

Standartlar ve Boyutlar *Specifications and Sizes*

Dönüşüm Tabloları / *Conversion Tables*

KABLolar / *CABLES AND WIRES*

Amerikan Kablo Ölçüleri Dönüşüm Tablosu / *Conversion Table of American Wire Sizes*

AWG #	Circ.Mils.	A=mm ²	AWG #	Circ.Mils.	A=mm ²
26	234 - 300	0.12 - 0.15	4	38900 - 49100	19.71 - 24.88
24	315 - 477	0.16 - 0.24	2	60100 - 66800	30.45 - 33.85
22	600 - 750	0.30 - 0.38	1	75800 - 84000	38.41 - 42.56
20	100 - 1200	0.51 - 0.61	1/0	99100 - 105800	50.21 - 53.61
18	1600 - 1900	0.81 - 0.96	2/0	124900 - 133800	63.29 - 67.80
16	2400 - 2830	1.22 - 1.43	3/0	157600 - 168000	79.86 - 85.12
14	3830 - 4500	1.94 - 2.28	4/0	198700 - 212200	100.68 - 107.52
12	6100 - 6700	3.09 - 3.40	250-300 MCM	250000 - 300000	117 - 151.0
10	9000 - 13100	4.56 - 6.64	300-350 MCM	300000 - 350000	151 - 192.0
8	13200 - 16900	6.69 - 8.56	400 MCM	400000 -	205 -
6	22800 - 30900	11.55 - 11.55	500-600 MCM	500000 - 600000	252 - 304

AWG = American Wire Gauge / Amerikan kablo teli ölçüsü
 Circular Mil Area (CMA): Area of a circle of 1 Mil diameter
 1x1 = 1 Circ. Mil. (1 Mil. = 0.001 inch = 0.0254 mm)
 1 Circle Mil. = 0.0005066 mm² inch = 0.0254 mm²
 1 mm² = 1973.51 Circ. Mils.

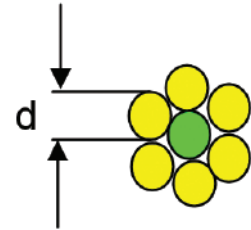
Kablo kesit formülü:

A = Kablo Kesiti mm²
 n = Kablo tel sayısı

Formula to determine the wire cross-section area:

A = Wire cross-section area (mm²)
 n = Number of strands

$$A = \frac{\pi \cdot d^2}{4} \times n$$



CIVATALAR / *BOLTS*

	DIN		USA		British Assoc
Standart Civata Tablosu <i>Standard Bolts Table</i>	M 2	1 =	1,9 mm	9 BA =	1,9 mm 1,9 mm
		2 =	2,2 mm	8 BA =	2,2 mm 2,2 mm
	M 2.6	3 =	2,5 mm	7 BA =	2,5 mm 2,5 mm
	M 3	4 =	2,8 mm	6 BA =	2,8 mm 2,8 mm
		5 =	3,2 mm	5 BA =	3,2 mm 3,2 mm
	M 3.5	6 =	3,5 mm	4 BA =	3,5 mm 3,5 mm
	M 4	8 =	4,2 mm	3 BA =	4,2 mm 4,2 mm
	M 5	10 =	4,8 mm	2 BA =	4,8 mm 4,8 mm
		12 =	5,5 mm	1 BA =	5,5 mm 5,5 mm
	M 6	14 =	6,1 mm	0 BA =	6,1 mm 6,1 mm
		1/4" =	6,35 mm	1/4" =	6,35 mm 6,35 mm
	M 8	5/16" =	7,9 mm	5/16" =	7,9 mm 7,9 mm
	M 10	3/8" =	9,5 mm	3/8" =	9,5 mm 9,5 mm
	M 12	7/16" =	11,1 mm	7/16" =	11,1 mm 11,1 mm
		1/2" =	12,7 mm	1/2" =	12,7 mm 12,7 mm
	M 16	5/8" =	15,8 mm	5/8" =	15,8 mm 15,8 mm
M 20	3/4" =	19,0 mm	3/4" =	19,0 mm 19,0 mm	
M 26	1" =	25,4 mm	1" =	25,4 mm 25,4 mm	



