

ECS.. Series cable sets use small form factor push-pull connectors which are much smaller than traditional MIL38999 connectors. These have been designed for military applications where size and weight are a premium, for example man-portable systems. The small form factor connectors conform to MIL-STD-810 and are suitable for military and defense use.



**APPLICATIONS**

- Handheld communication, ECM
- FLIR's, Gimbals, Thermal Imagers
- Headup-display, Missiles
- Various Man-Portable Military Equipments

**MIL STANDARDS CONFORMANCE**

- MIL-W-22759/18 conformant Cable, imported from reputed suppliers like Habia, Sweden
- Connectors conform to MIL-STD-810(enironmental), MIL-STD-202 (sealing)

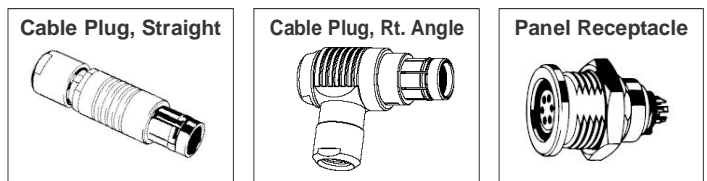
**FEATURES OF CONNECTORS USED**

- Smaller form factor connector as compared to MIL38999 yet meets all the MIL standards as of MIL38999.
- Far lighter in weight as compared to MIL38999, ideal for man-portable military equipments or applications where weight is a premium.
- High density contact packing upto 55 pins
- Rated to IP68
- High functional life of upto 5000 mating cycles
- -50°C ~ +150°C operating temperatures
- EMC Shielding: 360°
- Convenient push-pull locking mechanism
- Positive mating/unmating in all conditions

**FEATURES OF CABLE USED**

- Cable conforms to MIL-W-22759/18
  - ETFE polymer cable
  - -90°C ~ +155°C operating temperatures
- Highly chemical resistant to fuels, oils, acids
  - Highly flame retardant, low smoke

**Small Form Factor MIL-Confirmant Connectors**



**Connector Technical Specifications**

Sealing Performance	IP68: 2m submersion for 24 hours	IEC 60529
Operating Temperature	-65°C to +130°C	IEC 60512-6-11 i+j
Corrosion Resistance	Salt mist, 96 hours, 5% salt solution, 35°C	MIL-STD-202, Method 101 Condition A
Endurance	5000 mating cycles	IEC 60512-5-9a
Vibration	10 to 2000 Hz, 1.5 mm or 15 g, 12 sweep cycles per axis, 20 minutes per 10-2000-10 Hz sweep cycle, no discontinuity > 1 us	MIL-STD-202 Method 204 Condition B
Radiation Resistance	10 <sup>6</sup> Gy (=100M Rads)	

Insulation Resistance	> 10 <sup>10</sup> Ω, IEC 60512-2-3a Method C
Shell Resistance	45 mΩ, IEC 60512-2-2f
Contact Resistance over 5000 Mating Cycles	5 mΩ, IEC 60512-2-2a/b
Shielding Effectiveness	> 60 dB to 1GHz, IEC 60512-23-3

Body Shell	Brass, Chrome over Nickel
Cable Clamp, Nuts and other inner parts	Brass, Nickel
Contacts (Male)	Brass, Gold Plated
Contacts (Female)	Bronze, Gold Plated











Shown trademarks are property of their respective owners.

While the information contained herein in this catalog, has been carefully compiled to the best of our knowledge, nothing is intended as representation and warranty on our part; and no statement shall be construed as recommendation to infringe any of existing patents. We accept no liability of whatsoever for any faults and errors in the information contained herein. Contents of this catalogue and specifications of the products, are subject to change without notice due to continuous improvements.

