



AIR CONDITIONING

| member of
MEDHA group

ABOUT THE COMPANY

Enika was founded in 1992, and since the beginning of its operations, has specialized in the design, manufacturing, and servicing of electrical and power electronic equipment and related devices, primarily for urban transport and the railway sector.

The company's headquarters and production facilities are located in the heart of Poland – in Łódź. Since 2024, Enika has been part of the international MEDHA group, creating mutual synergy in the design and production of power electronics as well as in the execution of joint projects.

In recent years, the traditional production of traction systems and auxiliary converters have been complemented by a wide range of charging stations for electric buses – both stationary and mobile – as well as air conditioning units for trams and light rail vehicles. The portfolio also includes a number of auxiliary devices intended for public transport vehicles.

The equipment is designed for long-term operation in demanding urban transport conditions and is characterized by high operational reliability. The company maintains its own service infrastructure and, for most of the supplied equipment, offers remote monitoring capabilities that facilitate and accelerate maintenance processes.

Enika workforce:

120 EMPLOYEES

Devices manufactured:

> 107 000

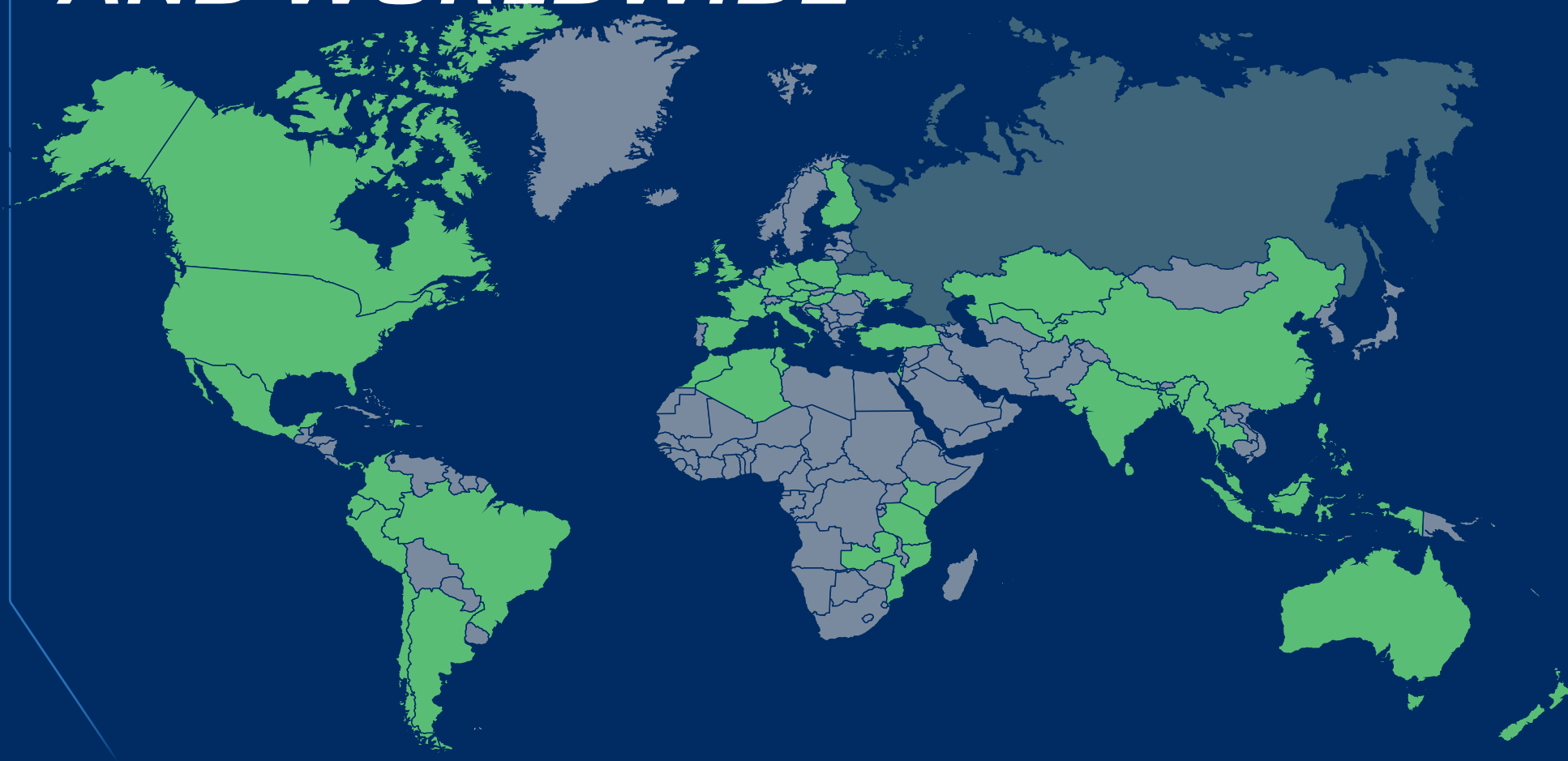
Technical availability rate:

