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MDKE10 Smart Operating Panel User Guide

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Preface

■ Introduction

Thank you for purchasing the MDKE10 series smart operating panel developed by Inovance.

The MDKE10 smart operating panel is a new-generation commissioning assistant designed for various types of AC drives (single-drive system), such as the MD520 series and MD580 series AC drives. It features LED display, parameter settings, status monitoring, and USB relay mode.

This user guide describes safety precautions, product information, installation and wiring, function and application, maintenance and repair of the MDKE10. Read through the user guide before use. Contact Inovance if you have any question during use.

■ Revision History

Date	Version	Description
May 2024	A01	- Updated "<i>Front Cover</i>" on page 1, "<i>Preface</i>" on page 1, and "<i>Fundamental Safety Instructions</i>" on page 4. - Modified the MDKE10 dimensions in "<i>1.3 Product Dimensions</i>" on page 15.
October 2023	A00	First release.

■ Access to the Guide

This guide is not delivered with the product. You can obtain the PDF version by the following methods:

- Do keyword search under Service and Support at <http://www.inovance.com>.
- Scan the QR code below to install the app, where you can search for and download manuals.



■ Warranty Disclaimer

Inovance provides warranty service within the warranty period (as specified in your order) for any fault or damage that is not caused by improper operation of the user. Maintenance will be charged after the warranty expires.

Within the warranty period, maintenance fee will be charged for the following damage:

- Damage caused by operations not following the instructions in the user guide
- Damage caused by fire, flood, or abnormal voltage
- Damage caused by unintended use of the product
- Damage caused by use beyond the specified scope of application of the product
- Damage or secondary damage caused by force majeure (natural disaster, earthquake, and lightning strike)

The maintenance is charged according to the latest Price List of Inovance. If otherwise agreed upon, the terms and conditions in the agreement shall prevail.

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Fundamental Safety Instructions

■ Safety Precautions

- This chapter presents essential safety instructions for a proper use of the equipment. Before operating the equipment, read through the guide and comprehend all the safety instructions. Failure to comply with the safety instructions may result in death, severe personal injuries, or equipment damage.
- "CAUTION", "WARNING", and "DANGER" items in the guide only indicate some of the precautions that need to be followed; they just supplement the safety precautions.
- Use this equipment according to the designated environment requirements. Damage caused by improper use is not covered by warranty.
- Inovance shall take no responsibility for any personal injuries or property damage caused by improper usage.

■ Safety Levels and Definitions



DANGER

Indicates that failure to comply with the notice will result in death or severe personal injuries.



WARNING

Indicates that failure to comply with the notice may result in death or severe personal injury.



CAUTION

Indicates that failure to comply with the notice may result in minor or moderate personal injuries or equipment damage.

■ General Safety Instructions

- Drawings in the guide are sometimes shown without covers or protective guards. Remember to install the covers or protective guards as specified first, and then perform operations in accordance with the instructions.
- The drawings in the guide are shown for illustration only and may be different from the product you purchased.
- Operators must take mechanical precautions to protect personal safety and wear protective equipment, such as anti-smashing shoes, safety clothing, safety glasses, protective gloves, and protective sleeves.

Unpacking



WARNING

- Do not install the equipment if you find damage, rust, or signs of use on the equipment or accessories upon unpacking.
- Do not install the equipment if you find water seepage or missing or damaged components upon unpacking.
- Do not install the equipment if you find the packing list does not conform to the equipment you received.



CAUTION

- Check whether the packing is intact and whether there is damage, water seepage, dampness, and deformation before unpacking.
- Unpack the package by following the unpacking sequence. Do not strike the package violently.
- Check whether there is damage, rust, or signs of bumping on the surface of the equipment and equipment accessories before unpacking.
- Check whether the package contents are consistent with the packing list before unpacking.

Storage and Transportation



WARNING

- Large-scale or heavy equipment must be transported by qualified professionals using specialized hoisting equipment. Failure to comply may result in personal injuries or equipment damage.
- Before hoisting the equipment, ensure the components such as the front cover and terminal block are secured firmly with screws. Loosely-connected components may fall off and result in personal injuries or equipment damage.
- Never stand or stay below the equipment when the equipment is being hoisted by the hoisting equipment.
- When hoisting the equipment with a steel rope, ensure the equipment is hoisted at a constant speed without suffering from vibration or shock. Do not turn the equipment over or let the equipment stay hanging in the air. Failure to comply may result in personal injuries or equipment damage.



CAUTION

- Handle the equipment with care during transportation and mind your steps to prevent personal injuries or equipment damage.
- When carrying the equipment with bare hands, hold the equipment casing firmly with care to prevent parts from falling. Failure to comply may result in personal injuries.
- Store and transport the equipment based on the storage and transportation requirements. Failure to comply will result in equipment damage.
- Avoid storing or transporting the equipment in environments with water splash, rain, direct sunlight, strong electric field, strong magnetic field, and strong vibration.
- Avoid storing the product for more than 3 months. When the product needs to be stored for an extended period, take more strict protection and necessary inspection.
- Pack the equipment strictly before transportation. Use a sealed box for long-distance transportation.
- Never transport the equipment with other equipment or materials that may harm or have negative impacts on this equipment.

