

*User Guide*

**UD78**

Servo  
large option module  
for Unidrive

Part Number: 0460 - 0086

Issue Number: 2

## **General Information**

The manufacturer accepts no liability for any consequences resulting from inappropriate, negligent or incorrect installation or adjustment of the operating parameters of the equipment or from mismatching the Drive with the motor.

This option module is intended for use only with Control Techniques Unidrive products. Any other use invalidates the warranty and may cause a safety hazard.

The contents of this Guide are believed to be correct at the time of printing. In the interests of a commitment to a policy of continuous development and improvement, the manufacturer reserves the right to change the specification of the product or its performance, or the contents of this Guide, without notice.

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## **Use within the European Union, etc**

The following information applies where the end use of the Drive is within the European Union, the European Economic Area, or other regions which have implemented Directives of the European Council or equivalent measures.

The Drive, together with its associated option modules, complies with the Low Voltage Directive 73/23/EEC.

The installer is responsible for ensuring that the equipment into which the Drive is incorporated complies with all relevant Directives.

The complete equipment must comply with the EMC Directive 89/336/EEC.

If the Drive is incorporated into a machine, the manufacturer is responsible for ensuring that the machine complies with the Machinery Directive 89/392/EEC. In particular, the electrical equipment should generally comply with European Harmonised standard EN60204-1.

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# 1 Introduction

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## 1.1 Main features of the UD78

**Note**

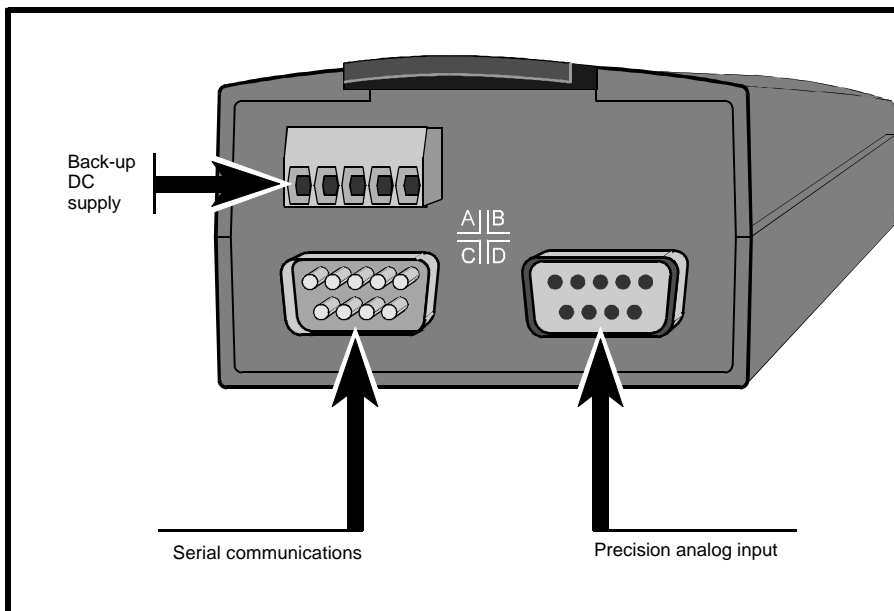
**The UD78 can be used only with Drives equipped with version 3 (or later) software. (Parameter 0.50 indicates the software version.)**

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**Main functions**

The UD78 *large option module* is an interface module for installation in a Unidrive and has the following functions:

- Precision analog input
- EIA RS485, 4-wire or 2-wire, serial communications interface (fully opto-isolated)
- Back-up +24V DC supply input for keeping the control circuits of the Drive (and the UD78) operating when the AC supply to the Drive is disconnected.



**Figure 1** The functions of the UD78 connectors

- Precision analog input** The precision analog input replaces terminals 5 and 6 *Analog input 1* in the Drive. Terminals 5 and 6 can then not be used for any purpose. The parameters associated with Analog input 1 now relate to the precision input.
- Serial comms. interface** The serial communications interface allows the following:
- The Drive to be controlled and monitored remotely by a system controller
  - The Drive to control or monitor another Drive
- Installation** The UD78 must be fitted in the *large option module* bay of the Unidrive. Precision analog input and serial communications connections are made by 9-way D-type connectors. The external Back-up DC supply connections are made by a pluggable 5-way screw-terminal block.

