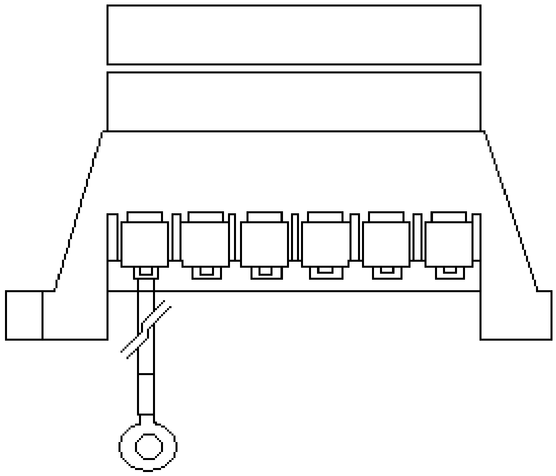
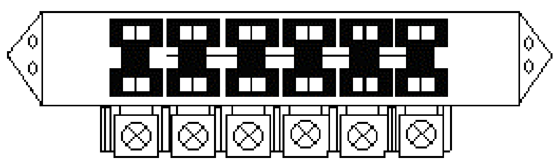
Installation Instructions for ATC6-GANG

1x6 ATO/ATC Fuse Block w/Cover, Common Feed

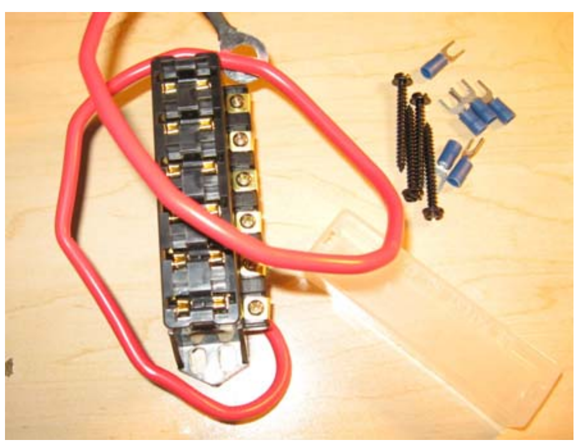
Again, we're trying to keep things simple and have effective responses to your enquiries. This was added as an "order item" on 05MAY2008, and may become a stocking item if there is enough demand for it.



Here's a line drawing of the block in profile. Distance between centres of mounting holes is $4^1/_8$", and the overall width is just over one inch. So, allow about 4-1/2" x 2½" "footprint" for mounting the beastie – you need the extra room for entry of the distribution leads. Terminals are brass, and the screws are steel and may be replaced with CRES or brass. Per the manufacturer datasheet, the screws are #6 machine screws. The feeder lead is listed as 22½" in length; I've been giving 18" as the length. Close enough – gives a little wiggle room there as well.



Top-down "plan" view – for illustration. Note that on the actual unit, however, the mounting screw holes on the end where the feeder cable exits are oval in shape, giving some small tolerance for screw position. Also, the #10 capscrews provided are slightly smaller than the holes they're meant to pass through, which also gives some tolerance for position.



Here's the kit – fuse block, cover, terminals, and mounting hardware. Sheetmetal screws are provided by the manufacturer. Included – but not pictured – is also a pair of #10-24x1" socket head capscrews and well nuts for mounting to panels. Either will work.

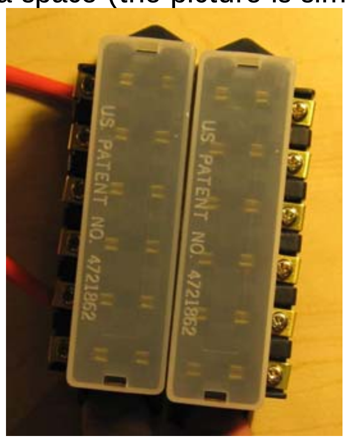
While this fuse block has a total of four mounting holes, you really only need to use two (that's why you only get two capscrews and well nuts with the kit. You can't really use four anyhow – the holes are too close together on the ends.) If you only use two screw holes, try to use them on opposing corners for stability.

You'll need a clear area about five or six inches long and about three inches wide, but the block may be mounted to one side (since all of the distribution leads enter from the same side.) The 8AWG feeder lead may be passed out from either side of the fuse block – but a bit of extra protection would be indicated if you were going to have it pass out from the "terminal side" (as it does in the picture above,) or have some variety of rigid mount to the panel – like a small "P"-clamp – to keep it from rubbing against the underside of the terminal pads and screws.

