



Enclosures & Components

Guardbox 33

Rugged EMC compact case with protection up to IP65.

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.

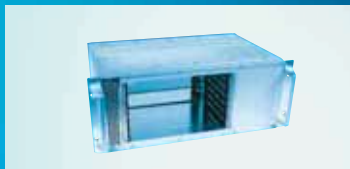
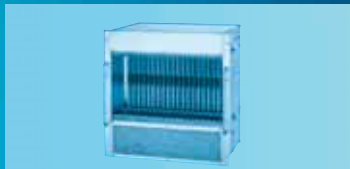
Why choose Elma?

- 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

4: Guardbox 33

B



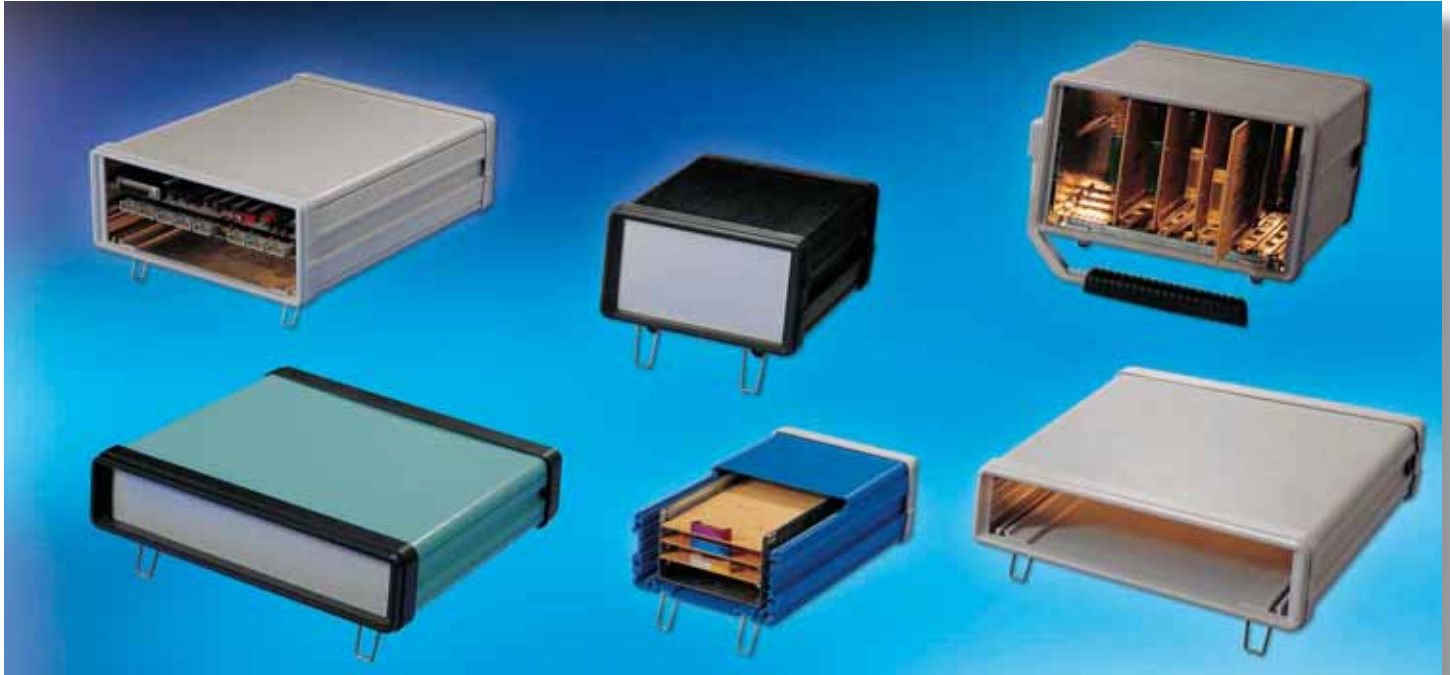
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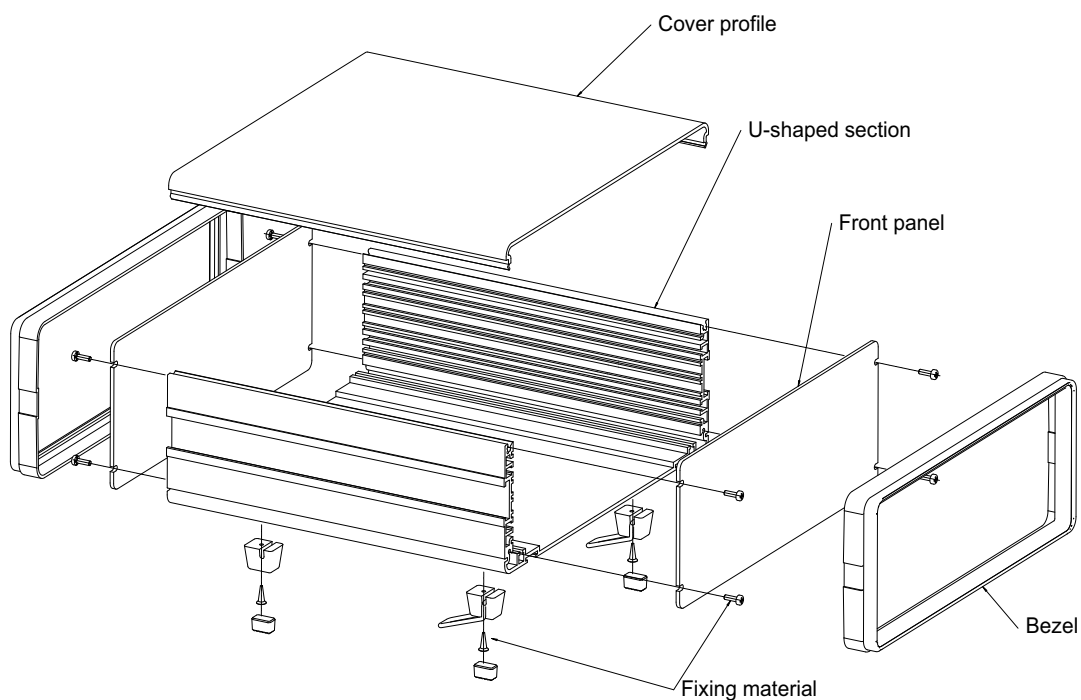
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4: Guardbox 33



4.1 Guardbox 33 Overview

- The Elma Guardbox 33 is manufactured from 2 aluminium sections only
- A U-shaped section forms the bottom with integrated sides and provides superior strength
- The extruded cover is held in place by the screws used for front/rear panel mounting
- The main features of this vibration-proof case are its rugged construction, ease of assembly and serviceability as well as its modern design
- The four screws used to assemble the Guardbox 33, and the fastenings for the feet and handle, are not visible
- The position of the feet is infinitely variable, allowing the case to be tilted to any angle within certain limits
- The aluminium design provides a high level of interference attenuation
- This compact case is available with or without ventilation slots in the base and front/rear panels
- Protection to IP30 is assured with ventilation slots, IP40 without ventilation slots
- A special sealing set allows the Guardbox 33 to be adapted to conform to protection class IP65
- This compact case is ideally used for test and measurement instruments, drive modules as well as for controls where rugged construction, design, colour and ease of serviceability are important
- The Guardbox 33 can easily accept single and double Eurocards as well as non-standard board sizes or other components



4: Guardbox 33



Sturdy, flexible and portable

Suitable for

- Mounting grooves
- Mounting panels
- Single eurocard
- Double eurocard (direct arrangement with case size 2, 3 and 5)

Application examples

- Measurement, control and test instrumentation
- Laboratory and maintenance equipment
- Equipment on train, trams, etc.

Versions

- EMC as standard
- IP65
- IP54 and EMC combined

Description

- Sturdy
- Handy
- Ease of service access
- Tilt-up feet
- No visible screws
- Optional carrying handle

Thermal Solutions

- Bottom with or without air perforation
- Front/rear panel with or without air perforation

Colours

- Colours bottom and cover: light grey (RAL 7035), black (RAL 9005), pebble grey (RAL 7032), other colours acc. to colour list upon request (MOQ: 10 pcs., no stock)
- Colours bezel: light grey (RAL 7035), black (RAL 9011), stone grey (RAL 7030)



The basic case consists of two aluminium extrusions and guarantees optimal and professional packaging of your boards or components.

