

Fancy a fast change?

The new generation of SIMOCODE pro.



sirius

MOTOR MANAGEMENT

SIEMENS

More compact, flexible and with a higher performance: **The new generation SIMOCODE pro**

SIMOCODE-DP has a successor! Our motor management system that

has been used for years in thousands of low-voltage switchboards

worldwide, has been completely innovated. Its name: SIMOCODE pro.

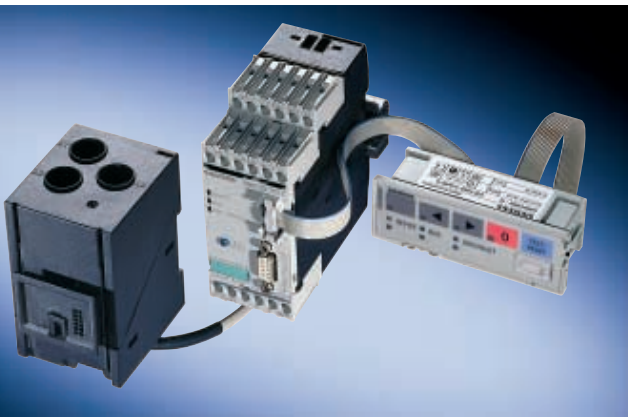
With SIMOCODE pro you have access to a new generation of

PROFIBUS DP-capable motor management systems that have many

convincing benefits.

The new SIMOCODE pro is more compact, is modular and can therefore be very flexibly and simply integrated into the overall plant or system. When all is said and done, with SIMOCODE pro, you save more space, more time and costs. However, the best is yet to come: You can immediately utilize the advantages of the new SIMOCODE pro. This is because SIMOCODE pro is compatible to its predecessor – SIMOCODE-DP – and can either be simply used in existing systems or can be used to replace existing devices. The new SIMOCODE pro motor management system is the further development of SIMOCODE-DP that has been improved at all levels by:

- Modular design
- Voltage, power and cos phi/power factor
- Temperature detection (Pt100/Pt1000)
- Graphic parameterization by dragging & dropping



Well-proven and new: SIMOCODE pro – an overview

Compatible to its predecessor

SIMOCODE pro not only saves time, money and space, but what is especially important, is the fact that it is compatible to its predecessor. This means that if you want to you can immediately change over to SIMOCODE pro – it's that simple. Complex and expensive hardware and software changes are just not necessary. Simply replace the old devices by the new ones.

Straightforward replacement:

- SIMOCODE pro can be directly incorporated in existing SIMOCODE-DP applications. Thanks to an integrated compatibility mode, data is exchanged along PROFIBUS just like SIMOCODE-DP. Changes to the automation system are not required.
- The function of the device in the motor feeder hasn't changed – as SIMOCODE pro is based on SIMOCODE-DP.
- The "old" parameter files, generated with Win-SIMOCODE-DP can be used! A free-of-charge tool in form of a Wizard (Win-SIMOCODE-DP converter*) converts these files and provides valuable support when generating parameter files for the new SIMOCODE ES parameterizing software. And not only this, the Win-SIMOCODE-DP converter provides helpful information and instructions when selecting devices.

Two series of devices:

SIMOCODE pro C and pro V

The SIMOCODE pro system has two series of devices:

SIMOCODE pro C – a compact solution and SIMOCODE pro V – the series of devices that can be flexibly expanded. And SIMOCODE pro V is especially versatile. Depending on the requirement, its functionality can be simply extended, e.g.:

- The number and type of the digital inputs and outputs can be increased step-by-step and adapted.
- A current/voltage measuring module can be used to additionally detect the voltage and to monitor power-dependent measured quantities.
- Several analog temperature sensors can be evaluated using a temperature module.
- In addition, an earth fault detection can be integrated in conjunction with a summation current transformer.
- An analog module extends the system by an additional analog input and output.

This means that you are fully equipped for each and every application!

Infinite innovations ...

Whether motor protection, motor control, diagnostics or communication – our new SIMOCODE pro solves every task.