## Small Form Factor Connectors based Cable Sets for Signal Transmission in Harsh Environments

Imported ETFE Insulated Cable from Habia, SFF MIL Connectors Imported from LEMO, Fischer










### Connector Choices and Contact Arrangements

CONTACT ARRANGEMENT	CONNECTOR CODE	Number of contacts	Contact Diameter [mm]	Dimension			Test Voltage [kV] in mated position				Max. Current [A] with 20°C Temp rise	Max. Current [A] with 40°C Temp rise	Compatible Wires
				A (mm)	B (mm) 1	C (m)	AC rms		DC				
							Contact - Body	Contact - Contact	Contact - Body	Contact - Contact			
	2A053	4	0.7	35	7	9	1.2	1.2	1.7	1.8	3.8	5.5	AW26-30
	2A054	5	0.7	35	7	9	0.8	1.0	1.3	1.8	3.6	5.2	AW26-30
	2A056	7	0.5	35	7	9	0.8	1.0	1.3	1.8	1.5	2.0	AW28-30
	3A053	4	0.9	46	9	12	1.2	1.6	2.0	2.4	5.0	7.0	AW22-30
	3A054	5	0.9	46	9	12	1.1	1.4	1.9	2.2	4.8	6.8	AW22-30
	3A058	8	0.7	46	9	12	0.8	1.1	1.4	1.9	2.5	3.8	AW26-30
	31A012	12	0.7	48	10	14	1.4	1.5	2.0	2.2	3.0	4.2	AW26-30
	31A019	19	0.5	48	10	14	1.2	0.9	2.0	1.5	1.8	2.5	AW28-30
	4A066	8	0.9	50	12	15	1.5	1.5	2.5	2.5	4.4	6.2	AW22-30
	4A055	9 $\left\{ \begin{array}{l} 1 \\ 8 \end{array} \right.$	1.3 0.9	50	12	15	2.4 1.4	2.2 1.5	3.8 2.0	3.6 2.4	8.0 4.0	12 6.0	AW20-30 AW22-30

Shown trademarks are property of their respective owners.

While the information contained herein in this catalogue, has been carefully compiled to the best of our knowledge, nothing is intended as representation and warranty on our part; and no statement shall be construed as recommendation to infringe any of existing patents. We accept no liability of whatsoever for any faults and errors in the information contained herein. Contents of this catalogue and specifications of the products, are subject to change without notice due to continuous improvements.

### Connector Choices and Contact Arrangements

CONTACT ARRANGEMENT	CONNECTOR CODE	Number of contacts	Contact Diameter [mm]	Dimension			Test Voltage [kV] in mated position				Max. Current [A] with 20°C Temp rise	Max. Current [A] with 40°C Temp rise	Compatible Wires
				A (mm)	B (mm)	C (mm)	AC rms		DC				
							Contact - Body	Contact - Contact	Contact - Body	Contact - Contact			
	4A056	11	0.9	50	12	15	1.4	1.5	2.1	2.2	4.0	5.8	AW22-30
	4A086	16	0.7	50	12	15	1.0	1.5	1.6	2.2	2.8	4.0	AW26-30
	4A092	19	0.7	50	12	15	0.8	1.2	1.2	1.8	2.5	3.5	AW26-30
	5A101	9 { 1 8	2.0	60	15	18	3.0	2.0	4.0	3.0	19	25	AW12-30
			1.3				1.8	1.5	2.5	2.0	4.0	5.0	AW20-30
	5A069	12	1.3	60	15	18	1.4	1.5	1.8	2.0	5.5	8.0	AW20-30
	5A110	16 { 4 12	1.6	60	15	18	1.6	1.3	2.8	2.1	10	14	AW14-30
			0.7				1.0	1.2	1.5	2.0	0.5	1	AW26-30
	5A038	18	0.9	60	15	18	1.4	1.6	1.8	2.2	3.2	4.5	AW22-30
	5A093	24	0.7	60	15	18	1.2	1.5	1.5	2.0	2.5	3.5	AW26-30
	5A102	27	0.7	60	15	18	1.2	1.5	1.5	2.0	2.2	3.0	AW26-30

Shown trademarks are property of their respective owners.

