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Franklin Application/Installation Data ***Europe*** No. 1/2015

The 6” Franklin Electric High Efficiency System (HES)

As the world’s leading manufacturer of submersible electric motors, drives and controls for water well pumping systems, we want to introduce our latest product:

The 6” Franklin Electric High Efficiency System (HES)

In consideration of environmental relief and energy saving, Franklin Electric has developed a High Efficiency 6“ Submersible Borehole System, consisting of a synchronous submersible 304SS NEMA motor (3000 1/min) associated variable frequency drive and output filter.

A large number of these products is already working successfully in the field, but let us enlighten today one specific installation to recognize the benefits of this unit:

Test installation Water Authority

On December 10, 2012 in corporation with the local Water Authority Franklin Electric installed and put into operation a 6“-15 kW Franklin Electric High Efficiency System, consisting of a 304SS NEMA synchronous submersible motor (3000 1/min), IP66 variable frequency drive (VFD) and an IP54 du/dt output filter.

Picture 1

Picture 2

Picture 3

Picture 4

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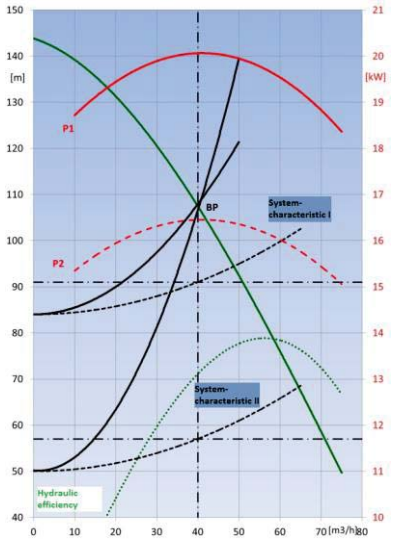
Initial situation:

The installation is operated from a central control room via SPS. In the past a 10 stage 60 m^3/h borehole pump with asynchronous submersible motor was installed at 31m below ground.
The well (Ø 400 mm and 50 m deep) is equipped with a continuous OBO filter. An additional cooling sleeve guarantees a minimum cooling flow alongside the motor.
Due to intake requirements as well as geological characteristics such as water quality and well yield, the pump has to constantly deliver 400 m³/h into a collecting pipe. Depending on additional wells being connected the delivery head varies between 57 to 91 m. As these required duty points are not directly on the Q/H curve the volume has to be throttled mechanically.
In the years 2011 and 2012 the pump ran an average of approximately 200 hours per month with an input of P_1= ~20 kW.
> *See graph 1.*



Graph 1

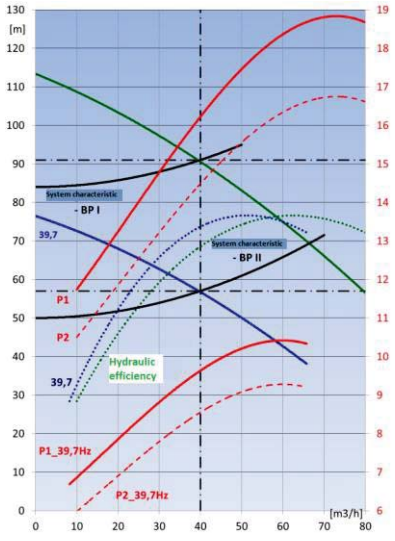
New installation December 12, 2012:

An existing 5 stage 60 m³/h borehole pump including the existing cooling sleeve was installed with a Franklin Electric HES at 31m. Due to limited space the electronic parts (VFD in IP66 and du/dt filter in IP 54) were mounted outside the cabinet directly to the wall.
> *See picture 4 above.*

At a rotating speed of 48,2 Hz the newly chosen pump accurately meets the duty point I of 40 m³/h at 91 m
> *green solid curve.*

The preset process reference 40 m³/h (read by existing flow control unit) adjusts the rotational speed in case of changing operational conditions/pumping heads. Duty point II is at 39,7 Hz for 40 m³/h at 57 m. > *blue solid curve.*

Due to the reduced rotation speed the efficiency curve "moves" left resulting in an improved hydraulic efficiency compared to nominal load > *blue dotted curve.*



Graph 2

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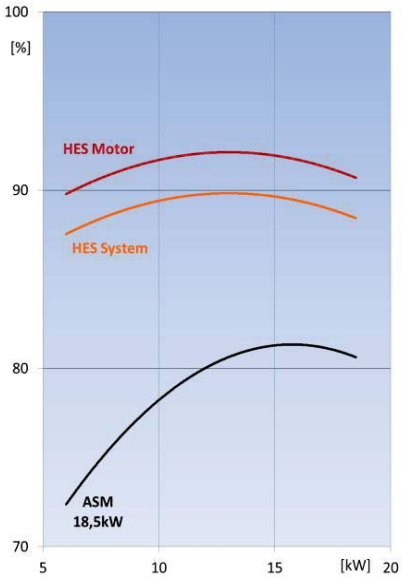
These two duty points can now be achieved with an input of P_1= 9,5 and 16,2 kW respectively.
> *See graph 2.*

Conclusion:

Due to this new method of operation the pump now works at an average input of P_1= ~10,3 kW. Thus, the energy consumption is halved (~ 80 % reduction caused by the speed control and ~20 % due to new motor technology).
The reduction in motor technology is due to a constant excellent efficiency throughout the entire performance range as well as perfectly balanced electronic components. > *See graph 3.*

The start-up went quickly and smoothly because of the custom-designed VFD software specifically developed by Franklin Electric.

Franklin Electric HES Systems are available from 4 to 37 kW.



Graph 3

We hope we could give you a self explaining sample of our new system.

For further information please contact your correspondent Franklin Electric sales representative or visit our website at www.franklin-electric.eu .

SEMINARE IM FRANKLIN TECH TRAINING CENTER 2015

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Please register by email to field-service@franklin-electric.de or by phone +49 (0)6571 105 – 0.

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