KEITHLEY
A Tektronix Company

Series 3700A Cables and Connector Kits

Installation Instructions

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Introduction

The following information for the Keithley Instruments Series 3700A System Switch/Multimeter cables and connector kits provides details to include all the necessary hardware to assemble cables and connectors.

⚠ WARNING

These installation instructions are intended for use by qualified service personnel only, as described in the Safety precautions pages, provided in this document.

Do not assemble connectors or make connections to them unless qualified to do so. These procedures may expose you to hazardous voltages, that if contacted, could cause personal injury or death. Use appropriate safety precautions when working with hazardous voltages.

Do not exceed the maximum specifications of the switching module.

General information

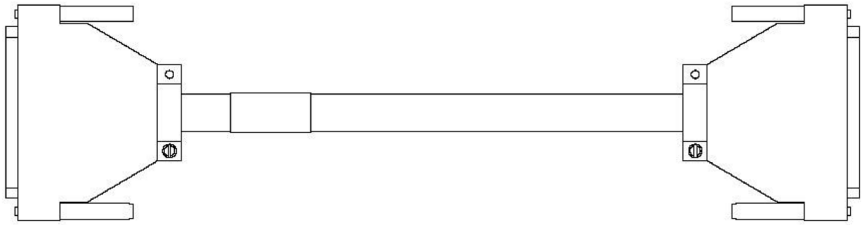
The following table lists available cable and connector kits, the number of connector pins for each kit, and cable length (where applicable).

Model number	Number of pins	Description	Length
3720-MTC-1.5	78	Cable	1.5 m (5 ft)
3720-MTC-3	78	Cable	3 m (10 ft)
3721-MTC-1.5	50	Cable	1.5 m (5 ft)
3721-MTC-3	50	Cable	3 m (10 ft)
3722-MTC-3	104	Cable	3 m (10 ft)
3722-MTC-1.5/MM	104	Cable	1.5 m (5 ft)
3722-MTC-3/MM	104	Cable	3 m (10 ft)
3722-MTC-1.5-KIT	104	Connector kit	N/A
3732-MTC-1.5	78	Cable	1.5 m (5 ft)
3732-MTC-3	78	Cable	3 m (10 ft)
3790-KIT50-R	50	Connector kit	N/A
3791-MTC-KIT78-R	78	Connector kit	N/A
3792-KIT104-R/F	104	Connector kit	N/A

Model 3720-MTC-1.5 / 3.0

The Model 3720-MTC-1.5 / 3.0 cable is a 78-pin cable assembly, 1.5 m (5 ft) or 3.0 m (10 ft) in length and terminated with a male D-sub connector on one end and a female D-sub connector on the other end.

Figure 1: Model 3720-MTC cable



WARNING

Make sure the instrument that you are installing is in a powered-down state with all cables unplugged. Failure to install an instrument in a discharged state may cause personal injury or death due to electrical shock. Do not exceed the maximum specifications of the switching module.

CAUTION

To prevent electrical shock, observe the following safety precautions:

- **Both ends of the cable must be connected before applying any power to the system.**
- **Remove all power in the system before connecting the cable to a switching module or external circuitry.**
- **Both D-sub connector shells of this cable must be connected to a safety earth ground. A shock hazard exists when voltage levels greater than 30 V RMS, 42.4 V peak, or 60 V dc are present.**

Cable maximum signal levels

The Model 3720-MTC-1.5 / 3.0 cable is rated for 300 V dc or 300 V RMS.

Maximum current rating

The Model 3720-MTC-1.5 / 3.0 cable maximum current rating:

- Single conductor: 4.4 A
- Multiple conductors: 2.2 A per wire
- Conductor gauge: 22 AWG

Pin number identification

Pin number identification for the Model 3720-MTC-1.5 / 3.0 cables are shown in the following figure and table.

Figure 2: Model 3720-MTC connectors

Male D-sub connector: Female D-sub connector:

