CHECK OF OVERTEMPERATURE WITHIN BOARDS ACCORDING TO CEI 17-43 (HD 528 52) STANDARD

When creating boards not intended for domestic or similar use it is necessary to check the internal overtemperature with the method specified by the CEI 17-43 Standard based on the formula

$D\vartheta_{05} = kd\ W_d^{0.804}$

where

- $D\vartheta_{05}$ is the overtemperature at mid height.
- k is the coefficient of enclosure.
- d is a coefficient that takes into account internal horizontal obstacles hindering air circulation.
- W_d is the power dissipated by the components inserted in the board.

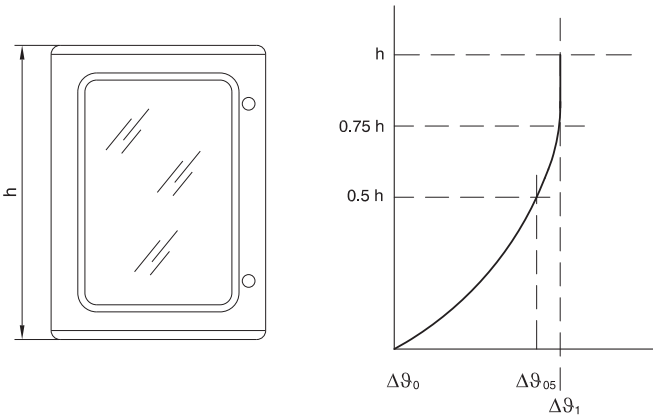
The coefficients k and d mainly depend on the dimensions, shape, type of installation and number of rows of modular devices.
Experimentally, GEWISS has obtained, for the 46 Range suitable for ANS type-boards, the overall coefficient $\bar{k}$ (product kd) that simplifies the verification of overtemperature at mid height reducing it to the relationship

$D\vartheta_{05} = \bar{k}\ W_d^{0.804}$

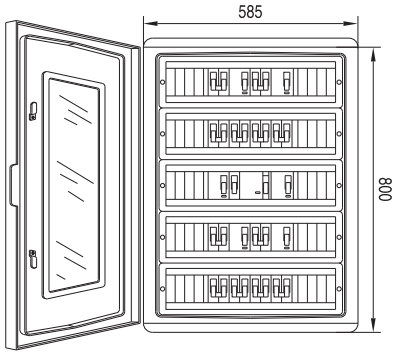
W_d is the power dissipated by the components inserted in the board. It can be calculated with the method described in point "B" of paragraph "CERTIFICATION CRITERIA FOR DISTRIBUTION BOARDS AND ENCLOSURES FOR DOMESTIC AND SIMILAR USE (CEI 23-51 STANDARD)" in the following pages.

To determine maximum overtemperature $D\vartheta_1$ (which for box boards with equivalent dispersion area up to 1.25 m^2 occurs in the upper part of the board as shown in the figure) multiply $D\vartheta_{05}$ by factor "c" which is also predetermined by GEWISS.

Distribution of overtemperature



Example of use of total coefficient of enclosure $\bar{k}$ and factor C specified for GEWISS 46 Range boards



GW 46 206
$\bar{k}$ = 0.5
c = 1.35
W_d = 90W (hypothetical)
ϑA (Room temperature) = 30°C

a) calculation of power dissipated: $W_d = 90W \rightarrow W_d^{0.804} = 37.25W$

- calculation of overtemperature at mid height:
  $D\vartheta_{05} = 0.5 \times 37.25 = 18.62°C$
- calculation of overtemperature at the top:
  $D\vartheta_1 = 18.62 \times 1.35 = 25.13°C$

Temperature check

- for devices placed in the first row (above):
  $\vartheta_1 = \vartheta_A + D\vartheta_1 = 30 + 25.13 = 55.13°C$
- for devices placed in the middle row:
  $D\vartheta_{05} = \vartheta_A + D\vartheta_{05} = 30 + 18.62 = 48.62°C$
- for devices placed in the lower rows:
  $\vartheta < 48{,}62°C$

