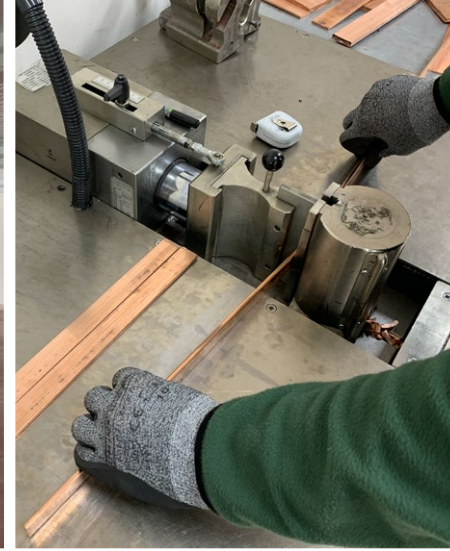


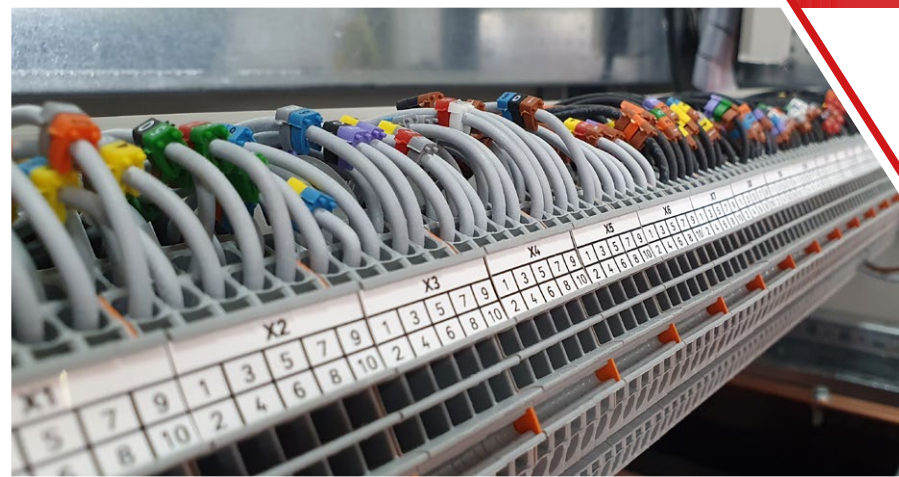
**GENERAL
INTRODUCTORY
CATALOG**



 **BİRLEŞİM**[®]
PANO







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INDOOR TYPE MODULAR PANEL

Indoor type panels have a modular structure, comprised by joining parts, all of which are standard. Installations inside the panel are made functionally and easily through various installation profiles. It also offers an aesthetically pleasing appearance, thanks to its unique design.

Technical specifications

Level of protection	IP20
Structure	Modular
Load-Bearing Construction	2 mm galvanized sheet
Coating	Epoxy-polyester powder coat
Color	Standard RAL 7035
Type of Application	Indoor



Panel Structure

- Electrical distribution panels all of which are of a modular system have a flexible structure that can address various requirements.
- It allows optimum utilization of different areas with a rich selection of sizes and complete accessory product range.
- It is the right choice in choosing electrical cabins with its extremely easy installation and cabling processes.

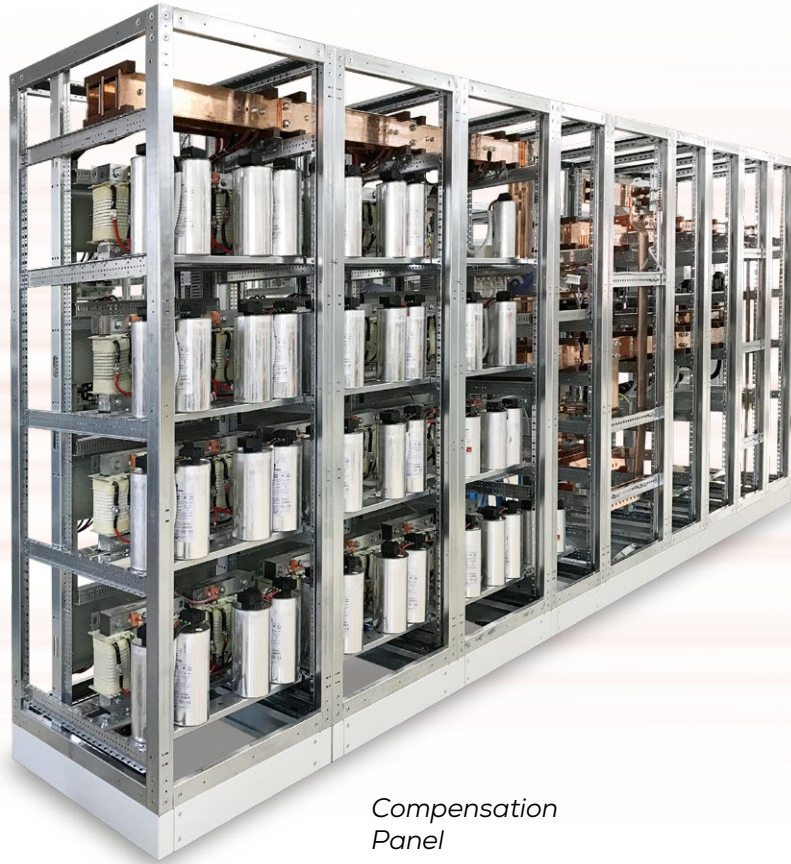
Dimensions (mm)

