Operating -Instructions

For machine operator and maintenance staff. Always keep by the machine.

DYNAJET 350me
Art. no. 1488003/029/032/110/149
Mach. no.

1 About these Operating Instructions

In this chapter you will find notes and information that will help you use these Operating Instructions. Do not hesitate to contact us if you have any queries:

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or the branch or services agent responsible for you.

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_____

_____

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1.1 Foreword

These Operating Instructions are intended to familiarize the user with the machine and to assist him in using the machine properly in various possible applications.

The Operating Instructions contain important information on how to operate the machine safely, properly and economically. Taking these instructions into consideration will help

- to avoid dangers,
- to reduce repair costs and downtimes
- to increase the reliability and service life of the machine.

The Operating Instructions must be supplemented by the relevant national rules and regulations for accident prevention and environmental protection.

The Operating Instructions must always be available wherever the machine is in use.

The machine owner must make the location of these Operating Instructions known to all personnel charged with performing jobs on the machine and ensure they are accessible. Furthermore these operating instructions must be read and applied by any person who carries out work with or on the machine, e.g.

- operation, including setting up, fault rectification in the course of work, removal of production waste, care and disposal of fuels and consumables
- service (maintenance, inspection, repair), and/or
- transport.

The generally recognized rules of technology for safe and proper working must be observed in addition to the Operating Instructions and mandatory rules and regulations for accident prevention and environmental protection in the country and place of use of the machine.

The Branch or Agent serving you, or the Nürtingen Works, will be happy to give you more information, should you have any questions following your study of the Operating Instructions.

You will make it much easier for us to answer any questions if you can give us the details of the machine model and the machine number.

These operating instructions do not include a description of the drive motor. For the drive motor please refer to the operating instructions provided by the motor manufacturer.

Modifications are made from time to time in the interests of constant improvement and it could be possible that we were unable to take these into consideration when these Operating Instructions were printed.

These operating instructions are not covered by the Amendment Service of Dynajet GmbH. Alterations may be made to these operating instructions without prior notification.

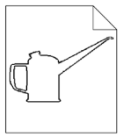
1.2 Icons and symbols

The following icons and symbols are used in the Operating Instructions:

► Action symbol

Text following this symbol describes tasks which you are required to work through, generally in the sequence shown from top to bottom.

⇒ Text after this icon describes the result or the effect of an activity.



Refer also to the maintenance charts:

This symbol is used to refer to the maintenance charts required, possibly as a supplement to the maintenance charts you are currently reading.

The following special tool is required:

This icon identifies the special tools necessary to carry out the work. Normal tools, i. e. standard tools or tools carried in the vehicle are not listed additionally.

Environmental protection

This symbol is used to identify tasks during which particular attention is to be paid to environmental protection.

Notes

Particular specifications with regard to the economic use of the machine are introduced with the word ”Note” and the pictogram illustrated.

⚠ Caution

Particular specifications or instructions and prohibitions with regard to the prevention of damage are introduced with the word ”Caution” in bold and the pictogram illustrated.

⚠ Danger

Particular specifications or instructions and prohibitions with regard to the prevention of personal injury or significant damage are introduced with the pictogram illustrated, the word ”Danger” written in bold and a line.

The appropriate symbol will be used if it is possible to identify the source of the danger precisely.

⚠ Suspended Load

This symbol is used to identify tasks in which suspended loads may fall down.

⚠ Danger of crushing

This symbol is used to identify tasks during which there is the danger of being crushed.

Heavy current

This symbol is used to identify tasks in which there is the danger of electrocution, possibly with lethal consequences.

2 Safety Regulations

This chapter summarises the most important safety regulations. This Chapter must be read and understood by all persons who handle the machine. The various regulations are also repeated once more at the appropriate points in the Operating Instructions.

Notes

Special safety regulations may be necessary for some tasks. These special safety regulations will only be found in the description of the particular task.

The following safety instructions should be regarded as a supplement to already existing valid national accident prevention regulations and laws.

Existing accident prevention regulations and laws must be observed in all cases.

2.1 Principle

Use only machines in a technically perfect condition, as designated and being conscious of safety and the dangers, taking account of the Operating Instructions. Any faults, especially those affecting the safety of the machine, must, therefore, be rectified immediately.

Make sure that

- no safety equipment is removed, rendered inoperable or modified,
- safety equipment removed for the purposes of maintenance work is refitted immediately after the work is completed.

Check operational safety every time you start work. Any defects found or suspected must be eliminated immediately. If necessary, inform the project supervisor.

If defects or faults are found or suspected during operation, operation must cease immediately. Eliminate the defect or fault before restarting.

2.2 Onwards sale

The following should be noted if you sell the machine on:
Pass on to the new operator all the accompanying documentation (Operating Instructions, Maintenance Instructions, diagrams, machine cards, inspection certificates etc.) you received with your machine. If necessary, you may have to order the papers from us, quoting the machine number. The machine may not be sold on without the accompanying documentation under any circumstances.

Reporting an onwards sale or acquisition to Dynajet ensures that you will be sent any information relating to modifications or innovations relevant to safety, and you will also be eligible for technical consultancy from our works.

2.3 Designated use

The machine has been built in accordance with the state of the art and recognized safety rules. Nevertheless, its use may constitute a risk to life and limb of the operator or of third parties, or cause damage to the machine and to other property.
The machine must only be used as specified in the Operating Instructions
and the enclosed documentation. All information and safety regulations in the Operating Instructions must be observed.
The machine is only designed for cleaning with pressurized water.
The machine supplies heated pressurized water at a maximum temperature
of 95 °C.
The machine supplies pressurized water at the pressure specified in the technical data, depending on the model.
The machine must be supplied with clean, cold mains water via the low-pressure hose as described in the chapter ”General technical description” - section: ”Water quality requirements”. Other materials should not be used.

The operator must provide personal protective equipment which should be used by the operating personnel.
Personal protective equipment includes:

- Protective helmet
- Ear defenders
- Protective goggles
- Face protection visor
- Protective suit
- Protective gloves
- Protective boots

Only qualified personnel may work on the burner.

All items of the machine’s protective paneling must be fitted or connected up during operation.

The machine must be operated only with the safety equipment fitted.

Specified maintenance work should be carried out at regular intervals.

The drive motor of the high pressure cleaner must be stopped before any work is carried out on the machine or accessories. This also applies to the replacement or adjustment of accessories (e.g. replacement of hose lines or nozzles).

Any work on the electrical system of the machine must be carried out by trained and qualified electricians only.

Never make any modifications, additions or conversions to the machine without obtaining the manufacturer's approval first.

The operational safety of the machine must be inspected by a technical expert at least once a year. The operator is responsible for commissioning the inspection.

2.4 Use contrary to the designated use

Use of the machine other than described in the section "Designated use", or which goes beyond such use, is considered contrary to the designated use. Dynajet GmbH accepts no liability for damage resulting from such use. The risk of such misuse lies entirely with the machine operator.

Modifications

Never make any modifications, additions or conversions to the machine which might affect safety without first obtaining the manufacturer's approval. This also applies to the installation and adjustment of safety devices and valves as well as to welding work on load-bearing elements.

The values quoted on the rating plate, in the Technical Data and on the machine card are the maximum permissible values.

The control and safety settings made at Dynajet GmbH must not be changed.

The machine must not be operated with deactivated, modified or defective safety devices.

Safety devices must only be repaired, adjusted or replaced by technically qualified experts.
All devices of relevance for safety must be in place and fully functional.

2.5 Liability

The operator is obliged to act in accordance with the Operating Instructions.

The safety and accident prevention regulations from the following institutions must be observed:

- Industrial Employers' Liability Insurance Association,
- the responsible corporate liability insurance company.
- the legal authorities in your country.

The following persons are liable under the law for accidents which can be ascribed to the failure to comply with safety regulations and accident prevention regulations:

- the operating personnel or (unless not liable due to lack of training or basic knowledge)
- their supervisors.

Please therefore ensure that the necessary caution prevails.

Exclusion of liability

We expressly state here that Dynajet accepts no liability for damage arising from incorrect or negligent operation, servicing or maintenance or as a result of use contrary to the designated use. This statement is equally valid for modifications to, additions to and customization of the machine which may compromise safety. The guarantee will no longer be valid in such cases.

2.6 Personnel selection and qualifications

The machine may only be operated or serviced independently by persons who

- have reached the minimum legal age;
- are physically capable (rested and not under the influence of alcohol, drugs or medication);
- have been instructed in the operation and maintenance of the machine;
- can be expected reliably to execute the tasks they are charged with.

Training

The machine must only be operated, serviced or maintained by persons who are trained to carry out such tasks and have been commissioned to do so.

The areas of responsibility for personnel must be clearly defined.

The following personnel must only work on the machine under the permanent supervision of an experienced person:

- personnel who have not yet completed training or instruction,
- untrained personnel,
- uninstructed personnel,
- personnel taking a general training course.

Qualified electrician

Work on the electrical system and equipment of the machine must be carried out by a qualified electrician or by instructed persons under the supervision and guidance of a qualified electrician and in accordance with electrical engineering rules and regulations.

2.7 Sources of danger

Never reach into moving machine components, whether the machine is running or switched off. Always switch off the main switch first. Take note of the warning plate.

In the event of malfunctions, stop the machine immediately and secure it. Have any faults rectified immediately.

Secure the machine at the set-up site against rolling away by means of wedges.

Make sure that nobody is placed at risk by the running machine before starting up the machine.

Never release or tighten threaded unions that are under pressure.

2.7.1 Hot machine components

During and after completion of work, there is a risk of burns from hot parts on the drive motor.

Before maintenance work, be aware that the drive motor, the high-pressure water pump and the exhaust system can still be hot. Allow these assemblies to cool before servicing.
Work with protective gloves.

2.7.2 Water jet tools

A high-pressure water jet, which can reach a very high pressure, emerges from the water jet tool. This results in a high risk of injury. When working with the water jet tool, always wear your complete personal protective equipment.

Never direct the high pressure water jet to persons, animals or loose material.

The high pressure creates rebound forces. Therefore, ensure good stability when working

2.7.3 Aerosol

⚠ Danger

During use of high pressure cleaners, aerosols may be formed. Inhalation of aerosols can be hazardous to health.

⚠ Danger

The employer shall perform a risk assessment in order to specify the necessary protective measures regarding aerosols, depending on the surface to be cleaned and its environment. Respiratory masks of class FFP 2 or higher are suitable for the protection against hydrous aerosols.

2.8 Safety equipment

Never remove or modify safety devices on the machine.

Any safety devices removed for set-up, maintenance or repair purposes must be refitted and checked immediately upon completion of the maintenance and repair work.

Safety devices must only be repaired, adjusted or replaced by technically qualified experts.

All equipment required for safety and accident prevention (warning signs and information plates, cover grilles, guards, etc.) must be in place. Such equipment must not be removed, modified or damaged.

2.9 Protective equipment

In order to limit the dangers to the life and limb of persons, the following protective equipment is required throughout the working area of the machine.

The operator is obliged to ensure that the protective equipment is worn properly and that its condition is regularly checked.

item	Designation
1	Protective helmet
2	Ear defenders
3	Protective goggles
4	Face protection visor
5	Protective suit
6	Protective gloves
7	Protective boots

⚠ Danger

Wear the complete personal protective equipment. This also applies to all persons who are in the work area of the machine (it is about your safety).
Clean your personal protective equipment regularly and check for damage.
Damaged parts of the personal protective equipment must be replaced immediately!

The protective equipment is not a complete protection against the dangers of the direct high-pressure jet.
The waterproof protective clothing provides only protection against spraying water and leaking particles. In the case of direct contact with the high-pressure water jet, the protective clothing does not provide sufficient protection against injury.

Never direct the high-pressure water jet to clean contaminated protective equipment on persons.

The personal protective equipment is not included in the scope of delivery of the machine. It is offered by DYNAJET GmbH and can be purchased from the parts sales department.

Note

An overview of the offered personal protective equipment can be found in the current catalog "DYNAJET" by DYNAJET GmbH.

2.10 Risk of injury – residual risk

The machine has been built in accordance with the state of the art and recognized safety rules. Nevertheless, its use may constitute a risk to life and limb of the operator or of third parties, or cause damage to the machine and to other property.

Some of the injuries that may be caused by improper use of the machine are listed below:

- Crushing and impact during process and machine setup.

– Risk of burning hot machine parts. These are, for example, drive motor, motor peripherals and frames.

– Injuries caused by tripping over cables, hoses, reinforcement material.

– Noise pollution if persons without hearing protection are permanently in the vicinity of the machine.

– Injuries caused by unauthorized starting or using of the machine.

– Health damage and environmental pollution caused by exhaust emissions.

– High-pressure injection at the high-pressure water pump, the high-pressure hose line and the water jet tool.

– Injuries caused by cutting of the high pressure water jet.

– Injuries by injecting fluid under the skin.

– Injuries caused by ejection of loosened parts during high pressure cleaning.

– Injuries due to loss of stability due to recoil forces.

– Injuries due to loss of stability due to changes in the position of the high-pressure hose line when the high-pressure water pump is switched on.

