

# Ordering Guide

for FIST-GSS2 product range



# Ordering Guide of the Generic Splicing Shelf (FIST-GSS2)

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This document provides assistance with the selection of shelves for use in FIST cable termination applications.

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## 1 Product description

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The Generic Splicing Shelf, FIST-GSS2, is a multi-purpose mechanical shelf assembly for the FIST fiber management system in a rack environment.

The product is typically used:

- to store splices of external cable to external/indoor cable
- to store splices of external cable to pigtails
- to store splices of cable to IFC (intra-facility cable)
- to store splices of pigtails to pigtails

It can be installed in Tyco's FIST racks and other 19" or metric (ETSI) rack sizes.



GSS2OG01.JPG

FIST-GSS2 Generic Splicing Shelf

Accessories are available for termination of most common cable types.

Modular wraparound groove plates can be clicked in the UMS (Universal Mounting System) profile. They provide the foundation for mounting combinations of SOSA2 (Splicing Only Sub-Assembly) and/or SASA2 (Splitter Array Sub-Assembly) modules. Typically, single circuit or ribbon fiber management is used.

Aramid yarns Termination Units (KTU's) can be mounted in the shelf to provide the necessary restraint relief when terminating common pigtail types.

The shelf is delivered with a metal cover.

Two identification cards and two card holders are provided at the back side of the front cover. (Cards will be visible when the cover is open).

## 2 Ordering information

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### 2.1 How to order this product?

#### **Order one of the application kits**

Some application kits have been identified for an easy product selection and ordering. These kits contain all necessary accessories for a certain application and fiber count.

The information can be found in paragraph 2.2.

#### **Order the shelf and its accessories separately**

For maximum flexibility, the shelf and the accessories can be ordered as separate items. The information can be found in paragraphs 2.3 and 2.4.

This is recommended when:

- splicing 'cable to cable' and splicing 'cable to pigtails' is integrated in one shelf
- splicing 'cable to IFC'
- the shelf is not completely filled up (e.g. when future extensions are planned)
- the required configuration is not covered by the application kits (e.g. ANT splice holders, using single element trays, back-termination of cable, ....)
- a mix of tray types (e.g. single fiber trays and ribbon trays) has to be used on one shelf.

## 2.2 Application kits

The following kits can be ordered as **FIST-GSS2-KITXX**

### Kit content

- GSS2 (for standard kit contents, please refer to paragraph 2.3)
- SOSA2's for indicated fiber count. Groove plates are pre-installed.
- Pigtail termination kits (KTUs + brackets) in case of 'cable to pigtail'.  
Pigtail Ø range for KTU: 1.6 to 3.1 mm.
- Heat-shrinkable splice protectors.
- Cable termination kit in case of:
  - Loose tube ribbon cable
  - Central core cable (ribbon or single fiber).

For the detailed kit contents please refer to Addendum 1.

### Notes:

1. For '**cable to cable**' applications, tubes enter the FAS block at both sides.  
(2 x 16 tubes of Ø 3.1 mm for single fiber loose tube or 2 x 6 tubes of Ø 5 mm for ribbon or central core types).
2. For '**cable to pigtail**' applications, one side of the wraparound groove plates has been removed to facilitate an easy access of the fibers to the KTU's. Tubes enter the FAS block at one side only. (1 x 16 tubes of Ø 3.1 mm for single fiber loose tube or 1 x 6 tubes of Ø 5 mm for ribbon or central core types. If 24 tubes of Ø 3.1 mm are needed (single fiber applications), order the empty shelf + accessories, see section 2.3).

