INTRODUCTION

These instructions explain how to install Furse ESP K Series Surge Protection Devices (SPDs) to LSA-PLUS distribution frames. Use:

ESP KT1, ESP KT1/PTC
for analogue PSTN and U interface ISDN telephone lines (via an ESP KE10 earth bar)

ESP KT2
for S/T interface ISDN telephone lines (via an ESP KE10 earth bar)

ESP K10T1, ESP K10T1/PTC
for analogue PSTN and U interface ISDN telephone lines

ESP K10T2
for S/T interface ISDN telephone lines

The mains power supply to PBX/ISDN equipment should also be protected with the appropriate Furse ESP SPD.

1. Safety note:

Warning! Installation by person with electrotechnical expertise only.

Warnung! Installation nur durch elektrotechnische Fachkraft.

Avvertenza! Fare installare solo da un elettricista qualificato.

Avertissement! Installation uniquement par des personnes qualifiées en électrotechnique.

Advertencia! La instalación deberá ser realizada únicamente por electricistas especializados.

2. Before installation

2.1 Check physical compatibility of the product.

– ESP KT1, ESP KT1/PTC and ESP KT2 SPDs are designed for installation on LSA-PLUS distribution frames with 'ten pair' disconnection strips, using LSA-PLUS earth bar ESP KE10

– ESP K10T1, ESP K10T1/PTC and ESP K10T2 SPDs are designed for installation on LSA-PLUS distribution frames with 'ten pair' disconnection strips

2.2 Be sure that the maximum working voltage of the telephone line (DC or AC peak) will never exceed the maximum working voltage of the ESP SPD.

Otherwise it will clamp signal or ringing voltages as though they were transient overvoltages.

	Line to line max. voltage	Line to earth max. voltage
ESP KT1	296 V	296 V
ESP KT2	5 V	58 V
ESP K10T1	275 V	275 V
ESP K10T1/PTC	296 V	296 V
ESP K10T2	5 V	58 V

3. Installation

3.1 Orientation

The distribution frame contains several disconnection strips (see Figure 1).
Each disconnection strip has wires entering from two sides.

One side provides connection to the equipment to be protected (ie PBX/ISDN equipment) - this will be our **clean** side.

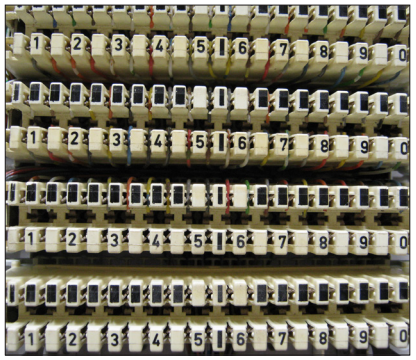

Figure 1:
Connection strips on an LSA-PLUS distribution frame.

The other side connects to where transients may come from, ie: the outside world (the incoming lines of the telephone company/ utility and extensions which are routed to another building) - this will be our **line** side.

3.2 Connection

This section is divided into two parts.
'Part (a)' refers to connection of ESP KT1, ESP KT1/PTC and KT2 units via an ESP KE10 earth bar. For connection of 'ten pair' ESP K10T1, ESP K10T1/PTC and ESP K10T2 units refer to 'Part (b)'.

(a) ESP KT1, ESP KT1/PTC, ESP KT2

Identify which lines require protection

Each line (or pair) which which connects with the outside world provides transient overvoltages with a route into the electrical system.

Protection must therefore be installed on each of these lines.

Identify:

(i) all incoming lines from your telecommunications provider, and

(ii) any telephone lines which leave the building (eg PBX extensions)

Remove any label holders, magazines & GDTs from the disconnection strip

If the disconnection strips requiring protection are already populated with label holders, magazines or gas discharge tubes (see Figure 2) these must be removed before the Furse ESP KE10 and ESP KT1 or ESP KT1/ PTCs or ESP KT2s can be installed.

Figure 2:
Clear the front face of the connection strip of all obstacles (eg label holders, magazines or gas tubes).