With convincing new features:

- 45 mm wide
- Removable current transformer
- Voltage, power and $\cos \phi$ *
- Temperature detection (Pt100/Pt1000)*
- Analog input and output (0/4–20 mA)*
- Graphic parameterizing interface*
- Overlapping current range from 0.3 A
- Voltage detection up to 690 V*
- Memory module to parameterize the device without a PC/PG
- Addressing plug to assign the PROFIBUS address
- Automatic baud rate detection, 12 Mbps
- All of the phase currents can be evaluated
- New control functions
- 110–240 V AC/DC wide-voltage range
- Measuring curves can be recorded*
- ... and much, much more!

* From the middle of 2005

Clever and reliable: The system

Just like SIMOCODE-DP, SIMOCODE pro is a flexible, modular motor management system for low-voltage, constant-speed motors. It optimizes the connection between the master control system and motor feeder, increases the plant and system availability and at the same time provides significant cost savings when it comes to planning, commissioning, operating and when servicing a plant or system. SIMOCODE pro is installed in the low-voltage switchboard and is the intelligent connection between a higher-level automation system and the motor feeder. It is now even more compact and combines the following functions:

- Multifunctional, electronic motor protection, independent of the automation system
- Integrated control programmes instead of extensive hardware wiring
- Detailed operating, service and diagnostics data
- Open communication via PROFIBUS DP – the standard of fieldbus systems

Put briefly: Not only are all of the functions provided that are required for a motor feeder, but also a lot more – certainly more than could be implemented conventionally.



SIMOCODE pro can now be even more precisely adapted to the specific requirements of each and every motor feeder – thanks to the fact that it has been subdivided into two series of devices with graduated functionality:

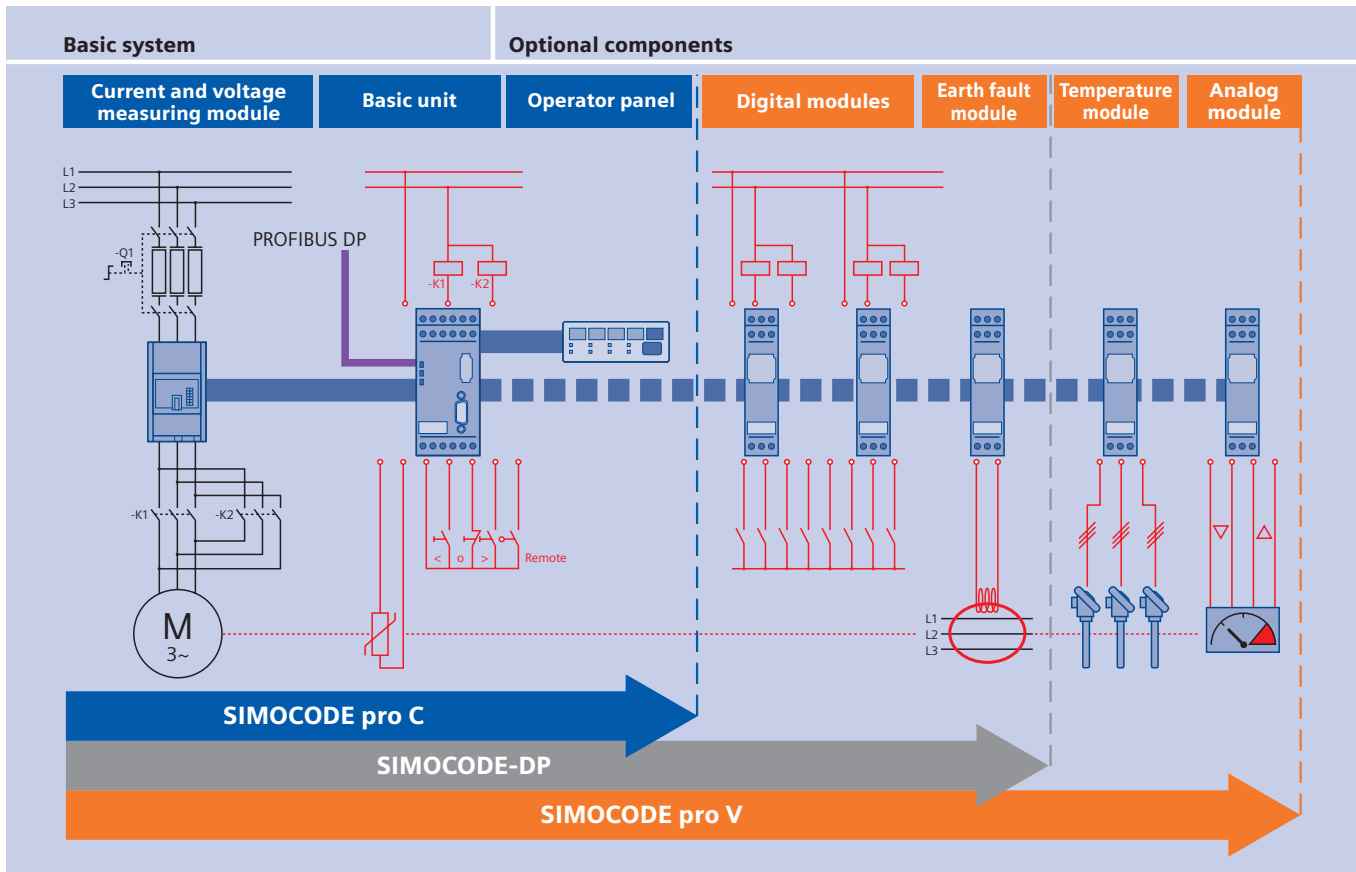
- **SIMOCODE pro C** – the compact motor management system for direct and reversing starters
- **SIMOCODE pro V** – the variable motor management system that, in addition to all of the SIMOCODE pro C functions, also includes many other functions. And not only this, new functions can be added using expansion modules.