99.8 %



MAIN SALES MARKETS

IN EUROPE AND WORLDWIDE



 MEDHA group / Enika is present
in the following countries

 Countries excluded from sales following
the introduction of sanctions in 2022



AIR CONDITIONING UNITS FOR TRAMS

Enika air conditioning units are designed and engineered specifically for use in trams and light rail vehicles. Their development is based on the company's extensive experience in the design and production of auxiliary converters for powering ventilation and air conditioning systems, as well as in the production of electric heating systems.

A common feature of the offered units is their modular design, which allows the core air conditioning components to be adapted to different vehicle types and operators' operational requirements. The air conditioning units can be integrated both into new vehicles and into older tram types as part of modernization projects.

The products presented in this catalog represent a selection from previously completed projects. If different performance or design parameters are required, solutions can be agreed directly with Enika.

***CALI
GLACIO
BARCO
GORRA
SANTIAGO
BELEM
RIO
QUITO***



DRIVER'S CAB AIR CONDITIONING

CALI



Driver's cab air conditioning unit designed for roof mounting on the vehicle. The unit is adapted for the distribution of conditioned air via ventilation ducts.

CALI is a lightweight and compact air conditioning unit designed for long tram service life in mind and to ensure thermal comfort at the driver's workstation. The unit is also available in a version with an integrated converter (iCALI), powered directly from the traction supply (600 V DC/750 V DC). This solution simplifies the vehicle's electrical system, reduces costs, and minimizes roof space requirements.

KEY FEATURES:

- integrated cooling, ventilation, and heating functions
- stepless compressor capacity control reducing energy consumption and noise emissions

CALI

TYPE	iCALI 6DC/5DC	CALI 6DC/5DC
Cooling capacity	6 kW	6 kW
Compressor supply voltage	600 V DC/750 V DC (via built-in converter)	24 V DC
Smoothly adjustable compressor capacity	Yes, via built-in converter	No
Refrigerant	R134a	R134a
Heating capacity	5 kW (for 720 V DC voltage)	5 kW (for 720 V DC voltage)
Heater supply voltage	600 V DC/750 V DC	600 V DC/750 V DC
Smoothly adjustable heater output	Yes	Yes
Blower fan capacity	$\geq 1000 \text{ m}^3/\text{h}$ (including $\geq 20\%$ fresh air)	$\geq 1000 \text{ m}^3/\text{h}$ (including $\geq 20\%$ fresh air)
Fan supply voltage	600 V DC/750 V DC (via a built-in converter)	24 V DC
Communication with vehicle control system	CAN Open	CAN Open
Housing material	aluminium	aluminium
Dimensions	1000 x 1100 x 335 mm	1000 x 1100 x 335 mm
Weight	100 kg $\pm$ 5%	90 kg $\pm$ 5%
Built-in converter	Yes, manufactured using SiC technology	No

PASSENGER COMPARTMENT AIR CONDITIONING

GLACIO



Passenger compartment air conditioning unit designed for roof mounting on the vehicle. The unit is adapted for the distribution of conditioned air via ventilation ducts.