The following kits can be ordered as **FIST-GSS2-KITXX**

Cable type	Application	Fiber type					
		Single fiber (SC)		R4/R8		R12	
		19"	ETSI	19"	ETSI	19"	ETSI
Loose tube cable	Cable to cable	96F <b>KIT01</b>	96F <b>KIT02</b>	96/192F <b>KIT05</b>	112/224F <b>KIT06</b>	192F <b>KIT09</b>	216F <b>KIT10</b>
	Cable to pigtail	96F <b>KIT03</b>	96F <b>KIT04</b>	96/192F <b>KIT07</b>	112/224F <b>KIT08</b>	192F <b>KIT11</b>	216F <b>KIT12</b>
Central core cable	Cable to cable	96F <b>KIT13</b>	96F <b>KIT14</b>	96/192F <b>KIT17</b>	112/224F <b>KIT18</b>	192F <b>KIT21</b>	216F <b>KIT22</b>
	Cable to pigtail	96F <b>KIT15</b>	96F <b>KIT16</b>	96/192F <b>KIT19</b>	112/224F <b>KIT20</b>	192F <b>KIT23</b>	216F <b>KIT24</b>

## 2.3 Shelf name string

### FIST-GSS2-X X

#### Chassis type

<b>M</b>	Metric
<b>I</b>	19"

#### Cable element provision and shelf configuration

<b>A</b>	Single fiber loose tube – cable to pigtail
<b>B</b>	Ribbon and/or central core – cable to pigtail
<b>C</b>	Single fiber loose tube – cable to cable
<b>D</b>	Ribbon and/or central core– cable to cable

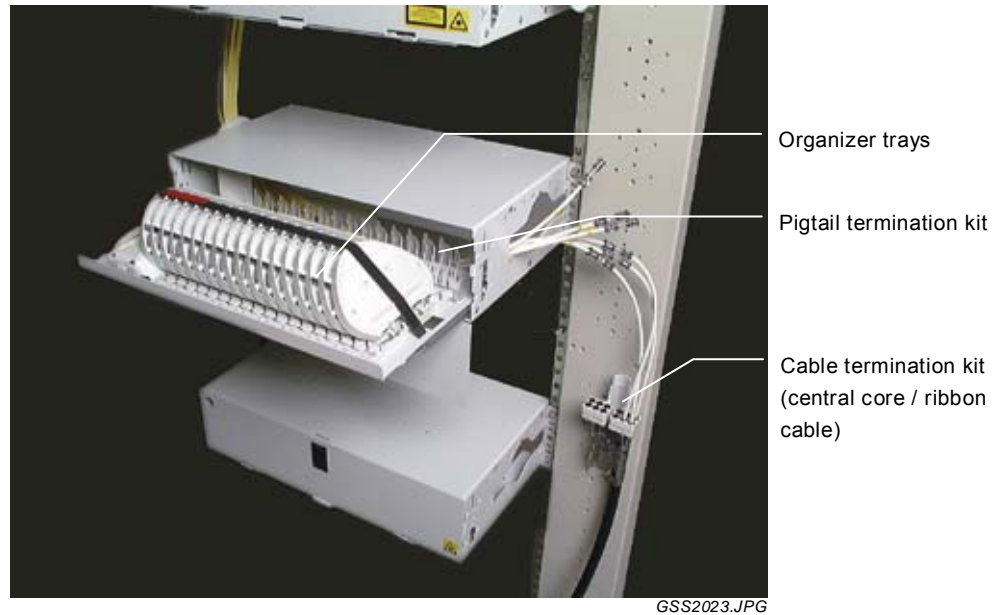
#### Standard kit content

- Shelf assembly with UMS profile
  - Mounting brackets
  - Pre-installed short FAS (Fiber Arrangement System) block with 1 tube holder and cover for controlled fiber routing.
  - Pre-installed transportation tubes that guide the cable elements to the entry of the FAS block.
- Quantities:

Cable type	Configuration	
	Cable to pigtail	Cable to cable
Single fiber loose tube	1x 24 tubes of $\varnothing$ 3.1 mm	2x 16 tubes of $\varnothing$ 3.1 mm
Ribbon and/or central core	1x 6 tubes of $\varnothing$ 5 mm + 6 tube connectors	2x 6 tubes of $\varnothing$ 5 mm + 12 tube connectors