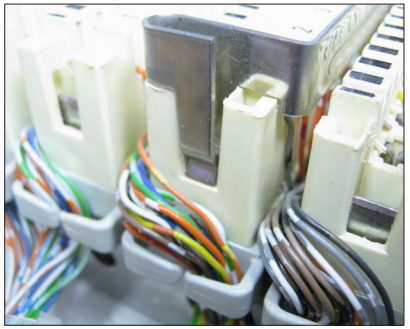

Figure 3:
Connection of ESP KE10 to mounting frame, for earth connection.

Insert the ESP KE10 earth bar

Push the earth bar into the disconnection strip, with the connecting rail on the equipment or **clean** side of the disconnection strip. Make sure that the earth bar is firmly clipped into the earth point (see Figure 3) with the clip or jaws at each end of the earth bar gripping the disconnection strip's earth point.

This will provide the ESP SPD with a substantial connection to earth.

CAUTION: Be sure that the ESP KE10 is installed the right way round, with the connecting rail on the equipment or clean side of the disconnection strip.

Push an ESP SPD into each line requiring protection

Firmly push one ESP KT1, ESP KT1/PTC or ESP KT2 SPD into each line (or pair) requiring protection, so that it clips securely onto the earth bar (see Figure 4).

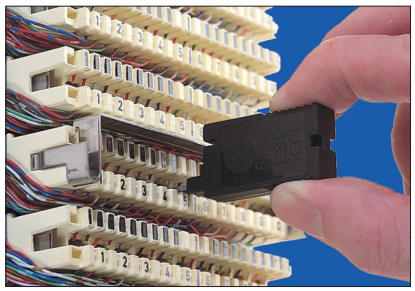

Figure 4:
ESP KT1 being plugged into the disconnection module, and connection into ESP KE10.

Note how the side of the ESP SPD marked **clean** is on the equipment side of the disconnection strip and that the **line** side of the ESP SPD is on the side of the disconnection strip which connects to the outside world.

WARNING: On no account should an ESP KT1, ESP KT1/PTC or ESP KT2 on one disconnection strip be clipped onto the earth bar on a neighbouring disconnection strip.

If installing both the black ESP KT1 (or ESP KT1/PTC) and the white ESP KT2 SPDs on the same distribution frame, be sure to install them on the appropriate lines.

Each ESP SPD is supplied with a small blank label for line identification data to be recorded.

You may find it helpful to mark these and stick them onto the ESP SPD prior to installing it.

(b) ESP K10T1 / ESP K10T1/PTC and ESP K10T2

Identify which lines require protection

Each disconnection strip which contains lines which connect with the outside world provides transient overvoltages with a route into the electrical system.

Protection must therefore be installed on each of these disconnection strips.

Identify:

(i) all strips which contain incoming lines from your telecommunications provider, and

(ii) any strips providing telephone lines to another building (eg PBX extensions)

Remove any label holders, magazines & GDTs from the disconnection strip

If the disconnection strips requiring protection are already populated with label holders, magazines or gas discharge tubes (see Figure 2) these must be removed before the Furse ESP K10T1, ESP K10T1/PTC or ESP K10T2 can be installed.

Push a SPD into each strip requiring protection

Firmly push one ESP K10T1, ESP K10T1/PTC or ESP K10T2 SPD into each disconnection strip requiring protection, so that it clips securely in to the earth point, at each end of the disconnection strip (see Figure 5). Make sure that the side of the SPD marked clean is on the equipment side of the disconnection strip and that the line side of the SPD is on the side of the disconnection strip which connects with the outside world.

CAUTION: It is vital that the ESP K10T1/PTC or ESP K10T2 is installed the right way round with its clean side on the equipment side of the disconnection strip.

Note that the ESP K10T1 can be installed in any direction given it uses bi-directional protection components.

If installing both the black ESP K10T1 (or ESP K10T1/PTC) and the white ESP K10T2 SPDs on the same distribution frame, be sure to install them on the appropriate disconnection strips.

