



Saving Energy for Tomorrow

VEHTEC – SWEDISH QUALITY

Care for quality has always been our highest priority at VEHTEC. That is why we develop, test and manufacture our products by working closely with our suppliers, making sure that we meet the need of each customer and maintain the highest quality and control.



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”Energy efficiency is all about the ability to harvest, store and distribute energy with minimum energy loss.



vehtec.se

For our full range of products, manuals, installation instructions and General Terms & Conditions VEH01/23, please visit vehtec.se

We reserve the right to correct any printing errors and to make changes in our product range without prior notice.





We are VEHTEC

VEHTEC develops, produces and delivers products, solutions and concepts for heating and cooling – with minimal environmental impact for optimal energy efficiency for the public transport industry as well as for work machines and trains in an increasingly electrified market.

Our focus is on energy-effective climate control solutions for hybrid and electric buses, as well as on decreasing the dependency on diesel preheating that is still in use on the market. VEHTEC draws upon extensive knowledge through more than 30 years of experience in developing and producing heating and preheating solutions for the public transport industry. By careful monitoring, assessment and evaluation of current technology it is possible to develop solutions that tend to current needs and facilitate the transition to newer technology.



JOHAN NILSSON, CEO VEHTEC

”By careful monitoring, assessment and evaluation of current technology it is possible to develop solutions that tend to current needs and facilitate the transition to newer technology.

From now to the future

We have, through a strategy based on products, patents and trademarks such as 3TEC, VeHeat and FleetHeat, a clear insight into the future requirements of energy-efficient and intelligent heating solutions.

Today

ALL PROGRESS DO COME WITH CHALLENGES

Green conversion means building a solid foundation for the growth of a sustainable community. Demands for more efficient and environmentally friendly energy sources are thereby increasing. The societal benefits of a transition from combustion engines to battery-driven and hydrogen vehicles are large and substantial as regulated and non-regulated emissions potentially are reduced to zero. But the challenges are multiple.

- Does E-mobility really mean zero emission?
- How do we adapt existing vehicle technology to these new prerequisites?
- How do we adapt the capacity and durability of that new technology to the harsher conditions such as those in the Nordic countries?

Tomorrow

ENERGY EFFICIENCY IS ALL ABOUT THE ABILITY TO HARVEST, STORE AND DISTRIBUTE ENERGY WITH MINIMUM ENERGY LOSS

VEHTEC works on development of multiple technologies: how to put solar power to optimum use for public transport vehicles by reducing the load on the electric support system in a bus, and exploring how to store, use and benefit from generated surplus energy.

SubZero Solution is our way of taking a firm grip on where we need to go, and is the concept under which we combine research and development of viable solutions with renewable resources – adapted to the current green conversion as well as finding forthcoming technologies that facilitates for future technology demands.

SubZero Solution today comprises of solutions to optimize traction battery environment in various ways; using Solar power as an energy source via solar panels, energy harvesting in Heat batteries and optimizing heating through Carbon dioxide heat pumps. All applications are integrated with FleetHeat, for operators to have full control over their bus fleets.

The Future

SUSTAINABILITY IS LIVING WITH CARE FOR THE EARTH'S RESOURCES

It's all about alternative energies and resources, finding efficient ways to handle all foreseeable aspects of efficient transportation.

Mastering the entire chain is vital when choosing suitable sustainable solutions for a fossil free future, and requires maintaining resource efficiency within recycling supply chains, from extraction through processing, recycling and final storage. Research and development work at high speed in order to meet society's demands.

The public transport industry needs to continue its work in being accessible to all and remain a reliable and safe means of transport. The industry needs to keep addressing obstacles and build trust for the research field.

What society chooses to do today will have an impact on what society is tomorrow, What will be the legacy we leave for generations to come?





ECONOMICAL • EFFICIENT • EASY

FleetHeat

Control your energy demand and usage with FleetHeat – the most clever system on the market that enables monitoring bus conditions of a bus fleet and its individual vehicles.

FleetHeat is a stand-alone system for any type or vehicle model and any type of engine. With high reliability and with many functional features, FleetHeat reduce costs by monitoring vehicle temperatures and battery levels, facilitate staff work and more.

FleetHeat is a secure system, fast and simple to install and operate, and is integrated with common route planning systems such as Hastus and Klartext.

FleetHeat is compliant with standards such as Bus Nordic and is approved for factory installations.