– Health damage from contact, inhalation or food intake of hazardous substances released during high pressure cleaning (e.g. asbestos containing, silicogenic or lead containing dusts).

– Injuries due to defects in pressure-bearing parts (e.g., damaged high-pressure hose).

– Injuries caused by the assembly of components which are not designed for the permissible operating pressure.
– Health damage caused by the effects of vibration on the human body.

– Biological or chemical contamination due to substances that are stirred up in the jet or cleaning process.

- Danger of burning and scalding at water carrying accessories like high pressure hose or the lance tube if the burner is interposed or switched on.
- Electrical contact (which may result in an accident causing injury or death) on the electrical equipment. If the connector is not used appropriately or electrical components are damaged.

2.11 Risk of crushing and bumping

During the following operating modes at the machine:

- Set-up
- Starting up
- Operation
- Cleaning, Troubleshooting, Maintenance
- Decomissioning

there is a risk of injury through crushing or bumping.

2.11.1 Transporting the machine

If you wish to load the machine onto a transport vehicle, attaching lugs must be fitted on the machine. If your machine is equipped with attaching lugs for lifting, they are located on the upper side of the machine and are coloured for identification purposes.

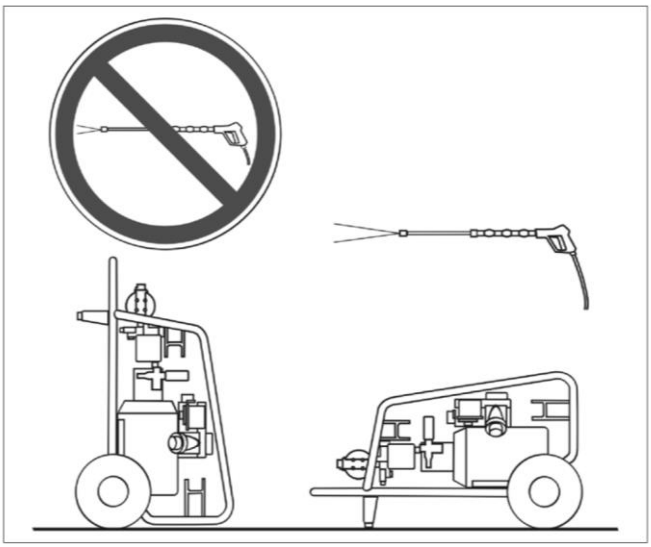
⚠ Danger of crushing

When lifting with the crane, determine the center of gravity of the machine by lifting carefully. All cables or chains on the lifting gear must be tensioned evenly and the machine must be raised evenly at all support points.

⚠ Suspended Load

Ensure no persons are under a suspended load.

2.12 Machine position



The machine may only be placed in vertical position for moving and storage.

⚠ Caution

The machine must only be operated in horizontal position. Operating the machine in vertical position can damage the pump.

Check the intended location carefully and do not accept the installation site if there are any safety concerns.

The load-bearing capacity of the ground must be able to withstand the weight of the machine.

The ground must be level and even.

⚠ Danger

Keep a safe distance from pits and embankments. Never perform construction beneath the machine.
Check the machine stability constantly during operation.

2.13 Determination of the recoil forces

The size and design of the nozzle on the high pressure water gun and the operating overpressure must be adapted so that operating personnel can withstand the recoil forces that occur depending on their current stance and body weight.

Notes

Only use nozzles suitable for the application in question! Refer to the corresponding nozzle table provided by the nozzle manufacturer to calculate the recoil forces!

Designation
d= diameter [mm]
p =pressure [bar]
Q = flow rate [l/min]
FR = recoil force [N]

Calculate the recoil forces in accordance with the following empirical formula:

$FR = 0,236 \times Q \times \sqrt{p}$

► Select the nozzle table relevant for your nozzle.

► Read the required values from the nozzle table.

► Calculate the recoil force using these values.

When performing hand--guided work with a high pressure water gun, select the nozzle diameter so that the recoil force along the longitudinal axis does not exceed 250 N at maximum operating pressure.

Notes

Using angled high pressure water guns may change the recoil forces.

⚠ Danger

Only use high pressure water guns that are suitable for the maximum recoil force of the nozzle used!
See nozzle table provided by the respective manufacturer.
– Use a support piece for recoil forces between 150 N and 250 N!
– If the recoil force exceeds 250N the high pressure water gun must be guided mechanically.
Always assume as stable stance when working with hand-guided high pressure water guns.

2.14 High-pressure injection

The high-pressure water pump, high-pressure hose and high-pressure gun pose a risk of high-pressure injection during the following operating modes:

- Starting up
- Operation
- Cleaning, Troubleshooting, Maintenance
- Decommissioning

Work with high-pressure water jets produces very high pressure that acts over a relatively small surface area. This concentration of energy can cause serious injuries.

⚠ Danger

If a high-pressure water jet makes contact with the skin, it can penetrate the surface of the skin and damage the tissue underneath. The water may inject foreign matter deep into the body and cause dangerous infections. With injuries caused by high-pressure water jets, it is not possible to assess the extent of damage to the tissue from the outside. Treat any injuries caused by high-pressure water jets as an acute surgical emergency. Injuries of this kind require treatment from a qualified orthopedic surgeon. Inform the acting doctor that the accident was caused by a high-pressure water jet.

Always inspect the machine for defects before starting work. Should you identify any defects during operation, shut down the machine immediately, depressurize and have the defect repaired by a qualified technician. Depressurize the machine before decommissioning.

2.14.1 High-pressure hoses

It is essential that correct high-pressure hoses be carefully selected and handled correctly to maintain the operational safety of the machine.

Observe the following rules when handling high-pressure hoses:

- Only use high-pressure hoses approved to withstand the maximum operating overpressure and maximum operating temperature.
- High-pressure hoses should only be connected by qualified personnel.
- High-pressure hoses must be laid and secured in such a way as to minimize any dangers.
- High-pressure hoses must consist of functioning hoses and connections that are compatible with one another.
- High-pressure hoses must not be painted.
- Depressurize the high-pressure hoses after operating the machine.
- Do not crush high-pressure hoses or guide them over sharp edges. Avoid tensile and bending stress.
- High-pressure hoses must be stored free of kinks and tension.
- Hoses generate pressure loss. For lengths which exceed the supplied length, the nozzle may need to be adjusted (larger nozzle).
- Check the pressure gauge of the machine to ensure that the max. nominal pressure is applied even though long hoses are used.
- When working at high altitudes, long hose lengths must be avoided and the hose should be pre-filled with water

High-pressure hoses are wear parts with a limited service life. They should therefore be replaced at appropriate intervals according to the operating conditions, even if there are no obvious visible external defects.

High-pressure hoses must be replaced should the following defects occur:

- Scuff marks, cuts or cracks that pierce the outer layer and reach through to the wire infill.
- Embrittlement of the outer layer (crack formation) due to improper storage.
- Storage time and usable service life have expired.
- As a guide value, DIN 20 066 specifies 6 years for the connected hose. This includes a storage time of 2 years.
- Leaks in the hose and at the connection point.
- Hose lines above 500 bar nominal pressure must be secured at each connection point (to the machine, to the gun, between hoses) with suitable safety devices (eg DYNAJET AN 547496).
- Familiarize yourself with the connection mechanism of the hoses, make sure that the connection parts engage securely, and only use as-new original components for connecting the hoses.

⚠ Danger

Never search for leaks in high-pressure hoses with your bare hands. Water escaping under high pressure may not be visible but can cause serious injury.

2.14.2 High-pressure gun

Correct handling of the high-pressure gun is essential to ensure the operational reliability of high-pressure cleaners.
Observe the following rules when handling high-pressure guns:

- Only use high-pressure guns that are designed to withstand the permitted operating overpressure.
- Always use the high-pressure gun with a nozzle approved for the relevant pressure and temperature range.
- Never direct the water jet at people or animals.
- Pay attention to the confines of the danger area when performing work involving high-pressure water jets. No personnel should stand within a 10 m radius of the high-pressure gun, apart from the operator.
- When operating the high-pressure gun, always hold firmly with both hands.
- The high-pressure gun produces recoil and torque when actuated.
- Ensure equipment is secure and stable.
- Use suitable means to support the high-pressure gun, depending on the model.
- Depressurise the high-pressure gun after operating the machine.

⚠ Danger

Waterproof protective clothing only provides protection from spray water and splash particles. In the case of direct contact with the high-pressure water jet, protective clothing does not provide sufficient protection from injury.
Wear all the necessary personal protective equipment. This also applies to all personnel standing within the working area around the machine (for their own safety).

2.15 Electrical contact

The control cabinet, electrical wiring and drive motor pose a risk of fatal injury from electrical contact during the following:

- Setting up
- Operation
- Cleaning, Troubleshooting, Maintenance
- Decommissioning

All electrical assemblies are protected as standard, as per IEC 60204 Part1 or ISO 20653:2013-02 in accordance with protection category IP 54.

Use only original fuses with the specified amperage! The electrical system can be destroyed by overrated fuses or overriding.

Through high currents dangerous electric arcs may occur.

Heavy current

Work on the electrical system and equipment of the machine must be carried out by a qualified electrician or by instructed persons under the supervision and guidance of a qualified electrician and in accordance with the electrical engineering rules and regulations.

2.16 Power supply

⚠ Danger

The maximum permissible mains impedance at the electrical connection point (see technical data) must not be exceeded. If you are unsure about the mains impedance at your connection point, please contact your power supply company.

Note

Match the power source.

Unsuitable power extension cables can be dangerous. Only use approved and appropriately marked power extension cables with a sufficient line cross-section outdoors:

1-10 m → 4 mm^2
10-30 m → 6 mm^2

2.17 Risk of burns and scalding

The engine, exhaust system and high-pressure water pump pose a risk of burns during the following:

- Starting up
- Operation
- Cleaning, Troubleshooting, Maintenance
- Decommissioning

⚠ Danger

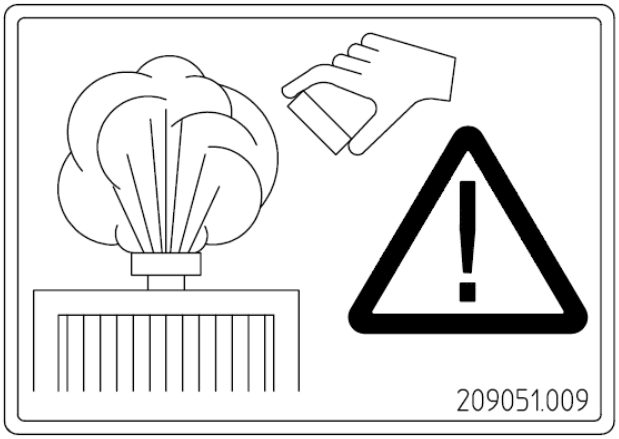
The control cabinet switches off the engine in the event of overheating. However, the engine, exhaust system and high-pressure water pump may become hot during operation. Allow the machine to cool before starting any maintenance work. Work with protective gloves.

⚠ Danger

Remember that the high-pressure gun poses a risk of burns as well as a risk of high-pressure injection. Wear all the necessary personal protective equipment.

2.17.1 Cooling water

There is special caution when handling the cap of the water cooler. The closure cap must be tight and locked.



⚠ Danger

Never remove the radiator cap when the engine is running or when the engine is still hot. Hot water can eject and lead to scalding by standing persons.
After the engine has been stopped, wait at least 10 minutes for the cover to be removed. Do not pour cold coolant into the hot cooler. Work with protective gloves and face protection

2.17.2Heating module

When a heating module is connected and the burner system is switched on, work can be performed with high water temperatures. The high-pressure hose and the high-pressure gun pose a risk of burns and scalding during the following:

- Starting up
- Operation
- Cleaning, Troubleshooting, Maintenance
- Decommissioning

Notes

Read the documentation accompanying the heating module.

⚠ Danger

In addition to high-pressure injection, bear in mind the risk of burns and scalding posed by the high-pressure hose and the high-pressure gun.

2.18 Place of work

The place of work is the area in which people must remain in order to carry out the work.

2.18.1 Machine operator

The place of work of the machine operator during operation is at the operating panel on the machine.

2.18.2 High-pressure gun operator

The place of work of the high-pressure gun operator is within the danger zone of the high-pressure gun. Proceed with extreme caution here. The high-pressure gun operator and the machine operator must have visual contact.

⚠ Danger

Removed material may spray back and cause serious injury. Never work alone.

If an operator falls unconsciousness or suffers serious injuries, you are advised to call for help as you will not be able to secure the machine alone.

2.19 Working area

The working area is the area in which work is carried out with and at the machine. Parts of the working area can become danger areas, depending on the job being performed.

The working area is also the area in which work is carried out with and on the high-pressure gun.

Any persons other than the operator of the high-pressure gun must keep a distance of at least 10 metres from operating area around the high-pressure gun while work is being performed.

Secure the working area and affix signs clearly indicating the dangers.

Suitable protective equipment is compulsory within the working area. The operator is responsible for safety in the working area when the machine is in use.

2.20 Conduct in emergency

Switch off the machine immediately in an emergency situation. Refer also to chapter: ”Operation” -- section: ”Emergency shutdown procedures” for further details.