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## 2 Safety Information

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2.1

### Warnings, Cautions and Notes

A **Warning** contains information which is essential for avoiding a safety hazard.

A **Caution** contains information which is necessary for avoiding a risk of damage to the product or other equipment.

A **Note** contains information which helps to ensure correct operation of the product.

2.2

### Electrical safety – general warning

The voltages used in the Drive can cause severe electric shock and/or burns, and could be lethal. Extreme care is necessary at all times when working with or adjacent to the Drive.

Specific warnings are given at the relevant places in this User Guide.

The installation must comply with all relevant safety legislation in the country of use.

The Drive contains capacitors that remain charged to a potentially lethal voltage after the AC supply has been disconnected. If the Drive has been energized, the AC supply must be isolated at least ten minutes before work may continue.

2.3

### System design

The Drive is intended as a component for professional incorporation into complete equipment or systems. If installed incorrectly the Drive may present a safety hazard. The Drive uses high voltages and currents, carries a high level of stored electrical energy, and is used to control mechanical equipment which can cause injury.

Close attention is required to the electrical installation and the system-design to avoid hazards either in normal operation or in the event of equipment malfunction. System-design, installation, commissioning and maintenance must be carried out by personnel who have the necessary training and experience. They must read this safety information and this User Guide carefully.

To ensure mechanical safety, additional safety devices such as electro-mechanical interlocks may be required. The Drive must not be used in a safety-critical application without additional high-integrity protection against hazards arising from a malfunction.

## 2.4 Environmental limits

Instructions in the *Unidrive Installation Guide* regarding transport, storage, installation and use of Drives must be complied with, including the specified environmental limits. Drives must not be subjected to excessive physical force.

## 2.5 Compliance with regulations

The installer is responsible for complying with all relevant regulations, such as national wiring regulations, accident prevention regulations and electromagnetic compatibility (EMC) regulations. Particular attention must be given to the cross-sectional areas of conductors, the selection of fuses or other protection, and protective earth (ground) connections.

The *Unidrive Installation Guide* contains instructions for achieving compliance with specific EMC standards.

Within the European Union, all machinery in which this product is used must comply with the following directives:

89/392/EEC: Safety of Machinery

89/336/EEC: Electromagnetic Compatibility

## 2.6 Safety of personnel

The STOP function of the Drive does not remove dangerous voltages from the output of the Drive or from any external option unit.

The Stop and Start controls or electrical inputs of the Drive should not be relied upon to ensure safety of personnel. If a safety hazard could exist from unexpected starting of the Drive, an interlock that electrically isolates the Drive from the AC supply should be installed to prevent the motor being inadvertently started.

Careful consideration must be given to the functions of the Drive which might result in a hazard, either through their intended functions (eg. Auto-start) or through incorrect operation due to a fault or trip (eg. stop/start, forward/reverse, maximum speed).

Under certain conditions, the Drive can suddenly discontinue control of the motor. If the load on the motor could cause the motor speed to be increased (eg. hoists and cranes), a separate method of braking and stopping the motor should be used (eg. a mechanical brake).

Before connecting the AC supply to the Drive, it is important that you understand the operating controls and their operation. If in doubt, do not adjust the Drive. Damage may occur, or lives put at risk. Carefully follow the instructions in this User Guide.

Before making adjustments to the Drive, ensure all personnel in the area are warned. Make notes of all adjustments that are made.



## **2.7 Risk analysis**

In any application where a malfunction of the Drive could lead to damage, loss of life or injury, a risk analysis must be carried out, and where necessary, further measures taken to reduce the risk. This would normally be an appropriate form of independent safety back-up system using simple electro-mechanical components.

## **2.8 Signal connections**

The control circuits are isolated from the power circuits in the Drive by basic insulation only, as specified in IEC664–1. The installer must ensure that the external control circuits are insulated from human contact by at least one layer of insulation rated for use at the AC supply voltage.

If the control circuits are to be connected to other circuits classified as Safety Extra Low Voltage (SELV) (eg. to a personal computer), an additional isolating barrier must be included in order to maintain the SELV classification.

## **2.9 Adjusting parameters**

Some parameters have a profound effect on the operation of the Drive. They must not be altered without careful consideration of the impact on the controlled system. Measures must be taken to prevent unwanted changes due to error or tampering.

