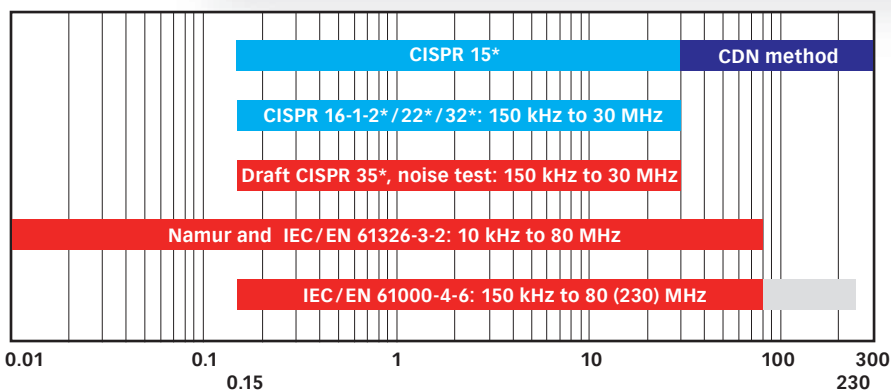




COUPLING DECOUPLING NETWORKS FOR IEC / EN 61000-4-6



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. 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). Each CDN is also useable for emission testing, special types are meet the requirements of CISPR 15, CISPR 16-1-2, CISPR 22, CISPR 32, CISPR 35, NAMUR NE 21 and IEC / EN 61326-3-2.

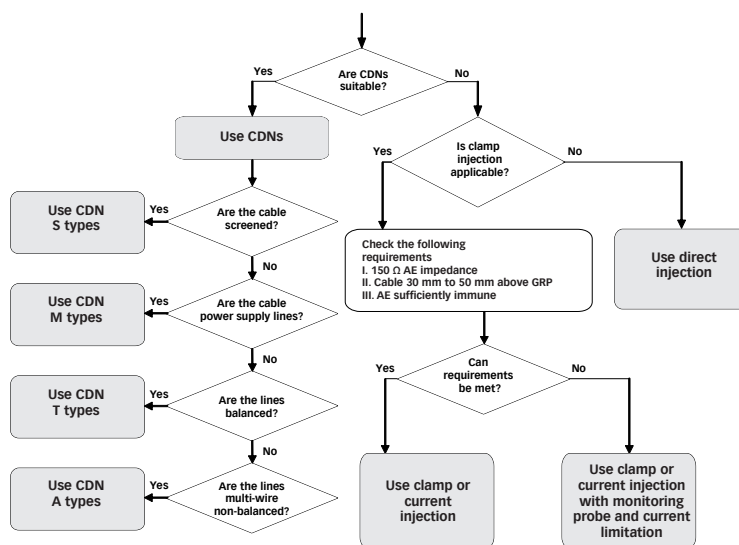


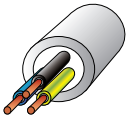

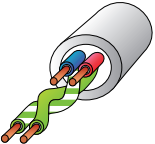
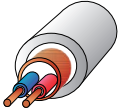

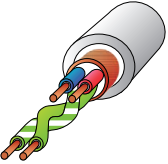
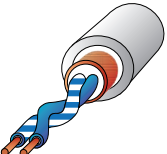

Frequency in MHz

■ Emissions testing, ■ Immunity testing, ■ Extended range

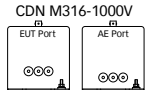
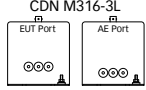
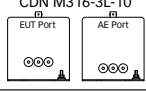
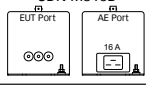
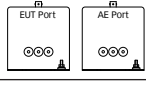
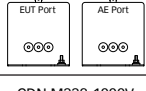
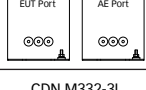
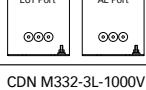
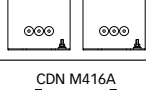
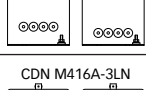
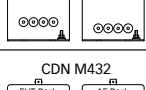
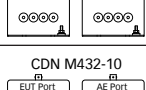
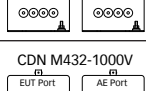
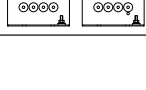
* Standard contains additional requirements for the CDN.

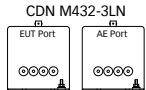
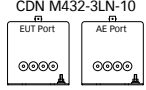
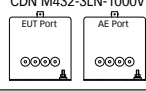
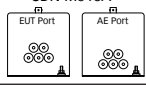
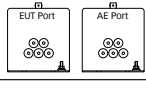
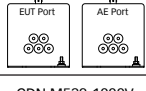
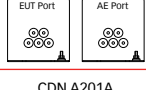
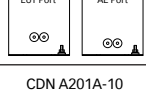
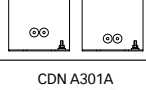
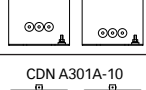
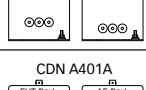
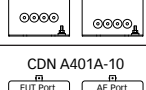
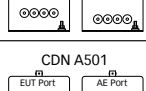
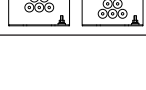
IEC / EN 61000-4-6: Rules for selecting the injection method

