



# *megates* E n e r j i



# megates






E n e r j i












## Our Founding Purpose

who set out not to

rest never get tired" as our motto. On our auspicious path, we have first prepared the documentation that confirms our conformity to international standards by getting type test certifications and/or verifications, and we aimed to become the largest Low Voltage Switchboard manufacturer in Turkey, and then to become a competitive actor in global markets. It is our obligation to our country, which raised us, to improve the workforce of our company and our country by training our own workers and engineers and providing them with new competencies.

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We do not need anything  
except for one thing, to be  
*hardworking.*

## ABOUT US

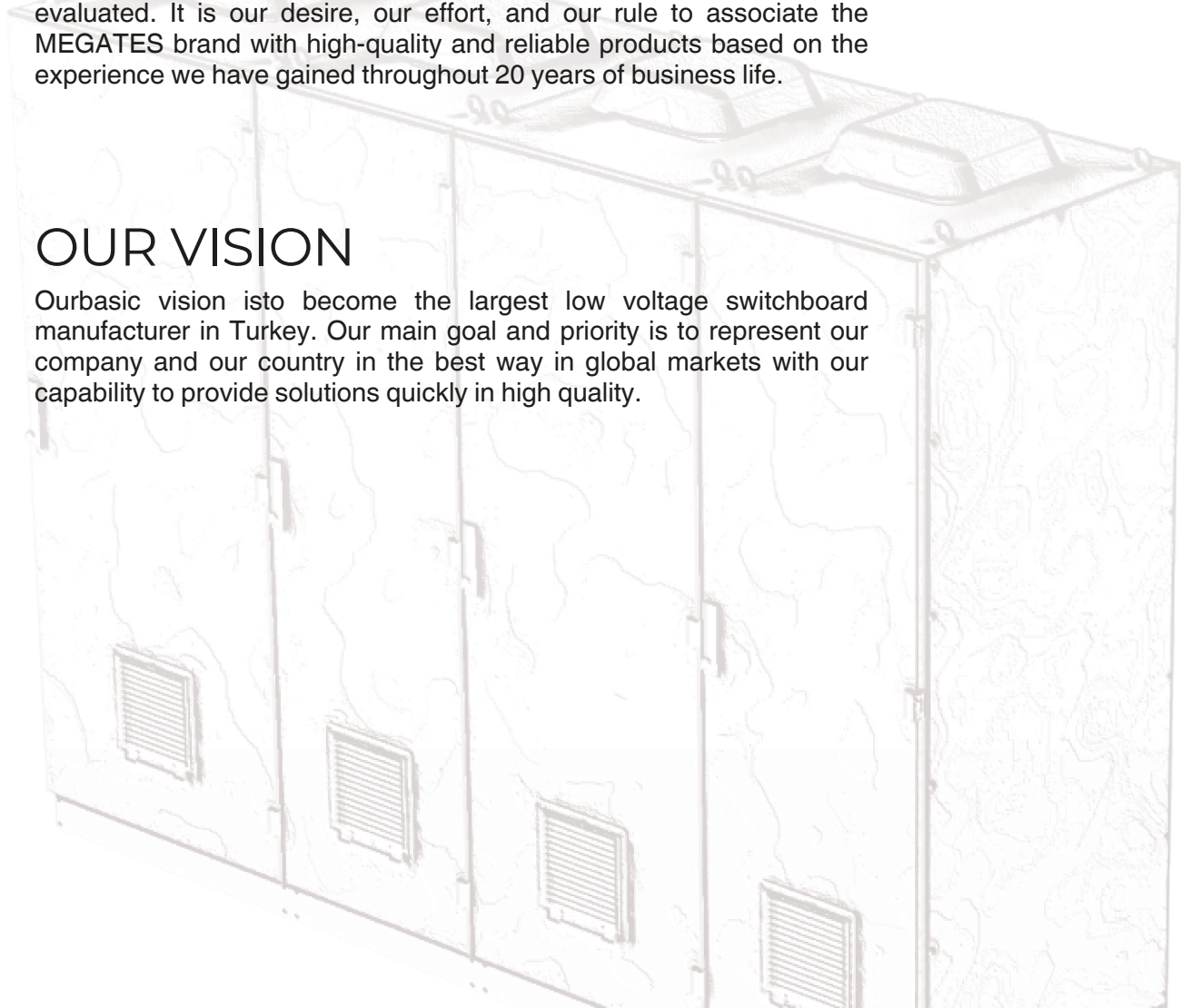
MEGATES .), is a specialized engineering company manufacturing Low Voltage Switchboards in an indoor area of 8000 m<sup>2</sup>.

## OUR MISSION

It is our priority to produce efficiently at the lowest possible costs and to meet customer requirements and demands in line with market dynamics based on a data-driven system that can be measured and evaluated. It is our desire, our effort, and our rule to associate the MEGATES brand with high-quality and reliable products based on the experience we have gained throughout 20 years of business life.

## OUR VISION

Our basic vision is to become the largest low voltage switchboard manufacturer in Turkey. Our main goal and priority is to represent our company and our country in the best way in global markets with our capability to provide solutions quickly in high quality.





# OUR QUALITY CERTIFICATES



Utility Model Certificate granted by Turkish Patent Institute for the Modular Withdrawable and Socket Type Compensation Switchboards not only for their mechanical properties but also their electrical properties.

Design Registration Certificate granted by Turkish Patent Institute for IP54 Outdoor Type Switchboards, which have completely bolted assembly.