Features provided by FleetHeat

MAP

Real-time tracking and logging of previous trips.

ALARM SETTINGS

Activate or deactivate the alarm, sent directly to your inbox if battery level is too low.

IN DEPOT

Indicates if the bus is inside the depot.

FLAME SIGNAL

Connect FleetHeat to the heater's flame signal and monitor how much fuel the heater consumes for preheating.

INTERIOR TEMPERATURE MONITOR

See in detail the inside temperature at specific times.

ACTIVATION METHOD

Select if the heater starts according to the inner or outer temperature.



FleetHeat heating system gives you full control

FleetHeat ensures a warm bus from the start. Being able to remotely operate the heating system gives full control over the vehicle temperature and battery level, ensuring the bus can leave the depot under the optimum conditions.



AUTOMATIC REMOTE CONTROL

- Heating system for each bus is easily operated regardless of location
- Designed to work with all brands of bus and engine heaters
- Integrated with common route planning systems
- Simplifies traffic management
- Increased vehicle mobility between depots



TIMER

- Automatic operation
- Individual timer functions for each vehicle
- Buses pre-heated on schedule



WEATHER

- Adapts heating to local temperature conditions
- Automatic regulation of inner temperature
- Displays temperature at the driver's seat



E-SERVICE

- Easily managed through the webpage
- Detailed logs on bus temperature, battery level etc
- Issues alerts on temperature deviations and warns if the bus is not ready



ECONOMY

- See how much money you spend on preheating.
- Make individual settings for fuel price and how much fuel the heater consumes per hour.
- Save costs on maintenance and work load.



VEHTEC SOLAR POWER

- Monitor how much green energy your panels has generated
- Monitor solar irradiance
- See how much electricity the panels have generated and how much has been consumed



ENVIRONMENT

- Reduced hazardous emission
- Reduced engine wear and tear
- Improved passenger comfort and working conditions for drivers



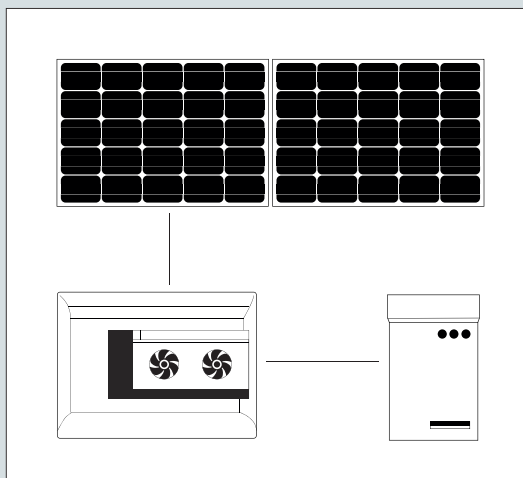
SubZero Solution

A system and a method for control of electric vehicle traction battery preconditioning

SZS is a Patent pending energy storage system with focus on alternative energy sources, solar panels and hydrogen.

Electric vehicles of today are often – if not always – outfitted with a preconditioning unit configured to regulate the temperature of the traction battery of the vehicle.

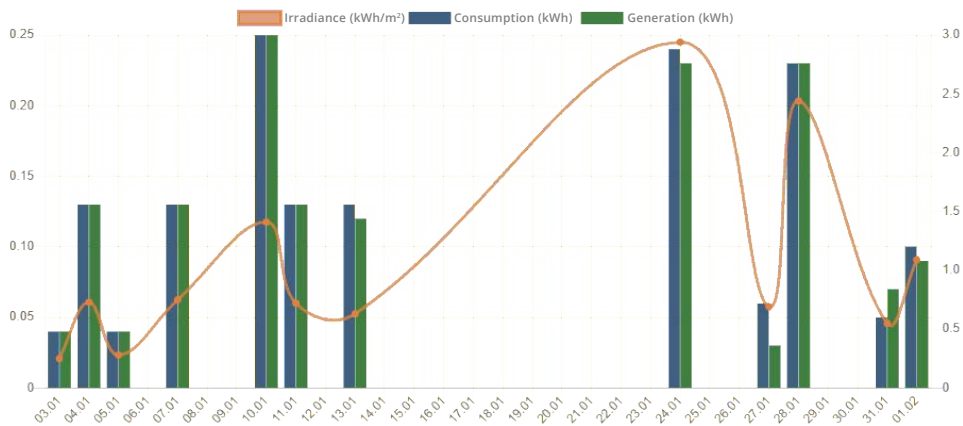
A traction battery operating at suboptimal temperature has its capacity, as well as its expected lifetime, greatly reduced. Thus, diesel powered preconditioned units are often provided to regulate the temperature of the traction battery. Using an auxiliary battery and predicting the charge rate of the battery, as well as the power consumption of the preconditioning unit and any other auxiliary systems connected to the auxiliary battery, allows for better control of the preconditioning.