Caution

In the event of malfunctions, stop the machine immediately and secure it. Have any faults rectified immediately.

2.21 Sound emissions

Sound emissions are generated during the following operating modes at the machine:

- Starting up
- Operation
- Cleaning, Troubleshooting, Maintenance
- Decommissioning

Refer to the technical data for the sound pressure level value in the vicinity of the machine.

We recommend wearing ear defenders for noises louder than 80 dB (A); the employer should provide personnel with ear defenders although this is not compulsory.

Wearing ear defenders for noises louder than 85 dB (A) is compulsory.

Notes

Wear your personal ear defenders.

Operator

Instruct your personnel always to wear their personal ear defenders.

As the operator, you are responsible for ensuring that your personnel comply with this regulation.

All soundproofing equipment must be present and in perfect condition.

This equipment must be set to protective position during operation.

High sound levels can cause permanent hearing damage.

2.22 Spare parts

Spare parts must comply with the technical requirements specified by the manufacturer. Spare parts from original equipment manufacturers guarantee this.

Use only original spare parts. Dynajet GmbH accepts no liability for damage caused as a result of using non-original spare parts.

2.23 Accessories

Accessories must meet the requirements specified by Dynajet GmbH and be compatible with one another. Using accessories from original equipment manufacturers guarantee this.

Notes

Accessories that are not included in the scope of supply delivered with the machine are supplied by Dynajet and can be purchased through Parts Sales.

Please refer to the delivery note for a list of accessories supplied.

The operating company is responsible for ensuring that the correct accessories are used.

Dynajet GmbH declines all responsibility and liability for damage caused as a result of using non-original accessories or using correct accessories inappropriately.

2.24 Storing the machine

The machine should be stored only in a dry, frost-free location.

If there is a danger of freezing at the storage location, take appropriate antifreeze protection measures.

For further details, refer also to the chapter: ”Decommissioning”.

2.25 Injuries through unauthorised starting or use the machine

During the following operating modes at the machine:

- Starting up
- Operation
- Cleaning, Troubleshooting, Maintenance
- Decommissioning

there is a risk due to unauthorised starting or use of the machine.

Always secure the machine against unauthorised starting before leaving the work area. This means:

- Switch the main switch to OFF.
- Close the hoods.
-

The operator of the water jetting tool must always have a clear view of the machine. If necessary, the operator will have to appoint a person to monitor the machine.
If unauthorised persons approach the machine, the operator must stop work immediately.

3 General Technical Description

This section describes the components and assemblies on this machine and describes how they function. Please note that possible options are also described.

3.1 Designation of machine

Your machine is a Dynajet me from Dynajet GmbH.
You will make it much easier for us to answer any questions or respond to orders if you can give us the details of the machine model and the machine number.

The rating plate is attached to the frame at the front right.

Dynajet xxx me
- Electric drive
- portable
- XXX bar maximum pressure

3.2 Machine number

The machine number you will find on the type plate.

3.3 Machine Version

The following data can be found on the accompanying machine card and on the rating plate:

- Machine type
- Machine number

These operating instructions are exclusively valid for the machine version indicated on the type plate and in the machine card.

Notes

The machine number is allocated by Dynajet GmbH. Each machine number is only allocated once. This means that the machine number identifies each individual machine.

3.4 Scope of supply

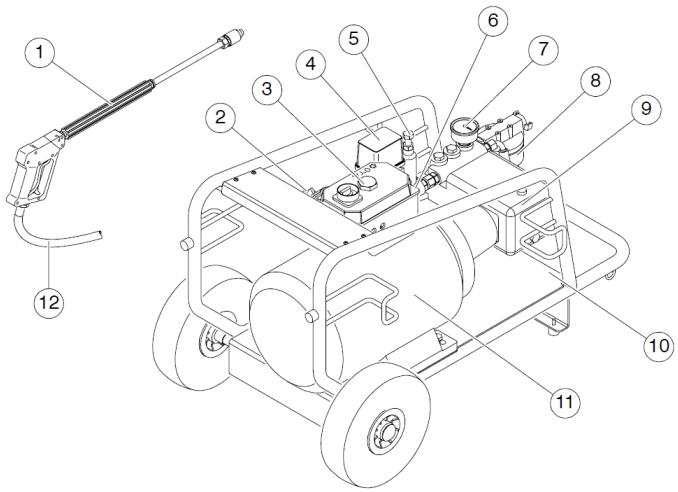
The scope of supply includes:

- Dynajet me high-pressure cleaner
- a 10 m high-pressure hose
- a high-pressure gun with high-pressure pipe and fan jet nozzle
- Operating Instructions
- a spare parts list
- a document folder

3.5 Summary

Below you will find an overview of the most important components; these will then be described on the following pages.

Dynajet me



Different models available

Item	Designation
1	High-pressure gun with fan jet nozzle
2	Power supply socket
3	Control cabinet
4	Pressure switch
5	Safety valve
6	Unloader
7	Pressure gauge
8	Water filter
9	High-pressure water pump
10	Rating plate
11	Drive motor
12	High-pressure hose

3.6 Technical Data

The technical data and characteristics shown below apply to the Dynajet me.

	Dynajet 150me	**Dynajet 350me**	**Dynajet 500me**
Dimensions			
Length	1100 mm		
Width	660 mm		
Height	650 mm		
Weights			
Weight	147 kg		
Performance data			
Drive engine	Electric motor 15 kW		
Working pressure	up to 150 bar	up to 350 bar	up to 500 bar
Delivery volume	up to 42 l/min	up to 21 l/min	up to 15 l/min
Measured sound power level	102 dB (A)		
Guaranteed sound power level	104 dB (A)		
Operating position	Horizontal		
Power connection			
Voltage	400 V/ 50 Hz	400 V/ 50 Hz or 440 V/60 Hz	400 V/ 50 Hz or 440 V/60 Hz
Appliance plug	CEE appliance plug, 5-pole,		
connection cable	5 x 4 mm2		
Fuse protection	C-32 A (inert)		
Maximum permissible mains impedance	0.23 Ohm		
Protection class	IP X4		

Water connection	
Low-pressure hose connection	GEKA 3/4”
Line cross-section	3/4”
Water pressure	min. 2 bar, max. 6 bar

	Dynajet 150me	**Dynajet 350me**	**Dynajet 500me**
High-pressure gun			
Operating pressure	150 bar	350 bar	500 bar
Flat spray nozzle			
Designation	15 15	15 05	D1,25
Spray angle		15°	
Nozzle size	Ø 2.7 mm	Ø 1.55 mm	Ø 1.25 mm
Dynajet Art. No.	425853	427144	543159

⚠ Danger

The use of different flat spray nozzles requires prior approval by Dynajet GmbH. Note that the use of other flat spray nozzles may cause higher recoil forces.

3.7 Water quality requirements

Observing the water quality requirements will extend the life of the high-pressure water pump and ensure it functions correctly.

Pressure-dependent parameters				
Parameter		**Pressure range**		
		max. 500 bar	**>500 bar bis 1200 bar**	**>1200 bar**
Solids concentration	(mg/l)	max. 100	max. 50	max. 10
Particle size	(µm)	max. 80	max. 50	max. 10
Temperature	(°C)	max. 40	max. 40	max. 30
Overall hardness	(mmol/l)	0,5-5	0,5-5	0,5-3,5
(Ca^{2+}+ Mg^{2+})	(°d), (°dH)	3-25	3-20	3-15
(Ca^{2+}+ Mg^{2+})	(mg/l)	20-200	20-200	20-145

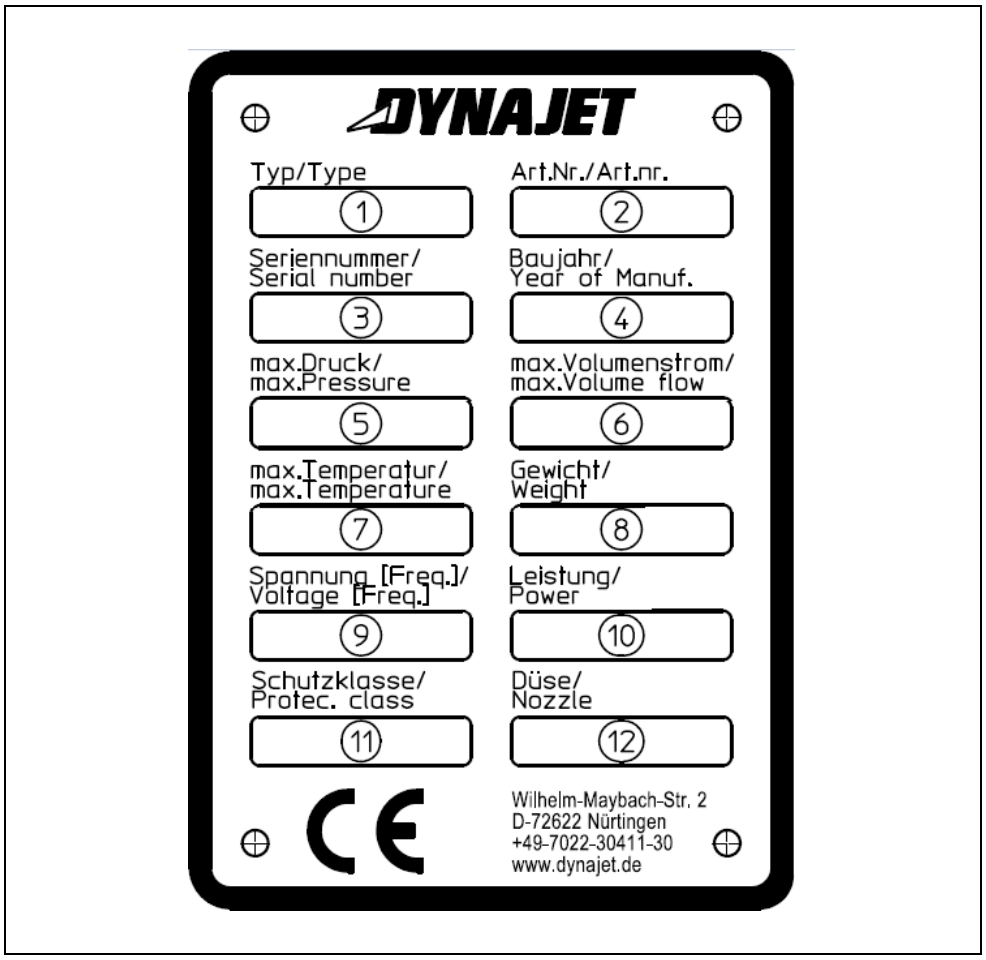
Pressure-independent parameters			
pH value			6,5-8,0
Conductivity		(µS/cm)	max. 2000 at 20°C
Dissolved oxygen		(mg/l)	min. 5
Organic materials		(mg/l)	max. 12
Aluminium	Al	(mg/l)	max. 0,2
Ammonium	NH^+	(mg/l)	max. 0,5
Calcium	Ca^{2+}	(mg/l)	max. 100
Chlorine	Cl^2	(mg/l)	max. 0,5
Chloride	Cl	(mg/l)	max. 100
Iron	FE^2	(mg/l)	max. 0,3
Silicon dioxode	SiO^2	(mg/l)	max. 20
Copper	Cu^{2+}	(mg/l)	max. 1
Magnesium	Mg^{2+}	(mg/l)	max. 50
Manganese	Mn^{2+}	(mg/l)	max. 0,1
Sulphate	SO^2	(mg/l)	max. 250
Nitrate	NO3	(mg/l)	max. 50
Nitrite	NO^2	(mg/l)	max. 0,1

Notes

All other parameters must correspond to standard drinking water values
and regulations.
Deviations from the values listed above are only permitted after consulting Dynajet GmbH

3.8 Nameplate

The most important data pertaining to the machine is included on the nameplate.

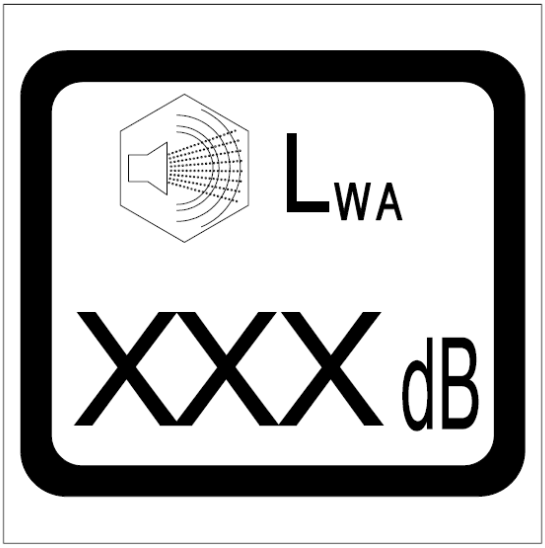


Item	Meaning
1	Type (machine type)
2	Machine article number
3	Machine serial number
4	Year of manufacture
5	Maximum permissible operating pressure
6	Maximum volume flow
7	Maximum temperature only at temperatures above 43°C
8	Weight when empty

9	Voltage/number of phases/frequency
10	Power
11	Protection class
12	Nozzle type + nozzle size

3.9 Sound power level

In accordance with Directive 2000/14/EC the sound power level emitted by the machine is given below.
Next to the rating plate on the machine there is the plate shown in the picture below which gives the machine's sound power level measurement.