Coefficient $\bar{k}$ and factor C of GEWISS boards

RANGE	CODE			$\bar{k}$	c
44 CEP	GW 44 808	GW 44 818		1.96	1.16
	GW 44 809	GW 44 819		1.99	1.22
	GW 44 810	GW 44 820		1.40	1.22
	GW 44 811	GW 44 821		1.11	1.21
46 QP	GW 46 001	GW 46 201		1.75	1.21
	GW 46 002	GW 46 202		1.29	1.23
	GW 46 003	GW 46 203		0.95	1.21
	GW 46 004	GW 46 204		0.81	1.24
	GW 46 005	GW 46 205		0.66	1.22
	GW 46 006	GW 46 206		0.50	1.35
	GW 46 007	GW 46 207		0.31	1.33
46 QM/QX	GW 46 031			1.75	1.21
	GW 46 032	GW 46 232	GW 46 052	1.29	1.23
	GW 46 033	GW 46 233		0.95	1.21
	GW 46 034	GW 46 234	GW 46 054	0.81	1.24
	GW 46 035	GW 46 235		0.66	1.22
	GW 46 036	GW 46 236	GW 46 056	0.50	1.35
	GW 46 037	GW 46 237		0.31	1.33

44 CEP - WATERTIGHT BOARDS IN GWPLAST 120 - GWT 650 °C - IP55

TECHNICAL CHARACTERISTICS

Standard: EN 60439-1; EN 62208; CEI 23-48; CEI 23-49	Material: GW PLAST 120, Halogen-Free according to EN 50267-2-2
Degree of protection: IP 55	Impact resistance: IK 08
Protection against indirect contacts: double insulation - ⧈(•)	Resistance to abnormal heat and fire: Thermo-pressure with ball 120°C Glow wire test 650°C
Installation temperature: Max +60°C; Min -25°C	
Maximum nominal operating voltage: 690V	

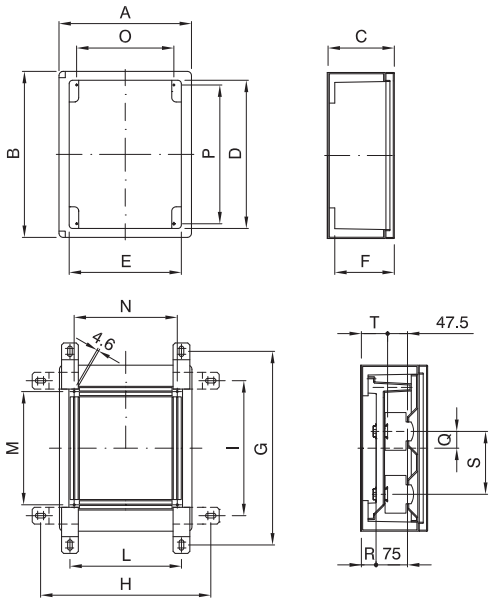
(•) Complete insulation to EN 61140 Standard, obtainable with screwcaps or fixing brackets GW 44 621 or GW 46 446 or GW 46 451.

BEHAVIOUR WITH CHEMICAL AND ATMOSPHERIC AGENTS

Saline solution	Acids		Bases		Solvents				Mineral oil	UV rays
	Concentrated	Diluted	Concentrated	Diluted	Hexane	Benzol	Acetone	Ethyl alcohol		
Resistant	Limited resistance	Limited resistance	Limited resistance	Limited resistance	Limited resistance	Not resistant	Not resistant	Limited resistance	Limited resistance	Limited resistance

DIMENSIONAL TABLES

BOARDS



BOARDS CODE	GW 44 808 GW 44 818	GW 44 809 GW 44 819	GW 44 810 GW 44 820	GW 44 811 GW 44 821
A	200	236	316	396
B	254	316	396	474
C	135	135	160	160
D	211.5	273.5	353.5	431.5
E	151.5	187.5	267.5	347.5
F	127.5	127.5	140	140
G	321	383	463	541
H	290	326	406	486
I	181	243	323	401
L	150	186	266	346
M	129	191	271	349
N	130	166	246	326
O	116	152	232	312
P	189	251	331	409
Q	-	40	40	75
R	-	27	35	35
S	-	150	150	150
T	-	54.5	62.5	62.5

BACK-MOUNTING PLATES

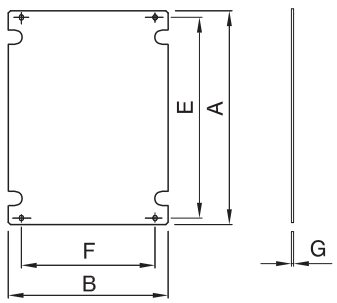


PLATE	A	B	E	F	G	DISTRIBUTION BOARD
GW 44 636	205.5	145.5	189	118	1.5	GW 44 808
GW 44 646					4	GW 44 818
GW 44 637	267.5	181.5	251	152	1.5	GW 44 809
GW 44 647					4	GW 44 819
GW 44 638	347.5	261.5	331	232	2	GW 44 810
GW 44 648					4	GW 44 820
GW 44 639	425.5	341.5	409	312	2	GW 44 811
GW 44 649					4	GW 44 821

