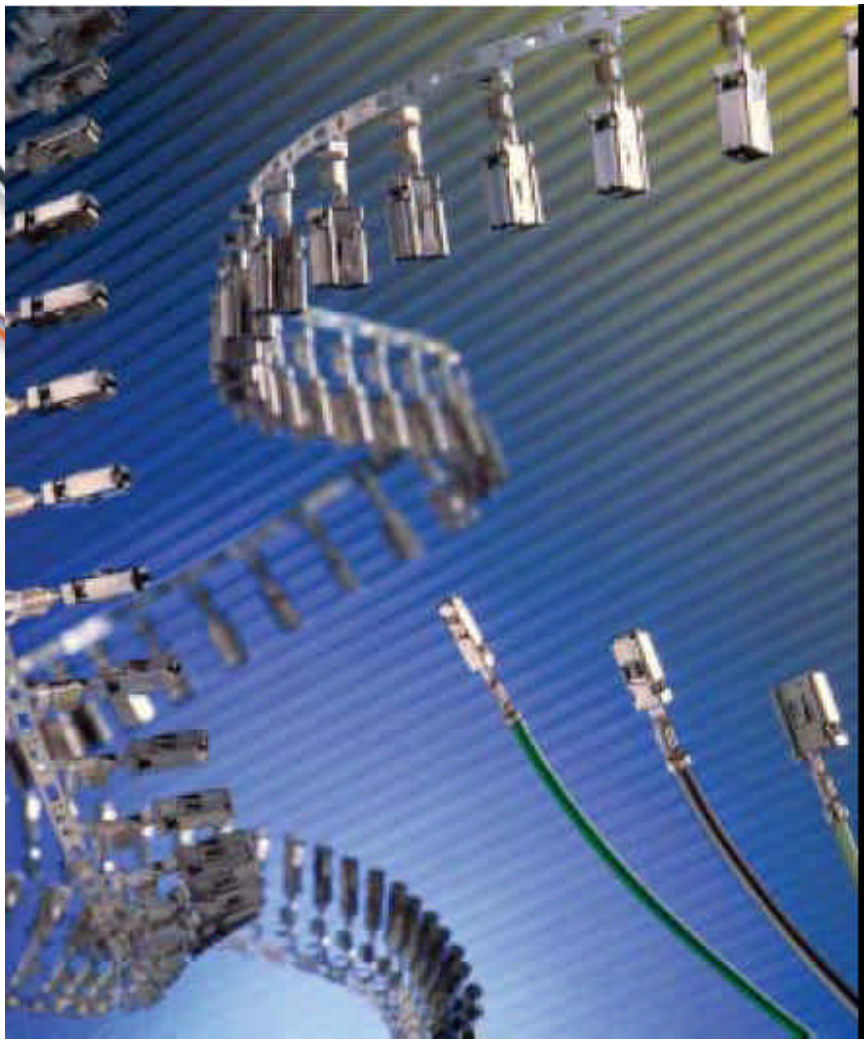
LEAR CORPORATION





MAK

Contact Systems for Automotive Applications

MAK

Contact Systems for Automotive Applications

The MAK contact system is especially designed to meet the requirements regarding quality, technology and process of the automotive industry.

Depending on the desired application, various designs are available, e.g. for single and multiple-pole connectors, for water-proof use, as soldered connection as well as for the connection of flat cables. The MAK system is predominantly used in applications such as inline connections, relay, fuse and aggregate contacting. The mating device - the renowned AFS flat connector, is used in a diversity of configurations.

The construction of the terminal box ensures extremely robust and process-secure handling in processing and final assembly of the terminal.
Dimensioning of the systems takes into account pitch sizes and interfaces to previous contacting systems.



MAK

Minimised insertion forces and a wider spectrum of performances through a greater selection of surfaces and materials are characteristics of this cutting edge technology. Premium quality and advanced process technology, as well as a favourable cost-performance ratio are further features of these contact systems.