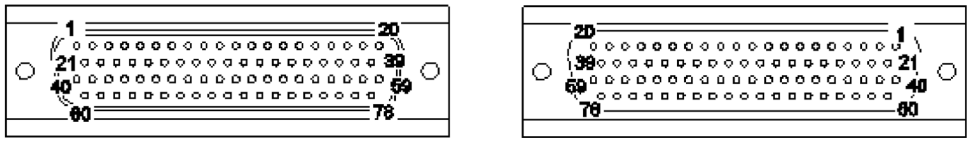


Table: Model 3720-MTC-1.5 / 3.0 pin number identification*

CONN 1 Pin #	Color	CONN 2 Pin #
1	Black	1
2	Brown	2
3	Red	3
4	Orange	4
5	Yellow	5
6	Green	6
7	Blue	7
8	Violet	8
9	Gray	9
10	White	10
11	White / Black	11
12	White / Brown	12
13	White / Red	13
14	White / Orange	14
15	White / Yellow	15
16	White / Green	16
17	White / Blue	17
18	White / Violet	18
19	White / Gray	19
20	White / Black / Brown	20
21	White / Black / Red	21
22	White / Black / Orange	22
23	White / Black / Yellow	23
24	White / Black / Green	24
25	White / Black / Blue	25
26	White / Black / Violet	26
27	White / Black / Grey	27
28	White / Brown / Red	28
29	White / Brown / Orange	29
30	White / Brown / Yellow	30
31	White / Brown / Green	31
32	White / Brown / Blue	32
33	White / Brown / Violet	33
34	White / Brown / Gray	34
35	White / Red / Orange	35
36	White / Red / Yellow	36
37	White / Red / Green	37
38	White / Red / Blue	38
39	White / Red / Violet (s)***	39

CONN 1 Pin #	Color	CONN 2 Pin #
40	White / Red / Gray	40
41	White / Orange / Yellow	41
42	White / Orange / Green	42
43	White / Orange / Blue	43
44	White / Orange / Violet	44
45	White / Orange / Gray	45
46	White / Yellow / Green	46
47	White / Yellow / Blue	47
48	White / Yellow / Violet	48
49	White / Yellow / Gray	49
50	White / Green / Blue	50
51	White / Green / Violet	51
52	White / Black / Orange / Yellow	52
53	N/C**	53
54	N/C	54
55	N/C	55
56	N/C	56
57	N/C	57
58	N/C	58
59	N/C	59
60	White / Black / Orange / Green	60
61	White / Black / Orange / Blue	61
62	White / Green / Gray	62
63	White / Blue / Violet	63
64	White / Blue / Gray	64
65	White / Violet / Gray	65
66	White / Black / Brown / Red	66
67	White / Black / Brown / Orange	67
68	White / Black / Brown / Yellow	68
69	White / Black / Brown / Green	69
70	White / Black / Brown / Blue	70
71	White / Black / Brown / Violet (s)***	71
72	N/C	72
73	White / Black / Brown / Gray	73
74	White / Black / Red / Yellow	74
75	White / Black / Red / Green	75
76	White / Black / Red / Blue	76
77	White / Black / Red / Violet	77
78	White / Black / Red / Gray	78

* Connect drain wire to shield at both ends

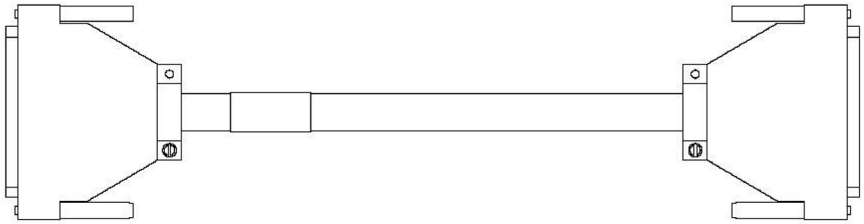
** N/C = Not connected

*** (s) = spare

Model 3721-MTC-1.5 / 3.0

The Model 3721-MTC-1.5 / 3.0 cable is a 50-pin cable assembly is 1.5 m (5 ft) or 3.0 m (10 ft) in length and terminated with a male D-sub connector on one end and a female D-sub connector on the other end.

Figure 3: Model 3721-MTC cable



WARNING

Make sure the instrument that you are installing is in a powered-down state with all cables unplugged. Failure to install an instrument in a discharged state may cause personal injury or death due to electrical shock. Do not exceed the maximum specifications of the switching module.

CAUTION

To prevent electrical shock, observe the following safety precautions:

- **Both ends of the cable must be connected before applying any power to the system.**
- **Remove all power in the system before connecting the cable to a switching module or external circuitry.**
- **Both D-sub connector shells of this cable must be connected to a safety earth ground. A shock hazard exists when voltage levels greater than 30 V RMS, 42.4 V peak, or 60 V dc are present.**

Cable maximum signal levels

The Model 3721-MTC-1.5 / 3.0 cable is rated for 300 V dc or 300 V RMS.

Maximum current rating

The Model 3721-MTC-1.5 / 3.0 cable maximum current rating:

- Single conductor: 4.4 A
- Multiple conductors: 2.2 A per wire
- Conductor gauge: 22 AWG

Pin number identification

Pin number identification for the Model 3721-MTC-1.5 / 3.0 D-sub cables are shown in the following figure and table.