46 QP - WATERTIGHT BOARDS IN POLYESTER - IP65

TECHNICAL CHARACTERISTICS

Standard: EN 60439-1; EN60439-4; EN 62208; CEI 23-48; CEI 23-49

Degree of protection: IP 65

Protection against indirect contacts: double insulation - ⧈(•)

Installation temperature: Max +60°C; Min -25°C

Maximum nominal operating voltage: 690V

Material: Fibreglass-reinforced polyester, Halogen-Free according to EN 50267-2-2

Impact resistance: IK 10

Resistance to abnormal heat and fire: Thermo-pressure with ball 200°C
Glow wire test 960°C blank door versions
Glow wire test 650°C transparent door versions

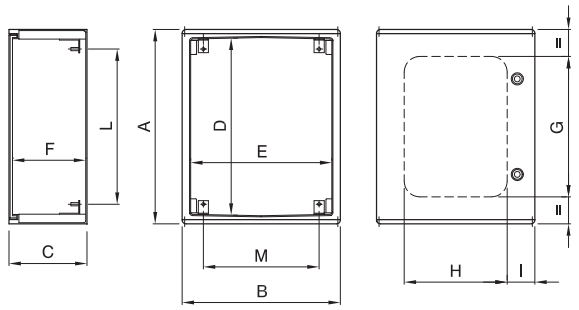
(•) Total insulation in compliance with EN 61140 Standard, ensured by GW 46 451 and GW 46 446 brackets.

BEHAVIOUR WITH CHEMICAL AND ATMOSPHERIC AGENTS

Saline solution	Acids		Bases		Solvents				Mineral oil	UV rays
	Concentrated	Diluted	Concentrated	Diluted	Hexane	Benzol	Acetone	Ethyl alcohol		
Resistant	Limited resistance	Limited resistance	Limited resistance	Limited resistance	Limited resistance	Limited resistance	Not resistant	Limited resistance	Resistant	Resistant

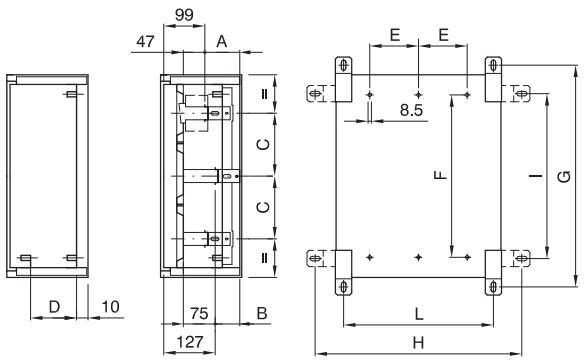
DIMENSION TABLES

BOARDS



BOARDS CODE	GW 46 001 GW 46 201	GW 46 002 GW 46 202	GW 46 003 GW 46 203	GW 46 004 GW 46 204	GW 46 005 GW 46 205	GW 46 006 GW 46 206	GW 46 007 GW 46 207
A	300	424	499	649	649	799	1060
B	250	313	406	406	514	586	777
C	160	160	200	200	250	300	350
D	251	375	450	600	600	750	1000
E	206	269	362	362	470	542	722
F	154	154	194	194	244	294	342
G	205	310	360	510	510	650	827
H	140	169	264	264	380	440	577
I	71	71	71	71	71	71	100
L	203	327	402	552	552	702	952
M	141	202	297	297	405	477	657

Adjustment and fixing centres for watertight boards in polyester



BOARDS CODE	GW 46 001 GW 46 201	GW 46 002 GW 46 202	GW 46 003 GW 46 203	GW 46 004 GW 46 204	GW 46 005 GW 46 205	GW 46 006 GW 46 206	GW 46 007 GW 46 207
A	-	55	95	95	145	195	245
B	-	27	67	67	117	167	217
C	-	125	150	150	150	150	200
D	85	85	125	125	175	225	275
E	53	84,5	131	131	184	221	307
F	185	309	384	534	470	620	860
G	348	472	547	697	695	845	1088
H	311	374	467	467	573	643	819
I	208	332	407	557	557	705	948
L	171	234	327	327	433	507	679

