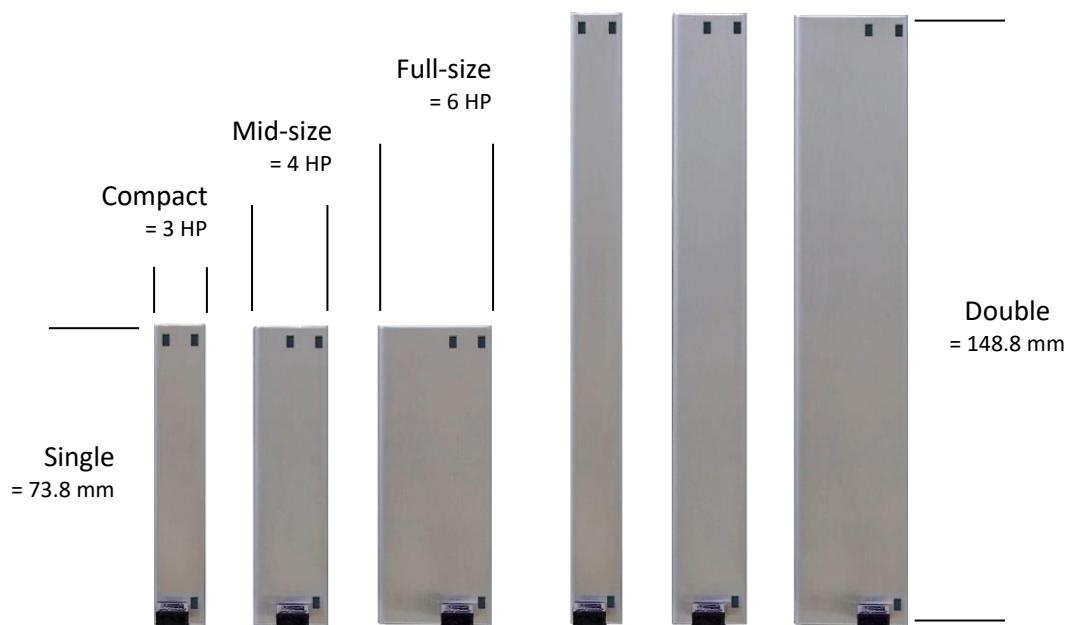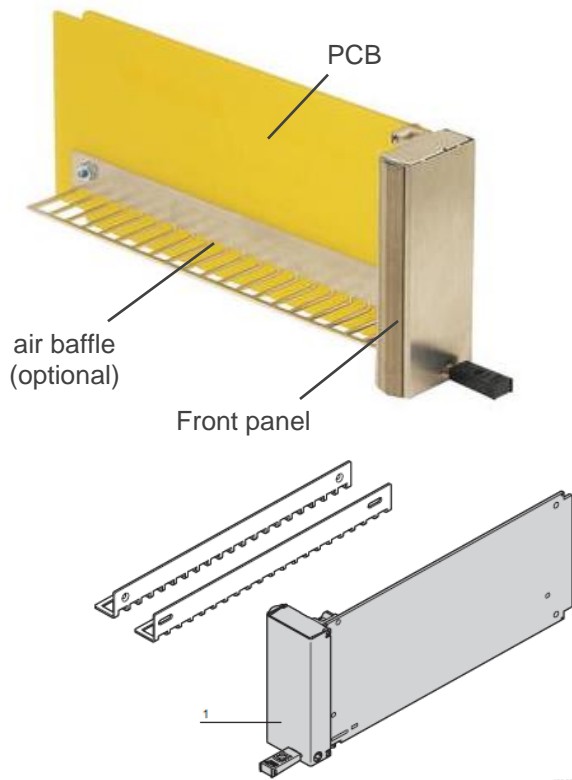# How to use MicroTCA Filler Modules

MicroTCA is a specification for high performance systems. Most AdvancedMC modules have high power needs. To ensure a proper cooling and EMC shielding of the MicroTCA chassis it's recommended to cover empty slots with filler panels with air blocking devices or empty spaces above a Single AdvancedMC module in a Double Slot with a front panel. This document provides an overview about the existing front panels and filler modules and where they can be used.

