

# KM6-II Universal and KM6-EC Subracks: EMC Conversion

## KM6-II EMC CONVERSION KITS

KM6-II Universal subracks and some sizes of KM6-EC can be retrospectively EMC screened by the addition of covers and suitable front and rear panels.

Two Basic types of screening cover are available:

**OVERALL**, (Fig. 1) which provide a screen over both the card area and the rear connector/backplane area. In this version, the rear of the subrack is completed by the addition of conventionally fixed panels, either full width or in combinations of lesser width front panels.

**PCB AREA ONLY** (Fig. 2) This application requires a motherboard/backplane which is specifically designed to provide rear screening using ground plane technology. With this geometry, only the front aperture requires screening panels.

Covers are generally available in ventilated and unventilated forms. They are designed to maintain intimate contact with the end plates by means of screws and internal flanges. At the interface with the extrusions, the covers have patented dimples in such a way as to provide an interference fit with a slot in the extrusion. The concept of this slot ensures that the card guide location holes are within the screened area of the subrack and also provides additional screening by introducing a labyrinth around the edge of the cover.

'A guide to the EMC screening of subracks' on page 9 discusses the effects of various configurations on the overall performance, with particular attention to the use of RFI fingers.

## ORDERING AN EMC SCREENED SUBRACK

- 1 Select a Universal subrack kit to suit your card size using table below. Note that, for instance, it is not possible to EMC screen a 220mm long card in a 240 deep subrack.
- 2 Select an EMC conversion kit to suit your subrack and card size (see page 19 for Overall Depth Covers and page 20 for PCB Depth Covers). Note – for screening 42HP subracks please refer to note 2 on page 19
- 3 Select front and rear panels as appropriate (see page 23).
- 4 Identify total quantity of RFI finger strips required according to the desired performance level of the final assembly. (See page 9 for guide and page 19 for EMC finger strips).

## KM6-II UNIVERSAL SUBRACKS

PCB Configurations accepted when using EMC conversions and cover kits

Height	PCB Depth (mm)	End Plate (mm)	Order code
3U	160	240	Refer to page 17
	160/220	300	
	160/220	360	
6U	160	240	Refer to page 17
	160/220	300	
	160/220	360	
	160/220/280/340	420	
9U	160	240	Refer to page 17
	160/220	360	
	160/220/280/340	420	

## KM6-EC SUBRACKS

Height	PCB Depth (mm)	End Plate (mm)	Order code
3U	160	240	Refer to pages 46 – 49
	160/220	360	
6U	160	240	Refer to pages 46 – 49
	160/220	360	



KM6-II EMC conversion kits

Figure 1

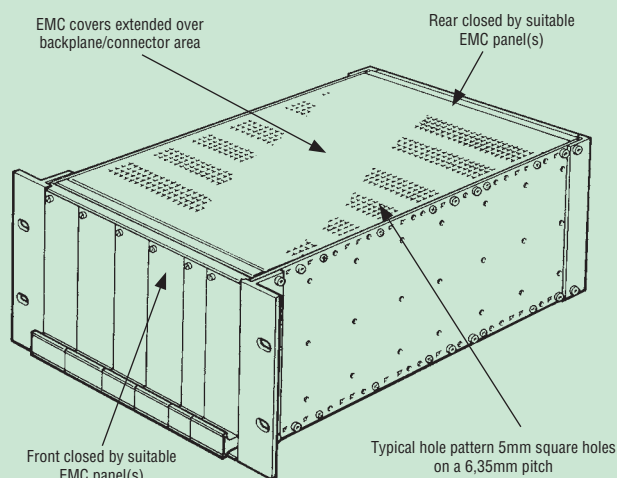
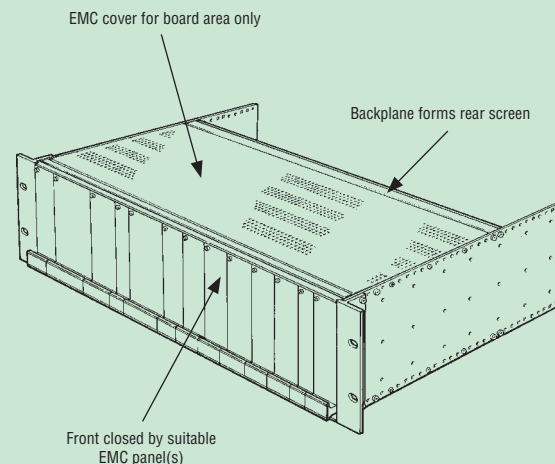


