automation solutions

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CHP Template

Reduces engineering effort by up to 80 %.

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Save time and resources

CHP Template: Reduce engineering effort by up to 80 %

We deliver a Combined Heat and Power (CHP) Template
specially tailored to the developers and manufacturers of CHP units.

The CHP Template offers solutions for the tasks most frequently required to operate a CHP unit. This includes all the relevant functions for dynamic and static grid support according to the VDE-AR-N 4105 Low-Voltage Directive and the VDE-AR-N 4110 Medium-Voltage Directive. The CHP Template saves up to 80 % in engineering time and costs.

Implement new requirements quickly

CHP unit manufacturers often need to implement new requirements, either by choice or through regulation. These can include, for example, the creation of virtual power stations or the implementation of grid connection in accordance with directives. Such tasks require a controller with more freedom than the compact PLCs often found in CHP units, and conversion efforts can be considerable. Bachmann has designed the CHP Template to reduce these efforts.

Integrate directly with certified Bachmann hardware

As well as tasks related to every aspect of grid connection, such as generator and grid monitoring, grid measurement and synchronization, typical close-loop control tasks are also solved. Speed, power, phase frequency and voltage regulation as well as the regulation of the mixture or engine cooling circuit are included. The template, provided as a ready-to-use Codesys project in Structured Text, offers an extensive range of functions. The CHP Template provides these and other functions as preprogrammed modules. The GSP274 hardware, part of the CHP Template, also meets the requirements of VDE-AR-N 4105 and VDE-AR-N 4110 for generating plants on the low-voltage and medium voltage grid. Compliance is verified with the appropriate certificates.

Know-how is protected

Each function can be modified or extended by the programmer as required. Development tools remain with the CHP unit manufacturer and are not required for operation, whilst access to operating parameters and status displays can be controlled with an access rights system. The CHP Template therefore provides a highly effective basis for the engineering of a combined heat and power unit. However, it also provides the freedom to implement manufacturer-specific extensions, whereby expertise is protected at all times.

Web visualization

A web visualization is also provided for efficient testing and commissioning. Visualization of the CHP unit can be adapted to customer requirements, enabling the CHP unit manufacturer to offer a unique product both graphically and functionally.

Contents and functions

- Motor control (starting, stopping, monitoring, etc.)

- Generator monitoring

- Grid monitoring acc. to VDE-AR-N 4105 and 4110

- Grid measuring with integrated GSP functions

- Generator-grid synchronization

- Speed measuring, speed control

- Power control, phase-frequency control

- Voltage control, power factor control

- Mixture control/exhaust gas (lambda/pressure) with and without turbo charger

- Reverse power protection

- Derating

- Engine cooling circuit, heating circuit, charge air cooling circuit

- Processing of anti-knock signals

- Emergency cooling circuit control

- Exhaust heat exchanger, room air cooling circuit control

- Control for throttle flap and gas air mixer (optionally also with stepper motors)

- Statistics recording such as operating hours, start counter, maintenance interval

- Alarm management/history, traffic light indication, data logger

- Saving machine parameters and loading in csv format

- Web visualization with user management

Separate program task for directive functions such as

- Static grid support (protection functions of the GSP274 with component certificate)

- Dynamic grid support/HVRT/LVRT/ 2-pole and 3-pole

- Q/U characteristic

- Q/P characteristic

- Q/U voltage limitation function

- Power factor CosPhi

- Cut-in conditions/active power gradients

- Active power adjustment with over frequency and under frequency (50.2 Hz characteristic)

- Grid safety management in accordance with VDE-AR-N 4110

- Graphical display of characteristics with support point tables and operating point display

- Reactive power in accordance with PT1 behavior (VDE-AR-N 4110)

- Grid and system protection in accordance with VDE-AR-N 4105

- Power factor control through:
  Setpoint CosPhi
  Analog
  Setpoint Q
  Characteristics
  Telecontrol protocols

- Output setting through:
  Binary inputs
  Analog input
  Setpoint P
  Telecontrol protocols
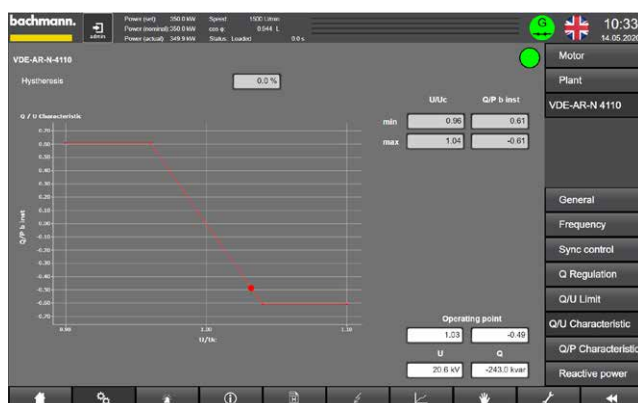
Q/U characteristic
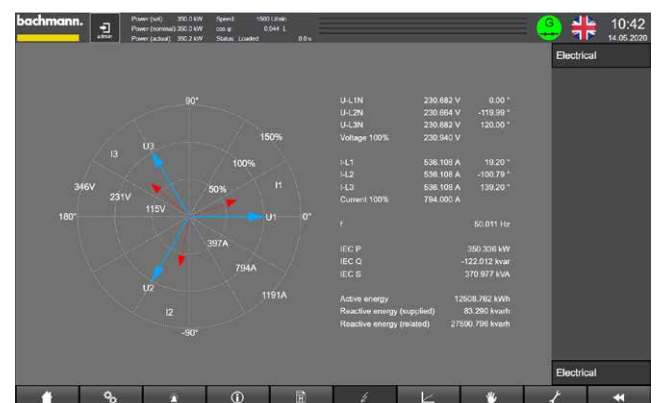
Vector diagram of currents and voltages

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