Item	Designation
LWA	Sound power level
dB	Decibel value

3.10 Description of the components

After the function of the machine and the general structure have already been explained, individual important components are described and explained in the following subchapters.

3.10.1 Safety equipment

Please review below a list of the safety equipment installed at the machine.

Over-pressure safety in high-pressure circuit

The unloader limits the water pressure. The additional safety valve secures the entire system.

The unloader is used to adjust the working pressure. If the working pressure exceeds the maximum pressure, the unloader returns the water to the water inlet without pressure.

If a lower working pressure is required, it can be reduced on the unloader by unscrewing the handwheel.

Note

Depending on the version, your machine may be equipped with a fixed unloader.
Working pressure adjustment is not possible using this version!

Safety valve

The safety valve limits the maximum water pressure. If the set pressure is exceeded, the water sprays out into the open air without pressure.

⚠ Caution

If the safety valve is triggered, switch off the machine immediately. Check the operating parameters (e.g. nozzle). Correct the error.

Personal protective equipment

Personal protective equipment is not part of the machine deliverables. However, it is offered by Dynajet GmbH and can be purchased from Parts Sales.

⚠ Danger

Wear the entire personal protective equipment. This also applies to all personnel within the working space of the machine (safety first).
Damaged components of personal protective equipment must be replaced immediately!

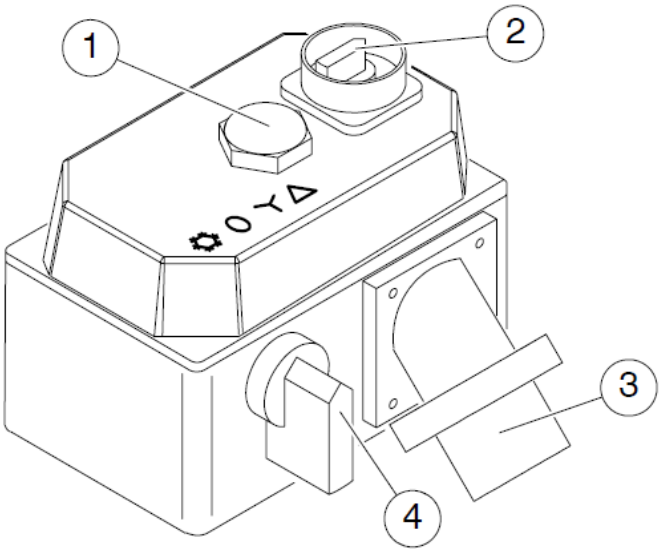
3.10.2Control cabinet

The machine is controlled and operated via the control cabinet.

Heavy current
Work on the electrical system and equipment on the machine must be carried out by a qualified electrician or by instructed persons un- der the supervision and guidance of a qualified electrician and in accordance with electrical engineering rules and regulations.

The control cabinet's wiring, earthing and connections comply with VDE codes of practice.

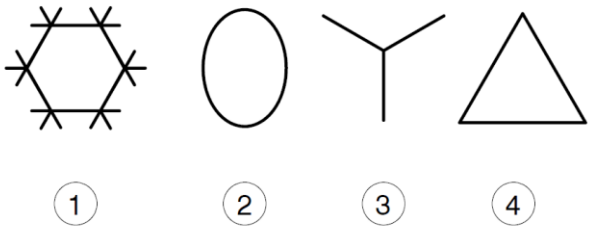
Use only original fuses with the specified amperage! The electrical system can be destroyed by over-rated fuses or bridging.



Item	Designation	Function/display
1	Operating hours meter	Analogue readout of number of operating hours
2	Main switch	Power supply ON / OFF
3	CEE external device plug	Power supply connection
4	Star-delta switch	Frost protection and starting the drive motor

3.10.2.1 Symbols on the star- delta switch

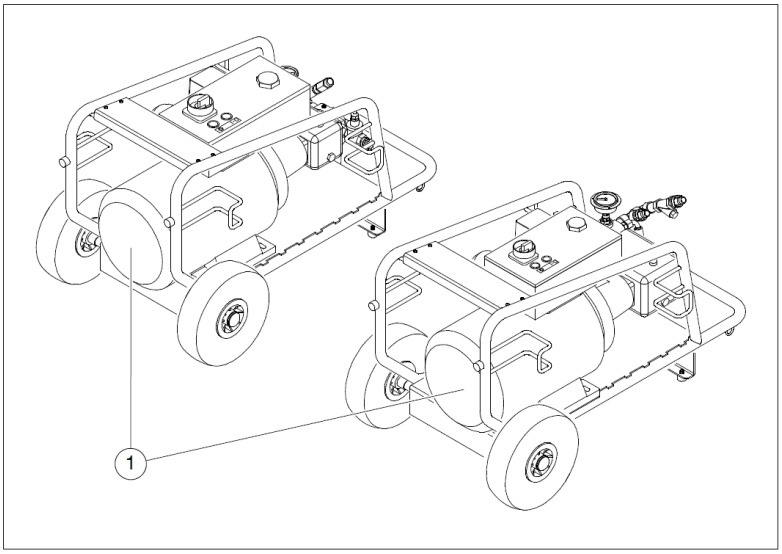
The following symbols are used on the star-delta switch:



Item	Designation
1	Frost protection
2	Off
3	Star
4	Delta

3.10.3 Drive motor

The machine is driven by an electric motor.



Item	Designation
1	Drive motor (depending on the version)

The drive motor has different connection values, depending on the model. Please refer to the rating plate, the machine card or to the ”Transport, setup and connection” chapter in the ”Electrical connections” section for the connection values for your machine.

Notes
Further information regarding the drive motor may be found in the manufacturer’s documentation.

3.10.4 Water system

The high-pressure cleaner is connected to a water supply (minimum 2 bar, maximum 6 bar) via the low-pressure hose and the water filter.

The high-pressure water pump ”sucks” the water through the water inlet and pressurises it.

The pressurised water then flows through the unloader and the relief valve.

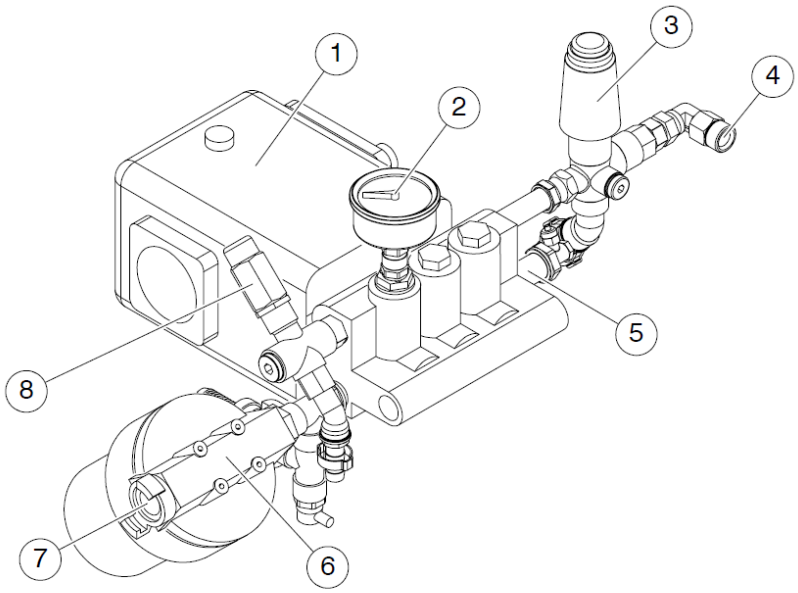
The unloader limits the system pressure to:

Model	Maximum pressure
Dynajet 150me	150 bar
Dynajet 280me	280 bar
Dynajet 350me	350 bar
Dynajet 500me	500 bar

The pressurised water is then directed through the high-pressure hose and the high-pressure gun.

The parallel-connected relief valve protects the entire high-pressure system against unauthorised excess pressure. The excess water is depressurised and flows through the bypass hose back into the water inlet.

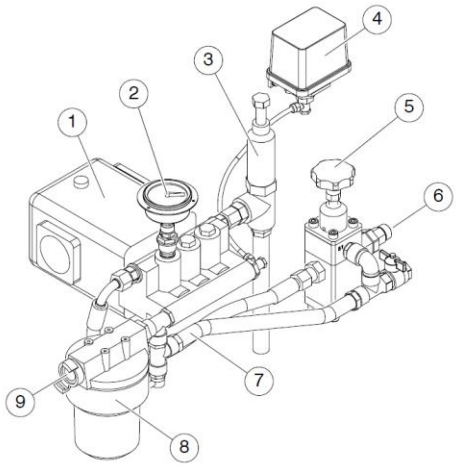
3.10.4.1 Dynajet 150me / 350me



Different models available

Item	Designation
1	High-pressure water pump
2	Pressure gauge
3	Unloader
4	Connecting the high-pressure hose
5	Bypass hose
6	Water filter
7	Connecting the low-pressure hose
8	Safety valve with drain hose

3.10.4.2 Dynajet 500me



Different models available

Item	Designation
1	High-pressure water pump
2	Pressure gauge
3	Safety valve with drain hose
4	Pressure switch
5	Unloader
6	Connecting the high-pressure hose
7	Bypass hose
8	Water filter
9	Connecting the low-pressure hose

The machine is supplied with water via the low-pressure hose. The water flows through the water filter so that the water supplied to the high-pressure water pump is clean.

The high-pressure water pump pumps the water into the high-pressure hose at the preset water pressure.

The safety valve is sealed. It limits the maximum water pressure. Excess water pressure is dumped via the drain hose.

The unloader limits the water pressure, excess water is depressurized and runs through the bypass hose back into the water inlet. Adjust the current water pressure by turning the unloader and view the reading on the pressure gauge.

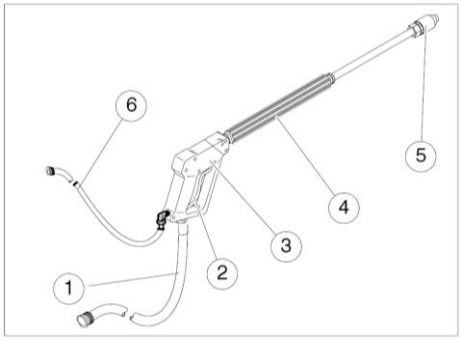
Notes

Your machine may be fitted with a preset unloader depending on the model. Adjusting the working pressure settings on this model is not possible!

3.10.5 High-pressure gun with fan jet nozzle

The high-pressure gun controls the high-pressure water jet and is connected to the high-pressure hose.

Your high-pressure gun may be fitted with a control line, depending on the model.



Item	Designation
1	High-pressure hose
2	High-pressure gun trigger with safety lock
3	High-pressure gun
4	High-pressure pipe with insulation
5	Fan jet nozzle
6	Control line (depending on the model)

Refer to the chapter: ”General Technical Description” - section: ”Technical data” for information on maximum operating pressures for the high-pressure gun.

When operating the high-pressure gun, always hold firmly with both hands. Place one hand on the high-pressure gun trigger and the other hand on the insulated section of the high-pressure pipe.

Always wear protective equipment when operating the machine, see chapter ”Safety Regulations”.

⚠ Danger

Waterproof protective equipment only provides protection from spray water and splash particles. In the case of direct contact with the high-pressure water jet, protective clothing does not provide sufficient protection from injury.

3.10.5.1 Trigger safety device

There is a trigger safety device on the high-pressure gun trigger that prevents the high-pressure gun from triggering accidentally. and prevent personnel from actuating the high-pressure gun trigger by mistake.

The design of the trigger lock depends on the gun model.

One version has a red securing lever that flips back and locks in place to prevent personnel from actuating the gun trigger by mistake.

Second version.

The safety device engages automatically when the high-pressure gun is closed and prevents personnel from actuating the high-pressure gun trigger by mistake. Press the securing lever upwards and then the trigger to actuate the high-pressure gun.

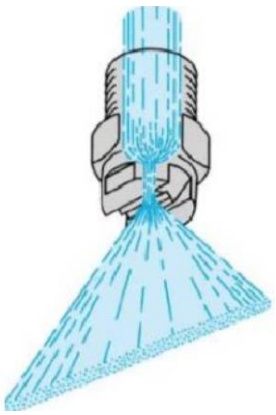
3.10.5.2 Control line

Before working with the high-pressure gun, connect this nozzle to the machine via the control line. Attach the control line to the connection sockets on the control cabinet and the high-pressure gun. If the control line is not connected correctly, pressure does not build in the machine. A fault message appears on the control cabinet display.

3.10.5.3 Fan jet nozzle

The high-pressure gun, high-pressure hose and fan jet nozzle must be assembled prior to operation.

Fan jet nozzles are characterised by a uniform liquid and pressure distribution. The flow geometry of the nozzles creates a compact, controlled jet. They can be used universally and are not sensitive to pressure fluctuations.



Refer to chapter: ”General Technical Description” - paragraph: ”Technical data” for data relating to the fan jet nozzle included in the scope of supply.

Note

Bear in mind that the nozzles have an influence on the water pressure. Incorrect water pressure may accelerate wear on the high-pressure cleaner.

