Direct Control Key Submodule

11

Validity

The following description applies to the components:

Designation	Order number
Direct control key submodule	6FC5247–0AF11–0AA0
Installation kit for OP 015A and TP 015A *)	6FC5247–0AF30–0AA0

*) Installation kit for OP 012 included in the scope of delivery of the direct control key submodule

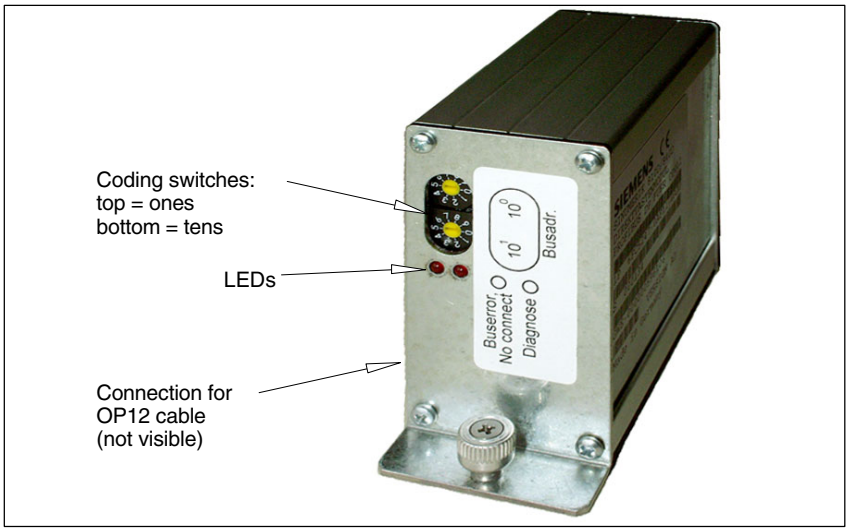

Fig. 11-1 Direct control key submodule complete with coding switches and LEDs

Brief description

The task of the direct control key submodule (DKM) is to directly transfer the operating signals for the two rows of keys on the sides of an operator panel front to SIMATIC without diversion through intermediate firmware. The signal-to-key assignments are shown in Table 11-1 and Figure 11-3.

The DKM can be combined with operator panel fronts of type OP 012 (see Subsection 11.2.1), OP 015A (see Subsection 11.2.2) or TP 015A (see Subsection 11.2.3).

The DKM converts the key signals to PROFIBUS DP protocol by means of the ASIC LSPM2 (PROFIBUS DIN 19245 Part 1, 12 Mbaud).

Power is supplied via the operator panel front. The Profibus is completely isolated from the DKM/operator panel front by means of an opto-coupler and DC/DC converter.

The DKM operates as a slave on PROFIBUS. The address can be set between 1 and 99 using rotary switches. Two bytes of data are transferred.

In SIMATIC, the keys are handled as if they were 16 ordinary digital inputs.

11.1 Interfaces

The DKM has the following interfaces:

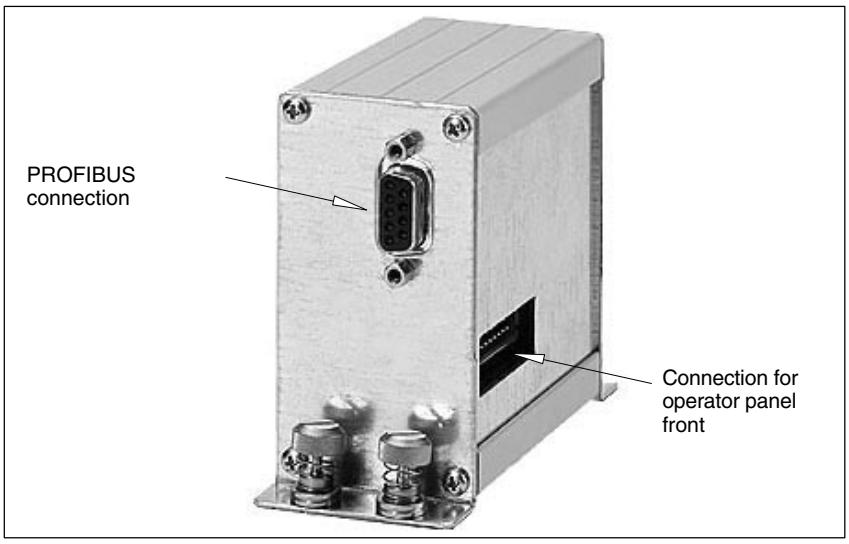

Fig. 11-2 Direct control key submodule with connections

Operator panel connection

The ribbon cable from the operator panel front (see e.g. Figure 11-8) is inserted through the cutout in the enclosure (see illustration above).

Here, the switching states of the vertical direct control keys can be tapped without intermediate firmware. These signals can be evaluated in the direct control key submodule and in pushbutton panels (e.g. PP031-MC).

Direct control key interface X11 on the keyboard controller for the operator panel front: to DIN 41651, plug connector, cable length max. 0.5 m.