Height	Width	Depth
1300	400	400
1500	500	500
1700	600	600
1900	700	700
	800	800



**Please see page 16 of our product catalog for detailed panel dimensions and technical drawings.*

E-Installation Applications

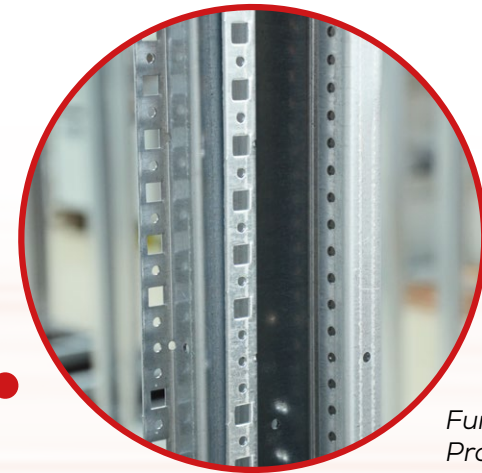


Structure Profiles

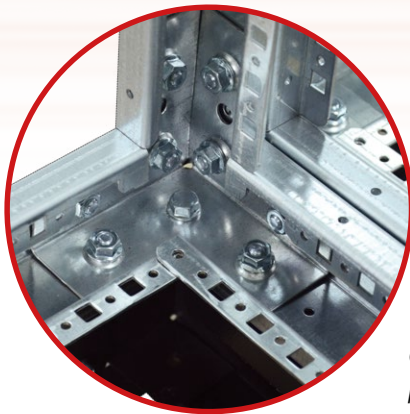
- Doors can be installed on the front and back of panels can also be increased in number side by side, thanks to their modular structure. They can also be lined up as an (L), using corner module.



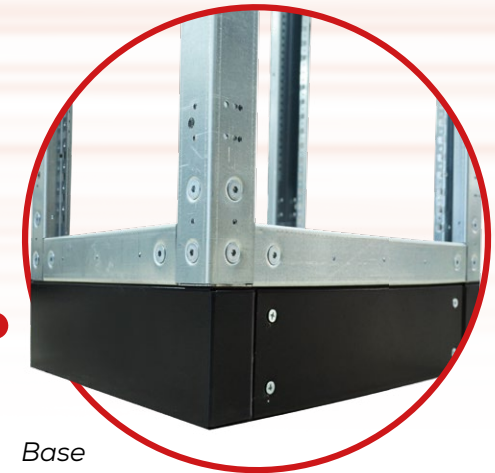
Assembly of depth, width and pillar profiles.



Functional Pillar Profile



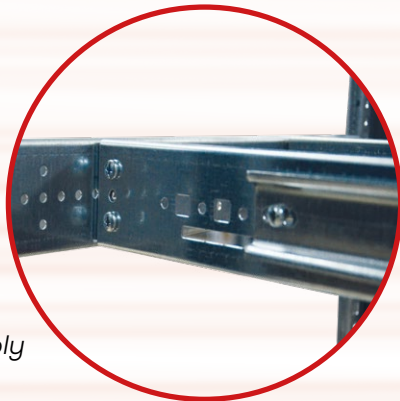
Corner connection profile



Base

Assembly Profiles

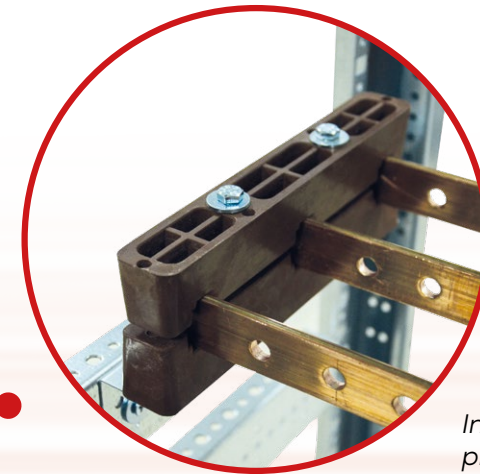
- Panels which have solid structure assembly profiles which facilitate e-assembly ensure maximum amount of joint use through minimum assembly profile in terms of ease of assembly.



