB 80 MHz: >45 dB		150 kHz: >35 dB 1.5 MHz: >55 dB 30 MHz: >55 dB 80 MHz: >40 dB				
Footnote	¹ : In 300 Ω loop for 80% AM signal ² : 3 dB bandwidth, all balanced parameters in relation to a symmetrical load of 100 Ω						

General Specifications

	CDN T402-10	CDN T4A-10	CDN T442A	CDN T443A	CDN T444A	CDN T445A	CDN T4A
Net Weight	approx. 1.5 kg	approx. 0.5 kg					
Operating Environment	Indoor use only						
Operating Temperature	+5°C to +40°C						
Humidity	up to 80%						

Application & adapter

Adapter Name	Connector	Applications	Pair 1	Pair 2	Pair 3	Pair 4
ADR T442	D-Sub 25/RJ45	Token ring, ISDN basic rate access/ S0	4	5	3	6
ADR T443	D-Sub 25/RJ45	ISDN primary rate access (2Mbps)	4	4	1	2
ADR T444	D-Sub 25/RJ45	10BaseT, and 100BaseTX			1	2
ADR T445	D-Sub 25/RJ45	ATM, FDDI, TP-PMD			1	2

Available Models

Product	Description	Item #
CDN T402-10	Coupling/Decoupling Network according IEC 61000-4-6 for telecommunication 2 pair, max 2 A, and from 10 kHz to 80 MHz (AE and EUT 4 mm banana)	257916
CDN T4A-10	Coupling/Decoupling Network according IEC 61000-4-6 for telecommunication 2 pair, max 600 mA, and from 10 kHz to 80 MHz (AE and EUT 1 mm banana)	257866
CDN T442A	Coupling/Decoupling Network according IEC 61000-4-6 for telecommunication 2 pair, max 600 mA, and from 150 kHz to 80 MHz (AE and EUT D-Sub 25) with adapter to RJ 45 (ADR T442).	254630
CDN T443A	Coupling/Decoupling Network according IEC 61000-4-6 for telecommunication 2 pair, max 600 mA, and from 150 kHz to 80 MHz (AE and EUT D-Sub 25) with adapter to RJ 45 (ADR T443).	254631
CDN T444A	Coupling/Decoupling Network according IEC 61000-4-6 for telecommunication 2 pair, max 600 mA, and from 150 kHz to 80 MHz (AE and EUT D-Sub 25) with adapter to RJ 45 (ADR T444).	254632
CDN T445A	Coupling/Decoupling Network according IEC 61000-4-6 for telecommunication 2 pair, max 600 mA, and from 150 kHz to 80 MHz (AE and EUT D-Sub 25) with adapter to RJ 45 (ADR T444).	254633
CDN T4A	Coupling/Decoupling Network according IEC 61000-4-6 for telecommunication 2 pair, max 600 mA, and from 10 kHz to 80 MHz (AE and EUT D-Sub 25) with adapters to RJ 45 (ADR T442, ADR T443, ADR T444 and ADR T445).	254626

Set Information

Set Name Order Nr.	CAL U100B 247825	CAL U100M 257138	SAR T801 242430	SAR T4X0 248718	SAR M116 239915	A 50-N 257521
CDN T4A-10S 257867	2	-	-	2	1	1
CDN T4AS 254627	1	1	2	-	1	1

Product	Description	Item #
CDN Txxx-TC	Traceable calibration (ISO17025) for IEC 61000-4-6 requirements, order only with device CDN T type	97-241924
CDN-DAkkS	DAkkS accredited calibration (ISO17025) for impedance and VDF in the frequency range of the CDN	98-231024
CAL U100X-TC	Traceable calibration (ISO17025), order only with CAL U100x device	97-247825
CAL U100XDAkkS	DAkkS accredited calibration (ISO17025), order only with CAL U100x device	98-247825
IMA U100	Universal impedance measuring adapter (0 Ω)	239902
IMA U100M	Universal impedance measuring adapter (0 Ω)	257137
AD RJ11	two Adapters for 1 mm banana to RJ11	257981
AD RJ45	two Adapters for 1 mm banana to RJ45	248694
ADR T4X0	Arranging adapter set for CDN T400A with 1 mm banana to RJ11 and RJ45	242045
ADR T442	Arranging adapter set for CDN T400A with RJ45.2, ISDN basic rate access, (S0)	242022
ADR T443	Arranging adapter set for CDN T400A with RJ45.3, ISDN primary rate access (2Mbps)	242023
ADR T444	Arranging adapter set for CDN T400A with RJ45.4, 10BaseT, 100BaseT	242024
ADR T445	Arranging adapter set for CDN T400A with RJ45.5, ATM, FDDI	242025
SAR MA41	Common mode adapter for CDN A4, M4, T402, 4 mm banana	247831



