

UNITROL® 1000

Compact Automatic Voltage Regulator for
small synchronous machines

UNITROL® 1000-7



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ABB

Applications of UNITROL® 1000-7

UNITROL 1000-7 is the latest and most compact member in the UNITROL 1000 Family of Automatic Voltage Regulators. Its smart mechanical design together with modern digital signal processing technology guarantees excellent performance also under harsh environmental conditions. The unit complies with relevant EN, ANSI, UL and CSA norms.

Superior reliability

UNITROL 1000-7 consists of a single printed circuit board equipped with all elements of the control as well as the power electronics. This board is attached to an effective heat sink which cools the power components. The surface of the board is casted in polyurethane, which makes the mechanical structure extremely robust and resistant to mechanical stress and dusty environments. This design guarantees excellent performance and reliability at reasonable prices.



UNITROL 1000-7 for field current up to 7 A in 70° C ambient temperature



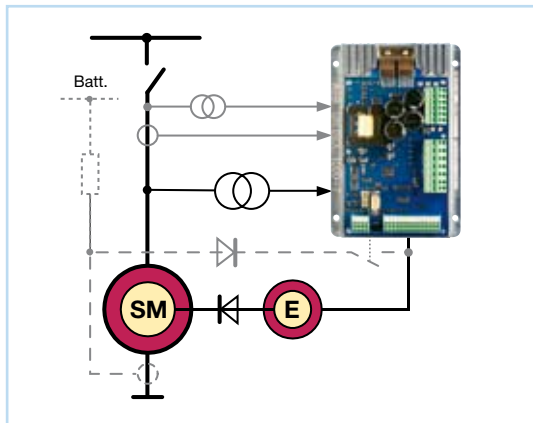
Powerful DSP ensures fast and precise voltage control

Adaptation to customer needs

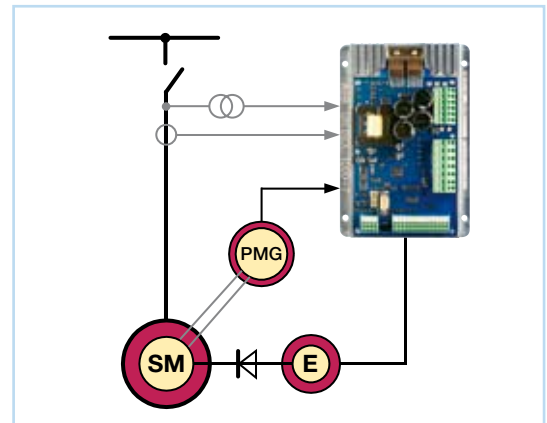
The powerful signal processor has significant spare capacity to handle additional functionality required by a machine manufacturer. Even small hardware changes can be considered.

Applications

UNITROL 1000-7 can be used in a vast variety of applications. It can be supplied from an AC or DC power source. Two typical applications are illustrated here.



Shunt excitation with optional short circuit support



Generator excitation with Permanent Magnet Generator (PMG) supply

Easy commissioning with CMT 1000

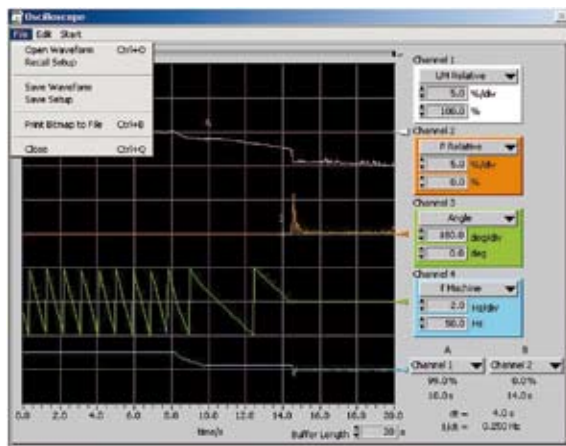
CMT 1000 is a user-friendly Commissioning and Maintenance Tool for the UNITROL 1000 Family.

Easy to operate

The most important status information is available on the board. To get detailed information, a laptop with the CMT 1000 tool installed needs to be connected.



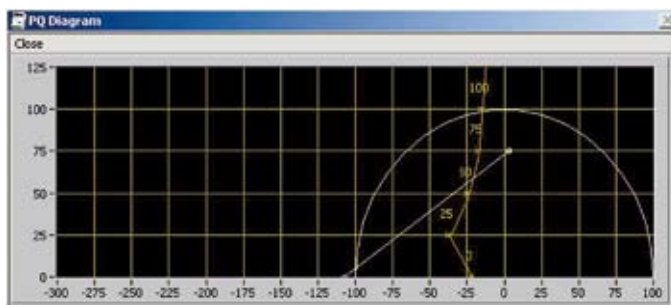
LEDs on the board



Screenshot of CMT 1000 Oscilloscope

CMT 1000 Oscilloscope

- Four signals can be selected for graphic display
- The resolution of the oscilloscope is 50 ms, and a total of 20 channels are recorded
- Parameter files and graphs can be saved in numerical form for later analysis



The power chart shows the actual operating point and the setting curves of the P/Q limiter

Simple tuning

All the parameter settings for the UNITROL 1000 Family can be performed using CMT 1000, Commissioning and Maintenance Tool, for Microsoft® Windows™.

