



PTC 2.0 Option board

For Emotron VFX/FDU 2.0-IP2Y AC drive

PTC/RTC Option board

For Emotron FlowDrive-IP2Y



Instruction Manual
English

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Instruction Manual - English

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Safety

Instruction manual

Read this instruction manual first!

This option is a supplementary part of the “main product” and the user must be acquainted with the original instruction manual of the main product. All safety instructions, warnings, etc. as mentioned in this instruction manual must be known to the user.

Safety instructions

Read the safety instructions in the instruction manual for the main product.

Installation

Installation, commissioning, dismantling, making measurements, etc. on the main product may only be carried out by personnel who are technically qualified for the task. Installation must also be carried out in accordance with the local standards. Ensure that all necessary safety measures are taken.



WARNING!

Take all necessary safety precautions during installation and commissioning to prevent personal injuries, e.g. by an uncontrolled load.

Opening the main product



WARNING!

Always switch off the mains supply before opening the main product.
For AC drives, wait at least 7 minutes to allow the buffer capacitors to discharge.

Always take adequate precautions before opening the main product, even though the connections for the control signals and jumpers are isolated from the mains voltage.

Contents

	Safety	1
	Contents	3
1.	Introduction	5
2.	Connections and functions	7
2.1	Board layout	7
2.2	General information	8
2.3	PTC input	11
3.	Installation	13
3.1	The option kit includes	14
3.2	Mounting the option board	15
3.3	Mount another option board	16

1. Introduction

This board is a combined PTC board and RTC(Real Time Clock) option board.

Emotron FDU/VFX type IP2Y

In Emotron FDU/VFX type IP2Y this can only be used as a PTC board, used to connect motor thermistors (PTC) acc. to DIN44081/44082 to the main product. Note that the PTC sensor needs to be isolated from live voltage, see § 2.2.3, page 10 for further details.

The PTC function can be used for thermal motor protection. When the monitored temperature e.g. motor temperature becomes too high, the main product will trip.

Emotron FlowDrive type IP2Y

In Emotron FlowDrive (models e.g. FLD48-XXX) type IP2Y this is a combined board used as PTC board as described above.

There is also a second function, The RTC-Real Time Clock function. With the RTC it is possible to see and use actual time and date in your process. When you install the PTC/RTC option board, certain menus and parameters will be displayed in the control unit which can be used to start or stop processes in your pump installation. For further information see separate “Software instruction” for FlowDrive.

2. Connections and functions

2.1 Board layout

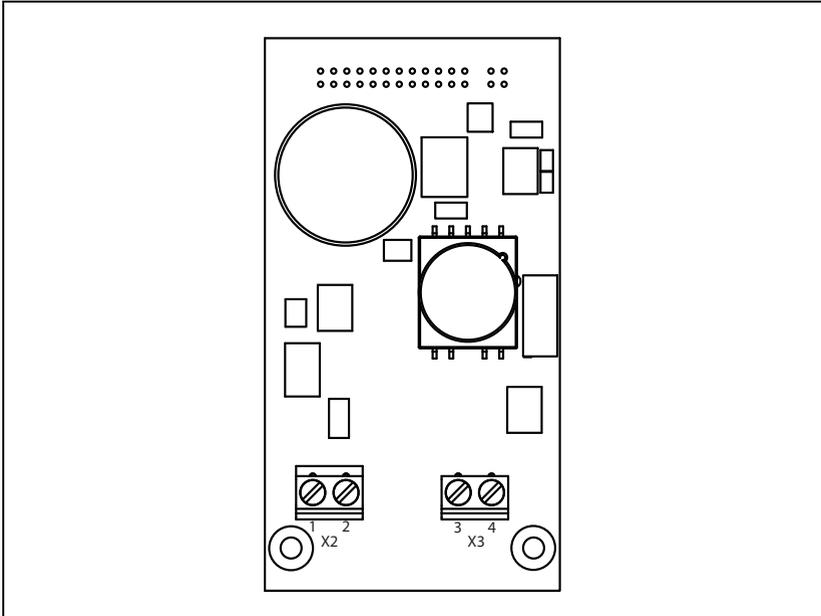


Fig. 1 Board layout

Table 1 Terminal description

X3	Name	Function
3	T1	PTC input
4	T2	PTC input
X2		
1	Not used	
2	Not used	

2.2 General information

2.2.1 Menus

The following menus are available when the PTC option board is installed in the main product.