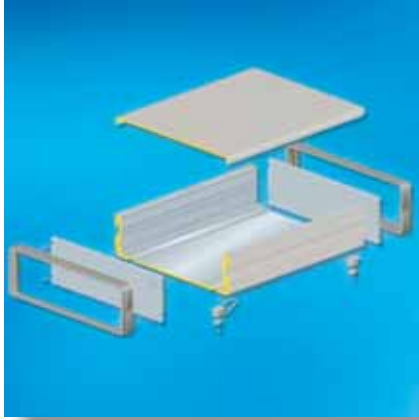
Cases and sizes

	Case 5 230.5 x 41	
Case 0 129.5 x 55	Case 2 230.5 x 55	
Case 1 129.5 x 71.5	Case 3 230.5 x 89	Case 4 183.5 x 111

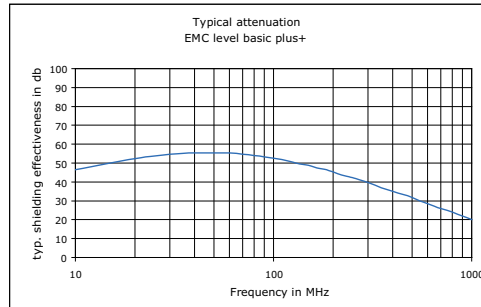
The Guardbox 33 series comes in 3 different widths and overall 6 different sizes to meet many different requirements.

4: Guardbox 33

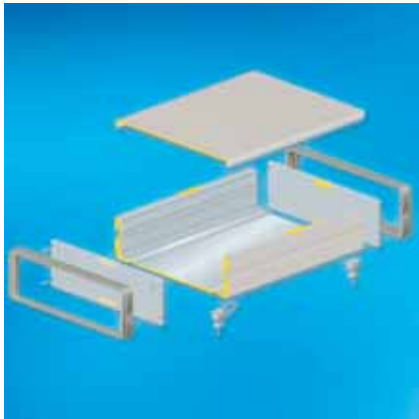
Guardbox 33 Standard



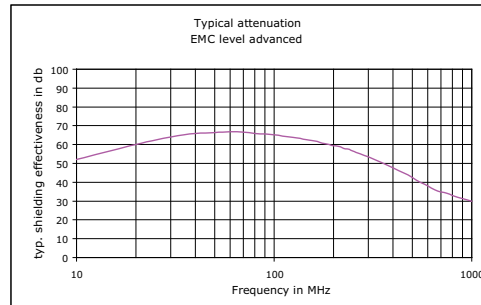
- EMC level basic plus+
- Top and bottom extrusions as well as front panels have conductive connections
- This provides effective EMC protection



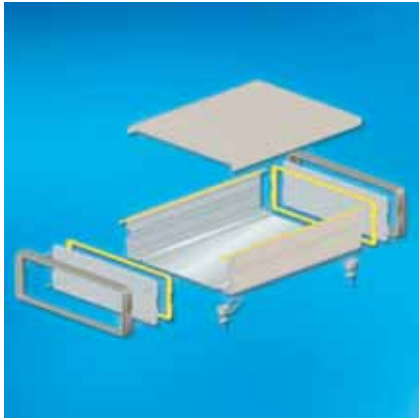
Guardbox 33 EMC



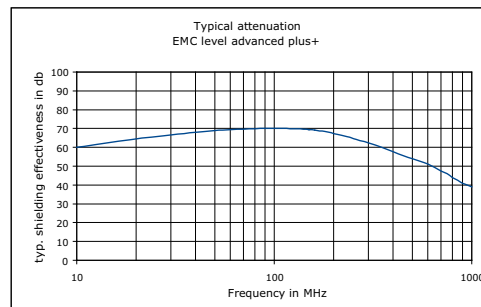
- EMC level advanced
- Standard housing and additional EMC Gasket set
- The EMC case for demanding applications!



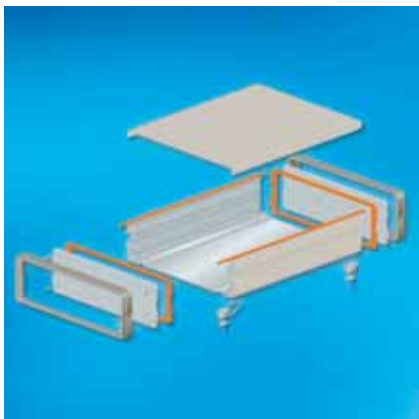
Guardbox 33 IP54 and EMC



- EMC level advanced plus+
- Standard housing and additional IP54/EMC set
- The EMC case for the most demanding applications!
- This version protects your electronics against splashes and dust



Guardbox 33 IP65



- This version protects your electronics against dust and water jets from a nozzle in all directions



Colours

Powder Coating

Powder coating is a method of applying coatings to surfaces without using solvents. The coating is applied as a free flowing powder and heated to cause it to flow and adhere to the surface. The powder may be a thermoplastic or a thermoset polymer.

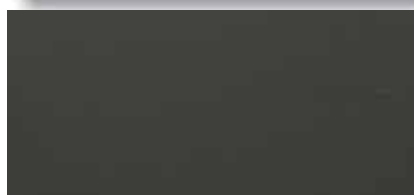
It is normally used to create a hard finish on metals. Powder coating is mainly used for coating of metals, such as "white goods", aluminium extrusions and automobiles. The polymer used by Elma is polyester-epoxy.

The most common way of applying the powder coating is to spray the powder using an electrostatic gun. The gun imparts an electric charge on the powder, which is then sprayed to the object which is grounded. The object is then heated, and the powder melts to form a hard coating.

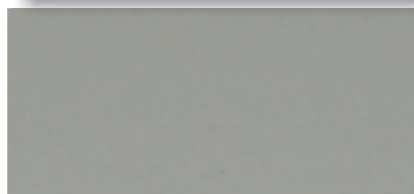
Colour samples (Standard-colours):



- Light grey, RAL 7035, structure, silky lustre



- Jet black, RAL 9005, structure, silky lustre



- Pebble grey, RAL 7032

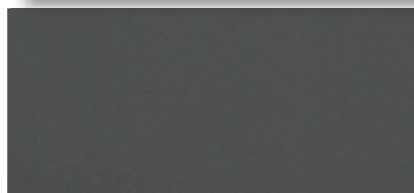
Other colours (options):



- Elma blue, Pantone 280C, structure, silky lustre



- Blue grey, NCS 5010-R 90B, structure, silky lustre



- Anthrazit, PES5803ME713 85A10, structure, silky lustre

Wet Painting

In a general, lacquer is a clear or coloured coating, that dries by solvent evaporation only which produces a hard, durable finish, that can be polished to a very high gloss, and gives the illusion of depth.



- Silver/Berluran Pantone 043.094.190, smooth

Note: other colours available upon request

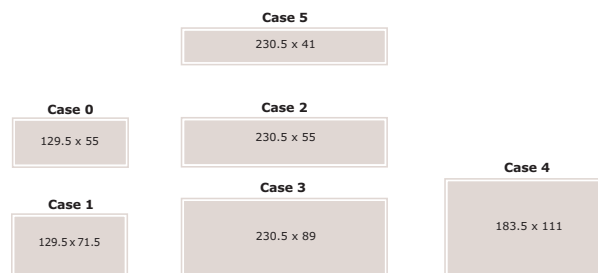
4: Guardbox 33

4.1.1 Complete Guardbox 33 Kit's

You find the most used complete kit's below.

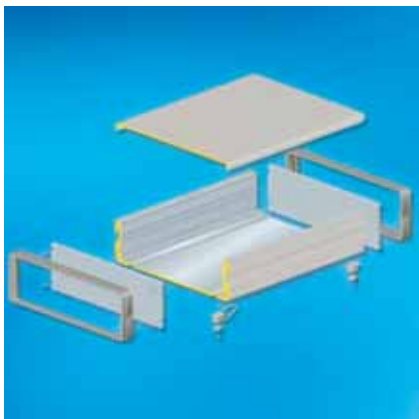
With the new order structure (see "Configuration" on next page) you have however the possibility of configure your individual housing in different steps. Use this offer or contact us for further information or any other help.

Cases and sizes



4.1.1 Guardbox 33 Kit EMC Basic

- Scope of delivery:
 - 1 basic case without perforation (detail see 4.2)
 - 2 bezels (detail see 4.3)
 - 2 front / rear panels without perforation (detail see 4.4)
 - 1 set assembly material (detail see 4.5.1)