Table 11-1 Assignment of interface X11: 2 x 8 vertical direct control keys

Pin	Name	Type	Remarks
1, ..., 16	DT 1, ..., 16 Data	O	Data output, direct control key #1, ..., 16
17 / 18	P5V_D_fused	V	+ 5 V (fused)
19 / 20	GND		Ground

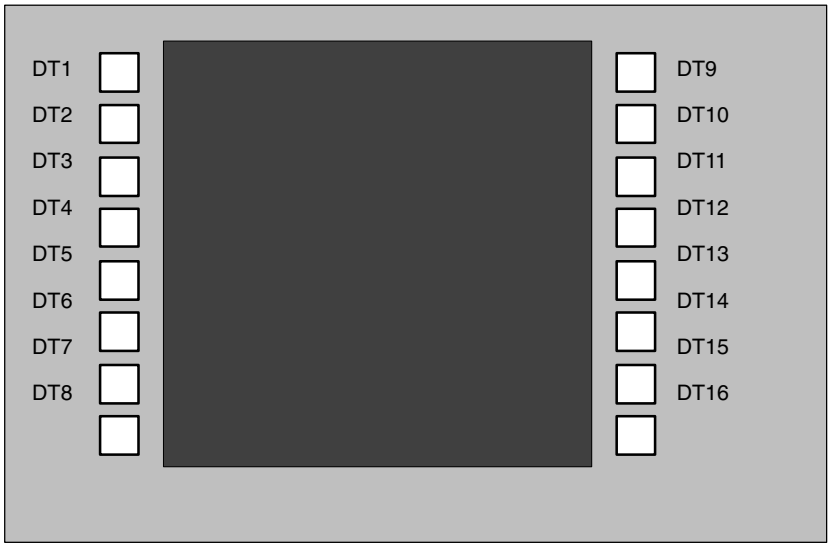

Fig. 11-3 Assignment of direct control keys on an operator panel front

Profibus connection

9-pin connector (see Figure 11-2).

Note

The Profibus cable used should have a connector with a straight outgoing cable.

11.2 Mounting

The DKM is installed to one side of the PCU on the operator panel front and connected to the keyboard controller via a short ribbon cable.

Installation kit

Mounting the DKM requires an installation kit appropriate to the operator panel front used (kit for the OP 012 already included with the DKM).

OP 015A and TP 015A require an installation kit (see illustration below) which must be ordered separately (see “Validity” at the start of this chapter).

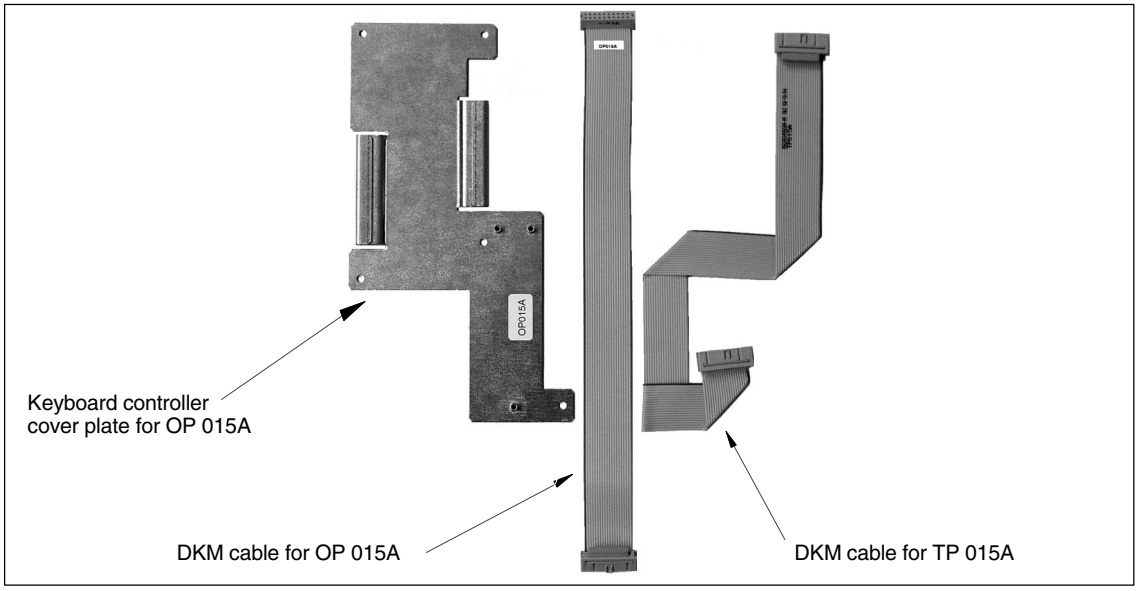

Fig. 11-4 DKM installation kit for OP 015A and TP 015A

11.2.1 Combination with OP 012

The OP 012 outputs the signals from the direct control keys (see Figure 11-3) at connector X11 (see illustration below).