Figure 4: Model 3721-MTC-1.5 /3.0 connectors

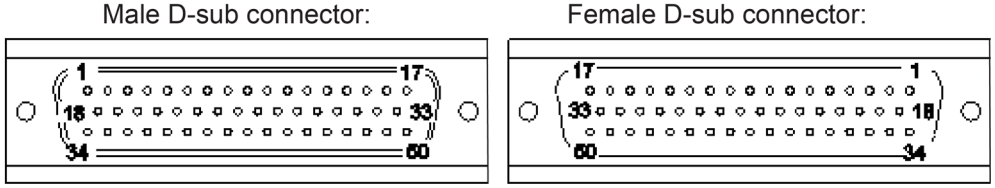


Table: Model 3721-MTC-1.5 / 3.0 pin number identification*

CONN 1 Pin #	Color	CONN 2 Pin #
1	Black	1
2	White	2
3	Red	3
4	Green	4
5	Orange	5
6	Blue	6
7	White / Black	7
8	Red / Black	8
9	Green / Black	9
10	Orange / Black	10
11	Blue / Black	11
12	Black / White	12
13	Red / White	13
14	Green / White	14
15	Blue / White	15
16	Black / Red	16
17	White / Red	17
18	Orange / Red	18
19	Blue / Red	19
20	Red / Green	20
21	Orange / Green	21
22	Black / White / Red	22
23	White / Black / Red	23
24	Red / Black / White	24
25	Green / Black / White	25

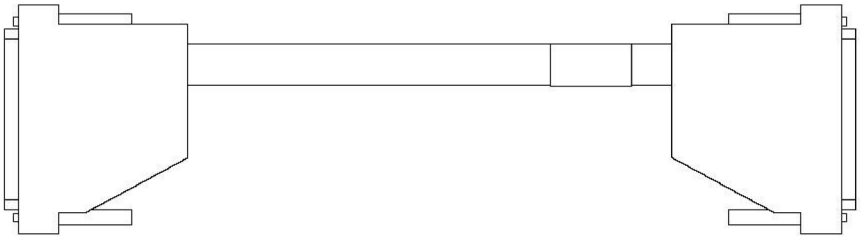
CONN 1 Pin #	Color	CONN 2 Pin #
26	Orange / Black / White	26
27	Blue / Black / White	27
28	Black / Red / Green	28
29	White / Red / Green	29
30	Red / Black / Green	30
31	Green / Black / Orange	31
32	Orange / Black / Green	32
33	Blue / White / Orange	33
34	Black / White / Orange	34
35	White / Red / Orange	35
36	Orange / White / Blue	36
37	White / Red / Blue	37
38	Black / White / Green	38
39	White / Black / Green	39
40	Red / White / Green	40
41	Green / White / Blue	41
42	Orange / Red / Green	42
43	Blue / Red / Green	43
44	Black / White / Blue	44
45	White / Black / Blue	45
46	Red / White / Blue	46
47	Green / Orange / Red	47
48	Orange / Red / Blue	48
49	Blue / Orange / Red	49
50	Black / Orange / Red	50

* Connect drain wire to shield at both ends

Model 3722-MTC-3.0

The Model 3722-MTC-3.0 cable is a 104-pin cable assembly is 3.0 m (10 ft) in length and terminated with a male D-sub connector on one end and a female D-sub connector on the other end.

Figure 5: Model 3722-MTC-3.0 cable



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CAUTION

To prevent electrical shock, observe the following safety precautions:

- **Both ends of the cable must be connected before applying any power to the system.**
- **Remove all power in the system before connecting the cable to a switching module or external circuitry.**
- **Both D-sub connector shells of this cable must be connected to a safety earth ground. A shock hazard exists when voltage levels greater than 30 V RMS, 42.4 V peak, or 60 V dc are present.**

Cable maximum signal levels

The Model 3722-MTC 3.0 cable is rated 300 V dc or 300 V RMS.

Maximum current rating

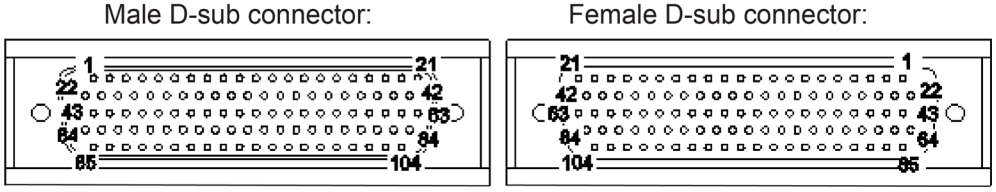
The Model 3722-MTC-3.0 cable maximum current rating:

- Single conductor: 4.4 A
- Multiple conductors: 2.2 A per wire
- Conductor gauge: 24 AWG

Pin number identification

Pin number identification for the Model 3722-MTC-3.0 D-sub connectors are shown in the following figure and the 3722-MTC-1.5/MM / 3/MM Pin number identification table (on page 7).