Kablo Boyutları

Kalın Yalıtımlı Kablo Boyutları

İletken												Yalıtım Kalınlığı (mm)		Kablo Dış Çapı (mm)	
Anma Kesit Alanı	Tellerin Yaklaşık Sayısı		Tek Tel Çapı (mm)		İletkenin Çapı (mm)		20 °C de iletkenin maksimum direnci (mΩ/m)								
mm ²	Adet	Tolerans	Min.	Max.	Min.	Max.	Cu	Cu (Sn Kaplamalı)	Anma	En Küçük*	Min.	Max.			
0.5	16	±1	0.18	0.21	0.90	1.10	37.10	38.20	0.60	0.44	1.80	2.30			
0.75	24	±1			1.10	1.30	24.70	25.40			2.00	2.50			
1	32	±2			1.30	1.50	18.50	19.10			2.20	2.70			
1.5	30	±2	0.23	0.26	1.60	1.80	12.70	13.00	0.70	0.53	2.50	3.00			
2.5	50	±2			2.00	2.20	7.60	7.82			3.10	3.60			
4	56	±2	0.28	0.31	2.60	2.80	4.71	4.85	0.80	0.62	3.90	4.40			
6	84	±2			3.20	3.40	3.14	3.23			4.50	5.00			
10	80	±2	0.38	0.41	4.30	4.50	1.82	1.85	1.00	0.80	5.90	6.50			
16	126	±3			6.10	6.30	1.16	1.18			7.70	8.30			
25	196	±3			7.60	7.80	0.743	0.757			9.80	10.40			
35	276	±3			8.80	9.00	0.527	0.538			11.00	11.60			
50	396	±3			10.30	10.50	0.368	0.375			12.80	13.50			
70	360	±3	0.48	0.51	12.20	12.50	0.259	0.264	1.50	1.25	14.70	15.50			
95	475	±4			14.50	14.80	0.196	0.200			17.20	18.00			
120	608	±4			16.20	16.50	0.153	0.156			18.90	19.70			

(*) En küçük yalıtım kalınlığı=Anma yalıtım kal.-0.10 mm-Anma yalıtım kalınlığı x 0.10

İnce Yalıtımlı Kablo Boyutları

İletken														Yalıtım Kalınlığı (mm)		Kablo Dış Çapı (mm)		
Anma Kesit Alanı	Yapılış 1			Yapılış 2				İletkenin Çapı (mm)		20° C de iletkenin maksimum direnci mΩ/m								
	mm ²	Adet	Tolerans	Min.	Max.	Adet	Tolerans	Min.	Max.	Min.	Max.	Cu	Cu (Sn Kaplamalı)	Anma	En Küçük*	Min.	Max.	
0.22	7	±1	0.18	0.21	-	-	-	-	0.6	0.70	84.80	86.50	0.30	0.24	1.1	1.3		
0.35	12	±1			7	±1	0.23	0.26	0.75	0.90	54.40	55.50			1.3	1.5		
0.50	16	±1			19	±1	0.29	0.32	0.90	1.10	37.10	38.20	0.35	0.28	1.5	1.9		
0.75	24	±1					0.16	0.19	1.10	1.30	24.70	25.40			1.7	2.1		
1	32	±2					0.23	0.26	1.30	1.50	18.50	19.10			1.9	2.3		
1.5	30	±2					0.23	0.26	0.29	0.32	1.60	1.80			12.70	13.00	2.2	2.6
2	28	±2					0.28	0.31	0.34	0.37	1.80	2.00			9.42	9.69	2.4	2.8
2.5	50	±2			0.23	0.26	0.38	0.41	2.00	2.20	7.60	7.82	2.6	3.0				
3	44	±2			0.28	0.31	37	±2	0.43	0.46	2.20	2.40	6.00	6.17	0.40	0.32	2.9	3.4
4	56	±2							0.29	0.32	0.34	0.37	2.60	2.80			4.71	4.85
5	70	±2	0.39	0.41			2.90	3.10	3.94	4.02	0.45	0.36	3.6	4.2				
6	84	±2	0.42	0.45			3.20	3.40	3.14	3.23			3.9	4.5				
10	80	±2	-	-			-	-	4.30	4.50			1.82	1.85	0.60	0.48	5.3	6.0
16	126	±3	0.38	0.41	-	-	-	-	6.10	6.30	1.16	1.18	0.65	0.52	7.1	7.9		
25	196	±3			-	-	-	-	7.60	7.80	0.743	0.757			8.6	9.4		