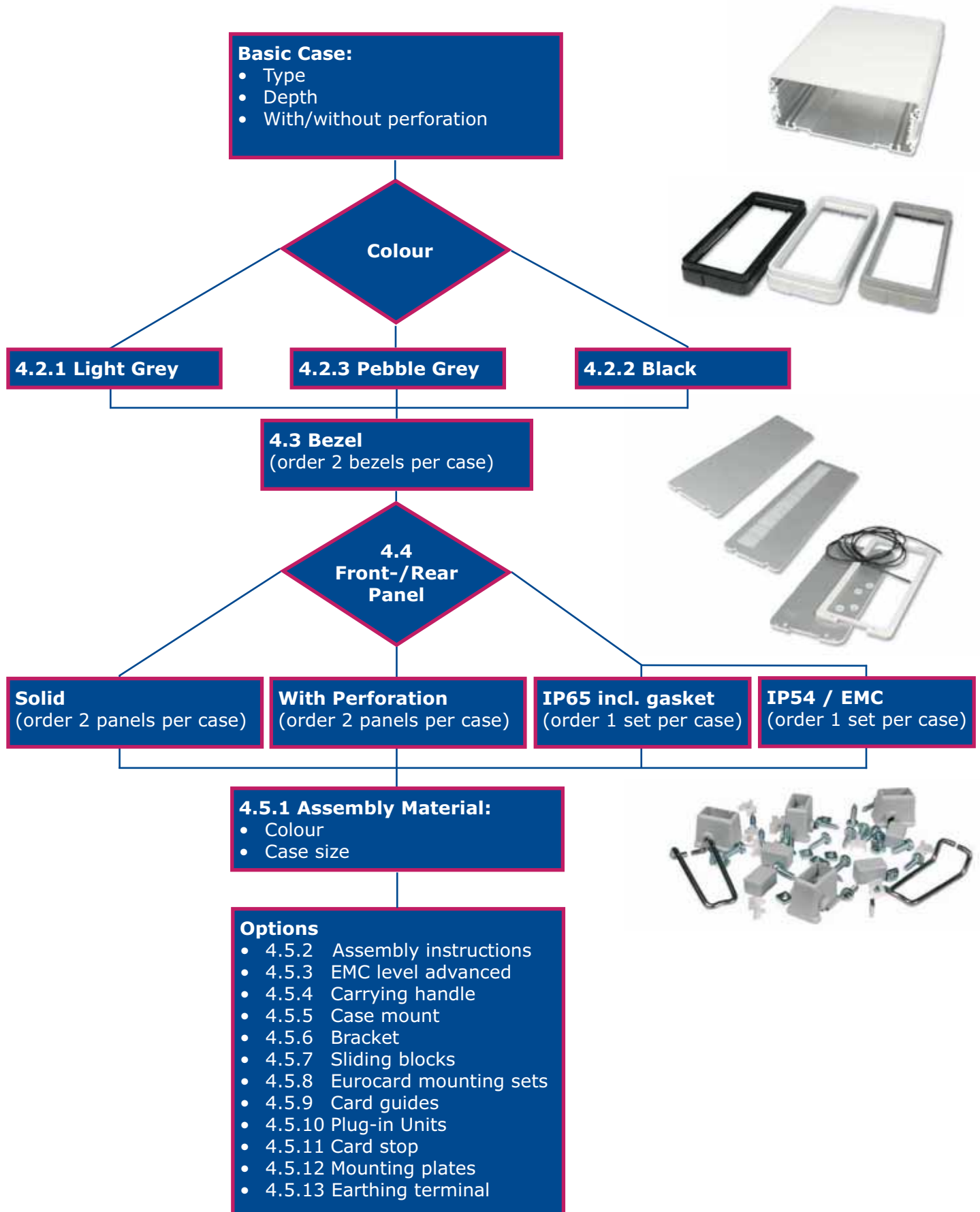


Case Size	Colour	Depth			
		120 mm 4.72"	180 mm 7.08"	240 mm 9.44"	300 mm 11.81"
0	black	33E012-25	33E018-25	33E024-25	-
0	light grey	33E012-45	33E018-45	33E024-45	-
1	black	33E112-25	33E118-25	33E124-25	-
1	light grey	33E112-45	33E118-45	33E124-45	-
2	black	-	-	33E224-25	33E230-25
2	light grey	-	-	33E224-45	33E230-45
3	black	-	-	33E324-25	33E330-25
3	light grey	-	-	33E324-45	33E330-45
4	black	-	33E418-25	33E424-25	33E430-25
4	light grey	-	33E418-45	33E424-45	33E430-45
5	black	-	33E518-25	33E524-25	-
5	light grey	-	33E518-45	33E524-45	-

4: Guardbox 33

Configuration

- The flexible way of setting your Guardbox 33 up:

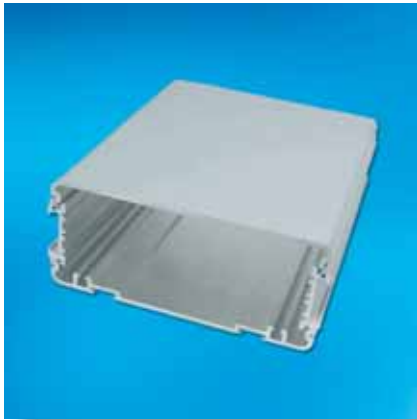
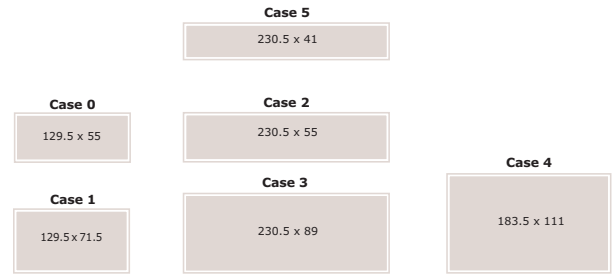


4: Guardbox 33

4.2 Basic Case

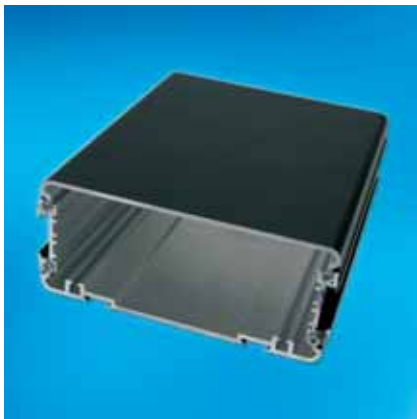
- Extruded aluminium
- Powder coated
- With or without air perforation slots in bottom
- **Scope of delivery:**
 - 1 U-shaped bottom
 - 1 cover

Cases and sizes



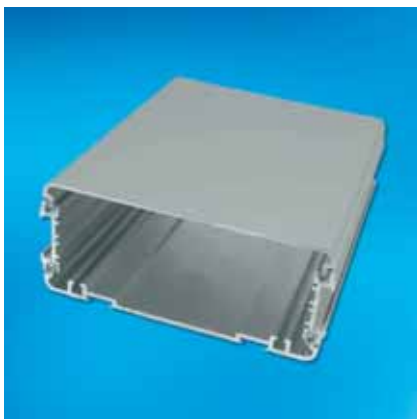
4.2.1 Basic Case Light Grey

Case Size	Without Air Perforation				With Air Perforation	
Depth mm	120	180	240	300	240	300
Depth inch	4.72	7.08	9.44	11.81	9.44	11.81
0	33E717	33E721	33E725			
1	33E705	33E709	33E713			
2			33E733	33E737	33E734	33E738
3			33E757	33E761	33E758	33E762
4		33E777	33E781	33E785	33E782	33E786
5		33E741	33E744			



4.2.2 Basic Case Black

Case Size	Without Air Perforation				With Air Perforation	
Depth mm	120	180	240	300	240	300
Depth inch	4.72	7.08	9.44	11.81	9.44	11.81
0	33E717-06	33E721-06	33E725-06			
1	33E705-06	33E709-06	33E713-06			
2			33E733-06	33E737-06	33E734-06	33E738-06
3			33E757-06	33E761-06	33E758-06	33E762-06
4		33E777-06	33E781-06	33E785-06	33E782-06	33E786-06
5		33E741-06	33E744-06			



4.2.3 Basic Case Pebble Grey

Case Size	Without Air Perforation				With Air Perforation	
Depth mm	120	180	240	300	240	300
Depth inch	4.72	7.08	9.44	11.81	9.44	11.81
0	33E717-00	33E721-00	33E725-00			
1	33E705-00	33E709-00	33E713-00			
2			33E733-00	33E737-00	33E734-00	33E738-00
3			33E757-00	33E761-00	33E758-00	33E762-00
4		33E777-00	33E781-00	33E785-00	33E782-00	33E786-00
5		33E741-00	33E744-00			

Note: Throughout the catalogue we put all EMC parts in a yellow table

4: Guardbox 33

4.3 Bezel

- Guards the complete case
- Moulded highquality plastic, UL94 V-0
- **Scope of delivery:**
 - 1 plastic bezel
- Note: For 1 Guardbox two bezels have to be ordered



4.3 Bezel

Case Size	Light grey	Black	Stone grey
0	33-000-03	33-000-06	33-000
1	33-001-03	33-001-06	33-001
2	33-002-03	33-002-06	33-002
3	33-003-03	33-003-06	33-003
4	33-004-03	33-004-06	33-004
5	33-005-03	33-005-06	33-005

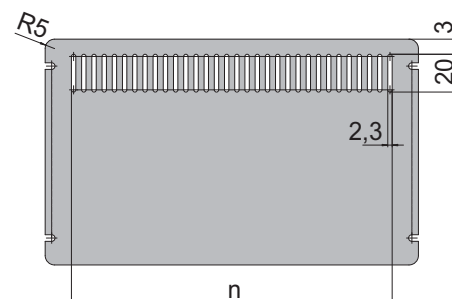
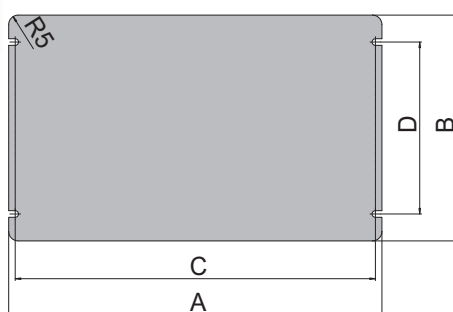
4.4 Front / Rear Panel

