



# Panel instrument cases and enclosures for top hat rail



24h

Edition 14

... the perfect shell for valuable electronics



# apra-group - we see the big picture

## Our products

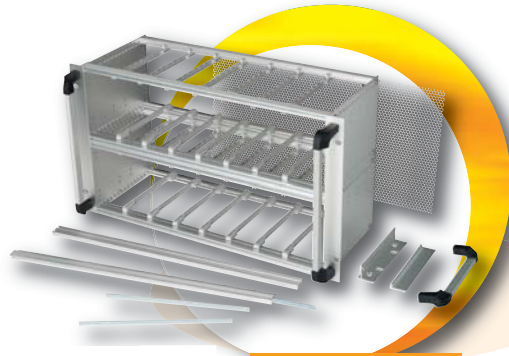
... are the result of the perfect symbiosis between the apra-group companies.

Just ask us!

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



Panel instrument cases and enclosures for top hat rail



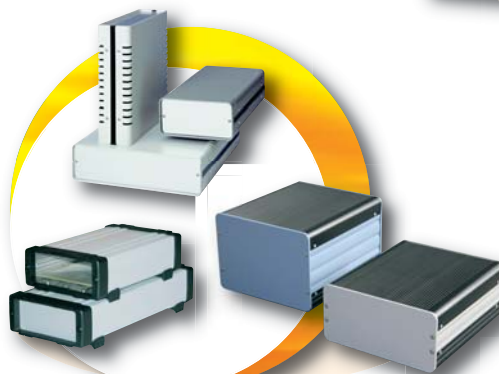
19" subracks



Customised enclosures made of plastic



Desktop enclosures, 19" enclosure systems



Small enclosures



19" cabinets, 19" racks



19" plug-in units



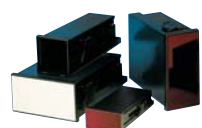
Standard enclosure 445/441

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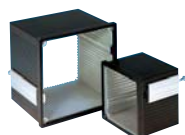
Transparent doors 446/447

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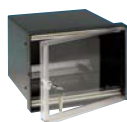
norm-case 448

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Aluminium panel instrument case 442

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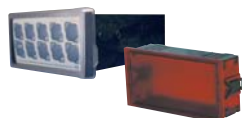
Plastic panel instrument case 446  
with 19" plug-in system

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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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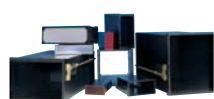
VisioDINbox

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DINcollect / VisioRAILbox

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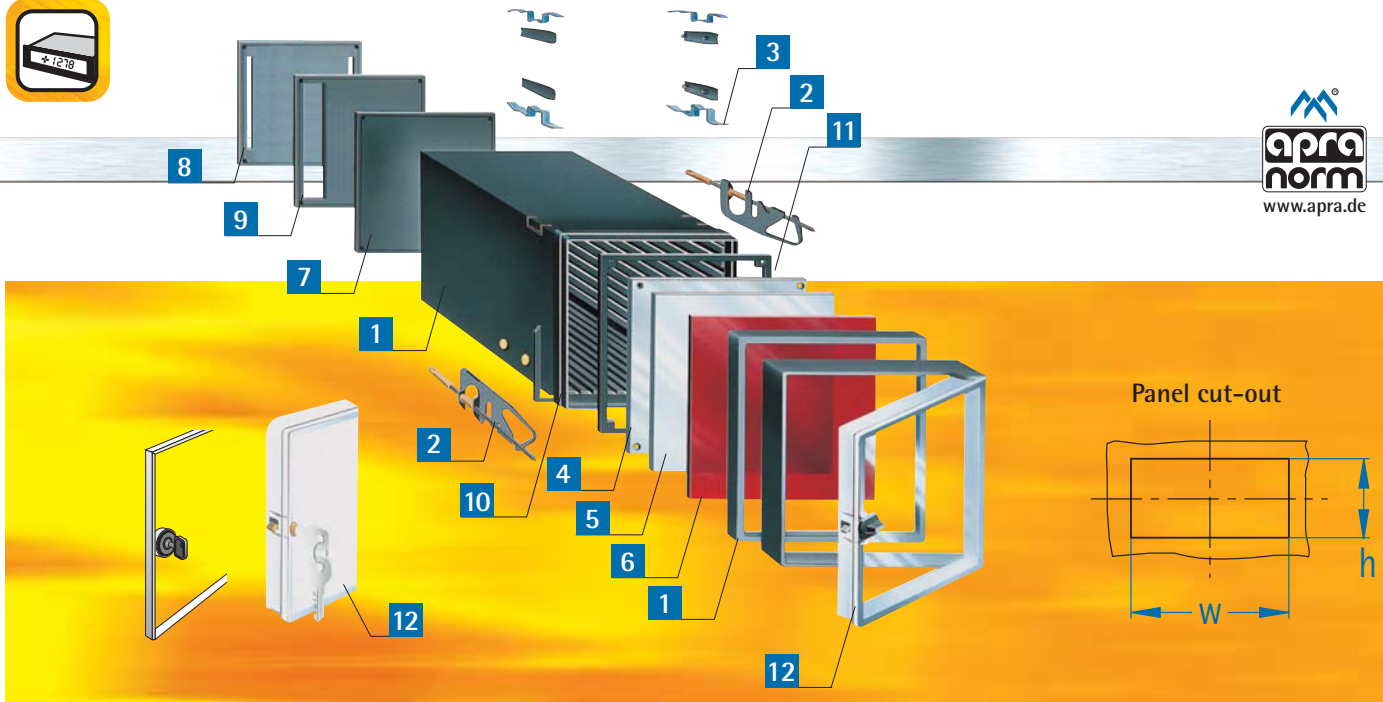


Technical information

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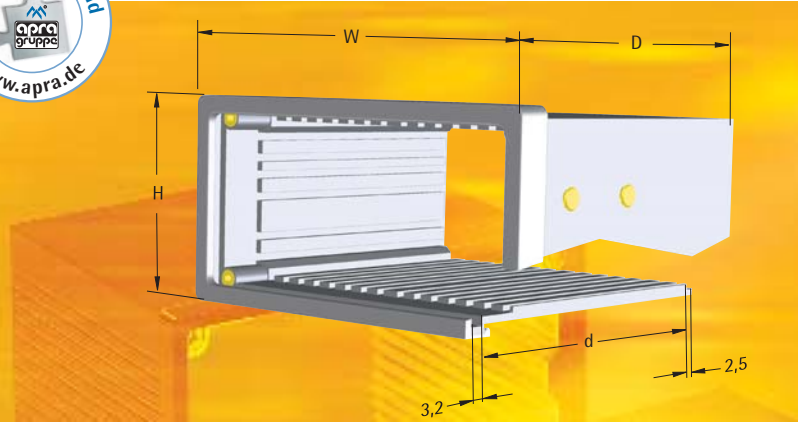
Tel.: +49 (0)  
65 92 204-0



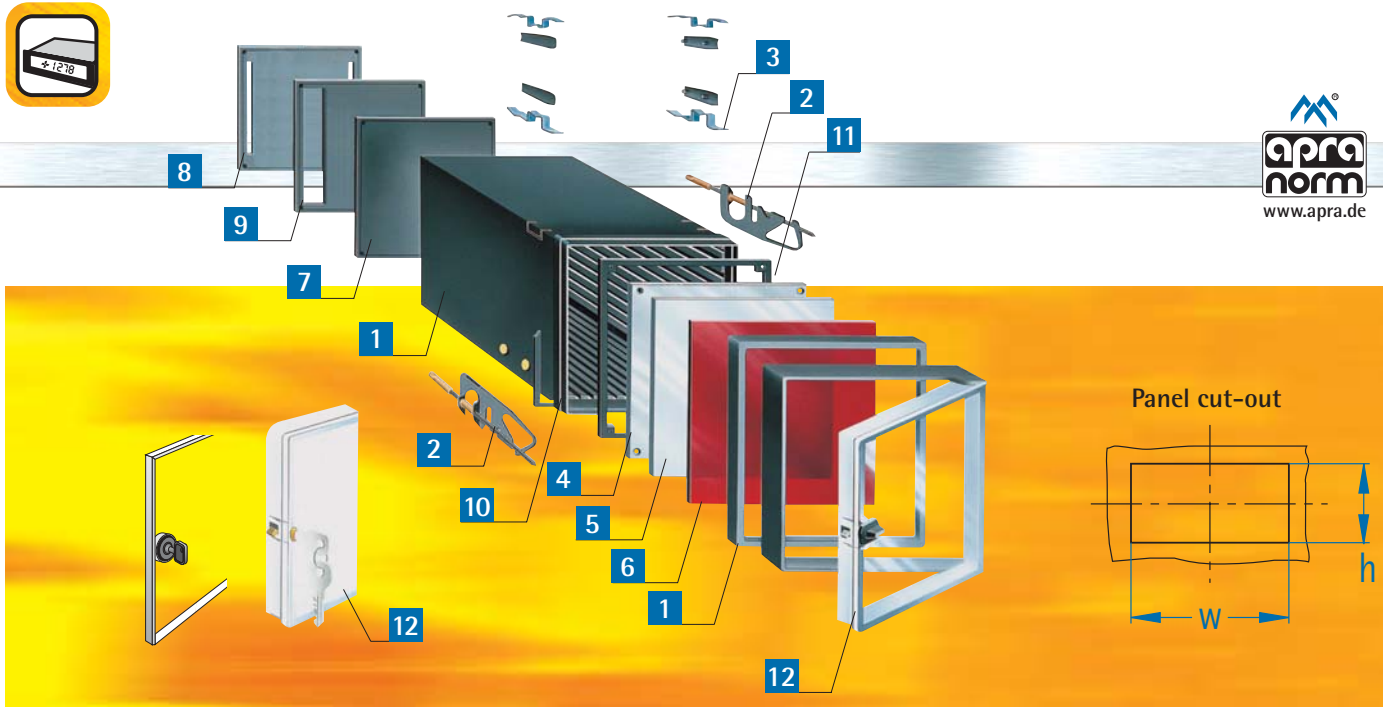
W mm	H mm	D (approx.) mm	d (approx.) mm	Case (acc. to IEC 61554)		Fixing clamp (choice)	Panel Clip Case		Cover plate Aluminium 1,5 mm	
				Standard	with corner webs		Standard	with corner webs		
				1a (p.14)	1b (p.14)	2 (p.14)	3a (p.15)	3b (p.15)	4 (p.15)	
<b>48 x 24</b>										
		60,0	53,0	445-440	-	440-001	441-440	-	-	
		82,5	75,5	445-441	-	440-005	441-441	-	-	
		107,0	100,0	445-444	-	440-019	441-444	-	-	
<b>48 x 48</b>										
		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	
<b>72 x 24</b>										
		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	-	-	
<b>72 x 36</b>										
		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



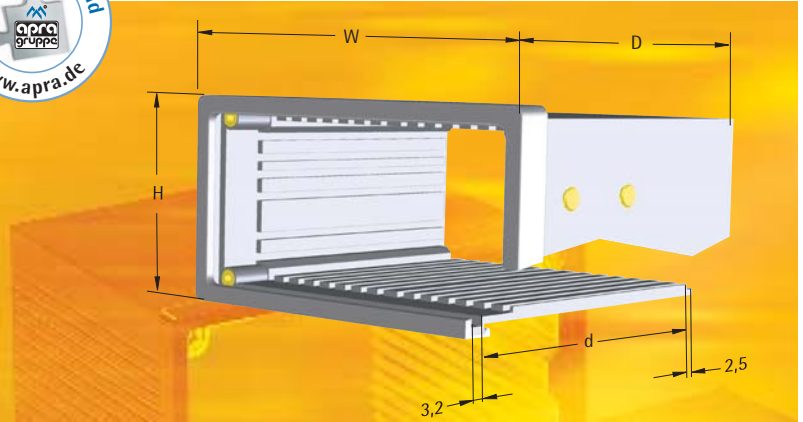
Panel Aluminium 1,5 mm	Filter screen Plexiglas® red: - 09 Makrolon® transparent: -05	Rear panel			Sealing		Transparent door with frame	
		closed	with slots	for terminals	between case and panel	behind front panel	with lock	with sash fastener
5 (p.15)	6 (p.15)	7	8	9	10	11	12 (p.16)	12 (p.16)
445-451	445-452-xx	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	-	-
445-131	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	-	-	-



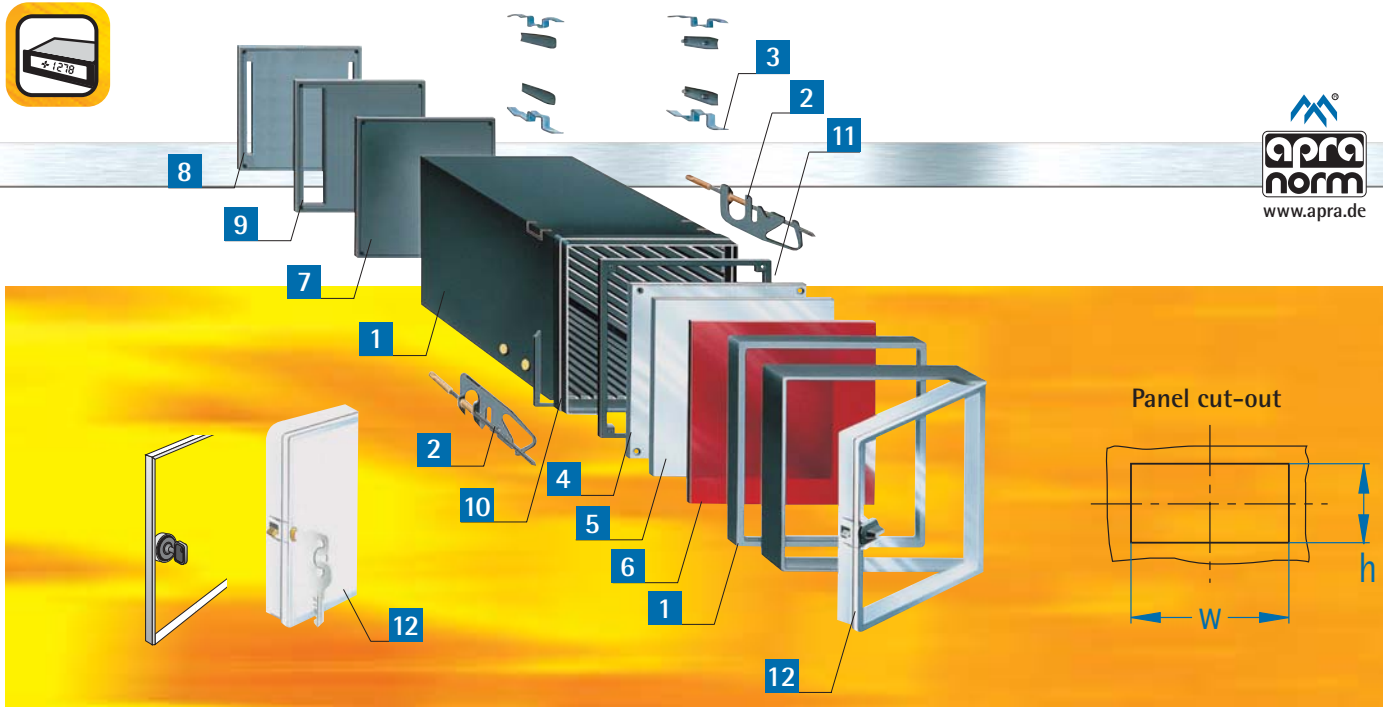
W mm	H mm	D (approx.) mm	d (approx.) mm	Case (acc. to IEC 61554)		Fixing clamp (choice)	Panel Clip Case		Cover plate Aluminium 1,5 mm	
				Standard	with corner webs		Standard	with corner webs		
				<b>1a</b> (p.14)	<b>1b</b> (p.14)	<b>2</b> (p.14)	<b>3a</b> (p.15)	<b>3b</b> (p.15)	<b>4</b> (p.15)	
<b>72 x 48</b>										
	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		
<b>72 x 72</b>										
	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		
<b>96 x 24</b>										
	60,5	53,5	445-100	-	440-001 440-005 440-019	441-100	-	-		
	82,5	75,5	445-101	-		441-101	-	-		
	116,5	109,5	445-102	-		441-102	-	-		
	107,0	100,0	445-104	-		441-104	-	-		
<b>96 x 48</b>										
	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	closed	Rear panel with slots	for terminals	Sealing		Transparent door with frame	
		7	8	9	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
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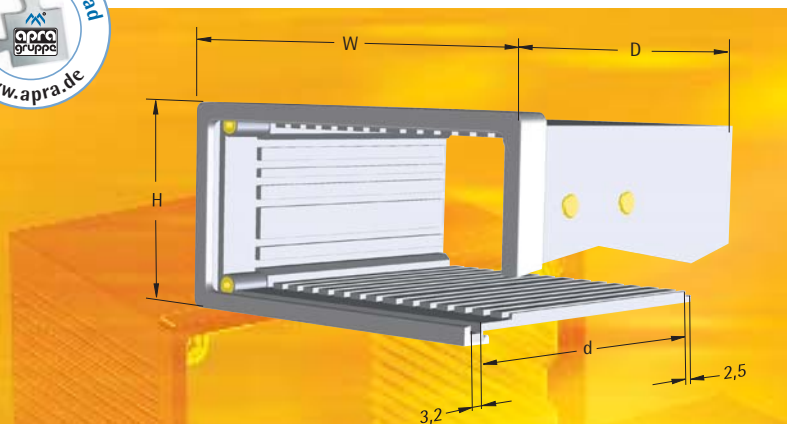


