USERS MANUAL

Version 01-2004

FIREXPRESS
FIRE FIGHTING ATV

Firexpress ApS
Lille Blodevej 3, 3600 Frederikssund, Denmark
Phone. +45 47 31 30 45 Fax +45 47 31 22 33
firexpress@firexpress.com www.firexpress.com

CONTENTS

SAFETY

This vehicle is an All terrain Vehicle, designed for driving in terrain. Use caution when driving on paved roads.

The ATV shall be operated and maintained according to Yamaha's "Operators Handbook"

The ATV is approved for one person only, no passenger allowed

Use caution driving with partly full water tanks

The nozzle shall be securely fastened when driving

The hose shall be carefully coiled up, and the hose-reel securely fastened when driving

The Fire Fighting equipment shall be operated and maintained according to this manual

Keep the equipment in good shape, check regularly the fastening, replace / repair defect or damaged components immediately

Observe the safety instructions for the foam concentrate

Use only foam approved for the Firexpress system. Wrong foam type reduces the fire fighting effect and might damage the equipment

THE ATV

This ATV is primly designed for driving in terrain on loses surfaces. Use caution when driving on paved roads. It is very important to slow down before turning and observing the long stopping distance that apply for this type of vehicle.

Tire pressure is a very important factor for driving stability.
Driving in terrain: For maximum tire friction and terrain grip use a tire pressure of:
0,25 bar/4psi
With this tire pressure and a fully loaded ATV do not exceed 30 Km/h.
Driving on paved roads: To avoid the tires from deforming / collapsing when turning and breaking on paved roads use a tire pressure of: **0,5 bar / 7,5 psi. IMPORTANT!**

ARRIVING AT THE FIRE SCENE

Approaching the fire scene it is important to slow down and evaluate the area. Look for a fairly level place to park the ATV. Do not park the ATV with more than 15 deg. Nose up. The dip tube inside the water tanks will not be able to pick up all the water if the front is more than 15 deg. up. Park the ATV with the front facing the fire. To make sure sufficient hose is available, park as close to the fire, safety permitting.

Always engage the parking brake when leaving the vehicle.

THE FIRE FIGHTING SYSTEM

The Firexpress Fire Fighting System is based on the patented dual-nozzle placed on a lance – 90 cm. long. The nozzle can deliver either a micro-drop spray or low expansion foam.
The Firexpress system utilizing the water's fire fighting capability to its maximum, therefore only a small amount of water is needed to extinguish fires.
However, it is important to keep in mind that the amount of water carried in the tank is correspondingly small. Therefore it is important to:

- **Plan carefully how to attack the fire**
- **Make a precise and concentrated attack**
- **Change position often and attack from various angles**

ACTIVATING THE SYSTEM

The Firexpress system is activated by opening the valve on the pressure tank. After a few seconds the pressure in the tank reaches 20 – 22 bar (2000 – 2200 Kpa.). The system is ready for immediate use and can be operated via the pistol grip.
IMPORTANT: The system should only be pressurised immediately before actual use. Although the system can retain pressure for several days, the pressure may slowly decrease due to microscopic leaks in seals and hose connections.

THE USE OF MICRO-DROPS

Using micro-drops for fire fighting is very effective. However, the operator should pay attention to some special factors.

Steam generation.
Due to the very small water droplets the water will be transformed into steam instantly when applied to areas with high temperature. This can be observed particularly in smaller, closed rooms.
The steam will rapidly increase the pressure in the room and force flames and burning gasses out of any available openings.

Especially in the first attack, when the temperature is high, it is important for the operator to keep clear of openings such as windows and doors. Flames and heat will most likely come out but in few seconds the temperature will decrease dramatically and a more offensive extinguishing can then be made.

IMPORTANT:
In the first attack in buildings, rooms, car cabins etc. **stay low and clear of openings.**

First attack with the Firexpress system.
The operator uses the special angled lance design to stay low and in a protected position.

When extinguishing a fire in a room, the steam can be pressed all the way to the floor and will impair the visibility in this area.
Applying the micro-drops in pulses or switch to foam and cool the walls and ceiling maintaining an acceptable steam level can control this.

