

# **USITT Recommended Practice RP-1**

## **CONTACT FUNCTION ASSIGNMENTS FOR MULTI-CIRCUIT CIRCULAR PIN CONNECTORS USED FOR THE DISTRIBUTION OF MULTIPLE LIGHTING CIRCUITS**

### **USITT ENGINEERING COMMISSION**

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In order to promote uniform use within the entertainment industry, listed below are the suggested contact function assignments for the 19-contact and 37-contact circular pin connectors used for distribution of multiple lighting circuits. Since the practice of using these connectors has evolved over time using available connectors, the 19-contact connector and the 37-contact connector do not follow the same philosophy. Furthermore, while this document expresses the preferred practice, many cables currently in use in the field employ variations to this Recommended Practice. Known variations are noted under “comments” so that users will be aware of these situations and adjust accordingly.

<b>19-CONTACT (SIX-CIRCUIT) CONNECTOR</b>			
<b>CONTACT NO.</b>	<b>FUNCTION</b>	<b>CONTACT NO.</b>	<b>FUNCTION</b>
1	Circuit #1 Ungrounded Conductor	11	Circuit #6 Ungrounded Conductor
2	Circuit #1 Grounded Conductor	12	Circuit #6 Grounded Conductor
3	Circuit #2 Ungrounded Conductor	13	Circuit #1 Grounding Conductor
4	Circuit #2 Grounded Conductor	14	Circuit #2 Grounding Conductor
5	Circuit #3 Ungrounded Conductor	15	Circuit #3 Grounding Conductor
6	Circuit #3 Grounded Conductor	16	Circuit #4 Grounding Conductor
7	Circuit #4 Ungrounded Conductor	17	Circuit #5 Grounding Conductor
8	Circuit #4 Grounded Conductor	18	Circuit #6 Grounding Conductor
9	Circuit #5 Ungrounded Conductor	19	Not Used
10	Circuit #5 Grounded Conductor		

**NOTES TO FUNCTION CHART:**

1. "Ungrounded" conductors are also known as "hot" conductors.
2. "Grounded" conductors are also known as "neutral" conductors though they are not necessarily neutrals.
3. "Grounding" conductors are also known as "ground" or "safety ground" conductors.
4. All "grounding" contacts shall be bonded (jumped) together as a set in each connector.
5. All "grounding" contacts shall make-first and break-last via extended female contacts that are set closer to the face of the connector.
6. Bonded "grounding" contact sets shall be connected to at least one cable conductor equal to the largest size in the cable, and preferably, connected to Contact #13. Two cable conductors are in common use and six cable conductors are permitted.
7. All connector shells shall be extra-hard anodized so as to be non-conductive.
8. Connector ampacity shall be equal to or greater than that of the overcurrent protection devices protecting it.
9. Cable ampacity shall be per the National Electrical Code, especially Articles 400 and 520.

**COMMENTS:**

1. Cables without the "grounding" conductors bonded together are in use. Continuity of "grounding" conductors in each circuit of a break-out should be verified.
2. Cables without the "grounding" contacts of the make-first, break-last type are in use. All circuits should be de-energized before connecting or disconnecting connectors of this type.
3. Eight-circuit cables are in use. These cables alternate "hot" and "neutral" on contacts 1 through 16, contact 17 is not used, and contacts 18 and 19 are "safety ground." They are not compatible with this recommended practice.

<b>37-CONTACT (TWELVE-CIRCUIT) CONNECTOR</b>			
<b>CONTACT NO.</b>	<b>FUNCTION</b>	<b>CONTACT NO.</b>	<b>FUNCTION</b>
1	Circuit #1 Ungrounded Conductor	20	Circuit #7 Grounded Conductor
2	Circuit #1 Grounded Conductor	21	Circuit #7 Grounding Conductor
3	Circuit #1 Grounding Conductor	22	Circuit #8 Ungrounded Conductor
4	Circuit #2 Ungrounded Conductor	23	Circuit #8 Grounded Conductor
5	Circuit #2 Grounded Conductor	24	Circuit #8 Grounding Conductor
6	Circuit #2 Grounding Conductor	25	Circuit #9 Ungrounded Conductor
7	Circuit #3 Ungrounded Conductor	26	Circuit #9 Grounded Conductor
8	Circuit #3 Grounded Conductor	27	Circuit #9 Grounding Conductor
9	Circuit #3 Grounding Conductor	28	Circuit #10 Ungrounded Conductor
10	Circuit #4 Ungrounded Conductor	29	Circuit #10 Grounded Conductor
11	Circuit #4 Grounded Conductor	30	Circuit #10 Grounding Conductor
12	Circuit #4 Grounding Conductor	31	Circuit #11 Ungrounded Conductor
13	Circuit #5 Ungrounded Conductor	32	Circuit #11 Grounded Conductor
14	Circuit #5 Grounded Conductor	33	Circuit #11 Grounding Conductor
15	Circuit #5 Grounding Conductor	34	Circuit #12 Ungrounded Conductor
16	Circuit #6 Ungrounded Conductor	35	Circuit #12 Grounded Conductor
17	Circuit #6 Grounded Conductor	36	Circuit #12 Grounding Conductor
18	Circuit #6 Grounding Conductor	37	Not Used
19	Circuit #7 Ungrounded Conductor		

**NOTES TO FUNCTION CHART:**

1. "Ungrounded" conductors are also known as "hot" conductors.
2. "Grounded" conductors are also known as "neutral" conductors though they are not necessarily neutrals.
3. "Grounding" conductors are also known as "ground" or "safety ground" conductors.
4. Contact #3 shall be bonded (jumped) to the shell of the connector.
5. Contact #3 shall make-first and break-last via a longer male contact. Longer male contacts are recommended on other "grounding" conductors.
6. Each "grounding" contact shall be connected to a cable conductor equal to the largest size in the cable.
7. Connector ampacity shall be equal to or greater than that of the overcurrent protection device protecting it.
8. Cable ampacity shall be per the National Electrical Code, especially Articles 400 and 520.

**COMMENTS:**

1. Cables without Contact #3 bonded to the shell of the connector are in use. Shell should be extra-hard anodized or otherwise made to be non-conductive.
2. Cables without "grounding" contacts all of the first-make, last-break type are in use. All circuits should be de-energized before connecting or disconnecting connectors of this type.
3. Cables without cable conductors terminated to all "grounding" contacts are in use. Continuity of "grounding" conductor in each circuit of a break-out should be verified.
4. Since Contact #3 is the only contact required to be bonded to the connector shell, Circuit #1 of a break-in should always be connected first, or the shell should be extra-hard anodized or otherwise made to be non-conductive.