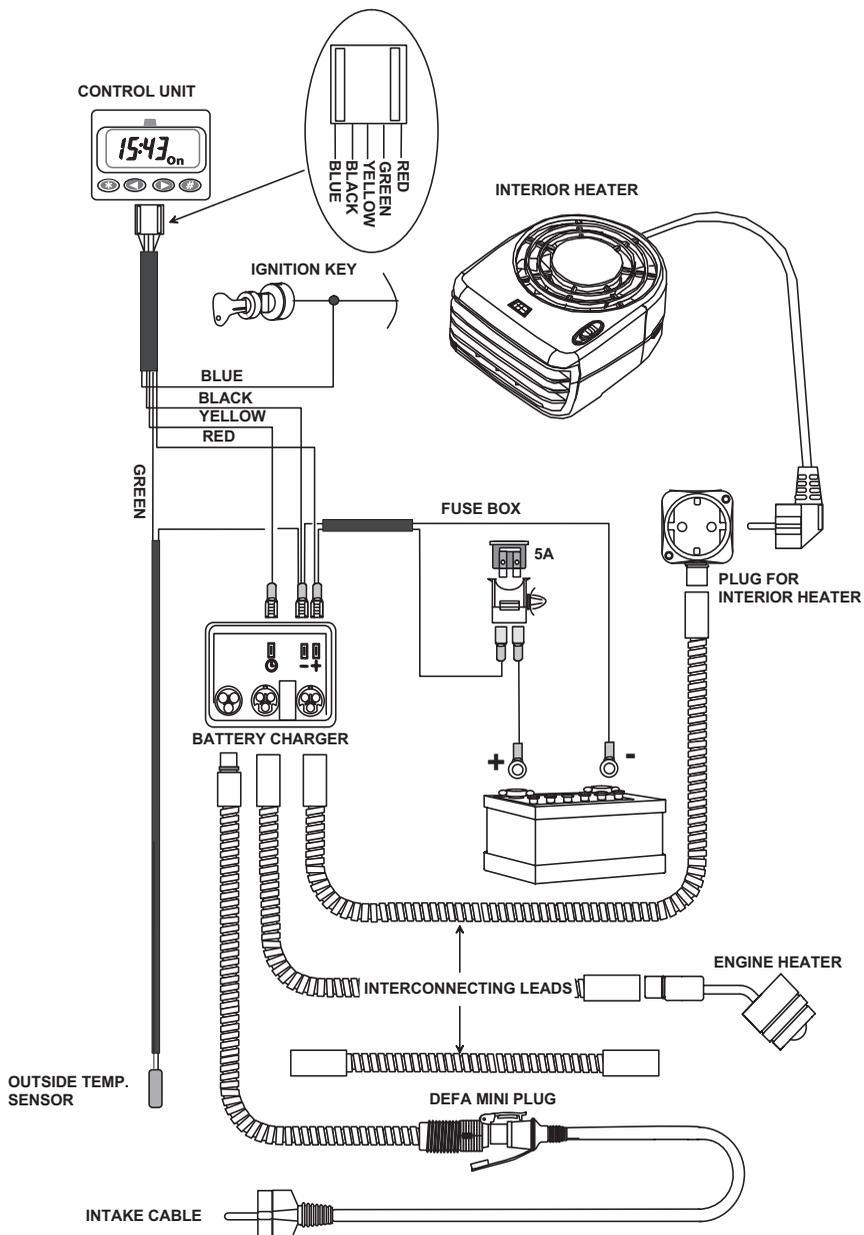


Wiring diagram.



Consisting of:

Components

- 1 Interior heater with fitting bracket
- 1 Control unit
- 1 Battery charger/Current distributor
- 1 Plug for interior heater
- 2 Interconnecting lead 1m
- 1 Interconnecting lead ½ m
- 1 DEFA Mini-plug cable 1.5 m
- 1 Attachment cable 2.5 m
- 1 12V cable rug for control unit and charger

Fastening equipment for DEFA Mini Plug

- 1 Fastening nut for recessing
- 1 Nut mounting ring for curved surfaces
- 1 O-ring for fastening nut
- 1 Fastening bracket
- 1 Distance sleeve for fastening bracket
- 2 Fastening screw for plug-in bracket 3x7 mm
- 2 Fastening screw for bracket M4
- 2 Well-nut for bracket
- 1 Self-sinking screw 4.2x13 mm for 12V-
- 2 Spring Washer

