



Enclosures & Components

Cassettes and Modules

- For several eurocards
- For one eurocard and bulky components

System
Platforms

Backplanes

Enclosures &
Components

Cabinets

Rotary
Switches

ELMA
Your Solution Partner

Local Service – global resources



Elma is a global manufacturer of products for housing electronic systems. The company provides everything from components such as modular enclosures, cabinets and backplanes up to complete standard or custom system platforms. Elma also manufactures precision rotary switches. The company offers fast, flexible response to customer needs and extensive practical knowledge in tailoring solutions to specific applications.

Founded in 1960, Elma is an industry innovator in the design and manufacture of electronic enclosures and passive electronic components. With vast expertise in Eurocard-based platforms, standard architectures include AdvancedTCA, CompactPCI, MicroTCA, Rugged COTS/ATR, VME, VME64x, VPX, VXI, VXS, and more. The company also tailors customised solutions to individual applications ensuring fast and cost-effective results. As a global company, Elma has production and assembly facilities in 8 countries and has representatives in over 40 countries. Elma has a broad base of customers in diverse industries such as telecommunications, industrial control, medical electronics, defense and aerospace.

We provide products superior in quality, reliability, performance, and consistently presents new, innovative designs to the market. Elma also offers design and integration services backed by responsive and knowledgeable technical support.

Our leading quality level is reached through training of all employees and following of systematic procedures per ISO 9001 standards to which Elma has been registered.

Why choose Elma?

- Flexibility** Elma tailors solutions to individual applications to ensure fast and cost-effective results.
- Experience** Extensive practical experience in packaging electronic systems is used to minimise the time taken to develop new customised solutions without compromising system performance or reliability.
- Compatibility** Because the two key electromechanical components – enclosures and backplanes – are made in-house, Elma guarantees compatibility, consistency and reliability.
- Global Resources** With manufacturing in Europe, Asia and the USA, customers benefit from local service backed by global resources.

Custom Solutions

Design Capabilities

Production Capabilities



Customisation is the standard at Elma. With an extensive offering of modular standard products as a foundation, we are able to leverage existing solutions and proven design concepts to meet any custom application. This approach ensures that Elma will provide quality, compliant solutions with significantly reduced lead time, cost and risk.

Combined with our integration capability for both embedded systems and switches, we provide a single solution to your outsourcing needs.

Allow us to take your latest product from prototype to production quickly, cost effectively and with reduced risk.

Elma has been a leader in design innovation for over 45 years. We use advanced design software and equipment to perfect your design. We can utilise our vast resource of experienced designers and engineers from facilities all over the world. The result is a superb design solution, completed to your specifications in a timely and cost-efficient manner.

From base components to fully-integrated computing systems, Elma can be your solution partner each step of the way. With production and assembly facilities worldwide, we can meet nearly any need – whether prototypes or high volumes, quickturn deliveries, or highly complex custom designs.

Custom system platforms

- Over 20 years of expertise in system design with emphasis on thermal management
- Specialists in EMC, shock/vibration, system monitoring, reliability and maintainability
- Applications for industrial and rugged environment

Custom backplanes

- Modified standards for all PICMG and VITA specifications
- NSC (non standard-based custom) design
- Proven, reliable high-speed designs with data rates up to 10 Gbps per differential pair

Custom enclosures & components

- Modified standards for IEC, IEEE, ATCA, MicroTCA mechanics or proprietary solutions
- IP protection classes
- EMC security

Custom cabinets

- Industrial, Rugged, Datacom/Server, or Shielded
- Highly complex or unusual configurations in any volume
- Silk screening, painting, tool making, validation testing, and agency certification

Custom rotary switches

- Modifiable switches & LEDs
- Integration of switches, panels and other components
- Custom switch bracket fabrication



Source: Telkoor, USA

4: Cassettes and Modules



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4: Cassettes and Modules

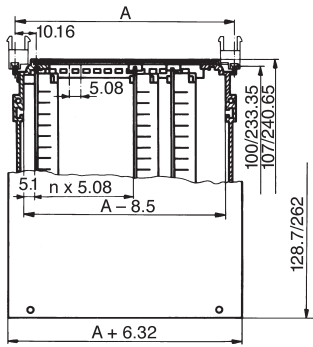


- Designed to accept single or double eurocards
- Depths 160 mm (6.29") or 220 mm (8.66")
- Aligned for connectors conforming to IEC 60603-2
- External dimensions meet the requirements for attachment to sub racks as specified in IEC 60297
- Plug-in units
- PCB firmly attached to the side extrusions