AdvancedMC module sizes

The Boards used in MicroTCA Systems are specified in the PICMG specification AMC.0. These AdvancedMC (Advanced Mezzanine Cards) modules for use in AdvancedTCA Carriers or MicroTCA Systems come in 6 different sizes. 3 different widths and 2 different heights are defined.

Compact
= 3 HP

Mid-size
= 4 HP

Full-size
= 6 HP

Single
= 73.8 mm

Double
= 148.8 mm

Filler modules with push-pull-handle mechanism

PCB

air baffle
(optional)

Front panel

This filler module consists of an AdvancedMC stainless steel or aluminum front panel without LED's, with EMC gaskets on the left hand and bottom side, an AdvancedMC push-pull handle and a pcb with provisions to mount an air baffle. The module can be used to cover an empty slot, to ensure EMC shielding and close the front to avoid an air flow short cut. These filler modules can be used in each AdvancedMC Carrier Board and in each MicroTCA front slot. It doesn't require a locking bar.

With the additional air baffles the air can be blocked in this slot to guide the air through the slots in which AdvancedMC modules are installed to ensure a proper cooling of those modules. The air baffle consists of a fixed and a movable part to adjust the air flow through the slot in a range of 60 to 80%.
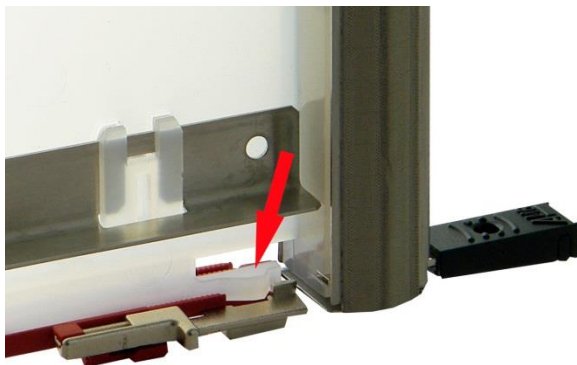
Order Information, Filler modules with push-pull-handle mechanism

Description	Aluminum	Stainless steel
Single Compact (3 HP)	20849-304	20849-022
Single Mid-size (4 HP)	20849-248	20849-106
Single Full-size (6 HP)	20849-250	20849-024
Double Compact (3 HP)	20849-305	20849-023
Double Mid-size (4 HP)	20849-249	20849-107
Double Full-size (6 HP)	20849-251	20849-025

Order Information, Air baffles for filler modules with push-pull-handle mechanism

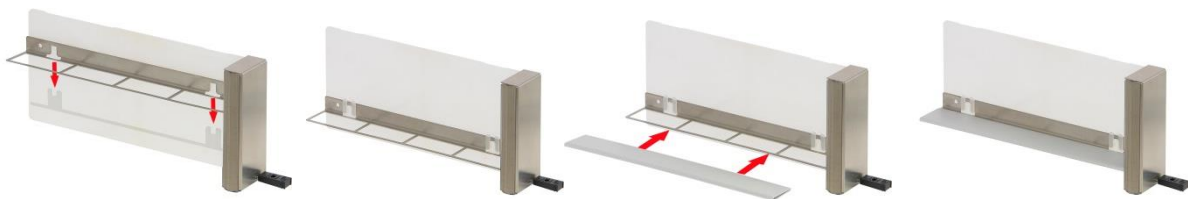| Description	Qty/PU	Order No.	For filler modules
Air baffle for Compact filler modules	10	20849-016	20849-304, 20849-022, 20849-305, 20849-023
Air baffle for Mid-size filler modules	10	20849-017	20849-248, 20849-106, 20849-249, 20849-107
Air baffle for Full-size filler modules	10	20849-018	20849-250, 20849-024, 20849-251, 20849-025

Filler modules ECO with fixed handle

This filler module is consisting of an AdvancedMC stainless steel front panel without LED's, with EMC gaskets on the left hand and bottom side, an AMC and a plastic board with provision to mount an air baffle. The handle doesn't have the push-pull mechanism as defined in the AdvancedMC specification, but is fixed into the card guide by a snap in plastic nose. The module can be used to cover an empty slot, to ensure EMC shielding and close the front to avoid an air flow short cut. These filler modules can be used in each AdvancedMC Carrier Board and in each MicroTCA front slot. It doesn't require a locking bar.

