MEDIFOR
ENERGY SOLUTIONS

TRANSFORMERS

A Sustainable Future...

www.medifor.com.tr

About Us

Our company designs, offers solutions, sells and markets electrical and mechanical products such as Medium Voltage Switching Products, Medium Voltage Substations (Transformer Module), Mobile Substations, Current Transformers, Medium Voltage Fuse Disconnectors with its experience and high quality understanding.

We offer complete turnkey installation services for the generation of electrical energy from renewable energy sources. For the most suitable energy system solution; we offer engineering, feasibility, project design, implementation, commissioning and maintenance and repair activities.

Our Vision

'Light up the world, add value to the future.'

To provide the world's best products and services with a passion for innovation and optimal operation in line with the vision of becoming the company of the future in the field of electric power generation from renewable energy sources, transmission and distribution of electric energy in the world.

As a company, we will welcome challenges and opportunities.

Our Mission

To inspire the industry and the world with innovative products and designs that adhere to national and international standards, customer-oriented, add value to all stakeholders, sensitive to energy efficiency and carbon emissions.

Oil Immersed Transformers

Oil type distribution transformers are transformers variable with input and output voltages in desired ratios up to 36 kV maximum voltage level and up to 5,000 kVA power, where cooling in transformers is provided by transformer oil.

All transformers are manufactured in conformity with ISO 9001 and ISO 14001. At the end of the production process, transformers are individually tested in accordance with IEC Standards.

Products

- Solar Power Plant Transformer
- Wind Turbine Transformer
- Distribution Transformer
- Earthing Transformer
- Dual Voltage Transformer
- Rectifier Transformer
- Starting Transformer
- Autotrafo
- Shunt Reactor
- Series Reactor Limiting Short Circuit
- Current Multi Winding Transformer

Hermetic Transformers

25 - 5.000 kVA power range (transformer requests larger than 5.000 kVA should be evaluated on a project basis), up to 36 kV maximum voltage level, three or single phase, oil filled, naturally cooled (ONAN), with off-load or on-load tap changer, can be used both externally and internally, are produced in accordance with national / international standards and customer requests.

Hermetic oil type distribution transformers are manufactured in special vacuum chambers by adjusting the pressure in the factory environment in such a way that there is no air gap and no contact with the atmosphere. Therefore, since there is no moisture in the boiler, the deterioration in the oil caused by oxidation is minimized.

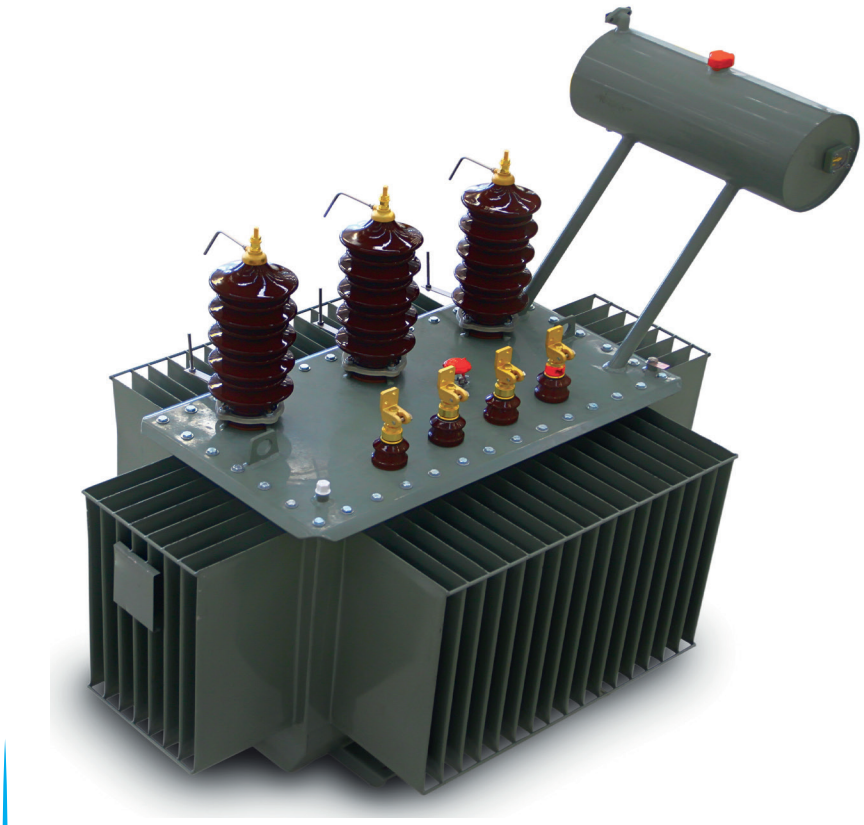
Since the oil in hermetic transformers does not come into contact with the atmosphere, it does not require oil change and maintenance in certain periods as in transformers with expansion tank. Hermetic oil type transformers can be used in smaller areas in terms of height compared to tank transformers.