46 QM - WATERTIGHT BOARDS IN METAL - IP55

TECHNICAL CHARACTERISTICS

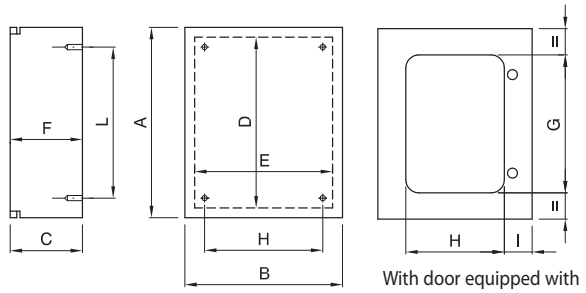
Standard: EN 60439-1; EN 62208; CEI 23-48; CEI 23-49	Material: sheet metal with epoxy-polyester powder coating
Degree of protection: IP 55	Impact resistance: IK 10
Indirect contact protection: metal sheath with earth terminal	Installation temperature: Max +60°C; Min -25°C
Maximum nominal operating voltage: 690V	

BEHAVIOUR WITH CHEMICAL AND ATMOSPHERIC AGENTS

Saline solution	Acids		Bases		Solvents				Mineral oil	UV rays
	Concentrated	Diluted	Concentrated	Diluted	Hexane	Benzol	Acetone	Ethyl alcohol		
Limited resistance	Limited resistance	Limited resistance	Not resistant	Not resistant	Resistant	Limited resistance	Not resistant	Resistant	Resistant	Resistant

DIMENSION TABLES

BOARDS

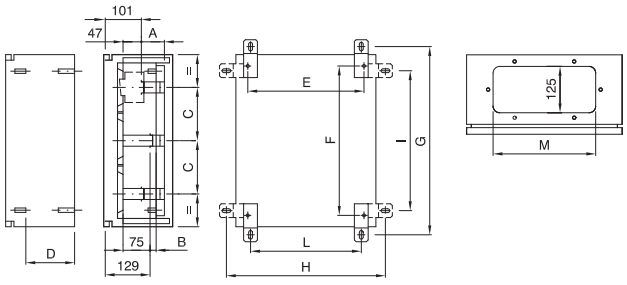


With blank door

With door equipped with toughened glass window

BOARDS CODE	GW 46 031 -	GW 46 032 GW 46 232	GW 46 033 GW 46 233	GW 46 034 GW 46 234	GW 46 035 GW 46 235	GW 46 036 GW 46 236	GW 46 037 GW 46 237
A	296	420	495	645	645	795	1045
B	246	309	402	402	510	582	762
C	160	160	200	200	250	300	350
D	256	380	455	605	605	755	1005
E	206	269	362	362	470	542	722
F	157	157	197	197	247	297	347
G	205	310	360	510	510	650	827
H	140	169	264	264	380	440	577
I	71	71	71	71	71	71	100
L	203	327	402	552	552	702	952
M	141	202	297	297	405	477	657

Adjustment and fixing centres for watertight boards in metal



BOARDS CODE	GW 46 031 -	GW 46 032 GW 46 232	GW 46 033 GW 46 233	GW 46 034 GW 46 234	GW 46 035 GW 46 235	GW 46 036 GW 46 236	GW 46 037 GW 46 237
A	-	55	95	95	145	195	245
B	-	27	67	67	117	167	217
C	-	125	150	150	150	150	200
D	65	65	65	65	200	250	300
E	191	254	347	347	453	527	699
F	228	352	427	577	577	725	968
G	348	472	547	697	695	845	1088
H	311	374	467	467	573	643	819
I	208	332	407	557	557	705	948
L	171	234	327	327	433	507	679
M	-	-	-	270	270	335	335

46 QX - WATERTIGHT BOARDS IN STAINLESS STEEL - IP55

TECHNICAL CHARACTERISTICS

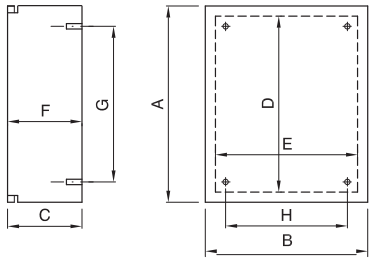
Standard: EN 60439-1; EN 62208; CEI 23-48; CEI 23-49	Material: AISI 304 type stainless steel
Degree of protection: IP 55	Impact resistance: IK 10
Indirect contact protection:	Installation temperature: Max +60°C; Min -25°C
metal sheath with earth terminal	Maximum nominal operating voltage: 690V