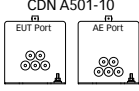
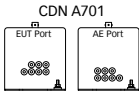
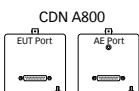
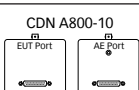
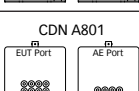
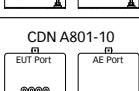
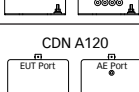
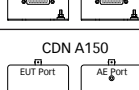



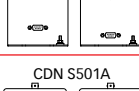
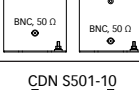
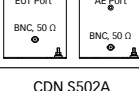


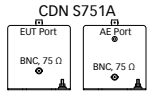
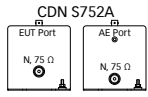
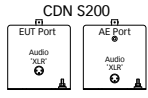
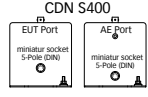
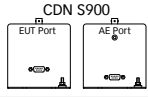
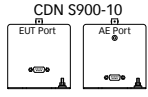
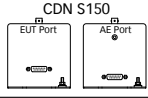
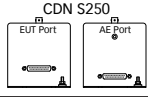
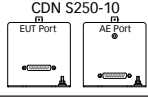
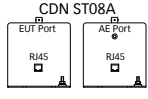
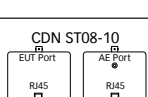
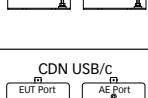
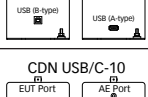
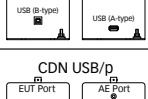
Cable type	CDN type	Application	Product range
	M type	Used for unscreened AC or DC power supply applications.	M1 for one line, M2 for two lines, M2/3 switchable for two or three lines, M3 for three lines, M4 for lines and M5 for five lines "-10 types" for frequency range 10 kHz to 80 MHz, "-3L and -3LN types" for connections without PE "-1000V types" for higher EUT supply voltages
	AF type	Used for all unscreened, unbalanced lines, carrying low current.	Types with 4 mm safety banana: AF2 for two lines, AF3 for three lines, AF4 for lines, AF5 for five lines, AF7 for 7 lines and AF8 for 8 lines Types with D-Sub connector: AF8 for 8 lines, AF12 for 12 lines and AF15 for 15 lines "-10 types" for frequency range 10 kHz to 80 MHz
	CAN bus type	Specially designed to test the unscreened CAN bus.	Types with D-Sub connector for unscreened four or five lines "-10 types" for frequency range 10 kHz to 80 MHz
	S type	Used for screened cables.	Types with D-Sub connector for screened lines with up to 25 lines: "-10 types" for frequency range 10 kHz to 80 MHz Type with DIN connector
	S type coaxial	Used for coaxial cables.	Types with coaxial connector: See also product range Impedance Stabilization Networks for ISN S501A, S502A, S751 and S752.
	S type for USB and HDMI	Specially designed to test the USB and HDMI	CDN USB/c, USB/p, CDN USB3.0, CDN HDMI
	ST type	Used for testing screened, balanced lines for telecommunication ports on ITE equipment.	CDN ST08A See also product range Impedance Stabilization Networks for ISN ST08.
	T type	Used for unscreened, balanced lines for telecommunication ports on ITE equipment.	CDN T2-10, T210A...T246AS, T4-10, T411A...T4AS CDN T8, T8-10 See also product range Impedance Stabilization Networks for ISN T2A, T4A, ISN T8 and ISN T8-CAT6.