Figure 2



# KM6-II Universal Subracks: EMC Conversion

## EMC CONVERSION KITS – OVERALL DEPTH

This kit contains the parts required to convert an 84HP subrack for EMC.

### Notes:

1. EMC front and rear panels and EMC fingers should be ordered separately to suit requirements – please refer to page 23.
2. 42HP card frames can be effectively screened by ordering the individual covers, rear closing angles and front panels featured on pages 22 and 23, together with the EMC finger strip detailed below.

### Contents of kit

Description	Qty.	Material and finish
Plain tie bars	2	Aluminium alloy BS1474-6063-T6 conductive clear chromate
Tapped strips	2	MS Zinc passivate
Rear closing angles	2	Aluminium Alloy BS1474-6063-T6 anodised
Top and bottom covers (either ventilated or unventilated)	2	0,9mm Aluminium alloy conductive clear chromate
All fixings		

## KM6-II EMC CONVERSION

### Ordering Information

Height	Ventilated	PCB Depth (mm)	End Plate (mm)	Order Code
3U	No	160	240	<b>950-240574K</b>
	Yes	160	240	<b>950-240575H</b>
6U	No	160	240	<b>950-240576F</b>
	Yes	160	240	<b>950-240577D</b>
9U	No	160	240	<b>950-240578B</b>
	Yes	160	240	<b>950-240579L</b>
3U	No	160/220	300	<b>950-240580D</b>
	Yes	160/220	300	<b>950-240581B</b>
6U	No	160/220	300	<b>950-240582L</b>
	Yes	160/220	300	<b>950-240583J</b>
3U	No	160/220	360	<b>950-240584G</b>
	Yes	160/220	360	<b>950-240585E</b>
6U	No	160/220	360	<b>950-240587A</b>
	Yes	160/220	360	<b>950-240588K</b>
9U	No	160/220	360	<b>950-240589H</b>
	Yes	160/220	360	<b>950-240590A</b>
6U	No	160/220/280/340	420	<b>950-240562F</b>
	Yes	160/220/280/340	420	<b>950-240563D</b>
9U	No	160/220/280/340	420	<b>950-240564B</b>
	Yes	160/220/280/340	420	<b>950-240565L</b>

## RFI FINGER STRIP

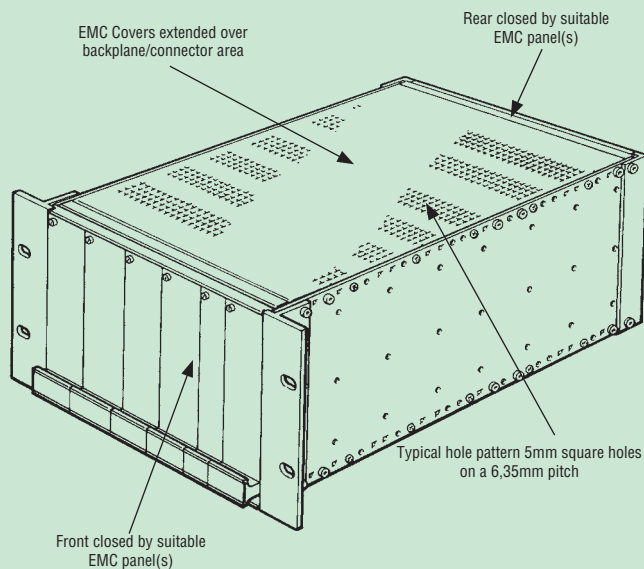
Supplied in lengths of 381mm consisting of 60 fingers. The fingers are self adhesive for easy application and replacement in the field. The quantity of fingers fitted at any panel/subrack interface is selected according to the performance required from the overall screen. Please see page 9 for details. They can be cut using a sharp pair of scissors, taking care to avoid crushing during cutting.

