



**OPERATING HANDBOOK
400MC
415v - 150bar - Item No: A0103
HIGH PRESSURE WASHER**



Nilfisk Ltd

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Please read these instructions carefully before use



Technical Data

Electrical Information	Power Consumption	5.5kW
	Voltage	415v 3~
	Frequency	50Hz
Water Requirements	Motor Power	7.5Hp
	Max inlet temperature	50C
	Max inlet pressure	10bar
Performance Data	Min inlet pressure	2bar
	Maximum working pressure	150bar
	Maximum water flow rate	15l/min
	Maximum output temperature	N/A
	Sound pressure	88dB(A)
Dimensions	Maximum gun recoil force	35N
	Length x Width x Height	930 x 580 x 820
	Weight	60kg
	High pressure hose length	9m

Functional Description

Your pressure washer is made up of the following major components: -

Chassis
Electric Motor
High Pressure Pump
Bypass Valve
Hose/Gun/Lance set
Cold water enters the break tank via a float valve which shuts off the inlet water once the tank becomes full. Water is drawn from this tank by the suction side of the high pressure pump. The pump is driven by an electric motor which turns a crankshaft within the pump. Three pistons are connected to this crank and move backwards and forwards in an oil bath, the level of which should be checked regularly at the dipstick. The end third of the pistons are made of ceramic material and they pass through high pressure seals. On the back stroke of each piston, water is drawn through a non-return valve into the cylinder and is then forced out on the forward stroke through another valve.

This movement of the three pistons creates a steady stream of water but it only becomes pressurised when restricted (see high pressure nozzle description later). The water is pumped through the high pressure hose to the gun and lance assembly. When the trigger is pressed on the gun, water flows through the lance and out through the high pressure nozzle. The nozzle has a very small orifice which the water is forced through and it is at this point that the high pressure water jet is produced.

When the gun trigger is released a bypass valve (unloader) connected to the high pressure pump opens and relieves the pressure back to the water break tank until the machine is switched off.

Note - "time-out" option

If the pressure washer has the optional time-out system fitted, the pump will continue to bypass back to the water tank until the timer shuts off the motor. The machine will need to be re-started by pressing the green button once it has timed out.

Certificate of Conformity

Name of Manufacturer DTE A division of Millisk-Advance Ltd
Address Unit 24, Hillside Business Park, Kempson Way, Bury St Edmunds, IP32 7EA

Declare that the product described below is in conformity with the relevant provisions of the following directives and the National Laws and Regulations adopting these directives.

Machinery Directive	98/37/EC
Low Voltage Directive	73/23/EEC (as amended by 93/68/EEC)
EMC Directive	89/336/EEC (as amended by 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/97/EEC)
Outdoor Equipment Directive	90/384
Product Type	: Wall Mounted Pressure Washers
Model	: 400 CM Series

The product has been tested and assessed by application of the following standards or specifications, the results of which are contained in the Manufacturers Technical File SDA07TF0338. Together with all relevant National Technical Standards and Specifications as applicable.