Using the pulsating technique, it is important to notice that the micro-drops need 20 (+/- 10%) bar to develop. It is recommended that each pulse last minimum 2 sec. to ensure the build up of sufficient nozzle pressure.

In order to give the micro-drops the required spray range, the spray pattern also consists of large drops. The large drops create a high-speed airflow that carries the micro-drops. This airflow is strongest close to the nozzle and can in extreme cases increase the combustion process in the fire. The nozzle should always be at least 2 metres (7 feet) away from the primary fire.

The airflow has no adverse effect in cooling the smoke and/or burning gasses. The nozzle can therefore be used directly into a room through windows and doors

USING FOAM

Types of foam:
Only use foam approved for the FIREXPRESS system.
The synthetic and protein types of foam, commonly used by fire brigades, are not applicable.
Important: Use of non-approved foam may dramatically influence the development of micro-drops and reduce the fire fighting capability. Non-approved foam may have corrosive effects, which causes deterioration of gaskets, rubber hoses etc.

The foam approved for the Firexpress system is a high quality AFFF AR (alcohol resistant) that extinguishes fires in all hydrocarbon and polar solvent fuels.
The film forming effect gives excellent burn back resistance and only a thin layer of foam is required to extinguish the fire.

Use:
With the nozzle selector in foam (forward) position, the nozzle delivers low expansion foam with an expansion rate 1:5

Let the foam drop down on to the surface of burning fuel and cover the entire surface evenly. Make sure that the powerful jet of foam does not stir up the foam surface.

Often it is a good idea to turn off the foam application for a few seconds, allowing the foam to spread evenly all over the surface. When the burning fuel surface is under control, there will often be small "islands" of burning fuel left. These can be extinguished with brief pulses of micro-drops.

The fire fighter moves around the burning fuel surface and distributes the foam evenly from different angles.

Foam for Preventive Use and Class A - Fires:

When foam is used preventively on fuel spills, it is important that an even layer of foam covers the whole surface. Only a thin layer of foam is sufficiently

The foam is also applicable when extinguishing class A fires and combination fires. Once the primary fire has been extinguished or reduced by using micro-drops, the foam is used to extinguish hot-spots and deep-seated smouldering fires.

EXTINGUISHING TECHNIQUES

ROOM FIRES / BUILDINGS

Fires in partially closed rooms do have an intense turbulent airflow. Air is drawn into the bottom of the combustion process. Hot gasses are created and are forced upwards and out through the opening with great force

Attack the fire where it “breathes”. Take advantage of the incoming air and apply the micro-drops in the same direction.

In this way the micro-drops are automatically dragged directly into the combustion process

WRONG TECHNIQUE:
Do not attack the outgoing air and burning gasses
Micro-drops and steam will be pressed out of the room immediately and no extinguishing effect is obtained

Buildings in General:
Launch attacks on heavy fires and flash-hovers from the outside. Use the lance to break a window and use the micro-drops as soon as the nozzle is inside the room. If the fire is attacked through a door, open the door slightly and stick the lance through at the door and use the micro-drops along the floor towards the fire. Always begin the extinguishing from below. Try to determine from which direction the fire gets air and attack that area.
Always be prepared for flash hovers, spurts of flames and expanding fumes during the first attack.

CAR FIRE

Attack from the windward side and attack burning fuels under the car first using foam. If there are persons trapped inside the car, the cabin must be attacked immediately in order to lower the temperature. Use the lance to break the side or the rear window. The windscreen/front window cannot be penetrated.

A fire in the cabin is treated like a fire in a small room, so fight the fire from below and up. Get the nozzle inside the car and attack on and between the seats before distributing the micro-drops in the entire cabin by using revolving movements.
Important: Change your position often and attack the fire from different angles. Do not attack flames coming out through the windows.