FleetHeat

Heat pumps in combination with solar power is a more complex technical system and thereby require smart control of the bus, both at the depot but also when operating. The FleetHeat with its upgraded software is able to manage and monitor both a solar panel solution and the CO2 heat pump system.

The system could also be combined by a thermal energy storage, PCM-material, that could be managed by the software of FleetHeat at the depot. By charging the thermal energy storage with the CO2 heat pump and applying the smart preheater of electrical buses would bring the driving range up even further. In combination with solar power the electric buses for public city transportation will be the best solution for the future.



Data generated from solar panels on vehicles in operation during days in January: current solar radiation (irradiance), amount of energy entering the system and the amount of energy extracted.



Electric buses in cities for public transportation is becoming popular due to its low climate impact.

However, since there is no heat generated as from a combustion engine it requires other solutions for both heating and cooling. This is a technical challenge as generating heat directly by using the battery would affect the driving range. Previous studies have showed that the driving range can be reduced with 50% by applying this method for direct heating with battery power.

VEHTEC Heat Battery

Proprietary heating batteries (PCM) charged by Eldi or alternative energy sources (Solar, Water).

CO2 Heat Pump

By using a CO2 heat pump for heating and cooling during operation the need for electricity would drop drastically. Heat pumps by CO2 can operate efficiently from -20 °C up to 35 °C and thereby increase the driving range drastically.

In combination with solar panels on bus rooftops, the electrical power need can be reduced even more. In studies with diesel buses, about 20-25% of the electrical energy could be covered by solar power and thereby reduce diesel consumption by 600-750 litres during a one year period.

VEHTEC Solar Power

Solar panels charge heating batteries to relieve traction batteries in vehicles. By using solar panels, diesel consumption can be reduced or, in the case of an electrical bus, the driving range increased. VSP is based on cooperation with the best verified technology in the world.

- Effect: ~200W/m²
- Tolerance: -5% +10%
- Supports 12V and 24V batteries
- Can be tailor-made to fit on roof

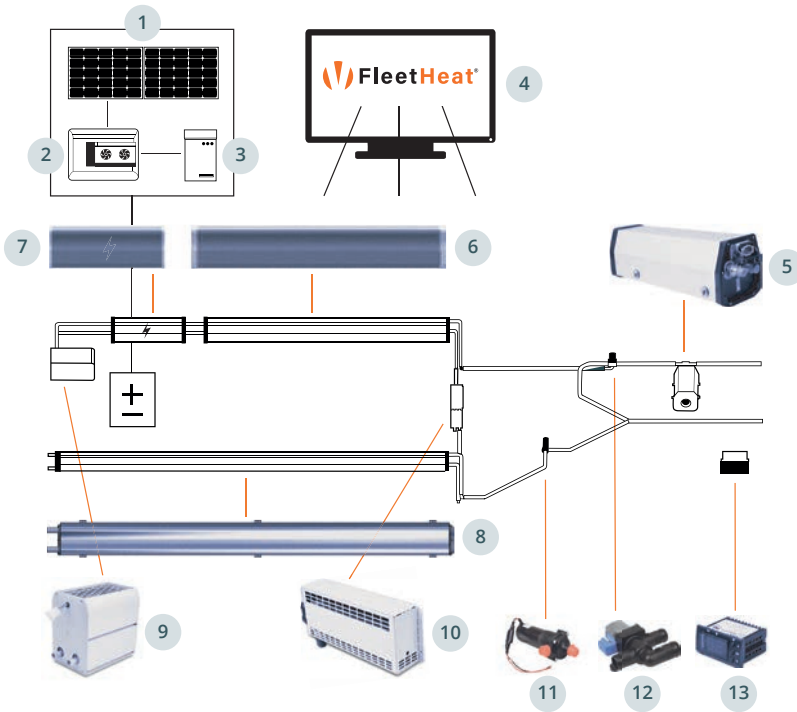
BENEFITS

- Increasing battery life time
- Reducing grid usage to charge battery in depot
- Embossed structure to improve efficiency
- For Diesel-, Hybrid and Electric vehicles
- Data access and control through FleetHeat



” From our manufacturing facilities in Stockholm and Gothenburg we deliver heating solutions to more than 20 countries, with focus on Europe, Asia, North and South America.





