Table 2- 6 Article numbers for the Advanced Operator Panel AOP30

Article	Article number
Advanced Operator Panel AOP30	6SL3055-0AA00-4CA4
RS485 connecting cable for connecting the AOP30 to one CUD; 3 m	6RY1807-0AP00
RS485 connecting cable for connecting the AOP30 to two CUDs; 3 m	6RY1807-0AP10
Additional cable lengths can be ordered as option. When ordering the RS485 cable with option, the suffix "-Z" must be attached to the article number followed by the order code for the required option. Ordering example for a 35 m long cable: Article number: 6RY1807-0AP00-Z, order code: K35	
Cable length	**Order code**
5 m	K05
10 m	K10
15 m	K15
20 m	K20
25 m	K25
30 m	K30
35 m	K35
40 m	K40
45 m	K45
50 m	K50

2.5 Accessories

2.5.1 Mounting kit to increase the degree of protection to IP20

IP20 according to EN 60529

The degree of protection indicates protection against touching and penetration of solid objects and/or water.

Units in the SINAMICS DCM range are delivered with degree of protection IP00 and therefore offer no protection against touching or penetration. The mounting kit for units with a rated DC current up to 850 A increases the degree of protection to IP20.

Degree of protection IP20 offer protection against touching with the finger and penetration of solid objects greater than 12.5 mm dia, but no protection against water.

See Chapter "Ordering information for options and accessories (Page 30)" for ordering data.

〈14〉Documentation of set values

The following facilities are available to document the executed settings outside the device:

- External memory card was inserted during the RAM to ROM (p0977=1). The parameters were therefore also transferred to the external CompactFlash Card.
- Write the parameters to a CompactFlash Card (p0804).
- Document the parameters in a STARTER project (load to PG). See also Chapter "Memory card functions (Page 359)" and "Commissioning with the STARTER commissioning tool (Page 287)".

8.4 Commissioning using the AOP30 operator panel

8.4.1 First commissioning

Note

To operate the AOP30, p2030=3 must be set.

8.4.1.1 First power-up

Start screen

When the system is switched on for the first time, the Control Unit (CUD) is initialized automatically. The following screen is displayed:

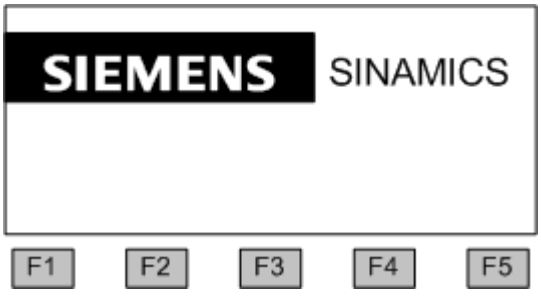


Figure 8-2 Splash screen

While the system is powering up, the parameter descriptions are loaded to the operator panel (remark: The memory card does not have to be inserted).

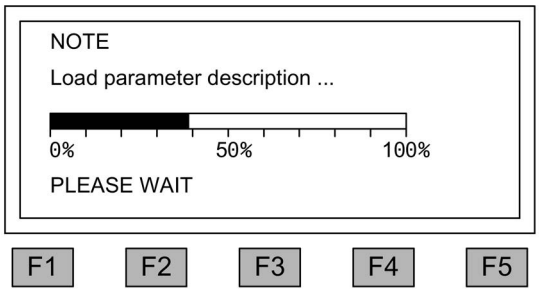
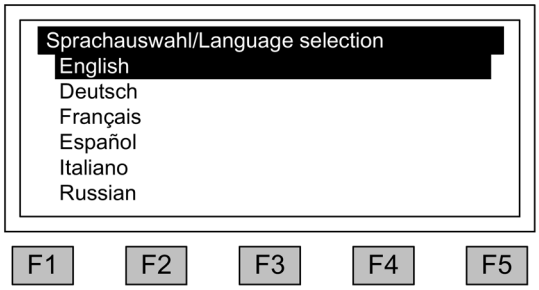


Figure 8-3 Loading of the parameter description during the system power-up

Selecting the language

When the system is first powered up, a screen for selecting the language appears.



You can select the language in the dialog screen.