RFI finger strip material: Beryllium copper

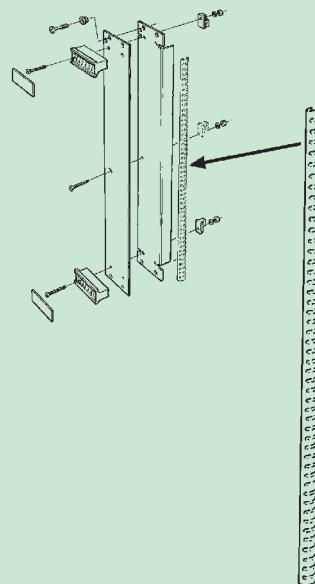
### Ordering information

Description	Length	Order code
RFI Finger strip	381mm (60 fingers)	<b>930-238243F</b>

Figure 3



RFI Finger strip



# KM6-II Universal Subracks: EMC Conversion

## BOARD AREA ONLY EMC COVER KITS

Board area only EMC cover kits (Fig.4) For use in situations where the backplane forms the rear EMC screen, these ventilated covers fit between the front, and backplane, extrusion only.



Select by board depth and subrack width (84HP only); end plate depth is not a consideration.

### Contents of kit

Description	Qty.	Materials/Finish
Top and Bottom Covers (ventilated)	2	0,9mm Aluminium alloy conductive clear chromate
Fixings		

### Ordering information

Description	Order code
84HP x 160 Ventilated EMC cover	950-259371F
84HP x 220 Ventilated EMC cover	950-259372D

This performance graph shows the results from randomly selected KM6-II subracks, 6Ux84HPx360 with ventilated and unventilated EMC covers. Both were fitted with overall closing panels and a maximum quantity of BeCu fingers.

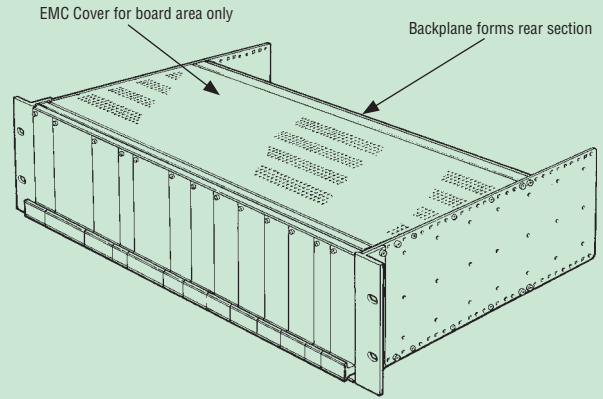
Measurements were taken at all six faces and the results shown in the graph are calculated as follows:

**H field** – minimum figures

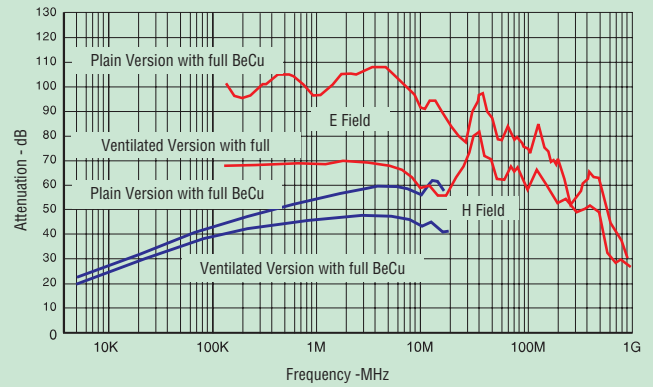
**E field** – minimum figures up to 30MHz above 30MHz the figures for all faces are plotted on a rolling seven point average.