W mm	H mm	D (approx.) mm	d (approx.) mm	Case (acc. to IEC 61554)		Fixing clamp (choice)	Panel Clip Case		Cover plate Aluminium 1,5 mm	
				Standard 1a (p.14)	with corner webs 1b (p.14)		Standard 3a (p.15)	with corner webs 3b (p.15)		
<b>96 x 48</b>										
	60,5	53,5	445-760	445-760-30	440-001 440-005 440-019	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		
<b>96 x 72</b>										
	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		
<b>96 x 96</b>										
	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		
<b>144 x 48</b>										
	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		

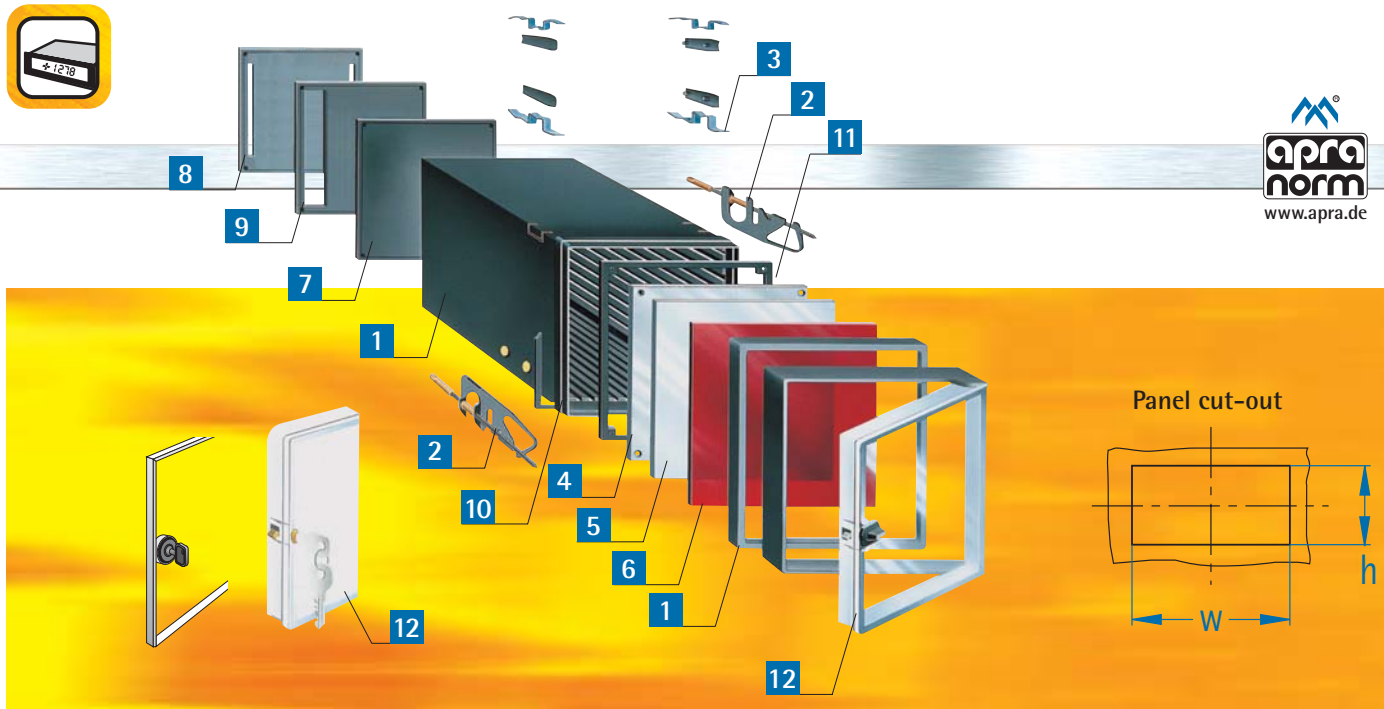




Case size		Panel cut-out			
W	H	w	perm. dev.	h	perm. dev.
mm	mm	mm	mm	mm	mm
96	48	92	+ 0.8	45	+ 0.6
96	72	92	+ 0.8	68	+ 0.7
96	96	92	+ 0.8	92	+ 0.8
144	48	138	+ 1.0	45	+ 0.6



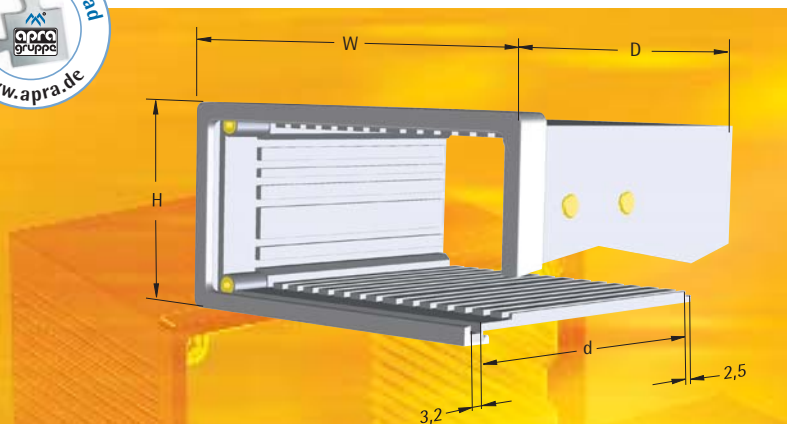
Panel Aluminium 1,5 mm	Filter screen Plexiglas® red: - 09 Makrolon® transparent: -05	closed	Rear panel		Sealing		Transparent door with frame	
		with slots	for terminals	between case and panel	behind front panel	with lock	with sash fastener	
5 (p.15)	6 (p.15)	7	8	9	10	11	12 (p.16)	12 (p.16)
445-171	445-172-xx	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
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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
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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
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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	-	-
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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)		
<b>144 x 72</b>										
		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	
<b>144 x 96</b>										
		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	
<b>144 x 144</b>										
		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	
<b>192 x 72</b>										
		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	

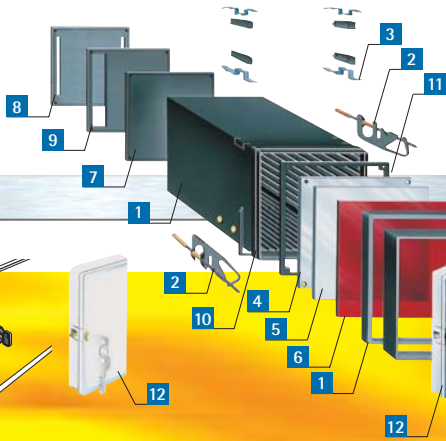


Case size		Panel cut-out			
W	H	w	perm. dev.	h	perm. dev.
mm	mm	mm	mm	mm	mm
144	72	138	+ 1.0	68	+ 0.7
144	96	138	+ 1.0	92	+ 0.8
144	144	138	+ 1.0	138	+ 1.0
192	72	186	+ 1.1	68	+ 0.7

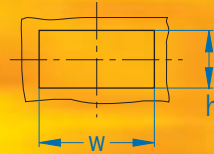


Panel Aluminium 1,5 mm	Filter screen Plexiglas® red: - 09 Makrolon® transparent: -05	closed	Rear panel with slots	for terminals	Sealing		Transparent door with frame	
		7	8	9	between case and panel	behind front panel	with lock	with sash fastener
5 (p.15)	6 (p.15)				10	11	12 (p.16)	12 (p.16)
445-271	445-272-xx	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	<b>Available rear panels for size 144x144:</b>			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	• <b>NEW:</b> 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	-	-





Panel cut-out

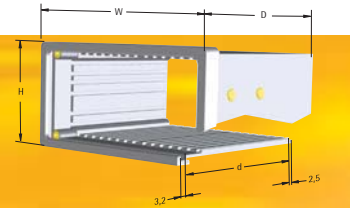


W mm	H mm	D (approx.) mm	d (approx.) mm	Case (acc. to IEC 61554)		Fixing clamp (choice)	Panel Clip Case		Cover plate Aluminium 1,5 mm	
				Standard	with corner webs		Standard	with corner webs		
				1a (p.14)	1b (p.14)	2 (p.14)	3a (p.15)	3b (p.15)	4 (p.15)	
<b>192 x 96</b>										
		60,5	53,5	445-340	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	
<b>192 x 144</b>										
		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	
<b>288 x 72</b>										
		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	
<b>288 x 96</b>										
		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	
<b>288 x 144</b>										
		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!

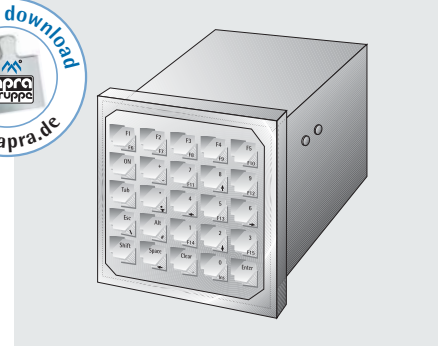
**2 Fixing clamps**

- 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

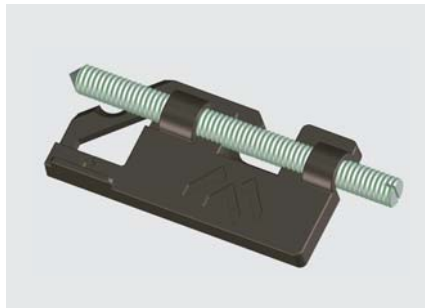
**2b Heavy-duty fixing clamp**



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

**Order no.**  
443-002

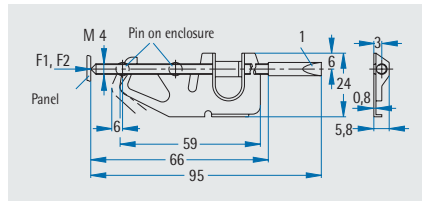
**2c Model B Miba (acc. to DIN 43835)**



- light-weight plastic construction
- M4 threaded rod

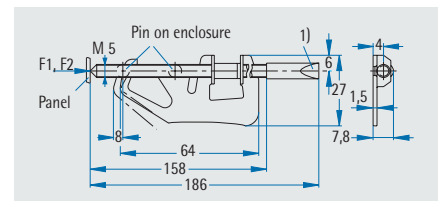
**Order no.**  
440-019

**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

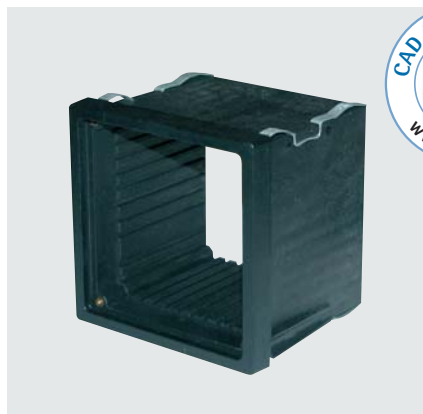
- patented by apra-norm
- fixing clamps are eliminated
- simple attachment by clipping it into the panel

**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

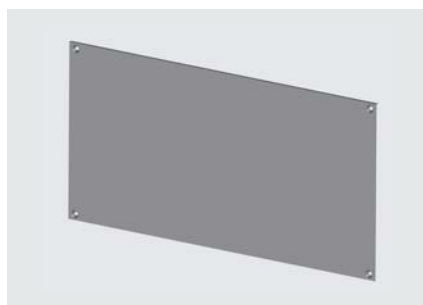
- front panels with 4 mounting holes
- mounting material included

**Material:**

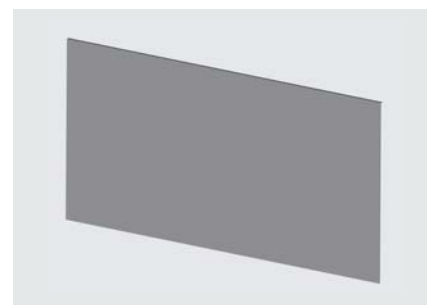
Aluminium 1,5 mm, anodised

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

### 4 Cover plate



### 5 Front panel



### 6 Filter screens

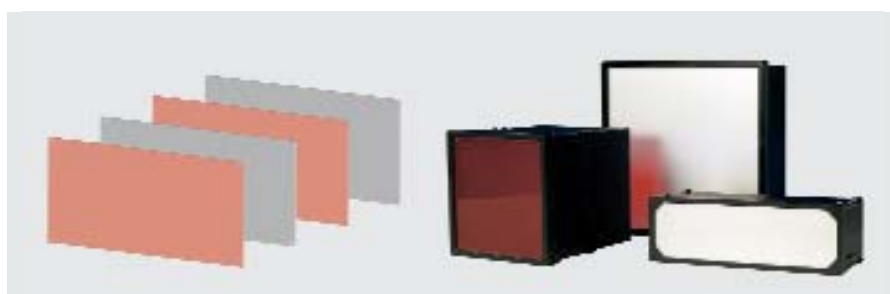
- with or without mounting holes

**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

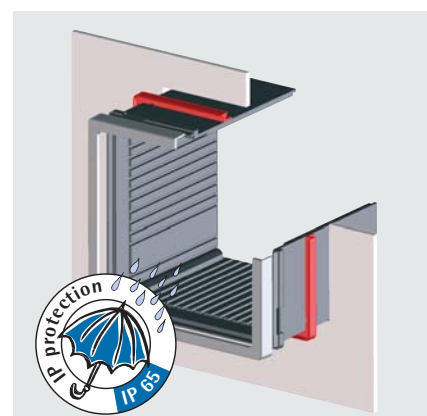
**Material:** SEPS

**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

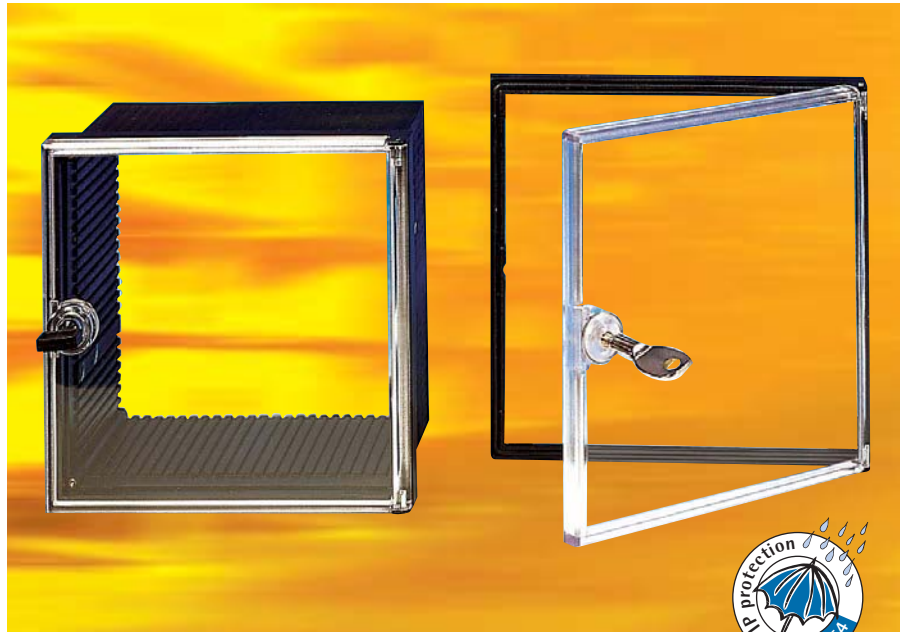
- for panel instrument cases acc. to IEC 61554
- can be mounted to the enclosure instead of a front frame
- high fitting accuracy and perfect sealing
- clear, high-quality glass
- high-grade materials ensure optimal impact strength and dimensional stability even in extreme temperatures.