(*) En küçük yalıtım kalınlığı = Anma yalıtım kalınlığı x 0.80

TSE 1435 Taşıt Kabloları Standardına Göre (Applicable only for Turkey)



Cable Sizes

Cable Dimensions with Thick Insulator

Conductor									Insulator Thickness (mm)		Cable Outer Diameter (mm)	
Wire Cross Section Area	Number of Wire		Single Wire Diameter (mm)		Conductor Diameter (mm)		Maximum Resistance of the Conductor at 20 °C (mΩ/m)					
mm ²	Piece	Tolerance	Min.	Max.	Min.	Max.	Unplated Cu	Cu (Sn plated)	Nominal	Min*	Min.	Max.
0.5	16	±1	0.18	0.21	0.90	1.10	37.10	38.20	0.60	0.44	1.80	2.30
0.75	24	±1			1.10	1.30	24.70	25.40			2.00	2.50
1	32	±2			1.30	1.50	18.50	19.10			2.20	2.70
1.5	30	±2	0.23	0.26	1.60	1.80	12.70	13.00	0.70	0.53	2.50	3.00
2.5	50	±2			2.00	2.20	7.60	7.82			3.10	3.60
4	56	±2	0.28	0.31	2.60	2.80	4.71	4.85	0.80	0.62	3.90	4.40
6	84	±2			3.20	3.40	3.14	3.23			4.50	5.00
10	80	±2	0.38	0.41	4.30	4.50	1.82	1.85	1.00	0.80	5.90	6.50
16	126	±3			6.10	6.30	1.16	1.18			7.70	8.30
25	196	±3			7.60	7.80	0.743	0.757	1.30	1.07	9.80	10.40
35	276	±3			8.80	9.00	0.527	0.538			11.00	11.60
50	396	±3			10.30	10.50	0.368	0.375			12.80	13.50
70	360	±3	0.48	0.51	12.20	12.50	0.259	0.264	1.50	1.25	14.70	15.50
95	475	±4			14.50	14.80	0.196	0.200			17.20	18.00
120	608	±4			16.20	16.50	0.153	0.156	18.90	19.70		

(*) The minimum insulator thickness= (Nominal insulator thickness -0.10 mm) - (Nominal insulator thickness x 0.10 mm)

