

3 Description

3.1 Applications

The main application of the SIMOREG CM converter is conversion and modernization of DC drives in existing installations.

In DC technology, many installations exist that are older than 5 - 10 years and still use analog technology.

When these installations are converted or upgraded, the motor, mechanical and power sections are left in the installation and the trigger and control section replaced by a 6RA70 control module. The result is a modern DC drive at an extremely low price, with the full functional scope of the tried and tested fully digital devices of the SIMOREG DC MASTER 6RA70 range.

The configuration of the existing components is adapted by simple parameterization.

The 6RA70 control module contains a power section for the field supply with a rated current of up to 40A.

3.2 Design

The 6RA70 control module is characterized by its compact, space-saving construction. Their compact design makes them particularly easy to service and maintain since individual components are readily accessible. The electronics box contains the basic electronic circuitry as well as any supplementary boards.

In order to make optimum use of the mounting possibilities of the installation, the 6RA70 control module can be divided along its depth. In addition, the PCBs for the firing pulse generation and distribution and for safety monitoring and voltage acquisition have been designed in such a way that they can be divided and either partially or completely mounted outside the converter directly on the power section and connected with the basic unit via cable.

All 6RA70 control modules are equipped with a PMU simple operator panel mounted in the converter door. The panel consists of a five-digit, seven-segment display, three LEDs as status indicators and three parameterization keys. The PMU also features connector X300 with a USS interface in accordance with the RS232 or RS485 standard.

The panel provides all the facilities for making adjustments or settings and displaying measured values required to start up the converter.

The OP1S optional converter operator panel can be mounted either in the converter door or externally, e.g. in the cubicle door. For this purpose, it can be connected up by means of a 5 m long cable. Cables of up to 200 m in length can be used if a separate 5 V supply is available. The OP1S is connected to the SIMOREG CM via connector X300.

The OP1S can be installed as an economic alternative to control cubicle measuring instruments which display physical measured quantities.

The OP1S features an LCD with 4 x 16 characters for displaying parameter names in plaintext.

German, English, French, Spanish and Italian can be selected as the display languages.

The OP1S can store parameter sets for easy downloading to other devices.

The converter can also be parameterized on a standard PC with appropriate software connected to the serial interface on the basic unit. This PC interface is used during start-up, for maintenance during shutdown and for diagnosis in operation. Furthermore, converter software upgrades can be loaded via this interface for storage in a Flash memory.

The field is supplied by a B2HZ single-phase single pair controllable two-pulse bridge connection. The power section for the field is constructed using isolated thyristor modules, the heat sink is therefore electrically isolated.

3.3 Mode of operation

All open-loop and closed-loop drive control and communication functions are performed by two powerful microprocessors. Drive control functions are implemented in the software as program modules which can be "wired up" by parameters.

3.4 Technical data

Measurable rated supply voltage armature	V	85V / 250V / 575V / 1000V
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); $I_N=1A$ or 1AC 190 (– 25%) to 230 (+15%); $I_N=2A$ (– 35% for 1min)
Rated supply voltage field ¹⁾	V	2AC 400 (+15% / – 20%) 2AC 460 (+10%)
Rated frequency	Hz	Converters self-adapt to the frequency of the available supply voltage in the range from 45 to 65 Hz
Rated DC voltage field ¹⁾	V	max. 325 / 373
Rated DC current field	A	40
Operational ambient temperature	°C	0 - +60
Storage and transport temperature	°C	– 25 to +70
Control stability		$\Delta n = 0.006\%$ of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint $\Delta n = 0.1\%$ of the rated motor speed, valid for analog tachometer or analog setpoint ⁵⁾
Environmental class DIN IEC 721-3-3		3K3
Degree of protection DIN 40050 IEC 144		IP00
Dimensions		Refer to dimensional drawings in Section 5
Weights (approx.)	kg	15

- 1) The field supply voltage can be lower than the rated field voltage (setting in parameter P078, input voltages of up to 85V are permissible). The output voltage is reduced accordingly.

The specified output DC voltage can be guaranteed up to an undervoltage corresponding to 5% of line voltage (rated supply voltage field).

- 2) Requirements:

The control stability (closed-loop PI control) is referred to the rated motor speed and applies when the SIMOREG converter is warm. The following conditions are applicable:

- Temperature changes of ± 10 °K
- Line voltage changes corresponding to +10% / – 5% of the rated input voltage
- Temperature coefficient of temperature-compensated tachogenerators 0.15% per 10 °K (applies only to analog tachogenerator)
- Constant setpoint (14-bit resolution)

3.5 Applicable standards

VDE 0106 Part 100

Arrangement of operator control elements in the vicinity of components/parts at hazardous voltage levels.

VDE 0110 Part 1

Insulation coordination for electrical equipment in low-voltage installations.

Degree of pollution 2 for boards and power section.

Only non-conductive pollution may occur. Occasional conductivity due to moisture condensation must, however, be expected..

"Moisture condensation is excluded, as the components are only permitted for humidity class F."

EN60146 T1-1 / VDE 0558 T11

Semiconductor converters

General requirements and line-commuted converters

DIN EN50178 / VDE 0160

Regulations for equipping electrical power systems with electronic equipment.

EN61800-3

Speed-variable drives, Part 3, EMC product standard incl. Special test methods

DIN IEC 60068-2-6 acc. to severity grade 12 (SN29010 Part1)

Mechanical stressing

3.6 Abbreviations

CB Communications board

PKW Parameter ID value

PZD Process data

TB Technology board

ZSW Status word

