



Panel instrument cases and enclosures for top hat rail



Edition 14

... the perfect shell for valuable electronics



apra-group - we see the big picture

Our products

... are the result of the perfect symbiosis between the apra-group companies.

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We will be pleased to develop the perfect shell for valuable electronics with you.



Panel instrument cases and enclosures for top hat rail



19" subracks



Customised enclosures made of plastic



Desktop enclosures, 19" enclosure systems



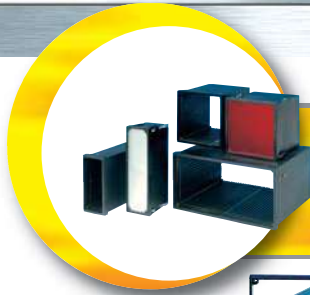
Small enclosures



19" cabinets, 19" racks



19" plug-in units



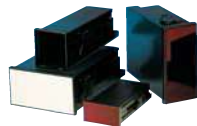
Standard enclosure 445/441

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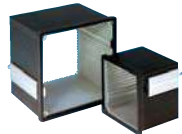
Transparent doors 446/447

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norm-case 448

page 22



Aluminium panel instrument case 442

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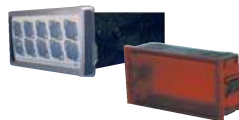
Plastic panel instrument case 446
with 19" plug-in system

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Sheet steel panel instrument case 443
with 19" plug-in system

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Chamfered front frame, transparent
cover, compact panel instrument case

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apra Rail enclosure system

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VisioDINbox

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DINcollect / VisioRAILbox

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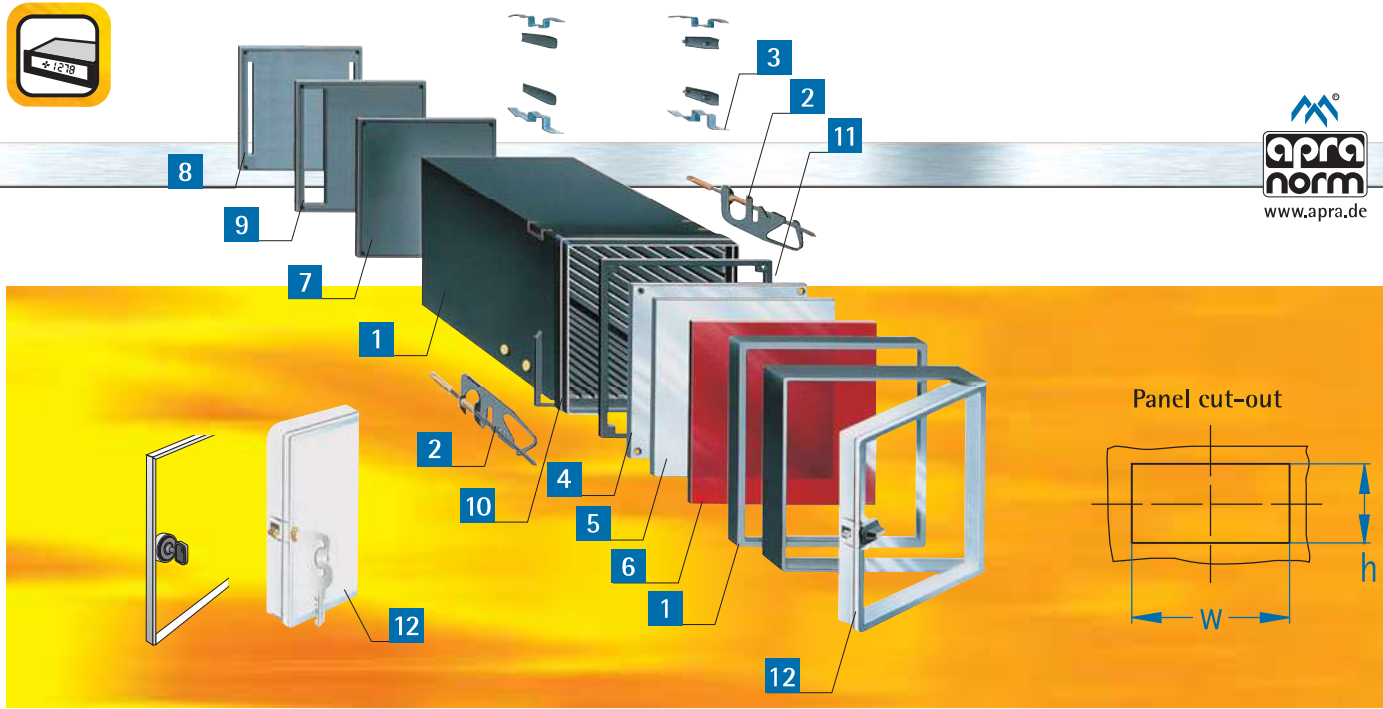


Technical information

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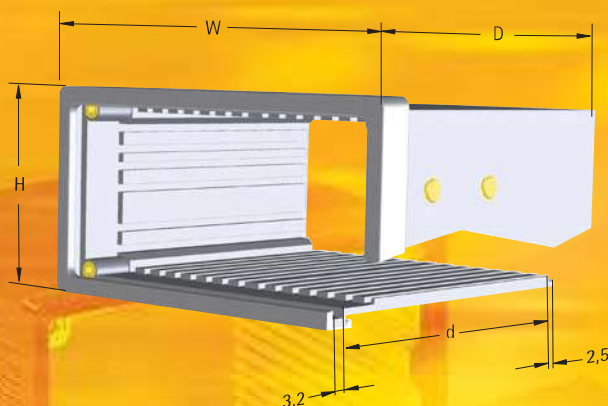
Tel.: +49 (0)
65 92 204-0



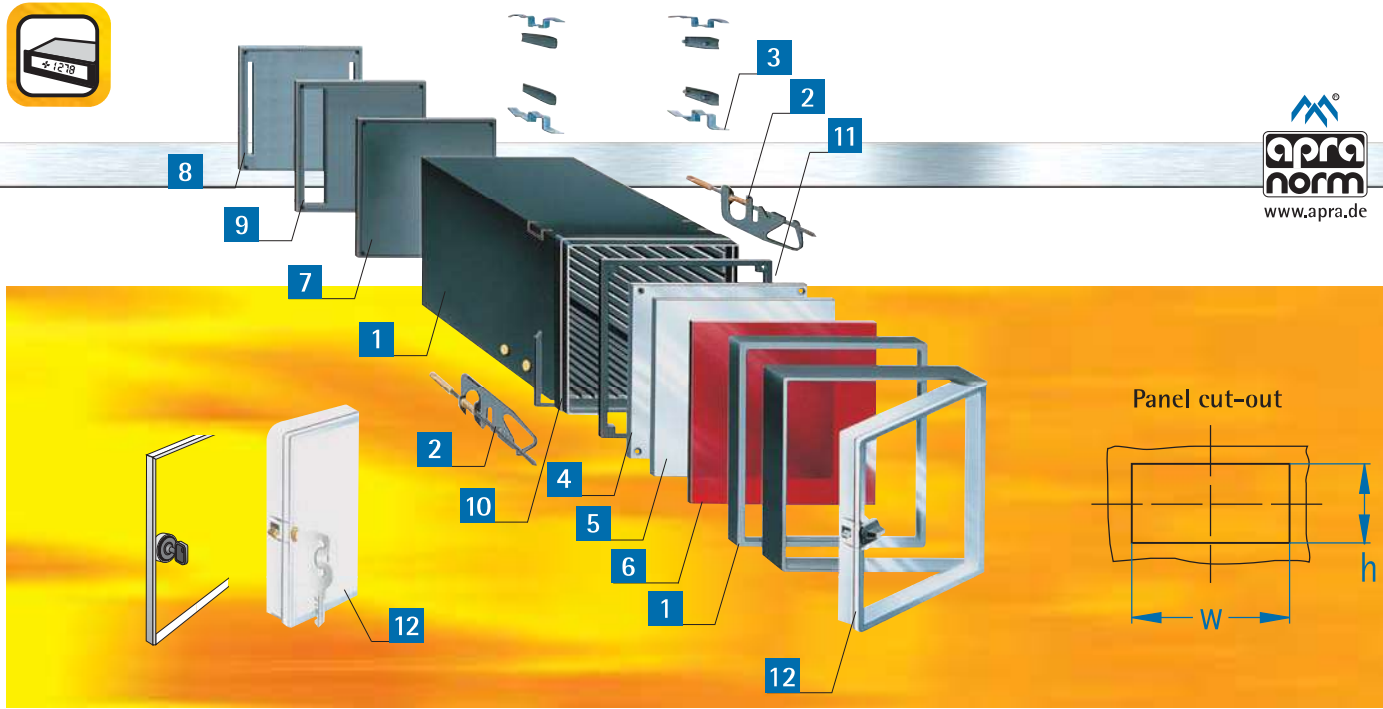
W mm	H mm	D (approx.) mm	d (approx.) mm	Case (acc. to IEC 61554)		Fixing clamp (choice)	Panel Clip Case		Cover plate Aluminium 1,5 mm	
				Standard	with corner webs		Standard	with corner webs		
				1a (p.14)	1b (p.14)	2 (p.14)	3a (p.15)	3b (p.15)	4 (p.15)	
48 x 24										
		60,0	53,0	445-440	-	440-001	441-440	-	-	
		82,5	75,5	445-441	-	440-005	441-441	-	-	
		107,0	100,0	445-444	-	440-019	441-444	-	-	
48 x 48										
		60,5	53,5	445-120	-	440-001 440-005 440-019	441-120	-	445-130	
		82,5	75,5	445-121	-		441-121	-	445-130	
		116,5	109,5	445-122	-		441-122	-	445-130	
		138,5	131,5	445-123	-		441-123	-	445-130	
		107,0	100,0	445-124	-		441-124	-	445-130	
		163,0	156,0	445-125	-		441-125	-	445-130	
72 x 24										
		60,0	53,0	445-420	-	440-001	441-420	-	-	
		82,5	75,5	445-421	-	440-005	441-421	-	-	
		107,0	100,0	445-424	-	440-019	441-424	-	-	
72 x 36										
		60,5	53,5	445-040	-	440-001 440-005 440-019	441-040	-	445-050	
		82,5	75,5	445-041	-		441-041	-	445-050	
		116,5	109,5	445-042	-		441-042	-	445-050	
		107,0	100,0	445-044	-		441-044	-	445-050	



Case size		Panel cut-out			
W	H	w	perm. dev.	h	perm. dev.
mm	mm	mm	mm	mm	mm
48	24	45	+ 0.6	22.2	+ 0.3
48	48	45	+ 0.6	45	+ 0.6
72	24	68	+ 0.7	22.2	+ 0.3
72	36	68	+ 0.7	33	+ 0.6



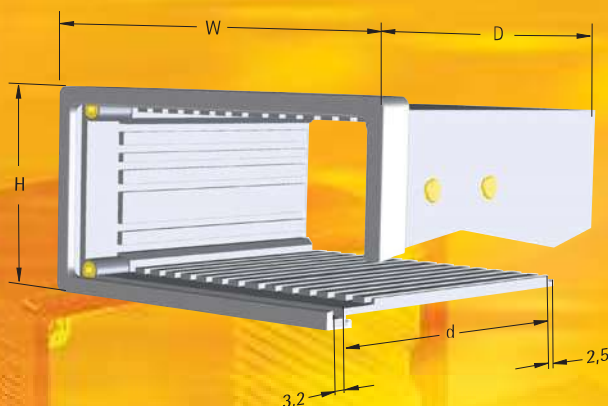
Panel Aluminium 1,5 mm	Filter screen Plexiglas® red: - 09 Makrolon® transparent: -05	Rear panel			Sealing		Transparent door with frame	
		closed	with slots	for terminals	between case and panel	behind front panel	with lock	with sash fastener
5 (p.15)	6 (p.15)	7	8	9	10	11	12 (p.16)	12 (p.16)
445-451	445-452-xx	445-453-01	445-453-02	-	448-445-01	-	-	-
445-451	445-452-xx	445-453-01	445-453-02	-	448-445-01	-	-	-
445-451	445-452-xx	445-453-01	445-453-02	-	448-445-01	-	-	-
445-131	445-132-xx	445-133-01	445-133-02	445-133-03	445-135-01	445-135-02	-	-
445-131	445-132-xx	445-133-01	445-133-02	445-133-03	445-135-01	445-135-02	-	-
445-131	445-132-xx	445-133-01	445-133-02	445-133-03	445-135-01	445-135-02	-	-
445-131	445-132-xx	445-133-01	445-133-02	445-133-03	445-135-01	445-135-02	-	-
445-131	445-132-xx	445-133-01	445-133-02	445-133-03	445-135-01	445-135-02	-	-
445-431	445-432-xx	445-433-01	445-433-02	-	448-425-01	-	-	-
445-431	445-432-xx	445-433-01	445-433-02	-	448-425-01	-	-	-
445-431	445-432-xx	445-433-01	445-433-02	-	448-425-01	-	-	-
445-051	445-052-xx	445-053-01	445-053-02	445-053-03	445-055-01	-	-	-
445-051	445-052-xx	445-053-01	445-053-02	445-053-03	445-055-01	-	-	-
445-051	445-052-xx	445-053-01	445-053-02	445-053-03	445-055-01	-	-	-
445-051	445-052-xx	445-053-01	445-053-02	445-053-03	445-055-01	-	-	-



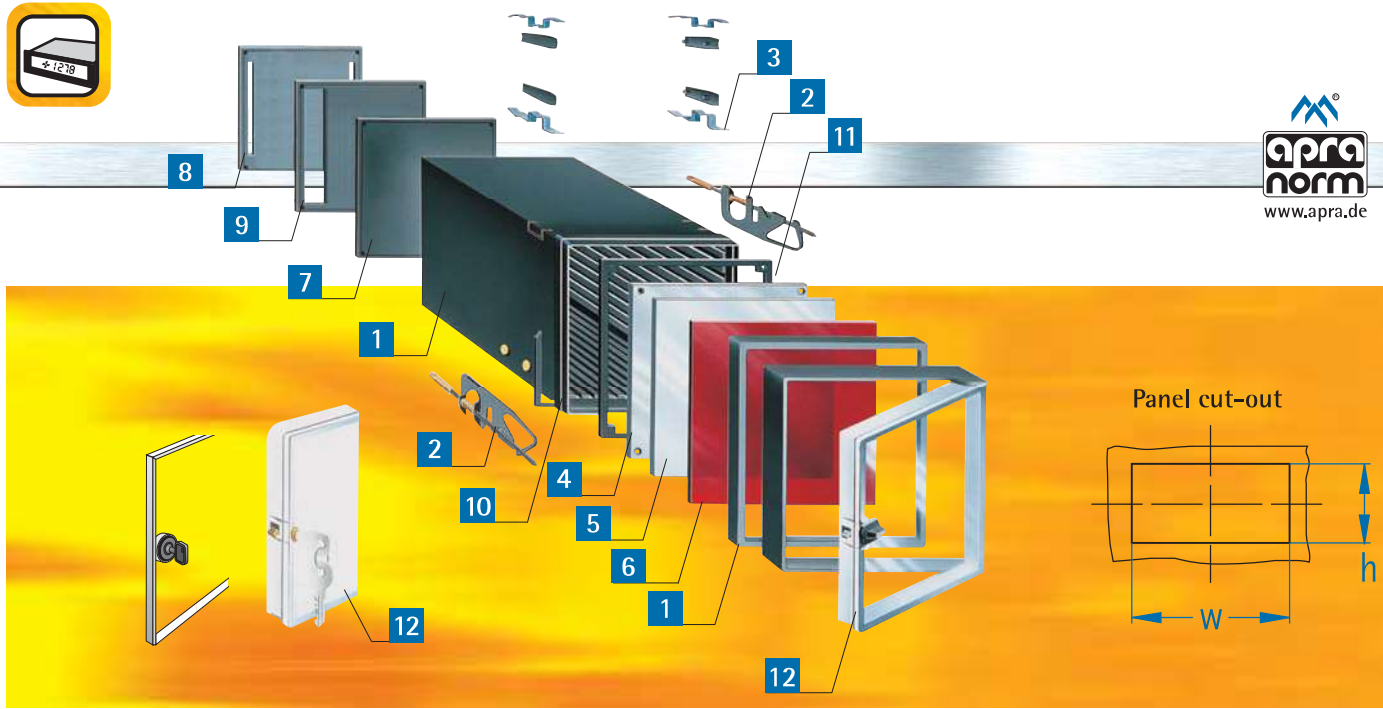
W mm	H mm	D (approx.) mm	d (approx.) mm	Case (acc. to IEC 61554)		Fixing clamp (choice)	Panel Clip Case		Cover plate Aluminium 1,5 mm	
				Standard 1a (p.14)	with corner webs 1b (p.14)		Standard 3a (p.15)	with corner webs 3b (p.15)		
72 x 48										
		60,5	53,5	445-140	-	440-001	-	-	445-150	
		82,5	75,5	445-141	-	440-005	-	-	445-150	
		116,5	109,5	445-142	-	440-019	-	-	445-150	
		107,0	100,0	445-144	-		-	-	445-150	
72 x 72										
		44,0	35,5	-	-	440-001 440-005 440-019	441-227	-	445-230	
		60,5	53,5	445-220	445-220-30		441-220	441-220-30	445-230	
		82,5	75,5	445-221	445-221-30		441-221	441-221-30	445-230	
		116,5	109,5	445-222	445-222-30		441-222	441-222-30	445-230	
		138,5	131,5	445-223	445-223-30		441-223	441-223-30	445-230	
		107,0	100,0	445-224	445-224-30		441-224	441-224-30	445-230	
		163,0	156,0	445-225	445-225-30		441-225	441-225-30	445-230	
		209,0	201,0	445-226	445-226-30		441-226	441-226-30	445-230	
96 x 24										
		60,5	53,5	445-100	-	440-001	441-100	-	-	
		82,5	75,5	445-101	-	440-005	441-101	-	-	
		116,5	109,5	445-102	-	440-019	441-102	-	-	
		107,0	100,0	445-104	-		441-104	-	-	
96 x 48										
		44,0	35,5	-	-	440-001 440-005 440-019	441-767	-	-	
		60,5	53,5	445-160	445-160-30		441-160	441-160-30	445-170	
		82,5	75,5	445-161	445-161-30		441-161	441-161-30	445-170	
		116,5	109,5	445-162	445-162-30		441-162	441-162-30	445-170	
		138,5	131,5	445-163	445-163-30		441-163	441-163-30	445-170	
		107,0	100,0	445-164	445-164-30		441-164	441-164-30	445-170	
		163,0	156,0	445-165	445-165-30		441-165	441-165-30	445-170	



Case size		Panel cut-out			
W	H	w	perm. dev.	h	perm. dev.
mm	mm	mm	mm	mm	mm
72	48	68	+ 0.7	45	+ 0.6
72	72	68	+ 0.7	68	+ 0.7
96	24	92	+ 0.8	22.2	+ 0.3
96	48	92	+ 0.8	45	+ 0.6



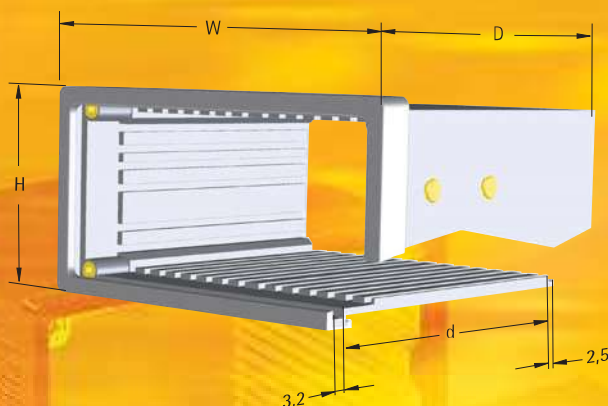
Panel Aluminium 1,5 mm	Filter screen Plexiglas® red: - 09 Makrolon® transparent: -05	Rear panel			Sealing		Transparent door with frame	
		closed	with slots	for terminals	between case and panel	behind front panel	with lock	with sash fastener
5 (p.15)	6 (p.15)	7	8	9	10	11	12 (p.16)	12 (p.16)
445-151	445-152-xx	445-153-01	445-153-02	445-153-03	-	-	-	-
445-151	445-152-xx	445-153-01	445-153-02	445-153-03	-	-	-	-
445-151	445-152-xx	445-153-01	445-153-02	445-153-03	-	-	-	-
445-151	445-152-xx	445-153-01	445-153-02	445-153-03	-	-	-	-
445-231	445-232-xx	445-233-01	445-233-02	445-233-03	445-235-01	445-235-02	446-030-01	446-030-02
445-231	445-232-xx	445-233-01	445-233-02	445-233-03	445-235-01	445-235-02	446-030-01	446-030-02
445-231	445-232-xx	445-233-01	445-233-02	445-233-03	445-235-01	445-235-02	446-030-01	446-030-02
445-231	445-232-xx	445-233-01	445-233-02	445-233-03	445-235-01	445-235-02	446-030-01	446-030-02
445-231	445-232-xx	445-233-01	445-233-02	445-233-03	445-235-01	445-235-02	446-030-01	446-030-02
445-231	445-232-xx	445-233-01	445-233-02	445-233-03	445-235-01	445-235-02	446-030-01	446-030-02
445-231	445-232-xx	445-233-01	445-233-02	445-233-03	445-235-01	445-235-02	446-030-01	446-030-02
445-231	445-232-xx	445-233-01	445-233-02	445-233-03	445-235-01	445-235-02	446-030-01	446-030-02
445-111	445-112-xx	445-113-01	445-113-02	-	448-115-01	-	-	-
445-111	445-112-xx	445-113-01	445-113-02	-	448-115-01	-	-	-
445-111	445-112-xx	445-113-01	445-113-02	-	448-115-01	-	-	-
445-111	445-112-xx	445-113-01	445-113-02	-	448-115-01	-	-	-
445-171	445-172-xx	445-173-01	445-173-02	445-173-03	445-175-01	445-175-02	446-090-01	446-090-02
445-171	445-172-xx	445-173-01	445-173-02	445-173-03	445-175-01	445-175-02	446-090-01	446-090-02
445-171	445-172-xx	445-173-01	445-173-02	445-173-03	445-175-01	445-175-02	446-090-01	446-090-02
445-171	445-172-xx	445-173-01	445-173-02	445-173-03	445-175-01	445-175-02	446-090-01	446-090-02
445-171	445-172-xx	445-173-01	445-173-02	445-173-03	445-175-01	445-175-02	446-090-01	446-090-02
445-171	445-172-xx	445-173-01	445-173-02	445-173-03	445-175-01	445-175-02	446-090-01	446-090-02
445-171	445-172-xx	445-173-01	445-173-02	445-173-03	445-175-01	445-175-02	446-090-01	446-090-02