All menus are described in the manual for the main product.

Menus available with the PTC option

Table 2 Menus for AC-drives available with the PTC option

Menu	Function	Default	Range/Selection
234	Thermal protection	Off	Off = No thermal protection PTC = PTC protection enabled
235	Motor Class	F140	A 100°C, E 115°C, B 120°C, F 140°C, F Nema 145°C, H 165°C

Menus available with the RTC option

Table 3 Menus for Emotron FlowDrive available with the RTC option

Menu	Function	Range/Selection
931	Time	Actual time displayed as HH:MM:SS. Adjustable in this menu.
932	Date	Actual date, displayed as YYYY-MM-DD. Adjustable in this menu.
933	Weekday	Displays actual weekday.

Apart from these menus, there will also be displayed other selections

2.2.2 Cable recommendations and shielding

Shielded twisted pair cables are recommended. The shield must be connected to the earthing screw (PE).

Only the signal wires should continue to the terminals of the option board.

Secure the cables with tie wraps according to Fig. 2.

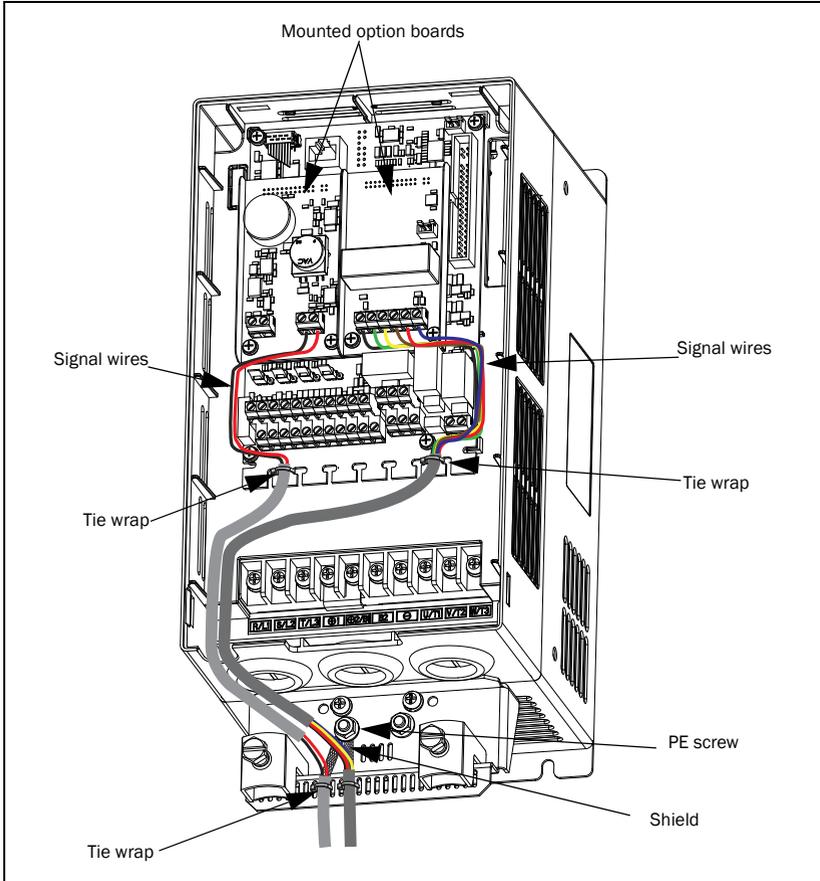


Fig. 2 General shielding connection principle

In most cases it is recommended that both ends of the shield are connected to PE. This will give a good attenuation of high frequency interference. Shield connections should be made using the largest possible surface.