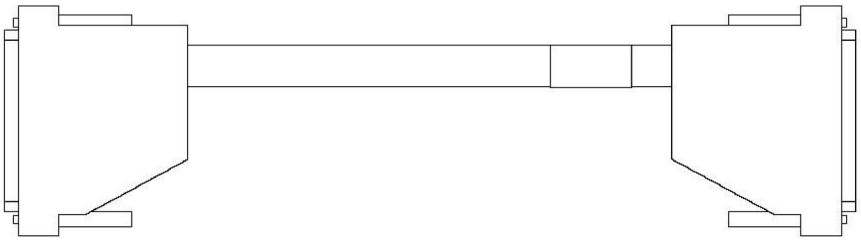
Figure 6: Model 3722-MTC-3.0 connectors



Model 3722-MTC-1.5/MM / 3/MM

The Model 3722-MTC-1.5/MM / 3/MM cable is a 104-pin cable assembly is 1.5 m (5 ft) or 3.0 m (10 ft) in length and terminated with a male D-sub connector on each end.

Figure 7: Model 3722-MTC-1.5MM / 3MM cable



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CAUTION

To prevent electrical shock, observe the following safety precautions:

- **Both ends of the cable must be connected before applying any power to the system.**
- **Remove all power in the system before connecting the cable to a switching module or external circuitry.**
- **Both D-sub connector shells of this cable must be connected to a safety earth ground. A shock hazard exists when voltage levels greater than 30 V RMS, 42.4 V peak, or 60 V dc are present.**

Cable maximum signal levels

The Model 3722-MTC-1.5/MM / 3/MM cable is rated for 300 V DC or 300 V RMS.

Maximum current rating

The Model 3722-MTC-1.5/MM / 3/MM cable maximum current rating:

- Single conductor: 4.4 A
- Multiple conductors: 2.2 A per wire
- Conductor gauge: 24 AWG

Pin number identification

Pin number identification for the Model 3722-MTC-1.5/MM / 3/MM D-sub connectors are shown in the following figure and table below.

Figure 8: Model 3722-MTC 1.5MM / 3MM connectors

Male D-sub connector: Male D-sub connector:

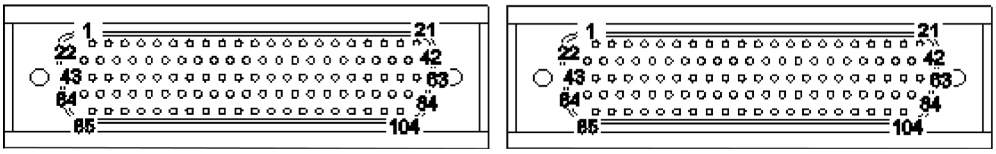


Table: Model 3722-MTC-1.5/MM / 3/MM pin number identification*

CONN 1		Paired wire colors**	CONN 2	
First color pin #	Second color pin #		First color pin #	Second color pin #
1	2	Blue paired w/ White	1	2
3	4	Orange paired w/ White	3	4
5	6	Green paired w/ White	5	6
7	8	Brown paired w/ White	7	8
10	11	Slate paired w/ White	10	11
12	13	Blue / White Striped paired w/ White	12	13
14	35	Blue / Orange Striped paired w/ White	14	35
15	16	Blue / Green Striped paired w/ White	15	16
17	18	Blue / Brown Striped paired w/ White (s)***	17	18
19	20	Blue / Slate Striped paired w/ White	19	20
21	42	Orange / White Striped paired w/ White	21	42
22	23	Orange / Green Striped paired w/ White	22	23
24	25	Orange / Brown Striped paired w/ White	24	25
26	27	Orange / Slate Striped paired w/ White	26	27
28	29	Green / White Striped paired w/ White	28	29
33	34	Green / Brown Striped paired w/ White	33	34
36	37	Green / Slate Striped paired w/ White	36	37
38	39	Brown / White Striped paired w/ White	38	39
40	41	Brown / Slate Striped paired w/ White	40	41
43	44	Slate / White Striped paired w/ White	43	44
45	46	Blue paired w/ Red	45	46
47	48	Orange paired w/ Red	47	48
49	50	Green paired w/ Red	49	50
51	52	Brown paired w/ Red	51	52
53	54	Slate paired w/ Red	53	54
55	56	Blue / White Striped paired w/ Red	55	56
57	58	Blue / Orange Striped paired w/ Red	57	58
59	80	Blue / Green Striped paired w/ Red	59	80
60	61	Blue / Brown Striped paired w/ Red	60	61
62	63	Blue / Slate Striped paired w/ Red	62	63
64	65	Orange / White Striped paired w/ Red	64	65
66	67	Orange / Green Striped paired w/ Red	66	67
68	69	Orange / Brown Striped paired w/ Red	68	69
70	71	Orange / Slate Striped paired w/ Red	70	71
72	73	Green / White Striped paired w/ Red	72	73
74	75	Green / Brown Striped paired w/ Red	74	75
76	77	Green / Slate Striped paired w/ Red	76	77
78	79	Brown / White Striped paired w/ Red	78	79
81	82	Brown / Slate Striped paired w/ Red	81	82
83	84	Slate / White Striped paired w/ Red	83	84
85	86	Blue paired w/ Black	85	86
87	88	Orange paired w/ Black	87	88
89	90	Green paired w/ Black	89	90
91	92	Brown paired w/ Black	91	92
93	94	Slate paired w/ Black	93	94
95	96	Blue / White Striped paired w/ Black	95	96
97	98	Blue / Orange Striped paired w/ Black	97	98
99	100	Blue / Green Striped paired w/ Black	99	100
101	102	Blue / Brown Striped paired w/ Black	101	102
103	104	Blue / Slate Striped paired w/ Black	103	104