If you use the capscrews and well nuts provided, you will need to drill $^{3}/_{8}$" holes to pass the well nuts. The mounting screw pattern (using the centre of each mounting hole) is $4^{1}/_{8}$" x $^{7}/_{16}$", so draw out that square and use two opposing corners to locate your holes. If using the sheetmetal screws provided, a $^{1}/_{16}$" pilot hole should be sufficient; if using tapping screws of your own provision, follow the instructions provided

Pairing:

If you are going to use a pair of these together (and why not? That puts distribution for twelve circuits in one compact place,) you will want to double the width of the area needed, and you'll have to mount the fuse blocks "back-to-back" in the centre of the area. Allow about $^1/_8$"-¼" between the blocks to allow for removal and replacement of the cover (you don't need much space, but you'll hang up if you don't have any at all. The thickness of a bit of corrugated cardboard will suffice – you just need to prevent interference.) Mounting will look rather like the picture below, save I didn't provide a space (the picture is simply for illustration):



Note that the terminals are on the outside of the pair of fuse blocks. Also, the feeder leads for the fuse blocks can either be passed out the side (pick one) or from between the feet (to provide space between the block.) However, if you're going to opt for the side exit, the use of a rigid retention method will be indicated.

Ratings:

Plan your circuit distribution carefully! While ATO/ATC fuses are available in ratings up to 30A, these fuse blocks are rated for a maximum distribution load of 65A *for the entire block* – regardless of what the individual branches are to be rated for!

To figure current needs for lighting circuits (or anything else rated in Watts, vice amperes,) take the power requirement and divide by a nominal twelve volts. Example:

$$2x55W = 110W. \quad 110W/12V = 9^1/_6A$$

So, for a pair of 55W fog lamps (a fairly common rating,) you will require a total current source of $9^1/_6$A, or a single 10A circuit.

Given the way that Ohm's Law and Watt's Law work, your *actual* current will be a bit less than the *nominal* current you've calculated, but size for nominal draw (you'll feel better.) Actual current draw will be somewhat less (using a 13.6VDC nominal operating voltage) at:

$$2x55W = 110W. \quad 110W/13.6V = \sim 8.088A$$

Or a shade over eight Amperes. Since you can't get a fuse between 7.5A and 10A, you're going to end up using a 10A fuse anyhow. However, it is useful to know that the value you are going to calculate will be slightly higher than the actual value you'd see if you tested the circuit – what we call "safety factor" in engineering. *Use the nominal 12V value for circuit calculations!*

Odd Applications:

Yes, given the construction of the thing, it is entirely possible to break it up into, say, a pair of three-circuit distribution blocks in a common body. However, *the 65A maximum still applies!* I really suggest you *do not* break it down into smaller blocks – but if I can think of it, so can someone else. Just note that *this does not allow you to run a higher capacity through the block!* This limitation is set due to the materials used and the heat load caused by running high currents through the thing. If you run it at full tilt, you're looking at 884W (at a nominal 13.6VDC) – in heat terms, think of "a small hair dryer." This would be *in addition to environmental heat* – like if you mount the thing underhood. This isn't an "artificially low" current limit – it is as real as a slap in the face, and electrical readings should not be exceeded for any reason!

Yes, it's possible to run several circuits where you will *not* have all circuits functioning at once, and therefore be able to have the *ability* to pass more than 65A through the block at the time. However, the circuits should be wired so that having some energised will exclude others. An example:

> Let's say you decide to run your headlamps through a single fuse block, using a pair of fuses (one for dip beam, one for full beam.) Assuming you don't do something silly and rewire your headlamps so that you can have dip *and* full beam (yes, it's silly. You'll chew through bulbs like popcorn...) And, let's further assume you want a bright full beam – so you've got an E-code conversion with 55W/100W bulbs. That will be 2x55W = 110W for the dip beam, and 2x100W= 200W for the full beam.
>
> As we've shown previously, 110W comes out to be $9^1/_6$A. 200W/12V = $16^2/_3$A. This will result in your having a 10A fuse and a 20A fuse in the block.
>
> However, both circuits are not active at the same time. So, you won't have a load of 30A full time – you figure with a 20A load at full time, leaving you 45A of capacity for other circuits.
>
> Why does this work? Because the dip beam and the full beam circuits will *not* be on at the same time for more than a brief moment during changeover, so it's not an effective 30A load. You simply take the "largest" circuit that will be engaged at any given time, and subtract that from the load specification to determine remaining capacity. Is this safe? Yes. How do you think OEMs do it?
>
> (N.B. If you have a "four-lamp" system for headlamps, verify that the dip beam bulb is *not* on when the full beams are on. If it is, then it's a constant load and needs to be accounted for separately.)