Operation instruction

Water Mist Fire Suppression System

Accommodation

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AMENDMENT INCORPORATION RECORD		
Amendment Number	**Brief Description of Content**	**Name of Person Incorporating Amendment**
1 2011-12-16	Issued for information	L. Elsrud
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1 FOREWORD

This manual is written for those who design, install and maintain Fire Suppression Systems.

IMPORTANT

Autronica Fire and Security AS assumes no responsibility for application of any system other than those addressed in this manual. The technical data concerned herein is limited strictly for information purposes only. Autronica Fire and Security AS believes this data to be accurate, but it is published and presented without any guarantee or warranty whatsoever. Autronica Fire and Security AS disclaims any liability for any use that may be made of the data and information contained herein by any and all other parties.

The Fire Suppression Systems are to be designed, installed, inspected, tested and recharged by qualified and trained personnel in accordance with the following.

- All instructions, limitations, etc. contained in this manual.
- Storage, handling, transportation, service, maintenance, recharge and test of agent storage containers shall be performed only by qualified and trained personnel in accordance with the information in this manual and the relevant compressed gas standard.
- Regulations imposed by the class, flag state or Authorities Having Jurisdiction for the hazard to be protected.

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2 OPERATION INSTRUCTION.

2.1 General

2.1.1 Accommodation wet system.

The water mist extinguishing system in the accommodation area is an automatic system capable of immediate operation at all times. The system is a low-pressure system of the wet pipe type, with a nominal working pressure of 9 -16 bar. The nominal stand-by pressure in the system is 8 bar and the jockey pump will start automatically if the pressure drops below 6,5 bar and build up more pressure on the system.

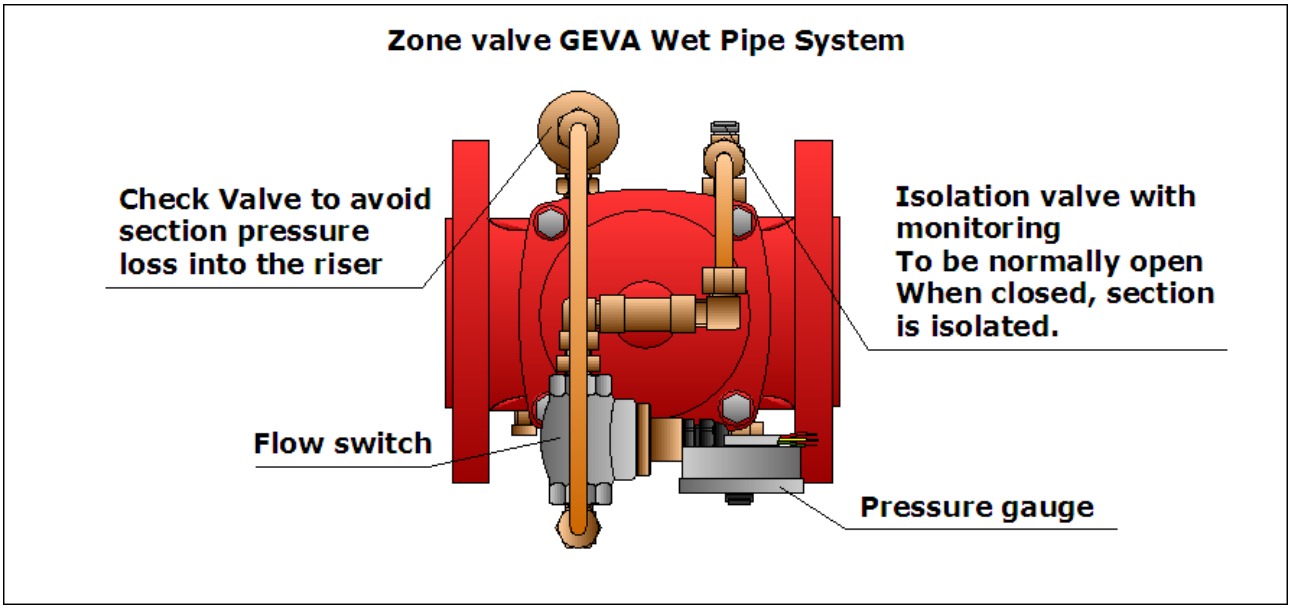
Each protected area can be divided into several sections, and each section is covered with nozzles complete with a heat sensitive element with fast response character at a nominal release temperature of 57 ^{0}C.