Cable Dimensions with Thin Insulator

Conductor													Insulator Thickness (mm)		Cable Outer Diameter (mm)			
Wire Cross Section Area	Type 1				Type 2				Conductor Diameter (mm)		Maximum Resistance of the Conductor at 20 °C (mΩ/m)							
	Number of Wire		Single Wire Diameter (mm)		Number of Wire		Single Wire Diameter (mm)											
mm ²	Pieces	Tolerance	Min.	Max.	Pieces	Tolerance	Min.	Max.	Min.	Max.	Unplated Cu	Cu (Sn Plated)	Nominal	Min*	Min.	Max.		
0.22	7	±1	0.18	0.21	-	-	-	-	0.6	0.70	84.80	86.50	0.30	0.24	1.1	1.3		
0.35	12	±1			7	±1	0.23	0.26	0.75	0.90	54.40	55.50			1.3	1.5		
0.50	16	±1			0.23	0.26	19	±1	0.29	0.32	0.90	1.10	37.10	38.20	0.35	0.28	1.5	1.9
0.75	24	±1	0.20	0.23					1.10	1.30	24.70	25.40	1.7	2.1				
1	32	±2	0.23	0.26					1.30	1.50	18.50	19.10	1.9	2.3				
1.5	30	±2	0.28	0.31					0.29	0.32	1.60	1.80	12.70	13.00			2.2	2.6
2	28	±2	0.34	0.37					1.80	2.00	9.42	9.69	2.4	2.8				
2.5	50	±2	0.38	0.41					2.00	2.20	7.60	7.82	2.6	3.0				
3	44	±2	0.43	0.46					2.20	2.40	6.00	6.17	0.40	0.32			2.9	3.4
4	56	±2	0.28	0.31	37	±2	0.29	0.32	2.60	2.80	4.71	4.85			3.3	3.8		
5	70	±2					0.34	0.37	2.90	3.10	3.94	4.02	0.45	0.36	3.6	4.2		
6	84	±2					0.39	0.41	3.20	3.40	3.14	3.23			3.9	4.5		
10	80	±2					0.38	0.41	-	-	-	-	4.30	4.50	1.82	1.85	0.60	0.48
16	126	±3	-	-	-	-			-	6.10	6.30	1.16	1.18	0.65	0.52	7.1	7.9	
25	196	±3	-	-	-	-			-	7.60	7.80	0.743	0.757	8.6	9.4			

(*) The minimum insulator thickness = Nominal insulator thickness x 0.80

According to TSE 1435 Vehicle Cable Standards (Applicable only for Turkey)

Fiziksel Özellikler

Takma - Çekme Kuvveti

CuZn-CuSn Malzemelerden üretilmiş standart dişi terminaller için (TSE EN 61210)

Anma Ölçüsü	Takma Kuvveti (Tek Takış)	
	Çekme Kuvveti	
	Kaplamasız N (max.)	Kaplamalı N (min.)
2,8	53	5
4,8	67	9
6,3	80	18
9,5	100	20

Akım Yüklenebilirlik Değerleri (*)

2.8 Dişi Terminaller

Malzeme/ Kaplama	Kablo Kesit (mm ²)	Max. Akım (A)	Çevresel Sıcaklık (°C)
CuZn	0,5	8	60
	0,75		65
	1		70
CuZn/Sn	0,5		80
	0,75		85
	1		90
CuSn	0,5		50
	0,75		60
	1		65
CuSn/Sn	0,5		70
	0,75		80
	1		90

4.8 Dişi Terminaller

Malzeme/ Kaplama	Kablo Kesit (mm ²)	Max. Akım (A)	Çevresel Sıcaklık (°C)
CuZn	0,5	12	35
	0,75	15	25
	1	16	30
	1,5	16	40
	2,5	16	45
CuZn/Sn	0,5	12	55
	0,75	15	50
	1	16	50
	1,5	16	60
	2,5	16	65
CuSn	0,5	8	60
	0,75	10	50
	1	12	45
	1,5	16	45
	2,5	20	40
CuSn/Sn	0,5	8	95
	0,75	10	90
	1	12	85
	1,5	16	80
	2,5	20	80

6.3 Dişi Terminaller

Malzeme/ Kaplama	Kablo Kesit (mm ²)	Max. Akım (A)	Çevresel Sıcaklık (°C)
CuZn	0,5	10	50
	0,75	16	20
	1	18	20
	1,5	22	20
	2,5	26	25
	4	29	28
	6	32	38
CuZn/Sn	0,5	10	75
	0,75	16	40
	1	18	40
	1,5	22	40
	2,5	26	45
	4	29	50
	6	32	60

9.5 Dişi Terminaller

Malzeme/ Kaplama	Kablo Kesit (mm ²)	Max. Akım (A)	Çevresel Sıcaklık (°C)
CuZn	4	32	35
	6	32	50
CuSn	4	32	65
	6	32	80

(*) According to DIN 46249 Teil 1.

