

# Citea Electric + Hybrid



MOVE. TOGETHER.

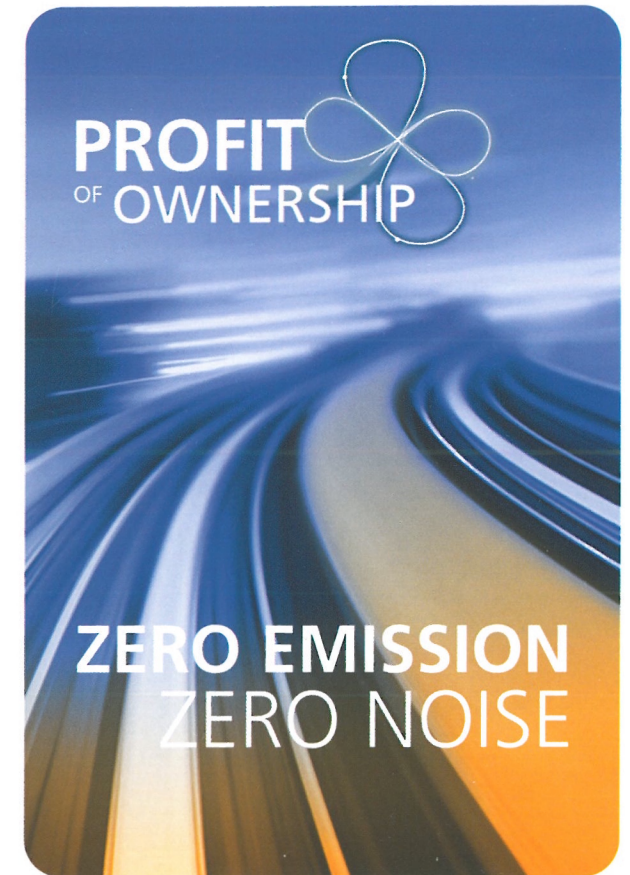


# Future. Now.

*VDL Bus & Coach sees a future in hybrid and electric bus transport for large cities, thereby making a contribution to a cleaner environment, lower energy consumption and a quieter and healthier living environment.*

*During the development of the Citea Electric and the Citea Hybrid the modular system on which the Citea range is based was used to its best advantage. This high degree of modular technology not only makes customisation possible, but also gives the carrier many advantages, for instance as regards repair, maintenance and stocks of parts.*

*The Citea Electric and the Citea Hybrid are buses that are ready for the future. The option of choosing from several drive systems and battery packs means that the ideal, optimal combination can be put together for any range of application, without affecting accessibility, interior layout or comfort. The Citea Electric and the Citea Hybrid are unique in terms of the options available for gearing them optimally to all of the operational requirements and wishes that a carrier might have and they dovetail seamlessly with the available infrastructure. In this way they make an optimal contribution to Total Cost of Ownership.*





# Many. Solutions.

*The operator can choose from two types of driveline, thereby making a conscious decision that is geared optimally to his range of application.*

*The Siemens driveline is fitted with a central electric motor.*

*This type is also suitable for hybrid buses and electric articulated vehicles.*

*The ZIEHL-ABEGG driveline is fitted with a wheel-hub motor.*

*Siemens:*

- Central electric motor
- In combination with a standard rear axle
- Also suitable for articulated buses
- Hybrid version

*ZIEHL-ABEGG:*

- Wheel-hub motor
- No mechanical driveline
- Highly efficient
- Reduced noise level



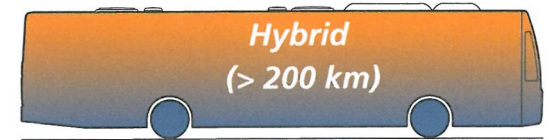


# Slow. Or fast?

When selecting options for the **VDL Citea Electric**, one can choose from various electric drive systems.

- The variant with a large battery charged via a plug-in connection is most suitable for use without interim recharging.
- If the operator opts for a more flexible concept, without consequences for the number of passengers and which is recharged periodically during operation, there are more possibilities. In this case a relatively small battery can be combined with automatic plug-in or pantograph (trolley).

- For optimal operation VDL Bus & Coach is developing the so-called 'range extender'. The range extender makes it possible for distances of more than 200 km to be covered without charging. Adding a range extender has no consequences for the number of passengers or the comfort. A big advantage is that investment in infrastructure is kept to a minimum. Regarding energy storage, choices include fuel cell, battery or diesel generator.



Citea Hybrid.



Citea Electric + energy storage for slow charging.



Citea Electric + energy storage for fast charging.



Citea Electric + energy storage for fast charging with range extender.

## CITEA ELECTRIC

- Zero emission
- Zero noise
- Recuperation of braking energy
- Large passenger transport capacity



The **VDL Citea Hybrid** is a new generation of serial hybrid bus.