# OUR TYPE TESTING CERTIFICATES



# OUR TYPE TESTING CERTIFICATES

SWITCHBOARD TYPE	STANDARD	DESCRIPTION	TEST CERTIFICATES
EMPTY SWITCHBOARD + PANEL	IEC 62208	FLOOR STANDING SWITCHBOARD, IP41, COMPLETELY BOLTED ASSEMBLY	www.lvt.com.tr/rapor/20-1367-R1-N1-1
		FLOOR STANDING SWITCHBOARD, IP55, COMPLETELY BOLTED ASSEMBLY	
		FLOOR STANDING SWITCHBOARD, IP66, COMPLETELY BOLTED ASSEMBLY	
		SURFACE AND FLUSH MOUNTED DISTRIBUTION BOARD, IP41, COMPLETELY BOLTED ASSEMBLY	
GENERAL PURPOSE (GP)	IEC 60670	SURFACE AND FLUSH MOUNTED DISTRIBUTION BOARD, IP55, COMPLETELY BOLTED ASSEMBLY	www.lvt.com.tr/rapor/20-1368-R1-N4-4 www.lvt.com.tr/rapor/20-1368-R1-N3-3
		UNIVERSAL SWITCHBOARD FOR ALL SWITCHES WITH A LOAD CAPACITY OF 40W (SMALLEST SIZE)	
CUSTOM APPLICATIONS (PD)		UNIVERSAL SWITCHBOARD FOR ALL SWITCHES WITH A LOAD CAPACITY OF 250W (SMALLEST SIZE)	www.lvt.com.tr/rapor/20-1700-R0-N1-1
MOUNTED SWITCHBOARD	IEC 61439/1-2	SWITCHBOARD WITH 160A MAIN SWITCH (SMALLEST SIZE)	www.lvt.com.tr/rapor/20-1368-R1-N2-2
		SWITCHBOARD WITH 160A MAIN SWITCH (LARGEST SIZE)	www.lvt.com.tr/rapor/20-1368-R1-N1-1
MOUNTED SWITCHBOARD	IEC 61439/1-2	FLOOR STANDING SWITCHBOARD, GP, 4000A, FORM 4B, 66kA, SIEMENS	www.lvt.com.tr/rapor/20-1700-R0-N1-1
MOUNTED SWITCHBOARD	IEC 61439/1-2	FLOOR STANDING SWITCHBOARD, GP, 4000A, FORM 4B, 66kA, EATON	www.lvt.com.tr/rapor/20-1372-R1-N1-1
MOUNTED SWITCHBOARD	IEC 61439/1-2	FLOOR STANDING SWITCHBOARD, GP, 4000A, FORM 4B, 66kA, FEDERAL	www.lvt.com.tr/rapor/20-1699-R1-N1-1
MOUNTED SWITCHBOARD	IEC 61439/1-2	FLOOR STANDING SWITCHBOARD, GP, 2500A, FORM 4B, 50kA, SIEMENS	www.lvt.com.tr/rapor/20-1373-R1-N1-1
MOUNTED SWITCHBOARD	IEC 61439/1-2	FLOOR STANDING SWITCHBOARD, GP, 2500A, FORM 4B, 50kA, EATON	www.lvt.com.tr/rapor/20-1702-R0-N1-1
MOUNTED SWITCHBOARD	IEC 61439/1-2	FLOOR STANDING SWITCHBOARD, GP, 2500A, FORM 4B, 50kA, ABB	www.lvt.com.tr/rapor/19-0989-R02-N1-1
MOUNTED SWITCHBOARD	IEC 61439/1-2	FLOOR STANDING SWITCHBOARD, GP, 1600A, FORM 4B, 40kA, SIEMENS	BY AUTHENTICATION
MOUNTED SWITCHBOARD	IEC 61439/1-2	FLOOR STANDING SWITCHBOARD, GP., 1600A, FORM 4B, 40kA, EATON	BY AUTHENTICATION
MOUNTED SWITCHBOARD	IEC 61439/1-2	FLOOR STANDING SWITCHBOARD, GP, GENERAL, 1600A, FORM 4B, 40kA, ABB	BY AUTHENTICATION
MOUNTED SWITCHBOARD	IEC 61439/1-2	FLOOR STANDING SWITCHBOARD, GP, 1600A, MAKEL	069-17-0019-61439-01/R00
MOUNTED SWITCHBOARD	IEC 61439/1-2	FLOOR STANDING SWITCHBOARD, GP, 630A, MAKEL	069-17-0019-61439-02/R00
MOUNTED SWITCHBOARD	IEC 61439/1-2	FLOOR STANDING SWITCHBOARD, GP, 630A, MAKEL	www.lvt.com.tr/rapor/20-1371-R1-N1-1
MOUNTED SWITCHBOARD	IEC 61439/1-2 FOR CUSTOMARY APPLICATIONS	INSULATED POWER PANEL	WITH ACCREDITATION
SPECIAL TESTS	IEC 61439/1-2 FOR CUSTOMARY APPLICATIONS	SSOLAR POWER DISTRIBUTION BOARDS (0.4kV, 1kV)	https://allianztechnik.com.tr/tr/rapor-sorgulama
SPECIAL TESTS	IEC 60068-3-3		K.D.11-0283-R.00
(Turkish Electricity Distribution Corporation)	IEC 61641	ENERJISA FORM 2B INTERNAL ARC TEST, 45kA, 500ms 50 KVA OUTDOOR	https://www.lvt.com.tr/belge/115-19-0008-61439-01/R00