4.1 Cassette A

- Accepts several PCBs on horizontal pitch of 1 HP (5.08 mm, 0.20")
- IEC60603-2 connectors can be mounted internally at rear
- Connectors can be interwired to form a functional plug-in unit
- Suitable for use with all sub racks, adaptation kits for mounting eurocards and eurocard mounting sets
- Several eurocards 100 x 160 mm (3.93" x 6.29") or 100 x 220 mm (3.93" x 8.66") can be fitted
- Several double eurocards 233.35 x 160 mm (9.18" x 6.29") or 233.35 x 220 mm (9.18" x 8.66") can be fitted
- Possibility to mount 100 x 160 mm (3.93" x 6.29") PCBs recessed inside a 100 x 220 mm (3.93" x 8.66") cassette with insertion from front or rear (see wiring example)
- Edge connectors used for interwiring are attached to connector mounting angles at the rear of the cassette
- Card guides are used to locate the cassette in the sub rack
- Right and left side extrusions with grooves for sliding in a PCB
- Installation of further PCB's by assembly of card guides in the perforated bottom/top covers
- **Scope of delivery:**
 - Front panel
 - Side extrusions
 - Top/bottom covers
 - Mounting angle
 - Extension piece
 - Assembly material
 - Rear panel (6 U version only)
 - Side covers (6 U version only)
- Front panel screws, see 4.1.1
- Handles, see 4.4.2

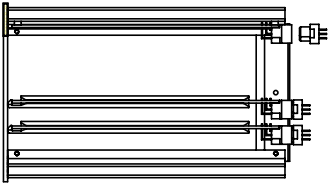
4: Cassettes and Modules



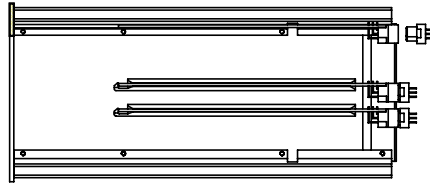
Dimensions Cassette A

Width	A mm	A inch
14 HP	64.60	2.54
21 HP	100.16	3.94
28 HP	135.72	5.34
42 HP	206.84	8.14

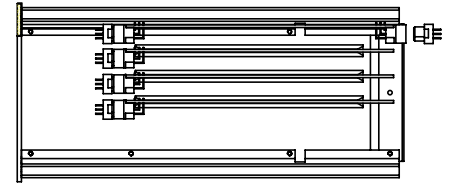
Mounting Possibilities



Card Depth 160/220 mm



Card Depth 160 mm Recessed



Card Depth 160 mm Rear Insertion*

* When 160 mm cards are inserted from the rear of a 220 mm cassette, a rear panel is required (see 4.1.5)

4.1.1 Cassette A, for Several Eurocards



4.1.1 Cassette A, for Several Eurocards

Depth	Width	3 U	6 U
160 mm 6.29"	14 HP	23A302	23A602
	21 HP	23A312	
	28 HP	23A322	
	42 HP	23A332	
220 mm 8.66"	14 HP	23A303	23A603
	21 HP	23A313	

Front Panel Screws

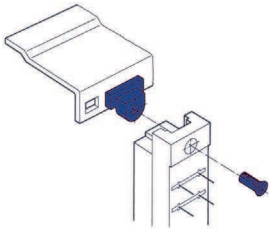
- Set of 10 screws, M2.5 x 11.3
- With screw retainer
- Per cassette A 4 screws are needed

Description	Part-No. 10 pcs.
Torx screws, size T8, with plastic screw retainer	63K159
Milled edge screws recessed, with plastic screw retainer	63-159