- One trumpet for guiding pigtails as they exit the shelf
- Identification labels and collets
- Hook-and-loop fastener (pre-installed)
- Shelf cover (pre-installed)
- When a 'single fiber loose tube' option is selected, a double flexclip for 2 flextubes and tie-wraps are provided to fix the flextubes that guide the loose tubes from the cable attachment point in the rack towards the shelf. (Flextube should be ordered separately).  
For loose tube cable fixation onto the shelf or for ribbon or central core cable, order the necessary accessories separately.
- Tray lid + fiber guiding pin
- Mounting screws and nuts
- Installation Instructions
- Identification cards and card holders

## 2.4 Accessories



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### 2.4.1 Cable termination kits

Name	Qty/Pk	Description
FIST-GR-CTB100	1 kit	Kit to terminate max. 2 loose tube ribbon cables in the side duct next to the shelf.
FIST-GR-CTB100-CC	1 kit	Kit to terminate max. 2 central core cables (single fiber or ribbon) in the side duct next to the shelf.
FIST-GSS2-CT-BS-2	1 kit	Kit to terminate loose tube single fiber cable at the back of the shelf. Cable jacket and strength member attachment are at the back of the shelf.
FIST-GSS2-CT-BR-2	1 kit	Kit for back cable entrance – no components for strength member attachment and cable jacket fixation included (this is done in the rack).

### 2.4.2 Organizer trays

See the relevant organizer ordering guide.

### 2.4.3 Pigtail and IFC termination kits

Name	Qty/Pk	Description
FIST-PTK2	1 pc	Pigtail Termination Kit including – Bracket to hold 4 KTUs – 4 x KTU (per KTU: 2 single fiber pigtails (∅ range: 1.6 to 3.1 mm) or 1 ribbon pigtail)
FIST-ITK2	1 pc	IFC termination kit to provide strain relief to the IFC sub-units in a cable-to-IFC configuration. (1 kit needed per shelf)

#### 2.4.4 Other Accessories

Name	Qty/Pk	Description
FIST-GS-FLEX-17-50-S5027	50 m	Flexible tubing (ID 17mm) for protection of the loose tubes between the outer sheath cut and the shelf. (average use: 1 m per cable).
FISTV-E7187-6316	25 m	Hook and loop fastener roll
FIST-KTU2	50 pc	Wraparound KTU for 2 single fiber pigtails (Ø range: 1.6 to 3.1 mm) or 1 ribbon pigtail. (usage in fully populated shelf: 48 pieces).
FISTV-E7186-0510-S5027	30 m	FOPT-CT transportation tubing
FIST-TUBE-5MM-30	30 m	5 mm tubing compatible with FIST-GR-CTB100(-CC)
FIST-MB2-M	1 pc	Adaptation bracket ETSI-19"
FIST-MB2-M-AS	1 pc	Adaptation bracket ETSI-19" (asymmetrical mounting)
FIST-GSS2-ID-10	10 pc	10 identification cards and card holders

#### 2.5 Installation tools

Name	Qty/Pk	Description
FACC-ALLEN-KEY-5-350	1 pc	Allen key, diameter 5 mm, length 350 mm
FACC-CAGE-NUT-TOOL	1 pc	Cage nut installation tool
FACC-TUBE-CUTTER-01	1 pc	Tube cutter RS 722-192
FACC-TUBE-STRIPPER-02	1 pc	Tube stripper OPTI-STRIP



## 3 Product guide

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### 3.1 Product description

#### 3.1.1 Standard shelf

##### Chassis and drawer

The FIST-GSS2 chassis are ready to be fitted inside an optical rack using mounting brackets, screws and cage nuts.

Shelves can be ordered according to the rack dimension (ETSI or 19").

All chassis are painted. (color RAL 7035)



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##### Mounting brackets

The sub-rack has field-mountable brackets to accommodate for:

- Front mounting of the shelf
- Mounting with brackets 240mm from the back of the shelf.
- Mounting specifically for Raychem's FIST Racks
- Back mounting



GSS2OG22.JPG

##### UMS profile and wraparound groove plates

On the UMS profiles, the wraparound groove plates can be clicked.