Attack possible fuel spills with foam. Fight fires under the hood with a brief attack of micro-drops and then use foam.
Many cars have an opening between the mudguard and the radiator, from where an attack on the engine is possible without opening the hood.
Fires in the tires should first be attacked with micro-drops, then apply foam if necessary. Take advantage of the angled lance for fighting fire inside the mudguards etc. Keep an eye on the cabin at all times, and attack with micro-drops again if necessary.
Use foam to ensure that the fire is thoroughly extinguished once the preliminary extinguishing is over. Keep an extra eye on the areas under the seats, the dashboard etc.

Car fire: The fire fighter stays low and protected during the first attack with micro-drops.

BUSH FIRES

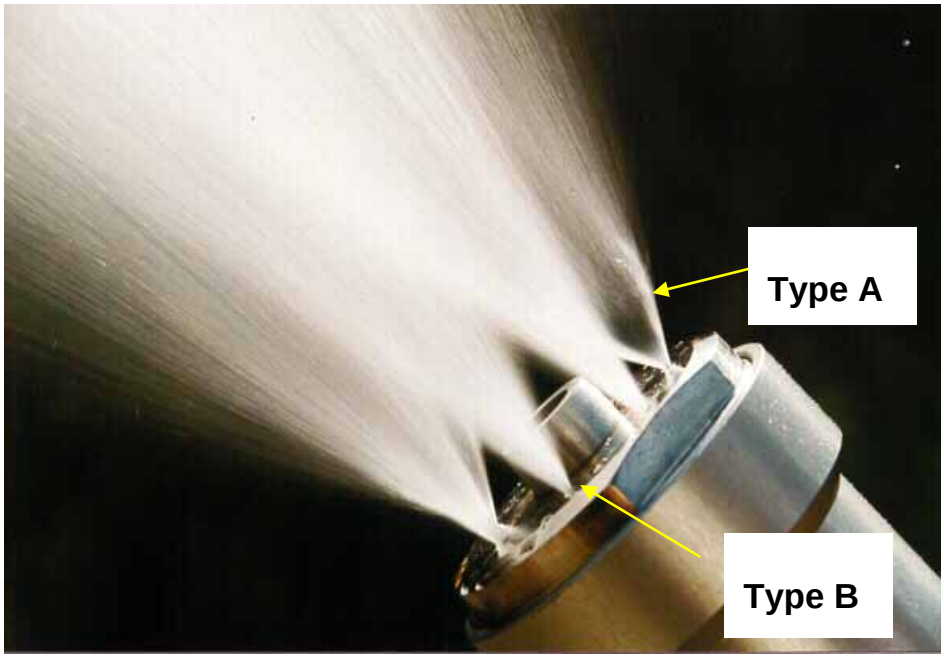
Evaluate the wind direction and attack the fire line where it appears to be spreading the most.
Select micro-drops, keep the nozzle high and attack the fire shooting down 2 -3 metres in front of you. Do **not** hold the nozzle low spraying parallel to the ground.
Concentrate your attacks along the fire line disregarding the fires in the already burned area The knock down effect is extreme high and can be performed as fast as you can walk, but be careful, small residual fires might be still be burning behind you causing a risk of flame up.
Always make sure the fires behind you are completely extinguished before moving to the next section. For taking out residual fires, use foam or micro-drops as appropriate. To conserve water the pistol grip might be squeezed partly during this type of operation.

AFTER USE

The system must always be completely emptied and subsequently refilled if it has been activated. Empty the tank and the hose using the remaining air-pressure. Be careful coiling the hose. Avoid squeezing the first turns.

