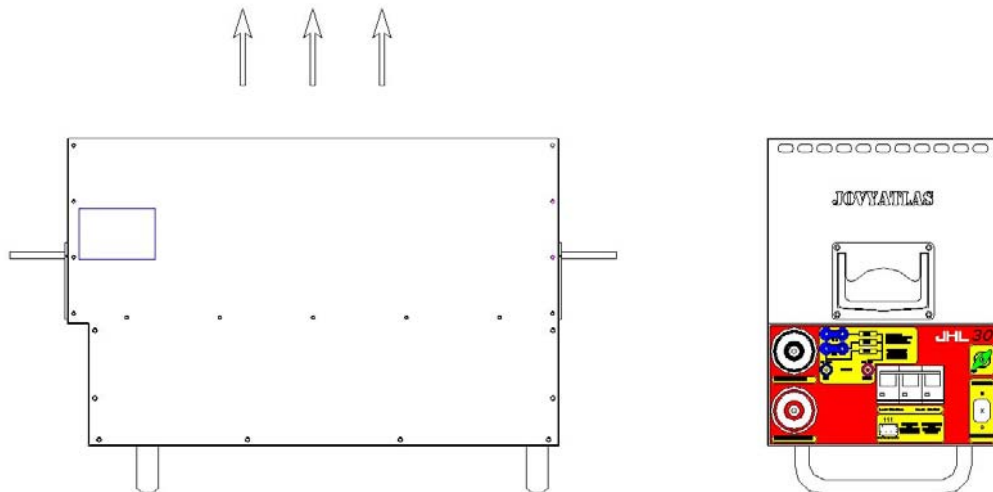


# Operating Manual

## Wärtsilä JOVYLOAD HANDY 30-690V



# BAX 5218\_en



Wärtsilä JOVYATLAS EUROATLAS GmbH  
Fennenweg 4, 26844 Jemgum, Germany  
[www.jovyatlas.de](http://www.jovyatlas.de)

Tel. +49 (0)4958 9394 - 0  
Fax. +49 (0)4958 9394 - 10

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## **Notes on these operating instructions**

### **Instruction Obligation**

These operating instructions must be read carefully by all persons working with or on the load resistor prior to installation and initial start-up.

These operating instructions are a composite part of the load resistor.

The operator of this device is obliged to communicate these instructions to all personnel transporting or starting the load resistor or performing maintenance or any other work on the unit.

### **Validity**

These operating instructions comply with the current technical specifications of the load resistor at the time of publication. The contents do not constitute a subject of contract, but serve information purposes only.

Wärtsilä JOVYATLAS EUROATLAS GmbH reserves the right to make modifications with regard to contents and technical data in these operating instructions without prior notification. Wärtsilä JOVYATLAS EUROATLAS GmbH cannot be held liable for any inaccuracies or inapplicable information in these operation instructions, as no obligation to continuously update the data and maintain their validity has been entered into.

### **Warranty**

Our goods and services are subject to the general conditions of supply for products of the electrical industry and our general sales conditions. We reserve the right to alter any specifications given in these operating instructions, especially with regard to technical data, operation, weights and dimensions. Claims in connection with supplied goods must be submitted within one week of receipt along with the packing slip. Subsequent claims cannot be considered.

Wärtsilä JOVYATLAS EUROATLAS GmbH will rescind all obligations such as warranty agreements, service contracts etc. entered into by Wärtsilä JOVYATLAS EUROATLAS GmbH or its representatives without notice in the event of maintenance and repairs being carried out with anything other than original JOVYATLAS parts or spare parts purchased by Wärtsilä JOVYATLAS EUROATLAS GmbH.

### **Structure**

These operating instructions for the load resistor are structured so that all work necessary for starting up, maintenance and repair of the unit can be performed by qualified personnel.

If any work possibly involves danger to personnel and the unit, it is highlighted accordingly by pictograms explained in Chapter 1, Safety Instructions.

### Hotline

Do you have any suggestions for improvement for these operating instructions?

Do you have any questions on any of the subjects dealt with?