1. VEHTEC Solar Power (s. 8-9)
2. VEHTEC CO2 Heat Pump (s. 8-9)
3. VEHTEC Heat Battery (s. 8-9)
4. FleetHeat (s. 6-7)
5. Electric Preheater (s. 14-15)
6. 3Tec (s. 13)
7. E3Tec (s.13)
8. VeHeat (s.12)
9. Breasy (s. 16)
10. Compact Climate (s. 17)
11. Pump (s. 18)
12. Valve (s. 18)
13. Climate Control Unit (s. 21)

Overview Heating System Kit

Complete heating systems for transport vehicles

We offer complete heating kits, ready for installation. You may choose to go for a full system, an intermediate system or just a simple version, using the components you need, adjusted to your specific vehicle type and geographical conditions. All designs are tailored to your needs.

We have more than 30 years experience in developing, testing and evaluating heating concepts. Through new and effective solutions, VEHTEC has gone from a Nordic supplier to an international producer.

From our manufacturing facilities in Stockholm and Gothenburg we deliver heating solutions to manufacturers of bus, train, boat, heavy machinery, service vehicles as well as military vehicles to more than 20 countries, with focus on Europe and Asia, North and South America.



Visit our website to see:

- Our full product range
- Download catalogue, installation manuals and more
- General terms and Conditions VEH01/23
- GDPR Privacy Policy



vehtec.se

” Premium comfort with effective heat distribution throughout the compartment.



SMART • SIMPLE • SWIFT

VeHeat

Agility, design and premium comfort

Our modular heating technology VeHeat is the most innovative and effective heating system on the market today. VeHeat combine convection and radiation heating in one unit. With the addition of forced heat in 3TEC and with yet another application for electric vehicles in E3TEC, we present a range of options with the ability to provide efficient energy at the lowest energy cost, all suitable to address the challenges for any size of bus fleet while switching from fuel-based systems to electromobility.

VeHeat units are wall-mounted convector radiator heaters. The combination of radiation and convection heating ensures effective heat distribution through the compartment in which it's mounted.

The VeHeat convector body is aluminium, which is both recyclable, durable and easy to maintain. The convectors will look as good as they did when they first were fitted throughout the vehicle's lifespan.

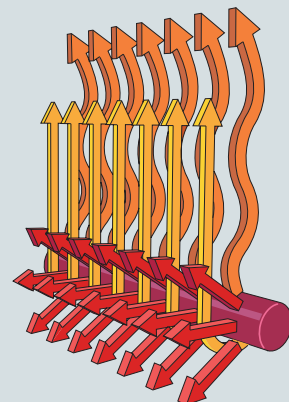
VeHeat is a complete and tailored heating kit to suit your needs, and can be supplied in any length up to 7 metres, cut with precision to the millimeter depending on your application.

The agile system works on 3 levels

- Convection + Radiation + Electric energy carrier
- All of the above fitted to fluid-based-systems
- All of the above + Forced air heat

Benefits with VeHeat

- Fast and consistent heat distribution
- Keeps fuel consumption low and energy efficiency high
- Easy to modify, install and maintain
- Homogenous and sustainable materials
- Easy to recycle



3Tec & E3Tec

An extra boost to our classic VeHeat convectors



3Tec

3TEC, our patented forced air heat technology, takes advantage of 3 technologies in one unit: Convection, Radiation and Forced air heat, benefiting from extensive R/D both with CFD and in real life tests across Sweden and Europe.

At a speed of 1.5 m/s, the unique combination delivers up to 4 times higher capacity than standard convectors, delivering 1 m³ of hot air per meter per minute, meaning your bus will warm up to 4 times faster.

A medium-sized city bus for up to 60 passengers equipped with the 3TEC system therefore can be heated in less than 4 minutes.



E3Tec

With the added electric application in E3TEC, the system has the potential to cover a multitude of varieties, from combustion engines with fluid-based systems to full-electric vehicles, while still maintaining the main task of maximum output with a minimum input.

For the individual fleet manager there are immediate advantages in maintenance and economy, but the overall outcome for society in general is even more important as we transgress towards electromobility and alternative energy resources, as the 3TEC system leads to less emission, less pollution and less strain on any energy resource.