* Connect drain wire to shield at both ends

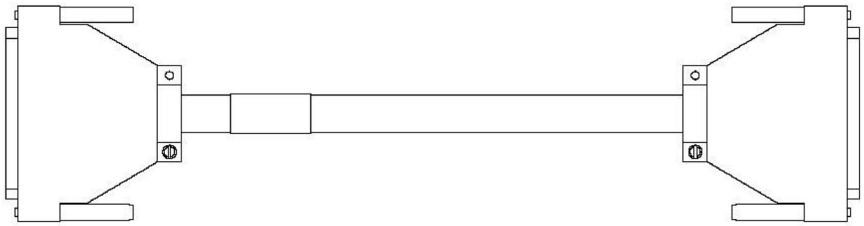
** Not connected: 9, 30, 31, 32

*** (s) = spare

Model 3732-MTC-1.5 / 3.0

The Model 3732-MTC-1.5 / 3.0 cable is a 78-pin cable assembly is 1.5 m (5 ft) or 3.0 m (10 ft) in length and terminated with a male D-sub connector on one end and a female D-sub connector on the other end.

Figure 9: Model 3732-MTC-1.5 / 3.0 cable



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CAUTION

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- **Both ends of the cable must be connected before applying any power to the system.**
- **Remove all power in the system before connecting the cable to a switching module or external circuitry.**
- **Both D-sub connector shells of this cable must be connected to a safety earth ground. A shock hazard exists when voltage levels greater than 30 V RMS, 42.4 V peak, or 60 V dc are present.**

Cable maximum signal levels

The Model 3732-MTC-1.5 / 3.0 cable is rated for 300 V dc or 300 V RMS.

Maximum current rating

The Model 3732-MTC-1.5 / 3.0 cable maximum current rating:

- Single conductor: 4.4 A
- Multiple conductors: 2.2 A per wire
- Conductor gauge: 22 AWG

Pin number identification

Pin number identification for the Model 3732-MTC-1.5 / 3.0 cables are shown in the following figure and table.

Figure 10: 3732-MTC-1.5 / 3.0 connector

Male D-sub connector: Female D-sub connector:

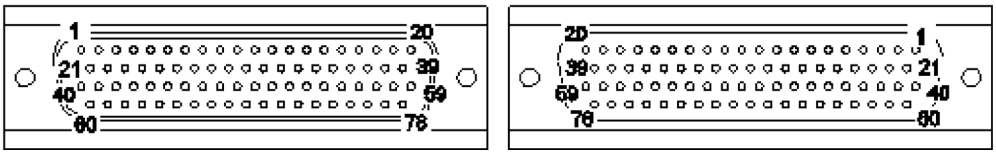


Table: Model 3732-MTC-1.5 / 3.0 pin number identification*

CONN 1 Pin #	Color	CONN 2 Pin #
1	Black	1
2	Brown	2
3	Red	3
4	Orange	4
5	Yellow	5
6	Green	6
7	Blue	7
8	Violet	8
9	Gray	9
10	White	10
11	White / Black	11
12	White / Brown	12
13	White / Red	13
14	White / Orange	14
15	White / Yellow	15
16	White / Green	16
17	White / Blue	17
18	White / Violet	18
19	White / Gray	19
20	White / Black / Brown	20
21	White / Black / Red	21
22	White / Black / Orange	22
23	White / Black / Yellow	23
24	White / Black / Green	24
25	White / Black / Blue	25
26	White / Black / Violet	26
27	White / Black / Grey	27
28	White / Brown / Red	28
29	White / Brown / Orange	29
30	White / Brown / Yellow	30
31	White / Brown / Green	31
32	White / Brown / Blue	32
33	White / Brown / Violet	33
34	White / Brown / Gray	34
35	White / Red / Orange	35
36	White / Red / Yellow	36
37	White / Red / Green	37
38	White / Red / Blue	38
39	White / Red / Violet (s)***	39