The significantly smaller dimensions and the modular design – e.g. the current measurement that is separate from the basic unit – free up even more space and allow a more flexible installation. This is especially advantageous when these devices are used in motor control centers in the process industry.

Especially important: The system has been designed for mixed operation. This means that both series of devices can be combined in the same switchboard – depending on the functional requirement and that without any additional costs.

In addition to the higher degree of functionality and flexibility, it goes without saying that the certifications and approvals, required for use in the process industry are decisive. The approvals that SIMOCODE-DP has are also planned in the appropriate form for the new SIMOCODE pro system.

Flexible and simple: The design



For each feeder, every system always comprises a basic unit and a separate current measuring module. Both of these modules are electrically connected using a cable and, just like for SIMOCODE-DP, can either be mounted, mechanically coupled as a single unit (behind one another) or separately (next to one another). The same version of the basic unit is always used because the basic unit and current measuring module are separate devices.

The motor current to be monitored only influences the selection of the associated current measuring module. This restricts the number of different device versions. As an option, an operator panel that is mounted in the cabinet door can be connected to the basic unit. The basic unit supplies the current measuring module and the operator panel. Additional wiring is not required.

Contrary to the basic unit of SIMOCODE pro C, various optional expansion modules can be used to supplement the SIMOCODE pro V basic unit. These include, for example, additional inputs/outputs and functions.

This means that it is possible to use special functions – e.g. the earth fault monitoring with a summation current transformer – precisely there where they are required.

Modular and versatile: The components

What do the modules look like in detail – just what are the new developments?

Basic units



The basic units are used for both series of devices. One of the essential new features is the fact that the width has almost been halved with respect to the previous unit and is now only 45 mm wide. This of course saves a lot of space. The new wide-voltage range (110–240 V AC/DC) for the power supply voltage provides a higher degree of flexibility in addressing applications.

The integrated thermistor connection was consequentially kept. This means that additional evaluation units are not required. The features already known from SIMOCODE-DP – such as the four digital inputs with internal 24 V DC supply, the three monostable relay outputs and the PROFIBUS DP connections are also included in both basic units.

Current ranges of the current measuring modules

The current measuring function is now separate from the basic unit, which means that the device can be far more flexibly integrated into the motor feeder. The main circuit can be easily located somewhat distant from the control circuit by using a connecting cable up to 2 m long. This means that SIMOCODE pro can also be used when space is very restricted.

