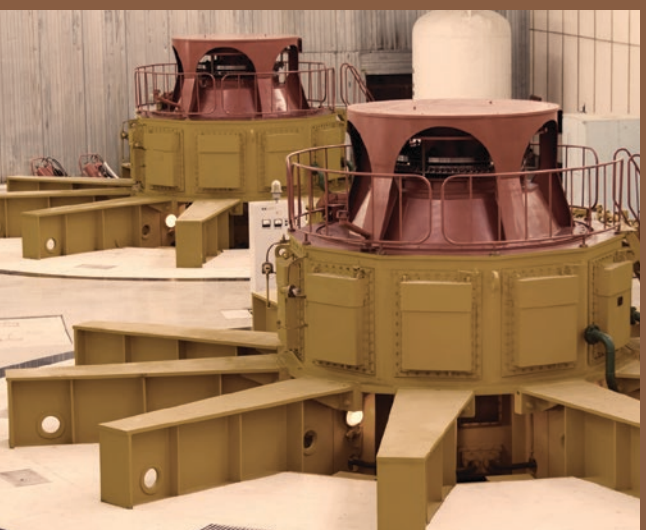
Exel International

ABSOLUTE SYNERGY

CATALOG

ABSOLUTE SYNERGY



Exel International

ABSOLUTE SYNERGY

MISSION STATEMENT

Exel is committed to making a difference in the global energy industry by constantly improving its product line and services and maintaining high quality standards, with the ultimate goal of exceeding customer expectations.

VISION

Exel strongly believes that the synergy of all aspects of our business is vital for worldwide success. The company aims to achieve excellence through teamwork, with the goal of becoming a world leader in its field and a business recognized by peers.

VALUES

COMMITMENT • RESPECT • INTEGRITY • CREATIVITY

Version 2.0 / Updated April 2016

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IMPORTANT INFORMATIONS

All dimensions in the catalog are in inches. Metric sizes are also available.

FLEXIBLE BRAIDED CONNECTORS

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FLEXIBLE BRAIDED CONNECTORS

RoHS COMPLIANT

For large or small quantities, Exel is equipped to meet the various requirements of its customers. Manufactured from top-quality materials using proven processes and exclusive, advanced numerically controlled equipment designed in house, Exel's flexible braided connectors display the highest levels of quality and performance.

APPLICATIONS

For low and medium voltage applications, flexible braided connectors are used mainly in the energy industry for wind turbines, generators, substations, transformers, switchgear, hydro turbines, circuit breakers and rectifiers. They are also used in the automotive, aerospace, information technologies and military sectors.

Flexible braided connectors are mainly used in the following situations:

- Heavy mechanical vibrations
- Thermal contraction and/or expansion of attached units
- Space constraints

SPECIFICATIONS

FERRULES

- Seamless copper tube, C11000 ETP as per to ASTM B188
- Seamless copper tube, C12200 DHP as per to ASTM B75 or ASTM B88

FERRULE PLATING OPTIONS

- Electrolytic tin plating as per ASTM B545
- Electrolytic silver plating as per ASTM B700
- Electroless nickel plating as per ASTM B733
- Lead-free hot tin dip plating

The standard thickness plating on a ferrule is 0.0003" although it can reach 0.004", upon customer's request.

FLAT, ROUND OR TUBULAR BRAIDS

- Tin plated C11000 ETP copper as per ASTM B33
- Silver plated C11000 ETP copper as per ASTM B298
- Nickel plated C11000 ETP copper as per ASTM B335
- Bare C11000 ETP copper as per ASTM B3
- Stainless steel alloys 302, 304, 321 or 430
- Aluminum alloy 5056

The most commonly used wire gauges in the industry are 30 AWG (0.010") to 44 AWG (0.002").

DIMENSIONS

- Ferrule widths up to 10"
- Ferrule thicknesses up to 3"
- Total connector length up to 1200"
- Mounting holes as per NEMA standards

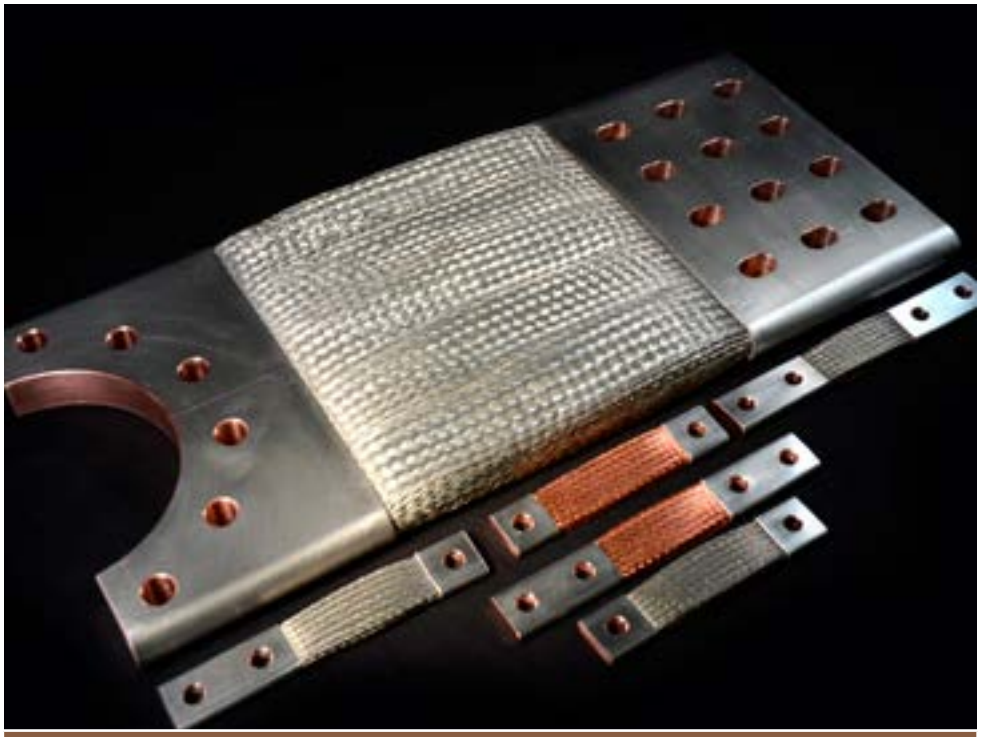
Custom sizes are also available.

CURRENT CAPACITY

- 100 Amperes to 7,500 Amperes

OPTIONS

- Insulation: Heat shrink PVC and polyolefin, ceramic heat shield and several other types of insulation materials are available.



FC001

FC002

FC003

FC004

FC005

FC006

FC007

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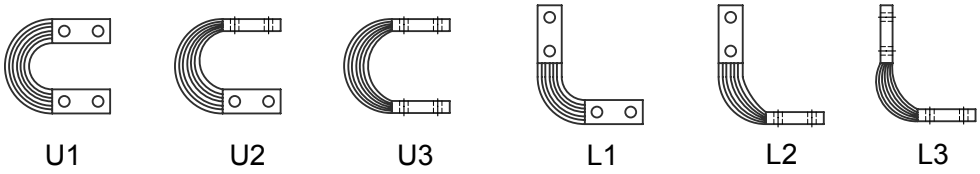
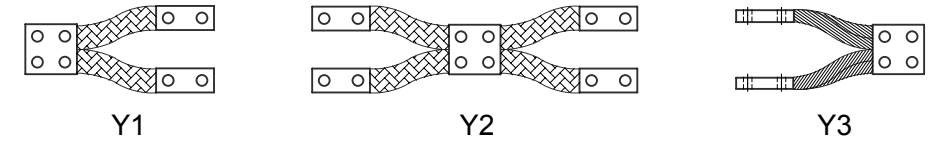
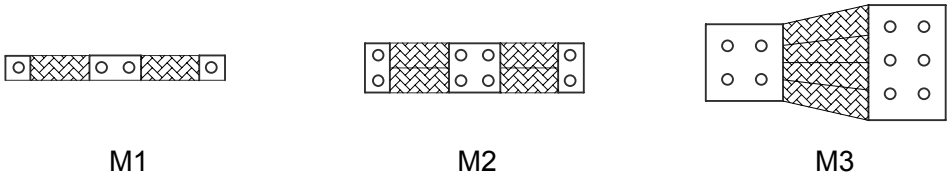
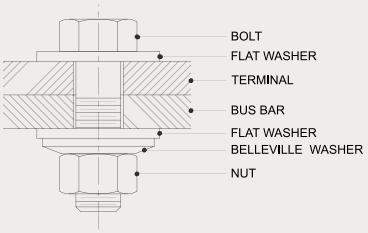
SPECIAL SHAPES AND CONFIGURATIONS







CUSTOM SHAPES ARE ALSO AVAILABLE



MOUNTING SUGGESTED METHOD

COPPER AND ALUMINIUM BUS BAR BOLTING TORQUES

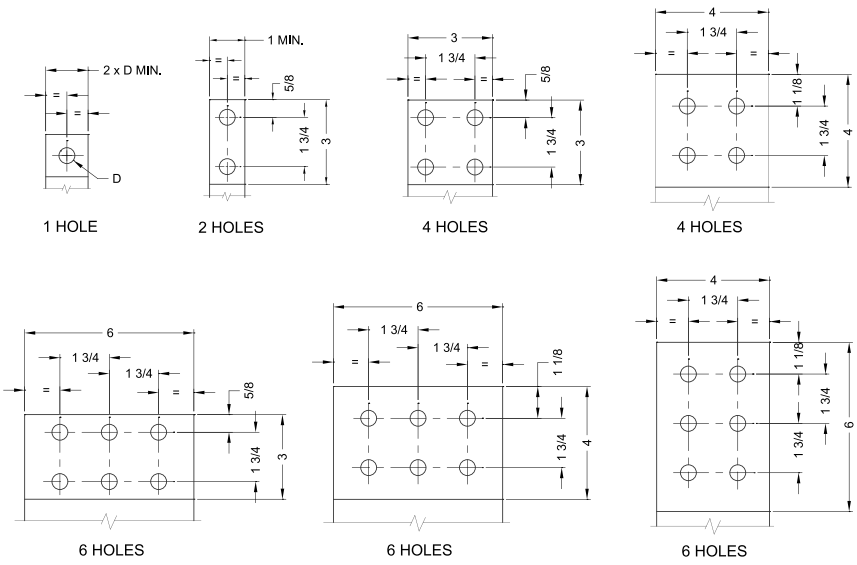
BOLT SIZE (UNC)	TERMINAL HOLE SIZE (IN)	FLAT WASHER 18-8 & 316 STAINLESS STEEL		RECOMMENDED BOLTING TORQUES			
				18-8 STAINLESS STEEL OR SILICON BRONZE		2024-T4 ALUMINIUM (LUBRICATED)	
		OUTSIDE DIAMETER (IN)	NOMINAL THICKNESS (IN)	FT-LBS	INCH-LBS	FT-LBS	INCH-LBS
5/16-18	3/8	0.750	0.050	15	180	10	120
3/8-16	7/16	0.875	0.050	20	240	14	168
1/2-13	9/16	1.250	0.062	40	480	25	300
5/8-11	11/16	1.500	0.078	55	660	40	480
3/4-10	13/16	1.875	0.109	80	960	60	840

WARNING

When copper and aluminium are exposed to air, prior to joining and bolting the conductor, it is necessary to proprely remove the oxide film and quickly apply a thin layer of the electrical contact compound on contact area.

Special care shall be taken for the joining of dissimilar materials due to the galvanic corrosion and differential thermal expansion. See galvanic corrosion table.

NEMA BOLT HOLES CONGIGURATIONS FOR TERMINAL CONNECTORS



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XB GROUNDING SERIES

FLEXIBLE BRAIDED CONNECTOR
FOR GOUNDING AND BONDING EQUIPEMENT STANDARD.
LISTED TO UL 467 & 468A, CERTIFIED TO CSA C22.2, NO 41

C SP US CLASSIFIED C UL US RoHS COMPLIANT

STANDARD FLEXIBLE BRAIDS
30 AWG individual wire - Copper C11000
tin plated as per ASTM B33.