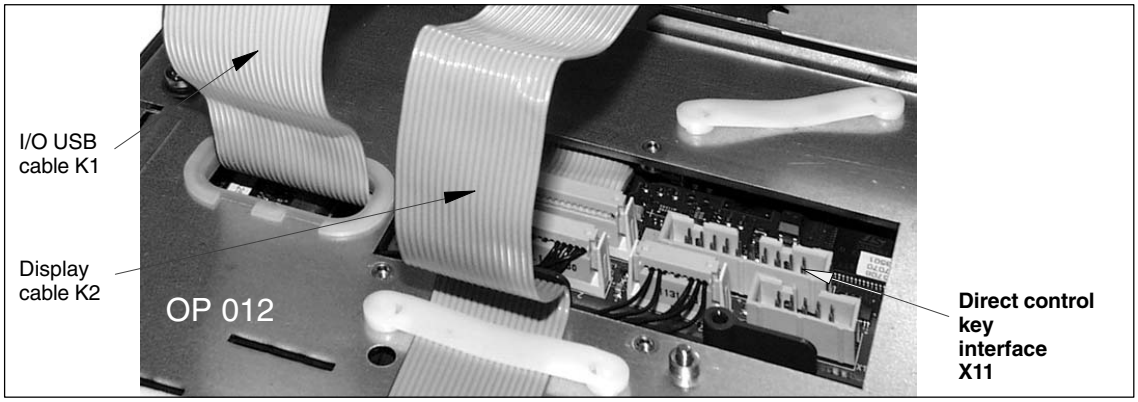

Fig. 11-5 OP 012 rear side

Preparation

1. Deinstall the PCU (if it is already installed) by removing the knurled-head screws at the four corners and lifting off the PCU.

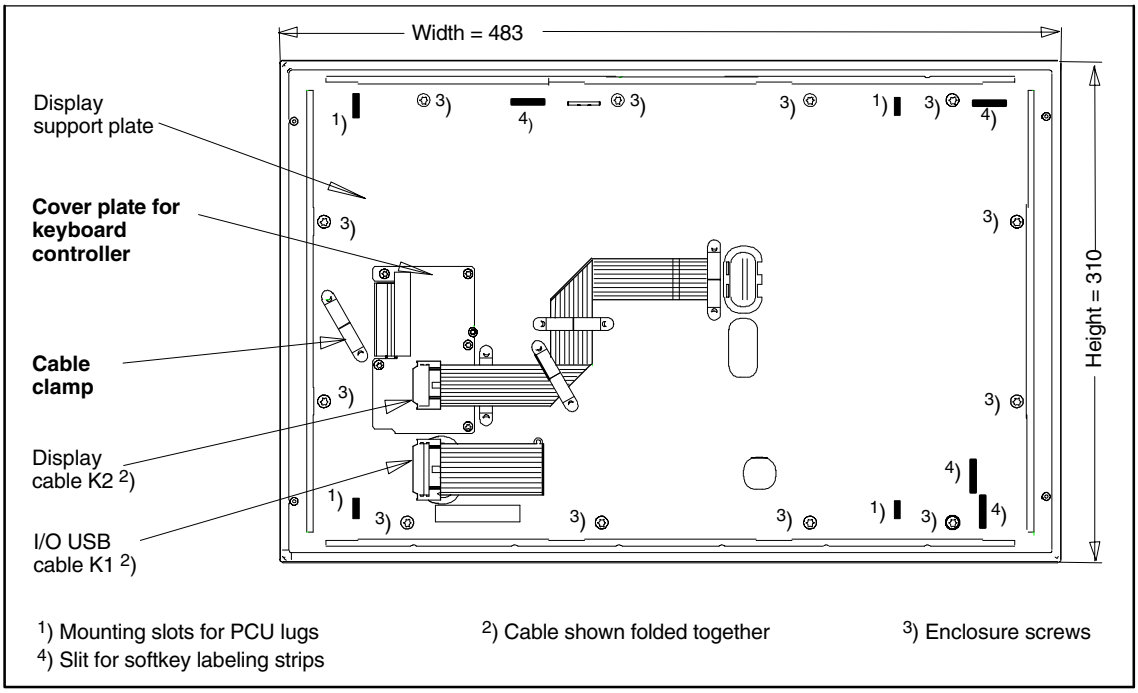

Fig. 11-6 OP 012 rear side

2. Remove the ribbon cable clamp alongside the keyboard controller cover plate (see illustration above), by inserting a pointed tool in each of the two slits and loosening the fixing cams by levering in the direction shown (see illustration below).

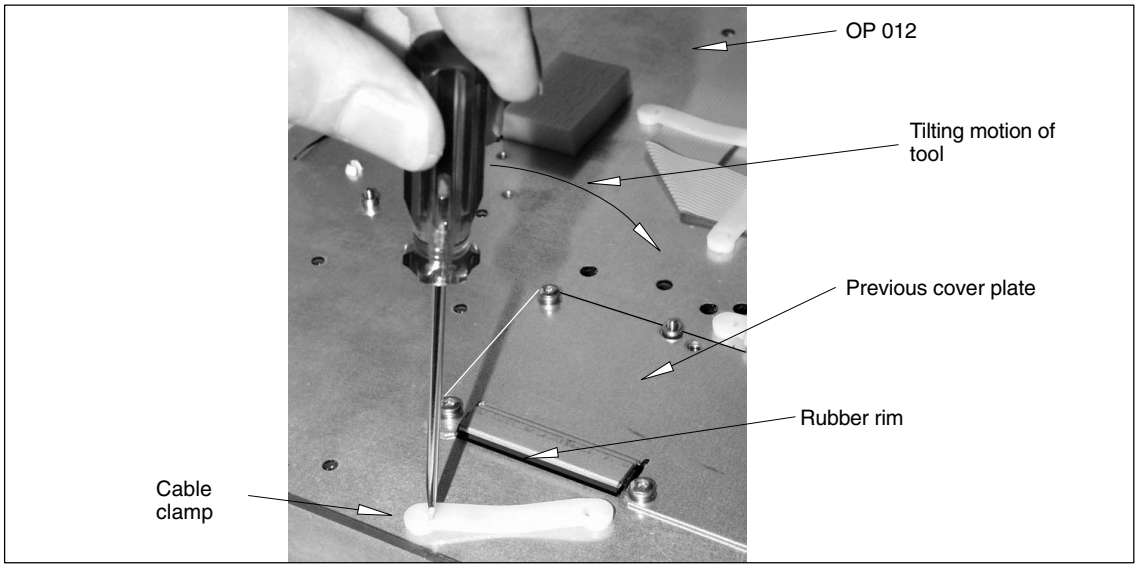

Fig. 11-7 Removing the cable clamp from the OP 012

3. Unscrew the keyboard controller cover plate.
   It is no longer needed for assembly.
4. Remove the rubber rim from the edge of the housing cutout (used to secure a pushbutton panel cable) (see Fig. 11-7).

