

Fischer Panda

Operation Manual

Description of the generator and operation manual



Marine Generator
Panda 8000 NE
Super silent technology

230V - 50 Hz / 6,5 kW

Fischer Panda GmbH

Current revision status






	Dokument
Actual:	Marine_Panda_8000NE_Operation Manual_9.1.08
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Revision	Page

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Icemaster GmbH	Fischer Marine Generators	Conclusion Fischer - Icemaster GmbH	100 % water cooled Panda generators	Panda Vehicle Generators

Fischer Panda

FISCHER GENERATORS have been manufactured since 1978 and are a well-known brand for first class diesel generators with especially effective sound-insulation.

Fischer has been one of the leading manufacturers in respect of quality and know-how during this period.

FISCHER, as the worldwide manufacturer of modern marine diesel generators, developed the Sailor-Silent series for example and produced a GFK sound-insulated capsule as early as 1979 and the basis for new generator technology.

The companies Fischer and Icemaster amalgamated under the direction of Icemaster in 1988, in order to concentrate on the development of new products. Production was moved to Paderborn.

The amalgamation of the two qualified companies led to the development of a complete new programme within a short space of time. The generators developed at that time set new technological standards worldwide.

The generators became more efficient and powerful than other generators in the same nominal performance range, because of the improved cooling. Panda generator demonstrated its superiority in several tests by renowned institutes and magazines during the past years. The patented VCS (voltage Control System) means it can meet all demands including motor speed. The start-booster (ASB) means Panda generators meet the highest demands in respect of voltage stability and starting values. A Panda generator, with the same drive motor, produces 15 % more effective output than the majority of conventional generators. This superiority in efficiency also ensures a fuel saving to the same extent.

The 100% water-cooled Panda generators are currently manufactured in the performance range from 2 to 100 kW in various versions. Fast running motors are preferred for performances up to approx. 30 kW (nominal speed 3000 rpm). The heavier slow runners are preferred for the higher range. The fast running generators have proved themselves many times for many uses, that they meet the demands in quality of yachts and vehicles, and offer space and weight saving of 50 % compared to slow running generators.

In addition to the Panda series, Fischer Panda also supply the super compact high-tech sound-insulated battery charging generators from the DC/AC Panda AGT series, which is a very interesting solution for the production of mobile power.

The HTG-alternators ensure that a charging rate of 285 amps is achieved that was scarcely thought possible for this compact construction. This alternator replaces a separate shipboard generators (constant 230 volts AC with up to 3500 kW from the main machine)

Fischer Panda GmbH, 33104 Paderborn, reserves all rights regarding text and graphics. Details are given to the best of our knowledge. No liability is accepted for correctness. Technical modifications for improving the product without previous notice may be undertaken without notice. Before installation, it must be ensured that the pictures, diagrams and related material are applicable to the genset supplied. Enquiries must be made in case of doubt.

Safety first

These symbols are used throughout this manual and on labels on the machine itself to warn of the possibility of personal injury. Read these instructions carefully. It is essential that you read the instructions and safety regulations before you attempt to assemble or use unit.



This danger symbol refers to toxic danger and draws attention to special warnings, instructions or procedures which, if not strictly observed, may result in severe personal injury or loss of life.



This danger symbol refers to electric danger and draws attention to special warnings, instructions or procedures which, if not strictly observed, may result in electrical shock which will result in severe personal injury or loss of life.









This warning symbol draws attention to special warnings, instructions or procedures which, if not strictly observed, may result in damage or destruction of equipment, severe personal injury or loss of life.



This warning symbol draws attention to special warnings, instructions or procedures which, if not strictly observed, may result in damage or destruction of equipment

Tools

This symbols are used throughout this manual to show which tool must be used at maintenance or installation.	
	<p>Spanners</p> <p>X = required size</p>
	<p>Hook wrench for oil filter</p>
	<p>Screw driver, for slotted head screws and for recessed head screws</p>
	<p>Multimeter, multimeter with capacitor measuring</p>
	<p>Socket wrench set</p>
	<p>Hexagon wrench keys</p>

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.



Attention, Important Directions regarding Operation!

1. The installation certificate must be completed when taken into use, and certified by a signature.
2. The installation certificate must be despatched within two weeks of use to Fischer Panda.
3. The official guaranty confirmation will be completed by Fischer Panda after receipt and sent to the customer.
4. A guaranty must be shown to make any claims.

Claims against the guaranty will not be accepted if the above said instructions are not, or only partially, carried out.

Manufacturer declaration in accordance with the machine guideline 98/37/EG

The generator has been developed in such a way, that all assembly groups correspond to the CE guidelines. If machine guideline 98/37/EG is applied, then it is forbidden to start the generator, until it has been ascertained that the system into which the generator is to be integrated, also corresponds to the machine guideline regulation 98/37/EG. This includes the exhaust system, cooling system and electrical installation.

The evaluation of "protection against contact" must be carried out when installed, in conjunction with the respective system. This includes correct electrical connections, a safe ground wire connection, foreign body and humidity protection, protection against humidity due to excessive condensation, as well as overheating through appropriate and inappropriate use in its installed state. The responsibility lies with those who undertake installation of the generator in the final system.

Use the advantages of the customer registration:

- Thus you receive to extended product informations, which are sometimes safety-relevant
- you receive, if necessarily free Upgrades

Far advantages:

By your full information Fischer Panda technicians can give you fast assistance, since 90% of the disturbances result from errors in the periphery.

Problems due to errors in the installation can be recognized in the apron.

Technical Support per Internet: info@fischerpanda.de

Safety Precautions



The electrical installations may only be carried out by trained and qualified personnel!

Safety Instructions concerning operating the generator

- The generator must not be taken into use with the cover removed.
- If the generator is being installed without a sound insulation capsule, then make sure, that all rotating parts (belt-pulley, belts etc) are covered and protected so that there is no danger to life and body!
- If a sound insulation covering will be produced at the place of installation, then well-placed signs must show that the generator can only be switched on with a closed capsule.
- All servicing-, maintenance or repair work may only carried out, when the motor is not running.
- There is full current in the AC control box when the generator is running. It must therefore be ensured that the control box is closed and cannot be touched when the generator is running.
- Do not work in an ambient, where there are explosives. Working on an electrical system in an ambient where there are flammable gases is dangerous.
- Electrical voltages above 48 volts (battery chargers greater than 36 volts) are always dangerous to life). The rules of the respective regional authority must be adhered to. Only an electrician may carry out installation of the electrical connections for safety reasons.

Ground Wire:

The generator, is "earthed" as series (centre and ground are connected together in the generator terminal box by a bridge). This is an initial ground fuse, which offers protection, as long as no other measures are installed. Above all, it is conceived for the delivery and possible test run.

This "neutralisation" (Protective Earthing Neutral - PEN) is only effective, if all parts of the electrical system are commonly "earthed" to a common potential. The bridges can be removed, if this is necessary for technical reasons and another protective system has been setup.

Safety Instructions concerning working on the generator

The battery must always be disconnected, if work on the generator or electrical system is to be carried out, so that the generator cannot be unintentionally started. **It is not allowed to disconnect the battery during operation!** After the generator has been stopped, the battery can be disconnected!

Switch off all load when working on the generator

All load must be disconnected, in order to avoid damages to the devices. In addition the semi conductors in the AC control box must be disconnected in order to avoid the boat capacitors being activated. The minus pole of the battery ought to be removed.

Safety Instructions concerning the capacitors

Capacitors are required to run the generator. These have two varying functions:

- A) The working capacitors
- B) The (Booster) capacitors

Both Groups are located in a separate AC-Control box.

Capacitors are electrical stores. There could be a residual of high electrical current at the contacts for a period disconnection from the circuit. The contacts may not be touched for safety reasons, If the capacitors are to be exchanged or checked, and then a short circuit between the contacts should be made so that the stored energy is discharged.

If the generator is switched off in the normal manner, the working capacitors are automatically discharged by means of the windings. The booster capacitors are discharged by means of internal discharge resistors.

All capacitors must be short-circuited before work is carried out on the AC-Control box for safety reasons.

Safety Instructions concerning the cables

Cable Type

It is recommended is that the cable used be UL 1426 (BC-5W2) compliant, with Type 3 stranding (ABYC Section E-11)

Cable Size

The cable size must be selected taking into account the amperage, voltage and conductor length (from the positive power source connection to the electrical device and back to the negative power source connection).

Cable Installation

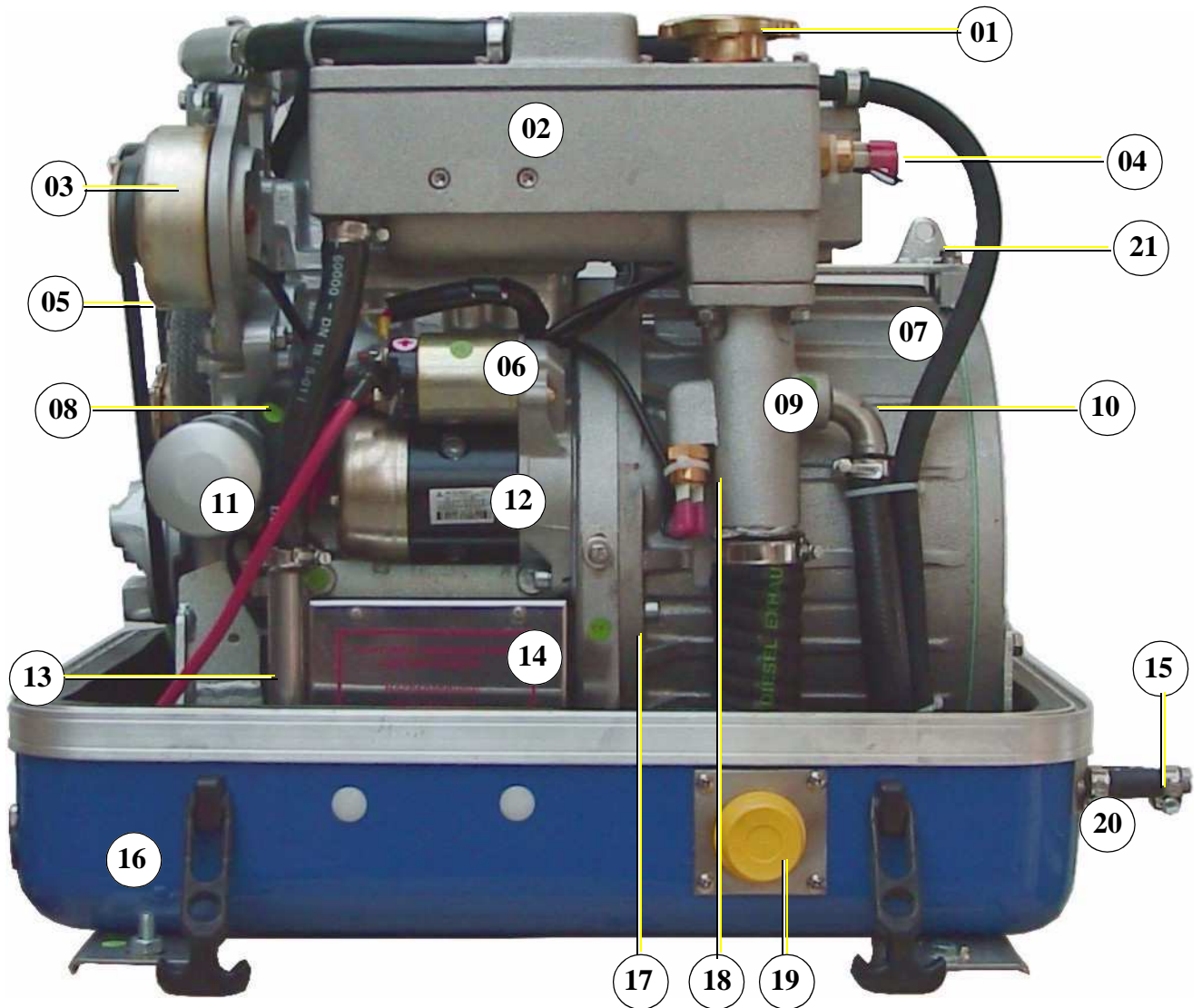
It is recommended that a self draining wire loom classified as V-2 or better in accordance with UL 94 be installed in the section of the cable routed in the interior of the sound capsule. Care should be taken to avoid hot surfaces such as the exhaust manifold or engine oil drain bolt and routed clear of any possible sources of chafing.