STANDARD FERRULE
Seamless pur copper tube C12200
as per ASTM B75 & B88

Electro-Tin 0.0003" as per ASTM B545

OPTIONAL FERULLE FINISHED
Silver plating 0.0003" As per ASTM B700
Nickel plating 0.0003" As per ASTM B733
Bare copper finished

LENGTH (G) END TO END TOLERANCE
+0.125"/-0 For 6" to 11";
+0.250"/-0 For 12" to 24"

+0.500"/-0 For 25" to 48";
+1.000"/-0 For 49" to 99"

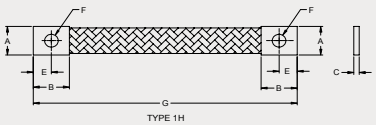
PART NUMBER EXAMPLE

Length (G)
6" to 99"

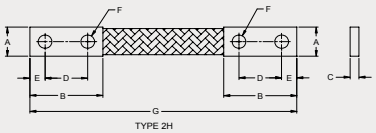
XB40A-XX-X

Serial

Plating
T = Tin
S = Silver
N = Nickel
U = Unplated



TYPE 1H



TYPE 2H

EXEL P/N	TYPE	NUMBER OF BRAIDS IN FERRULES	A FERRULE WIDTH +/-0.020	B FERRULE LENGTH +/-0.060	C FERRULE THICKNESS +/- 0.020	D HOLE DISTANCE +/-0.020	E HOLE END POSITION +/- 0.060	F HOLE DIAMETER +/-0.020	BRAIDS CROSS-SECTION		SHORT TIME TEST CURRENTS VS TIME				PULLOUT TEST (LBS)
											TEST VALUE		CALCULATION VALUE BY INTERPOLATION METHOD		
									CIRCULAR MILLS	mm²	9 sec	6 sec	3 sec	1 sec	
XB6-xx-x	1H	1	0.750	0.750	0.125	N/A	0.375	0.343	38400	19.5		1530A	2175A	3767A	100
XB4-xx-x	1H	1	1.000	1.250	0.150	N/A	0.625	0.438	48000	24.3		2450A	3466A	6004A	140
XB2-xx-x	1H	1	1.000	1.250	0.180	N/A	0.625	0.438	76800	38.9		3900A	5494A	9515A	180
XB2A-xx-x				2.500		1.250	0.625	0.438							
XB2B-xx-x				3.000		1.500	0.750	0.438							
XB2C-xx-x				3.000		1.750	0.625	0.563							
XB10-xx-x	1H	1	1.250	1.500	0.176	N/A	0.750	0.563	105600	53.5	5050A		8748A	15151A	250
XB10A-xx-x	2H			2.500		1.250	0.625	0.438							
XB10B-xx-x				3.000		1.500	0.750	0.438							
XB10C-xx-x				3.000		1.750	0.625	0.563							
XB20-xx-x	1H	2	1.250	1.500	0.220	N/A	0.750	0.563	153600	77.8	6400A		11020A	19088A	300
XB20A-xx-x	2H			2.500		1.250	0.625	0.438							
XB20B-xx-x				3.000		1.500	0.750	0.438							
XB20C-xx-x				3.000		1.750	0.625	0.563							
XB30-xx-x	1H	1	1.250	1.500	0.250	N/A	0.750	0.563	168000	85.1	8030A		13898A	24072A	350
XB30A-xx-x	2H			2.500		1.250	0.625	0.438							
XB30B-xx-x				3.000		1.500	0.750	0.438							
XB30C-xx-x				3.000		1.750	0.625	0.563							
XB40-xx-x	1H	2	1.250	1.500	0.290	N/A	0.750	0.563	211200	107.0	10100A		17495A	30302A	450
XB40A-xx-x	2H			2.500		1.250	0.625	0.438							
XB40B-xx-x				3.000		1.500	0.750	0.438							
XB40C-xx-x				3.000		1.750	0.625	0.563							
XB300-xx-x	1H	2	1.500	1.500	0.330	N/A	0.750	0.563	336000	170.3	14300A		24854A	43049A	550
XB300A-xx-x	2H			2.500		1.250	0.625	0.438							
XB300B-xx-x				3.000		1.500	0.750	0.438							
XB300C-xx-x				3.000		1.750	0.625	0.563							
XB350-xx-x	1H	3	1.500	1.500	0.352	N/A	0.750	0.563	374400	189.7	16700A		28997A	50224A	600
XB350A-xx-x	2H			2.500		1.250	0.625	0.438							
XB350B-xx-x				3.000		1.500	0.750	0.438							
XB350C-xx-x				3.000		1.750	0.625	0.563							
XB400A-xx-x	2H	2	1.500	2.750	0.450	1.250	0.625	0.438	460800	233.5	19100A		33139A	57399A	650
XB400B-xx-x				3.250		1.500	0.750	0.438							
XB400C-xx-x				3.250		1.750	0.625	0.563							
XB500A-xx-x	2H	3	1.500	2.750	0.480	1.250	0.625	0.438	504000	255.4	23900A		41424A	71749A	800
XB500B-xx-x				3.250		1.500	0.750	0.438							
XB500C-xx-x				3.250		1.750	0.625	0.563							
XB600A-xx-x	2H	2	1.625	2.750	0.500	1.250	0.625	0.438	614400	311.3	28700A		49709A	86099A	900
XB600B-xx-x				3.250		1.500	0.750	0.438							
XB600C-xx-x				3.250		1.750	0.625	0.563							
XB700A-xx-x	2H	3	1.625	2.750	0.580	1.250	0.625	0.438	756000	383.1	33500A		57994A	100448A	1000
XB700B-xx-x				3.250		1.500	0.750	0.438							
XB700C-xx-x				3.250		1.750	0.625	0.563							
XB900A-xx-x	2H	3	1.625	2.750	0.711	1.250	0.625	0.438	921600	467.0	43100A		74563A	129148A	1000
XB900B-xx-x				3.250		1.500	0.750	0.438							
XB900C-xx-x				3.250		1.750	0.625	0.563							

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X075 SERIES

FLEXIBLE BRAIDED CONNECTOR

RoHS COMPLIANT

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

STANDARD FLEXIBLE BRAIDS
30 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

X075A 12

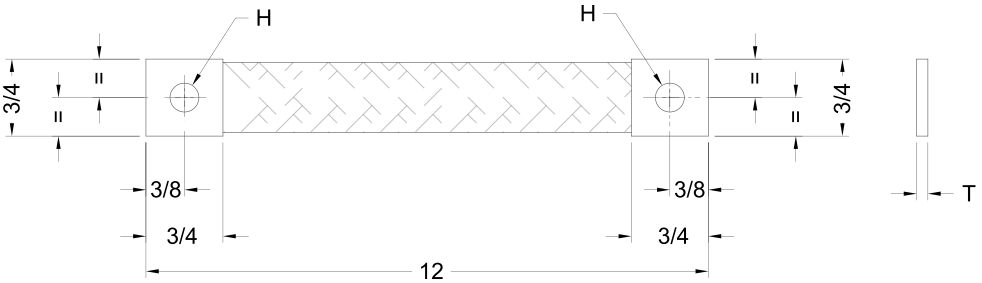
Standard length

CUSTOM PART NUMBER

X075A 16.50 - S3

Required length Plating

EXEL P/N	T	H	APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
				CROSS-SECTION mm^2	CROSS-SECTION in^2	CIRCULAR MIL	45°C RISE	65°C RISE
X075A12	0.125	0.343	0.15	19.5	0.030	38400	130	160
X075B12	0.209	0.343	0.30	38.9	0.060	76800	190	240
X075C12	0.250	0.343	0.42	58.4	0.090	115200	240	290



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XX075 SERIES

EXTRA FLEXIBLE BRAIDED CONNECTOR

RoHS COMPLIANT

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

EXTRA FLEXIBLE BRAIDS
36 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

XX075A 12

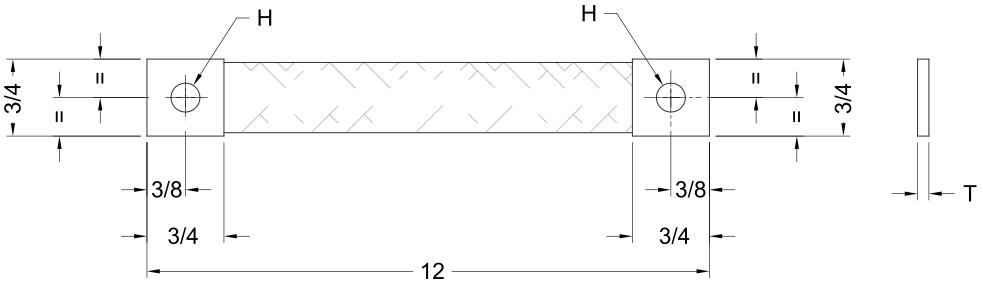
Standard length

CUSTOM PART NUMBER

XX075A 16.50 - S3

Required length Plating

EXEL P/N	T	H	APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
				CROSS-SECTION mm²	CROSS-SECTION in²	CIRCULAR MIL	45°C RISE	65°C RISE
XX075A12	0.125	0.343	0.16	20.4	0.032	40200	130	160
XX075B12	0.214	0.343	0.31	40.7	0.063	80400	200	240
XX075C12	0.250	0.343	0.41	61.1	0.095	120600	250	300



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X100 SERIES

FLEXIBLE BRAIDED CONNECTOR

RoHS COMPLIANT

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

STANDARD FLEXIBLE BRAIDS
30 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

EXEL P/N	T	H	APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
				CROSS-SECTION mm^2	CROSS-SECTION in^2	CIRCULAR MIL	45°C RISE	65°C RISE
X100A12	0.178	0.438	0.34	38.9	0.060	76800	210	250
X100B12	0.198	0.438	0.41	48.6	0.075	96000	230	290
X100C12	0.232	0.438	0.56	73.0	0.113	144000	290	360
X100D12	0.282	0.438	0.72	97.3	0.151	192000	340	420
X100E12	0.339	0.438	0.90	121.6	0.188	240000	390	470

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

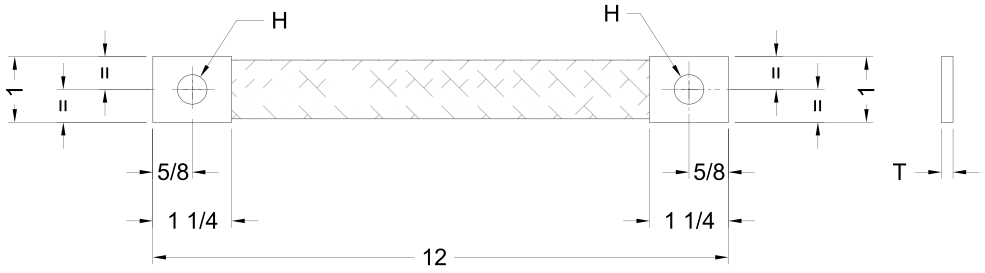
X100A 12

Standard length

CUSTOM PART NUMBER

X100A 16.50 - S3

Required length Plating



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XX100 SERIES

EXTRA FLEXIBLE BRAIDED CONNECTOR

RoHS COMPLIANT

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

EXTRA FLEXIBLE BRAIDS
36 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

XX100A 12

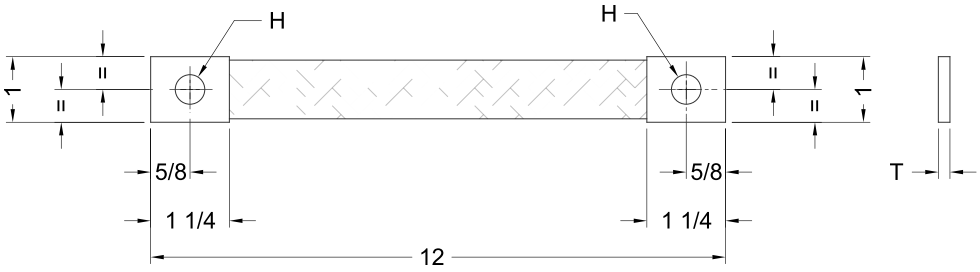
Standard length

CUSTOM PART NUMBER

XX100A 16.50 - S3

Required length | Plating

EXEL P/N	T	H	APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
				CROSS-SECTION mm^2	CROSS-SECTION in^2	CIRCULAR MIL	45°C RISE	65°C RISE
XX100A12	0.148	0.438	0.25	24.3	0.038	48000	160	200
XX100B12	0.198	0.438	0.41	48.6	0.075	96000	230	290
XX100C12	0.232	0.438	0.56	73.0	0.113	144000	290	360
XX100D12	0.282	0.438	0.72	97.3	0.151	192000	340	420
XX100E12	0.339	0.438	0.90	121.6	0.188	240000	390	470



Exel International
ABSOLUTE SYNERGY

X125 SERIES

FLEXIBLE BRAIDED CONNECTOR

RoHS COMPLIANT

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

STANDARD FLEXIBLE BRAIDS
30 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

