



Test report



Test report of synchronous generator under protection of XFlow® water mist system

Date/Place : Nov. 10, 2004 WUXI
Manufacturer : Wuxi Fenxi Electrical Machine Co., Ltd.
No. 83-D, Wuxi National High and New Tech Industrial Development Zone
Description of equipment : Synchronous generator (Type: 1FC5& 1FC6)
: X-Flow® water mist system manufactured by York Fire Fighting

This is to verify that the generators mentioned above of enclosure degree IP23 are capable of working normally under protection of X-Flow® water mist system above mentioned with installations specified below.

Type of protection : IP23

Tested and reported by:

Wuxi Fenxi Electrical Machine Co., Ltd.

Reviewed, witnessed and approved by:

YORK FIRE FIGHTING

CCS.	Accepted for installation in adjacent area where water may extend.
PN. Witnessed Kehm Zhang 10/11/2004	
Huasheng Lin 10 Nov. 2004 for Lloyd's Register	

Project: Synchronous Generator Test Under Protection
Of XFlow® Water Mist System

Client: Wuxi Fenxi Electric Machine Co., Ltd. &
York Fire Fighting

Office: Shanghai

Clients Order Number: -

Date: 04 April 2005

Order Status: Complete

Inspection Dates

First: 10 November 2004

Final: 10 November 2004

This certificate is issued to Wuxi Fenxi Electric Machine Co., Ltd. to certify that the undersigned surveyor to this society attended their works on the above date to inspect and witness the tests described below and the test result is found in order.

EQUIPMENT INVOLVED IN THE TEST:

1. Synchronous Generator of Type 1FC5 & 1FC6 manufactured by Wuxi Fenxi Electric Machine Co., Ltd.
2. XFlow® Water Mist System manufactured by York Fire Fighting, Nozzle type NHP2 & NHP4.

OBJECTIVE OF TEST:

To verify whether enclosure protection of degree IP23 is sufficient for electrical generator to be protected by XFlow® water mist system by means of a full scale test. The water mist spray shall have no harmful effects to the generator's performance.

TESTS WITNESSED:

The following tests were witnessed and the results were found satisfactory. The test report endorsed by CCS, BV & LR surveyors dated 10 November 2004 refers.

1. Running test of generator type 1FC5 with water mist spray by two NHP2 nozzles;
2. Running test of generator type 1FC5 with water mist spray by one NHP4 nozzle;
3. Running test of generator type 1FC6 with water mist spray by one NHP2 nozzles;
4. Insulation resistance measurement before & after 20 minutes water mist spray with generator running;
5. Dielectric strength test at 1600 volts ac for 1 minute.
6. Insulation resistance measurement after dielectric strength test.

CONCLUSION:

The generator type **1FC5 & 1FC6** of enclosure **IP23** manufactured by **Wuxi Fenxi Electric Machine Co., Ltd.** is capable of working normally under protection of **XFlow® Water Mist System** manufactured by **York Fire Fighting** with installation of nozzles in relative to the generator as specified in the appendix to the test report mentioned above.

Handwritten signature of Huasong Xia

Lloyd's Register Asia	Lloyd's Register
Huasong Xia HSX	
Surveyor to Lloyd's Register Asia	

A member of the Lloyd's Register Group



Test report of generator



1. Objective of Test:

The objective of the test is to verify if enclosure class IP23 is sufficient for the generators in connection with XFlow® water mist system by means of a full-scale test. Water mist sprayed shall have no harmful effects.

2. Testing method:

Using XFlow® water mist nozzle, min. pressure 7.7 bar for NHP4 & min. pressure 6.6 bar for NHP2.

These nozzles are to be supplied by the fire fighting system maker, York Fire Fighting
-construction of nozzle: Maker standard test nozzle

Refer to Appendix 1,2,3 for detailed construction

-water pressure at nozzle: min. pressure 7.7 bar for NHP4

min. pressure 6.6 bar for NHP2

-test duration: 20min.