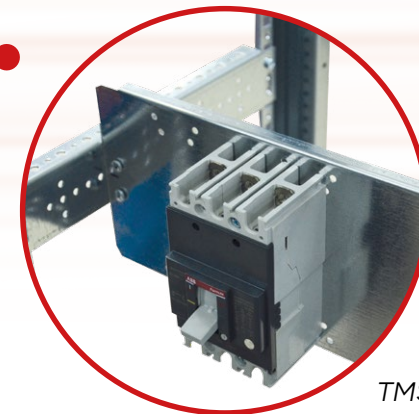
DIN assembly plate kit



Condenser or harmonic assembly plate kit



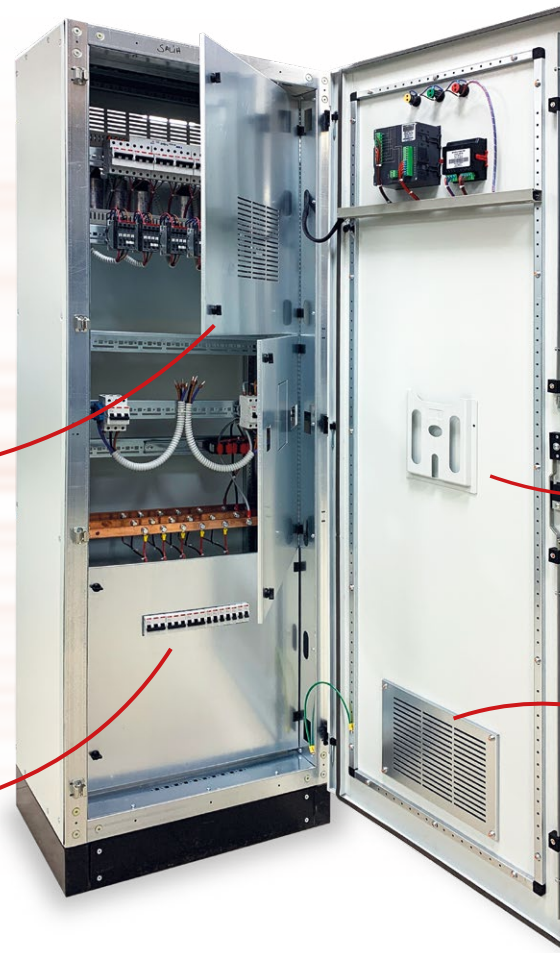
Insulator profile



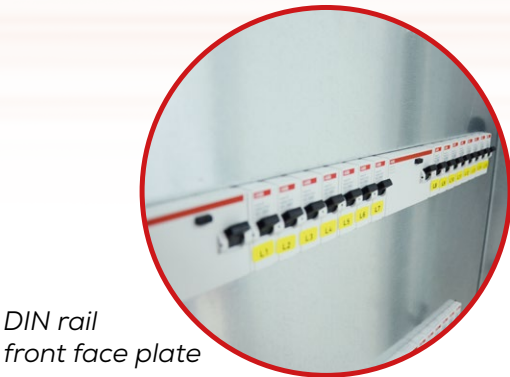
TMS assembly plate kit

Features of Panels

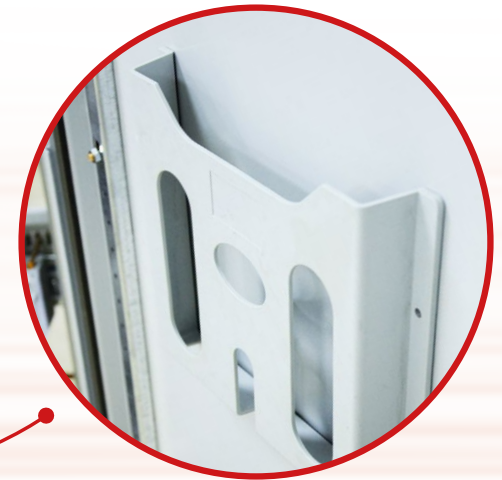
- There are inner covers which prevent direct contact between switch mechanisms and electrical connections. Hinges and mini locks are used in all inner covers.



Mini lock



DIN rail front face plate



Panel pocket



Ventilation unit

Features of Panels

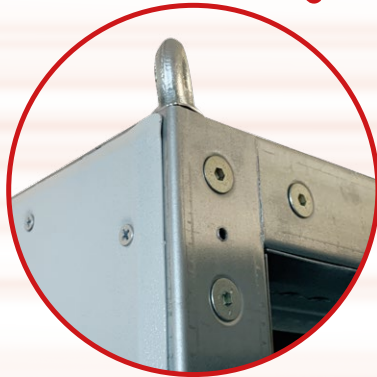
- Locking system, used in front doors, interlocks the door and panel pillar profile in four different points.
- Opening system of the door locks is of lift and turn type. It is suitable for locked or unlocked use. Side and rear covers can be opened and closed.



Seal



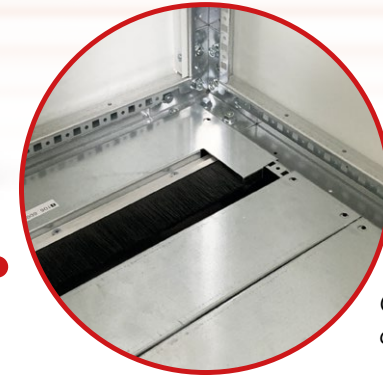
Functional lock mechanism



Bracket and openable covers



TMS front face plate



Cable entry covers



COMPENSATION PANEL WITH DRAWER

Compensation panels with drawers differ from regular compensation panels in terms of their structural characteristics. Power and control connections are fixed on the panel. Stage switch materials are collected in a drawer.

