QWLD
thermocouple contact availability

A complete line of cylindrical connectors containing thermocouple insert arrangements is available. The contact layout for a particular arrangement will be found in either the MIL-C-22992, QWLD contact arrangement section, pages 27-38, or the Special contact arrangement section, pages 39-47. All thermocouple contact layouts may contain either iron, alumel, chromel, constantan, standard (copper) or brass (dummy) contacts. See the thermocouple tabulations on the following pages.

The following abbreviations are used in the contact material column in the charts that follow. Also, thermocouple contacts are color coded as shown. (This identification is made by means of small dots of stain on solder well end of the contact.)

Abbreviation	Material	Color Code
Ir.	Iron	Black
Con	Constantan	Yellow
Cu.	Copper Alloy	N/A
Ch.	Chromel	White
Al.	Alumel	Green
Dummy	Brass	N/A

WIRE WELL DATA

Contact Size	Well Inside Dia. + .004 – .002	Well Depth + .031 – .000	Solder Well Barrel Outside Dia.
12	.125	.250	.166 ±.003
16	.094	.188	.125 +.002 –.004

RECOMMENDED WIRE

I Chromel-Alumel	Use wire in accordance with MIL-W-5848
II Iron-Constantan	Use wire in accordance with MIL-W-5845

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Shell Size and Arrg.	Similar to MS Arrg.	Total Contacts	Contact Size		Pin Insert Rotation CW	Contact Material
			12	16		
14-59	14-53	6		6	None	A = Al.; B = Ch.; C = Ir.; D = Con.; E,F = Cu.
16-52	16-11	2	2		90°	A = Al.; B = Ch.
16-53	16-9	4	2	2	70°	A = Al.; C = Ch.; B, D = Cu.
16-55	16-10	3	3		45°	A = Al.; B = Ch.; C = Cu.
16-56	16-13	2	2		90°	A = Con.; B = Cu.
16-57	16-10	3	3		None	A = Al.; B = Cu.; C = Ch.
16-58	16-10	3	3		None	A = Con.; B, C = Cu.
16-60	16-13	2	2		None	A = Al,; B = Ch.
16-62	16-11	2	2		None	A = Con.; B = Cu.
16-67	16-11	2	2		None	A = Al.; B = Ch.
16-68	16-9	4	2	2	None	A, B, C = Ch.; D = Al.
18-51	18-12	6		6	None	A = Ir.; B, E = Con.; D = Cu.; C, F = Dummy
18-52	18-11	5	5		None	A = Ir.; B = Con.; C = Ch.; D = Al.; E = Dummy
18-53	18-12	6		6	None	A, D = Ir.; B, E = Con.; C, F, = Dummy
18-54	18-15	4	4		None	A, C = Al.; B, D = Ch.
18-56	18-1	10		10	45°	A, C, E, G, I = Ir.; B, D, F, H, J = Con
18-57	18-12	6		6	45°	A, C, E = Al.; B, D, F = Ch.
18-59	18-12	6		6	45°	A, C = Ir,; B, E, F, = Con.; D = Cu.
18-60	18-11	5	5		45°	A, D = Al.; B, C = Ch.; E = Al.
18-61	18-12	6		6	None	A, C = Ir.; B, D = Con.; E = Ch.; F = Al.
18-62	18-12	6		6	None	A, B, D = Ir.; D, E, F = Con.
18-63	18-15	4	4		None	A, C = Con.; B, D = Cu.
18-65	18-12	6		6	None	A = Ir.; B = Con.; Balance = Cu.
18-66	18-1	10		10	None	A, C, E, G, I = Cu.; B, D, F, H, J = Con.
18-67	18-12	6		6	None	A, C, E = Cu.; B, D, F = Con.
18-68	18-11	5	5		None	A, D = Al.; B, C = Ch.; E = Cu.
18-69	18-1	10		10	None	A = Al.; B = Ch.; Balance = Cu.
18-70	18-11	5	5		None	A = Ir.; B = Con.; C = Ch.; D = Al.; E = Cu.
18-71	18-15	4	4		None	A = Con.; Balance = Cu.
18-72	18-15	4	4		None	D = Con.; Balance = Cu.
18-73	18-9	7	2	5	None	A = Al.; D = Ch; Balance = Cu.
18-74	18-12	6		6	None	A = Ch.; B = Al.; D = Ir.; E = Cu.; C, F = Con.
18-76	18-1	10		10	None	A, C, E, G, I = Al.; B, D, F, H, J = Ch.
18-77	18-1	10		10	None	A, C, E, G = Al.; B, D, F, H = Ch.; Bal. = Cu.
18-78	18-1	10		10	None	A = Al.; B = Ch.; D, F, H, J = Con.; Bal. = Cu.
18-79	18-12	6		6	None	A, F, = Ir.; B, E = Con.; C, D, = Cu.
18-80	18-15	4	4		None	A, C = Cu.; B, D = Con.
18-81	18-1	10		10	None	E, G = Con.; Bal. = Cu.
18-82	18-1	10		10	None	E, G = Con.; F, H = Ir.; Bal = Cu.
20-52	20-4	4	4		315°	A= Ir.; B = Con.; C = Ch.; D = Al
20-56	20-7	8		8	45°	A, B, G, H = Ir.; C, D, E, F = Con.
20-60	20-7	8		8	45°	D = Ch.; E = Al.; Balance = Cu.
20-61	20-29	17		17	45°	A, B, M = Cu.; Balance = Con.
20-62	20-15	7	7		80°	A, C, E, = Al.; B, D, F, = Ch.; G = Cu.

