


Modular polyester boxes




Standards

EN/IEC 61439-2
EN/IEC 60529
EN/IEC 62208

Approvals

-  Boxes with polyester cover: types 3, 3R, 4, 4X, 6, 6P, 12 and 13
 - Boxes with polycarbonate cover: types 3, 3R, 4, 4X, 12 and 13
 - Boxes with hinged cover: types 3, 3R, 4, 4X, 12 and 13
- Available on request

- Boxes with polyester cover: types 3, 3R, 4, 4X, 6, 6P, 12 and 13
 -  - Boxes with polycarbonate cover: types 3, 3R, 4, 4X, 12 and 13
 - Boxes with hinged cover: types 3, 3R, 4, 4X, 12 and 13
- Available on request

LR - Lloyd's Register of Shipping

DNV GL - Germanischer Lloyd

Features

- The range consists of nine boxes based on the 300 and 185 mm modules.
- The bases are made of light grey (RAL 7035), hot moulded glass fibre reinforced polyester, dyed in mass. These come complete with M4 threaded inserts (Dodge) for fixing a mounting plate or mounting frame.
- The cover is made of either transparent polycarbonate or light grey (RAL 7035) hot moulded glass fibre reinforced polyester, dyed in mass.
- APO-boxes provide optimum security to both operators and equipment because they feature total insulation and protection degree IP67 according to EN/IEC 60529
- Protection degree IK08 against external mechanical impacts according to EN/IEC 62208
- Each large box is a multiple of a smaller one. Its fixing points are also a multiple of those of a small box. These fixing points are blind holes for M4 threaded inserts.
- Four to six blind holes for M6 threaded inserts are also provided in each base.
- APO polyester boxes are designed for both wall and pole mounting.
- The box can be readily worked with conventional tools such as drills, cutting mills, saws punches, etc.
- Versatile service conditions: polyester enclosures can withstand continuous temperatures up to 70°C (peak temperatures up to 130°C) and the transparent polycarbonate covers resist service temperature up to 120°C
- Rated insulation voltage $U_i = 1000V$.
- APO boxes are UL listed, as per UL Standard 508. They are also CSA approved.

Applications

- Industry
- Oil refineries
- Shipyards
- Steel works
- Breweries
- Petro-chemical plants
- Public utilities
- Photovoltaic