To change the language, use <F2> or <F3>.
To select the language, use <F5>.

Once the language has been selected, the powering-up process continues.

Once the system has successfully powered up, the drive has to be commissioned when the system is switched on for the first time after it has been delivered. The converter can then be switched on.

When the system is then powered up again, it can be operated immediately.

Navigation within the dialog screens

Within a dialog screen, the selection boxes can usually be selected using the <F2> and/or <F3> keys. Selection boxes are generally texts surrounded by a frame. When they are selected, they are highlighted by means of white text on a black background.
The current value of a highlighted selection box can usually be changed by pressing <F5> "OK" and/or "Change". Another entry field then appears; the value you want can be entered directly in this using the numerical keypad or can be selected from a list.

In the wizard, you can change from a dialog screen to the next or previous screen by selecting the "Continue" or "Back" selection boxes and then confirming by pressing <F5> "OK".
If a screen contains particularly important parameters, the selection box "Continue" only appears at the bottom of the screen. This is because every single parameter in this dialog screen has to be checked thoroughly and/or corrected before the next screen can be accessed.

9.3 Controlling via the AOP30 operator panel

Note

The OFF switch on the AOP30 operator panel does not have an EMERGENCY OFF function.

The OFF switch on the AOP30 operator panel does not have an STO function regarding functional safety.

Note

To operate the AOP30, p2030 = 3 must be set.

An operator panel is located in the cabinet door of the cabinet unit for operating, monitoring, and commissioning tasks. It has the following features:

- Graphical, backlit LCD for plain-text display and a "bar display" of process variables
- LEDs for displaying the operating states
- Help function describing the causes of and remedies for faults and alarms
- Keypad for controlling a drive under normal operating conditions
- LOCAL/REMOTE switchover for selecting the control terminal (master control assigned to operator panel or customer terminal block/PROFIBUS)
- Numeric keypad for entering setpoints or parameter values
- Function keys for prompted navigation through the menus
- Two-stage safety concept to protect against accidental or unauthorized changes to settings
- IP54 degree of protection (when installed)

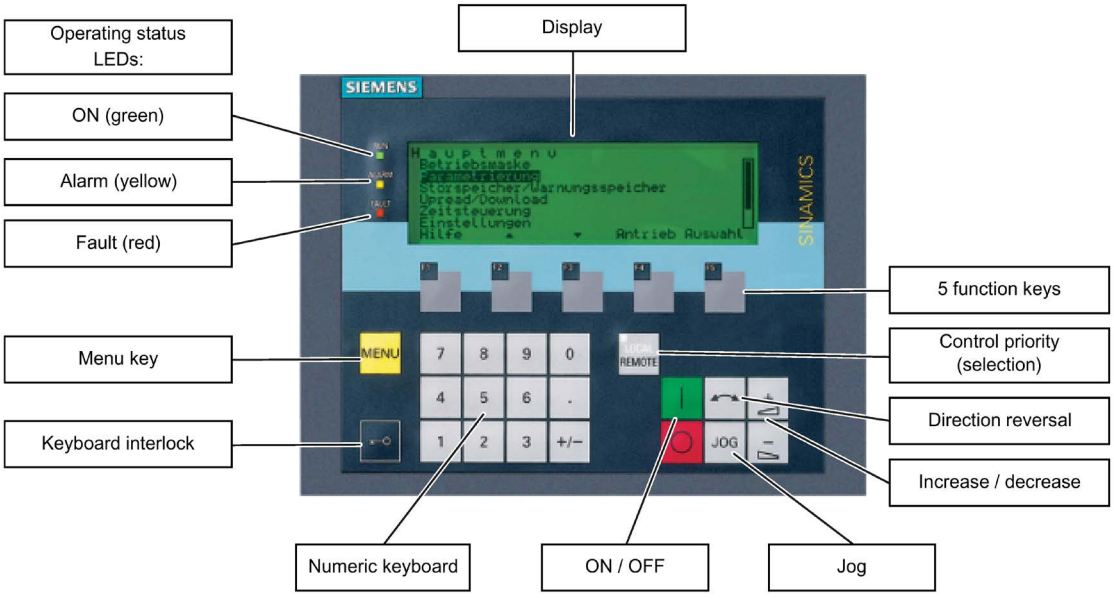


Figure 9-16 Components of the cabinet unit operator panel (AOP30)

