

Compact air conditioner for the city bus

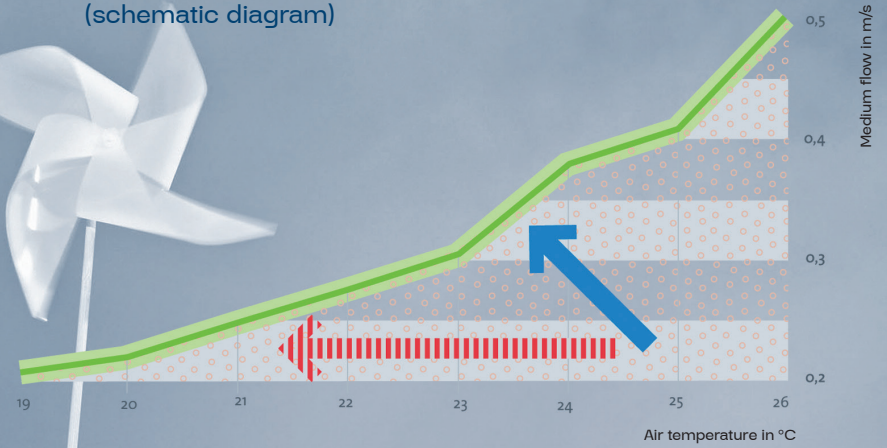
# CITYSPHERE



**Compact air conditioning unit  
with wind chill effect**



ISO Comfort line according to EN 7730\*1  
(schematic diagram)



Fully air-conditioned  
Only temperature reduction

Citysphere: Combination of  
cooling and air movement

Passengers feel  
uncomfortable  
in this range

\*1 Conditions: 30–70% relative humidity; max. temperature drop 3 °C  
(between head and foot height); little movement; normal clothing

## ► Wind chill Effect: The trick with the wind


We exploit a simple effect: when the air is circulated, it needs to be cooled less!


In this way what passengers consider to be an optimally “felt temperature” is achieved much faster and with less energy input, reduces operating expenses and protects the environment at the same time.

The ISO comfort line reflects this balanced system between temperature and air movement. 85% of passengers feel comfortable along the comfort line (green).

An example: an inside temperature of 25 °C and an air velocity of 0.2 m/s makes passengers feel uncomfortable.

### The way to comfort:

 Solution with the classic full air conditioning: comfort level achieved by radical reduction of the inside temperature. High energy input required.

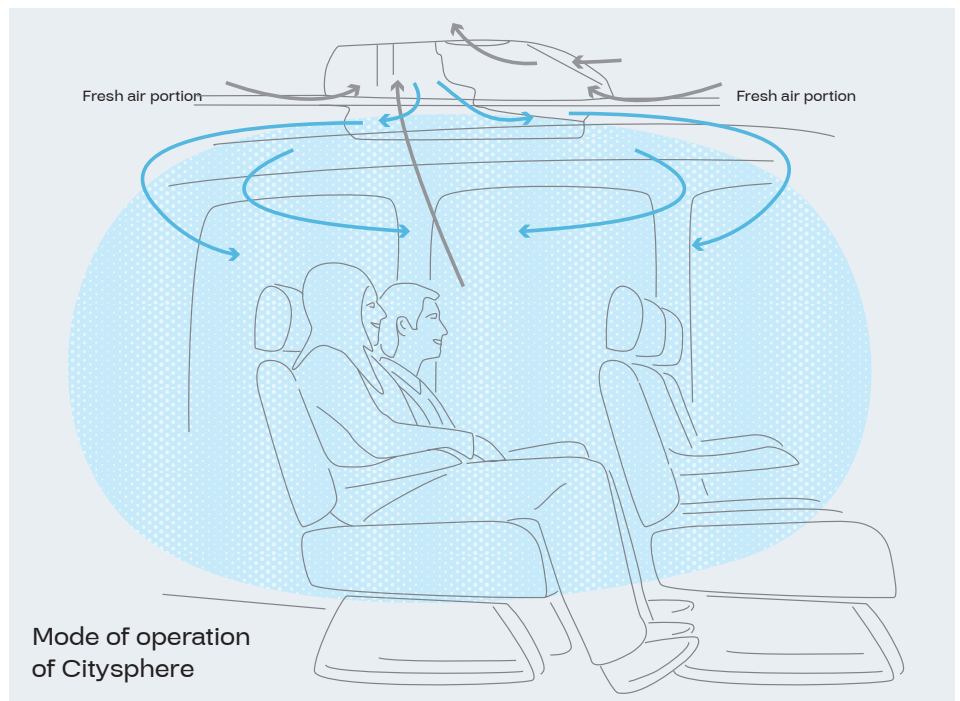
 Solution with the innovative Citysphere: comfort level is reached much faster with a combination of cooling and patented, direct air intake.

## ► Citysphere: small unit – big effect

Similar to a “Spanish fan” the Citysphere provides pleasant cooling without major energy input.

### The effect:

- A combination of gentle cooling and even air movement
- Pleasant temperatures within the comfort zone area easily reached
- Centrally located air distributor achieves a comfort level quickly and efficiently
- Outside temperature-dependent control



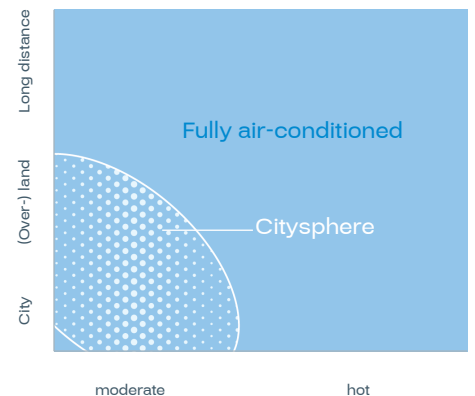




## ► Comfort in the city bus

In moderate climate zones the Citysphere optimally satisfies air conditioning needs in city buses. With the greatest possible efficiency and a revolutionary cooling

concept the Citysphere achieves a quality of air conditioning that could not hitherto be justified due to the costs for acquisition, maintenance and service a full air-conditioning system.