- The 2.5 mm (0.9") front panels of anodised aluminium serve both as front and rear panels
- They are screwed to the front end of the case profiles to give the snap-on bezel the required stability
- The panels are available with or without perforations
- IP54 / EMC and IP65: A special seal matching the Guardbox 33 ensures reliable sealing of the box
- **Scope of delivery:**
 - 1 Front- / Rear panel with or without perforation (Note: for one Guardbox 33 two panels have to be ordered)
 - IP65 and IP54 / EMC set: 1 Front- and 1 rear panel, 2 self-adhesive seals, sealing hose, washers
- Replacement seals IP65 see 4.4.2 / IP54 / EMC see 4.4.3
- Torque of mounting screws to ensure IP protection: 0.70Nm - 0.75Nm



4.4.1 Front / Rear Panel

Case Size	Without Perforation	With Perforation	IP65 Set incl. Gasket	IP54 / EMC Set incl. Gasket
EMC level	basic advanced (4.5.3)	basic (4.5.3)	-	advanced plus
0	33E400-50	33E400-51	33-520	33E520
1	33E401-50		33-521	33E521
2	33E402-50	33E402-51	33-522	33E522
3	33E403-50	33E403-51	33-523	33E523
4	33E404-50	33E404-51	33-524	33E524
5	33E405-50		33-525	33E525

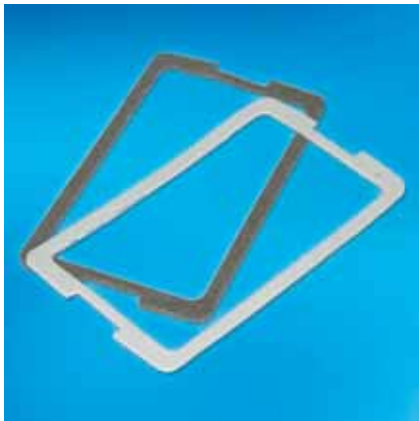


Case Size	A		B		C		D		n	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
0	142.3	5.60	63.5	2.50	137.0	5.39	35	1.37	126.5	4.98
1	142.3	5.60	80	3.14	137.0	5.39	51.5	2.02		
2	243.3	9.57	63.5	2.50	238.4	9.38	35	1.37	212.9	8.38
3	244.4	9.62	97.5	3.83	238.4	9.38	69	2.71	212.9	8.38
4	197.5	7.77	119.5	4.70	190.6	7.50	91	3.58	169.7	6.68
5	243.3	9.57	49.5	1.94	238.4	9.38	21	0.82		

4: Guardbox 33

4.4.2 Replacement Seals IP65

- As spare part
- Foamed plastic PVC grey, UL94 V-0
- Self-adhesive seals

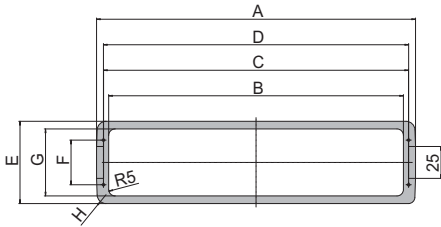


4.4.2 Replacement Seals IP65

Case Size	Scope of Delivery	Part-No.
0	5 pcs.	33-530
1	5 pcs.	33-531
2	5 pcs.	33-532
3	5 pcs.	33-533
4	5 pcs.	33-534
5	5 pcs.	33-535

4.4.3 Replacement Seals IP54/EMC

- As spare part
- Foamed plastic conductive PET-PU black, UL94 V-0
- Self-adhesive seals

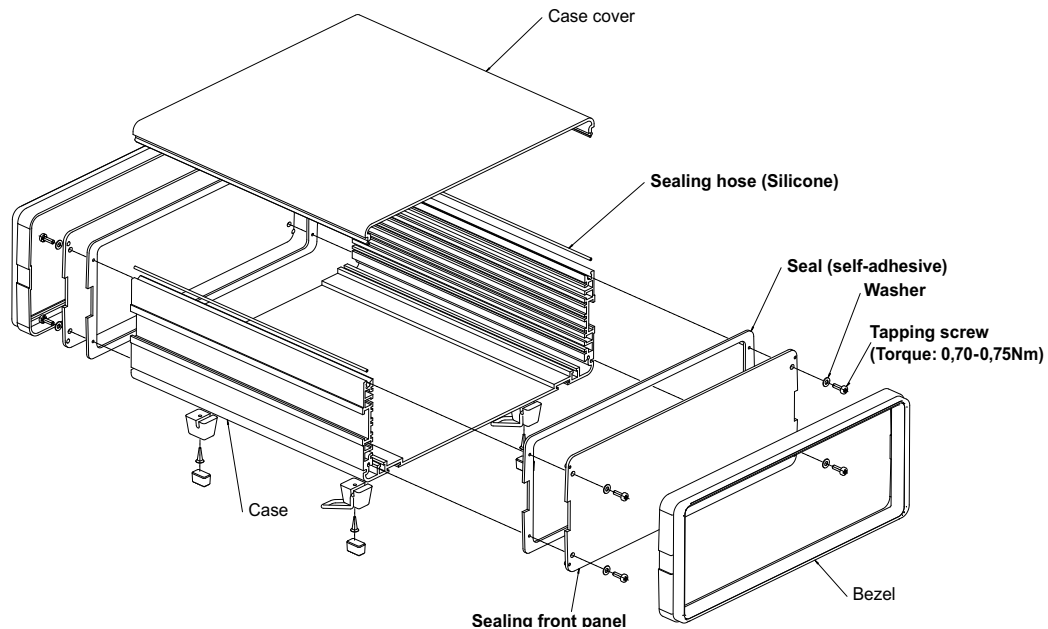


4.4.3 Replacement Seals IP54/EMC

Case Size	Scope of Delivery	Part-No.
0	5 pcs.	33E530
1	5 pcs.	33E531
2	5 pcs.	33E532
3	5 pcs.	33E533
4	5 pcs.	33E534
5	5 pcs.	33E535

Case Type	A		B		C		D		E		F		G		H	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
0	149	5.86	130	5.11	137	5.39	138	5.43	64.5	2.53	35	1.37	52.5	2.06	R6.5	0.25
1	149	5.86	130	5.11	137	5.39	138	5.43	81	3.18	51.5	2.02	69	2.71	R6.5	0.25
2	250	9.84	231	9.09	239	9.40	239	9.40	64.5	2.53	35	1.37	52.5	2.06	R7	0.27
3	251	9.88	231	9.09	239	9.40	240	9.44	98	3.85	69	2.71	86	3.38	R7	0.27
4	204	8.03	184	7.24	191	7.51	193	7.59	120.5	4.74	91	3.58	108.5	4.27	R7.5	0.29
5	249.5	9.82	231	9.09	239	9.40	239	9.40	50	1.96	21	0.82	38	1.49	R7	0.27

Guardbox 33 with IP54 / EMC Set or IP65 Set



4: Guardbox 33

4.5 Accessories

4.5.1 Assembly Material

- One set with all necessary materials for mounting one Guardbox 33
- **Scope of delivery:**
 - 4 feet (2 tilted) incl. screws, UL94 V-0
 - 4 tapping screws to assemble the case
 - Assembly material for internal extension (10 screws M3 x 8, 10 screw nuts M3, 10 nut holders)

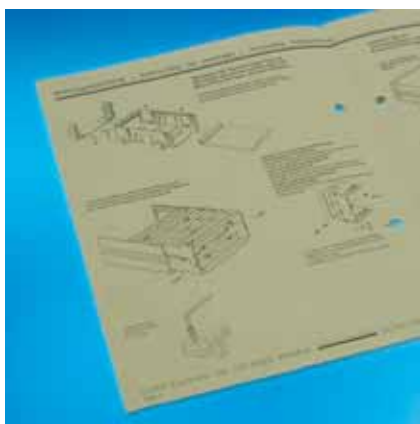


4.5.1 Assembly Material

Case Size	Light Grey	Black	Stone Grey
0 - 4	33-640	33-620	33-621
5	33-641	33-624	33-622

4.5.2 Assembly Instructions

- For a fast and secure assembly of the Guardbox 33
- **Scope of delivery:**
 - Detailed assembly instruction (1 Page)



4.5.2 Assembly Instructions

Description	Part-No.
Version: EMC only	33E100
Version: For Standard, IP65 and IP54/EMC	33-200