Fastening equipment for other components

- 3 Fastening screws 3.5x16 mm for interior heater bracket
- 1 Fastening screw 4.2x38 mm for battery charger
- 4 Two-sided tape for control unit
- 8 Fastening strips 200 mm for interconnecting leads
- 1 Fuse box with fuse 6A
- 1 Cable 200 mm fuse box/battery

Preparing for installation

The workshop/garage is always responsible for taking all necessary safety precautions when installing DEFA WarmUp. Avoid locating units too close to engine components with high temperature, for instance exhaust manifold, exhaust pipe, turbo etc. Ensure proper distance from moving parts such as alternator, cooling fan, steering rods etc.



Use the following method to install DEFA Warm Up

1. Disconnect the minus terminal of the battery. Check the manufacturer's instructions before disconnecting.
2. Choose engine heater according to DEFA's vehicle list. Refill the cooling system with approved engine coolant and bleed the cooling system in accordance with the manufacturer's instructions.
3. Find a suitable place for passing through the cables and mount the socket for the interior heater in the passenger compartment.
4. Mount the interior heater in the passenger compartment and connect the Plug-In cable from the engine compartment.
5. Fit the DEFA Mini-Plug in an accessible position in the front of the car in accordance with the customer's requirements.
6. Place the battery charger/relay box in correct position relative to the Plug-In cable from the interior heater, the engine heater and the power intake.
7. Mount the control unit and connect the battery charger.
8. Connect the minus terminal of the battery.
9. Check that the DEFA Warm Up functions properly.

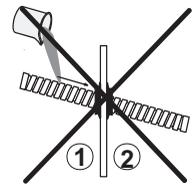
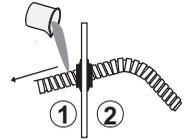
Passing through the interconnecting cable to the interior.

Pass the interconnecting cable through existing holes in the inner fender or via the A-pillar into the interior of the car. The plastic inner fender must be removed. Remember to pass through the 5-lead cable for the control unit.

Be careful if it is necessary to drill a hole to pass through the DEFA Plug-In cable from the engine compartment to the interior. Do not drill in double plating or reinforcements.

The DEFA Ø20mm hole saw is a particularly suitable tool for this task. Make sure that the tool does not damage fitted components, brake lines, electrical cables etc. For the rust-proofing warranty to be valid, scratches and cuts in the paint must be repaired with a material approved by the vehicle's manufacturer.

Use the enclosed rubber bushing to seal the hole. Make sure the rubber bushing is fitted properly as it may otherwise be a conduit for water seepage into the passenger compartment. DEFA Plug-In cables should slope downwards from the passing through point into the engine compartment (1) so that water or humidity does not run along the cable into the car interior (2).



When drilling a hole in the engine compartment wall, care must be taken so the tool does not damage fitted components, brake lines, electrical cables etc.

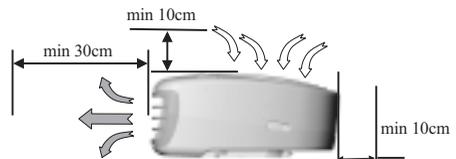
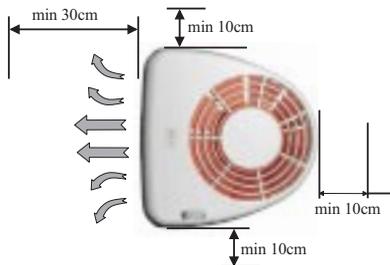
Installation of the interior heater.

Install the interior heater and its plug in a suitable location in the passenger compartment. Use the enclosed mounting bracket to mount the heater.

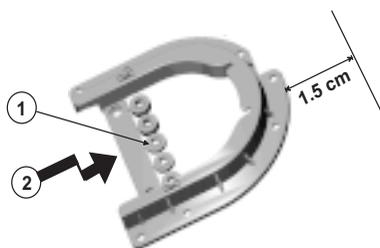
The interior heater can be installed in the following positions:

Upside-down, e.g. under the glove compartment; on the side wall, e.g. on the middle console or the A-pillar. The airflow must not be directed downwards. The interior heater must be mounted so as to satisfy the requirements for free space around the heater. The requirements are shown in the sketches below.

Mounting with the bracket.