While the information contained herein in this catalog, has been carefully compiled to the best of our knowledge, nothing is intended as representation and warranty on our part; and no statement shall be construed as recommendation to infringe any of existing patents. We accept no liability of whatsoever for any faults and errors in the information contained herein. Contents of this catalogue and specifications of the products, are subject to change without notice due to continuous improvements.

## Small Form Factor Connectors based Cable Sets for Signal Transmission in Harsh Environments

Imported ETFE Insulated Cable from Habia, SFF MIL Connectors Imported from LEMO, Fischer

### Cable Insulation (ETFE) Technical Data

Physical & Mechanical	Test method	Conditions	Value
Operating temperature	IEC 60216	20000 hrs	155°C
Elongation at break	ASTM D638		300%
Flexural modulus	ASTM D790		1380 MPa
Hardness	ASTM D2240		67 D
Radiation resistance	IEC 60544		10 E5 Gy
Temperature range			-100 to 155°C
Tensile strength at break	ASTM D638		45 Mpa
Water absorption	ASTM D570	25°C	< 0.01%
Dielectric constant	ASTM D150	0.1 kHz / 10 MHz	2.6 / 2.6
Dissipation factor	ASTM D150	1.2 kHz / 10 MHz	0.001 / 0.004
Volume resistivity	ASTM D257		10 E16 ohms-cm
Combustion corrosivity	DIN 57472-813		pH 2.6 / 2700uS/cm
Flammability	UL 94	1.6mm	V-0
Oxygen index	ASTM D2863		31%
Smoke index	Def Stan 61-12 Pt 18/2	per m wire	1
Temperature index	NES 715		290°C
Toxicity index	Def Stan 61-12 Pt 18/2	per m wire	5
Acid Resistance			Excellent
Fuels Resistance			Excellent
Oils Resistance			Excellent

### Cable Electrical and Mechanical Specifications - Single Wire, no Shield

#### Construction:

Conductor : Tin Plated Copper (TPC)  
 Insulation : ETFE  
 Temperature rating : -65 / +150°C  
 Voltage : 600VAC  
 Test voltage : 3400VAC

#### Colour code:

● Black : 00      ● Green : 55  
 ● Brown : 11      ● Blue : 66  
 ● Red : 22      ● Violet : 77  
 ● Orange : 33      ● Grey : 88  
 ● Yellow : 44      ○ White : 99

Type	Code	Size		Conductor			Finished Wire			
		AWG	mm <sup>2</sup>	Stranding	Wire Ø	DC Res @ 20°C (Ohms / km)	Core Ø	Tolerance	Weight (kg/km)	Amps (@ 40°C)
M-ZL 3007	AW30	30	0.057	7 x 0.10	0.30	355	0.61	+ 0.04 - 0.03	0.9	3
M-ZL 2807	AW28	28	0.089	7 x 0.13	0.38	225	0.68	+ 0.05 - 0.04	1.2	4
M-ZL 2619	AW26	26	0.155	19 x 0.10	0.48	135	0.81	± 0.05	1.9	6
M-ZL 2419	AW24	24	0.241	19 x 0.13	0.60	86.0	0.91	+ 0.06 - 0.05	2.8	9
M-ZL 2219	AW22	22	0.382	19 x 0.16	0.76	53.1	1.09	+ 0.06 - 0.05	4.2	12
M-ZL 2019	AW20	20	0.597	19 x 0.20	0.96	32.4	1.30	+ 0.06 - 0.05	6.4	16
M-ZL 1819	AW18	18	0.963	19 x 0.25	1.21	20.4	1.55	± 0.05	9.7	22
M-ZL 1619	AW16	16	1.229	19 x 0.29	1.36	15.8	1.70	± 0.05	12	27
M-ZL 1419	AW14	14	1.870	19 x 0.36	1.70	10.0	2.06	± 0.05	19	37
M-ZL 1237	AW12	12	2.976	37 x 0.32	2.20	6.63	2.62	± 0.05	31	50
M-ZL 1037	AW10	10	4.650	37 x 0.40	2.77	4.13	3.20	± 0.05	48	69

(All dimensions in mm)

Shown trademarks are property of their respective owners.