3 WATER MIST SYSTEM ACCOMMODATION

Each section of nozzles can be isolated by manually closing the zone valve. The zone stations consist of the following main items.

- Zone valve (Combined check and shut of valve) to be normally open.
- Flow switch. (For indication of released nozzle)
- Zone pressure gauge. (For indication of stand-by / operation pressure in the system)
- Zone test/drain valve with quick coupling. (For testing of system operation)
- Isolation valve monitoring.

Neither of the above items requires any operation upon activation of the system. The items are only for testing and indication purpose. If a zone needs to be sealed of manually the zone valve is closed by shutting of the 1/4" isolation valve on the downstream side of the zone valve.



3.1 Nitrogen-Cylinder battery.

The nitrogen cylinders will be activated caused by the following actions.

- System activated and no power to water pump starter cabinets or power distribution cabinets.
- System activated and pressure below 10 Bar for more than 30 seconds.

When activated, the butterfly valve installed after the FlexiFOG tank will open and the nitrogen solenoid valve will be activated.

3.1.1 Activation of an accommodation zone:

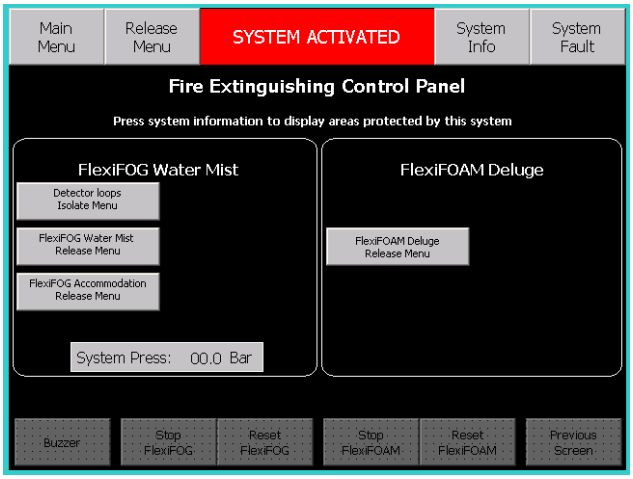
When the accommodation system is activated caused by a fire the touch screen will change to an accommodation released screen indicating which zone that has been activated and the buzzer will sound. In addition, information will be given with respect to number of pumps in operation and system pressure.

Pushing the ***"Main Menu"***button does return to the main screen.

Pushing the ***"FlexiFOG Accommodation Release Menu"***button does return to the «ACCOMMODATION RELEASED» screen.

To stop the pumps, press the «STOP» button on the bridge panel.

3.1.2 Touch screen in normal



The buttons that the operator should be familiar with:

Buzzer Off /Acknowledge

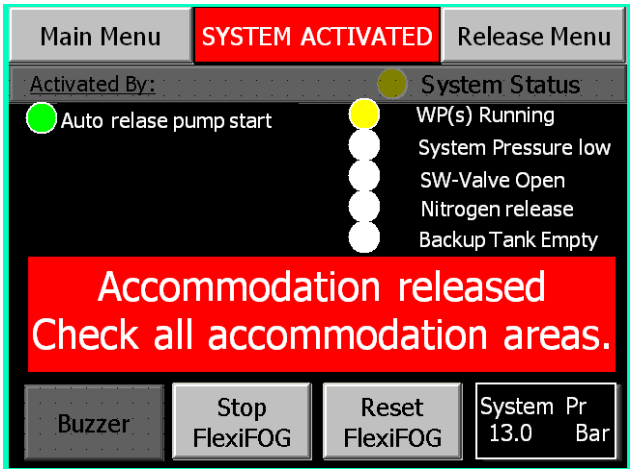
Stop

Reset

System Fault

Release menu

3.1.3 Touch screen in alamr.



When activated, the screen will display which fire zone is released.

To stop the pumps, press ***"Buzzer"*** to silence the buzzer, then ***"Stop FlexiFOG"***