Assembly

1. Insert the non-rubber-coated end of the ribbon cable supplied with the DKM through the slit in the cover also supplied with the DKM and into socket X11 on the keyboard controller.
2. Screw down the new cover tightly using the screws supplied (see illustration below).

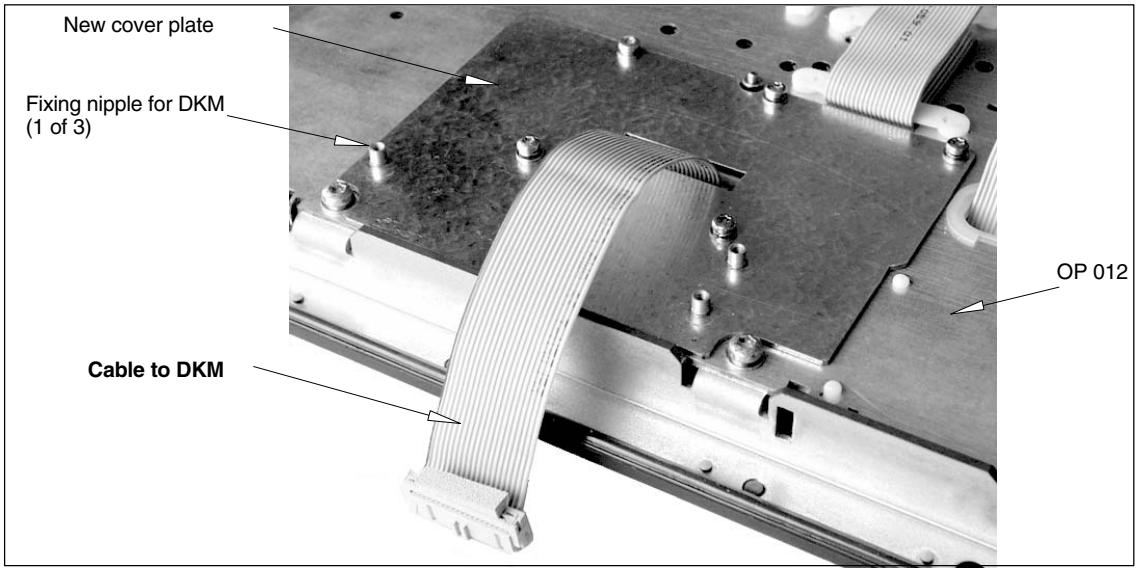

Fig. 11-8 Installation of the direct control key submodule on the OP 012

3. Install the PCU as described in Chapter “OP 012”, Section “Mounting”.
4. Set the PROFIBUS address 01 to 99 with the coding switches on the DKM (see Fig. 11-1; upper/lower coding switch: “Ones”/“Tens”).
5. Connect the ribbon cable to the DKM (see illustration below).

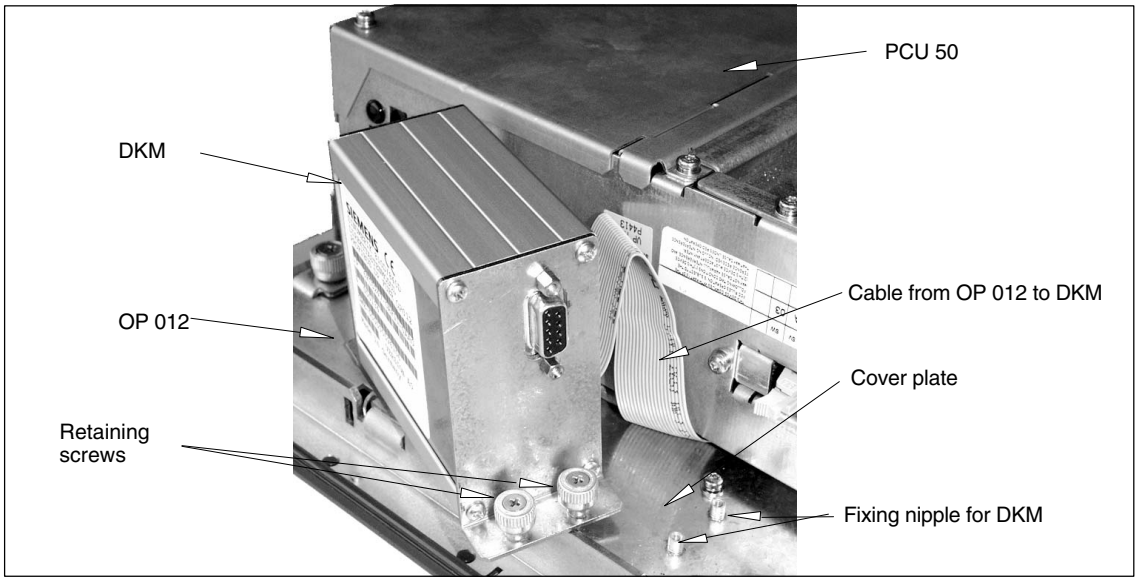

Fig. 11-9 Installation of the direct control key submodule on the OP 012

6. Screw the DKM firmly to the cover using the knurled screws on the side.

   The illustration below shows the fully assembled unit comprising OP 012, PCU 50 and DKM:

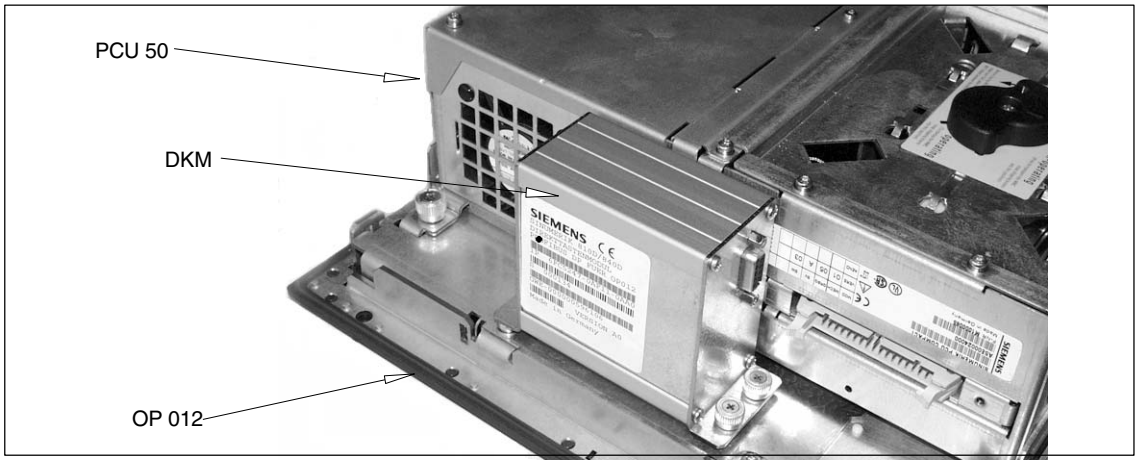

Fig. 11-10 Installed direct control key submodule

7. Insert the PROFIBUS plug (with straight outgoing cable) into the socket of the DKM (see Fig. 11-10).

If the DKM is not connected to PROFIBUS (or in the event of another fault), the “bus error” LED lights up (see Fig. 11-1).

Note

The direct control key submodule must be removed first on deinstallation of the PCU.

11.2.2 Combination with OP 015A

Preparation

1. Deinstall the PCU (if it is already installed) by removing the knurled-head screws at the four corners and lifting off the PCU.
2. Unscrew the keyboard controller cover plate (see illustration below):

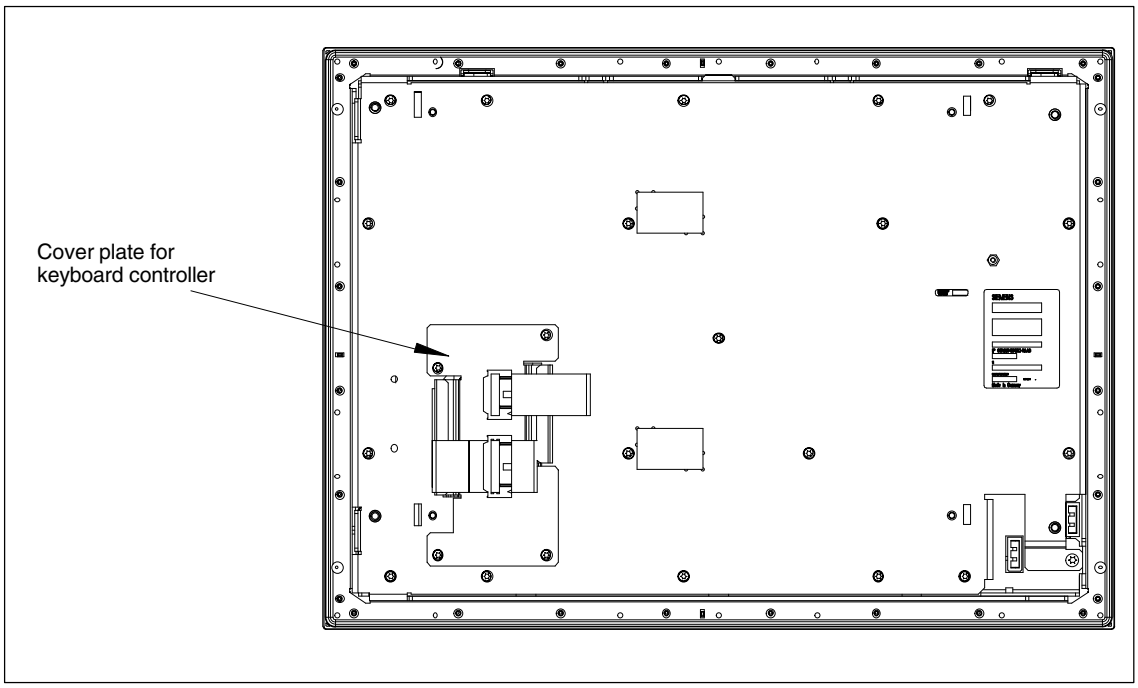

Fig. 11-11 OP 015A rear side

Assembly

1. Insert the *non*-rubber-coated end of the DKM ribbon cable (Figure 11-4; labeled “OP 015A”) into socket X11 on the keyboard controller (see illustration below, observe folding).