CONN 1 Pin #	Color	CONN 2 Pin #
40	White / Red / Gray	40
41	White / Orange / Yellow	41
42	White / Orange / Green	42
43	White / Orange / Blue	43
44	White / Orange / Violet	44
45	White / Orange / Gray	45
46	White / Yellow / Green	46
47	White / Yellow / Blue	47
48	White / Yellow / Violet	48
49	White / Yellow / Gray	49
50	N/C**	50
51	N/C	51
52	N/C	52
53	White / Green / Blue	53
54	White / Green / Violet	54
55	White / Blue / Orange / Yellow	55
56	N/C	56
57	N/C	57
58	N/C	58
59	N/C	59
60	White / Black / Orange / Green	60
61	White / Black / Orange / Blue	61
62	White / Green / Gray	62
63	White / Blue / Violet	63
64	White / Blue / Gray	64
65	White / Violet / Gray	65
66	White / Black / Brown / Red	66
67	White / Black / Brown / Orange	67
68	White / Black / Brown / Yellow	68
69	White / Black / Brown / Green	69
70	White / Black / Brown / Blue	70
71	White / Black / Brown / Violet (s)***	71
72	White / Black / Red / Green	72
73	White / Black / Brown / Gray	73
74	White / Black / Red / Yellow	74
75	N/C	75
76	White / Black / Red / Blue	76
77	White / Black / Red / Violet	77
78	White / Black / Red / Gray	78

* Connect drain wire to shield at both ends

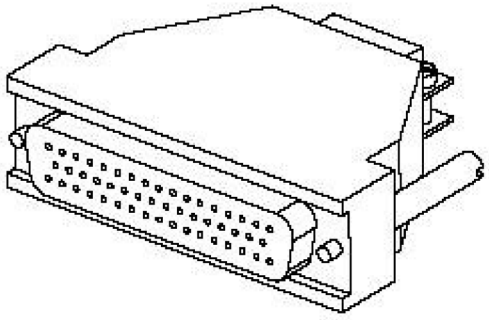
** N/C = Not connected

*** (s) = spare

Model 3790-KIT50-R

The Model 3790-KIT50-R kit is a 50-pin solder-cup connector kit terminated with a female D-sub connector.

Figure 11: Model 3790-KIT50-R connector



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CAUTION

To prevent electrical shock, observe the following safety precautions:

- **Both ends of the cable must be connected before applying any power to the system.**
- **Remove all power in the system before connecting the cable to a switching module or external circuitry.**
- **Both D-sub connector shells of this cable must be connected to a safety earth ground. A shock hazard exists when voltage levels greater than 30 V RMS, 42.4 V peak, or 60 V dc are present.**

Maximum signal levels

The Model 3790-KIT50-R connector kit is rated for 300 V RMS.

Maximum current rating

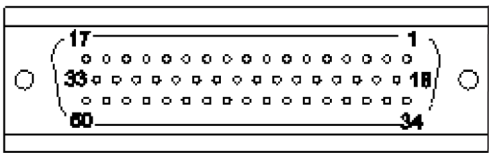
The Model 3790-KIT50-R connector kit maximum current is 7.5 A.

Pin number identification

Pin number identification for the Model 3790-KIT50-R D-sub connector is shown in the following figure.

Figure 12: Model 3790 Female D-sub connector

Female D-sub connector:



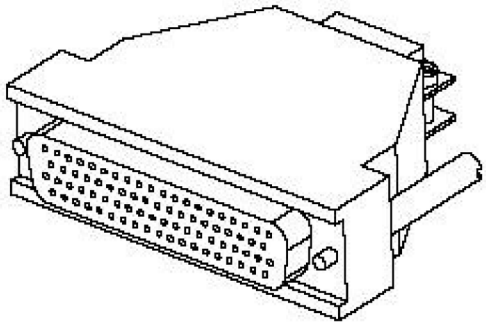
Contacts

The contact is 20 AWG maximum.

Model 3791-KIT78-R

The Model 3791-KIT78-R kit is a 78-pin solder-cup connector kit terminated with a female D-sub connector.

Figure 13: Model 3791-KIT78-R connector



WARNING

Make sure the instrument that you are installing is in a powered-down state with all cables unplugged. Failure to install an instrument in a discharged state may cause personal injury or death due to electrical shock. Do not exceed the maximum specifications of the switching module.

CAUTION

To prevent electrical shock, observe the following safety precautions:

- **Both ends of the cable must be connected before applying any power to the system.**
- **Remove all power in the system before connecting the cable to a switching module or external circuitry.**
- **Both D-sub connector shells of this cable must be connected to a safety earth ground. A shock hazard exists when voltage levels greater than 30 V RMS, 42.4 V peak, or 60 V dc are present.**

Maximum signal level

The Model 3791-KIT78-R connector kit is rated for 300 V RMS.

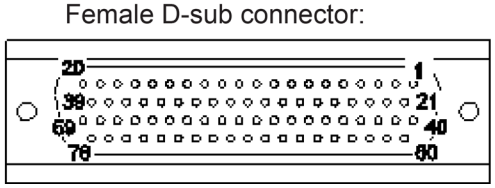
Maximum current rating

The Model 3791-KIT78-R connector kit maximum current is 5.0 A.

Pin number identification

Pin number identification for the Model 3791-KIT78-R D-sub connector is shown in the following figure.