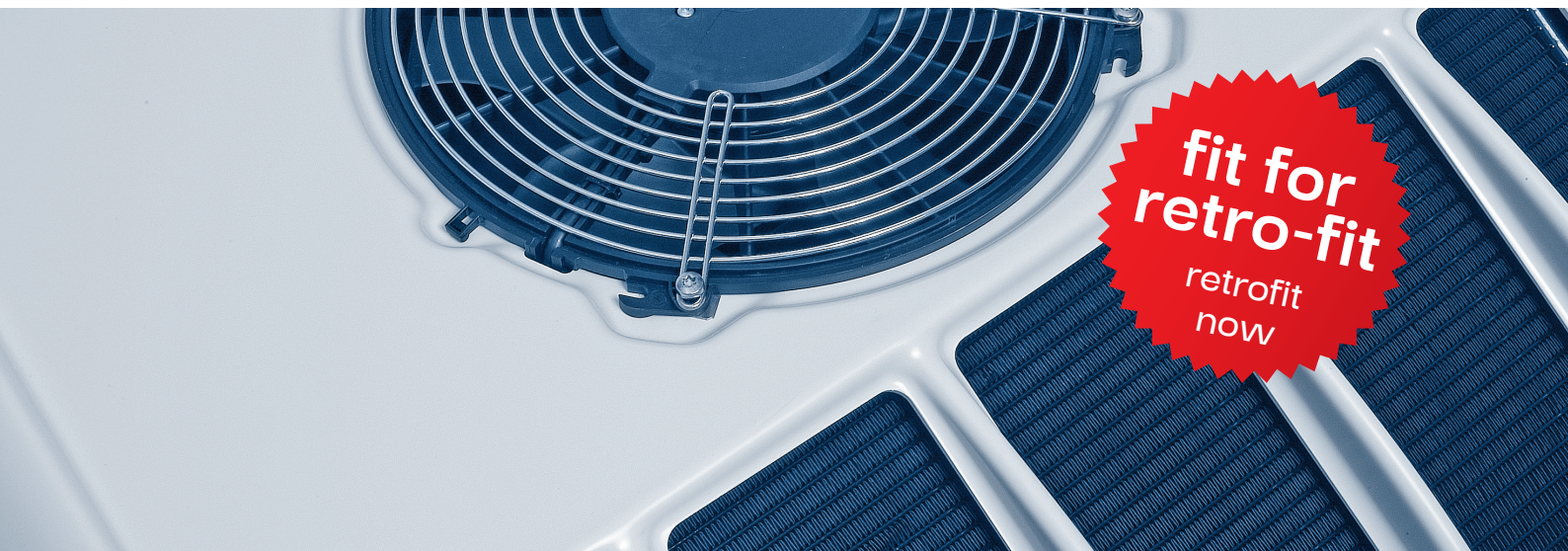
## ► For cool calculators

### Installation or retrofitting in a single day:

- Simple installation
- Hermetically sealed, pre-filled refrigerant circuit
- No pipes for refrigerant required
- No connection to air ducts necessary
- Low workshop costs
- Installation in hatch opening possible

### Low life cycle costs:

- No maintenance costs for refrigerant circuit
- Substantially less added fuel consumption than a conventional rooftop unit
- Low service costs (air filter change only once a year)



# For consistently pleasant temperatures

## HIGHLIGHTS



### Low life-cycle costs

- Low added fuel consumption
- Very low maintenance and service costs
- Long service life through brushless EC-blowers



### Easy installation:

- Simple installation in hatch opening possible
- Pre-filled refrigerant circuit
- No installation of refrigerant pipes because of integrated electrical compressor



### Environmentally friendly

- Low weight reduces CO2 emissions
- Low noise emissions



### Comfort

- Windchill-effect: Combination of gentle cooling and air movement along the comfort line
- 15 % fresh air
- Optional heating with PTC-heating element
- Conforms to the requirements of the VDV guideline 236/1



### Reach

- Maximisation of reach through reduced weight
- Low energy demand with stepless-regulated compressor



### Others

- Can be used also in hybrid and alternative bus drive concepts

## TECHNICAL DATA

### The advantages

Installation	Simple
Air duct	Direct injection
Cooling capacity	Engine-independent
Compressor	Hermetically sealed design
AC system weight	approx. 120 - 140 kg (2 units)

### Technical Data (per unit)

Dimensions L x W x H (mm)	1,200 x 860 x 250
Weight (kg)	approx. 45
Cooling capacity for inside temperature 25°C, outside temperature 29°C (kW)	3.8
Evaporator air flow (unimpeded) (m³/h)	1,350
Refrigerant <sup>1)</sup> filling capacity (g) CO2-equivalence (t)	800 (pre-filled) 1.1
Heating capacity (kW) (comfort version only)	approx. 1kw (regulation fully automated)

Contains fluorinated greenhouse gases

<sup>1)</sup> The specified values are based on the refrigerant R134A and R513A.

Fresh air portion (%)	15
Rated voltage (V) DC	24
Total power consumption: max. (A)	72
E-motor (A)	55
Condenser blower (A)	10
Evaporator blower (A)	7