EXEL P/N	T	H	APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
				CROSS-SECTION mm^2	CROSS-SECTION in^2	CIRCULAR MIL	45°C RISE	65°C RISE
X125A12	0.220	0.563	0.51	53.5	0.083	105600	270	330
X125B12	0.260	0.563	0.68	77.8	0.121	153600	320	400
X125C12	0.300	0.563	0.93	116.8	0.181	230400	400	490
X125D12	0.364	0.563	1.19	155.7	0.241	307200	420	560

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

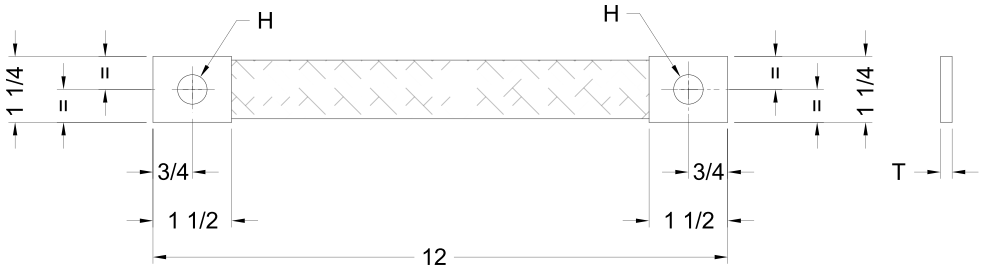
X125A 12

Standard length

CUSTOM PART NUMBER

X125A 16.50 - S3

Required length Plating



Exel International
ABSOLUTE SYNERGY

X126 SERIES

FLEXIBLE BRAIDED CONNECTOR

RoHS COMPLIANT

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

STANDARD FLEXIBLE BRAIDS
30 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

X125A 12

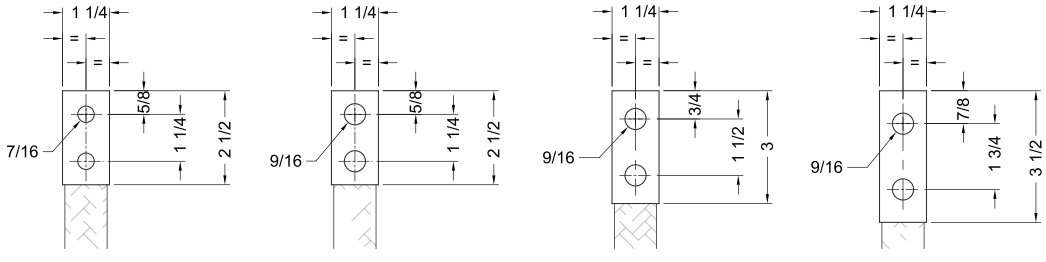
Standard length

CUSTOM PART NUMBER

X125A 16.50 AB - S3

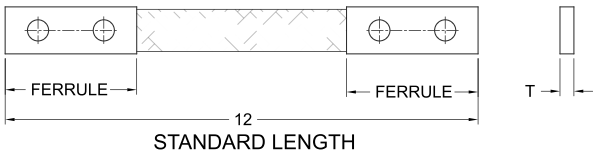
Required length | Ferrule configuration | Plating

EXEL P/N	FERRULE CONFIGURATION T	FERRULE CONFIGURATION TYPE	FERRULE CONFIGURATION TYPE	APPROX. WEIGHT (LBS)	BRAID DATA CROSS-SECTION mm²	BRAID DATA CROSS-SECTION in²	BRAID DATA CIRCULAR MIL	CURRENT RATING (A) 60 Hz Free-air 45°C RISE	CURRENT RATING (A) 60 Hz Free-air 65°C RISE
X126A12	0.220	D	D	0.67	53.5	0.083	105600	290	360
X126B12	0.260	D	D	0.84	77.8	0.121	153600	360	440
X126C12	0.300	D	D	1.09	116.8	0.181	230400	440	540
X126D12	0.364	D	D	1.35	155.7	0.241	307200	520	630
X126E12	0.453	D	D	1.71	194.6	0.302	384000	590	720
X126F12	0.478	D	D	1.87	233.5	0.362	460800	650	790
X126G12	0.541	D	D	2.13	272.4	0.422	537600	720	870
X126H12	0.647	D	D	2.53	311.3	0.483	614400	780	950



TYPE A TYPE B TYPE C TYPE D

FERRULE CONFIGURATION



STANDARD LENGTH

Exel International
ABSOLUTE SYNERGY

X150 SERIES

FLEXIBLE BRAIDED CONNECTOR

RoHS COMPLIANT

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

STANDARD FLEXIBLE BRAIDS
30 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

X150A 12

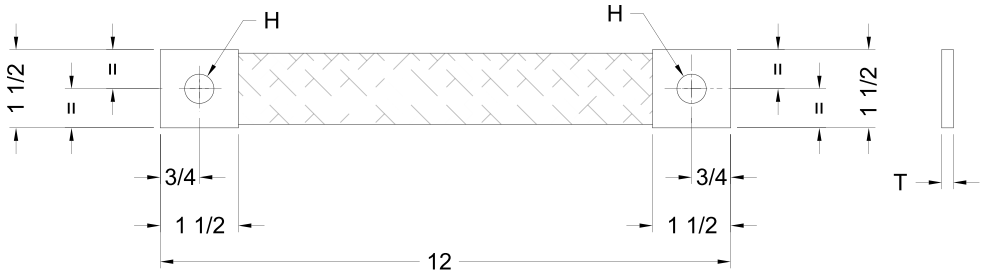
Standard length

CUSTOM PART NUMBER

X150A 16.50 - S3

Required length Plating

EXEL P/N	T	H	APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
				CROSS-SECTION mm^2	CROSS-SECTION in^2	CIRCULAR MIL	45°C RISE	65°C RISE
X150A12	0.171	0.563	0.52	53.5	0.083	105600	280	340
X150B12	0.242	0.563	0.87	107.0	0.166	211200	400	490
X150C12	0.313	0.563	1.22	160.5	0.249	316800	500	610
X150D12	0.438	0.563	1.65	214.0	0.332	422400	590	720
X150E12	0.500	0.563	2.00	267.6	0.415	528000	670	820
X150F12	0.563	0.563	2.36	321.1	0.498	633600	740	910



Exel International
ABSOLUTE SYNERGY

XX150 SERIES

EXTRA FLEXIBLE BRAIDED CONNECTOR

RoHS COMPLIANT

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

EXTRA FLEXIBLE BRAIDS
36 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

XX150A 12

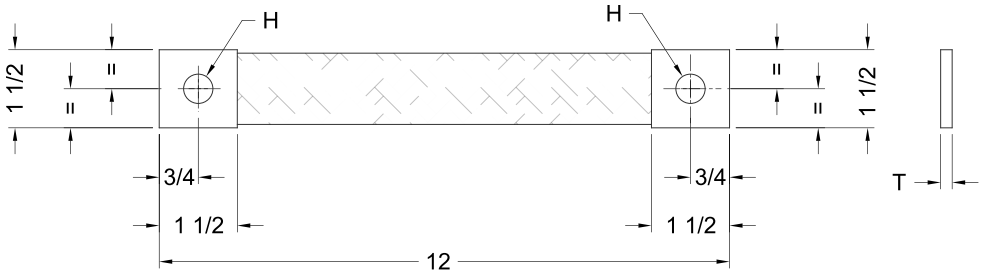
Standard length

CUSTOM PART NUMBER

XX150A 16.50 - S3

Required length | Plating

EXEL P/N	T	H	APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
				CROSS-SECTION mm^2	CROSS-SECTION in^2	CIRCULAR MIL	45°C RISE	65°C RISE
XX150A12	0.168	0.563	0.50	51.1	0.079	100800	270	330
XX150B12	0.236	0.563	0.84	102.2	0.158	201600	390	480
XX150C12	0.304	0.563	1.18	153.2	0.238	302400	490	600
XX150D12	0.375	0.563	1.51	204.3	0.317	403200	570	700
XX150E12	0.477	0.563	1.92	255.4	0.396	504000	650	800
XX150F12	0.546	0.563	2.26	306.5	0.475	604800	720	890



Exel International
ABSOLUTE SYNERGY

X151 SERIES

FLEXIBLE BRAIDED CONNECTOR

RoHS COMPLIANT

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

STANDARD FLEXIBLE BRAIDS
30 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

X151A 12

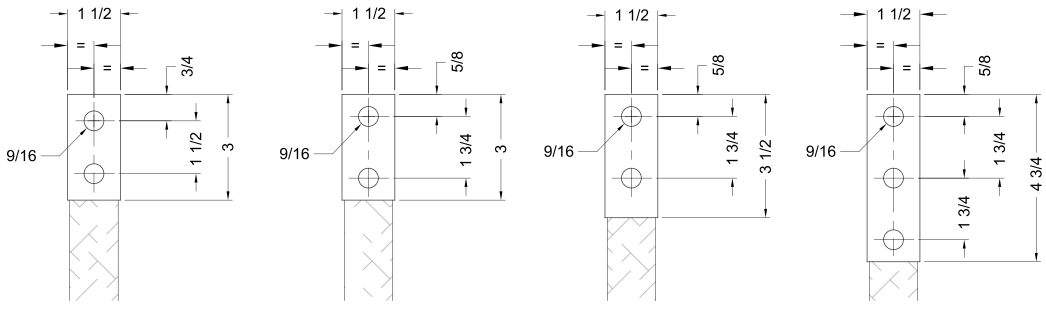
Standard length

CUSTOM PART NUMBER

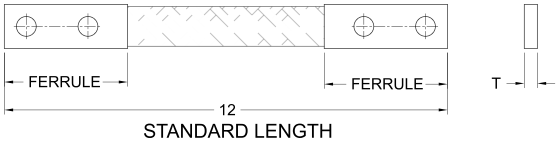
X151A 16.50 AB - S3

Required length | Ferrule configuration | Plating

EXEL P/N	FERRULE CONFIGURATION T	TYPE	TYPE	APPROX. WEIGHT (LBS)	BRAID DATA CROSS-SECTION mm²	CROSS-SECTION in²	CIRCULAR MIL	CURRENT RATING (A) 60 Hz Free-air 45°C RISE	65°C RISE
X151A12	0.171	C	C	0.74	53.5	0.083	105600	350	420
X151B12	0.242	C	C	1.09	107.0	0.166	211200	500	610
X151C12	0.313	C	C	1.44	160.5	0.249	316800	640	750
X151D12	0.438	C	C	1.96	214.0	0.332	422400	740	890
X151E12	0.500	C	C	2.32	267.6	0.415	528000	840	1010
X151F12	0.566	C	C	2.67	321.1	0.498	633600	930	1120
X151G12	0.625	C	C	2.99	374.6	0.581	739200	1010	1220
X151H12	0.688	C	C	3.35	428.1	0.664	844800	1100	1320
X151I12	0.785	C	C	3.85	481.6	0.746	950400	1180	1430
X151J12	0.856	C	C	4.20	535.1	0.829	1056000	1260	1520
X151K12	0.929	C	C	4.55	588.6	0.912	1161600	1340	1620
X151L12	0.985	C	C	4.91	642.1	0.995	1267200	1410	1700
X151M12	1.080	C	C	5.26	695.7	1.078	1372800	1490	1800
X151N12	1.150	C	C	5.74	749.2	1.161	1478400	1560	1880