	IEC61439/1-5	TYPE LOW VOLTAGE (LV) SWITCHBOARD 100 KVA OUTDOOR TYPE LV	https://www.lvt.com.tr/belge/115-19-0008-61439-02/R00
	IEC61439/1-5	SWITCHBOARD 160 KVA OUTDOOR TYPE LV SWITCHBOARD 160 KVA	https://www.lvt.com.tr/belge/115-19-0008-61439-03/R00
	IEC61439/1-5	INDOOR TYPE LV SWITCHBOARD 250 KVA OUTDOOR TYPE LV	https://www.lvt.com.tr/belge/115-19-0008-61439-06/R00
	IEC61439/1-5	SWITCHBOARD 250 KVA INDOOR TYPE LV SWITCHBOARD 400 KVA	https://www.lvt.com.tr/belge/115-19-0008-61439-04/R00
	IEC61439/1-5	OUTDOOR TYPE LV SWITCHBOARD	https://www.lvt.com.tr/belge/115-19-0008-61439-07/R00
	IEC61439/1-5	400 KVA INDOOR TYPE LV SWITCHBOARD WITH MOULDED CASE CIRCUIT	https://www.lvt.com.tr/belge/115-19-0008-61439-05/R00
	IEC61439/1-5	BREAKER	17-0391-R02-N01-01
	IEC61439/1-5	400 KVA INDOOR TYPE LV SWITCHBOARD WITH DIRECT BUSBAR	18-1199-R01-N01-01
	IEC61439/1-5	630 KVA INDOOR TYPE LV SWITCHBOARD	https://www.lvt.com.tr/belge/115-19-0008-61439-08/R00
	IEC61439/1-5	1000 KVA INDOOR TYPE LV SWITCHBOARD	https://www.lvt.com.tr/belge/115-19-0008-61439-09/R00
	IEC61439/1-5		LVT.12-0345-R00
	IEC61439/1-5		15-0887-R01-N01-01
	IEC61439/1-5		LVT.12-0346-R00
	IEC61439/1-5		LVT.D.15-0888-R.01-01
	IEC61439/1-5	1250 KVA INDOOR TYPE LV SWITCHBOARD	LVT.D.16-0759-R.01-01/01
	IEC61439/1-5	1600 KVA INDOOR TYPE LV SWITCHBOARD	https://www.lvt.com.tr/belge/115-19-0008-61439-12/R00
	IEC61439/1-5		https://www.lvt.com.tr/belge/115-19-0008-61439-14/R00
	IEC61439/1-5		https://www.lvt.com.tr/belge/115-19-0008-61439-18/R00
	IEC61439/1-5		https://www.lvt.com.tr/belge/115-19-0008-61439-16/R00
IEC61439/1-5		https://www.lvt.com.tr/belge/115-19-0008-61439-15/R00	
IEC61439/1-5		https://www.lvt.com.tr/belge/115-19-0008-61439-17/R00	
IEC61439/1-5		16-0700-R02-N01-01	
IEC61439/1-5		16-0701-R03-N01-01	
IEC61439/1-5		18-0307-R00-N01-01	
IEC61439/1-5		16-1174-R02-N01-01	
IEC61439/1-5		LVT.D15-0894-R02-01D	
IEC61439/1-5	LV METERING AUTOMATION PANEL 400A	18-1198-R01-N01-01D	
IEC61439/1-5	LIGHTING SWITCHBOARD	www.lvt.com.tr/rapor/19-1015-R5-N01-01D	
CUSTOM APPLICATIONS PROVIDED TO UTILITY ELECTRICITY DISTRIBUTION COMPANIES	CYPRUS KIBTEK	1600A INDOOR TYPE LV SWITCHBOARD	LVT.D.16-0284-R.04-01
		400 kVA (1900 + 100 x 450 x 1000)	18-0704-R00-N01-01
		400 kVA (1900 + 100 x 450 x 1300)	LVT.D.16-0330-R.02-01
			LVT.D.16-0286-R.04-01
			18-0704-R00-N01-01
		630 kVA (1900 + 100 x 450 x 1600)	LVT.D.16-0279-R.02-01D
			LVT.D.16-0280-R.02-01
		100 kVA OUTDOOR TYPE LV SWITCHBOARD WITH THERMIC MAGNETIC CUTTER	LVT.D.16-0291-R.02-01
		160 kVA OUTDOOR TYPE LV SWITCHBOARD WITH THERMIC MAGNETIC CUTTER	LVT.D.16-0281-R.02-01
			LVT.D.16-0282-R.02-01
	250 kVA OUTDOOR TYPE LV SWITCHBOARD WITH THERMIC MAGNETIC CUTTER	LVT.D.16-0283-R.02-01	
	400 kVA OUTDOOR TYPE LV SWITCHBOARD WITH THERMIC MAGNETIC CUTTER	LVT.12-0356-R.00	
	630 kVA OUTDOOR TYPE LV SWITCHBOARD WITH THERMIC MAGNETIC CUTTER	LVT.12-0339-R.01	
	1600 kVA INDOOR TYPE LV SWITCHBOARD WITH THERMIC MAGNETIC CUTTER – ENERJISA	K.D.11-0283-R.00	
		15-0858-R01-N01-01	
		LVT.12-0358-R.00	
		15-0892-R01-N01-01	

