Hardware and Engineering

DEX-KEY-10
LCD Keypad

03/02 AWB8240-1416GB

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Warning!
Dangerous electrical voltage!

Before commencing the installation

- Disconnect the power supply of the device.
- Ensure that devices cannot be accidentally restarted.
- Verify isolation from the supply.
- Earth and short circuit the device.
- Cover or enclose any adjacent live components.
- Follow the engineering instructions (AWA) for the device concerned.
- Only suitably qualified personnel in accordance with EN 50110-1/-2 (VDE 0105 Part 100) may work on this device/system.
- Before installation and before touching the device ensure that you are free of electrostatic charge.
- The functional earth (FE) must be connected to the protective earth (PE) or the potential equalisation. The system installer is responsible for implementing this connection.
- Connecting cables and signal lines should be installed so that inductive or capacitive interference does not impair the automation functions.
- Install automation devices and related operating elements in such a way that they are well protected against unintentional operation.
- Suitable safety hardware and software measures should be implemented for the I/O interface so that an open circuit on the signal side does not result in undefined states in the automation devices.
- Ensure a reliable electrical isolation of the extra-low voltage of the 24 V supply. Only use power supply units complying with IEC 60364-4-41 (VDE 0100 Part 410) or HD384.4.41 S2.
- Deviations of the mains voltage from the rated value must not exceed the tolerance limits given in the specifications, otherwise this may cause malfunction and dangerous operation.
- Emergency stop devices complying with IEC/EN 60204-1 must be effective in all operating modes of the automation devices. Unlatching the emergency-stop devices must not cause a restart.
- Devices that are designed for mounting in housings or control cabinets must only be operated and controlled after they have been installed and with the housing closed. Desktop or portable units must only be operated and controlled in enclosed housings.
- Measures should be taken to ensure the proper restart of programs interrupted after a voltage dip or failure. This should not cause dangerous operating states even for a short time. If necessary, emergency-stop devices should be implemented.
- Wherever faults in the automation system may cause injury or material damage, external measures must be implemented to ensure a safe operating state in the event of a fault or malfunction (for example, by means of separate limit switches, mechanical interlocks etc.).
- Depending on their degree of protection, frequency inverters may contain live bright metal parts, moving or rotating components or hot surfaces during and immediately after operation.
- Removal of the required covers, improper installation or incorrect operation of motor or frequency inverter may cause the failure of the device and may lead to serious injury or damage.
- The applicable national accident prevention and safety regulations apply to all work carried on live frequency inverters.
- The electrical installation must be carried out in accordance with the relevant regulations (e. g. with regard to cable cross sections, fuses, PE).
- Transport, installation, commissioning and maintenance work must be carried out only by qualified personnel (IEC 60364, HD 384 and national occupational safety regulations).
- Installations containing frequency inverters must be provided with additional monitoring and protective devices in accordance with the applicable safety regulations. Modifications to the frequency inverters using the operating software are permitted.

- All covers and doors must be kept closed during operation.
- To reduce the hazards for people or equipment, the user must include in the machine design measures that restrict the consequences of a malfunction or failure of the drive (increased motor speed or sudden standstill of motor). These measures include:
  - Other independent devices for monitoring safety-related variables (speed, travel, end positions etc.).
  - Electrical or non-electrical system-wide measures (electrical or mechanical interlocks).
  - Never touch live parts or cable connections of the frequency inverter after it has been disconnected from the power supply. Due to the charge in the capacitors, these parts may still be live after disconnection. Fit appropriate warning signs.

Contents

About this Manual

This manual describes the DEX-KEY-10 keypad.

It contains information that you will need to operate the DEX-KEY-10 keypad with the devices listed here:

- The DF5 series frequency inverters
- The DF6 series frequency inverters
- The DV5 series vector frequency inverters
- The DV6 series vector frequency inverters
- RA-SP speed control unit of the Rapid Link system.

The features, parameters and functions are described in detail, with examples for the most important applications. All information applies to the specified hardware and software versions.

This manual is available as a PDF file on the Drives Centre CD, which is supplied with each DF5, DF6, DV5 and DV6 frequency inverter. To view the file, you need a PC with the Windows 95, 98, ME, 2000 or NT operating system.

You can also download this manual from the Internet at:
ftp://ftp.moeller.net/DRIVES/index.html

Abbreviations and symbols

The following abbreviations and symbols are used in this manual:

EMC	**E**lectro**m**agnetic **c**ompatibility
ESD	**E**lectro**s**tatic **d**ischarge
Func. No.	**Func**tion number
PES	**P**ositive **E**arth (PE) connection of the cable **s**creen
PNU	**P**arameter**nu**mber
ro	**R**ead-**o**nly parameter value
rw	**R**ead/**w**rite parameter value
DS	**D**efault **s**ettings

All measurements are in millimetres unless otherwise stated.

In some of the illustrations, the enclosure or enclosure parts and other components affecting equipment safety have been omitted for improved clarity. However, the devices and subassemblies described here must always be operated with the enclosure and all necessary components that affect equipment safety correctly fitted.

Before you use the DEX-KEY-10 keypad with the frequency inverters or the speed control unit, thoroughly read the manual for the connected frequency inverter or speed control unit. We assume that you have a good knowledge of engineering fundamentals and that you are familiar with the electrical systems and the applicable principles and are able to read, interpret and apply the information contained in technical drawings.

▶ Indicates instructions to be followed

→ Indicates useful tips and additional information

▽ **Caution!**
Warns of the possibility of minor material damage.

⚠ **Warning!**
Warns of the possibility of major material damage and minor injury.

⚠ **Danger!**
Warns of the possibility of major material damage and serious or fatal injury.

To improve legibility, the title of the current section is given at the top of each left-hand page and the current subsection at the top of each right-hand page. The only exceptions are the title page of each section and the blank pages at the end of each section.

1 About the DEX-KEY-10 LCD keypad

System overview

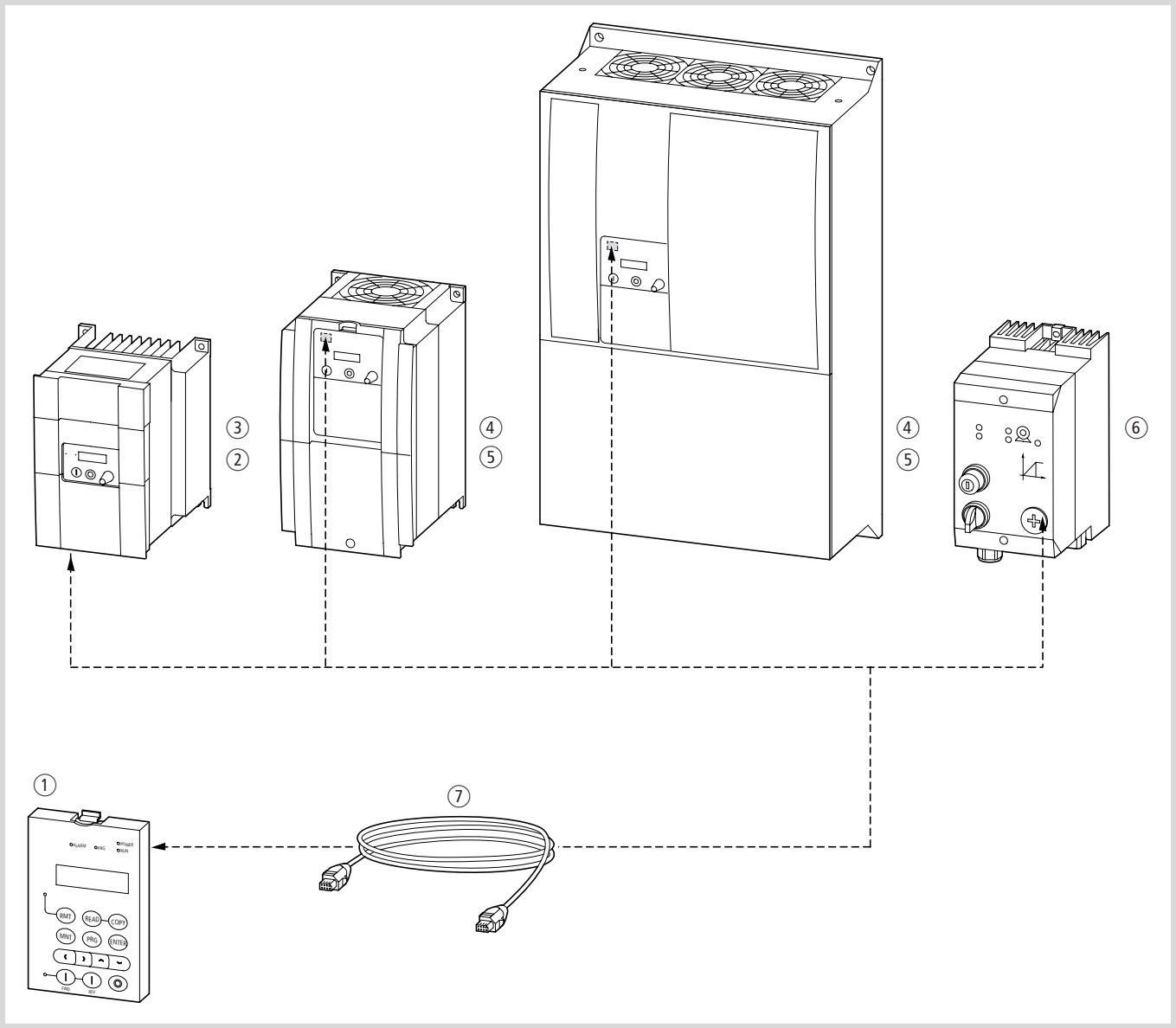


Figure 1 : System overview

① DEX-DEY-10 external keypad
② DF5 series frequency inverters
③ DV5 series frequency inverters
④ DF6 series frequency inverters
⑤ DV5 series vector frequency inverters
⑥ RA-SP speed control unit
⑦ DEX-CBL-...-ICS connection cable

Inspecting the package contents

The DEX-KEY-10 keypad is carefully packaged and prepared for transportation. The device must be transported only in its original packaging with a suitable transport system. Observe the instructions and the warnings on the side of the packaging. This also applies after the device has been removed from the package.

Open the packaging with suitable tools and inspect the contents immediately on receipt to ensure that they are complete and undamaged. The package should contain the following items:

- A DEX-KEY-10 LCD keypad
- The installation instructions, AWA8230-1939

→ The DEX-KEY-10 keypad is supplied without connection cables.

Required accessories

You can fit the DEX-KEY-10 keypad directly into the slot of the built-in operator unit of the DF6 and DV6 frequency inverters. To locate the keypad externally or to use it with the DF5, DV5 and RA-SP devices, you need a connection cable. The following preassembled cables are available for this purpose (with RJ45 plug):

	l	*l*
DEX-CBL-1M0-ICS	1 m	3.3 ft
DEX-CBL-3M0-ICS	3 m	9.8 ft

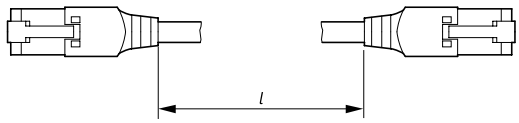


Figure 2 : DEX-CBL-...-ICS

Maximum permissible cable length: $l \leqq 20$ m.