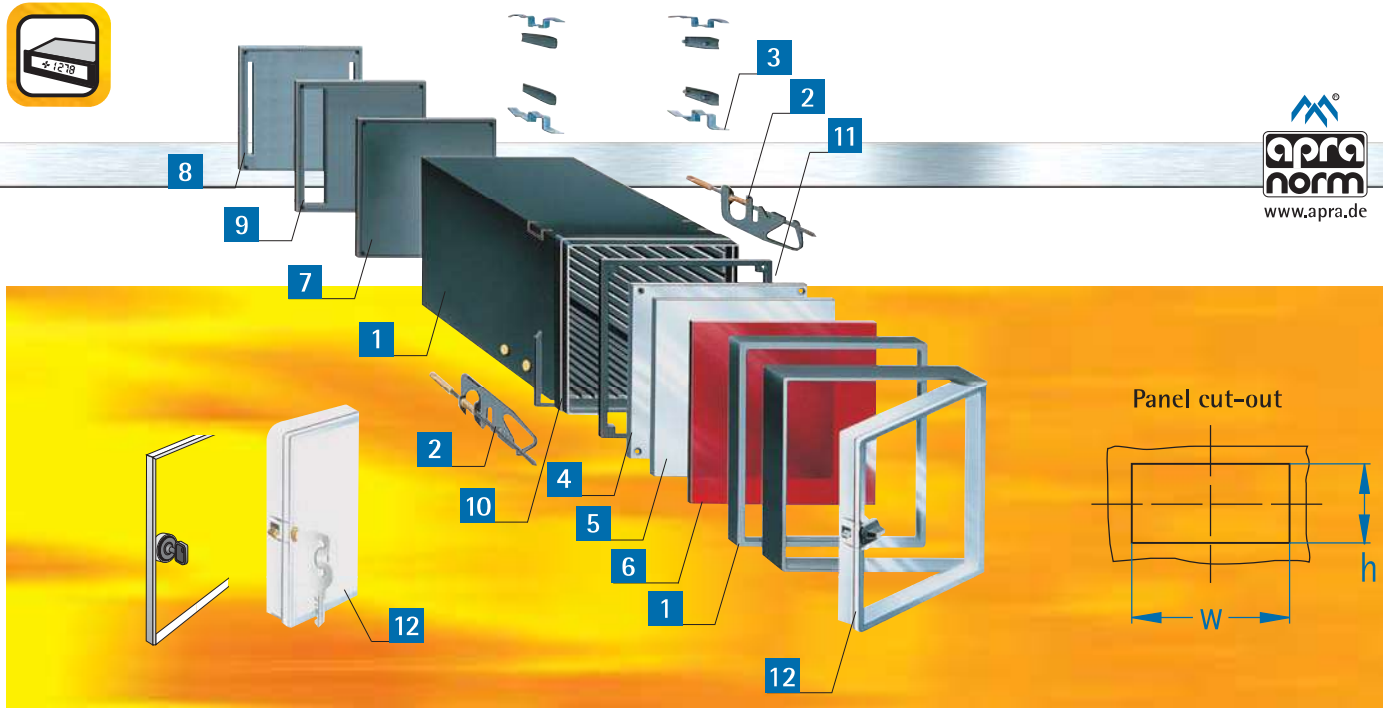
W mm	H mm	D (approx.) mm	d (approx.) mm	Case (acc. to IEC 61554)		Fixing clamp (choice)	Panel Clip Case		Cover plate Aluminium 1,5 mm	
				Standard 1a (p.14)	with corner webs 1b (p.14)		Standard 3a (p.15)	with corner webs 3b (p.15)		
96 x 48										
	60,5	53,5	445-760	445-760-30	440-001 440-005 440-019	441-760	441-760-30	445-170		
	82,5	75,5	445-761	445-761-30		441-761	441-761-30	445-170		
	116,5	109,5	445-762	445-762-30		441-762	441-762-30	445-170		
	138,5	131,5	445-763	445-763-30		441-763	441-763-30	445-170		
	107,0	100,0	445-764	445-764-30		441-764	441-764-30	445-170		
	163,0	156,0	445-765	445-765-30		441-765	441-765-30	445-170		
96 x 72										
	60,5	53,5	445-240	-	440-001 440-005 440-019	-	-	445-250		
	82,5	75,5	445-241	-		-	-	445-250		
	116,5	109,5	445-242	-		-	-	445-250		
	138,5	131,5	445-243	-		-	-	445-250		
	107,0	100,0	445-244	-		-	-	445-250		
	163,0	156,0	445-245	-		-	-	445-250		
	209,0	201,0	445-246	-		-	-	445-250		
96 x 96										
	44,0	36,0	-	-	440-001 440-005 443-001	441-307	441-307-30	445-310		
	60,5	53,5	445-300	445-300-30		441-300	441-300-30	445-310		
	82,5	75,5	445-301	445-301-30		441-301	441-301-30	445-310		
	116,5	109,5	445-302	445-302-30		441-302	441-302-30	445-310		
	138,5	131,5	445-303	445-303-30		441-303	441-303-30	445-310		
	107,0	100,0	445-304	445-304-30		441-304	441-304-30	445-310		
	163,0	156,0	445-305	445-305-30		441-305	441-305-30	445-310		
	209,0	201,0	445-306	445-306-30		441-306	441-306-30	445-310		
144 x 48										
	60,5	53,5	445-180	445-180-30	440-001 440-005 443-001	441-180	441-180-30	445-190		
	82,5	75,5	445-181	445-181-30		441-181	441-181-30	445-190		
	116,5	109,5	445-182	445-182-30		441-182	441-182-30	445-190		
	138,5	131,5	445-183	445-183-30		441-183	441-183-30	445-190		
	107,0	100,0	445-184	445-184-30		441-184	441-184-30	445-190		
	163,0	156,0	445-185	445-185-30		441-185	441-185-30	445-190		
	209,0	201,0	445-186	445-186-30		441-186	441-186-30	445-190		



Case size		Panel cut-out			
W	H	w	perm. dev.	h	perm. dev.
mm	mm	mm	mm	mm	mm
96	48	92	+ 0.8	45	+ 0.6
96	72	92	+ 0.8	68	+ 0.7
96	96	92	+ 0.8	92	+ 0.8
144	48	138	+ 1.0	45	+ 0.6



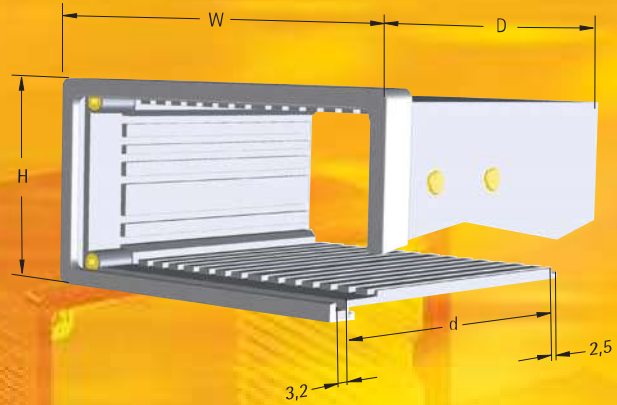
Panel Aluminium 1,5 mm 5 (p.15)	Filter screen Plexiglas® red: - 09 Makrolon® transparent: -05 6 (p.15)	closed	Rear panel with slots	for terminals	Sealing		Transparent door with frame	
		7	8	9	between case and panel 10	behind front panel 11	with lock 12 (p.16)	with sash fastener 12 (p.16)
445-171	445-172-xx	445-173-01	445-173-02	445-173-03	445-175-01	445-175-02	446-090-01	446-090-02
445-171	445-172-xx	445-173-01	445-173-02	445-173-03	445-175-01	445-175-02	446-090-01	446-090-02
445-171	445-172-xx	445-173-01	445-173-02	445-173-03	445-175-01	445-175-02	446-090-01	446-090-02
445-171	445-172-xx	445-173-01	445-173-02	445-173-03	445-175-01	445-175-02	446-090-01	446-090-02
445-171	445-172-xx	445-173-01	445-173-02	445-173-03	445-175-01	445-175-02	446-090-01	446-090-02
445-171	445-172-xx	445-173-01	445-173-02	445-173-03	445-175-01	445-175-02	446-090-01	446-090-02
445-171	445-172-xx	445-173-01	445-173-02	445-173-03	445-175-01	445-175-02	446-090-01	446-090-02
445-251	445-252-xx	445-253-01	445-253-02	445-253-03	445-255-01	445-255-02	-	-
445-251	445-252-xx	445-253-01	445-253-02	445-253-03	445-255-01	445-255-02	-	-
445-251	445-252-xx	445-253-01	445-253-02	445-253-03	445-255-01	445-255-02	-	-
445-251	445-252-xx	445-253-01	445-253-02	445-253-03	445-255-01	445-255-02	-	-
445-251	445-252-xx	445-253-01	445-253-02	445-253-03	445-255-01	445-255-02	-	-
445-251	445-252-xx	445-253-01	445-253-02	445-253-03	445-255-01	445-255-02	-	-
445-251	445-252-xx	445-253-01	445-253-02	445-253-03	445-255-01	445-255-02	-	-
445-311	445-312-xx	445-313-01	445-313-02	445-313-03	445-315-05	445-315-02	446-040-01	446-040-02
445-311	445-312-xx	445-313-01	445-313-02	445-313-03	445-315-05	445-315-02	446-040-01	446-040-02
445-311	445-312-xx	445-313-01	445-313-02	445-313-03	445-315-05	445-315-02	446-040-01	446-040-02
445-311	445-312-xx	445-313-01	445-313-02	445-313-03	445-315-05	445-315-02	446-040-01	446-040-02
445-311	445-312-xx	445-313-01	445-313-02	445-313-03	445-315-05	445-315-02	446-040-01	446-040-02
445-311	445-312-xx	445-313-01	445-313-02	445-313-03	445-315-05	445-315-02	446-040-01	446-040-02
445-311	445-312-xx	445-313-01	445-313-02	445-313-03	445-315-05	445-315-02	446-040-01	446-040-02
445-311	445-312-xx	445-313-01	445-313-02	445-313-03	445-315-05	445-315-02	446-040-01	446-040-02
445-191	445-192-xx	445-193-01	445-193-02	445-193-03	445-195-01	445-195-02	-	-
445-191	445-192-xx	445-193-01	445-193-02	445-193-03	445-195-01	445-195-02	-	-
445-191	445-192-xx	445-193-01	445-193-02	445-193-03	445-195-01	445-195-02	-	-
445-191	445-192-xx	445-193-01	445-193-02	445-193-03	445-195-01	445-195-02	-	-
445-191	445-192-xx	445-193-01	445-193-02	445-193-03	445-195-01	445-195-02	-	-
445-191	445-192-xx	445-193-01	445-193-02	445-193-03	445-195-01	445-195-02	-	-
445-191	445-192-xx	445-193-01	445-193-02	445-193-03	445-195-01	445-195-02	-	-



W mm	H mm	D (approx.) mm	d (approx.) mm	Case (acc. to IEC 61554)		Fixing clamp (choice)	Panel Clip Case		Cover plate Aluminium 1,5 mm	
				Standard 1a (p.14)	with corner webs 1b (p.14)		Standard 3a (p.15)	with corner webs 3b (p.15)		
144 x 72										
	44,0	36	-	-	440-001 440-005 440-019	441-267	-	445-270		
	60,5	53,5	445-260	445-260-30		441-260	441-260-30	445-270		
	82,5	75,5	445-261	445-261-30		441-261	441-261-30	445-270		
	116,5	109,5	445-262	445-262-30		441-262	441-262-30	445-270		
	138,5	131,5	445-263	445-263-30		441-263	441-263-30	445-270		
	107,0	100,0	445-264	445-264-30		441-264	441-264-30	445-270		
	163,0	156,0	445-265	445-265-30		441-265	441-265-30	445-270		
	209,0	201,0	445-266	445-266-30		441-266	441-266-30	445-270		
144 x 96										
	44,0	36	-	-	440-001 440-005 440-019	441-327	-	445-330		
	60,5	53,5	445-320	445-320-30		441-320	441-320-30	445-330		
	82,5	75,5	445-321	445-321-30		441-321	441-321-30	445-330		
	116,5	109,5	445-322	445-322-30		441-322	441-322-30	445-330		
	138,5	131,5	445-323	445-323-30		441-323	441-323-30	445-330		
	107,0	100,0	445-324	445-324-30		441-324	441-324-30	445-330		
	163,0	156,0	445-325	445-325-30		441-325	441-325-30	445-330		
	209,0	201,0	445-326	445-326-30		441-326	441-326-30	445-330		
144 x 144										
	44,0	36,0	-	-	440-001 440-005 443-001	441-367	441-367-30	445-370		
	60,5	53,0	445-360	445-360-30		441-360	441-360-30	445-370		
	82,5	75,5	445-361	445-361-30		441-361	441-361-30	445-370		
	116,5	109,5	445-362	445-362-30		441-362	441-362-30	445-370		
	138,5	131,5	445-363	445-363-30		441-363	441-363-30	445-370		
	107,0	100,0	445-364	445-364-30		441-364	441-364-30	445-370		
	163,0	156,0	445-365	445-365-30		441-365	441-365-30	445-370		
	209,0	201,0	445-366	445-366-30		441-366	441-366-30	445-370		
192 x 72										
	60,5	53,5	445-280	-	440-001 440-005 443-001	441-280	-	445-290		
	82,5	75,5	445-281	-		441-281	-	445-290		
	116,5	109,5	445-282	-		441-282	-	445-290		
	138,5	131,5	445-283	-		441-283	-	445-290		
	107,0	100,0	445-284	-		441-284	-	445-290		
	163,0	156,0	445-285	-		441-285	-	445-290		
	209,0	201,0	445-286	-		441-286	-	445-290		

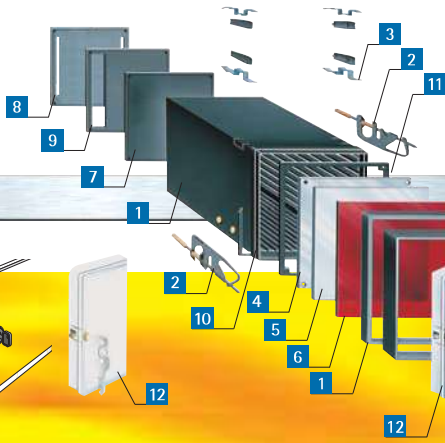


Case size		Panel cut-out			
W	H	w	perm. dev.	h	perm. dev.
mm	mm	mm	mm	mm	mm
144	72	138	+ 1.0	68	+ 0.7
144	96	138	+ 1.0	92	+ 0.8
144	144	138	+ 1.0	138	+ 1.0
192	72	186	+ 1.1	68	+ 0.7

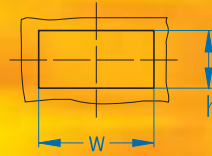


Panel Aluminium 1,5 mm 5 (p.15)	Filter screen Plexiglas® red: - 09 Makrolon® transparent: -05 6 (p.15)	closed	Rear panel with slots	for terminals	Sealing		Transparent door with frame	
		7	8	9	between case and panel 10	behind front panel 11	with lock 12 (p.16)	with sash fastener 12 (p.16)
445-271	445-272-xx	445-273-01	445-273-02	445-273-03	445-275-10	445-275-02	446-100-01	446-100-02
445-271	445-272-xx	445-273-01	445-273-02	445-273-03	445-275-10	445-275-02	446-100-01	446-100-02
445-271	445-272-xx	445-273-01	445-273-02	445-273-03	445-275-10	445-275-02	446-100-01	446-100-02
445-271	445-272-xx	445-273-01	445-273-02	445-273-03	445-275-10	445-275-02	446-100-01	446-100-02
445-271	445-272-xx	445-273-01	445-273-02	445-273-03	445-275-10	445-275-02	446-100-01	446-100-02
445-271	445-272-xx	445-273-01	445-273-02	445-273-03	445-275-10	445-275-02	446-100-01	446-100-02
445-271	445-272-xx	445-273-01	445-273-02	445-273-03	445-275-10	445-275-02	446-100-01	446-100-02
445-271	445-272-xx	445-273-01	445-273-02	445-273-03	445-275-10	445-275-02	446-100-01	446-100-02
445-331	445-332-xx	445-333-01	445-333-02	445-333-03	445-335-05	445-335-02	44-6150-01	44-6150-02
445-331	445-332-xx	445-333-01	445-333-02	445-333-03	445-335-05	445-335-02	44-6150-01	44-6150-02
445-331	445-332-xx	445-333-01	445-333-02	445-333-03	445-335-05	445-335-02	44-6150-01	44-6150-02
445-331	445-332-xx	445-333-01	445-333-02	445-333-03	445-335-05	445-335-02	44-6150-01	44-6150-02
445-331	445-332-xx	445-333-01	445-333-02	445-333-03	445-335-05	445-335-02	44-6150-01	44-6150-02
445-331	445-332-xx	445-333-01	445-333-02	445-333-03	445-335-05	445-335-02	44-6150-01	44-6150-02
445-331	445-332-xx	445-333-01	445-333-02	445-333-03	445-335-05	445-335-02	44-6150-01	44-6150-02
445-331	445-332-xx	445-333-01	445-333-02	445-333-03	445-335-05	445-335-02	44-6150-01	44-6150-02
445-371	445-372-xx	Available rear panels for size 144x144:			445-375-10	445-375-02	446-050-01	446-050-02
445-371	445-372-xx	• closed (445-373-01)			445-375-10	445-375-02	446-050-01	446-050-02
445-371	445-372-xx	• with slots (445-373-02)			445-375-10	445-375-02	446-050-01	446-050-02
445-371	445-372-xx	• with slots for terminal (445-373-03)			445-375-10	445-375-02	446-050-01	446-050-02
445-371	445-372-xx	• NEW: rear panel with top for bigger components like transformers or relays (445-373-04)			445-375-10	445-375-02	446-050-01	446-050-02
445-371	445-372-xx				445-375-10	445-375-02	446-050-01	446-050-02
445-371	445-372-xx				445-375-10	445-375-02	446-050-01	446-050-02
445-371	445-372-xx				445-375-10	445-375-02	446-050-01	446-050-02
445-291	445-292-xx	445-293-01	445-293-02	-	445-295-01	445-295-02	-	-
445-291	445-292-xx	445-293-01	445-293-02	-	445-295-01	445-295-02	-	-
445-291	445-292-xx	445-293-01	445-293-02	-	445-295-01	445-295-02	-	-
445-291	445-292-xx	445-293-01	445-293-02	-	445-295-01	445-295-02	-	-
445-291	445-292-xx	445-293-01	445-293-02	-	445-295-01	445-295-02	-	-
445-291	445-292-xx	445-293-01	445-293-02	-	445-295-01	445-295-02	-	-
445-291	445-292-xx	445-293-01	445-293-02	-	445-295-01	445-295-02	-	-





Panel cut-out



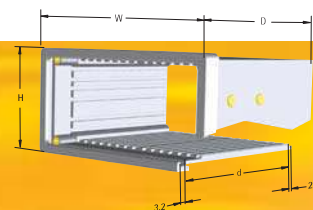
W mm	H mm	D (approx.) mm	d (approx.) mm	Case (acc. to IEC 61554)		Fixing clamp (choice)	Panel Clip Case		Cover plate Aluminium 1,5 mm	
				Standard 1a (p.14)	with corner webs 1b (p.14)		Standard 3a (p.15)	with corner webs 3b (p.15)		
192 x 96										
		60,5	53,5	445-340	445-340-30	440-001 443-001 443-002	-	-	445-350	
		82,5	75,5	445-341	445-341-30		-	-	445-350	
		116,5	109,5	445-342	445-342-30		-	-	445-350	
		138,5	131,5	445-343	445-343-30		-	-	445-350	
		107,0	100,0	445-344	445-344-30		-	-	445-350	
		163,0	156,0	445-345	445-345-30		-	-	445-350	
		209,0	201,0	445-346	445-346-30		-	-	445-350	
192 x 144										
		60,5	53,5	445-380	445-380-30	440-001 443-001 443-002	-	-	445-390	
		82,5	75,5	445-381	445-381-30		-	-	445-390	
		116,5	109,5	445-382	445-382-30		-	-	445-390	
		138,5	131,5	445-383	445-383-30		-	-	445-390	
		107,0	100,0	445-384	445-384-30		-	-	445-390	
		163,0	156,0	445-385	445-385-30		-	-	445-390	
		209,0	201,0	445-386	445-386-30		-	-	445-390	
288 x 72										
		60,5	53,5	445-460	-	440-001 443-001 443-002	441-460	-	445-470	
		82,5	75,5	445-461	-		441-461	-	445-470	
		116,5	109,5	445-462	-		441-462	-	445-470	
		138,5	131,5	445-463	-		441-463	-	445-470	
		107,0	100,0	445-464	-		441-464	-	445-470	
		163,0	156,0	445-465	-		441-465	-	445-470	
		209,0	201,0	445-466	-		441-466	-	445-470	
288 x 96										
		60,5	53,5	445-600	445-600-30	440-001	-	-	445-610	
		82,5	75,5	445-601	445-601-30	440-005	-	-	445-610	
288 x 144										
		60,5	53,5	445-480	-	440-001 443-001 443-002	441-480	-	445-490	
		82,5	75,5	445-481	-		-	-	445-490	
		116,5	109,5	445-482	-		-	-	445-490	
		138,5	131,5	445-483	-		-	-	445-490	
		107,0	100,0	445-484	-		-	-	445-490	
		163,0	156,0	445-485	-		-	-	445-490	
		209,0	201,0	445-486	-		-	-	445-490	