3. Test procedure

- 1) Insulation resistance measurements to be taken before starting up of the generator.
- 2) Starting up, test will be carried out for 10 minutes at no load, rated voltage and rated frequency.
- 3) After starting up, using water mist nozzle, water will be applied with NHP2 at 6.7 bar about 20 min. with 50% load according to SOLAS 2000 Amendment.
- 4) Insulation resistance measurements to be carried out, the value shall be more than 5 MΩ.
- 5) Rotor and stator high voltage test to be carried out at 80% of 2000V for one minute.
- 6) Repeat above test with NHP4 at min 7.7 bar for only type 1FC5 with 20% load.

Appendix I Installation drawing of test applied on generator set 1FC5 with two nozzles NHP2.

Appendix II Installation drawing of test applied on generator set 1FC5 with one nozzle NHP4

Appendix III Installation drawing of test applied on generator set 1FC6 with one nozzle NHP2

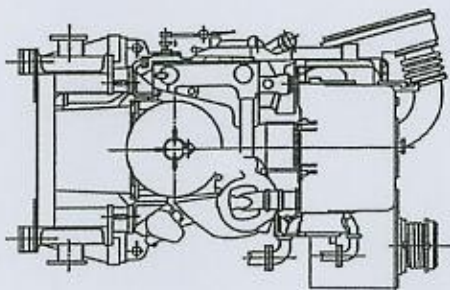
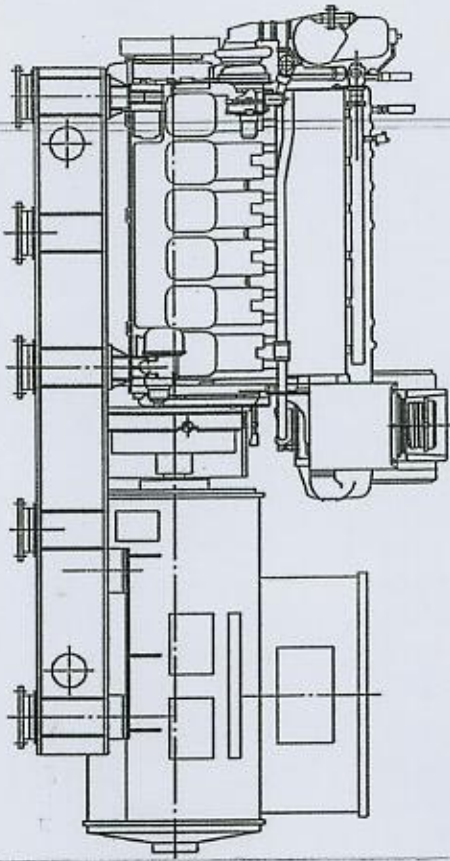
4. Test results:

The test was carried out with satisfactory result. No harmful effect was found. Insulation Resistance measurement and high voltage test are OK.

We confirmed that Siemens IP23 generators type 1FC5/1FC6 can withstand the XFlow® water mist system, "FWBLAFFS" and can be operated during the operation of XFlow® water mist system under test condition above mentioned item 3. The XFlow® section for the generators therefore doesn't need to separate in several sections for each generator.

	Insulation resistance (MΩ) before test	Insulation resistance (MΩ) After test	High voltage test For 1 minute
1FC6 284-4LA45 (serial No.0020830)	15/500(stator/rotor)	180/500	OK
1FC5 352-4TA45 (serial No.0401208)	200/500(stator/rotor)	200/500	OK

