ORION®	ARB V Transmitter	Installation Data

IDENTIFICATION
The ORION ARB® V transmitter is available in a three wire pit or remote transmitter configuration for connection to Neptune® ARB V encoder registers. All ORION ARB V transmitters are shipped from the factory pre-programmed and can be connected to any compatible encoder. Electronic readings broadcast from the ORION ARB V transmitter will contain the active number wheels programmed into the encoder, with a maximum of six digits.

To easily identify an ORION pit or remote ARB V transmitter, 'ARBV' has been added to the end of the eight-digit ORION serial number. In addition, each ORION ARB V pit transmitter will also have a letter 'M' or 'N' at the end of the serial number. This alpha character represents whether the transmitter is for Metal (M) or Nonmetal (N) pit lid applications. It is essential that the correct ARB V pit transmitter be used for the correct pit lid application. Failure to do so will result in a violation of FCC regulations.

All ORION ARB V transmitters are shipped factory programmed in a sleep mode with a standard cable (10' for Neptune encoder.) ORION ARB V transmitters will begin broadcasting their readings as soon as they are awakened – either by running consumption through the encoder it is connected to or by using the infrared communication program on the ORION reading equipment. If the transmitter is started by running consumption, note that it may take an hour for the ORION ARB V transmitter to begin broadcasting. This is due to the ORION ARB V transmitter update schedule, which has the transmitter updating its reading from the encoder once an hour.

REQUIRED SPLICE TOOLS

59983-001	Gel Splice Crimping Tool
59989-001	Coax Wire Stripper
	Wire Cutter
62009-004	Remote Clamp Installation Kit

INSTALLATION
Carefully remove the ORION ARB V transmitter from the shipping carton and inspect the unit for damage. Retain the contents of the installation kit for use in mounting and installing the transmitter in the field.

Wiring the ORION ARB V Transmitter to Encoder
The ORION ARB V pit and remote transmitter is a three-wire AMR device that requires connection to an encoder to complete the assembly. All three wires must be connected to complete the installation.

The ORION ARB V transmitter connection can be made to either the existing wires from the encoder or directly to the terminal screws of the encoder depending on the application and manufacturer. If making a connection to existing wires, use the installation kits provided and follow the instructions below.

To connect an encoder with existing wires to an ORION ARB V pit or remote transmitter, strip approximately 1 ½" of outer insulation sheath from the encoder and transmitter cables using stripping tool. Badger recommends using part number 59989-001 Coax Stripper, as the stripping tool. Use caution when removing the outer sheath so that the inner signal wire insulation is not nicked or damaged.

Unwind the outer foil shield from the transmitter cable and cut it off even with the outer sheath using a cutting device.

Using the wiring chart below, wire the ORION ARB V remote or pit transmitter to an approved encoder according to the following guide lines:

ARB V Transmitter Wire	Neptune ARB V
Red	R
Black	B
Green	G

R = Red B = Black G - Green

Connect the encoder cable wires to the ORION ARB V transmitter wires using the insulation gel connectors provided in the installation kit. Using the chart, determine what wires need to be connected to complete the installation. **Note that the encoder must be programmed to communicate in Sensus protocol, three wire mode.**

⚠CAUTION

Do not strip any insulation from the ends of the wires before you push them into the connector.

Push the wires that are to be connected together as far as possible into the connector.

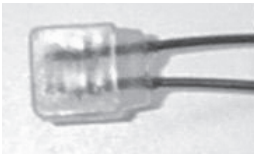

Figure 1

Using the required Gel Splice Crimping Tool, Badger Meter number 59983-001, place the connector with the wires into the jaws of the crimping tool.

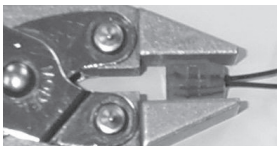

Figure 2

Crimp the connector by squeezing the handles until the connector is completely compressed. The crimp tool is designed to prevent applying too much pressure to the gel cap. Continue to apply pressure for three seconds.

Place the two plastic cable ties and tighten securely for strain relief. Remove excess cable tie with the cutting device.

For remote installations, the connection is complete.

For pit installations, place all three connected wires with gel caps into the field splice tube provided in the installation kit. Make sure that the wires with gel caps are inserted as far as possible into the field splice tube. Close the field splice tube. The connection is now complete.

Testing the Wire Connections
The connection of the encoder and ORION® ARB V transmitter can be tested using the ORION Data Collector. It is recommended that all wiring connections be tested while on site. To test, place the ORION Data Collector into the ORION Quick Read function. See the Badger Meter installation Manual RAD-IOM-01 for more information on the Quick Read function and how to operate the ORION Data Collector.

Pit Mounting Installation
The ORION ARB V pit transmitter is shipped pre-programmed with a factory potted cable that can be connected to any Neptune ARB V encoder. **Note that the encoder must be programmed to communicate in Sensus protocol, three wire mode.** Prior to installing an ORION pit transmitter, it is important to determine whether it should be installed in a pit with a metal or a non-metal lid. To determine the type of pit ORION transmitter, look at the serial number tag attached to the wire harness. At the end of the serial number tag attached to the wire harness. At the end of the serial number, either a 'M' for metal or a 'N' for non-metal will designate the proper lid application for the transmitter.

After determining the proper application, the ORION ARB V pit transmitter can be installed either through or beneath the lid. An installation kit can be ordered for each transmitter for mounting through or beneath a pit lid. Note that the ORION ARB V transmitter should not be mount through the lid in applications where vehicle traffic and exposure to snow plow blades and other equipment may damage the transmitter.