Groove plates are available for single fiber, R4/8 and R12 and in different sizes. See SOSA2 ordering guide for more details.

All shelves have a pre-installed UMS profile of 56 (ETSI) or 48 (19") units.



GSS2OG05.JPG

##### Cover

When the drawer is in its resting position, a metal cover is held on the front of the chassis by a latch.

Inside, the organizer and contents are protected and since cable and/or pigtailed exit through the side of the chassis, everything is safely located inside the rack, which therefore presents a clean and uncluttered appearance. The cover hinges and can easily be removed.



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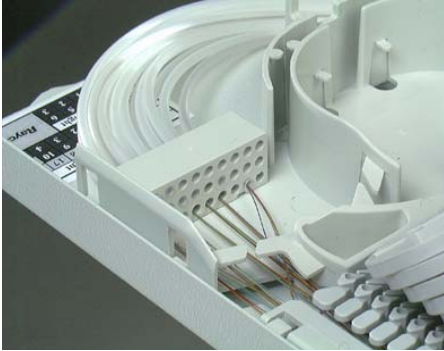
### Transportation tubes

Transportation tubes are pre-installed to ensure that:

all cable elements are carried securely from the cable jacket termination to the entry of the FAS block.

all bend radii are respected during drawer movement.

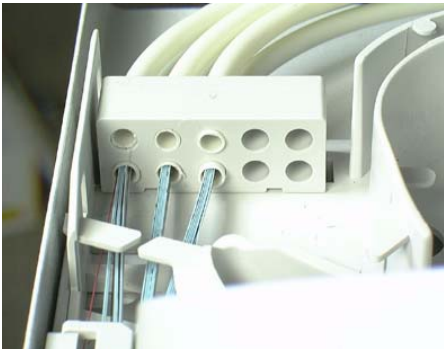
The tubes are secured on the short FAS block by tube holders.



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For single-fiber loose tube cables the following is installed:

- 24 tubes ( $\varnothing$  3.1 mm). Provision has been made to enter the shelf with the tubes from the right. All tubes enter the FAS block at the same side
- or
- 2x (left and right) 16 tubes ( $\varnothing$  3.1 mm). This option is recommended for cable-to-cable applications.



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For ribbon cable or central core cables the following is installed:

- 6 tubes ( $\varnothing$  5 mm). Provision has been made to enter the shelf with the fibers from the right. Furthermore, 6 tube connectors and 6 tubes of 1.5 m are available to make a proper connection to the cable termination kit. (FIST-GR-CTB100 or FIST-GR-CTB100CC)
- An option is available for 2x (left and right) 6 tubes. This option is recommended for cable-to-cable applications.

### 3.1.2 Product alternatives

The standard shelf can be adapted to suit specific needs:

- The cover can be equipped with a lock.
- Cable layouts can be changed: cables can enter from the back, left or right.
- Shelves can be equipped with a 'long FAS' (as used in the closures FIST-GCO2).
- Different configurations and quantities of tubes.

These specials need to be engineered and will get a specific ordering code.

Please contact your local sales engineer for more information.

### 3.2 Shelf dimensions

	Chassis standard	
	ETSI (metric)	19"
Width (with/without mounting brackets)	531 / 494 mm	481 / 444 mm
Height	125 mm	125 mm
HU-Height Units	(requires 5 metric HUs)	(requires 3 19" HUs)
Depth	280 mm	280 mm

Note: A HU is a "height unit". Refer to rack documentation for more details.