A. The Panda Generator

A.1 Description of the Generator

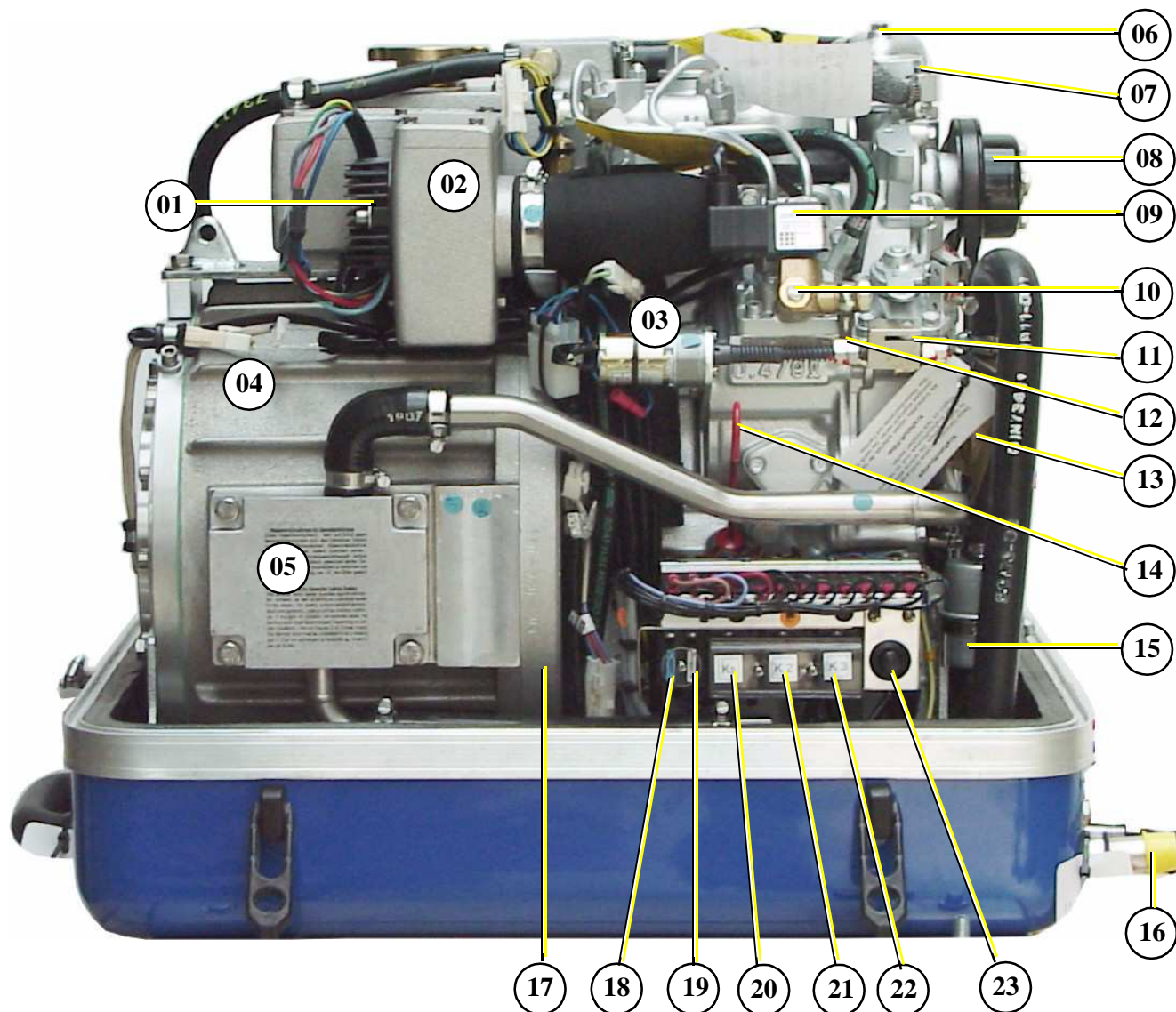
A.1.1 Right Side View



- | | |
|---|--|
| 01. Cooling water filler neck | 11. Engine oil filter |
| 02. Water-cooled exhaust manifold | 13. Cooling water backflow pipe |
| 03. 12 V DC-alternator | 14. Generator power terminal box |
| 04. Exhaust manifold thermo-switch | 15. Connection for external cooling water expansion tank |
| 05. V-belt for DC-alternator and cooling water pump | 16. Sound cover - base part |
| 06. Magnetic switch for starter motor | 17. Engine connecting flange |
| 07. Generator housing with winding | 18. Exhaust thermo-switch |
| 08. Oil pressure switch | 19. Exhaust hose connection |
| 09. Exhaust connection | 20. Connection for external ventilation valve |
| 10. Injector for cooling water | 21. Eyelet |

Fig. A.1.1-1: Right Side View

A.1.2 Left Side View

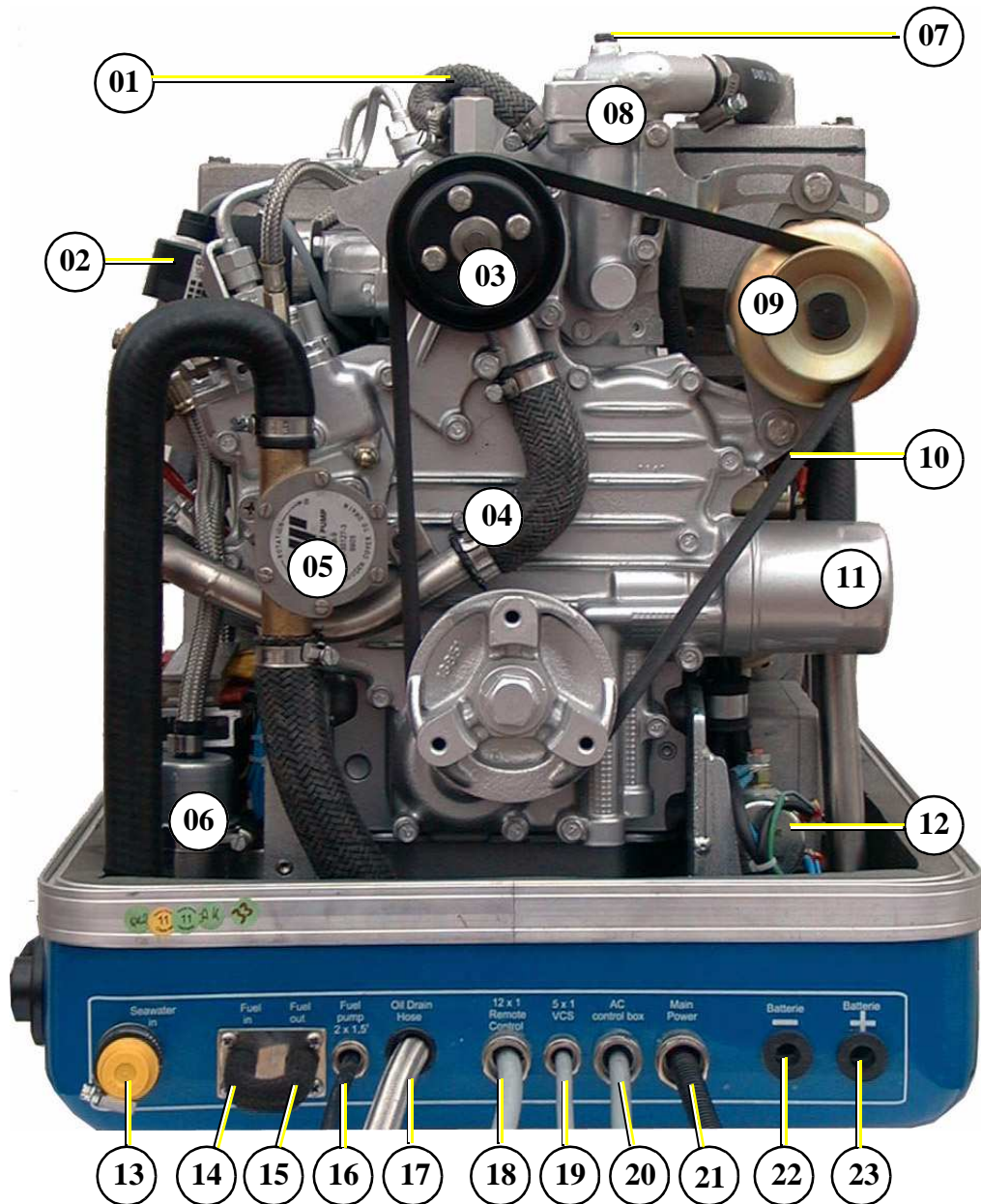


- | | |
|---|------------------------------------|
| 01) Charge control for DC-alternator | 13) Seawater pump |
| 02) Air suction housing with air filter | 14) Oil dipstick |
| 03) Actuator for speed control | 15) Fuel fine filter |
| 04) Generator housing with winding | 16) Seawater inlet |
| 05) Cooling water connection block | 17) Engine connecting flange |
| 06) Ventilation screw thermostat housing | 18) Flat fuse 15Amps (blue) |
| 07) Ventilation screw internal cooling water pump | 19) Flat fuse 25Amps (white) |
| 08) Pulley for internal cooling water pump | 20) Starter relay Ks |
| 09) Fuel solenoid valve | 21) Pre-glow relay (glow plugs) K2 |
| 10) Ventilation screw fuel solenoid valve | 22) Fuel pump start relay K3 |
| 11) Adjusting screw | 23) Failure override switch |
| 12) Stop screw for setting maximum speed | |