Keypad features

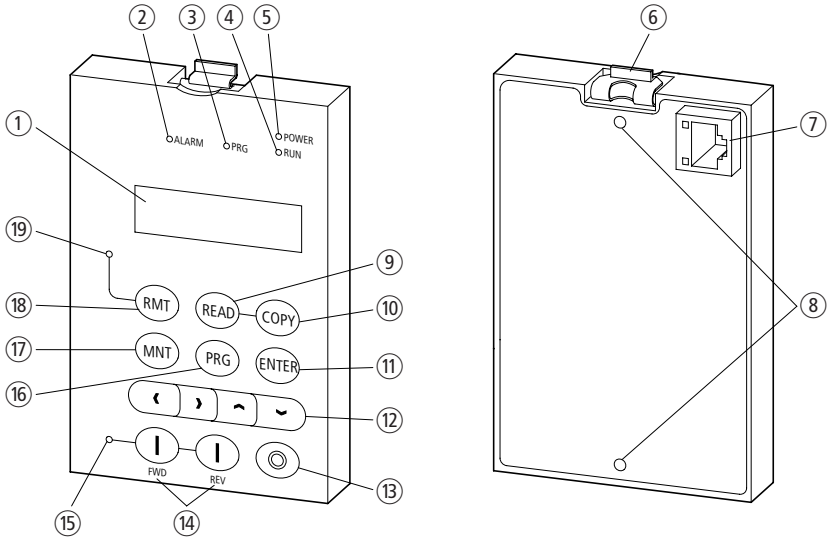


Figure 3 : DEX-KEY-10 keypad

No.	Name	Explanation	Connection with	
			DF5, DV5, RA-SP	DF6, DV6
①	Backlit LCD	Indication of parameter number, value, unit of measurement, set value, etc.	✓	✓
		Representation	Single-line	Two-line
		Languages	English	German, English, French, Italian, Spanish, Portuguese
②	Alarm LED (red)	LED is lit when a fault message is issued.	–[1)]	✓
③	PRG LED (yellow)	LED is lit in programming mode (PRG). If settings are wrong, the LED flashes.	–[1)]	✓
④	RUN LED (green)	LED is lit when the ON keys (FWD, REV) are active.	–[1)]	✓
⑤	Power LED (red)	LED is lit when the keypad is receiving power.	✓	✓
⑥	Latch	Mechanical latch for releasing the fitted keypad from the frequency inverter.	–	✓
⑦	Connector (RJ45)	Serial RS 422 port for connecting the DEX-CBL-...ICS cable and for mounting in the frequency inverter.	✓	✓
⑧	M3 threads	Screw holes for external mounting (surface mounting on control panel).	✓	✓
⑨	READ	Reads the adjustable parameter values and functions into the keypad from the connected device.	✓	✓
⑩	COPY	Copies the adjustable parameter values and functions from the keypad to the connected device. The copy function can be used only within a device series with the same rating.	✓	✓
⑪	ENTER	Saves the set functions and parameter values.	✓	✓

No.	Name	Explanation	Connection with	
			DF5, DV5, RA-SP	DF6, DV6
⑫	‹, ›, ^ and ˇ arrow keys	Selecting functions, changing numerical values and cursor movements:	✓	✓
	‹	Move cursor to left	–	✓
	›	Move cursor to right	✓	✓
	^	Increase value, change function	✓	✓
	ˇ	Reduce value, change function	✓	✓
⑬	O	Stops the running motor and acknowledges a fault message. Active by default, also when actuation is through terminals.	✓	✓
⑭	I FWD/REV	Enable/motor start: FWD = clockwise (forward) rotation, REV = anticlockwise (reverse) rotation. These keys are not active by default.	✓	✓
⑮	ON key LED (green)	Start signal through ON key (FWD/REV) is active.	✓	✓
⑯	PRG	PRG =programming mode. Selection and changeover in the Function menu.	✓	✓
⑰	MNT	MNT = Monitor menu. Selection and changeover in the display menu, e.g. operating data, settings and fault messages.	✓	✓
⑱	RMT	Activates the keypad after configuration.	✓	✓
		Select control mode (keypad, control signal terminals). For changeover, the drive must be at standstill (Stop) and the key pressed for more than 3 seconds.	–	✓
⑲	RMT LED (red)	LED is lit when the keypad is active.	✓	✓

✓ = Function present
– = Function not active
–[1)] = LED is lit only during configuration and keypad function test

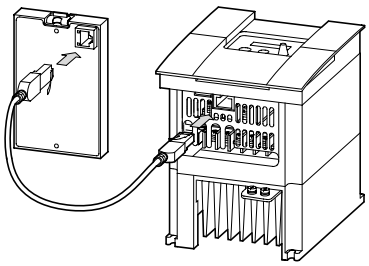
Intended use

With the DEX-KEY-10 keypad, the setpoint and actual values can be viewed and devices parameterized and operated remotely. It can be used as a hand-held device or surface-mounted on an enclosure (for example a control panel). With the DF6 and DV6 frequency inverters, it can also be slotted into the device.

Electrical connection and installation

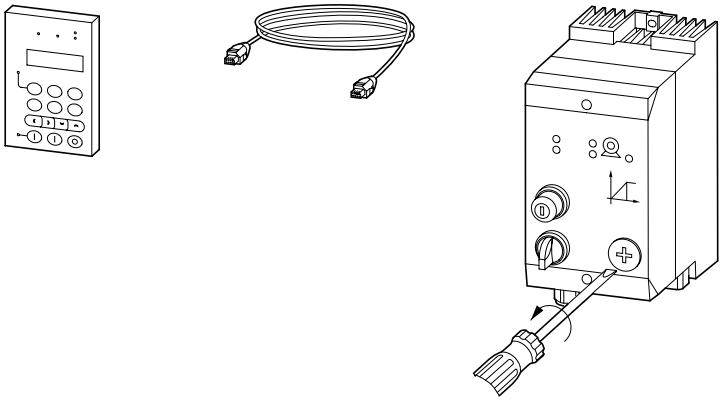
The keypad is connected through its serial RS 422 port. Used remotely, it is connected with preassembled DEX-CBL-1M0-ICS or DEX-CBL-3M0-ICS cables with RJ45 plugs.

DF5, DV5

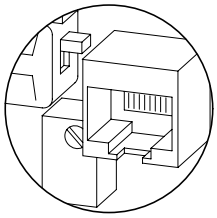


Remote use with DEX-CBL-...-ICS connection cables

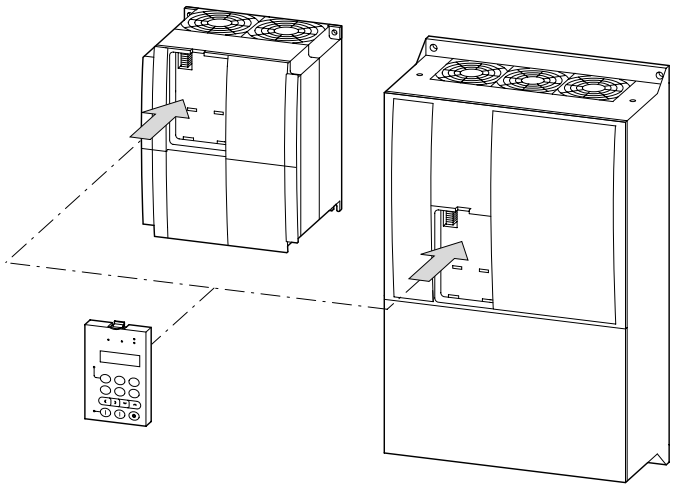
RA-SP



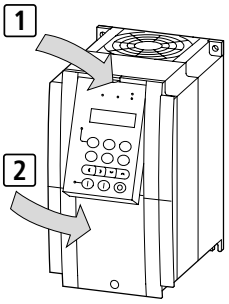
Remote use with DEX-CBL-...-ICS connection cables. The serial port is located under the PG coupling at the front.



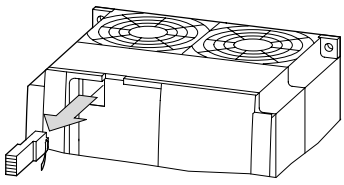
DF6, DV6

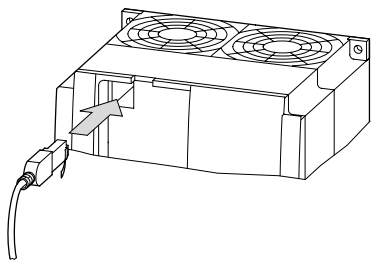


Insert into the device (remove standard keypad and covers)



Remote use with DEX-CBL-...-ICS connection cables (remove RJ45 adapter).





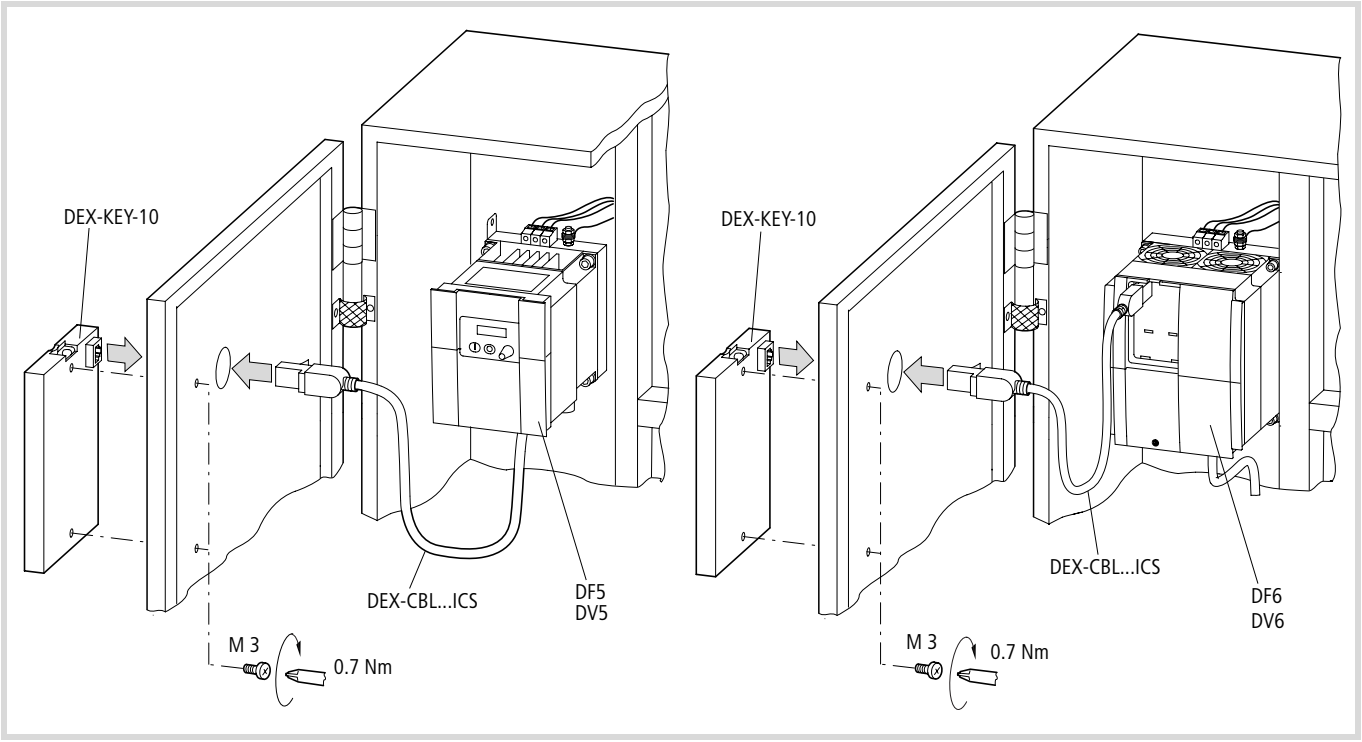


Figure 4 : Remote mounting on an enclosure (for example a control panel)

→ If the keypad is mounted, for example, on a control panel door, fit the connection cable with cable clamps or lay it in the cable duct to provide strain relief for the RJ45 plugs).

→ The keypad connection cable should be at least 15 cm from the main and control circuits.

→ Do not pull on the cable to move the keypad.

Note about operational safety

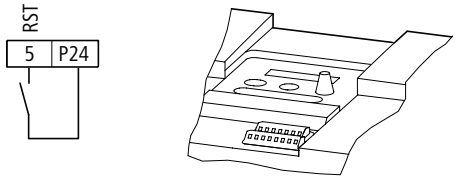
▽ **Caution!**
Do not connect or disconnect the cable between keypad and frequency inverter or speed control unit during operation, since this can lead to uncontrollable drive behaviour.

▽ **Caution!**
During operation or parameterization through the remote keypad, a contact fault or wire breakage can result in the STOP functions (STOP key) being disabled. Make sure, therefore, that a second STOP function is active in all operating states;if necessary, an Emergency-Stop must be forced.

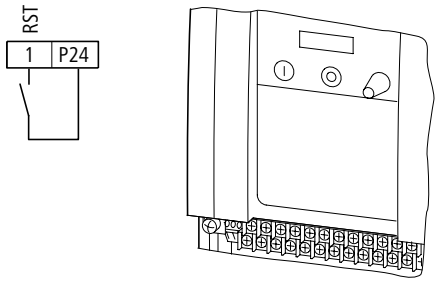
→ With the RA-SP speed control unit, the Emergency-Stop function must be effective on the RA-DI disconnect unit.