BEHAVIOUR WITH CHEMICAL AND ATMOSPHERIC AGENTS

Saline solution	Acids		Bases		Solvents				Mineral oil	UV rays
	Concentrated	Diluted	Concentrated	Diluted	Hexane	Benzol	Acetone	Ethyl alcohol		
Limited resistance	Non Resistant	Limited resistance	Limited resistance	Limited resistance	Resistant	Resistant	Resistant	Resistant	Resistant	Resistant

DIMENSION TABLES

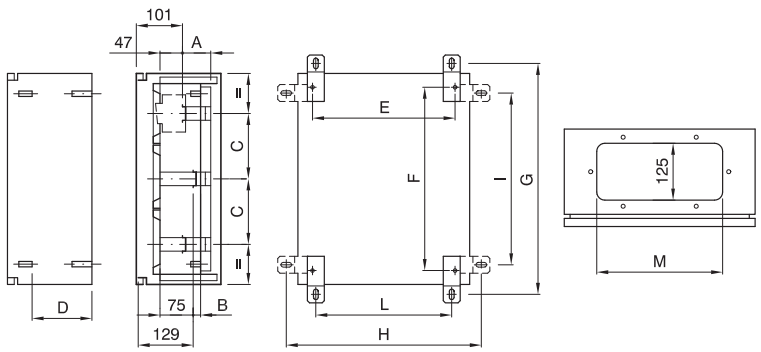
BOARDS



With blank door

BOARDS CODE	GW 46 052	GW 46 054	GW 46 056
A	420	645	795
B	309	402	582
C	160	200	300
D	380	605	755
E	269	362	542
F	157	197	297
G	327	552	702
H	202	297	477

Adjustments and fixing centres for watertight boards in satin-finish stainless steel

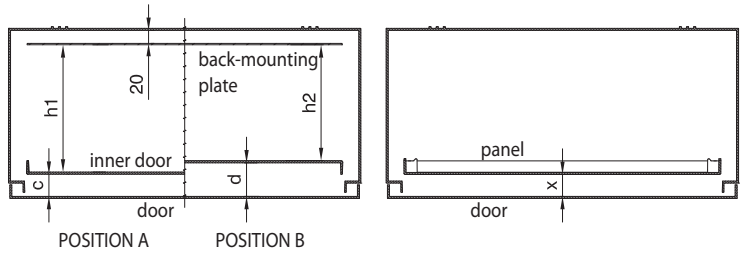


BOARDS CODE	GW 46 052	GW 46 054	GW 46 056
A	55	95	195
B	27	67	167
C	125	150	150
D	65	65	250
E	254	347	527
F	352	577	725
G	472	697	845
H	374	467	643
I	332	557	705
L	234	327	507
M	-	270	335

46 QP - QM - QX

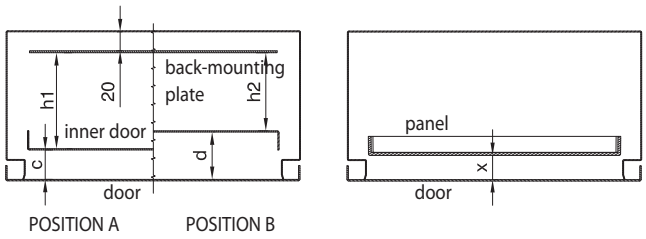
DIMENSION TABLES

46 QP: DISTANCES BETWEEN DOOR, INNER DOOR, BACK-MOUNTING PLATE AND PANEL



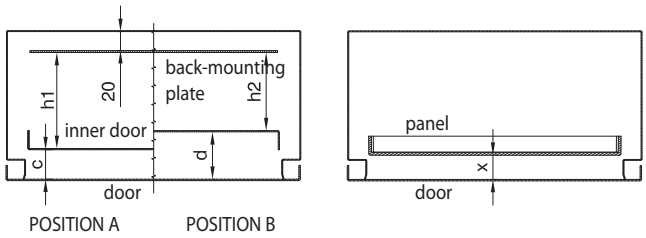
BOARD DIMENSION	WITH INNER DOOR				WITH PANELS	
	POSITION A		POSITION B		X	
	c	h1	d	h2	min	max
310 x 425	32	117	42	100	32	49
405 x 500	32	157	42	140	32	63
405 x 650	32	157	42	140	32	63
515 x 650	32	207	42	190	32	100
585 x 800	32	254	42	237	32	150
800 x 1060	43	292	55	266	37	189