Panel instrument case acc. to IEC 61554 • 445/441



Case size		Panel cut-out			
W mm	H mm	w mm	perm. dev. mm	h mm	perm. dev. mm
192	96	186	+ 1.1	92	+ 0.8
192	144	186	+ 1.1	138	+ 1.0
288	72	282	+ 1.1	68	+ 0.7
288	96	282	+ 1.1	92	+ 0.8
288	144	282	+ 1.1	138	+ 1.0



Panel Aluminium 1,5 mm	Filter screen Plexiglas® red: - 09 Makrolon® transparent: -05	Rear panel			Sealing		Transparent door with frame	
		closed	with slots	for terminals	between case and panel	behind front panel	with lock	with sash fastener
5 (p.15)	6 (p.15)	7	8	9	10	11	12 (p.16)	12 (p.16)
445-351	445-352-xx	445-353-01	445-353-02	445-353-03	445-355-01	445-355-02	446-110-01	446-110-02
445-351	445-352-xx	445-353-01	445-353-02	445-353-03	445-355-01	445-355-02	446-110-01	446-110-02
445-351	445-352-xx	445-353-01	445-353-02	445-353-03	445-355-01	445-355-02	446-110-01	446-110-02
445-351	445-352-xx	445-353-01	445-353-02	445-353-03	445-355-01	445-355-02	446-110-01	446-110-02
445-351	445-352-xx	445-353-01	445-353-02	445-353-03	445-355-01	445-355-02	446-110-01	446-110-02
445-351	445-352-xx	445-353-01	445-353-02	445-353-03	445-355-01	445-355-02	446-110-01	446-110-02
445-351	445-352-xx	445-353-01	445-353-02	445-353-03	445-355-01	445-355-02	446-110-01	446-110-02
445-351	445-352-xx	445-353-01	445-353-02	445-353-03	445-355-01	445-355-02	446-110-01	446-110-02
445-391	445-392-xx	445-393-01	445-393-02	445-393-03	445-395-01	445-395-02	446-120-01	446-120-02
445-391	445-392-xx	445-393-01	445-393-02	445-393-03	445-395-01	445-395-02	446-120-01	446-120-02
445-391	445-392-xx	445-393-01	445-393-02	445-393-03	445-395-01	445-395-02	446-120-01	446-120-02
445-391	445-392-xx	445-393-01	445-393-02	445-393-03	445-395-01	445-395-02	446-120-01	446-120-02
445-391	445-392-xx	445-393-01	445-393-02	445-393-03	445-395-01	445-395-02	446-120-01	446-120-02
445-391	445-392-xx	445-393-01	445-393-02	445-393-03	445-395-01	445-395-02	446-120-01	446-120-02
445-391	445-392-xx	445-393-01	445-393-02	445-393-03	445-395-01	445-395-02	446-120-01	446-120-02
445-471	445-472-xx	445-473-01	-	-	-	-	-	-
445-471	445-472-xx	445-473-01	-	-	-	-	-	-
445-471	445-472-xx	445-473-01	-	-	-	-	-	-
445-471	445-472-xx	445-473-01	-	-	-	-	-	-
445-471	445-472-xx	445-473-01	-	-	-	-	-	-
445-471	445-472-xx	445-473-01	-	-	-	-	-	-
445-471	445-472-xx	445-473-01	-	-	-	-	-	-
445-611	445-612-xx	445-613-01	-	-	-	-	-	-
445-611	445-612-xx	445-613-01	-	-	-	-	-	-
445-491	445-492-xx	445-493-01	-	-	445-495-05	-	446-130-01	446-130-02
445-491	445-492-xx	445-493-01	-	-	445-495-05	-	446-130-01	446-130-02
445-491	445-492-xx	445-493-01	-	-	445-495-05	-	446-130-01	446-130-02
445-491	445-492-xx	445-493-01	-	-	445-495-05	-	446-130-01	446-130-02
445-491	445-492-xx	445-493-01	-	-	445-495-05	-	446-130-01	446-130-02
445-491	445-492-xx	445-493-01	-	-	445-495-05	-	446-130-01	446-130-02
445-491	445-492-xx	445-493-01	-	-	445-495-05	-	446-130-01	446-130-02



1 Case acc. to IEC 61554

Material:
Case:
 Noryl SE1, GFN2, 701 black

Front frame:
 Lexan 920 black

The part number of the cases can be found starting on pages 4 to 13!

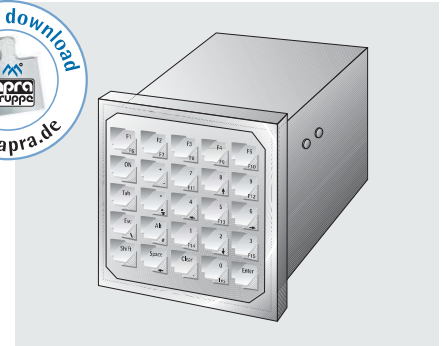
2 Fixing clamps

- fixing clamps for assembling the cases to the panel

1a Standard case



1b Case with corner webs



- optical appealing solution
- protection against electrostatic discharge for shielded enclosure

2a Light fixing clamp



- for lighter cases
- with threaded pin M2.5 x 50

Order no.
440-005

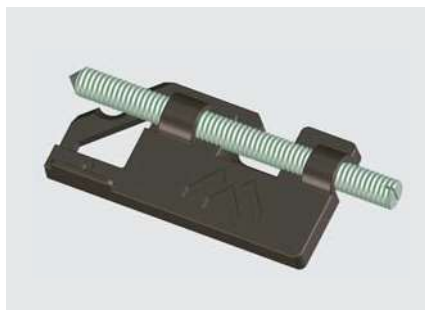
2b Heavy-duty fixing clamp



- approx. 190mm long
- M5 threaded rod with pressure piece

Order no.
443-002

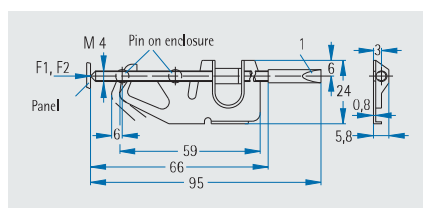
2c Model B Miba (acc. to DIN 43835)



- light-weight plastic construction
- M4 threaded rod

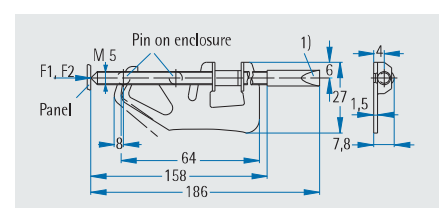
Order no.
440-019

2d Model B (acc. to DIN 43835)



Order no.
440-001

2e Model C (acc. to DIN 43835)



Order no.
443-001



3 Panel Clip Case

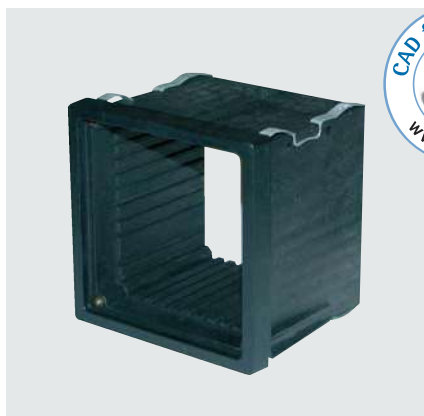
- patented by apra-norm
- fixing clamps are eliminated
- simple attachment by clipping it into the panel

Material:

Case: Noryl SE1, GFN2, 701 black
 Front frame: Lexan 920 black

The part number of the cases can be found starting on pages 4 to 13.

3a Standard case



3b Case with corner webs



4/5 Cover plate / Front panel

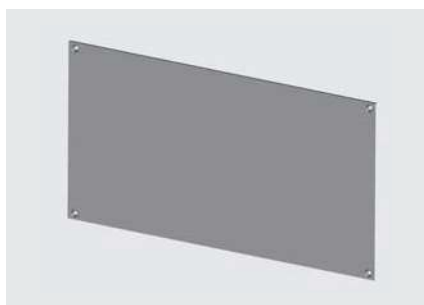
- front panels with 4 mounting holes
- mounting material included

Material:

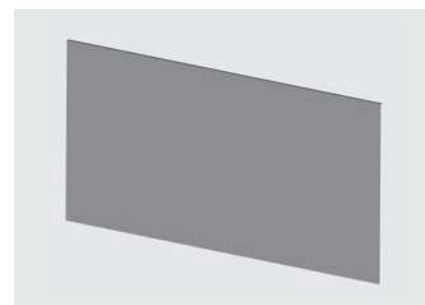
Aluminium 1,5 mm, anodised

The part number of the cases can be found starting on pages 4 to 13.

4 Cover plate



5 Front panel



6 Filter screens

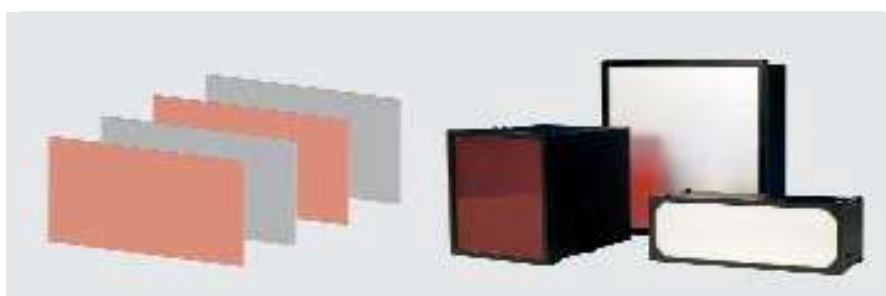
- with or without mounting holes

Material:

Plexiglas® red 502,
 Makrolon® transparent

The part number of the filter screens can be found on pages 4 to 13. To order, replace „-XX“ with the corresponding two digits of the adjacent chart.

*minimum order quantity = 100 pieces



Material	Thickness mm	Blanks without holes: last digits	Blanks with 4 mounting holes: last digits
Makrolon® transparent	3 ± 0,5	-05	-15*
Plexiglas® red 502	3 ± 0,5	-09	-10*

Moulded sealings IP 65

- new sealing for panel instrument cases acc. to IEC 61554
- the very special design allows to adjust slight unevenness of the panel and ensures to achieve IP protection 65 between enclosure and switchboard panel

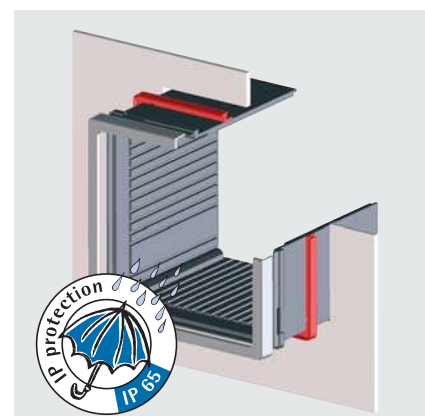
Material: SEPS

Degree of protection: IP 65 between enclosure and switchboard panel

Further sizes projected - please contact us!

Dimensions W x H mm	Order no.
48 x 24 mm	448-445-01
72 x 24 mm	448-425-01
96 x 24 mm	448-115-01
96 x 48 mm	445-175-10
96 x 72 mm	445-255-05
96 x 96 mm	445-315-05
144 x 72 mm	445-275-10
144 x 96 mm	445-335-05
144 x 144 mm	445-375-10
288 x 144 mm	445-495-05

Matching sealings for the norm-case enclosure (page 22) can be found on pages 22 and 23!





12 Transparent door with frame

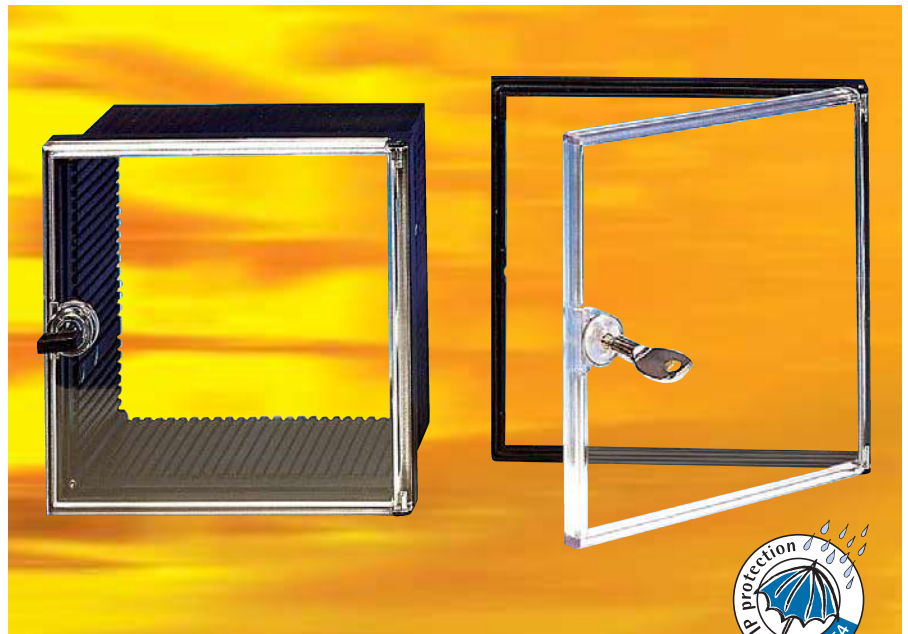
- for panel instrument cases acc. to IEC 61554
- can be mounted to the enclosure instead of a front frame
- high fitting accuracy and perfect sealing
- clear, high-quality glass
- high-grade materials ensure optimal impact strength and dimensional stability even in extreme temperatures.

Material:

Polycarbonate, listed acc. to UL 94 V-0

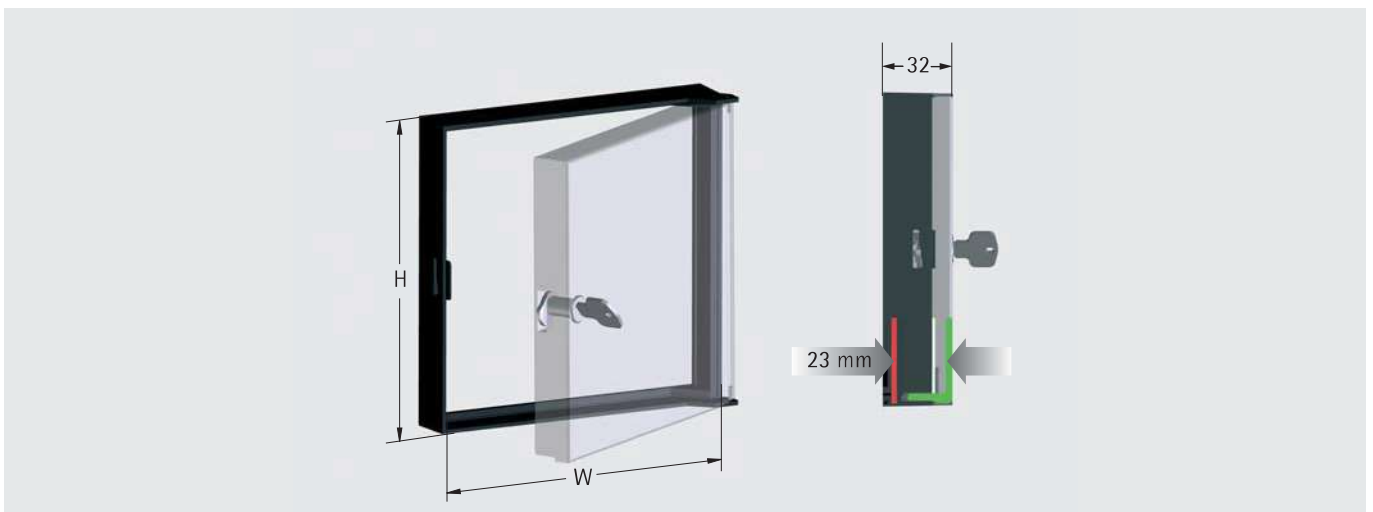
Degree of protection:

IP 54



After mounting, the door cannot be removed without applying force.

A Transparent door with frame

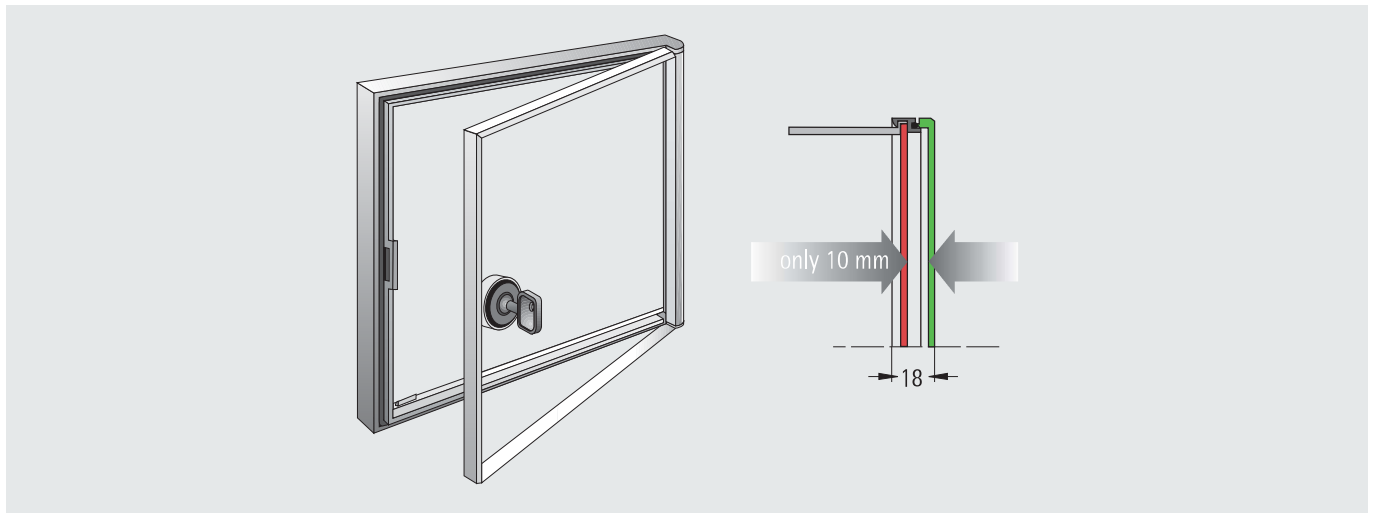


clear height between front panel and inside of the door = 23 mm

W x H mm	Degree of protection	A1 Transparent door with frame and lock (lockable)	A2 Transparent door with frame and plastic sash fastener
72 x 144	IP 54	446-100-01	446-100-02
72 x 72	IP 54	446-030-01	446-030-02
96 x 144	IP 54	446-150-01	446-150-02
96 x 48	IP 54	446-090-01	446-090-02
96 x 96	IP 54	446-040-01	446-040-02
144 x 144	IP 54	446-050-01	446-050-02
192 x 144	IP 54	446-120-01	446-120-02
192 x 96	IP 54	446-110-01	446-110-02
288 x 144	IP 54	446-130-01	446-130-02



B Flat transparent door with frame



clear height between front panel and inside of the door = 10 mm

W x H mm	Degree of protection	B1 Flat transparent door with frame and lock (lockable)	B2 Flat transparent door with frame and plastic sash fastener
144 x 144	IP 54	447-050-01	447-050-02

13 Transparent door with mounting brackets

- high tensile and impact strength, door frame reinforced with glass fibre
- excellent electrical and dielectric properties
- excellent light permeability of transparent doors
- optimum dimensional stability
- heat distortion temperature per DIN 53461: 135 °C
- **optional sealing** between transparent door and panel available
(Material: foam rubber black, 3 mm thick, self-adhesive on both sides)

Material:

Polycarbonate, listed acc. to UL 94 V-0

Degree of protection:

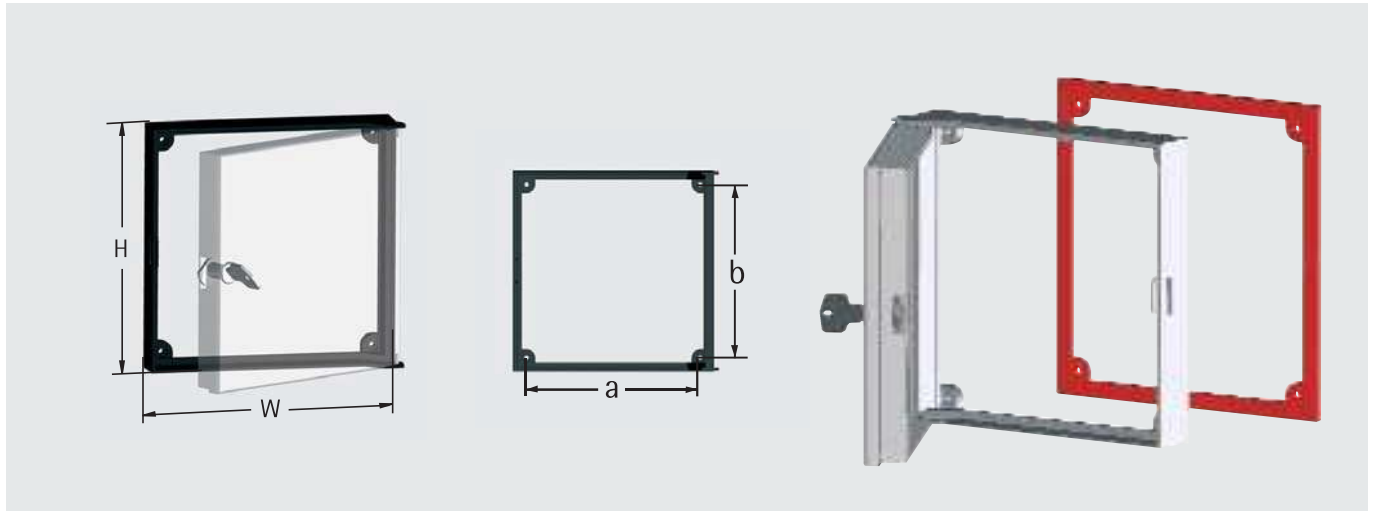
IP 54

Other sizes on request, Please ask us!