Fig. A.1.2-1: Left Side View



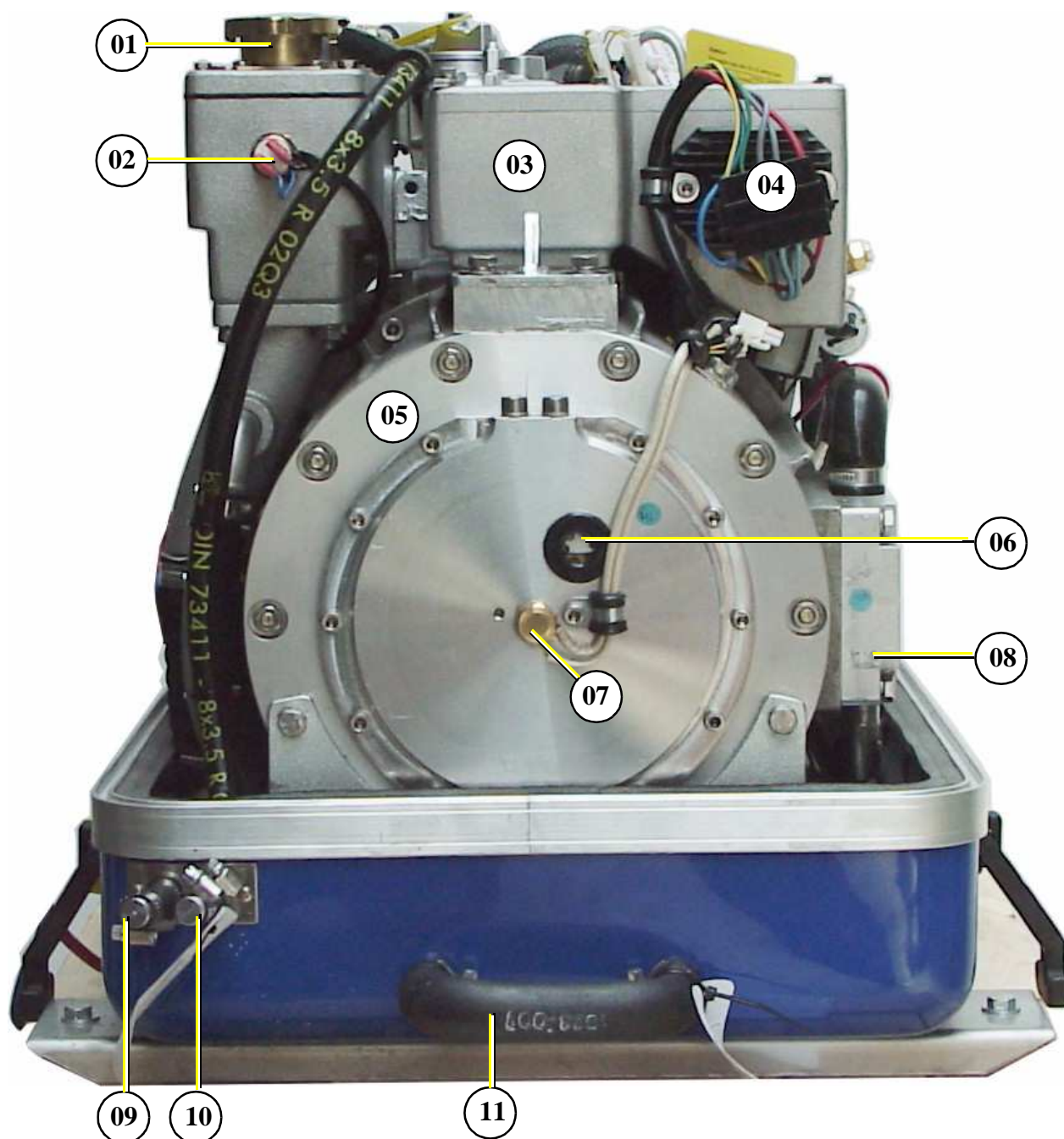
A.1.3 Font View



- | | |
|--|--|
| 01) Ventilation screw internal cooling water pump | 13) Seawater inlet |
| 02) Fuel solenoid valve | 14) Fuel intake connection |
| 03) Pulley for internal cooling water pump | 15) Fuel backflow connection |
| 04) Freshwater intake pipe | 16) Fuel pump cable (2x1,5mm ²) |
| 05) Seawater pump | 17) Oil drain hose |
| 06) Fuel fine filter | 18) Remote control panel cable (12x1mm ²) |
| 07) Ventilation screw thermostat housing | 19) Electronic Voltage Control cable VCS (5x1mm ²) |
| 08) Thermostat housing with thermostat set | 20) AC-Control box cable |
| 09) Alternator 12 V | 21) Load |
| 10) V-belt for DC-alternator and internal cooling water pump | 22) Batterie minus (-) |
| 11) Engine oil filter | 23) Batterie plus (+) |
| 12) Earth switch relay | |

Fig. A.1.3-1: Front View

A.1.4 Back View

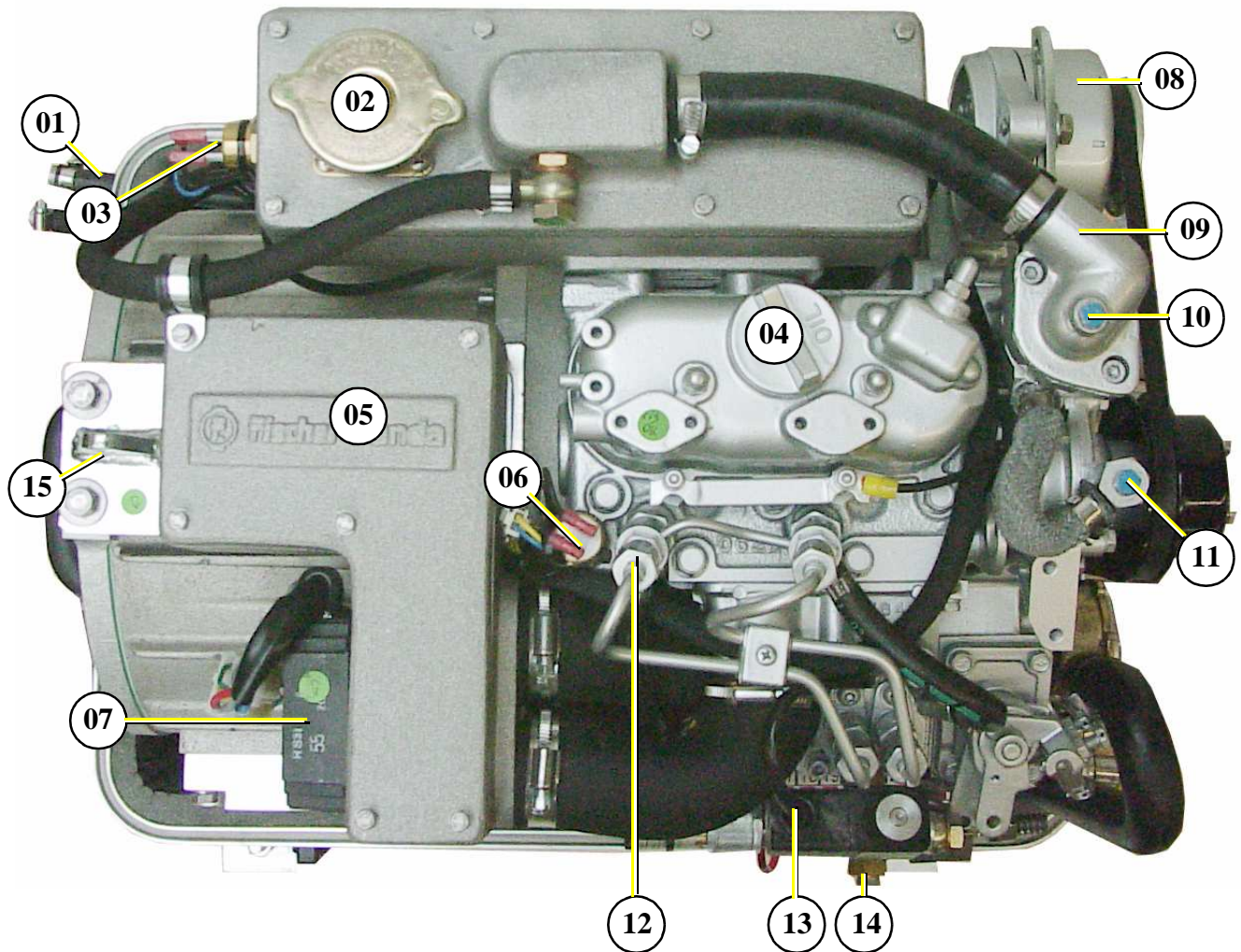


- | | |
|---|--|
| 01. Cooling water filler neck | 07) Thermo switch at oil cooled bearing |
| 02. Exhaust manifold thermo-switch | 08) Cooling water connection block |
| 03. Air suction housing with air filter | 09) Intake external cooling water expansion tank |
| 04. Charge control for DC-alternator | 10) Backflow external cooling water expansion tank |
| 05. Generator front plate | 11) External ventilation valve connection |
| 06. Oil flow glass | |

Fig. A.1.4-1: Back View



A.1.5 View from above



- 01) Intake external cooling water expansion tank
- 02) Cooling water filler neck
- 03) Exhaust manifold thermo-switch
- 04) Engine oil filler neck
- 05) Air suction housing with air filter
- 06) Cylinder head thermo-switch
- 07) Charge control for DC-alternator
- 08) 12 V DC-alternator

- 09) Thermostat housing with thermostat set
- 10) Ventilation screw thermostat housing
- 11) Ventilation screw internal cooling water pump
- 12) Injection nozzle
- 13) Fuel solenoid valve
- 14) Ventilation screw fuel solenoid valve
- 15) Eyelet

Fig. A.1.5-1: View from above

A.2 Details of functional units

A.2.1 Components of the Cooling System (Raw Water)

Raw water intake

The diagram shows the supply pipes for the generator. The connection neck for the raw water connection is shown on the right hand side. The cross-section of the intake pipe should be nominally larger than the generator connection.



Fig. A.2.1-1: Raw water intake

Raw water impeller pump

The raw water pump is fitted with a rubber impeller. This pump is self-inductive. If, for example, you forget to open the sea valve, then you must expect the impeller to be destroyed after a short period of time. It is recommended to store several impellers on board as spare parts.

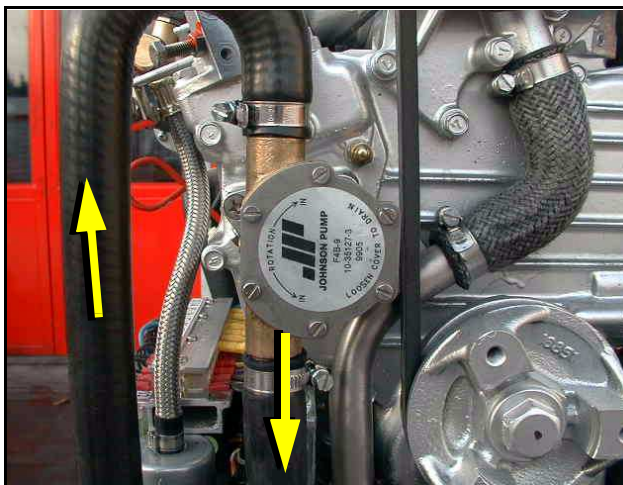


Fig. A.2.1-2: Raw water impeller pump



Heat exchanger

The heat exchanger separates the raw water system from the fresh water system, so that the generator components do not have contact with the raw water circulation system. The raw water is fed direct to the exhaust connection piece at the heat exchanger outlet.

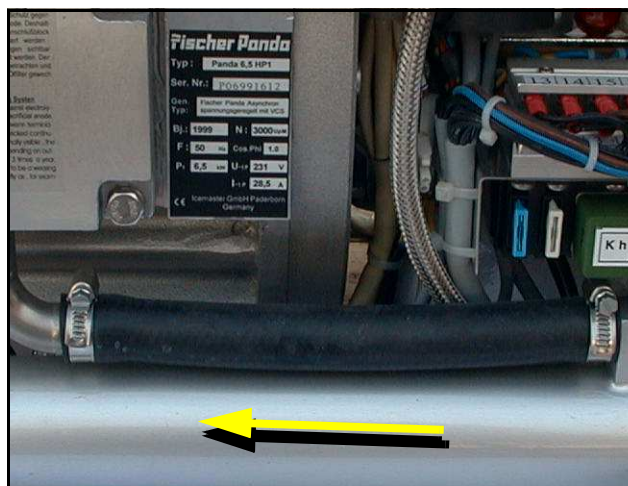


Fig. A.2.1-3: Heat Exchanger

Ventilation valve

A siphon must be installed if the generator sinks below the water line because of the rocking of the boat, even if it is only for a short period of time. A hose pipe on the generator casing has been produced for this. Both connecting pieces are bridged by a formed piece of hose.



Fig. A.2.1-4: Connection ventilation valve

Raw Water Injection

The injection point for the marine generator water-cooled exhaust system is situated at the exhaust connection pieces. The exhaust connections must be regularly checked for signs of corrosion.

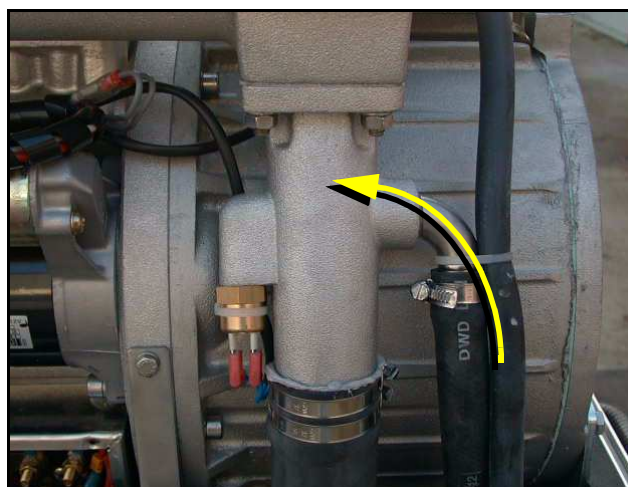


Fig. A.2.1-5: Raw Water Injection



A.2.2 Components of the Cooling System (Fresh Water)

Cooling water filler neck

The cooling water filler necks situated at the water-cooled manifold are only used, when the generator is initially started. Since the generator is normally already filled with cooling water, these components are only by the user, if repairs are to be carried out. Topping up with cooling water may only be carried out at the external cooling water compensation tank. Note that the water level in the cooling water compensation tank is only 20 % of the volume in a cold state.



Fig. A.2.2-1: Cooling water filler neck

Freshwater backflow

If the generator is fitted with a dual cooling system, the fresh water circulation system is sealed. The warmest point of the fresh water circulation system is located at the point marked at the exhaust elbow (see arrow). The cooling water leads from this point to the heat exchanger.