For more front panel screws refer to chapter E

4: Cassettes and Modules

4.1.2 Edge Connector Mounting Piece

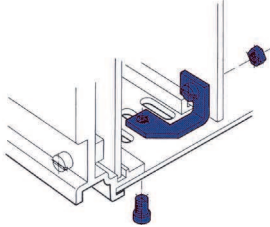


4.1.2 Edge Connector Mounting Piece

- For attaching edge connectors to cassettes

Description	Part-No. 10 cs.	Part-No. 100 pcs.
Edge connector, plastic UL94 V-0	63-122	63-123
S1 screw to edge connector M2 x 5.9	1904-06	1904-07

4.1.3 Card Stabilizer



4.1.3 Card Stabilizer

- By using stabilizers, additional PCBs fitted with connectors can be used to plug into the sub rack wiring at 5.08 mm horizontal spacing

Description	Part-No. 10 pcs.
Mounting bracket incl. assembly material	63-126

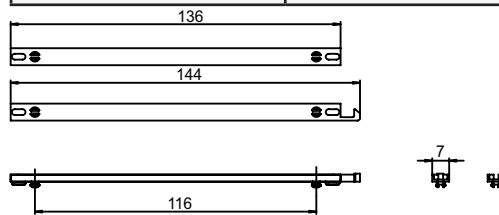
4.1.4 Card Guides



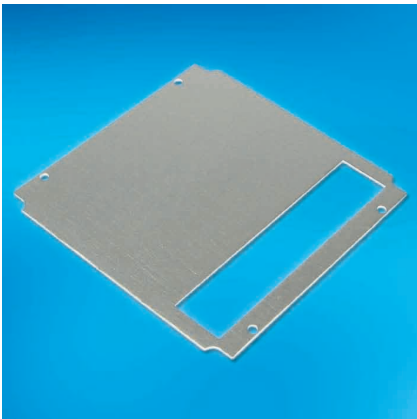
4.1.4 Card Guides

- For mounting PCBs in cassettes
- Assembly in the perforated bottom/top covers
- Light grey UL94 V-0

Description	Card Depth	Part-No. 5 Pairs	Part-No. 50 Pairs
Card guides in cassettes	160/220 mm (6.29"/8.66")	63-120	63-121



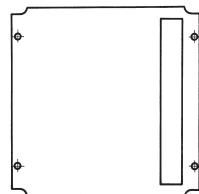
4.1.5 Rear Panel



4.1.5 Rear Panel

- For mounting from rear for 160 mm (6.29") cards in cassettes 220 mm (8.66")

Connector Body Style, acc. IEC60603-2	Height	14 HP	21 HP	28 HP
B, C, D	for 3 U	23-385-1	23-386-1	23-387-1
E, F, H	for 3 U	23-385-2	23-386-2	23-387-2



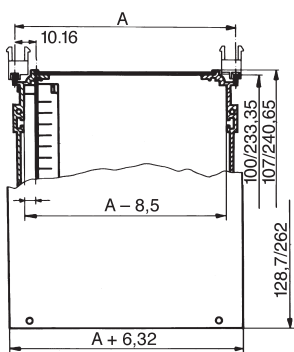
Please note:

For front panels, handles and front panel screws must be ordered separately. Card guides for use inside cassettes, card guides to locate cassettes, edge connector mounting pieces and special screws for mounting connectors need to be ordered separately.

4: Cassettes and Modules

4.2 Module B

- Accepts one PCB and various non-standard and bulky components which can be mounted using the grooves formed in the side extrusions
- By interwiring the components, the module can be used as functional plug-in unit
- Suitable for use with all sub racks, adaptation kits for mounting eurocards and eurocard mounting sets
- Accepts a eurocard 100 x 160 mm (3.93" x 6.29") or 100 x 220 mm (3.93" x 8.66") and double eurocards 233.35 x 160 mm (9.18" x 6.29") or 233.35 x 220 mm (9.18" x 8.66") fastened to the side extrusions and leaving room for non-standard and bulky components
- Card guides are used to locate the module in the sub rack
- **Scope of delivery:**
 - Front panel
 - Side extrusions
 - Top/bottom covers
 - Rear panel
 - Assembly material
 - Side covers (6 U versions only)
- Front panel screws, see 4.2.1
- Handles see 4.4.2