Physical Specifications

Insertion - Extraction Force

For standard receptacles made of CuZn-CuSn (TS EN 61210)

Nominal Value	Insertion Force (only one Insertion)	
	Extraction Force	
	Unplated N (max.)	Plated N (min.)
2,8	53	5
4,8	67	9
6,3	80	18
9,5	100	20

Current carrying capacity ()*

2.8 Receptacles

Material/ Plating	Wire Size (mm ²)	Max. Current (A)	Ambient Temp. (°C)
CuZn	0,5	8	60
	0,75		65
	1		70
CuZn/Sn	0,5		80
	0,75		85
	1		90
CuSn	0,5		50
	0,75		60
	1		65
CuSn/Sn	0,5		70
	0,75		80
	1		90

6.3 Receptacles

Material Plating	Wire Size (mm ²)	Max. Current (A)	Ambient Temp. (°C)
CuZn	0,5	10	50
	0,75	16	20
	1	18	20
	1,5	22	20
	2,5	26	25
	4	29	28
CuZn/Sn	0,5	10	75
	0,75	16	40
	1	18	40
	1,5	22	40
	2,5	26	45
	4	29	50
	6	32	60

4.8 Receptacles

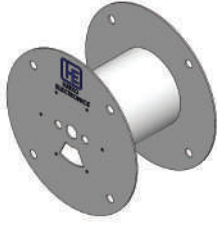
Material Plating	Wire Size (mm ²)	Max. Current (A)	Ambient Temp. (°C)
CuZn	0,5	12	35
	0,75	15	25
	1	16	30
	1,5	16	40
CuZn/Sn	2,5	16	45
	0,5	12	55
	0,75	15	50
	1	16	50
CuSn	1,5	16	60
	2,5	16	65
	0,5	8	60
	0,75	10	50
CuSn/Sn	1	12	45
	1,5	16	45
	2,5	20	40
	0,5	8	95
CuSn/Sn	0,75	10	90
	1	12	85
	1,5	16	80
	2,5	20	80

9.5 Receptacles

Material Plating	Wire Size (mm ²)	Max. Current (A)	Ambient Temp. (°C)
CuZn	4	32	35
	6	32	50
CuSn	4	32	65
	6	32	80

(*) According to DIN 46249 Teil 1.

Makaralar / Reels



MK01

Makara/Reel Ø290 mm



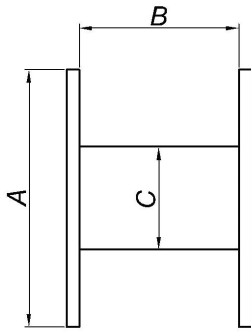
MK02

Makara/Reel Ø600 mm



MK03

Makara/Reel Ø295 mm



STANDART MAKARA TİPLERİ / STANDARD REEL TYPES				
	MK01-00	MK02-00	MK02-01	MK03-00
A	Ø290 mm	Ø600 mm	Ø600 mm	Ø290 mm
B	180 mm	30 mm	35 mm	180 mm
C	Ø135 mm	Ø135 mm	Ø135 mm	Ø120 mm

Ürün Tanımı Product Description	Standart M Tipi / Standart R Type
SF1/2D (2.8) SERİSİ SERİSİ	MK01-00
SF1/2DT (2.8) SERİSİ	MK01-00
SF1D MINI (4.8) SERİSİ	MK01-00
SF2D MINI (4.8) SERİSİ	MK01-00
SF23D MINI (4.8) SERİSİ	MK01-00
SF1D (6.3) SERİSİ	MK01-00
SF2D (6.3) SERİSİ	MK01-00
SF21D (6.3) SERİSİ	MK02-00
SF23D (6.3) SERİSİ	MK01-00
SF31D (6.3) SERİSİ	MK01-00
SF33D (6.3) SERİSİ	MK01-00
SF38D (6.3) SERİSİ	MK01-00
SF38D-T (6.3) SERİSİ	MK01-00
SF49D (6.3) SERİSİ	MK02-00
SF3D (9.5) SERİSİ	MK01-00
SF3DT (9.5) SERİSİ	MK01-00