Technical specifications

Level of protection	IP20
Structure	Modular
Load-Bearing Construction	2 mm galvanized sheet
Coating	Epoxy-polyester powder coat
Color	Standard RAL 7035
Type of Application	Indoor

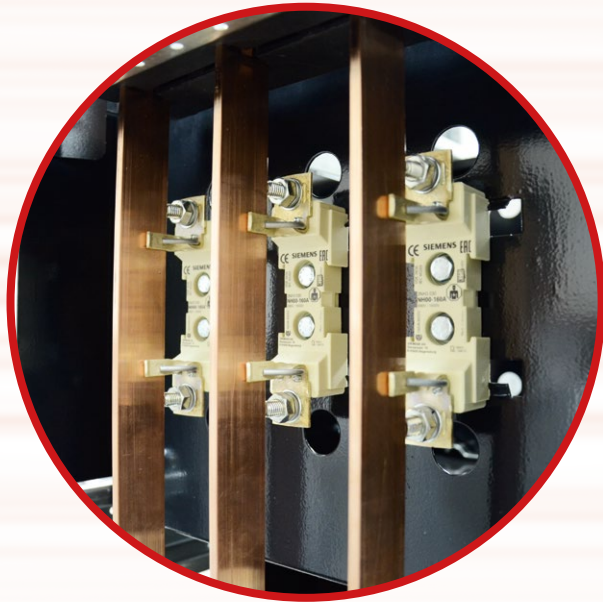


Panel Structure

- A drawer is used for every stage in the panel. Electrical connections between the drawer and the panel are carried out via the Plug-in system.
- Vertical busbar application is used for power transitions in stage drawers.
- There are the hunt reactor and input cell sections for panel feed, independent of the drawers.
- Panel installation, transfer, maintenance and repair processes can be performed easily.
- There is a cooling fan in every section.



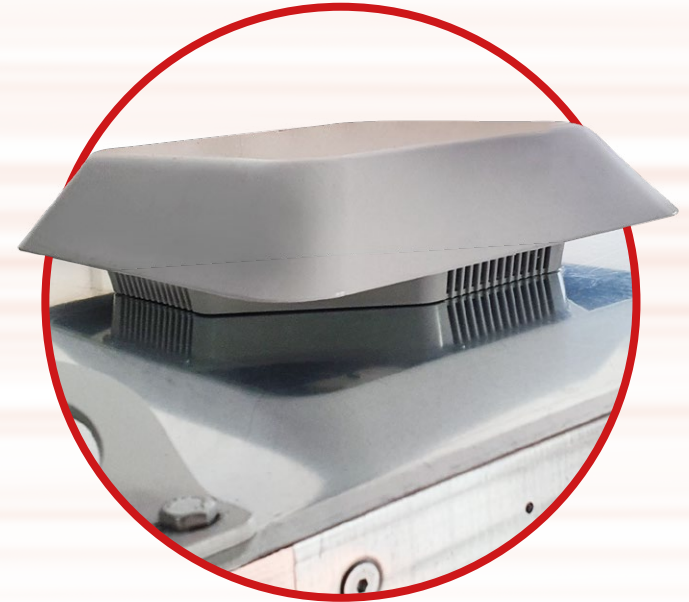
Panel Structure



- Centering 320A (2x160A) slide-in system which allows power input, is used.

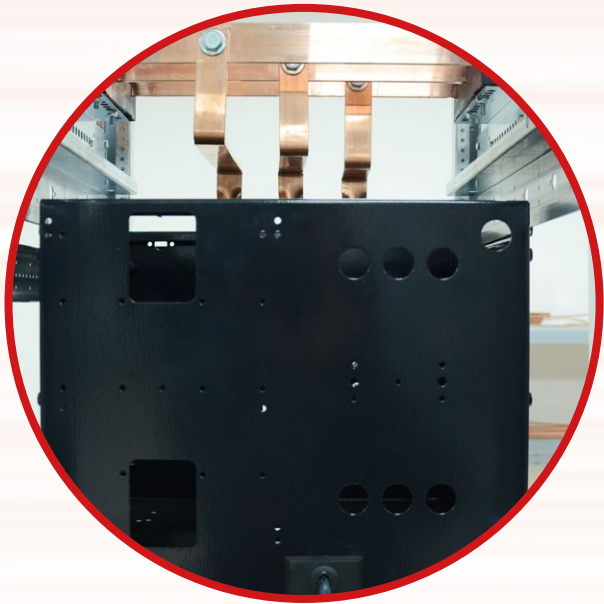


- 4 Pin socket electric terminal is used to ensure control transition between drawer and panel.



- Air flow is ensured via air wells in the drawer inside panel for ventilation and with ventilation unit outside the panel.

Features of Panel



- Stage contactor and automats have been designed to allow installation in the front part of the drawer.

- Control switch which enables stage drawer to be removed safely has been used. The switch works with the stabilizing switch.

- Stage harmonic filter and condenser are installed inside drawer.

Features of Panel



- Stage drawer is placed inside the drawer section with minimum stage gap.