Our service department is at your disposal for any questions on the Hotline number given below:



**Wärtsilä JOVYATLAS EUROATLAS GmbH**

**Fennenweg 4**

**26844 Jemgum / GERMANY**

**☎ ++49 (0)4958-9394-30**

**FAX ++49 (0)4958- 9394-10**

<http://www.jovyatlas.com>

E-Mail: [service.jovyatlas@wartsila.com](mailto:service.jovyatlas@wartsila.com)

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## 1 Safety Regulations

### 1.1 Important Instructions and Explanations

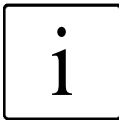
The instructions for operation and maintenance as well as the following safety regulations must be complied with to safeguard the safety of personnel as well as the function of the unit. All personnel installing/dismantling, starting up, and servicing the unit must be familiar with and observe these safety regulations. Only qualified personnel may perform the described work with suitable and intact tools, equipment, test equipment and materials. Important instructions are highlighted by "CAUTION:", "ATTENTION:", "NOTE:" and indented text.

**CAUTION:**

This symbol identifies all working and operational procedures requiring absolute compliance to avoid any danger to personnel.

**ATTENTION:**

This symbol identifies all working and operational procedures requiring absolute compliance to prevent any damage, irreparable or otherwise, to the discharging station or its components.

**NOTE:**

This symbol identifies technical requirements and additional information requiring the operator's attention.

### 1.2 Safety Notes / Precautions

Operation and maintenance procedures must be performed only by qualified personnel. The following load resistor operation and maintenance requirements must be observed at all times to assure maximum safety and performance.

Operate, service, and maintain the units as described in this manual.

Thoroughly understand unit and system operation and functions.

Understand all controls, indicators, and operating limits.

Before operating the load resistor, learn the significance of possible malfunctions and be prepared to take appropriate action if one occurs.

Understand and observe the following safety notices and precautions.

### 1.3 Electrical Safety Precautions

The load resistor must be considered energized unless all sources of input power have been removed and circuits are checked for voltage by an independent voltmeter.

Capacitors can retain voltage for long periods of time. All capacitors should be discharged with an adequate device by qualified personnel before maintenance, troubleshooting or repair is performed.

When switches have been opened or fuses removed to de-energize a circuit for maintenance, the switches and fuses should be tagged out to prevent accidental closure or replacement.

To the fullest extent possible, all load resistor maintenance should be conducted with external power removed.

When it is absolutely necessary to work on energized equipment, the following precautions must be observed:

- Never ground test equipment to live buses. Insulate all surrounding circuitry not under inspection with sheet rubber or dry heavy weight paper.
- Stand only on rubber matting.
- Use one hand only and wear insulating rubber gloves.
- Wear safety glasses.
- Never work alone.
- Personnel qualified in CPR (cardiopulmonary resuscitation) should be readily available.

For personnel safety and equipment protection keep all access doors and panels securely fastened or locked at all times.

For personnel safety and equipment protection never remove a printed circuit board or fuse from an energized circuit.

Never override or bypass an interlock or safety device during operation.



**ATTENTION:**

The discharging station must be considered energized unless input isolation and output isolation switch is confirmed open.

### 1.4 Accident Prevention Regulations

Compliance with the accident prevention regulations valid in the country of application and the general safety regulations in accordance with IEC 364 is mandatory.

The following must be observed prior to any work on the Load resistor:

disconnect the power supply,  
secure against reactivation,  
verify that the unit is disconnected from the power supply,  
earth and short the circuit,  
cover or isolate any neighbouring power-supplied units.

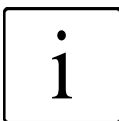
## 1.5 Danger Entailed During Maintenance and Repair Work

**CAUTION:**

The voltage applied to the discharging station can be fatal. Prior to start-up or maintenance work always disconnect the discharging station from the power supply and ensure that the unit cannot be switched on. Freestanding and movable components can enter the work area and cause injuries.

**ATTENTION:**

Considerable damage can be caused to equipment if unsuitable spare parts are used during repair work, if work is carried out by unauthorised personnel or the safety regulations are not observed.

**NOTE:**

Only trained and qualified personnel may work on or around the discharging station while strictly observing the safety regulations.

## 1.6 Fire Hazard

### Structure of fireproof enclosures

Appropriate measures must be taken if electrical devices are set up in rooms with flammable floors (e.g. textile, wood, PVC) or in computer centres. For example, a base may be provided made of sheet metal or another non-flammable material. The installer is responsible for proper assembly.

**CAUTION:**

If smoke is detected or a fire breaks out, immediately disconnect the discharging station from the power supply and inform the maintenance personnel.

## 1.7 Qualified Personnel

The discharging station may only be transported, installed, connected, started, serviced and operated by qualified personnel who are familiar with the pertinent safety and installation regulations. All work performed must be inspected by responsible experts.

The qualified personnel must be authorised to perform the work by the competent safety officer.

