



Expect Service

Radiation Products Design Inc

---

## INSTRUCTIONS

---

### RPD INFORMATION

<b>Address</b>	5218 Barthel Industrial Drive Albertville, MN 55301
<b>Website</b>	<a href="http://www.rpdinc.com">www.rpdinc.com</a>
<b>Email</b>	<a href="mailto:sales@rpdinc.com">sales@rpdinc.com</a>
<b>Phone</b>	763-497-2071 or 800-497-2071
<b>Fax</b>	763-497-2295

### RPD PRODUCT INFORMATION

<b>Item Number</b>	<b>Description</b>
323-1300+	Cables
323-2400+	Cable Reels

## CARE OF ION CHAMBER CABLES AND REELS

### CARE OF EXTENSION CABLES

The expected lifetime of a hand-crafted RPDinc triaxial cable or adaptor is at least five to ten years if the user:

1. NEVER twists or pulls the cable relative to the connector.
2. KEEPS the exposed insulators in the connector clean by storing the cables in zip-lock bags or utilizing connector dust caps, and by not dragging an uncapped connector across carpet or a dusty floor.
3. COILS the cable into a smooth coil rather than in a haphazard, twisted fashion. The proper way to coil cable is to lay the cable flat and straight on the floor, make a loop of the appropriate diameter on one end and tape it, and then roll up the rest of the cable, rather than coiling it as one would coil a rope or a garden hose.
4. NEVER steps or drops anything on the cable

### POINTS TO REMEMBER

1. The smaller the cable, the more fragile it is.
2. Turn high voltage off when connecting or disconnecting. Ion chamber polarizing voltage is between the two braids of triaxial cable (generally), so a shock hazard exists between connector body and the center ring.
3. It takes over an hour to properly and carefully assemble and test a triaxial cable connection.

### CABLE REELS

RPDinc offers extension cables mounted in a reel which can extend life of an extension cable by providing convenient storage and protection, and eliminating excess loops of cable.

### CABLE REEL DOS AND DON'TS

DO remember that the cable reel is a valuable and important part of your dosimetry system.

DON'T try to unroll the cable by turning the crank; instead, pull the cable straight out of the hole, one arm length at a time. Normally a gentle pull on the cable is sufficient to unroll the cable an arms length at a time.

However, occasionally the cable might bind up slightly. If so, do not pull with excessive force on the cable; simply unroll with the reel handle for a turn or so.

DON'T stuff the short cable into the central cavity; instead, take a few seconds to gently coil it into the cavity.

DO clean the cable if it gets dirty, especially if covered by gummy tape residue, before winding up the cable.

DON'T roll up the cable unless it is a straight or gently curved. Make sure that the cable is not kinked or looped and simply turn the reel handle clockwise while walking. Standing and dragging the cable toward the reel causes unnecessary wear and tends to get the cable dirty which can cause binding in the reel.

It is not anticipated that your cable reel will need dismantling. However, if you should do so, DON'T attempt to put the cable reel together unless the long section of the cable is out of the reel as much as possible, then wind it in. DO

make sure that the keyed axle washer and cavity cover plate's pin are properly seated prior to tightening the screws.

DO Check the resistance from one end of the cable to the other if the cable seems to be causing a problem; approximately  $2\Omega/10$  ft on center conductor,  $0.2\Omega/10$  ft. on inner braid and  $0.1\Omega/10$  ft on outer braid (i.e. connector housing to housing). If you don't have a good enough DMM to make this measurement, one can be obtained from RPDinc or Radio Shack

### CAUTION

Although triaxial BNC and coaxial BNC connectors have a similar appearance, it is generally not recommended that triaxial cables be serviced in-house for the following reasons:

1. Special training and special tools are required to assemble a triaxial connector.
2. Extreme cleanliness and dust-free conditions must be observed.
3. Test equipment capable of resolving 1 fA is required to properly test the assembled cable.