REGULAR UPKEEP

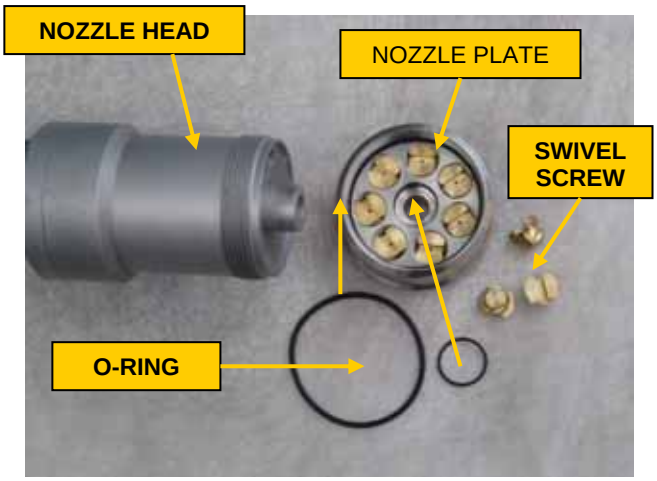
The lance, the nozzle and the pistol grip must be cleaned after use. Flush the parts with plenty of water alternating between the micro-drops and foam position. Select the micro-drops function while flushing and make sure that the spray patterns are not blocked. Remember that 3 nozzle holes have different spray patterns.



Correct spray pattern from a nozzle cleaned correctly.
Notice the different spray patterns coming from the two types of swivel screws.

Cleaning the nozzle:
Fixate the nozzle head carefully in a vice and loosen the nozzle plate with a wrench. The swivel screw can be dismantled with a screwdriver. Clean the swivel screws and the nozzle holes with compressed air.
Before re-assembling the nozzle, make sure that the O-ring between the nozzle head and the nozzle plate and the O-ring inside the nozzle plate are intact. (O-Rings number: NBR 70 Sh 200,00 x 1,50mm, and NBR 70 SH 58,42 x 2,62mm

It is recommended to spray the thread and the O-rings with silicone. Make sure they are placed correctly in the thread in the nozzle before tightening the swivel screw.



Pressure Regulator:
The pressure regulator is set to an outlet pressure of 20 bar (2000 kpa.). It is possible to adjust the pressure by turning the central screw. The outlet pressure should be between 19 bar (1900 kpa) and 22 bar (2200 kpa), 22 bar being the overall maximum.

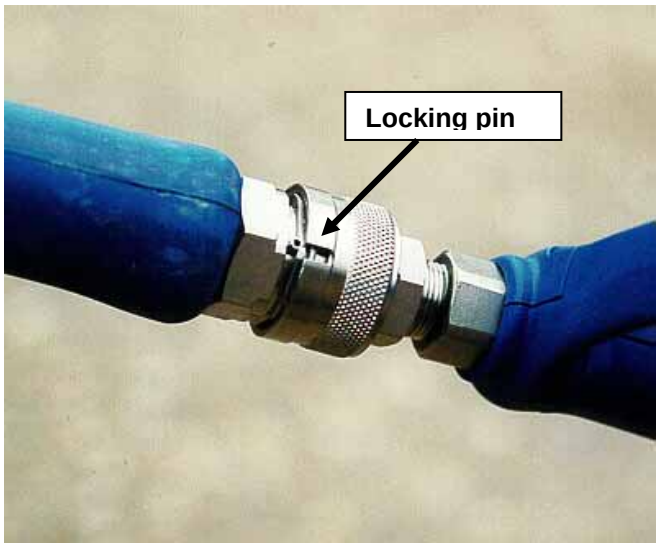
The pressure tank and the pressure cylinder must be maintained and the pressure must be checked by an approved workshop at intervals not exceeding 5 years. Check your national regulation.

REFILLING

Disconnect the pressure regulator and remove the pressure cylinder

Loosen the filling cap carefully to allow the release of any residual pressure before removing the cap.

Start filling the ***left*** tank. In order not to make partly filling of the *right* tank keep the *right* filling cap closed.
Add the FIREXPRESS approved foam to the tank. Be careful not to get dirt and other particles into the tank.
Place the filling-kit on the tank. Be very careful not to get dirt and other particles on the part of the hose that goes into the tank. If the filling-kit has been placed on the ground, dirt and other particles will stick to the hose and end up inside the tank.
Place the filling hose and the transparent outlet hose. Start filling with water and observe the outlet hose. Initially, only foam will come out of the hose, but continue to add water until a clear fluid appears.



The quick coupling on the pistol grip.
Some models are equipped with a locking pin.