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Shell Size and Arrg.	Similar to MS Arrg.	Total Contacts	Contact Size		Pin Insert Rotation CW	Contact Material
			12	16		
20-64	20-27	14		14	None	A = Al.; C = Ch.; Balance = Cu.
20-65	20-27	14		14	None	A, B, C, D, E, F, G = Ir.; H, I, J, K, L, M, N = Con.
20-67	20-16	9	2	7	None	H = Al.; I = Ch.; Balance = Cu.
20-68	20-7	8		8	None	A, B, G, H = Con.; C, D, E, F, = Cu.
20-69	20-27	14		14	None	A, B, C, D, E, F, G = Cu.; H, I, J, K, L, M, N = Con.
20-70	20-29	17		17	None	A, C, E, G, J, L, N, R, T = Ir.; B, D, F, H, K, M, P, S = Con.
20-71	20-29	17		17	None	S = Al.; R = Ch.; Balance = Cu.
20-74	20-29	17		17	None	A, C, E, G, J, L, N, R = Ir.; B, D, F, H, K, M, P, S = Con.; T = Cu.
20-75	20-15	7	7		None	G = Al.; Balance = Ch.
20-77	20-16	9	2	7	None	A = Con.; Balance = Std.
20-80	20-27	14		14	None	A, C, E, G, I, K, M = Cu.; B, D, F, H, J, L, N = Con.
20-81	20-27	14		14	None	A, C, E, G, I, K, M = Ch.; B, D, F, H, J, L, N = Al
20-82	20-29	17		17	None	A, C, E, G, J, L, N, R = Al.; B, D, F, H, K, M, P, S = Ch.; T = Cu.
20-85	20-33	11		11	None	K, L, = Al.; Bal. = Ch.
20-87	20-29	17		17	None	A, C, E, G, J, L, N, R = Con.; Bal. = Cu.
20-88	20-27	14		14	None	A, C, E = Al.; B, D, F, = Ch.; G, H, K, N = Con.; Bal. = Cu.
20-89	20-27	14		14	None	B, D, F, H, J, L = Al,; A, C, E, G, I, K = Ch., M, N = Cu.
20-90	20-27	14		14	None	C, G, I = Ch.; K, L, M = Al.; Bal. = Cu.
20-91	20-27	14		14	None	I = Ch.; K = Al.; Bal. = Cu.
20-92	20-7	8		8	None	A = Al.; H = Cu.; Bal. = Ch.
20-93	20-27	14		14	None	A = Ch.; B = Al.; Bal. = Cu.
20-94	20-15	7	7		None	A, C, E = Al.; B, D, F = Ch.; G = Cu.
20-99	20-33	11		11	None	A = Al.; Bal. = Ch.
22-57	22-14	19		19	45°	A, C, E, G, J, L, N, R = Ir.; B, D, F, H, K, M, P, S = Con.; T, U, V, = Cu.
22-60	22-14	19		19	45°	U = Al.; N = Ch.; Bal. = Cu.
22-62	22-23	8	8		60°	A, B, F, G = Al.; C, D, E, H = Ch.
22-68	22-19	14		14	45°	A, C, E, G, J, L, M = Ir.; B, D, F, H, K, P, N = Con.
22-69	22-19	14		14	45°	A, C, E, G, J, L, M = Cu.; B, D, F, H, K, P, N = Con.
22-71	22-14	19		19	None	V = Al.; U = Ch.; Balance = Cu.
22-72	22-5	6	2	4	None	B = Al.; E = Ch.; Balance = Cu.
22-73	22-5	6	2	4	None	E = Al.; B = Ch.; Balance = Cu.
22-74	22-23	8	8		None	A, C, E, G = Ir.; B, D, F, H = Con.
22-75	22-23	8	8		None	A = Al.; B, D, G, H = Cu.; C = Ch.; E = Ir.; F = Con
22-76		21		21	None	W = Con.; Balance = Cu.
22-77	22-19	14		14	None	B, D, F, H, J, K, M, P = Cu.; A, E, L = Ir.; C, G, N = Con.
22-78	22-14	19		19	None	A, C, E, G, H, K, M, P, R, T = Con.; Balance = Cu.
22-79	22-10	4		4	None	A, C = Con.; B, D = Cu.
22-82	22-14	19		19	None	A, C, E, G, J, L, N, R, T = Ir.; B, D, F, H, K, M, P, S, U = Con.; V = Cu.
22-83	22-18	8		8	None	A, C, E, G = Al.; B, D, F, H, = Ch.
22-84	22-14	19		19	None	A, C, S, = Ch.; B, D, T = Al.; Bal. = Cu.
22-85	22-19	14		14	None	A, C, E, G, J, L, N = Al.; B, D, F, H, K, M, P = Ch.
22-89	22-88	7	7		None	A, C, E = Ir.; B, D, F = Con.; G = Cu.
24-56	24-20	11	2	9	45°	E = Al.; F = Ch.; Balance = Cu.
24-57	24-26	24		24	45°	A, C, J, V, Y, W, K, E, H, U, S, M = Ch.; Balance = Al
24-62	24-28	24		24	None	A, C, E, G = Ir.; B, D, F, H = Con.; R, T = Ch.; S, U = Al.; Balance = Cu.