Standard / Year	Description
BS EN ISO 12100-1:2003 :	Safety of machinery. Basic concepts, general principles for design. Basic terminology, methodology
BS EN ISO 12100-2:2003 :	Safety of machinery. Basic concepts, general principles for design. Technical principles
BS EN 60204-1:1993 :	Safety of machinery. Electrical equipment of machines. Specification for general requirements
BS EN 294:1992 :	Safety of machinery. Safety distances to prevent danger zones being reached by the upper limbs
BS EN 349:1993 :	Safety of machinery. Minimum gaps to avoid crushing of parts of the human body
BS EN 418:1992 :	Safety of machinery. Emergency stop equipment, functional aspects. Principles for design
BS EN 811:1997 :	Safety of machinery. Safety distances to prevent danger zones being reached by the lower limbs
BS EN 954-1:1997 :	Safety of machinery. Safety related parts of control systems. General principles for design
BS EN 1050:1997 :	Safety of machinery. Principles for risk assessment
BS EN 1088:1996 :	Safety of machinery. Interlocking devices associated with guards. Principles for design and selection.
BS EN 1037:1996 :	Safety of machinery. Prevention of unexpected start-up
BS EN 982:1996 :	Safety of machinery. Safety requirements for fluid power systems and their components. Hydraulics
BS EN 547-1:1997 :	Safety of machinery. Human body measurements. Principles for determining the dimensions required for access openings
BS EN 547-2:1997 :	Safety of machinery. Human body measurements. Principles for determining the dimensions required for access openings
BS EN 574:1997 :	Safety of machinery. Two-hand control devices. Functional aspects. Principles for design
BS EN 842:1996 :	Safety of machinery. Visual danger signals. General requirements, design and testing
BS EN 953:1998 :	Safety of machinery. Guards. General requirements for the design and construction of fixed and movable guards
BS IEC 61000-5-1:1996 :	Electromagnetic compatibility (EMC). Installation and mitigation guidelines. General considerations.
BS IEC 61000-5-2:1997 :	Electromagnetic compatibility (EMC). Installation and mitigation guidelines. Earthing and cabling
BS EN 61000-6-4:2001 :	Electromagnetic compatibility (EMC). Generic standards. Emission standard for industrial environments
BS EN 61000-2-4:2002 :	Electromagnetic compatibility (EMC). Environment. Compatibility levels in industrial plants for low-frequency conducted disturbances
BS EN 61000-5-7:2001 :	Electromagnetic compatibility (EMC). Installation and mitigation guidelines. Degrees of protection by enclosures against electromagnetic disturbances (EM code)
BS EN 61000-6-2:2001 :	Electromagnetic compatibility (EMC). Generic standards. Immunity standard for industrial environments
BS IEC 61000-2-7:1998 :	Electromagnetic compatibility (EMC). Environment. Low frequency magnetic fields in various environments
BS EN ISO 4871:1997 :	Acoustics. Declaration and verification of noise emission values of machinery and equipment
PD 5304:2000 :	Safe use of machinery

BS EN 61000-6-2:2001 :	Electromagnetic compatibility (EMC). Generic standards. Immunity standard for industrial environments
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BS EN ISO 4871:1997 :	Acoustics. Declaration and verification of noise emission values of machinery and equipment
PD 5304:2000 :	Safe use of machinery

Issued In:
Burton - On - Trent
Authorised Representative:

Date: August 2007
Position: General Manager

Signature:



Operating Instructions - Start Up

Please read all of the instructions below in conjunction with the diagram on page 3 of this booklet.

- Please observe the safety instructions (1) on the machine control panel.
- Attach the water hose to the water inlet (4) and turn the water on at the tap.
- Connect the high pressure hose to the water outlet (5) and ensure it is fully tightened.

- Ensure the electric cable (2) has a compatible plug fitted and plug into an RCD protected socket.
- Turn the machine on by pressing the green button (3) the motor will start and the machine is now ready to use when the trigger/gun is pressed.

Operating Instructions - Shut Down

Turn the water supply off and run the machine until the water stops coming out of the lance and then turn the machine off at (3) by pressing the red stop button.

- Relieve any trapped pressure by pressing the trigger gun.
- Remove the water pipe from the inlet coupling (3)
- Turn off the power at the socket and wrap the cable (2) around the handles of the machine.
- The machine is ready for use next time. If there is a risk of frost, ensure the machine is kept in a warm place. If this is not possible you can remove the high pressure hose/gun/lance assembly from (5) and keep this in a frost free environment.

For additional protection add an antifreeze solution to the water break tank under the cover of the machine and run the pump until it just starts to come out of the water outlet (5). This will need to be pumped through and collected for re-use next time prior to using the machine again. **Remember** - always turn the power off at the socket before removing the cover from the machine.

Maintenance

- Maintenance of this machine must be carried out by one of our qualified mobile service engineers who can be contacted via our office. Work carried out by unauthorised persons will invalidate the warranty and may affect the longevity of the machine. The recommended service interval is 4 calendar months for machines in a busy commercial environment and a minimum of 6 calendar month for other machines.

- Particular attention should be paid to the electric cable for signs of damage or wear. Do not effect a temporary repair under any circumstances. The cable must be replaced by a qualified electrician. Cable connections must be kept dry and off the ground. Extension cables if used must be a minimum of 1.5mm and be used fully uncoiled.

The oil level in the pump should be checked before use at the dip stick and topped up with SAE 20:30 oil.