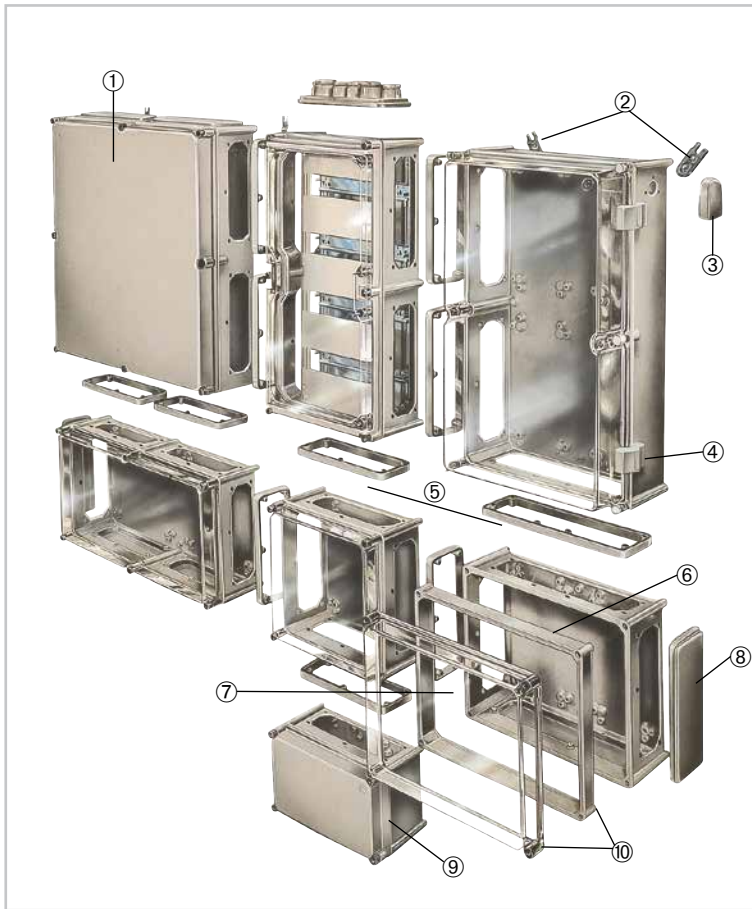
Overview of the range ● Page A.3

Dimensional drawings ● Page I.16

Specifications for tender documents ● Page I.51

Power dissipation values ● Page I.68

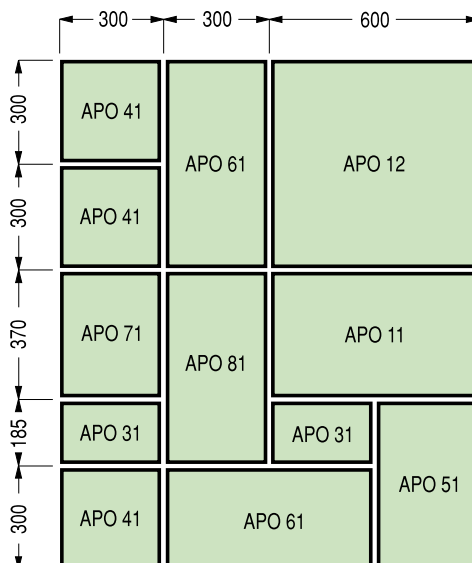
Modular panel building



- ① Polyester cover
- ② Wall mounting feet, stainless steel or non-metallic
- ③ Air vent
- ④ Non-metallic hinge
- ⑤ Coupling collar
- ⑥ Depth extension frame
- ⑦ Transparent polycarbonate cover
- ⑧ Coupling cover plate
- ⑨ Twist lock latch
- ⑩ Foamed polyurethane gaskets with tongue and groove labyrinths at all seal points

Optimal use of the modular design

The unique modular concept of APO boxes enables mounting of different standard functions in coupled boxes.



Technical data

Ingress protection according IEC 60529	
Single enclosure	
with polyester cover	IP67
with transparent cover	IP66
with hinged cover	IP67
Enclosure with flange plate	IP65 ⁽¹⁾
Enclosure with rubber cable sleeve	IP43/54 ⁽²⁾
Enclosure combination	IP67 ⁽¹⁾
Enclosure with depth extension frame	IP66

- (1) dependent on cover version used
- (2) IP54 when installed at bottom side of enclosure

Modular polyester boxes

Insulated boxes

		Type	 APO 1	 APO 31	 APO 41	 APO 71
	Box with polyester cover ☑ IP67	HxWxD	186×151×140	302×186×175	302×302×175	372×302×175
	Light-grey cover with fixing screws	Ref. No.	856048	856049	856050	856051
	Box with polycarbonate cover ☑ IP66	HxWxD	186×151×140	302×186×175	302×302×175	372×302×175
	Transparent cover with fixing screws	Ref. No.	856057	856058	856059	856060
	Box with hinged cover ☑ IP65	HxWxD	-	302×186×175	302×302×175	372×302×175
	Transparent cover with thumb screws for the door	Ref. No.	-	856066	856067	856068
	Box with hinged cover ☑ IP55	HxWxD	186×151×140	302×186×175	302×302×175	372×302×175
	Polyester cover light-grey	Ref. No.	856071	856072	856073	856074
	Box with hinged cover and lock (ventilated) ☑ IP44	HxWxD	-	302×186×175	302×302×175	372×302×175
	Polyester cover light-grey	Ref. No.	-	856080	856081	856082

Pack: 1





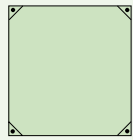


				
APO 51	APO 81	APO 61	APO 11	APO 12
488×302×175 856052	558×302×175 856053	603×302×175 856054	603×372×175 856055	603×603×175 856056
488×302×210 856061	558×302×210 856062	603×302×210 856063	603×372×210 856064	603×603×210 856065
488×302×175 856069	-	603×302×175 856070	-	-
488×302×175 856075	558×302×175 856076	603×302×175 856077	603×372×175 856078	603×603×175 856079
488×302×175 856083	558×302×175 856084	603×302×175 856085	603×372×175 856086	-