### 3.3 Shelf capacity

#### 3.3.1 General

	Metric (ETSI)	19"
UMS profile length (units) (a)	56	48
Maximum number of PTK2 (pigtail termination kit)	14	12
Maximum number of KTU's	56 (b)	48
Maximum number of ITK2 (IFC termination kit)	1	1
Maximum number of IFC sub-unit fixations	12	12
Maximum number of incoming or outgoing pigtails (c)		
– Single fiber pigtails (Ø 2.4 mm)	96	96
– Ribbon 4 pigtails (3.5 x 2.5 mm)	50	50
– Ribbon 8 pigtails (4.5 x 2.5 mm)	38	38
– Ribbon 12 pigtails (5 x 2.5 mm)	34	34
Patchcord length inside the shelf (from the splice till the trumpet – in cable to pigtail version only) (d)	1.86-2.20 m	1.86-2.12 m

- (a) The number indicated is the space that can be occupied by trays. A single circuit tray occupies 1 unit; a single element or R4/8 tray occupies 2 units; a R12 tray needs 3 units. One UMS profile length unit equals 6 mm.
- (b) This is a theoretical maximum. The exact quantity of KTU's is defined by the number of trays and the total number of pigtails allowed.
- (c) Max. number of pigtails that the back of the shelf can handle (due to geometrical limitations behind the KTU bracket); for other dimensions of pigtails, please contact your local sales engineer.
- (d) This patchcord length is measured for the open shelf, to allow access after installation. This length is calculated, based on the assumption that 1.5 m of fiber is stored on the splicing tray.

### 3.3.2 Splicing cable to cable (loose tube or central core cable)

	ETSI Fibers	Trays	19" Fibers	Trays
<b>Single circuit splicing capacity</b>				
2 primary coated fibers - SC	112	56	96	48
<b>Single element splicing capacity</b>				
– 8 primary coated fibers - SE tray	224	28	192	24
– 12 primary coated fibers - SE tray	336	28	288	24
<b>Ribbon fiber splicing capacity</b>				
– R4 cable - 1xR4 per tray	112	28	96	24
– R4 cable - 2xR4 per tray	224	28	192	24
– R8 cable - R8 tray	224	28	192	24
– R12 cable - R12 tray	216	18	192	16

### 3.3.3 Splicing cable to pigtails (loose tube or central core cable)

	ETSI Fibers	Trays	KTUs	19" Fibers	Trays	KTUs
<b>Single circuit splicing capacity</b>						
2 secondary coated fibers - SC	96	48	48 (b)	96	48	48
<b>Ribbon fiber splicing capacity</b>						
– R4 cable - 1xR4 per tray	112	28	28	96	24	24
– R4 cable - 2xR4 per tray	200	25	50 (a)	192	24	48
– R8 cable - R8 tray	224	28	28	192	24	24
– R12 cable - R12 tray	216	18	18	192	16	16

(a) max. 50 R4 pigtails can enter the shelf

(b) max. 96 single fiber pigtails can enter the shelf

### 3.3.4 Splicing cable to IFC (intra-facility cable with 12 fibers per sub-unit)

	ETSI Fibers	Trays	ITK fingers used*	19" Fibers	Trays	ITK fingers used*
<b>Single circuit splicing capacity</b>						
2 secondary coated fibers - SC	96	48	8 (a)	96	48	8 (a)
<b>Single element splicing capacity</b>						
– 6 secondary coated fibers - SE	144	24	12	144	24	12

\* The IFC termination bracket has 12 'fingers' onto which the IFC subunits can be attached.

(a) To obtain a good alignment between the fingers and the trays, not all fingers can be used in case of SC trays (see installation instructions for details).

### 3.3.5 Splicing pigtails to pigtails

	ETSI			19"		
	Fibers	Trays	KTUs	Fibers	Trays	KTUs
Single circuit splicing capacity						
1 secondary coated fiber - SC4/2	48	48	48	48	48	48
Ribbon fiber splicing capacity						
- R4 cable - 1xR4 per tray	96	24	48	96	24	48
- R8 cable - R8 tray	152	19	38 (a)	152	19	38 (a)
- R12 cable - R12 tray	204	17	34 (b)	192	16	32

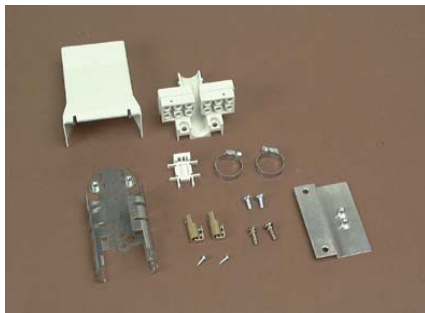
(a) 20 trays have to be ordered

(b) 18 trays have to be ordered

### 3.4 Accessories

The following accessories are ordered separately for field installation.