## ABOUT CHAMBER CABLE LENGTHS AND CONNECTORS

### SHORT VS LONG CABLE LENGTH

Ion chamber to electrometer interconnecting cable is an essential part of the dosimetry system. Therefore in any purchase of a dosimetry system the following must be considered:

- a. total length
- b. type of connectors

Some ionization chambers are still being sold with a permanently attached cable of 10 meter length. The current trend however, is to have zero to two meters of cable attached to the chamber and to use a separate extension cable. There are several good reasons for this approach:

1. Ten meters is an arbitrary number that is sufficiently long to satisfy requirements of most treatment facilities. There are many facilities however, which require a 12 meter, 15 meter, or even as long as a 20 meter cable length. In that case, an ion chamber with a 10 meter integral cable still needs an extension cable.
2. Many treatment facilities use permanently installed cables in a duct. In such cases, the cable necessarily becomes a separate part of the calibration stem.
3. We have observed a far greater incidence of broken thimbles on ion chambers with long integral cables. The damage invariably occurs during the coiling of the cable with the attached ion chamber. Since the bulk of the cost, including cost of re-calibration is in the precision-built and delicate ion chamber, it makes far greater sense to handle the relatively less expensive and more rugged cable separately, avoiding the possibility of damage to the ion chambers thimble. A chamber with a short cable can be handled with greater safety and stored separately in a compact storage case.
4. Most treatment facilities own several ion chambers and some of them may have a short cable. One extension cable can be used with numerous ion chambers, although a spare extension cable provides a redundancy as well.

5. Although the cable is a most vulnerable part of the ion chamber, it can be subjected to rough treatment. An ion chamber that is separate from the cable can remain in service while the damaged cable is being sent for repair.
6. When an ion chamber is sent to a calibration laboratory or for repair, the extension cable can remain behind. Substitution of the laboratory cable or the different cable length does not affect the calibration of an ion chamber.
7. A chamber with a short cable can be stored more conveniently and safely in a compact padded case.

Contrary to some beliefs, additional in-line connectors do not present appreciable signal loss if care is taken to keep the connectors capped when not in use to prevent dust and moisture deposits on the insulators.

### **BNC VS TNC CONNECTORS**

Many stories could be told about purchasing an electrometer and an ion chamber from separate sources only to experience incompatibility of connectors. Fortunately, over the years, the connector choices have narrowed down to only two types; BNC (bayonet, sometimes called BNT) and TNC (threaded). In USA, BNC system enjoys the overwhelming popularity due to several basic shortcomings of TNC design:

1. A TNC connector requires several turns of knurled ring to make a reliable connection as compared to one quarter-turn click-on action of the BNC connector.
2. Constant turning causes threads to produce fine metal dust that can cause problems such as noise over the signal. During a period of 20 years of cable and chamber repair experience, we have observed a far greater incidence of TNC connected chambers and cables requiring repairs.
3. Compatibility within a system using TNC connectors is complicated by the fact that four combinations are possible; male or female, either one can be had with an outside threaded or an inside threaded body. It is not generally known that Capintec and Wellhofer make chambers with a male connector having outside threaded body, whereas NE makes the chambers with a male connector having inside threaded ring. This means that the cable made for a Capintec or a Wellhofer chamber cannot be used with an NE chamber. Conversely, a BNC system is simple, a male connector always has two slots and female always has two lugs.

We recommend and normally supply all chambers, electrometers and extension cables with triaxial BNC connectors. We will supply TNC connectors on request. Our extensive experience and knowledge of various systems enabled us to assure compatibility with existing system by providing a proper connector the first time around. We also stock various connector adapters to provide adaptability among systems. Or, to effect standardization within a facility, we will modify your electrometer input, the ion chamber and extension cables with BNC connectors, preferably scheduled simultaneously with repair or ADCL calibration.

RPDinc offers all ionization chambers with a permanently attached short cable, 1 to 1.5 meters in length, terminated with a triaxial BNC connector, (TNC is optional) with dust and moisture protective cap secured by a chain, or in few cases with a connector mounted on the chamber itself. Each ionization chamber is supplied in a foam lined case fire protection and convenient storage.

**End of Document**

---