MAIN FEATURES

- Coupling networks designed for IEC/EN 61000-4-6
- T series for unscreened balanced up to four pairs
- Two CDNs with RJ45 socket with two different frequency range
- D Sub 25 adapters to RJ45 sockets for CDN T8

CDN T8x CDN IEC 61000-4-6

IEC/EN 61000-4-6 specifies the design and performance of a range of coupling/de-coupling networks (CDNs). Each CDN is specific to the type of cable and the intended signal carried on the cable. AMETEK CTS with its brand TESEQ offers an extensive range of CDNs that 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). In this datasheet, CDN used with unscreened data communication cables applications starting from 10 kHz, as required by NAMUR NE21, as well as from 150 kHz is presented.

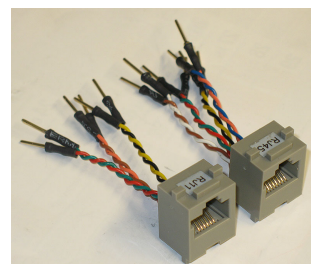
The CDN T8A-10 is used to inject common mode disturbance signal on up to four pairs cables of balanced data communication as in 10BaseT in the frequency ranges of 10 kHz to 80 MHz. CDN T8-230 is for the same application but from 150 kHz to 230 MHz.

The CDN T8 consists of one basic network (CDN T800A) with D-Sub-25-connectors. The connection to a different pin configuration of the modular RJ45 connectors in use is carried out via adapters. The adapter set of ADR T800, which consists of two identical adapters for EUT and AE side, is included.

Verification results are supplied with each unit. Traceable and accredited calibration according to ISO17025 are available upon request. The CDN can be ordered alone or as a kit, which includes the necessary adapters for verification. Please refer to the set order information for more details.



CDN T8-230

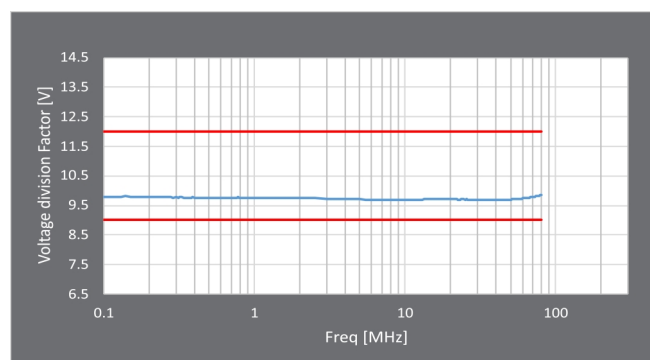
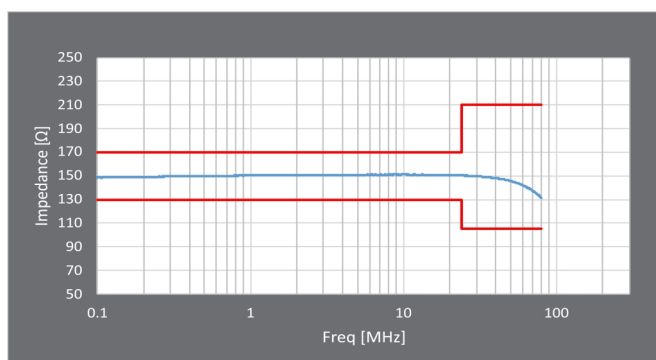


Option: Adapter AD RJ45 or AD RJ11

Electrical Specifications

	CDN T8A-10	CDN T8-230	CDN T8
Frequency Range	10 kHz to 80 MHz	150 kHz to 230 MHz	150 kHz to 80 MHz
Connector EUT Port	RJ45		D-Sub 25 pins
Connector AE Port			
Line Parameters	4 pairs		1 up to 4 pair(s)
Application Configuration	Ethernet 1000BaseT		different applications ¹
AC max. voltage (L-GND)	63 V		
DC max. voltage (L-GND)	100 V		
Current Max	600 mA (line), 1.2 A (pair)		
Test Voltage, 2 sec.	200 VDC		
PoE	PoE+		
Common Mode Impedance (EUT Port)	10 kHz to 24 MHz: 150 Ω ±20 Ω 24 MHz to 80 MHz: 150 Ω +60 Ω/-45 Ω	150 kHz to 24 MHz: 150 Ω ±20 Ω 24 MHz to 80 MHz: 150 Ω +60 Ω/-45 Ω 80 MHz to 230 MHz: 150 Ω ±60 Ω	150 kHz to 24 MHz: 150 Ω ±20 Ω 24 MHz to 80 MHz: 150 Ω +60 Ω/-45 Ω
Footnote	¹ : Depends on Adapter		

