5.14 Automatic voltage regulator

UNITROL 1010 and UNITROL 1020 are the latest automatic voltage regulators (AVR) which set new standards in functionality, reliability and connectivity.

Benefits

- Stable and reliable control of your machine
  - Highly integrated and robust AVR for harsh industrial environments. Stable and accurate regulation, even with highly disturbed voltages.
- AVR for various applications
  - Fully configurable I/Os and measurement inputs, and user-specific configurable field bus interface, enable easy plant integration.
- Easy operation, monitoring and maintenance of the system
  - Intuitive and user-friendly commissioning tool.
- Full support for grid codes
  - Built-in Power System Stabilizer (option), simulation models and grid code studies available.
- Efficient product life cycle management
  - Extended life time of your assets, with minimum costs.
- Professional technical help always within your reach
  - ABB's global excitation service network.

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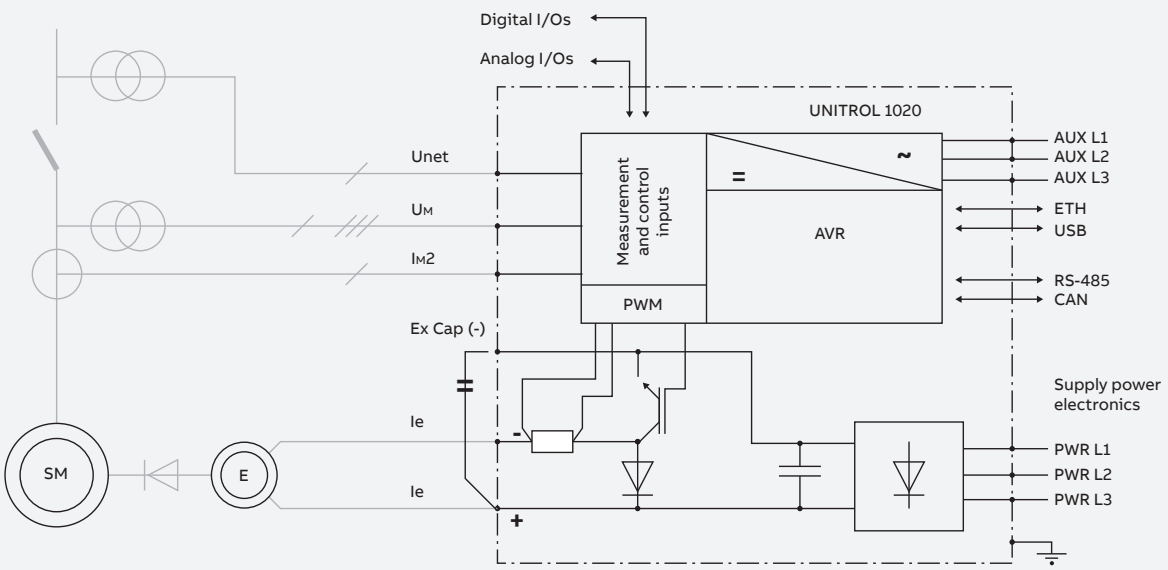
Block diagram of UNITROL 1020



Hardware
The UNITROL 1010/1020 automatic voltage regulator unit includes the most advanced microprocessor technology, together with IGBT semiconductor technology (Insulated Gate Bipolar Transistor).

The UNITROL 1010 provides a nominal excitation current of up to 10 A, while the UNITROL 1020 reaches 20 A.

Both devices are sufficiently vibration and pollution resistant to be mounted directly inside machines.

Control software
The UNITROL 1000's software includes all of the functions necessary for modern excitation systems. ABB offers three off-the-shelf software packages.

Light
The LIGHT version covers essential functionality for cost sensitive applications, where limited software functionality is required.
- Regulator control modes: Bumpless transfer between all modes
  - Automatic voltage regulator (AVR)
  - Field current regulator (FCR)
  - Power factor regulator (PF)
  - Reactive power regulator (VAR)
- Limiters: Keeping synchronous machines in a safe and stable operation zone
  - Excitation current limiter (min./max.)
  - PQ minimum limiter
  - Machine current limiter
  - V/Hz limiter
  - Machine voltage limiter
- Voltage matching