- Stage drawer is fixed to the rail system with stabilizing switch after it has been placed in the drawer section. The switch turns on-off the control signal with the same movement.



- Stage drawer is moved on the rail via 4 bearings on the bottom of the drawer.



OUTDOOR TYPE MODULAR PANEL

Outdoor type modular panels, designed to be used outdoor conditions can fulfill the usage requirements and their interior assembly is made as desired, using standard assembly profiles. Panels at various width and length are available with extensive product range.

Technical specifications

Level of protection	IPS4
Structure	Modular
Load-Bearing Construction	2 mm galvanized sheet
Coating	Epoxy-polyester powder coat
Color	Standard RAL 7035
Type of Application	Outdoor



Panel Structure

- Product groups that are suitable for use in outdoor conditions offer the most suitable solutions which can fulfill the demands of the users and with various accessory options.
- Completely standard products which are in stock are shipped pre assembled.
- Panels in various width and height are available with extensive product portfolio.



**Please see page 32 of our catalog for detailed panel sizes and technical drawings.*

E-Assembly Applications



*Transformer
Panels*

Features of Panels



- Top profile has been designed with perpendicular covers on the sides and openable covers in the front and back to allow adding side by side.

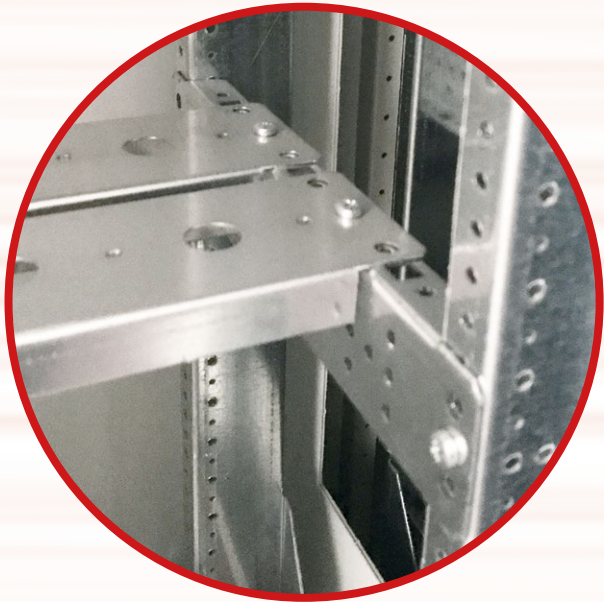


- Ventilation unit ensures air flow inside the panel with its dust preventive filter and maintains the temperature in the panel.



- Bracket connects to the structure profile skeleton and facilitates carrying of the panel.

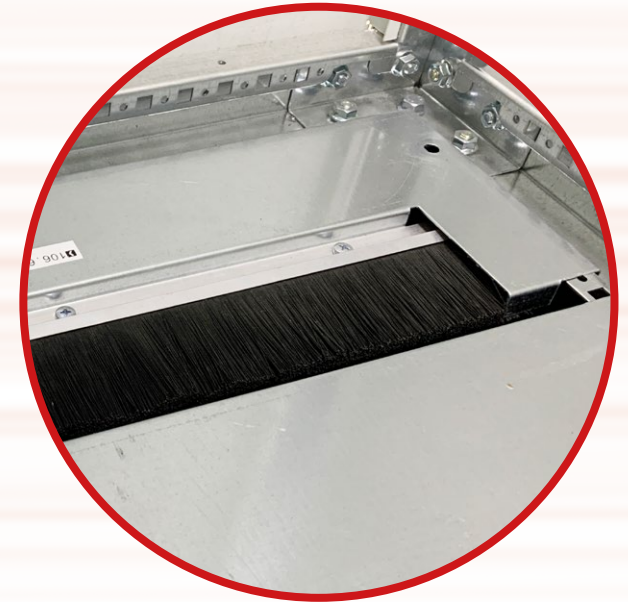
Features of Panels



- All installation profiles, used in indoor panels are also used in outdoor panels.



- Locking mechanism in the front doors connects to the panel body in four different points. Opening system of the door locks is of lift and turn type. It is suitable for locked or open use.



- Split covers are used to facilitate cable input. At least one of the split covers has a brush.



WALL TYPE SURFACE MOUNTED MODULAR PANEL

Used in applications, especially such as floor distribution and automation with its various size options, this product group is a unique product with its functional and modular design. It encompasses optimum solutions with its portfolio in stock according to application type. It facilitates easy installation with brackets, assembled on the panels.

Technical specifications

Level of protection	IP30
Structure	Modular
Load-Bearing Construction	2 mm galvanized sheet
Coating	Epoxy-polyester powder coat
Color	Standard RAL 7035
Type of Application	Indoor



Panel Structure



- Although the panels are of monoblock design, they are manufactured without welding.



- Panels consist of profiles and bearings with hinges that are suitable for the use of DIN Rail or base assembly plate.

**Please see page 48 of our catalog for detailed panel sizes and technical drawings.*

Features of Panels



- Rail and assembly plates to be used can be placed with a 200 mm space between them and changes can be made according to the requirements of the device, with surface mounted panels.