Depending on the application, contacting is effected by 2 variants:

- Spring-supported terminals (see Fig. 1)
- Lamella-supported terminals (see Fig. 2)

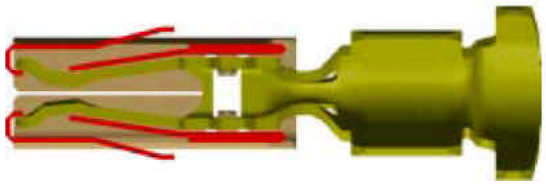


Fig. 1
for tab width 1.5 / 2.8 / 6.3 mm



Fig. 2
for tab width 8.0 / 1.2 mm

Characteristics

- minimal insertion forces
- overall secondary locking (system sizes 1.5 / 2.8 and 6.3 mm)
- high current carrying capacity and long life application
- high contact stability even in high ambient temperatures

MAK

Application

- as inline connection
- for relay, fuse and aggregate contacting
- for waterproof systems (PLUS model)
- for contacting to flat flexible cables
- for use on printed circuit boards

List of Terminals

Name of system	Variants		Tab width mm	Tab thickness mm	Connection technique					Wire cross section qmm	Single wire seal
	Lamella-supported	Spring-supported			Crimping	Crimping waterproof	Soldering	Crimp system for flat flexible cables	Multi-contact system flat flexible cable		
MAK 12*											
MAK 15		X	1,2 - 1,5	0,6	X						
MAK 15 PLUS		X				X					X
MAK 15 Solder terminal		X					X				
MAK 15 FLC		X						X			
MAK 15 FLM		X							X		
MAK 28		X	2,8 - 3,1	0,6 - 0,8	X						
MAK 28 PLUS		X				X					X
MAK 63		X	4,8 - 6,3	0,6 - 0,8	X					0,5 - 1,0	
MAK 63 PLUS		X				X				0,5 - 4,0	X
MAK 8	X		8,0 - 9,5	0,8	X					2,5 - 16	
MAK 8 PLUS	X			(1,2*)		X				2,5 - 10	X

* on request

LEAR CORPORATION

MAK

Single Wire Seals

The type of the single wire seal is selected in accordance with the thickness of the insulation cover of the employed wire and the dimensioning of the cavity of the housing. Please contact us for the right single wire seal for your specific application.

Housing

custom-made for individual application

Extraction tools

- MAK 15 / MAK 15 PLUS
  part no. 50000.017.610
- MAK 28 / MAK 28 PLUS
  part no. 50000.017.611
- MAK 63 / MAK 63 PLUS
  part no. 50000.017.612

Delivery form

Terminals:

- single form for hand crimping tools and crimping devices
- chain form for semi-automatic and fully-automatic machines

Housings:

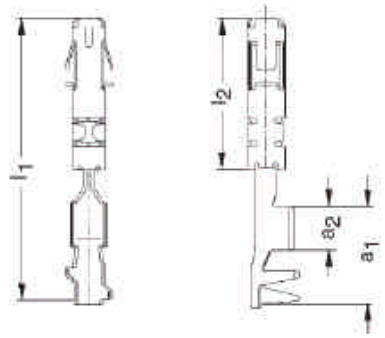
- loose in standard packs

Crimping Devices

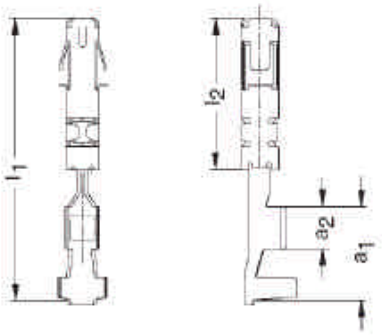
Processing tools and equipment perfectly adjusted to the products on request.

MAK 15

Type 1



Type 2

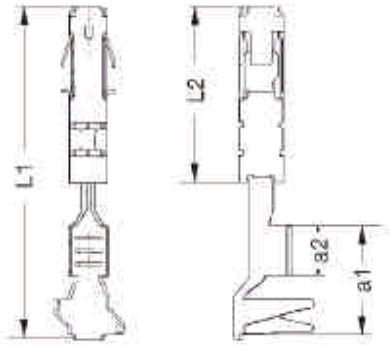


Type	Wire cross section qmm	a1	a2	L1	L2	Material thickness	Steel spring	Form E=single B=chain	Part number	Material	Surface	Terminal feed	Packing unit piece
1	0,2 - 0,35	5,70	2,50	19,80	10,60	0,25	X	B	**28287.306.185**	CuCrSiTi	frSn 1	NQ	12000
1	0,2 - 0,35	5,70	2,50	19,80	10,60	0,25	X	B	**28443.306.702**	CuCrSiTi	selAu	NQ	12000
1	0,5 - 1	6,60	3,00	19,80	10,60	0,25	X	B	**28288.306.185**	CuCrSiTi	frSn 1 selPd 2, selSn 1,5	NQ	10000
									28288.306.718			NQ	10000
1	0,5 - 1	6,60	3,00	19,80	10,60	0,25	X	B	**28442.306.702**	CuCrSiTi	selAu	NQ	10000
2	0,5 - 1	6,60	3,00	19,80	10,60	0,25	X	B	**28289.306.185**	CuCrSiTi	frSn 1	NQ	0
2	0,5 - 1	6,60	3,00	19,80	10,60	0,25	X	B	**28441.306.702**	CuCrSiTi	selAu	NQ	0