With the additional air baffles the air can be blocked in this slot to guide the air through the slots in which AdvancedMC modules are installed to ensure a proper cooling of those modules. The air baffle consists of a metal sheet part with big cutouts and a plastic part blocking the air flow. To adjust the air flow volume through the slot, the user can do cut outs in the plastic part to guide a certain air volume into a certain part of the slot.

Assembly of the air baffle:

Order Information, Filler modules ECO with fixed handle

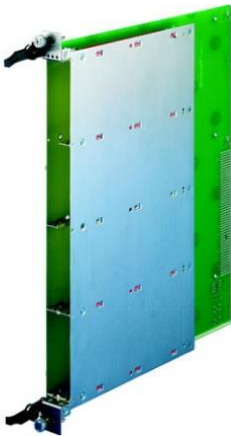| Description	Order No.
Single Compact (3 HP)	20849-348
Single Mid-size (4 HP)	20849-350
Single Full-size (6 HP)	20849-352
Double Compact (3 HP)	20849-349
Double Mid-size (4 HP)	20849-351
Double Full-size (6 HP)	20849-352

Order Information, Air baffles for filler modules ECO with fixed handle

Description	Qty/PU	Order No.	For filler modules
Air baffle for Compact filler modules	10	20849-355	20849-348, 20849-349
Air baffle for Mid-size filler modules	10	20849-356	20849-350, 20849-351
Air baffle for Full-size filler modules	10	20849-357	20849-352, 20849-353

Use cases for Filler modules with push-pull-handle mechanism and ECO Filler modules with a fixed handle

- To cover empty slots in an AdvancedMC Carrier
- To cover empty slots in MTCA.0, MTCA.1 or MTCA.4 chassis. Slots must have the card guides installed, but do not need to have a locking bar.
- To cover an empty space in a Double-Wide slot with only Single-Wide AdvancedMC module installed. The slot must not have a locking bar.
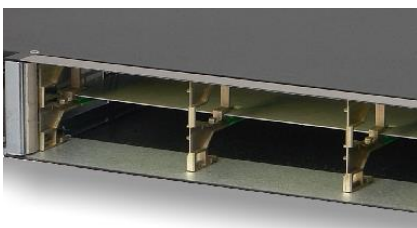
Samples

Cover empty slots in an AdvancedMC Carrier. If at least one AdvancedMC module is inserted, the air baffles should not be used to avoid blocking the air flow through the AdvancedMC module.

Either filler modules with push-pull handle or ECO filler modules can be used. The filler module size (Single / Double; Compact / Mid-size / Full-size) depends on the slot size which should be filled.

Cover empty slots in a MTCA.0, MTCA.1 or MTCA.4 System. The Slot might have a locking bar or not. Card guides must be installed in that slot. Air baffles should be installed if no AdvancedMC module is installed in the same air flow path.
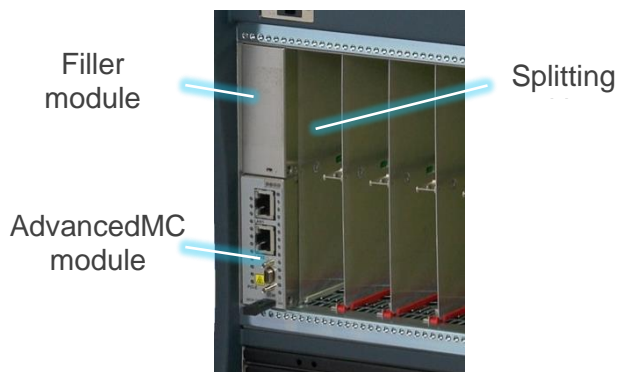

MicroTCA Slots without locking bar

Locking bar

MicroTCA Slots with locking bar

If a filler panel is installed into the same air flow path as an AdvancedMC module, no air baffle (without) should be used to avoid blocking the air flow to the AdvancedMC module.
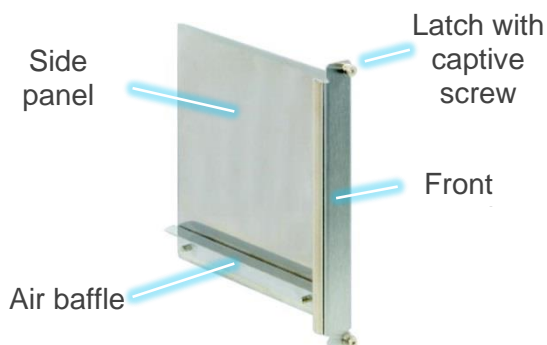

Filler module

Splitting

AdvancedMC module

If a Single-Wide Module is installed in a Double-Wide module slot, the splitting kit 20849-115 (Qty/PU: 5 pieces) is needed. The empty space should be covered with a filler module without an air baffle.