PIT ORION INSTALLATION

64394-015 ARB V Pit Thru Lid
64394-016 ARB V Pit Below Lid
64394-017 ARB V Pit Deep Vault
64394-018 ARB V Pit Armourcast

The Pit ORION Transmitter (see Figure 4) is shipped with a flying lead ready for connection to an approved competitive encoder. Excess wire should be coiled up inside the pit and cable tied to avoid any damage.

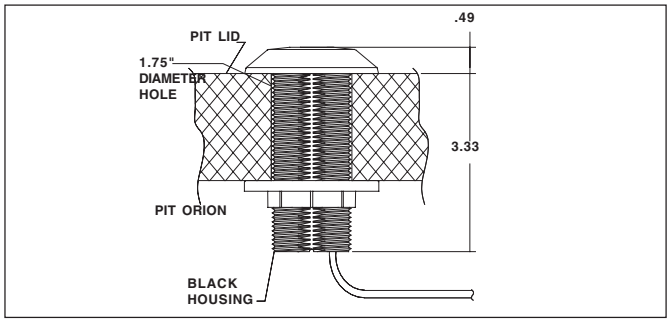

Figure 4 - Identification - Pit ORION Transmitter

ORION Pit transmitters can be mounted through or below the pit lid. See figures 4 and 6 for details. For below the lid installations, a special mounting bracket (Figure 5) is available. This mounting bracket is designed for use with 3/8", 1/2" and 5/8" rebar or 1/2" schedule 40 PVC pipe.

⚠CAUTION

To install, drive rebar or stake into the ground prior to attaching Pit ORION Transmitter to avoid damage. Once in the ground, secure the mounting bracket on the appropriate rebar or pipe using the enclosed washer, wing nut and hex head bolt provided with the bracket. Thread the bottom-locking nut onto the Pit ORION Transmitter. Insert the Pit ORION Transmitter through the bracket and thread the antenna nut to secure the ORION transmitter (see Figure 6). **For best results mount the Pit Transmitter approximately 1-2" below the underside of the lid.**

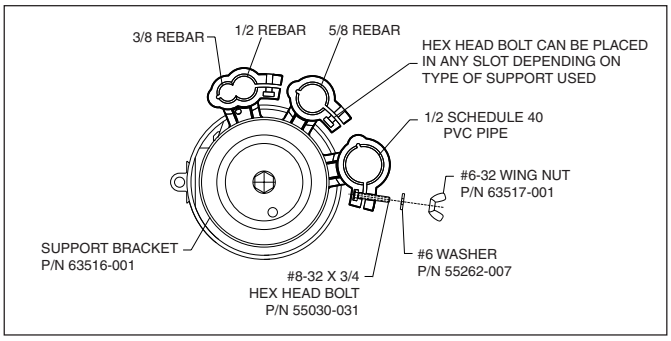

Figure 5 - Identification - Pit Mounting Bracket - Top View

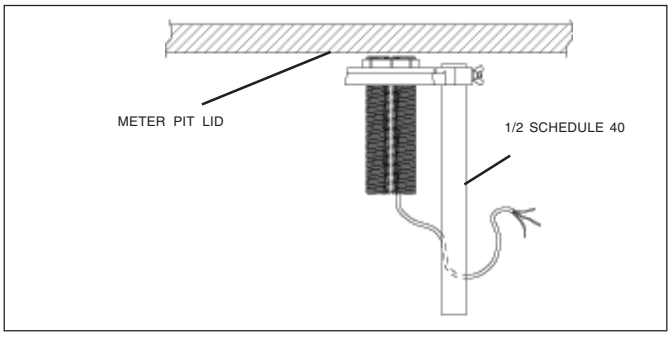

Figure 6 - Identification - Pit ORION Beneath Lid Installation

NOTE: ORION radio transmitters perform best with a clear line of site and performance will vary by installation and lid construction.

ORION pit transmitters can also be installed in composite and plastic lids like Armourcast. An installation kit for installing an ORION pit transmitter to the lid is available. To install an ORION transmitter to a composite or plastic lid, thread the locking ring onto the top of the ORION transmitter. Slide the transmitter into the mounting bracket. Thread the locking ring so that the transmitter is held firmly in place.

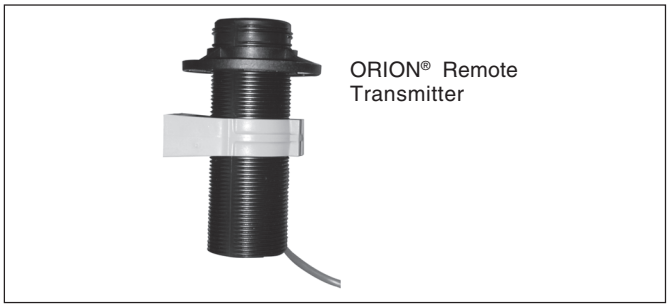

Figure 7 Identification - Pit ORION Remote Transmitter

Remote Clamp Installation
To install, mount 'C' clamp in a secure location on a wall or joist that is away from metal objects and faced insulation that typically reduce the performance of the radio. The transmitter must be installed in an upright vertical position with the bottom of the transmitter (end with wire) pointing toward the ground (see Figure 2). Place the tape supplied in the installation kit around the transmitter approximately ¾" from the top of the unit. Next, thread the locking ring onto the top of the transmitter. The locking ring should be located right above the tape placed on the transmitter. Insert the transmitter into the 'C' clamp and lock into place so that the clamp closes over the tape and securely holds the transmitter.

Please see our website at
www.badgermeter.com
for specific contacts.

BadgerMeter, Inc.
P.O. Box 245036, Milwaukee, WI 53224-9536
(800) 876-3837 / Fax: (888) 371-5982
www.badgermeter.com