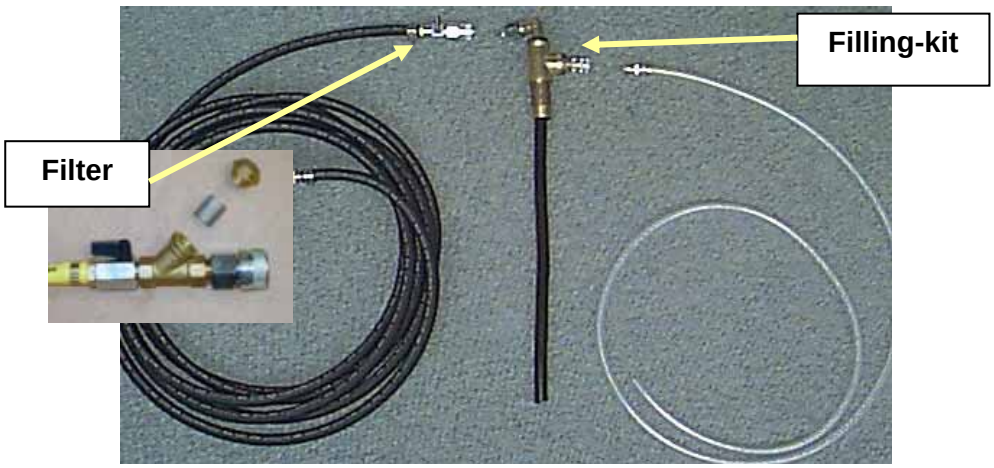
Disconnect the filling – kit. It might be necessary to ad some extra water to make sure that the tank is completely full before replacing the filling cap. (Remember to check the gasket on the filling cap).

Repeat the procedure for the ***right*** tank, making sure that the *left* filling cap is closed.

Disconnect the lance and flush the nozzle carefully using plenty of water. The quick coupling on the filling hose fits the pistol grip. Check all nozzle holes are clean and operates normally.

Place the pressure regulator on a fresh cylinder, min. 300 bar. Make sure that the gasket on the pressure regulator is intact and that the valve is tightened securely

FILLING KIT



FREEZE PROTECTION

Freeze protecting the FIREXPRESS System:

For protection against frost use inhibited ethylene glycol, which is ordinary antifreeze as used on most cars. It is available at most service stations. Each petrol company has its own brand that varies in the amount of colour used. The less colour the better. Pure, uncoloured ethylene glycol is of course also applicable.

Dosages:

25 litres tank: 3,5 litres of antifreeze secures down to -10 degrees Celsius

Freeze protection means that the unit is not damaged at the temperatures mentioned above. The effect lasts one year.

For freeze protection at even lower temperatures, contact FIREXPRESS.

Adding Antifreeze:

Empty and clean the system as usual. Fill the tank with antifreeze first, and then add the foam concentrate and then the water. Stirring may be necessary. Be sure to use a clean stirring stick.

The Lance:

Having flushed the lance with clean water, there will often be a few drops of water left in the nozzle and the valve. This water may freeze and cause malfunctions.
Counter measures:
Mix ½ a cup of water with ½ a cup of antifreeze. Remove the lance and pour the mixture into the quick coupling on the pistol grip. Press and release the grip alternating between the foam and micro-drops setting. Make sure that fluid is discharged from the foam pipe and the small holes in the micro-drops nozzle. The lance is now protected.