MicroTCA filler modules with latches

The series of MicroTCA filler modules provides you with the adequate solutions to fill unused slots in MTCA.1 and MTCA.4 Systems. Some of the modules can also be used for MTCA.0 systems which have a locking bar.

MicroTCA filler modules with air baffle

Side panel

Latch with captive screw

Front

Air baffle

To cover unused AdvancedMC, MCH or PM slots in MTCA.1 and MTCA.4 systems, or unused slots in a MTCA.0 system with locking bar. The module consists of a front panel with latches and captive screws, EMC gasket, side panel and air baffle. The module will be fixed to the card cage with the captive screws to the locking bar.
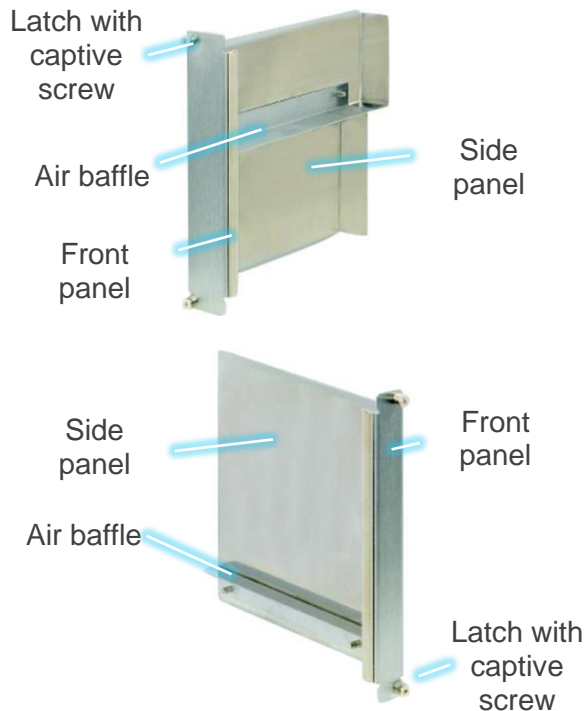
Order Information, MicroTCA filler modules with air baffle

Description	Order No.
Single Mid-size (4 HP)	21850-104
Single Full-size (6 HP)	21850-105
Double Mid-size (4 HP)	21850-106
Double Full-size (6 HP)	21850-107

Order Information, MicroTCA filler modules <u>without</u> air baffle, for MicroTCA Systems with horizontal board mounting

Description	Order No.
Double Mid-size (4 HP)	21850-138
Double Full-size (6 HP)	21850-139

MicroTCA RTM filler modules with air baffle

Latch with captive screw
Air baffle
Front panel
Side panel

Side panel
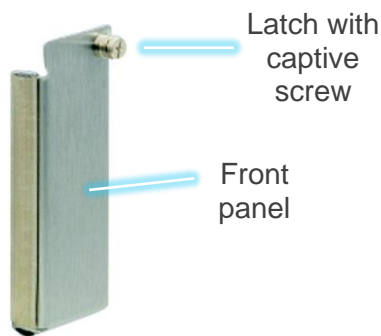Air baffle
Front panel
Latch with captive screw

To cover unused AdvancedMC RTM or MCH RTM (Rear Transition Module) slots in MTCA.4 systems. The module consists of a front panel with latches and captive screws, EMC gasket, side panel and air baffle. It also blocks the air flow between the front and rear card cage. The module will be fixed to the card cage locking bar with captive screws. There are 3 different versions available. The first version is for systems with only the MicroTCA backplane installed. The second and third versions are for systems which have an additional RTM backplane installed. Version two is for a RTM backplane which is only in the lower section of the card cage. Version 3 is used when the RTM backplane also fills the Zone 3 section.