- Electrical cable entry points are produced as cover with brush, as standard. Optionally, bushed cable or closed entry cover is used.



- DIN rail plates and mini locks are used to prevent direct contact with electrical devices.



FLUSH MOUNTED MODULAR PANEL

Used in applications, especially such as floor distribution and automation with its various size options, this product group is a unique product with its functional and modular design. It encompasses optimum solutions with its portfolio in stock according to application type. Panel installation case and electrical assembly kit have been designed as separable from each other.

Technical specifications

Level of protection	IP30
Structure	Modular
Load-Bearing Construction	2 mm galvanized sheet
Coating	Epoxy-polyester powder coat
Color	Standard RAL 7035
Type of Application	Indoor



Panel Structure



Panel Assembly Casing

- Panel assembly casing is the part where the electrical assembly kit is installed. It is placed on the wall without any plastering process.



Electrical Assembly Kit

- Electrical assembly kit is the part where the electrical devices are installed. It is placed on the assembly casing after devices are installed.

**Please see page 47 of our catalog for detailed panel sizes and technical drawings.*

Features of Panels



- Interior of the panel has modular system to position the electrical devices optimally in the panel.



- Panel installation casing is assembled by using multiplication profiles. Multiplication profiles are also used as cable conduit channels in terms of their functions.



- DIN rail plates are used to prevent direct contact with electrical devices and mini locks are used for safety.



CONSTRUCTION SITE PANELS

Construction site panels, designed to fulfill the demands of buildings and facilities in construction, have a functional structure.

Technical specifications

Structure	Modular
Load-Bearing Construction	2 mm galvanized sheet
Coating	Epoxy-polyester powder coat
Color	Standard RAL 2004
Type of Application	Outdoor



Panel Structure



- There are socket (three-phase+monophase) combination groups inside the panel. Cables of the electrical sockets are protected inside the panel when the panel cover is closed.



- Design of construction site panels accommodate ready section spaces, allocated for stray current protection relay, measuring counter, machine socket combinations and assembly of automats.

**Please see page 50 of our catalog for detailed panel sizes and technical drawings.*

Features of Panels



- There is a durable front door and there are lock systems where padlocks can be installed on the doors to ensure the security of panels in construction site environments.



- Cable entry points have been designed to be wide to install cable entries to panels easily.



- Construction site panels are movable. They can be fixed to the concrete floor with screws where it has been transported. It has a specific compact structure which is not affected by weather conditions.

Maximum Distance, Cables Can Bear Standard Powers

Power (kW)	Maximum Distance (m), 0.6/1 kV Insulated Cables Can Bear Standard Powers															
	1,5	2,5	4	6	10	16	25	35	50	70	95	120	150	185	240	300
2,5	103	169	271	404	675	1063										
3	87	142	227	339	567	892	1391									
3,5	73	120	192	287	480	756	1180									
4	65	106	169	253	423	666	1038									
4,5	58	94	51	226	378	595	927	1266								
5	51	84	135	202	337	531	828	1130								
6	43	70	112	168	280	442	689	940	1247							
7	36	60	96	143	240	378	590	805	1067							
8	32	52	84	125	210	330	515	703	932	1301						
9	28	46	74	111	186	293	457	625	828	1155						
10	25	42	67	101	168	265	414	565	750	1045						
12	21	35	56	84	141	223	347	474	630	878	1168					
14	18	30	49	73	123	194	302	413	547	764	1014					
16		26	42	62	105	165	257	351	466	650	863	1053				
18		23	37	56	94	148	231	316	419	585	777	948	1119			
20		21	34	51	85	135	210	287	381	532	706	862	1017			
22			30	45	76	120	288	256	340	475	630	769	907	1072		
25			27	40	67	106	165	226	299	418	555	677	799	944	1156	
30				33	56	89	139	189	251	351	466	569	671	793	971	1124
35					48	75	117	161	213	297	395	482	569	672	823	952
40					42	66	103	141	187	262	348	425	501	592	725	838
45						58	91	124	165	231	306	374	442	522	639	739
50						53	82	113	149	209	277	338	400	472	578	669
55						48	74	102	135	188	250	305	361	426	522	604
60							68	94	124	173	230	281	332	392	481	556
70							58	80	106	148	197	241	284	336	411	476
75							55	75	99	139	185	225	266	314	385	446
80								70	93	130	172	210	248	293	360	416
90								62	82	115	153	187	220	261	319	369
100									74	103	138	168	198	234	287	332
110									68	94	126	153	181	214	262	303
130										80	106	129	153	181	221	256
133										78	104	127	149	177	216	250
150											92	112	132	156	192	222
160											86	105	124	146	179	208
180												93	110	130	160	185
200													99	117	144	166
205														97	114	140
230															102	125
270																106
280																119
290																114
300																111
305																109

Cos φ has been taken as = 0.9

Selection Chart for materials to be used for Constant and Automatic Compensation (Operating Voltage 400V)