60910,001

MAK 15 PLUS

Type 1



Type	Wire cross section qmm	a1	a2	L1	L2	Material thickness	Steel spring	Form E=single B=chain	Part number	Material	Surface	Terminal feed	Packing unit piece
1	0,2 - 0,35	6,10	2,50	19,80	10,60	0,25	X	B	**28354.306.185**	CuCrSiTi	frSn 1	NQ	0
1	0,2 - 0,35	6,10	2,50	19,80	10,60	0,25	X	B	**28440.306.702**	CuCrSiTi	selAu	NQ	0
1	0,5 - 1	6,60	3,00	19,80	10,60	0,25	X	B	**28355.306.185**	CuCrSiTi	frSn 1	NQ	0
1	0,5 - 1	6,60	3,00	19,80	10,60	0,25	X	B	**28439.306.702**	CuCrSiTi	selAu	NQ	0

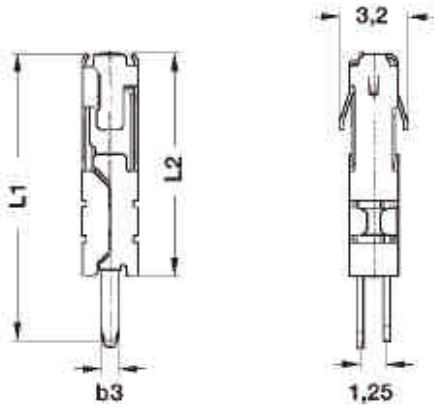
60911,001

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MAK 15

solder connection

Type 1

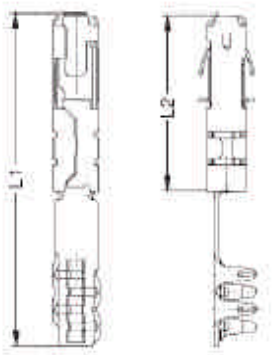


Type	b3	L1	L2	Steel spring	Form E=single B=chain	**Part number**	Material	Surface	Packing unit piece
1	0,85	13,60	10,60	X	B	**28376.306.710**	CuCrSiTi	selAg	0
									60913,001

MAK 15

crimp system for flat flexible cable

Type 1

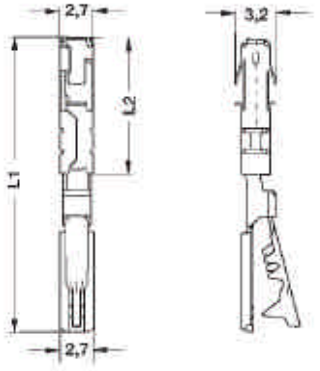


Type	L1	L2	Material thickness	Steel spring	Form E=single B=chain	**Part number**	Material	Surface	Terminal feed	Packing unit piece
1	19,90	10,60	0,25	X	B	**28449.213.178**	CuSn	frSn 2	NQ	7500
										60912,001

MAK 15 FLM

multi-contact system for flat flexible cables

Type 1

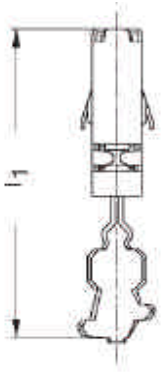


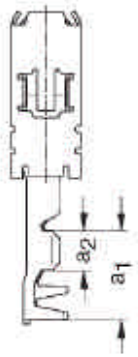
Type	L1	L2	Material thickness	Steel spring	Form E=single B=chain	**Part number**	Material	Surface	Terminal feed	Packing unit piece
1	23,00	10,60	0,30	X	B	**28416.306.178**	CuCrSiTi	frSn 2	NQ	5000
										60912,002