**Material:**

Polycarbonate, listed acc. to UL 94 V-0

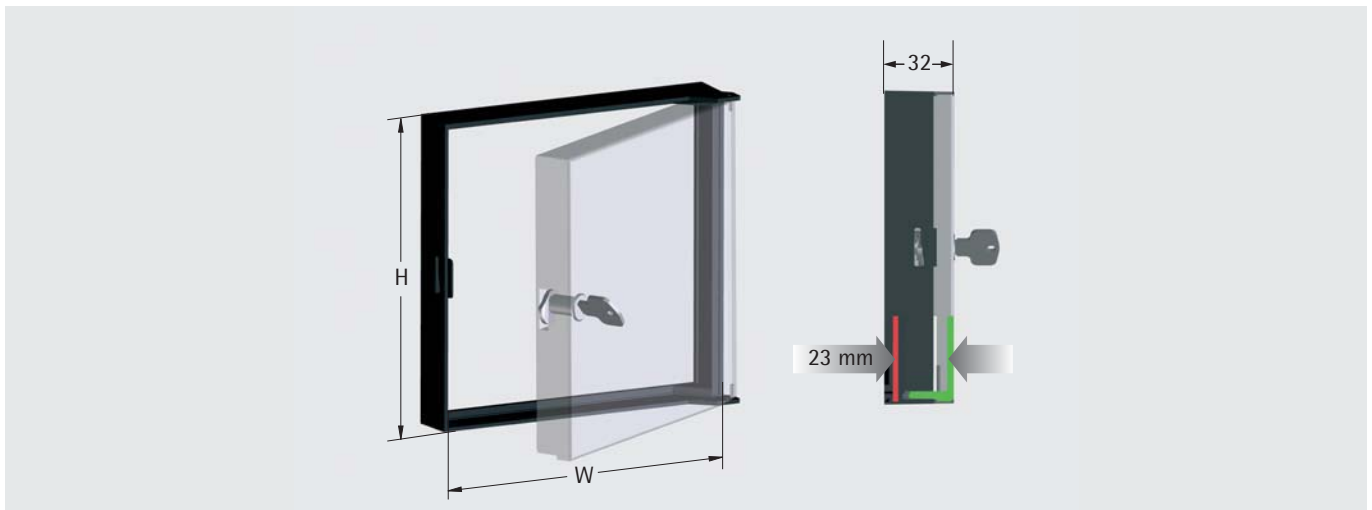
**Degree of protection:**

IP 54



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

**A** Transparent door with frame



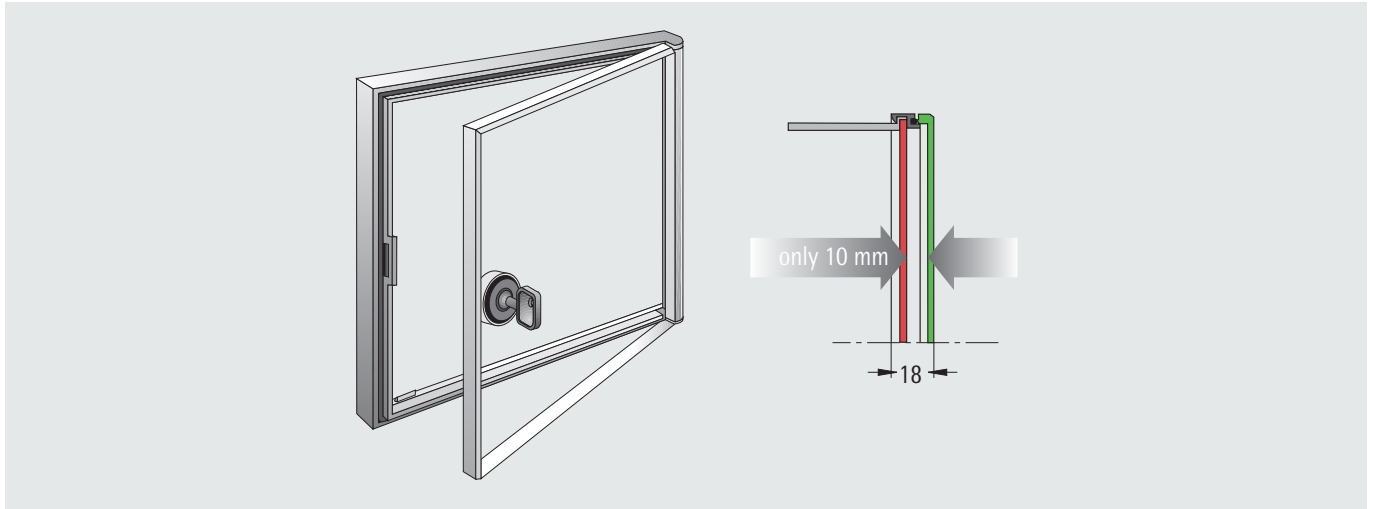
clear height between front panel and inside of the door = 23 mm

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

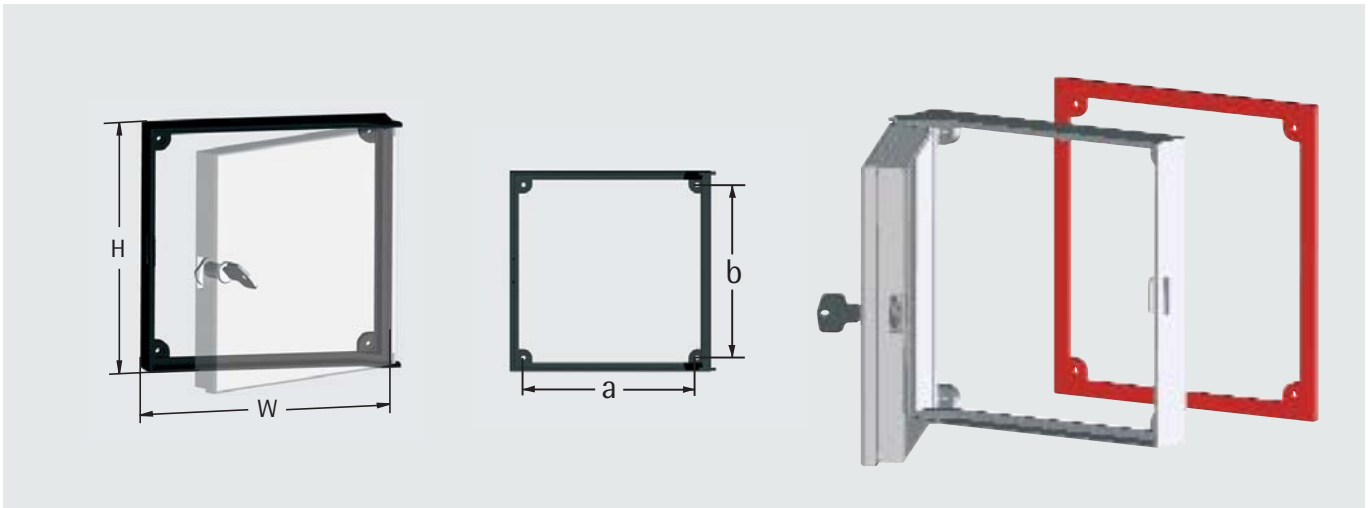
**Degree of protection:**  
IP 54

Other sizes on request. Please ask us!





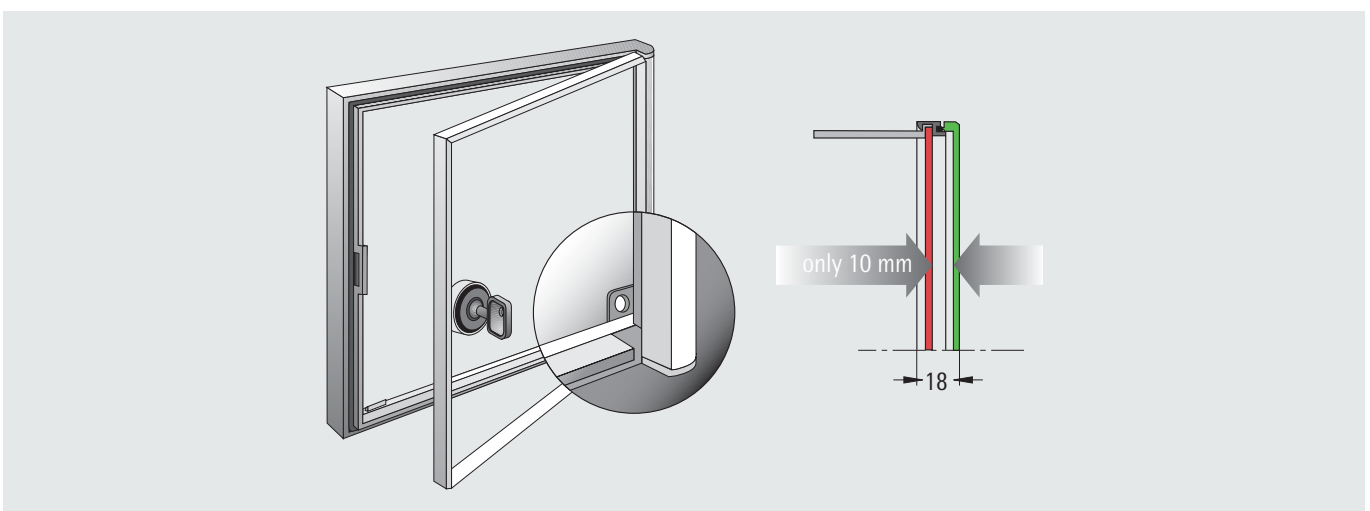
**A** Transparent door with mounting brackets



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

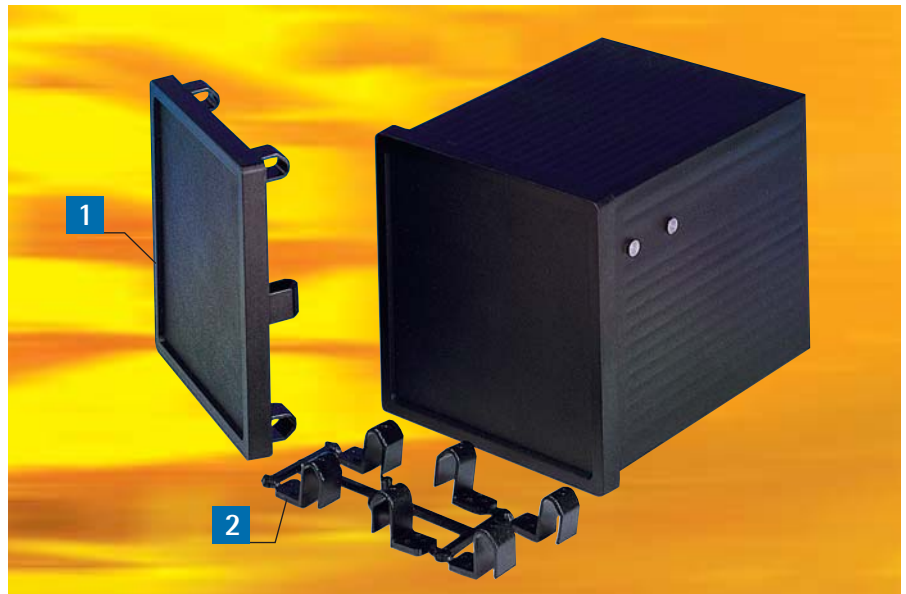


### Blind cover

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

#### Material:

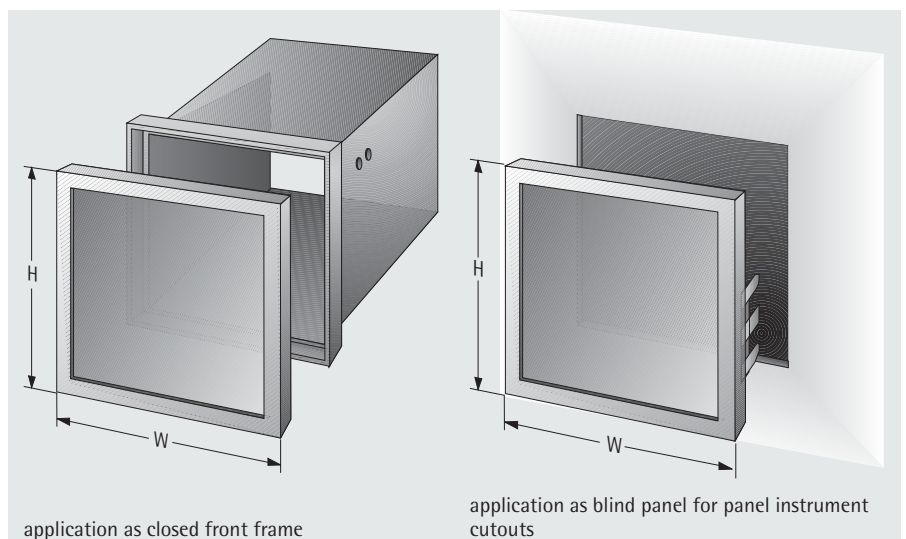
Lexan 141R, 701 black



### 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

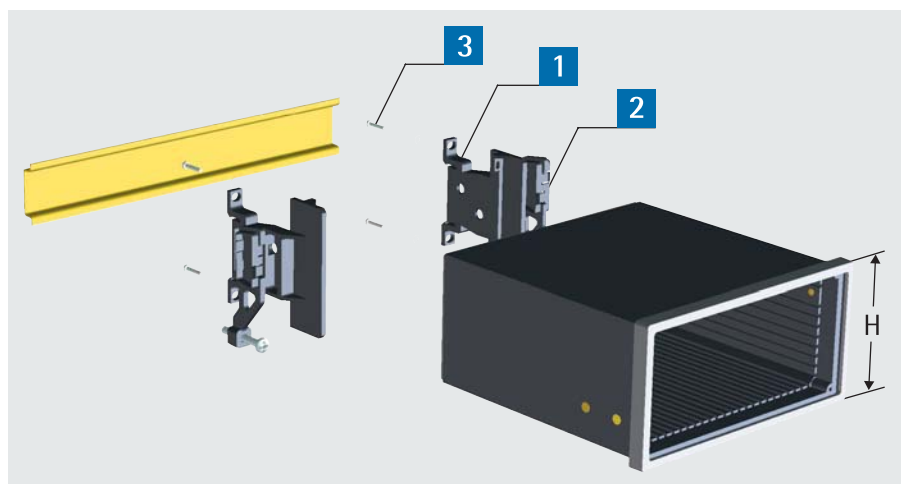
Just call us: +49 (0) 65 92 / 204-0  
We will be pleased to advise you!



### 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

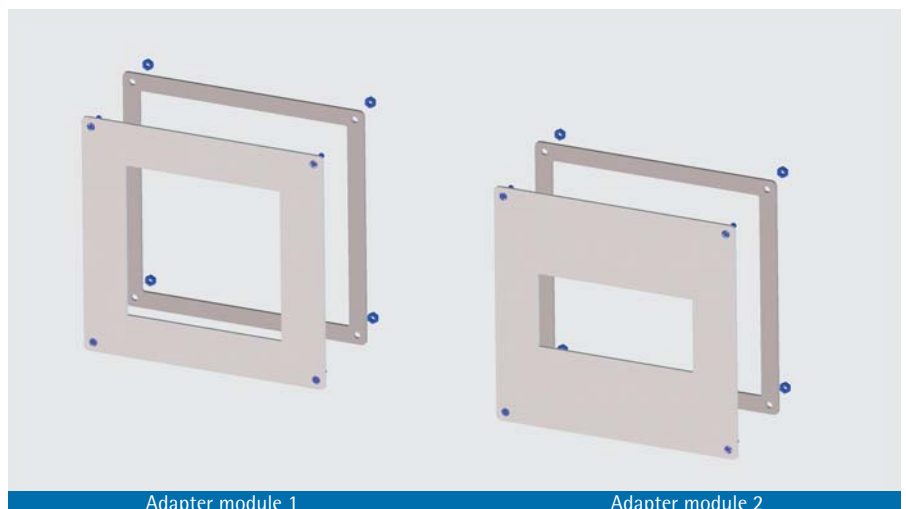
for enclosure height H mm	Complete set	1 Adapter, individual	2 Fixing clamp for adapter, individual
48	445-701-00	445-701-01	445-710-00
72	445-702-00	445-702-01	445-710-00
96	445-703-00	445-703-01	445-710-00
144	445-704-00	445-704-01	445-710-00