"Type Testing List" you requested from our company is presented above for your information. You can access the certificates issued by the accredited laboratory using the links provided.

You can search previous certificates that were issued before offering the laboratory link system directly from the laboratory using the "Certificate Number".

Note 1: Our company has type test certificates for both empty switchboards and assembled ones. Due to the following articles in the IEC 61 439/1 Standard, the mechanical tests must be performed in accordance with Empty Switchboard Board Standards in IEC 62208: 2011. Our company has these certificates as well.

10.2.1 General: In case an empty enclosure compliant with IEC 62208:2011 is used and the enclosure has not been modified to degrade its performance, it is not required to repeat the enclosure test up to 10.2.

Note2: Our company is also able to verify the tests in accordance with the following standards:

IEC 60890 Low voltage switchgear and control scheme,

The method of evaluating the temperature increase by extrapolation,

IEC 60865 Short-circuit currents – Calculation of effects (Thermal Strain),

IEC 61117 Method for assessing the short-circuit withstand strength of partially type-tested assemblies (PTTA)

# INSTITUTIONS WE COLLABORATE WITH

## SUBSTRUCTURE

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### TRANSPORTATION

- HIGHWAYS
- TUNNELS
- BRIDGES
- RAIL SYSTEMS
- AIRPORTS



### UTILITY ELECTRICITY DISTRIBUTION COMPANIES



### INDUSTRIAL PLANTS

- IRON AND STEEL PRODUCTION PLANTS
- NATURAL GAS STORAGE FACILITIES
- ORGANIZED INDUSTRIAL ZONE POWER DISTRIBUTION SYSTEMS



### RENEWABLE ENERGY

- SOLAR
- BIOGAS



MILITARY AND DEFENSE INDUSTRY



MINISTRY OF HEALTH



MINISTRY OF JUSTICE



MINISTRY OF YOUTH AND SPORTS

- STADIUMS
- INDOOR SPORTS FACILITIES
- STUDENT DORMITORIES



REAL ESTATE

PRIVATE  
SECTOR



- SHOPPING MALL
- HOTEL
- FACTORY

# OUR PRODUCTS



## Floor Standing (Empty) LV Switchboards (Pre-galvanized and Stainless Steel)

Technical Specifications		
Type Test Standard		IEC 62208
Access		Front side
Ingress protection rating		IP41 IEC 60529 IK10 Indoor Type IP55 IEC 60529 IK10 Indoor Type and Outdoor Type IP66 IEC 60529 IK10 Outdoor Type
Operating temperature	°C	-5/+40, +35 (approx. 24 h)
Internal separation		Form 1, Form 2/3/4 (a and b)
Metal surfaces		Pre-galvanized/Stainless Steel
Sheet thickness	mm	2 (Door and metal surfaces) 1.5 (Internal parts, side and rear covers)
Paint color		RAL 7032 & RAL 7035 electrostatic powder painting
Height	mm	1900+100 base 1900+200 base
Width	mm	400, 500, 600, 700, 800, 900, 1000, 1200
Depth	mm	400, 500, 600, 700, 800, 900, 1000, 1100





## Floor Standing LV Switchboards (Assembled) (Pre-galvanized and Stainless Steel)

		Technical Specifications			
Type Test Standard		IEC 61439/1-2, IEC 62208, IEC 62262, IEC 60529			
Special Test Standard		IEC 61641, IEC 60068/3-3, (IEC 60068/2-6, IEC 60068/2-47, IEC 60068/2-57)			
Verification Standard		IEC 60890, IEC 60865, IEC 61117			
Access		Front side			
Ingress protection rating		IP41 IEC 60529 IK10 Indoor Type IP55 IEC 60529 IK10 Indoor Type and Outdoor Type			
Operating frequency	Hz	50-60			
Operating temperature	°C	-5/+40, +35 (approx. 24 h)			
Internal separation		Form 1, Form 2/3/4 (a and b)			
Rated busbar current	$I_e$ A	1600	2500	4000	
Rated busbar short-circuit current	$I_{cw}$ kA	40	50	66	
Rated busbar pulse short-circuit current	$I_{pk}$ kA	84	105	143	
Rated insulation voltage	$U_i$ V	1000			
Rated operating voltage	$U_e$ V	690			
Impulse insulation voltage	$U_{imp}$ kV	12 (at the altitude of 2000 m)			
Metal surfaces		Pre-galvanized/Stainless Steel 2 (Door and metal surfaces) 1.5 (Internal parts, side and rear covers)			
Sheet thickness	mm	RAL 7032 & RAL 7035 electrostatic powder painting			
Paint color		1900+100 base 1900+100 base			
Height	mm				
Width	mm	400, 500, 600, 700, 800, 900, 1000, 1200			
Depth	mm	400, 500, 600, 700, 800, 900, 1000, 1100			



# OUR PRODUCTS



## MCC Switchboards (Pre-galvanized) Fixed or Withdrawable Type

### Technical Specifications

Type Test Standard		IEC 61439/1-2, IEC 62208, IEC 62262, IEC 60529		
Verification Standard		IEC 60890, IEC 60865, IEC 61117		
Access		Front side		
Ingress protection rating		IP41 IEC 60529 IK10 Indoor Type IP55 IEC 60529 IK10 Indoor Type and Outdoor Type		
Operating frequency	Operating temperature	Hz	50-60	
Internal separation	Rated busbar current	°C	-5/+40, +35 (approx. 24 h)	
Rated busbar short-circuit current	Rated busbar pulse short-circuit current		Form 1, Form 2/3/4 (a and b)	
Rated insulation voltage	Rated operating voltage	$I_e$ A	630	1000
Impulse insulation voltage	Metal surfaces	$I_{cw}$ kA	16	25
Sheet thickness		$I_{pk}$ kA	32	52,5
		$U_i$ V	1000	
		$U_e$ V	690	
		$U_{imp}$ kV	12 (at the altitude of 2000 m) Pre-galvanized 2 (Door and metal surfaces) 1.5 (Internal parts, side and rear covers) RAL 7032 & RAL 7035 electrostatic powder painting 1900+100 base 1900+200 base	
		mm		
Paint color				
Height		mm		
Width (For withdrawable type)		mm	600+400	
Width (For fixed type)		mm	500, 600, 700, 800	
Depth		mm	600, 700, 800, 900, 1000	