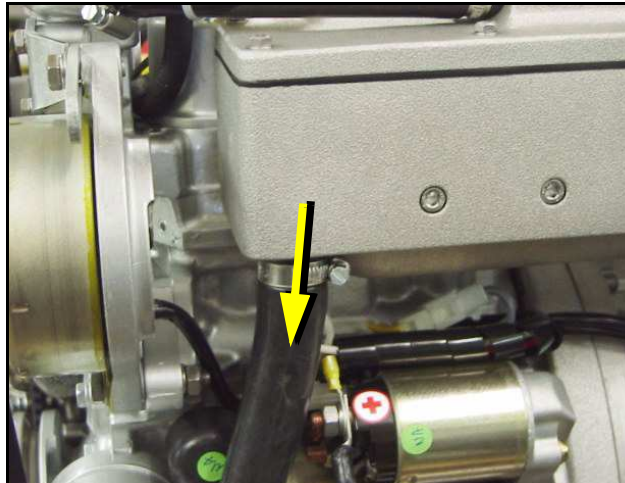


Fig. A.2.2-2: Freshwater backflow



Ventilation pipe

The ventilation pipe at the water-cooled exhaust manifold leads to the external expansion tank. This pipe only serves as a ventilation pipe, if both pipes are to be connected to the external expansion tank (ventilation pipe and intake pipe).



Fig. A.2.2-3: Ventilation pipe

Hose connection pieces for the external expansion tank

The external expansion tank is connected by two hose connections. The connecting pieces showed here serves as constant ventilation for the water-cooling system.

In case the external expansion tank is connected with two hoses, the system will ventilate itself. In this case, additional ventilation is only necessary when the generator is initially filled, or if the cooling water is not circulating.

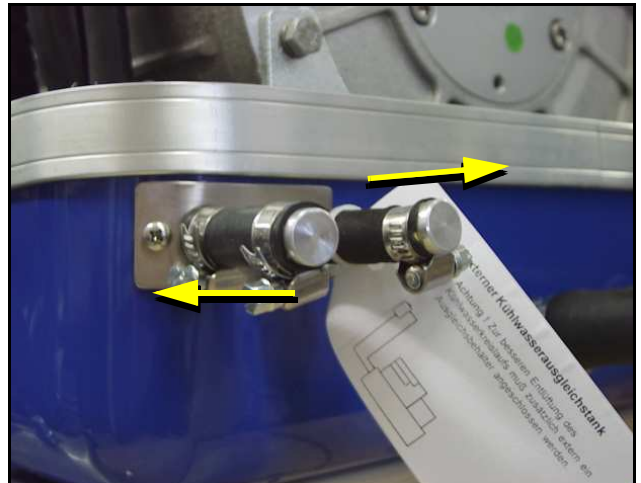


Fig. A.2.2-4: External Expansion Tank

Heat exchanger

The internal freshwater circulation system is separated from the Raw water circulation system by the heat exchanger. This means the Raw water circulation system does not come into contact with the generator components. The Raw water is fed directly to the exhaust connection at the heat exchanger outlet.

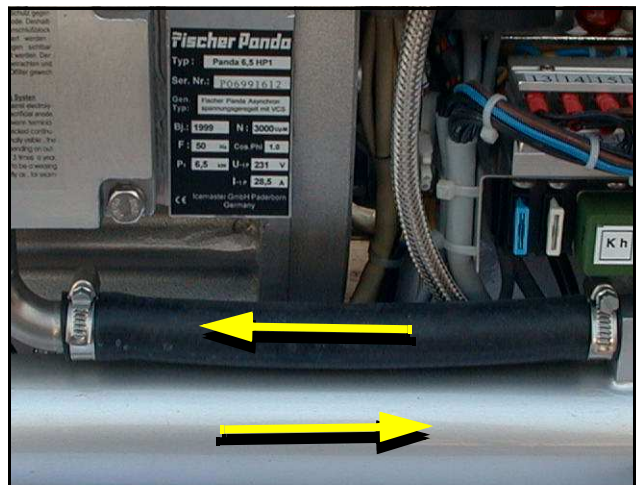


Fig. A.2.2-5: Heat Exchanger

Cooling Water Connection Block

The cooling water is fed to and from the double lined casing of the generator. The cooling water terminal block seals must be regularly checked for leaks.

In order to protect the generator casing from corrosion and electrolyse, the terminal block assumes the function of a sacrificial anode.

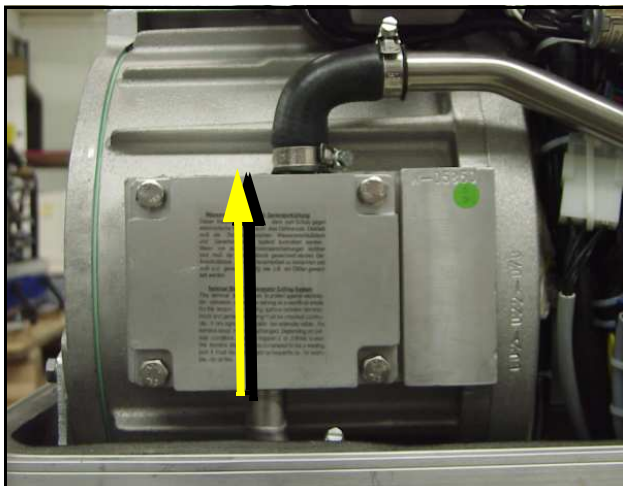


Fig. A.2.2-6: Cooling Water Connection Block

Internal Cooling Water Pump

The fresh water pump aids the circulation of the fresh water.

The fresh water enters and leaves the engine at the fresh water pump.

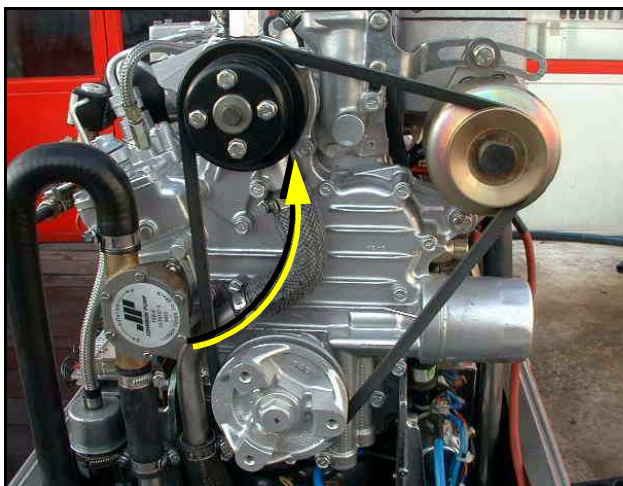


Fig. A.2.2-7: Internal Cooling Water Pump

Cooling water intake

A.) To the thermostat housing

B.) From the external expansion tank

The intake pipe from the external cooling water expansion tank is connected to the point shown with „B“.

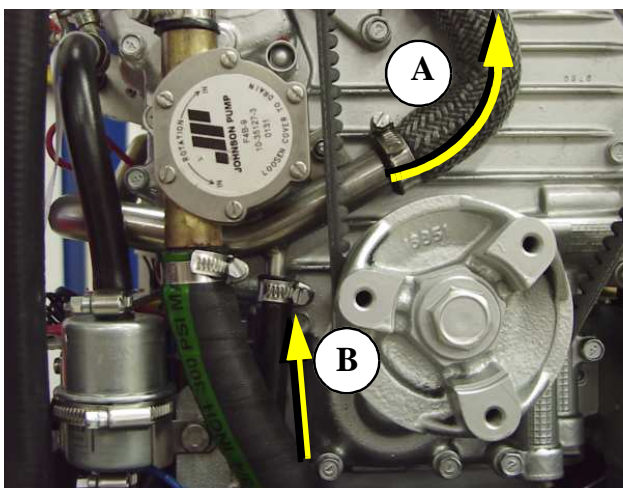


Fig. A.2.2-8: Cooling water intake



Ventilation screw cooling water pump

The ventilation screw above the cooling water pump casing may not be opened, whilst the generator is running. If this occurs by mistake, air will be drawn through the opening. Extensive ventilation of the whole system is then necessary.

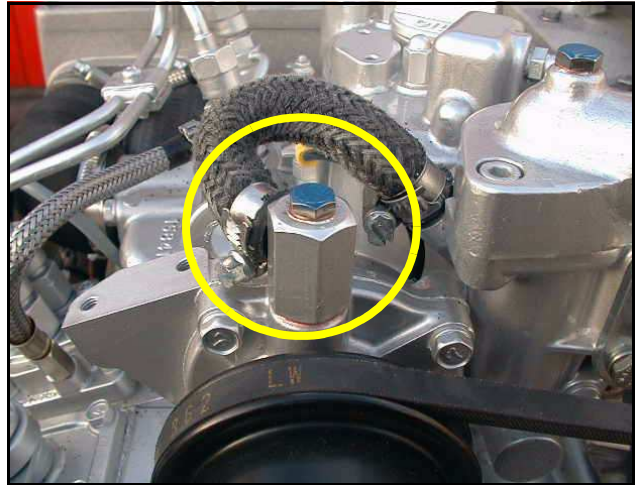


Fig. A.2.2-9: Ventilation Screw Cooling Water Pump

Ventilation screw thermostat housing

The ventilation screw on the thermostat housing should occasionally be opened for control purposes. Standing machinery should principally carry out ventilating.



Fig. A.2.2-10: Ventilation Screw Thermostat Housing

Water cooled exhaust manifold

The manifold is cooled by means of the internal cooling system (freshwater). The cooling water filler necks on the casing of the manifold may not be opened. These cooling water necks are only required to fill the motor with cooling water in cases of repair. The normal cooling water controls may only be carried out at the external expansion tank.

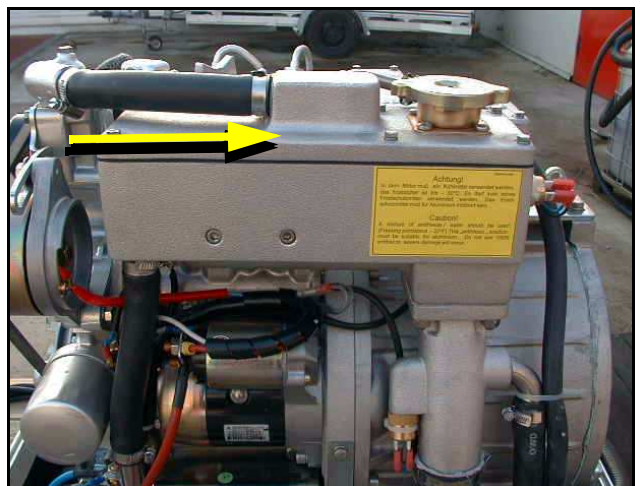


Fig. A.2.2-11: Water Cooled Exhaust Manifold

A.2.3 Components of Fuel System

External Electrical Fuel Pump

The Panda generator is always supplied with an external, electrical (12 V DC) fuel pump. The fuel pump must be always installed in the proximity of the tank. The electrical connections with the lead planned for it are before installed at the generator. Since the suction height and the supply pressure are limited, it can be sometimes possible that for reinforcement a second pump must be installed.



Fig. A.2.3-1: External Electrical Fuel Pump

Connecting Pieces for the Fuel Pipe

1. Fuel intake
2. Fuel backflow

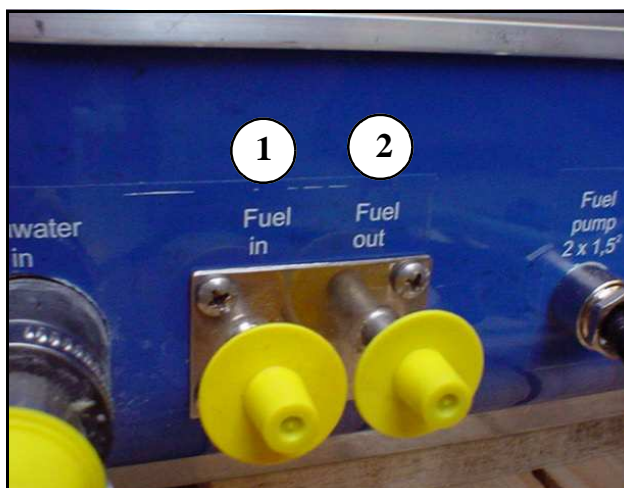


Fig. A.2.3-2: Connection Pieces for the Fuel Pipe

Fuel Filter

A consequential filtering of fuel is especially important for all marine systems.

A fine filter, which is firmly attached to the inside of the sound insulation capsule for the marine version, is supplied on delivery, and loose for other makes. In all cases a further pre-filter with water separator must be installed. See directions for fuel filter installation.