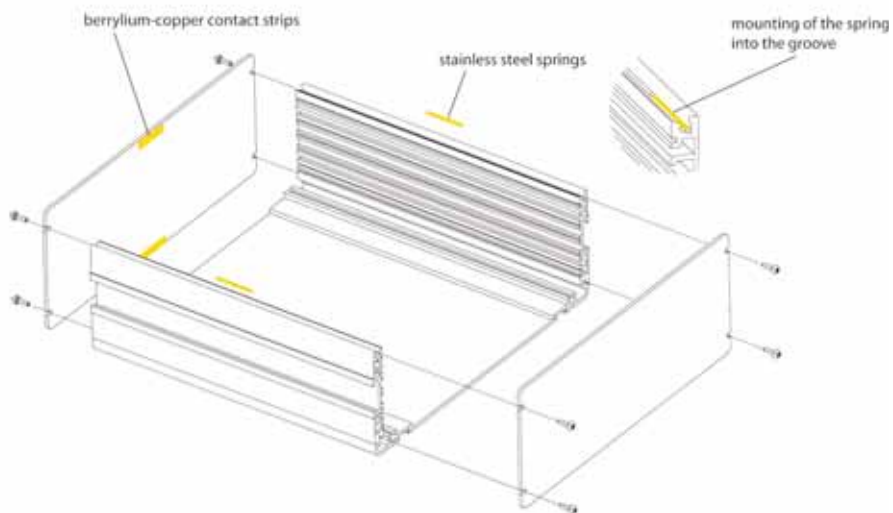
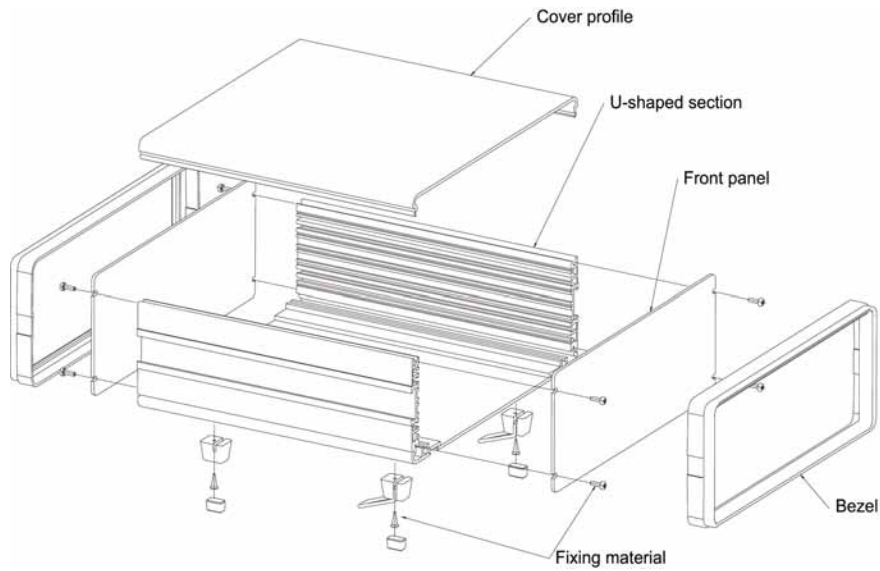
4: Guardbox 33

4.5.3 Supplementary EMC Gasket Set

- For EMC level advanced when using no perforations
- For EMC level basic when using perforations
- Increased EMC level by approximate 10 dB
- **Scope of delivery:**
 - 4 beryllium-copper contact strips
 - 2 stainless steel springs

4.5.3 Supplementary EMC Gasket Set

Case Size	Description	Part-No.
0 - 5	Increased by approx. 10 dB	33-642



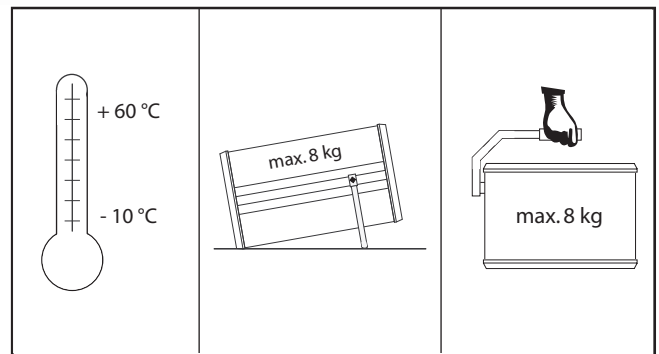
4: Guardbox 33

B



4.5.4 Carrying Handle

- Zinc die-cast, powder-coated
- Handle piece: Black polyurethane, UL94 V-0
- The handle is inserted into the side groove on the case and can be fixed in any position
- The handle is looking at 90°, while the carrying position has a slight detent only
- Following the case size, there are handles available in two different widths
- **Scope of delivery:**
 - Pre-assembled handle with assembly material

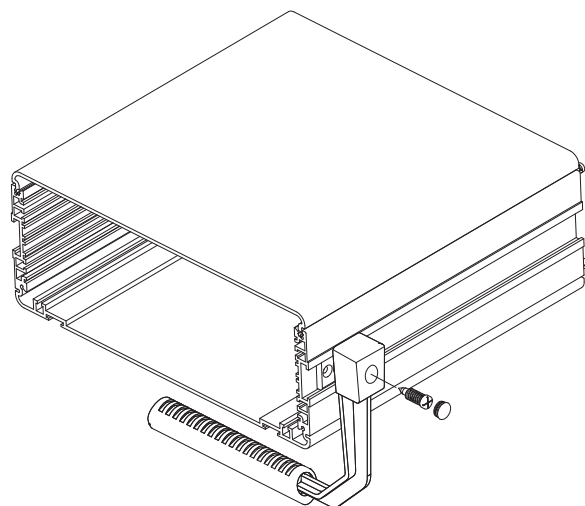
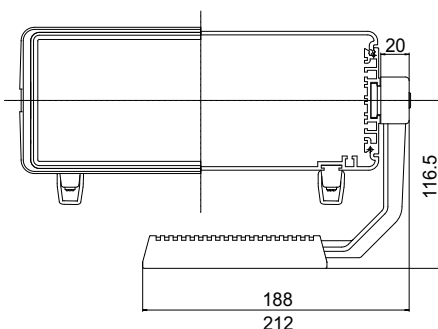


Carrying capacity dependent on distribution of load and handling. Decreases with dynamic stress



4.5.4 Carrying Handle

Colour	Part-No. 212 mm (8.34") for case size 2 + 3	Part-No. 188 mm (7.40") for case size 4
Light grey	33-635	33-636
Black	33-645	33-646
Pebble grey	33-630	33-631

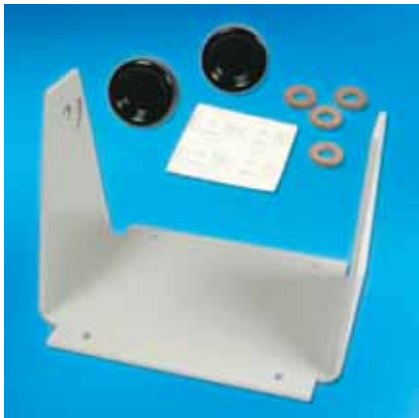


4: Guardbox 33



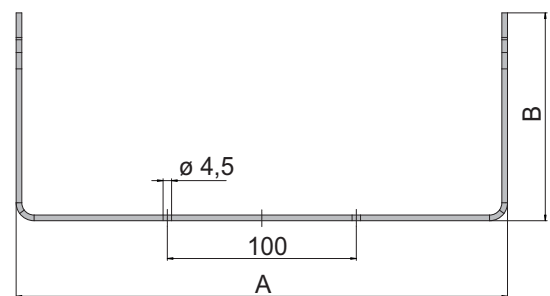
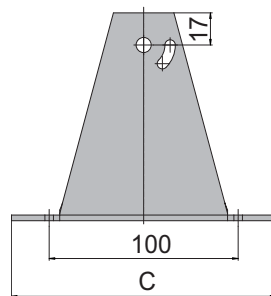
4.5.5 Case Mount

- Made of 3 mm (0.11") sheet aluminium, powder-coated
- Can be attached at any point along the slots in the side of the compact case
- Allows case to be tilted at a maximum angle of 45° to the horizontal axis
- Two knurled screws are tightened to fix the case in the desired position
- Used to attach the Guardbox 33 to a wall, ceiling or swivel arm
- Fitted with rubber feet, it can also be used as a stand for a table-top case
- **Scope of delivery:**
 - 1 case mount
 - 2 sliding blocks
 - Assembly material (2 knurled screws, 4 rubber feet, 4 washers)



4.5.5 Case Mount

Colour	Part-No. for Case Size 0 + 1	Part-No. for Case Size 2 + 3	Part-No. for Case Size 4
Light grey	33-671-03	33-673-03	33-674-03
Black	33-671-06	33-673-06	33-674-06
Pebble grey	33-671	33-673	33-674