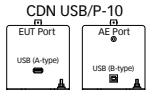
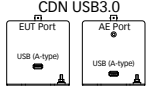
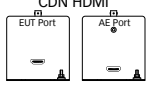
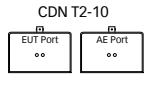
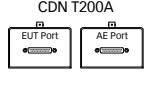
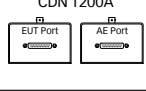
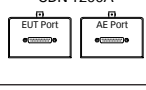
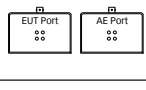
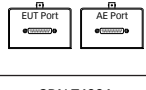
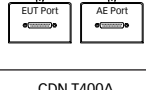
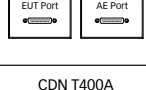
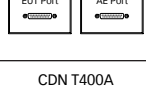
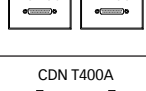
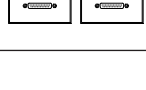
Product	Drawing	Frequency range	CDN type and application	Connector type	Immunity testing IEC/EN 61000-4-6	Immunity testing 10 kHz to 80 MHz	Emission testing CISPR 15 (CDN method)	Emission testing CISPR 22/32 (ISN/AAN)	Number of lines	Max. EUT current in A (50/60 Hz)	Max. EUT voltage in V for AC*	Max. RF voltage V	3 dB bandwidth (sinusoidal)
CDN M116		150 kHz to 230 (300) MHz	CDN M 1 1 PE line	AE: banana EUT: banana	■	■			1	16 (1)	—	20	—
CDN M1-10		10 kHz to 80 MHz	CDN M 1 1 PE line	AE: banana EUT: banana	■	■			1	16 (0.3)	—	20	—
new in 2015 CDN M132		150 kHz to 230 (300) MHz	CDN M 1 1 PE line	AE: banana EUT: banana	■	■			1	32 (1)	—	20	—
CDN M210B		150 kHz to 230 (300) MHz	CDN M2 2 power lines (L+N or DC+/DC-)	AE: IEC 60320 C14 EUT: CEE 7 / 17	■	■			2	10	250 (433)	30	—
CDN M216		150 kHz to 230 (300) MHz	CDN M2 2 power lines (L+N or DC+/DC-)	AE: banana EUT: banana	■	■			2	16	250 (433)	30	—
CDN M216-10		10 kHz to 80 MHz	CDN M2 2 power lines (L+N or DC+/DC-)	AE: banana EUT: banana	■	■			2	16	250 (433)	30	—
CDN M216-1000V		150 kHz to 230 (300) MHz	CDN M2 2 power lines (L+N or DC+/DC-)	AE: banana EUT: banana	■	■			2	16	500 (1000)	30	—
CDN M232		150 kHz to 230 MHz	CDN M2 2 power lines (L+N or DC+/DC-)	AE: banana EUT: banana	■				3	32	300 (520)	30	—
CDN M232-10		10 kHz to 80 MHz	CDN M2 2 power lines (L+N or DC+/DC-)	AE: banana EUT: banana	■	■			3	32	300 (520)	30	—
new in 2015 CDN M232-1000V		150 kHz to 230 MHz	CDN M2 2 power lines (L+N or DC+/DC-)	AE: banana EUT: banana	■				2	32	500 (1000)	30	—
CDN M016		150 kHz to 230 (300) MHz	CDN M2/3 switchable 2/3 power lines (L+N or L+N+PE)	AE: banana EUT: banana	■	■			2/3	16	250 (433)	30	—
CDN M310B		150 kHz to 230 (300) MHz	CDN M3 3 power lines (L+N+PE)	AE: IEC 60320 C14 EUT: Schuko CEE 7 / 4	■	■			3	10	250 (433)	30	—
CDN M316		150 kHz to 230 (300) MHz	CDN M3 3 power lines (L+N+PE)	AE: banana EUT: banana	■	■			3	16	250 (433)	30	—
CDN M316-10		10 kHz to 80 MHz	CDN M3 3 power lines (L+N+PE)	AE: banana EUT: banana	■	■			3	16	250 (433)	30	—



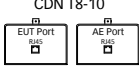

	Product	Drawing	Frequency range	CDN type and application	Connector type	Immunity testing IEC/EN 61000-4-6	Immunity testing 10 kHz to 80 MHz	Emission testing CISPR 15 (CDN method)	Emission testing CISPR 22/32 (ISN/AAN)	Number of lines	Max. EUT current in A (50/60 Hz)	Max. EUT voltage in V for AC*	Max. RF voltage V	3 dB bandwidth (sinusoidal)
new in 2015	CDN M316-1000V		150 kHz to 230 MHz	CDN M3 3 power lines (L+N+PE)	AE: banana EUT: banana	■				3	16	500 (1000)	30	—
	CDN M316-3L		150 kHz to 230 (300) MHz	CDN M3 3 power lines (3L)	AE: banana EUT: banana	■	■			3	16	250 (433)	30	—
new in 2015	CDN M316-3L-10		10 kHz to 80 MHz	CDN M3 3 power lines (3L)	AE: banana EUT: banana	■	■			3	16	250 (433)	30	—
	CDN M316B		150 kHz to 230 (300) MHz	CDN M3 3 power lines (L+N+PE)	AE: IEC 60320 C20 EUT: banana	■	■			3	16	250 (433)	30	—
	CDN M332		150 kHz to 230 MHz	CDN M3 3 power lines (L+N+PE)	AE: banana EUT: banana	■				3	32	300 (520)	30	—
	CDN M332-10		10 kHz to 80 MHz	CDN M3 3 power lines (L+N+PE)	AE: banana EUT: banana	■	■			3	32	300 (520)	30	—
new in 2015	CDN M332-1000V		150 kHz to 80 MHz	CDN M3 3 power lines (L+N+PE)	AE: banana EUT: banana	■				3	32	500 (1000)	30	—
	CDN M332-3L		150 kHz to 230 MHz	CDN M3 3 power lines (3L)	AE: banana EUT: banana	■				3	32	300 (520)	30	—
new in 2015	CDN M332-3L-1000V		150 kHz to 80 MHz	CDN M3 3 power lines (3L)	AE: banana EUT: banana	■				3	32	500 (1000)	30	—
	CDN M416A		150 kHz to 230 MHz	CDN M4 4 power lines (3L+PE)	AE: banana EUT: banana	■				4	16	300 (520)	30	—
	CDN M416A-3LN		150 kHz to 230 MHz	CDN M4 4 power lines (3L+N)	AE: banana EUT: banana	■				4	16	300 (520)	30	—
	CDN M432		150 kHz to 230 MHz	CDN M4 4 power lines (3L+PE)	AE: banana EUT: banana	■				4	32	300 (520)	30	—
	CDN M432-10		10 kHz to 80 MHz	CDN M4 4 power lines (3L+PE)	AE: banana EUT: banana	■	■			4	32	300 (520)	30	—
new in 2015	CDN M432-1000V		150 kHz to 80 MHz	CDN M4 4 power lines (3L+PE)	AE: banana EUT: banana	■				4	32	500 (1000)	30	—