Heat your bus in under 5 minutes

10-20 PASSENGERS

- Approximate volume 30 m³
- Equipped with 6 m 3Tec
- Heating time 5 minutes

40-60 PASSENGERS

- Approximate volume 72 m³
- Equipped with 20 m 3Tec
- Heating time less than 4 minutes

” *Wake up with energy – optimum preheating of diesel, hybrid, hydrogen and electric vehicles.*



OPTIMIZED • ENERGY • EFFICIENCY

VEHTEC Electric Preheaters

For optimum preheating of vehicles

For optimum preheating of diesel, hybrid, hydrogen and electric vehicles VEHTEC offers the Eldi Preheater, an all-electric heater. This independently operated heater with current 400VAC or 230VAC is our answer to reducing dependency on diesel preheating.

Eldi Preheater comes with an internal circulation pump; this means that it doesn't have to rely on the vehicle's own system. It is 100% emission free, no harmful exhaust gases and no noise. With a heat output of 2-10kW the heater is suitable even at extreme outdoor temperatures. Reliable operation is ensured by the temperature sensor in the heater.

The preheater can be supplied with complete connection cables in various lengths and a plug for easy connection to the heater. The water is simply connected in series with the bus heating system with hose fittings according to your measurements.

For optimal heating, Eldi can be operated with FleetHeat, a remote controlled system that activates the preheater depending on the external temperature. This ensures that the buses leave the depot under the optimum conditions.

- Emission-free heating
- No harmful exhaust gases
- Silent
- Compact size
- Easy to place & install
- Built in pump
- All in one heater

Certificates

EMC, ECE R10, R118



VEHTEC Eldi Preheater

ART NO	POWER (kW)/ SWITCHABLE TO	VOLTAGE (VAC)	CURRENT	DIMENSIONS (mm)	WEIGHT (KG)
91981	9.8	400 3-phase N	15	550x190x190	12.5
9149491	9.8/4.9	400 3-phase N	15/7.5	550x190x190	12.5
91761	7.6	400 3-phase N	11	550x190x190	12.5
9130301	6/3	400 3-phase N	9/4.5	450x190x190	10.5
912320101	3/2	230 1-phase	14/10	350x190x190	9.0
912330301*	6/3	230 1-phase	15	450x190x190	10.5

*Norway 6kW (3kW) 230V 3-phase

Connectors, cables & spare parts

Reliable, durable and safe. Perfect for your Eldi heaters. Eldi cables always come with protective hose for the toughest environments. Choose your desired length for an easy installation.

400V – Fits the models 6kW – 9.8kW

ART NO	PRODUCT, DESCRIPTION
9140440	Connector, 400V
9140210	Socket, 400V with cover
9140249	Connector, with cable (no socket)
9140249-2	Connector, with 2 m cable
9140250	Connector, with cable and socket
9140250-2	Connector, with 2 m cable & socket

230V – Fits the model 2/3kW

ART NO	PRODUCT, DESCRIPTION
91231440	Connector, 230V
91231410	Socket, 230V with cover
91231249	Connector, with cable (no socket)
91231249-2	Connector, with 2 m cable
91231250	Connector, with cable and socket
91231250-2	Connector, with 2 m cable & socket

400V – Fits the models 6kW – 9.8kW

ART NO	PRODUCT, DESCRIPTION
910000305	Circulation Pump
910020304	Thermostat
910020303	Overheating protection
910020230	O-ring



Breasy

A heater blower series for installation in vehicles such as buses, boats and heavy construction equipment.

Available in 3kW and 7kW capacities. 12V and 24V fans.
16/19/22 mm hose connections.

Heat exchangers and sidewalls of the blower in aluminium.
End pieces PA66.



Certificates

EMC, ECE R10, R122

ART NO	POWER (kW)	VOLTAGE (VDC)	AIR FLOW (m³/h)	PIPE Ø (mm)	WEIGHT (KG)
BR312/16	3	12	250	16	3
BR312/19	3	12	250	19	3
BR312/22	3	12	250	22	3
BR324/16	3	24	250	16	3
BR324/19	3	24	250	19	3
BR324/22	3	24	250	22	3
BR712/16	7	12	350	16	3.6
BR712/19	7	12	350	19	3.6
BR712/22	7	12	350	22	3.6
BR724/16	7	24	350	16	3.6
BR724/19	7	24	350	19	3.6
BR724/22	7	24	350	22	3.6

158 - 358

BR 3kW 158 mm
BR 7kW 238 mm

230,00

70,00

Compact Climate

A compact, reliable and efficient heating solution

A series of blowers which are both slim, powerful and adaptable. Housing in aluminium, riveted together for strength and damage-resistance.