46 QM: DISTANCES BETWEEN DOOR, INNER DOOR, BACK-MOUNTING PLATE AND PANEL



BOARD DIMENSION	WITH INNER DOOR				WITH PANELS	
	POSITION A		POSITION B		X	
	c	h1	d	h2	min	max
310 x 425	31	102	50	83	22	67
405 x 500	31	142	50	123	25	33
405 x 650	31	142	50	123	25	33
515 x 650	31	191	50	172	35	116
585 x 800	31	241	50	222	35	166
800 x 1060	31	295	60	266	35	216

46 QX: DISTANCES BETWEEN DOOR, INNER DOOR, BACK-MOUNTING PLATE AND PANEL

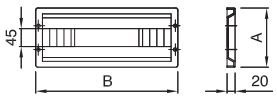


BOARD DIMENSION	WITH INNER DOOR				WITH PANELS	
	POSITION A		POSITION B		X	
	c	h1	d	h2	min	max
310 x 425	31	102	50	83	22	67
405 x 650	31	142	50	123	25	33
585 x 800	31	241	50	222	35	166

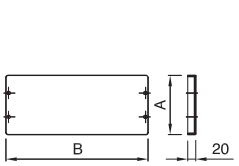
46 QP - QM - QX - COMMON COMPLEMENTARY ITEMS

DIMENSION TABLES

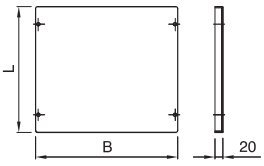
FRONT CONFIGURATION



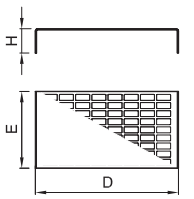
Panels with windows



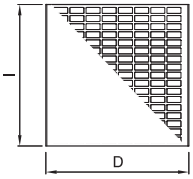
1-module high blank panels



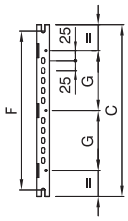
2-module high blank panels



perforated/full plates with 1-module height



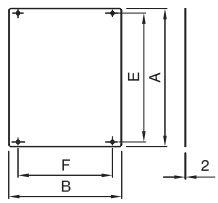
perforated/full plates with 2-module height



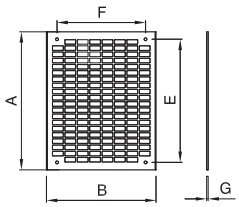
uprights

PANELS WITH WINDOWS	-	GW 46 420F	GW 46 421F	GW 46 421F	GW 46 422F	GW 46 423F	GW 46 424F
SINGLE BLANK PANELS	-	GW 46 425F	GW 46 426F	GW 46 426F	GW 46 427F	GW 46 428F	GW 46 429F
DOUBLE BLANK PANELS	-	GW 46 475F	GW 46 476F	GW 46 476F	GW 46 477F	GW 46 478F	GW 46 479F
UPRIGHTS	-	GW 46 435F	GW 46 436F	GW 46 437F	GW 46 437F	GW 46 438F	GW 46 439F
SINGLE PERFORATED PLATES	-	GW 46 440F	GW 46 441F	GW 46 441F	GW 46 442F	GW 46 443F	GW 46 444F
SINGLE FULL PLATES	-	GW 46 540F	GW 46 541F	GW 46 541F	GW 46 542F	GW 46 543F	GW 46 544F
DOUBLE PERFORATED PLATES	-	GW 46 480F	GW 46 481F	GW 46 481F	GW 46 482F	GW 46 483F	GW 46 484F
DOUBLE FULL PLATES	-	GW 46 580F	GW 46 581F	GW 46 581F	GW 46 582F	GW 46 583F	GW 46 584F
FOR BOARD DIMENSIONS L x H (mm)	300 x 250	425 x 310	500 x 405	650 x 405	650 x 515	800 x 585	1060 x 800
NUMBER MODULES	-	12	18	18	24	28	36
A	-	124	149	149	149	149	199
B	-	265	358	358	466	538	718
C	-	355	430	580	580	730	980
D	-	170	265	265	373	445	625
E	-	116	142	142	142	142	190
F	-	327	402	552	552	702	952
G	-	125	150	150	150	150	200
H	-	40	45	45	45	45	45
I	-	241	292	292	292	292	390
L	-	249	299	299	299	299	399