LEAR CORPORATION

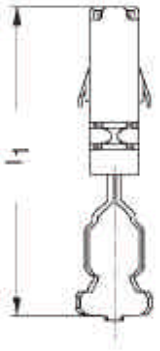
MAK 28

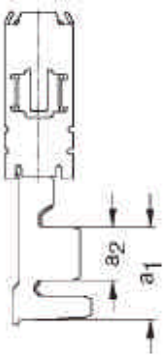
Type 1





Type 2



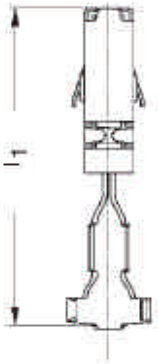


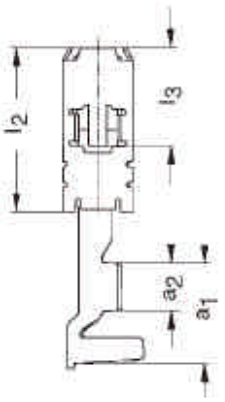
Type	Wire cross section qmm	Type of Lead	a1	a2	L1	Material thickness	Steel spring	Form E=single B=chain	Part number	Material	Surface	Terminal feed	Packing unit piece
1	0,2 - 0,35	FLR	5,20	2,50	18,80	0,32	X	B	**28271.306.185**	CuCrSiTi	frSn 1	NQ	5000
1	0,2 - 0,35	FLR	5,80	3,30	19,20	0,32	X	B	**28433.306.709**	CuCrSiTi	selAu	NQ	5000
2	0,5 - 1	FLR	5,50	3,00	19,20	0,32	X	B	**28272.306.185**	CuCrSiTi	frSn 1	NQ	4500
2	0,5 - 1	FLR	5,50	3,00	19,20	0,32	X	B	**28432.306.709**	CuCrSiTi	selAu	NQ	4500
2	1,5 - 2,5	FLR	5,80	3,30	19,20	0,32	X	B	**28273.306.185**	CuCrSiTi	frSn 1	NQ	4000
2	1,5 - 2,5	FLR	5,80	3,30	19,20	0,32	X	B	**28431.306.709**	CuCrSiTi	selAu	NQ	4000

60920,001

MAK 28 PLUS

Type 1





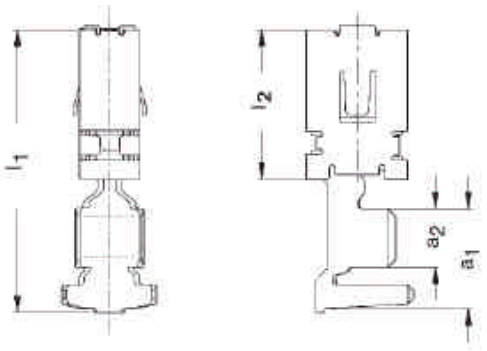
Type	Wire cross section qmm	a1	a2	L1	Material thickness	Steel spring	Form E=single B=chain	Part number	Material	Surface	Terminal feed	Packing unit piece
1	0,2 - 0,35	6,30	2,50	19,95	0,32	X	B	**28318.306.185**	CuCrSiTi	frSn 1	NQ	0
1	0,2 - 0,35	6,30	2,50		0,32	X	B	**28436.306.709**	CuCrSiTi	selAu	NQ	0
1	0,5 - 1	6,30	3,00	19,95	0,32	X	B	**28319.306.185**	CuCrSiTi	frSn 1	NQ	0
1	0,5 - 1	6,30	3,00	19,95	0,32	X	B	**28435.306.709**	CuCrSiTi	selAu	NQ	0
1	1,5 - 2,5	6,50	3,50	19,95	0,32	X	B	**28320.306.185**	CuCrSiTi	frSn 1	NQ	0
1	1,5 - 2,5	6,50	3,50	19,95	0,32	X	B	**28434.306.709**	CuCrSiTi	selAu	NQ	0

60921,001

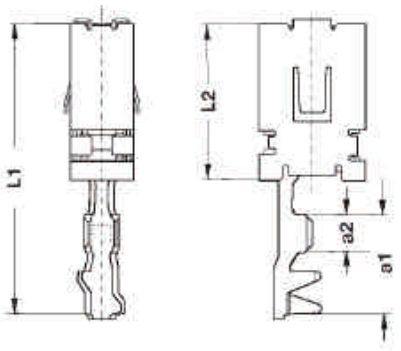
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MAK 63

Type 1



Type 2

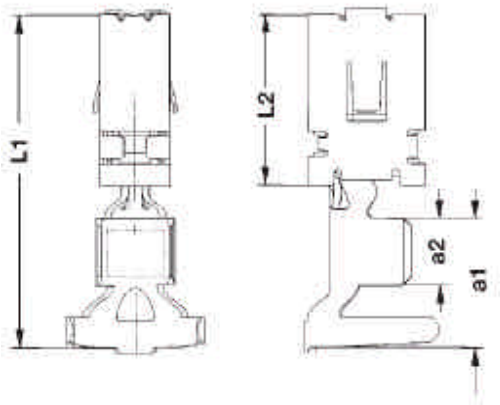


Type	Wire cross section qmm	a1	a2	L1	L2	Material thickness	Steel spring	Form E=single B=chain	Part number	Material	Surface	Terminal feed	Packing unit piece
1	0,5 - 1	5,80	3,00	19,05	10,30	0,40	X	B	**28305.306.185**	CuCrSiTi	frSn 1	NQ	2300
1	> 2,5 - 4	6,30	3,50	19,05	10,30	0,40	X	B	**28306.306.185**	CuCrSiTi	frSn 1	NQ	0
1	> 2,5 - 4	6,80	4,01	19,05	10,30	0,40	X	B	**28307.306.185**	CuCrSiTi	frSn 1	NQ	0
2	0,2 - 0,35	6,60	2,50	19,05	10,30	0,40	X	B	**28304.306.185**	CuCrSiTi	frSn 1	NQ	0