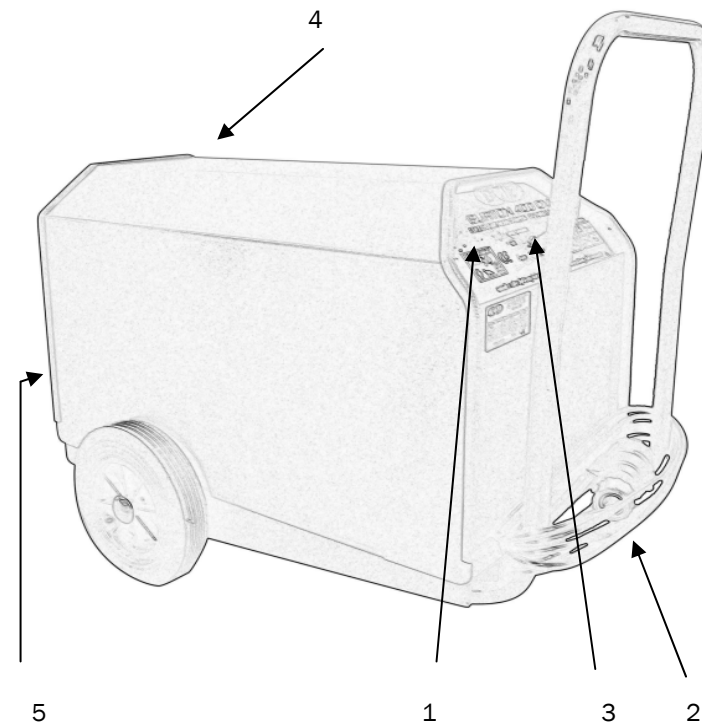
ATTENTION

- The high pressure hose is specifically designed with reinforced walls to handle high pressure water. We supply hose with a maximum rating of 400 bar but even this can easily be damaged and should be stored carefully.
- **Do not** kink, drive vehicles over, expose to sharp edges or corners.
- Do not use the machine if the hose is not completely uncoiled and extended.
- The external covering will wear out quickly if the hose is not completely uncoiled during operation.
- **Misuse will lead to ballooning or premature failure of the hose which may cause injury.**

Service Department Contact Details

Tel: 01768 868995 Email: sales.uk@nilfisk.com

Diagram



1. Safety Information

2. Electric cable

3. Start/stop switch

4. Water inlet

5. High Pressure Outlet

General Warnings

- 1) This manual has been produced for the USER.
- 2) Please read the enclosed instructions that include important points about the safety of installation, usage and maintenance.
- KEEP THIS BOOKLET HANDY FOR FURTHER INFORMATION**
- 3) Before connecting the unit to supplies, check that the data plate is the same as those of the electrical grid and the socket is protected by an RCD (Residual Current Device).
- 4) If the main plug & socket of the machine are incompatible, arrange for a qualified electrician to change one or the other. We recommend an IP67 protected plug/socket if used outdoors. We do not recommend the use of electrical extensions unless absolutely necessary, if there is no other alternative, please seek the advice of a qualified electrician.
- 5) This machine should only be used for the purpose for which it has been designed. Any other use shall be considered improper and therefore dangerous. The manufacturer cannot be held responsible if the unit is used improperly or irrationally.
- 6) Certain rules apply to any electrical machine, particularly: - **Never touch the machine with wet hands or bare feet. Never pull the power cable. If the machine stops in mid use, always turn off at the power supply. Do not allow the machine to be used by children or irresponsible people.**
- 7) The unit must always be run with an adequate water supply which is 30% higher than the water flow stated on the data label. Running dry will cause serious damage to the pump seals.
- 8) Protect the unit against freezing in cold weather.
- 9) For machines not equipped with "time-out", never leave the motor running with the trigger closed for more than 1-2 minutes as this will damage the pump seals. For machines fitted with "time-out", as a rule they should not be left switched on for any more than 5 minutes.
- 10) Ensure the machine has sufficient ventilation and never cover the unit.
- 11) Always wear suitable Personal Protective Equipment (PPE) when using the machine.
- 12) Disconnect the machine in the event of a breakdown and contact DTE (A Division of Nilfisk-Advance Limited) on 0800 542 2498. DTE or appointed agents should only repair this machine using original parts. Failure to observe this information may invalidate the warranty and compromise the safety of the machine.