Installation



DANGER

- The equipment must be operated only by professionals with electrical knowledge. Non-professionals are not allowed.



WARNING

- Read through the guide and safety instructions before installation.
- Do not install this equipment in places with strong electric or magnetic fields.
- Before installation, check that the mechanical strength of the installation site can bear the weight of the equipment. Failure to comply will result in mechanical hazards.
- Do not wear loose clothes or accessories during installation. Failure to comply may result in an electric shock.
- When installing the equipment in a closed environment (such as a cabinet or casing), use a cooling device (such as a fan or air conditioner) to cool the environment down to the required temperature. Failure to comply may result in equipment over-temperature or a fire.
- Do not retrofit the equipment.
- Do not fiddle with the bolts used to fix equipment components or the bolts marked in red.
- When the equipment is installed in a cabinet or final assembly, a fireproof enclosure providing both electrical and mechanical protections must be provided. The IP rating must meet IEC standards and local laws and regulations.
- Before installing equipments with strong electromagnetic interference, such as a transformer, install a shielding equipment for the equipment to prevent malfunction.
- Install the product on an incombustible object such as metal and do not contact or attach the product with combustible objects. Failure to comply will cause fires.



CAUTION

- Cover the top of the equipment with a piece of cloth or paper during installation. This is to prevent unwanted objects such as metal chippings, oil, and water from falling into the equipment and causing faults. After installation, remove the cloth or paper on top of the equipment to prevent over-temperature caused by poor ventilation due to blocked ventilation holes.
- Resonance may occur when the equipment operating at a constant speed executes variable speed operations. In this case, install the vibration-proof rubber under the motor frame or use the vibration suppression function to reduce resonance.

Wiring



DANGER

- Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals.
- Before wiring, disconnect all the power supplies of the equipment, and wait for at least the time designated on the equipment warning label before further operations because residual voltage still exists after power-off. Measure the direct voltage of the main circuit and ensure that the voltage is within the safety range. Failure to comply will result in an electric shock.
- Do not perform wiring, remove the equipment cover, or touch the circuit board with power ON. Failure to comply will result in an electric shock.
- Check that the equipment is grounded properly. Failure to comply will result in an electric shock.



WARNING

- Do not connect the input power supply to the output end of the equipment. Failure to comply will result in equipment damage or even a fire.
- When connecting a drive to the motor, check that the phase sequences of the drive and motor terminals are consistent to prevent reverse motor rotation.
- Cables used for wiring must meet cross sectional area and shielding requirements. The shield of the cable must be reliably grounded at one end.
- Fix the terminal screws with the tightening torque specified in the user guide. Improper tightening torque may overheat or damage the connecting part, resulting in a fire.
- After wiring is done, check that all cables are connected properly and no screws, washers or exposed cables are left inside the equipment. Failure to comply may result in electric shock or equipment damage.



CAUTION

- Follow the proper electrostatic discharge (ESD) procedure and wear an anti-static wrist strap to perform wiring. Failure to comply may result in damage to the equipment or to the internal circuit of the product.
- Use shielded twisted pairs for the control circuit. Connect the shield to the grounding terminal of the equipment for grounding purpose. Failure to comply can result in equipment malfunction.

Power-on



DANGER

- Before power-on, check that the equipment is installed properly with reliable wiring and the motor can be restarted.
- Check that the power supply meets equipment requirements before power-on to prevent equipment damage or a fire.
- Do not open the cabinet door or protective cover of the product, contact any wiring terminal of the product, or remove any part of the product at power-on. Failure to comply will result in an electric shock.



WARNING

- Perform a trial run after wiring and parameter setting to ensure the equipment operates safely. Failure to comply may result in personal injuries or equipment damage.
- Before power-on, check that the rated voltage of the equipment is consistent with that of the power supply. Failure to comply may result in a fire.
- Before power-on, check that no one is near the equipment, motor, or machine. Failure to comply may result in death or personal injury.

Operation



DANGER

- The equipment must be operated only by professionals. Failure to comply can result in death or personal injury.
- Do not touch any connecting terminals or disassemble any unit or component of the equipment during operation. Failure to comply can result in an electric shock.



WARNING

- Do not touch the equipment casing, fan, or resistor with bare hands to feel the temperature. Failure to comply may result in personal injuries.
- Prevent metal or other objects from falling into the equipment during operation. Failure to comply may result in a fire or equipment damage.

Maintenance



DANGER

- Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals.
- Do not perform maintenance with power ON. Failure to comply can result in electric shock.
- Before maintenance, disconnect all the power supplies of the equipment and wait for at least the time designated on the equipment warning label.
- When a permanent magnet motor is used, do not touch the motor terminals immediately after power-off because the motor terminals can generate induced voltage during rotation even after the equipment power supply is off. Failure to comply will result in an electric shock.



WARNING

- Perform routine and periodic inspection and maintenance on the equipment according to maintenance requirements and keep a maintenance record.

Repair



DANGER

- Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals.
- Do not repair the equipment with power ON. Failure to comply can result in electric shock.
- Before inspection and repair, disconnect all the power supplies of the equipment and wait for at least the time designated on the equipment warning label.