From F.W. Pump



6820mm

Appendix II
1PCS with 1
nozzle NHP4

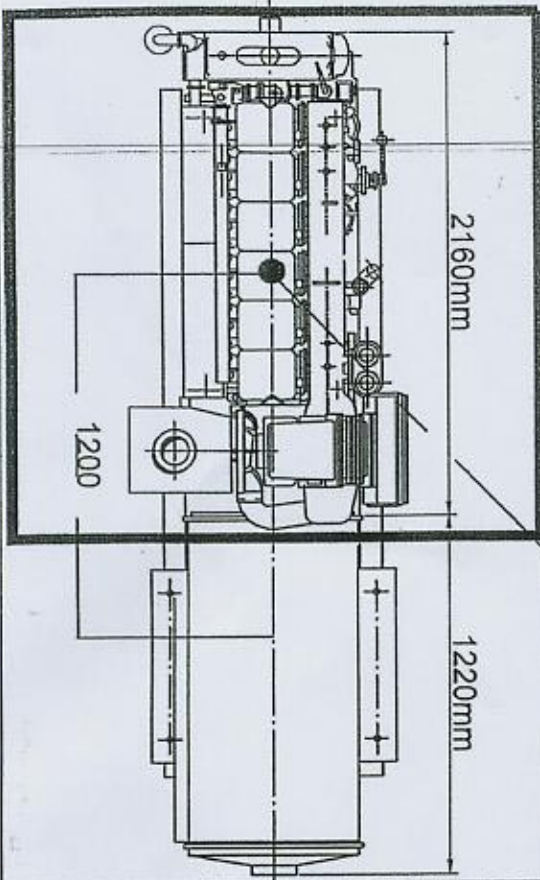
Protection Area