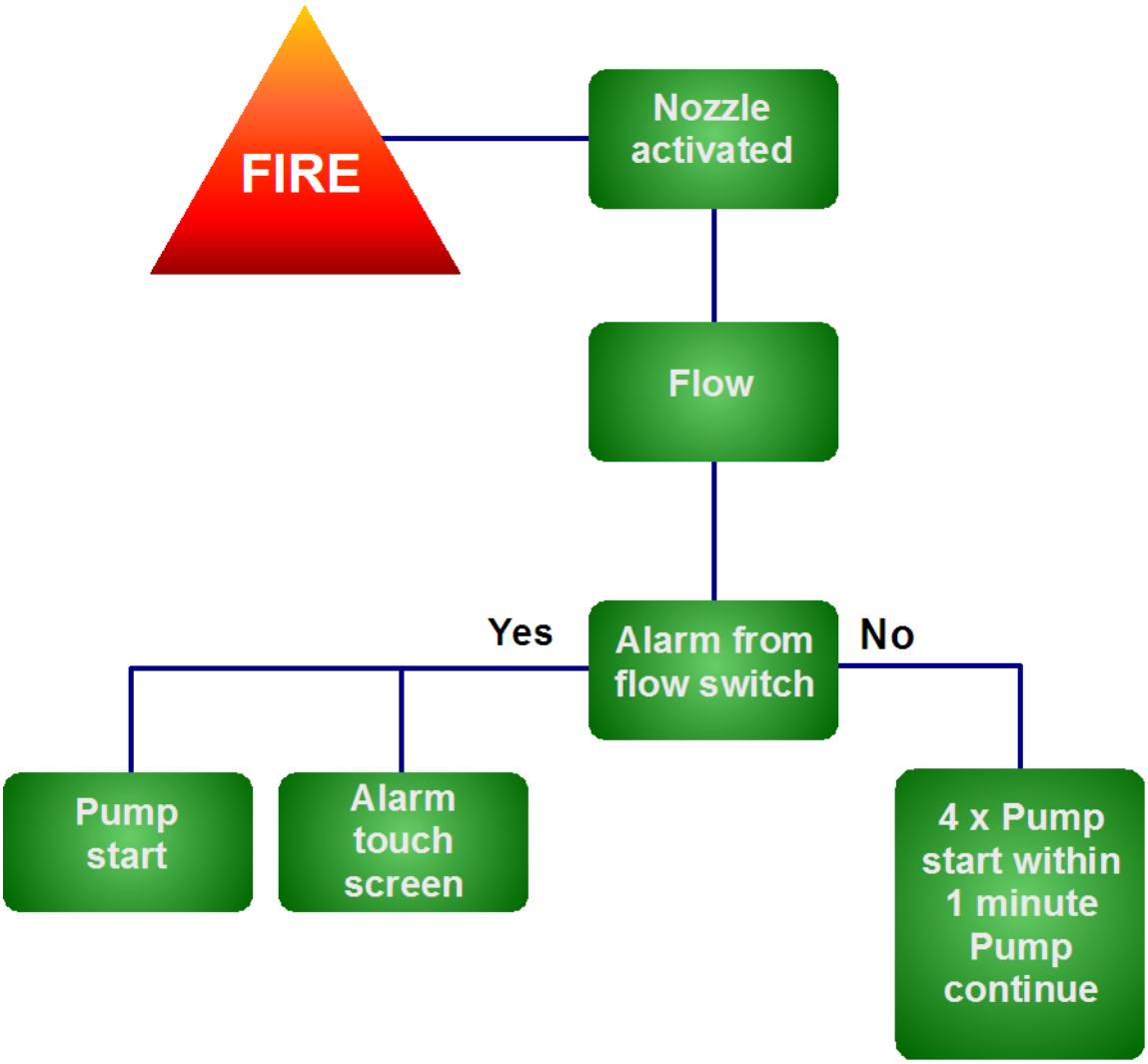
For å stoppe systemet trykk ***"Buzzer"*** deretter ***"Stop FlexiFOG"***

To set the system back to normal, press ***"Reset FlexiFOG"***

NOTE:

Prior to press the *"Reset FlexiFOG"* zone isolation valve has to be closed.