9.3.1 Overview and menu structure

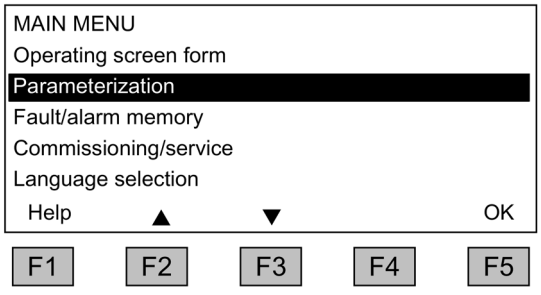
Description

The operator panel can be used for:

- Assigning parameters (commissioning)
- Monitoring status variables
- Controlling the drive
- Diagnosing faults and alarms

All the functions can be accessed via a menu.

Your starting point is the main menu, which you can always call up using the yellow MENU key:



Dialog screen for the main menu:
This can be accessed with the "MENU" key.

Press "F2" or "F3" to navigate through the menu options in the main menu.

Menu structure of the operator panel

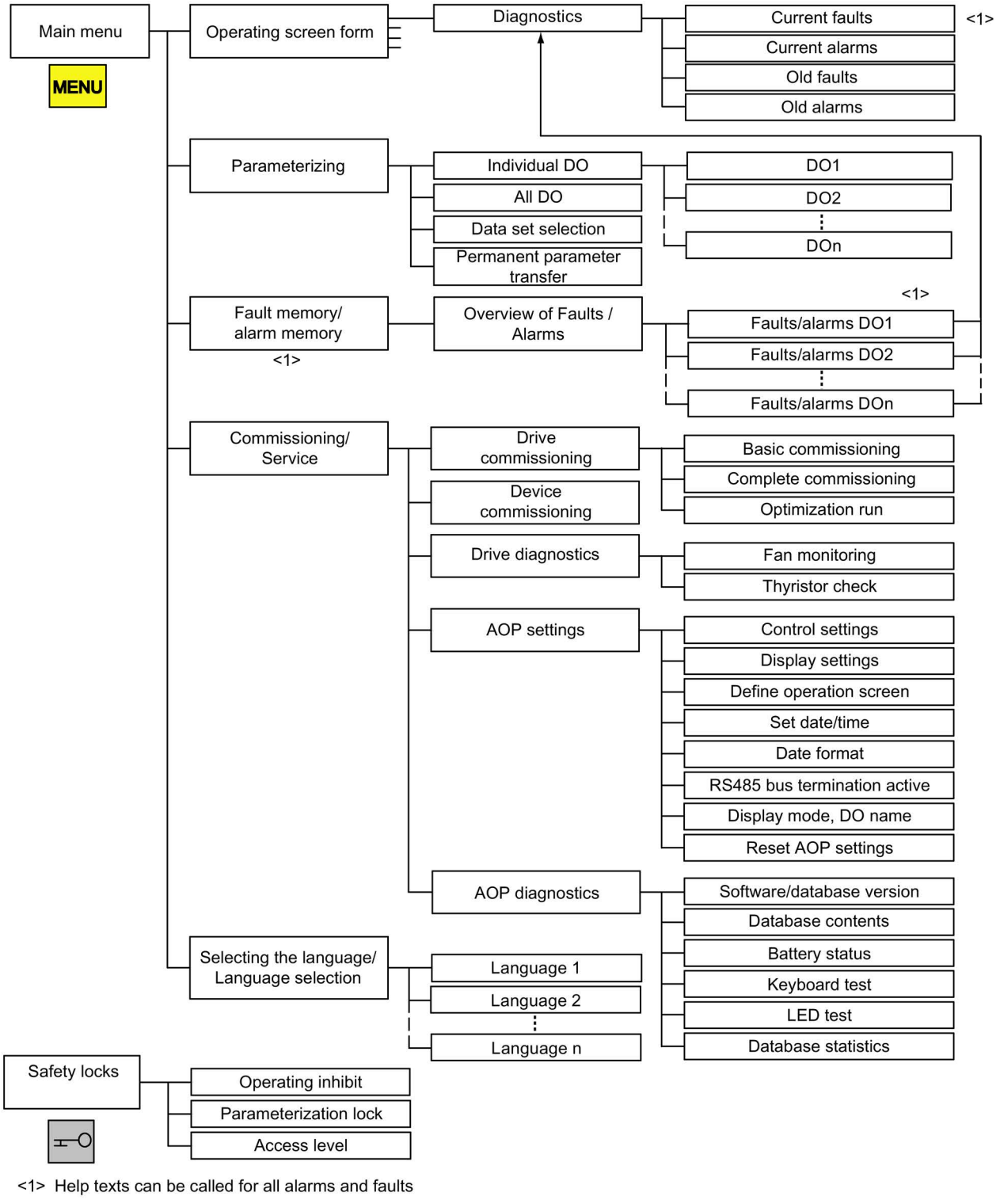


Figure 9-17 Menu structure of the AOP30 operator panel

9.3.2 Menu: Operation screen

Description

The operation screen displays the most important status variables for the drive unit:

In the factory setting, it displays the operating state of the drive, the direction of rotation, the time, as well as four drive variables (parameters) in numerical format and two values in the form of a bar display for continuous monitoring.

You can call up the operation screen in one of three ways:

1. Automatically after ramping-up is complete
2. From the main menu, by selecting the "Operation screen" menu command and F5 ("OK")
3. From the "Fault/alarm overview" screen, by selecting F4 ("Tools+"/"Back") and F5 ("OK") if the jump is from the operation screen into this screen

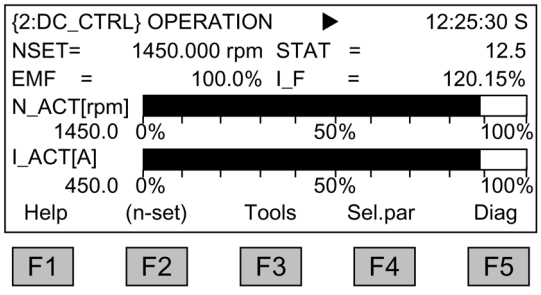


Figure 9-18 Operation screen

If a fault was registered during ramping-up, the system automatically branches from the operation screen into which the jump was made following the ramping-up process into the fault screen. This also happens if the system is on the operation screen and the first fault is registered here.