What is especially new and interesting are the wider current ranges from 0.3 A that now have a far greater overlap. Now, there is also a new option for the basic unit for SIMOCODE pro V – instead of the current measuring modules, the new current/voltage measuring modules¹⁾ can be used. This means that additional voltages up to 690 V can be detected in the main circuit and, for example, power-related measured quantities can be monitored.

45 mm	55 mm	120 mm	145 mm
			
0.3–3 A; 2.4–25 A	10–100 A	20–200 A	63–630 A
Straight-through transformer			Busbar connection

Matching 3UF18 intermediate transformers for the current measuring module are available to detect and monitor motor currents of between 630 A and 820 A.

1) From the middle of 2005, for the SIMOCODE pro V basic unit

Controlling the motor feeder at the cabinet: The operator panel makes it all possible



Half the time – the same width ... but far more efficient:

With dimensions of only 36 x 96 mm, the new operator panel can replace five conventional push buttons and ten indicator lights. It now has four freely assignable push buttons and seven LEDs that can be freely used. This means that the new operator panel is now packed with even more functions and at the same time saves up to 50 % space with respect to its predecessor.

Additional digital I/Os or bistable relay outputs¹⁾



1) For the SIMOCODE pro V basic unit

2) From the middle of 2005, for the SIMOCODE pro V basic unit

Just the same as for SIMOCODE-DP, additional digital inputs or relay outputs can be added when required to the SIMOCODE pro V basic unit. These can then be assigned to any function in the system. Contrary to SIMOCODE-DP, this can now be realized in two stages using up to two 22.5-mm wide digital modules.

Put another way: With SIMOCODE pro, only 50 % of the space is required when completely replacing a SIMOCODE-DP expansion module! Further, the versions listed below, can be flexibly combined and used with the same basic unit:

- Digital module: digital inputs, externally supplied with **24 V DC** and two **monostable** relay outputs
- Digital module: digital inputs, externally supplied with **110–240 V AC/DC** and two **monostable** relay outputs
- Digital module: digital inputs, externally supplied with **24 V DC** and two **bistable** relay outputs
- Digital module: digital inputs, externally supplied with **110–240 V AC/DC** and two **bistable** relay outputs

Earth fault monitoring with summation current transformer²⁾

With SIMOCODE-DP, users previously had to decide between a thermistor connection and an external earth fault monitoring – this is now a thing of the past. When required, both are possible in the same load feeder using just one system. An earth fault module can be attached to the SIMOCODE pro V basic unit. Using a sum-

mation current transformer, it is possible to configure a more accurate external earth fault monitoring circuit.

The advantage: A summation current transformer used with SIMOCODE-DP can remain in the main circuit and can still be operated with SIMOCODE pro.

Analog temperature detection and monitoring²⁾

In addition to temperature monitoring using PTC thermistors, motors are often monitored using analog temperature sensors. Using the new temperature module, up to three analog temperature sensors – e.g. Pt100/Pt1000 – can now be connected to the SIMOCODE pro V system in parallel to a thermistor motor protection circuit. SIMOCODE pro V detects and monitors the actual motor temperature and provides the appropriate signals to the automation system.

Expanded by one analog input and output (0/4–20 mA)²⁾

Do additional levels, flow rates or positions have to be detected and monitored? Then SIMOCODE pro has the matching expansion module.

The analog module allows detecting, monitoring and the output of a 0/4–20 mA signal that can be freely accessed by the automation system via PROFIBUS DP.

Comprehensive and orientated to what is required in the field: **The functions**

All of the SIMOCODE-DP functions have been included and made even more flexible – in addition, new functions have also been integrated:

- Almost all of the well-proven protective functions have now been configured so that they are multistage and can be delayed.
- Further, new monitoring functions have been added
- The control functions have been supplemented by new control functions and are as a whole more flexible.
- The freely useable logic modules and standard functions have been expanded, revised and optimized.

Protective functions

- Overload protection (Class 5–40)
- Thermistor motor protection
- Phase failure monitoring
- Unbalance protection
- Stall protection
- Earth fault monitoring
- Current limit monitoring
- Operating hours monitoring **NEW!**
- Motor stop time monitoring **NEW!**
- Number-of-starts monitoring **NEW!**

etc.