Dimensions Module B

Width	A mm	A inch
14 HP	64.60	2.54
21 HP	100.16	3.94
28 HP	135.72	5.34

4.2.1 Module B, for One Eurocard and Bulky Components



4.2.1 Module B, for One Eurocard and Bulky Components

Depth	Width	Connector Body Style acc. IEC 60603-2	3 U	6 U
160 mm 6.29"	14 HP	B, C, D	23B302-1	23B602-1
		E, F, H	23B302-2	23B602-2
	21 HP	B, C, D	23B312-1	23B612-1
		E, F, H	23B312-2	23B612-2
	28 HP	B, C, D	23B322-1	-
		E, F, H	23B322-2	-
220 mm 8.66"	14 HP	B, C, D	23B303-1	23B603-1
		E, F, H	23B303-2	23B603-2
	21 HP	B, C, D	23B313-1	23B613-1
		E, F, H	23B313-2	23B613-2

Front Panel Screws

- Set of 10 screws, M2.5 x 11.3
- With screw retainer
- Per module B 4 screws are needed

Description	Part-No. 10 pcs.
Torx screws, size T8, incl. plastic screw retainer	63K159
Milled edge screws recessed, incl. plastic screw retainer	63-159

For more front panel screws refer to chapter 7

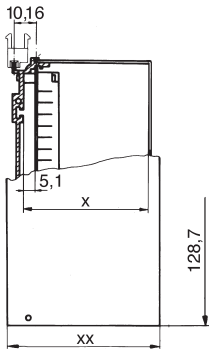
Please note:

Handles for front panels, front panel screws and card guides to locate the module need to be ordered separately.

4: Cassettes and Modules

4.3 Module C

- These narrow modules can be used for the shielding and mechanical protection of single PCBs or as small functional plug-in units
- Suitable for use with all sub racks and eurocard mounting sets
- The C-type module accepts one eurocard 100 x 160 mm (3.93" x 6.29") or 100 x 220 mm (3.93" x 8.66") with edge connector to IEC60603-2, types B, C, D
- The closed module provides good shielding and also mechanical protection for sensitive components
- Card guides are used to slide the module into the sub rack
- **Scope of delivery:**
 - Front panel
 - Side extrusion
 - Cover
 - Assembly material
- Front panel screws, see 4.3.1
- Handles see 4.4.2



Dimensions Module C

Width	x mm	x inch	xx mm	xx inch
7 HP	24.48	0.96	35.36	1.39
10 HP	39.72	1.56	50.60	1.99
14 HP	60.04	2.36	70.92	2.79

4.3.1 Module C, for One Eurocard and Bulky Components



4.3.1 Module C, for One Eurocard and Bulky Components

Depth	Width	Cover	3 U
160 mm 6.29"	7 HP	solid	23C307-10
		perforated	23C307-11
	10 HP	solid	23C310-10
		perforated	23C310-11
220 mm 8.66"	7 HP	solid	23C314-10
		perforated	23C314-11
220 mm 8.66"	7 HP	solid	23C307-30
		perforated	23C307-31

Front Panel Screws

- Set of 10 screws, M2.5 x 11.3
- With screw retainer
- Module C width 7 HP = 2 screws; ≥ 10 HP = 4 screws

Description	Part-No. 10 pcs.
Torx screws, size T8	63K159
Milled edge screws recessed	63-159

For more front panel screws refer to chapter E

Please note:

Handles for front panels, front panel screws and card guides to locate the module need to be ordered separately.

4: Cassettes and Modules

4.4 Accessories for Cassettes and Modules

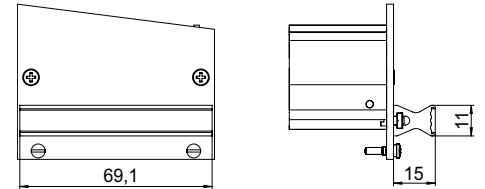
4.4.1 Card Guides



4.4.1 Card Guides

- Used to locate the module in the sub rack
- Black plastic UL94 V-0

Card Depth		Part-No. 10 pcs.	Part-No. 100 pcs.
mm	inch		
160	6.29	63-028	63-029
220	8.66	63-103	63-104