You can use F2 in the LOCAL state to enter the setpoint via the numeric keypad, if the drive is in the OPERATION state or the system setting "Save AOP setpoint" is set to YES.

You can switch to an alternative operation screen with F3 "Tools." It is used to display technological variables and can be defined or changed at "Menu" - "Commissioning / service" - "AOP settings" - "Define operation screen".

The individual parameters of the operation screen can be selected using F4 ("Sel. par"). F1 ("Help+") can be used to display the corresponding parameter number of the short identifier and call up a description of the parameter.

Setting options

When you choose Commissioning / service – AOP settings – Define operation screen, you can adjust the display type and the values displayed as required (see "AOP settings (Page 387)" Chapter).

9.3.3 Parameterization menu

You can adjust the unit settings in the Parameterization menu.

Two display types can be selected in the AOP:

1. All parameters
   All the parameters present in the unit are listed with this option. The DO to which the parameter currently selected belongs (inverted) is displayed in curly brackets in the top left of the screen. With this display type, the response time for turning a page is dependent on the number of DOs and is generally longer than with parameter lists that only display one DO.
2. DO selection
   With this display type, you can pre-select a DO so that only the parameters for this DO are listed. (The expert list in STARTER is only displayed in this DO view.)

In both cases, the set access level governs which parameters are displayed. You can set the access level in the menu for safety inhibits, which can be called up using the key button.

The parameters for access levels 1 and 2 are sufficient for simple applications.

At access level 3 ("Expert"), you can change the structure of the function by interconnecting BICO parameters.

