



## FAQs

### **ZIP BOX® BLUE™ SWITCH & OUTLET BOXES**

This information is an interpretation of the codes and standards mentioned. Please verify this information with all local inspection agencies.

#### **What do the engraved numbers in the bottom of the box mean?**

The engraved numbers tells the maximum number of the common wire sizes that can be installed in the box. Sections 314.16 of the 2002 NEC describe how to "deduct" from the engraved numbers to arrive at the "net" number permitted in the box.

#### **Can a single gang outlet/switch box be installed in a ceiling for a garage door opener or for a smoke detector?**

Yes, per the 2002 NEC, Section 314.17(c) Exception, a single gang outlet/switch box can be used in ceilings for outlets to be used with garage door openers, or to install smoke or carbon monoxide detectors. These boxes can be installed in fire resistive floor/ceiling assemblies with a 2 hour or less fire rating. Single gang boxes are not approved for "fixture support".

#### **Why are ceiling boxes made from a different plastic compound than the wall boxes?**

The ceiling boxes must pass a UL test where a 200-pound weight is supported for 5 minutes at 105°C. A PVC box will not pass this test.

#### **How heavy of a light fixture or ceiling fixture can a listed ceiling box support?**

A ceiling box can support a fixture of 50 pounds or less. A ceiling box rated for "fan support" can support a fan of 35 pounds or less.

#### **Are the zip boxes fire rated?**

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Zip Boxes are classified for 2 hour or less fire rated assemblies. Before the boxes can be used in a fire rated wall or floor/ceiling assembly, the assembly must be tested with the boxes installed to determine if these combustible materials will compromise the current fire ratings of these systems. Carlton's wall boxes may be used in both 2 and 1-hour fire rated wall assemblies. Ceiling boxes and single gang outlet/switch boxes may be used in a 2 hour or less fire rated floor/ceiling assembly. See Carlton's NER-140 report or the UL Fire Resistance Directory, which describes in detail the use of zip boxes in these assemblies.

#### **Is it permissible to install wall boxes in open stud construction, such as in an unfinished basement, or in a residential garage?**

Yes, nothing in the NEC or in the UL's requirements requires the boxes to be "covered". The code issue is whether the nonmetallic-sheathed cable is subject to physical damage in these types of installations. Most electrical inspectors permit these installations.

#### **Can Carlton Zip Boxes be installed at less than the horizontal spacing of 24" required by the model building codes?**

Yes, there is a UL fire resistive wall design, which permits a minimum 7" spacing on opposite sides of the wall in the same cavity space. Also, 3M offer a protective material (Putty Pad), which permits adjacent spacing of the boxes on opposite sides of the wall. Contact Carlton Technical Service for additional information.

#### **How many cables can you put in one integral cable clamp?**

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One. The National Electrical Code section 314.17(c) Exception allows you to put multiple cables through a knockout, but only one is allowed through each clamp.

**Does Carlon manufacture a 2-gang old workbox that has an extra large volume (an extended depth of approx 4") similar to the single gang or the 3-gang?**

Yes. Carlon offers the BH234R with 34 cubic inch capacity.

**Could you please tell me where I can get the UL fire resistive wall design that permits a minimum 7" spacing on opposite sides of the wall?**

Separations under 7" can be obtained by using a "Putty Pad". Companies like 3M and others manufacture these pads. They are found in the UL Fire Resistance Directory under "Wall Opening Protective Material". If you do not have this directory please call 1-800-3CARLON and ask for Technical Services. Someone will send the pages to you.

**All your blue boxes come stamped with a wire volume and corresponding conductor count. Do the volume and/or wire count account for the integral clamps that are present in many of your boxes?**

**For instance, your B520A-UPC ceiling box has a 20 cubic inch volume and therefore can receive ten (10) #14 gauge wires per the NEC. However, it also has six integral clamps. Per the Article 370-16(b)(2), where one or more internal cable clamps, whether factory or field supplied, are present**

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**in the box, a single volume allowance in accordance with Table 370-16(b) shall be made based on the largest conductor present in the box.**

**Therefore, does the installer need to take into account a volume reduction? Is the true available volume in the example above really 18 cu.in. assuming the use of #14 gauge wire?**

**Other boxes, such as some of your single gang models, have knock-outs in lieu of integral clamps; so, the actual wire count is not an issue.**

The volume inside an outlet box does not include any deductions for integral clamps. The clamps are removed from the box when the volume is determined by UL. Therefore a single deduction in the NEC is required for the space the clamps take up inside the box. A B520A is 18 cubic inches after the clamp deduction for #14 wire.