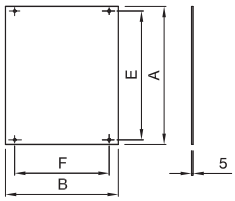
INTERNAL CONFIGURATION



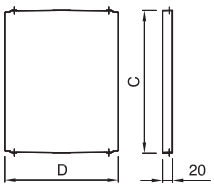
steel plates



steel perforated plates



insulating material plates

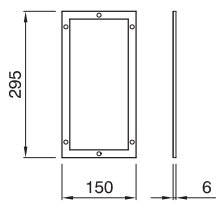


inner door in insulating material/
inner door in metal

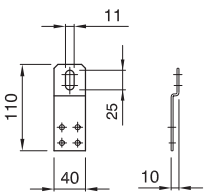
STEEL PLATES	GW 46 401	GW 46 402	GW 46 403	GW 46 404	GW 46 405	GW 46 406	GW 46 407
PERFORATED PLATES	GW 46 461	GW 46 462	GW 46 463	GW 46 464	GW 46 465	GW 46 466	GW 46 467
INSULATED PLATES	GW 46 408	GW 46 409	GW 46 410	GW 46 411	GW 46 412	GW 46 413	-
INSULATING INNER	-	GW 46 414	GW 46 415	GW 46 416	GW 46 417	GW 46 418	GW 46 419
DOOR METALLIC INNER DOOR	-	GW 46 564	GW 46 565	GW 46 566	GW 46 567	GW 46 568	GW 46 569
FOR BOARDS OF DIMENSIONS B x H (mm)	300 x 250	425 x 310	500 x 405	650 x 405	650 x 515	800 x 585	1060 x 800
A	235	359	434	584	584	734	984
B	199	260	355	355	463	535	715
C	-	370	445	595	595	745	995
D	-	264	357	357	465	537	712
E	203	327	402	552	552	702	952
F	141	202	297	297	405	477	657
G	1.5	2	2	2	2	2	2

MAXIMUM ALLOWABLE LOADS ON BACK-MOUNTING PLATES INSTALLED IN BOARDS OF SERIES 46 (Kg)					
BOARD SIZE L x H x D (mm)	QP	QM	QX	PLATE CODE	PLATE TYPE
250 x 300 x 160	50	42		**GW 46 401**	Steel
	35	35		**GW 46 461**	Perforated
	35	35		**GW 46 408**	Insulating
310 x 425 x 160	70	65	65	**GW 46 402**	Steel
	40	40	40	**GW 46 462**	Perforated
	70	65	65	**GW 46 409**	Insulating
405 x 500 x 200	110	65		**GW 46 403**	Steel
	90	65		**GW 46 463**	Perforated
	90	65		**GW 46 410**	Insulating
405 x 650 x 200	110	65	65	**GW 46 404**	Steel
	75	65	65	**GW 46 464**	Perforated
	80	65	65	**GW 46 411**	Insulating
515 x 650 x 250	130	115		**GW 46 405**	Steel
	95	95		**GW 46 465**	Perforated
	80	80		**GW 46 412**	Insulating
585 x 800 x 300	155	135	135	**GW 46 406**	Steel
	95	95	95	**GW 46 466**	Perforated
	95	95	95	**GW 46 413**	Insulating
800 x 1060 x 350	245	215		**GW 46 407**	Steel
	120	120		**GW 46 467**	Perforated

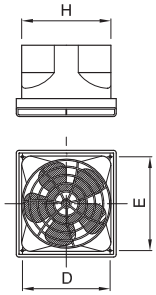
COMPLEMENTARY ITEMS

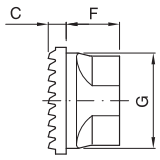


GW 46 449

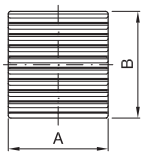


GW 46 446 - GW 46 451





GW 46 448



CODE	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)
GW 46 448	131	141	23,5	115	123	70	125	117
GW 46 471	131	141	23.5	115	123	-	-	-