With the frequency inverters, you can activate the second STOP function with the Reset input of the control signal terminals. Example:

DF5, DV5



DF6, DV6



Technical data

Weight	0.1 kg
Degree of protection (operator side)	IP54, NEMA 12
Ambient temperature	–10 °C to +50 °C
Environmental conditions	Corrosion-, gas- and dust-free
Climatic proofing	20 to 90 % mean relative humidity, non-condensing
Installation altitude	≦ 1000 m a.s.l.
Interface (serial)	RS 422 with RJ45 connectors
Write cycles (EEPROM)	100000
Interface connection cycles	1000
Display	Liquid crystal display (LCD), backlit, two-line, 16 characters
Language	English in combination with DF5, DV5 and RA-SP
	German, English, French, Spanish and Portuguese in combination with DF6 and DV6

Dimensions

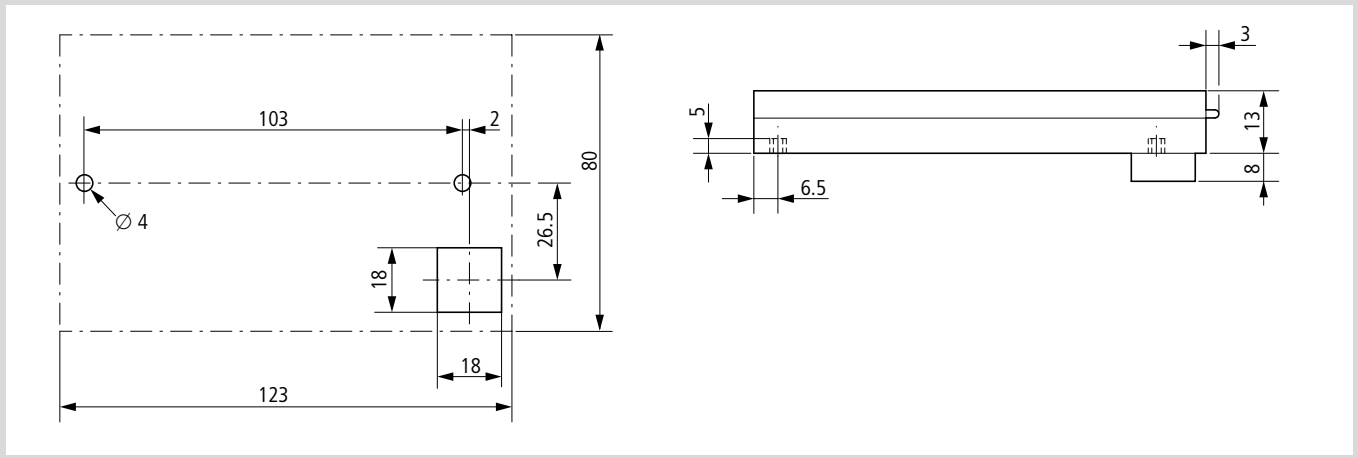


Figure 5 : Mounting dimensions (drilling template)

View from mounting side. Fixing with two M3 screws, depth 5 mm, maximum tightening torque 1.7 Nm.

2 Configuring the DEX-KEY-10 keypad

→ By default, the DEX-KEY-10 keypad is configured for communication with DF6 and DV6 frequency inverters. For use with the DF5, DV5 and RA-SP units and when you change to a device from another series, you need to reconfigure the keypad. Otherwise it will not work correctly.

To configure the keypad, it must be correctly connected to the frequency inverter or speed control unit.

▶ Press and hold the RMT and PRG keys at the same time and switch on the power supply.

On the frequency inverters, the POWER LED lights up, on the speed control unit the UV LED.

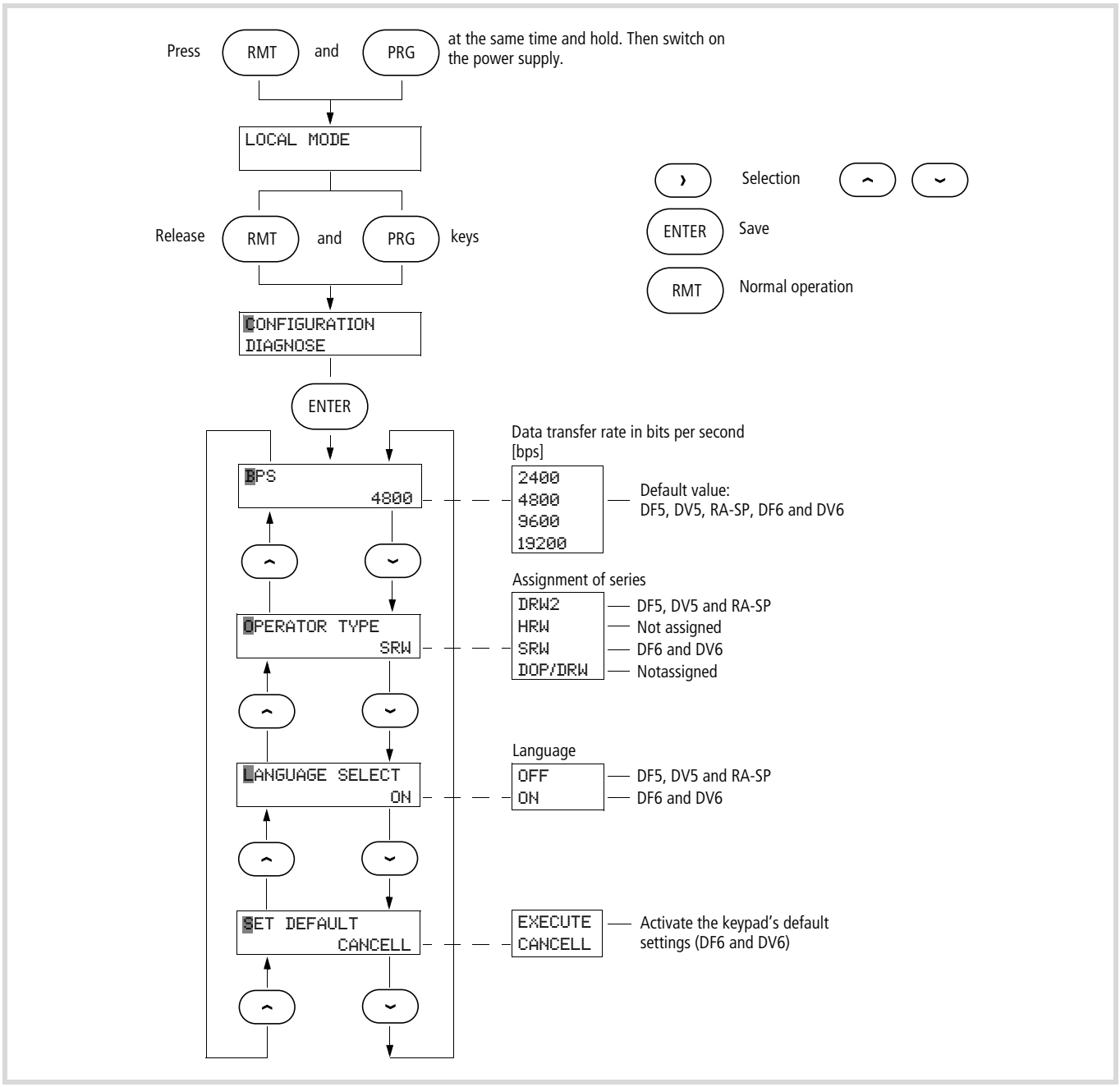


Figure 6 : Configuring the keypad

Configuration menu

The configuration of the keypad is described step by step in the following examples:

▶ Keep the RMT and PRG keys pressed at the same time and switch the power supply on.

All LEDs are lit.

```
LOCAL MODE
```

▶ Release the RMT and PRG keys.

```
CONFIGURATION
DIAGNOSE
```

→ The cursor ▮ flashes on an active function or in input fields.

To move the cursor, select functions and change values, use the ‹, ›, ∧ and ∨ arrow keys.

In the Monitor menu, the permissible changed values and functions are saved immediately.

In the Function menu, the permissible changes are marked with an "*" and must be confirmed and saved with the ENTER key. An "!" indicates an impermissible attempted change of a value or function. To move on here, use the ‹ and › arrow keys, and to go back without saving, press PRG or MNT.

▶ In the selected CONFIGURATION menu, press the ENTER key.

```
BPS
              4800
```

The data transfer rate is displayed in BPS (bits per second). For the DF5, DV5, DF6, DV6 and RA-SP devices, it is 4800. If any other transfer rate is selected, fault message R-ERROR COMM.<2> is issued. In that case, repeat step 1 and set the transfer rate value to 4800.

▶ Press the ∨ arrow key. The assigned device is identified with OPERATOR TYPE.

```
OPERATOR TYPE
              SRW
```

▶ Select the assignment ID with the › arrow key and assign it with ∧ or ∨:
- SRW = DF6 and DV6,
- DRW2 = DF5, DV5 and RA-SP.

```
OPERATOR TYPE
              SRW
```

```
OPERATOR TYPE
            *DRW2
```

DOP/DRW and HRW are not permissible for the devices covered by this manual.

Series	BPS	OPERATOR TYPE
DF6, DV6	4800	SRW
DF5, DV5, RA-SP	4800	DRW2

▶ Confirm the changes with the ENTER key and then press the RMT key twice.

```
CONFIGURATION
DIAGNOSE
```

Used with the DF5, DV5 or RA-SP, the display is single-line. The text language is English. The POWER and RMT LEDs are lit.

```
TM 000.0   0.0Hz
```

Used with the DF6 or DV6, the display has two lines. You can select the language in the LANGUAGE menu (see language selection, DF6 and DV6). The POWER LED is lit.

```
FM      0000.00Hz
>F001   0000.00Hz
```

Default settings

You can reset the DEX-KEY-10 keypad (not the connected devices) to its default settings in the CONFIGURATION menu. To do this, carry out the steps described in Section "Configuration menu".

▶ With the BPS (4800) showing, press the ∧ arrow key.

```
SET DEFAULT
          CANCELL
```

▶ With the ‹ or › arrow key, select CANCELL.
▶ With the ∧ or ∨ arrow key, select EXECUTE.

```
SET DEFAULT
         *EXECUTE
```

▶ To confirm your selection, press ENTER.
▶ To exit the configuration menu, press RMT.

→ By default, the DEX-KEY-10 keypad is configured for use with the DF6 and DV6 frequency inverters (OPERATOR TYPE SRW = DF6/DV6).
Used with other devices, undefined symbols and text appear here when the RMT key is pressed. The keys then have no function until you have configured the keypad for the connected devices (OPERATOR TYPE).

Activating language selection

This function can be used only with DF6 and DV6 series devices.

With the DF5, DV5 and RA-SP devices, the display is always in English. For these units, LANGUAGE SELECT should be set to OFF.

```
LANGUAGE SELECT
              ON
```

Copy and Read functions

→ The copy function can be used only with the drive at standstill (STOP). During drive operation, in a fault condition, during a Reset and in a software lock, this function is not available.

→ The Copy and Read functions are only active when the keypad is configured for the connected device and the Monitor menu (RMT key) is selected.

→ Having pressed the READ or COPY key, wait for about ten seconds before pressing another key, issuing a Reset command or switching the power supply off.

After switching the power supply on, you can access all parameters of the connected device with the keypad. Changes to functions and parameter values are made directly in the device, even with a remotely sited keypad. To save the current or new device parameters in the keypad, press the READ key.

Read function

When you press READ, all parameters of the connected device are saved permanently to the DEX-KEY-10 keypad, i.e. they remain saved even when the power is switched off.

The keypad memory is an EEPROM which can hold the data for at least 100000 Read commands.

```
WRITER INV -> REMT
```

Parameter protection

To protect the parameters that are saved in the keypad, you can disable the Read command. To do that, press the MNT, < and STOP keys at the same time for about two seconds.

```
CONFIGURATION
```

With the >, ∧ and ∨ arrow keys, you can select and change over the Read function (READ LOCK = ON).

```
READ LOCK
             OFF
```

To activate the function, press the ENTER key and to exit the configuration menu, press RMT.

Copy function

→ All parameter changes are transferred directly to the connected device. To use the Copy function, the changes must have been saved to the keypad with the Read function.

→ The copy function can be used only with the drive at standstill (STOP). During drive operation, in a fault condition, during a Reset and in a software lock, this function is not available.

▶ Press the COPY key.

All parameters saved in the keypad are copied to the connected device.

```
WRITER REMT -> INV
```

```
WRITER REMT->->INV
```

ANy fault messages, the content of the fault register and the configuration for software parameter protection are not transferred.

→ A fault-free transfer of parameters is only possible between frequency inverters and speed control units of the same series and with the same rating.

Any invalid attempts to copy data are automatically cancelled and the error message R-ERROR INV.TYPE is displayed. Acknowledge the message with the ENTER key.

```
R-ERROR INV.TYPE
```

→ When you copy parameters between devices of the same series but with different ratings, you must adjust the ratings-related values (current limitation, overload protection, etc.) for the new device.