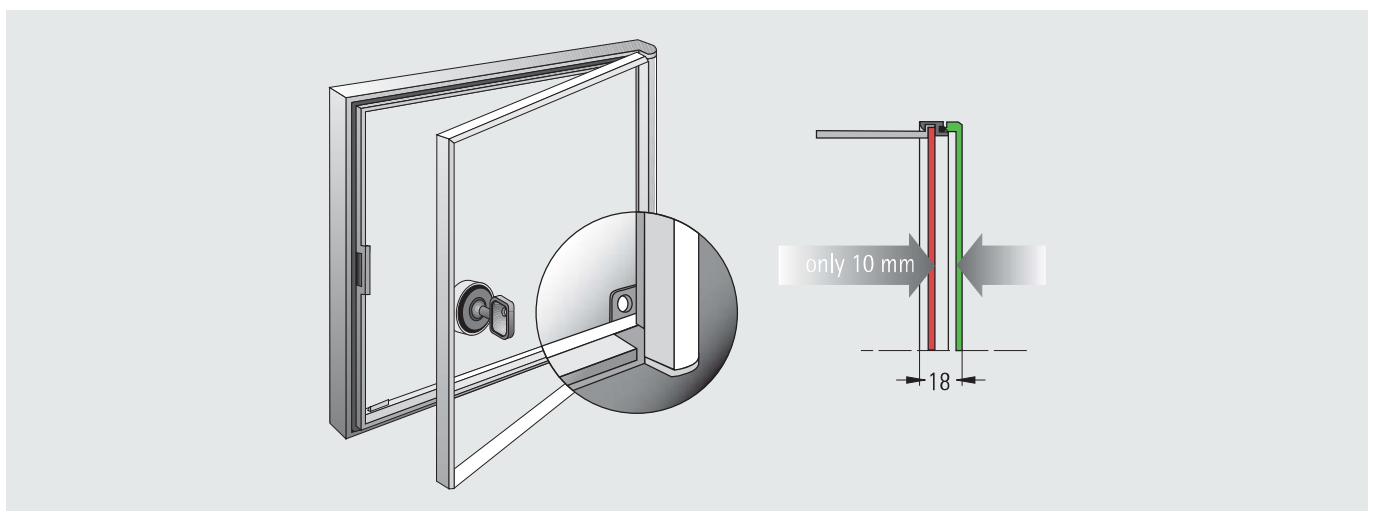
A Transparent door with mounting brackets



clear height between front panel and inside of the door = 23 mm

W x H mm	Degree of protection	Hole pattern a x b mm	A1 Transparent door with mounting brackets and lock (lockable)	A2 Transparent door with mounting brackets and plastic sash fastener	Sealing between frame and case
72 x 144	IP 54	52,5 x 125,6	446-100-04	446-100-05	-
72 x 72	IP 54	51,6 x 51,3	446-030-04	446-030-05	-
96 x 144	IP 54	76,9 x 125,1	446-150-04	446-150-05	446-150-10
96 x 48	IP 54	76,9 x 28,8	446-090-04	446-090-05	-
96 x 96	IP 54	77,2 x 76,8	446-040-04	446-040-05	446-040-10
144 x 144	IP 54	125,9 x 125,3	446-050-04	446-050-05	446-050-10
192 x 144	IP 54	173,3 x 125,1	446-120-04	446-120-05	446-120-10
192 x 96	IP 54	173,3 x 76,9	446-110-04	446-110-05	446-110-10
288 x 144	IP 54	269,5 x 125,1	446-130-04	446-130-05	446-130-10

B Flat transparent door with mounting brackets



clear height between front panel and inside of the door = 10 mm

W x H mm	Degree of protection	Hole pattern a x b mm	B1 Flat transparent door with mounting brackets and lock (lockable)	B2 Flat transparent door with mounting brackets and plastic sash fastener
144 x 144	IP 54	125,5 x 125,5	447-050-04	447-050-05



Blind cover

- to cover unused panel cut-outs
- can also serve as a solid front frame for DIN enclosures

Material:

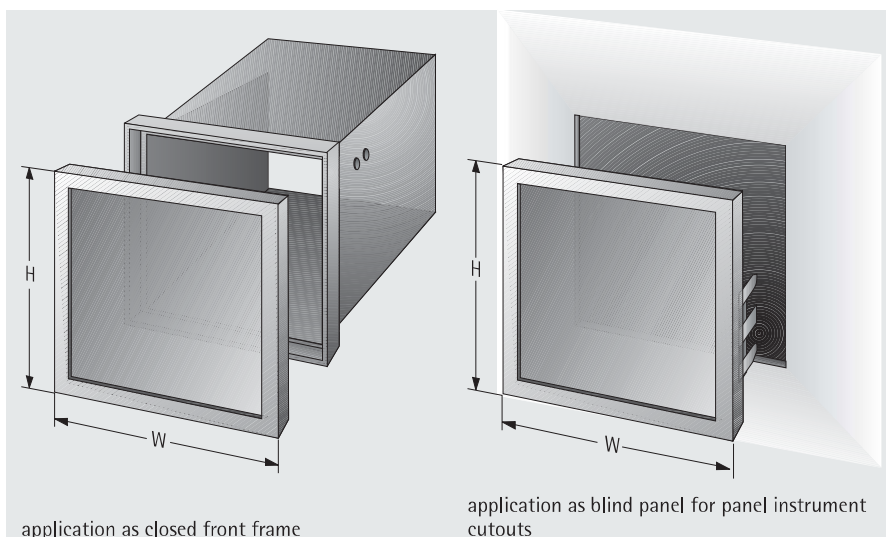
Lexan 141R, 701 black



Delivery

Item	Pc.	Description
1	1	Cover
2	6	Clip springs

W mm	H mm	Order no.
48	24	448-457-00
96	24	448-117-00
48	48	445-137
72	36	445-077
72	72	445-237
96	48	445-177
96	96	445-317
144	72	445-277
144	96	445-337-00
144	144	445-377



Machining for front panels, rear panels and cases

- as a special customer service, we can treat rear panels, front panels and enclosures according to your specifications using modern CNC-controlled processing machines. An outline is all we need!
- rear panels or enclosures with customer-specified cut-outs, holes or vents can be manufactured at low cost thanks to our modular tool system.
- even individual tools built according to the customer's design or 3D data (igs, stp, sat) are no problem for us.



We will be pleased to advise you! Just call us: +49 (0) 65 92 / 204-0



Front foils and keypad technology

- individual adaption of all elements to your requirements
- composed of 4 layer foils:
 - mounting foil
 - distance foil
 - contact foil
 - decor foil
- different types of switching elements/buttons (see f. 2)
 - flat (without embossment)
 - ball element
 - flat (with embossment)
 - metal snap slice
- surface varieties of upper decor foil:
 - microstructure
 - glossy
 - mattfinished
 - anti scratches
 - all colours acc. to RAL
- embossment type of decor foil:
 - flat embossment
 - ball segments
 - frame embossment
 - others
- PCB connection by
 - NON ZIF 1,25 (straight/angled)
 - NON ZIF 2,54 (straight/angled)
 - Crimpflex F 2,54
 - Others
- EMC shielding (also area of display by transparent screen)
- can be assembled with LCD, LED and SMD-LED:
 - single-colour (red, green, yellow, white)
 - two-colour (red/green)
- pockets and cut-outs for individual components possible
- silk-screening inside of the foil possible
- excellent chemical resistance

Material:

Polycarbonate or Polyester

Degree of protection:

possible up to IP 65

Just call us: +49 (0) 65 92 / 204-0
We will be pleased to advise you!

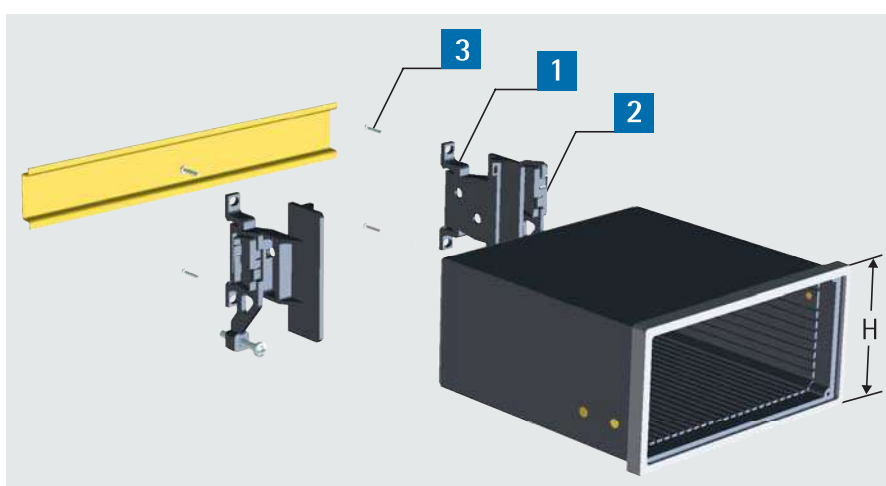


Adapter for DIN rails TS 35

- for mounting panel instrument cases on DIN rails acc. to DIN EN 50022
- a clearance of 47mm between the rear panel of the case and the DIN rails guarantees that the connecting cable has a sufficient bending radius
- the fixing clamps, which can be clipped onto the side of the adapter, ensure that the case is properly fixed in place. The adjusting screw can be used to align the case at a right angle to the mounting plate

Material:

Schulaform 9B black (POM)



Delivery

Item	Pc.	Description
1	2	Adapter
2	2	Fixing clamps
3		Mounting material

for enclosure height H mm	Complete set	1 Adapter, individual	2 Fixing clamp for adapter, individual
48	445-701-00	445-701-01	445-710-00
72	445-702-00	445-702-01	445-710-00
96	445-703-00	445-703-01	445-710-00
144	445-704-00	445-704-01	445-710-00

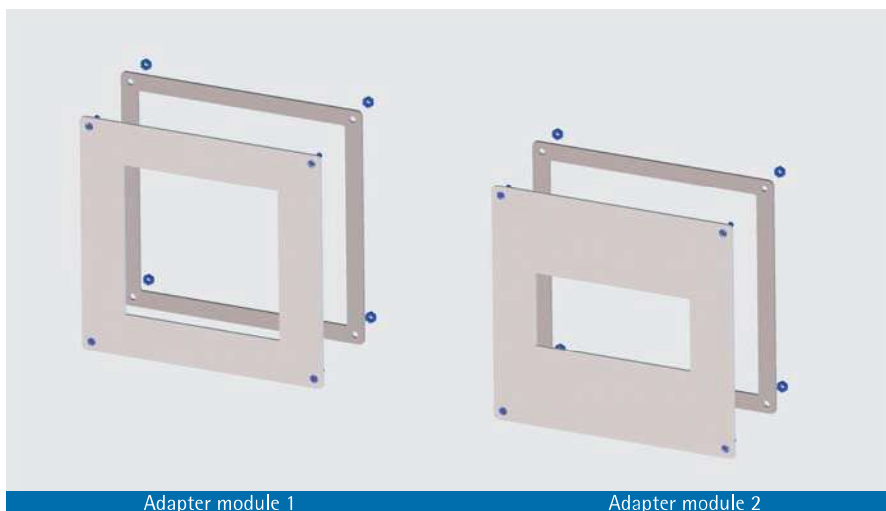
Adapter module

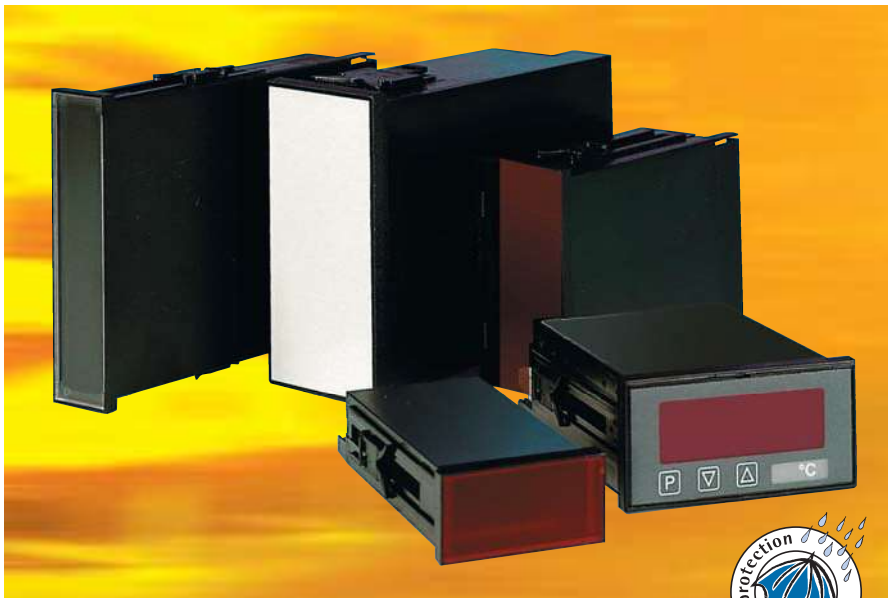
- for mounting of smaller panel instrument cases to a panel cut-out for case 144 x 144 mm
- Adapter module 1: 96 x 96 mm for cut-out 144 x 144 mm
- Adapter module 2: 96 x 48 mm for cut-out 144 x 144 mm

Material:

Aluminium

Description	Order no.
Adapter module 1	445-750-00
Adapter module 2	445-750-10





norm-case

- non-reflecting filter screen, can be clipped on for accurate fitting
- front panel can be clipped on for accurate fitting
- integrated PCB cover on the rear panel
- space for a second PCB
- quick mount via plastic clips that lock into place
- stackable both horizontally and vertically (e.g. in a grid system)
- installation in panel with thickness of up to 50 mm possible
- case and accessories can be recycled as they are mono-materials and contain no metal parts

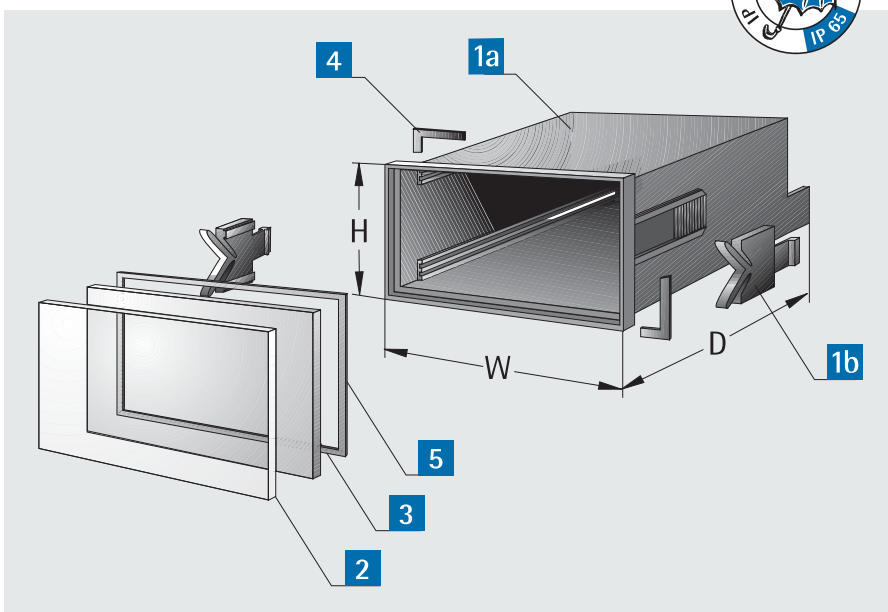
Material:

Case: Cycloy C2800
 listed acc. to UL 94
 Filter screen: Plexiglas® 7N red
 listed acc. to UL 94 HB
 Front panel: Terluran GP-22
 listed acc. to UL 94 HB

Depending on the surface of the panel, a protection of IP 65 can be achieved by using the high-quality moulded sealings marked with (*).

Delivery

Item	Pc.	Description
1a	1	Case
1b	2	Fixing clamps



W x H x D mm	1 Case	2 Filter screen	3 Front panel	4 Sealing between case and panel	5 Sealing between front panel / filter screen and case	6 Rear panel closed	Fixing clamp
48 x 24 x 90,5	448-441	448-452-09	448-451-01	448-445-01*	448-445-02	-	448-100-10
48 x 48 x 130,5	448-121-00	448-132-09	448-131-01	448-135-01	448-135-02	-	448-200-00
72 x 24 x 96,5	448-421-00	448-432-09	-	448-425-01*	448-425-02	-	448-100-10
72 x 36 x 72,0	448-062-00	448-052-09	448-051-01	448-055-01	448-055-02	448-053-01	448-100-10
72 x 36 x 96,5	448-041-00	448-052-09	448-051-01	448-055-01	448-055-02	448-053-01	448-100-10
96 x 24 x 130,5	448-102-00	448-112-09	448-111-01	448-115-01*	448-115-02	-	448-100-10
96 x 48 x 122,0	448-162	448-162-09	448-162-01	448-175-01	448-175-02	-	448-200-00
96 x 48 x 130,5	448-163-00	448-162-09	448-162-01	448-175-01	448-175-02	-	448-200-00



norm-case 48 x 24 x 82 mm

- protection system IP 65 due to integrated front panel with recess for foil and sealing (please order sealing separately!)
- safe connection of enclosure and rear panel due to moulded-in threaded inserts M2
- registered design of quick fixing to control panel
- enclosures can easily be customised with cut-outs, ventilation slots or displays by adaption of the tooling

Material:

Noryl SE1 GFN1
listed acc. to UL 94 V-1

Finish:

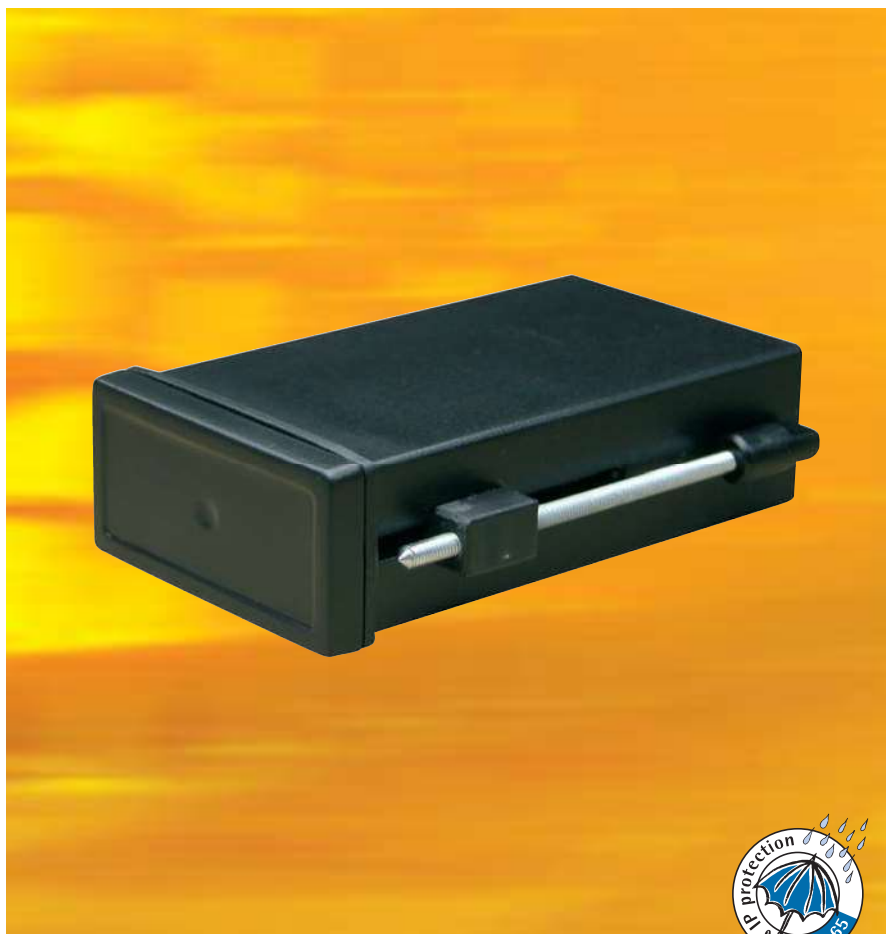
RAL 9005 black

Special depths, colours, individual modifications or foil keypads available on request!