Figure 14: Model 3791 Female D-sub connector



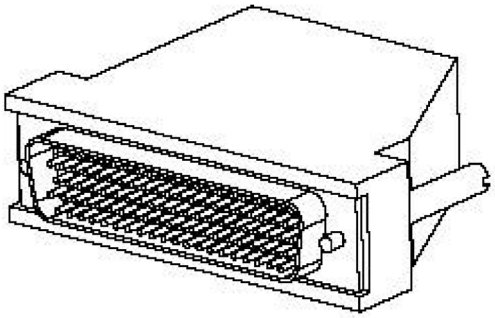
Contacts

The contact is 22 AWG maximum, and an insertion tool (not included) is required (part number 3791-CIT).

Model 3792-KIT104-R

The Model 3792-KIT104-R kit is a 104-pin solder-cup connector kit terminated with a male D-sub connector.

Figure 15: Model 3792-KIT104-R connector



WARNING

Make sure the instrument that you are installing is in a powered-down state with all cables unplugged. Failure to install an instrument in a discharged state may cause personal injury or death due to electrical shock. Do not exceed the maximum specifications of the switching module.

CAUTION

To prevent electrical shock, observe the following safety precautions:

- **Both ends of the cable must be connected before applying any power to the system.**
- **Remove all power in the system before connecting the cable to a switching module or external circuitry.**
- **Both D-sub connector shells of this cable must be connected to a safety earth ground. A shock hazard exists when voltage levels greater than 30 V RMS, 42.4 V peak, or 60 V dc are present.**

Maximum signal level

The Model 3792-KIT104-R connector kit is rated for 300 V RMS.

Maximum current rating

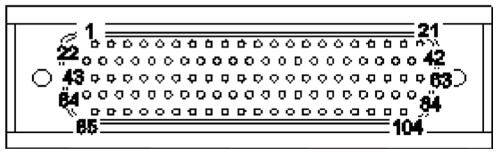
The Model 3792-KIT104-R connector kit maximum current is 5.0 A.

Pin number identification

Pin number identification for the Model 3792-KIT104-R D-sub connector is shown in the following figure.

Figure 16: Model 3792-R Male D-sub connector

Male D-sub connector:



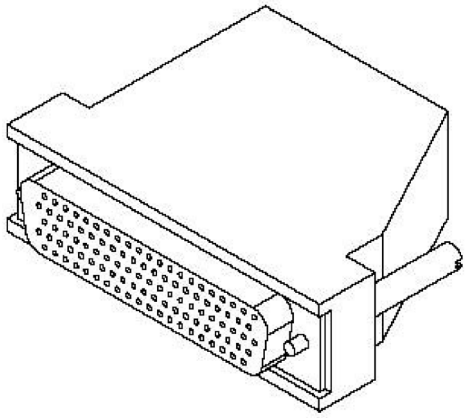
Contacts

The contact is 22 AWG maximum, and an insertion tool (not included) is required (part number 3791-CIT).

Model 3792-KIT104-R/F

The Model 3792-KIT104-R/F kit is a 104-pin solder-cup connector kit terminated with a female D-sub connector.

Figure 17: Model 3792-KIT104-R/F connector



WARNING

Make sure the instrument that you are installing is in a powered-down state with all cables unplugged. Failure to install an instrument in a discharged state may cause personal injury or death due to electrical shock. Do not exceed the maximum specifications of the switching module.

CAUTION

To prevent electrical shock, observe the following safety precautions:

- **Both ends of the cable must be connected before applying any power to the system.**
- **Remove all power in the system before connecting the cable to a switching module or external circuitry.**
- **Both D-sub connector shells of this cable must be connected to a safety earth ground. A shock hazard exists when voltage levels greater than 30 V RMS, 42.4 V peak, or 60 V dc are present.**

Maximum signal level

The Model 3792-KIT104-R/F connector kit is rated for 300 V RMS

Maximum current rating

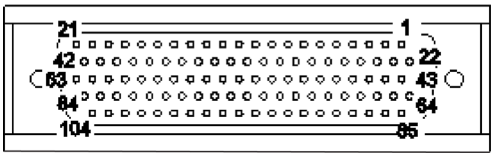
The Model 3792-KIT104-R/F connector kit maximum current is 5.0 A.

Pin number identification

Pin number identification for the Model 3792-KIT 104-R/F D-sub connector is shown in the following figure.

Figure 18: Model 3792-KIT 104-R/F Female D-sub connector

Female D-sub connector:



Contacts

The contact is 22 AWG maximum, and an insertion tool (not included) is required (part number 3791-CIT).

Safety precautions

The following safety precautions should be observed before using this product and any associated instrumentation. Although some instruments and accessories would normally be used with nonhazardous voltages, there are situations where hazardous conditions may be present.