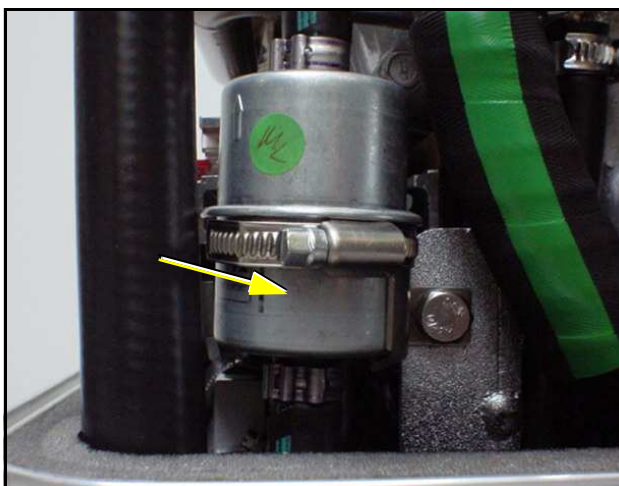


Fig. A.2.3-3: Fuel Filter



Fuel Solenoid Valve

The fuel solenoid valve opens automatically if "START" is pressed on the remote control panel". The solenoid closes, if the generator is switched to "OFF" position.

It takes a few seconds before the generator stops. If the generator does not start or does not run smoothly (i.e. stutters), or does not attain full speed, then the cause is fore-mostly the solenoid.

Fig. A.2.3-4: Kraftstoff-Magnetventil

Injection Nozzles

If the engine does not start after the ventilation, the fuel injection lines must be ventilated individually.

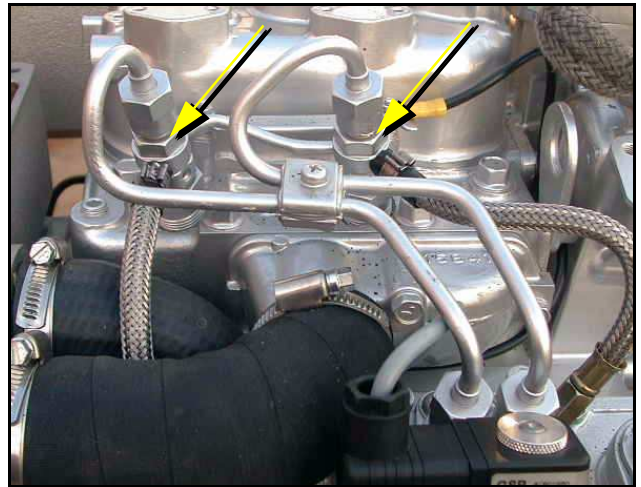


Fig. A.2.3-5: Injection nozzles

Glow plugs

The glow plugs serve the pre-chamber for the heating with cold start. The glow device must be operated, if the temperature of the generator is below 16 °C. This is practically the case with each start. The glow device and starter button are set so that neither may be used at the same time.

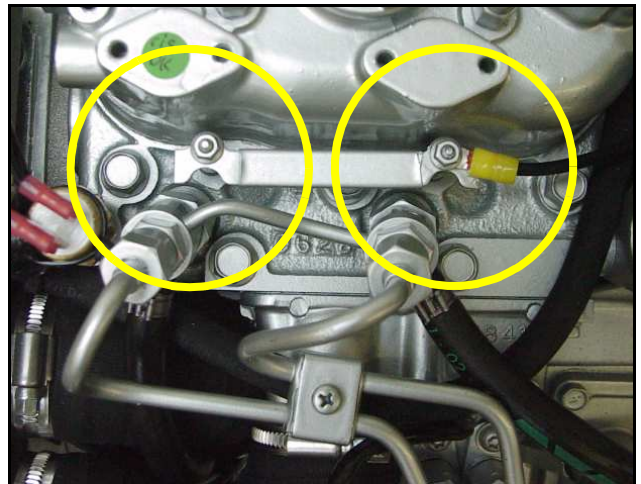


Fig. A.2.3-6: Glow Plugs

Stop solenoid for engine stop

Some models are additionally equipped with a stop solenoid. The generator is stopped by the co-operation of the stop solenoid immediately after switching off. The adjustment of the stop solenoid must always be checked, in order to be sure that the stop lever operates freely and is not placed under pre-stress.

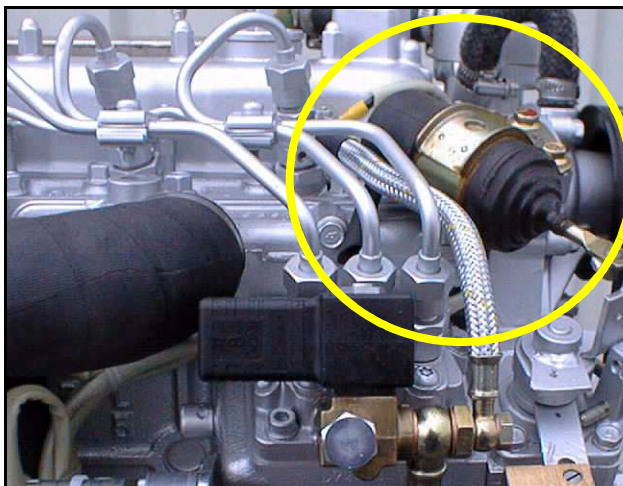


Fig. A.2.3-7: Stop Solenoid

A.2.4 Components of Combustion Air

Air Suction Openings at the Sound Insulated Capsule

The sound cover for the marine generator is normally provided at the lower surface with drillings, through which the combustion air can inflow.

It must be consistently paid attention that the generator is installed in such a way that no water can enter from below in close proximity to these air openings. (Minimum distance 150 mm).



Fig. A.2.4-1: Combustion air intake

Drillings for combustion air at the sound insulated capsule

Drillings at the lower surface of the sound cover serve the admission of fresh air for the entrance. It must be safe that no raw water or other water can come into this range of openings. If air is sucked in through these openings, water can penetrate also into the sound cover.

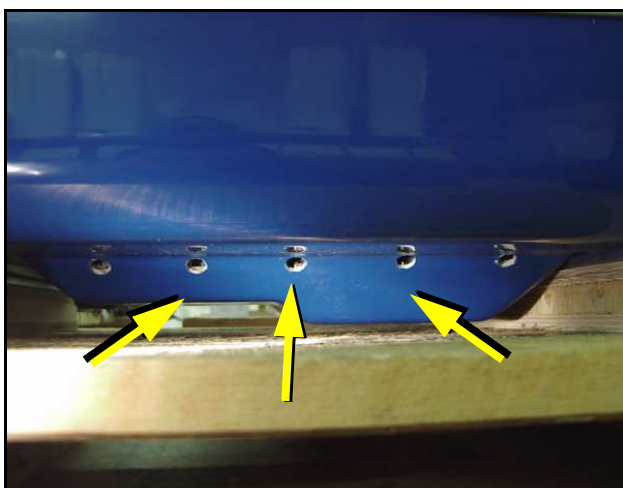


Fig. A.2.4-2: Drillings for Combustion Air

**Air suction housing with 12 V DC charge control**

The air intake casing in the diagram shows the 12-volt DC charge control. This control must be checked if the 12-volt DC voltage is no longer correct.

If the cover is removed, the inside of the air suction housing becomes visible. In these air suction housings is a filter element. The filter for the marine version is normally changed. It should be checked once in a while.

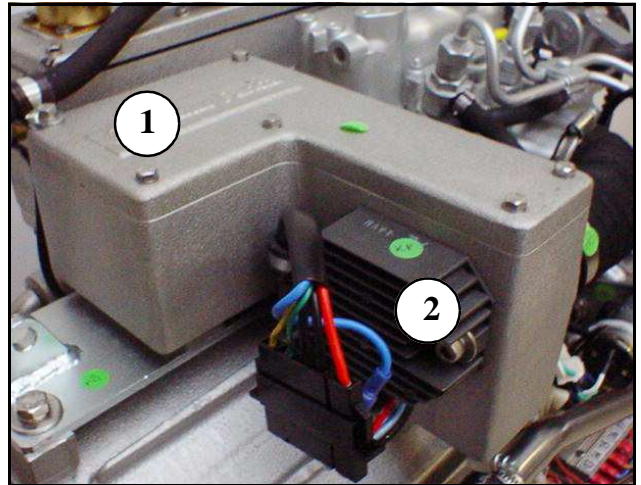


Fig. A.2.4-3: Air Suction Housing

Air Suction Housing with Air Filter Set

If the cover is removed, the inside of the air suction housing becomes visible. In these air suction housings is a filter element. At the marine version the filter is normally not changed. It should be checked once in a while.



Fig. A.2.4-4: Air Filter

Combustion chamber intake elbow

The figure shows the induction elbow at the combustion engine. At the front of this induction elbow you can see the hose connection between air suction housings and induction elbow. The air filter must be checked, if this hose contracts during operation.



Fig. A.2.4-5: Combustion Chamber Intake Elbow

Water-cooled Exhaust Elbow

At the back side of the engine is the water-cooled exhaust elbow.

Underneath the exhaust elbow, the raw water is injected into the exhaust

On the top side, the pipe union for the internal raw water circuit is to be seen and the filler neck for the cooling water.

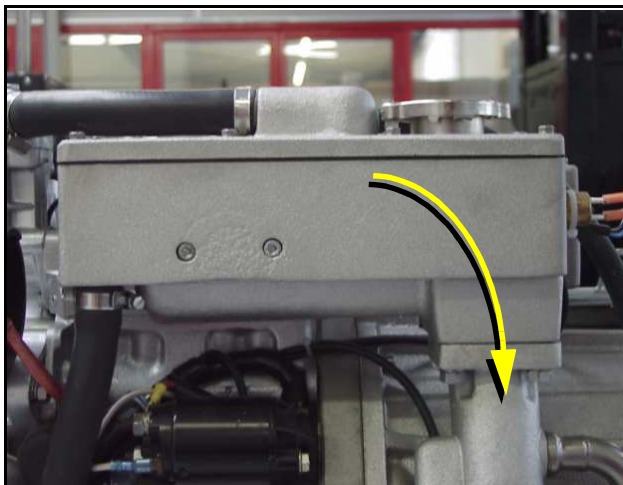


Fig. A.2.4-6: Exhaust Elbow

Exhaust connection at the exhaust elbow

Seawater from the external cooling circle is fed here.

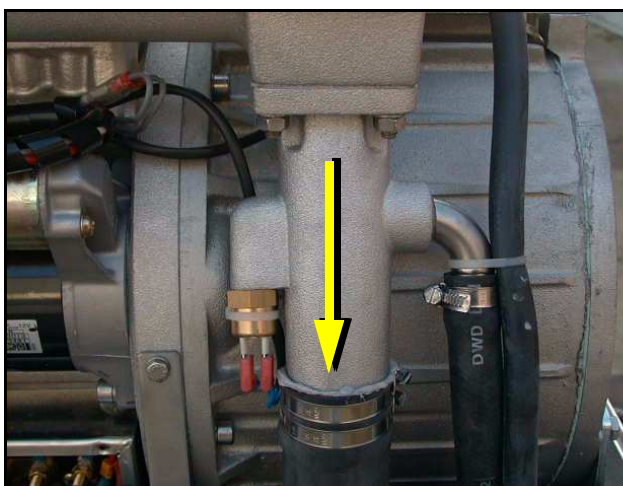


Fig. A.2.4-7: Exhaust Connection

Exhaust outlet

Connect the exhaust pipe with the water lock.

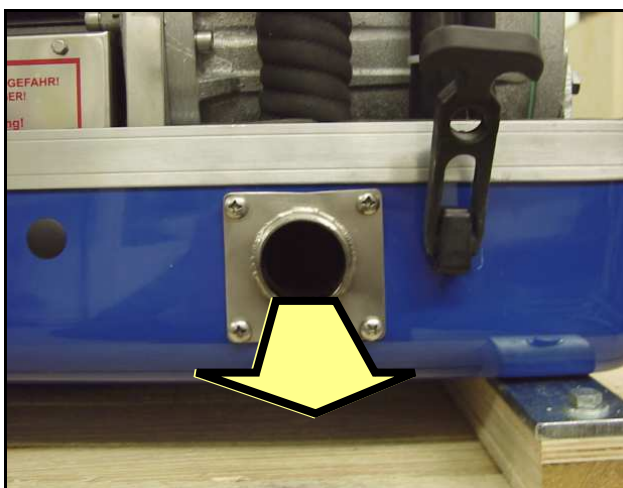


Fig. A.2.4-8: Exhaust Outlet

A.2.5 Components of the Electrical System

Connection starter battery

1. Cable for starter battery (plus)
2. Cable for starter battery (minus)

During connection to the starter battery, it must be always ensured that the contact is guaranteed.