▽ **Caution!**
Do not copy parameters within a device series between 230 V frequency inverters (e.g. DF5-322...) and 400 V inverters e.g. DF5-340...).

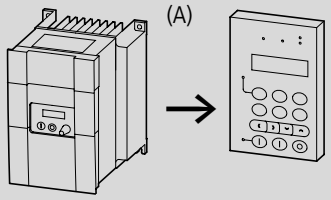
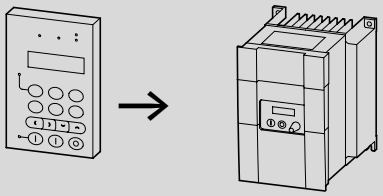
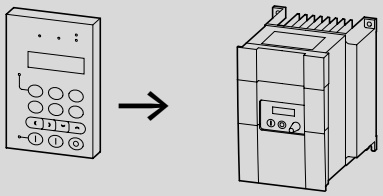
▽ **Caution!**
Never transfer data from devices with different versions of the operating system (such as Japanese or American). The DF5, DV5, DF6, DV6 and RA-SP series described here have a European operating system.

Example for the Copy and Read functions

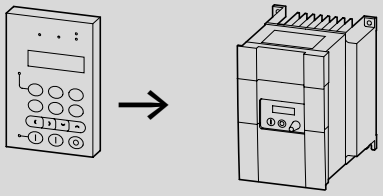
Frequency inverter A with connected and configured DEX-KEY-10 keypad.

The parameters of frequency inverter A are set for the connected drive unit.

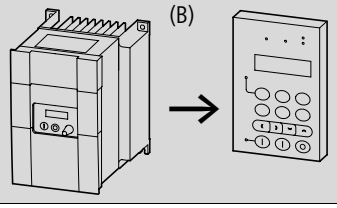
The table below describes the required steps to copy the parameters from frequency inverter A to three further, identical frequency inverters (B, C and D) with the same application (i.e. the same drive unit):

Step	Key	Description	Data transfer
1	READ	The parameters in frequency inverter A are copied to the keypad.	 (A)
2		Switch the power supply of frequency inverter A off and disconnect the keypad connection cable.	
3		Plug the connection cable into frequency inverter B and switch on the power.	
4[1)]	COPY	The parameters saved in the keypad are copied to frequency inverter B. This takes about ten seconds, during which time you should not press any keys.	 (B)
5		Switch the power supply of frequency inverter B off and disconnect the keypad connection cable.	
6	COPY	Repeat steps 3 to 5 with frequency inverters C and D.	 (C, D)

1) Additional step
If you want to change drive-specific parameters after copying the data, for example the acceleration time, you can carry out step 4a (below) without changing the saved content of the keypad.

4a	RMT	After the Copy command, you can use the keypad to adapt parameters for frequency inverter B. The changed data is automatically saved to frequency inverter B. The data saved in the keypad is not changed.	 (B)

If you want to also use the changed parameters for frequency inverters C and D, you can save them to the keypad.

4b	READ	Copy the parameters in frequency inverter B to the keypad. The parameters saved in step 1 are overwritten and the keypad now contains the parameter values from step 4a.	 (B)

3 Device-specific parameter lists

After its configuration, the DEX-KEY-10 keypad allows communication with the connected device on three levels:

- The Monitor menu lets you view and enter user data
- The Function menu contains input levels for drive-specific parameters
- Fault and error messages are displayed as they occur and can be recalled

The tables below list the parameters according to the connected device. For a detailed description of the parameters, display values and functions, refer to the relevant device manuals:

DF5 frequency inverters	AWB8230-1412
RA-SP speed control unit	AWB2190-1430
DV5 vector frequency inverters	AWB8230-1414
DF6 frequency inverters	AWB8230-1413
DV6 vector frequency inverters	AWB8230-1415

→ You must configure the DEX-KEY-10 keypad for the assigned device series (→ chapter "Configuring the DEX-KEY-10 keypad", page 13).

DF5 frequency inverters

→ For a description of the parameters, see manual AWB8230-1412.

DF5 Monitor menu

To call up the Monitor menu, press the MNT key.

```
TM 000.0   0.0Hz
```

To select individual menu items, use the MNT key or the arrow keys ∧ and ∨. The parameters marked "rw" in the table below can be selected with the > arrow key and changed with ∧ and ∨. Depending on the parameter, inputs can be activated in one of two ways:

- online: Direct activation of the input value;
- STOP: Input possible only at standstill (STOP function).

Confirm parameter changes with the ENTER key.

Display	DF5 PNU	Explanations	Access rights	Acceptance
TM 000.0F 0.0Hz	–	TM = setpoint value through control signal terminals (O/OI) 000.0 = frequency setpoint F = enable forward operation, R = enable reverse operation 0.0Hz = frequency actual value	ro	–
TMP000.0F 0.0Hz	–	TMP = setpoint value through control signal terminal (O/OI) with active PID controller. Indication only on activation (→"F-43 PID", page 23).	ro	–
FS 000.0F 0.0Hz	–	FS = frequency setpoint selection through DEX-KEY-10 keypad. Indication only on activation (F-SET-SELECT REM, →"F-SET-SELECT TRM", page 18).	rw	online
FSP000.0F 0.0Hz	–	FSP = frequency setpoint through DEX-KEY-10 keypad with active PID controller. Indication only on activation (→"F-43 PID", → page 23 and F-SET-SELECT REM, →"F-SET-SELECT TRM", page 18).	rw	online
VR 000.0F 0.0Hz	A20	VR = setpoint selection through built-in variable resistor. Indication only on activation (F-SET-SELECT VR, →"F-SET-SELECT TRM", page 18).	ro	–
VRP000.0F 0.0Hz	A20	VR = setpoint selection through built-in variable resistor with active PID controller. Indication only on activation (→"F-43 PID", page 23 and F-SET-SELECT VR, →"F-SET-SELECT TRM", page 18).	ro	–
1S 000.0F 0.0Hz	A21 to A35	1S to 15S = fixed frequency 1 to 15 setpoint value. Indication only on activation through control signal terminals.	ro	–
1P 000.0F 0.0Hz	A21 to A35	1P to 15P = fixed frequency 1 to 15 setpoint value with active PID controller. Indication only on activation through control signal terminals (→"F-43 PID", page 23).	ro	–
ACC1 0010.0S	F02	ACC1 = acceleration time 1, from 0 Hz to the end frequency 0010.0S = 10 s (default).	rw	online
ACC2 0015.0S	A92	ACC2 = acceleration time 2, from 0 Hz to the end frequency. Indication only on activation (→"F-06 ACC", page 20). 0015.0S = 15 s (default).	rw	online

Display	DF5 PNU	Explanations	Access rights	Acceptance
DEC1 0010.0S	F03	DEC1 = deceleration time 1, from the end frequency to 0 Hz 0010.0S = 10 s (default).	rw	online
DEC2 0015.0S	A93	DEC2 = deceleration time 2, from the end frequency to 0 Hz. Indication only on activation (→"F-06 ACC", page 20). 0015.0S = 15 s (default).	rw	online
F-SET-SELECT TRM	A01	F-SET-SELECT = frequency setting selection through: • TRM = control signal terminals (O/OI), • REM = remote operator (DEX-KEY-10 keypad), • VR = variable resistance (DF5 keypad)	rw	STOP
F/R-SELECT TRM	A02	F/R-SELECT = enable with forward/reverse operation: • TRM = terminals, • REM = remote operator (DEX-KEY-10 keypad).	rw	STOP
/Hz01.0 0.00	b86	/Hz01.0 = output frequency [Hz], factor (0.1 to 99.9) 0.00 = display value (output frequency × factor)	rw	online
Im 0.0A 0.0%	–	Im 0.0A = motor current 0.0% = display value in percent of rated current	ro	–
I0 00.00A	b32	I0 = magnetization current 00.00A = matching for overload protection and display value Im	rw	online
V-Boost code‹11›	A42	V-Boost = voltage boost (→"F-04 CONTROL", page 19) code‹11› = manual voltage boost: 11 % of maximum output voltage	rw	online
V-Boost F 10.0%	A43	V-Boost F = voltage boost, final value frequency (→"F-04 CONTROL", page 19) 10.0% = manual frequency value: 10 % of the transition frequency	rw	online
V-Boost Mode 0	A41	V-Boost Mode = voltage boost, characteristic (→"F-04 CONTROL", page 19) • 0 = manual boost • 1 = automatic boost	rw	STOP
V-Gain 100%	A45	V-Gain = output voltage (→"F-03 AVR", page 19 and "F-04 CONTROL", page 19) 100% = 50 to 100 % of mains input voltage	rw	STOP
Jogging 1.00Hz	A38	Jogging = jog mode 1.00Hz = frequency in jog mode.	rw	online
Jog Mode 0	A39	Jog Mode = Stop in jog mode • 0 = unguided deceleration • 1 = braking with deceleration ramp • 2 = DC braking	rw	STOP
ADJ 80	b81	ADJ = analog adjustment – compensation for analog displays at FM output 80 = setting range (0 to 255)	rw	online
PANEL d01	b89	PANEL = panel display selection (display value for DE5-KEY-R03). • d01 = actual frequency [Hz] • d02 = motor current (I0) [A] • d03 = direction of rotation (r, F) • d04 = PID actual value • d05 = status of digital inputs (1 to 5) • d06 = status of digital outputs (fault signal, 11, 12) • d07 = display value [Hz] (output frequency × factor)	ro rw[1)]	– online[1)]
TERM LLL LLLLL	–	TERM = terminal – signal state of control signal terminals • H = High – input/output actuated, • L = Low – input/output not actuated LLL = signalling relay and output 12, 11 LLLLL = input 5, 4, 3, 2, 1	ro	–
ERR1 ……	–	ERR1 = most recent fault signal …… = type of detected fault	ro	–

Display	DF5 PNU	Explanations	Access rights	Acceptance
ERR1 0.0Hz	–	0.0Hz = frequency on error ERR1	ro	–
ERR1 0.0A	–	0.0A = current on error ERR1	ro	–
ERR1 000.0Vdc	–	000.0Vdc = internal DC link voltage on error ERR1	ro	–
ERR1 RUN 000000H	–	RUN 000000H = operating hours on error ERR1	ro	–
ERROR COUNT 000	–	ERROR COUNT 000 = number of faults to date.	ro	–
ERR2	–	ERR2 = previous error signal, further indication as for ERR1	ro	–
ERR3	–	ERR2 = third from last error signal, further indication as for ERR1	ro	–

1) Access rights "rw[1)]" and non-permanent acceptance "online[1)]" in combination with the DF5 (display is built-in keypad).

DF5 Function menu

To call up the Function menu, press the PRG key. Here, you can configure all parameters of the DF5. To select the function numbers (Func. No.), use the ∧ and ∨ arrow keys.

F-00 F-BASE

Example: Function F-06, acceleration ramp ACC (acceleration)

F-06 ACC

With the PRG key, activate the input levels (ACC) for function F-06.

ACC 1 0010.0s

The input level indication display is identified by an ACC. 1 stands for the first acceleration time and 0010.0s is the corresponding value. Press the > arrow key 2 + n times to select the value (10 s) and change it with ∧ or ∨. To confirm the changed values, press ENTER.

When you have selected the value "1", you can access further acceleration ramp functions (such as the acceleration ramp characteristic ACC LINIE) with the ∧ arrow key.

ACC 1 0010.0s

ACC LINIE L

Change the values and settings with the >, ∧ and ∨ keys, and confirm them with ENTER.

ACC LINIE L

L = linear

To go back to the Function menu (F-.....), press PRG; to go to the Monitor menu, use MNT.

→ In the Function menu, input values and functions can be changed only at standstill (STOP function, output frequency = 0 Hz).