FERRULE CONFIGURATION



STANDARD LENGTH

Exel International
ABSOLUTE SYNERGY

RoHS COMPLIANT

XX151 SERIES

EXTRA FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

EXTRA FLEXIBLE BRAIDS
36 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

XX151A 12

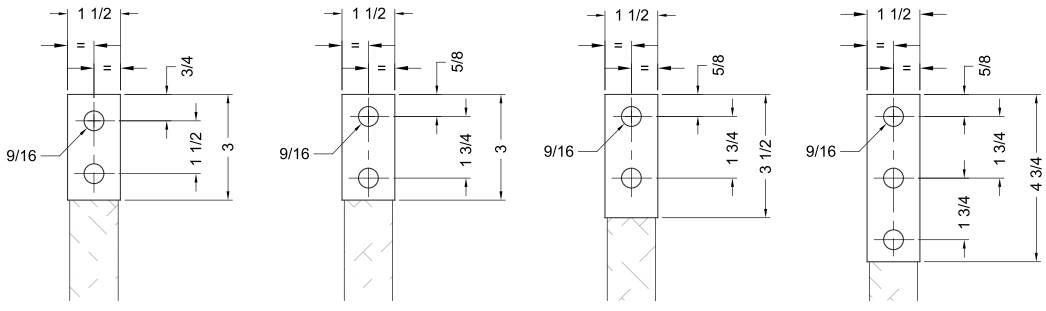
Standard length

CUSTOM PART NUMBER

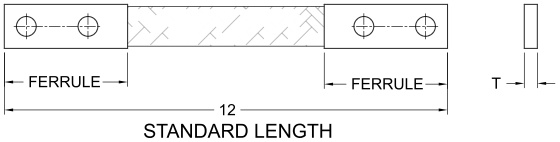
XX151A 16.50 AB - S3

Required length | Ferrule configuration | Plating

EXEL P/N	FERRULE CONFIGURATION T	FERRULE CONFIGURATION TYPE	FERRULE CONFIGURATION TYPE	APPROX. WEIGHT (LBS)	BRAID DATA CROSS-SECTION mm²	BRAID DATA CROSS-SECTION in²	BRAID DATA CIRCULAR MIL	CURRENT RATING (A) 60 Hz Free-air 45°C RISE	CURRENT RATING (A) 60 Hz Free-air 65°C RISE
XX151A12	0.168	C	C	0.72	51.1	0.079	100800	340	410
XX151B12	0.236	C	C	1.06	102.2	0.158	201600	490	590
XX151C12	0.304	C	C	1.39	153.2	0.238	302400	610	730
XX151D12	0.375	C	C	1.73	204.3	0.317	403200	710	860
XX151E12	0.477	C	C	2.24	255.4	0.396	504000	810	980
XX151F12	0.546	C	C	2.57	306.5	0.475	604800	900	1090
XX151G12	0.590	C	C	2.88	357.6	0.554	705600	980	1190
XX151H12	0.660	C	C	3.22	408.6	0.633	806400	1060	1290
XX151I12	0.760	C	C	3.70	459.7	0.713	907200	1150	1390
XX151J12	0.830	C	C	4.04	510.8	0.792	1008000	1230	1480
XX151K12	0.900	C	C	4.38	561.9	0.871	1108800	1300	1570
XX151L12	0.950	C	C	4.72	613.0	0.950	1209600	1370	1650
XX151M12	1.020	C	C	5.06	664.0	1.029	1310400	1440	1740
XX151N12	1.100	C	C	5.50	715.1	1.108	1411200	1520	1830



FERRULE CONFIGURATION



STANDARD LENGTH

Exel International
ABSOLUTE SYNERGY

X163 SERIES

FLEXIBLE BRAIDED CONNECTOR

RoHS COMPLIANT

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

STANDARD FLEXIBLE BRAIDS
30 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

X163A 12

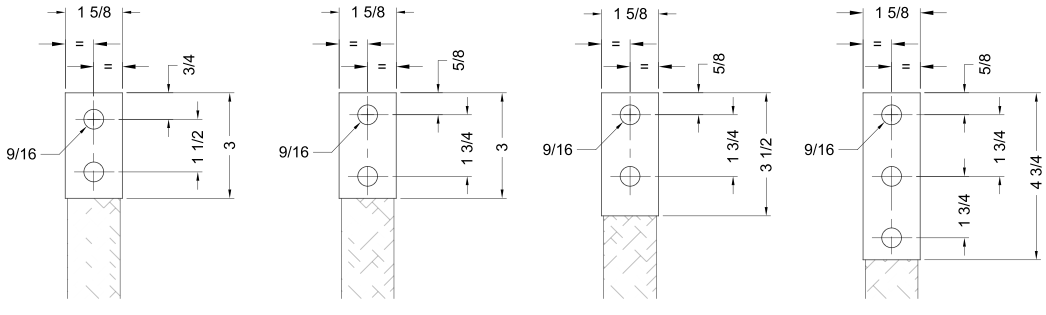
Standard length

CUSTOM PART NUMBER

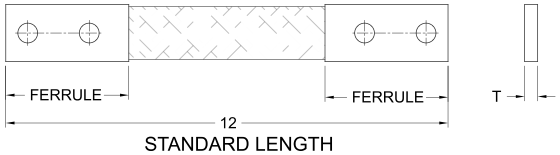
X163A 16.50 AB - S3

Required length | Ferrule configuration | Plating

EXEL P/N	FERRULE CONFIGURATION T	TYPE	TYPE	APPROX. WEIGHT (LBS)	BRAID DATA CROSS-SECTION mm²	CROSS-SECTION in²	CIRCULAR MIL	CURRENT RATING (A) 60 Hz Free-air 45°C RISE	65°C RISE
X163A12	0.165	C	C	0.74	53.5	0.083	105600	360	430
X163B12	0.231	C	C	1.09	107.0	0.166	211200	510	620
X163C12	0.330	C	C	1.44	160.5	0.249	316800	620	770
X163D12	0.396	C	C	1.96	214.0	0.332	422400	750	910
X163E12	0.463	C	C	2.32	267.6	0.415	528000	850	1030
X163F12	0.500	C	C	2.67	321.1	0.498	633600	940	1130
X163G12	0.570	C	C	2.99	374.6	0.581	739200	1020	1240
X163H12	0.663	C	C	3.35	428.1	0.664	844800	1110	1340
X163I12	0.729	C	C	3.85	481.6	0.746	950400	1200	1440
X163J12	0.796	C	C	4.20	535.1	0.829	1056000	1270	1540
X163K12	0.847	C	C	4.55	588.6	0.912	1161600	1350	1630
X163L12	0.914	C	C	4.91	642.1	0.995	1267200	1420	1720
X163M12	0.980	C	C	5.26	695.7	1.078	1372800	1500	1810
X163N12	1.062	C	C	5.74	749.2	1.161	1478400	1570	1900



FERRULE CONFIGURATION



STANDARD LENGTH

Exel International
ABSOLUTE SYNERGY

RoHS COMPLIANT

XX163 SERIES

EXTRA FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

EXTRA FLEXIBLE BRAIDS
36 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

XX163A 12

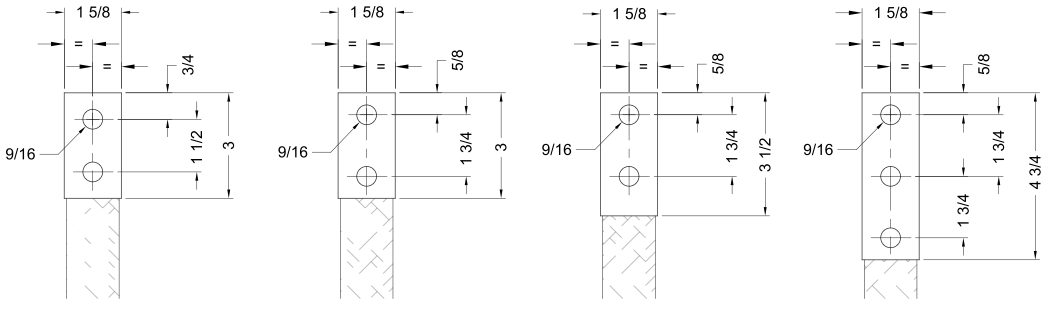
Standard length

CUSTOM PART NUMBER

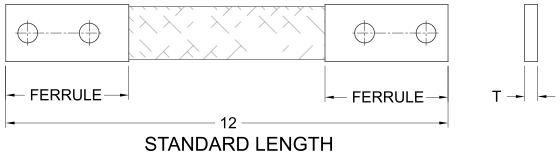
XX163A 16.50 AB - S3

Required length | Ferrule configuration | Plating

EXEL P/N	FERRULE CONFIGURATION T	TYPE	TYPE	APPROX. WEIGHT (LBS)	BRAID DATA CROSS-SECTION mm²	CROSS-SECTION in²	CIRCULAR MIL	CURRENT RATING (A) 60 Hz Free-air 45°C RISE	65°C RISE
XX163A12	0.162	C	C	0.72	51.1	0.079	100800	350	420
XX163B12	0.225	C	C	1.06	102.2	0.158	201600	500	600
XX163C12	0.321	C	C	1.56	153.2	0.238	302400	620	750
XX163D12	0.384	C	C	1.90	204.3	0.317	403200	730	880
XX163E12	0.448	C	C	2.24	255.4	0.396	504000	830	1000
XX163F12	0.486	C	C	2.54	306.5	0.475	604800	910	1100
XX163G12	0.549	C	C	2.88	357.6	0.554	705600	1000	1210
XX163H12	0.612	C	C	3.22	408.6	0.633	806400	1080	1300
XX163I12	0.702	C	C	3.70	459.7	0.713	907200	1160	1400
XX163J12	0.765	C	C	4.04	510.8	0.792	1008000	1240	1500
XX163K12	0.829	C	C	4.40	561.9	0.871	1108800	1310	1580
XX163L12	0.877	C	C	4.72	613.0	0.950	1209600	1380	1670
XX163M12	0.941	C	C	5.06	664.0	1.029	1310400	1450	1750
XX163N12	1.020	C	C	5.50	715.1	1.108	1411200	1530	1840



FERRULE CONFIGURATION



STANDARD LENGTH

Exel International
ABSOLUTE SYNERGY

X175 SERIES

FLEXIBLE BRAIDED CONNECTOR

RoHS COMPLIANT

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

STANDARD FLEXIBLE BRAIDS
30 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

X175A 12

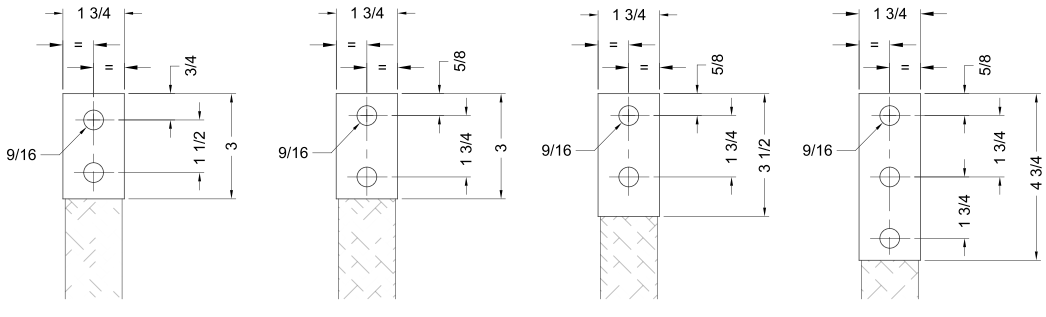
Standard length

CUSTOM PART NUMBER

X175A 16.50 AB - S3

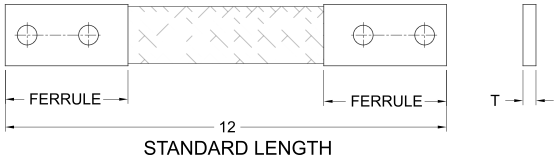
Required length | Ferrule configuration | Plating

EXEL P/N	FERRULE CONFIGURATION			APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
	T	TYPE	TYPE		CROSS-SECTION mm²	CROSS-SECTION in²	CIRCULAR MIL	45°C RISE	65°C RISE
X175A12	0.190	C	C	0.90	53.5	0.083	105600	370	450
X175B12	0.250	C	C	1.25	107.0	0.166	211200	530	640
X175C12	0.314	C	C	1.61	160.5	0.249	316800	660	790
X175D12	0.353	C	C	1.93	214.0	0.332	422400	760	920
X175E12	0.413	C	C	2.28	267.6	0.415	528000	860	1040
X175F12	0.474	C	C	2.64	321.1	0.498	633600	950	1150
X175G12	0.560	C	C	3.14	374.6	0.581	739200	1050	1260
X175H12	0.625	C	C	3.49	428.1	0.664	844800	1130	1360
X175I12	0.683	C	C	3.85	481.6	0.746	950400	1210	1460
X175J12	0.731	C	C	4.20	535.1	0.829	1056000	1290	1550
X175K12	0.792	C	C	4.56	588.6	0.912	1161600	1360	1640
X175L12	0.853	C	C	4.91	642.1	0.995	1267200	1440	1730
X175M12	0.929	C	C	5.38	695.7	1.078	1372800	1510	1800
X175N12	1.000	C	C	5.73	749.2	1.161	1478400	1580	1910