### 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

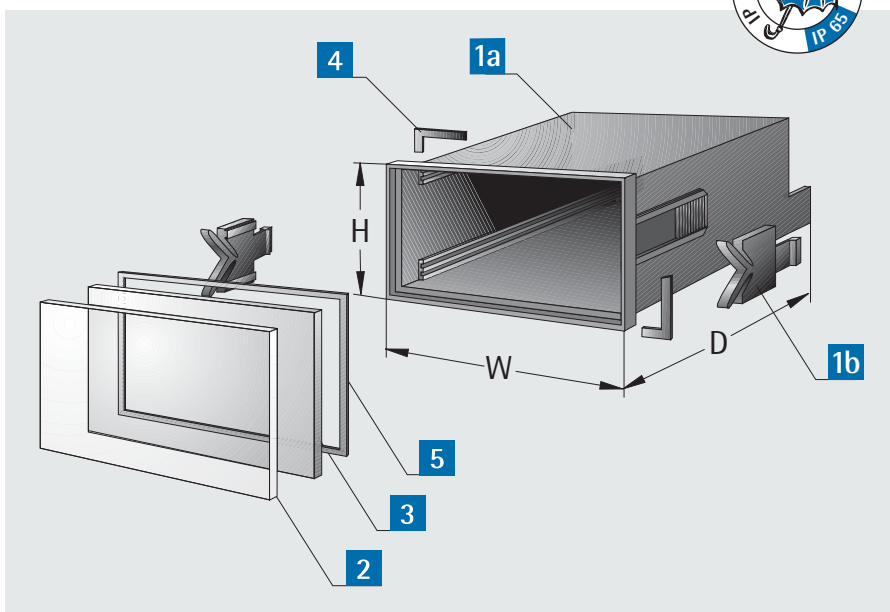
**Material:**

Case: Cycoloy 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

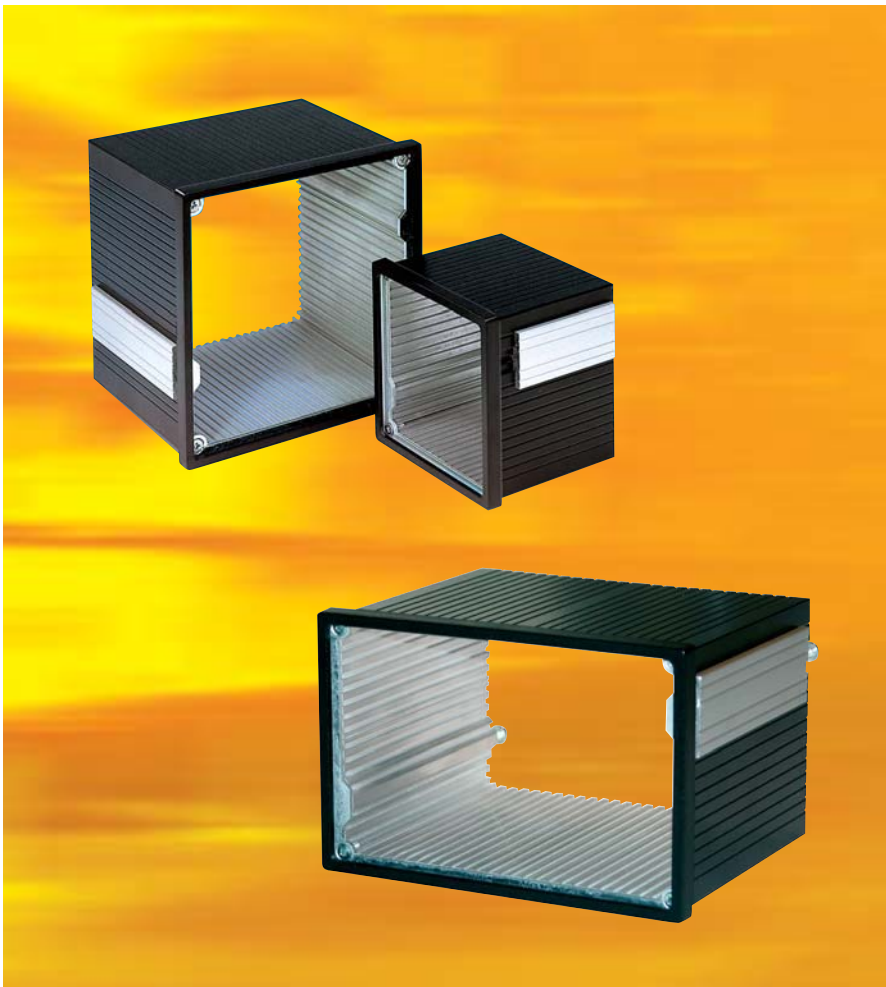
Item	Pc.	Description
1	1	Case
2	2	Hook-in fixing



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



## 442 • Aluminium panel instrument case



### 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

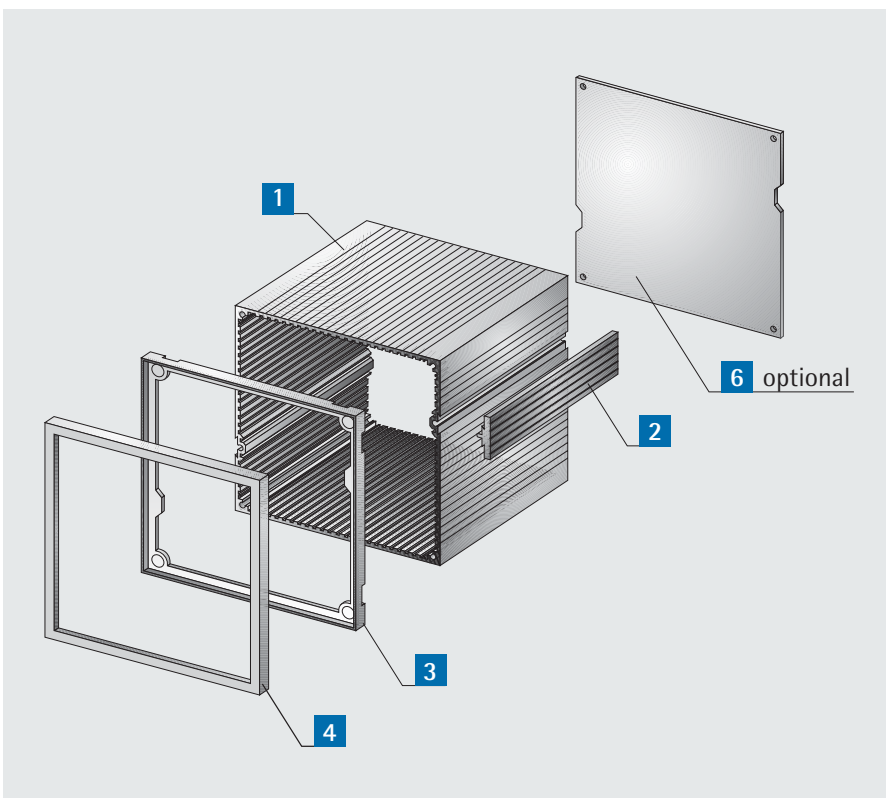
Front / rear panel: exterior anodized,

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 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

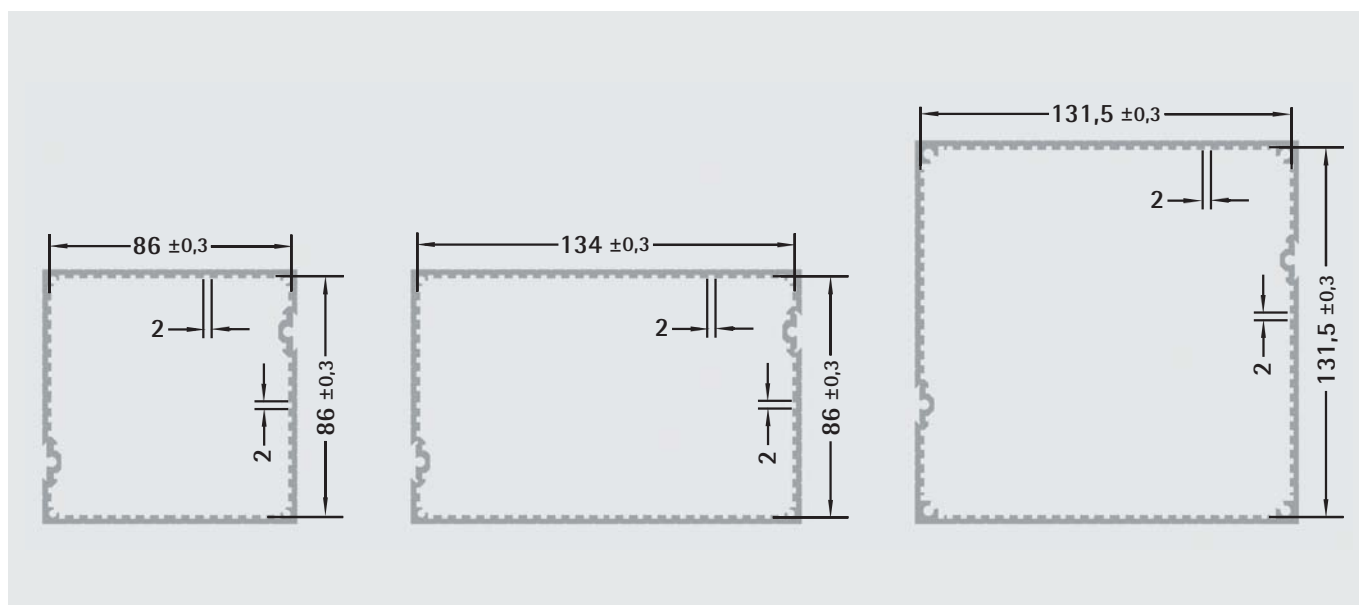
## Aluminium panel instrument case 144 x 96 (W x H)

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

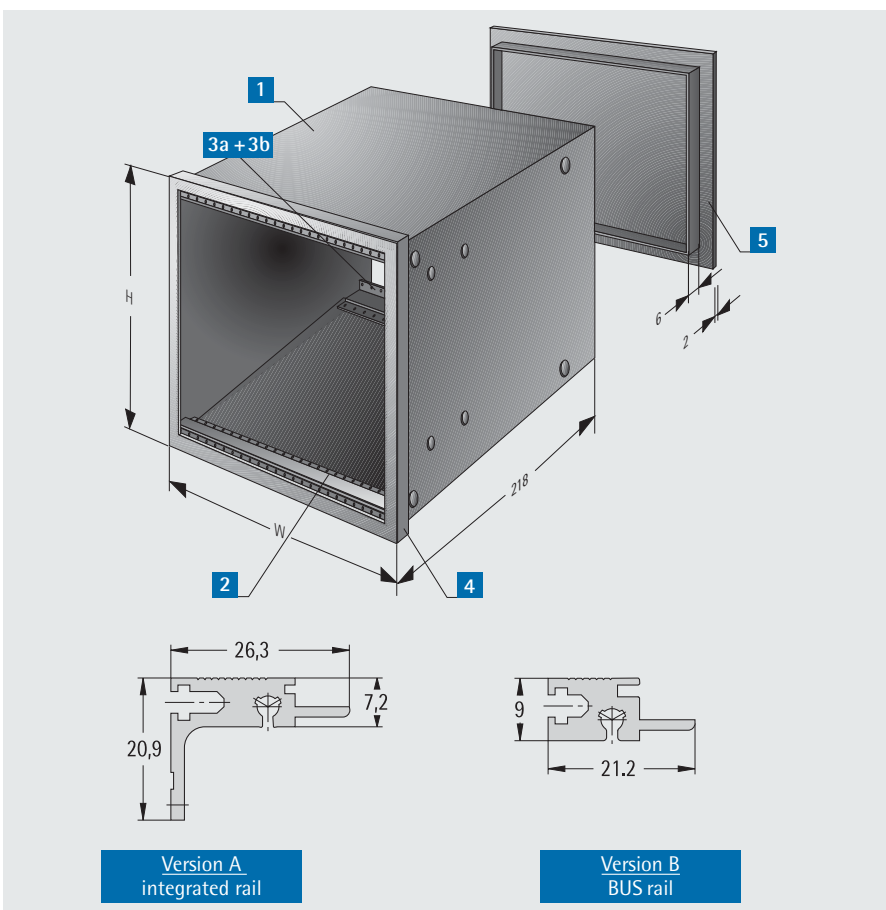


### Plastic panel instrument case with 19" plug-in system

- 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 <b>A</b> and <b>B</b> )
3a	(2)	Rear: integrated module rails, 32 pole acc. to DIN 41612 (type <b>A</b> only)
3b	(2)	Rear: module rails „BUS“ model, with threaded strips M2.5 (type <b>B</b> only)
4	1	Front frame
5	1	Rear panel, snap-in
6	(4)	Card guides (without fig.) (only types <b>A</b> and <b>B</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

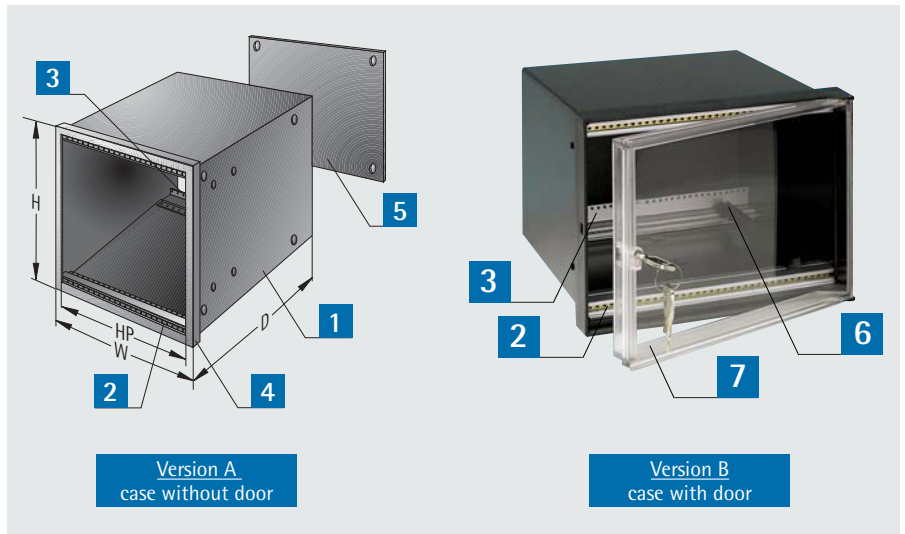
### Degree of protection:

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 <b>A</b> and <b>B</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 <b>A</b> and <b>B</b> )
4	1	Front frame
5	1	Rear panel with 4 screws
6	(2)	Card guides 160 mm (only types <b>A</b> and <b>B</b> )
7	(1)	Transparent door with lock (only type <b>B</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

<b>Order no.</b>
443-001

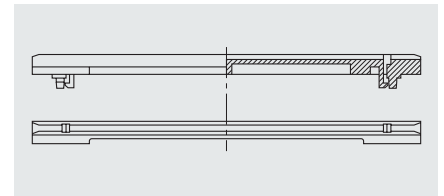
### Heavy-duty fixing clamp



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

<b>Order no.</b>
443-002

### Card guide

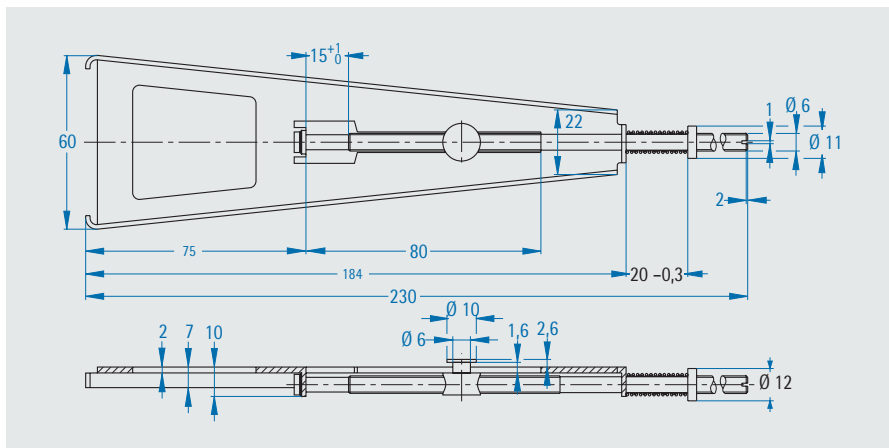


- for 160 mm / 220 mm long cards
- flammability tested acc. to UL 94 V-0

#### Material:

Valox DR 48 - 8233

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

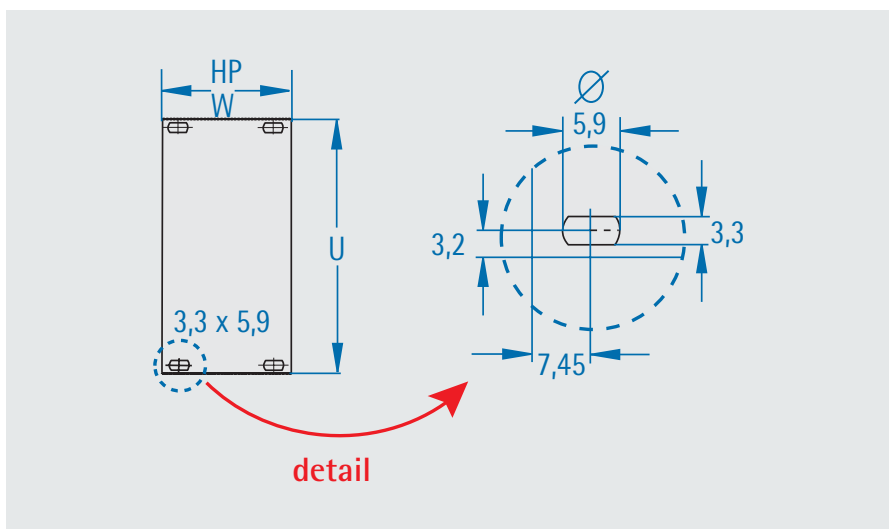


### Mounting element acc. to DIN 43834

- for heavy plug-in units, etc.