This product is intended for use by personnel who recognize shock hazards and are familiar with the safety precautions required to avoid possible injury. Read and follow all installation, operation, and maintenance information carefully before using the product. Refer to the user documentation for complete product specifications.

If the product is used in a manner not specified, the protection provided by the product warranty may be impaired.

The types of product users are:

Responsible body is the individual or group responsible for the use and maintenance of equipment, for ensuring that the equipment is operated within its specifications and operating limits, and for ensuring that operators are adequately trained.

Operators use the product for its intended function. They must be trained in electrical safety procedures and proper use of the instrument. They must be protected from electric shock and contact with hazardous live circuits.

Maintenance personnel perform routine procedures on the product to keep it operating properly, for example, setting the line voltage or replacing consumable materials. Maintenance procedures are described in the user documentation. The procedures explicitly state if the operator may perform them. Otherwise, they should be performed only by service personnel.

Service personnel are trained to work on live circuits, perform safe installations, and repair products. Only properly trained service personnel may perform installation and service procedures.

Keithley products are designed for use with electrical signals that are measurement, control, and data I/O connections, with low transient overvoltages, and must not be directly connected to mains voltage or to voltage sources with high transient overvoltages. Measurement Category II (as referenced in IEC 60664) connections require protection for high transient overvoltages often associated with local AC mains connections. Certain Keithley measuring instruments may be connected to mains. These instruments will be marked as category II or higher.

Unless explicitly allowed in the specifications, operating manual, and instrument labels, do not connect any instrument to mains.

Exercise extreme caution when a shock hazard is present. Lethal voltage may be present on cable connector jacks or test fixtures. The American National Standards Institute (ANSI) states that a shock hazard exists when voltage levels greater than 30 V RMS, 42.4 V peak, or 60 VDC are present. A good safety practice is to expect that hazardous voltage is present in any unknown circuit before measuring.

Operators of this product must be protected from electric shock at all times. The responsible body must ensure that operators are prevented access and/or insulated from every connection point. In some cases, connections must be exposed to potential human contact. Product operators in these circumstances must be trained to protect themselves from the risk of electric shock. If the circuit is capable of operating at or above 1000 V, no conductive part of the circuit may be exposed.

For maximum safety, do not touch the product, test cables, or any other instruments while power is applied to the circuit under test. ALWAYS remove power from the entire test system and discharge any capacitors before: connecting or disconnecting cables or jumpers, installing or removing switching cards, or making internal changes, such as installing or removing jumpers.

Do not touch any object that could provide a current path to the common side of the circuit under test or power line (earth) ground. Always make measurements with dry hands while standing on a dry, insulated surface capable of withstanding the voltage being measured.

For safety, instruments and accessories must be used in accordance with the operating instructions. If the instruments or accessories are used in a manner not specified in the operating instructions, the protection provided by the equipment may be impaired.

Do not exceed the maximum signal levels of the instruments and accessories. Maximum signal levels are defined in the specifications and operating information and shown on the instrument panels, test fixture panels, and switching cards.

Chassis connections must only be used as shield connections for measuring circuits, NOT as protective earth (safety ground) connections.

The **WARNING** heading in the user documentation explains hazards that might result in personal injury or death. Always read the associated information very carefully before performing the indicated procedure.

The **CAUTION** heading in the user documentation explains hazards that could damage the instrument. Such damage may invalidate the warranty.

The **CAUTION** heading with the ⚠ symbol in the user documentation explains hazards that could result in moderate or minor injury or damage the instrument. Always read the associated information very carefully before performing the indicated procedure. Damage to the instrument may invalidate the warranty.

Instrumentation and accessories shall not be connected to humans.

Before performing any maintenance, disconnect the line cord and all test cables.

To maintain protection from electric shock and fire, replacement components in mains circuits — including the power transformer, test leads, and input jacks — must be purchased from Keithley. Standard fuses with applicable national safety approvals may be used if the rating and type are the same. The detachable mains power cord provided with the instrument may only be replaced with a similarly rated power cord. Other components that are not safety-related may be purchased from other suppliers as long as they are equivalent to the original component (note that selected parts should be purchased only through Keithley to maintain accuracy and functionality of the product). If you are unsure about the applicability of a replacement component, call a Keithley office for information.

Unless otherwise noted in product-specific literature, Keithley instruments are designed to operate indoors only, in the following environment: Altitude at or below 2,000 m (6,562 ft); temperature 0 °C to 50 °C (32 °F to 122 °F); and pollution degree 1 or 2.

To clean an instrument, use a cloth dampened with deionized water or mild, water-based cleaner. Clean the exterior of the instrument only. Do not apply cleaner directly to the instrument or allow liquids to enter or spill on the instrument. Products that consist of a circuit board with no case or chassis (e.g., a data acquisition board for installation into a computer) should never require cleaning if handled according to instructions. If the board becomes contaminated and operation is affected, the board should be returned to the factory for proper cleaning/servicing.

Safety precaution revision as of June 2017.