TYPE A TYPE B TYPE C TYPE D

FERRULE CONFIGURATION



STANDARD LENGTH

Exel International
ABSOLUTE SYNERGY

RoHS COMPLIANT

XX175 SERIES

EXTRA FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

EXTRA FLEXIBLE BRAIDS
36 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

XX175A 12

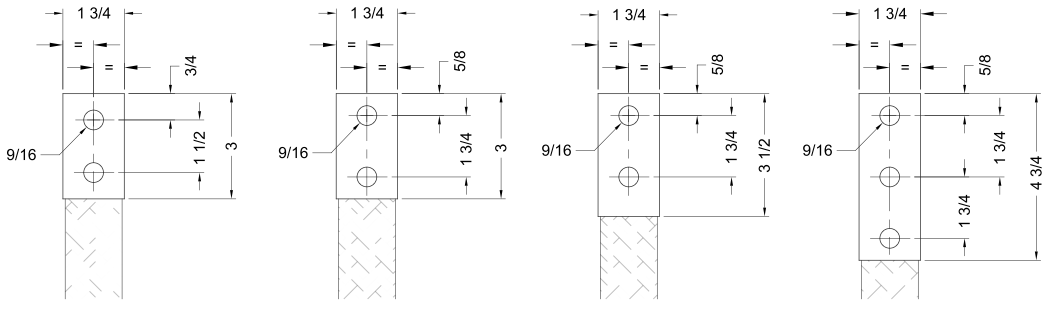
Standard length

CUSTOM PART NUMBER

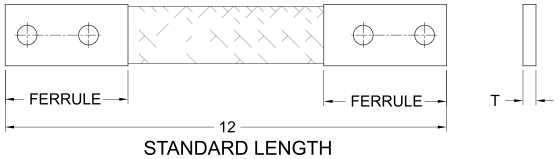
XX175A 16.50 AB - S3

Required length | Ferrule configuration | Plating

EXEL P/N	FERRULE CONFIGURATION T	TYPE	TYPE	APPROX. WEIGHT (LBS)	BRAID DATA CROSS-SECTION mm²	CROSS-SECTION in²	CIRCULAR MIL	CURRENT RATING (A) 60 Hz Free-air 45°C RISE	65°C RISE
XX175A12	0.189	C	C	0.89	51.1	0.079	100800	360	440
XX175B12	0.247	C	C	1.22	102.2	0.158	201600	520	620
XX175C12	0.306	C	C	1.56	153.2	0.238	302400	640	770
XX175D12	0.342	C	C	1.87	204.3	0.317	403200	740	900
XX175E12	0.400	C	C	2.20	255.4	0.396	504000	840	1010
XX175F12	0.458	C	C	2.54	306.5	0.475	604800	930	1120
XX175G12	0.541	C	C	3.03	357.6	0.554	705600	1020	1230
XX175H12	0.573	C	C	3.27	408.6	0.633	806400	1100	1320
XX175I12	0.658	C	C	3.70	459.7	0.713	907200	1180	1420
XX175J12	0.703	C	C	4.04	510.8	0.792	1008000	1250	1510
XX175K12	0.761	C	C	4.38	561.9	0.871	1108800	1300	1600
XX175L12	0.819	C	C	4.72	613.0	0.950	1209600	1400	1690
XX175M12	0.892	C	C	5.17	664.0	1.029	1310400	1470	1770
XX175N12	0.951	C	C	5.50	715.1	1.108	1411200	1540	1860



FERRULE CONFIGURATION



Exel International
ABSOLUTE SYNERGY

RoHS COMPLIANT

X200 SERIES

FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

STANDARD FLEXIBLE BRAIDS
30 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

X200A 12

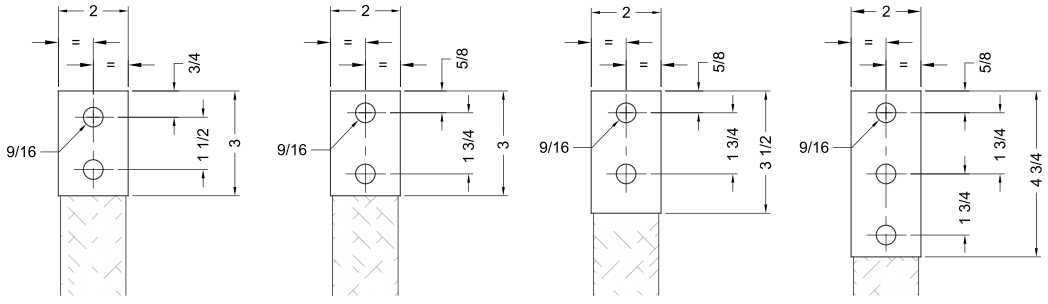
Standard length

CUSTOM PART NUMBER

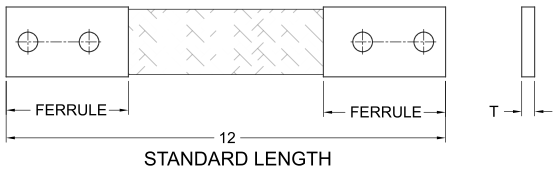
X200A 16.50 AB - S3

Required length | Ferrule configuration | Plating

EXEL P/N	FERRULE CONFIGURATION			APPROX. WEIGHT (LBS)	BRAID DATA			CURRENT RATING (A) 60 Hz Free-air	
	T	TYPE	TYPE		CROSS-SECTION mm²	CROSS-SECTION in²	CIRCULAR MIL	45°C RISE	65°C RISE
X200A12	0.187	C	C	0.91	77.8	0.121	153600	460	560
X200B12	0.235	C	C	1.43	155.7	0.241	307200	670	800
X200C12	0.362	C	C	2.21	233.5	0.362	460800	830	1000
X200D12	0.440	C	C	2.72	311.3	0.483	614400	970	1180
X200E12	0.505	C	C	3.24	389.2	0.603	768000	1100	1330
X200F12	0.582	C	C	3.75	467.0	0.724	921600	1220	1470
X200G12	0.672	C	C	4.38	544.8	0.844	1075200	1340	1610
X200H12	0.750	C	C	4.89	622.7	0.965	1228800	1450	1740
X200I12	0.827	C	C	5.41	700.5	1.086	1382400	1550	1870



FERRULE CONFIGURATION



STANDARD LENGTH

Exel International
ABSOLUTE SYNERGY

RoHS COMPLIANT

XX200 SERIES

EXTRA FLEXIBLE BRAIDED CONNECTOR

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

EXTRA FLEXIBLE BRAIDS
36 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

XX200A 12

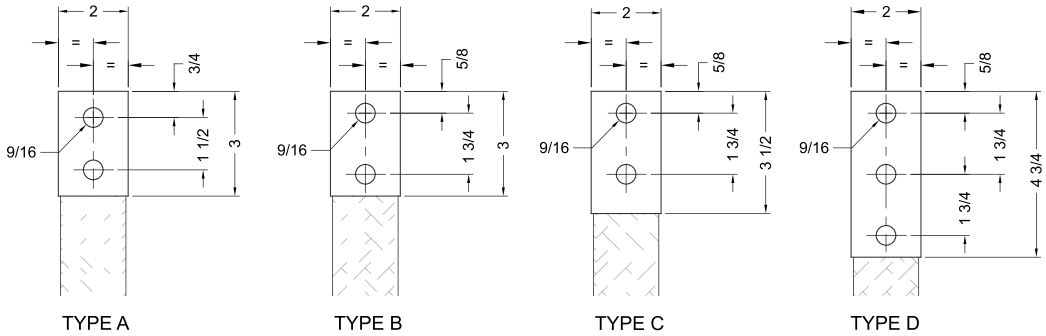
Standard length

CUSTOM PART NUMBER

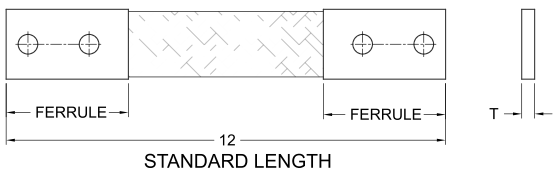
XX200A 16.50 AB - S3

Required length | Ferrule configuration | Plating

EXEL P/N	FERRULE CONFIGURATION T	FERRULE CONFIGURATION TYPE	FERRULE CONFIGURATION TYPE	APPROX. WEIGHT (LBS)	BRAID DATA CROSS-SECTION mm²	BRAID DATA CROSS-SECTION in²	BRAID DATA CIRCULAR MIL	CURRENT RATING (A) 60 Hz Free-air 45°C RISE	CURRENT RATING (A) 60 Hz Free-air 65°C RISE
XX200A12	0.187	C	C	1.07	102.2	0.158	201600	540	650
XX200B12	0.235	C	C	1.41	153.2	0.238	302400	660	800
XX200C12	0.335	C	C	2.01	204.3	0.317	403200	780	940
XX200D12	0.384	C	C	2.35	255.4	0.396	504000	880	1060
XX200E12	0.437	C	C	2.69	306.5	0.475	604800	970	1170
XX200F12	0.486	C	C	3.05	357.6	0.554	705600	1050	1270
XX200G12	0.524	C	C	3.37	408.6	0.633	806400	1130	1370
XX200H12	0.575	C	C	3.71	459.7	0.713	907200	1210	1460
XX200I12	0.625	C	C	4.04	510.8	0.792	1008000	1290	1550
XX200J12	0.740	C	C	4.83	613.0	0.950	1209600	1430	1730
XX200K12	0.790	C	C	5.17	664.0	1.029	1310400	1500	1810
XX200L12	0.841	C	C	5.50	715.1	1.108	1411200	1570	1890

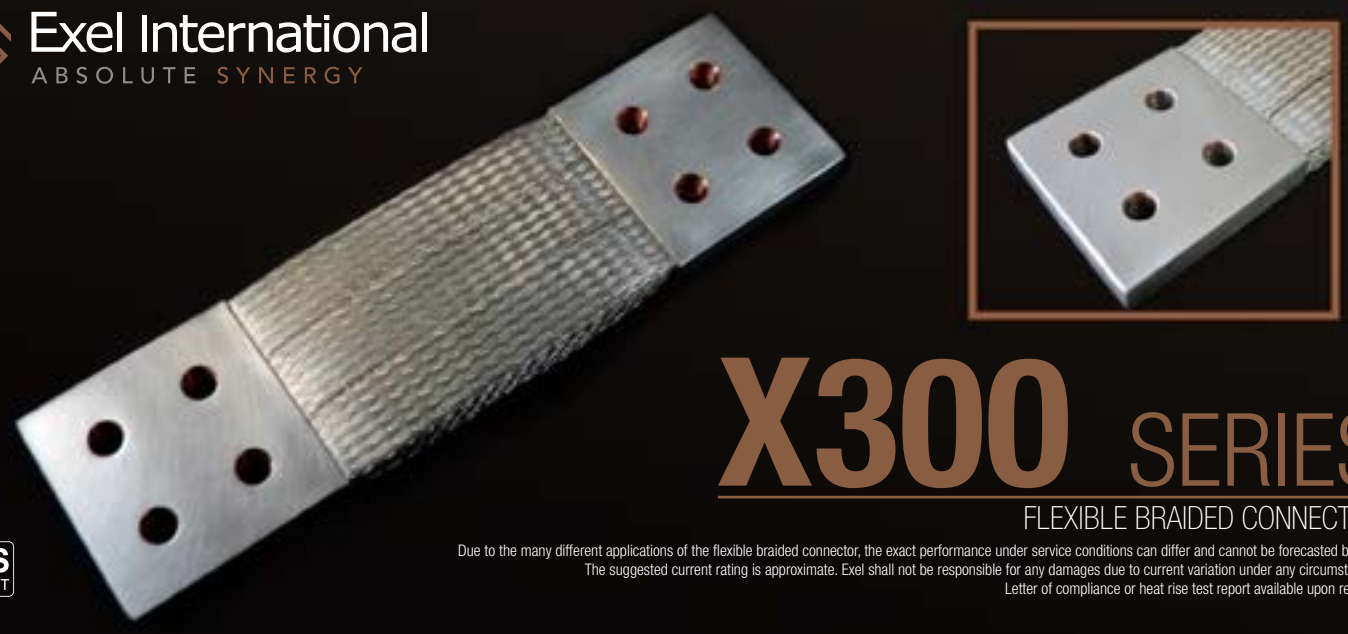


FERRULE CONFIGURATION



STANDARD LENGTH

Exel International
ABSOLUTE SYNERGY



X300 SERIES

FLEXIBLE BRAIDED CONNECTOR

RoHS COMPLIANT

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

STANDARD FLEXIBLE BRAIDS
30 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