Expanded monitoring functions:

- Temperature monitoring Pt100/Pt1000 ²⁾ **NEW!**
- Voltage monitoring ²⁾ **NEW!**
- Power monitoring ²⁾ **NEW!**
- COS-phi monitoring ²⁾ **NEW!**
- Phase sequence detection ²⁾ **NEW!**
- Input, output and monitoring 0/4–20 mA signal ²⁾ **NEW!**

Recording of measured curves ²⁾ **NEW!**

- Logic blocks (truth tables, counters, timers, edge evaluation functions, limit monitors ...)
- Standard functions (power failure monitoring, emergency start, external faults ...)

Control functions

- Direct online starter
- Reversing starter
- Star-delta starter ¹⁾
- Star-delta starter with reversal of rotational direction ¹⁾ **NEW!**
- Two speeds, motors with separate windings (pole changeover switch), also with reversal of rotational direction ¹⁾ **NEW!**
- Two speeds, motor with separate Dahlander windings, also with reversal of rotational direction ¹⁾ **NEW!**
- Solenoid valve actuation ¹⁾
- Positioner actuation ¹⁾
- Soft starter actuation ¹⁾
- Soft starter actuation with reversal of rotational direction ¹⁾ **NEW!**

1) For the SIMOCODE pro V basic unit

2) From the middle of 2005, for the SIMOCODE pro V basic unit

The significantly higher quantity of operating and diagnostics data makes your motor feeder now even more transparent.

The new integrated function relevant for maintenance and service data support service and maintenance personnel. Comments can be saved in the device and can be accessed by the automation system.

Operating data

- Motor switching state (on, off, ccw, cw, slow, fast)
 - Currents in phase 1, 2, 3 and maximum current **NEW!**
 - Voltages in phase 1, 2, 3 ²⁾ **NEW!**
 - Active power **NEW!**
 - Apparent power **NEW!**
 - Power factor **NEW!**
 - Phase unbalance
 - Phase sequence ²⁾ **NEW!**
 - Time to trip **NEW!**
 - Temperature rise, motor model **NEW!**
 - Remaining cooling time of the motor
 - Temperature (e.g. motor temperature) ²⁾ **NEW!**
 - Actual value, analog signal ²⁾ **NEW!**
- etc.

Communications

- 12 Mbps, automatic baud rate detection **NEW!**
- Time synchronization ²⁾ **NEW!**
- Cyclic and acyclic services

Service data

- Motor operating hours
 - Motor stop times **NEW!**
 - Number of motor starts
 - Number of overload trips
 - Internal comments saved in the device **NEW!**
 - Device operating hours **NEW!**
- etc.

Diagnostics data

- Numerous detailed early-warning and fault messages, also for further processing in the device or in the master control system
 - Internal device fault logging with time stamp **NEW!**
 - Any selectable status, alarm and fault message can be provided with a time stamp ²⁾ **NEW!**
 - Value of the last tripping current
 - Checkback faults (e.g. no current flowing in the main circuit after an On control command)
- etc.



Everything easy: Commissioning

The SIMOCODE pro system has, in addition to many powerful components, naturally the matching software. The system can be optimally used when these ergonomically designed tools are utilized!

Parameterization and diagnostics with SIMOCODE ES

SIMOCODE ES is the new parameterizing software for SIMOCODE pro – running on a PC/PG under Windows 2000 or Windows XP. With SIMOCODE ES, the SIMOCODE pro motor management system offers a user-friendly and transparent operator interface.

SIMOCODE pro can be parameterized, handled, visualized and tested in an extremely user-friendly fashion using this man-machine interface – either in the field or from a central location. Thanks to the fact that all of the operating, service and diagnostics data are displayed, SIMOCODE ES provides informative data for maintenance, as well as for service and much, much more. If a fault does occur, disturbances can be quickly localized and removed.

The two versions:

- **SIMOCODE ES Smart:** To establish a direct link to SIMOCODE pro via the system interface at the unit – point-to-point – using the new PC cable
- **SIMOCODE ES Professional:** To connect to one or several units via PROFIBUS DP – or point-to-point via the system interface

Note: SIMOCODE-DP cannot be parameterized using SIMOCODE ES.