DEX-KEY-10 Func. No./indication	DF5 PNU	Meaning (display code DF5)	Value range	DS	Setpoint
F-00 F-BASE	A03	Base frequency	50 to 360 Hz	50	
F-01 F-MAX	A04	Maximum end frequency	50 to 360 Hz	50	
F-02 F-MIN	b82	Increased starting frequency	0.5 to 9.9 Hz	0.5	
F-03 AVR	Motor voltage stabilization				
AVR AC 000V	A82	Motor voltage • 230 V (DF5-322) • 400 V (DF5-340)	200 to 240 V, 380 to 460 V	230 400	
AVR MODE DOFF	A81	Function • ON = 00 (active) • OFF = 01 (not active) • DOFF = 02 (not active during deceleration time)	ON, OFF, DOFF	DOFF	
F-04 CONTROL	A44	*U/f* characteristic VC = 00 (linear) VP1 = 01 (quadratic)	VC, VP1	VC	

DEX-KEY-10 Func. No./indication	DF5 PNU	Meaning (display code DF5)	Value range	DS	Setpoint
F-06 ACC	Acceleration ramp				
ACC 1 0010.0s	F02	Acceleration time 1	0.1 to 3000 s	10	
ACC CHG TM	A94	Changeover from first to second acceleration time • TM = 00 (digital input 2CH) • FRE = 01 (frequency CHFr)	TM, FRE	TM	
ACC 2 0015.0s	A92	Acceleration time 2	0.1 to 3000 s	15	
ACC CHFr 000.0Hz	A95	Changeover frequency on changeover from first to second acceleration time	0 to 360 Hz	0	
ACC LINE L	A97	Acceleration characteristic • L = 00 (linear) • S = 01 (S-shaped)	L, S	L	
F-07 DEC	Deceleration ramp				
DEC 1 0010.0s	F03	Deceleration time 1	0.1 to 3000 s	10	
DEC 2 0015.0s	A93	Deceleration time 2	0.1 to 3000 s	15	
DEC CHFr 000.0Hz	A96	Changeover frequency on changeover from first to second deceleration time	0 to 360 Hz	0	
DEC LINE L	A98	Deceleration characteristic • L = 00 (linear) • S = 01 (S-shaped)	L, S	L	
F-10 RUN	b88	Motor restart after removal of the FRS signal • ZST = 00 (with 0 Hz) • fST = 01 (with current motor frequency)	ZST, fST	ZFT	
F-11 SPD	Fixed frequency				
SPD 1 000.0Hz	A21	First fixed frequency	0 to 360 Hz	0	
SPD 2 000.0Hz	A22	Second fixed frequency	0 to 360 Hz	0	
SPD 3 000.0Hz	A23	Third fixed frequency	0 to 360 Hz	0	
SPD 4 000.0Hz	A24	Fourth fixed frequency	0 to 360 Hz	0	
SPD ... 000.0Hz	A...	...th fixed frequency	0 to 360 Hz	0	
SPD 15 000.0Hz	A35	15th fixed frequency	0 to 360 Hz	0	
F-20 DCB	DC braking				
DCB SW OFF	A51	DC braking • OFF = 00 (not active) • ON = 01 (active)	OFF, ON	OFF	
DCB F 00.5Hz	A52	Activation frequency	0.5 to 10 Hz	0.5	
DCB WAIT 0.0s	A53	Waiting time	0 to 5 s	0	
DCB V 000	A54	Braking torque	0 to 100 %	0	
DCB T 00.0s	A55	Braking duration	0 to 60 s	0	
F-22 IPS	Power failure duration				
IPS UVTIME 01.0s	b02	Permissible power failure duration	0.3 to 25 s	1	
IPS WAIT 001.0s	b03	Waiting time before restart	0.3 to 100 s	1	
IPS POWR ALM	b01	Restart mode • ALM = 00 (no automatic starting after a fault signal) • ZST = 01 (with 0 Hz) • RST = 02 (synchronizing and acceleration) • FTP = 03 (synchronized and deceleration to 0 Hz)	ALM, ZST, RST, FTP	ALM	

DEX-KEY-10 Func. No./indication	DF5 PNU	Meaning (display code DF5)	Value range	DS	Setpoint
F-23 E-THM	Electronic motor protection				
E-THM CHAR CRT	b13	Overload protection characteristic • CRT = 01 (constant) • SUB = 00 (raised)	CRT, SUB	CRT	
E-THM LVL 00.00A	b12	Tripping current (I_e = rated current of the frequency inverter)	0.5 to 1.2 × I_e [A]	I_e	
F-24 OLOAD	Current limit				
OLOAD LVL 00.00A	b22	Tripping current	0.5 to 1.5 × I_e [A]	1.25 × I_e	
OLOAD CONST 01.0	b23	Time constant	0.1 to 30 Hz/s	1	
OLOAD MODE	b21	Motor current limitation • OFF = 00 (not active) • ON = 01 (active) • CRT = 02 (not active during acceleration)	OFF, ON, CRT	ON	
F-25 S-LOCK	b31	Parameter protection • MD0 = 00 (with SFT digital input, all functions inhibited) • MD1 = 01 (with SFT digital input, all functions inhibited except PNU F01) • MD2 = 02 (without SFT digital input, all functions inhibited) • MD3 = 03 (without SFT digital input, all functions inhibited except PNU F01)	MD0, MD1, MD2, MD3	MD1	
F-26 LIMIT	Frequency limit values				
LIMIT H 000.0Hz	A61	Maximum operating frequency	0 to 360 Hz	0	
LIMIT L 000.0Hz	A62	Minimum operating frequency	0 to 360 Hz	0	
F-27 JUMP	Frequency jump				
JUMP F1 000.0Hz	A63	First frequency jump	0 to 360 Hz	0	
JUMP F2 000.0Hz	A65	Second frequency jump	0 to 360 Hz	0	
JUMP F3 000.0Hz	A67	Third frequency jump	0 to 360 Hz	0	
JUMP W1 00.5Hz	A64	Jump width of the 1st frequency jump	0 to 10 Hz	0	
JUMP W2 00.5Hz	A66	Jump width of the 2nd frequency jump	0 to 10 Hz	0	
JUMP W3 00.5Hz	A68	Jump width of the 3rd frequency jump	0 to 10 Hz	0	
F-28 STOP-SW	b87	STOP key • ON = 00 (active) • OFF = 01 (not active on control through FWD/REV digital inputs)	ON, OFF	ON	
F-31 IN	Frequency initialization				
IN EXS 000.0Hz	A11	Frequency on minimum setpoint value	0 to 360 Hz	0	
IN EXE 000.0Hz	A12	Frequency on maximum setpoint value	0 to 360 Hz	0	
IN EX%S 000%	A13	Minimum setpoint value in %	0 to 100 %	0	
IN EX%E 000%	A14	Minimum setpoint value in %	0 to 100 %	0	
IN LEVEL 0Hz	A15	Conditions for start frequency • EXS = 00 (with value PNU A11) • 0Hz = 01 (with 0 Hz)	EXS, 0Hz	0 Hz	
IN F-SAMP 8	A16	Filter for the time constant of the analog setpoint value input.	1 to 8	8	
F-32 ARV	Frequency signal, output FA2				

DEX-KEY-10 Func. No./indication	DF5 PNU	Meaning (display code DF5)	Value range	DS	Setpoint
ARV ACC 000.0Hz	C42	In the acceleration ramp	0 to 360 Hz	0	
ARV DEC 000.0Hz	C43	In the deceleration ramp	0 to 360 Hz	0	
F-33 OV	Overload signal				
OV LOAD 00.0A	C41	Threshold for signal to digital output 11 or 12	0 to 2 × I_e [A]	I_e	
OV PID 003.0%	C44	PID controller deviation	0 to 100 %	3	
F-34 IN-TM	Initialization of the digital inputs				
IN-TM 1 FW	C01	Function of digital input • FW = 00 (FWD, forward operation) • RV = 01 (REV, reverse operation) • CF1 = 02 (FF1, fixed frequency input 1) • CF2 = 03 (FF2, fixed frequency input 2) • CF3 = 04 (FF3, fixed frequency input 3) • CF4 = 05 (FF4, fixed frequency input 4) • JG = 06 (JOG, jog mode) • 2CH = 09 (second time ramp) • FRS = 11 (controller inhibit) • EXT = 12 (external fault signal) • USP = 13 (restart inhibit) • SFT = 15 (parameter protection) • AT = 16 (analog input OI) • RS = 18 (RST, reset) • PTC = 19 (PTC thermistor, only permissible at terminal 5)	FW, RV, CF1, CF2, CF3, CF4, JG, 2CH, FRS, EXT, UPS, SFT, AT, RS, PTC Note: Functions can not be assigned more than once.	FW	
IN-TM 2 RV	C02			RV	
IN-TM 3 CF1	C03			CF1	
IN-TM 4 CF2	C04			CF2	
IN-TM 5 RS	C05			RS	
IN-TM O/C-1 NO	C11	Configuration of the digital inputs • NO = 00 (active at +24 V) • NC = 01 (active at 0 V)	NO, NC	NO	
IN-TM O/C-2 NO	C12				
IN-TM O/C-3 NO	C13				
IN-TM O/C-4 NO	C14				
IN-TM O/C-5 NO	C15				
F-35 OUT-TM	Initialization of the digital outputs				
OUT-TM 1 FA1	C21	Function of digital output • RUN = 00 (Run signal) • FA1 = 01 (frequency reached) • FA2 = 02 (frequency exceeded) • OL = 03 (overload signal) • OD = 04 (PID controller deviation) • AL = 05 (fault signal)	RUN, FA1, FA2, OL, OD, AL	FA1	
OUT-TM 2 RUN	C22			RUN	
OUT-TM O/C-A NC	C33	Relay (changeover contact) • NO = 00 (make contact K11-K12) • NC = 01 (break contact K11-K14)	NO, NC	NC	
OUT-TM O/C-1 NO	C31	Configuration of the digital outputs • NO = 00 (make contact) • NC = 01 (break contact)	NO, NC	NO	
OUT-TM O/C-2 NO	C32				
F-36 CARRIER	b83	Pulse frequency	0.5 to 16 Hz	5	
F-37 MONITOR	C23	Indication through FM output • A-F = 00 (analog, frequency) • A = 01 (analog, motor current) • D-F (digital, frequency)	A-F, A, D-F	A-F	

DEX-KEY-10 Func. No./indication	DF5 PNU	Meaning (display code DF5)	Value range	DS	Setpoint
F-38 INIT	Initialization				
INIT SEL EUR	b85	Software Initialization EUR = 01 Note: Other settings are not permissible with the DF5	JPN, EUR, USA, SP1, SP2, SP3	EUR	
INIT DEBG OFF	C91	Reserved (display fault) OFF = 00 Caution: Do not change settings!	ON, OFF	OFF	
INIT DOPE FWD	F04	Direction of rotation • FWD = 00 • REV = 01	FWD, REV	FWD	
INIT MODE TRP	b84	Intialization mode • TRP = 00 (clear fault register) • DATA = 01 (activate default settings)	TRP, DATA	TRP	
F-43 PID	PID control				
PID SW OFF	A71	PID control • OFF = 00 (not active) • ON = 01 (active)	ON, OFF	OFF	
PID P 1.0	A72	P component	0.2 to 5.0	1.0	
PID I 001.0s	A73	I component (T_i)	0.0 to 150 s	1.0	
PID D 000.0	A74	D component (T_d)	0.0 to 100 s	0.0	
PID CONV 01.00	A75	Factor for indication of setpoint or actual value	0.01 to 99.99	1.00	
PID INPT CUR	A76	Analog actual value input • CUR = 00 (OI: 4 to 20 mA) • VOL = 01 (O: 0 to 10 V)	CUR, VOL	CUR	

RA-SP speed control unit

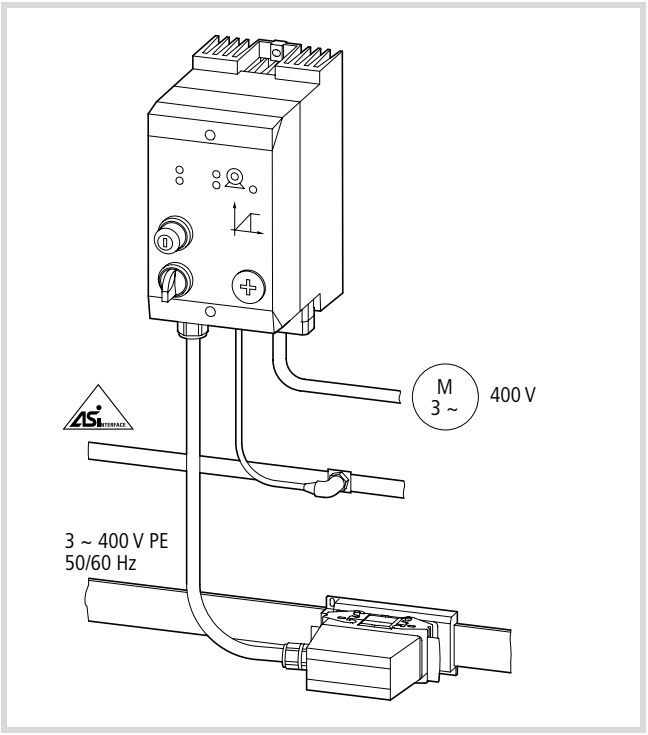


Figure 7 : RA-SP speed control unit

The RA-SP speed control unit is part of the Rapid Link switchgear and installation system. It contains a power module with the associated control section and is based on the DF5 series frequency inverters.