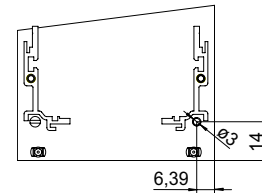


4.4.2 Fluted Handles



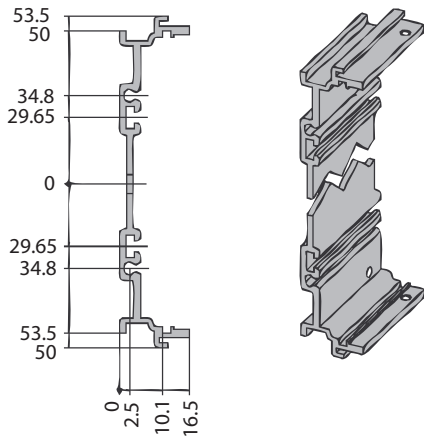
4.4.2 Fluted Handles

- Extruded aluminium handles, shaped to facilitate withdrawal of plug-in units
- Two grooves in the front face will accept identification strips (0.5 x 9 mm)
- **Scope of delivery:**
 - Extruded handle, clear anodised
 - Assembly material



7 HP	10 HP	14 HP	21 HP	28 HP	42 HP
23-060	23-061	23-062	23-063	23-064	23-065

4.4.3 Side Wall Extrusion

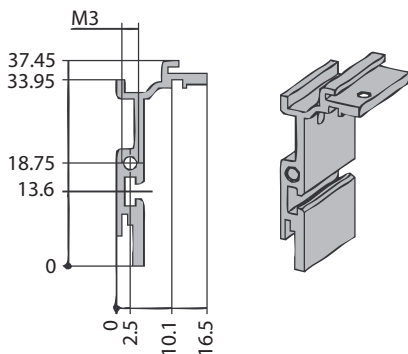


4.4.3 Side Wall Extrusion

- To build up customised solutions
- For 3 U type 23 cassettes and modules
- **Scope of delivery:**
 - 165.7 + 225.7 mm: 2 pcs.
 - 1350 mm: 1 pc.
- Assembly material has to be ordered separately

Length mm	Length inch	Part-No. Clear Passivation	Part-No. Raw
165.7	6.52	66-106-40	—
225.7	8.87	66-106-41	—
1350.0	53.14	—	66-106-14

4.4.4 Depth Extrusion



4.4.4 Depth Extrusion

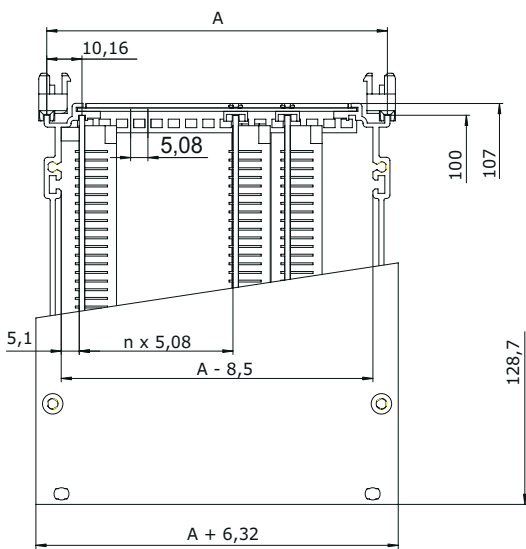
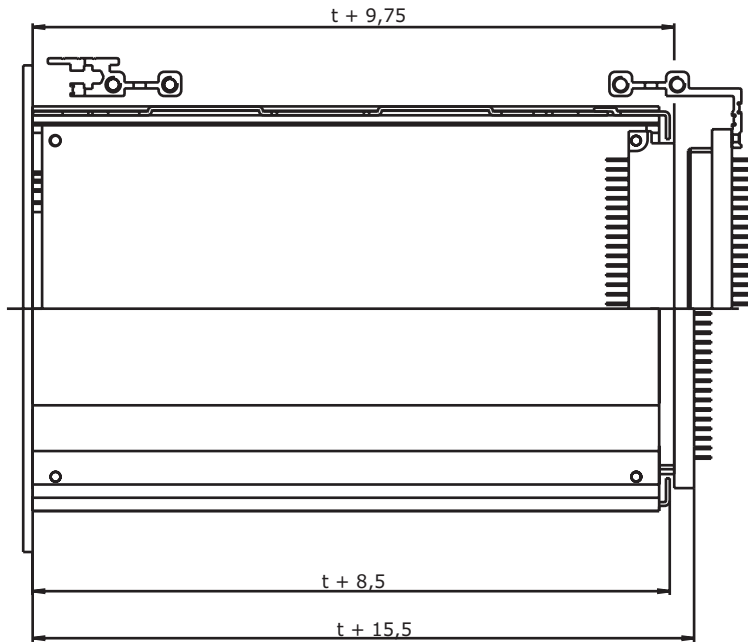
- To build up customised solutions
- For 6 U cassettes and modules type 23
- **Scope of delivery:**
 - 1 depth extrusion
- Assembly material has to be ordered separately