Condenser Power (kVar)	Main Feed Line Circuit Elements					Constant and Automatic Compensation Stages Circuit Elements								Condenser Capacity (μF)
	Nominal Current (A)	Automatic Switch (A)	Cable NYN (mm ²)	Main Busbar Cu(mm ²)	Stage Busbar Cu(mm ²)	Fuze NH Type (A)	Contactor (A)	Automatic Fuze (A)	Stage Cable NYN (mm ²)	Discharge Resistances				
										Automatic		Constant		
										kΩ	W	kΩ	W	
5	7,6	16	3x2,5	-	-	16	9	16	3x2,5	31	4	205	3	3x33
10	15	25	3x4	-	-	25	16	25	3x4	15	4	102	5	3x66
15	22	40	3x6	-	-	36	32	40	3x6	10	6	68	8	3x99
20	29	63	3x6	-	-	50	32	50	6	6,8	6	51	10	3x132
25	36	100	3x6	-	-	63	40	63	6	1,5	6	41	12	3x165
30	43	100	3x6	-	-	80	45	80	6	1,5	6	34	15	3x198
40	58	100	3x10	25x3	25x3	100	63	100	10	1,5	6	25	20	3x264
50	72	125	3x16	25x3	25x3	125	80	125	16	1,5	6	20	25	3x330
60	87	125	3x25	25x3	25x3	160	90	-	25	1	12	17	30	-
80	115	160	3x35	25x3	25x3	200	115	-	35	1	12	14	34	-
100	144	200	3x50	25x3	25x3	250	160	-	50	1	12	10	50	-
125	180	250	3x70	30x5	-	-	185	-	-	-	-	-	-	-
150	216	300	3x95	30x5	-	-	225	-	-	-	-	-	-	-
200	288	400	2x(3x50)	30x5	-	-	-	-	-	-	-	-	-	-
250	361	400	2x(3x70)	40x5	-	-	-	-	-	-	-	-	-	-
300	433	630	2x(3x95)	40x5	-	-	-	-	-	-	-	-	-	-
350	505	630	3x(3x70)	40x5	-	-	-	-	-	-	-	-	-	-
400	577	800	3x(3x95)	40x5	-	-	-	-	-	-	-	-	-	-
450	650	800	3x(3x95)	40x10	-	-	-	-	-	-	-	-	-	-
500	722	1000	3x(3x95)	40x10	-	-	-	-	-	-	-	-	-	-
550	793	1000	4x(3x70)	40x10	-	-	-	-	-	-	-	-	-	-
600	866	1000	4x(3x95)	40x10	-	-	-	-	-	-	-	-	-	-

Note: figures in () are equivalent cable sections.

Continuous Charge Currents in Aluminum Busbars

Ambient Temperature: 25°C Heating: 30°C										
Dimensions (mm)	Section (mm ²)	Weight (kg/m)	Continuous Charge Current (A) – 50 Hz. A.C.							
			Number of Coated Busbars				Number of Plain Busbars			
			I	II	III	IIII	I	II	III	IIII
12x2	24	0,0648	95	170	-	-	75	135	-	-
15x2	30	0,0795	120	205	-	-	90	160	-	-
15x3	45	0,12	140	250	-	-	110	200	-	-
20x2	40	0,107	155	265	-	-	115	210	-	-
20x3	60	0,161	185	325	-	-	140	255	-	-
20x5	100	0,268	245	420	-	-	185	330	-	-
25x3	75	0,201	230	390	-	-	170	315	-	-
25x5	125	0,335	295	510	-	-	220	410	-	-
30x3	90	0,242	265	455	-	-	195	365	-	-
30x5	150	0,403	340	595	-	-	255	475	-	-
40x3	120	0,323	350	600	-	-	265	475	-	-
40x5	200	0,538	435	760	-	-	330	620	-	-
40x10	400	1,08	635	1140	1570	2140	490	925	1280	1700
50x5	250	3,673	530	920	1330	1760	405	740	1070	1430
50x10	500	1,35	780	1370	1860	2530	595	1090	1520	2050
60x5	300	0,808	635	1140	1570	2140	490	925	1280	1700
60x10	600	1,62	910	1600	2170	2890	695	1260	1800	2380
80x5	400	1,08	835	1430	1900	2470	645	1110	1570	2120
80x10	800	2,16	1190	2030	2720	3600	890	1620	2240	3000
100x5	500	1,35	1030	1790	2330	2950	780	1370	1900	2470
100x10	1000	2,7	1440	2420	3250	4100	1100	1950	2650	3500
100x15	1500	4,04	1760	2900	3800	4900	1400	2400	3200	4200
120x10	1200	3,24	1710	2850	3650	4750	1300	2280	3100	4100
120x15	1800	4,86	2070	3360	4400	5400	1550	2750	3700	4750
160x10	1600	4,32	2200	3600	4750	5900	1650	2850	3950	5050
160x15	2400	6,47	2600	4250	5450	7050	2000	3400	4600	5950