By default, the RA-SP is set up for direct operation within the Rapid Link system without additional parameterization:

- Acceleration time = 10 s
- Deceleration time = 10 s
- PTC monitoring activated
- Frequency setpoint 1 = 30 Hz
- Frequency setpoint 2 = 40 Hz
- Frequency setpoint 3 = 50 Hz
- Setpoint potentiometer n_0 (under the PG coupling), about 5 Hz

The RA-SP does not have a built-in keypad. Parameters can be changed only with the DEX-KEY-10 keypad, which is connected through the serial RS 422 port under the PG coupling.

→ The parameters and functions of the speed control unit are described in manual AWB2190-1430.

RA-SP Monitor menu

→ The following table shows only the parameters, display values and functions that can be used with the RA-SP. All other parameters available on the keypad, which are not described here, have no effect on the RA-SP.

To call up the Monitor menu, press the MNT key (→ section "DF5 Monitor menu", page 17). Depending on the parameter, inputs can be activated in one of two ways:

- online: Direct activation of the input value;
- STOP: Input possible only at standstill (STOP function).

Confirm parameter changes with the ENTER key.

Display	Explanations	Access rights	Acceptance
TM 005.0F 0.0Hz	TM = terminal – setpoint value through spindle potentiometer n_0 005.0 = frequency setpoint F = Enable forward operation/R = Enable reverse operation 0.0Hz = frequency actual value	ro	–
FS 000.0F 0.0Hz	FS = frequency setpoint through DEX-KEY-10 keypad. Indication only on activation (F-SET-SELECT REM, →"F-SET-SELECT TRM").	rw	online
1S 000.0F 0.0Hz	1S to 3S = fixed frequency 1 to 3 setpoint value on operation through AS interface.	ro	–
ACC1 0010.0S	ACC1 = acceleration time 1, from 0 Hz to the end frequency 0010.0S = 10 s (default).	rw	online
ACC2 0015.0S	ACC2 = acceleration time 2, from 0 Hz to the end frequency. Indication only on activation (→"F-06 ACC", page 26). 0015.0S = 15 s (default).	rw	online
DEC1 0010.0S	DEC1 = deceleration time 1, from the end frequency to 0 Hz 0010.0S = 10 s (default).	rw	online
DEC2 0015.0S	DEC2 = deceleration time 2, from the end frequency to 0 Hz. Indication only on activation (→"F-06 ACC", page 26). 0015.0S = 15 s (default).	rw	online
F-SET-SELECT TRM	F-SET-SELECT = frequency setting selection through: • TRM = terminal – spindle potentiometer n_0, • REM = remote operator – DEX-KEY-10 keypad; independent of the position of keyswitch AUTO-0-HAND and selector switch L-0-R	rw	STOP

Display	Explanations	Access rights	Acceptance
F/R-SELECT TRM	F/R-SELECT = enable with forward/reverse operation: • TRM = terminal – L-0-R selector switch or AS interface, • REM = remote operator – DEX-KEY-10 keypad; independent of the position of keyswitch AUTO-0-HAND and selector switch L-0-R.	rw	STOP
/Hz01.0 0.00	/Hz01.0 = output frequency [Hz], factor (0.1 to 99.9) 0.00 = display value (output frequency × factor)	rw	online
Im 0.0A 0.0%	Im 0.0A = motor current 0.0% = display value in percent of rated current	ro	–
I0 00.00A	I0 = magnetization current 00.00A = matching for overload protection and display value Im	rw	online
V-Boost code‹11›	V-Boost = voltage boost (→"F-04 CONTROL", page 26) code‹11› = manual voltage boost: 11 % of maximum output voltage	rw	online
V-Boost F 10.0%	V-Boost F = voltage boost, final value frequency (→"F-04 CONTROL", page 26) 10.0% = manual frequency value: 10 % of the transition frequency	rw	online
V-Boost Mode 0	V-Boost Mode = voltage boost, characteristic (→"F-04 CONTROL", page 26) • 0 = manual boost • 1 = automatic boost	rw	STOP
V-Gain 100%	V-Gain = output voltage (→"F-03 AVR", page 26 and "F-04 CONTROL", page 26) 100% = 50 to 100 % of mains input voltage	rw	STOP
TERM LLL LLLLL	TERM = terminal – signal state of internal control signal inputs • H = High – input/output actuated, • L = Low – input/output not actuated LLL = fault signal and internal signals HLLLL = PTC (function activated) HLLLH = PTC, switch positions: HAND and R HLLHL = PTC, switch positions: HAND and L HLHLL = PTC, switch position: AUTO; AS interface: Q2 = 1 HHLLL = PTC, switch position: AUTO; AS interface: Q3 = 1 HHHLL = PTC, switch position: AUTO; AS-Interface: Q2 = 1 and Q3 = 1	ro	–
ERR1	ERR1 = most recent fault signal ..... = type of detected fault	ro	–
ERR1 0.0Hz	0.0Hz = frequency on error ERR1	ro	–
ERR1 0.0A	0.0A = current on error ERR1	ro	–
ERR1 000.0Vdc	000.0Vdc = internal DC link voltage on error ERR1	ro	–
ERR1 RUN 000000H	RUN 000000H = operating hours on error ERR1	ro	–
ERROR COUNT 000	ERROR COUNT 000 = number of faults to date.	ro	–
ERR2	ERR2 = previous fault signal, further indication as for ERR1	ro	–
ERR3	ERR3 = third from last fault signal; further indication as for ERR1	ro	–

RA-SP Function menu

→ The following table shows only the parameters, display values and functions that can be used with the RA-SP. All other parameters available in the keypad, which are not described here, have no effect on the RA-SP.

To call up the Function menu, press the PRG key (→ section "DF5 Function menu", page 19).

To go back to the Function menu (F-.....), press PRG; to go to the Monitor menu, use MNT.

→ In the Function menu, input values and functions can be changed only at standstill (STOP function, output frequency = 0 Hz).

DEX-KEY-10 Func. No./indication	RA-SP PNU	Function	Value range	DS	Setpoint
F-00 F-BASE	A03	Base frequency	50 to 360 Hz	50	
F01 F-MAX	A04	End frequency	50 to 360 Hz	50	
F-03 AVR	Motor voltage stabilization				
AVR AC 400V	A82	Motor voltage rated value 400 V	380, 400, 415, 440, 460	400	
AVR MODE DOFF	A81	Function ON = active OFF = not active DOFF = not active during deceleration time	ON, OFF, DOFF	DOFF	
F-04 CONTROL	A44	*U/f* characteristic: • VC = linear • VP1 = quadratic	VC, VP1	VC	
F-06 ACC	Acceleration ramp				
ACC 1 0010.0s	F02	Acceleration time 1	0.1 to 3000 s	10	
ACC CHG TM	A94	Changeover from first to second acceleration time FRE = activate frequency CHFr	TM, FRE	TM	
ACC 2 0015.0s	A92	Acceleration time 2	0.1 to 3000 s	15	
ACC CHFr 000.0Hz	A95	Changeover frequency on changeover from first to second acceleration time	0 to 360 Hz	0	
ACC LINE L	A97	Acceleration characteristic • L = linear • S = S-shaped	L, S	L	
F-07 DEC	Deceleration ramp				
DEC 1 0010.0s	F03	Deceleration time 1	0.1 to 3000 s	10	
DEC 2 0015.0s	A93	Deceleration time 2	0.1 to 3000 s	15	
DEC CHFr 000.0Hz	A96	Changeover frequency on changeover from first to second deceleration time	0 to 360 Hz	0	
DEC LINE L	A98	Deceleration characteristic • L = linear • S = S-shaped	L, S	L	
F-11 SPD	Fixed frequency				
SPD 1 000.0Hz	A21	First fixed frequency	0 to 360 Hz	30	
SPD 2 000.0Hz	A22	Second fixed frequency	0 to 360 Hz	40	
SPD 3 000.0Hz	A23	Third fixed frequency	0 to 360 Hz	50	
F-20 DCB	DC braking				
DCB SW OFF	A51	DC braking • OFF = not active • ON = active	OFF, ON	OFF	
DCB F 00.5Hz	A52	Activation frequency	0.5 to 10 Hz	0.5	
DCB WAIT 0.0s	A53	Waiting time	0 to 5 s	0	
DCB V 000	A54	Braking torque	0 to 100 %	0	
DCB T 00.0s	A55	Braking duration	0 to 60 s	0	
F-22 IPS	Power failure duration				
IPS UVTIME 01.0s	b02	Permissible power failure duration	0.3 to 25 s	1	
IPS WAIT 001.0s	b03	Waiting time before restart	0.3 to 100 s	1	

DEX-KEY-10 Func. No./indication	RA-SP PNU	Function	Value range	DS	Setpoint
IPS POWR ALM	b01	Restart mode • ALM = no automatic starting after a fault signal • ZST = with 0 Hz • RST = synchronizing and acceleration • FTP = synchronized and deceleration to 0 Hz	ALM, ZST, RST, FTP	ALM	
F-23 E-THM	Electronic motor protection				
E-THM CHAR CRT	b13	Overload protection characteristic • CRT = constant • SUB = raised	CRT, SUB	CRT	
E-THM LVL 00.00A	b12	Tripping current (I_e = rated current of speed control unit)	0.5 to 1.2 × I_e [A]	I_e	
F-24 OLOAD	Current limit				
OLOAD LVL 00.00A	b22	Tripping current	0.5 to 1.5 × I_e [A]	1.25 × I_e	
OLOAD CONST 01.0	b23	Time constant	0.1 to 30 Hz/s	1	
OLOAD MODE	b21	Motor current limitation • OFF = not active • ON = active • CRT = not active during acceleration	OFF, ON, CRT	ON	
F-25 S-LOOK	b31	Parameter protection • MD0, MD1 = no parameter inhibit • MD2 = all functions inhibited • MD3 = all functions inhibited except PNU F01	MD0, MD1, MD2, MD3	MD1	
F-26 LIMIT	Frequency limit values				
LIMIT L 000.0Hz	A62	Minimum operating frequency	0 to 360 Hz	0	
LIMIT H 000.0Hz	A61	Maximum operating frequency	0 to 360 Hz	0	
F-34 IN-TM	Initialization of the internal digital inputs (only for default settings)				
IN-TM 1 FW	C01	AS interface Q0 = 1 FW = FWD, forward operation	Note: Do not change!	FW	–[1]
IN-TM 2 RV	C02	AS interface Q1 = 1 RV = REV, reverse operation		RV	–[1]
IN-TM 3 CF1	C03	AS interface Q2 = 1 CF1 = fixed frequency FF1		CF1	–[1]
IN-TM 4 CF2	C04	AS interface Q3 = 1 CF2 = fixed frequency FF2		CF2	–[1]
IN-TM 5 PTC	C05	PTC = PTC thermistor input		PTC	–[1]
F-35 OUT-TM	Initialization of the internal digital outputs (only for default settings)				
OUT-TM 0/C-A NC	C33	AS interface I1 = 0 Fault message	Note: Do not change!	NC	–[1]
F-36 CARRIER	b83	Pulse frequency	0.5 to 16 kHz	5	–[1]

1) Only for testing the default settings

DV5 vector frequency inverters

→ For a description of the parameters, see manual AWB8230-1414.

DV5 Monitor menu

To call up the Monitor menu, press the MNT key (→ section "DF5 Monitor menu", page 17). Depending on the parameter, inputs can be activated in one of two ways:

- online: Direct activation of the input value;
- STOP: Input possible only at standstill (STOP function).

Confirm parameter changes with the ENTER key.