Product	Drawing	Frequency range	CDN type and application	Connector type	Immunity testing IEC/EN 61000-4-6	Immunity testing 10 kHz to 80 MHz	Emission testing CISPR 15 (CDN method)	Emission testing CISPR 22/32 (ISN/AAN)	Number of lines	Max. EUT current in A (50/60 Hz)	Max. EUT voltage in V for AC*	Max. RF voltage V	3 dB bandwidth (sinusoidal)
CDN M432-3LN		150 kHz to 230 MHz	CDN M4 4 power lines (3L+N)	AE: banana EUT: banana	■				4	32	300 (520)	30	—
CDN M432-3LN-10		10 kHz to 80 MHz	CDN M4 4 power lines (3L+N)	AE: banana EUT: banana	■	■			4	32	300 (520)	30	—
new in 2015 CDN M432-3LN-1000V		150 kHz to 80 MHz	CDN M4 4 power lines (3L+N)	AE: banana EUT: banana	■				4	32	500 (1000)	30	—
CDN M516A		150 kHz to 230 MHz	CDN M5 5 power lines (3L+N+PE)	AE: banana EUT: banana	■				5	16	300 (520)	30	—
CDN M532		150 kHz to 230 MHz	CDN M5 5 power lines (3L+N+PE)	AE: banana EUT: banana	■				5	32	300 (520)	30	—
CDN M532-10		10 kHz to 80 MHz	CDN M5 5 power lines (3L+N+PE)	AE: banana EUT: banana	■	■			5	32	300 (520)	30	—
new in 2015 CDN M532-1000V		150 kHz to 80 MHz	CDN M5 5 power lines (3L+N+PE)	AE: banana EUT: banana	■				5	32	500 (1000)	30	—
new in 2015 CDN A201A		150 kHz to 230 (300) MHz	CDN AF2 for unscreened unbalanced 2 lines application	AE: banana EUT: banana	■	■			2	4	250	30	20 kHz
new in 2015 CDN A201A-10		10 kHz to 80 MHz	CDN AF2 for unscreened unbalanced 2 lines application	AE: banana EUT: banana	■	■			2	4	250	30	20 kHz
new in 2015 CDN A301A		150 kHz to 230 (300) MHz	CDN AF3 for unscreened unbalanced 3 lines application	AE: banana EUT: banana	■	■			3	4	250	30	20 kHz
new in 2015 CDN A301A-10		10 kHz to 80 MHz	CDN AF3 for unscreened unbalanced 3 lines application	AE: banana EUT: banana	■	■			3	4	250	30	20 kHz
new in 2015 CDN A401A		150 kHz to 230 (300) MHz	CDN AF4 for unscreened unbalanced 4 lines application	AE: banana EUT: banana	■	■			4	4	250	30	20 kHz
new in 2015 CDN A401A-10		10 kHz to 80 MHz	CDN AF4 for unscreened unbalanced 4 lines application	AE: banana EUT: banana	■	■			4	4	250	30	20 kHz
CDN A501		150 kHz to 230 (300) MHz	CDN AF5 for unscreened unbalanced 5 lines application	AE: banana EUT: banana	■	■			5	4	160	30	20 kHz