Modular polyester boxes

		Type	 APO 1	 APO 31	 APO 41	 APO 71
	Base with plain sides	HxWxD Ref. No. Pack	186x151x85 856000 4	302x186x131 856001 4	302x302x131 856002 4	372x302x131 856003 4
	Base with 1 open side	HxWxD Ref. No. Pack	-	302x186x131 852057 4	302x302x131 852079 4	372x302x131 852135 4
 Sizes in box refer to location of open side panel side-wall	Base with 2 open sides	HxWxD Ref. No. Pack	-	302x186x131 856009 4	302x302x131 856010 4	372x302x131 856011 4
	Base with 4 open sides	HxWxD Ref. No. Pack	-	302x186x131 856017 4	302x302x131 856018 4	372x302x131 856019 4
	Polyester cover Light-grey cover with fixing screws	HxWxD Ref. No. Pack	186x151x45 856025 4	302x186x45 856026 4	302x302x45 856027 4	372x302x45 856028 4
	Polycarbonate cover Transparent cover with fixing screws	HxWxD Ref. No. HxWxD Ref. No. Pack	186x151x45 851196 - 4	302x186x45 851173 - 4	302x302x45 851277 - 4	372x302x45 851176 - 4
	Hinged cover Transparent cover with thumb screws for the door	HxWxD Ref. No. Pack	-	302x186x45 856034 4	302x302x45 856035 4	372x302x45 856036 4
	Depth extension frame Glass fibre reinforced polyamide PA6	HxWxD Ref. No. Pack	186x151x35 856040 4	302x186x35 856041 4	302x302x35 856042 4	372x302x35 856043 4
	Mounting plate Hard paper 5 mm Sendzimir zinc coated sheet steel 2 mm	HxW Ref. No. HxW Ref. No. HxW Ref. No. Pack	140x105 851190 134x99 851191 134x99 852874 1	228x139 851187 249x134 851188 249x134 852875 1	254x228 851278 249x249 851279 249x249 852876 1	298x254 851181 319x249 851185 319x249 852877 1
	Blind cover plate PVC 1.5 mm	HxW Ref. No. Pack	150x115 851189 1	265x150 851186 1	265x265 851281 1	335x265 851180 1

				
APO 51	APO 81	APO 61	APO 11	APO 12
488×302×131 856004 2	558×302×131 856005 2	603×302×131 856006 2	603×372×131 856007 2	603×603×131 856008 2
488×502×131 854103 2	558×302×131 852436 2	603×502×131 852117 2	603×572×131 852446 2	603×603×131 852451 2
488×502×131 856012 2	558×302×131 856013 2	603×502×131 856014 2	603×572×131 856015 2	603×603×131 856016 2
488×302×131 856020 2	558×302×131 856021 2	603×302×131 856022 2	603×372×131 856023 2	603×603×131 856024 2
488×302×45 856029 2	558×302×45 856030 2	603×302×45 856031 2	603×372×45 856032 2	603×603×45 856033 2
488×302×80 852092 2	558×302×80 851193 2	603×302×80 851282 2	603×372×80 851290 2	603×603×80 852280 2
- 2	- 2	603×302×45 851283 2	- 2	- 2
488×302×45 856037 2	-	603×302×45 856038 2	603×372×115 856039 (1) 2	-
-	558×302×60 856044 2	603×302×60 856045 2	603×372×60 856046 2	603×603×60 856047 2
413×254 852091	484×254 851170	528×254 851286	528×324 851289	555×555 852174
435×249 852095	505×249 851171	550×249 851287	550×319 851292	550×555 852178
435×249 852878 1	505×249 852879 1	550×249 852880 1	550×319 852881 1	550×555 852882 1
450×265 852090 1	-	-	-	-

(1) **856039** 1
Hinged cover with side flange



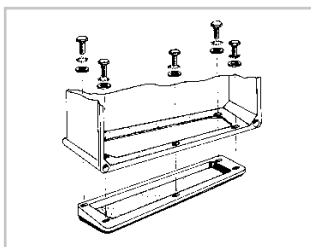
Accessories

Combi end-plates in polystyrene			
	Width		
4xM20/16 + 1xM32/25	185	856096	1
2xM32/25 + 3xM25/M20 + 4xM20/16	300	856131	1
9xM25/20	300	856097	1
2xM50/40 + 2xM25/20	300	856098	1
13xM20/16	300	856099	1
3xM40/32 + 2xM20/16	300	856100	1
1xM40/32 + 10xM25/20	370	856101	1
13xM25/20	370	856102	1



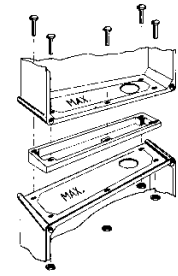
Cable glands, see "General accessories"

Blind end-plates in polyester			
	Width		
	185	856103	1
	300	856104	1
	370	856105	1



For dimensions of maximum opening, see "Dimensional drawings".