Display	Explanations	Access rights	Acceptance
TM 000.0F 0.0Hz	TM = setpoint value through control signal terminals (O/OI) 000.0 = frequency setpoint F = enable forward operation, R = enable reverse operation 0.0Hz = frequency actual value	ro	–
TMP000.0F 0.0Hz	TMP = setpoint value through control signal terminal (O/OI) with active PID controller. Indication only on activation (→"F-43 PID", page 35).	ro	–
FS 000.0F 0.0Hz	FS = frequency setpoint selection through DEX-KEY-10 keypad. Indication only on activation (F-SET-SELECT REM, →"F-SET-SELECT TRM", page 28).	rw	online
FSP000.0F 0.0Hz	FSP = frequency setpoint through DEX-KEY-10 keypad with active PID controller. Indication only on activation (→"F-43 PID", page 35 and F-SET-SELECT REM, →"F-SET-SELECT TRM", page 28).	rw	online
2FS 000.0F 0.0Hz	2FS = frequency setpoint through DEX-KEY-10 keypad for parameter set 2. Indication only on activation (F-SET-SELECT REM, →"F-SET-SELECT TRM", page 28 and SET input).	rw	online
VR 000.0F 0.0Hz	VR = setpoint selection through built-in variable resistor. Indication only on activation (F-SET-SELECT VR, →"F-SET-SELECT TRM", page 28).	ro	–
VRP000.0F 0.0Hz	VR = setpoint selection through built-in variable resistor with active PID controller. Indication only on activation (→"F-43 PID", page 35 and F-SET-SELECT VR, →"F-SET-SELECT TRM", page 28).	ro	–
1S 000.0F 0.0Hz	1S to 15S = fixed frequency 1 to 15 setpoint value. Indication only on activation through control signal terminals.	ro	–
1P 000.0F 0.0Hz	1P to 15P = fixed frequency 1 to 15 setpoint value with active PID controller. Indication only on activation through control signal terminals (→"F-43 PID", page 35).	ro	–
ACC 0010.0S	ACC = acceleration time 1, from 0 Hz to the end frequency 0010.0S = 10 s (default).	rw	online
2ACC 0010.0S	ACC2 = acceleration time 1 in parameter set 2. Indication only on activation (SET input). Acceleration time, from 0 Hz to the end frequency. 0010.0S = 10 s (default).	rw	online
DEC 0010.0S	DEC = deceleration time, from the end frequency to 0 Hz 0010.0S = 10 s (default).	rw	online
2DEC 0010.0S	DEC2 = deceleration time 1 in the second parameter set. Indication only on activation (SET input). Deceleration time, from the end frequency to 0 Hz 0010.0S = 10 s (default).	rw	online
F-SET-SELECT TRM	F-SET-SELECT = frequency setting selection through: • TRM = control signal terminals (O/OI), • REM = remote operator (DEX-KEY-10 keypad), • VR = variable resistance (potentiometer on DV5 keypad)	rw	STOP
F/R-SELECT TRM	F/R-SELECT = Enable with forward/reverse operation through: • TRM = terminals, • REM = remote operator (DEX-KEY-10 keypad).	rw	STOP
/Hz01.0 0.00	/Hz01.0 = output frequency [Hz], factor (0.1 to 99.9) 0.00 = display value (output frequency × factor)	rw	online

Display	Explanations	Access rights	Acceptance
Im 0.0A 0.0%	Im 0.0A = motor current 0.0% = display value in percent of rated current	ro	–
V-Boost code 11	V-Boost = voltage boost (→"F-04 CONTROL", page 30) in parameter set 2. Indication only on activation (SET input). code 11 = manual boost: 11 % of maximum output voltage	rw	online
2V-Boost code 11	2V-Boost = voltage boost (→"F-04 CONTROL", page 30) code 11 = manual boost: 11 % of maximum output voltage	rw	online
V-Boost F 10.0%	V-Boost F = voltage boost, final value frequency (→"F-04 CONTROL", page 30) 10.0% = manual frequency value: 10 % of the transition frequency	rw	online
2V-Boost F 10.0%	2V-Boost F = voltage boost, final value frequency (→"F-04 CONTROL", page 30) in parameter set 2. Indication only on activation (SET input). 10.0% = manual frequency value: 10 % of the transition frequency	rw	online
V-Boost Mode 0	V-Boost Mode = voltage boost, characteristic (→"F-04 CONTROL", page 30) • 0 = manual boost • 1 = automatic boost	rw	STOP
2V-Boost Mode 0	2V-Boost Mode = voltage boost, characteristic (→"F-04 CONTROL", page 30) in parameter set 2. Indication only on activation (SET input). • 0 = manual boost • 1 = automatic boost	rw	STOP
V-Gain 100%	V-Gain = output voltage (→"F-03 AVR", page 30 and →"F-04 CONTROL", page 30) 100% = 50 to 100 % of mains input voltage	rw	STOP
Jogging 1.00Hz	Jogging = jog mode 1.00Hz = frequency in jog mode.	rw	online
Jog Mode 0	Jog Mode = Stop in jog mode • 0 = unguided deceleration • 1 = braking with deceleration ramp • 2 = DC braking	rw	STOP
ADJ-0 ……	ADJ-0 = analog adjustment – compensation for the analog voltage input, terminal O. …… = setting range (0 to 255). Compensation required on commissioning.	rw	online
ADJ-0I ……	ADJ-0I = analog adjustment – compensation for the analog current input, terminal OI. …… = setting range (0 to 255). Compensation required on commissioning.	rw	online
PANEL d01	PANEL = panel display selection (display value for DE5-KEY-R03). • d01 = actual frequency [Hz] • d02 = motor current (I_0) [A] • d03 = direction of rotation (r, F) • d04 = PID actual value • d05 = status of digital inputs (1 to 5) • d06 = status of digital outputs (fault signal, 11, 12) • d07 = display value [Hz] (output frequency × factor)	ro rw[1)]	– online[1)]
TERM LLL LLLLLL	TERM = terminal – signal state of control signal terminals • H = High – input/output actuated, • L = Low – input/output not actuated LLL = fault signal and output 12, 11 LLLLLL = input 6, 5, 4, 3, 2, 1	ro	–
RUN 000000H	RUN = operating duration (enable FWD/REV) 000000H = total operating hours	ro	–
ERR1 ……	ERR1 = most recent fault signal …… = type of detected fault	ro	–
ERR1 0.0Hz	0.0Hz = frequency on error ERR1	ro	–
ERR1 0.0A	0.0A = current on error ERR1	ro	–

Display	Explanations	Access rights	Acceptance
ERR1 000.0Vdc	000.0Vdc = internal DC link voltage on error ERR1	ro	–
ERR1 RUN 000000H	RUN 000000H = operating hours on error ERR1	ro	–
ERROR COUNT 000	ERROR COUNT 000 = number of faults to date.	ro	–
ERR2	ERR2 = previous fault signal, further indication as for ERR1	ro	–
ERR3	ERR2 = third from last fault signal, further indication as for ERR1	ro	–

1) Access rights "rw[1)]" and non-permanent acceptance "online[1)]" in combination with the DV5 (display is built-in keypad).

DV5 Function menu

To call up the Function menu and the input level, press the PRG key (→ section "DF5 Function menu", page 19).

To go back to the Function menu (F-.....), press PRG; to go to the Monitor menu, use MNT.

→ In the Function menu, input values and functions can be changed only at standstill (STOP function, output frequency = 0 Hz).

→ The function numbers, which are identified by a leading "2", are only displayed when a digital input is configured and actuated with "SET" (changeover to parameter set 2).

DEX-KEY-10 Func. No./indication	DV5 PNU	Meaning (display code DV5)	Value range	DS	Setpoint
F-00 F-BASE	Base frequencies				
F-BASE 050Hz	A03	Base frequency	50 to 360 Hz	50	
2F-BASE 050Hz	A203				
F01 F-MAX	End frequencies				
F-MAX 050Hz	A04	End frequency	50 to 360 Hz	50	
2F-MAX 050Hz	A204				
F02 Fmin	b82	Starting frequency	0.5 to 9.9 Hz	0.5	
F-03 AVR	Motor voltage stabilization				
AVR AC 000V	A82	Motor voltage • 230 V (DV5-322) • 400 V (DV5-340)	200 to 240 380 to 460	230 400	
AVR MODE DOFF	A81	Function • ON = 00 (active) • OFF = 01 (not active) • DOFF = 02 (not active during deceleration time)	ON, OFF, DOFF	DOFF	
F-04 CONTROL	Voltage/frequency characteristic				
CONTROL SLV	A44	• VC = 00 (linear) • VP1 = 01 (quadratic) • SLV = 02 (sensorless vector)	VC, VP1, SLV	SLV control	
2CONTROL SLV	A244				
F-05 AUX	Autotuning mode				
AUX AUTO NOR	H01	• NOR = 00 (not active) • AUT = 01 (during motor operation) • NRT = 02 (at motor standstill)	NOR, AUT, NRT	NOR	
AUX DATA NOR	H02	Selection of motor data • NOR = 01 (standard motor) • AUT = 02 (autotuning data)	NOR, AUT	NOR	
2AUX DATA NOR	H202				
AUX K ....kW	H03	Motor shaft output	0.2 to 7.5 kW	Depending on rating	
2AUXK ....kW	H203				

DEX-KEY-10 Func. No./indication	DV5 PNU	Meaning (display code DV5)	Value range	DS	Setpoint
AUX P 4P	H04	Number of motor poles	2, 4, 6, 8	4	
2AUXP 4P	H204				
AUX R1 00.000	H20	Motor constant R1	0 to 65.535	Depending on rating	
2AUXR1 00.000	H220				
AUX R2 00.000	H21	Motor constant R2	0 to 65.535		
2AUXR2 00.000	H221				
AUX L 000.00mH	H22	Motor constant L	0 to 65.535 mH		
2AUXL 000.00mH	H222				
AUX L 000.00mH	H23	Motor constant L	0 to 65.535 mH		
2AUXL 000.00mH	H223				
AUX J 0000.0	H24	Motor constant J	1 to 1000.0		
2AUXJ 0000.0	H224				
AUX KP 20	H05	Motor constant J	0 to 99	20	
2AUXKP 20	H205				
AUX KCD 100	H06	Motor stabilization constant	0 to 255	100	
2AUXKCD 100	H206				
F-06 ACC	Acceleration ramp				
ACC 1 0010.0s	F02	Acceleration time 1	0.1 to 3000 s	10	
2ACC1 0010.0s	F202				
ACC CHG TM	A94	Changeover from first to second acceleration time • TM = 00 (control signal terminal 2CH) • FRE = 01 (frequency CHFr)	TM, FRE	TM	
2ACCCHG TM	A294				
ACC 2 0015.0s	A92	Acceleration time 2	0.1 to 3000 s	15	
2ACC2 0015.0s	A292				
ACC CHFr 000.0Hz	A95	Changeover frequency on changeover from first to second acceleration time	0 to 360 Hz	0	
2ACCCHFr 000.0Hz	A295				
ACC LINE L	A97	Acceleration characteristic • L = 00 (linear) • S = 01 (S-shaped)	L, S	L	
F-07 DEC	Deceleration ramp				
DEC 1 0010.0s	F03	Deceleration time 1	0.1 to 3000 s	10	
2DEC1 0010.0s	F203				
DEC 2 0015.0s	A93	Deceleration time 2			
2DEC2 0015.0s	A293				
DEC CHFr 000.0Hz	A96	Changeover frequency on changeover from first to second deceleration time	0 to 360 Hz	0	
2DECCHFr 000.0Hz	A296				
DEC LINE L	A98	Deceleration characteristic • L = 00 (linear) • S = 01 (S-shaped)	L, S	L	
F-10 RUN	Start/stop conditions				
RUN FRS ZST	b88	Motor restart after removal of the FRS signal • ZST = 00 (with 0 Hz) • fST = 01 (with current motor frequency)	ZST, fST	ZFT	