Product	Drawing	Frequency range	CDN type and application	Connector type	Immunity testing IEC/EN 61000-4-6	Immunity testing 10 kHz to 80 MHz	Emission testing CISPR 15 (CDN method)	Emission testing CISPR 22/32 (ISN/AAN)	Number of lines	Max. EUT current in A (50/60 Hz)	Max. EUT voltage in V for AC*	Max. RF voltage V	3 dB bandwidth (sinusoidal)
CDN A501-10		10 kHz to 80 MHz	CDN AF5 for unscreened unbalanced 5 lines application	AE: banana EUT: banana	■	■			5	4	160	30	20 kHz
CDN A701		150 kHz to 230 (300) MHz	CDN AF7 for unscreened unbalanced 7 lines application	AE: banana EUT: banana	■		■		7	2	160	30	20 kHz
CDN A800		150 kHz to 230 (300) MHz	CDN AF8 for unscreened unbalanced 8 lines application	AE: 25 pin D-sub EUT: 25 pin D-sub	■		■		8	0.2	63	15	20 kHz
CDN A800-10		10 kHz to 80 MHz	CDN AF8 for unscreened unbalanced 8 lines application	AE: 25 pin D-sub EUT: 25 pin D-sub	■	■			8	0.2	63	15	20 kHz
CDN A801		150 kHz to 230 (300) MHz	CDN AF8 for unscreened unbalanced 8 lines application	AE: banana EUT: banana	■		■		8	2	160	30	20 kHz
CDN A801-10		10 kHz to 80 MHz	CDN AF8 for unscreened unbalanced 8 lines application	AE: 25 pin D-sub EUT: 25 pin D-sub	■	■			8	2	160	15	20 kHz
CDN A120		150 kHz to 230 (300) MHz	CDN AF12 for unscreened unbalanced 12 lines application	AE: 25 pin D-sub EUT: 25 pin D-sub	■		■		12	0.2	63	15	20 kHz
CDN A150		150 kHz to 230 (300) MHz	CDN AF15 for unscreened unbalanced 15 lines application	AE: 25 pin D-sub EUT: 25 pin D-sub	■		■		15	0.2	63	15	20 kHz
CDN CAN-U4		150 kHz to 230 MHz	CDN for unscreened CAN bus with 4 lines	AE: 9 pin D-sub EUT: 9 pin D-sub	■				4	3/0.5	48	20	30 MHz
CDN CAN-U4-10		10 kHz to 80 MHz	CDN for unscreened CAN bus with 4 lines	AE: 9 pin D-sub EUT: 9 pin D-sub	■				4	3/0.5	48	20	30 MHz
CDN CAN-U5		150 kHz to 230 MHz	CDN for unscreened CAN bus with 5 lines	AE: 9 pin D-sub EUT: 9 pin D-sub	■				5	3/0.5	48	20	30 MHz
CDN S501A		150 kHz to 230 MHz	CDN S1 for coaxial line 50 Ω	AE: BNC 50 Ω EUT: BNC 50 Ω	■		■		1	0.25	250	20	2 GHz
CDN S501A-10		10 kHz to 80 MHz	CDN S1 for coaxial line 50 Ω	AE: BNC 50 Ω EUT: BNC 50 Ω	■	■	■		1	0.25	250	20	2 GHz
CDN S502A		150 kHz to 230 MHz	CDN S1 for coaxial line 50 Ω, double screened	AE: N 50 Ω EUT: N 50 Ω	■		■		1	0.25	250	20	2 GHz

Product	Drawing	Frequency range	CDN type and application	Connector type	Immunity testing IEC/EN 61000-4-6	Immunity testing 10 kHz to 80 MHz	Emission testing CISPR 15 (CDN method)	Emission testing CISPR 22/32 (ISN/AAN)	Number of lines	Max. EUT current in A (50/60 Hz)	Max. EUT voltage in V for AC*	Max. RF voltage V	3 dB bandwidth (sinusoidal)
CDN S751A		150 kHz to 230 MHz	CDN S1 for coaxial line 75 Ω	AE: BNC 75 Ω EUT: BNC 75 Ω	■		■		1	0.25	250	20	2 GHz
CDN S752A		150 kHz to 230 MHz	CDN S1 for coaxial line 75 Ω, double screened	AE: N 75 Ω EUT: N 75 Ω	■		■		1	0.25	250	20	2 GHz
CDN S200		150 kHz to 230 MHz	CDN S2 for 2 wires, screened line	AE: XLR EUT: XLR	■				2	0.25	150	20	20 kHz
CDN S400		150 kHz to 230 MHz	CDN S4 for 4 wires, screened line	AE: 5 pin DIN EUT: 5 pin DIN	■				4	0.25	34	20	20 kHz
CDN S900		150 kHz to 230 MHz	CDN S9 for 9 wires, screened line	AE: 9 pin D-sub EUT: 9 pin D-sub	■				9	0.25	150	20	20 kHz
CDN S900-10		10 kHz to 80 MHz	CDN S9 for 9 wires, screened line	AE: 9 pin D-sub EUT: 9 pin D-sub	■	■			9	0.25	150	20	20 kHz
CDN S150		150 kHz to 230 MHz	CDN S15 for 15 wires, screened line	AE: 15 pin D-sub EUT: 15 pin D-sub	■				15	0.25	150	20	20 kHz
CDN S250		150 kHz to 230 MHz	CDN S25 for 25 wires, screened line	AE: 25 pin D-sub EUT: 25 pin D-sub	■				25	0.25	150	20	20 kHz
CDN S250-10		10 kHz to 80 MHz	CDN S25 for 25 wires, screened line	AE: 25 pin D-sub EUT: 25 pin D-sub	■	■			25	0.25	150	20	20 kHz
CDN ST08A		150 kHz to 230 MHz	CDN for screened and balanced telecommunication lines, Ethernet 10BaseT, 100BaseT, 1000BaseT, 10GBaseT and others	AE: RJ45 EUT: RJ45	■		■		8	1	100	20	250 MHz
CDN ST08-10		10 kHz to 80 MHz	CDN for screened and balanced telecommunication lines, Ethernet 10BaseT, 100BaseT, 1000BaseT, 10GBaseT and others	AE: RJ45 EUT: RJ45	■	■	■		8	1	100	20	250 MHz
CDN USB/C		150 kHz to 230 MHz	CDN USB for central devices, USB up to 2.0	AE: USB "A" type EUT: USB "B" type	■				4	1	100	20	80 MHz
CDN USB/C-10		10 kHz to 80 MHz	CDN USB for central devices, USB up to 2.0	AE: USB "A" type EUT: USB "B" type	■	■			4	1	100	20	80 MHz
CDN USB/P		150 kHz to 230 MHz	CDN USB for peripheral devices, USB up to 2.0	AE: USB "B" type EUT: USB "A" type	■				4	1	100	20	80 MHz