While the information contained herein in this catalog, has been carefully compiled to the best of our knowledge, nothing is intended as representation and warranty on our part; and no statement shall be construed as recommendation to infringe any of existing patents. We accept no liability of whatsoever for any faults and errors in the information contained herein. Contents of this catalogue and specifications of the products, are subject to change without notice due to continuous improvements.

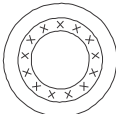



## Cable Electrical and Mechanical Specifications - Shielded & Jacketed

**Construction:**

Conductor : Tin Plated Copper (TPC)  
 Insulation : ETFE  
 Shield : Tin Plated Copper (TPC)  
 Jacket : ETFE  
 Temperature rating : -65 / +150°C  
 Voltage : 600 V AC  
 Test voltage : 1500 V AC

**Colours:**

Single core : White  
 Two cores : White / Red  
 Three cores : White / Red / Black  
 Four cores : White / Red / Black / Blue  
 Jacket : White

	Type	Size		Conductor			Finished Cable			
		AWG	mm <sup>2</sup>	Stranding	Wire Ø	DC Res @ 20°C (Ohms/km)	Core Ø	Shield Ø	Jacket Ø	Weight (kg/km)
 Single, Shielded Jacketed	M-ZL 3007 STZ 1	30	0.06	7 x 0.10	0.30	355	0.61	1.1	1.5	5.3
	M-ZL 2807 STZ 1	28	0.09	7 x 0.13	0.38	225	0.68	1.2	1.6	5.9
	M-ZL 2619 STZ 1	26	0.16	19 x 0.10	0.48	135	0.81	1.3	1.7	7.0
	M-ZL 2419 STZ 1	24	0.24	19 x 0.13	0.60	86.0	0.91	1.4	1.8	8.8
	M-ZL 2219 STZ 1	22	0.38	19 x 0.16	0.76	53.1	1.09	1.5	2.0	10
	M-ZL 2019 STZ 1	20	0.61	19 x 0.20	0.96	32.4	1.30	1.8	2.2	14
	M-ZL 1819 STZ 1	18	0.96	19 x 0.25	1.21	20.4	1.55	2.0	2.5	18
M-ZL 1619 STZ 1	16	1.20	19 x 0.29	1.36	15.8	1.70	2.2	2.7	21	
 Pair, Shielded Jacketed	M-ZL 3007 STZ 2	30	0.06	7 x 0.10	0.30	355	0.61	1.7	2.1	7.9
	M-ZL 2807 STZ 2	28	0.09	7 x 0.13	0.38	225	0.68	1.8	2.3	9.1
	M-ZL 2619 STZ 2	26	0.16	19 x 0.10	0.48	135	0.81	2.1	2.6	9.5
	M-ZL 2419 STZ 2	24	0.24	19 x 0.13	0.60	86.0	0.91	2.3	2.8	14
	M-ZL 2219 STZ 2	22	0.38	19 x 0.16	0.76	53.1	1.09	2.7	3.2	18
	M-ZL 2019 STZ 2	20	0.61	19 x 0.20	0.96	32.4	1.30	3.1	3.6	24
	M-ZL 1819 STZ 2	18	0.96	19 x 0.25	1.21	20.4	1.55	3.6	4.1	32
M-ZL 1619 STZ 2	16	1.20	19 x 0.29	1.36	15.8	1.70	3.9	4.5	40	
 Triple, Shielded Jacketed	M-ZL 3007 STZ 3	30	0.06	7 x 0.10	0.30	355	0.61	1.8	2.2	10
	M-ZL 2807 STZ 3	28	0.09	7 x 0.13	0.38	225	0.68	1.9	2.4	12
	M-ZL 2619 STZ 3	26	0.16	19 x 0.10	0.48	135	0.81	2.2	2.7	15
	M-ZL 2419 STZ 3	24	0.24	19 x 0.13	0.60	86.0	0.91	2.4	2.9	19
	M-ZL 2219 STZ 3	22	0.38	19 x 0.16	0.76	53.1	1.09	2.8	3.3	24
	M-ZL 2019 STZ 3	20	0.61	19 x 0.20	0.96	32.4	1.30	3.3	3.8	33
	M-ZL 1819 STZ 3	18	0.96	19 x 0.25	1.21	20.4	1.55	3.8	4.4	45
M-ZL 1619 STZ 3	16	1.20	19 x 0.29	1.36	15.8	1.70	4.1	4.8	56	
 Quad, Shielded Jacketed	M-ZL 3007 STZ 4	30	0.06	7 x 0.10	0.30	355	0.61	1.9	2.4	12
	M-ZL 2807 STZ 4	28	0.09	7 x 0.13	0.38	225	0.68	2.1	2.6	14
	M-ZL 2619 STZ 4	26	0.16	19 x 0.10	0.48	135	0.81	2.4	2.9	18
	M-ZL 2419 STZ 4	24	0.24	19 x 0.13	0.60	86.0	0.91	2.7	3.2	22
	M-ZL 2219 STZ 4	22	0.38	19 x 0.16	0.76	53.1	1.09	3.1	3.6	30
	M-ZL 2019 STZ 4	20	0.61	19 x 0.20	0.96	32.4	1.30	3.6	4.1	41
	M-ZL 1819 STZ 4	18	0.96	19 x 0.25	1.21	20.4	1.55	4.2	4.7	58
M-ZL 1619 STZ 4	16	1.20	19 x 0.29	1.36	15.8	1.70	4.6	5.3	70	