3.1.4 System release sequence.



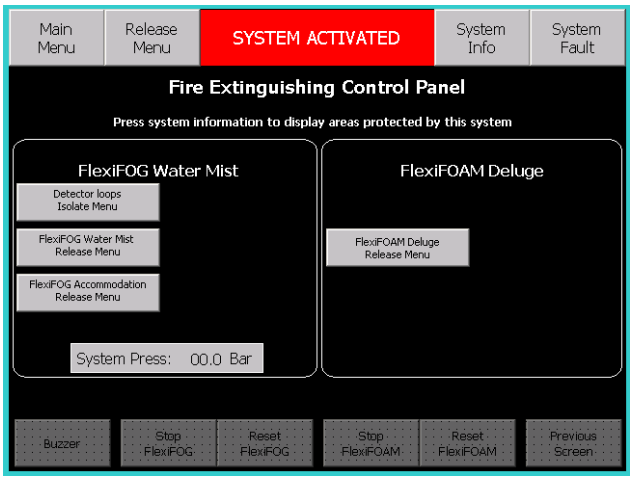
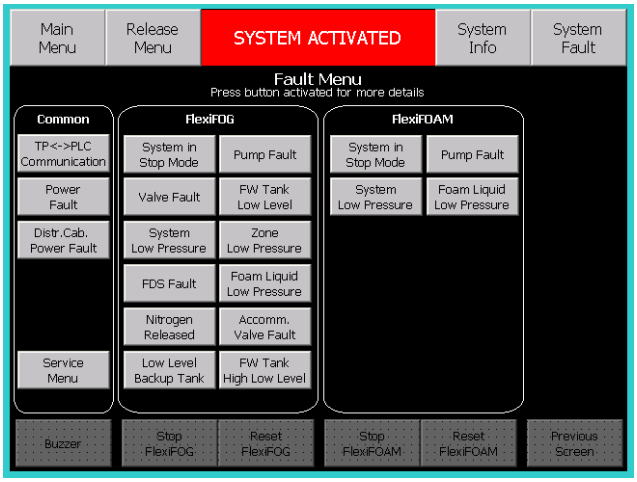
4 TOUCH SCREEN FAULT MENUS.

If a fault should occur the ***"System Fault"*** button will turn into yellow. Press the button to verify the fault.

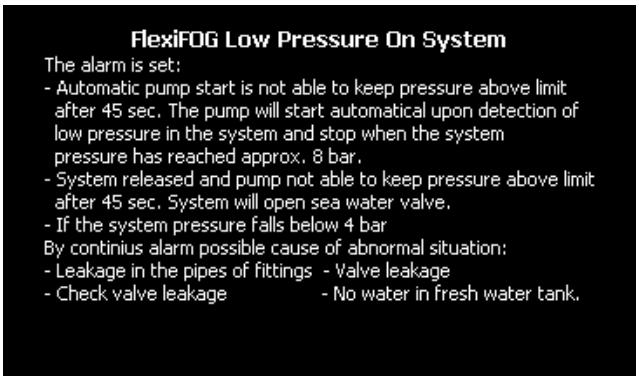
To silence the buzzer, press the button marked ***"BUZZER"***

To verify the fault, press the button marked ***"SYSTEM FAULT"***

When the fault is corrected press the button marked ***"RESET"***

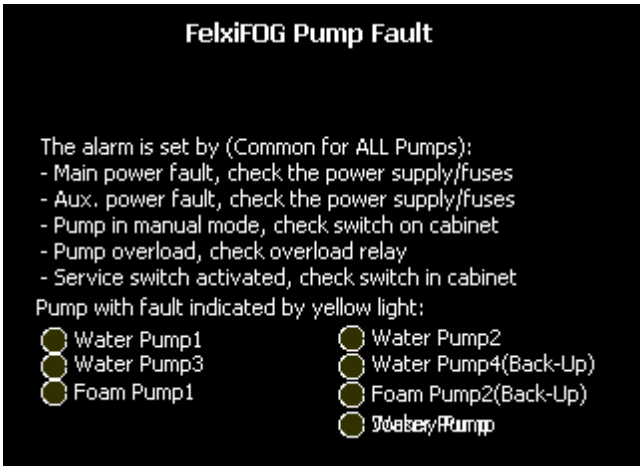
Main screen 	If a fault should occur the ***"System Fault"*** button will turn into yellow and the buzzer will sound. Press the button to verify the fault. The screen will change to the***"Fault Menu Screen"***
Fault Menu Screen 	Depending on the system set-up, the fault menu screen is divided into different sections, one for common faults and one or more which is system specific. The faulty item will be displayed as a yellow button. Press this to get further information.

4.1.1 Low pressure on water mist system



The alarm is set if the water mist system pressure is below 6,5 Bar. The pump will start automatically to re-pressurise the system. The pump will stop automatically when the pressure reaches 8 bar.