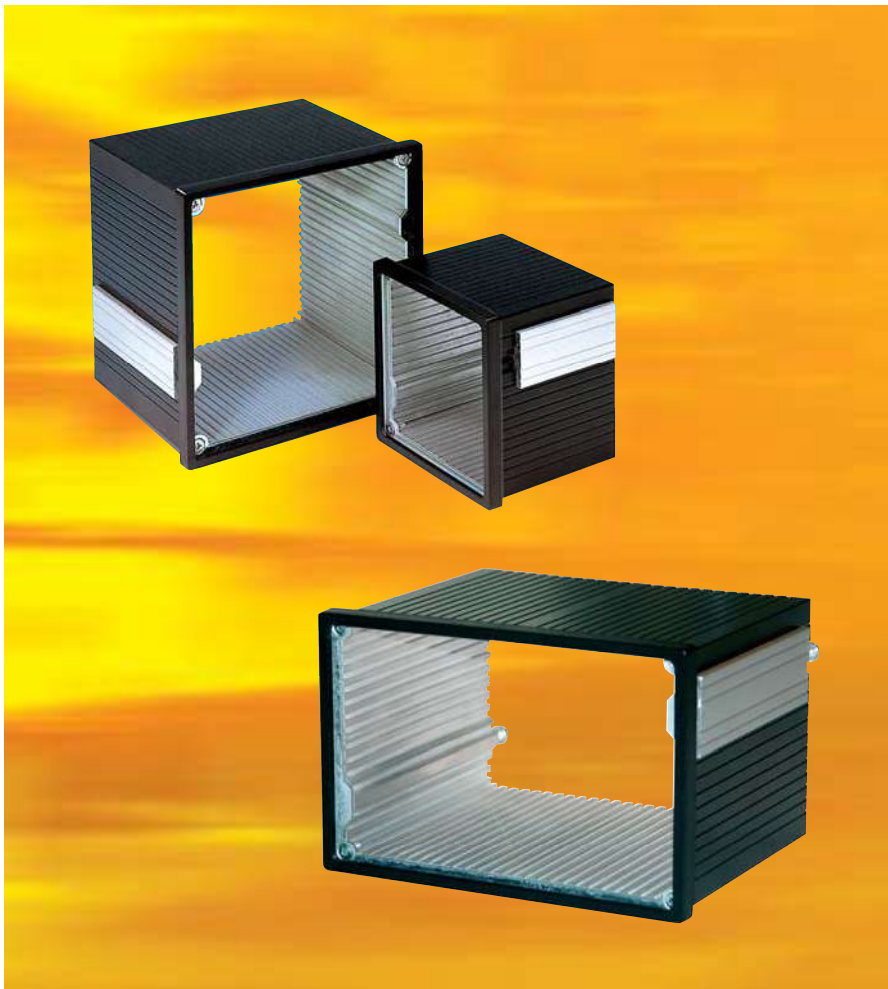
Depending on the surface of the panel, a protection of IP 65 can be achieved by using the high-quality moulded sealings marked with (*).

Delivery

Item	Pc.	Description
1	1	Case
2	2	Hook-in fixing



Case	Rear panel	Moulded sealing between case and panel
448-442-00	448-453-01	448-445-05*



Aluminium panel instrument case

- high stability due to closed extruded aluminium profile
- well suited for EMC shielding due to conductive coating
- as an alternative to the removable plastic front frame, a transparent door from our standard product line can also be attached (see page 16)
- as an alternative to mounting with fixing clamps, two mounting plates with pins can be pushed into the groove.

Material:

Enclosure/mounting extrusion:

Aluminium

Frame: Zinc, die-cast

Front / rear panel: Aluminium 2,5mm

Front frame: Lexan 141 R black 701

Finish:

Enclosure extrusion: exterior finish

RAL9005 deep black, interior chromated

Mounting extrusion: anodized

Zinc die-cast frame: conductive surface

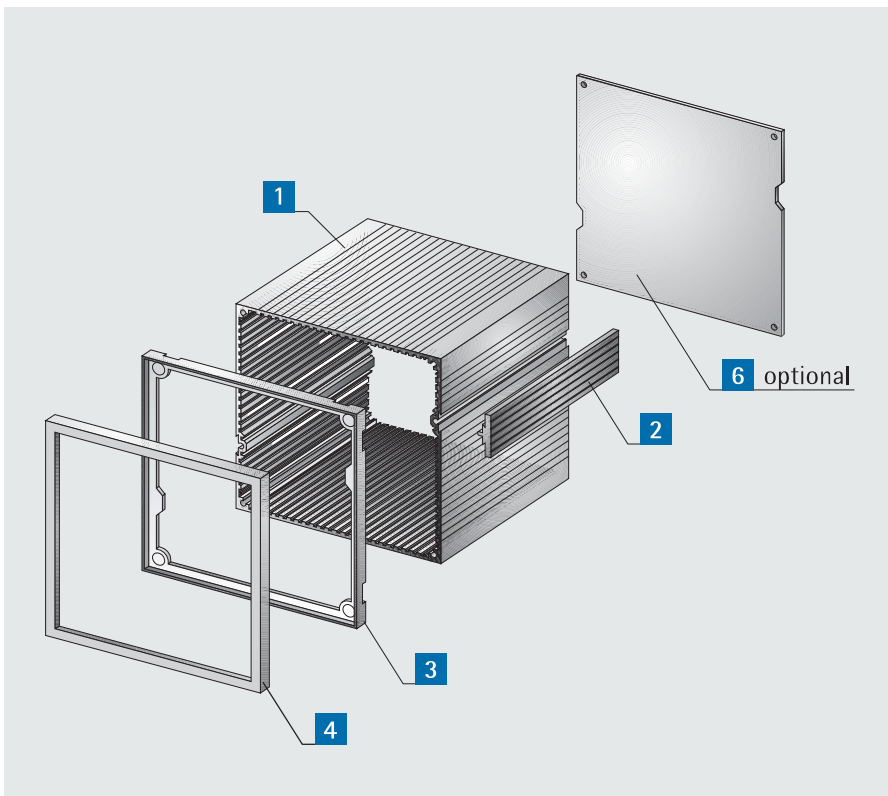
Front / rear panel: exterior anodized,

interior chromated

Other dimensions and individual colours and machining on request. Front and rear panel are not included in delivery. Please order separately!

Delivery

Item	Pc.	Description
1	1	Enclosure extrusion
2	2	Mounting extrusion
3	1	Zinc die-cast frame
4	1	Plastic front frame
5		Mounting material





Aluminium panel instrument case • 442

Aluminium panel instrument case 96 x 96 (W x H)

D mm	Case	Front panel	Rear panel	Sealing between case and panel	Sealing between front panel and case
60,5	442-300-00	442-310-00	442-313-00	442-315-01	442-315-02
82,5	442-301-00	442-310-00	442-313-00	442-315-01	442-315-02
107,0	442-304-00	442-310-00	442-313-00	442-315-01	442-315-02
116,5	442-302-00	442-310-00	442-313-00	442-315-01	442-315-02
138,5	442-303-00	442-310-00	442-313-00	442-315-01	442-315-02
163,0	442-305-00	442-310-00	442-313-00	442-315-01	442-315-02
209,0	442-306-00	442-310-00	442-313-00	442-315-01	442-315-02

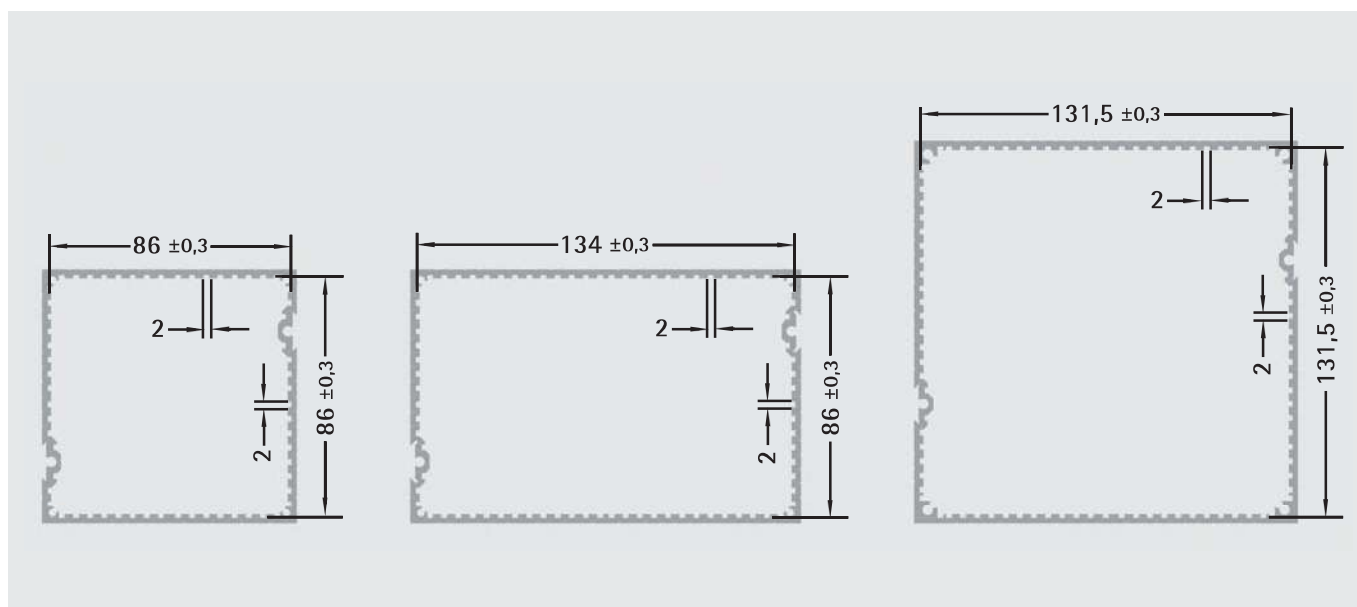
Aluminium panel instrument case 144 x 96 (W x H)

D mm	Case	Front panel	Rear panel	Sealing between case and panel	Sealing between front panel and case
60,5	442-320-00	442-330-00	442-333-00	442-335-01	442-335-02
82,5	442-321-00	442-330-00	442-333-00	442-335-01	442-335-02
107,0	442-324-00	442-330-00	442-333-00	442-335-01	442-335-02
116,5	442-322-00	442-330-00	442-333-00	442-335-01	442-335-02
138,5	442-323-00	442-330-00	442-333-00	442-335-01	442-335-02
163,0	442-325-00	442-330-00	442-333-00	442-335-01	442-335-02
209,0	442-326-00	442-330-00	442-333-00	442-335-01	442-335-02

Aluminium panel instrument case 144 x 144 (W x H)

D mm	Case	Front panel	Rear panel	Sealing between case and panel	Sealing between front panel and case	Sealing between frame and extrusion
60,5	442-360-00	442-370-00	442-373-00	442-375-03	442-375-02	442-375-01
82,5	442-361-00	442-370-00	442-373-00	442-375-03	442-375-02	442-375-01
107,0	442-364-00	442-370-00	442-373-00	442-375-03	442-375-02	442-375-01
116,5	442-362-00	442-370-00	442-373-00	442-375-03	442-375-02	442-375-01
138,5	442-363-00	442-370-00	442-373-00	442-375-03	442-375-02	442-375-01
163,0	442-365-00	442-370-00	442-373-00	442-375-03	442-375-02	442-375-01
209,0	442-366-00	442-370-00	442-373-00	442-375-03	442-375-02	442-375-01

Internal dimensions





446 • Plastic panel instrument case with 19" plug-in system

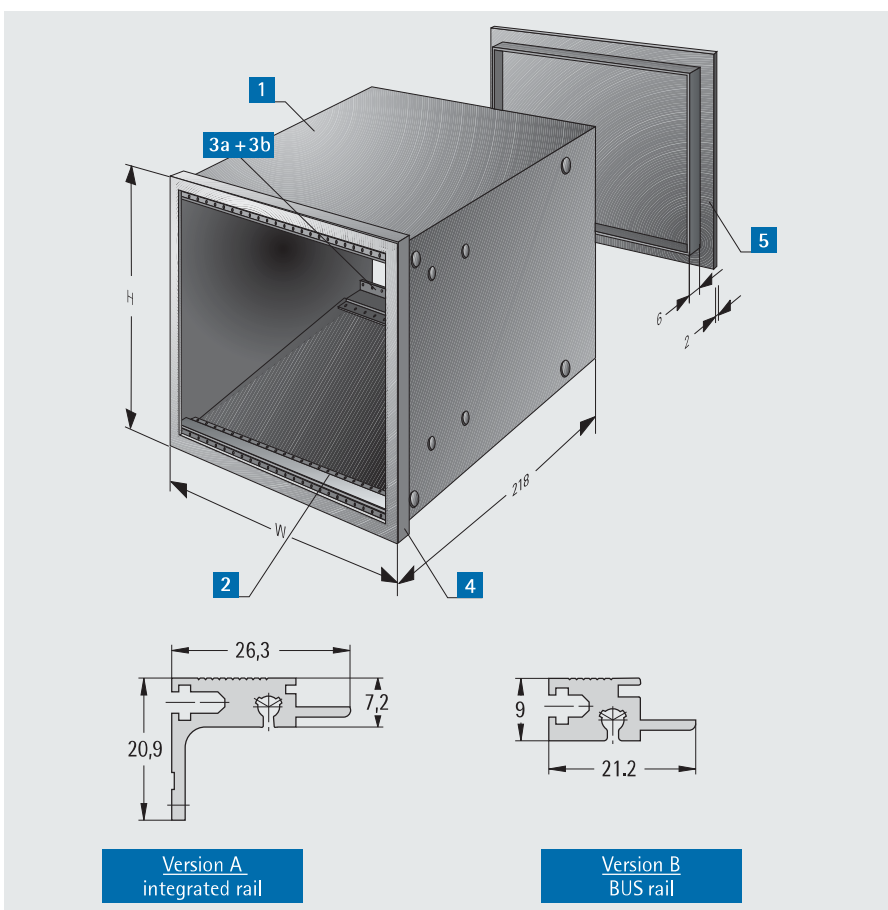


Plastic panel instrument case with 19" plug-in system

- installation dimensions of plug-in system acc. to IEC 297-3-101
- for installing europe cards of 100 x 160 mm
- front frame can be clipped on or glued on
- **three versions available:**
 - A:** case for connectors (rear: integrated module rail)
 - B:** BUS case (rear: BUS module rail)
 - C:** case, empty (without module rails)

Material:

Noryl SE1 GFN 2, black



Delivery

Item	Pc.	Description
1	1	Panel instrument case with mounting pins on the sides/top and bottom
2	(2)	Front: standard module rails with threaded strips M2.5 (only types A and B)
3a	(2)	Rear: integrated module rails, 32 pole acc. to DIN 41612 (type A only)
3b	(2)	Rear: module rails „BUS“ model, with threaded strips M2.5 (type B only)
4	1	Front frame
5	1	Rear panel, snap-in
6	(4)	Card guides (without fig.) (only types A and B)

W x H mm	Panel cut-outs w x h	HP	A Case for connector	B Case BUS	C Case empty	Cover plate for empty case	Filter screen for empty case	Transparent door with lock	Transparent door with sash fastener
72 x 144	68 x 138	12	446-102	446-106	446-101	445-271	445-272-09	446-100-01	446-100-02
96 x 144	92 x 138	16	446-152	446-156	446-151	445-331	445-332-09	446-150-01	446-150-02
144 x 144	138 x 138	26	446-052	446-056	446-051	445-371	445-372-09	446-050-01	446-050-02
192 x 144	186 x 138	35	446-122	446-126	446-121	445-391	445-392-09	446-120-01	446-120-02
288 x 144	282 x 138	54	446-132	446-136	446-131	445-491	445-492-09	446-130-01	446-130-02



Sheet steel panel instrument case with 19" plug-in system • 443



Sheet steel panel instrument case with 19" plug-in system

- acc. to IEC 61554
- with 19" plug-in system acc. to IEC 297-3
- for europe cards and modules 100 x 160 mm and 100 x 220 mm
- also available with lockable transparent door
- **three versions available:**
 - A:** case without door
 - B:** case with door
 - C:** case, empty

Material:

Case: sheet steel

Front frame: Lexan 141 R black 701

Rear panel: Noryl SE1 GFN2 black

Finish: RAL 9005 black

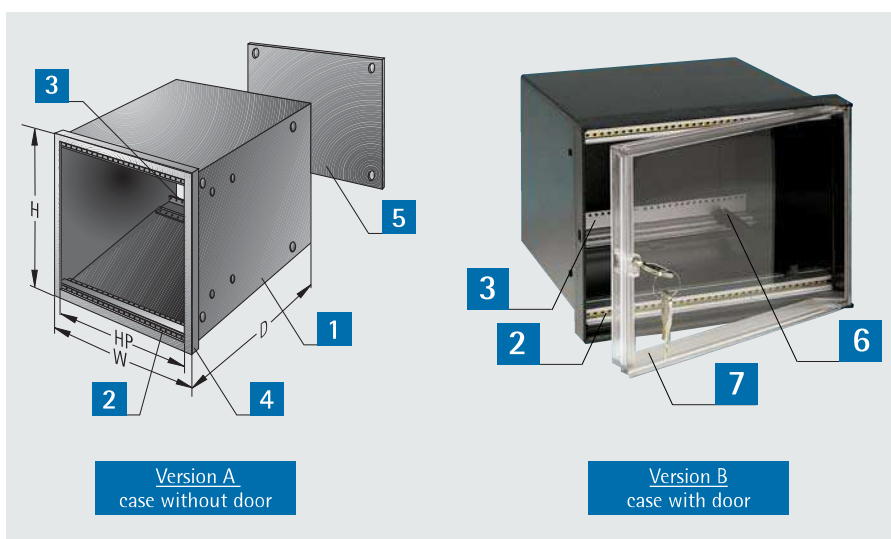
Degree of protection:

IP 42 (from the front)



Delivery

Item	Pc.	Description
1	1	Case with side mounting pins
2	(2)	Front: integrated module rail with threaded strips M2.5 (only types A and B)
3	(2)	Rear: integrated module rail with threaded strips M2.5 for plug-in connectors (32/64 pole) acc. to DIN 41612 (only types A and B)
4	1	Front frame
5	1	Rear panel with 4 screws
6	(2)	Card guides 160 mm (only types A and B)
7	(1)	Transparent door with lock (only type B)



Other colours available upon request for orders starting at 100 pieces.

The transparent door is permanently attached to the case. It is glued on from the back with sealing compound ensuring the case and door are securely sealed against the panel.

W x H mm	HP	Cut-out for instrument panel w x h mm	A Case without door D = 200 mm	A Case without door D = 260 mm	B Case with door D = 200 mm	B Case with door D = 260 mm	C Case empty D = 200 mm	C Case empty D = 260 mm
48 x 144	7	42 x 138	443-241	443-247	-	-	443-741	443-747
72 x 144	12	66 x 138	443-101	443-107	443-402	443-408	443-601	443-607
96 x 144	16	90 x 138	443-151	443-157	443-452	443-458	443-651	443-657
144 x 144	26	138 x 138	443-051	443-057	443-352	443-358	443-551	443-557
192 x 144	35	186 x 138	443-121	443-127	443-422	443-428	443-621	443-627
288 x 144	54	282 x 138	443-131	443-137	443-432	443-438	443-631	443-637



Fixing clamp Type C (acc. to DIN 43835)



- acc. to DIN 43835
- approx. 185mm long
- M5 threaded rod

Order no.
443-001

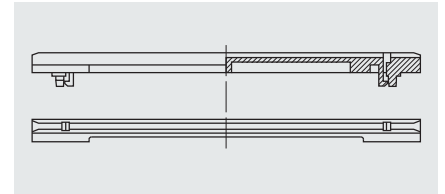
Heavy-duty fixing clamp



- approx. 190mm long
- M5 threaded rod with pressure piece

Order no.
443-002

Card guide

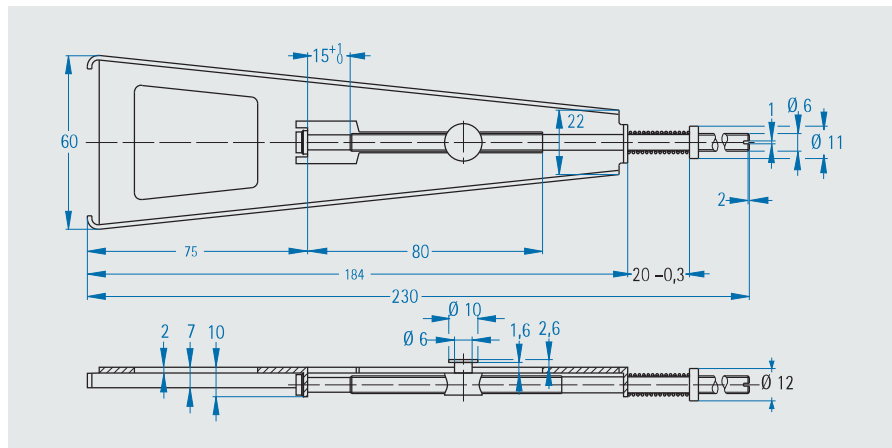


- for 160 mm / 220 mm long cards
- flammability tested acc. to UL 94 V-0

Material:

Valox DR 48 - 8233

for card depth d mm	Order no.
160	240-401-00
220	240-406-00

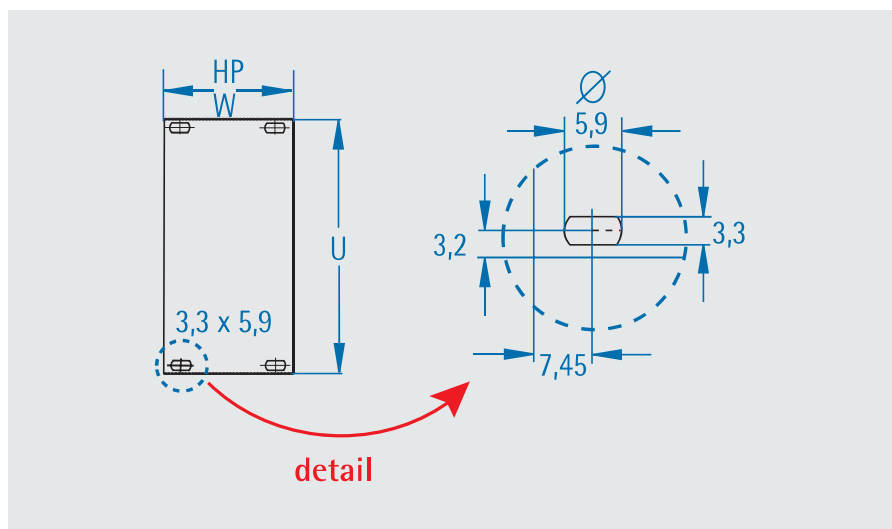


Mounting element acc. to DIN 43834

- for heavy plug-in units, etc.

