

Re: How much current safe for 30m extension?

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From: Watson A.Name - \ (NOSPAM_at_dslextreme.com)

Date: 02/13/05

Date: Sat, 12 Feb 2005 17:17:16 -0800

<bigcat@meeow.co.uk> wrote in message
news:1108237955.923021.112840@f14g2000cwb.googlegroups.com...

Watson A.Name - "Watt Sun, the Dark Remover" wrote:

> "Sammo" <noone@no-where.com> wrote in message

> news:95FB7BA1F25441A7D4@130.133.1.4...

>> *I am in the UK (so mains voltage is about 230V or 240V).*

> *I'm in the U.S. and this gives me a flashback on what I was thinking
> about trying a few months ago. We have a PBX at work that's on 48V
> batteries, but the batteries are 9 yrs old and need replacing. They
> cost a bundle*

> *the first logical thought is repair them rather than replace. Lead
> acids are often repairable.*

> *Quick repair, doesnt always work:
> rinse muck out of cells
> fill with new acid
> charge, monitor acid conc and adjust as required*

> *This wont fix all cells by any means, but many it will. Those it wont
> in some cases may only need replacement plates and acid, which can be
> made much cheaper than buying new batts.*

No. These cells are 4V each, 12 in all, each is sealed. Well, except for the one cell that's split open because of internal pressure. :-(
They must be replaced, not repaired. This is a phone system, where it has to be online during emergencies. Batteries that are working fine, but over 5 years old are considered unacceptable and must be replaced.

> *Also they can often be run happily at 24v, if not in all cases. If
> yours could, it may be that your present cells would do that as is.*

This is **not** how you run a battery backup system! The idea is to start out with fully charged batteries, so that when the power fails for a long period, the voltage of the batteries may drop to 40V or less as the

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cells discharge, keeping the PBX online. If you start at anything less, even 36V, you're not going to have any discharge time before the PBX system crashes. It would be essentially worthless.

> *What capacity at 48v is it on?*

The rectifier can put out a hundred amps at 54VDC, to charge the batteries while the PBX is also running. That must be 6 or so kW input. So I would guess that it's 208V at 30A breakers. But with no batteries, the load would be more like 3.6kW.

> *I thought it would be possible to run a power cable
> underground to the big UPS we have in our computer room. Problem is
> that the PBX's rectifier takes 30A max at 120VAC, or about 3.6kW.*

> *i've no idea how that fits into this*

The UPS in the computer room is 150kW, easily capable of handling another 6 or so kW.

> *And
> the distance between is about 1300 feet or about 400m.
>
> I would guess that the UPS output should go into a transformer and
come
> out 480VAC, so the cable losses would be minimized. Then another
transf
> on the PBX end to bring it back to 120VAC. But should I expect to
have
> a max loss of 5% at max current, or what?*

> *well how much current are you shifting??
> And why cant you power your pbx from whatever power source it uses
now?
> You havent given us nearly enough information.*

The batteries and rectifier are a "UPS" to protect the PBX against failure of the commercial power. That's what it's being fed from.

> *I think I came up with 4GA
> cable, but at 480VAC, I'm guessing that it would have to be special
> insulated underground cable.*

> *standard uk T&E should do that, but should be insulation tested to the
> required v first. Costs around £12 a 100m reel, depending on copper
> size.*

Assuming that it could be pulled 1300 feet. Probably not without damage. Heavily insulated cable would be needed. Probably double jacketed.

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- > *Someday I'll have to ask one of the electricians that work on our HV*
- > *stuff. We have 4160VAC underground around campus but that's all*
- > *specialized switchgear, etc.*

- > *rf transmission co-ax is rated pretty high... and its concentric.*

RF transmission coax is typically copper clad steel wire center conductor, which would have much greater I^2R loss than pure copper cable at 50 or 60Hz. That would be unacceptable.

- > *T&E's probably far more practical.*

Thanks, but I've never heard of T&E here in the U.S. I don't know what that acronym stands for.

[snip]

NT