1D

## eVArQ Compensation Switchboards Fixed, Withdrawable or Socket Type Compensation Switchboards, Hybrid System

Technical Specifications			
Type Test Standard		IEC 61439/1-2, IEC 62208, IEC 62262, IEC 60529	
Access		Front side	
Ingress protection rating		IP41 IEC 60529 IK10 Indoor Type IP55 IEC 60529 IK10 Indoor Type and Outdoor Type	
Operating frequency	Hz	50-60	
Operating temperature	°C	-5/+40, +35 (approx. 24 h)	
Internal separation		Form 1, Form 2	
Model type		Fixed, withdrawable or socket type	
Dropper busbar current (For withdrawable type)	Ie A	400	
Module power (For withdrawable type)	kVAr	240 (400 VAC)	
Withdrawer power	kVAr	5-10-20-40 (400 VAC)	
Rated insulation voltage	Ui V	1000	
Rated operating voltage	Ue V	690	
Rated pulse Insulation voltage	Uimp kV	12 (at the altitude of 2000 m) Pre-galvanized 2	
Metal surfaces		(Door and metal surfaces) 1.5 (Internal parts, side and rear covers) RAL 7032 & RAL 7035	
Sheet thickness	mm	electrostatic powder painting 1900+100 base 1900+200 base	
Paint color			
Height	mm		
		Withdrawable Type	Fixed Type
Width	mm	500, 600	400, 600, 800, 1000
Depth	mm	700	600, 800

### Advantages of Our e-VArQ Fixed Withdrawable or Socket Type Compensation Switchboards

- The conformity of the switchboard (400 VAC) with 6x40kVA withdrawers to the EC 61439-1/2 standard has been verified by type testing.
- Problems experienced in the project design stage have been resolved thanks to e-VArQ.
- Thanks to the universal feature, the switchboard can be easily applied to any single line diagram.
- Thanks to the electrical and mechanical modularity of our switchboards, mounting problems have been solved.
- During the assembly/disassembly of the withdrawers in the switchboard, withdrawers are interchangeable with each other. (Electrical modularity)
- The switchboard can be disassembled and assembled in the field without disturbing the routine tests performed at the factory. In this way, it can be easily transported to the installation site.
- It can be detached in the field and each withdrawer can be used in a different place.
  - It can be added to the existing facilities.
- Active Harmonic Filter can be placed before the switchboards in our hybrid model.
- Thanks to the high-power radial fan system, the ventilation problems due to the place of use of the switchboards are eliminated.
- Mechanical locking mechanism takes precautions against the wrong actions in our switchboards.
- The switchboard allows the operation technicians to easily intervene in the system.
- The switchboard can be stored empty or assembled. In case it is stored empty and electrical materials are available, the switchboard can be assembled on the same day. (In this way we can contribute particularly to our colleagues who manufacture switchboards but do not have sufficient production capacity.)



# OUR PRODUCTS



## eVArQs Dynamic Compensation Switchboards for Low-Power Facilities

Technical Specifications				
Type Test Standard		IEC 61439/1-2, IEC 62208, IEC 62262, IEC 60529		
Access		Front side		
Ingress protection rating		IP41 IEC 60529 IK10 Indoor Type		
Operating frequency	Hz	50-60		
Operating temperature	°C	-5/+40, +35 (approx. 24 h)		
Model type		Fixed type		
Power	kVAr	30	50	100
Shunt power	kVAr	3Ad 1,5 (230VAC)	3Ad 2,5 (230 VAC)	3Ad 5 (230 VAC)
Condenser power	kVAr	3Ad 1,5 (230 VAC)	3Ad 2,5 (230 VAC)	3Ad 5 (230 VAC)
		1Ad 5 (400 VAC)	1Ad 7,5 (400 VAC)	1Ad 10 (400 VAC)
		2Ad 10 (400 VAC)	1Ad 15 (400 VAC)	1Ad 15 (400 VAC)
			1Ad 20 (400 VAC)	2Ad 30 (400 VAC)
Rated insulation voltage	Ui V	1000		
Rated operating voltage	Ue V	690		
Impulse insulation voltage	Uimp kV	12 (at the altitude of 2000 m)		
Metal surfaces Sheet thickness	mm	Pre-galvanized		
Paint color		RAL 7032 & RAL 7035 electrostatic powder painting		
		30 kVAr	50 kVAr	100 kVAr
Height	mm	790	790	890
Width	mm	400	400	500
Depth	mm	705	705	850



## Advantages of Our e-VArQs Dynamic Compensation Switchboards

- e-VArQs Dynamic Compensation Switchboard is a new generation compensation switchboard.
- Conventional compensation switchboards respond to the system by using the capacitor and reactor taps in groups.
- In addition, since the conventional compensation switchboards have a predetermined power, which is limited, they cannot provide the complete reactive power required by the system.
- They try to reach the closest possible values.
- e-VArQs dynamic compensation switchboards, similar to the conventional compensation switchboards, have a dynamic compensation system that changes the power of the inductive load driver and shunt reactor separately for each phase and completely meets the requirements of the system, as well as the contractor-switched capacitor groups.
- Another advantage of e-VArQs dynamic compensation switchboards over the conventional compensation switchboards is that they can respond to the requirements of the system very quickly (standard <200ms, optional <40ms)
- It fully responds to the capacitive compensation that may occur due to the use of energy-saving lighting, uninterruptible power supplies, inverter air conditioners, and chillers, etc.
- Since the rapidly changing loads are compensated by the inductive load driver, contactor-switching is performed occasionally; thus, the service life of the contactor is extended.
- The operation is easily compensated for quickly incoming and outgoing loads.
- The assembly and commissioning labor is less since all settings are made in the factory environment.
- It conveniently works even in low-power facilities or high-power facilities with a high current transformer ratio since the detection current is 3 mA.
- The tap values are constantly updated by performing tap tests automatically.
- Automatic detection and correction of the changes in the current transformer connections.
- It reduces the maintenance costs since compensation extends the maintenance period.