Coupling frames			
Coupling frames are made of polyamide (polyurethan gasket).			
- Complete with drilling template.			
- The smallest side of the coupling frame fits the front side of the box.			
- The maximum passage between two coupled boxes can be marked off with the aid of the drilling template. Within this mark, any desired opening can be made.			
Width			
185	856106		1
300	856107		1
370	856108		1



For dimensions of maximum opening, see "Dimensional drawings".

Cable-end boxes					
In polyester (funnel-shaped in polystyrene)		For side	Type	Max Ø cable (mm)	No. of clamps provided
856115	1	300	APO31	1x75	1
856116	1	300	APO31	2x75	2
856117	1	300	APO41	1x75	1
781936	1	300	APO61	1x75	1
781937	1	300	APO71	1x75	1
856118	1	370	APO71	3x75	1

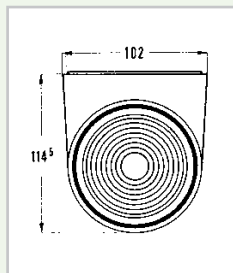
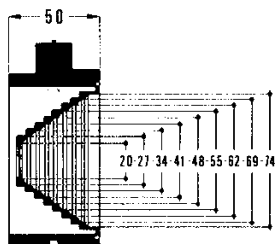
Dimensions, see "Dimensional drawings".



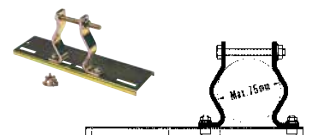
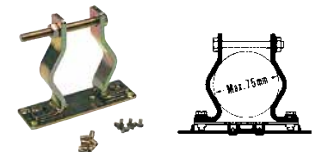
Rubber cable sleeves			
- For direct mounting			
- Complete with cut-out template			
		851106	1



For use as a sealing gland on cable end boxes.
Max. Ø cable: 75 mm

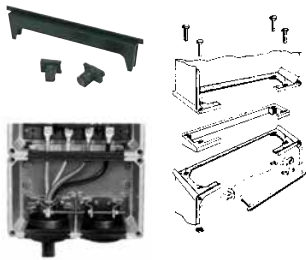


Cable clamps			
	851105		1
For direct mounting to cable end box or on a mounting plate. Max. Ø cable: 75 mm Used in APO 31 and APO 71 Enclosure side 185, 300, 370 mm			
	851110		1
Universal stress relieving cable clamp for use in standard enclosures. Max. Ø cable: 75 mm Used in APO 41 Enclosure side 300 and 600 mm			
	851111		1
For mounting to universal stress relieving cable clamp 851110. Max. Ø cable: 75 mm Spare part/extension.			



Dimensions, see "Dimensional drawings".

Accessories



Bridges

Make heavy connections easier whilst guaranteeing that the original degree of protection is maintained.

851103 1

Fits the 300 mm side.

851112 1

Fits the 370 mm side.

Air vents IP44

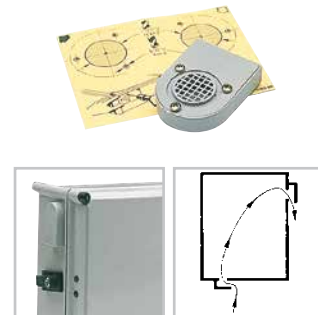
Two air vents must be mounted per enclosure to ensure sufficient air circulation and prevent water condensation.

Complete with drilling template and screws.

The air vents are preferably mounted in the upper and lower part of the base.

833677 1

Set of 2 pieces in polyamide.
RAL 7035



Safety locks with handle*

Complete with drilling template, keys and mounting hardware.

852020 1

2 keys V 2432E

Safety locks without handle

852021 1

Square key 8 mm

852022 1

Triangular key 8 mm

852024 1

Triangular key 11 mm

852023 1

Double-bit gale key 3 mm

* Not usable with hinged cover.