Qualified personnel is defined as personnel:

- having completed training and gained experience in the respective field,
- familiar with the pertinent standards, rules and regulations and accident prevention regulations,
- having received instruction on the mode of operation and operating conditions of the discharging station.
- capable of recognising and preventing dangers.
- Regulations and definitions for qualified personnel are contained in DIN 57105/VDE 0105, Part 1.



## 1.8 Safety Awareness

The personnel defined in the section above are responsible for safety and must ensure that only suitably qualified persons are permitted access to the safety area or to be in the proximity of the discharging station. The following points must be observed:

- **All** working procedures are prohibited which are detrimental to the safety and operation of the discharging station in **any way**.
- The discharging station may only be operated in perfect working condition.
- Never remove or render inoperable any safety devices.

All necessary operational measures must be initiated prior to deactivation of any safety devices for maintenance, servicing or any other work on the unit. Safety awareness also entails informing colleagues of any unsuitable behaviour and reporting any detected faults to the respective authority or person.

## 1.9 Application

The load resistor may only be used for power supply with the maximum permissible connected loads in accordance with these operating instructions in the described mode of installation and operating mode. The device may only be used for this intended purpose. It is not permitted to make any unauthorised modifications to the load resistor or to use any spare parts and replacement parts not approved by Wärtsilä JOVYATLAS EUROATLAS GmbH or to use the device for any other purpose.

The person responsible for the installation must ensure that:

- safety instructions and operating instructions are readily available and are complied with,
- operating conditions and technical data are observed,
- safety devices are employed,
- the prescribed maintenance work is performed,
- maintenance personnel is informed or that the device is shut down immediately in the event of abnormal voltages or noises, high temperatures, vibration or any similar effects in order to detect the cause.

These operating instructions contain all information required by qualified personnel for operation of the load resistor. Additional information for unqualified personnel and for the use of the load resistor in non-industrial applications is not included in these operating instructions.

The warranty obligations of the manufacturer are only applicable when these operating instructions are complied with.

## 1.10 Liability

No liability is accepted if the discharging station is used for applications not intended by the manufacturer. Any necessary measures for prevention of injury or damage to equipment is the responsibility of the operator or user. In the event of any claims in connection with the discharging station please contact us quoting:

- the type designation,
- works number,
- reason for claim,
- period of use,
- ambient conditions,
- operating mode.

### 1.11 Regulations

The load resistor devices comply with current DIN and VDE regulations. VBG4 is met on the basis of compliance with the regulation VDE 0106, Part 100.

The CE sign on the device confirms the conformance to the basic EC regulations for -72/23 EEC - Low voltage and for -89/336 EEC - Electromagnetic compatibility, if the installation and commissioning instructions described in the operating manual are observed!

## 2 Technical data

<b>Designation</b>	: Load resistor
<b>Type</b>	: Wärtsilä JOVYLOAD HANDY30-690V

### Auxilliary voltge for fan and steering

Voltage	: 1~230V ±10%
Frequency	: 50/60Hz ±5%
Nominal input current	: 0,26A
Input plug	: Plug acc. IEC 60320-C14

### Resistor unit

Nominal power	: 30kW
Nominal voltage	: 1~690V AC/DC ± 5%
Max. nominal current	: 1~43,5A
Temperature rise	: approx. 250°C
Resistor material	: NiCr 8020
Air outlet temperature	: max. 300°C
Cooling	: vertical forced ventilation

### General

Operation mode	: Continous operation
Classifikation	: DIN, VDE, IEC
Radio interference level	: acc. EN 50091 : 1994 class A
Noise level	: < 50 dB(A)
Protection degree, Resistor	: IP 20
Protection class	: 1 acc VDE 0106/ Part 1
Ambient temperature	: -10°C...+45°C (without condensation)
Humidity	: max. 95% (without condensation)
Altitude	: max. 1000m above sealevel
Power reduction at altitude >1000m	: 0,03% / Meter

### Housing

Width x Depth x Height	: W274 x D581 x H420 mm
Material	: Stainless steel, polished
Varnishing	: none
Equipment	: incl. transport handles

<b>Weight</b>	:20kg
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### Including:

- Load switch as automatic circuit breaker with under voltage trigger
- Temperature monitoring
- Safety switch off at failure (Over temperature, no aux. voltage)
- Safety plugs for Load connection +/-
- Safety measuring plugs (max. 20A) for +/-
- 5m cable set with safety plugs at one cable end (other cable end without cable lugs/ plugs etc.)