The Parameterization menu offers four options:

- **Individual DO**

  Shows the parameters of a DO to be selected in advance

- **All DOs**

  Shows the parameters of all DOs in list format (as described previously)

- **Data set selection**

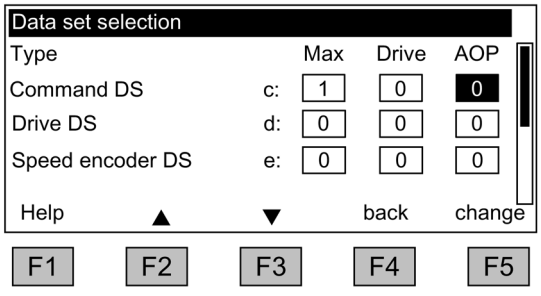


Figure 9-19 Data set selection

In the "AOP" column of the "Data set selection" screen, you can choose which of the data sets selected is currently displayed on the operator panel. The data set numbers that are set in the drive (i.e. are currently active) are displayed in the "Drive" column. The "Max" column shows the maximum data set number to be entered for the AOP30 display.

In parameter lists, data set parameters are indicated by the letter c, d, or e between the parameter number and parameter designator. The number at the right of the first row from the top shows which data set a highlighted parameter comes from.

In the commissioning wizard, the drive is commissioned using the data set selected on this screen in the AOP column.

The data set selection dialog appears whenever a data set parameter is changed in the parameter list. The data set selected in the data set selection screen is a default setting.

- **Permanent parameter transfer**

  Parameter changes in the SINAMICS DC MASTER are only made temporarily in the RAM. If a parameter assignment is intended to be permanent, it is possible to trigger a save process at this point. Depending on the configuration, this can take from 45 s to several minutes.

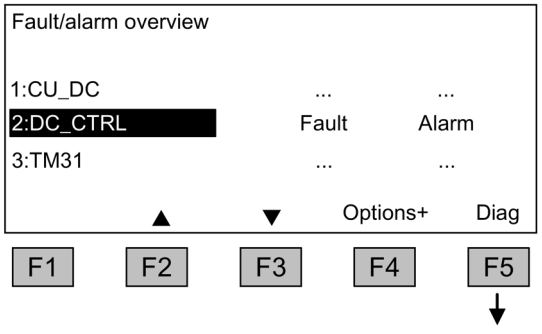
  Also refer to Chapter "Operation", Section "Memory card functions".

9.3.4 Menu: Fault/alarm memory

When you select this menu, a screen appears containing an overview of faults and alarms that are present.

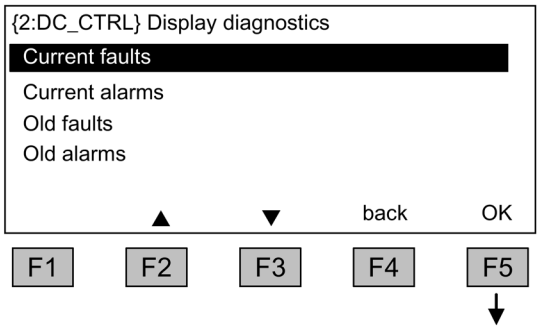
For each drive object, the system indicates whether any faults or alarms are present. ("Fault" or "Alarm" appears next to the relevant drive object).

In the graphic below, you can see that at least one active fault/alarm is present for the "DC_CTRL" drive object. No faults or alarms are indicated for the other drive two objects.



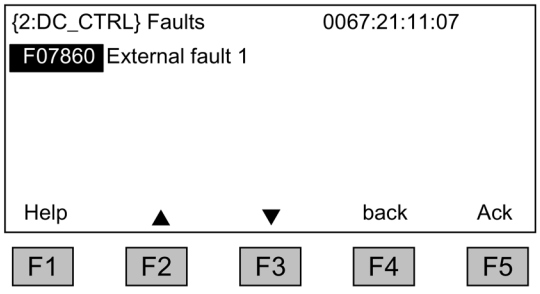
Overview of Faults / Alarms

When you navigate to the line with active alarms/faults and then press the F5 <Diag> key, the system displays a screen in which you may select the current or old alarms/faults.



Display diagnostics

When you navigate to the required line and then press the F5 <OK> key, the corresponding faults/alarms are displayed. The list of current faults is selected here as an example.



Current faults display

A maximum of eight current faults are displayed along with their fault number and a description of the fault.

To display additional help regarding the cause of the problem and how to solve it, choose F1 <Help>.