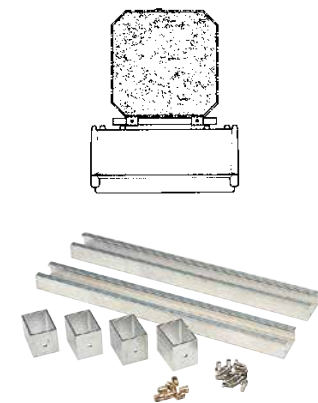
Pole mounting

- At the rear of enclosure, C-profiles are installed.

- Around the pole, a fixation (holding) band is installed. On the C-profile, clamps are placed to catch the holding band securely.

890510 1

Set of 2 C-profiles for side 300 and 370 mm (fixation band not included).



Mounting brackets

851266 1

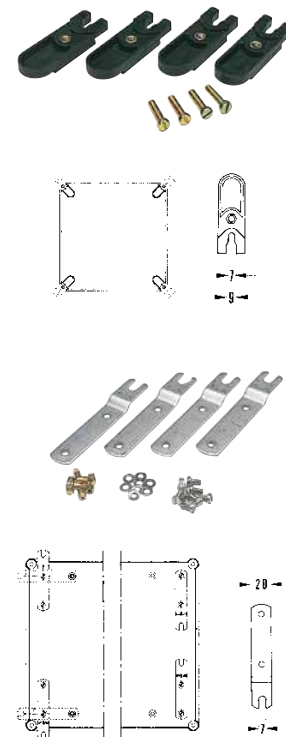
Set of 4 pieces in glass fibre reinforced polyamide

- For external fixing points.
- Direct fixing through the four corner holes of the enclosure.
- If extension frames are to be used, the mounting brackets shall be mounted before the frames.
- Maximum permissible component weight: 100 kg.

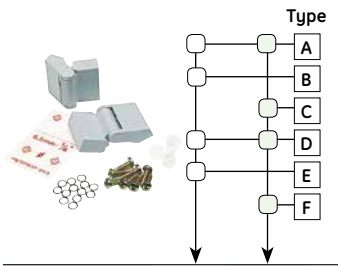
852025 1

Set of 4 pieces in stainless steel (type 304)

- For extremely severe working conditions.
- For band iron fixation to round poles.
- The four brackets are mounted directly at the rear of the box in reinforcements provided for that purpose.
- Fixing by M4 threaded bushes (supplied).
- Maximum permissible component weight: 100 kg.



Accessories



Selection	Base	
	APO 1	31-41-71-51
		81-61-11-12
Polyester cover	A	A
Polyester cover + depth extension	B	C
Polycarbonate cover	D	D
Polycarbon. cover + depth extension	E	F

Type	Hinges		
A	856109	1	
B	856110	1	
C	856111	1	
D	856112	1	
E	856113	1	
F	856114	1	

- In order to enable hinge mounting, holes must be drilled in the cover and in either the base or the extension frame. Templates for drilling these holes are supplied with each set. The type of hinge depends on the required combination.

- Hence six sets of hinges are available. Each set consists of two hinges, screws, a drilling template, the mounting instructions and, if necessary, spacer shims.

Hinge screw		
	851256	1

Set of 2 pieces

Remark: the box must be mounted prior to fitting the hinge screw.



Triangular TTR sealing screw		
	851262	1

For screwed cover.

Set of 2 pieces.



	852016	1
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For hinged cover.

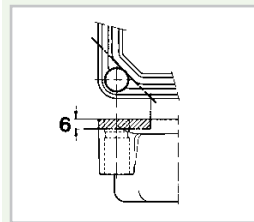
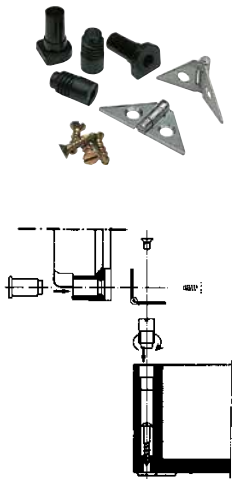
Set of 2 pieces.



Cover hinges

	851268	1
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Set of 2 pieces in stainless steel (complete with fixing hardware)



Cover must be milled along the dotted line to a depth of 6 mm prior to hinge mounting.

Spanner		
	851016	1

For triangular TTR sealing screw.



