xantrex™

Technical Note

Recommended and Acceptable Cable Sizes for the PROsine™ 2.0 Inverter/Charger

512-0019-01-01 Rev 2

Abstract

Xantrex recommends DC cable sizes for the PROsine 2.0 to ensure you can receive full performance benefits from the unit. Because of the difficulty in obtaining the recommended sizes, Xantrex suggests other acceptable alternatives. Some precautions must be observed in using them, however.

Cable sizes

Recommended sizes

The PROsine 2.0 inverter/charger is a high performance unit. To achieve the best performance that it can offer, Xantrex recommends the cable sizes shown in Table 1.

Note that the lengths apply to each cable, the positive and the negative.

Table 1 Recommended cable sizes for Prosine 2.0

Length (each)	Size
up to 6 feet	250 MCM
6 to 12 feet	350 MCM
12 to 20 feet	Not recommended, keep inverter close to battery bank.

Alternate acceptable sizes

However, Xantrex recognizes that these cable sizes can be difficult to find. Many applications can be accommodated with cable sizes listed in Table 2.

Table 2 Acceptable cable sizes for PROsine 2.0

Length (each)	Minimum Acceptable Size
up to 12 feet	4/0
12 to 20 feet	350 MCM

Using the alternate sizes may affect the following characteristics of the installation:

- surge capability
- load starting capability
- compliance with electrical codes applicable to your installation

Surge performance

The surge performance of the PROsine as stated in the specifications can only be met by using the recommended cable sizes.

If cable size is reduced or length increased, the surge performance of the unit will be reduced. When the unit starts loads with a large surge requirement (especially compressor-type loads such as air conditioners, refrigerators, and air compressors) it will draw up to 600 A – the internal current limit – from the battery.

Load starting capability

As the DC voltage at the unit is reduced (due to voltage drop in the cable, fuse etc.), the unit can not draw as much power and therefore is less able to start heavy loads. This is reflected by the inverter shutting down due to low battery, overload, or low bus voltage. Note that an undersized battery, a battery with low charge or in poor condition can give the same results.

If you experience problems starting loads try connecting the unit to a fully charged battery bank of at least 450 Ahr (2 group 8D batteries connected in parallel) with the cable sizes recommended in Table 1 (or 4/0 at a length less than 3 feet for each cable). Note that the inverter should not be permanently located in the same compartment as non-sealed batteries to avoid problems of corrosion and explosion hazards.

Finally, if at all possible, keep the cables close together to reduce possible interference problems. Xantrex also recommends that the DC positive and negative cables be tied together at regular intervals

Code compliance

The 4/0 cable size is not rated for use with a 300 amp fuse in RV and residential installations.

Note

It is the responsibility of the system installer to ensure compliance with the relevant electrical codes.

Cable supplier

Supplier

Cobra Wire and Cable can provide the recommended cable and connectors and may be contacted at:

Tel: 1-888-732-6272 x 115, Dave Swiren
Web: www.cobrawire.com
Email: daves@cobrawire.com

The company accepts credit cards and small orders. Tell them that you are ordering wire for a Xantrex inverter.

Cable options

We recommend the use of Cobra's X-Flex cable which is composed of fine copper strands resulting in an extra-flexible wire that easy to work with. This cable has a number of agency approvals – consult the Cobra Wire website for more information. This wire is available in a range of gauges:

- 4/0 is #A2140B
- 250 MCM is #AT250MB
- 350 MCM is #A1350MB

For #4/0 and smaller this wire is available in red and black colors. For larger wires it is available only in black (but a band of red heat-shrink could be shrunk over both ends of the positive wire, if desired). As of March 2002, the cost for 350 MCM wire is US$5.24/ft.

Lug options

We recommend the use of compression lugs for fine-strand wire but these lugs require the use of specialized crimping tools. Check with local industrial electricians or electrical supply houses to see if they have the tools to crimp these for you. If you can not get compression lugs crimped then a second choice would be setscrew box lugs but note that these are not permitted in some installations (e.g. marine) and can tear off some of the fine strands of the wire. Cobra can supply the following lugs maufactured by Burndy (see www.burndy.com for more information):

- Compression style
  - 4/0 is #YA29L-TC38FX
  - 250MCM is #YA31L-TC38FX
  - 350MCM is #YA34L-TC38FX
- Box style
  - KA31U can accommodate #6-350MCM wire.

As of March 2002 all of these lugs cost US$10-15 each.

Note

It is the responsibility of the system installer to ensure compliance with the relevant electrical codes - check the Cobra Wire website for details on insulation properties and ratings

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