If the nozzle used is too small, the pressure may increase, which could trigger the overpressure safety device in the high-pressure circuit and limit the system pressure.

If the nozzle used is too large, the high-pressure water pump may not be able to attain maximum pressure at the full output.

The working pressure decreases as the nozzle wears.

Always keep a sufficient number of replacement nozzles in stock.

4 Transport, Set-up and Connection

In this section you will find information concerning safe transport of the machine. Furthermore, work is described in this section, which is also necessary for the installation and connection of the machine. Starting up the machine will be first described in chapter ”Starting up”.

4.1 Unpacking the machine

Before shipment, the machine is packaged for transportation. Un- pack the machine and dispose of the packaging material.

Environmental protection

Recyclable materials are used for packaging the machine. Dispose of the packing material in compliance with the nationally valid environmental protection regulations.

4.2 Transporting the machine

If you wish to load the machine onto a suitable transport vehicle, jack rings must be fitted on the machine.

Use the slinging points provided on the machine when loading it by crane. Only in this way can you be sure that the machine is suspended horizontally and securely in the hook and will not be able to tip over.

Danger of crushing

When lifting with the crane, determine the centre of gravity of the machine by lifting carefully. All cables or chains on the lifting gear must be tensioned evenly and the machine must be raised evenly at all support points.

Suspended Load

Make sure personnel do not walk under suspended loads.
Only use an auxiliary loading device with a loadbearing capacity designed to support the gross weight of the machine!

⚠ Danger

The machine may only be loaded by crane if it is attached by the lifting eyes designed for this purpose. Lifting equipment, lifting tackle, support trestles and other auxiliary equipment must be reliable and safe in operation. Make sure that the load-bearing capacity is sufficient. Additional loads on the machine are not permitted. Observe the maximum gross weight on the rating plate.
The machine must be properly secured on the transport vehicle to prevent it rolling away, slipping or tipping over.

4.3 Selecting the set-up site

The set-up site of the machine is usually determined and appropriately prepared by the site management.

Notes

The responsibility for setting up the machine safely falls on the operator.

4.4 Requirements for installation site

Check the intended installation site carefully and do not accept the installation site if there are any safety concerns.

- The load-bearing capacity of the ground must be able to withstand the weight of the machine.
- The ground must be level and even.

⚠ Danger

Keep a safe distance from pits and embankments. Never perform construction beneath the machine. Check the machine stability constantly during operation.

► Put the machine in working position – horizontal position.

⚠ Caution

The machine must only be operated in horizontal position.

4.5 Positioning

The machine must be positioned in such a way that it is absolutely safe and secured against slippage.

► Secure the machine against rolling by securing it with the foot brake

► Align your machine horizontally.

Foot brake

To secure the machine against rolling, foot brakes are fitted to the castors.

⚠ Caution

Always press the foot brake firmly to prevent unintentional release!

To release the foot brake, lift the lever with the tip of your foot.

Note

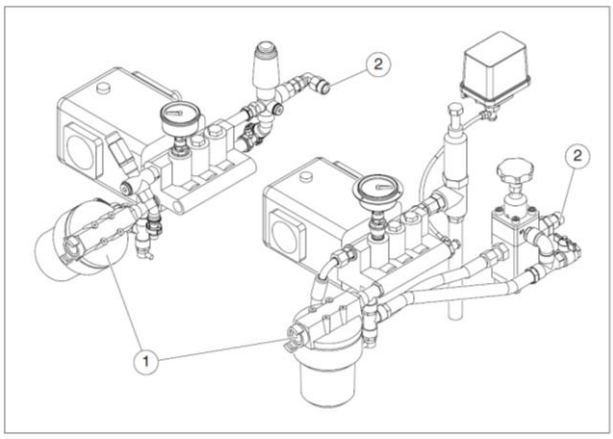
The foot brake must be released before moving the machine.

4.6 Connecting the machine

Before the machine can be put into operation, the unit must be connected correctly. The correct connection of water supply line, high pressure hose lines and standard accessories is described in the following subchapters.

4.6.1 Water connections

Instructions for connecting the high-pressure washer to the water supply are provided below.



Item	Designation
1	Connection to the water supply (depending on model)
2	High-pressure hose line connection (depending on model)

The connection to the water supply may only be made in accordance with DIN 1988 - TRWI, i.e. by means of a pipe separator of installation type 1 or free outlet (intermediate tank with booster pump).

Before starting the connection work, check that prerequisites for the water connection are met.

- The line cross-section must be at least 3/4".
- The connection must be made via a water hose at least 5 metres long (alternatively, the installation of a water hammer damper is permissible)
- The available water pressure must be at least 2 bar and must not exceed 6 bar.

The water supply line must be clearly laid and secured against damage, taking into account the local conditions. They must not obstruct the operating personnel.

► Unwind the water hose from the water hose reel to the required length and connect it to the water supply (1).

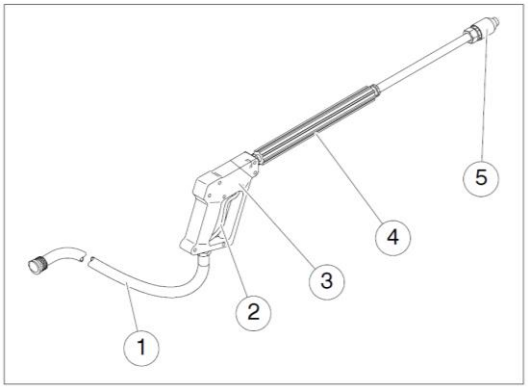
► Unwind the high-pressure hose line and connect it to the high-pressure connection (2).

⚠ Caution

The water used must be clean and of potable water quality.
The maximum water temperature is 40 °C. Never use: Salt water, seawater, demineralised water or water with added chemicals.
Only add chemicals or cleaning agents after consultation with DYNAJET GmbH.
If there is a risk of frost, the lines must be laid in such a way that the water cannot freeze.

4.6.2 Installing the high-pressure gun

When using the high-pressure gun for the first time or after maintenance or cleaning, you must assemble it as described below.



Item	Designation
1	High-pressure hose
2	High-pressure gun lever with safety
3	High-pressure gun
4	High-pressure pipe with insulation
5	Flat spray nozzle

► Fit the high-pressure pipe with insulation (4) and flat spray nozzle (5) to the high-pressure gun (3).

►Connect the high-pressure hose line (1) to the high-pressure connection (2).

4.6.3 Electrical connection

Please also refer to the ”General Technical Description” or the electrical circuit diagram for the electrical connection values.

Refer also to chapter: ”General Technical Description” - section: ”Technical data” and “rating plate” for more details.

Heavy current

Work on the electrical system and equipment of the machine must be carried out by a qualified electrician or by instructed persons under the supervision and guidance of a qualified electrician and in accordance with electrical engineering rules and regulations.

The electrical connection must be made on the basis of the electrical circuit diagram supplied.

The electrical circuit diagram can be found in the machine spare parts list.

Caution

Do not turn the main switch on at this stage.
The main switch must remain locked until the entire system has been completely assembled.

4.6.3.1 Prerequisites

Electrical installation prerequisites should be checked by a qualified electrician before connection work begins.

- The connected load of the existing electrical installation must be sufficient for the machine.
- Please refer to the technical data for the maximum back-up fuse values.
- The installation should always be connected to a special feed point.
- All 3 phases and the PE (Potential Earth) protective conductor must be present.

4.6.3.2 Laying electrical supply cables

Supply cables must be laid visibly, taking local conditions into consideration, and secured against damage.

⚠ Danger

There is a danger of electric shock which may have lethal consequences by:
– contact with electrical cables;
– contact with machines with electrical drives, if the electrical connection has not been properly made or the supply cable is damaged.

4.6.3.3 Connection to the mains power supply

The machine must be connected to a separate feed point at the construction site.

The following power sources are permissible as a special feed point:

- Site power distribution point
- Small site power distribution point
- Protective distributor
- Movable protective device

The machine is electrically ready for service once the mains plug is plugged into a power source.

5 Starting up

In this chapter you will find information on starting up the machine. The work steps for initial operation of the machine are described as well as how to prepare the machine for operation after a long break.

There is also a description on how to check the condition of your machine and how to carry out a test run with function checks.

Notes

The operating personnel should be trained on the machine during initial operation.

Every time the machine is in operation, the operator accepts full responsibility for the safety of anyone located in the machine's danger zone. He is therefore obliged to ensure absolute operating safety of the machine. The operator must familiarise himself with the machine during machine handover.

This means:
He must have read and understood the Operating Instructions (especially the chapter on Safety Regulations).

He must be in a position to carry out the correct measures in case of emergency and switch off and secure the machine.

The entire system must be observed during the initial hours of operation to identify possible malfunctions.

5.1 Checks

Each time the machine is used at a construction site, you should check the condition of your machine and carry out a test run including function checks. If you identify any faults during the checks, you must eliminate these (or have these eliminated) immediately.

5.1.1 Visual checks

Some important visual checks should be carried out before starting up the machine.

- Always check the machine thoroughly for apparent defects be- fore starting work.
- Check that the water supply is connected to the machine correctly.
- Check that the high-pressure pipe, fan jet nozzle and high- pressure hose are fitted to the high-pressure gun correctly.
- Check the high-pressure hose for damage.
- Check the water filter for contamination.
- Check that all safety equipment is in place and is fully operational.

5.1.2 Water filter

A contaminated water filter may result in damage to the high-pressure water pump. The filter system cleans the supplied water, thus safeguarding the high-pressure water pump.

Caution

Use only clean mains water.

If the water filter is contaminated, the integral water deficiency monitor switches the machine off or prevents the machine from being started.

The filter element changes colour when dirty.

Replace the filter element on the water filter should discolouration occur.

⚠ Environmental protection

Observe all applicable local waste disposal regulations when changing the filter.

5.1.3 Electrical connection

Using faulty electrical components or connecting components incorrectly may result in serious injury (possible fatal) or severe damage to the machine.

- Always check all electrical components carefully for apparent defects before starting work.
- Check whether the required power supply is available.

5.2 Test run

Prior to operating the machine, execute a test run.

5.2.1 Start-up conditions

Before starting up the drive engine, the following start-up conditions must be present:

- The machine must be in horizontal position.
- The machine must be connected to a suitable water supply (min. 2 bar, max. 6 bar). Observe the section “Water connection” in the chapter “Transport, installation and connection”.
- The machine must have the required power supply. Observe the section “Power connection” in the chapter “Transport, installation and connection”.
- The water filter must be clean (water shortage safety device).

For the test run, start the drive engine first and then switch on the pump. While the machine is running, check some functions.

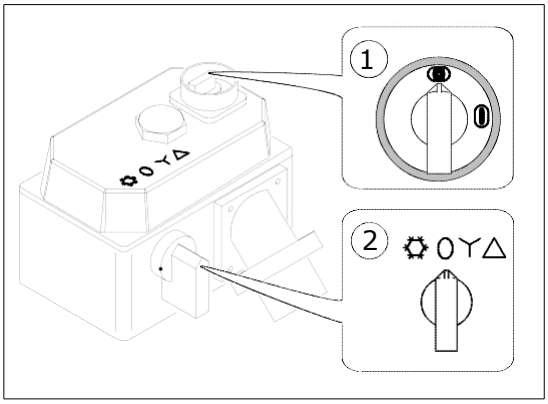
Note

If this test reveals faults, they must be remedied immediately.

After each repair, recheck the machine. Operate the machine only when all subsequent checks have been completed successfully.

5.2.2 Starting the drive engine

The drive engine is switched on with the main switch and the star-delta switch.



Item	Designation
1	Main switch
2	Star-delta switch

- Switch the main switch (1) on.

⚠ Caution

When switching on the drive engine, the pressure end must be fully open, that is, you must press the high-pressure gun lever.
Rapid filling of the pump is favoured thus preventing dry running.

- Switch the star-delta switch (2) to "star" position.
  - The drive engine starts up.

- After approx. 5 seconds switch further to "delta" position.
  - The drive engine reaches its rated speed.

5.3 Shutting down machine after initial operation

After the function check, you can shut down the machine.

►Switch the main switch to OFF.

►Press the high-pressure gun lever to relieve the pressure.
=>The residual pressure in the hose and high-pressure gun is relieved.

► Secure the machine against unauthorised starting or use.

6 Operation

In this section you will find information on machine operation. You will learn what operations are required for setting up the machine, operation and for cleaning.

Requirements

Before starting work, you must carefully carry out the working steps for commissioning and installing the machine.

Notes

If a malfunction occurs during the working process, refer to the Section ”Faults, causes and remedies” first. If you are unable to rectify the fault yourself, consult a dealer authorised by Dynajet GmbH.

6.1 Setting values

The setting values depend on the tasks being carried out.

Notes

There are specific setting values for every type of cleaning task to help achieve the best cleaning results. Contact Dynajet GmbH for advice on the correct setting values for your specific cleaning needs.

Cleaning surfaces

Do not direct the cleaning jet vertically onto the surfaces to be cleaned. Try to ”peel off” the dirt layer from the surfaces.