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

<b>Order no.</b>
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



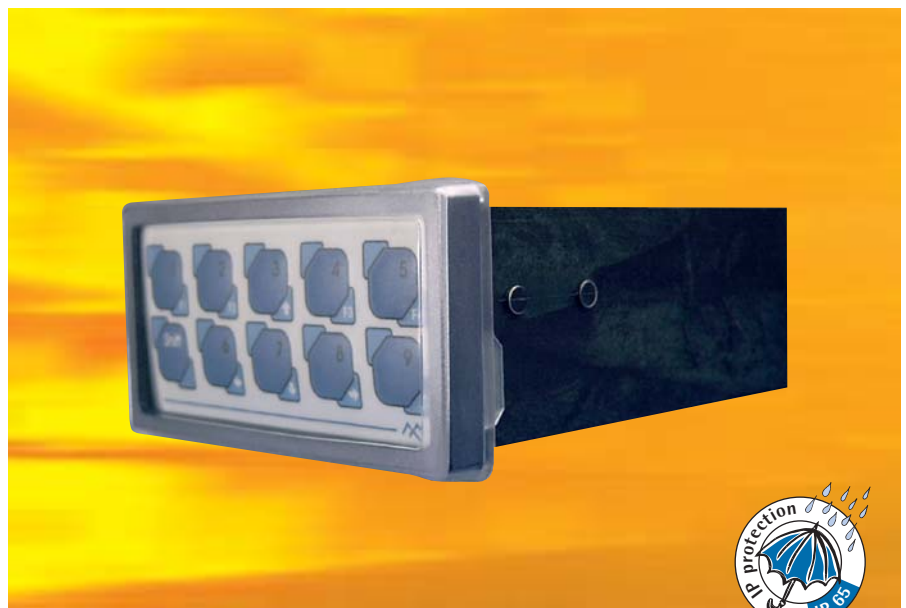
## Transparent cover

- 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/cm<sup>3</sup>

### Electrical properties

**Electric resistivity**  
as per IEC 93 ..... >10<sup>15</sup> 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



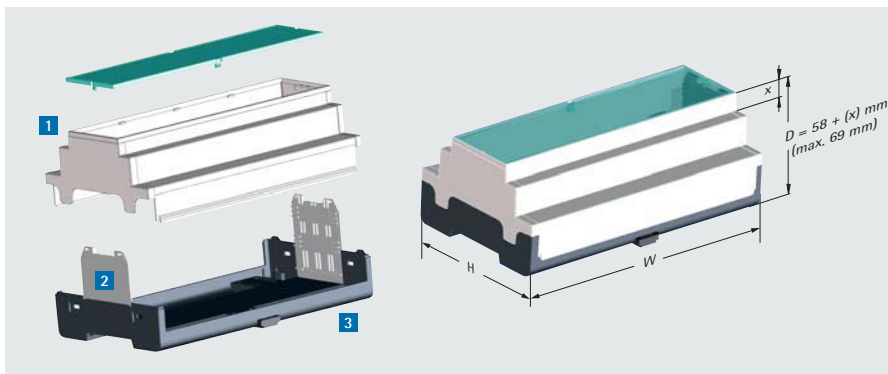
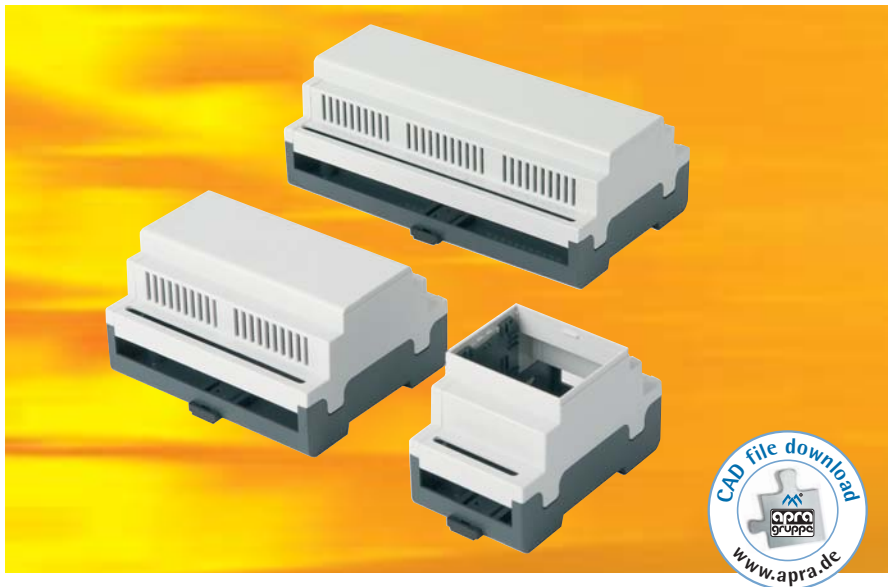
# Enclosure system **apra Rail**



... the perfect shell for valuable electronics



## 449 • Enclosure system apra Rail DB



### 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](http://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 58mm  
(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:

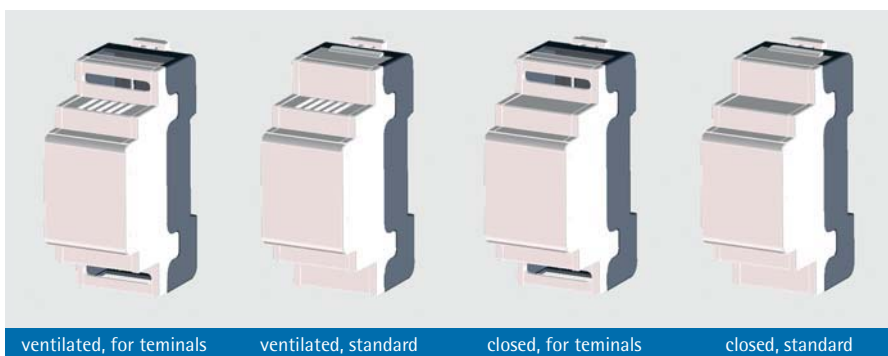
Polycarbonate UL 94 V-0

#### Finish:

Top shell: RAL 7035 light grey

Bottom shell: RAL 7016 anthracite grey

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



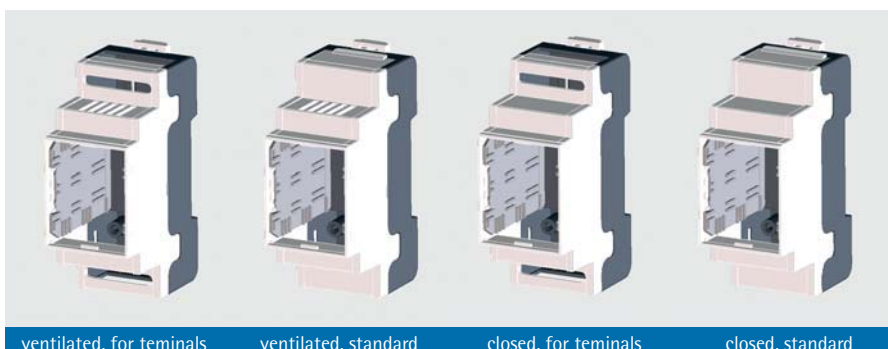
ventilated, for terminals

ventilated, standard

closed, for terminals

closed, standard

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



ventilated, for terminals

ventilated, standard

closed, for terminals

closed, standard

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

#### Delivery

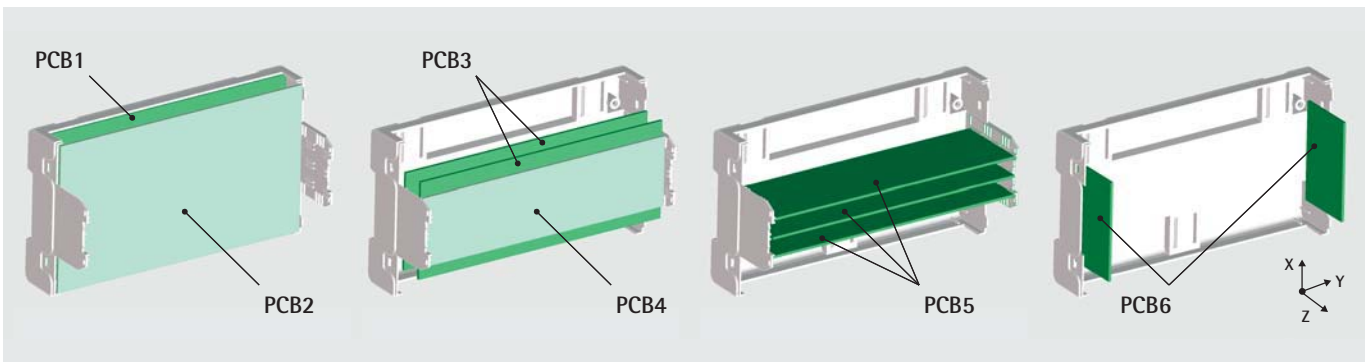
Item	Pc.	Description
1	1	apra Rail DB, consisting of top and bottom shell
2	2	PCB fixing
3	2/3	mounting clips



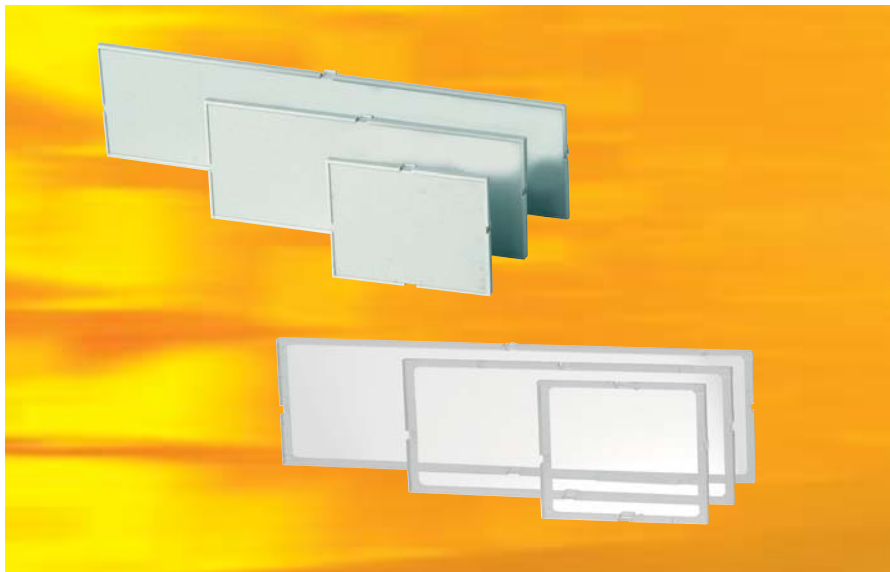


No. of modules	closed, ventilated for terminals	closed, ventilated standard	closed, not ventilated for terminals	closed, not ventilated standard	open for front panel, ventilated for terminals	open for front panel, ventilated standard	open for front panel, not ventilated for terminals	open for front panel, 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

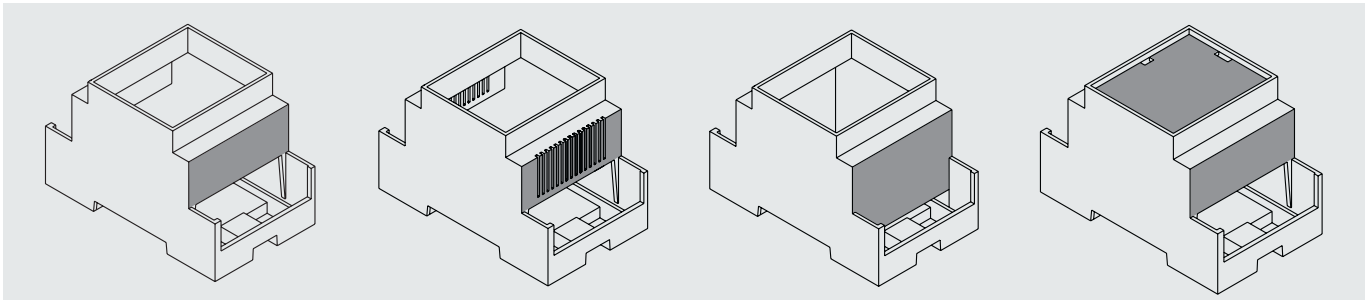
Accessories: see pages 39-40

#### Delivery

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

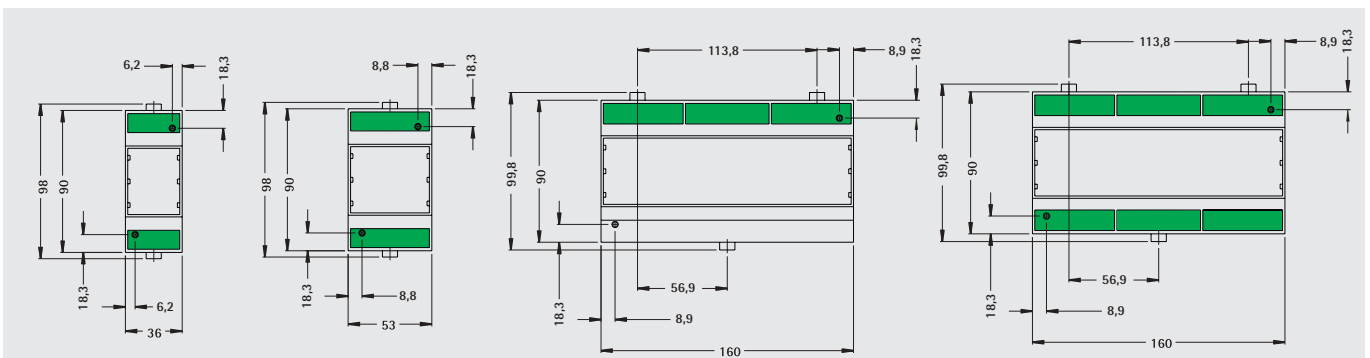


# Enclosure system apra Rail MB • 449

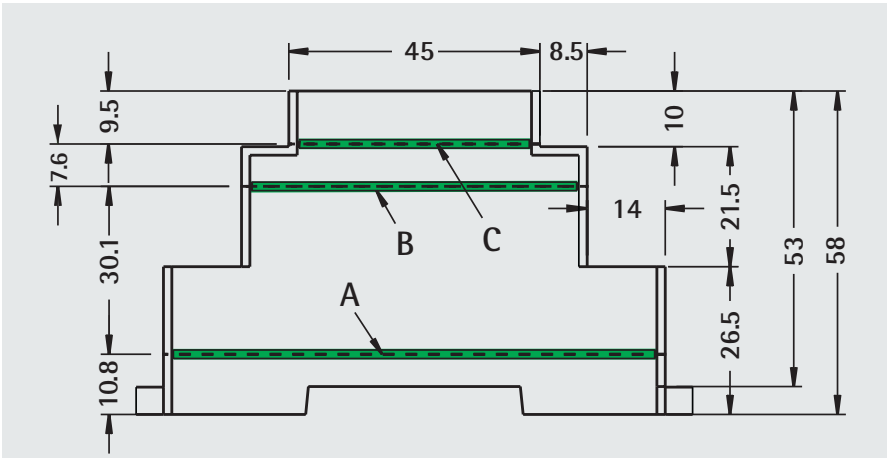


Type I: short side panel      Type II: short side panel, ventilated      Type III: long side panel      Type IV: short side panel with closed front

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



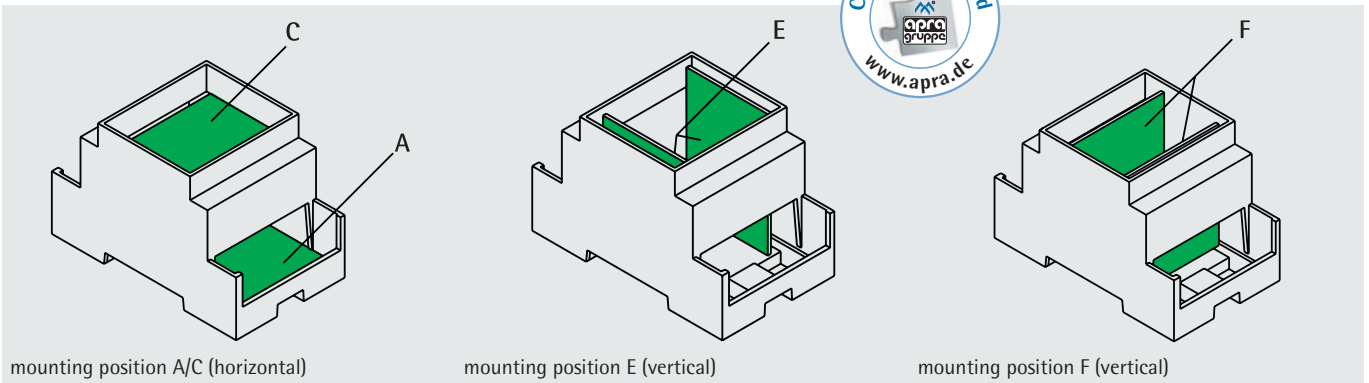
2 modules, 2 sides open      3 modules, 2 sides open      9 modules, 1 side open      9 modules, 2 sides open



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.

