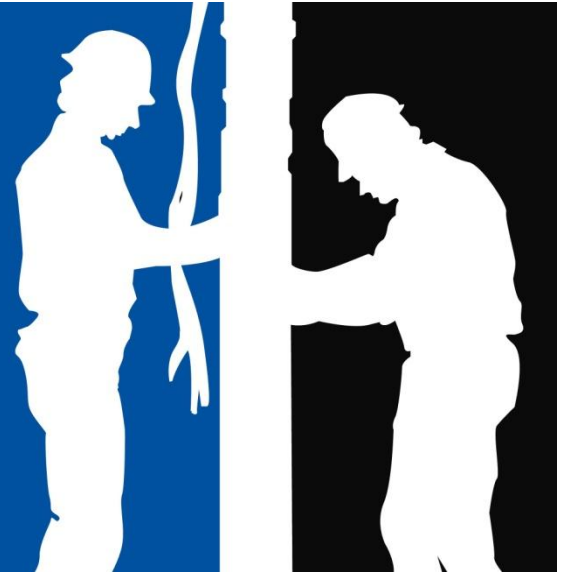


# FRANKLIN AID



Franklin Electric



Franklin Application/Installation Data *Europe*

No. 3/2011

Many questions regarding submersible motors in combination with a VFD reach our Franklin Electric Field Service team.

In this Franklin AID we want give you additional information on VFD drives and submersible motors. Our Franklin AID I/2004 already dealt with this subject.

### Output filters:

Output filters should be chosen in accordance to Franklin AID 01-2004.

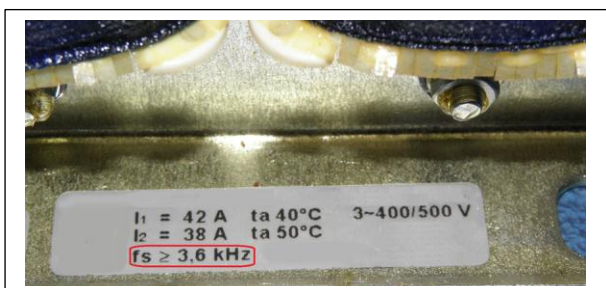
In addition, the frequency range of the filter must be taken in consideration.

It is important to select the filter covering the right "carrier frequency range".

This means if for example the nameplate of the filter shows  $f_s \geq 3,6$  kHz, the carrier frequency of the VFD has to be adjusted to a minimum of 3.6 kHz.

A wrongly selected output filter or a badly adjusted frequency range can lead to a premature failure of the installation. Thus possibly resulting in reduced performance, increased heating or non-smooth run of the submersible motor.

Output filter nameplate



VFD manual

|                         |   |  |
|-------------------------|---|--|
| Mains connection        | Input voltage $U_n$                       | 380 - 500V, -15%...+10% 3-<br>208...240V, -15%...+10% 3-   |
|                         | Input frequency                           | 45...66 Hz   |
|                         | Connection to mains                       | Once per minute or less (normal case)  |
| Motor connection        | Output voltage                            | 0 - $U_n$  |
|                         | Continuous output current                 | $I_n$ : Ambient temperature max. +50°C, overload 1.5 x $I_n$ (1min/10min)<br>$I_L$ : Ambient temperature max. +40°C, overload 1.1 x $I_L$ (1min/10min) |
|                         | Starting torque                           | 150% [Low overload]; 200% [High overload]  |
|                         | Starting current                          | 2 x $I_n$ 2 secs every 20 secs, if output frequency <30Hz and temperature of heatsink <+60°C   |
|                         | Output frequency                          | 0...320 Hz   |
| Control characteristics | Frequency resolution                      | 0.01 Hz  |
|                         | Control method                            | Frequency Control U/f<br>Open Loop Sensorless Vector Control   |
|                         | Switching frequency [See parameter 2.6.8] | 1...16 kHz; Factory default 6 kHz  |
|                         | Frequency reference                       |  |
|                         | Analogue input                            | Resolution 0.1% (10bit), accuracy $\pm 1\%$  |
|                         | Keypad reference                          | Resolution 0.01 Hz   |
| Field weakening point   | 30...320 Hz                               |  |

QUALITY  
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### Another important topic:

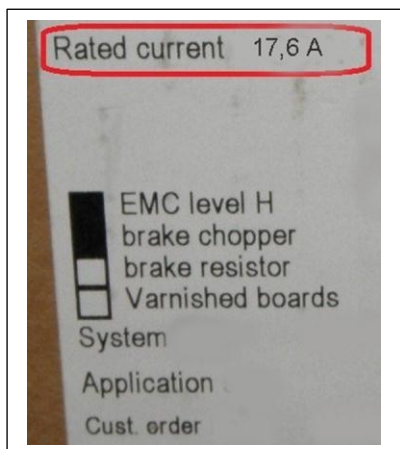
The majority of the VFD's are designed for "above ground" motors, which means the selection/purchase is generally done according to the performance of the motors in kW.

Due to their construction features submersible motors usually take higher amps (Ampere) than comparable above ground motors at the same performance ( $P_2$ ).

As a result, the VFD cannot supply the necessary current for Submersible motors and move into an "Overload" condition.

Therefore VFD's for Submersible motors must be selected on the nominal Amps basis of the motor (Inominal) which can be found on the motor nameplate as well as in our documentation.

VFD label



VFD nameplate

|    |        | Input<br>Alimentation<br>Entrada | Output<br>Sortie<br>Salida |
|----|--------|----------------------------------|----------------------------|
| kW | U (V~) | 380...480 $\Phi$ 3               | 0...380 - 480 $\Phi$ 3     |
|    | F (Hz) | 50/60                            | 0.5...1000                 |
|    | I (A)  | 27 Max                           | 17.6                       |
| HP | U (V~) | 460...480 $\Phi$ 3               | 0...460 $\Phi$ 3           |
|    | F (Hz) | 60                               | 0.5...1000                 |
|    | I (A)  | 22.2                             | FLA 14                     |

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### Seminars in 2012:

Please check our website <http://www.franklin-electric.de/de/training.asp> and sign up.

Upon request we offer specific seminars tailored to your needs.

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*The Franklin Electric Service Team thanks for the good cooperation and wishes "Merry Christmas" and good success with Franklin products in 2012.*