#### 3.4.1 Cable termination kits



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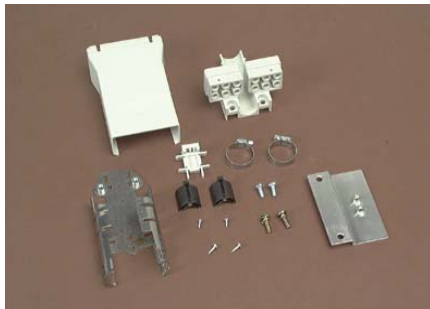
##### Loose tube ribbon cable termination kit

###### FIST-GR-CTB100

Cable termination kit for max. 2 ribbon loose tube cable. Can be mounted next to the shelf.

Up to 6 tubes of R12.

Strength member fixation compatible with most types of strength members (1.5-5 mm Ø).



GC020G15.JPG

##### Central core cable termination kit

###### FIST-GR-CTB100CC

Cable termination kit for max. 2 central core cables. Can be mounted next to the shelf.

Strength member fixation (till 2.5 mm Ø).



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##### Back cable termination kit – strength member fixation on shelf

###### FIST-GSS2-CT-BS-2

Cable termination kit for max. 2 single fiber loose tube cables, to be mounted at the back of the shelf. The kit includes components for strength member fixation and cable jacket fixation onto the shelf.



7N3K5397.JPG

**Kit for back cable entrance - strength member fixation in rack**  
**FIST-GSS2-CT-BR-2**

Kit for back cable entrance into FIST-GMS2 for max. 2 single fiber loose tube cables, to be mounted at the back of the shelf.

This kit is applicable when the cable strength member and jacket are fixed in the rack and when the loose tubes are guided in a flextube from the cable attachment point in the rack towards the shelf back. The kit does not include components for strength member fixation and cable jacket fixation.

**3.4.2 Pigtail and IFC termination kits**



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**Pigtail termination kit**  
**FIST-PTK2**

Kit to terminate fibers to pigtails. Includes 4 KTU's and a bracket to position them on the shelf.



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**IFC termination kit**  
**FIST-ITK2**

Kit to terminate IFC cable subunits. Outside the shelf, the outer jacket has to be stripped and the strength member has to be attached. Foam and tie-wraps to secure the subunits are included in the kit.

**3.4.3 Other accessories**



RA11.JPG

**Flexible tubing**  
**FIST-GS-FLEX-17-50-S5027**

When guiding the loose tubes from the cable opening in the rack to the entrance of the shelf, flexible tubing is used to protect loose tubes and to control the bend radius.

It has an inner diameter of minimum 17 mm and a capacity of up to 8 loose tubes (Ø 3.1 mm).



FRWR044.JPG

**Hook and Loop fastener**

**FISTV-E7187-6316**

Hook-and-loop fastener to segment or secure pigtails. Supplied on a roll 25m long (width 25 mm) to be cut on length as required.



GSS20G10.JPG

**Aramid yarns termination units**

**FIST-KTU2**

Wraparound KTU. The KTU can accommodate:

- 2 single fiber pigtails with a max. diameter of 3.1 mm or
- 1 Ribbon4 pigtail or
- 1 Ribbon8 pigtail or
- 1 Ribbon12 pigtail



I&C013.JPG

**Fiber protection tube**

**FISTV-E7186-0510-S5027**

FOPT-CT fiber protection tube for optional use as a transition tube between the loose buffer tube and the pre-installed CS tubing of the shelf.