An additional $\varnothing 12$ mm hole on the cases is required for this!

Order no.
443-003



Front panels 3 U

Material:

Aluminium 2,5 mm

Finish:

front anodised,
rear transparent chromated

HP	W mm	H mm	Order no.
7	35	129	243-007-45
12	61	129	243-012-45
16	81	129	243-016-45
26	132	129	243-026-45
35	178	129	243-035-45
54	274	129	243-054-45



Rounded front frame 96 x 96

- the new front frame with integrated sealing is a perfect combination of design and functionality.
- the sealing which is laid in foam on the inside provides secure sealing between enclosure and panel instrument
- injection-moulded snap-fits ensure a solid attachment to the enclosure
- with front panel IP 54 possible

Material: Polycarbonate black

Other colours on request!

Description	Order no.
Front frame 96 x 96 mm	445-316-30
Matching front panel	445-316-33



Transparent cover

- reliable protection against outer defects
- quick and easy fixation without tools
- no unintended movement because of special flaps at the edges
- soft, flexible transparent material enables operation of keys, front foils, etc.
- can be retrofitted easily on instruments that are already in use

Material: Plasticised PVC

Degree of protection: IP 65

Dimensions W x H mm	Order no.
144 x 72	445-279-00
144 x 96	445-339-00
96 x 48	445-179-00
96 x 72	445-259-00
96 x 96	445-319-00



Compact display enclosure

- extremely small depth of only 25 mm
- red transparent antireflection-filter screen
- card fixation by slots in top and bottom of the case, parallel to the filter screen

Material:

Polycarbonate, listed acc. to UL 94 V-0

Dimensions H x W x D:

96 x 48 x 30 mm

Degree of protection:

IP 65 (with use of moulding seals)

Customer-specific solutions and other colours available on request!

Description	Order no.
Enclosure	448-160-00
Moulded sealing	448-160-10





The largest range of panel instrument cases

The injection-moulded cases can be configured for any type of use. The entire interior of the case is equipped with guide grooves for cards. Threaded inserts (M2) are located on the front and rear and mounting pins for fixing clamps are mounted on the sides. The front frame can easily be locked into place and is included in the delivery of the case. The rear panel is injection moulded and fits exactly onto the case. Special material properties ensure the best quality. DIN cases and rear panels are made of glass fibre reinforced Noryl SE1 GFN2 with the best mechanical and electrical properties.



Mechanical properties

Bending strength
as per ISO 178 125 MPa

Tenacity until break
as per ISO 527 80 MPa

Hardness, H 358/30
as per ISO 2039/1 125 MPa

Physical properties

Water absorption
as per DIN 53495 0,22 %

Density 1,23 g/cm³

Electrical properties

Electric resistivity
as per IEC 93 >10¹⁵ Ohm

Dielectric strength
as per DIN 53481 250 kV/cm

Observe low-voltage guidelines when installing devices that have an operating voltage above 50V.

Thermal properties

Thermal conductivity
as per DIN 52612 150° 0,28 W/m°C

Continuous operating temperature:
up to 135 °C

Additional notes of interest

- 1) For a one-time contribution to the tooling costs, all enclosures can be adapted to meet your specific requirements:
 - a) depth of the enclosure
 - b) position and arrangement of PCB guides
 - c) depression depth for retaining the front panel or pane
- 2) Provided the tooling costs are shared, even the rear Noryl panel can be customized with
 - a) cut-outs (e.g., vent slots)
 - b) company logo and address in raised lettering according to your specifications.

Your enclosure is manufactured using only your tool set - individuality is guaranteed.

For small orders, we also offer cost-effective treatment of enclosures and rear panels according to your specifications in our modern CNC-controlled treatment centre.

Conductive coatings

To gain interference immunity or prevent radiation from interfering transmissions, it is usually necessary to cover these devices with a conductive enclosure. This can be done either with a metal enclosure or by applying a conductive metal coating to a plastic enclosure, which, as a rule, is non-conductive.

The latter has the advantage of lower cost and weight. A conductive coating can be added to a plastic enclosure by lining the surface with metal foil or galvanic coating, by metallizing it in a high-vacuum or by applying a metallic lacquer.

apra-norm uses a high-quality conductive lacquer that offers excellent conductivity, outstanding resistance to corrosion and an impressive cost-performance ratio since the use of costly devices and equipment is not needed.

The coating used by apra-norm was developed to shield against EMI (electromagnetic interferences) and electrostatic discharge and to earth sensitive electrical devices. Our standard lacquer is copper-based as it represents the best economical and environmental solution for high shielding performance coupled with high conductivity.

Physical properties of the conductive varnish

Sheet resistance: < 0,25 Ω/square with 50 µm layer thickness

Attenuation as per ASTM ES 7-83:
>60 dB at 50 µm

Adhesion as per ASTM 3359 B: 5 B

Pencil hardness: > 9 H

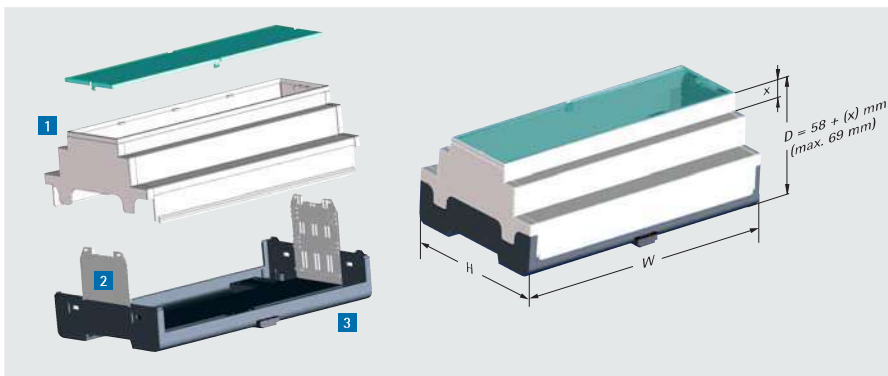
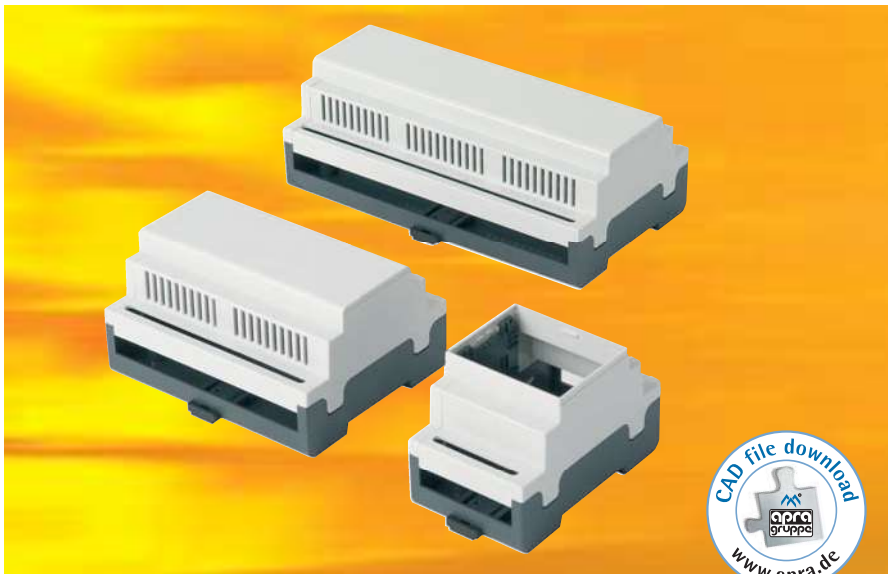
max. operating temperature: 95 °C



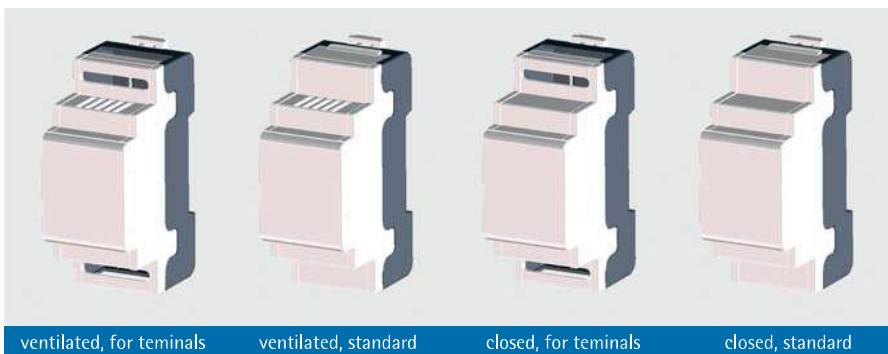
Enclosure system **apra Rail**



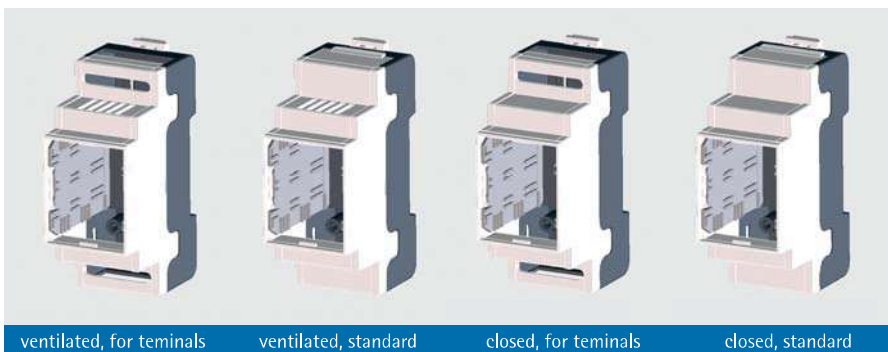
... the perfect shell for valuable electronics



Types CLOSED (using the example of DB case 2 modules)



Types OPEN FOR FRONT PANEL (using the example of DB case 2 modules)



apra Rail DB

- sturdy electronic enclosure as per DIN EN 43880 (modular case) consisting of top and bottom shell, PCB fixing and mounting clips for top hat rail or wall mounting
- depth of enclosure can be increased by maximum 11 mm in sector x (see drawing)
- snap-in front panel available
- safe hold of horizontally or vertically mounted PCB due to separate fixings which may be used in various positions
- possibility to screw PCB to domes on bottom part
- detailed information can be found at www.apra-norm.com

Dimension W x H x D:

- DB 2 modules: 36 x 90 x 58 mm (max. 69 mm)
- DB 3 modules: 53,5 x 90 x 58 mm (max. 69 mm)
- DB 4 modules: 72 x 90 x 58 mm (max. 69 mm)
- DB 6 modules: 107 x 90 x 58 mm (max. 69 mm)
- DB 9 modules: 160,6 x 90 x 58 mm (max. 69 mm)

Material:

Polycarbonate UL 94 V-0

Finish:

Top shell: RAL 7035 light grey
Bottom shell: RAL 7016 anthracite grey

Special depths, colours or customisation on request! Further sizes will follow.

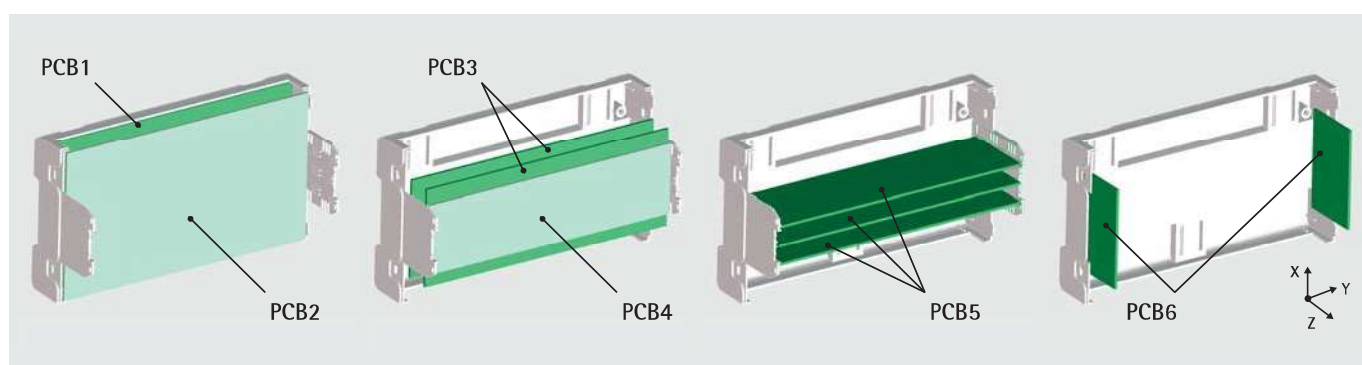
Delivery

Item	Pc.	Description
1	1	apra Rail DB, consisting of top and bottom shell
2	2	PCB fixing
3	2/3	mounting clips

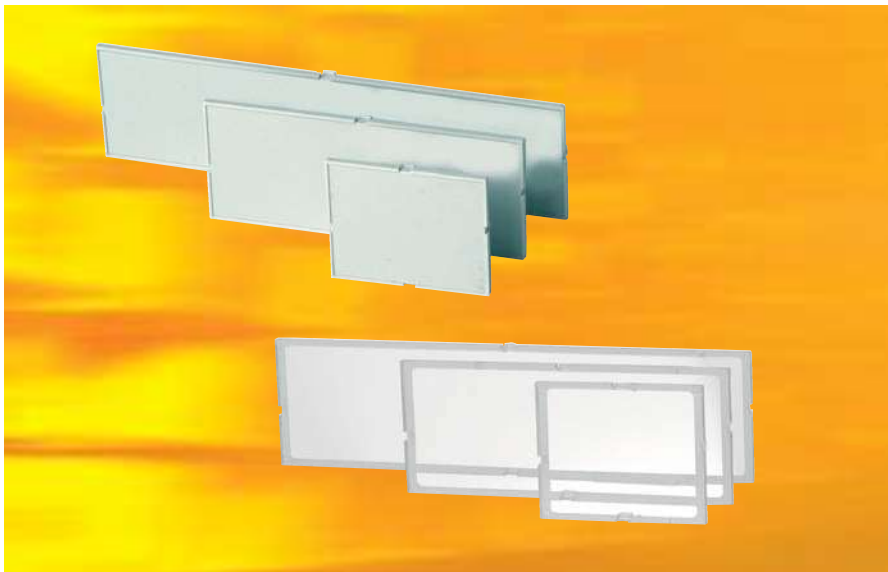


No. of modules	closed, ventilated for terminals	closed, ventilated standard	closed, not ventilated for terminals	closed, not ventilated standard	open for front panel, ventilated for terminals	open for front panel, ventilated standard	open for front panel, not ventilated for terminals	open for front panel, not ventilated standard
2 modules	449-320-55	449-320-50	449-320-45	449-320-40	449-320-65	449-320-60	449-320-35	449-320-30
3 modules	449-330-55	449-330-50	449-330-45	449-330-40	449-330-65	449-330-60	449-330-15	449-330-10
4 modules	449-340-55	449-340-50	449-340-45	449-340-40	449-340-65	449-340-60	449-340-15	449-340-10
6 modules	449-360-55	449-360-50	449-360-45	449-360-40	449-360-65	449-360-60	449-360-05	449-360-00
9 modules	449-370-55	449-370-50	449-370-45	449-370-40	449-370-65	449-370-60	449-370-05	449-370-00

apra Rail DB PCB dimensions and installation positions



Enclosure	PCB	X	Y	Z
2 modules	PCB1	86,0	31,0	-
	PCB2	85,6	30,4	-
	PCB3	56,6	30,4	-
	PCB4	40,6	30,4	-
	PCB5	-	30,4	43,0
	PCB6	58,2	-	34,3
3 modules	PCB1	86,0	48,5	-
	PCB2	85,6	47,9	-
	PCB3	56,6	47,9	-
	PCB4	40,6	47,9	-
	PCB5	-	47,9	43,0
	PCB6	58,2	-	34,3
4 modules	PCB1	86,0	67,0	-
	PCB2	85,6	66,4	-
	PCB3	56,6	66,4	-
	PCB4	40,6	66,4	-
	PCB5	-	66,4	43,0
	PCB6	58,2	-	34,3
6 modules	PCB1	86,0	102,0	-
	PCB2	85,6	101,4	-
	PCB3	56,6	101,4	-
	PCB4	40,6	101,4	-
	PCB5	-	101,4	43,0
	PCB6	58,2	-	34,3
9 modules	PCB1	86,0	155,6	-
	PCB2	85,6	155,0	-
	PCB3	56,6	155,0	-
	PCB4	40,6	155,0	-
	PCB5	-	155,0	43,0
	PCB6	58,2	-	34,3



apra Rail DB front panel

- snap-in front panel for apra Rail DB series
- secure fastening due to sturdy clips

Front panel dimensions W x H x D:
 for DB 2 modules: 34 x 41,6 x 2,5 mm
 for DB 3 modules: 51,4 x 41,6 x 2,5 mm
 for DB 4 modules: 69,8 x 41,6 x 2,5 mm
 for DB 6 modules: 104,7 x 41,6 x 2,5 mm
 for DB 9 modules: 158,5 x 41,6 x 2,5 mm

Material:
 Polycarbonate UL 94 V-0

Special colours and individual machining available on request!

Description	2 modules	3 modules	4 modules	6 modules	9 modules
light grey RAL 7035	449-320-01	449-330-01	449-340-01	449-360-11	449-370-11
transparent	449-320-02	449-330-02	449-340-02	449-360-12	449-370-12

Individual adaptation? No problem!

The enclosures of the apraRail DB series may be easily adapted to your requirements such as cutouts for terminals, ventilation slots or displays. Almost infinite possibilities!

- mechanical treatment
- modification of tools
- printing and front foils

We will be pleased to assist you with the configuration of your perfect apraRail DB enclosure – just ask us!