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			12	16		
24-63	24-28	24		24	None	A, C, E, G, J, L, K, N, S, U, W, Y = Cu.; B, D, F, H, Q, R, M, P, T, V, X, Z = Con.
24-64	24-5	16		16	None	A, B, C, D, E, F, G, H = Ir.; J, K, L, M, N, P, R, S = Con.
24-68	24-28	24		24	None	D = Con.; Balance = Cu.
24-81	24-7	16	2	14	None	A, C, E, G, I, K, M, N, P = Cu.; B, D, F, H, J, L, O = Con.
24-88	24-28	24		24	None	A, B, C, D, E, F, G, H, J, K, L, M = Con.; Bal. = Ir.
24-91	24-5	16		16	None	A, B, C, D, E, F, G, H = Al.; J, K, L, M, N, P, R, S = Ch.
28-53	28-11	22	4	18	45°	J, L = Al.; K, M = Ch.; Balance = Cu.
28-58	28-20	14	10	4	45°	A, C, E, G, K, M = Al.; B, D, F, H, L, N = Ch.; J, P = Cu.
28-61	28-21	37		37	45°	A, C, J, Z, m, r, n, a, K, F, H, X, k, h, T, M, N, d = Ir.; Balance = Con.
28-63	28-20	14	10	4	45°	A, C, E, G, J = Al.; B, D, F, H, P = Ch.; Balance = Cu.
28-64	28-15	35		35	None	A, d = Al.; B, j = Ch.; C, D, E, F, G, N, P, R, S, H, J, K, L, M, W, X, Y, Z = Con.; Balance = Cu.
28-65	28-12	26		26	None	A, C, E, G, J, L, N, R, T, V = Ir.; X, Z = Al.; B, D, F, H, K, M, P, S, U, W = Con; Y, a = Ch.; b, d = Cu.
28-67	28-16	20		20	None	U = Con.; Balance = Cu.
28-68	28-15	35		35	45°	T = Al.; U = Ch.; Balance = Cu.
28-69	28-11	22	4	18	None	G = Al.; R = Ch.; Balance = Cu.
28-70	28-11	22	4	18	None	A = Al.; B = Ch.; Balance = Cu.
28-77	28-11	22	4	18	None	J = Con.; Balance = Cu.
28-81	28-21	37		37	None	A, D, S, Z, n, s = Ir.; B, J, K, f, g, r = Con.; G, L, P, b, e, j = Al.; F, H, T, X, h, k = Ch.; Balance = Cu.
28-85	28-11	22	4	18	45°	K, M = Al.; J, L = Ch.; Bal. = Cu.
28-91	28-9	12	6	6	None	M = Ir.; L = Con.; Bal. = Cu.
28-94	28-12	26		26	None	B, D, F, H, K, M, P, S, U, W, Y, a, d = Al.; Bal. = Ch.
28-98	28-21	37		37	None	M = Al.; F = Ch.; Bal. = Cu.
28-99	28-12	26		26	None	B, D, F, H, K, M, P, S, U, W, Y, a = Con.; Bal. = Cu.
28-AC	28-16	20		20	None	A, C, E, G, J, L = Ir.; B, D, F, N, K, M = Con.; Bal. = Cu.
28-AD	28-21	37		37	45°	A, C, F, H, J, K, M, N, T, X, Z, a, d, h, k, m, n, r = Cu.; Bal. = Cu.
28-AE	28-21	37		37	None	A, C, E, G, J, L, N, R, T, V, X, a, c, e, g, j, m, p. s = Cu.; Bal. = Con.
28-AF	28-18	12		12	None	A, C, E, G, J, L = Ch.; Bal. = Al.
28-AG	28-12	26		26	None	A, C, E, G, J, L, N, R = Al.; B, D, F, H, K, M, P, S = Ch.; Bal. = Cu.
28-AK	28-21	37		37	45°	A, B, C, D, J, K, L, M, N, P, a, b, c, d, e, m, p = Ch.; n = Cu.; Bal. = Al.
32-51	32-8	30	6	24	90°	M = Ch.; N = Al.; Balance = Cu.
32-55	32-8	30	6	24	125°	M, N = Ch.; O, P = Al.; Balance = Cu.
32-91	32-64	54		54	None	A, C, E, G, J, L, N, P, S, U, W, Y, a, c, e, g, j, m = Ir.; B, D, F, H, K, M, O, R, T, V, X, Z, b, d, f, h, k, n = Con.; Bal. = Cu.
36-53	36-7	47	7	40	45°	u, v, w = Al.; x, y, z = Ch.; Balance = Cu.
36-56	36-10	48		48	None	A, C, E, G, L, J, H, P, R, T, V, X, Z, b, d, f, h, k, q, n, m, u, w, y = Con.; Bal. = Cu.
36-57	36-8	47	1	46	None	W = Al.; f = Ch.; Balance = Cu.
36-58	36-15	35		35	None	H = Al.; G = Ch.; Balance = Cu.
36-61	36-15	35		35	None	A, C, E, J, K, L, M, N, P, R, T, V, f, X, Y, h, j, c = Con.; Balance = Cu.
36-62	36-10	48		48	None	A, C, E = Al.; B, D, F = Ch.; Balance = Cu.
36-82	36-52*	52		52	None	v, g = Ir.; p, y, c = Con.; x = Ch.; Balance = Cu.