# OUR PRODUCTS



## eVArQs Dynamic Compensation Switchboards for Low-Power Facilities

Technical Specifications		
Type Test Standard		IEC 61439-1/2 Front side IP41 IEC 50529 IK10
Access		Indoor Type 50-60 0-50 Up to 50 A 690 8 (at the
Ingress protection rating		altitude of 2000 m) 6, 12, 18, 24 Pre-galvanized 2
Operating frequency	Hz	(Door and metal surfaces) 1.5 (Internal parts, side
Operating temperature	°C	and rear covers) RAL 7032 & RAL 7035 electrostatic
Rated busbar current	I <sub>e</sub> A	powder painting 1600+100 base 1600+200 base 500
Rated operating voltage	U <sub>e</sub> V	500
Impulse insulation voltage	U <sub>imp</sub> kV	
Output fiber count		
Metal surfaces		
Sheet thickness	mm	
Paint color		
Height	mm	
Width	mm	
Depth	mm	





## Solar Power Distribution Boards

### Technical Specifications

Type Test Standard		IEC 51439/1-2, IEC 62208, IEC 52262, IEC 60529
Verification Standard		IEC 608890, IEC 60865, IEC 61117 Front side IP41
Access		IEC 60529 IK10 Indoor Type IP55 IEC 60529 IK10
Ingress protection rating		Indoor Type and Outdoor Type 50-60 -5/+40, +35 (approx. 24 h) Form 1, Form 2/3/4 (a and b) Optional
Operating frequency	Hz	1000 690 12 (at the altitude of 2000 m) Pre-
Operating temperature	°C	galvanized 2 (Door and metal surfaces) 1.5 (Internal parts, side and rear covers) RAL 7032 & RAL 7035
Internal separation Rated busbar current Rated insulation voltage Rated operating voltage Impulse insulation voltage Metal surfaces Sheet thickness	le A Ui V Ue V Uimp kV mm	electrostatic powder painting According to the project requirements. According to the project requirements. According to the project requirements.
Paint color	mm	
Height	mm	
Width	mm	
Depth	mm	

### Types

- AC MAIN DISTRIBUTION BOARDS
- AC FIELD DISTRIBUTION BOARDS
- SCADA BOARDS
- DC FIELD DISTRIBUTION BOARDS



# OUR PRODUCTS



## Surface and Flush Mounted LV Distribution Boards (Empty)

Technical Specifications		
Type Test Standard		IEC 62208
Access		Front side
Ingress protection rating		IP41 IEC 60529 IK10 Indoor Type IP41 IEC 60529 IK10 Indoor Type IP55 IEC 60529 IK10 Indoor Type and Outdoor Type IP66 IEC 60529 IK10 Outdoor Type
Operating frequency	Hz	50-60
Operating temperature	°C	-5/+40, +35 (approx. 24 h)
Rated busbar current	le A	up to 160 A
Metal surfaces		Pre-galvanized/ Stainless Steel
Sheet thickness	mm	1-1.5-2
Paint color		RAL 7032 & RAL 7035 electrostatic powder painting
Height	mm	400, 600, 800, 1000, 1200
Width	mm	300, 400, 500, 600, 700
Depth	mm	125, 150, 200, 250, 300



IP2X

IP41



IP66

IP55



## Surface and Flush Mounted LV Distribution Boards (Assembled)

### Technical Specifications

Type Test Standard		IEC 60670, IEC 62208 Front side IP41 IEC 60529 IK10
Access		Indoor Type
Ingress protection rating		IP41 IEC 60529 IK10 Indoor Type IP55 IEC 60529 IK10 Indoor Type and Outdoor Type IP66 IEC 60529 IK10 Outdoor Type IP66 IEC 60529 IK10 Outdoor Type
Operating frequency	Hz	50-60
Operating temperature	°C	-5/+40, +35 (approx. 24 h)
Rated busbar current	I <sub>e</sub> A	up to 160 A
Rated insulation voltage	U <sub>i</sub> V	1000
Rated operating voltage	U <sub>e</sub> V	690
Impulse insulation voltage	U <sub>imp</sub> kV	8 (at the altitude of 2000 m)
Metal surfaces		Pre-galvanized/ Stainless Steel
Sheet thickness	mm	1-1.5-2
Paint color		RAL 7032 & RAL 7035 electrostatic powder painting
Height	mm	400, 600, 800, 1000, 1200
Width	mm	300, 400, 500, 600, 700
Depth	mm	125, 150, 200, 250, 300



# OUR PRODUCTS



## Technical Specifications

Type Test Standard		IEC/EN61439/1-2
Access		Front side IP31 IEC/EN 60529 IK10
Ingress protection rating		Internal Type IP42 IEC/EN 60529 IK10 Internal Type IP55 IEC/EN 60529 IK10 Internal Type
Operating frequency	Hz	
Operating temperature	°C	-5/+40, +35 (approx. 24 h)
Internal separation		Form 1, Form 2/3/4 (a and b)
Rated busbar current	$I_e$ A	up to 7100
Rated busbar short-circuit current	$I_{dw}$ kA	100 (1s)
Rated busbar pulse short-circuit current	$I_{pk}$ kA	220
Rated insulation voltage	$U_i$ V	1000 VAC / 1200 VDC
Rated operating voltage	$U_e$ V	690
Impulse insulation voltage	$U_{imp}$ kV	12 (at the altitude of 2000 m)
Metal surfaces		Pre-galvanized/ Stainless Steel
Sheet thickness	mm	2 (Door and metal surfaces) 1.5 (Internal parts, side and rear covers)
Paint color		RAL 7035 electrostatic powder painting
Height	mm	2000+100/200 base
Width	mm	425, 600, 800, 850, 1000, 1100, 1200
Depth	mm	600, 800, 1000