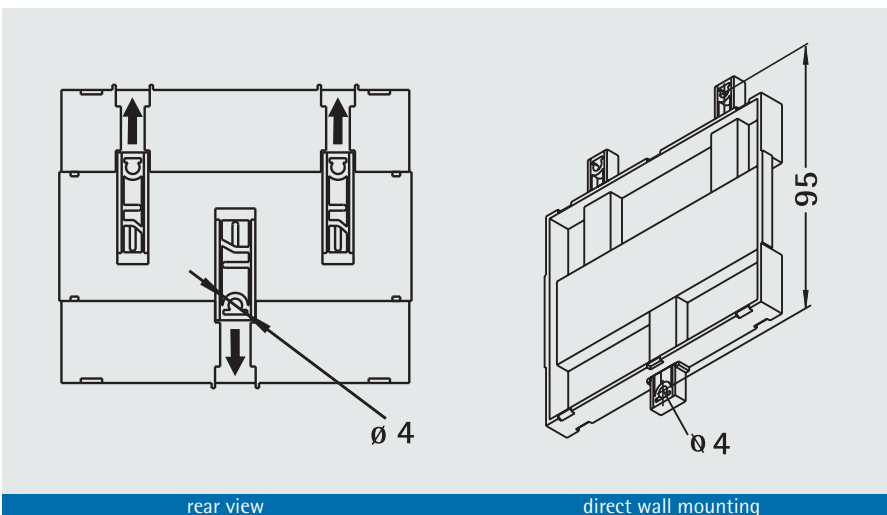


mounting position A/C (horizontal)

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

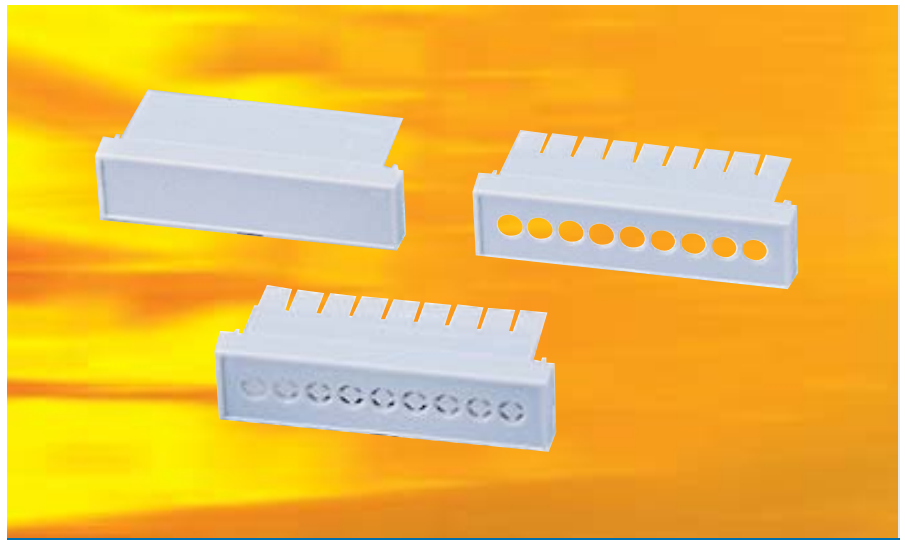


## apra Rail MB terminal cover

- 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

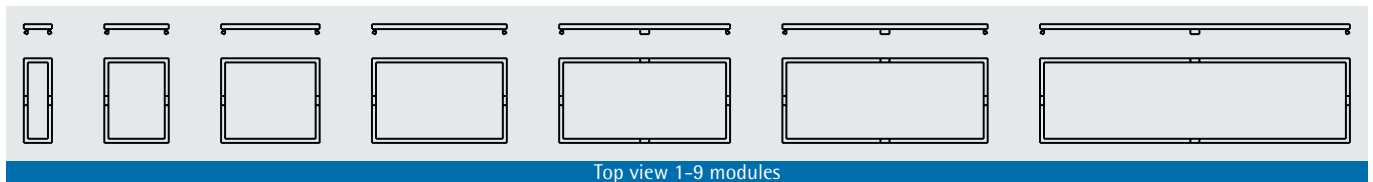
No. of modules	closed	open		perforated		open		open	
		contacts	grid 5,08 mm	contacts	grid 5,08 mm	contacts	grid 7,5 mm	contacts	grid 10,16 mm
1 module	449-110-09	3	449-110-06	3	449-110-05	2	449-110-07	2	449-110-08
2 modules	449-120-09	6	449-120-06	6	449-120-05	4	449-120-07	3	449-120-08
3/6/9 modules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

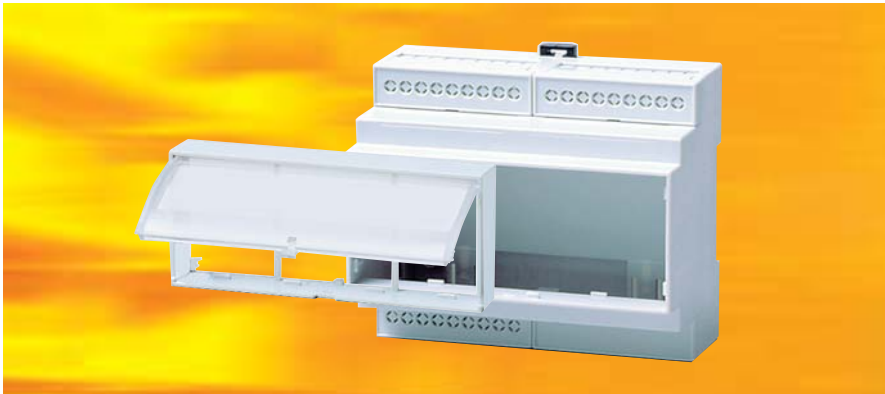
- can be clipped on enclosure
- 4 types available:
  - grey
  - red transparent
  - transparent
  - grey transparent
- foils can be integrated
- machining possible

### Material:

Polycarbonate



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

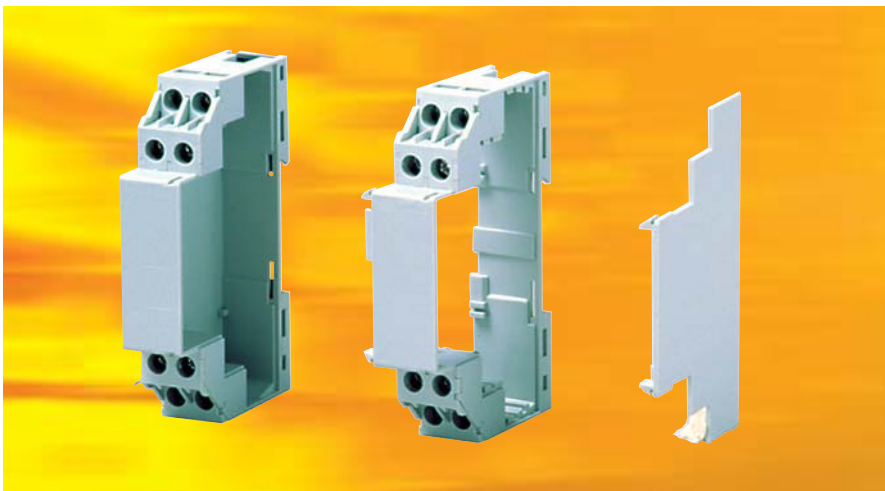


**apra Rail MB chamfered cover**

- 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

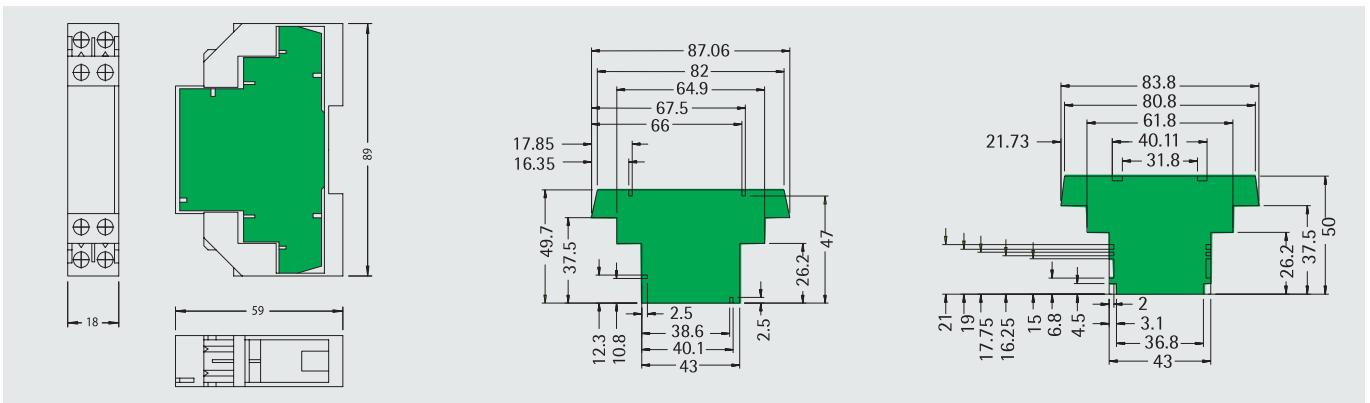


**apra Rail EMB**

- 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

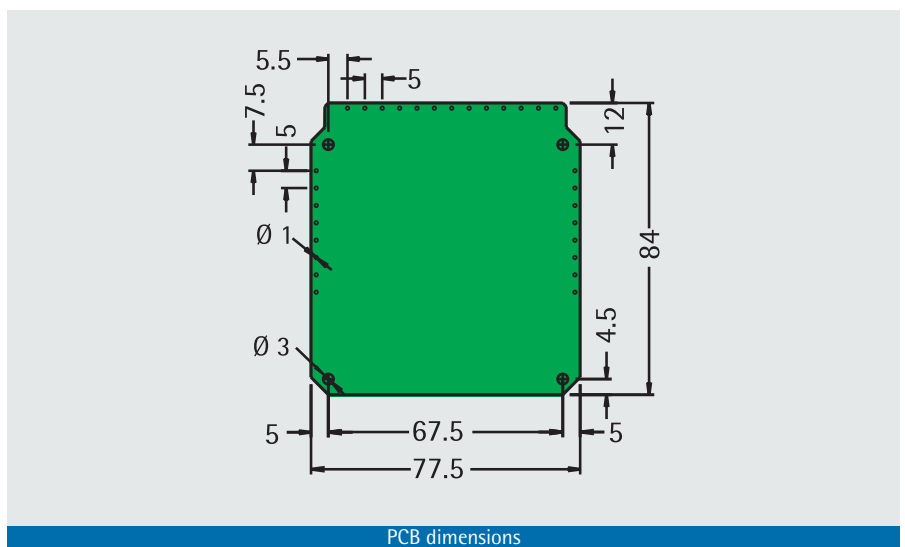
Description	W mm	Order no.
Basic enclosure	18	449-180-00
Extension set	18	449-180-10



**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



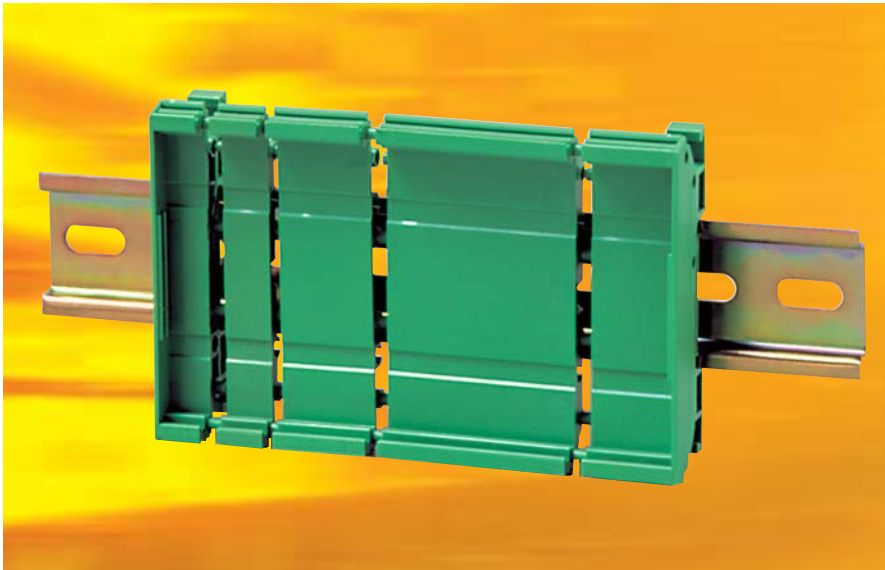
**Delivery**

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

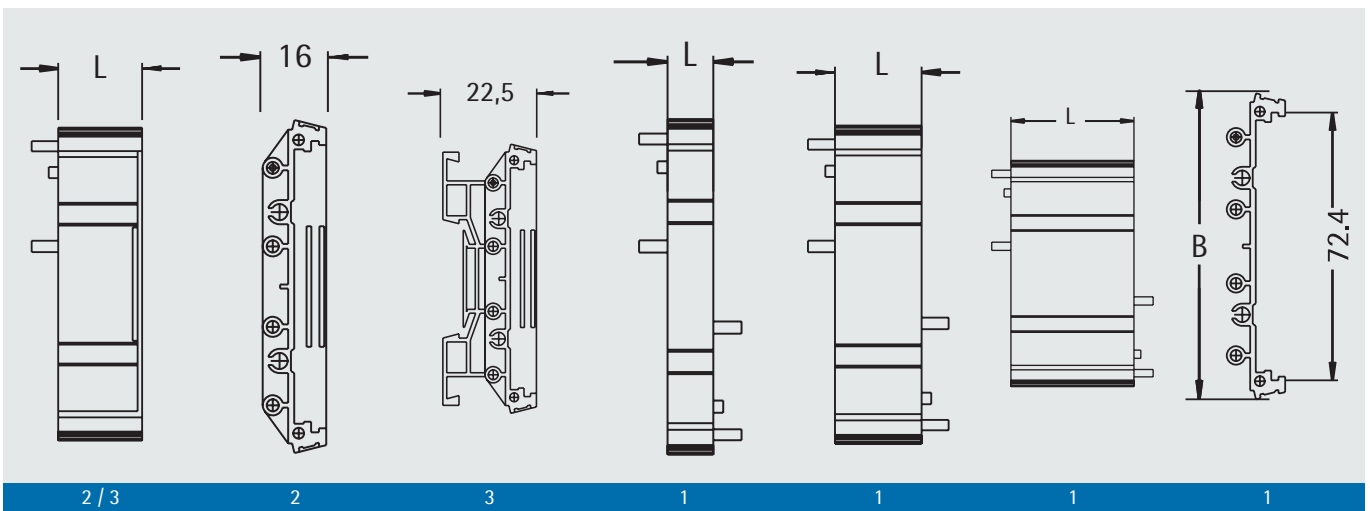


### apra Rail MIS 72 mm

- 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





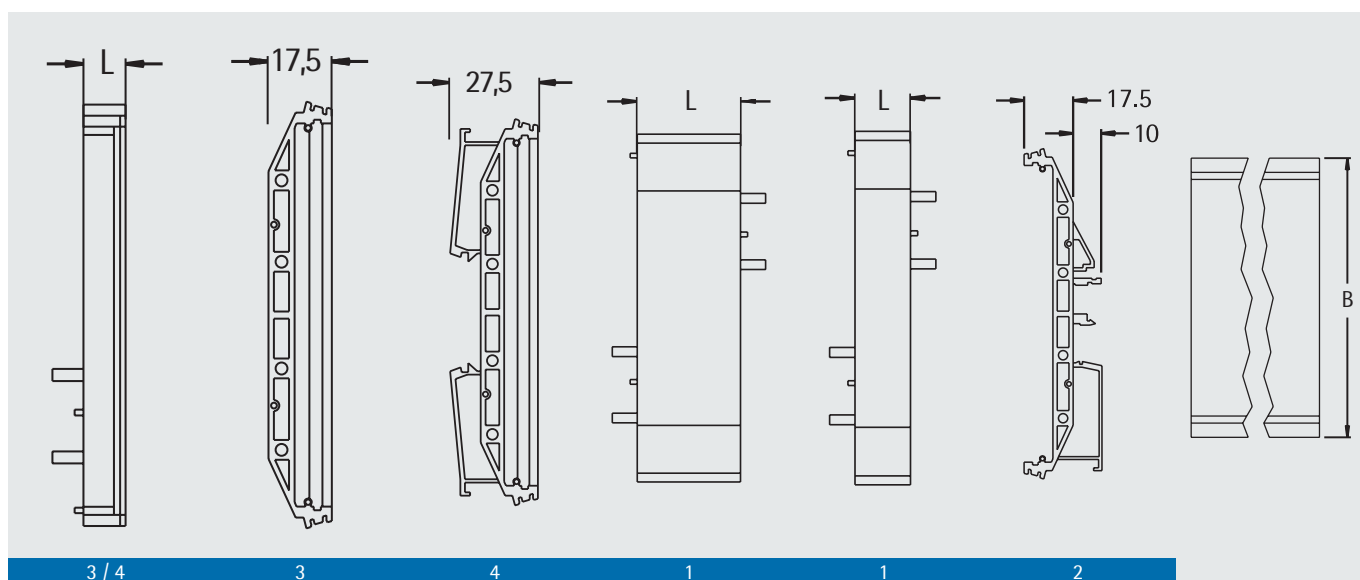
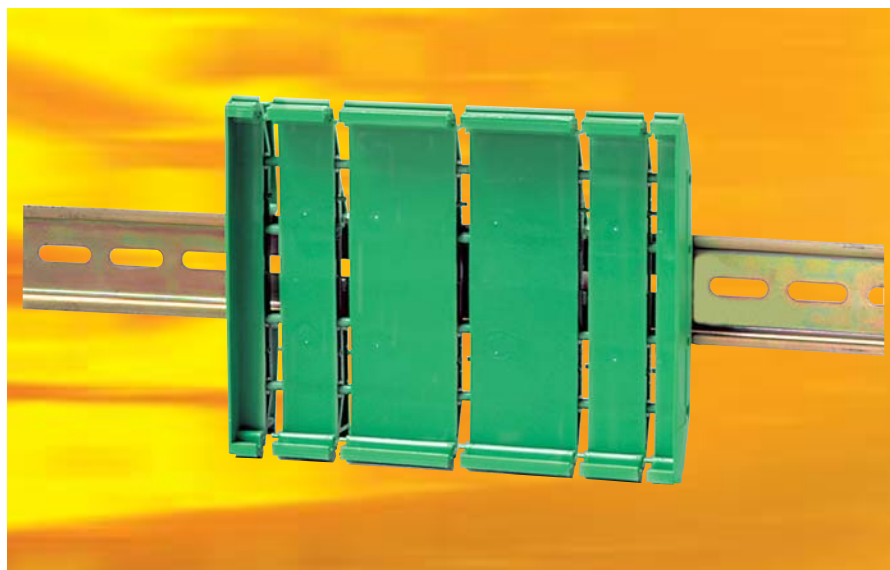