Length mm	Length inch	Part-No. Clear Passivation	Part-No. Raw
165.7	6.52	66-188-20	
225.7	8.87	66-188-22	
1350.0	53.14		66-188-14

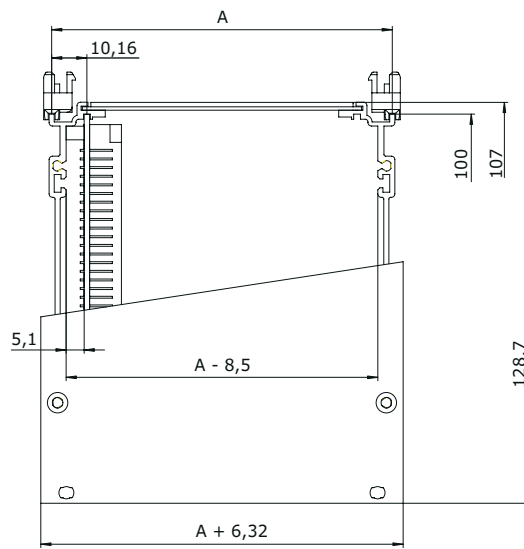
4: Cassettes and Modules

4.5 Line Drawings

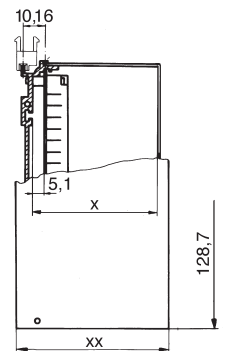
4.5.1 3 U Cassettes and Modules



Cassette A



Module B



Module C

Cassette A and Module B

Width	A mm	A inch
14 HP	64.60	2.54
21 HP	100.16	3.94
28 HP	135.72	5.34
42 HP	206.84	8.14

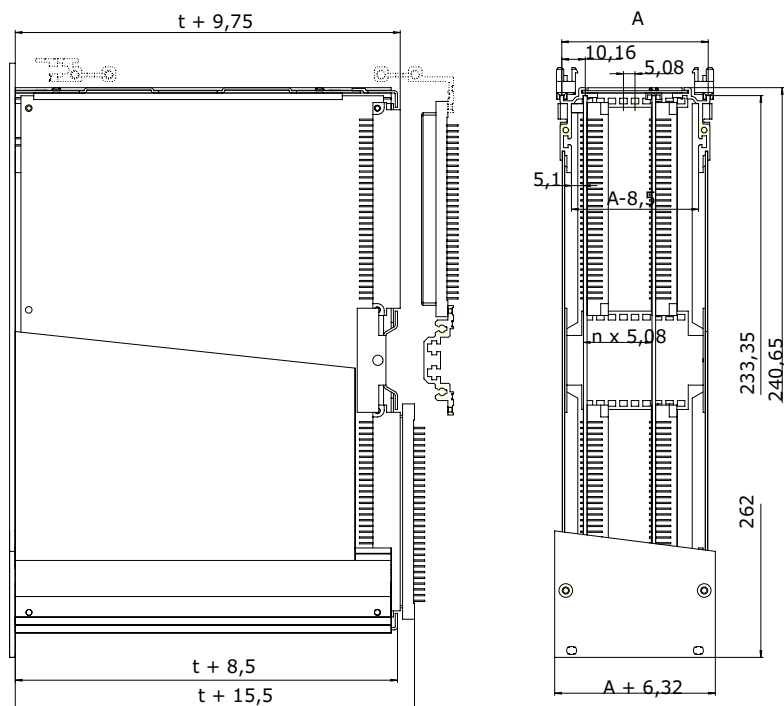
Module C

Width	x mm	x inch	xx mm	xx inch
7 HP	24.48	0.96	35.36	1.39
10 HP	39.72	1.56	50.60	1.99
14 HP	60.04	2.36	70.92	2.79

t = card depth = 160/220 mm (6.29"/8.66")