X300A 12

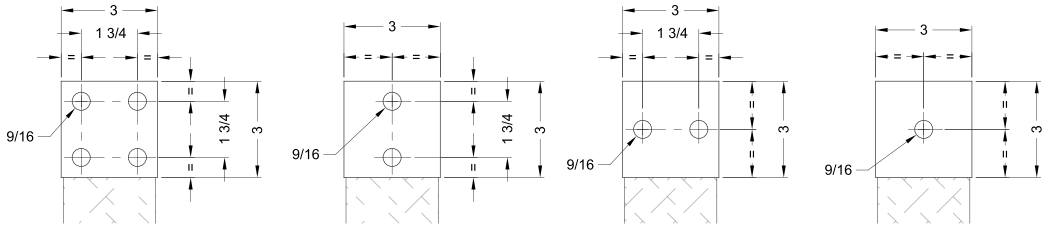
Standard length

CUSTOM PART NUMBER

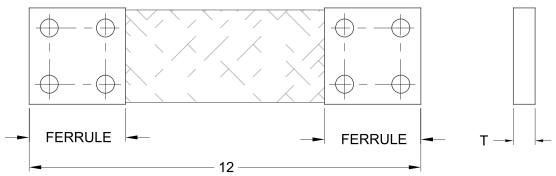
X300A 16.50 AB - S3

Required length | Ferrule configuration | Plating

EXEL P/N	FERRULE CONFIGURATION T	FERRULE CONFIGURATION TYPE	FERRULE CONFIGURATION TYPE	APPROX. WEIGHT (LBS)	BRAID DATA CROSS-SECTION mm²	BRAID DATA CROSS-SECTION in²	BRAID DATA CIRCULAR MIL	CURRENT RATING (A) 60 Hz Free-air 45°C RISE	CURRENT RATING (A) 60 Hz Free-air 65°C RISE
X300A12	0.250	A	A	2.14	214.0	0.332	422400	900	1090
X300B12	0.323	A	A	2.85	321.1	0.498	633600	1120	1350
X300C-12	0.392	A	A	3.56	428.1	0.664	844800	1300	1570
X300D-12	0.461	A	A	4.27	535.1	0.829	1056000	1470	1770
X300E12	0.530	A	A	4.97	642.1	0.995	1267200	1620	1950
X300F12	0.615	A	A	5.87	749.2	1.161	1478400	1760	2130
X300G12	0.685	A	A	6.57	856.2	1.327	1689600	1900	2290
X300H12	0.754	A	A	7.28	963.2	1.493	1900800	2030	2450
X300I12	0.824	A	A	7.99	1070.2	1.659	2112000	2150	2600
X300J12	1.032	A	A	10.21	1391.3	2.156	2745600	2500	3030



FERRULE CONFIGURATION



Exel International
ABSOLUTE SYNERGY

XX300 SERIES

EXTRA FLEXIBLE BRAIDED CONNECTOR

RoHS COMPLIANT

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

EXTRA FLEXIBLE BRAIDS
36 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

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4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

XX300A 12

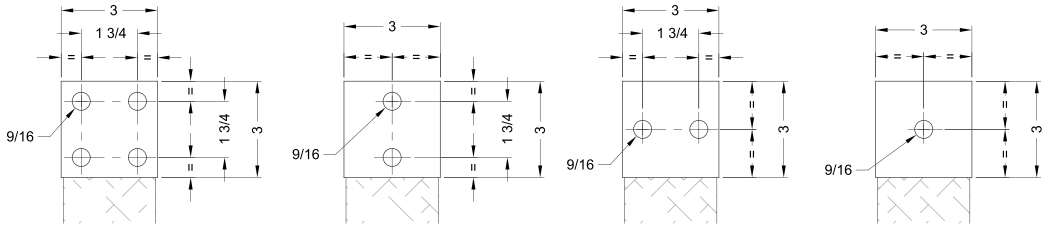
Standard length

CUSTOM PART NUMBER

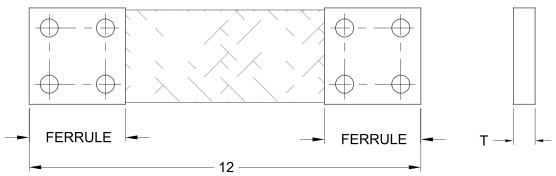
XX300A 16.50 AB - S3

Required length | Ferrule configuration | Plating

EXEL P/N	FERRULE CONFIGURATION T	FERRULE CONFIGURATION TYPE	FERRULE CONFIGURATION TYPE	APPROX. WEIGHT (LBS)	BRAID DATA CROSS-SECTION mm²	BRAID DATA CROSS-SECTION in²	BRAID DATA CIRCULAR MIL	CURRENT RATING (A) 60 Hz Free-air 45°C RISE	CURRENT RATING (A) 60 Hz Free-air 65°C RISE
XX300A12	0.250	A	A	2.08	204.3	0.317	403200	880	1070
XX300B12	0.313	A	A	2.76	306.5	0.475	604800	1090	1320
XX300C-12	0.375	A	A	3.43	408.6	0.633	806400	1270	1530
XX300D12	0.445	A	A	4.11	510.8	0.792	1008000	1430	1720
XX300E12	0.511	A	A	4.78	613.0	0.950	1209600	1580	1900
XX300F12	0.593	A	A	5.64	715.1	1.108	1411200	1720	2070
XX300G12	0.660	A	A	6.32	817.3	1.267	1612800	1850	2230
XX300H12	0.726	A	A	6.99	919.4	1.425	1814400	1980	2390
XX300I12	0.792	A	A	7.70	1021.6	1.583	2016000	2100	2530
XX300J12	1.000	A	A	9.79	1328.1	2.058	2620800	2440	2950



FERRULE CONFIGURATION



Exel International
ABSOLUTE SYNERGY

X400 SERIES

FLEXIBLE BRAIDED CONNECTOR

RoHS COMPLIANT

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

STANDARD FLEXIBLE BRAIDS
30 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

X400A 12

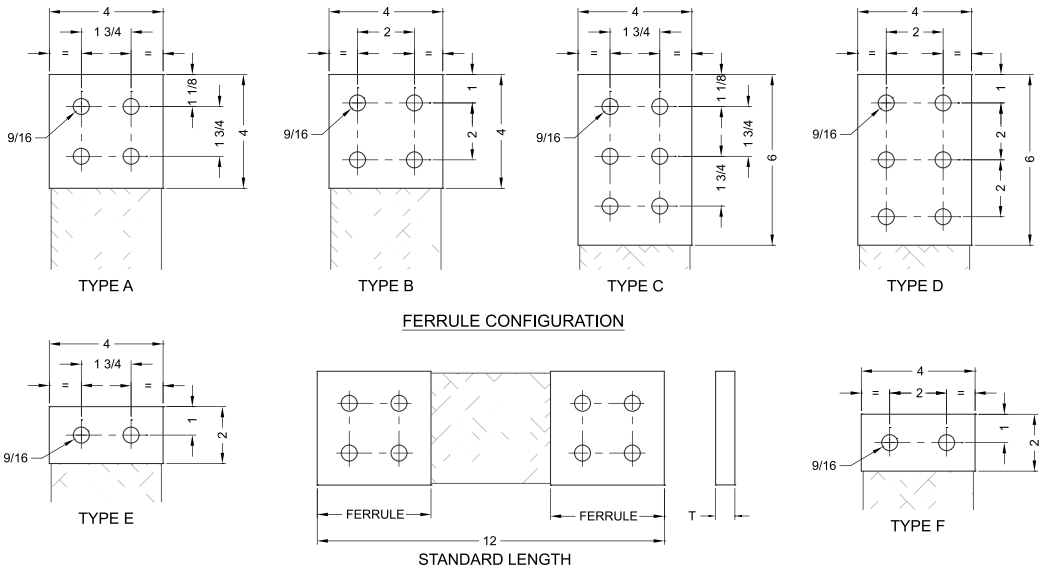
Standard length

CUSTOM PART NUMBER

X400A 16.50 AB - S3

Required length | Ferrule configuration | Plating

EXEL P/N	FERRULE CONFIGURATION T	FERRULE CONFIGURATION TYPE	FERRULE CONFIGURATION TYPE	APPROX. WEIGHT (LBS)	BRAID DATA CROSS-SECTION mm²	BRAID DATA CROSS-SECTION in²	BRAID DATA CIRCULAR MIL	CURRENT RATING (A) 60 Hz Free-air 45°C RISE	CURRENT RATING (A) 60 Hz Free-air 65°C RISE
X400A12	0.230	A	A	2.77	214.0	0.332	422400	1000	1210
X400B12	0.250	A	A	3.12	255.4	0.396	504000	1100	1320
X400C12	0.280	A	A	3.41	311.3	0.483	614400	1210	1470
X400D12	0.320	A	A	4.04	394.0	0.611	777600	1370	1650
X400E-12	0.336	A	A	4.18	428.1	0.664	844800	1430	1730
X400F-12	0.354	A	A	4.52	467.0	0.724	921600	1500	1810
X400G12	0.375	A	A	4.81	510.8	0.792	1008000	1570	1890
X400H12	0.438	A	A	5.68	642.1	0.995	1267200	1770	2130
X400I12	0.500	A	A	6.58	778.4	1.206	1536000	1960	2360
X400J12	0.763	A	A	10.27	1284.3	1.991	2534400	2570	3100
X400K12	0.841	A	A	11.33	1444.8	2.239	2851200	2740	3310



Exel International
ABSOLUTE SYNERGY

X600 SERIES

FLEXIBLE BRAIDED CONNECTOR

RoHS COMPLIANT

Due to the many different applications of the flexible braided connector, the exact performance under service conditions can differ and cannot be forecasted by Exel. The suggested current rating is approximate. Exel shall not be responsible for any damages due to current variation under any circumstances. Letter of compliance or heat rise test report available upon request.

STANDARD FLEXIBLE BRAIDS
30 AWG individual wire - Copper C11000 tin plated as per ASTM B33.

STANDARD FERRULE
Seamless copper tube C12200 as per ASTM B88.

STANDARD FERRULE PLATING
Electro-tin 0.0003" as per ASTM B545. RoHS compliant.

OPTIONAL ORDERING INFORMATION

LENGTH
Change the standard length of the part number for the required length in inches.

FERRULE PLATING
Add the required plating material and thickness codes at the end of the part number.

FERRULE PLATING CODE

PLATING MATERIAL
S = Silver **N =** Nickel **T =** Tin

PLATING THICKNESS
1 = 0.0003" **2 =** 0.0005" **3 =** 0.001"
4 = 0.002" **5 =** 0.004"

EXAMPLE

STANDARD PART NUMBER

X600A 12

Standard length

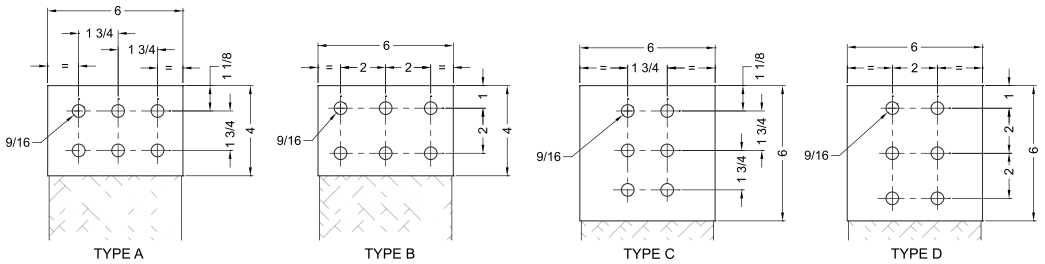
CUSTOM PART NUMBER

X600A 16.50 AB - S3

Required length | Ferrule configuration | Plating

EXEL P/N	FERRULE CONFIGURATION T	FERRULE CONFIGURATION TYPE	FERRULE CONFIGURATION TYPE	APPROX. WEIGHT (LBS)	BRAID DATA CROSS-SECTION mm²	BRAID DATA CROSS-SECTION in²	BRAID DATA CIRCULAR MIL	CURRENT RATING (A) 60 Hz Free-air 45°C RISE	CURRENT RATING (A) 60 Hz Free-air 65°C RISE
X600A12*	0.250	A	A	4.94	389.2	0.603	768000	1610	1940
X600B12**	0.286	A	A	5.46	467.0	0.724	921600	1750	2120
X600C-12	0.348	A	A	6.61	642.1	0.995	1267200	2030	2450
X600D12	0.366	A	A	7.00	700.5	1.086	1382400	2130	2570
X600E12	0.416	A	A	8.03	856.2	1.327	1689600	2360	2850
X600F12	0.441	A	A	8.54	934.0	1.448	1843200	2470	2980
X600G12	0.484	A	A	9.44	1070.2	1.659	2112000	2650	3190
X600H12	0.515	A	A	10.08	1167.5	1.810	2304000	2770	3340
X600I12	0.552	A	A	10.86	1284.3	1.991	2534400	2910	3510
X600J12	0.589	A	A	11.63	1401.0	2.171	2764800	3050	3680
X600K12	0.663	A	A	13.17	1634.5	2.533	3225600	3310	4000
X600L12	0.737	A	A	14.71	1868.0	2.895	3686400	3550	4280
X600M12	0.756	A	A	15.10	1926.4	2.986	3801600	3610	4360
X600N12	0.812	A	A	16.26	2101.6	3.257	4147200	3780	4560

* ferrule width = 6.375 imstead of 6.000
** ferrule width = 6.250 instead of 6.000



BRAIDED COPPER CABLES

THE BRAIDED COPPER CABLES SHOWN ON THIS PAGE ARE THE MOST COMMONLY USED IN THE INDUSTRY. THEY ARE EITHER TIN PLATED OR BARE COPPER. SILVER AND NICKEL PLATING ARE ALSO AVAILABLE.