Nozzles Pressure 7.7bar for NHP4

2160mm

1220mm

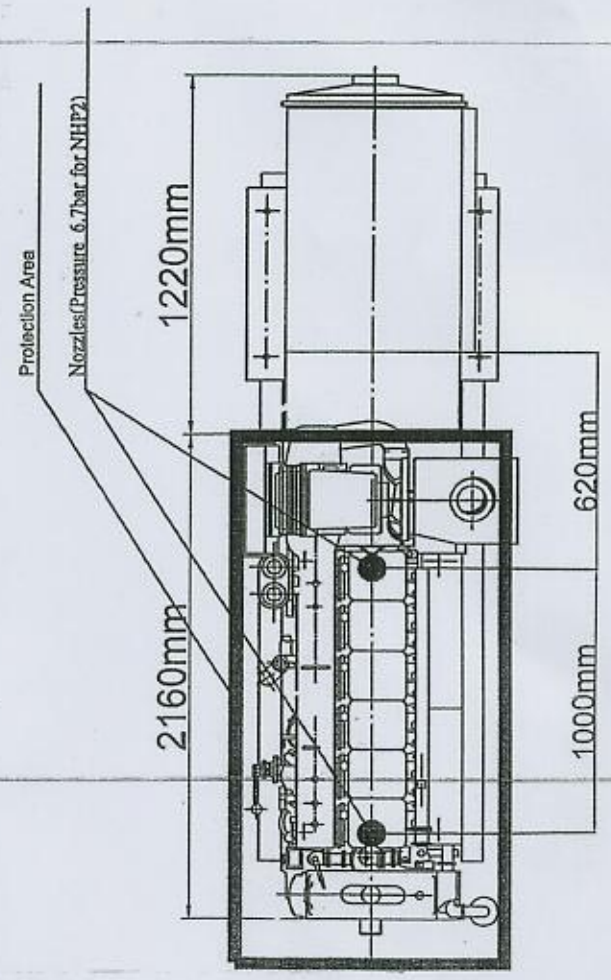
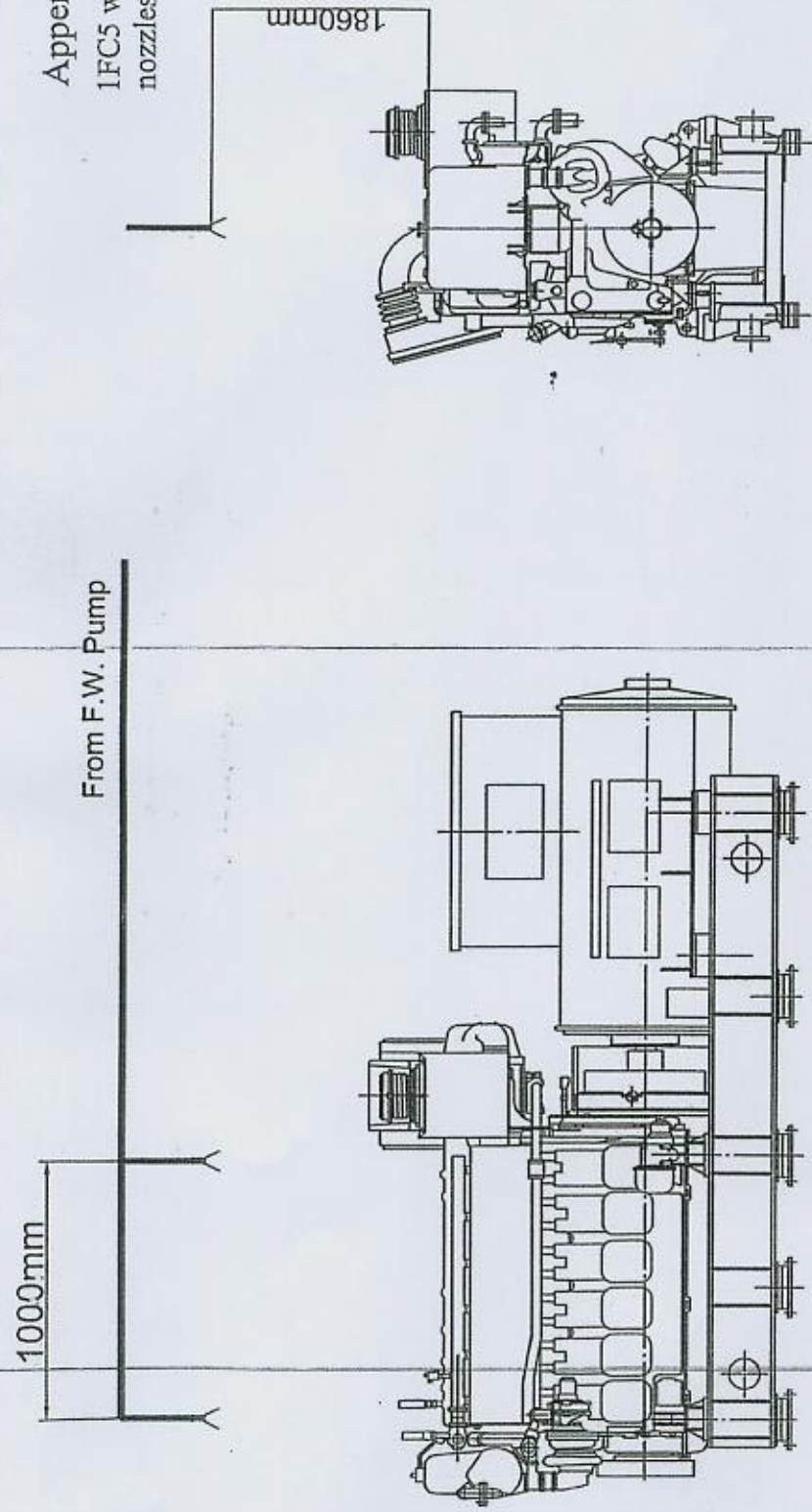
1200