Configuration examples



apra Rail MB

- single parts can be mounted without tools
- mounting on top-hat rail or on wall
- maximum 3 horizontally and 2/4 vertically PCBs

Material: polycarbonate UL 94 V-0

Degree of protection: IP 20

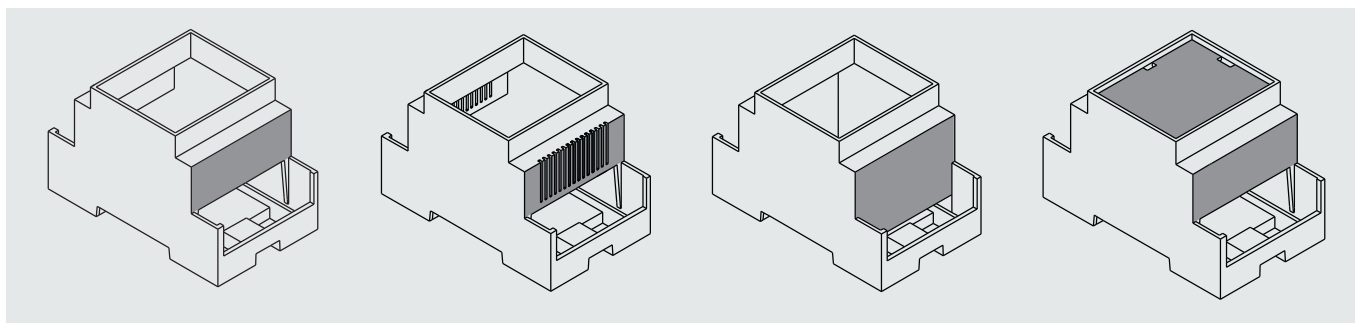
Accessories: see pages 39–40

Delivery

Item	Pc.	Description
1	1	Top part
2	1	Bottom part
3	2/3	Snap-in mounting clip



Enclosure system apra Rail MB • 449



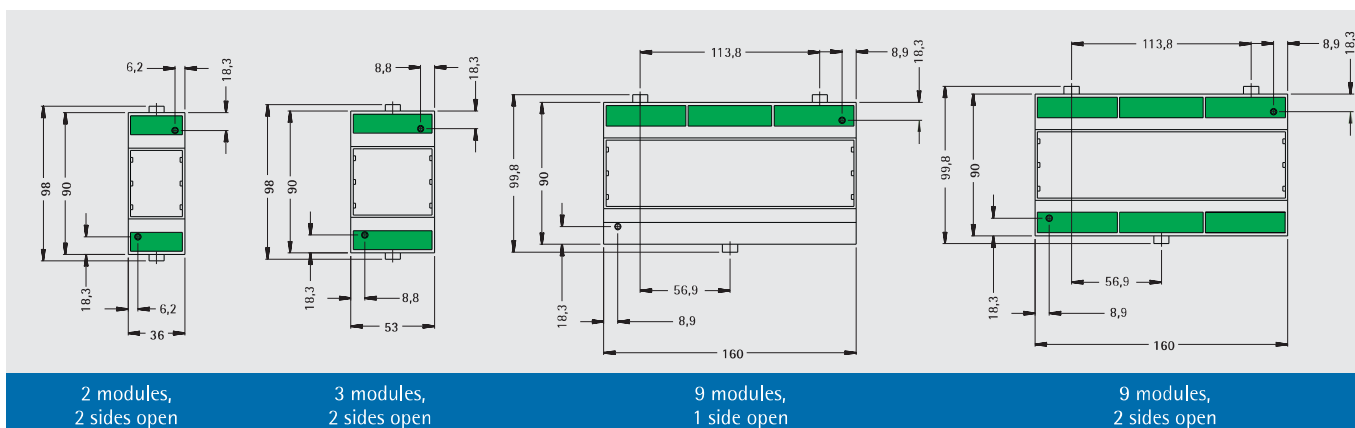
Type I:
short side panel

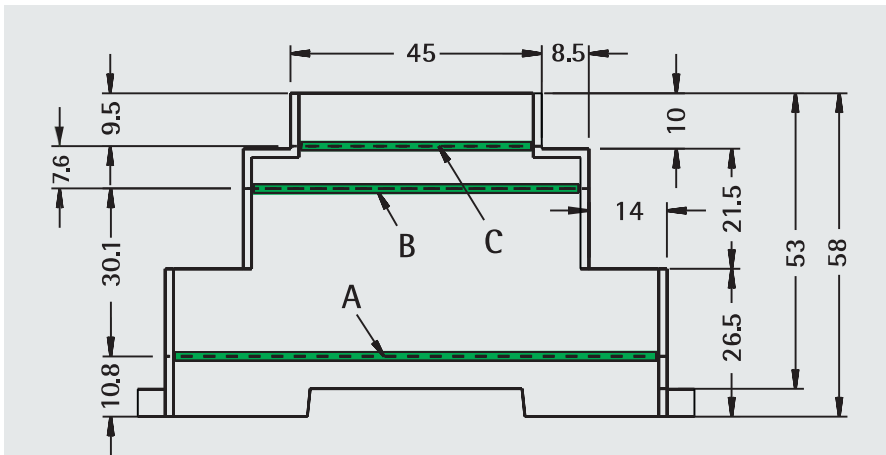
Type II:
short side panel, ventilated

Type III:
long side panel

Type IV: short side panel
with closed front

Description	Type	No. of modules	W mm	H mm	L mm	1 side open	2 sides open
apra Rail MB	I	1 module	18	90	58	-	449-110-00
apra Rail MB	II	1 module	18	90	58	-	449-110-60
apra Rail MB	III	1 module	18	90	58	-	449-110-20
apra Rail MB	IV	1 module	18	90	58	-	449-110-40
apra Rail MB	I	2 modules	36	90	58	-	449-120-00
apra Rail MB	II	2 modules	36	90	58	-	449-120-60
apra Rail MB	III	2 modules	36	90	58	-	449-120-20
apra Rail MB	IV	2 modules	36	90	58	-	449-120-40
apra Rail MB	I	3 modules	53	90	58	-	449-130-00
apra Rail MB	II	3 modules	53	90	58	-	449-130-60
apra Rail MB	III	3 modules	53	90	58	-	449-130-20
apra Rail MB	IV	3 modules	53	90	58	-	449-130-40
apra Rail MB	I	4 modules	71	90	58	-	449-140-00
apra Rail MB	II	4 modules	71	90	58	-	449-140-60
apra Rail MB	III	4 modules	71	90	58	-	449-140-20
apra Rail MB	IV	4 modules	71	90	58	-	449-140-40
apra Rail MB	I	5 modules	88	90	58	449-150-00	449-150-10
apra Rail MB	II	5 modules	88	90	58	449-150-60	449-150-70
apra Rail MB	III	5 modules	88	90	58	449-150-20	449-150-30
apra Rail MB	IV	5 modules	88	90	58	449-150-40	449-150-50
apra Rail MB	I	6 modules	106	90	58	449-160-00	449-160-10
apra Rail MB	II	6 modules	106	90	58	449-160-60	449-160-70
apra Rail MB	III	6 modules	106	90	58	449-160-20	449-160-30
apra Rail MB	IV	6 modules	106	90	58	449-160-40	449-160-50
apra Rail MB	I	9 modules	160	90	58	449-170-00	449-170-10
apra Rail MB	II	9 modules	160	90	58	449-170-60	449-170-70
apra Rail MB	III	9 modules	160	90	58	449-170-20	449-170-30
apra Rail MB	IV	9 modules	160	90	58	449-170-40	449-170-50
apra Rail MB	I	12 modules	210	90	58	-	449-500-10
apra Rail MB	II	12 modules	210	90	58	-	449-500-70

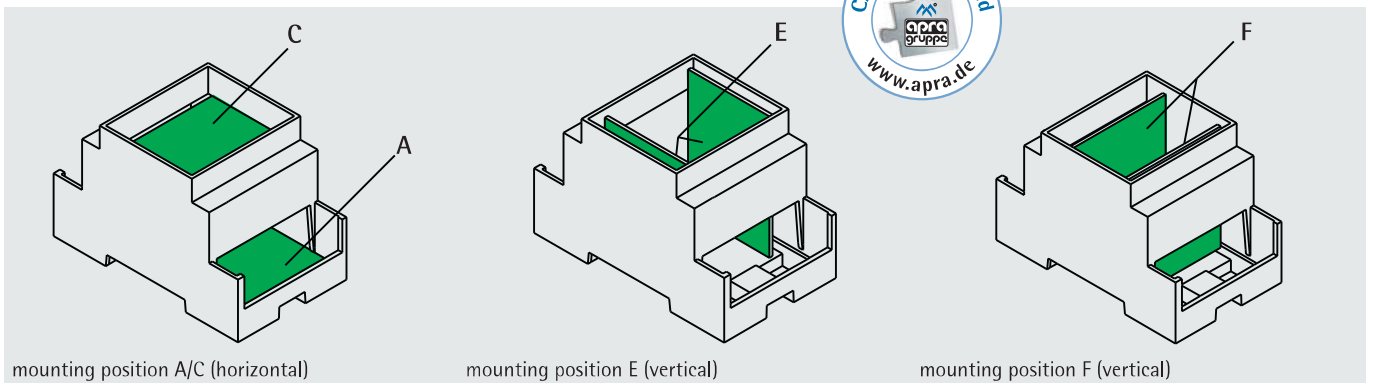




cross-section mounting position A/B/C (horizontal)

apra Rail MB PCB dimensions and installation positions

Please see the possible mounting positions for circuit boards for apra Rail MB in the drawing mentioned below.

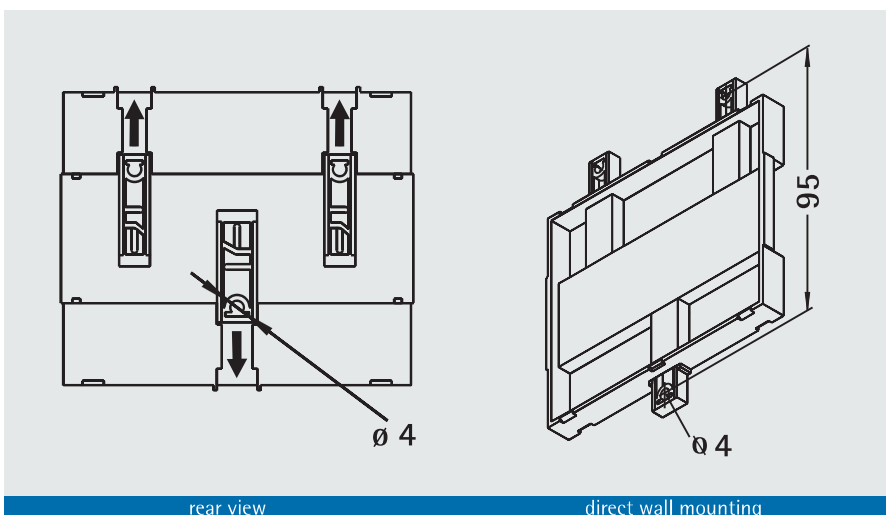


mounting position A/C (horizontal)

mounting position E (vertical)

mounting position F (vertical)

No. of modules	Installation position				
	A (horizontal) mm	B (horizontal) mm	C (horizontal) mm	E (vertical) mm	F (vertical) mm
1 module	86,5 x 14	57 x 14	41,8 x 14	34 x 59,6	40 x 14,8
2 modules	86,5 x 33	57 x 32	42 x 32	34 x 59,7	40 x 33
3 modules	86,5 x 50	57 x 49	42 x 49	34 x 59,8	40 x 50
4 modules	86,5 x 68	57 x 67	42 x 67	34 x 59,9	40 x 68
5 modules	86,5 x 84	57 x 83	42 x 83	34 x 59,10	40 x 84
6 modules	86,5 x 103	57 x 102	42 x 102	34 x 59,11	40 x 103
9 modules	86,5 x 155	57 x 155,4	42 x 154	34 x 59,12	40 x 155



rear view

direct wall mounting

Snap-in mounting clip

- DIN rail fixing
- suitable for top hat rail TS 35
- can also be used for wall mounting (3 x \varnothing 4 mm)

Description	Order no.
Snap-in clip, white	449-001-00
Snap-in clip, black	449-002-00

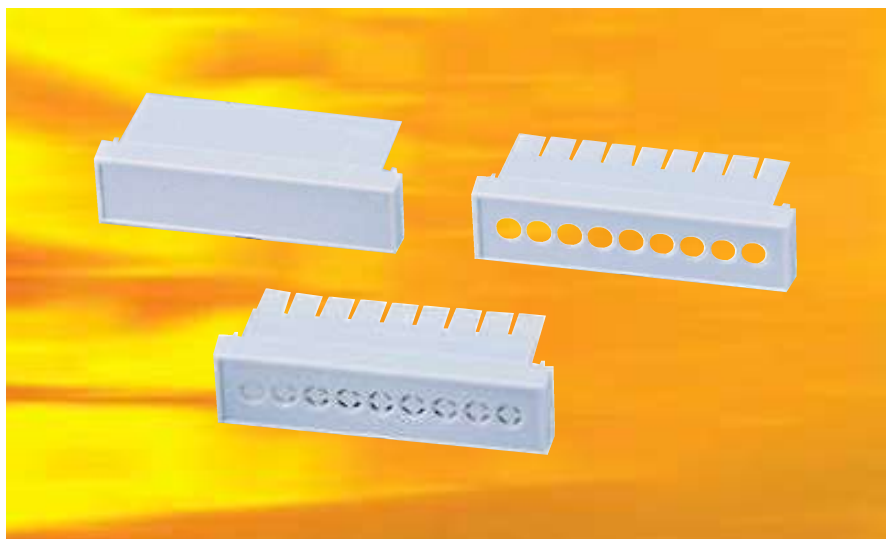


apra Rail MB terminal cover

- protection against contacts to mounted connectors
- can be used to cover unused terminals
- 3 versions available: closed, perforated or with open drillings

Material:

Polycarbonate,
flammability tested acc. to UL 94-V0



versions: closed · perforated · open for drillings

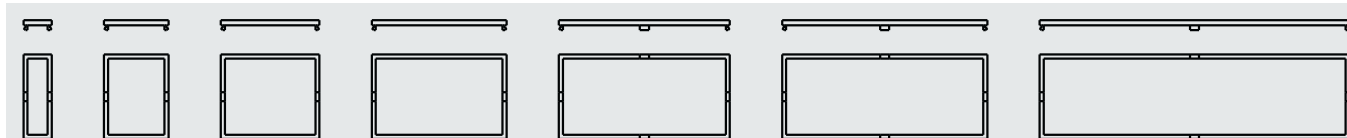
No. of modules	closed	open		perforated		open		open	
		contacts	grid 5,08 mm	contacts	grid 5,08 mm	contacts	grid 7,5 mm	contacts	grid 10,16 mm
1 module	449-110-09	3	449-110-06	3	449-110-05	2	449-110-07	2	449-110-08
2 modules	449-120-09	6	449-120-06	6	449-120-05	4	449-120-07	3	449-120-08
3/6/9 modules	449-130-09	9	449-130-06	9	449-130-05	6	449-130-07	5	449-130-08
4 modules	449-140-09	12	449-140-06	12	449-140-05	8	449-140-07	6	449-140-08
5 modules	449-150-09	15	449-150-06	15	449-150-05	10	449-150-07	7	449-150-08

apra Rail MB front panel

- can be clipped on enclosure
- 4 types available:
 - grey
 - red transparent
 - transparent
 - grey transparent
- foils can be integrated
- machining possible

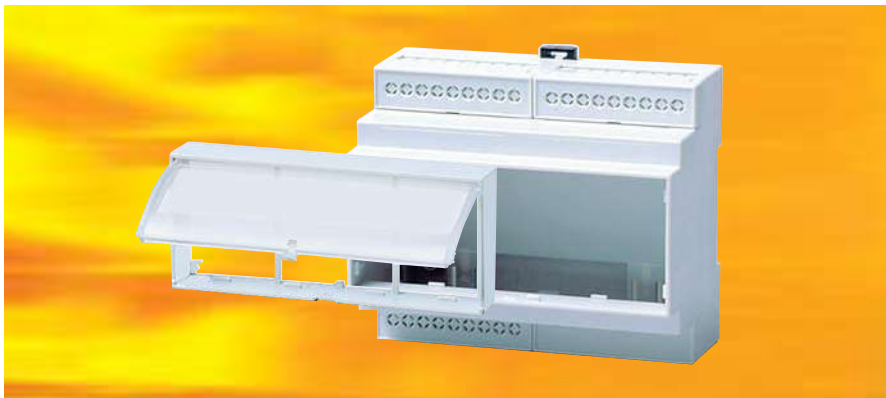
Material:

Polycarbonate



Top view 1-9 modules

No. of modules	grey	grey transparent	red transparent	transparent
1 module	449-110-01	449-110-04	449-110-02	449-110-03
2 modules	449-120-01	449-120-04	449-120-02	449-120-03
3 modules	449-130-01	449-130-04	449-130-02	449-130-03
4 modules	449-140-01	449-140-04	449-140-02	449-140-03
5 modules	449-150-01	449-150-04	449-150-02	449-150-03
6 modules	449-160-01	449-160-04	449-160-02	449-160-03
9 modules	449-170-01	449-170-04	449-170-02	449-170-03

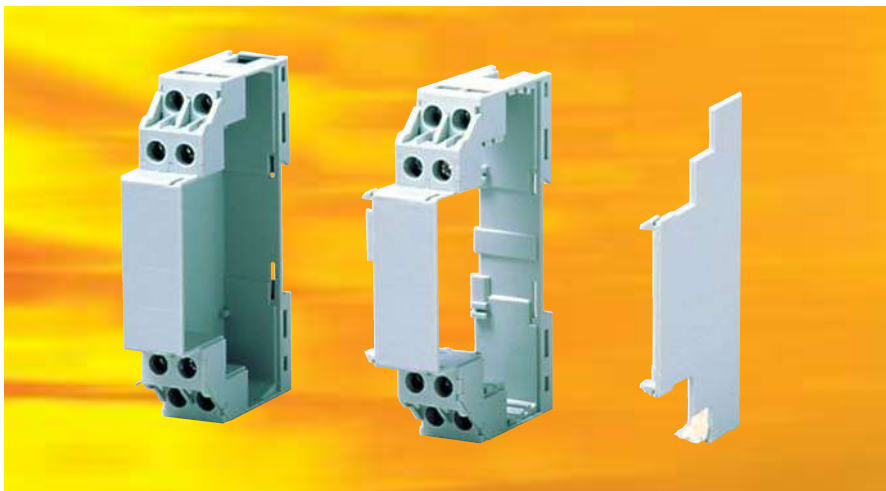


apra Rail MB chamfered cover

- protection against contact of switching elements
- available with or without hinge

Material:
Polycarbonate UL 94 V-0

No. of modules	Chamfered cover without hinge (for direct enclosure mounting)			Chamfered cover with hinge (only to be used with mounting frame)			Mounting frame grey
	grey	red transparent	transparent	grey	red transparent	transparent	
2 modules	449-120-81	449-120-82	449-120-83	449-120-91	449-120-92	449-120-93	449-120-90
3 modules	449-130-81	449-130-82	449-130-83	449-130-91	449-130-92	449-130-93	449-130-90
4 modules	449-140-81	449-140-82	449-140-83	449-140-91	449-140-92	449-140-93	449-140-90
5 modules	449-150-81	449-150-82	449-150-83	449-150-91	449-150-92	449-150-93	449-150-90
6 modules	449-160-81	449-160-82	449-160-83	449-160-91	449-160-92	449-160-93	449-160-90
9 modules	449-170-81	449-170-82	449-170-83	449-170-91	449-170-92	449-170-93	449-170-90

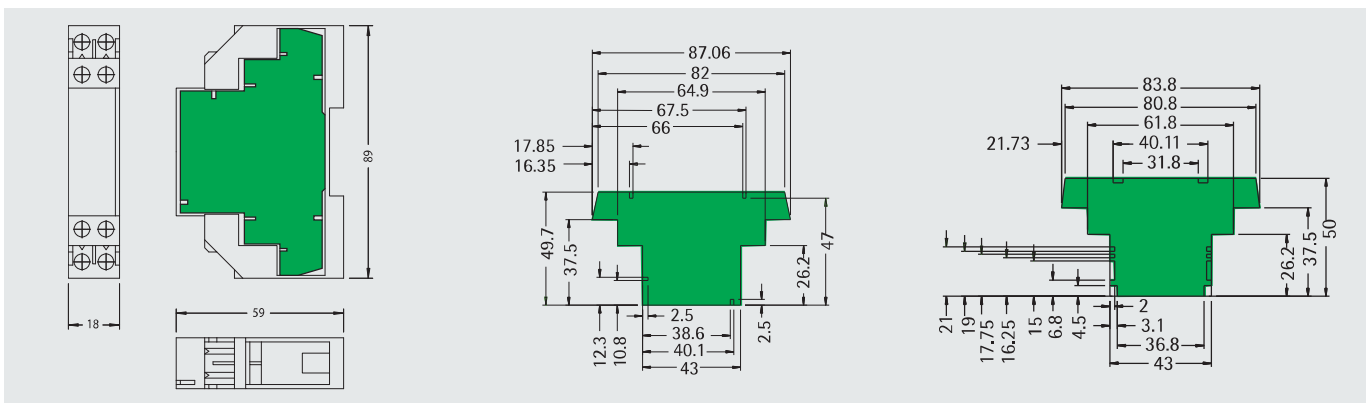


apra Rail EMB

- consists of basic case and two side panels (one detachable)
- variable sizes by using extension set
- each unit with 8 removable screw type terminals
- mounting on top-hat rail or wall mounting

Material:
ABS (for a minimum of 1000 pieces also Polycarbonate possible)

Degree of protection: IP 20



dimensions standard enclosure

PCB dimensions for basic enclosure

PCB dimensions for extension set

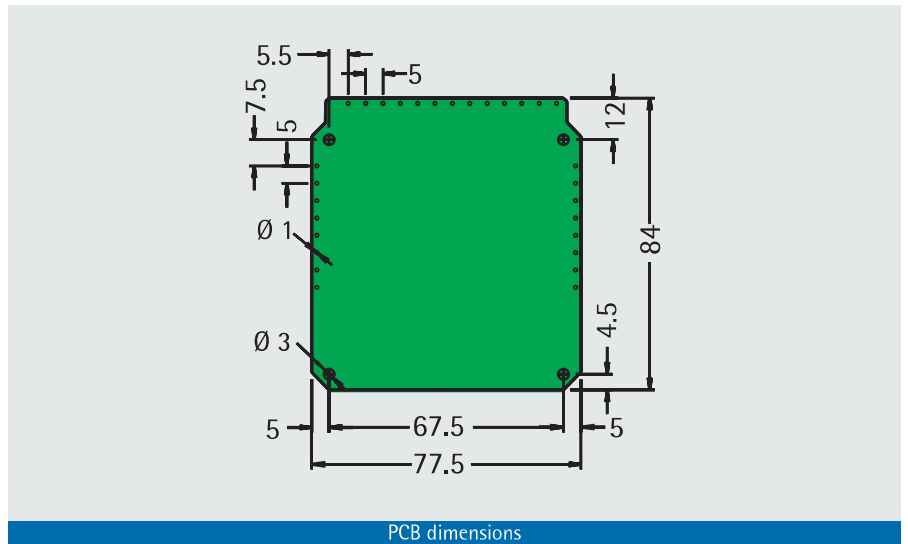
Description	W mm	Order no.
Basic enclosure	18	449-180-00
Extension set	18	449-180-10



apra Rail VB

- fitting TS35, TS15 and C-rail
- 2 enclosure sizes for pluggable terminals in 5 mm grid
- cover plates for unused terminal areas
- maximum 12 terminals per side

Material:
Polyamide green



Delivery

Item	Pc.	Description
1	2	Enclosure shells
2	2	Cover plates

Description	Dimensions W x H x L mm	Order no.
apra Rail VB 22,5 mm	22,5 x 90 x 82	449-180-20
apra Rail VB 45 mm	45 x 90 x 82	449-180-25