## Switchboard Types

- PowerSection–For Input, Output and Coupling circuit breakers
- Distribution Section – For fixed type output circuit breakers
- Distribution Section – For on-load removable type output circuit breakers
- Distribution Section – For withdrawable type feeding and MCC starting system
- For assembly of general devices and the compensation system



4A

## INDOOR TYPE PENDA SWITCHBOARDS

Place of use	Indoor Type										
Altitude	1000 m 2000 m										
Maximum ambient temperature (°C)	40 °C										
Average ambient temperature (°C) for the last 24 hours	35 °C										
Minimum ambient temperature (°C)	-5 °C										
Pollution degree rating	Pollution Degree 2										
Relative humidity											
Horizontal peak ground acceleration	0,5g										
Vertical peak ground acceleration	0,4g										
System grounding	Directly grounded										
Rated frequency	50 Hz										
Rated operating voltage	231/400 V 3 (three)-phase 4 (four)-wire system										
Rated impulse withstand voltage, kV (Uimp)	8 (at the altitude of 2000 m)										
Transformer power (kVA)	50	100	160	250	400	630	800	1000	1250	1600	
Main busbar rated current (A)	72	145	230	360	580	910	1155	1445	1800	2312	
Input Unit rated current (A)	72	145	230	360	580	910	1155	1445	1800	2312	
Effective Value (kA)	2	4	6	9	15	23	19	24	30	38	
Peak Value (kA)	3	6	10	15	30	48	38	50	63	80	
	0,7	0,7	0,5	0,5	0,3	0,25	0,3	0,25	0,25	0,25	
Enclosure type Exterior design	Sheet metal										
Mounting method	Cabinet Type										
Ingress protection rating	Pedestal Type										
Inlet connection side											
Outlet connection side	Top side From bottom										



## OUTDOOR TYPE PENDA SWITCHBOARDS

Place of use	Outdoor Type				
Altitude	1000 m , 2000 m				
Maximum ambient temperature (°C)	40 °C				
Average ambient temperature (°C) for the last 24 hours	35 °C				
Minimum ambient temperature (°C)	-25 °C				
Pollution degree rating	Pollution Degree 3				
Relative humidity					
Horizontal peak ground acceleration	0,5g				
Vertical peak ground acceleration	0,4g				
System grounding	Directly grounded				
Rated frequency	50 Hz				
Rated operating voltage	231/400 V 3 (three)-phase 4 (four)-wire system				
Rated impulse withstand voltage, kV (Uimp)	8 (at the altitude of 2000 m)				
Transformer power (kVA)	50	100	160	250	400
Rated busbar current (A)	72	145	230	360	580
Input Unit rated current (A)	72	145	230	360	580
Effective Value (kA)	2	4	6	9	15
Peak Value (kA)	3	6	10	15	30
	0,7	0,7	0,5	0,5	0,3
Enclosure type Exterior design Mounting method	Sheet				
Ingress protection rating	Cabinet Type				
Inlet connection side (for Pedestal Type)	Pedestal Type, Pole Type				
Inlet connection side (for Pole Type)	IP 54 (When mounted on its pedestal)				
Outlet connection side (for Pedestal Type)	Bottom side				
Outlet connection side (for Pole Type)	Top side				
	Bottom side				
	Top side or bottom side				



# OUR PRODUCTS

4C-D

## PENDA TYPE-A FIELD DISTRIBUTION BOXES PENDA TYPE-B FIELD DISTRIBUTION BOXES

Place of use	Altitude	Maximum	Outdoor Type
ambient temperature (°C)	Average		2000 m
ambient temperature (°C) for the last 24 hours	Minimum	ambient	(+40 °C
temperature (°C)	Pollution degree	rating	(+50 °C
Maximum solar radiation			(+35 °C
			(+45 °C
Relative humidity	Icing		-25 °C
			-25 °C
Horizontal peak ground acceleration			Pollution Degree 3
Vertical peak ground acceleration			1000 Wm <sup>2</sup>
System grounding			
Operating (system) frequency			Class 10, 10mm
Operating (system) voltage			0,5g
Insulation voltage			0,4g
Rated impulse withstand voltage, kV (Uimp)			Directly grounded
Input unit rated current (A)			50 Hz
Ring output unit current (A)			231/400 VAC 3 (three)-phase 4 (four)-wire system
(Output to other FDB)			690 V
Maximum short circuit current (kA)			8 (at the altitude of 2000 m)
Enclosure type			250; 400
Exterior design			250; 400
Mounting method			38
Ingress protection rating			
			Sheet, Glass Fiber Reinforced Polyester
			Cabinet Type
			Mounting on pedestal
			IP 44 (when mounted on its pedestal)



# OUR PRODUCTS



## PENDA TYPE LV METERING AUTOMATION PANEL FIELD DISTRIBUTION BOXES

Place of use	Outdoor Type
Altitude	2000 m
Maximum ambient temperature (°C)	+40 °C /+50 °C
Average ambient temperature (°C) for the last 24 hours	35 °C
Minimum ambient temperature (°C)	- 25 °C- 40 °C
Pollution degree rating	Pollution Degree 3
Maximum solar radiation	1000 W/m <sup>2</sup>
Relative humidity	+ 25°C'da %100
Icing	Class 10, 10mm
Horizontal peak ground acceleration	0,5g
Vertical peak ground acceleration	0,4g
System grounding	Directly grounded
Operating (system) frequency	50 Hz
Operating (system) voltage	231/400 VAC 3 (three)-phase 4 (four)-wire system
Insulation voltage	690 V - active
Rated impulse withstand voltage, kV (Uimp)	8 (at the altitude of 2000 m)
Rated busbar current (A) Input Unit rated current (A) Ring output unit current (Output to the other LVMA) (A) Supply output units current (A) Maximum expected short circuit current in LV meter automation panel input	400 250-400 250-400 25-100 25 kA - active
Enclosure type	Sheet, Glass Fiber Reinforced Polyester
Exterior design	Cabinet Type
Mounting method	Pedestal Type or Pole Type
Ingress protection rating	IP54