WARNING

- Submit the repair request according to the warranty agreement.
- When the fuse is blown or the circuit breaker or earth leakage current breaker (ELCB) trips, wait for at least the time designated on the equipment warning label before power-on or further operations. Failure to comply may result in death, personal injury or equipment damage.
- When the equipment is faulty or damaged, the troubleshooting and repair work must be performed by professionals that follow the repair instructions, with repair records kept properly.
- Replace quick-wear parts of the equipment according to the replacement instructions.
- Do not use damaged equipment. Failure to comply may result in death, personal injury, or severe equipment damage.
- After the equipment is replaced, check the wiring and set parameters again.

Disposal



WARNING

- Dispose of retired equipment in accordance with local regulations and standards. Failure to comply may result in property damage, personal injury, or even death.
- Recycle retired equipment by observing industry waste disposal standards to avoid environmental pollution.

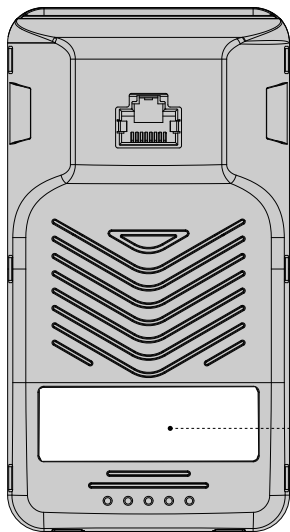
■ Safety Labels

For safe equipment operation and maintenance, comply with the safety labels on the equipment. Do not damage or remove the safety labels. See the following table for descriptions of the safety labels.

Safety Label	Description
	• Read through the safety instructions before operating the equipment. Failure to comply may result in death, personal injuries, or equipment damage. • Do not touch the terminals or remove the cover with power ON or within 10 min after power-off. Failure to comply will result in an electric shock.

1 Product Information

1.1 Nameplate



MODEL: MDKE10

S/N: 010401824H800009

Certification
mark



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1.2 Applicable AC Drive

Operating Panel model	Ordering Code	Applicable AC Drive
MDKE10	01040182	MD520
		MD580

1.3 Product Dimensions

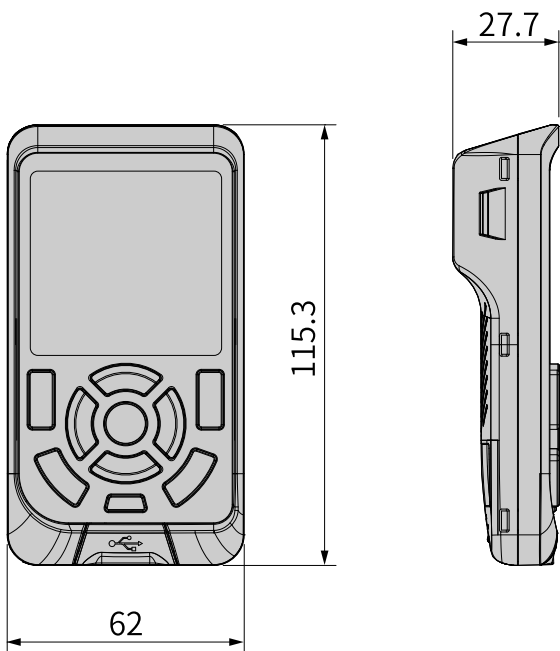
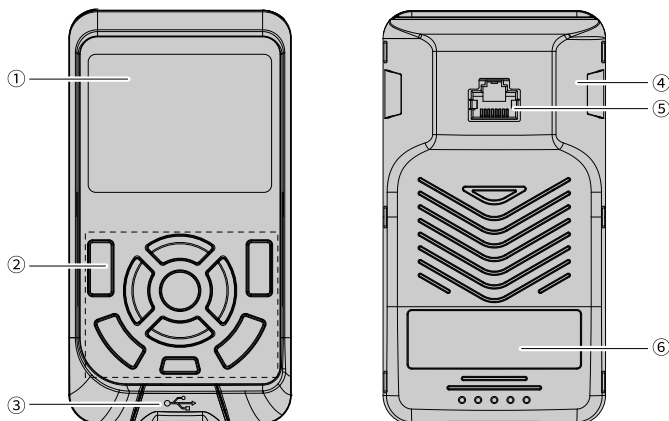


Figure 1-1 MDKE10 dimensions (Unit:mm)

1.4 Components



No.	Name	Description
①	Display	It displays parameters.
②	Key	The keys are used to enter parameters.
③	USB port	It is used to connect the MDKE10 to a PC with an USB cable for data exchange.
④	Snap-fit joint	The snap-fit joints at both sides are used to fix the MDKE10 to the base.
⑤	RJ45 port	It is used to connect the MDKE10 to the drive. The MDKE10 is mechanically connected to the drive through the snap-fit joints at both sides.
⑥	Nameplate	The nameplate displays the product model and serial number.

1.5 Technical Specifications

Type	Working Specification	Storage Specification	Transportation Specification
Temperature	-20°C to +55°C	-40°C to +70°C	-40°C to +70°C
Altitude	< 4000 m	-	-

Type	Working Specification	Storage Specification	Transportation Specification
Relative humidity	95%, without condensation		
Pollution degree	3C3 (IEC 60721-3-3, IEC 60721-3-2, and IEC 60721-1-3-1)		
Vibration	61800-5-1 ed 2 EN 60082-2-6 test Fc (1g)	-	2M3 (according to EN 60082-2-6)
Shock	3M4 (according to EN 60062-2-27)	-	2M2 (according to EN 60082-2-27)
Free drop	IEC-60068-2-32 Drop height: 1 meter	-	-
IP rating	IP20 for the operating panel		
EMC	IEC 61800-3		
Material	Disposal: All the materials of the operating panel are recyclable to protect the environment and conserve resources. Follow recycling instructions and disposal methods specified in international and local regulations.		