Basic
In addition to all of the functionality of the LIGHT version, the BASIC version covers the following:
- Modbus TCP
- Rotating diode monitoring
- VDC mode: Reactive load sharing for up to 31 machines in island operation
- Dual channel/monitoring: Enables dual channel operation based on self-diagnostics

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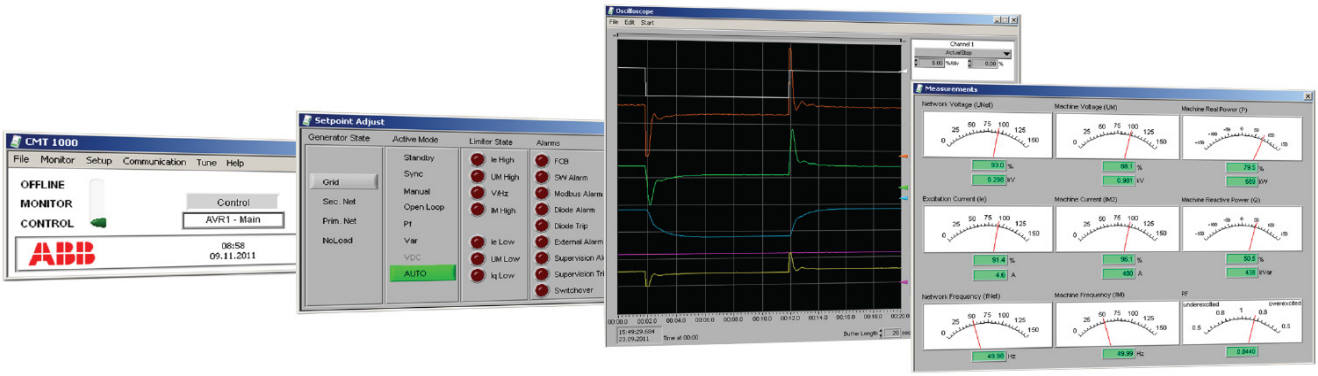
Software packages for UNITROL 1010/1020

	Software function	UNITROL 1010			UNITROL 1020			
		LIGHT	BASIC	BASIC+ SYNCHRONIZATION	BASIC	BASIC+ SYNCHRONIZATION	FULL	FULL+ PSS
	AVR/FCR/PF/VAR	•	•	•	•	•	•	•
	Limiters	•	•	•	•	•	•	•
Light	Voltage matching	•	•	•	•	•	•	•
	Modbus TCP		•	•	•	•	•	•
	Rotating diode monitoring		•	•	•	•	•	•
Basic	VDC mode		•	•	•	•	•	•
(Configurable SW)	Dual channel / monitoring		•	•	•	•	•	•
	Synchronization						•	•
	Event logger						•	•
Full	Data logger			•			•	•
(Configurable SW)	Real-time clock					•	•	•
Option	Power system stabilizer							•



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Commissioning and maintenance tool CMT1000

Full

In addition to all of the functionality of the BASIC version, the FULL version covers the following:

- Synchronization: Fast and reliable built-in synchronizer.
- Event logger: Up to 500 events are stored in a non-volatile memory.
- Data logger: A data log of 12 signals can be saved automatically in the non-volatile memory.
- Real-time clock: For accurate time stamped events and data logs.

Power System Stabilizer (PSS)

The FULL software version can be complemented with the power system stabilizer function. Compliant with standard IEEE 421.5-2005 2A / 2B, the PSS improves the stability of the generator across the highest possible operation range.

Commissioning and maintenance tool CMT1000

CMT1000 is a commissioning and maintenance tool for the UNITROL 1000 product family. This tool is used to setup all parameters and tune the PID, in order to guarantee stable operation. The CMT1000 software enables the system's extensive supervision, which helps the user to identify and locate problems during on-site commissioning.

The CMT1000 is connected to the UNITROL 1000 via a USB or Ethernet port, whose Ethernet connection allows remote access from over 100 meters.

Savings and payback time

UNITROL 1000 products are designed for compliance with worldwide grid codes, guaranteeing reliable control of the machine, even during heavy failure conditions on the network. In addition, UNITROL 1000 products set an easy-operation benchmark for automatic voltage regulators. PC-based commissioning, using the SW CMT1000, enables the customer to shorten commissioning times and focus on rapid troubleshooting.


N07FC
305MT
N07FS
370MT