4F

## PENDA TYPE LIGHTING SWITCHBOARDS

Rated busbar current (A)	80
Input unit rated current (A)	80
Maximum short circuit current (kA)	38
Peak Value (kA)	80
	0,25
Enclosure type Exterior	Sheet, Glass Fiber Reinforced Polyester
design Mounting method	Cabinet Type
Ingress protection rating	Pedestal Type
	IP54 (When mounted on its pedestal)



# OUR PRODUCTS

5A

## 1 kV Steel Sheet Metal Substations

Test Standard	IEC 62208
Place of use	Outdoor Type
Intended use	It is used to prevent voltage drops in long-distance road lighting in urban roads, motorways and highways. Usually, transformers with a power of 40 kVA, 50 kVA, or 63 kVA is preferred. The substation has an input voltage of 1 kV and an output voltage of 0.4 kV. A 1 kV fuse group or 1 kV Thermal Magnetic Switch is used at the input. The fuses and switches in accordance with the numbers and current values specified in the project are used at the output.
Altitude	2000 m 40°C 35 °C -25°C 1000 Wm2 Pollution Degree 3 95 80 60 0.5 g 0.4 g
Maximum ambient temperature (°C)	According to the technical specifications 50-60 Hz Paint on 2 mm Pre-galvanized
Average ambient temperature (°C) for the last 24 hours	Sheet or Hot-Dip Galvanization on 3 mm HRP Sheet Cabinet Type Pedestal Type IP
Minimum ambient temperature (°C)	54D (when mounted on its pedestal), IK10, Enclosure Class 10 850 N/m2 Bottom side
Maximum solar radiance	Bottom side
Pollution degree rating	
Horizontal peak ground acceleration	
Vertical peak ground acceleration	
System grounding Rated frequency	
Enclosure type Exterior design	
Mounting method Ingress protection rating	
Roof mechanical strength load	
Inlet connection side Outlet connection side	



# OUR PRODUCTS



## 11kV-24kV-36kV Steel Sheet Metal Substations

Test Standard	IEC 62208 Outdoor Type Enclosure for substations with RMU or modular cells
Place of use	with metal enclosure 2000 m 40°C 35°C -25°C 1000 Wm2 Pollution Degree 3 95
Intended use	80 60 0.5 g 0.4 g According to the technical specifications 50-60 Hz Paint on 2 mm
Altitude	Pre-galvanized Sheet or Hot-Dip Galvanization on 3 mm HRP Sheet Cabinet Type
Maximum ambient temperature (°C)	Pedestal Type IP 54D (when mounted on its pedestal), IK10, Enclosure Class 10
Average ambient temperature (°C) for the last 24 hours	450 N/m2 Bottom side Bottom side
Minimum ambient temperature (°C)	
Maximum solar radiance	
Pollution degree rating	
Horizontal peak ground acceleration	
Vertical peak ground acceleration	
System grounding Rated frequency	
Enclosure type Exterior design	
Mounting method Ingress protection rating	
Roof mechanical strength load	
Inlet connection side Outlet connection side	

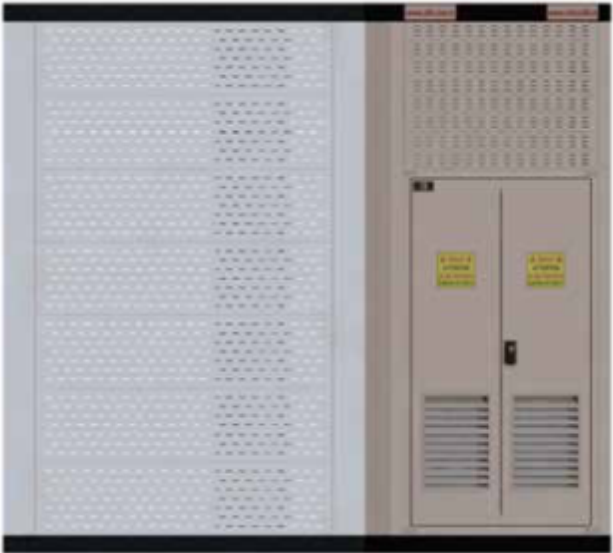
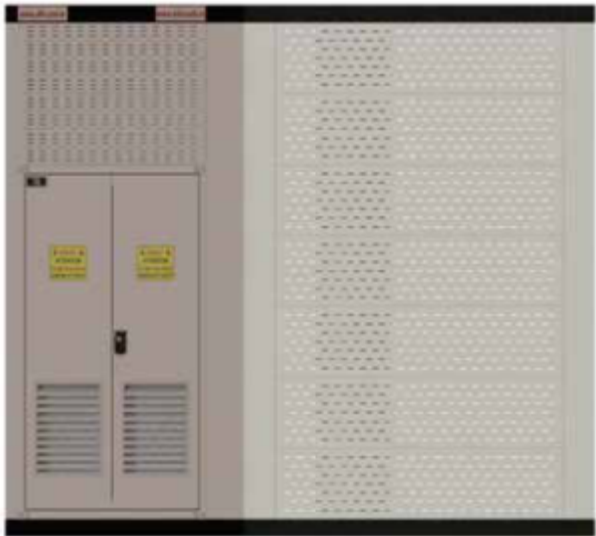


# OUR PRODUCTS



## Special Type Steel Sheet Cabinets (Dry-Type Transformer Cabinet, etc.) Sheet Metal Parts Manufacturing

Enclosure Type	Paint on 2mm Pre-galvanized Sheet Metal
Intended Use	Transformer enclosure





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