The GLACIO air conditioning system has been designed as a lightweight unit for cooling, ventilation, and heating of both new and modernized trams and is available in various power supply configurations. In addition to the standard version, a model with an integrated converter (iGLACIO), powered directly from the traction supply (600 V DC / 750 V DC), is also available. This solution simplifies the vehicle's electrical system and minimizes roof space requirements.

KEY FEATURES:

- GLACIO and iGLACIO units use a compressor compatible with various refrigerants
- stepless compressor capacity control reduces energy consumption and noise emissions

GLACIO

TYPE	iGLACIO 20DC/18DC	GLACIO 20AC/18DC
Cooling capacity	20 kW	20 kW
Compressor supply voltage	600 V DC/750 V DC (via built-in converter)	3x400 V AC / 50Hz
Smoothly adjustable compressor capacity	Yes, via built-in converter	No
Refrigerant	R134a	R134a
Heating capacity	18 kW (for 720 V DC)	18 kW (for 720 V DC)
Heater supply voltage	600 V DC/750 V DC	600 V DC/750 V DC
Smoothly adjustable heater output	Yes	Yes
Blower fan capacity	≥4000 m ³ /h (including ≥1850 m ³ /h fresh air)	≥4000 m ³ /h (including ≥1850 m ³ /h fresh air)
Fan supply voltage	24 V DC	24 V DC
Communication with vehicle control system	CAN Open	CAN Open
Housing material	aluminium	aluminium
Dimensions	1980 x 1510 x 480 mm	1980 x 1510 x 480 mm
Weight	330 kg ± 5%	310 kg ± 5%
Built-in converter	Yes, manufactured using SiC technology	No

PASSENGER COMPARTMENT AIR CONDITIONING

BARCO



Passenger compartment air conditioning unit designed for roof mounting on the vehicle. The unit is adapted for the distribution of conditioned air via ventilation ducts.

The BARCO air conditioning system was originally designed for the modernization of Duewag MGT6D/NF6D trams; however, its design also allows installation in other vehicle types. Two basic versions are available, both with an integrated converter (designated iBARCO) powered directly from the traction supply (600 V DC / 750 V DC). The iBARCO+ version also enables interior heating thanks to a heat pump function, while the iBARCO variant is intended solely for cooling and ventilation.

KEY FEATURES:

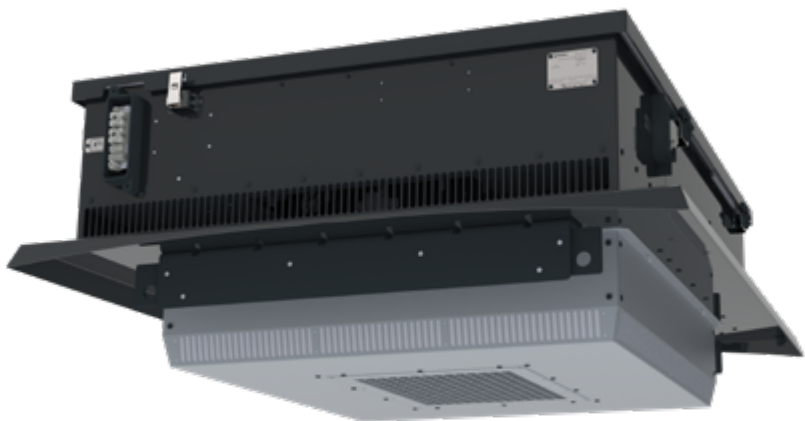
- lightweight and cost-effective design intended primarily for the modernization of older low-floor trams
- stepless compressor capacity control reduces energy consumption and noise emissions