It is easy to see how the changing of a parameter affects the overall behavior of the regulator by referring to the power chart and oscilloscope function. This means that the optimum settings are found within a short time. A program for tuning aid is provided.

Typically, the UNITROL 1000-7 is preset during machine testing and the site personnel only need to verify the correct operation.

Direction	Digital Input/Output	Polarity
D001 In	Excitation ON	Normal
D002 In	Gen CB Closed Status	Normal
D003 Out	Limit Active	Normal
D004 Out	SW Alarm	Inverted
D05	Remote SP Enable	Normal
D06	PF Enable	Normal
D07	Var Enable	Normal
D08	Manual Enable	Normal
D09 from +AI	None	Normal
D10 from -AI	Reset Setpoint	Normal
D11 from +AI	None	Normal
D12 from -AI	None	Normal
D13 from +AI	Increase	Normal
D14 from -AI	Decrease	Normal

High Level: 10.0 V
Low Level: 4.0 V

The digital inputs and outputs can be configured according to requirements

Technical Data of UNITROL® 1000-7

Power electronics supply

AC input voltage 3-ph min/max	9 to 250 V _{AC}
AC input voltage 1-ph min/max	30 to 250 V _{AC}
DC input voltage min/max	16 to 300 V _{DC}
Frequency range 3-ph	up to 600 Hz
Frequency range 1-ph	40 to 600 Hz
Test voltage	2 kV

Measurement inputs

Generator voltage 3-ph	max. 500 V
Generator current 1-ph	1 A and 5 A
Network voltage 1-ph	max. 500 V
Frequency range	10 to 100 Hz

Excitation output at 70 °C ambient temperature

Continuous output current	7 A _{DC}
Overload (10 s maximum)	14 A _{DC}
Overload (4 min maximum)	9 A _{DC}

Internal voltage source

Auxiliary voltage source	24 V _{DC}
Maximum output current	300 mA

Analog inputs/outputs

Voltage range	± 10 V
Impedance	300 kOhm
Reference source for external potentiometer	± 10 V

Serial interface

For PC connection	RS 232
For paralleling of several devices	RS 485 (optional)
For local extension devices	CAN bus (optional)

Accuracy

Voltage regulation	< 0.2 %
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Ambient values

Operating temperature range	- 40 to + 70 °C
Storage temperature range	- 40 to + 85 °C
Vibration	IEC 60068-2-6 Class 2
Shock and bump	IEC 60255-21-2 Class 2
Seismic	IEC 60255-21-3 Class 2

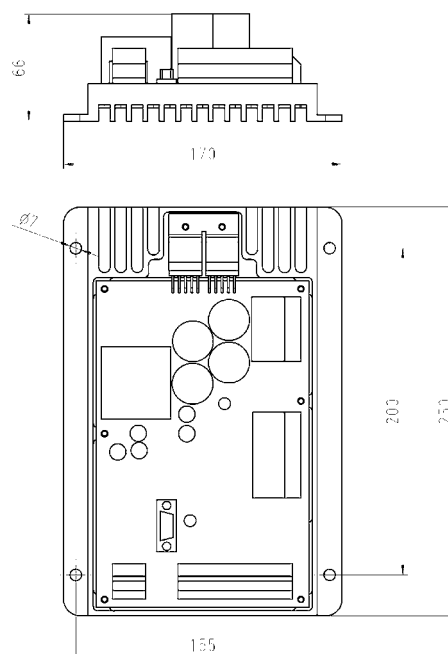
EMC withstand

Immunity	EN 61000-6-2
Emission	EN 61000-6-4
UL Certification (pending)	UL 508

Mechanical data

Weight	1.7 kg
Protection class	open frame

Dimensions (in mm)



Learn to operate UNITROL® 1000 via E-Learning !

The interactive training program provides a comprehensive guide to installation and operation of the UNITROL 1000 voltage regulator.

More information about this program can be found on our Website www.abb.com/unitrol in the product's "Downloads" section.

Please use the "Contact us" section to order the UNITROL 1000 E-Learning program on CD.

Products of the UNITROL® 1000 Family

UNITROL® 1000 Family is a series of digital Automatic Voltage Regulators. A modern controller design together with IGBT chopper power stage enables them to be used in a large variety of applications.



UNITROL 1000-7

UNITROL 1000-7 is an AVR for maximum 7 A continuous field current. It is targeted at synchronous machine manufacturers and system integrators who look for a straight-forward and cost-effective solution.

UNITROL 1000-15

UNITROL 1000-15 is an AVR with field current up to 15 A. A local operation panel serves for easy monitoring and parameter settings. This compact and easily operated unit covers a wide range of applications.

UNITROL 1000-PM40

UNITROL 1000-PM40 is the power module extending the output current of the UNITROL 1000-15 up to 40 A. A CAN bus interface between the two units is used for this plug&play combination, **UNITROL 1000-40**.

ABB Switzerland Ltd in Turgi, Switzerland, is the worldwide Center of Excellence for Excitation and Synchronizing Systems



ABB Switzerland Ltd
Static Excitation Systems, Voltage Regulators
and Synchronizing Equipment
CH-5300 Turgi / Switzerland
Telephone: +41 (0)58 589 24 86
Fax: +41 (0) 58 589 23 33
Email: pes@ch.abb.com
Internet: www.abb.com/unitrol