4: Cassettes and Modules

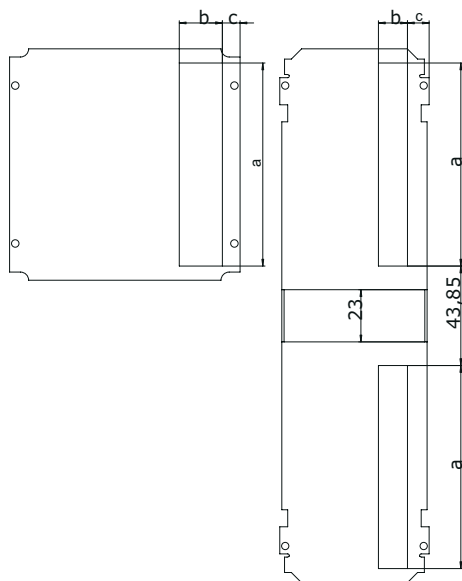
4.5.2 6 U Cassettes and Modules



Width	A mm	A inch
14 HP	64.60	2.53
21 HP	100.16	3.94
28 HP	135.72	5.34
42 HP	206.84	8.14

t = Card Depth = 160/220 mm (6.29"/8.66")

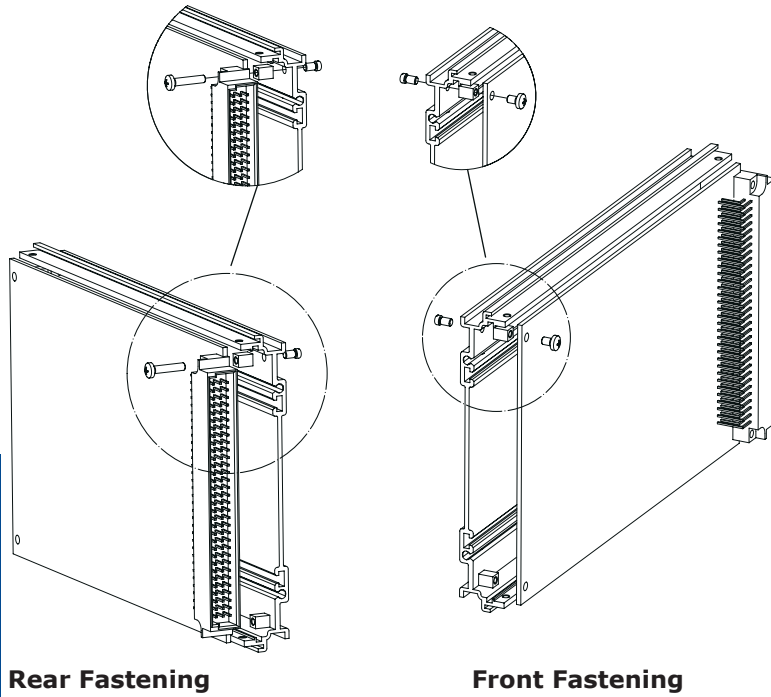
4.5.3 Rear Panel



	Height	IEC60603-2 Connectors			
		B, C, D mm	B, C, D inch	E, F, H mm	E, F, H inch
a	3 U	89.5	3.52	89.5	3.52
	6 U	89.5	3.52	89.5	3.52
b	3 U	12.0	0.47	19.0	0.74
	6 U	12.8	0.50	19.1	0.75
c	3 U	9.65	0.38	7.80	0.30
	6 U	9.55	0.37	7.75	0.30