4.1.2 Pump fault



The alarm is set by any of the abnormal situations:

Main power fault to pump starter cabinet

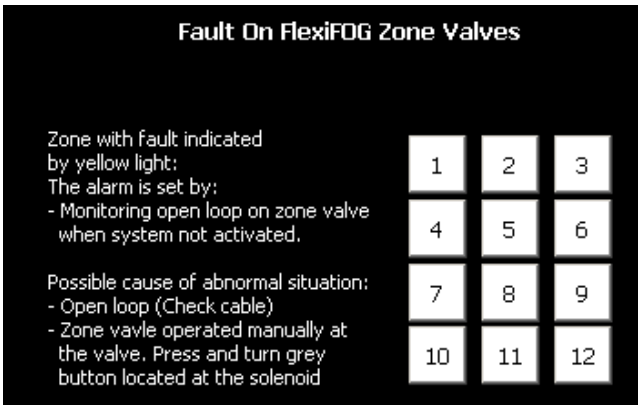
Aux power fault to pump starter cabinet

Pump in manual mode

Pump overload

Service switch activated.

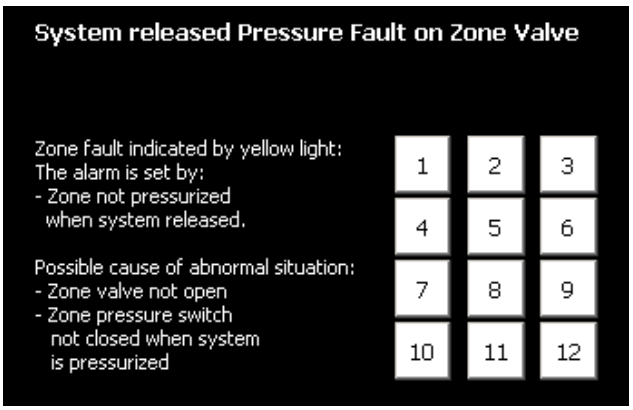
4.1.3 Zone valve fault.



The alarm is set by any of the abnormal situations:

Open loop

4.1.4 Zone pressure fault water mist system



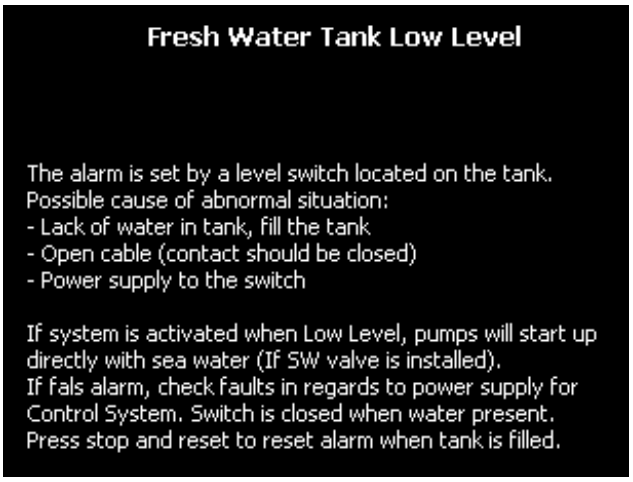
The alarm is set by any of the abnormal situations:

Pressure below 5 Bar at the zone valve.

Check pressure switch setting.

Check if zone valve and/or zone isolation valve is open. If closed, water will not be discharged through the nozzles, and the system will not work.

4.1.5 Low level



The alarm is set by any of the abnormal situations:

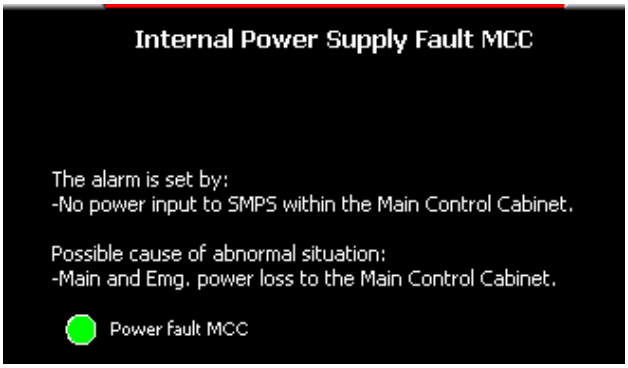
Low level in any of the monitored pressure vessels or atmospheric tanks such as:

Fresh water tank

Check tank level.

Check for open loop.