Sealing plate		
	851260	1

Set of 2 pieces, for cover-screw sealing.



Cover screws (spare parts)

	851255	50
Slotted screw		
	852015	50
Screws for hinged cover		



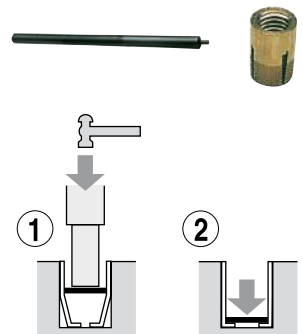
Padlocking set		
	852004	1

Max. diameter of padlock: 8 mm.

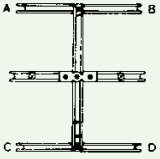
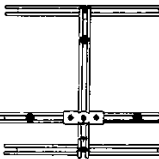
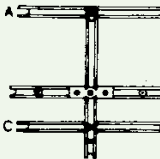
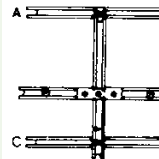



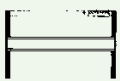

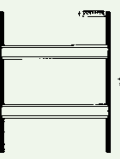






Threaded inserts

	851026	100
M4 Dodge type inserts		
	851371	100
M6 Dodge type inserts x12, 50 mm		
	851027	1
M4 special tool for securing		
	852003	1
M6 special tool for securing		







Universal fuseboard frames - Metering and modular frames




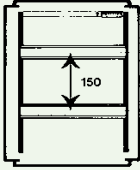
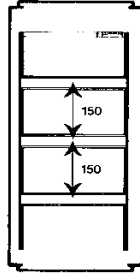
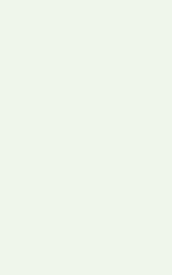

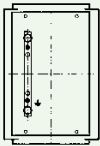
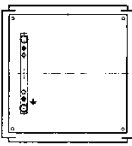
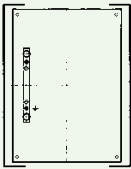
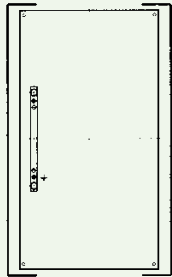
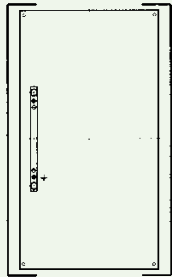
Type	APO 71 (delivery condition)	APO 51	APO 81	APO 61	APO 11 - APO 12
Metering For the installation in APO71, APO51, APO81 and APO61. The meter-cross is pre-assembled for APO71. It can be adjusted for other sizes by moving the lower profile. The vertical profile is punched accordingly.					
	AZZ1 890239	AZZ1 890239	AZZ1 890239	AZZ1 890239	AZZ2 890266

Type	APO 31	APO 41	APO 71	APO 51	APO 61
					
	302 x 186 14 modules AN31 851326	302 x 302 14 modules AN41 851336	372 x 302 28 modules AN72 851353	488 x 302 42 modules AN53 852283	603 x 302 42 modules AN63 851345
Universal fuseboard frames Includes: - Empty frames fitted with an earth terminal and cover plate. - The packaging includes fixing screws and height extension studs.					
	302 x 186 14 modules AN32 851330	302 x 302 28 modules AN42 851338	372 x 302 36 modules AN722 851358		603 x 302 56 modules AN64 851347


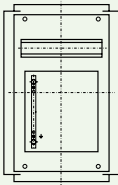

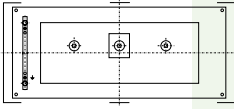
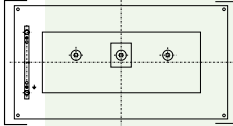
Accessories

	Blank plate for screening off rectangular openings 828056 1m For cutout of 45 mm		Marking strip self adhesive 851321 1m
	Blanking plate 610142 4 For 4 modules 610484 500 For 4 modules		Branch terminals 6x10 mm ² + 2x16 mm ² to clip on 12x2 mm bar 610186 4 Earth bar - green 610187 4 Neutral bar - blue