* Amphenol arrangement

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Shell Size and Arrg.	Similar to MS Arrg.	Total Contacts	Contact Size		Pin Insert Rotation CW	Contact Material
			12	16		
36-86	36-10	48		48	None	A, C, E, G, J, L, N, P, R, T, V, X = Al.; B, D, F, H, K, M, O, Q, S, U, W, Y = Ch.; z, b, d, f, h, k, n, q, s, u, w, y = Con.; a, c, e, g, j, m, p, r, t, v, x, z = Cu.
36-88	36-52	52		52	None	A, C, E, H, K, M, P, S, U, W, Y, a, c, f, h, j, m, p, r, t, v, x, z, AB, AD, AF = Cu.; Bal. = Con.
40-58	40-56*	85		85	None	A, C, E, H, K, M, P, S, U, W, Y, a, c, f, h, j, m, p, r, t, v, x, z, AB, AD, AF, AJ, AL, AN, AP, AS, AU, AW, AY, BA, BC, BE, BH, BK, BM, BP, BS, BU = Ir.; Balance = Con.
40-59	40-56*	85		85	None	B = Ch.; C = Con.; Balance = Cu.
40-77	40-53*	60		60	None	55, 60 = Ir.; 57, 58, 59 = Con.; 56 = Ch.; Balance = Cu.
40-78	40-53*	60		60	None	50, 51 = Ir.; 27, 28, 29, 31, 32, 34, 36, 37 = Con.; 25, 39, 40, 41 = Al.; 43, 44, 45, 46, 47, 48, 49, 52, 53, 54 = Ch.; Balance = Cu.
40-88	40-53	60		60	None	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59 = Con.; Bal. = Cu.
40-AA	40-56	85		85	None	A, C, E, H, K, M, P, S, U, W, Y, a, c, f, h, j, m, p, r, t, v, x, z, AB, AD, AF, AJ, AL, AN, AR, AT = Cu.; B, D, F, J, L, N, R, T, V, X, Z, b, d, g, i, k, n, q, s, u, w, y, AA, AC, AE, AH, AK, AM, AP, AS = Con.; AU, AW, AY, BA, BC, BE, BH, BK, BM, BP, BS, BU = Cu.; AV, AX, AZ, BB, BD, BF, BJ, BL, BN, BR, BT, BV = Al.
44-57	44-52	104		104	None	A, C, E, G, J, L, etc. = Cu.; B, D, F, H, K, M, etc. = Con.
44-59	44-52	104		104	None	34 = Con.; 70 = Cu.
44-60	44-52	104		104	None	A, C, E, etc. = Ch., (52); B, D, F, etc. = Al., (52)
44-62	44-52	104		104	None	BY, BZ, CA, CB, CC, CD, CE, CR = Al.; CH, CJ, CK, CL, CM, CN, CP, CS = Ch.; Bal. = Cu.

* Amphenol arrangement