This procedure was determined by IAEI and UL. Not everybody agrees to this. The 2002 NEC (314.16(B)(2)) still has the deduction requirement. Keep an eye on the 2005 NEC because it may be changed.

**In all your plastic (blue) ceiling boxes, there is a set of double holes (4 holes) to attach a crossbar. Should all four holes be used with screws to provide proper strength- and should the holes be tapped with an 8-32 tap or are number 8 sheet metal screws used? I want to know what is recommended by the manufacturer in this area.**

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I am assuming that the "crossbar" that you mentioned is for the bar supplied with the lighting fixture. No, only two holes need to be used. The standard number 8 screws supplied with the light fixture are fine to use with out tapping the hole or using metal self tapping screws. The nonmetallic boxes are designed to allow the screws to be screwed right into the box.

**I'm an electrician doing a residents home. He would like his 110v line in the same box with his communication wires, e.g. phone and coaxial. The inspector requires that they be in a special box that has a partition between the two services. I understand that they are called a low voltage partitioned box. Do you carry this item?**

We make two products that will work. Carlton's multi-gang Super Blue Boxes (two gang box PN# BH235A) are available with dividers (supplied separately PN# SCDIV). Carlton also makes a Dual Voltage Box/Bracket (SC200DV).

**The single gang nonmetallic box, B120A does not have integral clamps, only knockouts. For nonmetallic-sheathed cable, Romex, is a clamp where the cable enters the box required?**

Clamps are not required for single gang boxes. See 314.17(C) Exception of the 2002 NEC (370-17(c) Exception of the 1999 NEC).

**I am installing these boxes on interior 2X4 walls and am concerned that where the 10/2 NM enters the box the NM is too close to the drywall. Should I be using a narrower box so that the NM cable is centered more on the wall**

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**stud? Code dictates that any NM wire running through a stud closer than 1 1/4" will need a nailing plate to protect from drywall nails, etc. Is this the same for electrical boxes?**

**The SuperBlue Boxes I am using are just about 3.5". Is this too big for a 2X4 wall stud and only used for 2X6 walls? I am tempted to not use the entrance/exit knockouts in the back and just drill some holes nearer the center of the stud but it would take too much time.**

It is acceptable for the NM Cable to enter the outlet box through its knockouts even though it comes close to the drywall. The NEC is concerned with damage to the cable from nails or screws. Outlet boxes are usually located low to the floor or above counter spaces. Also switches will be found near door opens and a little above the waist. It is unlikely that a picture would be hung in these areas. Section 300.4(B)(2) does state that "if" it is likely that a screw or nail would penetrate the cable than a steel plate needs to be used.

Finally, if you drilled a hole in the box than you would void the listing of the product and would get tagged by the inspector. Last year we sold over 500 million boxes with knockouts without a problem pertaining to the NM Cable entering the knockouts.

**I am installing some of your old work boxes B114 R. Several questions:**

**1. Routing of cable through the openings. Should the opening cover flap be:**

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**a. Pushed from the outside of the box into the box (making a slight clicking sound) and the wire inserted basically parallel to the back of the box, or**

**b. Pushed from the inside of the box outward (making no clicking sound) and the wire inserted basically parallel to the side of the box?**

**2. The B 114 R is labeled "Switch box". Can it also be used per code for a power outlet (receptacle) box?**

**3. Number of conductors allowed in a single box. In counting the number of conductors, are the ground wires counted? I would assume they are not counted as under normal conditions they do not conduct electricity, but I would appreciate a definitive answer.**

1) The clamps are pushed from the outside in (a). The clamp than is pushed back against the cable.

2) The B114R is UL listed for both switches and receptacles.

3) The ground wires are only counted once per Section 314.16(B)(5) of the NEC.

**What is the size of the screw that is used in your old-work nonmetallic boxes?**

A Number 6 screw is used with Carlon's old-work boxes. This is the same screw supplied with devices and receptacles.

**Do all your plastic boxes have a 2-hour fire rating? If they don't how do you tell the difference.**

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The majority of Carlton outlet boxes have a two-hour rating. We choice not to rate our old work boxes for two-hour assemblies for liability reasons. An easy well to tell if a box is rated for firewall construction is to look at the UL logo in the box (or in the area of the UL logo). If the box is marked with a 2-HR-\* (\* = W, C, F or W-C) it is classified for two fire resistive assemblies.

#### **What is the weight limit for your old work round box #B618R if you are hanging a light fixture from the ceiling.**

The B618R is a round old work outlet box and is not listed for fixture support in the ceiling. Only approved ceiling boxes are allowed to support fixtures in the ceiling. These boxes will be permitted to support a minimum weight of 50 pounds. The B618R can be used in the ceiling as a junction box. Do not hang a fixture from it since it relies on the strength of the ceiling itself.