Case Size	A		B		C	
	mm	inch	mm	inch	mm	inch
0 + 1	158	6.22	117.7	4.63	120	4.72
2 + 3	260	10.23	110.7	4.35	140	2.51
4	213	8.38	117.7	4.63	140	2.51

4: Guardbox 33

B



4.5.6 Bracket for Mounting in Consoles

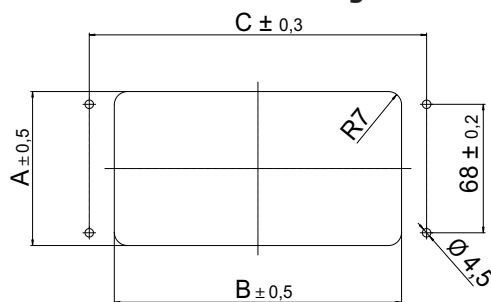
- 3 mm (0.11") sheet aluminium mounting bracket
- Inserted into the slots on the sides of the Guardbox 33 and positioned using two M4 x 6 mm set screws
- Using the mounting brackets, the compact case can be mounted in consoles, etc.
- **Scope of delivery:**
 - 2 mounting brackets
 - 4 screws M4 x 6



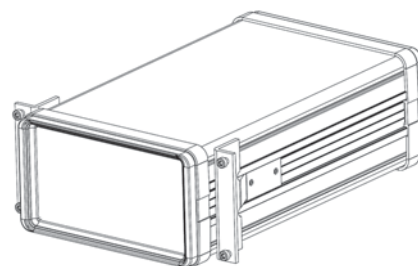
4.5.6 Bracket for Mounting in Consoles

Description	Part-No.
For case sizes 0 - 4	33-650

Cut-out drawing:



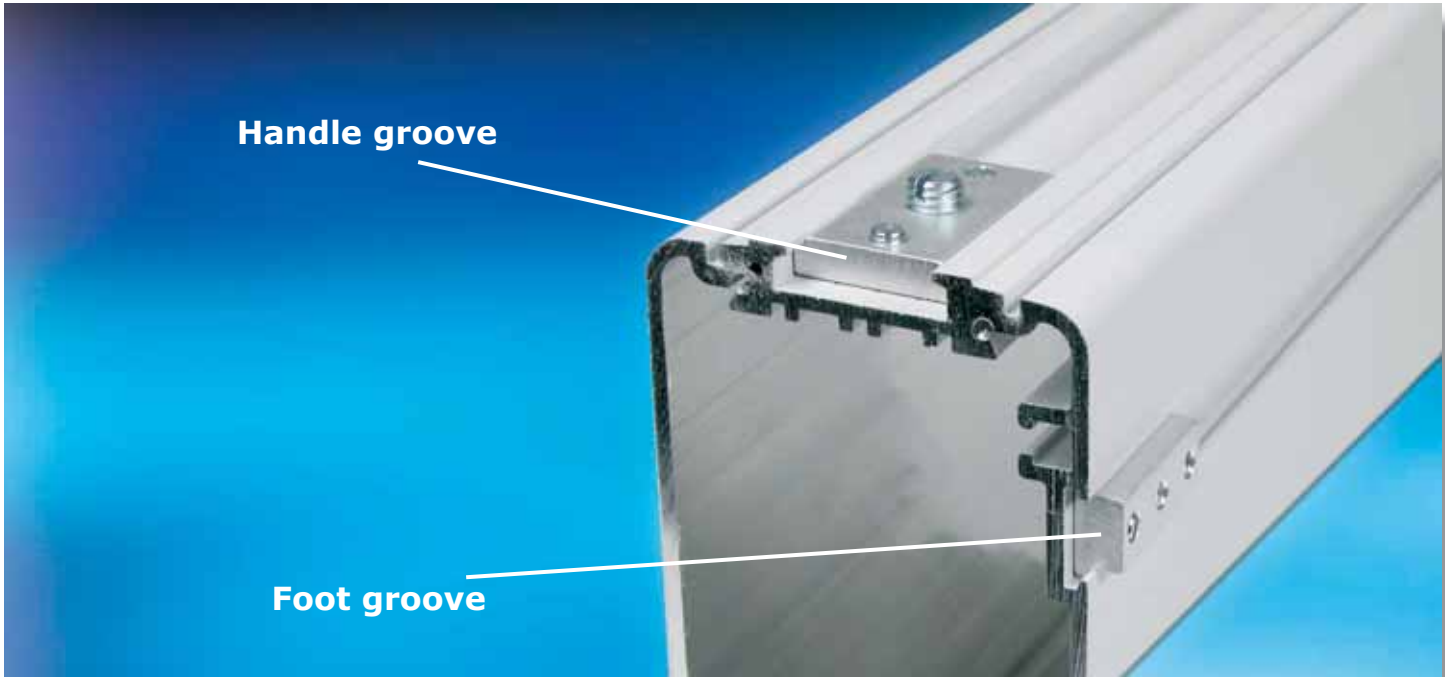
Mounting position of brackets:



Case Size	A		B		C	
	mm	inch	mm	inch	mm	inch
0	65	2.55	152	5.98	178.5	7.02
1	81.5	3.20	152	5.98	178.5	7.02
2	65	2.55	253	9.96	279.5	11.00
3	99	3.89	254	10.00	280.5	11.02
4	121	4.76	207	8.14	233.5	9.19

4: Guardbox 33

B



4.5.7 Sliding Blocks for Handle Slots and Feet Slots

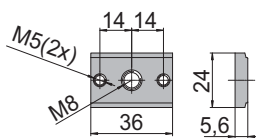
- The sliding blocks (extruded aluminium) provide an optional means of attachment for the Guardbox 33
- The blocks are inserted in the handle slot on the side of the case or in place of the feet
- **Scope of delivery:**
 - Sliding blocks incl. screws



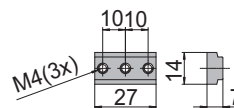
4.5.7 Sliding Blocks for Handle and Feet Slots

Case Size	Description	Scope of Delivery	Part-No.
0 - 4	Handle groove	1 pc.	33-665
0 - 5	Foot groove	4 pcs.	33-666

Handle groove slot nut



Foot groove slot nut





4.5.8 Single-Eurocard Mounting Sets

- Card carrier of 1 mm (0.03") galvanised sheet steel for mounting in case sizes 0 - 4
- Card guides are the same as used in Elma Type 23 cassettes
- For 100 x 160 mm (3.93 x 6.29") eurocards with plug-in connectors acc. to IEC 60603-2
- Other use is: for vertical mounting of cards in case size 4 (fastening lugs have to be removed)
- **Scope of delivery:**
 - 1 card carrier
- Assembly material included in set see 4.5.1
- Please note: A mounting plate (see 4.5.12) has to be ordered if cards are to be mounted horizontally in case sizes 2, 3 and 4

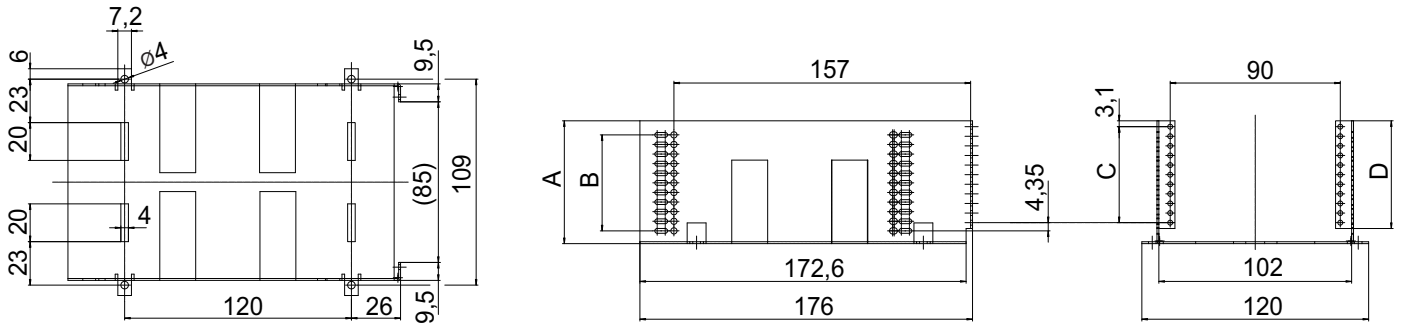


4.5.8 Single-Eurocard Mounting Sets

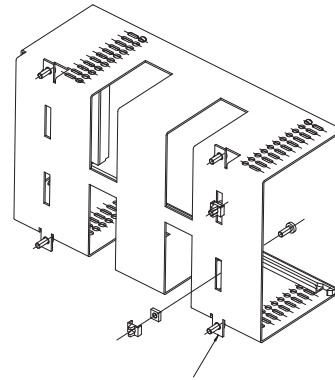
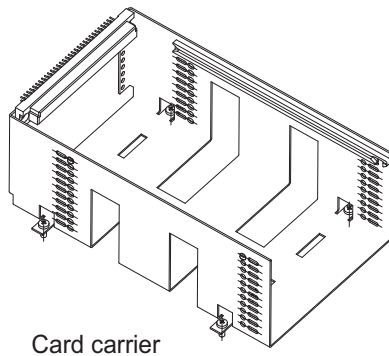
Case Size	Mounting of Cards	Part-No.
1, 3 and 4	horizontally	33-205
0 and 2	horizontally	33-204
4	vertically	33-210