12V axial fans.

16/19 mm hose connections on left (L) or right (R) side.

Certificates

EMC, ECE R10, R122



ART NO	POWER (kW)	VOLTAGE (VDC)	AIR FLOW (m ³ /h)	PIPE Ø (mm)	DIMENSIONS (mm)	WEIGHT (KG)
CC1216L-ALC	7.5	12	350	16	418x150x85	2.7
CC1216R-ALC	7.5	12	350	16	418x150x85	2.7
CC1219L-ALC	7.5	12	350	19	418x150x85	2.7
CC1219R-ALC	7.5	12	350	19	418x150x85	2.7

Cargo Heat

Heating for distribution and service vehicles

Adapted for vehicles with volumes up to 40-45 m³.

Equipped with a high-capacity 24V double radial blower and an aluminium heat exchanger.

Certificates

ECE R10, R122



ART NO	POWER (kW)	VOLTAGE (VDC)	AIR FLOW (m ³ /h)	PIPE Ø (mm)	DIMENSIONS (mm)	WEIGHT (KG)
CR2419	14	24	750	19	350x435x180	3.1

VEHTEC Components

Valves

Solenoid valves from Pierburg and Bitron.
Brass fittings 16 mm and 19 mm available.

ART NO	DESCRIPTION
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900114	Bitron 3-way, 12VDC, N/C, 20 mm connection
900111P	Pins for Bitron valve
900111C	Plug for Bitron valve
900202	Pierburg 2-way, 12VDC, N/O, 20 mm connection
900250	4-way non return valve
900302	Tork 2-way, 12VDC, N/C
900302-16	Incl 16 mm connections
900302-19	Incl 19 mm connections

Bitron Solenoid Valve 900114

- 12V
- Normally closed
- Max flow rate 600 l/h @ 300mbar
- Designed for 50:50 glycol/water mix
- Temperature range -40°C to 120°C
- Built-in bracket for easy mounting
- Supplied with electrical pins/plug



900250



900114

Pumps

We supply pumps from SPX Flow, one of the leading pump manufacturers in Europe.

Max system pressure 2.5 bar.

Glass fiber reinforced plastic, stainless steel.

Motor protection IP67.



900160

ART NO	VOLTAGE (V)	CURRENT (A)	FLOW (L/MIN)	PIPE Ø (mm)
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900160	12	1.2	15	16
900161	12	2.2	22.5	20
900163	24	2.2	22.5	20

Hoses

VeHose

SAE J20. REACH/SVHC. Reinforced, double lining, fully flexible. Withstands pressure up to 25 bar. Grey. Standard length 50 m.

ART NO	DESCRIPTION
1067	ID 16 mm OD 24.7 mm 25 bar
1068	ID 19 mm OD 29.5 mm 25 bar

Standard Hose

SAE J20. REACH/SVHC. Withstands pressure up to 10 bar. Black. Standard length 50 m.

ART NO	DESCRIPTION
1036	ID 16 mm OD 23 mm 10 bar
1037	ID 19 mm OD 26.5 mm 10 bar
1038	ID 22 mm OD 30.3 mm 10 bar

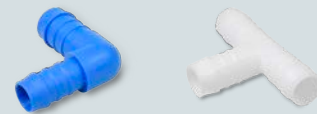
Connectors

PA66

ART NO	DESCRIPTION
1071GRS16	Straight connector 16 mm
1071GRS19	Straight connector 19 mm
1071GRS19/16	Straight reducer 19/16 mm
1071TS16	T connector 16 mm
1071TS19	T connector 19 mm
1071TES19/16	T reducer 19/16 mm
1071WS16	Elbow connector 16 mm
1071WS19	Elbow connector 19 mm

Delrin

ART NO	DESCRIPTION
1070GS16	Straight connector Delrin 16 mm
1070GS19	Straight connector Delrin 19 mm
1070TS16	T connector Delrin 16 mm
1070TS19	T connector Delrin 19 mm
1070YS16	Y connector Delrin 16 mm
1070YS19	Y connector Delrin 19 mm



VEHTEC Spring band clamps

Suitable for coolant and heating systems with hose connections. Sold in quantities of 100 pcs.