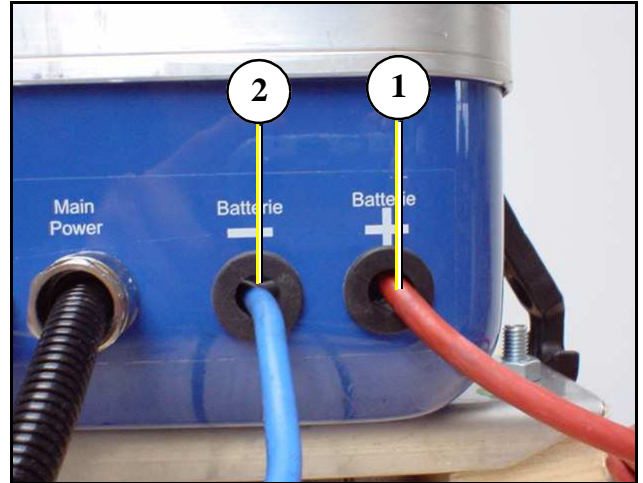


Fig. A.2.5-1: Cable for Starter Battery

Main Power

At the front of the sound insulation cover is also the outlet for the main power cable. Here are also the cables for external condensers connections, depending upon type of generator (see Connection Diagram for the AC-Control box!)

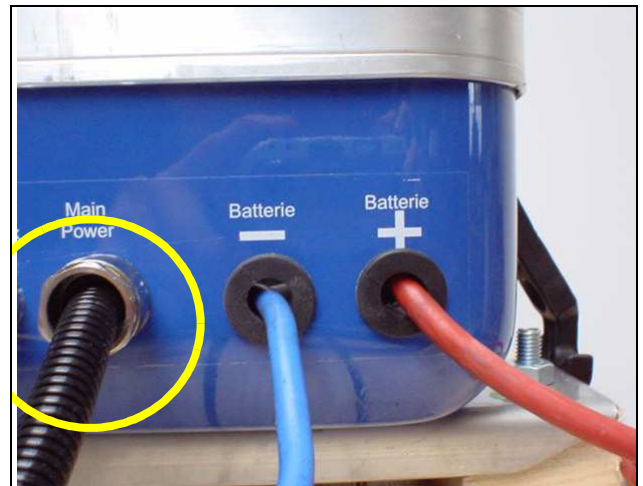


Fig. A.2.5-2: Main Power



Electrical connections for control

All remaining cables are located at the front end of the generator for electrical connections, depending upon type. The connections are taken from the AC-Control Box Plan. See here:

1. Fuel pump
2. Remote control panel
3. VCS
4. AC-Control-Box

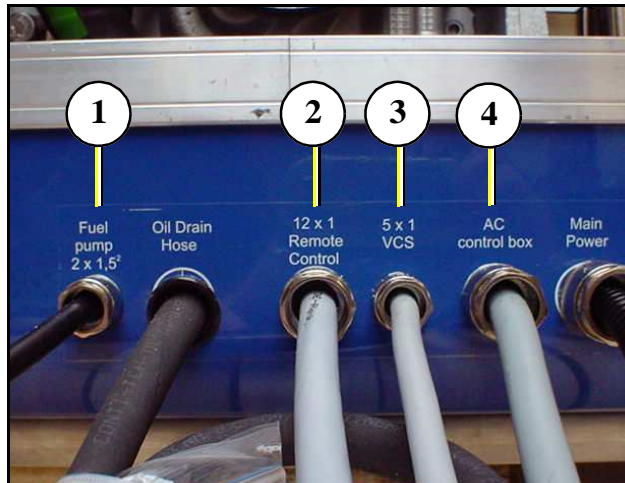


Fig. A.2.5-3: Electrical Connections

Starter motor

1. Starter motor and
2. Solenoid switch

The diesel engine is started electrically. The electrical starter with the solenoid switch is located at the rear of the engine.

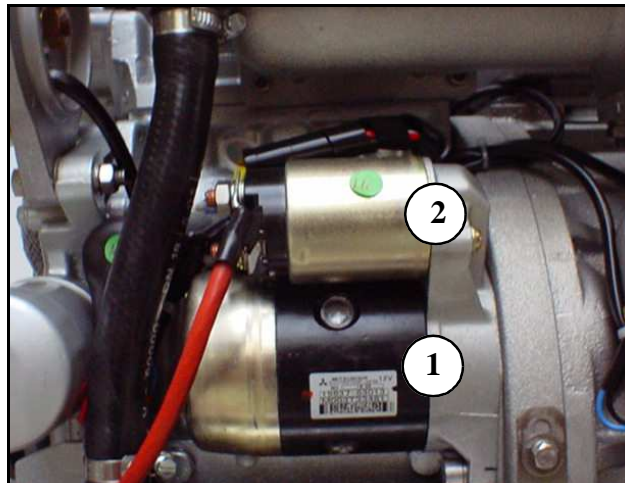


Fig. A.2.5-4: Starter Motor

Actuator for speed regulation

The generator voltage is determined by progressive speed control through "VCS" in conjunction with the speed actuator. Speed increases with increasing load.



Fig. A.2.5-5: Actuator



Blind Plug for Speed Sensor

All Panda Generators can be fitted with an external automatic starter. A separate speed sensor is necessary for this automatic starting system. The speed sensor is fitted as series in the case of some models. In the case of other models, the opening for the speed sensor is closed off by means of a sealing plug.

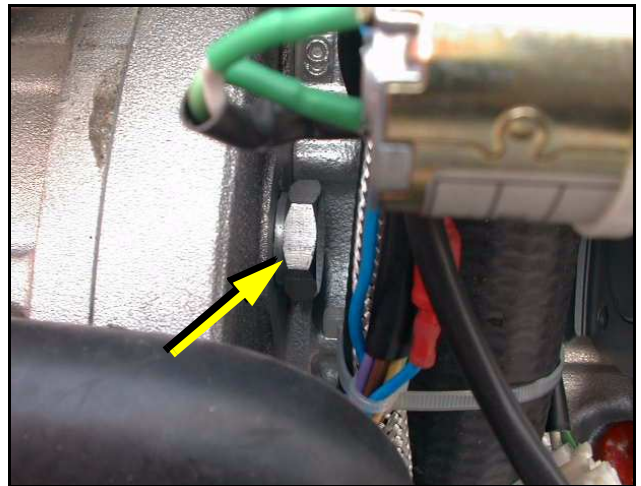


Fig. A.2.5-6: Blind Plug

DC Alternator

All Panda generators from Panda 6.000 are provided with its own charge system for the 12V DC mains. This DC-alternator is powered over a v-belt together with the internal cooling water pump.

The 12 V charge system may be used only for the generator-own starter battery.

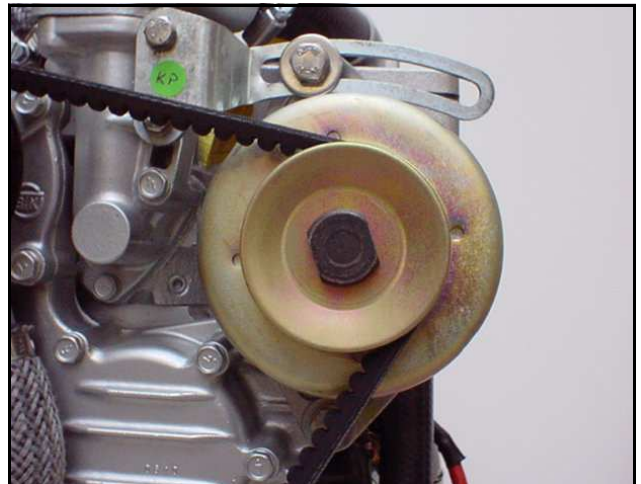


Fig. A.2.5-7: DC Alternator

Charge control for DC alternator

The voltage regulator for the 12 V DC-alternator is located at the back of the air suction housing. The housing is streamlined for cooling purposes. The voltage regulator may not be externally covered. The surface must be accessible for cooling.



Fig. A.2.5-8: Charge Control

Generator Power Terminal Box

At the rear of the generator are the generator terminal boxes. Located in these terminal boxes are the electrical connection points for the AC generator. Here is also the bridge for the protective grounding of the generator. The cover may only be removed, if it is guaranteed that the generator cannot be inadvertently started.

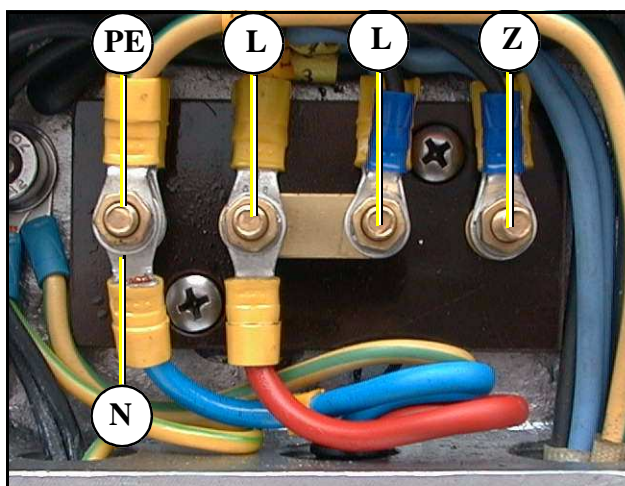


Fig. A.2.5-9: Generator Power Terminal Box

Terminal block for remote control cable with fuses and power relays

F1 fuse 15 A for DC wiring

F2 fuse 25 A for starter relay

Ks power relays for starter

K2 power relays for glow plugs

K3 power relays for fuel pump

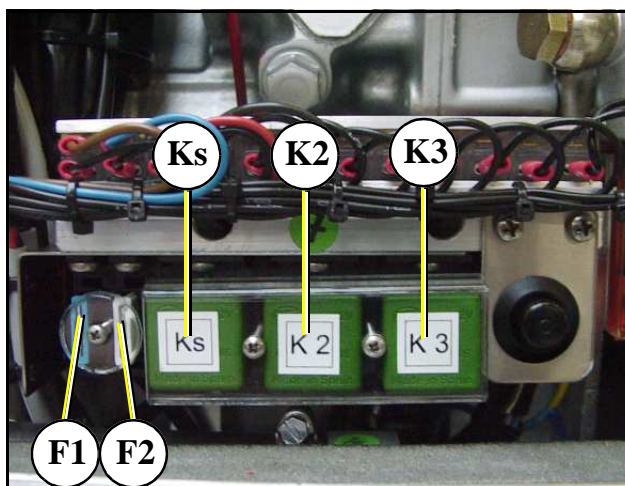


Fig. A.2.5-10: Terminal Block



A.2.6 The Operation Surveillance System

Thermo-switch at cylinder head

The thermo-switch at the cylinder head serves to monitor the generator temperature. All thermo-switches for the generators from Panda 6.000 upward are two-pole (earthed), so called "openers". This means the contacts are open in normal cases and close only when the limits have been exceeded.

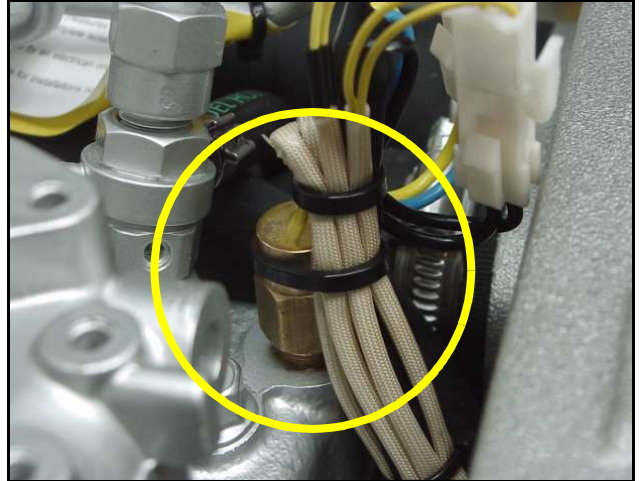


Fig. A.2.6-1: Thermo-switch at Cylinder Head

Thermo-switch at water-cooled exhaust elbow

This Thermo switch is located at the water-cooled exhaust elbow and serves to monitor the freshwater circulation system. It takes a measurement at the warmest spot, since the combustion gases are guided from the cylinder head to the exhaust elbow.