4.1.6 Power fault



The alarm is set by any of the abnormal situations:

Loss of 1 phase, 3 phase and 24 VDC supply

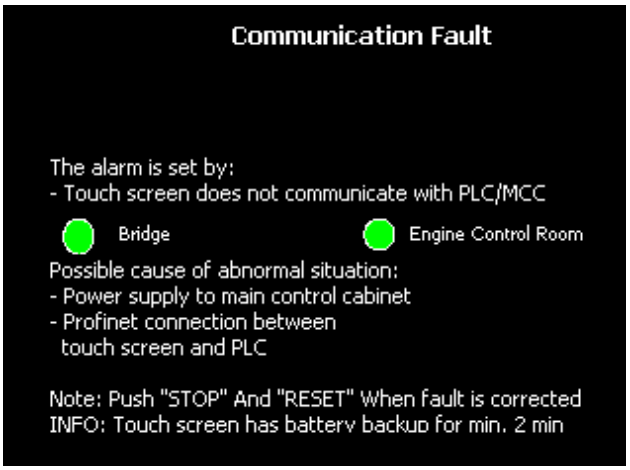
Switch mode power supply broken.

Main control cabinet circuit breaker released.

Power lost from main or emergency switch board.

Open circuit, check wire connections.

4.1.7 Communication fault



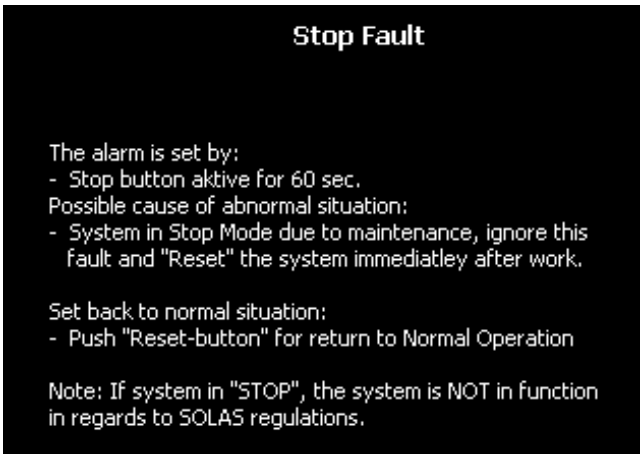
Communication fault to the touch screens are activated by:

No power supply

Open loop, PROFINET

Press ***"STOP"*** and ***"RESET"*** when the fault is repaired***.***

4.1.8 System i STOP Mode

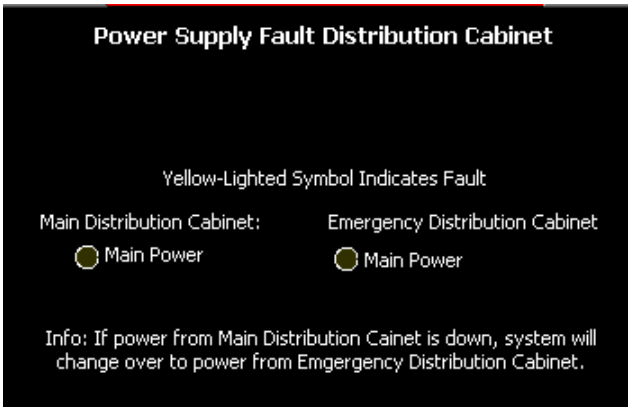


If the ”STOP” button is activated for more than 60 seconds, the system will go into STOP mode.

NOTE:

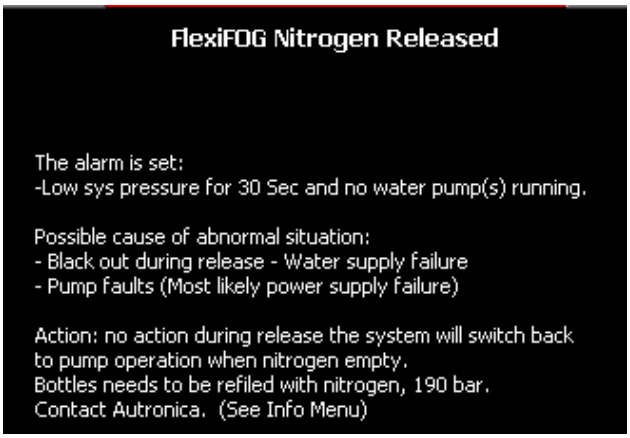
This will put the system out of function. Shall only be used for major maintenance work. Press “RESET” to set the system back into normal operation.

4.1.9 Distribution cabinet fault



If a fault occur on the power distribution cabinets an alarm will be initiated.

4.1.10 Nitrogen activated

	If the nitrogen back-up system is activated due to lack of pump pressure, an alarm will be initiated. The nitrogen is activated if the system is released and the power supply is lost.