The mounting bracket is designed for use on uneven surfaces. Remove the bracket from the heater by pushing it backwards. The bracket is mounted by means of the enclosed distance sleeves (1) shown in the picture to the right. All the holes in the bracket can be used, but it is desirable for the mounting points to be as far apart as possible. Use the enclosed 3 screws to fasten the mounting bracket. The distance sleeves must be removed before the bracket is mounted. Guide the interior heater onto the bracket and push (2) until a click is heard.



The interior heater must be positioned so that it does not constitute a safety hazard in case of a collision or hard braking.

When used in a vehicle the interior heater must always be connected to a power socket mounted in the interior and connected to a power outlet on the outside with interconnecting lead or mini-plug. Only original DEFA connector kits with original DEFA Mini-Plug may be used. The lead may only be connected to an earthed power socket.



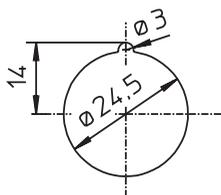
Make sure that screws or drill bits do not damage cables or control units on the back of the panel where the mounting bracket and the plug is fitted.

Installation of the DEFA Mini-Plug and interconnecting cables

Fitting of DEFA Mini-Plug.

Recessing the Mini-Plug.

The DEFA Mini Plug should be mounted in such a way that it is protected against splash and mechanical damage and so that the connector lead can be connected without difficulty. When the mounting surface for the fastening nut is uneven the enclosed mounting ring should be used. Insert the O-ring in the groove in the plastic nut or on the mounting ring if this is used. Drill a hole with a diameter of $\text{Ø}24,5$ mm and file a guide groove with a diameter of $\text{Ø}3$ mm to recess the Mini plug. (Special tool no. 460840). Make sure there is sufficient space in the rear for the cable and enough room for the fastening nut. Be careful when drilling so that mounted components, cables etc. are not damaged. The plug can be painted, if desirable, in the car's own colour.



The bracket can be mounted both ways depending on the mounting location. The plug can be adjusted and turned to the required position. Normally the plug is fitted with the cover hinge pointing upwards, but may also be fitted with the hinge to one side. The plug must not be fitted with the cover hinge pointing downwards.



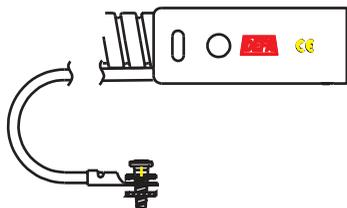
Drainage.

Regardless of whether the DEFA Mini Plug is mounted recessed or on the bracket, the plug should be fitted so that it leans downwards towards the cover allowing water and condensation to be drained away. If the plug is fitted leaning upwards, the lower of the three weakened points(1) on the plug **MUST** be removed for drainage. It is best done with a knife or similar tool. (Do not **push** the plastic piece into the plug).



Earth connection.

The earth connection (black single-core cable with ring-shaped cable shoe) **MUST** be connected to a good earth point on the metal part of the car body. Paint, underseal etc. **MUST** be removed from the contact point of the earth connection. A toothed washer must be used both under the screw head and between the cable shoe and the car body.



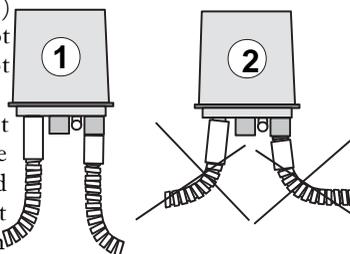
DEFA Plug-In connectors and interconnection leads.

It is important when connecting the leads to press the contacts together sufficiently hard for the O-ring on the male contact to seal properly. Make sure the O-ring is not pushed out of the groove when pressing the contacts together. Fasten the extension leads with plastic strips in suitable spots in the engine compartment, well away from sharp, hot or moving parts.

Battery charger.

Connect the battery charger in accordance with the wiring diagram on the cover. Connection to the battery must always be made with the enclosed fuse. Use the fastening hole at the bottom of the charger and mount the charger with a body screw or plastic strips. Route the cables straight away from the contacts (1) on the battery charger so that the Plug-In contacts are not bent or twisted (2). Make sure the battery charger is not placed too close to hot parts such as exhaust

The cable for the control unit is connected to the contact under the small cover. The cover is opened as shown in the picture. The plug is fitted so that the red cable is located as shown in the picture (1). The thick part of the cable must be inside the edge (2) of the cover so that the tension when closed keeps the cable in place.