To acknowledge the faults, choose F5 <Ack>. If a fault cannot be acknowledged, the fault remains.

9.3.5 Menu: Commissioning/Service

9.3.5.1 Drive commissioning

Selecting this option enables you to re-commission the drive from the main menu, using the AOP wizard.

Basic commissioning

A few key parameters (such as the maximum speed, ramp-up time, and ramp-down time) are requested. The changes can then be permanently saved in the final confirmation screen.

Complete commissioning

Complete commissioning, with entry of the motor and encoder data, is carried out. Following this, key motor parameters are recalculated on the basis of the motor data. The parameter values calculated during the previous commissioning process are lost. The calculated values are then overwritten during a subsequent optimization run.

Optimization run

The selection screen for the optimization runs appears.

9.3.5.2 Device commissioning

In this menu, you can enter the device commissioning status directly. This is the only way to reset parameters to the factory setting, for example.

9.3.5.3 AOP settings

Control settings

This defines the settings for the control keys in LOCAL mode (see the section titled "Operation/Operation via the operator panel") as well as additional settings that are relevant for drive control.

Display settings

In this menu, you set the lighting, brightness, and contrast for the display.

Define operation screen

In this menu, you can switch between five operation screens. You can set the parameters to be displayed.

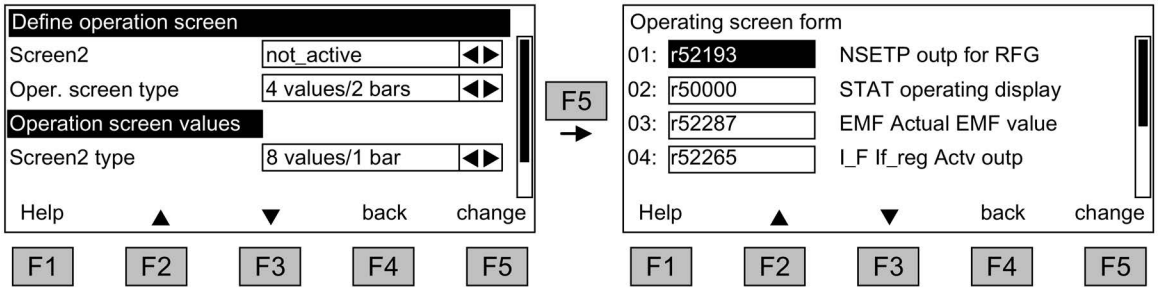


Figure 9-20 Define operation screen

- Insert the protective cover ⑤ so that the mounting sockets below it are covered.
- Hold the new CUD at an angle of 10° to 15° at the connector and parallel to the side wall ⑥.
- Press the CUD onto the terminal strip ⑦.
- Pull out the mounting aid ⑧.
- Screw the CUD tight and attach all the components again that were removed from the old CUD. Reconnect the connections.

Replacement/installation of a CUD in the right slot

A CUD is installed in the right slot in the same way as in the left slot.

For simple handling, it is recommended that you swing out the electronics plate slightly.

Make sure that the mounting sockets are covered by the mounting aid.

11.3 Replacing the back-up battery in the AOP30 operator panel

Table 11- 1 Technical specifications of the backup battery

Type	CR2032 3 V lithium battery
Manufacturer	Maxell, Sony, Panasonic
Nominal capacity	220 mAh
Self-discharge at 20 °C	1%/year
Service life (in backup mode)	> 1 year at 70 °C; >1.5 years at 20 °C
Service life (during operation)	> 2 years

Replacement

1. Disconnect the SINAMICS DCM from the power supply
2. Open the cabinet.
3. Disconnect the 24 V DC power supply and communications line on the operator panel.
4. Open the cover of the battery compartment.
5. Remove the old battery.
6. Insert the new battery.
7. Close the cover of the battery compartment.
8. Reconnect the 24 V DC power supply and communications line.
9. Close the cabinet.

Note

The battery must be replaced within one minute to ensure that no AOP settings are lost.



Figure 11-13 Replacing the backup battery for the cabinet operator panel

Note

The battery must be disposed of in accordance with the manufacturer guidelines and applicable country-specific laws and directives.