4.1.11 Check list in case of a fault alarm:

1. If a system fault should occur, the buzzer will sound and the «SYSTEM FAULT» will lit.
2. Pushing the «BUZZER OFF» will silence the buzzer and acknowledge the alarm.
3. Pushing the «SYSTEM FAULT» button will take you to the «FAULT INFORMATION» screen.
4. Pushing the button activated (Yellow) will take you to a detailed description of the fault and a possible cause.
5. To reset the system, the fault has to be rectified and the «RESET» button has to be pushed.

LED/Alarm Text:	Possible cause of alarm	Actions (help text):
Pump fault Listing which pump starter cabinet that has a fault.	Pump overload	Check motor starter in the main control cabinet or any of the pump starter cabinets.
	Pump In local	The key switch has been switched into local mode. If the system shall work as it supposed to do the switch must be in remote.
	Motor starter switch off	The motor starter has been switched off. There is no power to the pump in case of an activation of the system. Check the on / off switch on the motor starter.
	Main and/or emergency power lost	Main and/or emergency power lost. Check fuses for both emergency and the main supply.
Comm. fault		Check communication cable / plug.
Power Failure	24 VDC power lost	Check the 220VAC/24DC SMPS in the battery cabinet. Check fuses
	1 Ph. Main power lost	Check 1 ph power supply for main power cabinet. Check fuses
	3 Ph. Main power lost	Check 3 ph power supply for main power cabinet. Check fuses
	3 Ph main or emergency power lost to distribution cabinets if installed.	Check power supply for power distribution cabinets. Check fuses within the cabinets.
ATTENTION! SYSTEM IS IN STOP MODE ABNORMAL CONDITION	STOP Button has been pressed without pressing RESET afterwards.	In case of fire the system will not operate. Examine the reason why it has been activated. To get the system back into normal operation, press the reset button on the panel.
Sea Water Valve Open	Fresh water tank empty. (Only on systems with sea water supply)	Seawater will be used in case of an activation of the system. Fresh water tank to be re-filled.
Low Level Fresh Water tank	Fresh water tank empty or below level for dedicated water to the water mist system..	Check the level on the fresh water tank. Tank to be refilled if empty or low level. If the level is OK, level switch to be checked. Seawater will be used in case of an activation of the system.
System Low Pressure	Leakage in piping system. Back pressure into water tank.	Water pressure is below 6,5 Bar. The pump is programmed to start if the pressure gets below 6,5 Bar. Check for leakage on the piping system and/or if the pumps are running. Check check/foot valve in fresh water tank.
Nitrogen Released	Nitrogen has been activated. This means that a flow switch is activated and that the Accommodation system is activated	Only activated when the power to the pumps is lost or the system pressure is below 10 bar for more than 30 seconds.

LED/Alarm Text:	Possible cause of alarm	Actions (help text):
ACCOMMODATION SYSTEM RELEASED (and the specific zone)	Check if there is a fire for the area that has been released.	If the alarms were set by a failure in the system or by an accidental release of a nozzle, push stop button on the bridge operating panel and/or shut off the zone by closing the isolation valve on the zone valve.

5 EMERGENCY OPERATION.

The system can be operated manually if the control system is down or the main power is lost.

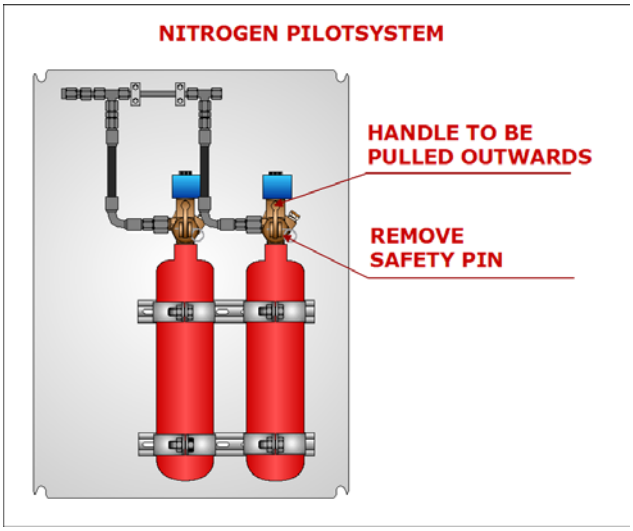
5.1 Emergency operation, nitrogen and freshwater tank.