ART NO	DESCRIPTION	ART NO	DESCRIPTION
1040	No 21 20.3–22.5 mm	1076	No 27 26–29.2 mm
1033	No 22 21.3–24.2 mm	1035	No 29 28–31.5 mm
103316G	No 24 24–26 mm	103322G	No 32 32–34.5 mm
1034	No 25 24–26.8 mm	1055	Tool for clamps
103319	No 26 26–28 mm	1056	Tool for clamps, with extender





Rubber Elbows SAE J20. REACH/SVHC

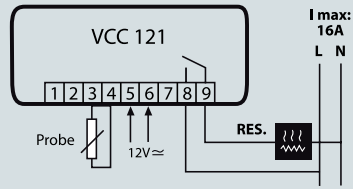
ART NO	PRODUCT DESCRIPTION	ART NO	PRODUCT DESCRIPTION
1141	Elbow reducer 110x110 mm ø 16/22 mm	1157	Straight reducer 110 mm ø 28/22 mm
1142	Elbow reducer 110x110 mm ø 28/22 mm	1158	Double elbow right reducer 100x120x400 mm ø 22/19 mm
1143	Elbow reducer 100x400 mm ø 22/16 mm	1159	Double elbow left reducer 100x120x400 mm ø 22/19 mm
1144	Elbow 100x400 mm ø 19 mm	1160	Elbow 150x150 mm ø 15 mm
1145	Elbow 110x110 mm ø 16 mm	1161	C profile c/c 166 23x166x30 mm ø 15 mm
1146	Elbow 110x110 mm ø 19 mm	1162	U profile c/c 65 80.5x80.5 mm ø 22 mm
1147	Elbow 110x110 mm ø 22 mm	1163	Elbow 90x90 mm ø 22 mm ID
1149	Elbow reducer 110x1000 mm ø 16/19 mm	1164	Elbow 90x90 mm ø 22 mm
1150	Straight reducer 110 mm ø 16/19 mm	1166	Wheel arch profile H=265 mm ø 19/22 mm
1151	Straight reducer 110 mm ø 16/22 mm	1167	Wheel arch profile H=190 mm ø 22 mm
1152	Elbow reducer 110x110 mm ø 16/19 mm	1198	T 16 mm
1153	Elbow reducer 110x110 mm ø 19/22 mm	1199	T 19 mm
1154	Elbow reducer 100x400 mm ø 22/19 mm	191011	Connector with air nipple
1155	Elbow reducer 100x400 mm ø 19/16 mm	191012	Elbow with air nipple
1156	Straight reducer 110 mm ø 22/19 mm		



Climate Control Units

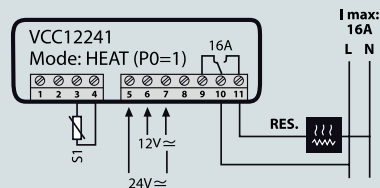
VCC121/S

- 12V
- Panel cut-out dimensions 58x25.4 mm
- Front dimensions 66x32 mm
- Depth 51 mm
- Two-digit display
- EMC approved
- VCC121: 1.5 m probe, VCC121S: 6 m probe



VCC12241/S

- 12/24V multivolt
- Panel cut-out dimensions 71x29 mm
- Front dimensions 79x38 mm
- Depth 61 mm
- Three-digit display
- EMC approved
- VCC12241: 1.5 m probe, VCC12241S: 6 m probe



VTP6

- VEHTEC temperature probe, 6 m, separate

VEHTEC School Sign

ART NO	DESCRIPTION
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7007	12/24V Black, aluminium
7008	12/24V White, aluminium
7009	12/24V Anodised aluminium

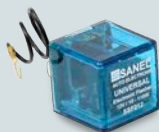
- Foldable when not in use
- 3M reflective sheeting
- Amber colour LED lamps
- 12/24VDC multivolt
- 12/24V relay available as accessory
- EMC approved for light



School Sign Flasher Relay

ART NO	DESCRIPTION
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630104	12V
630106	24V



PA1

ART NO: 430016
(previously 430015)

Central unit for Radio/CD/AUX, guide and driver microphones, video sound output. Individual controls. Output to the speaker system.