Typical Performance for Common Mode Impedance and Voltage Division Factor



RF to EUT/AE Specifications

	CDN T8A-10	CDN T8-230	CDN T8
RF Port	BNC 50 Ω		
RF Voltage	< 33 V ¹		< 22 V ¹
Voltage division factor (RF input to EUT port)	10.5 dB ±1.5 dB	10 dB ±1.5 dB	9.5 dB ±1 dB
Transmission bandwidth EUT / AE:	>100 MHz sin. ²	>80 MHz sin. ²	>100 MHz sin. ²
Crosstalk (EUT and AE port)	1 MHz to 100 MHz: ≥ 61 dB to ≥21 dB		
LCL (EUT)	150 kHz: >75 dB 1.5 MHz: >75 dB 30 MHz: >55 dB	150 kHz: >75 dB 1.5 MHz: >75 dB 30 MHz: >60 dB	
CM decoupling (RF to AE)	10 kHz: >20 dB 1.5 MHz: >55 dB 30 MHz: >55 dB 80 MHz: >45 dB	150 kHz: >55 dB 1.5 MHz: >55 dB 30 MHz: >45 dB 80 MHz: >35 dB	150 kHz: >35 dB 1.5 MHz: >55 dB 30 MHz: >55 dB 80 MHz: >45 dB
Footnote	¹ : In 300 Ω loop for 80% AM signal ² : 3 dB bandwidth, all balanced parameters in relation to a symmetrical load of 100 Ω		

General Specifications

	CDN T8A-10	CDN T8-230	CDN T8
Net Weight	approx. 0.5 kg		
Operating Environment	Indoor use only		
Operating Temperature	+5°C to +40°C		
Humidity	up to 80%		

Application & adapter

Adapter Name	Connector	Applications	Pair 1		Pair 2		Pair 3		Pair 4	
ADR T800	D-Sub 25/RJ45	100BaseT4, 100Base VG-AnyLan, 1000BaseT, Token ring, ISDN, 10BaseT, 100BaseTx, ATM, FDDI, TP-PMD	4	5	1	2	3	6	7	8

Available Models

Product	Description	Item #
CDN T8A-10	Coupling/Decoupling Network according IEC 61000-4-6 for telecommunication 4 pair, max 600 mA, and from 10 kHz to 80 MHz (AE and EUT RJ45)	257868
CDN T8-230	Coupling/Decoupling Network according IEC 61000-4-6 for telecommunication 4 pair, max 600 mA, and from 150 kHz to 230 MHz (AE and EUT RJ45)	257917
CDN T8	Coupling/Decoupling Network according IEC 61000-4-6 for telecommunication 4 pair, max 600 mA, and from 150 kHz to 80 MHz (AE and EUT D-Sub 25) with adapter to RJ 45 (ADR T800).	244156

Set Information

Set Name Order Nr.	CAL U100B 247825	CAL U100M 257138	SAR T801 242430	SAR T802 242428	SAR M116 239915	A 50-N 257521
CDN T8A-10S 257869	1	1	-	2	1	1
CDN T8S 244157	1	1	2	-	1	1
CDN T8-230S 257918	1	1	-	2	1	1

Product	Description	Item #
CDN Txxx-TC	Traceable calibration (ISO17025) for IEC 61000-4-6 requirements, order only with device CDN T type	97-241924
CDN-DAkkS	DAkkS accredited calibration (ISO17025) for impedance and VDF in the frequency range of the CDN	98-231024
CAL U100X-TC	Traceable calibration (ISO17025), order only with CAL U100x device	97-247825
CAL U100XDAkkS	DAkkS accredited calibration (ISO17025), order only with CAL U100x device	98-247825
IMA U100	Universal impedance measuring adapter (0 Ω)	239902
IMA U100M	Universal impedance measuring adapter (0 Ω)	257137
AD RJ11	two Adapters for 1 mm banana to RJ11	257981
AD RJ45	two Adapters for 1 mm banana to RJ45	248694
ADR T2X0	Arranging adapter set for CDN T200A with 1 mm banana to RJ11 and RJ45	242030
ADR T800	Arranging adapter set for CDN T800A with RJ45	242049