Transformers with Expansion Tank

Transformer with expansion tank; 25-5000 kVA power range (transformer requests larger than 5.000 kVA should be evaluated on project basis), up to 36 kV maximum voltage level, three or single phase, oil cooled, natural cooling (ONAN), with off-load or on-load tap changer, can be used externally and internally, are produced in accordance with national / international standards and customer requests.

Since the transformer with expansion tank is open to the atmosphere, the oil pressure changing due to thermal effects is dehumidified by the slicagel (air dryer) in the transformer's tank and air exchange is provided.

In the expansion tank type transformers, due to temperature changes of ambient, silicagel loses its protection against humid inside oil by time and that cause problems for transformer oil. For this reason, maintenance such as measuring the breakdown voltage of oil and replacing the slicagel should be done by taking samples from the oil in certain periods.



Tests

Fidex Tests	Typical Teets	Customized Tests
•Measurement of winding resistance	•Temperature rise test	•Determination of the shallow between windings to earth and winding to winding
•Measuring the voltage ratio and checking the connection group	•Lightning impulse test	•2. Measurement of zero sequence impedance in three-phase transformers
•Measurement of short circuit impedance and load loss	•Measurement of sound levels	•Short circuit withstand test (KEMA, Bogazici University,...)
•Measurement of no load losses and no load current		•Measurement of harmonics of no load current
•Dielectric routine tests		•Measurement of the insulation resistance of the windings to earth and/or the loss factor (loss angle tangent) of the insulation system capacities
•Step end displacement tests under load		
•Insulation resistance		

Areas Of Use

- Distribution Centers
- MV/LV Substations
- Construction sites
- Factories
- Industrial Zones
- Irrigation Projects
- Power Plants
- In-City Distribution Centers (Pole Type or Substation)

Accessories

1. Pressure Safety Valve

It is a preferred circuit element in hermetic designs. It protects the transformer tank in case of sudden pressure rise. It is mounted on the cover. If the tank is exposed to the internal pressure to which the valve is set, the valve opens and prevents the tank from rupturing by compensating the effect of the pressure through oil discharge. Optionally, it can be used with contact.

2. Hermetic Protection Relay

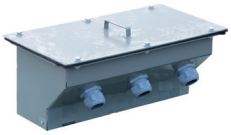
It is a relay used in hermetic transformers. The relay indicates gas discharge, oil temperature and internal pressure in the tank. It is generally used in transformers larger than 500 kVA. There are two contacts each for gas discharge, tank pressure and oil temperature on the relay. It gives alarm and trip warnings according to the set limit values.

3. Wheels

Wheels of various diameters, selected to be strong enough to carry the weight of the transformer, are shipped with the transformer depending on customer demand.

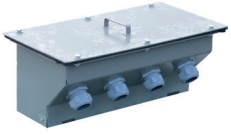
4. High Voltage Cable Box

It is a mechanical enclosure that protects transformer high voltage bushing connections against environmental influences. It can be designed in various IP classes depending on customer demand.



5. Low Voltage Cable Box

It is a mechanical enclosure that protects the transformer low voltage bushing connections against environmental influences. It can be designed in various IP classes depending on customer demand.



6. Switch Oil Temperature Thermometer

There is a maximum indicator showing the maximum temperature reached by the oil in the transformer and it can be reset with the button on the bottom. Oil temperature can be read up to 120°C. It is contacted. The electrical value of the micro switches can be set as 5A 250 VAC or 0.2 A, 250 VDC. If the customer wants to see the temperature reached by the oil in the transformer with the indicator on it without contact, Dial Type Thermometer should be used.

7. Buchholz Relay

It is connected with pipes between the transformer tank and the oil expansion tank. Buchholz relay is an element used to observe gas and oil movements in transformers. It warns of malfunctions that cause small gas accumulations in transformers, sudden oil fluctuations and oil leaks.