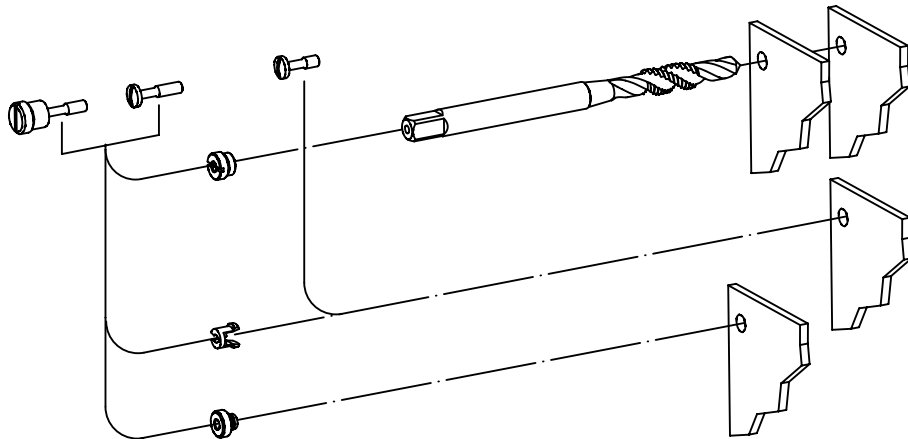
4: Cassettes and Modules

4.5.4 Fixing Methods



The PCB can be fastened to the front or rear of the side extrusions

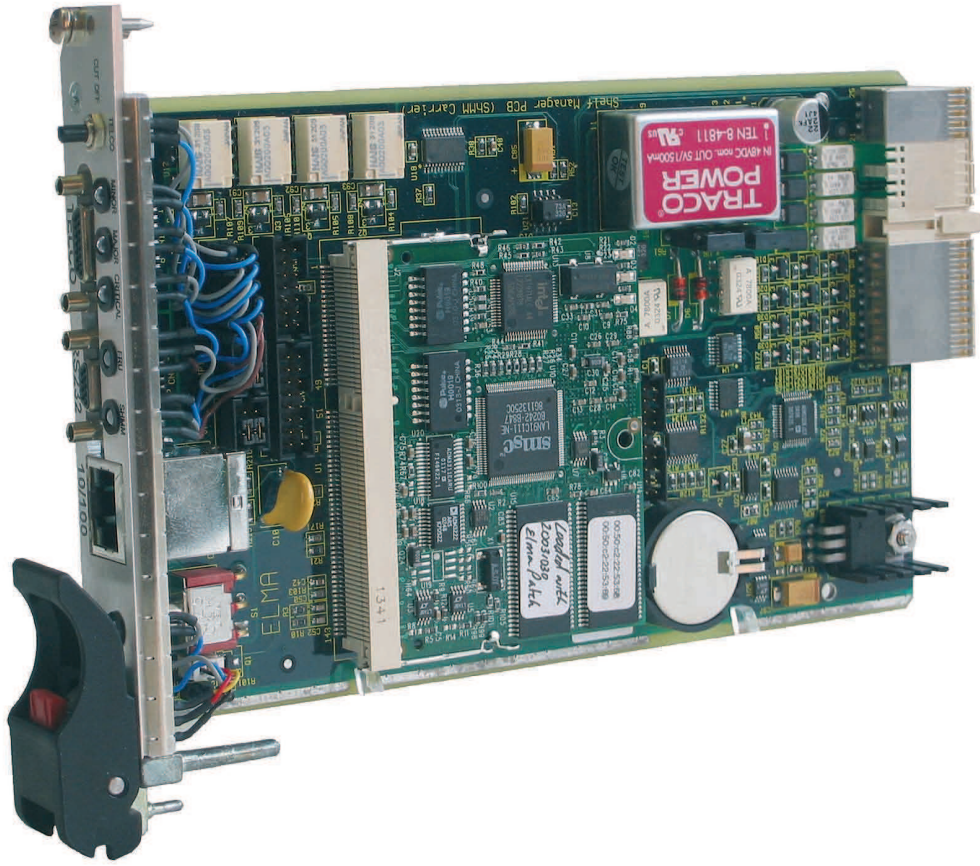
Fixing of Front Panel Screws



- Fixing screw only
- Screw with threaded bush
- Screw with retainer
- Screw with press-fit bush (M2.5 only)

If threaded bushes are used, the fixing holes must be drilled out and tapped, M5 x 0.5. Elma will perform this task on request.

No reworking is necessary when press-fit bushes are used.



Source: Elma Group



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