BARCO

TYPE	iBARCO 12 DC	iBARCO+ 12/10 DC
Cooling capacity	12 kW	12 kW
Compressor supply voltage	600 V DC/750 V DC (via built-in converter)	600 V DC/750 V DC (via built-in converter)
Smoothly adjustable compressor capacity	Yes, via built-in converter	Yes, via built-in converter
Refrigerant	R513A	R513A
Heating capacity	N/A	10 kW
Heater supply voltage	N/A	600 V DC/750 V DC (via built-in converter)
Smoothly adjustable heater output	N/A	Yes
Blower fan capacity	$\geq 2000 \text{ m}^3/\text{h}$	$\geq 2000 \text{ m}^3/\text{h}$
Fan supply voltage	600 V DC/750 V DC (via built-in converter)	600 V DC/750 V DC (via built-in converter)
Communication with vehicle control system	CAN Open	CAN Open
Housing material	aluminium	aluminium
Dimensions	1500 x 1400 x 365 mm	1500 x 1400 x 365 mm
Weight	200 kg $\pm$ 5%	220 kg $\pm$ 5%
Built-in converter	Yes, manufactured using SiC technology	Yes, manufactured using SiC technology

PASSENGER COMPARTMENT AIR CONDITIONING

GORRA

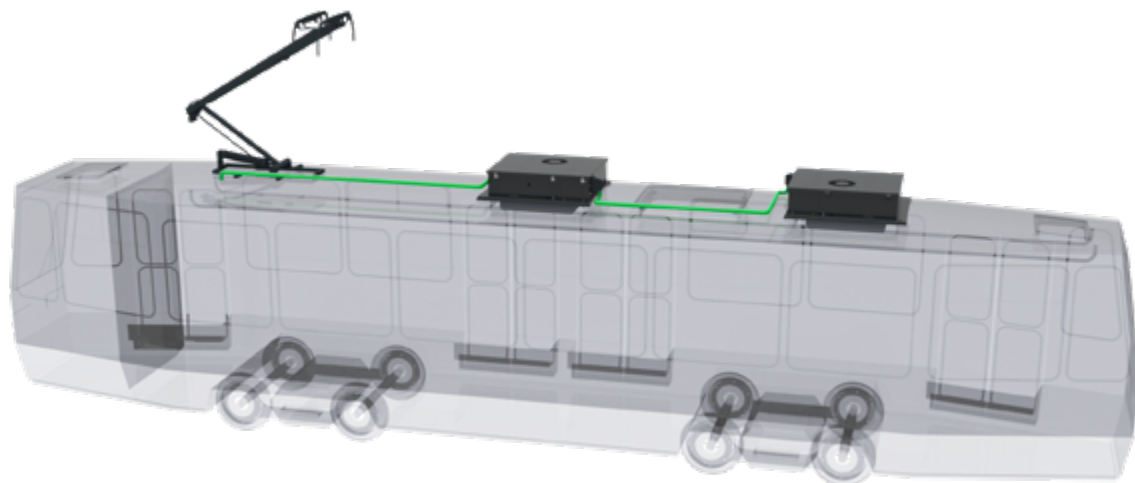


Passenger compartment air conditioning system with an integrated converter, intended for older tram designs (e.g., Duewag, Tatra, Konstal). The units are designed for installation in existing roof openings of the tram, without ventilation ducts.

GORRA air conditioning units provide a cost-effective solution for supplementing passenger compartment air conditioning in trams that do not have ventilation ducts and whose design does not allow their subsequent installation, or where such installation would be technically or economically impractical. The GORRA product is designed as a set consisting, in its basic configuration, of two units (iGORRA) – the first contains the converter and cooling system, while the second contains the control system and cooling system.