I&C003.JPG

**5 mm tubing**

**FIST-TUBE-5MM-30**

If the pre-installed tubing for ribbon or central core cable is not long enough to reach to FIST-GR-CTB100(-CC), additional 5 mm tubing is needed (the necessary parts to connect both tubings are included in the standard kit for the ribbon or central core version of the shelf.



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**ETSI-19" adaptation mounting brackets**

**FIST-MB2-M**

Adaptation bracket ETSI-19"



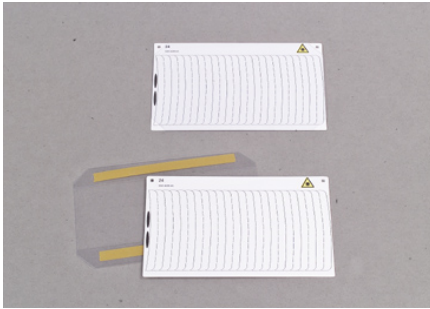


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### Asymmetrical ETSI-19" adaptation mounting brackets

#### FIST-MB2-M-AS

Adaptation bracket ETSI-19", to be used when asymmetrical mounting is preferred. A modified trumpet is provided in the kit in case a trumpet has to be mounted at the 'narrow' side.



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### Identification cards (10 pcs)

#### FIST-GSS2-ID-10

10 identification cards and card holders to stick to the shelf cover.  
For detailed layout see Addendum B.

## 3.5 Tools



T004.JPG

### Long Allen key

#### FACC-ALLEN-KEY-5-350

Allen key, diameter 5 mm, length 350 mm for easy back mounting of shelf in rack.



T023.JPG

### Cage nut tool

#### FACC-CAGE-NUT-TOOL

Cage nut tool to install or remove cage nuts in racks.



T007.JPG

### Tube cutter

#### FACC-TUBE-CUTTER-01

Tube cutter to cut fiber optic protection tubes used with the FIST organizer management system



T017.JPG

### Tube stripper

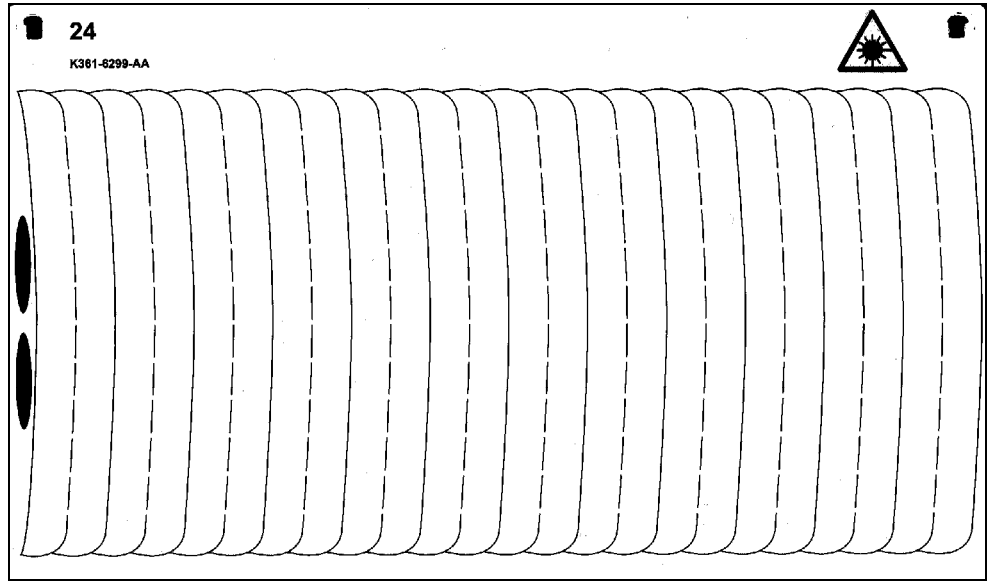
#### FACC-TUBE-STRIPPER-02

Tube stripper OPTI-STRIP to cut the loose buffer tubes of the fiber cable in confined spaces.





**Addendum 2: identification card layout**



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