## apra Rail MIS 107 mm

- 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



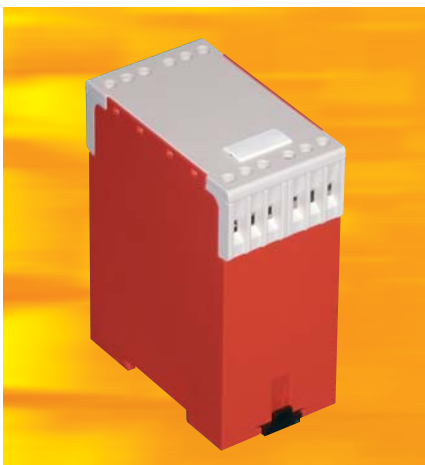
**apra Rail EIS 107 mm**

- 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

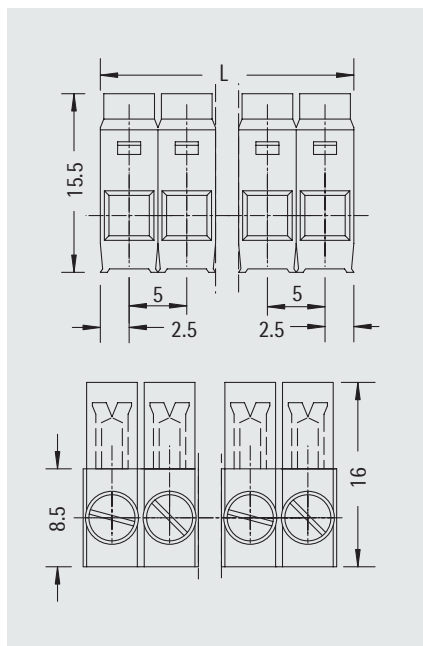
**Material:**  
Polycarbonate UL 94 V-0

Order no.
449-180-30



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

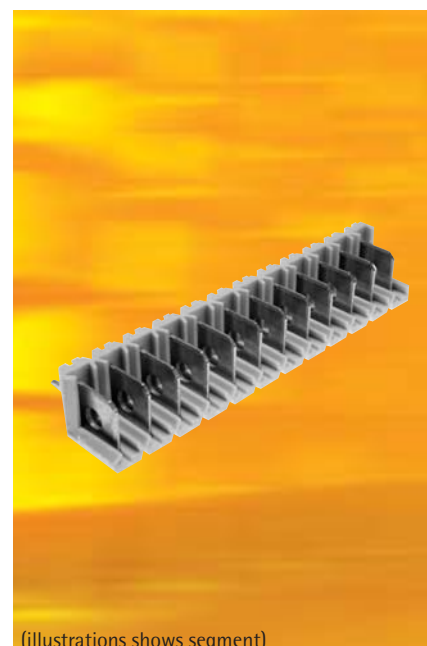
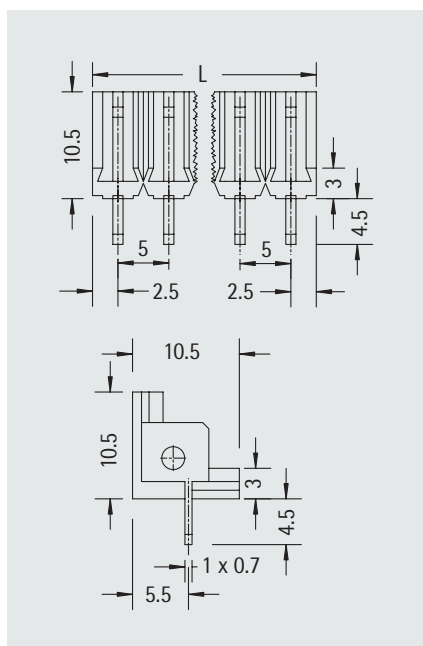
**Nominal voltage:** 380 V  
**Nominal current:** 13,5 A  
**Cross section:** max. 4 mm<sup>2</sup>  
**Material:** Lexan grey, flammability tested acc. to UL 94 V-0  
**Insulating resistance:** >5 MOhm  
**Working temperature:** -20 °C up to 125 °C, 160 °C temporary  
**Approval:** UL, , CE conformity



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



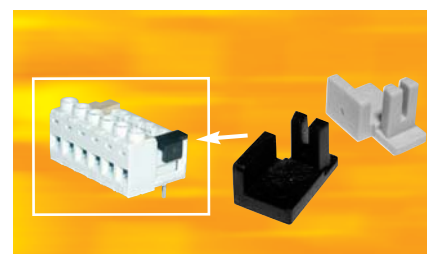
Description	L mm	Grid mm	Order no.
Terminal pin, 36 contacts	180	5,00	449-410-02

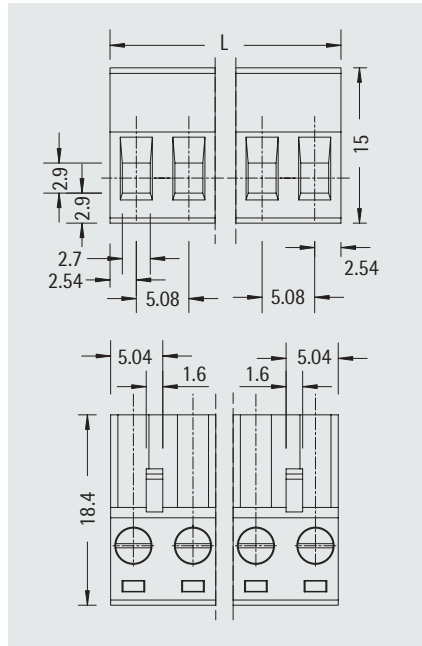
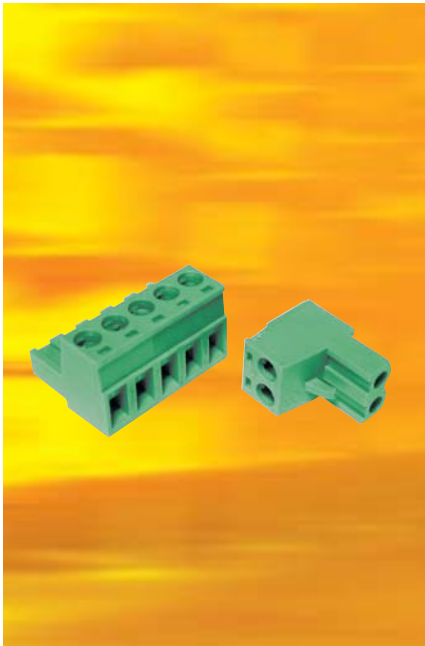
### Polarising clip

- 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

<b>Order no. (pair)</b>
449-410-03

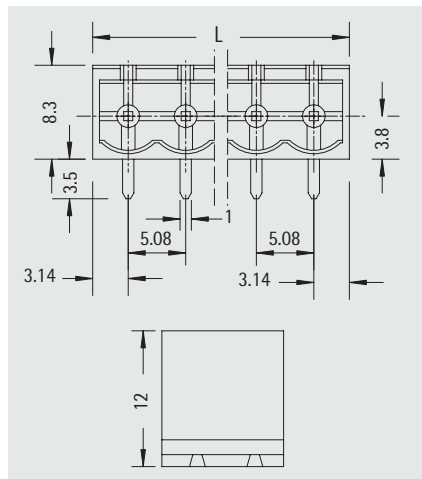
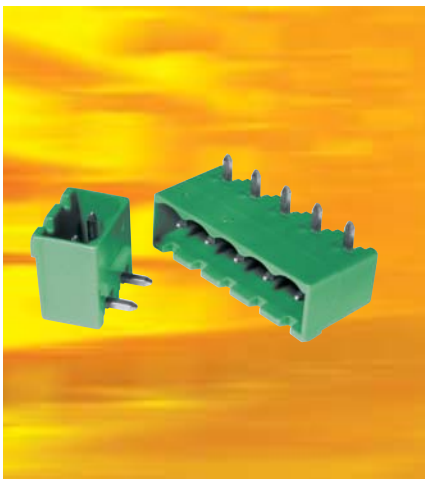





**Pluggable terminal strip**  
(length can be customised)

**Nominal voltage:** 380 V  
**Nominal current:** 12 A  
**Cross section:** max. 2,5 mm<sup>2</sup>  
**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)

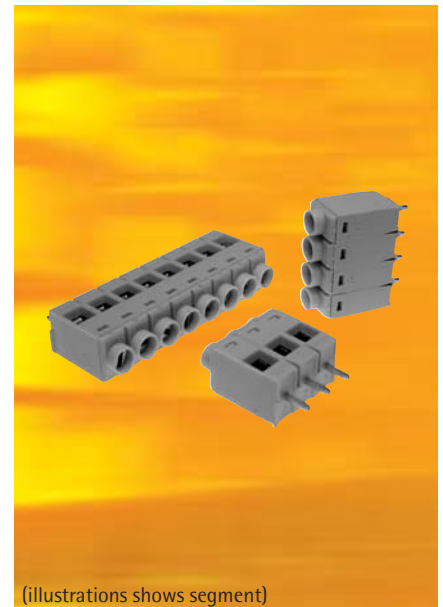
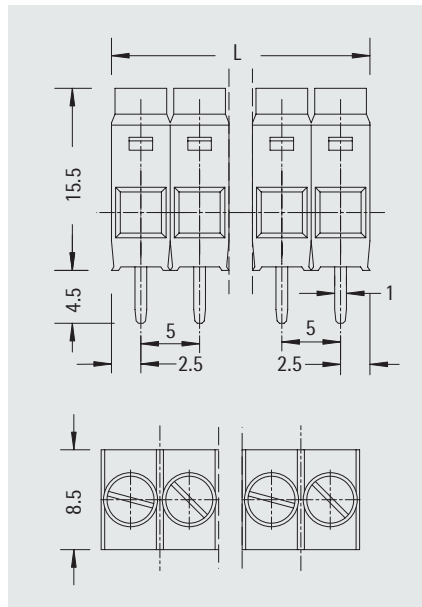
**Nominal voltage:** 380 V  
**Nominal current:** 12 A  
**Material:** PA green, flammability tested acc. to UL 94 V-0  
**Insulating resistance:** >5 MOhm  
**Working temperature:** -20 °C up to 125 °C, 160 °C temporary  
**Approval:** UL, , CE conformity

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)

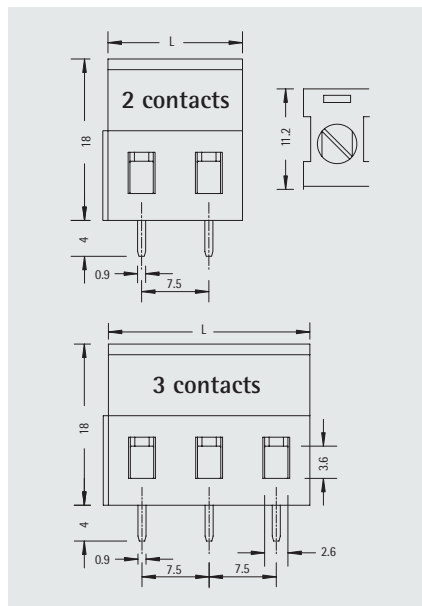
**Nominal voltage:** 380 V  
**Nominal current:** 17,5 A  
**Cross section:** max. 4 mm<sup>2</sup>  
**Material:** Lexan grey, flammability tested acc. to UL 94 V-0  
**Insulating resistance:** >5 MOhm  
**Working temperature:** -20 °C up to 125 °C, 160 °C temporary  
**Approval:** UL, , CE conformity



Description	L mm	Grid mm	Order no.
Terminal 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 mm<sup>2</sup>  
**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



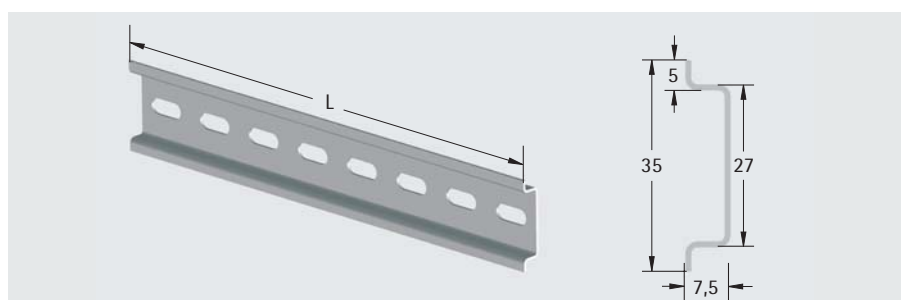
Description	L mm	Grid mm	Order no.
Terminal clamp, 2 contacts	15	7,50	449-440-02
Terminal clamp, 3 contacts	22,5	7,50	449-440-03

**Top hat rail, type TS 35/7,5**

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

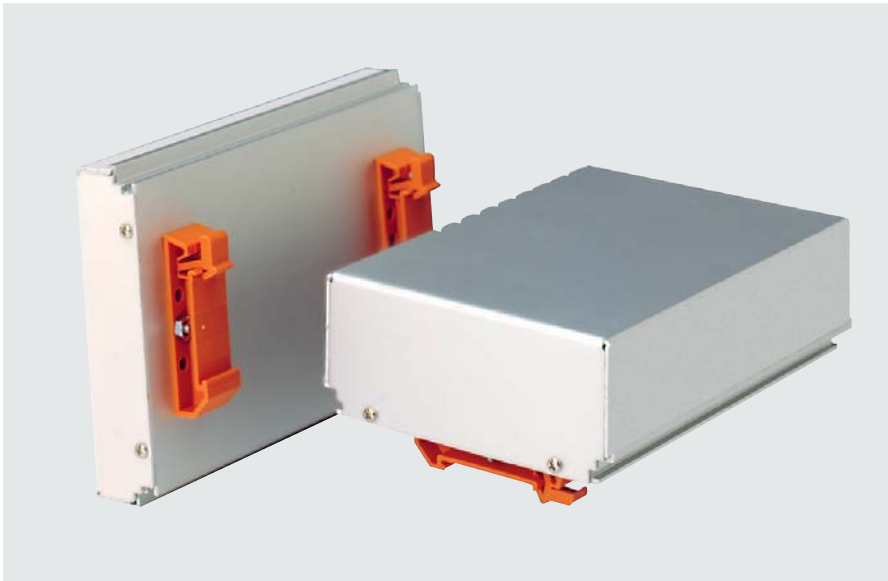
Other lengths available on request!