Make sure that you select a cable of material appropriate for your environment. Consider ambient temperature, humidity and occurrence of chemical substances such as oil. Standard copper wire with cross-sectional area of approximately $0.14 - 1.5 \text{ mm}^2$ will be sufficient in most cases.

2.2.3 Isolation

The control board in the main product is a Separated Extra Low Voltage (SELV) circuit. This means that this board is safely separated from other circuits that carry higher voltages and is isolated from earth and protective earth conductors of other circuits. The PTC circuit on this option board is separated from the control board SELV circuit with separation rated for:

1. Double insulation when used in main product rated up to 480 VAC.
2. Basic insulation when used in main product rated up to 690 VAC.

It is recommended that the PTC sensor is always separated from live parts with at least basic insulation for the relevant voltage.



WARNING!

For main products rated higher than 480 VAC it is mandatory to have at least basic insulation between the temperature sensor and live voltage.

2.3 PTC input

This PTC input is for safety reasons isolated from internal supplies and electronics, see § 2.2.3, page 10 for detailed information. The PTC sensor should be connected to terminal X3. No polarisation is needed. Up to six PTCs may be connected in series according to DIN44081/44082.

Table 4 Terminal configuration for PTC connection

X3	Name	Function
3	T1	PTC input
4	T2	PTC input

2.3.1 Electrical specification

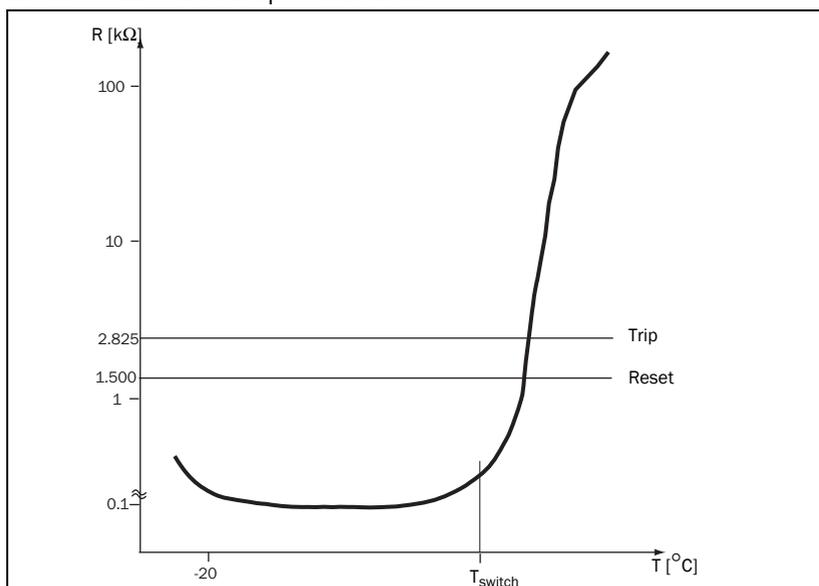


Fig. 3 Typical PTC-curve

The Fig. 3 shows a typical PTC-curve. The resistance increases drastically with the temperature after a certain switch temperature, T_{switch} , which is typically 60 - 120 °C (depending on PTC type).