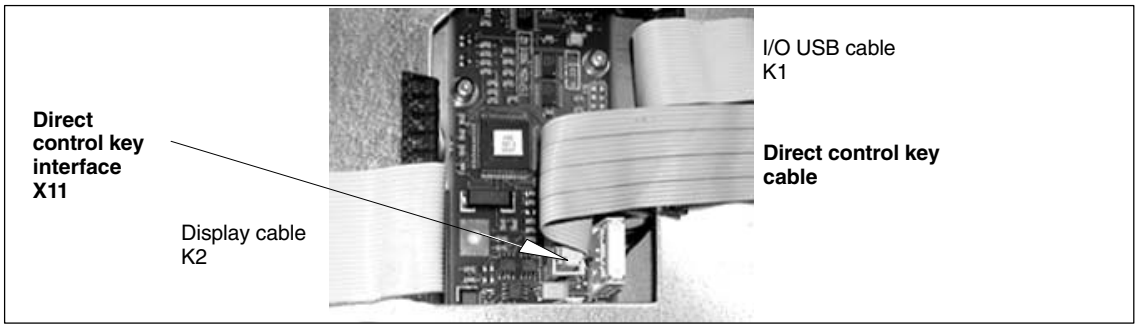

Fig. 11-12 OP 015A: Keyboard controller connections

2. Screw down the cover plate supplied with the installation kit and labeled “OP 015A” (see Figure 11-4).

3. Fold the DKM cable as shown in the illustration below:

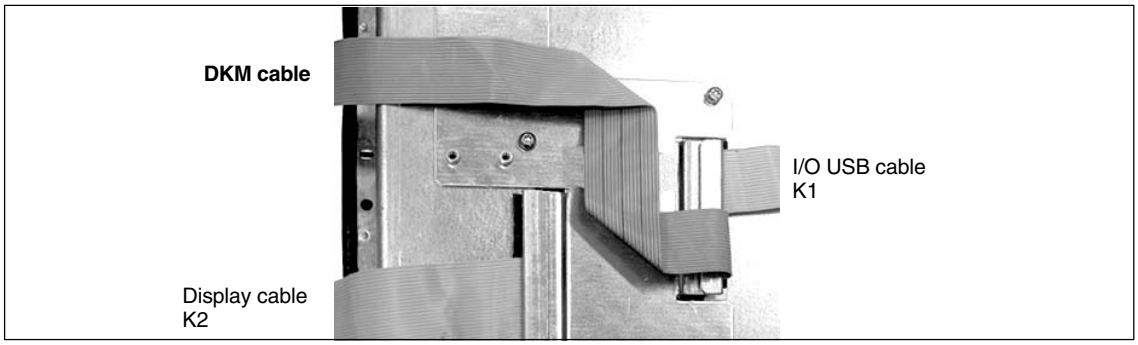

Fig. 11-13 OP 015A: DKM cable routing

4. Install the PCU as described in Chapter “OP 012”, Section “Mounting”.
5. Set the PROFIBUS address 01 to 99 with the coding switches on the DKM (see Fig. 11-1).

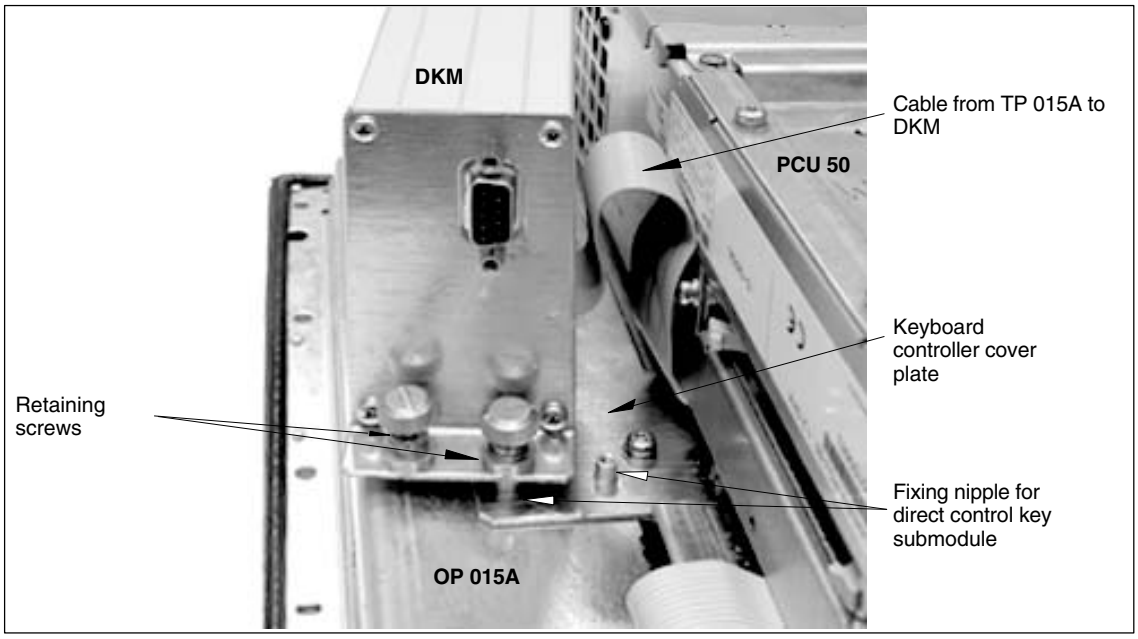

Fig. 11-14 Installation of the direct control key submodule on the OP 015A

6. Connect the ribbon cable to the DKM.
7. Screw the DKM firmly to the keyboard controller cover plate using the knurled screws.