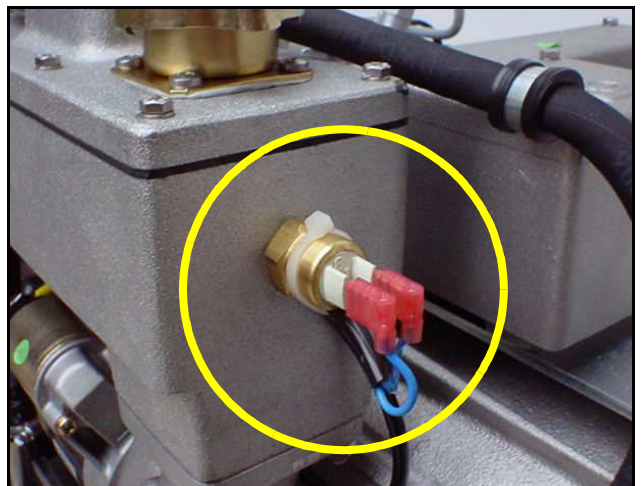


Fig. A.2.6-2: Thermo-switch at water-cooled exhaust elbow

Thermo-switch at exhaust connection

If the impeller pump stops and delivers no more seawater, the exhaust connection becomes extremely hot.

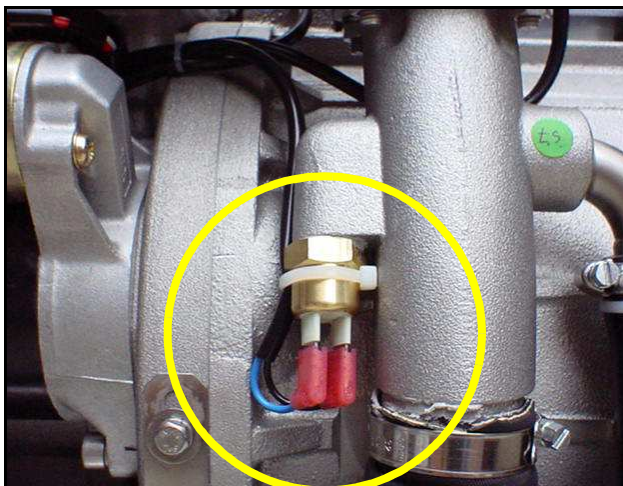


Fig. A.2.6-3: Thermo-switch at exhaust connection

Thermo-switch in the generator winding

1. Generator winding
2. Thermo-switch
3. Housing

Two thermo-switches inside the windings to protect the generator winding, which for safety reasons are installed independently in parallel.

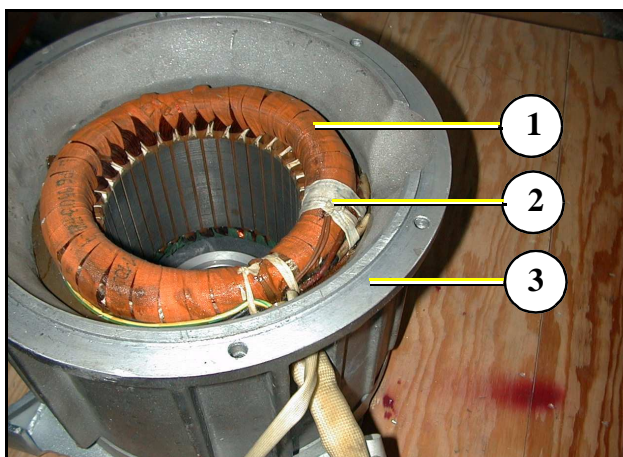


Fig. A.2.6-4: Thermo-switch in the generator winding

Thermo-switch at the front plate

The generator bearing is equipped with an oil thermo-switch, which switches the engine off, if the oil temperature becomes too high.

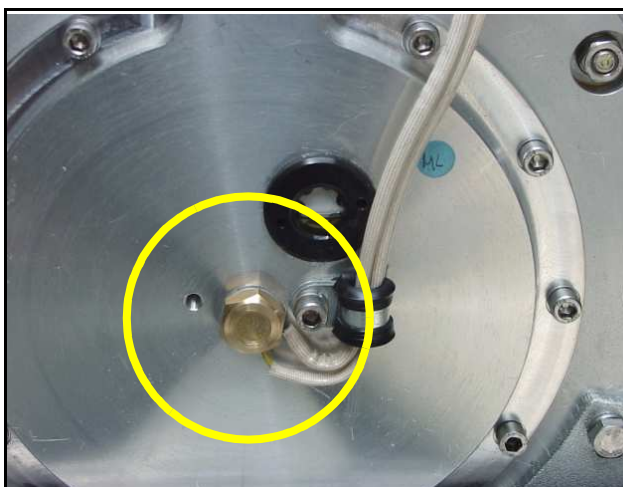


Fig. A.2.6-5: Oil thermo-switch



Oil pressure switch

In order to be able to monitor the lubricating oil system, an oil pressure switch is built into the system. The oil pressure switch is at the rear of the engine (In front of the electrical starter).

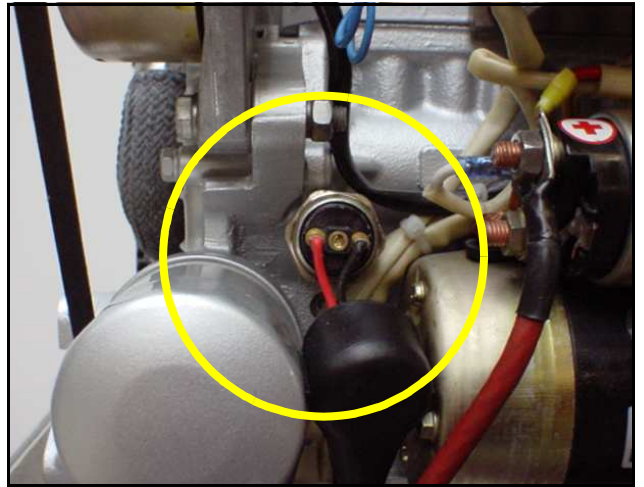


Fig. A.2.6-6: Oil Pressure Switch

Failure bypass switch

The failure bypass switch offers the possibility of starting the generator if the electrical control switches off due to overheating of the cooling system.



Fig. A.2.6-7: Failure Bypass switch

A.2.7 Components of the Oil Circuit

Oil filter neck with cap

Normally the filler neck for the engine oil is on the top side of the valve cover. A second filler neck is additionally attached at the operating side for numerous generator types. Please ensure the filler necks are always well secured after filling with engine oil.

Consider also the references to the engine oil specification.



Fig. A.2.7-1: Oil filter neck with cap

Oil dipstick

At the dipstick the permissible level is indicated by the markings "maximum" and "minimum". The engine oil should be never filled beyond the maximum.

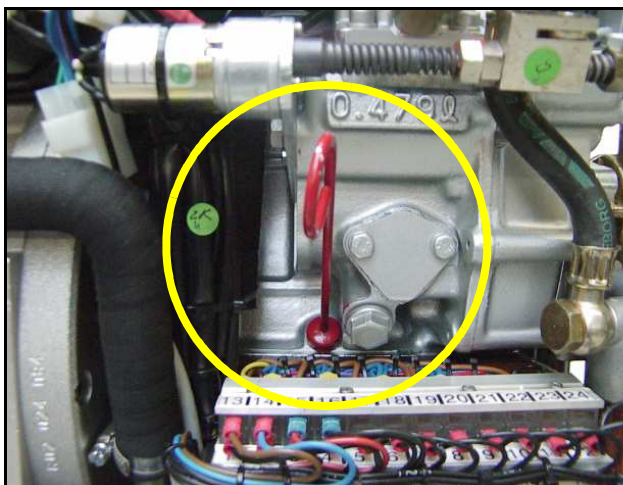


Fig. A.2.7-2: Oil dipstick

Oil filter

The oil filter should also be replaced, when an oil change is carried out.

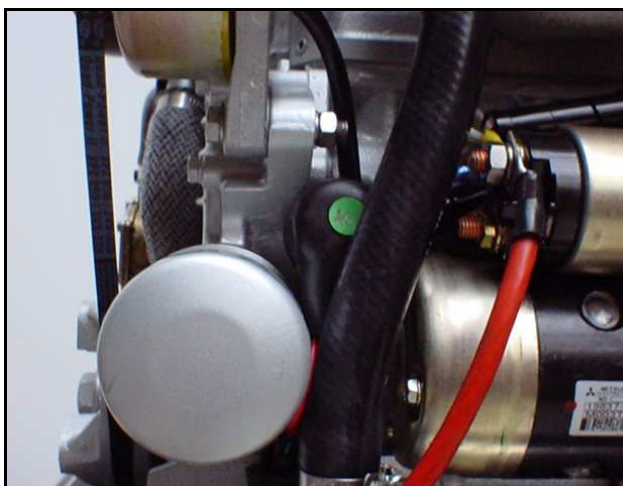


Fig. A.2.7-3: Oil filter



Oil Drain Hose

The Panda generator is equipped so that the engine oil can be drained by means of a hose. The generator should be installed in such a way, that a collecting basin can be placed deeply enough. If this is not possible, an electrical oil drain pump must be installed.

Note: Lubricating oil should be drained warm!



Fig. A.2.7-4: Oil Drain Hose

A.2.8 Other Components

AC Control Box

An AC-Control box is necessary for running the generator. This AC-Control Box contains electronics for the VCS control as well as different monitoring elements and condensers necessary for the excitation of the generator.



Fig. A.2.8-1: AC Control Box

AC Control Box - opened

The AC-Control Box has an operating voltage of 120/230 and/or 230/400 Volts. It must be guaranteed that the generator cannot be inadvertently started, if the control box is opened. For this reason the negative pole of the starter battery is to be de-clamped when working on the electrical system.

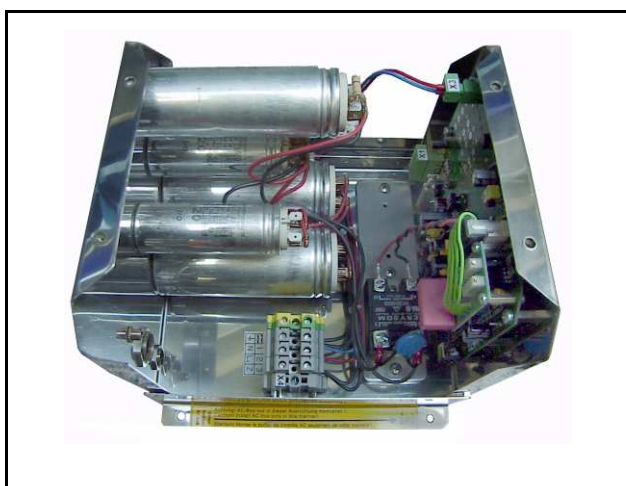


Fig. A.2.8-2: Opened AC Control Box

Voltage Control (VCS)

The diagram shows the control circuit board for the VCS. The control signals are passed to the actuator for speed regulation by means of this circuit control board. The VCS board allows for voltage adjustment.

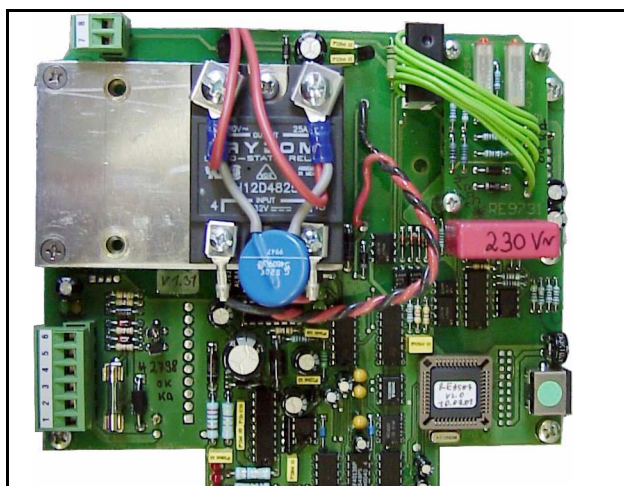


Fig. A.2.8-3: VCS Voltage Control

A.3 Remote Control Panel - see separate Control Panel Manual



A.4 Starting the Generator - see separate Control Panel Manual

A.5 Stopping the Generator - see separate Control Panel Manual



Fischer Panda Datasheet

B. Impellerfilter

 Fischer Panda	Art Nr..	31.06.03.003P
 Fischer Panda	Bez.	Impellerfilter for Marine Panda P6, P8, P9, P10, P12 and P14 since March 2007

	Dokument	Hardware	Software
Aktuell:	R2 04.05.07	12.04.07	-----
Replace:	V1 12.04.07		-----

Tested for a flow rate up to 22l/min





Fischer Panda Datasheet

B.1 General

Starting with March 2007 the Fischer Panda generators type 6, 8, 9, 10, 12 and 14 has got an extra impellerfilter.