- 140x160x50 mm
- 24V
- 30W



- 4–8 Ω
- Output power: 30W at 4–8 Ω load and 28V supply
- Input sensitivity: Microphone 1 mV, Line 100 mV, Speaker input 2V
- Contact pieces and pins available
- EMC approved

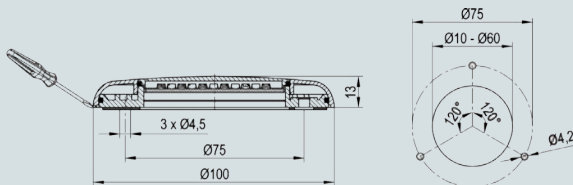


Capacitive Touch Control Buttons

ART NO DESCRIPTION

630201 Wheelchair
630204 Trolley
630205 Hand

- 12/24VDC multivolt
- ABS frame/polycarbonate lens
- Surface-mounted
- Ø 100 mm, 13 mm thick
- IP67 dust/water resistant
- EMC approved



Reversing Alarm

ART NO: 470015

- 12/24VDC multivolt
- Ø 55 mm
- IP67 dust/water resistant
- RoHS compliant
- EMC approved

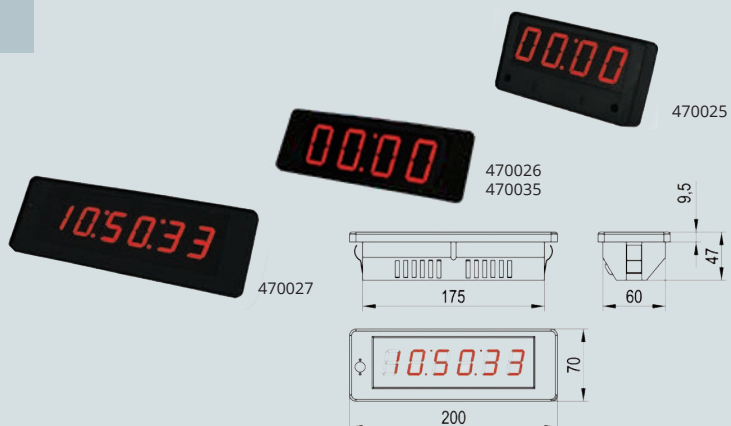


Bus Digital Clocks

ART NO DESCRIPTION

470025 12V
470026 12V
470027 12V
470035 24V

- 12V or 24V
- Real Time Clock (RTC technology)
- EMC approved



Led interior lights

ART NO DESCRIPTION

640039	12V red, capacitive on/off button
640040	12V white, capacitive on/off button
640041	12V white
640049	24V white
640050	24V white, capacitive on/off button

- 12V or 24V
- 12V=170 mA / 24V=85 mA
- ABS frame / Polycarbonate lens
- Surface mounting
- Slim design h=10 mm
- 30 LED and 34 LED (capacitive on/off button)
- EMC approved



Led interior lightings

ART NO DESCRIPTION

640061	12V, 0.15A, 18 LED, 135 mm
640063	12V, 0.15A, 36 LED, 266 mm
640065	12V, 0.23A, 54 LED, 400 mm
640065K	400 mm, on/off switch
640069	12V, 0.26A, 72 LED, 500 mm
640069K	500 mm, on/off switch
640070	12V, 0.4A, 108 LED, 730 mm
640070K	730 mm, on/off switch
640071	12V, 0.6A, 144 LED, 960 mm

- Aluminium Profile / Polycarbonate lens
- Surface mounting
- Optional night light
- EMC approved



Led interior spot lamps

ART NO DESCRIPTION

640261 <i>(replacing 640241)</i>	12V white, capacitive on/off button
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- 12 V 0.1A with 18 LED
- Recessed mounting
- ABS frame / Polycarbonate lens
- EMC approved

Multi functional led lightings

ART NO DESCRIPTION

640051	Rear position, red
640052	Step lighting, blue
640053	Side marker, yellow
640054	Front position, white
640055	Mount for lamps

- 12V=170 mA / 24V=85 mA
- ABS frame / Polycarbonate lens
- Surface mounting
- Ultra slim design h=7,5 mm
- 6 LEDs
- IP67 dust/water resistant
- EMC approved



Flash light led yellow

ART NO DESCRIPTION

640033	12V red, capacitive on/off button
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- 12/24V multivolt
- 12V = 0.3A / 24V = 0.1A
- 6 LED 1W=6W
- IP67 dust/water resistant
- EMC approved