Find a suitable position for the control unit in the passenger compartment. Dashboard, switch panel, console or sun visor are good possibilities. Clean the surfaces carefully with a suitable grease solvent (for instance Acrysol). Do not use acetone, trichlorethylene, Breackclean or similar products as PVC and plastic may be damaged. Fasten the control unit by means of the enclosed double-sided tape.



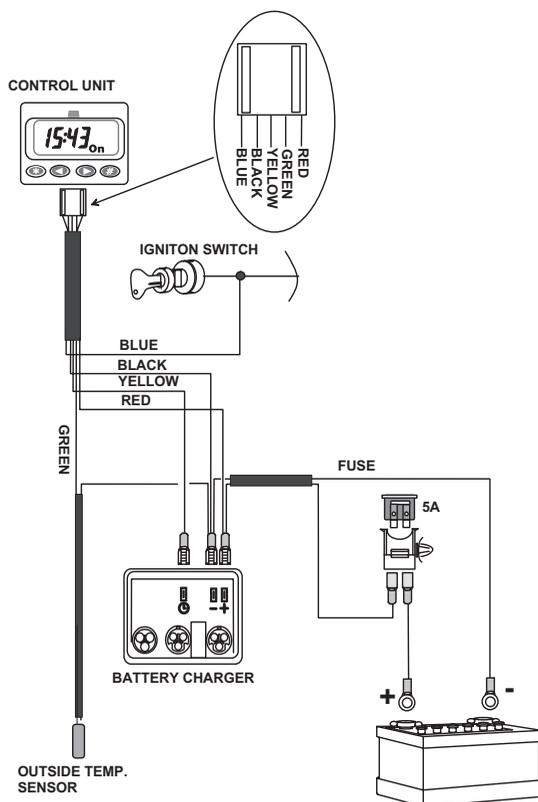
Note that the two ends of the cover are different. It can only be opened from one.

It must also be positioned well clear of moving parts such as pulleys, cooling fan and steering rods. Two or more battery chargers can not be connected in series or parallel to charge e.g. a 24V device, or to achieve higher voltage. Avoid charging batteries in an enclosed area, as there is a potential danger of explosion. The temperature of the battery may not exceed +40°C during charging. The charger contains high voltage current. Therefore do not use a drill on it or open it.



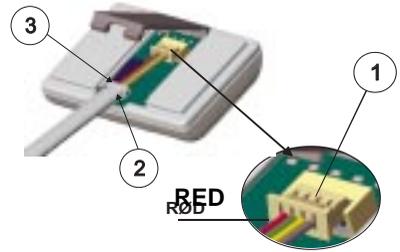
The charger must be positioned with the contacts facing DOWN and is fastened by means of screws or strips.

Control unit.

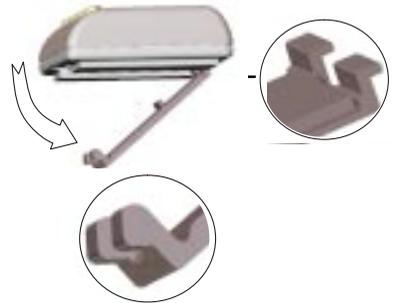


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The cable for the control unit is connected to the contact under the small cover. The cover is opened as shown in the picture. The plug is fitted so that the red cable is located as shown in the picture (1). The thick part of the cable must be inside the edge (2) of the cover so that the tension when closed keeps the cable in place.



Find a suitable position for the control unit in the passenger compartment. Dashboard, switch panel, console or sun visor are good possibilities. Clean the surfaces carefully with a suitable grease solvent (for instance Acrysol). Do not use acetone, trichlorethylene, Breakclean or similar products as PVC and plastic may be damaged. Fasten the control unit by means of the enclosed double-sided tape.



Note that the two ends of the cover are different. It can only be opened from one end.

Fit the outside temperature sensor in the front of the car, and place it so that hot parts do not influence it.

Claims

Claims may not be made for damage resulting from:

- Normal wear and tear.
- Faulty installation.
- Lack of maintenance and faulty or irresponsible use.
- The use of non-original connectors/leads or use together with non-original parts.
- Modification or repairs of the product, or attempts thereon, carried out by others than DEFA without written authorization by DEFA to carry out such modification or repair.
- Conditions after delivery beyond the control of DEFA.

SEND CLAIMS TO:

DEFA A.S
Service Department
N-3540 NESBYEN
Telephone: 32 06 77 20
Fax: 32 06 77 01
e-mail: ts.awu@defa.no

Remember to enclose a copy of receipt/invoice!