Table 5 Electrical specifications for the PTC input

Number of PTCs	1 to 6 in series acc. to DIN44081/44082
Trip at	2,825 $\Omega \pm 10\%$
Reset at	1,500 $\Omega \pm 10\%$
Measurement voltage U_{T1-T2} at $\leq T_{\text{switch}}$	<1 VDC

2.3.2 PTC connection example

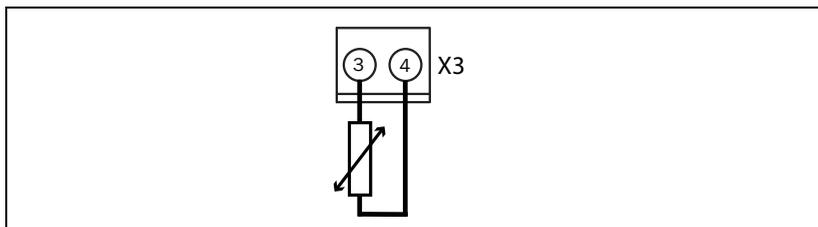


Fig. 4 Connecting a PTC

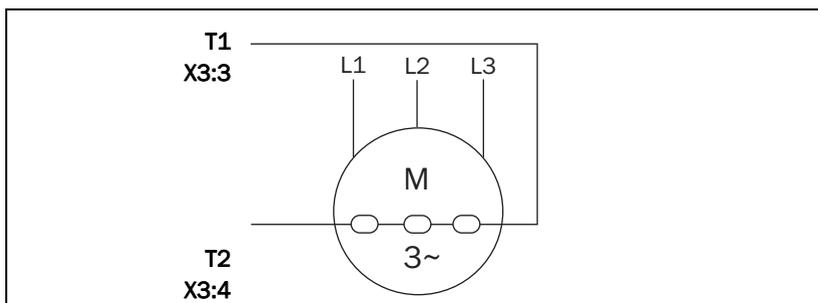


Fig. 5 Example of an application with three PTCs in series.

3. Installation



This chapter describes how to mount the option board in the AC drive. Two different option boards and one communication board can be mounted.

Table 6 Emotron FDU/VFX/FLD-IP2Y frame size explanation

Model	Frame size
VFX/FDU/FLD48-2P5-2Y	A3
VFX/FDU/FLD48-3P4-2Y	
VFX/FDU/FLD48-4P1-2Y	
VFX/FDU/FLD48-5P6-2Y	
VFX/FDU/FLD48-7P2-2Y	
VFX/FDU/FLD48-9P5-2Y	
VFX/FDU/FLD48-012-2Y	
VFX/FDU/FLD48-016-2Y	B3
VFX/FDU/FLD48-023-2Y	
VFX/FDU/FLD48-032-2Y	C3
VFX/FDU/FLD48-038-2Y	

3.1 The option kit includes

- option board.
- Two screws (M3 x 6).
- Insulating sheet.

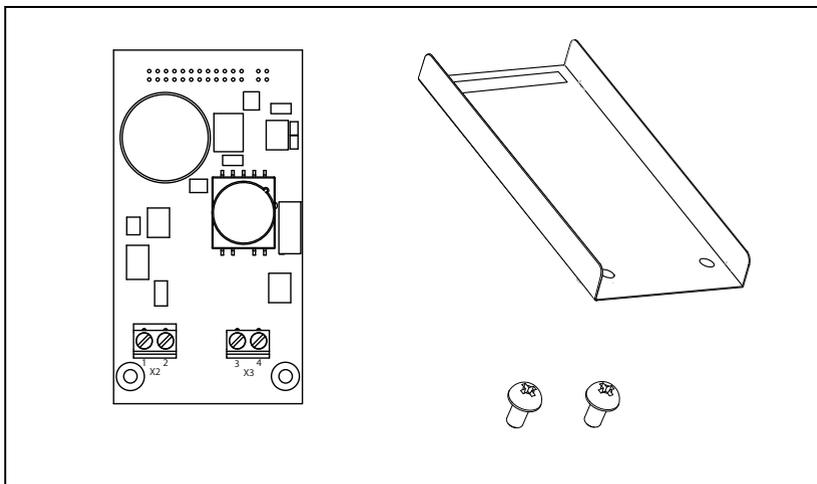


Fig. 6 The IP2Y option kit includes.



CAUTION!

Incorrect connection might cause damage to both the option and to the control board/external equipment.