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





## 420 • DIN rail case



### DIN rail case

- stable and convenient clip device for mounting on DIN rails
- easy assembly
- cost-effective

#### Application:

for 100 x 160 mm and 100 x 220 mm PCBs

#### Finish:

RAL 7035 light grey  
transparent chromated interior

#### Construction:

Aluminium extrusion rear panel,  
Aluminium cover shells and polyamide plastic DIN rail clips

#### Degree of protection:

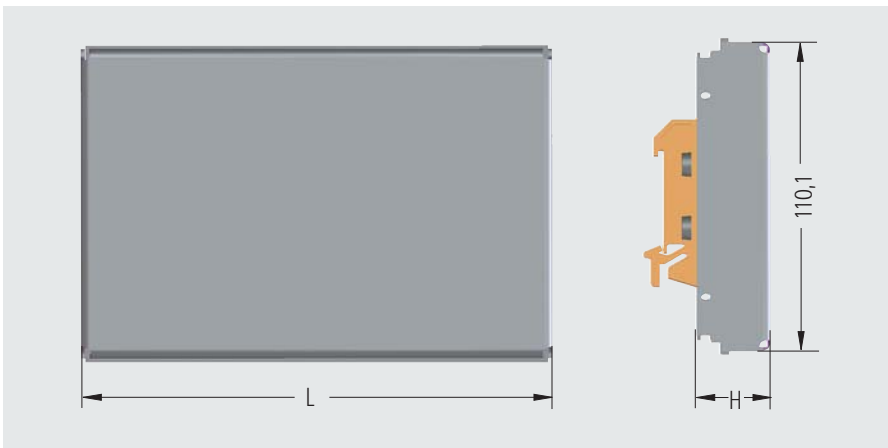
IP 30

#### Delivery:

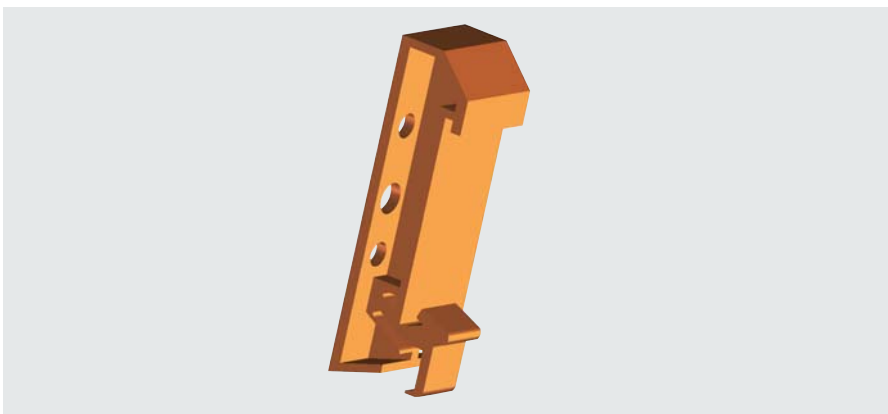
not assembled, with mounting material

#### Delivery

Item	Pc.	Description
1	1	Cover shell
2	1	Rear panel
3	2	Din rail clips
4		Mounting material



H mm	L mm	PCB height H mm	PCB length L mm	Order no.
26	164	100	160	420-001-00
26	224	100	220	420-001-10
46	164	100	160	420-002-00
46	224	100	220	420-002-10



### DIN rail clip

- for mounting the enclosure to DIN rails

#### Material:

Polyamide, orange

Order no.
442-311



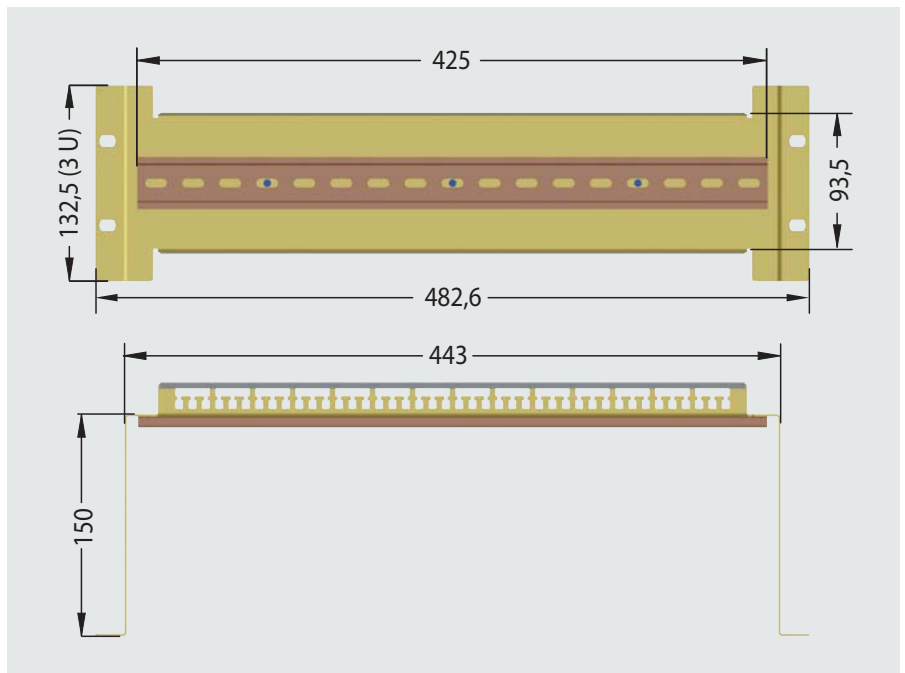
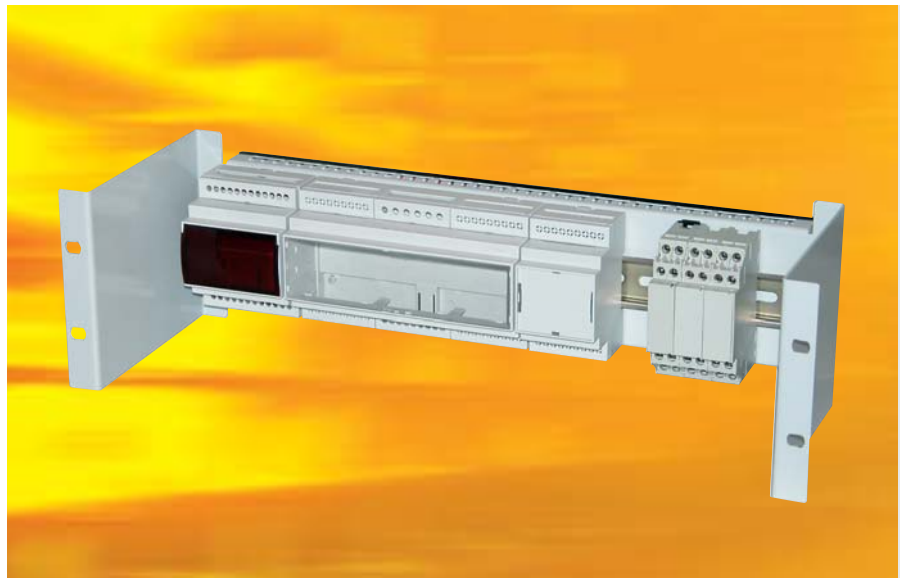
### 19" top hat rail support 3U

- for a recessed mounting of top hat rail enclosures at 19" levels of cabinets, racks or enclosures
- standard fitted with top hat rail TS 35 (width 425 mm)
- perfect to mount our top hat rail enclosures apraRail
- integrated cable guarding and strain-relief by cable clip bar

**Material:**  
sheet metal

**Finish:**  
galvanised or  
RAL 7035 light grey

**Delivery:**  
not assembled, with mounting material



Other top hat rail types, installation widths, heights or depths available on request!

Finish	Order no.
galvanised	205-420-20
RAL 7035	205-420-25
Protection against contact	Order no.
galvanised	205-420-00
RAL 7035	205-420-10

## Further enclosure variations for top hat rail

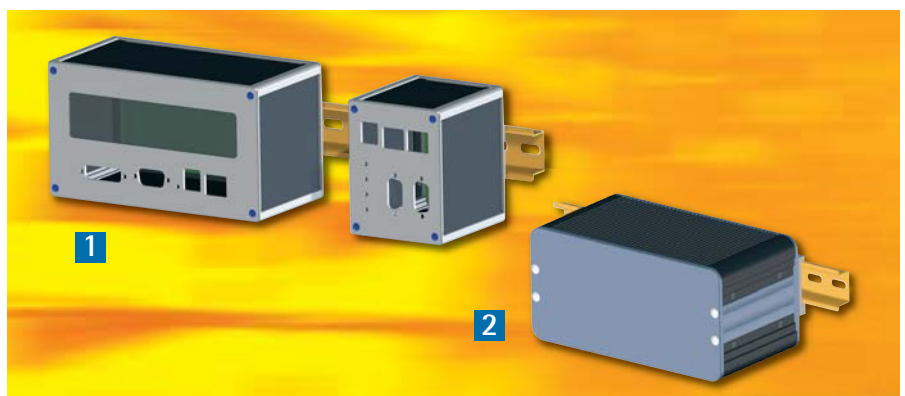
### 1 RAIL 414

- flexible dimensions and very sturdy - the adaptable enclosure solution

### 2 profi-set 264 cool

- enclosure solution with heat dissipating aluminium extrusions for heated surroundings

Ask us for your individual top hat rail enclosure solution - we will be pleased to advise you!





### VisioDINbox

The VisioDINbox has an integrated top hat rail for front mounting in enclosure or cabinet doors. It offers the possibility to operate or read meters and control units easily without opening the door. Due to the optionally available transparent door with an IP rating of 54 the components are perfectly protected against dust and humidity.

- protection system from front: IP 54 for combination of transparent door and VisioDINbox
- tool-free mounting owing to panel-clip technology
- enclosure offers space for 1 – 14 modules
- easy cable connection in the cabling area by a frontally screwed plastic plate
- cable entry in the rear with integrated strain relief
- unused space can be covered by separate strips

#### Dimensions W x H x D:

Size 1: 144 x 144 x 60,5 mm

(opening: 138 +1,0 x 138 +1,0 mm)

Size 2: 288 x 144 x 60,5 mm

(opening: 282 +1,1 x 139 +1,0 mm)

#### Material:

Enclosure: Noryl SE1 GFN2,

listed acc. to UL 94 V-1

Door: Lexan 920A,

listed acc. to UL 94 V-0

#### Finish:

RAL 9005 black

Other sizes, special depths and colours, individual machining or key pad foils available on request – contact us!

Description	Order no.
<b>VisioDINbox 144 x 144 mm</b>	441-360-60
Transparent door, IP 54, 144 x 144 mm, with lock (lockable)	446-050-01
Transparent door, IP 54, 144 x 144 mm, with sash fastener	446-050-02
<b>VisioDINbox 288 x 144 mm</b>	441-480-60
Transparent door, IP 42, 288 x 144 mm, with lock (lockable)	446-130-01
Transparent door, IP 42, 288 x 144 mm, with sash fastener	446-130-02
Cover strip S 35 G (length 219 mm, pre-stamped with 9 mm grids)	640-222-00





### DINcollect

Enclosure to take control units and displays mounted in panel instrument cases acc. to IEC 61554. Wiring can be done through the rear cable outlet.

The enclosure can easily be fixed to any kind of machinery or production equipment by means of an adjustable fitting which allows the operator a perfect viewing angle. The front accommodates two units of 96 x 96 mm and one unit of 48 x 96 mm size.

**Material:** Aluminium  
**Finish:** RAL 7035 light grey  
 RAL 9005 black

Other sizes available on request.



Description	Dimensions H x W x D mm	Order no.
DINcollect	130 x 370 x 260	190-300-00

### VisioRAILbox

Optically appealing wall-mounting enclosure for the installation of DIN rail based controls in office or at home applications. Control lights or settings are visible through the tinted door.

The base enclosure can easily be fixed to a wall by 4 screws and the control units may be rapidly clipped onto 2 integrated DIN rails. Cabling can be wired through the rear cable outlet.

After installation, the top part with tinted door can easily be attached on the base and fixed with screws.

**Dimensions H x W x D:**  
 Size 12 M: 316 x 150 x 95 mm  
 (accommodates max. 12 modules)  
 Size 24 M: 316 x 250 x 95 mm  
 (accommodates max. 24 modules)

**Material and design:**

Base enclosure:

Aluminium with 2 integrated DIN rails and rear cable outlet

Top part:

metal finish alu brush surface ABS with tinted plexiglass® door



Description	Dimensions H x W x D mm	Order no.
VisioRAILbox 12 M	316 x 150 x 95	190-350-00
VisioRAILbox 24 M	316 x 250 x 95	190-350-10

Other sizes available on request.

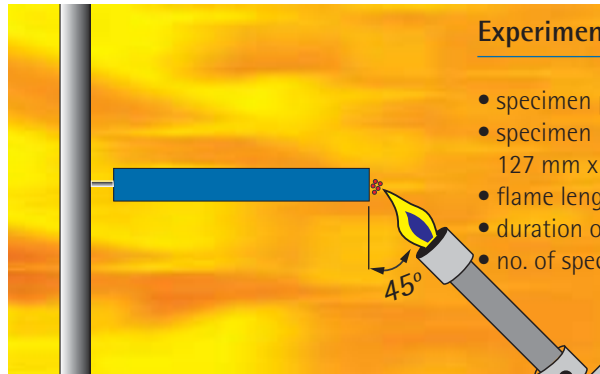


## Fire test classification of plastic material

### Fire protection class UL94 HB

#### Classified acc. to UL94 HB if:

- burning rate  $\leq 76$  mm/min at specimen thickness of up to 3 mm
- burning rate  $\leq 38$  mm/min at specimen thickness of more than 3 mm
- combustion distance  $< 102$  mm



#### Experimental set-up:

- specimen placed horizontally
- specimen  
127 mm x 12,7 mm x max. 12,7 mm
- flame length: 25 mm
- duration of flaming: 30 s
- no. of specimen: 3

### Fire protection class UL94 V-2/-1/-0

#### Classified acc. to UL94 V-2 if:

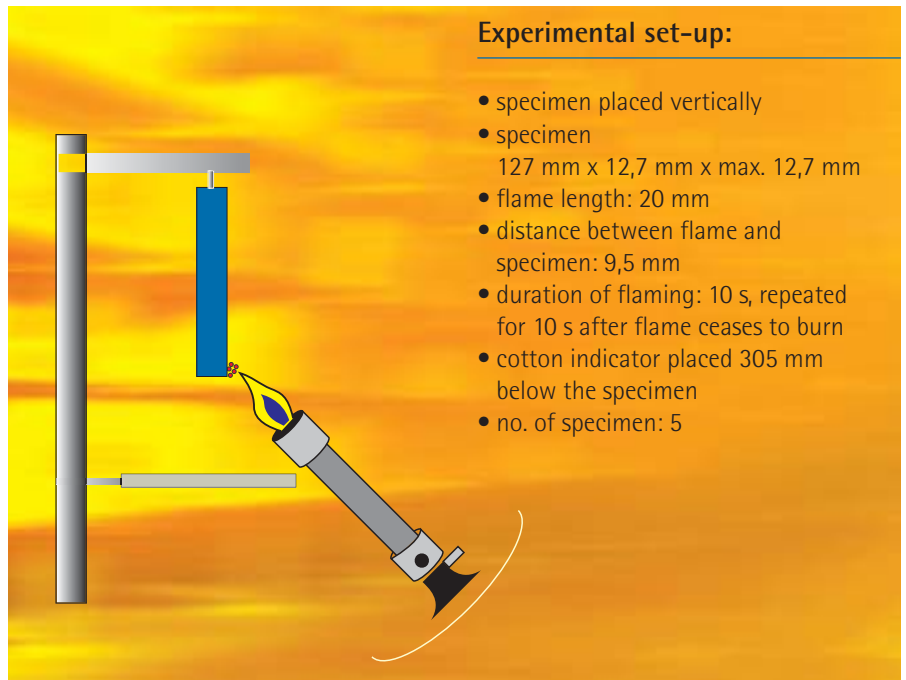
- afterflame time  $\leq 30$  s
- total afterflame time of the 10 tests  $\leq 250$  s

#### Classified acc. to UL94 V-1 if:

- afterflame time  $\leq 30$  s
- no dripping of burning parts
- total afterflame time of the 10 tests  $\leq 250$  s

#### Classified acc. to UL94 V-0 if:

- afterflame time  $\leq 10$  s
- no dripping of burning parts
- total afterflame time of the 10 tests  $\leq 50$  s



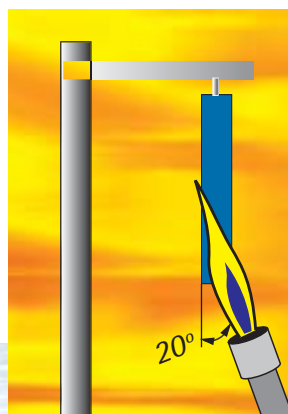
#### Experimental set-up:

- specimen placed vertically
- specimen  
127 mm x 12,7 mm x max. 12,7 mm
- flame length: 20 mm
- distance between flame and specimen: 9,5 mm
- duration of flaming: 10 s, repeated for 10 s after flame ceases to burn
- cotton indicator placed 305 mm below the specimen
- no. of specimen: 5

### Fire protection class UL94-5V

#### Classified acc. to UL94-5V if:

- afterflame time  $\leq 60$  s
- no dripping of any parts



#### Experimental set-up:

- specimen placed vertically
- specimen  
127 mm x 12,7 mm x max. 12,7 mm
- flame length: 127 mm
- duration of flaming: 5 x 5 s with 5 s pause inbetween flamings
- no. of specimen: 5



## Certification

The apra Group relies on innovative products of high quality, which form the basis of the continually growing corporate group. A sound quality and environmental management system is a prerequisite for this.

Independent proof of this system is provided by means of a certificate issued when a company can prove by means of an audit that all requirements arising from the DIN standard have been met.

One of these requirements is, for example, that all processes are documented clearly, transparently and in full.

The apra Group can produce proof of certification of its quality and environmental management system for all locations.

**DIN EN ISO 9001:2008** is a standard that regulates the selection and installation of a quality management system within a company.

**DIN EN ISO 14001:2009** is an environmental standard. It is awarded when a company complies with all environmental aspects.

The management systems described in a management manual for quality and the environment set out all organisational measures to ensure that all products comply with the rules and regulations to be applied as agreed and function as intended during operation.

The apra Group undertakes to comply with the environmental requirements and to continuously improve its environmental protection.

Compliance with the environmental protection policy is monitored regularly. The certificates issued are checked annually by TÜV to ensure they are valid.

A quality management system certified in accordance with the standard proves to the customer that the supplier will deliver good products in compliance with its own rules.

These certificates significantly reduce the cost for the verification of suppliers and customers on both sides.





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