



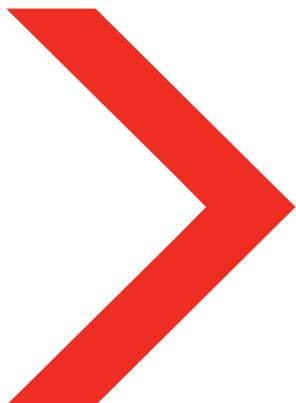
ELECTRIC MULTIPLE UNITS

MODERN SOLUTIONS
FOR RAILWAYS



ELECTRIC MULTIPLE UNITS

EN57



NEWAG S.A. modernises and overhauls Electric Multiple Units of the **EN57 & EN71** series. As a result, these vehicles get a new lease of life with significant improvements in their appearance, comfort of travelling and driver's work comfort. With regards to maintenance, these vehicles become more economical and reliable.

THE SCOPE OF MODERNISATION:

The vehicle interiors are completely re-designed complying with current functional and design requirements meeting the carrier's needs. Passenger compartments and driver's cabs are fully air-conditioned. Vehicles are equipped with modern passenger-information and monitoring systems. During the modernisation, the old-style sliding doors are totally replaced with modern plug sliding doors powered by electricity, opening individually and fitted with a mechanism that prevents a passenger being trapped by the door.

Driver's cabs receive modern furnishings in the form of ergonomic control panels, comfortable seats and additional amenities.

Vehicles are fitted with composite fronts with a modern lighting system, new windows and window panes as well as single-arm pantographs. They also receive a completely new thermal and acoustic insulation. The gear, drive and brake systems are also overhauled.

These vehicles are suitable for passengers with impaired mobility.

POWER EFFICIENCY AND RELIABILITY

NEWAG S.A. is the first company on the Polish market to install completely new drive systems in the modernised Electric Multiple Units, consisting of brand-new asynchronous traction motors and double reduction gearing with flexible axle couplings.

The gear and drive system conversion has resulted in the reduction of approx. 4.5t in the vehicle weight, which led to decreased operating and maintenance costs and increased its reliability and significantly improved comfort of travelling.

The mounted drive (powered by a set of inverters) enables energy recovery to the overhead line during braking. Optimal braking parameters are provided by the KNORR BREMSE modern blended braking system i.e., automatic alternation between ED (electro-dynamic) and EP (electro-pneumatic) braking with the priority given to ED braking.

Vehicles are equipped with a modern CANOpen-based diagnostic system.

SAFETY

Application of modern drive and braking systems, modern control and diagnostics systems, as well as plug sliding doors and additional functional improvements have significantly increased travelling safety.



BASIC FEATURES

- > vehicles for transporting passengers in suburban and regional rail service,
- > capable of travelling at speeds of up to 120km/h,
- > modern, comfortable and practical interior,
- > plug sliding external doors.

DRIVE

- > optimal traction characteristics due to implementation of four (in EN57) and eight (in EN71) brand-new asynchronous motors mounted on bogies placed under the middle section,
- > two-stage traction transmission,
- > application of individual inverter drive per each traction bogie,
- > power recovery to the overhead line during braking.

PASSENGER COMPARTMENT

- > a three-section open coach or compartment car,
- > attractively-designed and practical interior accessible for people with impaired mobility including designated spaces for wheelchairs,
- > vandal-proof and comfortable seats,
- > modern passenger information system,
- > monitoring of the vehicle interior,
- > automatically-controlled air-conditioning and heating system.

TOILETS

- > with hermetically sealed retention tanks,
- > equipped with a frost protection system preventing water pipes from freezing,
- > attractively-designed interior with modular plastic panels to facilitate cleaning,
- > automatic flush and toilet drainage system,
- > accessible for people with impaired mobility.



DRIVER'S CAB

- > modern, ergonomic control panel and driver's seat,
- > air-conditioned interior,
- > footrest with automatically- adjusted height,
- > amenities: kettle, fridge, cooker, lockers.



TECHNICAL PARAMETERS	AFTER MODERNISATION	BEFORE MODERNISATION
NUMBER OF UNITS	3	3
AXLE CONFIGURATION	2'2'+Bo'Bo'+2'2'	2'2'+Bo'Bo'+2'2'
MAXIMUM OPERATIONAL SPEED	120 km/h	110 km/h
ACCELERATION [0 - 40 km/h]	1,0 m/s ² , max. 1,1 m/s ²	0,5 m/s ²
NUMBER OF PASSENGER DOORS PER VEHICLE SIDE	6	6
POWER SUPPLY VOLTAGE	3 kVDC	3 kVDC
TRACTION MOTORS CONTINUOUS POWER	4 x 250 kW	4 x 145 kW
VEHICLE CONTINUOUS POWER	1 000 kW	580 kW
MOTOR TYPE	TMF 50-29-4 three-phase asynchronous	LK 450 direct current
TRACTION TRANSMISSION	Gmeinder GGM 275 S0/549	single reduction gear
NUMBER OF SEATS	up to 185 (depending on seat plan)	212
FRONTAL COUPLER	automatic after modernisation	automatic
TRACK WIDTH	1 435 mm	1 435 mm
BRAKING SYSTEM	KNORR - PN/EP/ED	Oerlikon PN/EP
SERVICE BRAKE DECELERATION	≥ 0,8 mm/s ²	≥ 0,8 mm/s ²
EMERGENCY BRAKING DECELERATION	≥ 1,0 mm/s ²	≥ 1,0 mm/s ²
MULTIPLE TRACTION	yes (up to 3 vehicles)	yes (up to 3 vehicles)
DESIGNATED SPACES FOR PERSONS WITH IMPAIRED MOBILITY	yes	no designated spaces
VEHICLES FOR PERSONS WITH IMPAIRED MOBILITY	yes	none

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GME

NEWAG S.A. was founded in 1876. It is one of the biggest and oldest rail industry companies in Poland, a leader in rolling stock manufacturing, modernisation and repairs. The company has extensive industry experience in manufacturing modern and fast passenger rolling stock, electric and diesel locomotives, trams and subway trains.

Making customer satisfaction its priority, **NEWAG S.A.** places emphasis on the quality of the products and services it provides. The company was named "The company that transforms Polish industry" in recognition of its spectacular market success in competing with European rolling stock industry giants.

NEWAG S.A. Rail Vehicles Competence Centre in Gliwice specializes in manufacturing of a six-axle Dragon and a four-axle Griffin. The company also repairs and modernizes electric locomotives of all types, electric multiple units and subassemblies for rail vehicles.

Both companies hold the PN-EN ISO 9001:2003 certificates, confirming that they introduced and have implemented the modern quality control system and the IRIS rev. 2. certification which proves that they have implemented the international railway industry standard.

newag
GROUP

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ISO 9001:2008