2 Installation and Wiring

2.1 Connecting the MDKE10 to the AC Drive

Note

The MDKE10 is suitable for the MD520 and MD580 AC drives. This user guide takes the MD580 as an example to describe the installation and wiring of the MDKE10. Refer to the corresponding user guide for details if the MDKE10 is installed on other AC drives.

Locate the external operating panel port on the AC drive and connect the port to the RJ45 port on the back of the MDKE10 by using a standard network cable (optional). To locate the external operating panel port on the MD580, remove the MDKE10 operating panel.

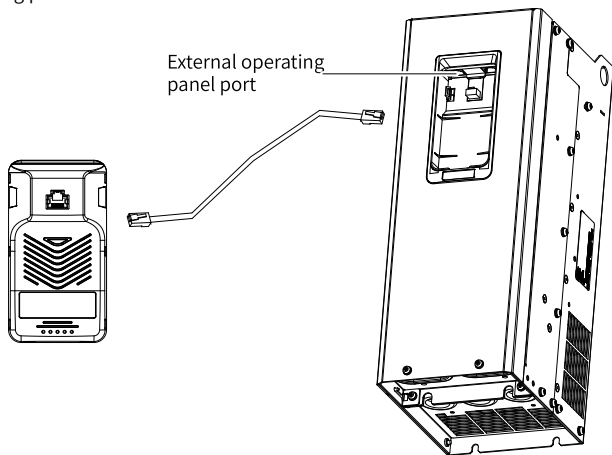


Table 2-1 Recommended Inovance standard network cable

Model	Ordering Code	Specification
C45590-GNCN-C25003	01040020	3000-mm network cable
C45590-GNCN-C250015	01040017	1500-mm network cable
C45590-GNCN-C2500080	01040016	800-mm network cable

2.2 Connecting the MDKE10 to the PC

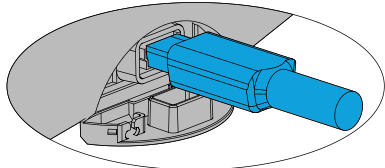
Note

The MDKE10 is suitable for the MD520 and MD580 AC drives. This user guide takes the MD580 as an example to describe the installation and wiring of the MDKE10. Refer to the corresponding user guide for details if the MDKE10 is installed on other AC drives.

1. Open the USB port cover.



2. Connect the MDKE10 to the PC by using a cable with the Type-C connector and the ferrite magnetic ring.



3. After the MDKE10 and the PC are connected, the



MDKE10 automatically enters the USB relay mode. "USb" is displayed in the status display area, which indicates the USB relay mode. You can use the InoDriveStudio to commission the drive.

2.3 Installing the MDKE10 to the AC Drive and Removing the MDKE10 from the AC Drive

■ Installing the MDKE10

1. Align the bottom of the MDKE10 with the bottom slot of the AC drive operating panel bracket.
2. Push the upper part of the MDKE10 until you hear a click.
3. The MDKE10 is installed to the MD580 AC drive.

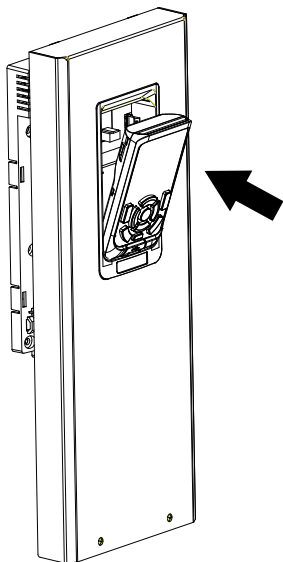


Figure 2-1 Installation of the MDKE10 to the AC drive

■ Removing the MDKE10 from the AC drive

1. Pull out the MDKE10 from the upper part.

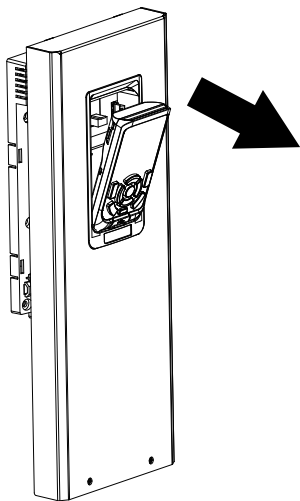


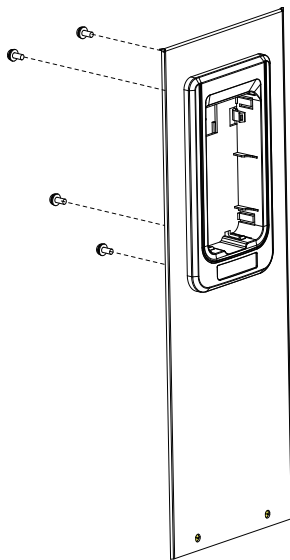
Figure 2-2 Removal of the MDKE10 from the AC drive

2.4 Installing the MDKE10 to the Cabinet Door

Note

The MDKE10 is suitable for the MD520 and MD580 AC drives. This user guide takes the MD580 as an example to describe the installation and wiring of the MDKE10. Refer to the corresponding user guide for details if the MDKE10 is installed on other AC drives.