Equipped individual units

Type	APO 31	APO 41	APO 71	APO 61	APO 11
 <p>Enclosures for DIN-rail equipment</p> <p>Includes:</p> <ul style="list-style-type: none"> - base with two open sides - with combi end plates top: 13xM20/16 bottom: 2xM32/25 + 3xM25/20 + 4xM20/16 - base frame with earth connector and coverplate - transparent hinged cover 	 <p>186x302x175 14 modules 856119</p>	 <p>302x302x175 14 modules 856123</p>	 <p>372x302x175 28 modules 856120</p>	 <p>603x302x175 42 modules 856121</p>	 <p>603x372x270 42 modules 856127</p>
 <p>Enclosures for disconnecter loadbreak switches (Dilos) and fused disconnecter loadbreak switches (Fulos)</p> <p>Includes:</p> <ul style="list-style-type: none"> - base with two open sides - combi end plates: APO31 on top and bottom: side 185: 4xM20/16 + 1xM32/25 APO 41 on top and bottom: side 300: 2xM50/40 + 2xM25/20 APO 71 and APO 11 are with 2 open sides, cable entry plates are to be ordered separately, see p. A.19 - mounting plate with threaded holes and earthing connector - transparent cover with handle cut-out and with screws - extension shaft and operating handle <p>Disconnecter loadbreak switches and fused disconnecter loadbreak switches are to be ordered separately</p>	 <p>302x186x175 DILOS 1 40/63/80/100/125A 3P/4P + ⊕ 856122</p>	 <p>302x302x175 DILOS 2 160/200A 3P/4P + ⊕ 856123</p>	 <p>372x302x175 DILOS 3 160/200/250/315A 3P/4P + ⊕ 856125</p>	 <p>603x372x270 DILOS 4 400/500/630A 3P/4P + ⊕ 856127</p>	 <p>603x372x270 DILOS 4 400/500/630A 3P/4P + ⊕ 856127</p>

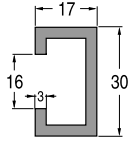
Equipped individual units

Type	APO 31	APO 41	APO 71	APO 61	APO 11
					
Enclosures for loadbreak switches (Dilos) and fuse bases Includes: - base with two open sides - with combi end plates top and bottom: 4xM20/16 + 1xM32/25 - one DIN-rail and mounting plate with earthing - transparent cover with handle cut-out and with screws - extension shaft and operating handle	302x186x175 DILOS 1 40/63/80A 3P/4P + \perp 856128				
Disconnecter loadbreak switches, fuse bases and fuses are to be ordered separately					
					
Enclosures for changeover switches (Dilos/Fulos) Includes: - base with two open sides - cable entry plates are optional, see p. A.22 - mounting plate with changeover system (I-O-II) and earth bar - transparent cover with handle cut-out and with screws - extension shaft and operating handle					
Changeover switches are to be ordered separately				603x302x210 DILOS 1H 125A 3P/4P + \perp FULOS 000 32/63/100A 3P/4P + \perp 856129	603x372x270 DILOS 3 160/200/250/315A 3P/4P + \perp FULOS 00 160A 3P/4P + \perp FULOS 0 160A 3P/4P + \perp 856130

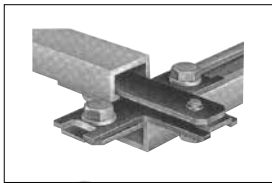
LMC mounting-frame

Quick-assembly frame for APO distribution boards.

Mounting-frame



LMC-profile		
MRC	851254	1
30x17x3 mm		
Length = 3 m		

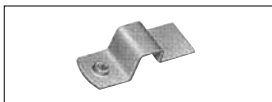


Cross-connection set		
ZLMCKV	851247	10
LMC cross connector		
ZLMCGM	851248	20
LMC sliding nut		
ZLMCM815	783062	1
LMC screw M8x16		
ZLMCU84	783061	1
LMC washer		

Required parts for 1 cross-connection:
1x851247 + 2x851248 + 4x783062 +
4x783061



Wall-mounting-brackets		
MRW	851249	10
M8		



Bracket		
AMRB	851250	10
Universal, with screw M5x25		

Assembly sequences

- Combine empty enclosures with each other.
- Cut vertical profile to length and slide on cross-connections.
- Fix distribution board at the bracket on the vertical profile.
- Cut horizontal profile to length and slide in cross-connections.
- Adjust profiles and tight all screws.
- Add wall-mounting-brackets.