8. Magnetic Oil Level Indicator

It is the indicator used to check the oil level in the oil expansion tank. For changing the transformer oil, the oil level is indicated by a magnetically connected float. If desired, contact level indicators are also used.

9. The Dehydrating Breather

In connection with the oil expansion tank, when the oil volume changes, it prevents moisture from passing into the oil by trapping the moisture in the air passing through it. The size of the dehumidifier is used depending on the amount of oil.

Customized Transformers

Custom type transformers are transformers that require a special design suitable for the area of use and intended use.

Products

- Dual Voltage Transformers
- Transformers in accordance with ANSI / BS Standards
- FR3 Vegetable Oil Transformers
- Arc Furnace Transformers
- Induction Furnace Transformers
- 6 Pulse Rectifier Type Transformers
- Shunt Reactors
- Isolation Transformers

  SPP, HEPP, WPP, GPP Type Transformers

As Medifor, we design and supply British Standard (BS) transformers from 50kVA to 3150kVA in accordance with Eco Design and BSEN60076 standards. Our Tier2 loss standard transformers are manufactured using CRGO sheet metal. Transformer voltage can be selected as 11kV or 33kV on HV side, 415V or 433V on LV side according to customer demand. Step adjustment field can be selected from 5 to 7 steps as idle.

Our transformers are designed as flanged on the HV and LV side and are offered to the customer in accordance with LV and HV cable box assembly, ACB / MCCB cabinet-board assembly and switchgear assembly in accordance with ENATS standards.

The radiators used in our transformers are designed in accordance with the use of switchgear on the HV side and are presented to our customer in a way to leave enough space for installation on the HV side.

Transformer cooling type can be selected as mineral oil or Midel - FR3 oil based.

The harmonic distortions that the transformers can tolerate are selected as <5% as standard, but can be set to higher values according to customer request.

Tests

Fidex Tests	Typical Teets	Customized Tests
•Measurement of winding resistance	•Temperature rise test	•Determination of the shallow between windings to earth and winding to winding
•Measuring the voltage ratio and checking the connection group	•Lightning impulse test	•2. Measurement of zero sequence impedance in three-phase transformers
•Measurement of short circuit impedance and load loss	•Measurement of sound levels	•Short circuit withstand test (KEMA, Bogazici University,...)
•Measurement of no load losses and no load current		•Measurement of harmonics of no load current
•Dielectric routine tests		•Measurement of the insulation resistance of the windings to earth and/or the loss factor (loss angle tangent) of the insulation system capacities
•Step end displacement tests under load		
•Insulation resistance		

Areas Of Use

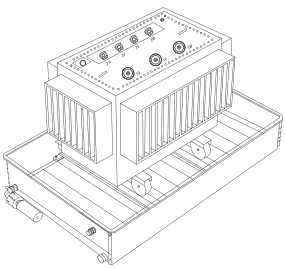
- Distribution Centers
- MV/LV Substations
- Construction sites
- Irrigation Projects
- Factories
- City Distribution Centers (Pole Top or Substation)
- Industrial Zones
- Power Plants

Oil Bund (Optional)

Oil-type transformers contain transformer oil for cooling and insulation. These oils cause environmental pollution by mixing with soil and water in case of leakage.

Oil storage Tank should be used instead of concrete or pebbles where oil-type transformers are to be installed. The Oil storage Tank, which is used outdoors, provides safe drainage of rainwater with its special filters. It also minimizes the possibility of fire with different product ranges. Products are specially designed and manufactured in line with the demands of the customers in an environmentally and climate sensitive manner.

Medifor continues to design environmentally friendly products with the solutions it has developed.



Dry Type Transformers

Dry-type distribution transformers are moisture-proof, suitable for operation in humidity or severe polluted conditions. These transformers are the ideal transformers for operation at temperatures as low as -25°C as well as in environments with more than 95% humidity. HV windings are coated with epoxy cast resin under vacuum and LV windings can be manufactured with both cast resin and resin soaked prepreg.

Dry type transformers have a wide range of applications. They can be used in distribution systems, co-generation systems, rectifier and traction applications.