6.2 High-pressure cleaning

For cleaning work, proceed as follows:

⚠ Danger

Wear all necessary protective equipment. This also applies for all personnel standing within the operating area of the machine (for their own safety).

Never direct the water jet at people or animals.

Pay attention to the confines of the danger area when performing work involving high-pressure water jets. No personnel apart from the machine operator should stand within a 10 m radius of the high-pressure gun.

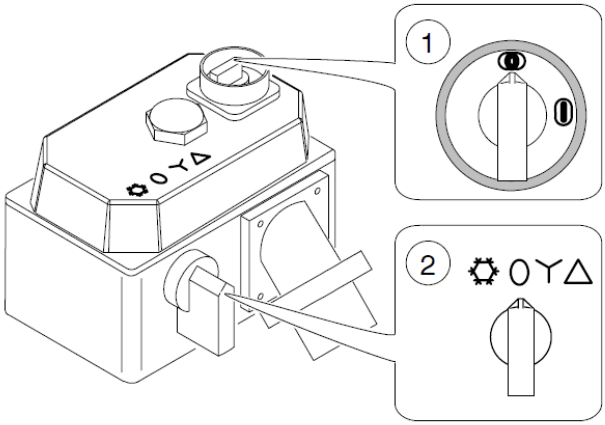
When operating the high-pressure gun, always hold firmly with both hands.
Place one hand on the high-pressure gun trigger and the other hand on the insulated section of the high-pressure pipe.

The high-pressure gun produces recoil and torque when activated. Ensure equipment is secure and stable.

Do not crush high-pressure hoses or guide them over sharp edges. Avoid tensile and bending stress.

6.2.1 Starting the drive motor

The drive motor is switched on at the main switch and the star-delta switch.



Item	Designation
1	Master switch
2	Star-delta switch

► Switch on the main switch (1).

Caution

The delivery side must be fully open when the drive motor is switched on, i.e. press the high-pressure gun trigger.
This fills the pump more quickly and avoids dry runs.

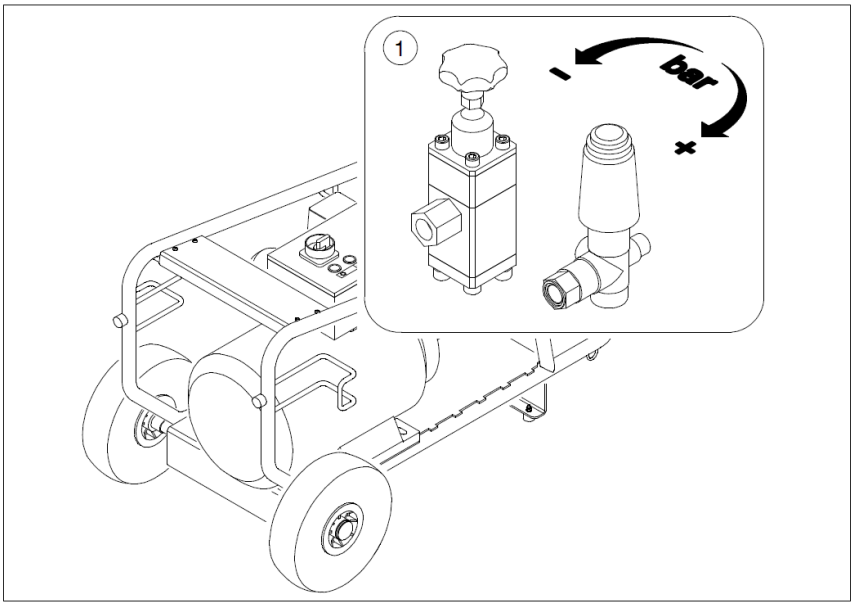
- Switch the star-delta switch (2) to the ”star” position.
  - The drive motor starts up.

- After approx. 5 seconds, switch to the ”delta” position.
  - The drive motor reaches its rated speed.

6.2.2 Adjusting the working pressure

You can adjust the working pressure by turning the unloader.

Notes
There is no motor speed adjustment feature on the drive motor. The engine speed is controlled depending on the load.



Item	Designation
1	Handwheel on the unloader (depending on model)

► Turn the handwheel on the unloader (1) clockwise to increase the working pressure.

► Turn the handwheel on the unloader (1) anticlockwise to de- crease the working pressure.

Notes
Your machine may be fitted with a preset unloader depending on the model.
Adjusting the working pressure settings on this model is not possible!

6.3 Operating the heating module (optional)

The high-pressure cleaner is designed for operation with hot water that reaches a max. temperature of 95 °C. A heating module (not included in the scope of supply) must be integrated in the system. Read the ”Heating module” section in the chapter ”General technical description”.

⚠ Danger

The high-pressure hose, the high-pressure gun and the pressurised water pose a risk of burns and scalding.
Perform any work extremely carefully while a heating module is connected.

Notes

Read the documentation accompanying the heating module.
Consult the Dynajet GmbH After Sales department.

6.4 Cleaning the machine

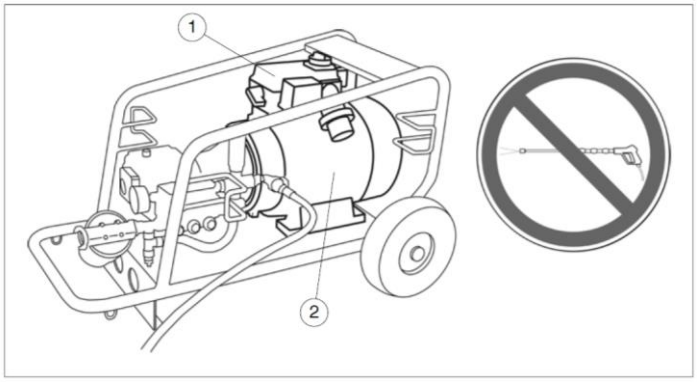
After completing your work, clean the machine, the high-pressure gun and the high-pressure hose. This ensures that the machine will function correctly the next time it is used.

6.4.1 Information on cleaning

Notes

In the first four operating weeks clean all painted surfaces with cold water with a maximum water pressure of 5 bar only. Do not use any aggressive cleaning additives. Only after this time will the paint have hardened completely, allowing you to use steam jet equipment or similar tools.

Under no circumstances use sea water or any other salty water for cleaning purposes. Should sea water get onto the machine you must rinse it off without fail.



Item	Designation
1	Control cabinet
2	Drive motor

Caution

Do not clean the control cabinet or the drive motor with pressurised water.

Cover all openings prior to cleaning. For safety or operating reasons, moisture must not be allowed to enter these openings.

⚠ Environmental protection

Observe all applicable local waste disposal regulations when performing cleaning work.

Do not allow cleaning additives to enter the sewerage system.

- Remove all covers after cleaning!

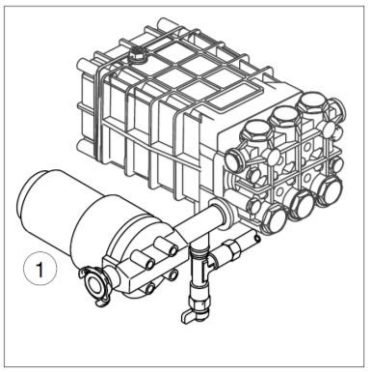
- Clean the low-pressure hose and the high-pressure hose with a suitable cleaning cloth and wind up the hoses.

- Clean the high-pressure gun with a suitable cleaning cloth.
  The high-pressure gun trigger must be easy to operate.

6.4.2 Water filter

The amount of dirt on the water filter depends on the water quality. The filter element changes colour when dirty. Clean or replace the filter element if it changes in colour or the maintenance intervals have been reached. Read the ”Maintenance intervals” section in the chapter ”Maintenance”.

► Completely drain the water from the hoses.



Item	Designation
1	Water filter

► Unscrew the water filter(1).

► Unscrew the union nut on the water filter(1) and remove the fil- ter casing and filter element.

► Clean the water filter(1).

► Replace the cleaned or new water filter(1).

Notes
Ensure that the gasket is correctly seated.

7 Faults, Cause and Remedy

This section gives you a summary of faults and their possible causes, and also ways in which you may rectify them. Observe the safety regulations when troubleshooting.

Heavy current

Work on the electrical system and equipment of the machine must be carried out by a qualified electrician or by instructed personnel under the supervision and guidance of a qualified electrician and in accordance with electrical engineering rules and regulations.

7.1 Machine in general

Some common causes of faults and their remedies are described below.

The operating pressure fluctuates	
Cause	**Remedy**
The water filter is dirty.	Clean or replace the water filter.
The flat spray nozzle is clogged or worn.	Clean or replace the flat spray nozzle.

The operating pressure is too low	
Cause	**Remedy**
The flat spray nozzle is too big.	Use a smaller flat spray nozzle.
The water pump seal is worn.	Have the pump seal replaced.
The pump valves are soiled or stick.	Consult the customer service of DYNAJET GmbH.

The operating pressure is too high (pressure relief valve or unloader responded)	
Cause	**Remedy**
The flat spray nozzle is too small.	Use a larger flat spray nozzle.
The flat spray nozzle is soiled.	Clean the flat spray nozzle.

The LED "Oil pressure of drive engine" is lit.	
Cause	**Remedy**
Too low of a motor oil pressure	Too low of a motor oil level
	Wrong grade of lubricant of motor oil
Too low of a motor oil pressure	Check motor oil level; top up, if necessary
Wrong grade of lubricant of motor oil	Change motor oil
Motor oil filter soiled or clogged	Clean motor oil filter; replace, if necessary
Defective motor oil pressure switch	Check it; have it replaced, if necessary

7.2 Electrical system

Some possible causes of faults affecting the electrical system and their remedy are described below.

High-voltage current

Tasks at electrical systems may be completed only by an electrician or instructed personnel under guidance and supervision of an electrician, and according to the generally accepted rules of electrical engineering.

The drive engine does not pull in at start-up.	
Cause	**Remedy**
The drive engine does not run on three phases.	Check the electrical supply line.
The electrical fuse protection of the machine is inadequate.	Use the correct electrical fuse protection.

The main switch does not engage and falls back to zero position.	
Cause	**Remedy**
The water pressure in the water supply line is too low.	Use a different water supply or connect a booster pump.
The water filter is dirty.	Clean or replace the water filter.
The electrical fuse protection of the machine has tripped.	Refer to the section “The electrical fuse protection has tripped” in this chapter.
The motor circuit breaker has tripped.	Refer to the section “The motor circuit breaker has tripped” in this chapter.

The electrical fuse protection has tripped.	
Cause	**Remedy**
The electrical fuse protection of the machine is inadequate.	Use the correct electrical fuse protection.
The tripping characteristic of the electrical fuse protection is too sensitive.	Use the correct electrical fuse protection.
The electrical supply profile is too small.	Use a higher electrical supply profile.

The motor circuit breaker has tripped.	
Cause	**Remedy**
The electrical supply profile is too small.	Use a higher electrical supply profile.
The electrical supply line is wound up, e.g. on a cable drum.	Unwind the electrical supply line.
The electrical connection has the wrong power frequency.	Compare the power frequency with the machine frequency indicated on the nameplate. The two frequencies must match.
The drive engine is not adequately ventilated.	Position the machine so that the drive engine receives circulating air opposite.

8 Maintenance

In this chapter you will find information on the maintenance work necessary for the safe and efficient operation of the machine.

Following the general maintenance information, you will find the maintenance charts necessary for this machine. A summary of the maintenance charts listed by number is included in the table of contents.

We should like here to emphasise expressly that all prescribed checks, inspections and preventative maintenance work must be conscientiously carried out. Otherwise we will refuse any liability or warranty claim. Our After Sales department is available to you with advice and help at any time should you be in doubt.

8.1 Maintenance intervals

The following table shows the intervals for the various maintenance tasks.

Notes

Have the initial after-sales service carried out by a Dynajet GmbH After Sales service engineer or by a dealer authorised by Dynajet GmbH.

Interval	Assembly	Inspection criteria	Measure	Reference
daily	Safety equipment	Visual inspection	Repair the safety device	
daily	Electric cabling	Visual inspection	Replace the electric cabling	
daily	High-pressure gun trigger	Ease of movement	Make sure the high-pressure gun trigger is fully functional	
daily	Water filter	Cleanliness	Clean the water filter	Chapter *"Operation"*– section: *"Water filter"*
daily	High-pressure hose	Visual inspection	Replace the high-pressure hose	
50 h	High-pressure water pump	Full oil change	Change the oil after operating for the first time	Chapter "Maintenance" *section:* "Operating materials"
150 h	Fan jet nozzle	Cleanliness, wear	Clean or replace the fan jet nozzle	
	High-pressure water pump	Fluid level	Top up oil	
	High-pressure water pump	Check pump valves	Clean or replace the pump valves	
400 h	Water filter	Cleanliness	Replace the water filter	Chapter *"Operation"*– section: *"Water filter"*

Interval	Assembly	Inspection criterion	Measure	Reference
500 h	High-pressure water pump	Full oil change	Change oil after the first oil change	Chapter ”Maintenance” - *section:* “Operating materials”
annually	Entire machine	Industrial safety inspection (APR)	Industrial safety inspection by qualified personnel	Use industrial safety inspection form
annually	Threaded connections	Torque	Check threaded connections with the torque wrench in accordance with the torque table	Chapter *”Appendix”* section: “*General tightening torques*”
6 years	High-pressure hoses	High-pressure hoses may be used for a maximum of 6 years. The previous storage time for unconnected hoses is a maximum of 4 years.		
If there is danger of free- zing	Complete water system	Frost protection	Provide antifreeze protection	Maintenance chart: *Antifreeze protection measures*

8.2 Operating materials

This section lists all the operating materials used in your machine.