Wires are made of copper C11000 soft annealed.

TIN COPPER BRAID
Raw material meets ASTM B33.

BARE COPPER BRAID
Raw material meets ASTM B3.

NICKEL PLATED COPPER BRAID
Raw material meets ASTM B355.

SILVER PLATED COPPER BRAID
Raw material meets ASTM B298.

When bare copper is required, add (B) at the end of the part number.

When nickel plated copper is required, add (N) at the end of the part number.

When silver plated copper is required, add (S) at the end of the part number.

All dimensions are approximate and for reference only.

PLEASE CALL OUR SALES DEPARTMENT FOR OTHER AVAILABLE SIZES.

	EXEL PART NUMBER	NOMINAL FLAT WIDTH (IN)	NOMINAL THICKNESS (IN)	INDIVIDUAL AWG	CONSTRUCTION	TOTAL CIRCULAR MIL	APPROX. AWG EQUIVALENT	APPROX. WEIGHT (LBS/1000 FT)
FLAT BRAID EXTRA FLEXIBLE	FBC36-24-7	0.250	0.030	36	24 x 7	4200	14	14.0
	FBC36-24-16	0.375	0.063	36	24 x 16	9600	11	32.0
	FBC36-48-15	0.625	0.040	36	48 x 15	18000	8	61.2
	FBC36-24-40	0.500	0.094	36	24 x 40	24000	7	75.2
	FBC36-26-67	0.750	0.094	36	26 x 67	40200	4	142.7
	FBC40-48-86	1.000	0.060	40	48 x 86	40700	4	140.0
	FBC36-48-40	1.000	0.094	36	48 x 40	48000	3	163.0
	FBC36-48-84	1.625	0.080	36	48 x 84	100800	1	359.0
FLAT BRAID STANDARD FLEXIBLE	FBC30-24-10	0.500	0.094	30	24 x 10	24120	6	85.0
	FBC30-24-16	0.625	0.094	30	24 x 16	38400	4	125.0
	FBC30-24-20	0.750	0.110	30	24 x 20	48000	3	170.0
	FBC30-24-27	0.937	0.130	30	24 x 27	64800	2	225.0
	FBC30-24-32	1.000	0.140	30	24 x 32	76800	1	270.0
	FBC30-24-44	1.000	0.125	30	24 x 44	105600	1/0	362.0
	FBC30-48-22	1.375	0.125	30	48 x 22	105600	1/0	362.0
	FBC30-48-32	2.000	0.140	30	48 x 32	153600	3/0	530.0
	FBC30-48-52	2.500	0.190	30	48 x 52	249600	250 MCM	900.0
MULTI-LAYER FLAT BRAID	FBC30-2-24-32	1.250	0.290	30	2 x 24 x 32	153600	3/0	560.0
	FBC30-2-24-35	1.250	0.300	30	2 x 24 x 35	168000	3/0	600.0
	FBC30-3-24-32	1.250	0.400	30	3 x 24 x 32	230400	4/0	825.0
	FBC30-4-24-32	1.375	0.510	30	4 x 24 x 32	307200	300 MCM	1110.0

	EXEL PART NUMBER	NOMINAL DIAMETER (IN)	INDIVIDUAL AWG	CONSTRUCTION	TOTAL CIRCULAR MIL	APPROX. AWG EQUIVALENT	APPROX. WEIGHT (LBS/1000 FT)
ROPE-LAY ROUND BRAID	RLC36-7-7-43	0.339	36	7 x 7 x 43	52675	3	169.0
	RLC30-7-7-34	0.605	30	7 x 7 x 34	167601	3/0	538.0
	RLC36-19-7-64	0.690	36	19 x 7 x 64	212800	4/0	689.0
	RLC30-7-7-43	0.681	30	7 x 7 x 43	211966	4/0	680.0

	EXEL PART NUMBER	NOMINAL INSIDE DIAMETER (IN)	INDIVIDUAL AWG	CONSTRUCTION	TOTAL CIRCULAR MIL	APPROX. AWG EQUIVALENT	APPROX. WEIGHT (LBS/1000 FT)
TUBULAR BRAID	TBC30-24-7	0.375	30	24 x 7	16880	8	62.0
	TBC30-24-15	0.500	30	24 x 15	36180	5	122.0
	TBC30-48-8	1.000	30	48 x 8	38600	4	140.0
	TBC30-48-9	1.125	30	48 x 9	43200	4	155.0
	TBC30-48-10	1.250	30	48 x 10	48240	3	168.0
	TBC30-48-11	1.375	30	48 x 11	53060	3	185.0
	TBC30-48-12	1.500	30	48 x 12	57890	3	200.0
	TBC30-48-14	2.000	30	48 x 14	67540	2	230.0
	TBC30-48-16	2.500	30	48 x 16	77180	1	260.0

STANDARD WIRE GAUGE

COPPER			STEEL			
AWG NO	WIRE DIAMETER	CIRCULAR MIL AREA	SHEET METAL	STEEL WIRE	MUSIC WIRE	DRILL ROD
4/0	0.46000	212000	—	0.3938	0.006	—
3/0	0.40960	168000	—	0.3625	0.007	—
2/0	0.36480	133000	—	0.3310	0.008	—
0	0.32480	106000	—	0.3065	0.009	—
1	0.28930	83700	—	0.2830	0.010	0.227
2	0.25760	66400	—	0.2625	0.011	0.219
3	0.22940	52600	0.2391	0.2437	0.012	0.212
4	0.20430	41700	0.2242	0.2253	0.013	0.207
5	0.18190	33100	0.2092	0.2070	0.014	0.204
6	0.16200	26300	0.1943	0.1920	0.016	0.201
7	0.14430	20800	0.1793	0.1770	0.018	0.199
8	0.12850	16500	0.1644	0.1620	0.020	0.197
9	0.11440	13100	0.1495	0.1483	0.022	0.194
10	0.10190	10400	0.1345	0.1350	0.024	0.191
11	0.09070	8230	0.1196	0.1205	0.026	0.188
12	0.08080	6530	0.1046	0.1055	0.029	0.185
13	0.07200	5180	0.0897	0.0915	0.031	0.182
14	0.06410	4110	0.0747	0.0800	0.033	0.180
15	0.05710	3260	0.0673	0.0720	0.035	0.178
16	0.05080	2580	0.0598	0.0625	0.037	0.175
17	0.04526	2050	0.0538	0.0540	0.039	0.172
18	0.04030	1620	0.0478	0.0475	0.041	0.168
19	0.03589	1290	0.0418	0.0410	0.043	0.164
20	0.03196	1020	0.0359	0.0348	0.045	0.161
21	0.02846	810	0.0329	0.0317	0.047	0.157
22	0.02535	642	0.0299	0.0286	0.049	0.155
23	0.02257	509	0.0269	0.0258	0.051	0.153
24	0.02010	404	0.0239	0.0230	0.055	0.151
25	0.01790	320	0.0209	0.0204	0.059	0.148
26	0.01594	254	0.0179	0.0181	0.063	0.146
27	0.01420	202	0.0164	0.0173	0.067	0.143
28	0.01264	160	0.0149	0.0162	0.071	0.139
29	0.01126	127	0.0135	0.0150	0.075	0.134
30	0.01003	100	0.0120	0.0140	0.080	0.127
31	0.00893	79.2	0.0105	0.0132	0.085	0.120
32	0.00795	64.0	0.0097	0.0128	0.090	0.115
33	0.00708	50.4	0.0090	0.0118	0.095	0.112
34	0.00630	39.7	0.0082	0.0104	0.100	0.110
35	0.00561	31.4	0.0075	0.0095	0.106	0.108
36	0.00500	25.0	0.0067	0.0090	0.112	0.106
37	0.00445	20.3	0.0064	0.0085	0.118	0.103
38	0.00396	16.0	0.0060	0.0080	0.124	0.101
39	0.00353	12.3	—	0.0075	0.130	0.099
40	0.00314	9.9	—	0.0070	0.138	0.097
41	0.00280	7.8	—	—	—	—
42	0.00249	6.2	—	—	—	—
43	0.00222	4.9	—	—	—	—
44	0.00198	3.9	—	—	—	—

ELECTRICAL COMPONENTS

Exel International
ABSOLUTE SYNERGY

LAMINATED COPPER AND ALUMINIUM CONNECTORS

When flexible braided connectors do not meet customer needs, flexible copper and aluminum laminated connectors may be suitable. Manufactured according to unsurpassed internal procedures, they offer a solution that meets the highest quality standards. Designed to be tailor-made to customer's specifications, the laminated connectors are then manufactured by a team of keen experts.

APPLICATIONS

Frequently used for electrical connections in extreme conditions and environments, laminated connectors are mainly found under the following circumstances:

- Low mechanical vibrations
- Minor thermal contraction and/ or expansion of attached units
- Low movements
- Space constraints

If vibration is a critical factor, we suggest using flexible braided connectors.

SPECIFICATIONS

LAMINATES

- Tin plated C11000 ETP copper as per ASTM B33
- Silver plated C11000 ETP copper as per ASTM B298
- Nickel plated C11000 copper as per ASTM B355
- Bare C11000 ETP copper as per ASTM B152
- Aluminum alloy 1350 as per ASTM B209

Standard laminates vary in thickness from 0.005" to 0.04" and in width from 0.5" to 10".

PLATING OPTIONS FOR CONTACT PADS

- Electrolytic tin plating as per ASTM B545
- Electrolytic silver plating as per ASTM B700
- Electroless nickel plating as per ASTM B733
- Lead-free hot tin dip plating

The standard thickness plating on a contact pad is 0.0003" although it can reach 0.004", upon customer's request.

OVERALL DIMENSIONS

- Width of contact pad up to 10"
- Thickness of contact pad up to 3"
- Total connector length up to 72"
- Mounting holes in accordance with NEMA standards

Custom sizes are also available.

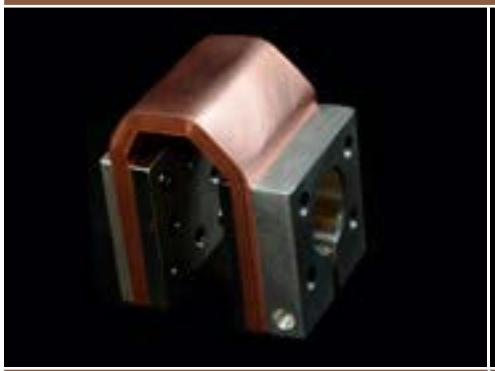
CURRENT CAPACITY

- 100 amperes to 7,500 amperes, according to design specifications

OPTIONS

- Insulation: Heat shrink PVC and polyolefin, ceramic heat shield and several other types of insulation materials are available.

LC001



LC002

LC003

LC004

LC005

LC006

Exel International
ABSOLUTE SYNERGY

COPPER AND ALUMINUM BUS BARS

Parts are manufactured with proprietary equipment employing cutting edge technology designed by Exel. Primarily used to conduct electricity from one fixed contact to another, Exel bus bar assemblies demonstrate flawless quality and reliability.

MATERIALS

Materials known for their conductivity properties are ETP C11000 copper and aluminum alloys 1350 and 6061. Other alloys can be used upon request.

PLATING OPTIONS

- Electrolytic tin plating as per ASTM B545
- Electrolytic silver plating as per ASTM B700
- Electroless nickel plating as per ASTM B733

FABRICATION CAPABILITIES

- Width up to 60"
- Thickness up to 3"
- Length up to 240"
- Mounting holes as per NEMA standards or customer specifications

CURRENT CAPACITY

Current capacity is determined according to assembly configuration and bus dimension. In some cases, current capacity can reach over 50,000 Amperes.

OPTIONS

- Insulation: Heat shrink PVC and polyolefin, ceramic heat shield and several other types of insulation materials are available.
- Epoxy Powder-Coated Bus Bar Insulation available

BB001

BB002

BB003

BB004

BB005

BB006

BB007

BB008

BB009

Exel International
ABSOLUTE SYNERGY

ELECTRICAL COMPONENTS FOR GENERAL APPLICATIONS

More complex than the simple bus bar, electrical components are tailor-made according to customer's specifications, and are entirely built and manufactured in our factory by Exel experts. Using digital control or conventional machines as well as unique, Exel-designed equipment, high volume production of exceptional quality components remains worry-free.