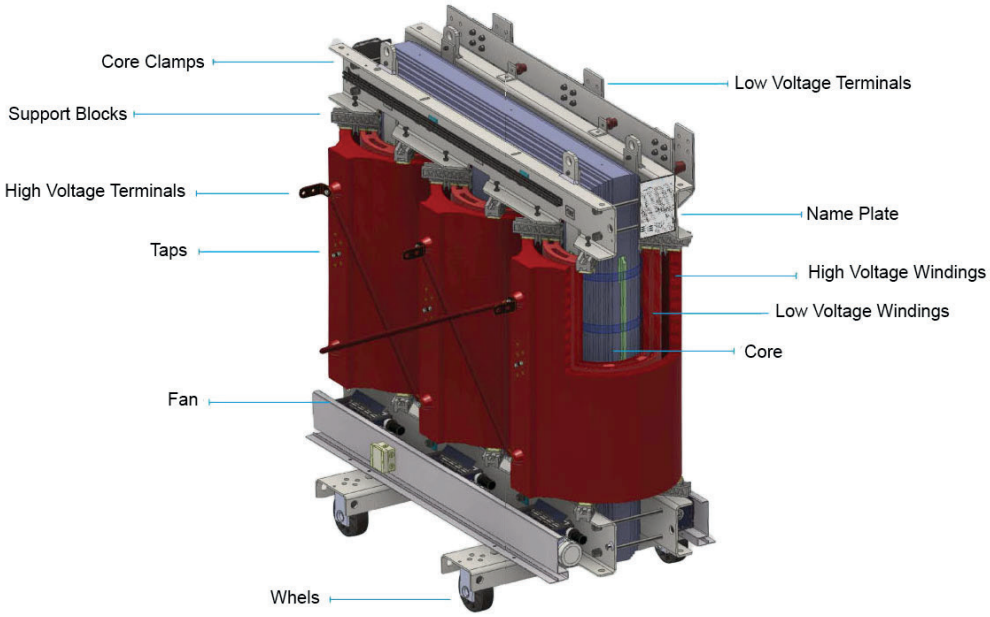
All transformers are manufactured in accordance with ISO 9001 and ISO 14001. At the end of the production process, transformers are individually tested in accordance with IEC Standards.

Advantages

- Non-flammable and self-extinguishing.
- Resistant against moisture.
- Does not cause environmental pollution.
- Insulation materials are environmentally friendly materials that do not contain halogen and nitrogen.
- Requires minimal maintenance (once a year).
- No risk of leaks as it does not contain liquid.
- On-site maintenance and repair service.
- Oppurtunity of installation very close to consumer centers.
- Low operating and installation costs.
- No need for special safety measures as it is self-extinguishing.
- Better performance against oil type transformers in short-term overloads.
- High mechanical resistance against short circuit

Areas Of Use

- Internal and external transformer centers
- Solar Power Plants
- Industry and oil refineries
- Subways
- Oil platforms
- Energy production facilities
- Hospitals
- Schools
- Airports
- Shopping Centers
- Wind Power Plants



Tests

Fixed Tests	Typical and Customized Tests
•Measurement of Winding Resistances (IEC 60076-11 Clause 14.2.1)	•Full Wave Lightning Impulse Test (IEC 60076-11 Clause 14.3.1)
•Measurement of Voltage Ratio and Control of Phase Difference (IEC 60076-11 Clause 14.2.2)	•Temperature Rise Test (IEC 60076-11 Clause 14.3.2)
•Measurement of Short Circuit Impedance and on load Loss (IEC 60076-11 Clause 14.2.3)	•Sound Level Measurement Test (IEC 60076-11 Clause 14.4.2)
•Measurement of no load Loss and no load Current (IEC 60076-11 Clause 14.2.4)	
•Applied Voltage Test (IEC 60076-11 Clause 14.2.5)	
•Induced Voltage Withstand Test (IEC 60076-11 Clause 14.2.6)	
•Measurement of Partial Discharge (IEC 60076-11:2006 Clause 14.2.7)	

Enclosure (Optional)

With respect to customers request, transformers can be enclosed according to IEC 60529 standards.
The most commonly used enclosures are;

- IP 20/23/33
- IP 44 (for indoor or outdoor use)

The enclosure with higher IP level can be designed with special cooling methods.

Power Transformers

Power transformers are used in power plants, electricity transmission-distribution lines and industrial plants. Power transformers have a wide range of technical specifications such as power, voltage and adjustment. 5000 kVA and above powers are produced up to 1250 MVA power up to 700 kV voltage level according to customer requests.

All transformers are manufactured in accordance with ISO 9001 and ISO 14001. At the end of the production process, transformers are individually tested in accordance with IEC Standards.