(All dimensions in mm)

Shown trademarks are property of their respective owners.

While the information contained herein in this catalog, has been carefully compiled to the best of our knowledge, nothing is intended as representation and warranty on our part; and no statement shall be construed as recommendation to infringe any of existing patents. We accept no liability of whatsoever for any faults and errors in the information contained herein. Contents of this catalogue and specifications of the products, are subject to change without notice due to continuous improvements.

# Small Form Factor Connectors based Cable Sets for Signal Transmission in Harsh Environments

Imported ETFE Insulated Cable from Habia, SFF MIL Connectors Imported from LEMO, Fischer

## Ordering Codes Description

ECS - (Connector 1) (Connector 2) (Length) (Cable) (Cable)  
 □ (□ / □) - □ (□ / □) - □ □ - □ □ □ C - REPEAT  
**1 2 3 1 2 3 L U 4 5 6**

<b>1</b>	Connector Series	2A053 = 2A053; 3A058 = 3A058 ; see previous pages for full list
<b>2</b>	Male/Female Designator	M = Male ; F = Female
<b>3</b>	Orientation of Connector	ST = Straight; RT = Right Angle
<b>LL</b>	Length	0.5 = 0.5 ; 1 = 1.0 ; 2 = 2.0
<b>U</b>	Unit of Length	M = Meter ; F = Feet ; I = Inch
<b>4</b>	Cable Code	AW30 = AW30; AW28 = AW28 ; see previous pages for full list
<b>5</b>	Cable type	D = Discrete ; ST1 = Shielded Jacketed Single ; ST2 = Shielded Jacketed Pair; ST3 & 4 = Shielded Jacketed Triple & Quad
<b>6</b>	No. of Cables	Mention total No. of cables in set, Example 5 cables = 5 & so on