1. Drill an opening according to the mounting hole dimension, and insert the operating panel bracket into the opening.
2. Secure the operating panel bracket with four M4×8 SEMS screws.



3. Ensure that the snap-fit joint at the bottom of the operating panel is placed into position, install the operating panel, and fasten the snap-fit joint.
-

Note

The optional operating panel bracket (01040202) is not equipped with a network interface adapter board. Disconnect the network cable before removing the operating panel. Install the operating panel and then plug the network cable.

The installation and removal methods of the MDKE10 on the operating panel bracket are the same as those on the MD580. For details, see ["2.3 Installing the MDKE10 to the AC Drive and Removing the MDKE10 from the AC Drive" on page 20.](#)

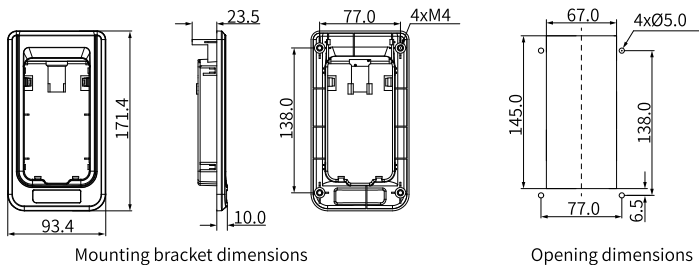


Figure 2-3 Dimensions and opening sizes (mm) of the MDKE10 mounting bracket

Note

If the thickness of the door is 1.5 mm, no bolts are required.

3 Functions and Applications

3.1 Overview

Note

This section takes connection between the MDKE10 and the MD580 as an example.

■ Main interface

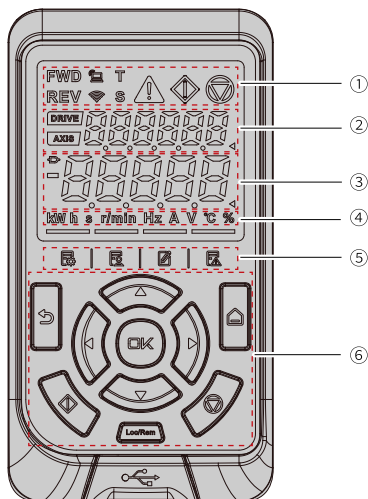


Figure 3-1 MDKE10 LED operating panel

Table 3-1 Operating panel description

No.	Name	Description
①	Status indicator	Displays the forward/reverse rotation status, running/stop status, warning/fault, local/remote control mode, and torque/speed mode.
②	Multi-function display area	- Displays information on key test and auto-tuning. - Monitors fault and system status. - Displays the station number, jogging status, and STO status.
③	Parameter display	Displays the AC drive parameters.
④	Unit display area	Displays the unit of a parameter.
⑤	Menu	Indicates the parameter menu, shortcut menu, differential parameter menu, and historical fault menu from left to right.
⑥	Key area	Displays the entered parameters.

■ Status indicators

Indicator Status		Description
FWD REV	Forward running Reverse running	FWD indicator steady on: The current target speed is positive. REV indicator steady on: The current target speed is negative. FWD and REV indicators off: The current target speed is 0.
	Remote mode	Off: The local control mode through the MDKE10 applies. Steady on: The remote control mode through the I/O terminal or bus applies.
T	Torque control mode	Steady on: The torque control mode applies.
S	Speed control mode	Steady on: The speed control mode applies.

Indicator Status		Description
	Alarm or fault	Off: No fault Steady on: A fault occurs. Blinking: An alarm occurs.
	Running status	Off: Stop Steady on: Operation
	Stop status	Off: Operation Steady on: Stop
	Station number	Steady on: The station number is displayed in the auxiliary display area.
		Off: The value displayed in the auxiliary display area is not the station number.
	Reserved	/
	/	/
	Connector indicator	Steady on: The connector variable is displayed in the main display area.
		Off: The variable displayed in the main display area is not the connector variable.
	Minus sign indicator	Steady on: The value displayed in the main display area is negative.
		Off: The value displayed in the main display area is positive.
	Operating cursor 1	Steady on: The main display area is active.
	Operating cursor 2	Steady on: The auxiliary display area is active.
	Unit indicator	Steady on: The unit corresponding to the data displayed in the main display area is the unit with the indicator on.

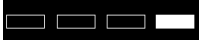
Indicator Status		Description
	Indicator 1	Steady on: The main display area displays the parameter menu.
	Indicator 2	Steady on: The main display area displays the shortcut menu.
	Indicator 3	Steady on: The main display area displays the differential parameter menu.
	Indicator 4	Steady on: The main display area displays the historical fault menu.

Menu icon

The menu icons indicate the current menu type. The MDKE10 operating panel has four types of menus and one current status parameter display interface. The status parameter interface is displayed by default. You can switch between the status parameter interface and the current level-1 menu by pressing the back key. The four indicators and corresponding icons indicate the four menu types. When an indicator is on, the corresponding menu is active. The correspondence between menu types and indicators is described in the following table.