If the main power is lost the system can be operated using the back-up tank as follows:

The tank has a capacity to supply fresh water to the system for 1 minute of operation at design capacity. In case of a power failure or a malfunction of the system, fresh water can be discharged manually as follows:

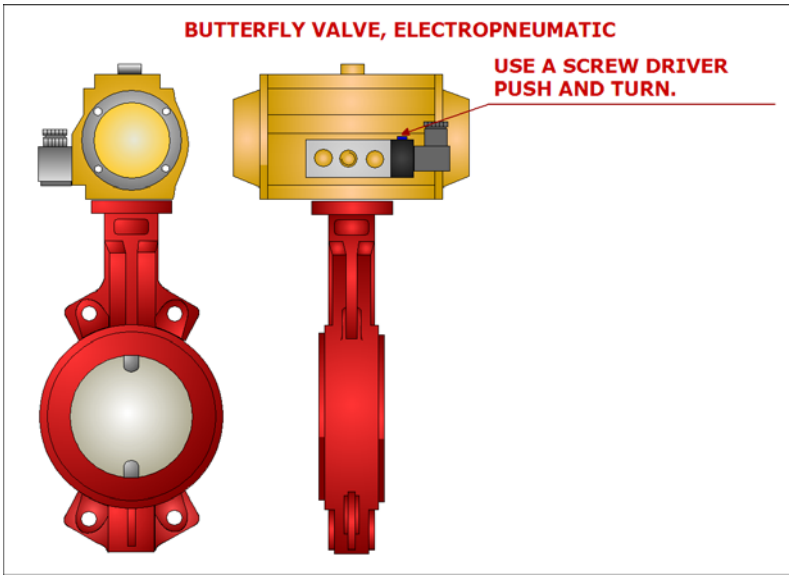
5.1.1 Nitrogen cylinders

The system can be released remotely manually from the pilot cylinders.



5.1.2 Bach-up tank, main valve.

The back-up tank main valve can be operated as follows.



WARNING:

The Main Outlet Valve must be closed before the tank is completely emptied. This to avoid nitrogen to be discharged through the nozzles.

Watch the liquid level indicator.

To close the valve, reset the button.

5.2 Emergency start of pumps.

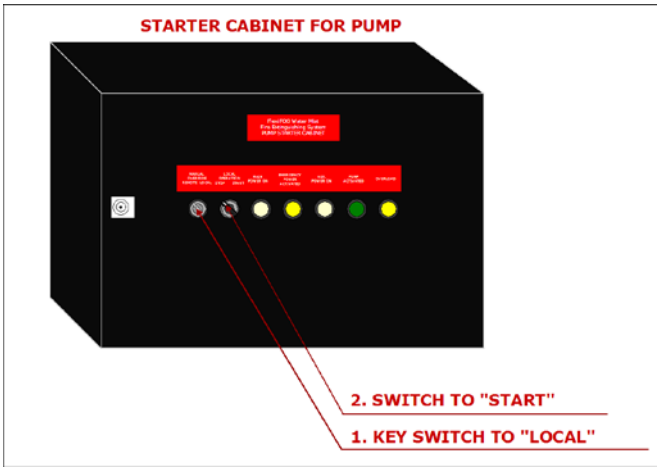
1. Go to the pump station and turn the black key switch to local mode.

2. Turn the black selector switch to “START”

3. To be done both for the water pump and the foam pump. Foam is only required for machinery space total flooding.

NOTE: In an emergency situation, all water pumps should be started.

4. AFFF Foam valve is hardwired from the starter cabinet.



Autronica Fire and Security is an international company, headquartered in Trondheim, one of the largest cities in Norway.

Our products cover a broad range of systems for integrated solutions, including fire detection systems, integrated fire and gas detection systems, control and presentation systems, voice alarm systems, public address systems, emergency light systems, plus suppression systems.

All products are easily adaptable to a wide variety of applications, among others, hospitals, airports, churches and schools, as well as to heavy industry and high-risk applications such as power plants, computer sites, offshore installations and to the marine market, world wide.

The company's strategy and philosophy is plainly manifested in the business idea:

Protecting life, environment and property.

Quality Assurance

Stringent control throughout Autronica Fire and Security assures the excellence of our products and services. Our products are CE marked and developed for worldwide standards and regulations, and conform to the CEN regulation EN54 in addition to IMO, classification societies and marine administrations. Our quality system conforms to the Quality System Standard NS-EN ISO 9001:2000 and is valid for the following product and service ranges: marketing, sales, development, engineering, manufacture, installation, commissioning and servicing of suppression, integrated fire and gas detection and alarm systems, plus petrochemical, oil and gas instrumentation systems for monitoring and control.

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