Order Information, MicroTCA filler modules with / without air baffle

Description	Order No.
Double Mid-size (4 HP), RTM, with Air buffle	21850-108
Double Full-size (6 HP), RTM, with Air buffle	21850-109
Double Mid-size (4HP), RTM, without Air buffle (*)	21850-140
Double Full-size (6HP), RTM, without Air buffle (*)	21850-141
Double Mid-size for RTM backplane (4 HP)	21850-130
Double Full-size for RTM backplane(6 HP)	21850-131
Double Full-size for RTM backplane covering zone 3 (6 HP)	21850-129

(*) RTM module used for MicroTCA Systems with horizontal board mounting

MicroTCA filler modules, Single for Double slot
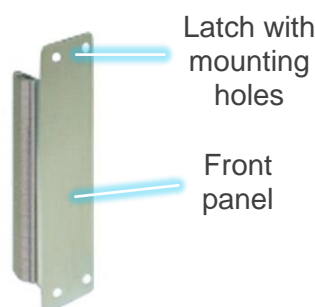
Latch with captive screw

Front panel

To cover the unused space in a Double slot when only a single module is installed. If a Single Module is installed in a double module slot, the splitting kit 20849-115 (Qty/PU 5 pieces) is needed. The AdvancedMC module or MCH will be located in the bottom place and the MicroTCA filler module will cover the empty space above the AdvancedMC module or MCH. The module will be fixed to the card cage with the captive screw to the upper locking bar.

Order Information, MicroTCA filler modules, Single for Double slot

Description	Order No.
Single Mid-size (4 HP), (Qty/PU 5 pieces)	21850-102
Single Full-size (6 HP), (Qty/PU 5 pieces)	21850-103

MicroTCA filler modules, 2 HP

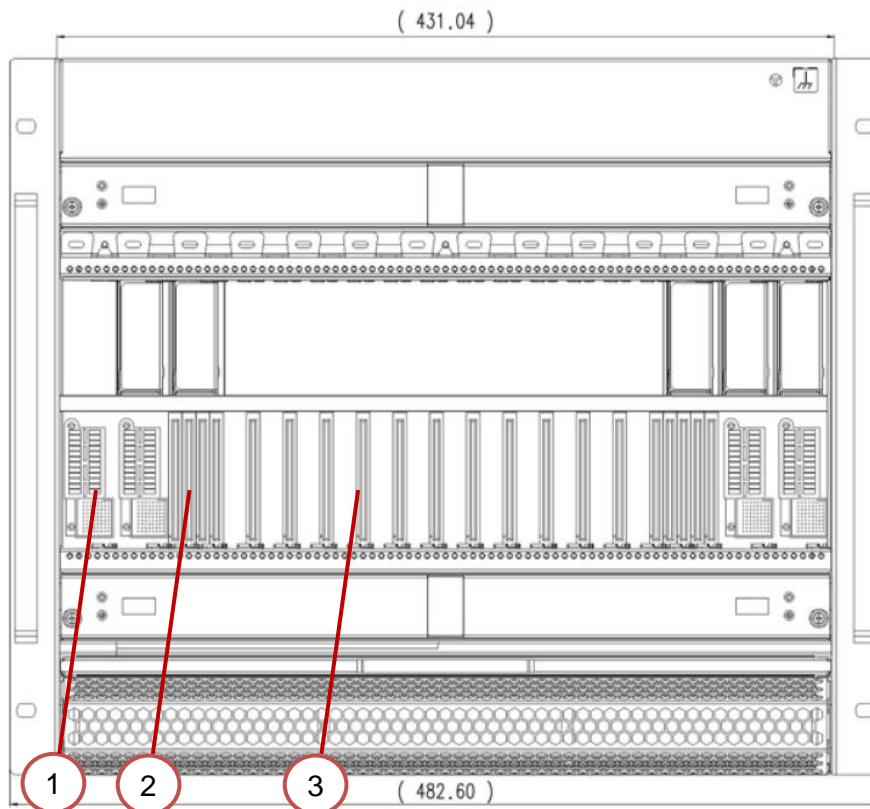Latch with mounting holes

Front panel

The 2 HP filler panels are used to close the gap in a Full-size slot when only a Mid-size module is installed. The filler panel is available for Single and Double slots. The fillers have an EMC gasket, therefore the front gets closed for EMC and air flow. Locking bars on top and bottom of the card cage are required.