Table 3-2 Correspondence between menu types and indicators

Menu Icon	Menu Name	Indicator Status
	Parameter menu	
	Shortcut menu	

Menu Icon	Menu Name	Indicator Status
	Differential parameter menu (reserved)	
	Historical fault menu (reserved)	

■ Unit indicator

Table 3-3 Unit indicator descriptions

Indicator	Unit
kW	Power unit
h	Time unit
s	Time unit
r/min	Revolution per minute
Hz	Frequency unit
A	Current unit
V	Voltage unit
°C	Temperature unit
%	Percentage

■ Multi-function display area

Both the parameter display area and the multi-function display area of the MDKE10 include a triangle cursor on the right side, which indicates the current operating area. The default operating area is the parameter display area. The multi-function display area can display a total of four interfaces, which are described as follows.

- Operating status display (default). The types of status supported are described in the following table.

Table 3-4 Operating status display

Display	Name	Applicable Scenario	Description
	reset Initializing	During initialization upon power-on	The device is being initialized upon power-on, after which the device will switch to another state.
	nr Not ready	When OFF2, OFF3, STO, or fault state is activated	The device is not ready to run.
	ry Ready	When OFF2, OFF3, STO, and fault state are not activated and the device is waiting for the operation command OFF1	The device is ready to run and is waiting for the operation command.
	rn Operation	When the operation command is issued in the ready state	The device is in the normal running state.
	JoG Jogging	After the jogging command takes effect	The device is in the jogging state.
	busy Parameter restoring or downloading	After the parameter reset or parameter download command is confirmed	The device parameters are being restored to factory settings or being downloaded. Device connection fails.
	tune Auto-tuning	After the auto-tuning function is enabled	The device is in the auto-tuning process.
	STO STO1 and STO2 activated	STO1 and STO2 input circuits disconnected	The STO function has been activated.
	STO1F STO1 input activated	The input circuit of STO1 is disconnected due to faults related to wiring or power supply.	The device is in the STO fault activation state. STO1 input is activated, but STO2 input is normal.

Display	Name	Applicable Scenario	Description
	STO2F STO2 input activated	The input circuit of STO2 is disconnected due to faults related to wiring or power supply.	The device is in the STO fault activation state. STO2 input is activated, but STO1 input is normal.
	STOF STO fault activated	When the power supply, buffer, optocoupler, flash, or RAM is abnormal	The device is in the STO fault activation state.

- Station number display. The device station number corresponds to the communication address of parameter A10-03 and ranges from 1 to 64. When the station number of the current device is displayed, the DRIVE status indicator is on. For example, when the station number of the current device is 2, the last two digits of the multi-function display area will be displayed as "02", as shown below.



Figure 3-2 Device station number display

- Current motor parameter group display. The motor parameter group corresponds to parameter A0-24 and the parameter values 0 to 3 represent the motor parameter groups 1 to 4, respectively. For example, when the current motor parameter group is 1, the multi-function display is shown in the following figure.



Figure 3-3 Motor parameter group display

- Fault display. This interface is displayed only when the device is in an abnormal state. The fault status indicator flashes or stays on depending on the fault or alarm level. The fault is displayed as follows.



Figure 3-4 Fault display

■ Basic operation

Table 3-5 Key descriptions

Icon	Name	Description
	Back key	- Short press: Return to the previous menu; switch between the menu bar and the status parameter display. - Long press: Enter or exit the parameter menu.
	Menu key	- Short press: Switch among different menus. - Long press: Switch between the parameter display area and the multi-function display area.
	Operation key	In the local control mode, press this key to start the device.
	Stop/Fault reset key	- In the local control mode, press this key to stop the device in the operation state. - Press this key to reset the device upon faults.
	Local/Remote switchover key	Switch between the local mode (MDKE10) and remote mode.
	Increment key	Increase the parameter value, or increase the target speed in the local control mode.
	Decrement key	Decrease the parameter value, or decrease the target speed in the local control mode.
	Left shift key	- Parameter display: Move the cursor to the left when selecting or setting a parameter. - Multi-function display area: Switch the interface to the left.
	Right shift key	- Parameter display: Move the cursor to the right when selecting or setting a parameter. - Multi-function display area: Switch the interface to the right.
	OK key	Enter the next interface or confirm the parameters or values.

■ Fault

When a fault occurs, the fault information will be displayed on the fault interface.

When a fault, a minor fault, or an alarm occurs, the multi-function display area will display this interface. You can switch the display interface by pressing the left or right



keys. If there is no switch command within five seconds, the device will automatically switch to the fault display interface. When multiple faults are present at the same time, you can switch to the multi-function display area by long pressing



. To switch to the fault interface, press the left or right shift key. To view

each fault code, press the increment key  or decrement key . You can view up to six faults, six minor faults, and six alarms. When the fault is reset, the multi-function display area automatically switches back to the original display. For example, the following figures display a fault, a minor fault, and an alarm.

8015.01

Figure 3-5 Fault display

8015.02

Figure 3-6 Minor fault display

8083.01

Figure 3-7 Alarm display

■ Switching the device

When the station number of the AC drive changes or multiple AC drives are connected to the bus, you can change the target station number through the operating panel to switch between different devices.