KEY FEATURES:

- installation in roof openings with little or no modification to the roof structure
- low initial and maintenance costs
- installation time on the tram under 8 hours
- possibility of increasing the number of units for articulated trams



GORRA

TYPE	iGORRA 6DC
Set construction	iGORRA 6DC/P – box with compressor and converter iGORRA 6DC/S – box with compressor and control system
Cooling capacity	2 x 6 kW
Compressor supply voltage	600 V DC (via the built-in converter)
Smoothly adjustable compressor capacity	Yes, via the built-in converter
Refrigerant	R134a
Blower fan capacity	$\geq 2 \times 1500 \text{ m}^3/\text{h}$
Fan supply voltage	600 V DC (via built-in converter)
Control	autonomous operation (activation upon detection of vehicle movement) or CAN Open
Housing material	aluminium
Dimensions	1342 x 1175 x 295 mm
Weight	90 kg $\pm$ 5% (iGORRA 6DC/P) 70 kg $\pm$ 5% (iGORRA 6DC/S)
Built-in converter	Yes, manufactured using SiC technology

PASSENGER COMPARTMENT AIR CONDITIONING

SANTIAGO



Passenger compartment air conditioning unit designed for roof mounting on the vehicle. The unit is adapted for the distribution of conditioned air via ventilation ducts.

The SANTIAGO air conditioning system was originally designed for articulated, partially low-floor Moderus Beta trams. Its design makes it suitable for vehicles with low-profile rooftop side panels or without such panels. A distinctive feature is the aerodynamic, trapezoidal shape of the unit housing, which enhances the vehicle's aesthetics.

KEY FEATURES:

- aerodynamic housing design visually reducing overall height
- integrated cooling, ventilation, and heating functions
- dual-compressor configuration enabling capacity control

SANTIAGO

TYPE	SANTIAGO 16AC/12DC
Cooling capacity	16 kW
Compressor supply voltage	3x400 V AC / 50Hz
Smoothly adjustable compressor capacity	yes, 2-stage
Refrigerant	R134a
Heating capacity	12 kW (for 720 V DC voltage)
Heater supply voltage	600 V DC (400÷800 V DC)
Smoothly adjustable heater output	Yes
Blower fan capacity	≥4000 m ³ /h (including ≥1850 m ³ /h of fresh air)
Fan supply voltage	24 V DC
Communication with vehicle control system	CAN Open
Housing material	aluminium
Dimensions	2100 x 1700 x 365 mm
Weight	310 kg ± 5%
Built-in converter	No

PASSENGER COMPARTMENT AIR CONDITIONING

BELEM



Passenger compartment air conditioning unit designed for roof mounting on the vehicle. The unit is adapted for the distribution of conditioned air via ventilation ducts.

The BELEM air conditioning system was originally designed for the modernization of Bombardier Cityrunner trams; however, its compact design also allows installation in other vehicle types. Power is supplied from a separately installed converter. In terms of cooling and heating capacity, the unit is comparable to the RIO and QUITO types.

KEY FEATURES:

- compact dimensions adapted to limited installation space
- integrated cooling, ventilation, and heating functions
- dual-compressor configuration enabling capacity control

BELEM

TYPE	BELEM 17AC/18DC
Cooling capacity	17 kW
Compressor supply voltage	3x400 V AC / 50Hz
Smoothly adjustable compressor capacity	yes, 2-stage
Refrigerant	R134a
Heating capacity	18 kW (for 720 V DC voltage)
Heater supply voltage	600 V DC (400÷800 V DC)
Blower fan capacity	≥4000 m³/h
Fan supply voltage	24 V DC
Communication with vehicle control system	CAN Open
Housing material	aluminium
Dimensions	1477 x 1221 x 575 mm
Weight	260 kg ± 5%
Built-in converter	No

PASSENGER COMPARTMENT AIR CONDITIONING

RIO



Passenger compartment air conditioning unit designed for roof mounting on the vehicle. The unit is adapted for the distribution of conditioned air via ventilation ducts.