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## 3 Installing the UD78

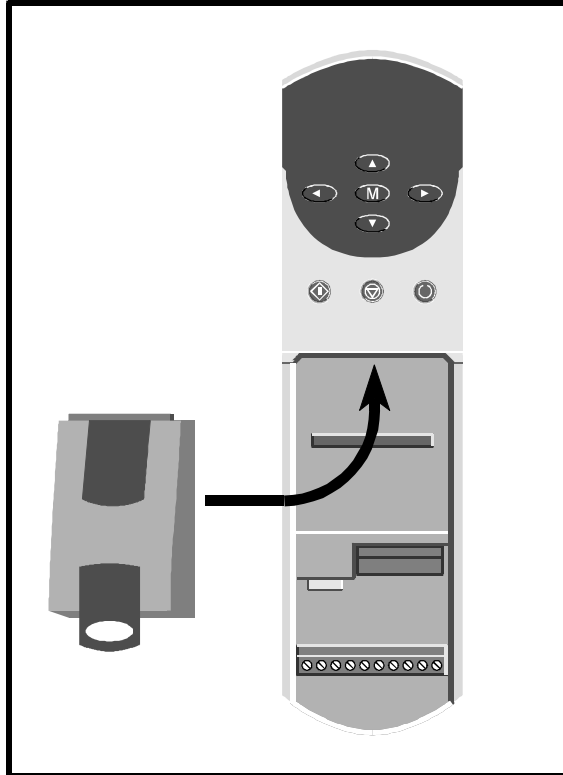
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### Warning

**Before using the following procedure, refer to the Warnings at the beginning of Chapter 2 *Installing the Drive in the Unidrive Installation Guide*.**

- 1 Before installing the UD78 in the Unidrive, ensure the AC supply has been disconnected from the Drive for at least 10 minutes.
- 2 Check that the exterior of the UD78 is not damaged, and that the multi-way connector is free from dirt and debris. Do not install a damaged or dirty UD78 in the Drive.
- 3 Remove the terminal cover from the Drive (for removal instructions, see *Installing the Drive and RFI filter* in Chapter 2 of the *Unidrive Installation Guide*).
- 4 Push the UD78 into the cavity immediately behind the keypad and display until the UD78 locks in place.
- 5 Re-fit the terminal cover to the Drive.
- 6 Connect the AC supply to the Drive.
- 7 Set parameter **.00** at **149** to unlock security.
- 8 Check that parameter **7.31** is set at **1** to indicate that the module is fitted.
- 9 If the check in step 8 fails, perform the following:
  - Remove the AC supply from the Drive.
  - Wait at least 10 minutes.
  - Remove the terminal cover.
  - Check that the UD78 is fully inserted.
  - Replace the terminal cover.
  - Re-apply the AC supply.
  - Check again that parameter **7.31** is set at **1**.



**Figure 2** *Installing the UD78 in the Unidrive*

Do not remove the UD78 from the Drive when either the AC supply or a DC back-up supply is applied to the Drive. If the UD78 is removed when the Drive is powered-up, the Drive will trip; the display will indicate **ANI.diS**.

If the UD78 is deliberately removed, it may be necessary to re-adjust the parameters related to analog input 1, since they will now relate to terminals 5 and 6.

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## 4 Making Connections

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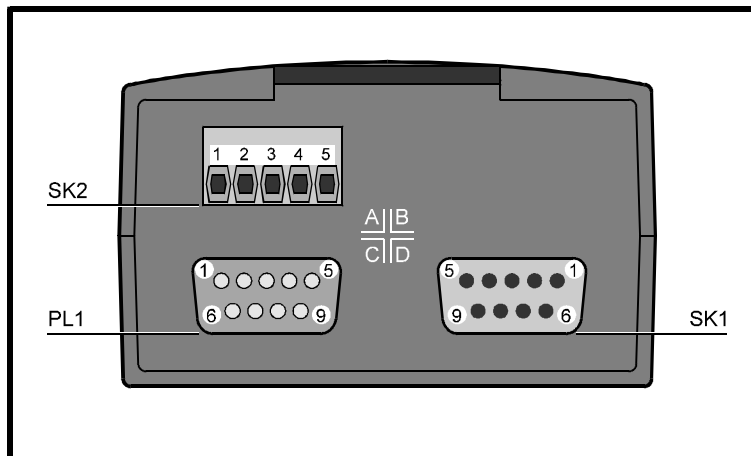


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### 4.1 Locations of the connectors



**Figure 3** Locations of the connectors on the UD78

























