Product	Drawing	Frequency range	CDN type and application	Connector type	Immunity testing IEC/EN 61000-4-6	Immunity testing 10 kHz to 80 MHz	Emission testing CISPR 15 (CDN method)	Emission testing CISPR 22/32 (ISN/AAN)	Number of lines	Max. EUT current in A (50/60 Hz)	Max. EUT voltage in V for AC*	Max. RF voltage V	3 dB bandwidth (sinusoidal)
CDN USB/P-10		10 kHz to 80 MHz	CDN USB for peripheral devices, USB up to 2.0	AE: USB "B" type EUT: USB "A" type	■	■			4	1	100	20	80 MHz
CDN USB3.0		150 kHz to 230 MHz	CDN USB, up to 3.0	AE: USB "A" type EUT: USB "A" type	■				9	1	100	20	-
CDN HDMI		150 kHz to 230 MHz	CDN for high speed HDMI with HDCP, HEC (Ethernet), ARC and DSC	AE: HDMI socket EUT: HDMI socket	■				19	-	100	20	-
CDN T2-10		10 kHz to 300 MHz	T2 for 1 unscreened balanced wire pair	AE: 1 mm banana EUT: 1 mm banana	■	■	■		2	0.4	63	20	100 MHz
CDN T210A		150 kHz to 80 MHz	T2 for 1 unscreened balanced wire pair, pin arrangement customer specific	AE: D-sub/RJ11 EUT: D-sub/RJ11	■				2	0.4	63	15	100 MHz
CDN T240A		150 kHz to 80 MHz	T2 for 1 unscreened balanced wire pair, pin arrangement customer specific	AE: D-sub/RJ45 EUT: D-sub/RJ45	■				2	0.4	63	15	100 MHz
CDN T246A		150 kHz to 80 MHz	T2 for 1 unscreened balanced wire pair, German Telecom, Siemens, UP0	AE: D-sub/RJ45 EUT: D-sub/RJ45, with ADR T246	■				2	0.4	63	15	100 MHz
CDN T4-10		10 kHz to 300 MHz	T4 for 2 unscreened balanced wire pairs	AE: 1 mm banana EUT: 1 mm banana	■	■	■		4	0.4	63	20	100 MHz
CDN T410A		150 kHz to 80 MHz	T4 for up to 2 unscreened balanced wire pairs, pin arrangement customer specific	AE: D-sub/RJ11, EUT: D-sub/RJ11	■				2 4	0.4	63	15	100 MHz
CDN T411A		150 kHz to 80 MHz	T4 for up to 2 unscreened balanced wire pairs, German Telecom, US standard	AE: D-sub/RJ11, EUT: D-sub/RJ11, with ADR T411	■				2 4	0.4	63	15	100 MHz
CDN T440A		150 kHz to 80 MHz	T4 for up to 2 unscreened balanced wire pairs, pin arrangement customer specific	AE: D-sub/RJ45, EUT: D-sub/RJ45	■				2 4	0.4	63	15	100 MHz
CDN T442A		150 kHz to 80 MHz	T4 for up to 2 unscreened balanced wire pairs, ISDN basic rate access S0	AE: D-sub/RJ45, EUT: D-sub/RJ45, with ADR T442	■				2 4	0.4	63	15	100 MHz
CDN T443A		150 kHz to 80 MHz	T4 for up to 2 unscreened balanced wire pairs, ISDN primary rate access (2Mbps)	AE: D-sub/RJ45, EUT: D-sub/RJ45, with ADR T443	■				2 4	0.4	63	15	100 MHz
CDN T444A		150 kHz to 80 MHz	T4 for up to 2 unscreened balanced wire pairs, Ethernet 10BaseT, 100BaseT	AE: D-sub/RJ45, EUT: D-sub/RJ45, with ADR T444	■				2 4	0.4	63	15	100 MHz

Product	Drawing	Frequency range	CDN type and application	Connector type	Immunity testing IEC/EN 61000-4-6	Immunity testing 10 kHz to 80 MHz	Emission testing CISPR 15 (CDN method)	Emission testing CISPR 22/32 (ISN/AAN)	Number of lines	Max. EUT current in A (50/60 Hz)	Max. EUT voltage in V for AC*	Max. RF voltage V	3 dB bandwidth (sinusoidal)
CDN T445A		150 kHz to 80 MHz	T4 for up to 2 unscreened balanced wire pairs, ATM, FDDI	AE: D-sub/RJ45, EUT: D-sub/RJ45, with ADR T445	■				2 4	0.4	63	15	100 MHz
CDN T4A		150 kHz to 80 MHz	T4 for up to 2 unscreened balanced wire pairs with 5 adapter sets	AE: D-sub/RJxx, EUT: D-sub/RJxx, with ADR T411, T442, T443, T444, T445	■				2 4	0.4	63	15	100 MHz
CDN T8-10		10 kHz to 230 MHz	T8 for 4 unscreened balanced wire pairs, Ethernet 1000BaseT	AE: RJ45 EUT: RJ45	■	■			8	0.4	63	15	100 MHz
CDN T8		150 kHz to 80 MHz	T8 for up to 4 unscreened balanced wire pairs with 2 adapter sets, Ethernet 10BaseT, 100BaseT, 1000BaseT and others	AE: D-sub/RJxx, EUT: D-sub/RJxx, with ADR T811, T800	■				2 4 6 8	0.4	63	15	100 MHz