A detailed discussion of our EMC test facility and procedures is shown in our separate leaflet 'The Science of Compliance'. If you require a copy, please contact your local sales office.

Figure 4



## KM6-II Shielding Effectiveness



# KM6-II Universal Subracks: EMC Conversion

## 4U AND 7U COMPONENTS

In addition to the conventional methods of screening sensitive electronic equipment for EMC, it is possible to enclose normal plug-in units and cards together with the interface wiring within a fully screened area by using 4U or 7U endplates and other relevant components.

For a typical EMC build please refer to the chart below for selection of piece parts and page cross reference.

### Typical 4U build with a 3U inner subrack configured

Item	Qty	Page
EMC front panel fingers	–	19
4U Endplates of required depth	2	25
4U Endplate angles	2	25
Front tie bars of required width	6	26
Rear backplane or connector tie bars of required width	2	27 and 28
EMC top and bottom cover kits of required width	1	22
Rear closing angle kit	1	22
Front and rear closing panels	2	23
Tapped strips of required width	8	31
Tie bar to endplate screws – pack of 100	Pack	45

## ACCESSORIES

Order separately

Product	Page
EMC Covers/conversion kit	18 – 20
Overall EMC closing panels	23
Backplane spacers	31
DIN 41612 connector mounting	31
PCB or Plug-in module guides	32
PCB Grounding clips	33
Positive guide retention – tapped strips	33
PCB Retainers and guide nose extensions	34
PCB Ejectors	35
Divider Kits	38 – 40
Top and Bottom covers – non-EMC	41
Horizontal mounting modules	42
Subrack handles	43
Fixing screws	45 and 75
Front panels and Plug-in units	50 – 77

*Note: The conductive finish gives excellent electrical conductivity but is more easily marked than anodising. During assembly care should therefore be taken to avoid the deposition of grease and oil, particularly on the visible surfaces.*



KM6-II EMC conversion

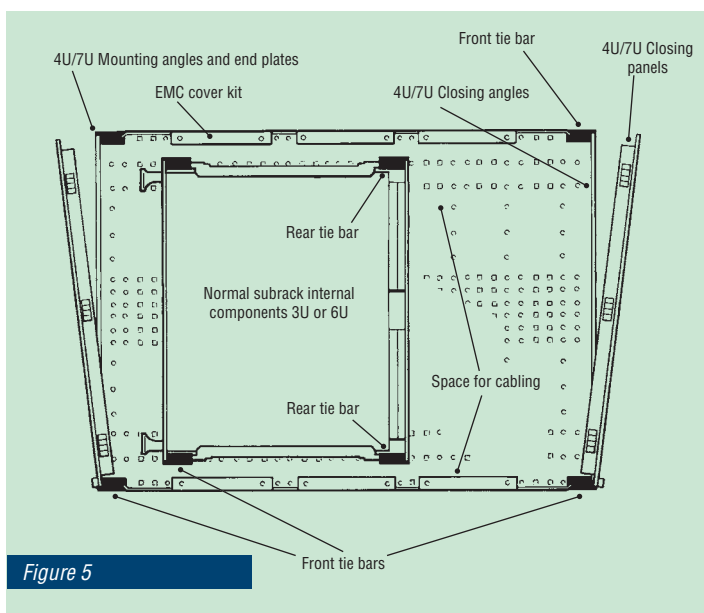


Figure 5

# KM6-II Universal and KM6-EC Subracks: EMC Conversion - piece parts

## KM6-II EMC CONVERSION: TOP AND BASE COVERS – OVERALL DEPTH

The 'Overall' EMC conversion kits are also available in their constituent parts.