449 • Enclosure system apra Rail MIS

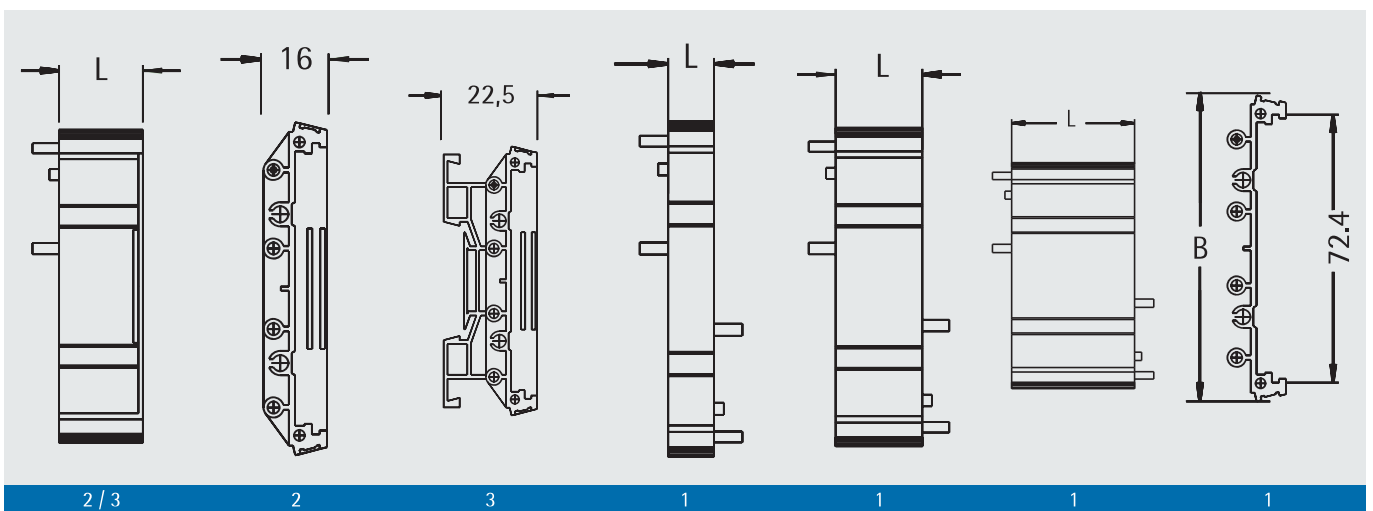


apra Rail MIS 72 mm

- applicable for 72 mm wide PCBs
- high flexibility due to its modular construction
- integrated fixing
- insertion possibility for labelling

Material:

Polyamide 66 green UL 94 V-0



Position	Description	L	W	PCB dimensions l	PCB dimensions w	Order no.
1	Intermediate unit	11,25	82	11,25	72	449-310-00
1	Intermediate unit	22,5	82	22,5	72	449-320-00
1	Intermediate unit	45	82	45	72	449-330-00
2	Header unit	11,25	82	10	72	449-310-10
2	Header unit	22,5	82	21	72	449-320-10
3	Header unit with foot	11,25	82	10	72	449-310-20
3	Header unit with foot	22,5	82	21	72	449-320-20
	Foot unit					449-340-00

Adapter for wall mounting

- flat adapter: wall mounting of units without foot
- high adapter: wall mounting of units with foot
- fits to apra Rail MIS 72 mm

Description	Order no.
Adapter flat	449-350-00
Adapter high	449-350-10



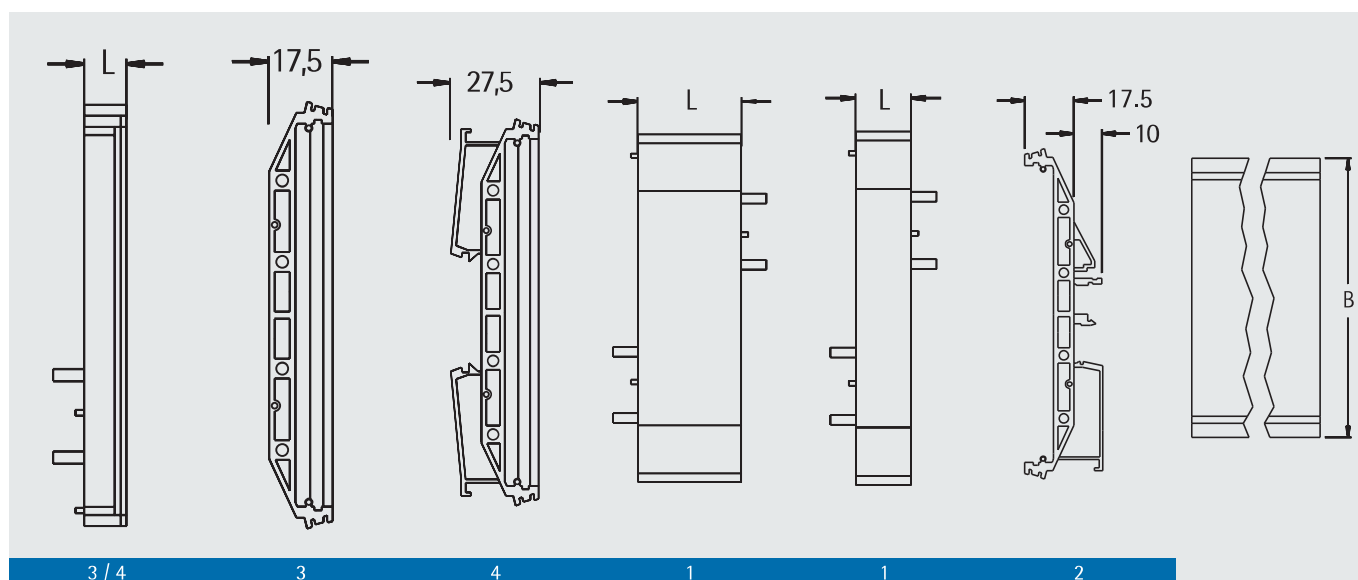


apra Rail MIS 107 mm

- applicable for 107 mm wide PCBs
- high flexibility due to its modular construction
- integrated fixing
- insertion possibility for labelling

Material:

Polyamide 66 green UL 94 V-0



Position	Description	L	W	PCB dimensions l	PCB dimensions w	Order no.
1	Intermediate unit	18,5	118	18,5	107	449-220-00
1	Intermediate unit	35	118	35	107	449-230-00
2	Intermediate unit with foot	18,5	118	18,5	107	449-220-10
2	Intermediate unit with foot	35	118	35	107	449-230-10
3	Header unit	11,5	118	10	107	449-210-00
4	Header unit with foot	11,5	118	10	107	449-210-10

Adapter for wall mounting

- flat adapter: wall mounting of units without foot
- high adapter: wall mounting of units with foot
- fits to apra Rail MIS 107 mm

Description	Order no.
Adapter flat	449-240-00
Adapter high	449-240-10





apra Rail EIS 72 mm

- for 72 mm wide PCBs
- special lengths possible

Material:
Polyamide 66 green UL 94 V-0

*Other lengths on request, extrusion length = PCB length - 4 mm

Description	Length mm *	Order no.
Extruded basic unit	2000	449-300-10
Header unit		449-300-20
Locating screws for header unit		449-300-40
Foot unit		449-300-30



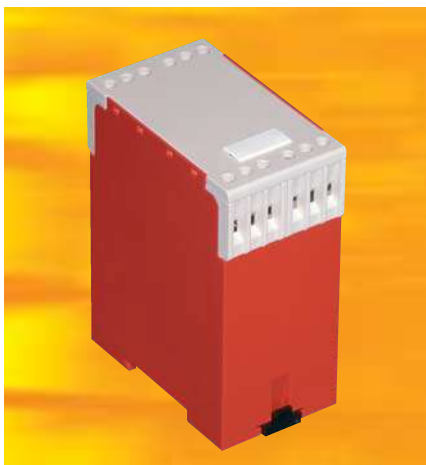
apra Rail EIS 107 mm

- for 107 mm wide PCBs
- special lengths possible

Material:
Polyamide 66 green UL 94 V-0

*Other lengths on request, extrusion length = PCB length - 4 mm

Description	Length mm *	Order no.
Extruded basic unit	2000	449-300-11
Header unit		449-300-22
Locating screws for header unit		449-300-44
Foot unit		449-300-33



apra Rail CH

- 12 contacts
- internal card guides
- interchangeable front panel
- terminals with pins for a minimum wiring complexity

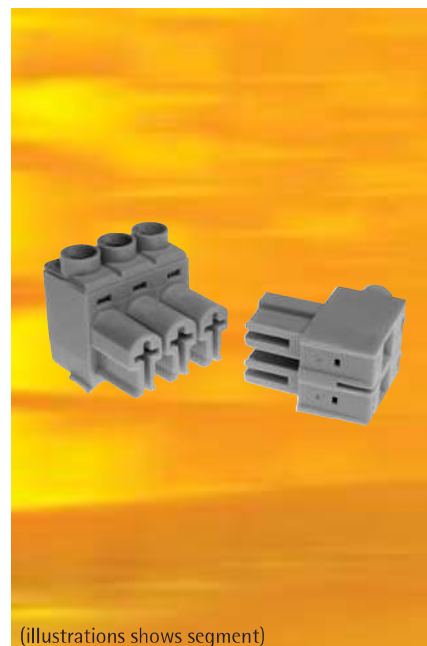
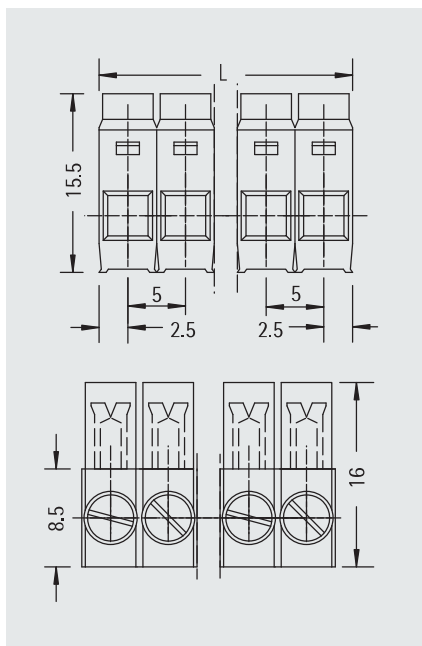
Material:
Polycarbonate UL 94 V-0

Order no.
449-180-30



Pluggable terminal strip (length can be customised)

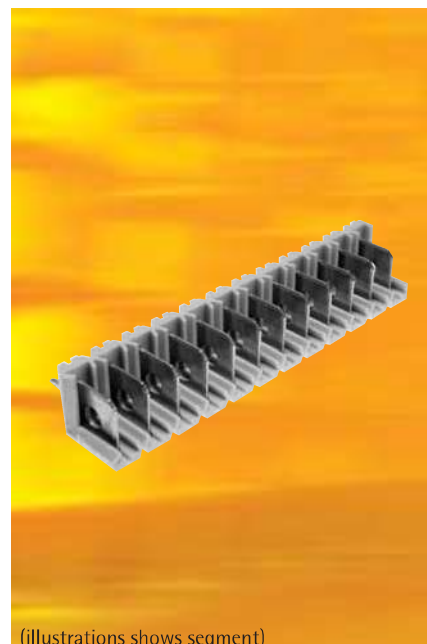
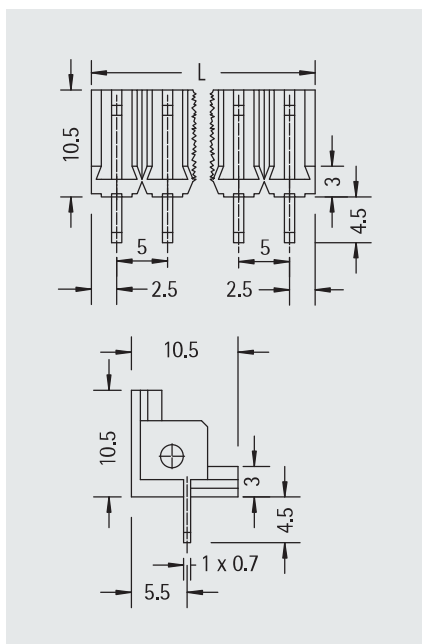
Nominal voltage: 380 V
Nominal current: 13,5 A
Cross section: max. 4 mm²
Material: Lexan grey, flammability tested acc. to UL 94 V-0
Insulating resistance: >5 MOhm
Working temperature: -20 °C up to 125 °C, 160 °C temporary
Approval: UL, , CE conformity



Description	L mm	Grid mm	Order no.
Pluggable terminal strip, 36 contacts	180	5,00	449-410-01

Terminal pin (length can be customised)

Nominal voltage: 380 V
Nominal current: 13,5 A
Material: Lexan grey, flammability tested acc. to UL 94 V-0
Insulating resistance: >5 MOhm
Working temperature: -20 °C up to 125 °C, 160 °C temporary
Approval: UL, , CE conformity



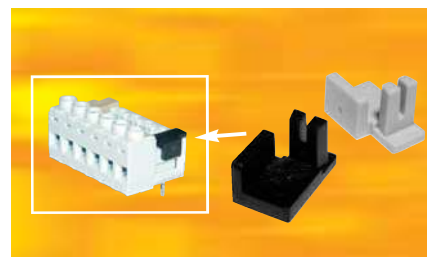
Description	L mm	Grid mm	Order no.
Terminal pin, 36 contacts	180	5,00	449-410-02

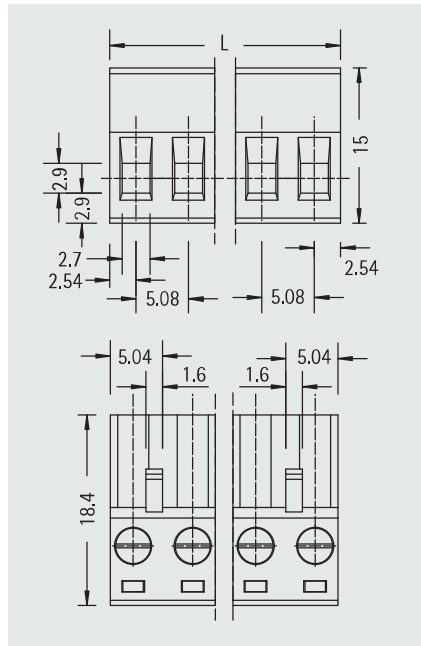
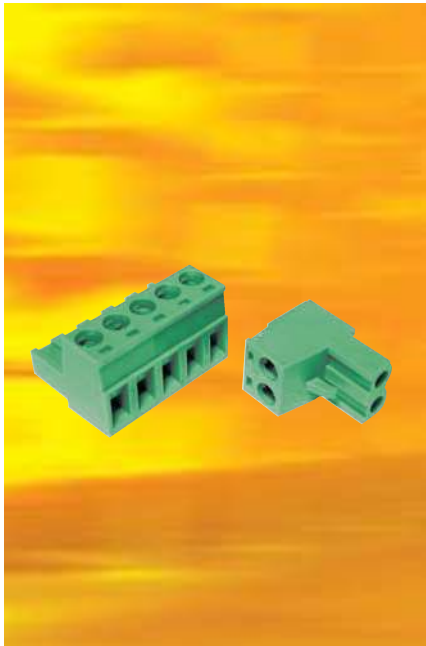
Polarising clip

- ensures correct vertical or horizontal orientation of the pluggable terminal strip

Material: Lexan grey, flammability tested acc. to UL 94 V-0
Working temperature: -20 °C up to 125 °C, 160 °C temporary
Approval: UL, , CE conformity

Order no. (pair)
449-410-03

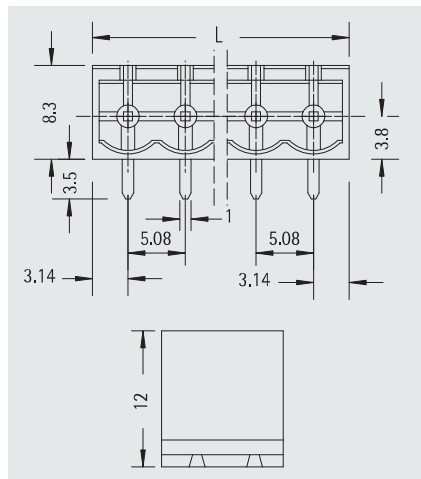
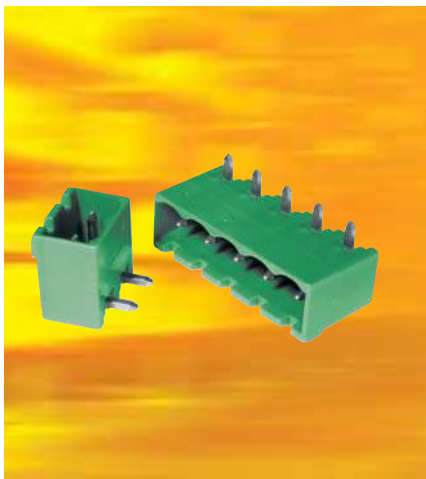




**Pluggable terminal strip
(length can be customised)**

Nominal voltage: 380 V
Nominal current: 12 A
Cross section: max. 2,5 mm²
Material: PA green, flammability tested acc. to UL 94 V-0
Insulating resistance: >5 MOhm
Working temperature: -20 °C up to 125 °C, 160 °C temporary
Approval: UL, , CE conformity

Description	L mm	Grid mm	Order no.
Pluggable terminal strip, 3 contacts	15,24	5,08	449-420-03
Pluggable terminal strip, 6 contacts	30,48	5,08	449-420-06
Pluggable terminal strip, 9 contacts	45,72	5,08	449-420-09
Pluggable terminal strip, 12 contacts	60,96	5,08	449-420-12




**Bended terminal pin
(length can be customised)**

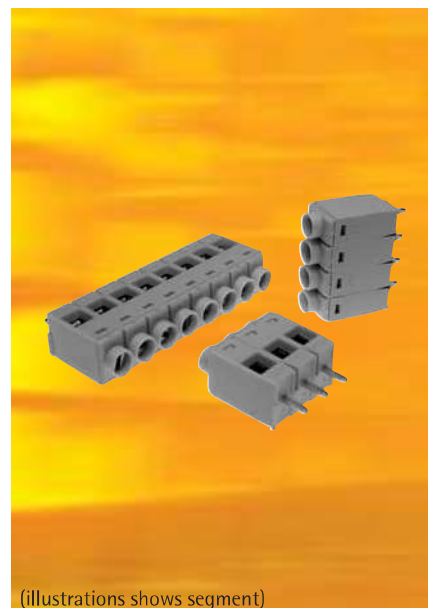
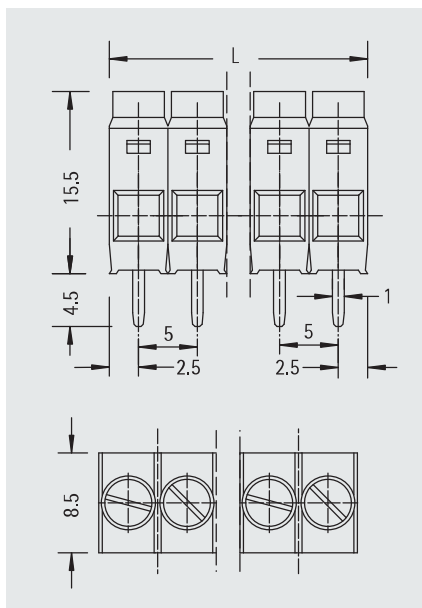
Nominal voltage: 380 V
Nominal current: 12 A
Material: PA green, flammability tested acc. to UL 94 V-0
Insulating resistance: >5 MOhm
Working temperature: -20 °C up to 125 °C, 160 °C temporary
Approval: UL, , CE conformity

Description	L mm	Grid mm	Order no.
Bended terminal pin, 3 contacts	15,24	5,08	449-430-03
Bended terminal pin, 6 contacts	30,48	5,08	449-430-06
Bended terminal pin, 9 contacts	45,72	5,08	449-430-09
Bended terminal pin, 12 contacts	60,96	5,08	449-430-12



**Terminal clamp
(length can be customised)**


Nominal voltage: 380 V
 Nominal current: 17,5 A
 Cross section: max. 4 mm²
 Material: Lexan grey, flammability tested acc. to UL 94 V-0
 Insulating resistance: >5 MOhm
 Working temperature: -20 °C up to 125 °C, 160 °C temporary
 Approval: UL, , CE conformity

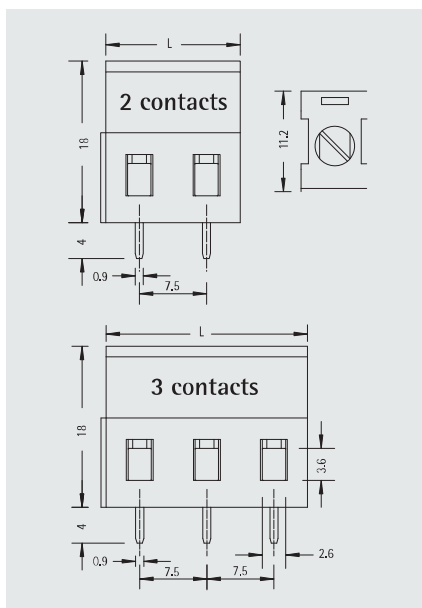


(illustrations shows segment)

Description	L mm	Grid mm	Order no.
Terminal clamp, 36 contacts	180	5,00	449-410-00

**Terminal clamp
(length can be customised)**

Nominal voltage: 750 V
 Nominal current: 24 A
 Cross section: max. 4 mm²
 Material: PA 66 green, flammability tested acc. to UL 94 V-0
 Insulating resistance: >5 MOhm
 Working temperature: -20 °C up to 125 °C, 160 °C temporary
 Approval: UL, , CE conformity



Description	L mm	Grid mm	Order no.
Terminal clamp, 2 contacts	15	7,50	449-440-02
Terminal clamp, 3 contacts	22,5	7,50	449-440-03

Top hat rail, type TS 35/7,5

• with perforation for M 6
 Material: sheet steel, galvanised

Other lengths available on request!

L mm	Order no.
200	640-236-02
500	640-236-09
600	640-236-08