High-pressure water pump

If the high-pressure pump is used at other ambient temperatures, a separate request regarding the required oil grade must be made. The oil should only be changed at operating temperature.

⚠ Environmental protection

You must carefully collect all operating materials, e.g. used oil, filters and auxiliary materials and dispose of them separately from other waste. Observe the national and regional regulations applicable to your area.

Only work with waste disposal companies who are approved by the responsible authorities.

DYNAJET
Water Jetting Systems up to 3,000 bar

Service information

Part no.	SI grp.	SI no.
XXXXXX	80	SI101130

Oil types and volumes for Dynajet machines

Kind of Unit / Trolley										
			HD - Pump		Gear		Engine			Note:
			Oil Type	Volume	Oil Type	Volume	Oil Type	Volume with oil filter	Volume without oil filter	
*	150/280	ME	SAE 30 W	1,13 L	-	-	-	-	-	-
*	150/280	MG	SAE 30 W	1,13 L	SAE90 W	0,26 L	SAE 30 W	1,60 L	1,40 L	-
*	350	ME	SAE 30 W	1,13 L	-	-	-	-	-	**
*	350	MG	SAE 30 W	1,13 L	SAE90 W	0,26 L	SAE 30 W	1,20 L	1,10 L	**
*	350	MG+	SAE 30 W	1,04 L	SAE85/140 W	0,35 L	SAE 30 W	1,20 L	1,10 L	**
*	350	MD	SAE 30 W	1,13 L	-	-	SAE 10W40	2,75 L	2,50 L	**
*	500	ME	SAE 75W90 / 30W	0,90 L	-	-	-	-	-	**
*	500	MG	SAE 75W90 / 30W	0,90 L	SAE90 W	0,26 L	SAE 30 W	1,20 L	1,10 L	**
*	500	MD	SAE 75W90 / 30W	0,90 L			SAE 10W40	2,75 L	2,50 L	**
*	500 / 27L	ME	SAE 30 W	2,59 L	-	-	-	-	-	-
*	500 / 30L	ME	VG220 o. SAE 90	3,00 L	-	-	-	-	-	-
*	800/1000	ME	VG220 o. SAE 90	1,70 L	-	-	-	-	-	-

Kind of Unit / Trailer										
			HD - Pump		Gear		Engine			Note:
			Oil Type	Volume	Oil Type	Volume	Oil Type	Volume with oil filter	Volume without oil filter	
*	350	th	SAE 30 W	1,13 L	-	-	SAE 10W40	3,50 L	-	-
*	500	th	VG220 o. SAE 90	3,00 L	-	-	SAE 10W40	8,00 L	-	-
*	800	th	VG220 o. SAE 90	1,70 L	-	-	SAE 10W40	8,00 L	-	-
*	UHP	170	VG220 o. SAE 90	13,00 L	-	-	SAE 10W40	10,50 L	-	-
*	UHP	220	VG220 o. SAE 90	14,00 L	-	-	SAE 15W40	13,00 L	-	AdBlue 10L

* Check oil level by dipstick. Please ensure that the dipstick is always completly screwed in to check the level.

** AGIP Synthetic ÖI PAO API GL5 / GL4

DYNAJET GmbH Wilhelm-Maybach-Straße 2 72622 Nürtingen Germany Tel + 49. 7022. 30411-444 Fax + 49. 7022. 30411-5444

8.3 Notes on maintenance

This measure is necessary for all machines connected to the mains.

Heavy current

Work on the electrical system and equipment of the machine must be carried out by a qualified electrician or by instructed persons under the supervision and guidance of a qualified electrician and in accordance with the electrical engineering rules and regulations.

⚠ Danger

During initial maintenance, all cable connections pertaining to the control cabinet (clips, connectors etc.) must be checked and retightened in accordance with the electrical engineering rules and regulations. Otherwise, correct electrical contact cannot be guaranteed, and there is a risk of short-circuit and fire!

8.4 Maintenance Chart

8.4.1 General maintenance work (2)

This maintenance chart describes general maintenance tasks and contains notes that apply to all maintenance work using maintenance charts.

Caution

Maintenance work must only be carried out by authorised personnel with special knowledge and experience.

Preparation

The following tasks must be carried out prior to maintenance work:

► Set the machine up horizontally on level ground.

⚠ Danger

Shut down the machine before starting maintenance work and secure it against unauthorized or accidental starting.

If it is necessary to start up the machine in the course of its maintenance, this is specially indicated in the maintenance charts.

► Switch off the machine.

► Secure the machine against unauthorised starting.

► Secure your working area and fix notices to the locked controls and setting devices.

► Disconnect the machine from the main supply for all electrical work.

Completion

To complete the maintenance work, you must carry out the following activities:

► Remove the piece of wood between the frame and the hood.

► Close the hood again.

8.4.2 High-pressure water pump (3)

This maintenance chart describes how to check the oil level and change the oil in the high-pressure water pump. You will find the maintenance intervals in the maintenance summary at the start of this chapter.

Refer also to the maintenance charts:
Maintenance tasks, general

Note

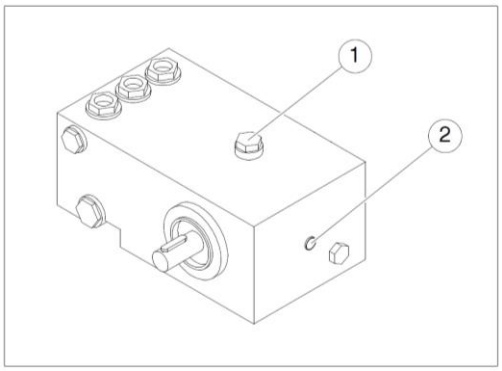
Ensure that dirt or other impurities cannot enter the pump oil system. Access the high-pressure water pump via the maintenance flap. Refer also to the documentation provided by the high-pressure water pump manufacturer for further information on the high-pressure water pump.

Caution

Maintenance work must only be carried out by authorised personnel with special knowledge and experience.

Fluid level check

The high-pressure water pump is located in the engine compartment. Check the oil level as follows:



Item	Designation
1	Oil filler plug with vent valve
2	Inspection glass

► Remove the maintenance flap.

► Check the oil level for the high-pressure water pump at the inspection glass (2) and top up oil if necessary.

► Unscrew the oil filler plug (1) and top up with fresh oil until the required oil level is reached.

► Screw in the oil filler plug (1) again.

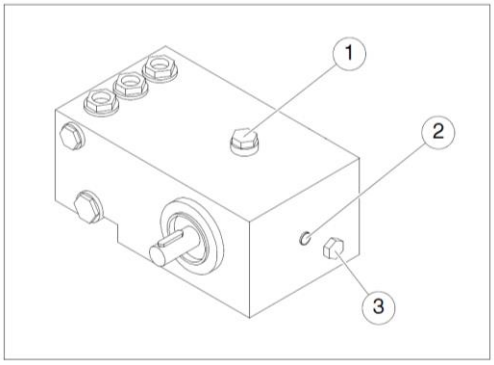
► Replace the maintenance flap correctly.

Notes

Top up the oil level of the high-pressure water pump to the middle of the inspection glass. The high-pressure water pump requires a high pressure oil SAE 10W-40.

Oil change

The oil should only be changed at operating temperature. Carry out the fluid change as follows:



Item	Designation
1	Oil filler plug with vent valve
2	Inspection glass
3	Oil drain plug

► Remove the maintenance flap.

► Place a sufficiently large oil catch pan under the machine.

► Unscrew the oil filler plug (1).

► Unscrew the oil drain plug (3).

► Dispose of the old oil in accordance with regulations.

► Screw in the oil drain plug (3) again.

► Now add fresh oil through the oil filler plug opening until the required oil level is reached.

Refer also to chapter: ”General Technical Description” - section: ”Technical data” for more information on fluid capacities.

► Screw in the oil filler plug (1) again.

► Replace the maintenance flap correctly.

Environmental protection

Carefully collect the old oil and avoid oil spillage. Separate the collected oil from other waste. Dispose of all components in accordance with current applicable regulations! Observe the national and regional regulations applicable to your area. Only work with waste disposal companies who are approved by the responsible authorities.

Checking for leaks

The following checks are necessary after changing the oil:

► Start the engine. Refer also to chapter: ”Starting up” - section:”Starting the engine”.

► Leave the engine to run for approximately 2 minutes while actuating the high-pressure gun.

► Switch off the engine and check whether the oil drain plug is leaking.

► Seal up any leaks that occur.

► Inspect the oil level at the inspection glass.

► Top up with oil if required.

8.4.3 Antifreeze protection measures (14)

This maintenance chart describes the implementation of antifreeze protection measures for the machine.

Refer also to the maintenance charts:
General maintenance work

⚠ Environmental protection

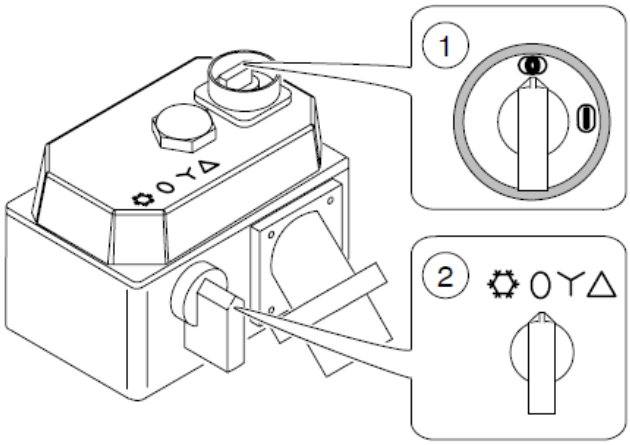
Carefully collect escaping antifreeze and keep it separate from other waste.
Dispose of all fluids in accordance with current applicable regulations.
When using antifreeze, observe the waste disposal regulations that apply to your region.

Protecting the machine against freezing

To protect the machine from freezing, proceed as follows:

► Assemble the high-pressure gun without a fan jet nozzle and connect accordingly.

► Connect the low-pressure hose and place in a container with sufficient antifreeze (concentration as required).



Item	Designation
1	Main switch
2	Star-delta switch

- Set the star-delta switch to the ”Antifreeze” position, actuate and hold.

Caution

The machine should only be operated momentarily in the ”Antifreeze position”. Otherwise, the drive motor may be damaged.

- Switch the main switch on.
  - The drive motor starts up.

- Hold the high-pressure gun over a bucket and actuate the high-pressure gun trigger.
  - The water valve fitting is filled with antifreeze.

- Actuate the high-pressure gun trigger until antifreeze escapes from the gun.

- Release the high-pressure gun trigger.

- Allow the machine to continue operating for approx. 10 seconds.
  - The bypass is filled with antifreeze.

▶ **Notes**
These measures ensure that antifreeze floods the entire high-pressure section.

- Release the star-delta switch.

- Press the high-pressure gun lever to relieve the pressure.
  - The residual pressure in the hose and high-pressure gun is relieved.

- Detach the low-pressure hose and hang up to drain.

- Detach the high-pressure hose and hang up to drain.

- Detach the high-pressure gun. Allow the water to drain by holding the high-pressure gun upright while actuating the high- pressure gun trigger.

- Comply with regulations when disposing of any escaped anti- freeze.

Recommissioning the frost-protected machine

To recommission the frost-protected machine, proceed as follows:

► Assemble the high-pressure gun without a fan jet nozzle and connect accordingly.

► Connect the low-pressure hose.

► Start the drive motor. Refer also to the chapter: ”Starting up” - section: ”Starting the drive motor”.

► Hold the high-pressure gun over a bucket and actuate the high-pressure gun trigger.
⇒ The water valve fitting is rinsed.

► Actuate the high-pressure gun trigger until antifreeze no longer escapes from the gun.

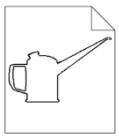
Notes
Minimal amounts of antifreeze in the tank and lines may discolour the water or cause foam to form after a longer operating period. However, this has no influence on the service life or wear characteristics of the high-pressure pump.

► Switch the main switch to OFF.

► Press the high-pressure gun lever to relieve the pressure.

⇒ The residual pressure in the hose and high-pressure gun is relieved.

8.4.4 Cleaning the cooling air section (38)



This maintenance chart describes how to clean the cooling air section.
You will find the maintenance intervals in the maintenance summary at the start of this chapter.
Refer also to the maintenance charts:

General maintenance work

Notes

See also the documentation provided by the engine manufacturer for information on cleaning the cooling air section..

Caution

Ensure that dirt or other impurities cannot enter the air system.
Maintenance and care work on the drive motor must only be carried out by a specialist authorised by Dynajet GmbH or a technically qualified specialist workshop authorised by the engine manufacturer.