Order Information, MicroTCA filler modules, 2 HP

Description	Order No.
Single (2 HP), Standard Pack Quantity 5 pieces	20849-213
Double (2 HP), Standard Pack Quantity 5 pieces	20849-214

Use cases for MicroTCA filler modules with latches

12 slot MTCA.4 System (11850-026) **front** card cage with 12x Double Mid-size AdvancedMC slots, 2x Double Full-size MCH slots and 4x Double Full-size Power Module (PM) slots

(1) Double Full-size Power Module Slot

Task	Product description	Order No.
Cover empty slot	Filler module, Double Full-size	21850-107
Install Single Full-size Power Module	Splitting kit (Qty/PU 5 pieces)	20849-115
	Filler Module , Single Full-size	21850-103

(2) Double Full-size MCH Slot

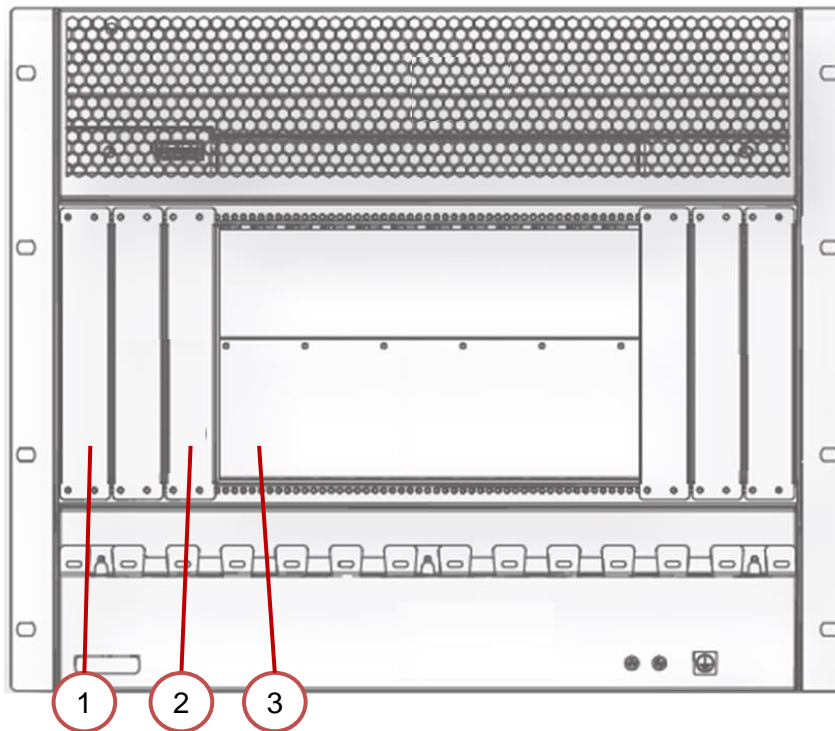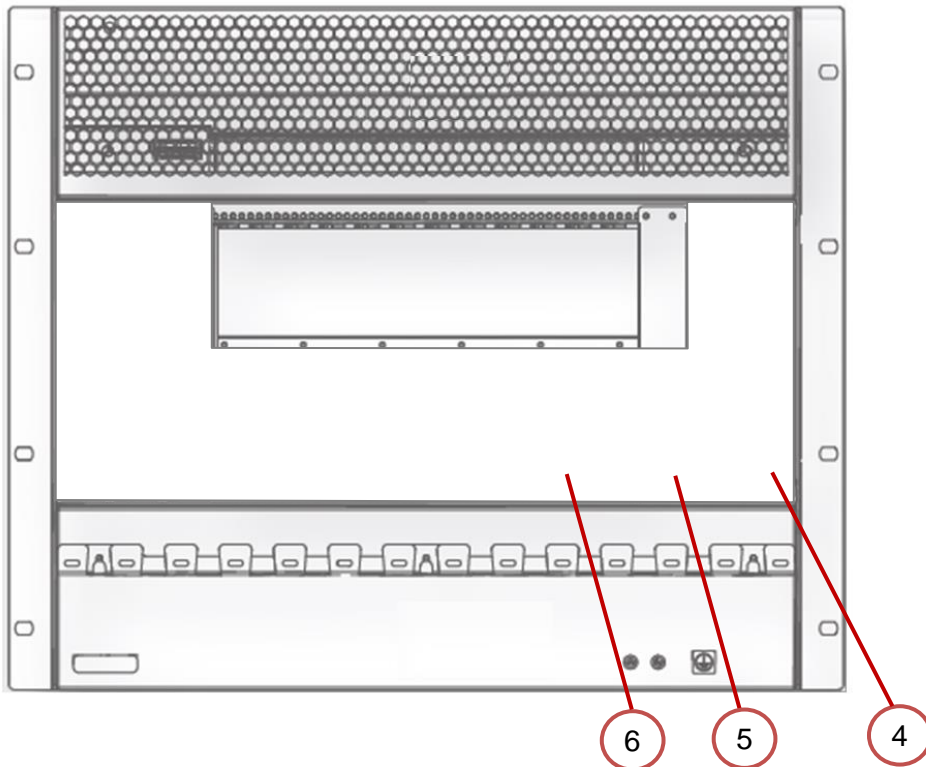| Task	Product description	Order No.
Cover empty slot	Filler module, Double Full-size	21850-107
Install Single Full-size MCH	Splitting kit (Qty/PU 5 pieces)	20849-115
	Filler Module , Single Full-size	21850-103