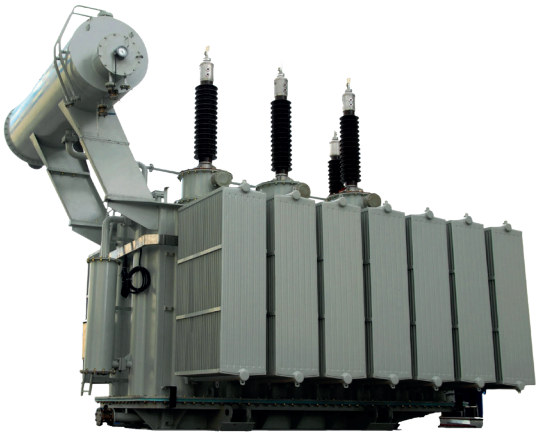
Product Types

- Generator Transformers
- Network Transformers
- Industrial Transformers
- Special Transformers

1. Mobile Transformers
2. Railway Tranformers
3. Monophase Transform
4. Marine Transformers
5. Booster Transformers

Areas of Use

- Electricity Transmission Line
- Industrial Facilities
- Electricity Generation Center
- Mobile Substations



Tests on Power Transformers

- Measurement of Winding Resistances (IEC 60076-1 Clause 11.2)
- Measurement of Voltage Convertion Ratio and Control of Phase Displacemenent (IEC 60076-1 Clause 11.3)
- Measurement of Short Circuit Impedance and load Loss (IEC 60076-1 Clause 11.4)
- Measurement of no-load loss and current (IEC 60076-1 Clause 11.5)
- Tests on tap changer under load, if applicable (IEC 60076-1 Clause 11.7)
- Leakage Test under Pressure for Liquid Immersed Transformers (Sealing Test) (IEC 60076-1 Clause 11.8)
- Sealing Tests and Pressure Tests for Tanks for Gas-Filled Transformers (IEC 60076-15)
- Conversion Rate and Polarity Control of Internal Current Transformers
- Control of Core or Body Insulation for oil immersed transformers (IEC 60076-1 Clause11.12)
- Determination of Capacitances Between Windings and Between Windings and Ground
- Measurement of D.A. Insulation Resistance Between Each Winding and Ground and Between Windings
- Measurement of Loss Factor (tan δ) of Insulation System Capacitances
- Measurement of Loss and Current at 90% and 110% of the Rated Voltage at No Load (IEC 60076-1 Clause 11.5)
- Temperature Rise Test (IEC 60076-2)
- Determination of the Sound Level for Each Cooling Method for Which a Guaranteed Sound Level is Specified (IEC 60076-10)
- Measurement of Power consumed by Fan and Liquid Pump Motors
- Determination of Transient Regime Voltage Transfer Characteristics (IEC 60076-3:2000 Annex B)
- Measurement of Zero Component Impedance in Three Phase Transformers (IEC 60076-1 Clause 11.6)
- Shape Change Test under Vacuum in Liquid Immersed Transformers (IEC 60076-1 Clause 11.9)
- Shape Change Test under Pressure in Liquid Immersed Transformers (IEC 60076-1 Clause 11.10)
- Measurement of Frequency Response (Frequency Response Analysis, FRA)
- Measurement of Paint Thickness
- Paint Quality Control Experiment
- Checking Core and Body Insulation
- Isolation of Auxiliary Circuits (IEC 60076-3 Clause 9)
- Applied Voltage Test (IEC 60076-3 Clause 10)
- Induced Voltage Withstand Test (IEC 60076-3 Clause 11.2)
- Induced Voltage Test with Partial Discharge Measurement (IEC 60076-3 Clause 11.3)
- Line Connection End A.A. Voltage Withstand Test (IEC 60076-3 Clause 12)
- Full Wave Lightning Impact Test (IEC 60076-3 Clause 13.2)
- Intermittent Wave Lightning Impact Test (IEC 60076-3 Clause 13.3)
- Lightning Impact Test at Neutral Connection End (IEC 60076-3 Clause 13.4)
- Switching Impact Test (IEC 60076-3 Clause 14)
- Radio Interference Voltage (RIV) Experiment
- DIRANA (Determination of the amount of water in the transformer insulator) experiment
- Measurement of Warning Currents
- Measurement of Idle Current and Voltage Harmonics

Certificate

MEDİFOR ENERJİ ÇÖZÜMLERİ VE ELEKTRİK MALZEMELERİ SAN. TİC. LTD. ŞTİ.

