



Single-Phase Motors

APPLICATION

Two or More Different Cable Sizes Can Be Used

Depending on the installation, any number of combinations of cable may be used.

For example, in a replacement/upgrade installation, the well already has 40 Metres of buried 4mm² cable between the service entrance and the wellhead. A new 2.2kW, 230-volt, single-phase motor is being installed in a bore at 50 Metres to replace a smaller motor. The question is: Since there is already 40M of 4mm² installed, what size cable is required in the well with a 2.2kW, 230-volt, single-phase motor setting at 50 Metre?

From table 11, a 2.2kW motor can use up to 60 Metres of 4mm² cable. The application has 40 Metres of 4mm² copper wire installed.

Using the formula below, 40M (actual) ÷ 60M (max allowable) is equal to 0.666. This means 66.6% (0.666 x 100) of the allowable voltage drop occurs in this wire. This leaves us 33.4% (1.00 - 0.666 = 0.334) of some other wire size to use in the remaining 50 Metres “down hole” wire run.

FIRST EXAMPLE

The table shows 6mm² copper wire is good for 100 Metres. Using the formula again, 50M (used) ÷ 100M (allowed) = 0.5; adding this to the 0.666 determined earlier; 0.666 + 0.5 = 1.16. This combination is greater than 1.00, so the voltage drop will not meet the ASNZ3000 recommendations.

SECOND EXAMPLE

Tables 11 show 10mm² copper wire is good for 170 Metres. Using the formula, 50 ÷ 170 = 0.294, and using these numbers, 0.666 + 0.294 = 0.96, we find this is less than one and will meet the ASNZ3000 recommended voltage drop.

This works for two, three or more combinations of wire and it does not matter which size wire comes first in the installation.

Formula:	$\frac{\text{Actual Length}}{\text{Max Allowed}}$	+	$\frac{\text{Actual Length}}{\text{Max Allowed}}$	=	1.00
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EXAMPLE: 2.2kW, 230-Volt, Single-Phase Motor

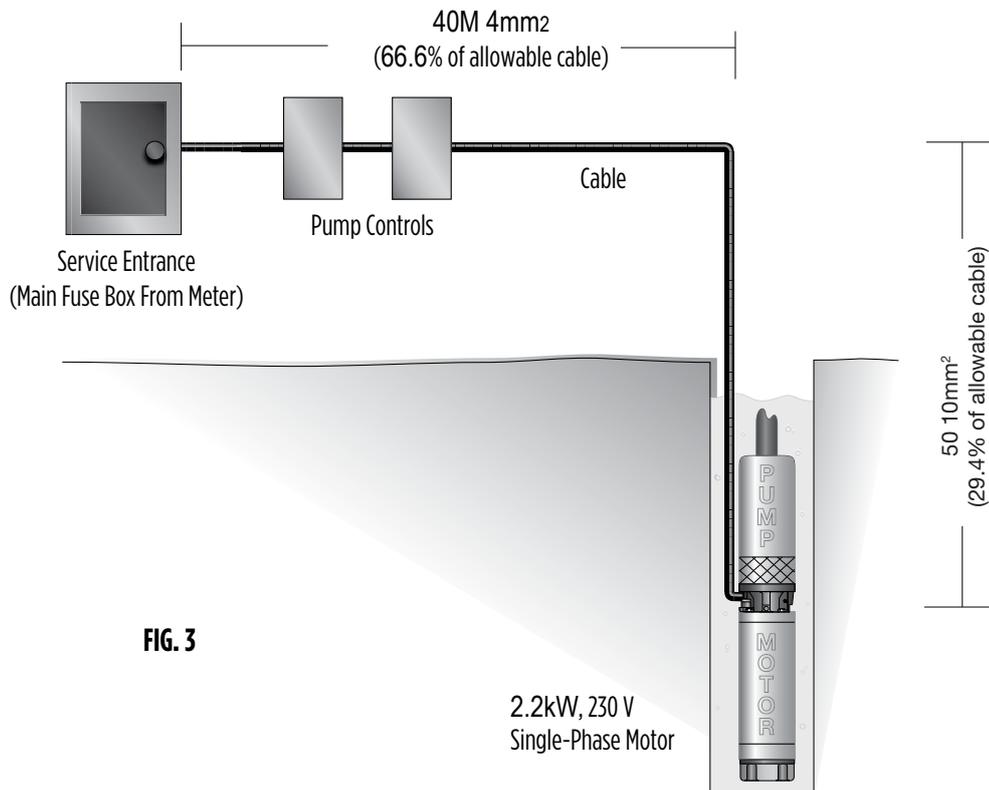


FIG. 3

2.2kW, 230 V
Single-Phase Motor