APPLICATIONS

Electrical components are used to transfer current between parts frequently found in breakers, transformers, circuit breakers and wind turbines just to name a few.

MACHINABLE ALLOYS

- C11000 copper as per ASTM B187 or other copper alloys
- C360 brass as per ASTM B16 or other brass alloys
- 6061-T6 aluminum or other aluminum alloys
- Silver
- GP-03 and G10 (insulation)
- Carbon
- Steel
- Stainless steel

Other materials can be used upon request.

RC001

RC002

RC003

RC004

RC005

RC006

RC007

RC008

RC009

RC010

RC011

Exel International
ABSOLUTE SYNERGY

BRAZED ELECTRICAL CONTACTS

A brazed electrical contact is a machined part onto which a silver plate is welded. Exel can design entirely new contacts, repair damaged parts or even visit your site to determine the solution that best meets your needs.

MATERIALS USED

- C11000 copper
- C1300 aluminum
- C1350 aluminum
- C6061 aluminum
- C260 brass
- C360 brass

Other materials can be used upon request.

CONTACT MATERIALS

SILVER AND COPPER

- 90% silver, 10% copper

SILVER AND TUNGSTEN

- 50% tungsten, 50% silver
- 65% tungsten, 35% silver
- 78% tungsten, 22% silver

COPPER AND TUNGSTEN

- 56% tungsten, 44% copper
- 68% tungsten, 32% copper
- 70% tungsten, 30% copper
- 75% tungsten, 25% copper
- 80% tungsten, 20% copper

PLATING OPTIONS

- Electrolytic tin plating as per ASTM B545
- Electrolytic silver plating as per ASTM B700
- Electroless nickel plating as per ASTM B733

WELDING METHODS

- Tungsten-electrode inert gas (TIG) welding
- Metal inert gas (MIG) welding
- Metal-arc welding
- Resistance welding
- Brazing (silver)

BC001

BC002

BC003

BC004

BC005

BC006

BC007

BC008

BC009

BC010

BC011

BC012

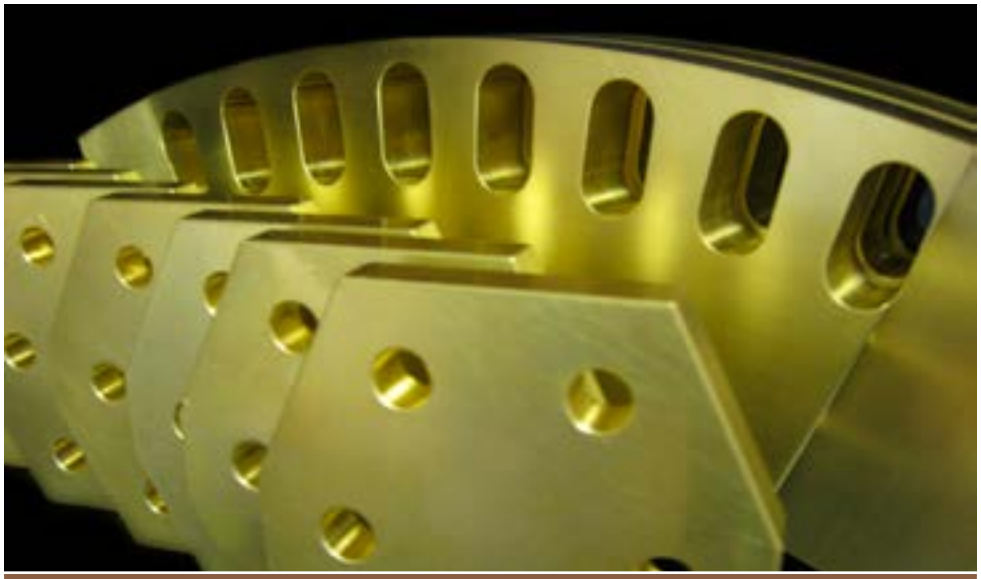
GENERAL MACHINING

Exel International
ABSOLUTE SYNERGY

GENERAL MACHINING

Exel owns numerically controlled and conventional machining centers which includes specialized equipments such as a unique digital control hydraulic press designed exclusively by the company. Exel's team of manufacturing and machining experts will make the best use of their skills and expertise to fill a wide range of needs, whether they require basic or extremely precise machining.

With its specialty in manufacturing small to medium size electrical and industrial components from raw materials such as copper, silver, aluminum, stainless steel, steel, plastics, composite materials and other machinable materials, Exel is a reference when it comes to machining.



MG001

MG002

MG003

MG004

MG005

MG006

MG007

MG008

TECHNICAL INFORMATION

METAL PROPERTIES

METAL	CHEMICAL SYMBOL	SPECIFIC GRAVITY	WEIGHT PER CUBIC INCH (LBS)	MELTING POINT (°F)	LINEAR EXPANSION PER UNIT LENGTH PER °F	% IACS
STEEL, CARBON	—	—	0.2830	2500	68	3 to 15
LEAD	Pb	11.342	0.4096	621	212	7
TIN	Sn	7.290	0.2633	449	64-212	15
IRON	Fe	7.800	0.2830	2750	68	17
NICKEL	Ni	8.800	0.3178	2651	68	22
ZINC	Zn	7.100	0.2565	788	68	27
TUNGSTEN	W	18.850	0.6810	6098	32-212	31
ALUMINIUM	Al	2.700	0.0975	1220	68	61
GOLD	Au	19.300	0.6969	1945	68	70
COPPER	Cu	8.890	0.3230	1981	68	100
SILVER	Ag	10.475	0.3780	1761	68	105

TEMPERATURE (DEGREES) CONVERSION:
Fahrenheit = (1.8 x Celsius) + 32 / Celsius = 0.5555 x (Fahrenheit - 32) / Kelvin = Celsius + 273.2 / Rankine = Fahrenheit + 459.7

COPPER ALLOY		% IACS	TYPICAL USE
C15000	COPPER CLASS 1 - ZIRCONIUM COPPER	93	*Rwma Class 1, Switches, Circuit Breakers For High Temperature Application, Stud Bases For Rectifiers, Soldering Welding Tip
C16200	COPPER CLASS 1 - CADMIUM COPPER	90	*Rwma Class 1, Trolley Wire, Heating Pad. Spring Contact, Connectors, Switche Gear Compoments
C18150	COPPER CLASS 2 - CHROMIUM ZIRCONIUM COPPER	80	*Rwma Class 2, Electrode Holder, Spot Welding Tips, Seam Welding Wheels, Ciecuit Breaker Parts, Switch Contact, Electrical Conductor, Arcing And Bridging Parts
C18200	COPPER CLASS 2 - CHROMIUM COPPER	80	
C17500	COPPER CLASS 3 - BERYLLIUM COPPER	45	*Rwma Class 3, Welding Equipment, Fuse Clips, Fasterner, Spring, Switch, Relay, Electrical Conductor
C18000	COPPER CLASS 3 - BERYLLIUM FREE COPPER	45	*Rwma Class 3, Welding Equipment, Fuse Clips, Fasterner, Spring, Switch, Relay, Electrical Conductor
C17200	COPPER CLASS 4 - BERYLLIUM COPPER	22	*Rwma Class 4, Welding Equipment, Fuse Clips, Fasterner, Spring, Switch, Relay, Electrical Compoments
C26000	CARTRIDGE BRASS	28	Electrical And Mechanical Compoments For General Application
C33000	LOW-LEADED BRASS TUBE	26	Electrical And Mechanical Compoments For General Application
C36000	FREE CUTTING BRASS	26	Electrical And Mechanical Compoments For General Application
C46400	NAVAL BRASS	26	Electrical And Mechanical Compoments For General Application
C51000	PHOSPHOR BRONZE	15	Electrical And Mechanical Compoments For General Application, Spring Contact For Switches And Relays

* Resistance Welding Manufacturers Association

ALUMINIUM ALLOY		% IACS	TYPICAL USE
1350	NON-HEAT TREATABLE ALLOY	61	Bus conductor application
6101-T64	HEAT TREATABLE ALLOY	60	Bus conductor application
6101-T61	HEAT TREATABLE ALLOY	58	Bus conductor application
6101-T63	HEAT TREATABLE ALLOY	56	Bus conductor application
6101-T6	HEAT TREATABLE ALLOY	55	Bus conductor application
6063-T6	HEAT TREATABLE ALLOY	53	Bus conductor application
6061-T6	HEAT TREATABLE ALLOY	40	Bus conductor application

GALVANIC CORROSION OR DISSIMILAR METAL CORROSION

GALVANIC CORROSION IS AN ELECTROCHEMICAL PROCESS OCCURING WHEN TWO OR MORE METALS ARE IN CONTACT.

THERE ARE THREE CONDITIONS THAT MUST EXIST FOR GALVANIC CORROSION TO OCCUR.

1- Electrochemically dissimilar metals must be present.

2- The metals must be in contact with electricity.

3- The metals must be exposed to an electrolyte.

All materials listed within each group in the galvanic chart may be considered similar and not affected by gavalnic action when coupled with other metals of that group in a normal environment such as storage in warehouses or indoor applications. Typically there should not be more than 0.25 V difference in the anodic index.

For critical envrironments such as outdoors, high humidity, saline envrironments, etc. the differential anode index between metals to be coupled should not be more than 0.15 V. In controlled envrionments, the differential anode index can be tolerated up to 0.50 V.

METAL	ANODIC INDEX (V)	COMPATIPLE COUPLE GROUPING
Gold and gold alloys, platinum and platinum alloys	0.00	C
Rhodium (plated on silver plated copper)	0.10	A C
Silver and high silver alloys	0.15	A A C
Nickel, monel and high nickel copper alloys (70-30)	0.30	A A C
Copper, red brass, high copper-nickel alloys (80-20), nickel silver, phosphor bronze, silicon bronze	0.35	A A A C
Brass: Cartridge, naval and commercial. Commercial bronze	0.40	A A A C
Brass half hard and free cutting yellow, manganese bronze, leaded and non-leaded copper zinc, muntz metal	0.45	A A A C
Stainless steel 18% chromium	0.50	A A A A C
Stainless steel 12% chromium, chromium plated	0.60	A A A A C
Tin plate and tin-lead solder	0.65	A A A A C
Lead and high lead alloys	0.70	A A A A C
Aluminium types 2014, 2024 and 2017	0.75	A A A A C
Iron: gray, malleable, plain carbon Low alloys steel (.13 carbon)	0.85	A A A A C
Aluminium types 1100, 3003, 5052, 6061 and 7075 Aluminium other than aluminium-copper alloys Aluminium casting alloys, silicon type Aluminium casting alloys other than silicon type	0.90	A A A A C
Cadnium plate	0.95	A A A A A C
Galvanized steel, zinc coatings	1.20	A C
Zinc alloys	1.25	A
Magnesium and magnesium alloys	1.75	

c: indicates the cathodic member.
a: indicates the anodic member that will corrode.

CONVERSIONS

MULTIPLY → TO OBTAIN ←	BY → BY ←	TO OBTAIN → DIVIDE ←

AREA CONVERSION

Circular mil	0.0000007854	Square inch
Circular mil	0.0005067	Square millimetre
Square inch	645.16	Square millimetre

LENGTH CONVERSION

Foot	0.3048	Metre
Inch	25.4	Millimetre
Inch	25000	Micron
Mile (U.S.)	1.609344	Kilometre
Yard	0.9144	Metre

VOLUME CONVERSION

Cubic foot	0.02831685	Cubic metre
Gallon (U.S.)	3.785412	Litre
Cubic inch	16387.06	Cubic millimetre
Cubic yard	0.7645549	Cubic metre

MASS AND DENSITY CONVERSION

Ounce (troy)	31.10348	Gram
Pound	0.4535924	Kilogram
Ton (2000 lbs)	907.1847	Kilogram
Ton (metric)	1000	Kilogram

MISCELLANEOUS CONVERSION

Atmosphere	33.9	Feet of water
Atmosphere	29.92	Inch of mercury
Atmosphere	14.7	PSI (pounds/sq. inch)
BTU	778.3	Foot pound
BTU per Hour	0.2932	Watt
BTU per Minute	0.02356	Watt
Gallon (U.S.)	231	Cubic inch
Horsepower	745.7	Watt
Micron	0.0004	Inch
Ounce	0.0625	Pound
Quart	0.25	Gallon
Square foot	144	Square inch

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