### 3 System description

This manual describes how to install and operate the load resistor, as well as troubleshooting.

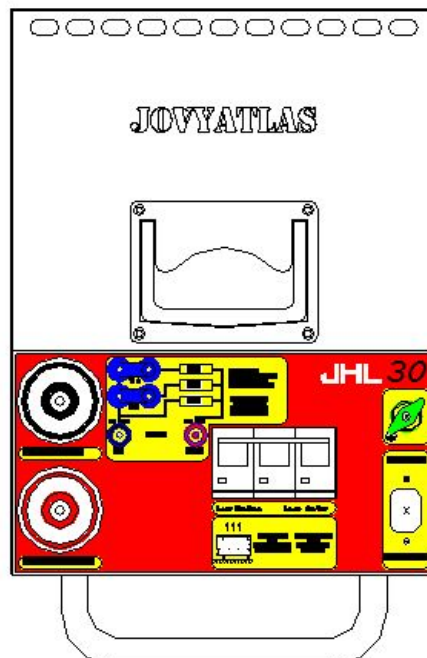
The resistor unit with 15KW total power output is built into an unpainted stainless steel housing.

The exhaust air temperatures under full load can reach up to 300°C. The unit must therefore be set up in such a way that items sensitive to heat or flammable items cannot be affected by the heated exhaust air.

Inside the resistor unit electric energy is transformed into heat. On account of their low mass, the resistor elements can only absorb part of the heat themselves and the majority is released into the ambient air.

The ventilation is designed according to the requirements of the resistor subassemblies. A thermal contact and under voltage release are provided as safety mechanisms. In the absence of an auxiliary supply or if the thermal contact is tripped, the resistance load is switched off.

The maximum air intake temperature must not exceed 45°C.



Front view „Wärtsilä JOVYLOAD HANDY 30" (Connection/ Operation)

## 4 Setting up and installation

To ventilate the resistor unit, vents are provided at the top and bottom for air intake and outlet.  
It must be ensured before initial start-up that these vents are not covered.



### **CAUTION:**

Air exiting the resistor installation during operation is very hot.

### 4.1 Visual inspection

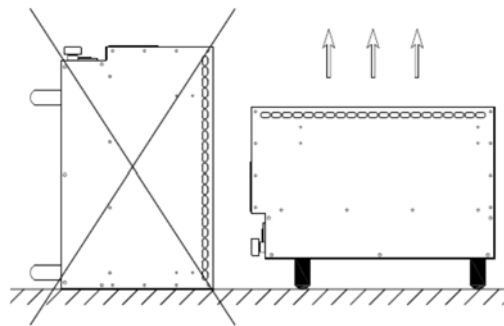
A thorough visual inspection must be carried out before the initial start-up. All parts should be checked for damage or other abnormal changes. In the event of complaints, notify the manufacturer immediately.

### 4.2 Requirements at the point of installation



### **ATTENTION:**

Only operate the load resistor in a horizontal position on a level surface.



In addition, the installation site:

- must be free from conductive dust,
- there must be no escaping caustic or acid fumes,
- air supplied to the units must not exceed a temperature of 45°C and
- air vents must not be covered as a result of construction measures or any other conditions.
- Surfaces blasted from the air outlet side must be made from non-flammable materials.

### 4.3 Installation and cable connections



#### CAUTION:

First determine that the cable that is to be connected is de-energized and ensure external switches cannot be switched on again!

When dimensioning the necessary cable cross sections, precise on-site dimensioning is essential. For larger distances cables must be dimensioned with regard for the permitted voltage drop, the ambient temperature and cable bundling in accordance with VDE [Association of German Electrotechnical Engineers] regulations.

Local regulations with regard to protective earthing and connection cross sections for cables must be observed.

The optionally available load connection cable is recommended.

The 1~230V 50Hz auxiliary voltage supply is connected to the socket for non-heating apparatus.

The test sample is connected to (X2/ +) and 0V (X1/ -) sockets.

### 4.4 Plug locking system

The MC locking system works in the same way as the “push-pull coupling” of an automatically locking (during plug insertion) quick-connect coupling and is released by means of an axially sliding coupling ring: to release, push first, then pull.