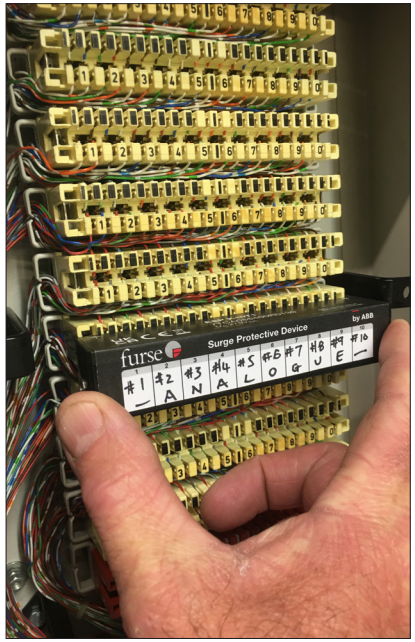

Figure 5:
Firmly push an ESP K10T1, ESP K10T1/PTC or ESP K10T2 into each of the disconnection strips required. ESP SPDs should be showing labels marked for line identification.

Each SPD is supplied with a blank label for line identification data to be recorded.

You may find it helpful to mark it and stick it on to the SPD prior to installation (see Figure 5).

3.3 Earthing

ESP SPDs are connected to earth in the following manner:

– ESP KT1, ESP KT1/PTC and ESP KT2 SPDs are connected to earth via the ESP KE10 earth bar, which clips directly onto the distribution frame's metal 'backmount frame' (note this is also the earth point for the disconnection strip).

– ESP K10T1, ESP K10T1/PTC and ESP K10T2 SPDs are connected to earth via the disconnection strips earth bar (ie part of the distribution frame's metal 'backmount frame').

Although the backmount frame should already be earthed, this existing earth is unlikely to be sufficient.

We recommend that an earth cable (of at least 4 mm²) is used to provide an additional bond from the distribution frame to the electrical earth of the system requiring protection.

If the backmount frame is composed of separate left and right sections, both should be bonded to this earth.

If the backframe mount is non-metallic, then the earth connection can be made directly to the Faston (6.2mm) tab connection on the ESP KE10 earth bar (Fig.6) or directly to the M4 earth stud on the ESP K10T1, ESP K10T1/PTC or ESP K10T2 (Fig.7)

4. After installation

4.1 Keep good records

We recommend that a record is kept of the date of installation, which lines are protected and the dates and results of subsequent inspections. A copy of these installation instructions should be kept with this record.

4.2 Inspect the installation regularly

We recommend that the installation is inspected at least once a year. Check that the SPDs and their earth bars are pushed firmly into their disconnection strip(s).

4.3 Checking for failure

When the SPD reaches the end of its life it will fail short circuit (in order to prevent subsequent transient overvoltages from damaging the protected equipment).

Consequently, the protected line will cease to function.

In case of suspected failure the SPD should be removed. If the SPD is damaged the line will now function normally.

A new SPD should be installed immediately.

SAFETY NOTE:

1. **Always handle cables by their insulation**
2. **Never work on Surge Protection Devices (SPDs) or their cables during a storm**

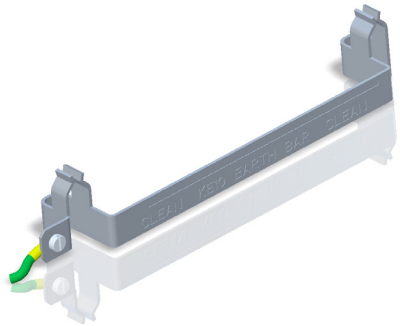

Fig 6:
Earth connection on ESP KE10 earth bar (using M3 ring crimp or Faston tab), for non-earthed module frames.

Environment
Consider the protection of the environment! Used electrical and electronic equipment must NOT be disposed of with domestic waste. The device contains valuable raw materials which can be recycled. Therefore, contact ABB for disposal of this equipment.

Fig 7:
Earth connection to earth stud on ESP K10T1, ESP K10T1/PTC or ESP K10T2.

Notes

Protecting PBX & ISDN telephone lines

ESP KT & K10T Series

INSTALLATION INSTRUCTIONS

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