* From the middle of 2005

Simply re-use "old" parameters

When a SIMOCODE-DP is being replaced by a SIMOCODE pro then the Win-SIMOCODE-DP converter* helps to convert the original parameter files into SIMOCODE ES parameter files. Further, the tool provides useful information and instructions regarding the necessary and modified hardware. This means that the parameter files do not have to be re-generated.

SIMOCODE ES Graphic*

The optional SIMOCODE ES software package allows an extremely ergonomic and user-friendly parameterization using drag and drop. Inputs and outputs of the function blocks can be graphically inter-linked and parameters can be set. The configured functions can be described in more detail and the unit parameterization graphically documented using comments. This clearly speeds up the commissioning phase and simplifies the documentation.

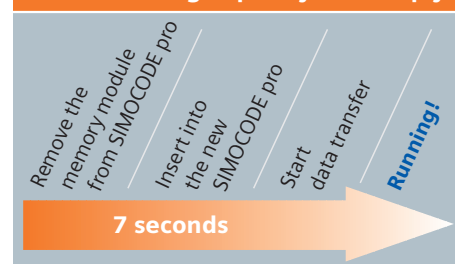
Memory module for parameterization without PC/PG



Do you want to commission a new SIMOCODE pro without PC/PG?

The availability of motors and therefore the availability of the process itself is especially decisive when it comes to motor control centers used in the process industry. Often, even short downtimes represent high costs. Using the new memory module you can quickly parameterize SIMOCODE pro and that without any additional resources or equipment.

Parameterizing – quickly and simply



Addressing plug for the PROFIBUS address



Depending on the particular application, PROFIBUS slaves can be parameterized in a user-friendly fashion from a central location via PROFIBUS. In this case, a valid PROFIBUS address is required. Every basic unit can be assigned any PROFIBUS address using the new addressing plug – which means that it can be addressed via PROFIBUS DP. For example, using SIMOCODE ES Professional, several SIMOCODE pro units can be quite simply commissioned from a central location.

Simultaneous operation on the bus/replacing devices: **SIMOCODE-DP and SIMOCODE pro**

When expanding a plant or replacing a device, do you want to limit the necessary changes in the master control system to a minimum or even avoid them in the first place? SIMOCODE pro has a solution!