11.2.3 Combination with TP 015A

Preparation

1. Deinstall the PCU (if it is already installed) by removing the knurled-head screws at the four corners and lifting off the PCU.

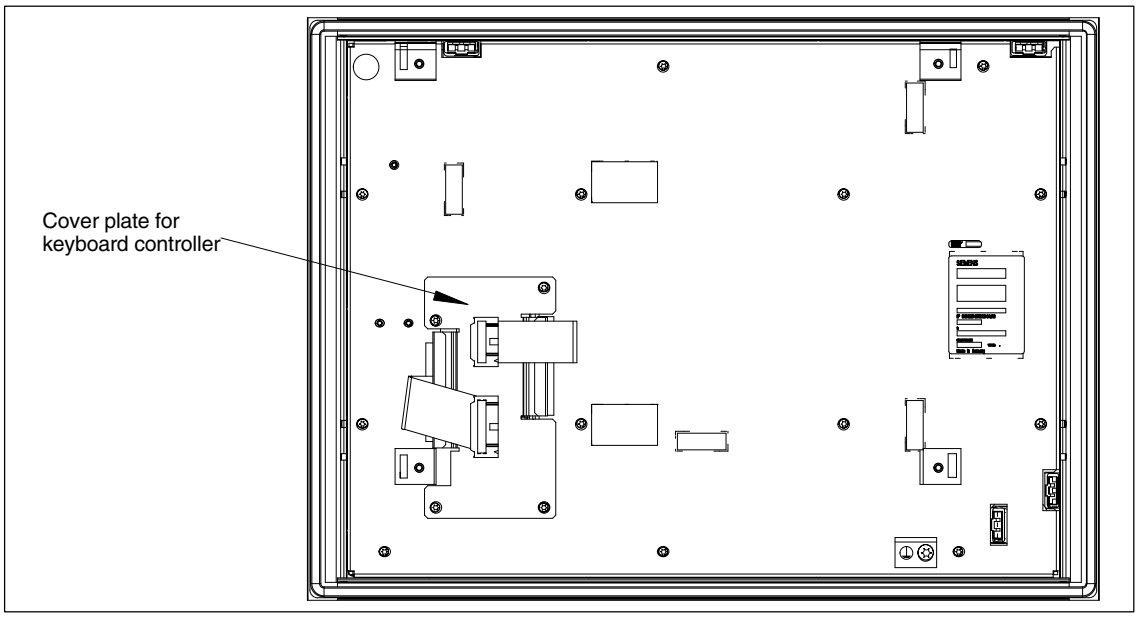

Fig. 11-15 TP 015A rear side

2. Unscrew the keyboard controller cover plate (see illustration below).

   The plate is required for installation.

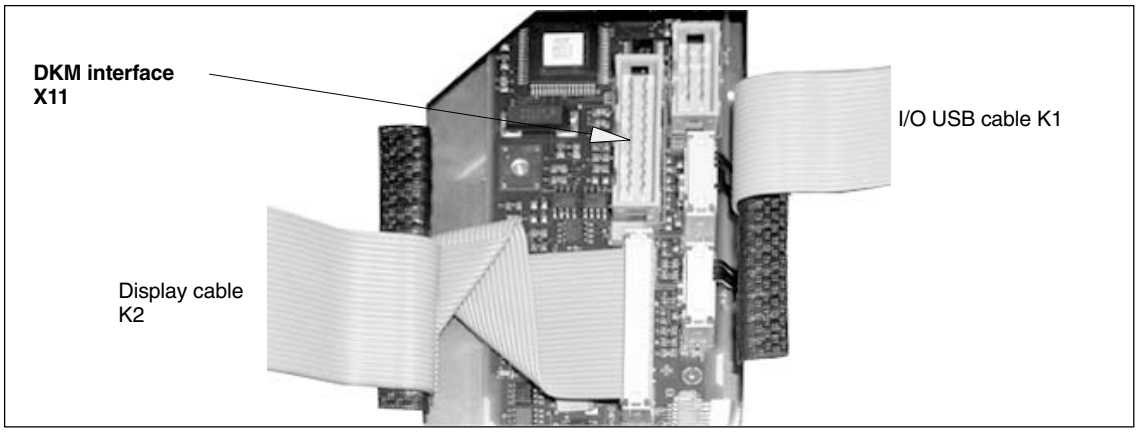

Fig. 11-16 TP 015A: Keyboard controller connections

Assembly

1. Insert the DKM ribbon cable (Figure 11-4; labeled “TP 015A”) into socket X11 on the keyboard controller (see illustration below).
   The cable is ready folded.

