

PHOENIX

HIGH FREQUENCY CONTROL UNIT FOR SEPARATELY EXCITED MOTORS

OPEN SYSTEM

The new line of control units manufactured by ELEKTROSISTEM has been designed according to recent developments, that have led to the application of the microprocessor in every sector of the electronics. The new control unit is not only a microprocessor aided chopper, but a real control equipment representing the new generation of DC control systems.

The basic principle of this unit is to be found in the so-called "OPEN SYSTEM", that is a system with a variable configuration composed of 1 up to 3 elements:

- Traction controller type PHOENIX T
- Pump controller type IMC P
- Graphic display type IGS

Each element can be connected with the other components of the "chain" through a double-wire serial line, to allow an interchange of data and functioning synchronism. These units have been devised and configured to interact among them to create an "open system", but at the same time are independent and can work even if not connected to the other elements of the new intelligent line created by ELEKTROSISTEM.

VERSATILITY

The most important advantage coming from the use of a microprocessor aided logic is the possibility to control on the same HARDWARE different functions that can be rapidly adjusted for special applications.

The potentiometer has a value included between 1 and 10 Kohm. The potentiometer adjustment is "read" and permanently recorded by the logic microprocessor. This avoids long and complicated setting operations and those problems concerned with non-perfectly centered potentiometers.

Moreover, the phoenix control unit is able to control the motor speed through a pulses rev. transducer.

SAFETY AND RELIABILITY

The phoenix control unit has been specially designed by ELEKTROSISTEM's electronic engineers to offer the operator safety working conditions and to avoid the immediate stop of the vehicle in case of temporary anomaly. This has so far represented quite a hindrance, inducing the operator to prefer a "stupid system".

The logic constantly checks the internal power section and external actuators. In this way the chopper running is stopped only in case of events that may be dangerous for the operator's safety (i.e. MOSFET short circuit, control potentiometer blocked at max. value, etc.), while in case of "not serious" anomalies the logic signals the irregularity on the IGS display or by means of an intermittent led.

Many other inputs are available for further safety signals, including:

- operator presence on the vehicle
- speed reduction (ex. to slow down running with forks up)
- hand brake.

The safety system is moreover integrated with a series of protections:

- proportional control of the max. current when the heatsink reaches 70°C
- protection against short circuit of contactor drivers
- protections against motor overload
- protection against polarity inversion by means of an external contactor.

SIMPLE FUNCTIONING

The Phoenix control unit has been devised to completely interact with the graphic display IGS to offer the operator a complete understanding of the system functioning. Processes, numerical data and possible anomalies are visualised and explained through the IGS display, which combines three important elements:

- simple functioning (no numerical codes to understand how the system operates)
- exhaustive information (in the desired language)
- synthesis.

TECHNOLOGY

The Phoenix control unit has been designed and built with high technology components, such as high voltage and high current MOSFETs, high frequency switching diodes able to stand 100% overloads, filter capacitors for high current and temperature. All components are assembled inside a strong specially shaped aluminium case allowing a rapid heat disposal.

Every single electronic component is automatically tested by a computer aided device (Automatic Test Equipment) to check the quality of the finished product before the power test.

SPECIFICATIONS AND ADVANTAGES

The high frequency control guarantees higher performances both for the unit and for the battery that operate with continuous and not pulse currents with smaller losses for Joule effect.

The full bridge control of the motor field allows reversing without the use of direction contactors.

The main contactor guarantees the insulation of the control unit from the battery during emergency situations or when the key is disabled.

Recovery braking enables a high braking couple with limited armature currents reducing brush wear and motor heating.

APPLICATION

The Phoenix control units have been designed for the drive of separately excited motors and are divided into Phoenix T60 suitable for motors from 4.8 Kw to 16 Kw and Phoenix T80 suitable for motors from 12 Kw to 25 Kw for 24-80 V, and Phoenix T61 suitable for motors up to 19.2 Kw and Phoenix T81 suitable for motors up to 25.6 Kw for 96 V.

GENERAL FEATURES

- Parameters adjustment by programming terminal.
- Safety code to enter adjusting functions.
- Possibility to program more units with the same adjusting parameters.
- Hour meter and battery charge control inside the logic or synchronized with the IGS display (if present).
- Automatic recording of working hours and conditions of the vehicle in case of breakdowns, for a simple anomaly diagnosis.
- Malfunctioning file.
- Real time control unit monitoring (only with IGS display).
- Possibility to drive the vehicle by means of remote controls.
- Control of 2 contactors with programmable functions:
 - Main Contactor
 - Contactor for power steering motor.
- Electrically insulated case.
- Retroaction of the motor speed by means of a proximity sensor.

