Re: Energy − Power Meters

Source: http://sci.tech−archive.net/Archive/sci.electronics.design/2009−07/msg00604.html

- *From*: krw <krw@xxxxxxxxxxxxxxxx>
- *Date*: Sat, 04 Jul 2009 16:48:35 −0500

On Sat, 04 Jul 2009 13:53:29 −0700, Jim Thompson
<To−Email−Use−The−Envelope−Icon@xxxxxxxxxxxxxxx> wrote:

> On Sat, 04 Jul 2009 15:09:49 −0500, krw <krw@xxxxxxxxxxxxxxxxx> wrote:
>
> > On Sat, 04 Jul 2009 16:02:51 −0400, "Michael A. Terrell"
> > <mike.terrell@xxxxxxxxxxxxx> wrote:
> >
> > > Jim Thompson wrote:
> > >
> > > > On Sat, 4 Jul 2009 18:13:51 +0000 (UTC),
> > > > David Lesher
> > > > <wb8foz@xxxxxxxxx> wrote:
> > > >
> > > > > Jim Thompson
> > > > > <To−Email−Use−The−Envelope−Icon@xxxxxxxxxxxxxxx>
> > > > > writes:
> > > > >
> > > > > > I
> > > > > > don't
> > > > > > know
> > > > > > what
> > > > > > "central
> > > > > > HVAC"
> > > > > > is
> > > > > > (so
> > > > > > I'd
> > > > > > guess
> > > > > > that
> > > > > > I
> > > > > > don't
> > > > > > have

it).

> You don't
> have air
> conditioning
> ?:−)

> Jim; not everyone lives in
> the middle of the desert...

Thankfully ;−)

Remember folks, it's hell−on−wheels out here in Arizona and, with global warming, it'll get worse... so stay away !−)

> WHAT IS
> your
> significant
> consumer.

> I'd suspect his fridge.

Probably rents, has steam heat provided. Has no clue that part of his rent pays for that.

> BTW, another poster
> commented:

> The device
> will not
> reduce the
> losses in the
> motors only
> the losses in
> the
> conductors

> between it
> and the
> meter. (and
> maybe not
> even that)

Not quite true; it will cut the I^2R losses in the motor by reducing the
current.

I realize I forgot part of the spiel re: the NASA story...

So power needed is a function of load. Ask the water pump to raise 6 gallons per minute 8 feet, and it needs mumble_out watts. Make that 12 gallons & 10 feet; it's bigger mumble watts...true?

Each of the output power needs will be reflected in an input power need of (mumble_out+the losses). And that is I*E*pf, integrated over time.

And:
An induction motor's power factor varies with load. The closer it is to
full load, the better its power factor.

Mumble_out is fixed *by the load* in everyday apps. Changing a variable must change others so you still get the output.

Say:

Ia * Ea * .8 pf = Ib * Eb * .9 pf

If you improve the PF, and the E is fixed, Ib > Ia.

Ergo, Ia^2R > Ib^2R...
lower losses in b.

But the alleged way to lower
the pf is to lower the pf and
you do that by
loading the motor to full{er}
load. But that's fixed, so you
lower the E
to improve the PF...but wait,
won't that raise I? [Let's not
always see
the same hands, class...]

And here's the hype.... when
demo'ed at county fairs and
flea markets;
the carnie's display
ALWAYS showed an
unloaded, free−spinning
shaft
motor. THAT case could be
helped by the Magic box.
But in any consumer
fridge, or dishwasher, you
know Frigidaire or Kenmore
or whoever had
carefully designed the motor
to be fully loaded; they are
hardly going to
give you more copper and
iron than needed, are they?
In real uses, as LeRC
tested them, it's no better
than a wash.

I vaguely remember some hype about an AC
motor controller that varied
its consumption according to load?

Here's one for you... my electric
consumption (in kWh) is about 15%
lower so far this year than last... looks like
global _cooling_ to me
;−)

> Mine have been dropping for several years. Last month was
> still
> under $100.

> Just got my water bill. $205, for June. <ouch>

> How much is actually water? Probably lots of "fees" for garbage,
> etc... taxation without vote :−(

$141.63. The rest is sewer. Garbage collection fees are on the power
bill, yet to come.

> Here in Arizona, my bill is just over 1/2 that.
>
> But my electric bill was $600.73 :−(

I'll be interested to see what that is. It'll be the first one with a
full month of AC. I'm hoping AC isn't any more expensive than heat.
Can't see why it should be; smaller temperature differential.

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