The RIO air conditioning system was originally designed for the modernization of Duewag N8C/M8C trams. In terms of cooling and heating capacity, the unit is comparable to the BELEM and QUITO types, but differs in installation dimensions. Power is supplied from a separately installed converter.

KEY FEATURES:

- reduced height of the unit housing
- integrated cooling, ventilation, and heating functions
- dual-compressor configuration enabling capacity control

RIO

TYPE	RIO 17AC/18AC
Cooling capacity	17 kW
Compressor supply voltage	3x400 V AC / 50Hz
Smoothly adjustable compressor capacity	Yes, 2-stage
Refrigerant	R407C
Heating capacity	18 kW (for 720 V DC voltage)
Heater supply voltage	3x400 V AC / 50Hz
Smoothly adjustable heater output	Yes
Blower fan capacity	≥4000 m ³ /h
Fan supply voltage	24 V DC
Communication with vehicle control system	CAN Open
Housing material	aluminium
Dimensions	1600 x 1560 x 400 mm
Weight	250 kg ± 5%
Built-in converter	No

PASSENGER COMPARTMENT AIR CONDITIONING

QUITO



Passenger compartment air conditioning unit designed for roof mounting on the vehicle. The unit is adapted for the distribution of conditioned air via ventilation ducts.

The QUITO air conditioning system was originally designed for the modernization of Bombardier Flexity Classic trams, but can also be used in other tram types. In terms of cooling and heating capacity, the unit is comparable to the BELEM and RIO types, differing primarily in installation dimensions. Power is supplied from a separately installed converter.

KEY FEATURES:

- integrated cooling, ventilation, and heating functions
- dual-compressor configuration enabling capacity control

QUITO

TYPE	QUITO 17AC/18DC
Cooling capacity	17 kW
Compressor supply voltage	3x400 V AC / 50Hz
Smoothly adjustable compressor capacity	Yes, 2-stage
Refrigerant	R134a
Heating capacity	18 kW (for 720 V DC voltage)
Heater supply voltage	600 V DC (400÷800 V DC)
Blower fan capacity	≥4000 m ³ /h
Fan supply voltage	24 V DC
Communication with vehicle control system	CAN Open
Housing material	aluminium
Dimensions	1560 x 1400 x 550 mm
Weight	270 kg ± 5%
Built-in converter	No



EDC SERVICE MONITORING SYSTEM

EDC – proprietary service monitoring system.

The system enables remote supervision and analysis of power electronic devices, allowing for quick diagnostics, fault detection and service optimisation.

BASIC FUNCTIONS:

- remote monitoring of operating parameters via the website,
- quick diagnostics and fault detection,
- recording of device operating parameters with millisecond accuracy,
- management support (ability to create your own groups and define individual names for specific devices),
- analysis of operating data for optimisation purposes,
- defining your own views and creating additional panels.

ESA 24

24-HOUR DIAGNOSTIC SERVICE

ESA24 - diagnostic service within 24 hours of confirmation of receipt of the request:

- access to technical support for customers using Enika devices,
- quick service response in the event of a failure or operational problems,
- remote monitoring, diagnostics and possible repairs of devices,
- guarantee of minimised downtime and maintenance of transport infrastructure continuity,
- support applies to both Enika and third-party devices,
- repairs are carried out as soon as possible; in the event of a device failure, a description of the fault is prepared by a third party a description of the fault is prepared.





OTHER EQUIPMENT



Traction inverters

Traction inverters designed for trams, powered by 600/750 V DC, manufactured using IGBT or SiC technology.



Converters

DC and AC auxiliary circuit converters designed for trams, powered by 600/750 V DC.



Chargers OppCharge

High-power charger with inverted pantograph.



Charging stations

Charging stations designed for fast and safe charging of electric vehicles.



Integrated inverter with converter

Integrated traction inverter and DC and AC auxiliary converter container. Designed for trams and trolleybuses, powered by 600/750 V DC.



Control and visualisation systems (TCMS)

Complete tram control, visualisation and diagnostic systems (TCMS).



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