#### Locking the plug connector

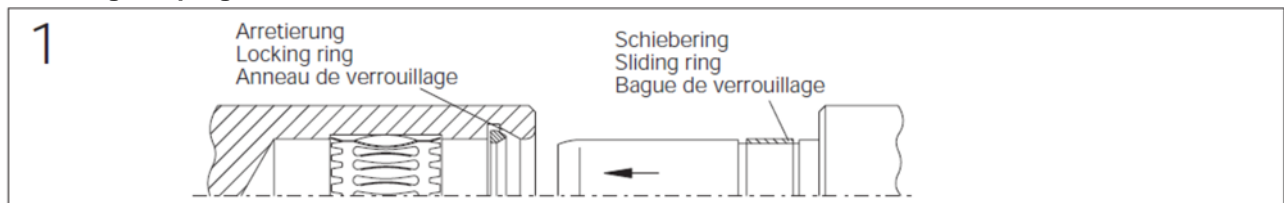


Figure 1. Push the plug into the socket...

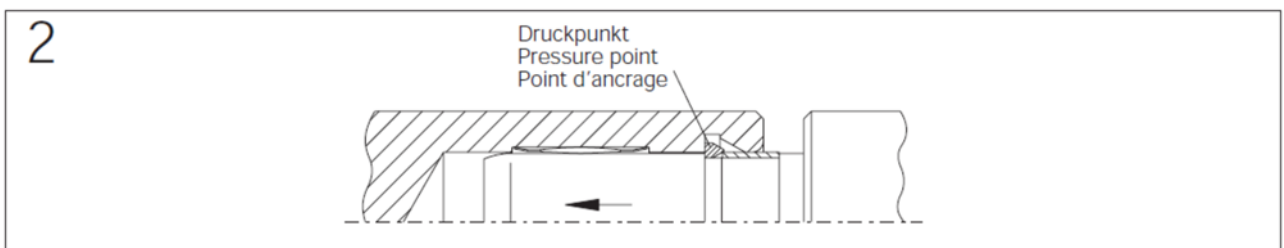


Figure 2. ...and lock.

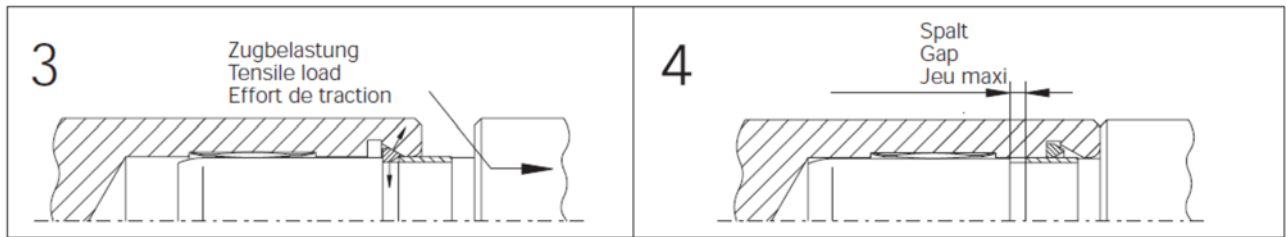


Figure 3. To check:



***Apply tensile load to the connection!***

**Releasing the plug connector**

Figure 4. To release, first push further in...

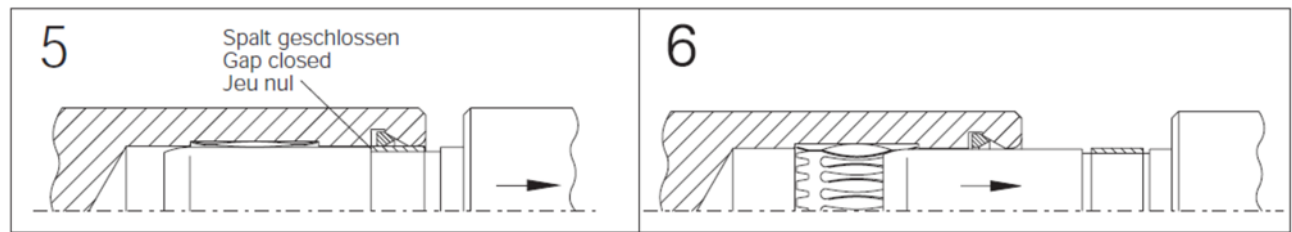


Figure 5. ... and then pull.

Figure 6. The connector is released.

## 5 Initial start-up

### 5.1 Preconditions

- All connection and installation measures have been carried out as described in the section 'Setting up and installation'.
- The supply network corresponds to the necessary input voltage of 230V 50/60Hz.
- The earth conductor has been connected.
  
- Set the desired power through jumper W1 and W2 (only without load remove / insert!)
- The test load has been connected.
- The air intake and outlet vents are not covered. If necessary, remove any foreign matter!
- An appropriate guard has been set up to protect personnel and property.