#### **B518P Ceiling Box - 3 questions:**

- 1) Is this box listed to be in contact with insulation?**
- 2) There are little 'air gap' openings...must they be sealed to maintain the 2-hour rating?**
- 3) NER-140 says electrical outlet boxes are designed to be used with listed steel cover plates.... etc. Need more information on these cover plates.**

- 1) There is no restriction to the box in relationship to its position with insulation.
- 2) A box does not have to be sealed to maintain the 2-hour fire rating. However, our old work boxes are not 2 hour rated.

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3) The NER-140 report is clear that listed metal covers must be used in combustible construction (whether wires are there or not). I consider the canopy of the light fixture a steel cover.

**I recently purchased 5 PVC Carlon box extenders (B1EXTB) that are advertised to "fit most non-metallic boxes." Turns out they do not fit the \*Carlon\* boxes (B1114, 14 cu in old work boxes with plaster tabs) the electrician put in while rewiring my kitchen (we later put in a tile backsplash and need to extend the switches and receptacles out about half an inch). The extenders are narrow enough but too tall. Does Carlon make extenders that fit these Carlon boxes? Can I "shave down" the extenders in some way to fit the boxes?**

The box extenders were not designed to fit "Old Work Boxes" since the box can be removed prior to installing the backsplash by backing off on the screws (you can do that without removing the device). The extenders were designed for "New Work Boxes".

**Is the box "captured" behind the backsplash? If it is, you are going having to remove the box by cutting it out. If it is not captured, please reverse the screws for the flippers and see if you cannot pull the box forward.**

**Are B620H 20 cu in. round adjustable bar hanger boxes OK to use for hanging ceiling fans? If so do they need any other type of support used with them?**

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The B620H is listed for fixture support up to 50lbs, but it is not listed for ceiling fan support. If you would like to hang a ceiling fan box, it is very important to use a box listed for that use. I would recommend that you use our B720-SHK, B708-SHK, or BH525A, which are rated for supporting ceiling fans up to 35lbs.

**A customer had some very sloppy wiring. Among other goofiness, boxes were recessed about an inch, far enough that the original device mounting screws would not reach, so they were replaced with drywall screws. The installer's rep originally disputed the violation associated with the recessing, but later recanted. However, they separately claimed this screw replacement was legal. Of course, the definition of "legal" is ultimately up to the AHJ. However, Section 110.3(B) is adopted by the jurisdiction in question. Do the standards to which wiring devices and your switch boxes comply restrict the devices' mounting to the boxes to using 6-32 screws, or are wood/sheet metal/ etc. screws in compliance?**

You can use replacement screws but they have to be Number 6-32 for wall boxes. He is in violation for the screws and the depth. 314.20 is the rule for the depth. The screws are a requirement of the UL Standards (UL514A and UL514C).

How many and who's boxes were installed? If they are Carlton boxes he can purchase Carlton's box extenders (Part Number B1EXT). These UL Listed extenders come with longer Number 6 screws and can make up for the 1" depth.

**Please help me make my boss understand that the two nubs on the side of a nail on are basically a depth gauge for drywall. I have noticed (and**

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**measured) both the blue boxes and the black have different size nubs. blue having a 3/8 " and the black one has a 1/2" nub. I have brought to my bosses attention the nubs are a quick way to nail a box up and maintain the same depth. Please if you can understand he asked if I knew this to be true if you could help me with info on this fact I would be at ease knowing I'm not a moron as he called me.**

Your understanding is absolutely correct. The two "nubs" are used to determine the depth the box needs to be placed against the stud for 3/8" (Carlon's boxes) drywall. The nubs are strictly a feature and does not mean that a box has to be installed at that depth.

**Hi could you please tell me your box rating on 4 sq. plastic boxes, also on single gang box?**

If you are discussing fire classification, most of Carlon's blue nonmetallic outlet boxes, with the exception of old work boxes, are fire classified for two-hour fire rated walls or less.

You can view the UL fire classification card with the part numbers at: <http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/gfilenbr.html>

Type in "R8326" for the search by UL file and you'll have two choices for the fire classification card. You can choose either one.

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**I would like to know if it is acceptable to use the B618R box for mounting smoke detectors in the ceiling. I read that this box is not for fixture support.**

It is acceptable. Smoke detectors are not fixtures. Please refer to Section 314.27(B), a Luminaire is a fixture. Article 100 defines a luminaire as a complete lighting unit. In addition, 314.27(A) Exception permits this box to be used in the wall to support a luminaire of 6 pounds or less.

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