NOTE:

PTC IP2Y option board 01-6070-08 require software 4.37 or later in order to work safely.

How do i check the software version in my AC drive?
Menu “[922] Software” shows actual software version.

If you have software 4.36 you have to update the software.
Please contact CG drives & Automation for software update.

3.2 Mounting the option board

Make sure that the AC drive has been switched off for at least seven minutes to ensure that the capacitor bank is discharged before continuing with installation! Also make sure that no external equipment connected to the drive's interface is powered on.

NOTE: Correct installation is essential for fulfilling the EMC requirements and for proper operation of the module.

It is possible to mount two option boards on the control board connectors X7A and X7B. It does not matter if you mount the option board on place X7A or X7B you are free to choose.

NOTE: On Framesize A3, the option board RS/485-2Y always needs to be mounted on connector X7B. Otherwise there is not enough room for the D-Sub connector.

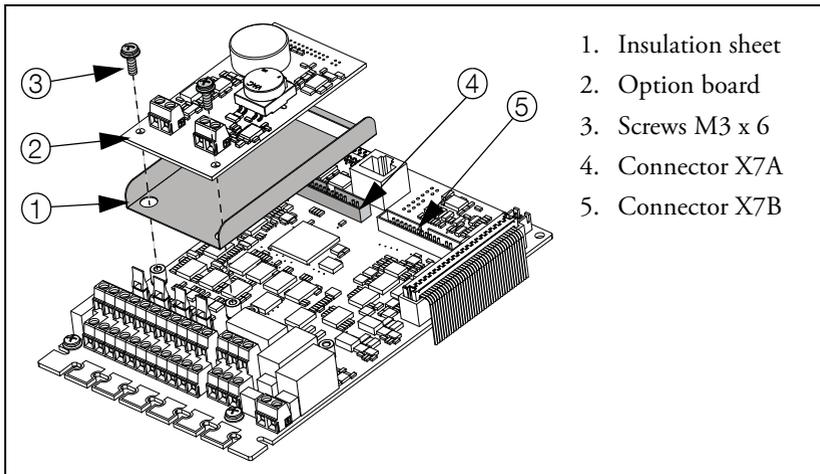


Fig. 7 How to mount the option board on connector X7A.

1. Place the insulating sheet over the short spacers and make sure the slot fits around the X7 connector on the control board. Make sure the flaps are bent upwards.

- Put the option board into position by pressing the connector on the option board into connector X7 on the control board. Make sure it rests on the spacers.
- Secure the option card with the two screws M3 x 6.

3.3 Mount another option board

A second option board is mounted in the same way as the first, see Fig. 8 where the second board in this case is mounted to connector X7B

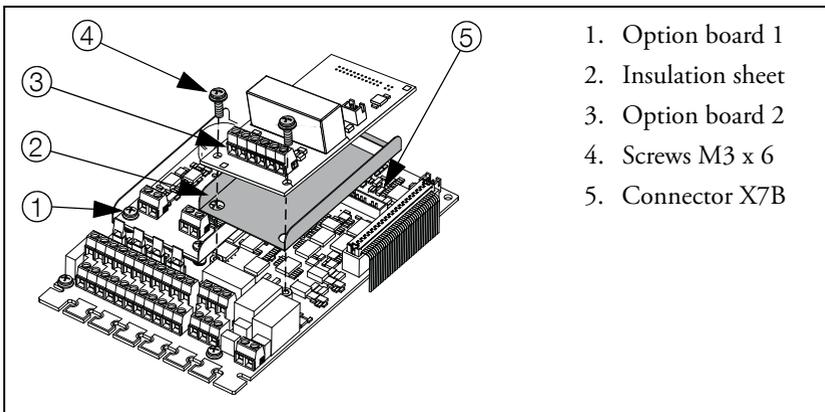


Fig. 8 Mount the second option board, in this case on to connector X7B.

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