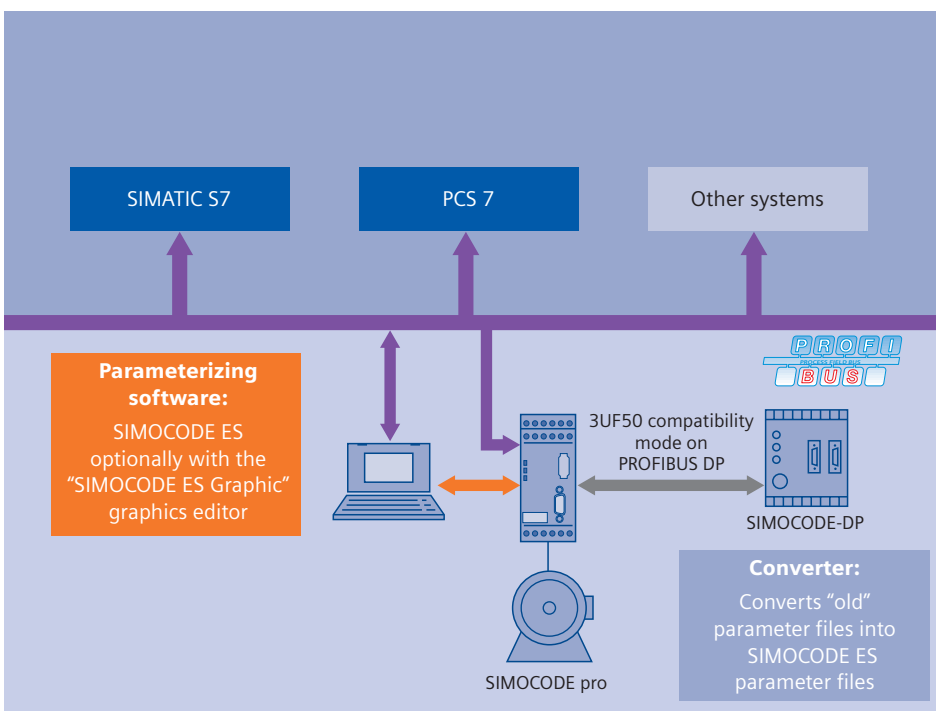
Integration into the automation system

Today, SIMOCODE-DP (3UF5) is used in many low-voltage systems. Frequently it is integrated into the higher-level automation system using GSD files or in a SIMATIC PCS 7 environment using the associated PCS 7 library (PCS 7 function block).

Especially in processes that must have a high degree of availability, when a device is replaced, this cannot automatically result in extensive configuring and engineering work in the automation system – and never to plant downtimes. This is the reason that a “3UF50 compatibility mode” has been integrated in the SIMOCODE pro V basic unit (3UF70). In this compatibility mode, communications between the automation system and SIMOCODE pro V remain unchanged as for SIMOCODE-DP. This means that the automation system is still supplied with the required data and that without any additional resources or equipment – although instead of SIMOCODE-DP, SIMOCODE pro V is being used in the field.

Parameterizing the devices

The SIMOCODE ES parameterizing software is always used to parameterize the unit and to select the compatibility mode. The parameterizing files of SIMOCODE-DP that frequently exist can be converted into SIMOCODE ES parameterizing files and used to parameterize the new devices. Advantage: The protection, monitoring and tripping behavior and characteristics at the motor practically don't change due to the functions that have been taken over from SIMOCODE-DP and the same parameterization. This means that in the field SIMOCODE pro behaves just like SIMOCODE-DP.



Which SIMOCODE pro components are required in order to functionally replace SIMOCODE-DP?

SIMOCODE-DP functions	SIMOCODE pro components										
Number of relay outputs used at the basic unit and, where relevant at the expansion block											
Is more than 3	BU2	DM									
Is more than 5 (for 8, an output must be removed)	BU2	DM	2 nd DM								
Digital inputs used at the expansion block											
Inputs 1–4 were used	BU2	DM									
Inputs 5–8 were used	BU2	DM	2 nd DM								
Number of bistable relay outputs used											
Less than or equal to 2	BU2	DM									
Are more than 2 (for more than 4, then outputs must be removed)	BU2	DM	2 nd DM								
Control function implemented with SIMOCODE-DP											
Is neither a pure overload function nor a direct or reversing starter	BU2										
Protective function realized with SIMOCODE-DP											
External earth fault detection with 3UL22	BU2			EM							
Thermistor motor protection using an analog sensor (e.g. KTY)	BU2				TM						
Logic blocks used in SIMOCODE-DP											
More than 2 signal adaptation blocks are used	BU2										
Truth table with 5 inputs/2 outputs	BU2										
SIMOCODE-DP motor current/maximum setting current I _e in the main circuit											
0.3 A to 3 A					IM (0.3–3 A)						
3 A to 25 A						IM (2.4–25 A)					
25 A to 100 A							IM (10–100 A)				
100 A to 200 A								IM (20–200 A)			
200 A to 630 A									IM (63–630 A)		
630 A to 820 A					IM (0.3–3 A)					3UF18 (intermediate converter)	
3UF52 operator panel											
Is used											OP

Comment:

- If you did not select the basic unit for SIMOCODE pro V, use the basic unit for SIMOCODE pro C with the associated current measuring module and if required, the operator panel.
- Select the digital module with the monostable or relay outputs corresponding to your particular application.
- An appropriate number of connecting cables must be taken into consideration.

CAUTION: This table is only used for orientation purposes and cannot take into account every configuration possible in a motor feeder.

We urgently recommend that the situation is precisely studied, e.g. by referring to the appropriate catalog.

Legend: BU2 = basic unit for SIMOCODE pro V; IM = Current measuring module; OP = Operator panel; DM = Digital module; EM = Earth fault module; TM = Temperature module

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