4: Guardbox 33

Line drawing, cards mounted horizontally

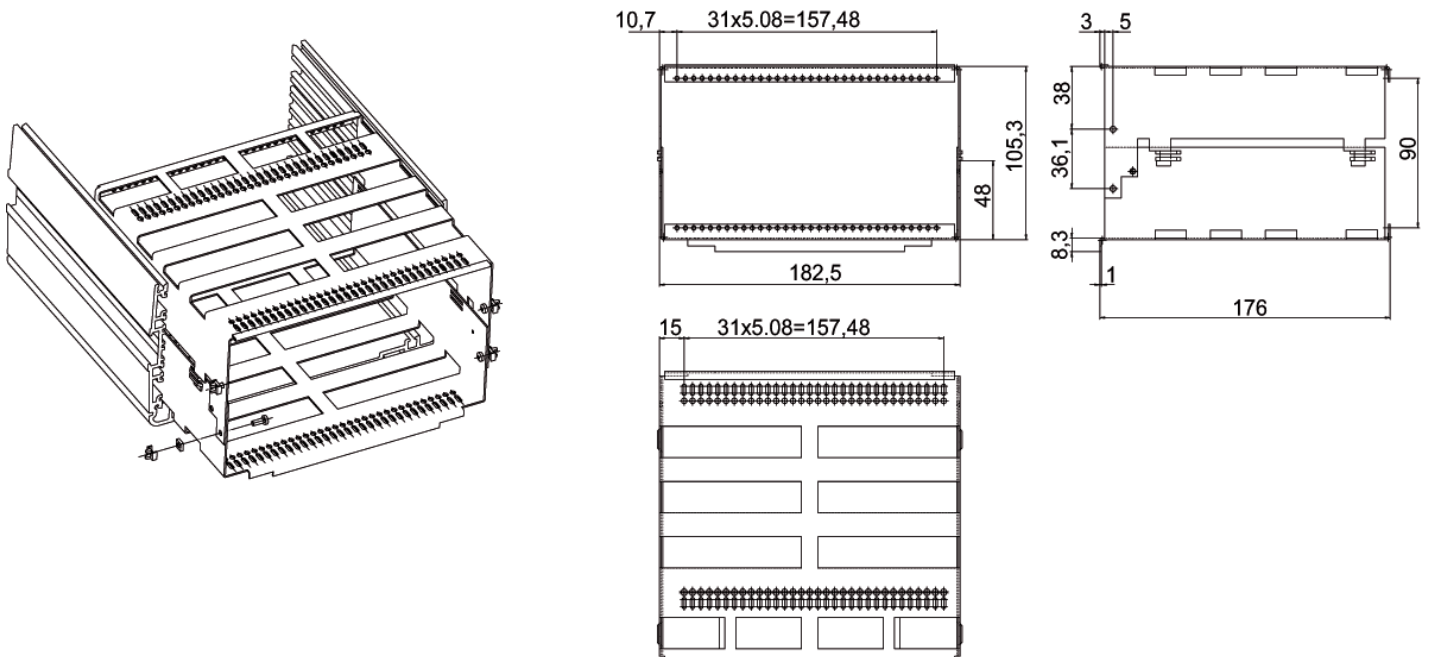


Case Size	A		B		C		D	
	mm	inch	mm	inch	mm	inch	mm	inch
0 + 2	49.76	1.95	7 x 5.08	0.20	7 x 5.08	0.20	41.76	1.64
1, 3, 4	65	2.55	10 x 5.08	0.20	10 x 5.08	0.20	57	2.24



Note: For vertical mounting of cards in case size 4, fastening lugs have to be removed

Line drawing, case size 4, card mounted vertically



4: Guardbox 33

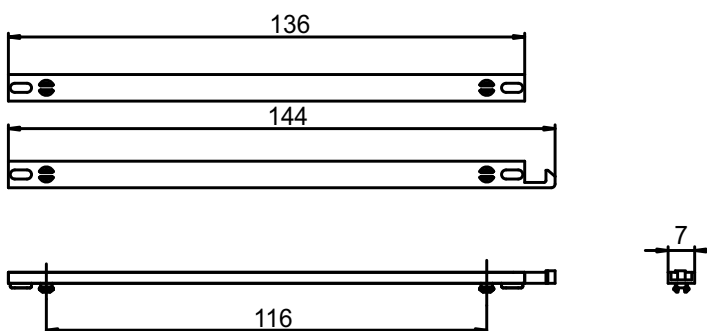
4.5.9 Card Guides

- In each pair, one card guide is fitted with a card locking mechanism
- Light Grey UL94 V-0
- **Scope of delivery:**
 - 1 pair of card guides
- Card handles see 4.5.9.1



4.5.9 Card guides

Card Depth	Scope of Delivery	Part-No.
160 mm (6.29")	5 pairs	63-120
	50 pairs	63-121

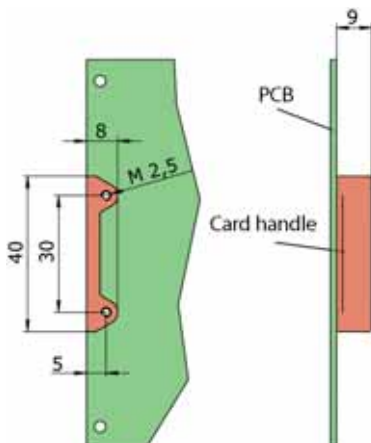


4.5.9.1 Card Handles

- Coloured, transparent handles which will accept labels and facilitate the handling and identification of PCBs
- **Scope of delivery:**
 - 1 card handle
- Two screws M2.5 x 5 are needed per handle and have to be ordered separately

Description	Colour	Part-No. 1 pc.	Part-No. 100 pcs.
Card handle	clear	1091-51	
	red	1091-54	
Cylindrical screw M2.5 x 5			1901-05
Torx cylinder head screw M2.5 x 5, size T8		5470-07	
Labels (1 A4 sheet of 185)		1091-59	

- Other colours (blue, yellow, green, orange) upon request





4.5.10 Mounting Set for Plug-In Units (Single Eurocards)

- Galvanised sheet steel plug-in sub-unit allowing 3U plug-in units (eurocards 100 x 160 mm with IEC 60603-2 connectors and flat or extruded front panels) to be mounted horizontally in the Guardbox 33
- The usable height is 12 HP
- The case front panel with the 129.2 x 61 mm (5.08 x 2.40") opening is made from 2.5 mm (0.07") thick anodised sheet aluminium
- Scope of delivery:**
 - 1 plug-in card carrier sub-unit
 - 1 front panel with opening for case size 1
 - Assembly material for sub-unit
- Sub-unit for case size 3 and 4 see 4.5.10.1
- Card guides see 4.5.9



4.5.10 Mounting Set for Plug-In Units (single eurocard)

Description	Part-No.
Complete sub-unit for case 1	33-207

4.5.10.1 Sub-unit for case size 3 and 4

- The sub-unit can also be used for case size 3 and 4. The case front panel can be manufactured with openings to your own specifications
- An appropriate mounting plate (see 4.5.12) is required to mount the sub-unit. The mounting plate has to be ordered separately
- For front panels for single eurocards see 4.5.10.2

Description	Part-No.
Plug-in card carrier sub-unit	33-206
Assembly material for plug-in unit	33-616

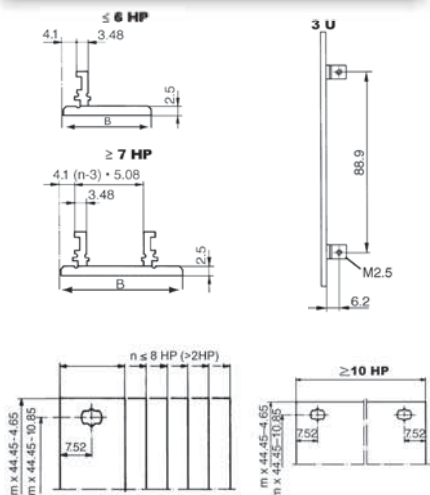
4: Guardbox 33



4.5.10.2 Extruded Front Panels

- Aluminium 2.5 mm, clear anodised (non-conductive)
- PCB mounting lugs are formed on the rear face of the panel
- No PCB fixing screws on the front face of the panel, leaving more space for silk screening and mounting front panel components
- Suitable for all sub racks and cases
- Thickness of the mounting lugs (3.48 mm) allows PCBs to be mounted on either side of the lugs
- At rear drill marks for handle-fixing holes
- Scope of delivery:**
 - Extruded front panel, clear anodised
- Front panel screws see below