1. Long press the back key

multi-function display area will display .

2. Use the increment key  or decrement key  to switch to the

station number setting parameter PF-00 , and then press

the OK key .

3. Use the increment key  or decrement key  to change the station

number, and then press the OK key  to confirm the change.



4. Long press the back key to exit the operating panel parameter menu. The MDKE10 will attempt to connect to the device according to the set station number of the device.

3.2 Parameter Settings

To view or edit parameters, do as follows:

The parameter menu of the MDKE10 is divided into three levels:

- Level-1 menu: parameter group
- Level-2 menu: parameter
- Level-3: parameter value

In each level of menu, the bit you are operating on will flash. You can use the up and down keys to increase or decrease numerical values, and the left and right keys to switch between the bits you are operating on. For example, if you want to change the value of parameter b0-00 to 1, do as follows:

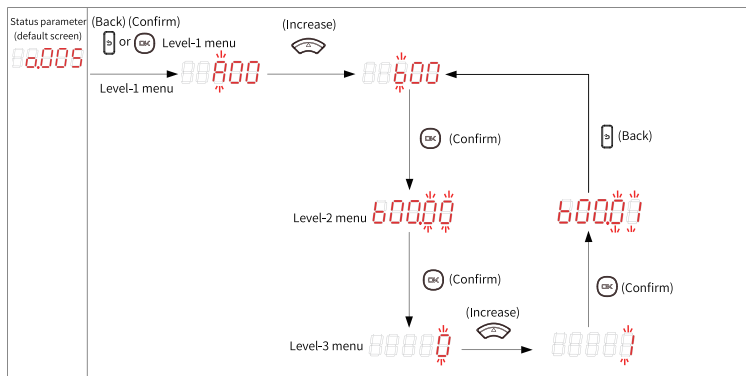


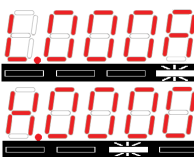
Figure 3-8 Flowchart for three-level menu operation

Note

- You can return to the level-2 menu from the level-3 menu by pressing the OK key or Back key.
 - If you press the OK key, the system saves the parameter setting, and then returns to the level-2 menu and automatically shifts to the next parameter.
 - If you press the Back key, the system directly returns to the level-2 menu without saving the parameter setting.
- If no bit of a parameter value in the level-3 menu is blinking, the parameter cannot be set. The possible causes include:
 - The parameter is not modifiable. For example, it is a measured value or indicates the product type.
 - The parameter is modifiable only when the AC drive is in the stop state.

The following table provides examples of different types of parameter displays.

Table 3-6 Parameter display examples

Parameter Code	Parameter Value	Data Type and Value Description	Remarks
-		Current state machine S5: Ready to switch on	-
A02-41		Date October 11	-
U5-40		Hexadecimal single word 0x000E	-
U19-18		Hexadecimal double word 0x0000000A Low word: 0x000A High word: 0x0000	• Double-word data needs to be displayed on two screens, and the menu indicator indicates the current screen. • When the rightmost indicator blinks, the first screen (low word) is displayed. You can move the screen leftward to view the second screen. • When the second rightmost indicator blinks, the second screen (high word) is displayed. You can move the screen rightward to view the first screen.
A4-00		Decimal 12.0	The MD580 supports display of up to four decimal places. If the data exceeds four decimal places, it will be rounded to four decimal places.

Parameter Code	Parameter Value	Data Type and Value Description	Remarks
L9-02		Negative number -100.0	The negative sign is displayed in the first place of the data.
L10-11		Connector parameter U0-00	When the connector can be used as the source of the parameter value, the icon on the left of the data display area will light up. In this case, 1000 indicates connector U0-00.

3.3 Status Monitoring

When the AC drive is stopped or running, the MDKE10 displays different status information according to the parameter settings.

■ Fault state

When an alarm or a fault occurs, the multi-function display area will switch to the

fault interface to display the current fault code. The alarm status indicator  will flash or remain on according to the fault or alarm level. For details on the operation of the fault interface, see section Main interface - Faults.

■ Commissioning by shortcut

The status parameter interface is displayed by default after the device is powered on and is used to display some necessary device operation information. You can use the



left and right shift keys to view different parameters. The parameters displayed at stop differ from those displayed during running. In addition, the parameters displayed at stop are blinking, while those displayed during running are steady on. The parameters displayed at stop are set according to the parameters of the connected AC drive. The following table takes the MD580 as an example to describe the parameters displayed at stop and during running. You can determine whether a parameter is displayed by default by setting A10-30 and A10-32.

Table 3-7 Parameters displayed on the status parameter interface

No.	Parameter Displayed at Stop	Displayed by Default	Parameter Displayed During Running	Displayed by Default
①	Current state machine	Yes	Motor frequency reference	Yes
②	Target frequency	Yes	Actual motor frequency	Yes
③	Target speed	Yes	Motor speed reference	No
④	Bus voltage	Yes	Actual motor speed	No
⑤	Module temperature	Yes	Reserved	No
⑥	AI1 input proportion	No	RFG frequency reference	No
⑦	AI2 input proportion	No	RFG speed reference	No
⑧	Reserved	No	Bus voltage	Yes
⑨	Reserved	No	Output voltage	Yes
⑩	Reserved	No	Output current	Yes
⑪	Reserved	No	Output torque	No
⑫	Reserved	No	Output power	No
⑬	Reserved	No	Module temperature	No
⑭	Reserved	No	Current state machine	Yes
⑮	Reserved	No	AI1 input proportion	No
⑯	Reserved	No	AI2 input proportion	No

3.4 AC Drive Tuning

When using the MDKE10 to tune the AC drive, determine the parameters of the auto-tuning function according to the function guide of the connected AC drive. For example, the MD580 is used to control the asynchronous motor in the V/f control mode. Check the following parameters related to the motor auto-tuning function in the *MD580 Series Low-Voltage High-Performance Engineering AC Drive Function Guide*.