In addition to the 84HP versions, a small range of ventilated overall covers is available in 42HP and 60HP widths. In order to fit these, it is necessary to order reduced width front extrusions and tapped strips, M4 fixing screws and rear closing angles.

### Contents of kit

Description	Qty.	Material/Finish
Covers	2	0,9mm aluminium alloy, conductive clear chromate
All fixings		

### Ordering Information

Width	Ventilated	PCB Depth (mm)	End Plate (mm)	Order code
42HP	No	160	240	–
	Yes	160	240	950-259417H
60HP	No	160	240	–
	Yes	160	240	950-259418F
84HP	No	160	240	950-240557K
	Yes	160	240	950-240553G
42HP	No	160/220	300	–
	Yes	160/220	300	950-259419D
	No	160/220	300	950-240556A
	Yes	160/220	300	950-240552J
84HP	No	160/220	360	950-240559F
	Yes	160/220	360	950-240554E
	No	160/220	420	950-240558H
	Yes	160/220	420	950-240555C

## REAR CLOSING ANGLES

These are fitted at the rear in conjunction with rear mounting tie bars. EMC Beryllium copper fingers should be ordered separately to maintain the shield between the subrack and EMC panels.

### Contents of kit

Description	Qty.	Material/Finish
Angles	2	AL extrusion, conductive clear chromate

### Ordering information

Description	Order code
3U Rear closing angles	950-240549J
4U Rear closing angles	950-259278G
6U Rear closing angles	950-240550B
7U Rear closing angles	950-259279E
9U Rear closing angles	950-240551L

## REAR MOUNTING TIE BARS

Two should be ordered per subrack. 84HP version use a plain tie bar. Other widths use standard front tie bars. Sold in singles. Two tapped strips and eight fixings are also required.

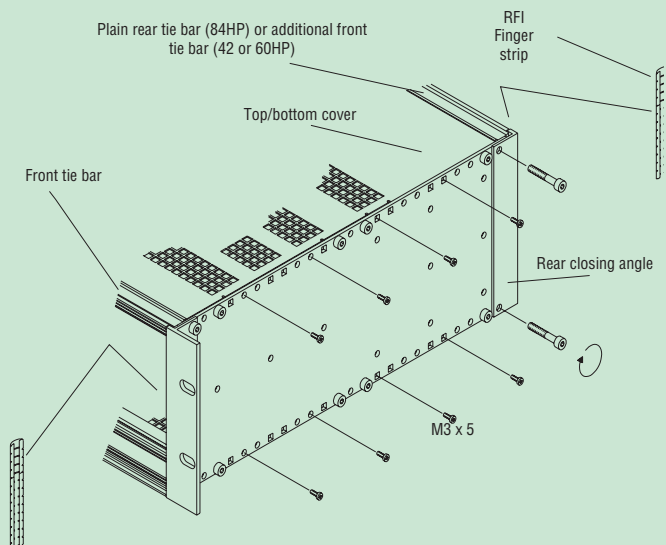
### Ordering information

Description: Rear mounting bars

Width	Type	Order code
84HP	Plain tie bar	950-221909A
	Tapped strip	950-202001E
	Front tie bar top	950-202743E
60HP	Front tie bar bottom	950-202742G
	Tapped strip	950-202740L
	Front tie bar top	950-202736B
42HP	Front tie bar bottom	950-202735D
	Tapped strip	950-202739G

Tie bar fixing screws: Pack 100 (4 per tie bar required)

950-202734F



# KM6-II Universal Sub racks: EMC Conversion - front panel options

## INDIVIDUAL TWO-PART EMC PANELS



Available in various widths as blanking panels or for mounting circuit boards. Copper fingers are required for maintaining continuity between neighbouring panels. 6U and 9U panels have type C handle format.