KURTKÖY MAH. SEYİT ONBAŞI SOK. NO:8/2
PENDİK / İSTANBUL / TÜRKİYE

Has been assessed and found to Comply with the Requirements of:
Denetlenmiş ve aşağıdaki standardın gerekliliklerine uygunluğu görülmüştür:

ISO 45001:2018

The Occupational Health and Safety Management System is applicable to:
İş Sağlığı Ve Güvenliği Yönetim Sistemi:

PRODUCTION, SALES AND INSTALLATION OF MODULAR CELLS, SOLAR COLLECTION PANELS, TRANSFORMERS, SUBSTATIONS (CONCRETE, PREFABRICATED AND SHEET METAL KIOSK), CURRENT AND VOLTAGE TRANSFORMERS, MV FUSES, SOLAR ENERGY SYSTEMS

MODÜLER HÜCRELER, SOLAR TOPLAMA PANOLARI, TRANSFORMATÖRLER, TRAFO MERKEZLERİ (BETON, PREFABRİK VE SAC KÖŞKÜ), AKIM VE GERİLİM TRAFOLARI, OG SİGORTALAR, GÜNEŞ ENERJİ SİSTEMLERİ ÜRETİMİ, SATIŞI VE KURULUMU

Certificate No: ISO/27386
Sertifika Numarası: ISO/27386

Date of Certification Audit: 19.08.2022
Denetim Tarihi: 19.08.2022

Date of Issue: 26.08.2022
Yayınlanma Tarihi: 26.08.2022

Date of Expiry: 25.08.2023
Son Geçerlilik Tarihi: 25.08.2023

1st Surveillance Audit : August 2023
1. Gözetim Denetim Tarihi : Ağustos 2023
2nd Surveillance Audit : August 2024
2. Gözetim Denetim Tarihi : Ağustos 2024

Certificate of validity information E-mail: info@iqrcert.com mail to confirm

CERTIFICATE

MEDİFOR ENERJİ ÇÖZÜMLERİ VE ELEKTRİK MALZEMELERİ SAN. TİC. LTD. ŞTİ.

KURTKÖY MAH. SEYİT ONBAŞI SOK. NO:8/2
PENDİK / İSTANBUL / TÜRKİYE

Has been assessed and found to Comply with the Requirements of:
Denetlenmiş ve aşağıdaki standardın gerekliliklerine uygunluğu görülmüştür:

ISO 9001:2015

The Quality Management System is applicable to:
Kalite Yönetim Sistemi:

PRODUCTION, SALES AND INSTALLATION OF MODULAR CELLS, SOLAR COLLECTION PANELS, TRANSFORMERS, SUBSTATIONS (CONCRETE, PREFABRICATED AND SHEET METAL KIOSK), CURRENT AND VOLTAGE TRANSFORMERS, MV FUSES, SOLAR ENERGY SYSTEMS

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Certificate Number: QMS-0106094
Belge Numarası: QMS-0106094

Initial Certification Date: 26.08.2022
İlk Belgelendirme Tarihi: 26.08.2022

Certification Period: 3 Years
Belgelendirme Periyodu: 3 Yıl

Certificate Validity Date: 25.08.2023
Belge Geçerlilik Tarihi: 25.08.2023

IAF INTERNATIONAL ACCREDITATION FORUM
IAS ACCREDITED Management Systems Certification Body MSCB-135
IQR

IQR Sertifikasyon Onayı

IQR ULUSLARARASI BELGELENDİRME HİZMETLERİ LTD.ŞTİ.
Beşevler Mah. Kocayunus Sk. No:3 Arslan Han Plaza K:2 Nilüfer / BURSA
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CERTIFICATE

MEDİFOR ENERJİ ÇÖZÜMLERİ VE ELEKTRİK MALZEMELERİ SAN. TİC. LTD. ŞTİ.

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PENDİK / İSTANBUL / TÜRKİYE

Has been assessed and found to Comply with the Requirements of:
Denetlenmiş ve aşağıdaki standardın gerekliliklerine uygunluğu görülmüştür:

ISO 14001:2015

The Environmental Management System is applicable to:
Çevre Yönetim Sistemi:

PRODUCTION, SALES AND INSTALLATION OF MODULAR CELLS, SOLAR COLLECTION PANELS, TRANSFORMERS, SUBSTATIONS (CONCRETE, PREFABRICATED AND SHEET METAL KIOSK), CURRENT AND VOLTAGE TRANSFORMERS, MV FUSES, SOLAR ENERGY SYSTEMS

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