- 13) If the equipment is to remain idle for any time, disconnect the electric and water supplies.
- 14) Do not use the machine if the power cable, plug or other important parts of the machine are damaged. E.g. Safety devices, high pressure hose/gun/lance.
- 15) **WARNING:** The water jet from the high pressure nozzle creates a recoil on the trigger/gun. You should therefore hold the gun and lance firmly with two hands and adopt a stable stance on firm ground.
- 16) **WARNING:** This machine has been designed only for use with cleaning agent recommended by the manufacturer. The use of other cleaning agents may adversely affect the performance, reliability and safety of the equipment.
- 17) **WARNING:** Do not use this equipment if in the range of people not wearing PPE.
- 18) **WARNING:** High pressure jets can be dangerous if subjected to misuse. Jets must not be directed at persons, animals or live electrical equipment - including the machine itself.
- 19) Do not direct the jet at yourself or others to clean footwear or clothing.
- 20) **WARNING:** High pressure hoses, fittings and couplings are important for the safety of the appliance. Use only hoses, fittings and couplings recommended by the manufacturer; preservation of the integrity of these components by preventing improper use is extremely important.
- 21) If an extension lead must be used, the plug and socket must be of a waterproof construction.
- 22) **WARNING:** Inadequate/incorrectly rated extension leads can be very dangerous.
- 23) The machine is fitted with a calibrated high pressure nozzle which determines the rated performance of the machine. Variation of the nozzle's section by damage or tampering can affect the performance of the machine and can lead to damage of the machine's components.
- 24) The machine must not be left unattended when running.
- 25) The machine cover must be in place at all times.
- 26) It is advisable to use ear protection when using this machine.
- 27) Safety devices fitted: -
GUN EQUIPPED WITH SAFETY LOCK.
MOTOR FITTED WITH THERMAL OVERLOAD
WATER PUMP FITTED WITH PRESSURE SAFETY VALVE

Warranty Conditions

All our machines are subjected to strict tests and are covered against manufacturing defects by a 12 month guarantee.

Guarantee repairs are made free of charge on the following conditions: -

- That defects are attributable to flaws or defects in materials or workmanship.
 - That the directions of this instruction manual have been thoroughly observed.
 - That the repair has not been carried out or attempted by anyone other than authorised repair staff.
 - That only original accessories have been applied.
 - That the machine has not been exposed to abuse, misuse, bumps, impacts or frost.
 - That only water free of impurities has been used.
 - That the high pressure washer has not been used for rental nor used commercially in any other way
- Important - the following are not included in the warranty: -**
- Parts subject to normal wear and tear.
 - The high pressure hose, lance or gun.
 - The electric cable.

- Accidental damage caused by transport, neglect or inappropriate treatment of the machine.
- Installation failing to comply with the indications in the instruction manual.
- Damage caused by the machine being subjected to incorrect voltages.

Repairs under this guarantee include replacement of defective parts, exclusive of packing, postage/carriage. The warranty shall not cover replacement of the machine or extension of the guarantee resulting from a breakdown. Repairs shall be carried out by one of our engineers or by an authorised agent appointed by us. The manufacturer declines all responsibility for damage to persons or property caused by bad installation or incorrect use of the machine.

This warranty does not affect your statutory rights.

Correct Use of the Machine

The performance of this machine is suitable for professional use. Structural technologies have been studied to assure high reliability and safety levels. The working temperature range is between +5 and +50°C.

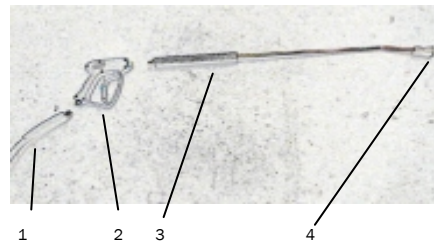
The pressure washer must be positioned on a safe and steady plane and in a horizontal position.

Do not run the machine with the cover open and ensure that the lance is being used well away from the machine in order to prevent spraying the unit. Check the supply voltage corresponds to the voltage indicated on the machine specification plate.

Electrical installation must be carried out by a qualified electrician. We recommend that this unit is protected by an RCD protected circuit either at the distribution board or at the plug/socket.

It is forbidden to carry out any modification to the structure and to any elements of the machine. The machine is used where high pressure water is needed to remove dirt.

Failure to comply with the previous procedures invalidates all warranties and the manufacturer is not responsible for any injuries or deaths employed personnel.



Hose Gun and Lance

- 1. High pressure hose** - should be kept tangle free, be checked regularly for signs of wear and replaced if necessary.
- 2. Gun** - the gun has a safety lock which should be deployed when not in use.
- 3. Lance** - the lance insulation is in place to protect from heat and the lance should be replaced if this becomes damaged.
- 4. Nozzle** - and nozzle protector. The integrity of the nozzle is important in ensuring that the machine works at its designed performance and should not be tampered with. The protector is in place to prevent the nozzle from damage.