DEX-KEY-10 Func. No./indication	DV5 PNU	Meaning (display code DV5)	Value range	DS	Setpoint
RUN STP DEC	b91	Motor stop DEC = 00 (with deceleration ramp) FRS= 01 (unguided deceleration – free run stop)	DEC, FRS	DEC	
F-11 SPD	Frequency setpoint/fixed frequency				
SPD FS 000.0Hz	A20	Frequency setpoint, activated with PNU A01 = 02	0 to 360 Hz	0	
SPD 2FS 000.0Hz	A220				
SPD 1 000.0Hz	A21	First fixed frequency			
SPD 2 000.0Hz	A22	Second fixed frequency			
SPD 3 000.0Hz	A23	Third fixed frequency			
SPD 4 000.0Hz	A24	Fourth fixed frequency			
SPD … 000.0Hz	A...	...th fixed frequency			
SPD 15 000.0Hz	A35	15th fixed frequency			
F-20 DCB	DC braking				
DCB SW OFF	A51	DC braking • OFF = 00 (not active) • ON = 01 (active)	OFF, ON	OFF	
DCB F 00.5Hz	A52	Activation frequency	0.5 to 10 Hz	0.5	
DCB WAIT 0.0s	A53	Waiting time	0 to 5 s	0	
DCB V 000	A54	Braking torque	0 to 100 %	0	
DCB T 00.0s	A55	Braking duration	0 to 60 s	0	
F-21 BRD-%ED	b90	Permissible relative percentage duty factor of the built-in braking transistor	0 to 100 %	0	
F-22 IPS	Power failure duration				
IPS UVTIME 01.0s	b02	Permissible power failure duration	0.3 to 25 s	1	
IPS WAIT 001.0s	b03	Waiting time before restart	0.3 to 100 s	1	
IPS POWR ALM	b01	Restart mode • ALM = 00 (no automatic starting after a fault signal) • ZST = 01 (with 0 Hz) • RST = 02 (synchronizing and acceleration) • FTP = 03 (synchronized and deceleration to 0 Hz)	ALM, ZST, RST, FTP	ALM	
F-23 E-THM	Electronic motor protection				
E-THM CHAR CRT	b13	Overload protection characteristic • CRT = 01 (constant) • SUB = 00 (raised)	CRT, SUB	CRT	
2E-THMCHAR CRT	b213				
E-THM LVL 00.00A	b12	Tripping current (I_e = rated current of the frequency inverter)	0.5 to 1.2 × I_e [A]	I_e	
2E-THMLVL 00.00A	b212				
F-24 OLOAD	Current limit				
OLOAD LVL 00.00A	b22	Tripping current	0.5 to 1.5 × I_e [A]	1.25 × I_e	
OLOAD CONST 01.0	b23	Time constant	0.1 to 30 Hz/s	1	
OLOAD MODE ON	b21	Motor current limitation • OFF = 00 (not active) • ON = 01 (active) • CRT = 02 (not active during acceleration)	OFF, ON, CRT	ON	

DEX-KEY-10 Func. No./indication	DV5 PNU	Meaning (display code DV5)	Value range	DS	Setpoint
F-25 S-LOOK	b31	Parameter protection • MD0 = 00 (with SFT, all functions inhibited) • MD1 = 01 (with SFT, all functions inhibited except PNU F01) • MD2 = 02 (without SFT, all functions inhibited) • MD3 = 03 (without SFT, all function inhibited except PNU F01)	MD0, MD1, MD2, MD3	MD1	
F-26 LIMIT	Frequency limit values				
LIMIT L 000.0Hz	A62	Minimum operating frequency	0 to 360 Hz	0	
LIMIT H 000.0Hz	A61	Maximum operating frequency			
F-27 JUMP	Frequency jump				
JUMP F1 000.0Hz	A63	First frequency jump	0 to 360 Hz	0	
JUMP F2 000.0Hz	A65	Second frequency jump			
JUMP F3 000.0Hz	A67	Third frequency jump			
JUMP W1 00.5Hz	A64	Jump width of the 1st frequency jump	0 to 10 Hz	0.5	
JUMP W2 00.5Hz	A66	Jump width of the 2nd frequency jump			
JUMP W3 00.5Hz	A68	Jump width of the 3rd frequency jump			
F-28 STOP-SW	b87	STOP key • ON = 00 (active) • OFF = 01 (not active on control through FWD/REV digital input)	ON, OFF	ON	
F-31 IN	Frequency initialization				
IN EXS 000.0Hz	A11	Frequency on minimum setpoint value	0 to 360 Hz	0	
IN EXE 000.0Hz	A12	Frequency on maximum setpoint value			
IN EX%S 000%	A13	Minimum setpoint value in %	0 to 100 %	0	
IN EX%E 000%	A14	Minimum setpoint value in %			
IN LEVEL 0Hz	A15	Conditions for start frequency • EXS = 00 (with value PNU A11) • 0Hz = 01 (with 0 Hz)	EXS, 0Hz	0 Hz	
IN F-SAMP 8	A16	Filter for the time constant of the analog setpoint value input.	1 to 8	8	
F-32 ARV	Frequency signal, output FA2				
ARV ACC 000.0Hz	C42	In the acceleration ramp	0 to 360 Hz	0	
ARV DEC 000.0Hz	C43	In the deceleration ramp			
F-33 OV	Overload signal				
OV LOAD 00.0A	C41	Threshold for signal to digital output 11 or 12	0 to 2 × I_e [A]	I_e	
OV PID 003.0%	C44	PID controller deviation	0 to 100 %	3	

DEX-KEY-10 Func. No./indication	DV5 PNU	Meaning (display code DV5)	Value range	DS	Setpoint
F-34 IN-TM	Initialization of the digital inputs				
IN-TM 1 FW	C01	Function of digital input • FW = 00 (FWD, forward operation) • RV = 01 (REV, reverse operation) • CF1 = 02 (FF1, fixed frequency input 1) • CF2 = 03 (FF2, fixed frequency input 2) • CF3 = 04 (FF3, fixed frequency input 3) • CF4 = 05 (FF4, fixed frequency input 4) • JG = 06 (JOG, jog mode) • DB = 07 (activate DC braking) • SET = 08 (activate parameter set 2) • 2CH = 09 (second time ramp) • FRS = 11 (controller inhibit) • EXT = 12 (external fault signal) • USP = 13 (restart inhibit) • SFT = 15 (parameter protection) • AT = 16 (analog input OI) • RS = 18 (RST, reset) • PTC = 19 (PTC thermistor, only permissible at terminal 5) • UP = 27 (acceleration, motor potentiometer) • DWN = 28 (deceleration, motor potentiometer)	FW, RV, CF1, CF2, CF3, CF4, JG, DB, SET,2CH, FRS, EXT, UPS, SFT, AT, RS, PTC, UP, DWN Note: Functions can not be assigned more than once.	FW	
IN-TM 2 RV	C02			RV	
IN-TM 3 CF1	C03			CF1	
IN-TM 4 CF2	C04			CF2	
IN-TM 5 RS	C05			RS	
IN-TM 6 2CH	C06			2CH	
IN-TM 0/C-1 NO	C11	Configuration of digital inputs • NO = 00 (active at +24 V) • NC = 01 (active at 0 V)	NO, NC	NO	
IN-TM 0/C-2 NO	C12				
IN-TM 0/C-3 NO	C13				
IN-TM 0/C-4 NO	C14				
IN-TM 0/C-5 NO	C15				
IN-TM 0/C-6 NO	C16				
F-35 OUT-TM	initialization of digital outputs				
OUT-TM 1 FA1	C21	Function of digital output • RUN = 00 (Run signal) • FA1 = 01 (frequency reached) • FA2 = 02 (frequency exceeded) • OL = 03 (overload signal) • OD = 04 (PID controller deviation) • AL = 05 (fault signal)	RUN, FA1, FA2, OL, OD, AL	FA1	
OUT-TM 2 RUN	C22			RUN	
OUT-TM RY AL	C24			AL	
OUT-TM 0/C-RY NC	C33	Relay (changeover contact) • NO = 00 (make contact K11-K12) • NC = 01 (break contact K11-K14)	NO, NC	NC	
OUT-TM 0/C-1 NO	C31	Configuration of the digital outputs • NO = 00 (make contact) • NC = 01 (break contact)		NO	
OUT-TM 0/C-2 NO	C32			NO	
F-36 CARRIER	b83	Pulse frequency	0.5 to 16 kHz	5	
F-37 MONITOR	C23	Indication through FM output • A-F = 00 (analog, frequency) • A = 01 (analog, motor current) • D-F (digital, frequency)	A-F, A, D-F	A-F	
F-38 INIT	Initialization				
INIT SEL EUR	b85	Software Initialization EUR = 01 Note: Other settings are not permissible with the DV5	JPN, EUR, USA, SP1, SP2, SP3	EUR	

DEX-KEY-10 Func. No./indication	DV5 PNU	Meaning (display code DV5)	Value range	DS	Setpoint
INIT DEBG OFF	C91	Reserved (display fault) OFF = 00 Caution: Do not change settings!	ON, OFF	OFF	
INIT DOPE FWD	F04	Direction of rotation • FWD = 00 • REV = 01	FWD, REV	FWD	
INIT MODE TRP	b84	Intialization mode • TRP = 00 (clear fault register) • DATA = 01 (Activate default settings)	TRP, DATA	TRP	
INIT FAN-CTL OFF	b92	Device fan control • OFF = 00 (fan always active) • ON = 01 (fan active only during motor operation)	OFF, ON	OFF	
F-43 PID	PID control				
PID SW OFF	A71	PID control • OFF = 00 (not active) • ON = 01 (active)	ON, OFF	OFF	
PID P 1.0	A72	P component	0.2 to 5.0	1.0	
PID I 001.0s	A73	I component (T_i)	0.0 to 150 s	1.0	
PID D 000.0	A74	D component (T_d)	0.0 to 100 s	0.0	
PID CONV 01.00	A75	Factor for indication of setpoint or actual value	0.01 to 99.99	1.00	
PID INPT CUR	A76	Analog actual value input: • CUR = 00 (OI: 4 to 20 mA) • VOL = 01 (O: 0 to 10 V)	CUR, VOL	CUR	
F-50 V-Boost	Voltage boost (V-Boost)				
V-Boost Mode 0	A41	• Mode 0 = manual boost • Mode 1 = automatic boost	0, 1	0	
2V-Boost Mode 0	A241				
V-Boost code 11	A42	code 11 = manual boost, 11 % of maximum output voltage	0 to 99	11	
2V-Boost code 11	A242				
V-Boost F 10.0%	A43	F 10.0% = manual frequency value, 10 % of the base frequency	0 to 50 %	10	
2V-Boost F 10.0%	A243				

Error messages (DF5, DV5, RA-SP)

The DF5 and DV5 frequency inverters show error messages on the standard display of the keypad (7-segment display, error message E...). The RA-SP speed control unit indicates them with a red LED in the motor symbol (group fault message). To acknowledge the error message:

- turn the mains power off (for about five minutes);
- on the DF5 and DV5, press the red STOP key of the built-in keypad;
- on a remotely located DEX-KEY-10 keypad or DE5-KEY-RO3 indicator unit, press the red STOP key, or,
- on the RA-SP, use the keyswitch (position 0) or a Reset command (AS interface).

⚠ **Warning!**
Risk to persons and machines: If a Start signal (FWD or REV) is present, an automatic restart takes place when the fault message is acknowledged.

The current fault signal with the associated operating data (voltage, current, operating hours, etc.) and the previous and last but two fault signals are saved within the device. You can view the fault register through the Monitor menu of the DEX-KEY-10 keypad.

The table below lists possible error messages.

DEX-KEY-10 display	DF5/DV5 fault signal		Description		DF5	DV5	RA-SP
CPU1	E11	Processor malfunction	Fault in the processor, e.g. through radio interference or excessive temperature.		✓	✓	✓
CPU2	E22						
EEPROM	E08	EEPROM fault	Program memory fault due to radio interference or power supply short circuit (P24-L) or excessive temperature.		✓	✓	✓
EXTERNAL	E12	External fault message	External fault signal through actuation of a digital input (1 to 5) configured as EXT input.		✓	✓	–
GND. Flt	E14	Earth fault	Earth fault between outputs U, V or W and earth.		✓	✓	✓
OC. Drive	E01	Overcurrent	In static operation	• Short circuit in the output or in the motor cable, • The motor is blocked, • Extreme load impulses causing high output current peaks. • Output voltage switching during operation.	✓	✓	✓
OC. Accel	E02		In the acceleration phase		✓	✓	✓
OC. Decel	E03		During the acceleration phase		✓	✓	✓
Over. C	E04		At standstill		✓	✓	✓
Over. L	E05	Overload	Disconnection through the built-in electronic overload protection		✓	✓	✓
Over. V	E07	Overvoltage	Disconnection due to overvoltage in regenerative operation.		✓	✓	✓
OV. SRC	E15		The mains voltage is above the highest permissible value. Disconnection takes place after about 100 s.		✓	✓	✓
OH FIN	E21	Overtemperature	Temperature sensor in the power section: the operating temperature has exceeded the limit value		✓	✓	✓
PTC	E35	Temperature drift in the motor circuit	Resistance value of the PTC thermistor input too high (3 kΩ ± 10 %): • Overtemperature in the motor (thermistor, themo-click) • Motor cable interrupted		✓	✓	✓
Under. V	E09	Undervoltage	Undervoltage in the internal DC link, for example through mains undervoltage or phase failure. Risks: faulty function of electronics, overheating of motor, insufficient torque.		✓	✓	✓
USP	E13	Restart inhibit	Actuation of a digital input (1 to 5) configured as USP input or intermittent interruption of the mains voltage.		✓	✓	–

Index