

PROTRAM 204WRAS TRAMS EQUIPPED WITH THE iGORRA AIR CONDITIONING SYSTEM



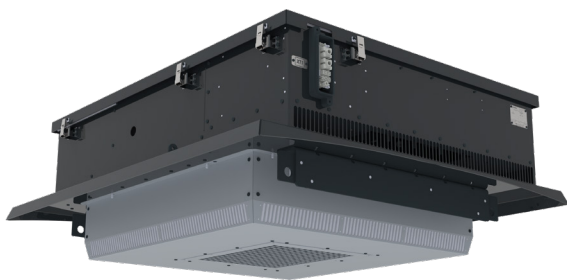
In 2025 and 2026, MPK Wrocław purchased iGORRA air conditioning units manufactured by ENIKA for its Protram 204WrAs tram fleet. When these vehicles were originally developed, they were based on a traditional tram design that had not been intended for the installation of passenger compartment air conditioning. The iGORRA units were therefore developed specifically for trams without ceiling-mounted air ducts, providing a simple and cost-effective solution that significantly improves passenger comfort.

Although the Protram 204WrAs trams were derived from the American PCC concept, they were entirely new vehicles when introduced. However, they adopted the front-end styling previously developed for the modernization of the well-known Polish Konstal 105Na trams. At the same time, they could easily be distinguished by their bonded windows, skirted bogies, and wider doors.

MPK Wrocław originally planned to purchase 20 trams of this type from the local manufacturer Protram. From the outset,

the vehicles were intended to operate as fixed two-car sets consisting of a leading vehicle with an operator's cab (including cab air conditioning) and a trailing vehicle equipped only with an emergency driving position. Ultimately, Wrocław purchased only 12 cars (six sets) between 2005 and 2008, numbered 2601–2612. The remaining eight vehicles were replaced by an order for partially low-floor trams, whose development had originally been envisioned as the next step after the 204WrAs design.

The Protram 204WrAs became the first newly built trams



iGORRA air conditioning unit for older-generation trams (Düwag, Tatra, Konstal, etc.).

manufactured in Wrocław after World War II. The three-door cars have a length of 13,500 mm, a width of 2,355 mm (making them slightly narrower than Konstal 105Na trams), and a height of 3,515 mm. Floor height throughout the passenger compartment is uniformly 900 mm above the top of rail. The trams are equipped with EMIT STDa 200 L4 A asynchronous traction motors rated at 50 kW. Each bogie is fitted with two motors. Passenger capacity differs between the two cars: the leading vehicle accommodates 75 standing and 20 seated passengers, while the trailing vehicle accommodates 80 standing and 19 seated passengers.

One of the most significant shortcomings of these vehicles was the absence of passenger compartment air conditioning. At the same time, the roof structure of the Protram 204WrAs did not allow the installation of conventional HVAC units due both to their weight and to the need for additional air ducts. As part of a partial modernization program for these vehicles, ENIKA therefore proposed the iGORRA solution, developed specifically for vehicles of similar design.

In its basic configuration, the iGORRA system consists of two independent units, each providing 6 kW of cooling capacity. The two modules differ in their internal configuration. The iGORRA 6DC/P unit is connected directly to the traction voltage supply (600 V DC), incorporates an onboard converter based on SiC technology, and weighs approximately 90 kg. The second

unit, designated iGORRA 6DC/S, does not contain an onboard converter but includes the control system components and weighs approximately 70 kg. The two units are interconnected and complement each other in providing all required functions. When used on articulated trams, additional units can be installed, increasing total cooling capacity proportionally.

The air conditioning units are installed directly into prepared roof openings. On some tram types, existing roof ventilation openings can be utilized without modification, which was also the case for the Protram 204WrAs fleet. Installation in the prepared openings requires less than eight hours.

The iGORRA units are designed exclusively for cooling. They were developed to provide transit operators with an effective yet simple solution for improving passenger comfort in older vehicle designs without requiring modifications to the interior layout or the installation of air distribution ducts.

The first Protram 204WrAs two-car set was modernized in 2025 (fleet numbers 2604+2603). Following installation trials and verification of system performance, a decision was made to equip the remaining vehicles of this type with air conditioning as well. An order covering ten additional cars was placed in early 2026, and deliveries were completed at the beginning of summer 2026.



Example of an iGORRA air conditioning system installation on a Protram 204WrAs tram.