(3) Double Mid-size AdvancedMC Slot

Task	Product description	Order No.
Cover empty slot	Filler module, Double Mid-size	21850-106
Install Single Mid-size AMC	Splitting kit (Qty/PU 5 pieces)	20849-115
	Filler Module , Single Mid-size	21850-102

12 slot MTCA.4 System (11850-026) **rear** card cage with 12x Double Mid-size AdvancedMC slots, 2x Double Full-size MCH slots and 4x Double Full-size Power Module (PM) slots

MTCA.4 Chassis without RTM backplane, rear view

MTCA.4 Chassis with RTM backplane, rear view

(1) Double Full-size Power Module RTM Slot (included in the delivery of the System 11850-026)

Task	Product description	Order No.
Cover empty slot	Filler module RTM, Double Full-size	21850-109
Cover empty slot when RTM backplane is installed	Filler module RTM short, Double Full-size	21850-131
Cover empty slot when RTM backplane is installed and is covering Z3 zone	Filler module RTM, Double Full-size	21850-129

(2) Double Full-size MCH RTM Slot (included in the delivery of the System 11850-026)

Task	Product description	Order No.
Cover empty slot	Filler module RTM, Double Full-size	21850-109
Cover empty slot when RTM backplane is installed	Filler module RTM short, Double Full-size	21850-131
Cover empty slot when RTM backplane is installed and is covering Z3 zone	Filler module RTM, Double Full-size	21850-129

(3) Double Mid-size AdvancedMC RTM Slot

Task	Product description	Order No.
Cover empty slot	Filler module RTM, Double Mid-size	21850-106
Cover empty slot when RTM backplane is installed	Filler module RTM short, Double Mid-size	21850-130

MTCA.4 System front card cage with Double Full-size AdvancedMC slots

(1) Double Full-size AdvancedMC Slot

Task	Product description	Order No.
Cover empty slot	Filler module, Double Full-size	21850-107
Install Single Full-size AMC	Splitting kit (Qty/PU 5 pieces) Filler Module , Single Full-size	20849-115 21850-103
Install Double Mid-size AMC	Filler Module, 2 HP (Qty/PU 5 pieces)	20849-214
Install Single Mid-size AMC	Splitting kit (Qty/PU 5 pieces) Filler Module, 2 HP (Qty/PU 5 pieces) Filler Module , Single Mid-size	20849-115 20849-214 21850-102

MTCA.4 System rear card cage with Double Full-size AdvancedMC slots

(2) Double Full-size AdvancedMC Slot

Task	Product description	Order No.
Cover empty slot	Filler module RTM, Double Full-size	21850-109
Cover empty slot when RTM backplane is installed	Filler module RTM short, Double Full-size	21850-131