## Few Examples of Cable Sets Ordering Code - Make your own customization

Ordering Code	Conn 1	Conn 2	Conn 1 Contacts & Code	Conn 2 Contacts & Code	Length	Cable Code	Cable Type	No of Cables
ECS-2A053(M/ST)-2A053 (M/S)-1F-AW30-D-5C	St. Plug	St. Plug	5, 2A053	5, 2A053	1 feet	AW30	Discrete	5
ECS-2A053(M/ST)-2A053 (M/S)-1M-AW30-D-5C	St. Plug	St. Plug	5, 2A053	5, 2A053	1 meter	AW30	Discrete	5
ECS-3A058(M/ST)-3A058 (M/S)-1F-AW26-D-8C	St. Plug	St. Plug	8, 3A058	8, 3A058	1 feet	AW26	Discrete	8
ECS-3A058(M/ST)-3A058 (M/S)-1M-AW26-D-8C	St. Plug	St. Plug	8, 3A058	8, 3A058	1 meter	AW26	Discrete	8
ECS-31A019(M/ST)-31A019 (M/S)-1F-AW30-D-19C	St. Plug	St. Plug	19,31A019	19,31A019	1 feet	AW30	Discrete	19
ECS-31A019(M/ST)-31A019 (M/S)-1M-AW30-D-19C	St. Plug	St. Plug	19,31A019	19,31A019	1 meter	AW30	Discrete	19
ECS-4A055(M/ST)-4A055(M/S)-1F-AW22-D-1C-AW26-D-8C	St. Plug	St. Plug	9, 4A055	9, 4A055	1 feet	AW22 AW26	Discrete Discrete	1 8
ECS-4A055(M/ST)-4A055(M/S)-1M-AW22-D-1C-AW26-D-8C	St. Plug	St. Plug	9, 4A055	9, 4A055	1 meter	AW22 AW26	Discrete Discrete	1 8
ECS-4A086(M/ST)-4A086 (M/S)-1F-AW30-D-16C	St. Plug	St. Plug	16, 4A086	16, 4A086	1 feet	AW30	Discrete	16
ECS-4A086(M/ST)-4A086 (M/S)-1M-AW30-D-16C	St. Plug	St. Plug	16, 4A086	16, 4A086	1 meter	AW30	Discrete	16
ECS-5A069(M/ST)-5A069 (M/S)-1F-AW22-D-12C	St. Plug	St. Plug	12, 5A069	12, 5A069	1 feet	AW22	Discrete	12
ECS-5A069(M/ST)-5A069 (M/S)-1M-AW22-D-12C	St. Plug	St. Plug	12, 5A069	12, 5A069	1 meter	AW22	Discrete	12
ECS-5A102(M/ST)-5A102 (M/S)-1F-AW28-D-27C	St. Plug	St. Plug	27, 5A102	27, 5A102	1 feet	AW28	Discrete	27
ECS-2A053(M/ST)-2A053 (M/S)-1F-AW30-ST4-1C	St. Plug	St. Plug	5, 2A053	5, 2A053	1 feet	AW30	Quad Shielded jacketed	1
ECS-3A058(M/ST)-3A058 (M/S)-1F-AW26-ST3-2C	St. Plug	St. Plug	8, 3A058	8, 3A058	1 feet	AW26	Triple Shielded jacketed	2
ECS-31A019(M/ST)-31A019 (M/S)-1F-AW30-ST4-4C	St. Plug	St. Plug	19,31A019	19,31A019	1 feet	AW30	Quad Shielded jacketed	4

Shown trademarks are property of their respective owners.

While the information contained herein in this catalog, has been carefully compiled to the best of our knowledge, nothing is intended as representation and warranty on our part; and no statement shall be construed as recommendation to infringe any of existing patents. We accept no liability of whatsoever for any faults and errors in the information contained herein. Contents of this catalogue and specifications of the products, are subject to change without notice due to continuous improvements.