- The rear axle is driven by an electric motor for which the electrical current is either taken from the battery pack (in which case the vehicle is operating solely on electrical power) or generated by the diesel generator. When the diesel motor is running the batteries are also being charged. The batteries are also charged by recuperation of the braking energy.
- The battery pack has sufficient capacity to provide a considerable electric range. This means that it is possible to drive using 100% electrical power for a fairly long distance. There is also sufficient capacity to drive all the auxiliary generator units (compressor, steering pump, doors, air conditioning, etc.) electrically.
- The hybrid Citeas can be fitted with a start-stop system. With this system the diesel engine is switched off at bus-stops or when stationary and the bus then drives off fully electrically. This means 0% emissions. An additional, and certainly not unimportant, environmentally friendly aspect is that far less noise is produced.
- Considerable fuel savings are also achieved: around 20 to 30% less than for a conventional diesel bus.



## CITEA HYBRID

- Start-stop system
- Recuperation of braking energy
- Less noise
- Lower CO<sub>2</sub> emissions
- Large passenger transport capacity

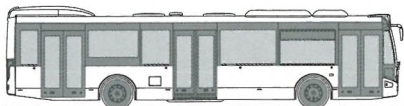


# Technical specifications

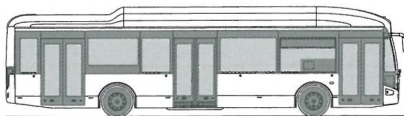
Cîtea	SLF-120 Electric	SLF-120 Hybrid	SLFA-180 Electric	SLFA-187 Electric
Overall length:	12,000 mm	12,000 mm	18,000 mm	18,750 mm
Overall width:	2,550 mm	2,550 mm	2,550 mm	2,550 mm
Overall height (included roof unit/air conditioning):	3,120 mm	3,300 mm	3,120 mm	3,120 mm
Wheelbase:	6,000 mm	6,000 mm	5,250 mm	6,000 mm
Wheelbase 2 <sup>nd</sup> and 3 <sup>rd</sup> axle:			6,750 mm	6,750 mm
Front overhang:	2,600 mm	2,600 mm	2,600 mm	2,600 mm
Rear overhang:	3,400 mm	3,400 mm	3,400 mm	3,400 mm
Interior saloon height (low-floor):	2,416 mm	2,416 mm	2,416 mm	2,416 mm
Turning circle:	21,176 mm	21,176 mm	23,510 mm	24,540 mm
Unladen vehicle weight*:	+/-11,355 kg	+/-11,855 kg	+/-16,040 kg	+/-16,320 kg
Max. total technical weight**:	19,000 kg	19,000 kg	29,000 kg	29,000 kg
Capacity (passengers)*:	+/-85	+/-85	+/-160	+/-170

\* Kerb weight and capacity depend on the selected driveline and battery pack.

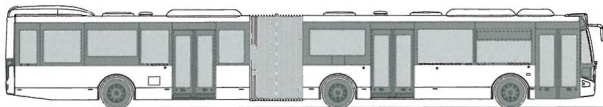
\*\* According to European legislation, individual country legislation may differ.



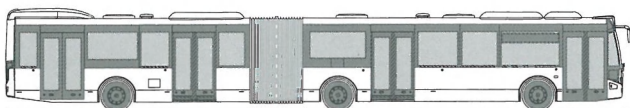
Cîtea SLF-120 Electric



Cîtea SLF-120 Hybrid



Cîtea SLFA-180 Electric



Cîtea SLFA-187 Electric





# Drivelines

<b>Diesel engine</b>	Cummins ISB4.5 Euro 6 134 kW (180 hp) – 4.5 litres 700 Nm at 1,200-1,700 rpm			
<b>Max. torque</b>				
<b>Electric motor</b>	Siemens 1DB2016	Siemens 1DB2016	ZIEHL-ABEGG ZAwheel wheel-hub motor, 2x	Siemens 1DB2022
<b>Max. rated output</b>	160 kW	160 kW	100 kW per motor	210 kW
<b>Max. peak output</b>			180 kW per motor	
<b>Max. rated torque</b>	1,500 Nm	1,500 Nm	2,100 Nm per motor	2,000 Nm
<b>Max. peak torque</b>	2,500 Nm	2,500 Nm	6,000 Nm per motor	3,800 Nm
Citea SLF-120 Electric				
Citea SLF-120 Hybrid				
Citea SLFA-180 Electric				
Citea SLFA-187 Electric				





**VDL Bus & Coach bv**

De Vest 7, 5555 XL Valkenswaard, P.O. Box 645, 5550 AP Valkenswaard, The Netherlands  
Phone +31 (0) 40 208 44 00, Fax +31 (0) 40 208 44 99, [info@vdlbuscoach.com](mailto:info@vdlbuscoach.com), [www.vdlbuscoach.com](http://www.vdlbuscoach.com)



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