60930,001

MAK 63 PLUS

Type 1

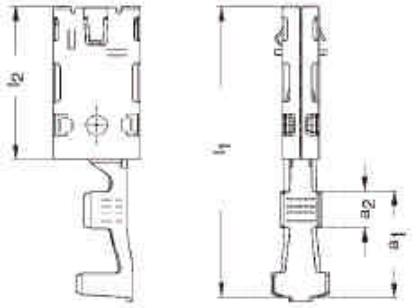


Type	Wire cross section qmm	a1	a2	L1	L2	Material thickness	Steel spring	Form E=single B=chain	Part number	Material	Surface	Terminal feed	Packing unit piece
1	0,5 - 1	7,20	3,00	19,95	10,30	0,40	X	B	**28364.306.185**	CuCrSiTi	frSn 1	NQ	0
1	1,5 - 2,5	7,70	3,50	19,95	10,30	0,40	X	B	**28365.306.185**	CuCrSiTi	frSn 1	NQ	0
1	4	7,70	4,00	19,95	10,30	0,40	X	B	**28366.306.185**	CuCrSiTi	frSn 1	NQ	0
													60931,001

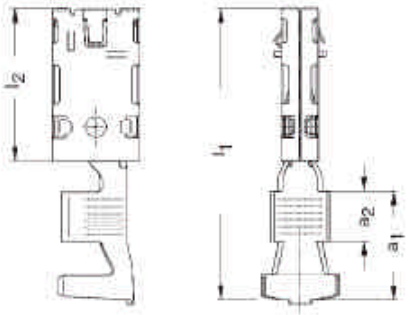
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MAK 8

Type 1



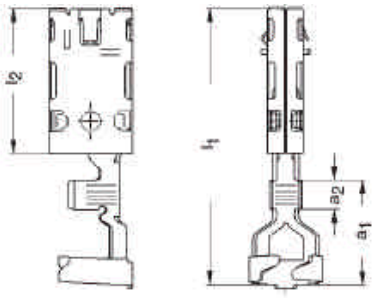
Type 2



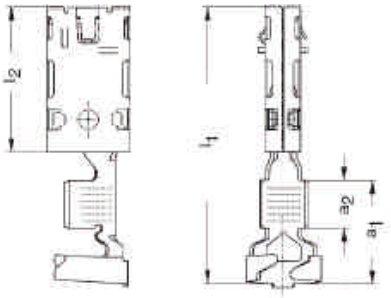
Type	Wire cross section qmm	a1	a2	L1	L2	Material thickness	Steel spring	Form E=single B=chain	Part number	Material	Surface	Terminal feed	Packing unit piece
1	2,5 - 4	13,00	4,50	35,80	18,80	0,60	X	B	**28222.306.179**	CuCrSiTi	frSn 3	NQ	700
									28222.306.710	CuCrSiTi	selAg		700
2	6 - 10	13,00	6,00	35,80	18,80	0,60	X	B	**28223.306.179**	CuCrSiTi	frSn 3	NQ	700
									28223.306.710	CuCrSiTi	selAg		700
2	10 - 16	16,00	6,50	35,80	18,80	0,60	X	B	**28238.306.179**	CuCrSiTi	frSn 3	NQ	600
									28238.306.710	CuCrSiTi	selAg		600
													60940,001

MAK 8 PLUS

Type 1



Type 2



Type	Wire cross section qmm	a1	a2	L1	L2	Steel spring	Form E=single B=chain	Part number	Material	Surface	Terminal feed	Packing unit piece
1	2,5 - 4	16,00	4,50	38,80	18,80	X	B	**28224.306.179**	CuCrSiTi	frSn 3	NQ	600
								28224.306.710	CuCrSiTi	selAg		600
2	6 - 10	16,00	4,50	38,80	18,80	X	B	**28225.306.179**	CuCrSiTi	frSn 3	NQ	600
								28225.306.710	CuCrSiTi	selAg		600
												60941,001

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