Face-mask and respiratory protector
A face-mask and respiratory protector protect you against particles of dust entering your body through your respiratory passages.

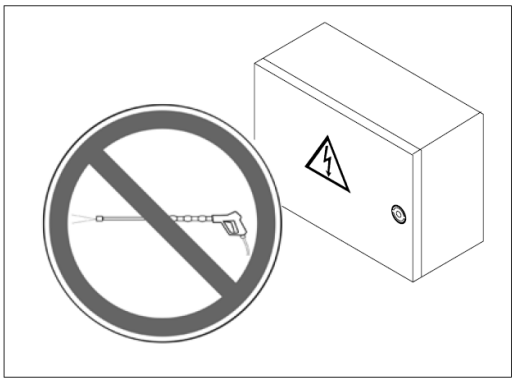
Danger

Risk of burning from hot engine components.
Work with protective gloves.

Environmental protection

Observe all applicable local waste disposal regulations when performing cleaning work.
Do not allow cleaning additives to enter the sewerage system.

Prior to cleaning the machine, cover or seal all openings where moisture should not enter for safety or operating reasons. Especially at risk are electric motors, control cabinets and electrical plug connectors.



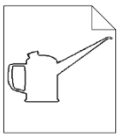
Do not allow water to enter the electrical systems

Caution

Do not clean the control cabinet or the drive motor with pressurised water.
Cover all openings prior to cleaning. For safety or operating reasons, moisture must not be allowed to enter these openings.

► Clean the cooling air section. Refer also to the documentation of the engine manufacturer.

8.4.5 Cleaning the water filter (44)



This maintenance chart describes how to clean the cartridge in the water filter.

Refer also to the maintenance charts:
General maintenance work

Notes

The filter cartridge must be changed in line with the degree of contamination
in the water supply.
Dirt is visible on the filter housing.

Caution

Rapid, heavy contamination of the filter element indicates poor water quality.
We recommend using an additional primary water filter to guarantee the required water quality.

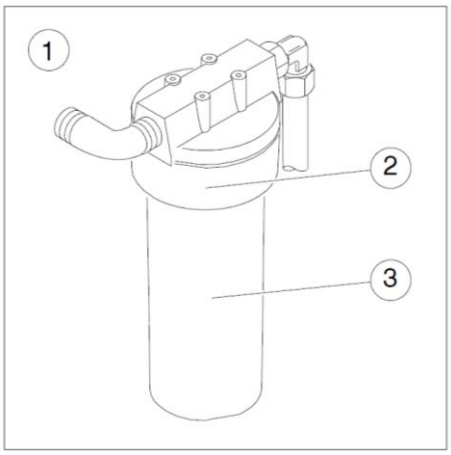
Do not use a high-pressure cleaner to clean the filter cartridge.
For cleaning work, always use clean mains water with a maximum temperature of 60 °C and a maximum water pressure of 6 bar.
On no account should salt water be used.

Environmental protection

When changing filters, observe the waste disposal regulations that apply to your region.

Continuation next side

To clean the filter cartridge, proceed as follows:



Item	Designation
1	Water filter
2	Union nut
3	Filter housing with filter cartridge

► Unscrew the union nut(2) on the water filter(1).

► Remove the filter housing with the filter cartridge(3).

► Remove the filter cartridge from the filter housing.

► Clean the filter cartridge thoroughly with water. Replace the filter cartridge if damaged or extremely dirty.

► Clean the filter housing thoroughly.

Notes

Achten Sie auf den korrekten Sitz von Filterpatrone, Filtergehäuse und Dichtungen.

► Insert a clean filter cartridge in the water filter.

► Reassemble the filter housing.

► Tighten the union nut on the water filter again.

9 Decommissioning

This chapter contains information on decommissioning the machine.

9.1 Temporary decommissioning

If the machine is to be shut down temporarily, take the following measures.

► Switch off the machine.

► Cut off the water supply.

► Actuate the high-pressure gun until water no longer escapes and the machine is depressurised.

9.1.1 Frost protection

The machine must be drained fully of residual water if there is a risk of freezing.

Maintenance chart: Antifreeze protection measures

9.2 Decommissioning

If the machine is to be taken out of service temporarily, the following measures must be carried out.

► Carry out work for temporary decommissioning.

► Before storing the machine, top it up with all the service fluids and grease it at the lubrication points.

► Read the documentation provided by the engine manufacturer.

► Protect the machine with a suitable agent.

Notes

Preservation and greasing of the machine will protect it against corrosion and rapid ageing. It is necessary, if the machine:

– is not used for longer periods

– is exposed to corrosive atmospheres during storage or transportation.

9.2.1 Location

The machine should only be stored in a dry, clean and well ventilated area.

⚠ Danger

There is a risk of fuel vapours building up and igniting if the machine is stored in a poorly ventilated area.

9.2.2 Storing the machine

Observe the following when placing the high-pressure cleaner in storage:

► Store the machine in a dry, frost-free location.

► Place the high-pressure cleaner in a horizontal position if you intend to store it for longer periods.

► If the high-pressure cleaner is to be stored for a long time you must remove the battery and charge it regularly.

► If there is a danger of freezing at the storage location, take appropriate protection measures.

Maintenance chart: *Antifreeze protection measures*

Caution

Always implement antifreeze protection measures because freezing temperatures may damage the water tank, the pressurised water pump and cause the hoses to burst.

9.3 Final decommissioning, disposal

The final decommissioning and disposal requires complete disassembly of the machine into its individual components.
When disposing of all machine components, ensure that there is no possibility of damage to health or the environment.

Environmental protection

Commission a qualified specialised company with final disposal of the machine.

⚠ Danger

During final decommissioning of the machine, escaping lubricants, solvents, preserving agents etc. represent a hazard.
They can cause chemical burns in the event of direct skin contact. Risk of injury on sharp-edged machine components.

9.3.1 Material used

The main materials used for machine construction were:

Material	Use for/in
Copper	Cables
Steel	Machine frame
	Pump units
Plastic, rubber, PVC	Gaskets
	Hoses
	Cables
	Wheels
Tin	PCBs
Polyester	PCBs

9.3.2 Parts requiring separate disposal

The following components and working materials must be separated prior to disposal:

Designation	Applies to...
Electronic scrap	Electrical supply
	PSBs with electrical components
Oil	Drive motor
	High-pressure water pump

10 Appendix

10.1 General tightening torques

Tightening torques depend on bolt grade, thread friction and bolt head bearing area. The values given in the following tables are for guidance. These values should only be used if no other values are specified in the relevant chapters of the Operating Instructions or in spare parts sheets.

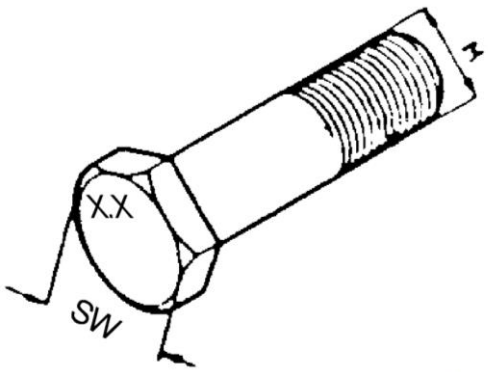
Caution

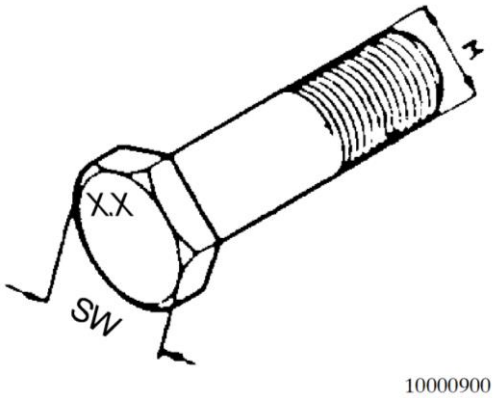
Bolts must always be replaced with bolts of the same size and grade.
Bolts with adhesive in the locking threads and self-locking nuts must always be replaced after removal.

The tables below give the maximum tightening torques (maximum torque) in Nm for a friction factor of m_{total} = 0.14, with the thread lightly-oiled or lightly-greased.

Notes

All tightening torques X 1.1 apply for bolts with cement in the thread.

Set screws -- metric triangular thread, DIN 13, Part 13					
	Dimensions [mm]		Tightening torque Md [Nm]		
	M	SW	8.8	10.9	12.9
 SW = Width across flats (A/F) X.X = Grade 8.8, 10.9, 12.9	M 4	7	3,0	4,4	5,1
	M 5	8	5,9	8,7	10
	M 6	10	10	15	18
	M 8	13	25	36	43
	M 10	17	49	72	84
	M 12	19	85	125	145
	M 14	22	135	200	235
	M 16	24	210	310	365
	M 18	27	300	430	500
	M 20	30	425	610	710
	M 22	32	580	820	960
	M 24	36	730	1050	1220
	M 27	41	1100	1550	1800
	M 30	46	1450	2100	2450

Set screws -- metric precision thread, DIN 13, Part 13					
	Dimensions [mm]		Tightening torque Md [Nm]		
	M	SW	8.8	10.9	12.9
 SW = Width across flats (A/F) X.X = Grade 8.8, 10.9, 12.9	M 8 x 1	13	27	39	46
	M 10 x 1,25	17	52	76	90
	M 12 x 1,25	19	93	135	160
	M 12 x 1,5	19	89	130	155
	M 14 x 1,5	22	145	215	255
	M 16 x 1,5	24	225	330	390
	M 18 x 1,5	27	340	485	570
	M 20 x 1,5	30	475	680	790
	M 22 x 1,5	32	630	900	1050
	M 24 x 2	36	800	1150	1350
	M 27 x 2	41	1150	1650	1950
	M 30 x 2	46	1650	2350	2750

11 EU-Konformitätserklärung

Hersteller:

DYNAJET GmbH
Wilhelm-Maybach-Straße 2
D - 72622 Nürtingen

Telefon: +49 702230411-30
E-Mail: info@dynajet.de
Dokumentationsbevollmächtigter: Jörg Helge Wirfs

Hiermit erklären wir, dass die nachfolgende Maschine

Bezeichnung:	Wasserstrahlmaschine
Typ:	150me, 280me, 350me, 500me, 500me-30, 800me, 1000me
Seriennummer:	6200XXXX

aufgrund ihrer Konzipierung und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den einschlägigen Sicherheits- und Gesundheitsanforderungen folgender **EU-Richtlinien** entspricht:

2006/42/EG	Maschinenrichtlinie
2014/35/EU	Niederspannungsrichtlinie
2000/14/EG	Outdoor-Richtlinie

Folgende harmonisierte Normen wurden angewandt:

EN ISO 12100:2011-03	Sicherheit von Maschinen – Allgemeine Gestaltungsleitsätze – Risikobeurteilung und Risikominderung
EN 1829-1:2021-04	Hochdruck-Wasserstrahlmaschinen – Sicherheitsanforderungen Teil 1: Maschinen
EN 60204-1:2019-06	Sicherheit von Maschinen – Elektrische Ausrüstung von Maschinen Teil 1: Allgemeine Anforderungen

Angewandtes Konformitätsbewertungsverfahren:

2000/14/EG: Anhang V Outdoor-Richtlinie

Schallleistungspegel gemessen: 102dB(A) Schallleistungspegel garantiert: 104dB(A)

Bei einer nicht mit dem Hersteller abgestimmten Änderung der Maschine verliert diese Erklärung ihre Gültigkeit.

Nürtingen, den 22.05.2024

Ort, Datum

Gunter Stöhr
CEO

i.A. Jörg Helge Wirfs

Jörg Helge Wirfs
Head of R&D

12 EU Declaration of Conformity

Manufacturer:

DYNAJET GmbH
Wilhelm-Maybach-Strasse 2
D - 72622 Nürtingen

Phone: +49 702230411-30
Email: info@dynajet.de
Person authorised to compile the technical documentation:
Jörg Helge Wirfs

We hereby declare that the following machine

Designation:	Water jet machine
Type:	150me, 280me, 350me, 500me, 500me-30, 800me, 1000me
Serial number:	6200XXXX

corresponds in design and construction and in the form marketed by us to the relevant health and safety requirements of the following **EU Directives**:

2006/42/EC	Machinery Directive
2014/35/EU	Low Voltage Directive
2000/14/EC	Directive relating to the noise emission in the environment by equipment for use outdoors

The following harmonised standards were applied:

EN ISO 12100:2011-03	Safety of machinery – General principles for design – Risk assessment and risk reduction
EN 1829-1:2021-04	High-pressure water jet machines – Safety requirements Part 1: Machines
EN 60204-1:2019-06	Safety of machinery – Electrical equipment of machines Part 1: General requirements

Applied conformity assessment procedure:

2000/14/EC: Annex V	Directive relating to the noise emission in the environment by equipment for use outdoors

Measured sound power level: 102dB (A) Guaranteed sound power level: 104dB (A)

The validity of this declaration expires if the machine is modified without the authorisation of the manufacturer.

Nürtingen, 22.05.24

Place, Date

Gunter Stöhr
CEO

i.A. Jörg Helge Wirfs

Jörg Helge Wirfs
Head of R&D