Ürün Tanımı Product Description	Standart M Tipi / Standart R Type
SF1DE MINI (A) SERİSİ SERİSİ	MK02-00
SF1DE (6.3) SERİSİ SERİSİ	MK02-00
SF19D MINI (4.8) SERİSİ	MK01-00
SF1D MİNİ EGRI (4.8) SERİSİ	MK01-00
SF1D EGRI (6.3) SERİSİ	MK01-00
SF2D EGRI (6.3) SERİSİ	MK01-00
SF16D (6.3)	MK01-00
SF19D (6.3) SERİSİ	MK01-00
SF32D (6.3) SERİSİ	MK01-00
SF2,5D EGRI TIR (7.7) SERİSİ	MK01-00
SF36D SERİSİ (2.8) SERİSİ	MK01-00
LIF1D-V1 MİNİ EGRI (4.8) SERİSİ	MK01-00
LIF1D V1-(6.3) SERİSİ	MK01-00
LIF1DT V1-(6.3) SERİSİ	MK01-00
LIF1D EGRI (6.3) SERİSİ	MK01-00
PiM TERMİNAL	MK01-00

Makaralar / Reels

Ürün Tanımı Product Description	Standart M Tipi / Standart R Type
EKOTER2	MK01-00
TVT1	MK02-00
TVT2	MK02-00
TVT3	MK02-00
TVT4	MK02-00
SF29D-V SERİSİ	MK02-00
FAR TERMINAL SERİSİ	MK02-00
KT01E (2.8) SERİSİ	MK01-00
KT01D SERİSİ	MK01-00
SF40D (4.8) SERİSİ	MK01-00
SF41D SERİSİ	MK02-00
SF42D SERİSİ	MK02-00
SF43D SERİSİ	MK02-00
SF45D SERİSİ	MK02-00
SF46D SERİSİ	MK02-00
SF47D SERİSİ	MK02-00
SF48D SERİSİ	MK02-00
HAT-MATE D1	MK01-00
HAT-MATE E1	MK02-00
SF22D SERİSİ	MK02-00
SF25D	MK01-00
SF26D	MK01-00
SF4D	MK01-00
SF4DO	MK01-00
SF17D SERİSİ	MK02-00
SF18D	MK01-00
SF4DK-L SERİSİ	MK01-00
SF28D SERİSİ	MK01-00
AR KLEMENS TER.	MK02-01
SF22E SERİSİ	MK02-00
SF4EK-L SERİSİ	MK01-00
SF4E	MK01-00
SF4EO	MK01-00
SKN1 SERİSİ	MK01-00
SKN2 SERİSİ	MK01-00
SKN2,5 SERİSİ	MK01-00

Ürün Tanımı Product Description	Standart M Tipi / Standart R Type
SKN2,5 VIB SERİSİ	MK01-00
SKN4 SERİSİ	MK01-00
SKN4-YT SERİSİ	MK01-00
SKN5 SERİSİ	MK01-00
SKN6 SERİSİ	MK01-00
SKN6K SERİSİ	MK01-00
SKN10 SERİSİ	MK01-00
SW4 SERİSİ	MK01-00
SW5 SERİSİ	MK01-00
SM5 SERİSİ	MK01-00
SKNC2 SERİSİ	MK01-00
SKNC7	MK01-00
SM5C	MK01-00
SK1	MK01-00
SK3	MK01-00
SK5	MK01-00
SK7 SERİSİ	MK01-00
SK8	MK01-00
SK9	MK02-00
STK1	MK01-00
STK2	MK01-00
STK3 SERİSİ	MK01-00
STK4 SERİSİ	MK01-00
STK5-K	MK01-00
STK6	MK01-00
STK7	MK01-00
STK7-B	MK01-00
STK8	MK01-00
STK9	MK01-00
STK10	MK01-00
STK11	MK01-00
SF2EU2 (1.5) SERİSİ	MK02-01
SF1/2EU-A2 (2.8) SERİSİ	MK02-01
SF1EU2 (6.0) SERİSİ	MK01-00
SF1EU1KM (6.3) SERİSİ	MK01-00
SF1EÇK (6.3) SERİSİ	MK01-00