B.2 How it works

When the impeller breaks, pieces of rubber will penetrate into the cooling system. This pieces can stock in the pipes with lower diameter (such as the heat exchanger) and reduce the cooling water flow. Expensive reconstruction and cleaning of the raw water circle is necessary.

The Fischer Panda impellerfilter hold this pieces of rubber back, so they can be easily removed. The flow through diameter of the cooling water is expanded in the impellerfilter, in emergency situation (like heavy sea) it is possible to change only the impeller itself and clean the impellerfilter afterwards at a better time. an emergency stop of the generator in fact of a to low cooling water flow and an overheating will be nearly banned. The impellerfilter must be cleaned after each impeller break. If you are not sure that every piece of rubber is removed at the cleaning we recommend to change the impellerfilter.

B.3 Cleaning and replacement of the impellerfilter



The battery must always be disconnected, if work on the generator or electrical system is to be carried out, so that the generator cannot be unintentionally started.

Note the safety instruction in the generator manual.

Seawater valve must be shut.

Open the generator sound cover like it is explained in the generator manual



**Attention!!! Parts of the generator and the cooling water may be hot after operation
!!!DANGER!!!**

Fischer Panda Datasheet

Impellerfilter

The impellerfilter is mounted at the right front motorbase.

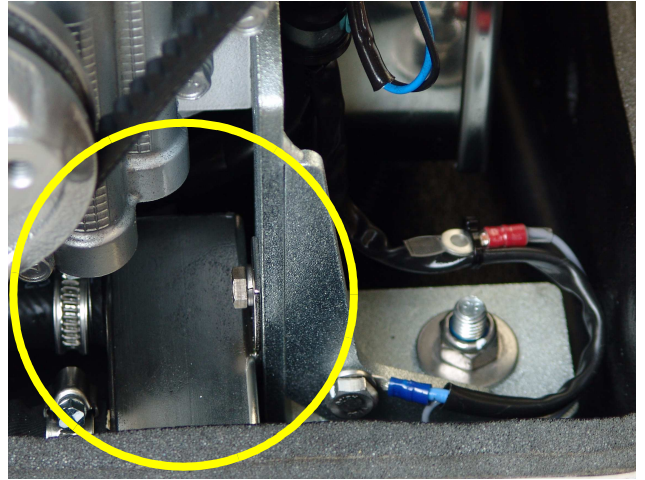


Fig. B.3-1: Impellerfilter

Loose holding screw

Loose the holding screw two turns

Screw M6 (*SW 10)

*SW 10 = wrench size 10mm



Fig. B.3-2: Holding screw

First hose clamp

Loose the front hose clamp.

Use a screwdriver, or better a wrench SW 7mm

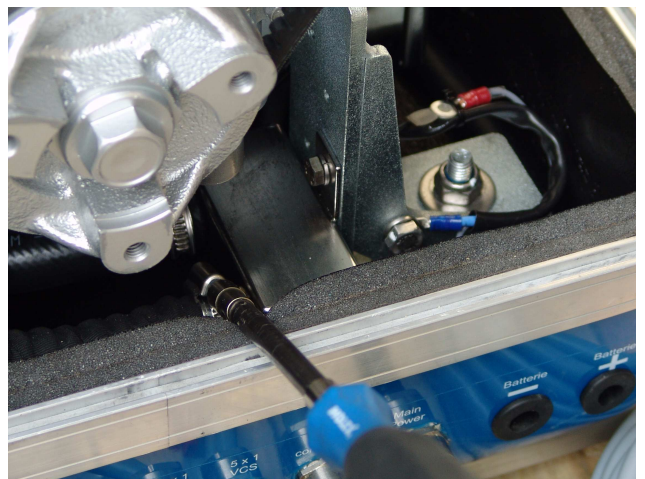
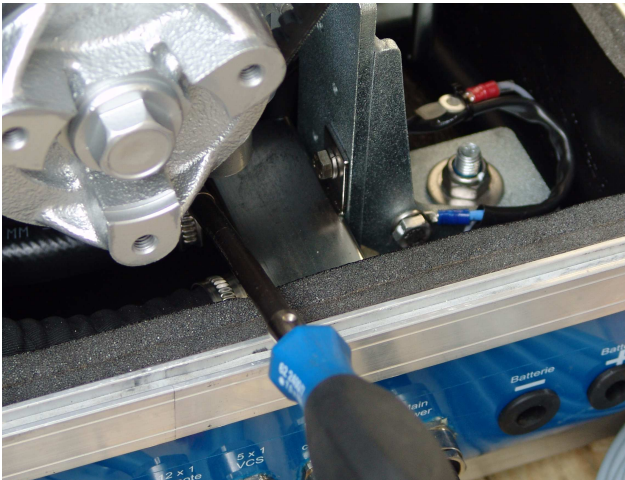


Fig. B.3-3: First hose clamp



Fischer Panda Datasheet



Second hose clamp

Loose the second hose clamp

Use a screw driver, or better a wrench SW 7mm

Fig. B.3-4: Second hose clamp



Remove the cooling water hose

remove the first cooling water hose

Some raw water may flow out of the hose or the impellerfilter

The hose can be closed with the cap you get together with the impellerfilter spare part pack.

Fig. B.3-5: cooling hose



Remove the holding screw

Remove the impellerfilter holding screw

Fig. B.3-6: Holding screw

Fischer Panda Datasheet

Pull the Impellerfilter out of the capsule

The second cooling water hose can be removed within these procedure.

Some raw water may flow out of the hose or the impellerfilter

The hose can be closed with the cap you get together with the impellerfilter spare part pack.

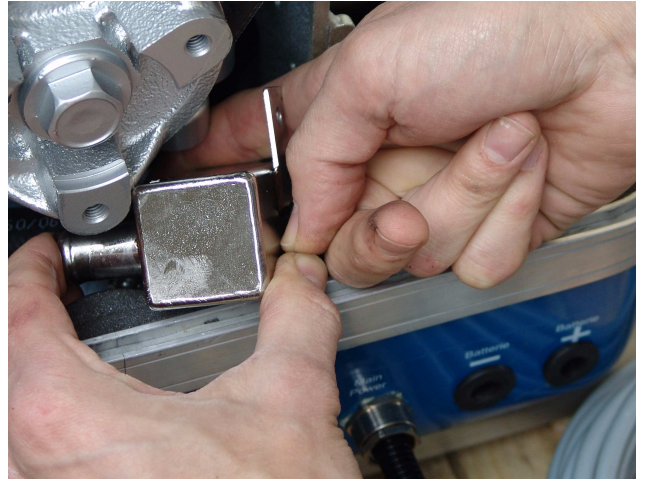


Fig. B.3-7: Remove Impellerfilter

Clening of the impellerfilter with water

The best cleanind will be to flush the filter against the flow direction



Fig. B.3-8: Cleaning with water

Option: Cleaning of the impellerfilter with air pressure

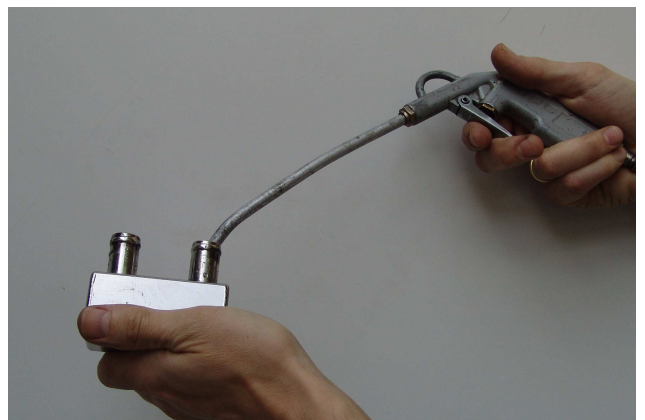


Fig. B.3-9: Cleaning with air

Replace the cleaned/new filter in reverse procedure..

Fig. B.3-10: Replace



B.4 Spare part kit

Fischer Panda Art Nr. 21.03.02.005S

Impellerfilter Art. No. 31.06.03.003P
Screw M6x10 Art. No. G3A20093306010
with spring ring Art.No. G3A20012706
cap 19mm (2x) Art.No. PMGPN610U19





Fischer Panda Datasheet

B.5 Dimensions

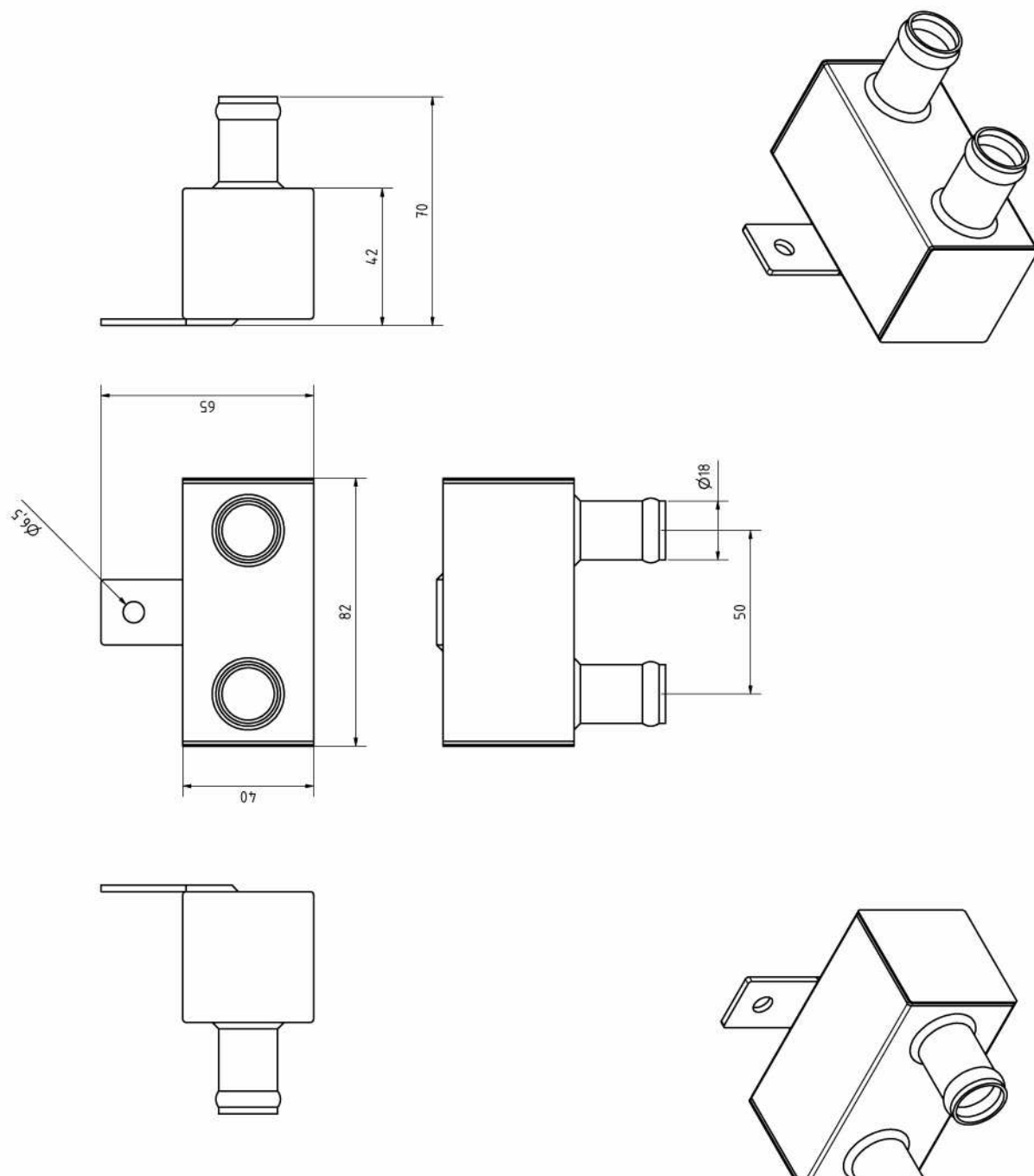


Fig. B.5-1: Dimensions