**CAUTION:**

Air exiting the resistor installation during operation is very hot (up to 300°C). It is the operator's responsibility to provide a guard around any safety clearance that might be necessary.

### 5.2 Switching on

- The preconditions described in chapter 5.1 have been satisfied.
- Connect the supply voltage to the socket for non-heating apparatus.
- Wait briefly until the fans have run up.
- The load resistor is now ready for use.
- The resistance load is switched on and off by activating the automatic circuit-breaker.

### 5.3 Ending the load test

Once the load test has ended, the load interrupter switch (automatic circuit-breaker) is deactivated first. The fans should then be allowed to operate for about 1 minute to prevent a build-up of heat and to allow any stored heat to be removed from the unit.

After that the fan can be disconnected from the power supply by unplugging the auxiliary supply lead.



## 6 Maintenance

### 6.1 Introduction

This section provides information for routine preventive maintenance and general fault recognition guidelines for proper operation of the unit. Physical maintenance or troubleshooting must be performed only by personnel trained on the unit. Operating personnel not trained and instructed in the maintenance of unit equipment should limit their efforts to identifying the symptoms of a fault.

### 6.2 Safety instructions

The general safety instructions in Chapter 1 and the instructions that follow here must be observed at all times. **WARNINGS, instructions to observe CAUTION** and comments highlight particularly important information shown as follows:



**CAUTION:**

This instruction requires absolute compliance to avoid injury or death.



**ATTENTION:**

These instructions require absolute compliance to avoid the risk of injury to personnel or damage, irreparable or otherwise, to station components.



**CAUTION:**

Extreme caution is essential for maintenance and servicing work and when locating faults.



**ATTENTION:**

Before performing maintenance inside, shut down the unit!

### 6.3 Preventive maintenance

The continued monitoring of the operational status of any electronic equipment is essential for assuring system reliability. Operating personnel should be knowledgeable of all equipment and indicators. Records should be maintained for all preventive maintenance activities.

The rectifier requires periodic preventive maintenance. The following procedures should be performed by personnel familiar with basic electronics and electrical theory who have been trained in unit operations.

1. Ensure all fans are operational and that adequate ventilation is available.
2. Check for any unusual noises or doors.
3. Check the indicating- and operating elements and verify that an alarm condition is not indicated.
4. Inspect the Fan Assembly air filter and replace if necessary.
5. The cooling ducts have to be cleaned regular.
6. The set values for the output voltage and the monitoring facility should be checked annually.

7. Shorted fuses should only be replaced with fuses of the same type (current value and triggering characteristics)!

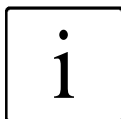
## 6.4 Troubleshooting

Troubleshooting is a logical, methodical process involving tests, measurements, observations, and deductive reasoning. It proceeds from a general recognition that a failure condition exists to a specific determination of the cause or causes of the failure and localization of the failure to one or more specific components.

Successful troubleshooting of all but the most obvious failures (e.g. blown fuses, defective fan, etc.) requires an in-depth technical background in electronics technology. Specifically, one needs a solid education, including dc and ac circuits, solid state devices, and digital electronics. In addition, a solid background in three phase power systems is also necessary.

Troubleshooting requires the use of a dual trace (or two channel) oscilloscope, a digital multi-meter, a phase rotation meter and other electronic instruments. Any one lacking experience with these instruments or the above cited technical background should NOT attempt to troubleshoot the unit.

## 7 Spare Parts and Customer Service



### **NOTE:**

When ordering spare parts please always state the designation (position/component) and unit number.

We draw your attention to the fact that spare parts not supplied by us are not tested or approved. Installation of such spare parts can therefore have a detrimental effect on the operation and passive safety of the unit. We do not accept any liability for any resulting damage.


Our customer service department will be pleased to send you a complete spare part list for your unit upon request.

Please contact the following address in this case or if you should have any questions or suggestions.

 **Wärtsilä JOVYATLAS EUROATLAS GmbH**

**Fenneweg 4**

**26844 Jemgum GERMANY**

 **++49 (0)4958-9394-30**

**FAX ++49 (0)4958-9394-10**

<http://www.jovyatlas.com>

E-Mail: [service.jovyatlas@wartsila.com](mailto:service.jovyatlas@wartsila.com)

**8 Appendix**

- Dimensional drawing R9312800.MZ3
- Circuit diagram R9312800.SP3