*) Line to ground voltage, in brackets line to line voltage

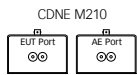
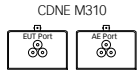
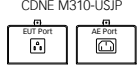
COUPLING DECOUPLING NETWORK FOR EMISSION MEASUREMENT (CDNE)



CISPR 16-2-1's most recent edition 3.0 specifies a new test method which allows the use of a coupling/decoupling network for emission measurement (CDNE) to measure disturbance voltages in the 30 to 300 MHz frequency range. This method enables EUTs to be connected directly to the CDNE, allowing a single conducted emission measurement to replace a lengthy radiated emission test. Product standards may use this fast, convenient and economical alternative.

CISPR 15 offers an independent method for measurement of radio disturbance characteristics of electrical lighting equipment. This method specifies the use of a coupling/decoupling network (CDN) as defined in IEC 61000-4-6 with an extended frequency range 30 to 300 MHz. Using a CDNE as described in CISPR 16-1-2 instead of CDN offers improved measurement reproducibility due to standard's requirements for more restrictive limits of asymmetrical impedance, phase angle, symmetrical impedance and internal attenuation.

The Teseq CDNEs are compliant with the actual versions of CISPR 16-1-2, CISPR 16-2-1 and CISPR 15's CDN method.

	Drawing	Frequency range	CDN type and application	Connector type	Immunity testing	Emission testing CISPR 15	Emission testing draft CISPR 16-1-2	Number of lines	Max. EUT current in A	Max. EUT voltage in V for AC*	Transducer factor in dB	Internal attenuator
CDNE M210		30 MHz to 300 MHz	M2, L, N or DC	AE: banana EUT: banana	-	■	■	2	10	300 (520)	20	■
CDNE M310		30 MHz to 300 MHz	M3, L, N, PE	AE: banana EUT: banana	-	■	■	3	10	300 (520)	20	■
CDNE M310-USJP		30 MHz to 300 MHz	M3, L, N, PE	AE: IEC C14 EUT: NEMA 5-15	-	■	■	3	10	125 (125)	20	■

*) Line to ground voltage, in brackets line to line voltage







IMPEDANCE STABILIZATION NETWORK (ISN), ASYMMETRIC ARTIFICIAL NETWORK (AAN)

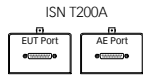
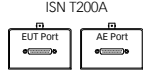
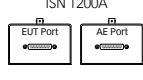
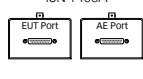
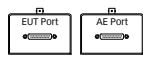
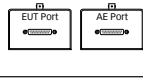
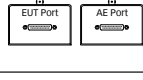



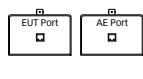


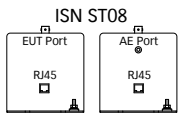
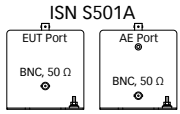
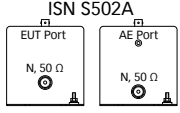
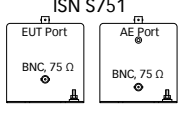
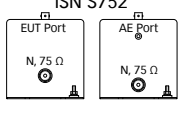
Impedance stabilization networks (ISN, or with CISPR 16-1-2 called AAN: asymmetric artificial network) are defined for measuring of conducted common mode disturbances at information technology equipment (ITE) as required in CISPR 22 and CISPR 32. The ISN is placed between the equipment under test (EUT) and auxiliary equipment (AE) or load which are necessary for the operation of the EUT. The ISN establishes the common-mode termination impedance for the EUT's telecommunication port during measurement and emulates the unsymmetrical contribution (longitudinal conversion loss, LCL) of the connected line. Different ISNs are available in relation to the line category, line numbers and pin-arrangement. The ISN must not affect the normal quality of the wanted symmetrical signal.

The CISPR 16-1-2 gives additional requirements and provides examples and measurements for the networks. The ITU-T recommendations G.117 and O.9 offers the background knowledge for measurements on symmetrical telecommunication lines.

Further the ISNs (with exception ISN T8) can be used as coupling/decoupling network as defined in IEC/EN 61000-4-6 „Immunity to conducted disturbances, induced by radio frequency fields“.