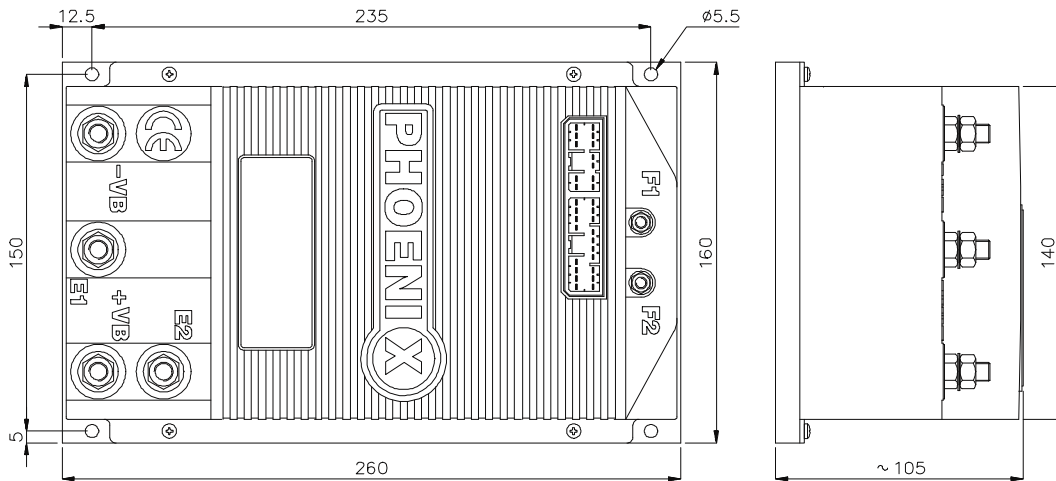
TECHNICAL SPECIFICATIONS

Rated current	600A - 800A
Multivoltage	24 / 80V or 96V (-33% +20%)
Operation frequency	15800 Hz
Max. ambient temperature	-20 +40°C
Relative humidity at 25°C	90%
Proportional action thermal limiter	from 70 to 75 °C
Weight	4.5 Kg (Phoenix T60/T61) - 6 Kg (Phoenix T80/T81)

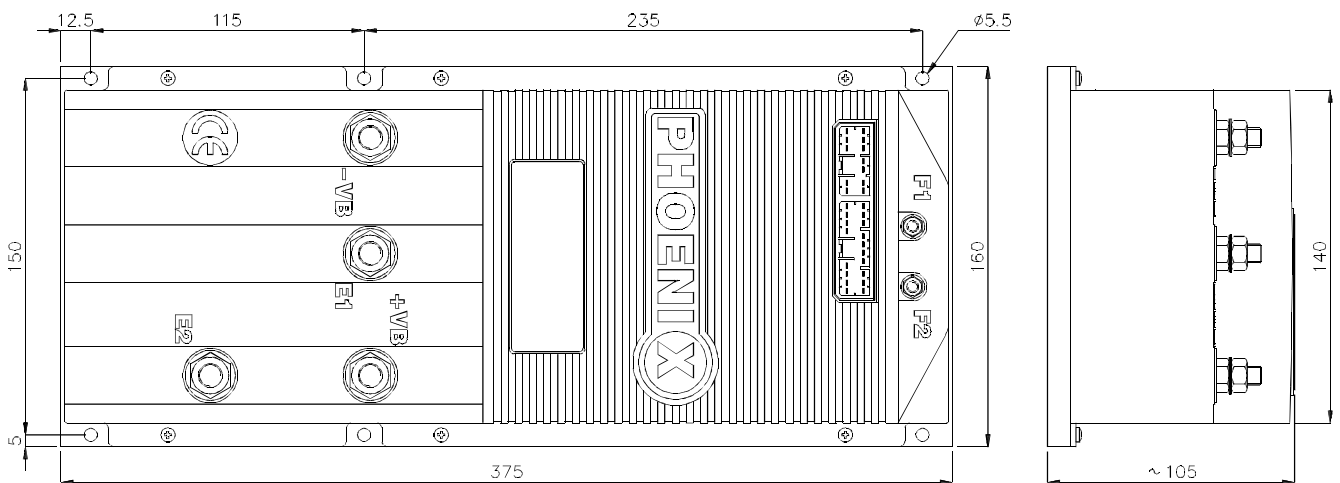
MODELS AND MECHANICAL CLERANCE

Model	Size	Operation Voltage	Starting Current	Current supplied for 1 minute	Current for 1 hour	Max. Field Current
Phoenix T60	600A	24-80V	600A	600A	200A	60A
Phoenix T61	600A	96V	600A	600A	200A	60A
Phoenix T80	800A	24-80V	800A	800A	350A	80A
Phoenix T81	800A	96V	800A	800A	350A	80A

PHOENIX T60/T61



PHOENIX T80/T81



N.B. All models meet EC requirements.
 Specifications subject to change without notice.