B5: Auto-tuning					
Parameter Code	Parameter Name	Value Range	Default	Change Mode	Communication Address
B5-00	Auto-tuning mode	0: Disable	0	At stop	3734
		1: Static auto-tuning for asynchronous motor			
		2: No-load complete auto-tuning for asynchronous motor			
		4: Inertia auto-tuning for asynchronous motor (SVC or FVC)			
		11: With-load auto-tuning for synchronous motor (FVC)			
		12: No-load auto-tuning for synchronous motor			
		13: Static auto-tuning for synchronous motor			
		14: Inertia auto-tuning for synchronous motor			
B5-02	Parameter calculation selection	0: Disable	0	At stop	3739
		1: Calculate motor parameters			
B5-03	Parameter calculation confirmation	0: Cancel	0	At stop	3740
		1: Confirm			

To use the MDKE10 to tune the MD580, do as follows:

1. Check the AC drive before power-on. Check the installation and wiring according to the installation guide and ensure that the input and output terminals of the AC drive are wired correctly. For details, see the *MD580 Series Low-Voltage High-Performance Engineering AC Drive Hardware Guide*.

2. In the parameter menu  , use the increment key

 or decrement key  to locate the parameters in group B05



3. Press the OK key  to enter the level 2 menu. use the increment key 

or decrement key  to locate the B05-00 parameter 

4. Press the OK key  to enter the level 3 menu . Use the increment key  to set the value to 02, that is, "① No-load complete auto-

tuning for asynchronous motor". Press the OK key  to save the settings. The

multi-function display area displays 

5. Enable the local control mode by pressing the local/remote control key .

The local control mode takes effect when the status indicator  becomes OFF.

6. Press the RUN key  to start the AC drive. The drive starts auto-tuning and

the status indicator  becomes steady on. When the status indicator 

becomes off and the stop status indicator  becomes steady on, the auto-tuning process is complete. If no fault is displayed in the status display area, and

the alarm indicator  is OFF, the auto-tuning operation is successful.

Note

The motor will rotate when the MD580 is performing "No-load complete auto-tuning for asynchronous Motor". Select the proper auto-tuning function according to the actual situation and refer to the function guide of the connected AC drive.

3.5 Permission Management

You must log in to the MDKE10 before using some functions under the operating panel parameter menu.

■ Login

1. Long press the back key  to enter the operating panel parameter menu. The

multi-function display area will display .

2. Switch to the password input parameter PF-02  by using the

increment key  or decrement key , and then press the OK key



3. Move the cursor by using the left shift key  and right shift key . Use the increment key  or the decrement key  to set the password, and then press the OK key  to confirm the password.
4. After successful login, the permission level parameter will be displayed in the operating panel parameter menu.

3.6 System Settings

Long press the back key  to enter the operating panel parameter menu, where you can set the functions of the MDKE10. By default, basic parameters of the MDKE10 are described in the following table.

Table 3-8 MDKE10 basic parameters

Parameter Code	Parameter Name	Parameter Value	Default	Read/Write Permission	Data Type	Communication Address
PF-00	Station No.	1-128	1	Write	U16	00000
PF-01	Baud rate	1: 19200 2: 57600 3: 115200 4: 500000 5: 1000000 6: 2000000 7: 4000000 9: 38400 10: 5000000 11: 10000000	-	Read-only	U16	00001

Parameter Code	Parameter Name	Parameter Value	Default	Read/Write Permission	Data Type	Communication Address
PF-02	Password input	-	-	Write	U16	00002
PF-04	LED brightness	1–16	8	Write	U16	00004
PF-34	Software version	-	-	Read-only	U16	00034
PF-35	USB software version	-	-	Read-only	U16	00035

3.7 System Upgrade

The MDKE10 does not support the self-upgrade function. To upgrade the firmware of the operating panel, connect the operating panel to the PC with a USB cable and upgrade the firmware through the software.

4 Inspection and Maintenance

Perform daily and regular inspections according to the following table.

Type	Period	Item	Checked
Routine inspection	Routine	Check the ambient temperature, humidity, dust, and foreign objects.	☐
		Check whether unusual noise is generated.	☐
		Check whether the USB dustproof plug and the operating panel rear housing are installed properly.	☐
		Check whether the LED display is normal.	☐
		Check whether the operation through the operating panel is normal.	☐
		Check whether unusual smell is generated.	☐
Regular inspection	1	Check whether the fastening parts get loosened.	☐
		Check whether the equipment overheats.	☐
		Check whether the USB connector is damaged.	☐
		Check whether the fastening parts of the USB connector and RJ45 interface get loosened.	☐