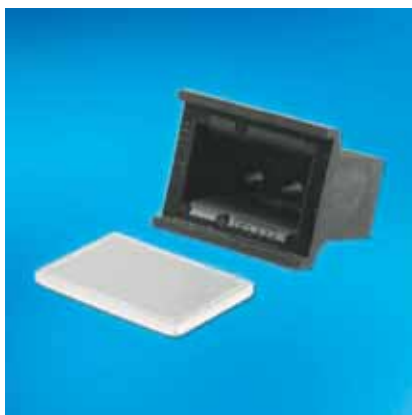
Width	B		Part-No. 3 U
	mm	inch	
3 HP	15.0	0.59	26N303
4 HP	20.1	0.79	26N304
5 HP	25.2	0.99	26N305
6 HP	30.3	1.19	26N306
7 HP	35.3	1.38	26N307
8 HP	40.4	1.59	26N308
10 HP	50.6	1.99	26N310
12 HP	60.7	2.38	26N312



Front Panel Screws

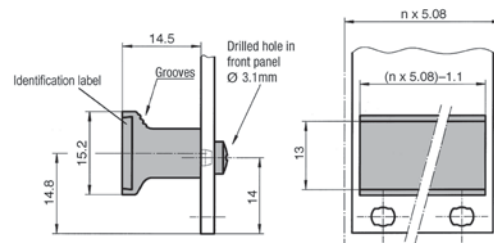
- Set of 10 screws
- With screw retainer
- Front panel width up to 9 HP = 2 screws; ≥ 10 HP = 4 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with plastic screw retainer	63K159
Milled edge screws recessed M2.5 x 11.3, with plastic screw retainer	63-159



4.5.10.3 Rigid-Mounted Handle with Identification Label

- Black, plastic UL94 V-0, label aluminium anodised
- Scope of delivery:**
 - Rigid-mounted handle
 - Identification label
- Assembly material see below



Width	Scope of Delivery	Part-No.
4 HP top*	5 pcs.	60-200-01
4 HP bottom*	5 pcs.	60-200-02
4 HP	10 pcs.	60-200-04
5 HP	10 pcs.	60-200-05
6 HP	10 pcs.	60-200-06
7 HP	10 pcs.	60-200-07
8 HP	10 pcs.	60-200-08
10 HP	10 pcs.	60-200-10
12 HP	10 pcs.	60-200-12

- Other sizes (up to 84 HP) are available upon request
- * (Flat front panel with card holder)

Assembly Material

Description	Part-No. 100 pcs.
Recessed round head screw	1902-70

Other front panels and handles see chapter C "Front Panels, Handles and Plug-In Units"

4: Guardbox 33



4.5.11 Card Stop Set

- Card stoppers are used for card fixation when direct horizontal insertion of double eurocards (case size 2, 3 and 5) or other inserted cards is required
- **Scope of delivery:**
 - 4 extruded card stoppers
 - 4 hexagon socket set screws
 - 1 hexagon socket key



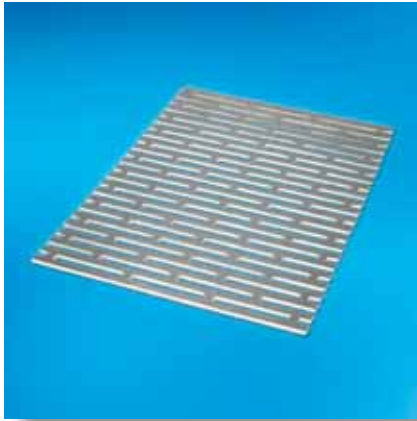
4.5.11 Card Stop Set

Case Size	Part-No.
0 - 5	33-618

4: Guardbox 33

4.5.12 Mounting Plates

- Made of 2 mm (0.07") thick sheet aluminium
- Dimensions correspond to the respective case size
- The position of the slots allows various mounting arrangements
- The mounting plate is screwed to the grooved case profile
- **Scope of delivery:**
 - Mounting plate, blank aluminium
- Assembly material included with in set see 3.5.1



4.5.12 Mounting Plates

Case Size	Part-No. 120 mm 4.72 inch	Part-No. 180 mm 7.08 inch	Part-No. 240 mm 9.44 inch	Part-No. 300 mm 11.81 inch
0 + 1	33-312	33-313	33-314	
2, 3, 5			33-324	33-325
4		33-343	33-344	33-345

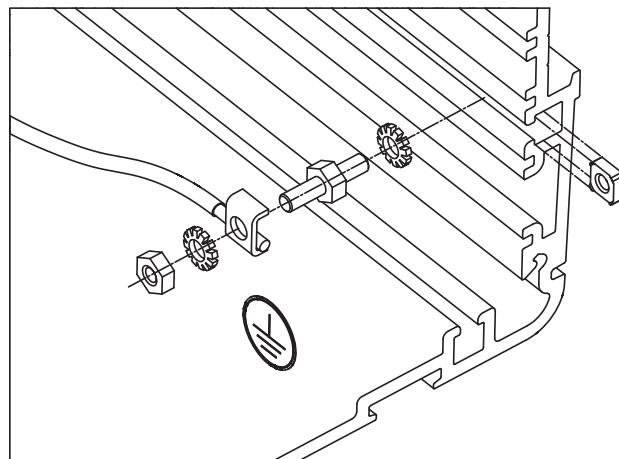
4.5.13 Earthing Terminal

- The earthing terminal facilitates grounding of the Guardbox 33 in accordance with EN / VDE / SEV standard
- **Scope of delivery:**
 - 1 earthing nut M3.5
 - 1 threaded bolt M3.5
 - 1 clamping yoke
 - 2 serrated washers
 - 1 nut M3.5
 - 1 earthing symbol



4.5.13 Earthing Terminal

Case Size	Description	Part-No.
0 - 5	Earthing terminal	33-619



4: Guardbox 33

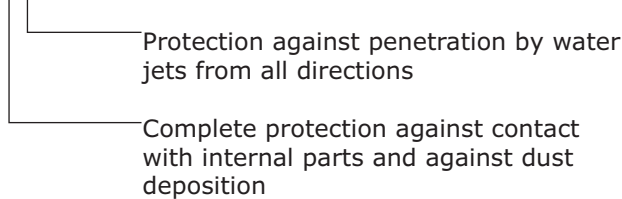
4.6.3 IP Protection Classes

- Protection against contact and foreign bodies
- Protection against water
- Acc. to IEC 60529

Evaluation of classification

- The test results according to the standard do not entirely exclude leaks and an individual test is therefore recommended in critical cases (with the actual equipment layout)
- The protection class for cabinets and enclosures is specified by IP (International Protection) and two indices

Example IP 55



3.6.3 IP Protection Classes

First Index	Contact Protection	Foreign-Body Protection
0	No special protection	
1	Against large areas of body	Large foreign bodies $\varnothing \geq 50$ mm (1.97")
2	Against fingers or objects of similar size	Medium-sized foreign bodies $\varnothing \geq 12.5$ mm (0.49")
3	Against tools, wires, etc. with a thickness of ≥ 2.5 mm	Granular foreign bodies $\varnothing \geq 2.5$ mm (0.10")
4	Against tools, wires, etc. with thickness ≥ 1.0 mm	Granular foreign bodies $\varnothing \geq 1.0$ mm (0.04")
5	Complete protection	Dust-protected; dust deposits are permitted, but their volume must not affect the function of the unit
6	Complete protection	Dust-proof

Second Index	Water Protection
0	No special protection
1	Against water dripping vertically
2	Against water dripping at an angle (up to 15° from the vertical)
3	Against spray water (any direction up to 60° from the vertical)
4	Against spray water from all directions
5	Against water jets from a nozzle in all directions
6	Against inundation
7	Against immersion
8	Against submersion

4: Guardbox 33

4.6.4 Climatic and Mechanical Tests

The Guardbox 33 fulfils the following test according to:

- Vibration EN 50155 (EN 61373)
- Shock EN 60068-2-27
- IP Protection IEC 60529
- Salt Spray Test DIN 50021

The functionality of the box was ensured during all tests



B



Detail information to climatic and mechanical tests:

- **Vibration EN 50155** (EN 61373, Cat. 1, Class B)
Eff. Acceleration: 7.9m/s^2 , Duration: 5h/Axis
Frequency: 5Hz to 150Hz
Axis of stimulation: X, Y, Z
- **Shock EN 60068-2-27**
Shockform: Halfsinus Acceleration: 150m/s^2 Duration: 11ms
Number of Shocks: 3 per Axle Total: 18 Shocks
- **IP Protection IEC 60529**
IP65: Guardbox 33 with IP65 sealing kit
IP54: Guardbox 33 with IP54/EMC sealing kit
- **Salt Spray Test DIN 50021**
Salt concentration: 5g/l Duration: 96h Temperature: $+35^\circ\text{C}$





Source: Ellisys, Switzerland



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