### Contents of kit

Description	Finish
Panel inc. fixings	Facia panel etch and clear anodise, inner panel conductive clear chromate
Handles and idents (1-3U, 2-6U and 9U)	

### Ordering information

Description: Individual EMC panel

Height	Width	Qty.	Order code
3U	4HP	1	951-242963C
	6HP	1	951-242964A
	8HP	1	951-242965K
	24HP	1	951-242968D
6U	4HP	1	951-242969B
	6HP	1	951-242970F
	8HP	1	951-242971D
9U	12HP	1	951-242972B
	4HP	1	951-242975G



Individual EMC panels

## OVERALL CLOSING PANELS



These full width (84HP) closing panels can be used at the front or rear of the subrack and make contact with the end plates and tie bars as described below.

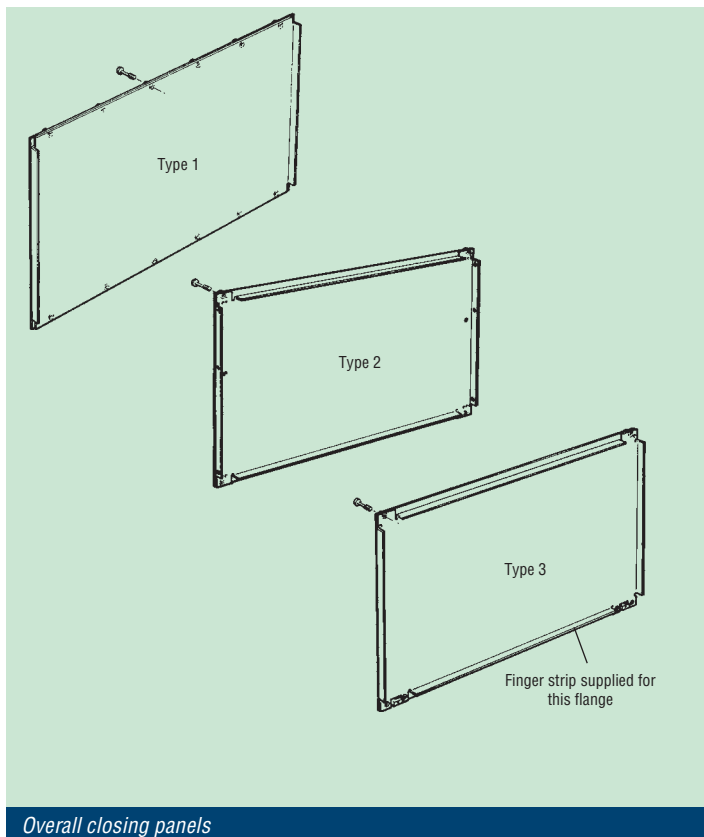
**Type 1** which is secured by twelve captive screws and is available for installations where access is seldom necessary. Contact to the end plates is achieved using beryllium copper fingers.

**Type 2** is secured by four captive screws only, relying on beryllium copper fingers to maintain contact on all four edges.

**Type 3** is a horizontally hinged panel which relies almost entirely on beryllium copper fingers for contact on all four edges, having only two captive screws.

A special finger strip is provided with the kit for the bottom flange only.

**Types 2 and 3** are particularly useful in situations where frequent access is likely to be required.



Overall closing panels

### Contents of kit

Description	Finish
Panel inc. fixings	Facia panel etch and clear anodise, inner panel conductive clear chromate
Handles and idents (Type 2 only)	

### Ordering information

Description: Overall closing panels

Type	Qty	Width	Height	Order code
1	1	84HP	3U	950-202694C
			6U	950-202695A
			9U	950-202696K
2	1	84HP	3U	951-242957J
			6U	951-242958G
			9U	951-242959E
3	1	84HP	3U	951-242960J
			4U	951-259284D
			6U	951-242961G
			7U	951-259285B
			9U	951-242962E

### Order separately

Product	Page
BeCu RFI Fingers	19
Additional card mounting brackets	57