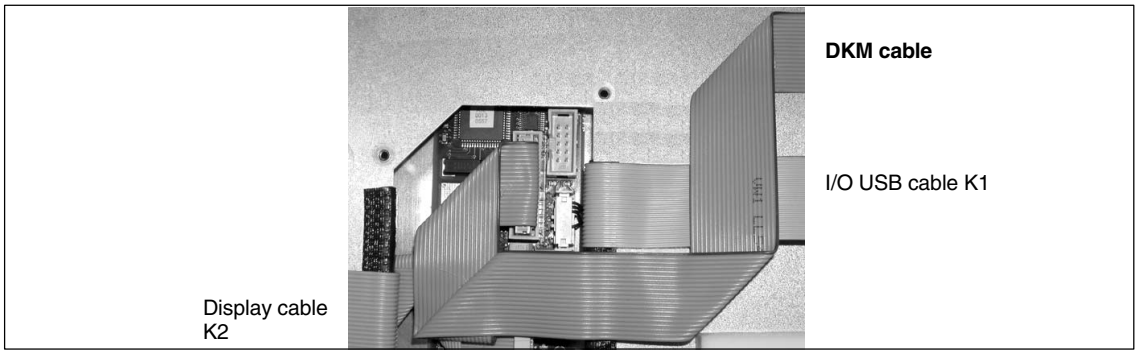

Fig. 11-17 TP 015A: DKM cable routing

2. Tighten the screws in the cover plate. To do this, turn over the cable as shown in the illustration below:

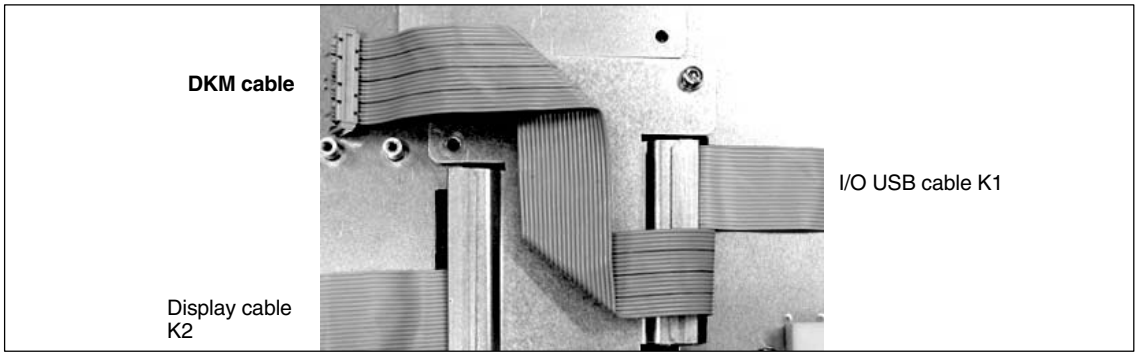

Fig. 11-18 TP 015A: Fitting the cover plate

3. Install the PCU as described in Chapter “OP 012”, Section “Mounting”.
4. Set the PROFIBUS address 01 to 99 with the coding switches on the DKM (see Fig. 11-1).
5. Connect the ribbon cable to the DKM (see illustration below).
6. Screw the DKM onto the fixing nipple with the knurled screws.

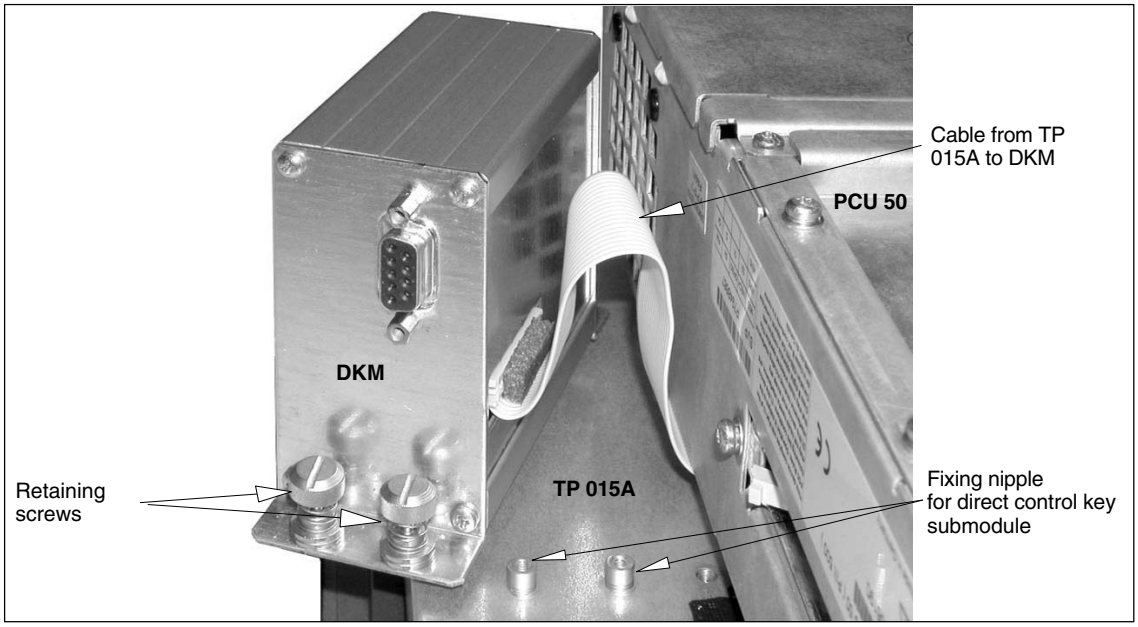

Fig. 11-19 Installation of the direct control key submodule on the TP 015A