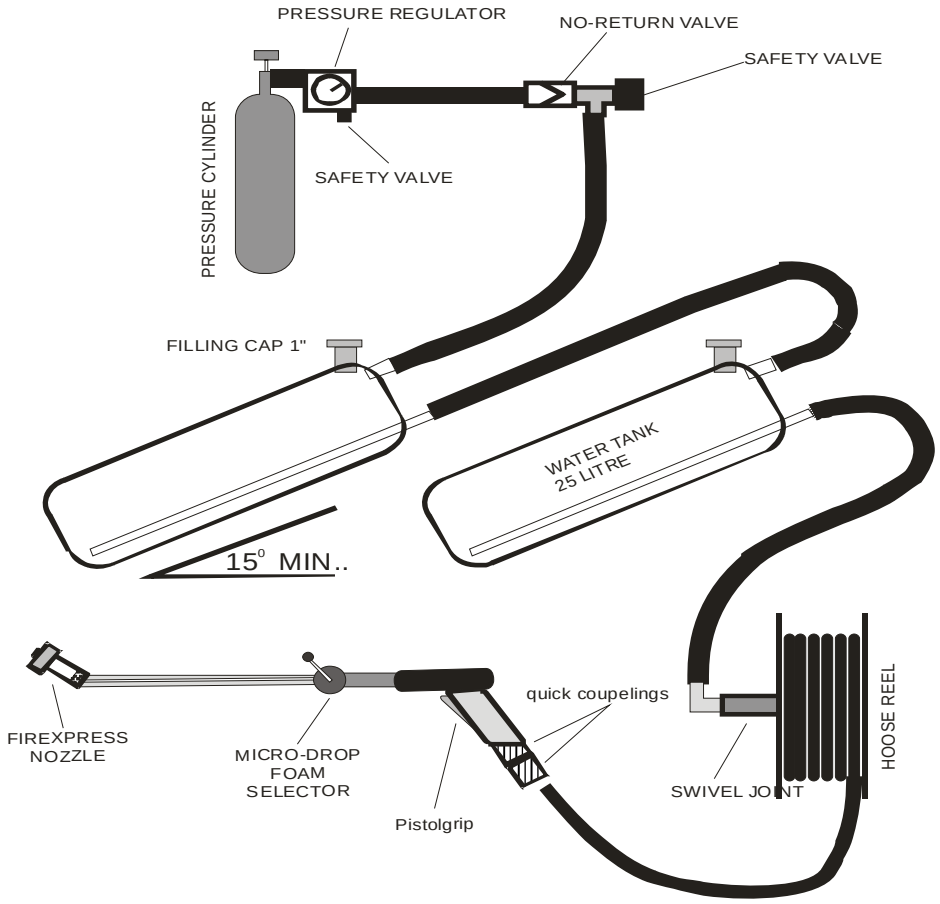
SYSTEM SPECIFICATION

Mode of operation:

The tanks (2 x 25 litres) containing water / foam is pressurised with compressed air from a 300 bar 3,3 litres (minimum) BA-cylinder. The pressure regulator regulates the pressure down to 20 – 22 bar.

The system incorporates 2 safety / pressure relief valves. One in the pressure regulator with a cracking pressure at 40 bar and one at the tank inlet with an opening pressure of 25 bar.
In order to prevent water / foam from entering the pressure regulator, a no-return valve has been placed by the tank entrance.

Normally the tank must not be pressurised until use.



FIREXPRESS EXTINGUISHER:	**DATA:**
Tank Volume:	50 litres (2 x 25 litres)
Operating pressure:	20 bar
Pressure source:	Compressed air
Pressure cylinder:	300 bar
Nozzle:	Firexpress patented dual nozzle, foam and micro-drops
Flow rate micro-drops / foam:	22 / 23 litres/min.
Range micro-drops / foam:	11 / 12 metres
Droplet size micro-drops:	7 – 100 micron
Foam expansion :	1:5
Foam premix:	3% special foam (AFFF-AR)
Hose:	30 metres ½” hose

AFTER USE CHECK LIST

ATV N^{o}_____

ATV CONDITION: Brakes, light, tire pressure etc.	☐ **OK**
FUEL: Full tank	☐ **OK**
NOZZLE: Flushed, Cleaned and Checked	☐ **OK**
HOSE REEL: Checked and locked	☐ **OK**
WATER TANKS: Completely full, Filling cap closed	☐ **OK**
PRESSURE IN WATER TANKS: No pressure	☐ **OK**
PRESSURE CYLINDER: 300 bar and closed	☐ **OK**
PRESSURE REGULATOR: Securely fastened	**OK** ☐

Date _____ **SIGNATURE**