Continuous Charge Currents in Copper Busbars

Ambient Temperature : 25°C Heating: 30°C										
Dimensions (mm)	Section (mm ²)	Weight (kg/m)	Continuous Charge Current (A) – 50 Hz. A.C.							
			Number of Coated Busbars				Number of Plain Busbars			
			I	II	III	IIII	I	II	III	IIII
12x2	24	0,21	125	250	-	-	110	220	-	-
15x2	30	0,27	155	270	-	-	140	240	-	-
15x3	45	0,4	185	330	-	-	170	300	-	-
20x2	40	0,36	205	350	-	-	185	315	-	-
20x3	60	0,54	245	425	-	-	220	380	-	-
20x5	100	0,89	325	550	-	-	290	495	-	-
25x3	75	0,67	300	510	-	-	270	460	-	-
25x5	125	1,12	385	670	-	-	350	600	-	-
30x3	90	0,8	350	600	-	-	315	540	-	-
30x5	150	1,34	450	780	-	-	400	700	-	-
40x3	120	1,07	460	780	-	-	420	710	-	-
40x5	200	1,78	600	1000	-	-	520	900	-	-
40x10	400	3,56	835	1500	2060	2800	750	1350	1850	2500
50x5	250	2,23	720	1200	1750	2300	630	1100	1500	2100
50x10	500	4,45	1025	1800	2450	3330	920	1620	2200	3000
60x5	300	2,67	825	1400	1980	2650	750	1300	1740	2400
60x10	600	5,34	1200	2100	2800	3800	1100	1860	2500	3400
80x5	400	3,56	1060	1800	2450	3300	950	1650	2200	2900
80x10	800	7,12	1540	2600	3300	4600	1400	2300	3100	4200
100x5	500	4,45	1310	2200	2950	3800	1100	2000	2600	3400
100x10	1000	8,9	1880	3100	4000	5400	1700	2700	3600	4800
120x10	1200	10,68	2200	3500	4600	6100	2000	3200	4200	5500
160x10	1600	14,24	2880	4400	5800	7800	2600	3900	5200	7000

LV Fuze Main Cable and measurement Characteristics of Transformers of Various Power

Power (kVA)	Rated Currents					HV Fuze				LV Busbar (mm ²)	LV Main Cable (Transformer Cables)			Thermomagnetic Automatic Circuit Breaker		Current Transformer and Ammeter	Main Counter (A)	Constand Cont. (kVAR)
	0.4 kV	6 kV	10,5 kV	15 kV	30 kV	7.2 kVA	10.5 kVA	15 kVA	36 kVA		Underground (mm ²)	Air (mm ²)	Type	Nominal Current	Thermal Coil			
50	72	4,8	2,75	1,93	0,96	6	6	6	6		4x16	4x16	NY Y	3x80	63-80	3x100	3x100	2
100	144	9,6	5,5	3,85	1,9	16	16	10	6	40x3	3x35+16	3x50+25	NY Y	3x160	125-160	3x200/5	X5	3
160	213	15,36	8,8	6,16	3,1	25	20	16	10	40x3	3x70+35	3x95+50	NY Y	3x250	200-250	3x250/5	X5	5
200	289	19,2	11	7,7	3,8	25	20	16	10	40x3	3x120+70	3x150+70	NY Y	3x300	250-300	3x400/5	X5	6
315	455	30,24	17,32	12,13	6,07	30	25	20	16	40x3	3x185/95	2(3x95+50)	NY Y	3x500	400-500	3x500/5	X5	10
400	578	38,4	22	15,41	7,7	50	40	30	16	40x5	3x240/120	2(3x150+70)	NY Y	3x600	480-600	3x600/5	X5	12,5
											Bakır Bara		Alüminyum Bara					
500	723	48	27,5	19,26	9,63	63	63	50	20	40x10	40x10	50x10		3x800	700-800	3x800/5	X5	15
630	910	60,48	34,6	24,3	12,15	63	50	40	30	50x10	50x10	60x10		3x1000	800-1000	3x1000/5	X5	20
800	1.156	76,8	44	30,82	15,4	80	63	50	30	60x10	60x10	80x10		3x1200	1000-1400	3x1200/5	X5	25
1.000	1.445	96	55	38,53	19,2	100	80	63	40	80x10	80x10	100x10		3x1600	1400-1600	3x1600/5	X5	30
1.250	1.804	120	68,73	48,15	24,08	125	100	80	50	100x10	100x10	2x(80x10)		3x2000	1600-2150	3x2000/5	X5	40
1.600	2.312	153,60	88	61,6	30,8	160	125	100	63	2x80x10	2x80x10	2x(100x10)		3x2500	2150-2500	3x2500/5	X5	50
2.000	2.890	192	110	77	38,4	180	160	125	63		2x(100x10)	2x(100x15)		3x3000	2500-3000	3x3000/5	X5	60
2.500	3.613	240	138	96	48,16	200	180	125	80		3x(100x10)	3x(100x15)		3x4000	3000-4000	3x4000/5	X5	75





BİRLEŞİM ELEKTRİK
İNŞ. VE İML. SAN. TAAH. TİC. PAZ. LTD. ŞTİ.

Our Production Facility and Head Office

1. Organize Sanayi Bölgesi Gezköyü OSB Mah.
Yönetim Cad. No: 11 25700 Aziziye/Erzurum/Türkiye

- +90 442 213 45 65
- info@birlesimelektrik.com.tr
- www.birlesimelektrik.com.tr