Cable type	Number of pairs	Example figures in CISPR 32	Measurement type	Product
Balanced unscreened	1 (2 wire) 2 (4 wire) 3 (6 wire) 4 (8 wire)	Figure G.1 to Figure G.3 Figure G.2 to Figure G.5 Figure G.3 Figure G.3 or Figure G.6 or Figure G.7	Voltage	ISN T 
Balanced unscreened	>4		Voltage and current	CVP, CSP 
Screened or coaxial	n/a	Figure G.8 Figure G.9 Figure G.10	Voltage	ISN S 
Screened or coaxial	n/a		Voltage or current	CVP, CSP 
Unbalanced	n/a		Voltage and current	CVP, CSP 
AC Mains	n/a	AMN CISPR 16-1-2:2003 Figure 4 and Figure 5	Voltage	NNB 

	Drawing	Frequency range	CDN type and application	Connector type	Immunity testing IEC/EN 61000-4-6	Emission testing CISPR 22/32	Regarding figure in CISPR 32	Number of lines	Changeable adapter wiring	LCL values	Max. EUT current in A (per wire)	Max. EUT voltage in V for AC/DC	Max. RF voltage in V	3 dB bandwidth (sinusoidal)
ISN T2A		150 kHz to 30 (80) MHz	T2 for 1 unscreened balanced pair with adapter ADS T246 and ADS T2X0	RJ11 RJ45 1 mm	■	■	G.2	2	■	55/40 65/50	0.6	63/ 100	15	100 MHz
ISN T216A		150 kHz to 30 (80) MHz	T2 for 1 unscreened balanced pair, UP0 with RJ11, with adapter ADS T216	RJ11	■	■	G.2	2		55/40 65/50	0.6	63/ 100	15	100 MHz
ISN T246A		150 kHz to 30 (80) MHz	T2 for 1 unscreened balanced pair, UP0 with RJ45, with adapter ADS T246	RJ45	■	■	G.2	2		55/40 65/50	0.6	63/ 100	15	100 MHz
ISN T4A		150 kHz to 30 (80) MHz	T4 for up to 2 unscreened balanced pairs, with adapter ADS T411, T442, T443, T444 and T4X0	RJ11 RJ45 1 mm	■	■	G.2	2 4	■	55/40 65/50	0.6	63/ 100	15	100 MHz
ISN T411A		150 kHz to 30 (80) MHz	T4 for up to 2 unscreened balanced pairs, German Telecom, US standard, with adapter ADS T411	RJ11	■	■	G.2	2 4		55/40 65/50	0.6	63/ 100	15	100 MHz
ISN T442A		150 kHz to 30 (80) MHz	T4 for up to 2 unscreened balanced pairs, ISDN basic rate access S0, with adapter ADS T442	RJ45	■	■	G.2	2 4		55/40 65/50	0.6	63/ 100	15	100 MHz
ISN T443A		150 kHz to 30 (80) MHz	T4 for up to 2 unscreened balanced pairs, ISDN primary rate access (2Mbps), with ADS T443	RJ45	■	■	G.2	2 4		55/40 65/50	0.6	63/ 100	15	100 MHz
ISN T444A		150 kHz to 30 (80) MHz	T4 for up to 2 unscreened balanced pairs, Ethernet 10BaseT, 100BaseT, with adapter ADS T444	RJ45	■	■	G.2	2 4		55/40 65/50	0.6	63/ 100	15	100 MHz
ISN T4X0A		150 kHz to 30 (80) MHz	T4 for up to 2 unscreened balanced pairs, with changeable adapter ADS T4X0	RJ11 RJ45 1 mm	■	■	G.2	2 4	■	55/40 65/50	0.6	63/ 100	15	100 MHz
ISN T8		150 kHz to 30 MHz	T8 for up to 4 unscreened balanced pairs, Ethernet 10BaseT, 100BaseT, 1000 BaseT and others, with adapter ADS T800 and T8X0	RJ11 RJ45 1 mm		■	G.3	2 4 6 8	■	55/40 65/50	0.6	63/ 100		100 MHz
ISN T8-Cat6		150 kHz to 30 (80) MHz	T8 for up to 4 unscreened balanced pairs, Ethernet 10BaseT, 100BaseT, 1000 BaseT and others	RJ45	■	■	G.3	2 4 6 8		75/60	0.6	63/ 100	15	250 MHz

Drawing	Frequency range	CDN type and application	Connector type	Immunity testing IEC/EN 61000-4-6	Emission testing CISPR 22/32	Regarding figure in CISPR 32	Number of lines	Changeable adapter wiring	LCL values	Max. EUT current in A (per wire)	Max. EUT voltage in V for AC/DC	Max. RF voltage in V	3 dB bandwidth (sinusoidal)
ISN ST08 	150 kHz to 230 MHz	For screened and balanced telecommunication lines, Ethernet 10BaseT, 100BaseT, 1000BaseT, 10GBaseT and others	RJ45	■	■	G.11	8			1.2	100	20	250 MHz
ISN S501A 	150 kHz to 230 MHz	For coaxial telecommunication lines with 50 Ω	BNC	■	■	G.9	1			0.25	250	20	2 GHz
ISN S502A 	150 kHz to 230 MHz	For coaxial telecommunication lines with 50 Ω, double screened	N	■	■	G.9	1			0.25	250	20	2 GHz
ISN S751 	150 kHz to 230 MHz	For coaxial telecommunication lines with 75 Ω	BNC	■	■	G.9	1			0.25	250	20	2 GHz
ISN S752 	150 kHz to 230 MHz	For coaxial telecommunication lines with 75 Ω, double screened	N	■	■	G.9	1			0.25	250	20	2 GHz

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