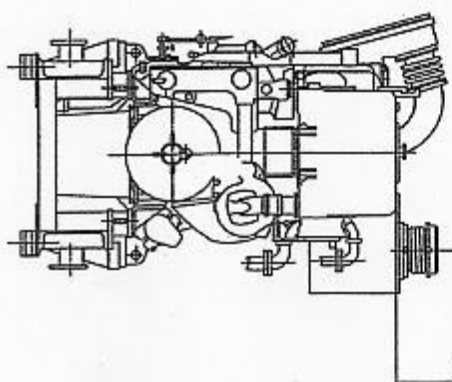
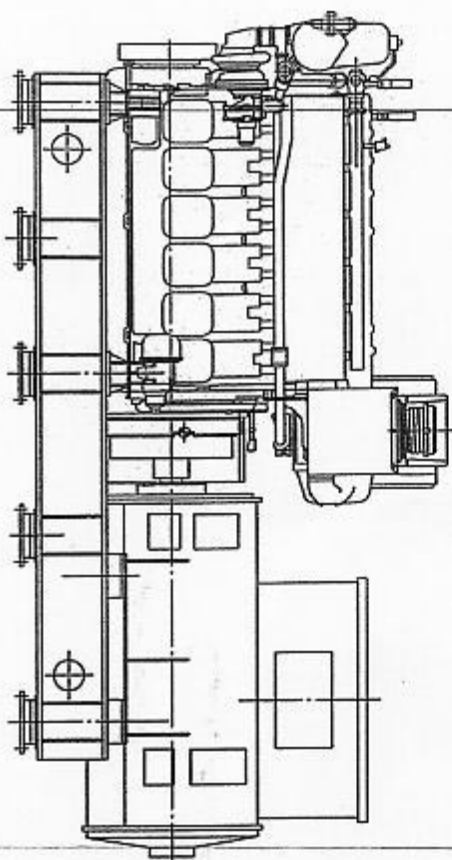
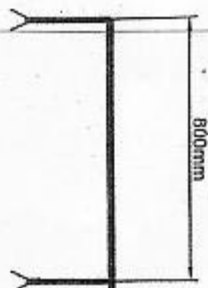
Checked by: JH	Date:	Drawn by: JH	Date:
Mr. JH	Mr. JH	Mr. JH	Mr. JH
YORK NOVATEC		YORK NOVATEC	
Industrial 22, DSC-470		Industrial 22, DSC-470	
Nantes, France		Nantes, France	
Tel: +33 2 51 70 12 00		Tel: +33 2 51 70 12 00	
Fax: +33 2 51 70 12 00		Fax: +33 2 51 70 12 00	
The drawing must be kept in accordance with the drawing		The drawing must be kept in accordance with the drawing	
Type: Xbow Water Mist System		Type: Xbow Water Mist System	
Pump Unit		Pump Unit	
Local Protection		Local Protection	
Approved by: JH		Approved by: JH	
Date: 2004-10-10		Date: 2004-10-10	
Drawing No:		Drawing No:	

Appendix I
1FC5 with 2
nozzles NHP2

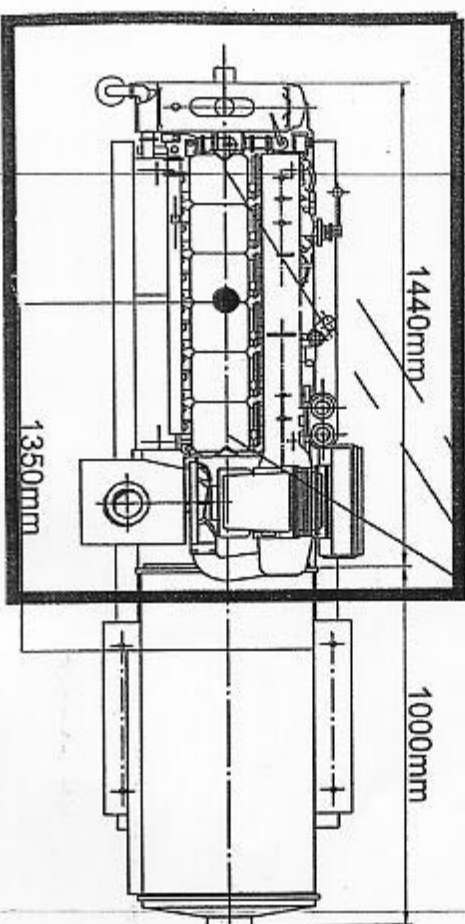
From F.W. Pump



Checked by: JH		Sub	
File	Date	Inst.	Revision
FPM 0048			
 YORK Novenco Industrieweg 22, DK-4700 Nieuwvliet, Denmark Tel.: +45 70124222 Fax: +45 83795005		Part Customer	
		I.M.A. No. Project	
		On Job Book	
		Drawn by: JH Date: 2004-10-10	
		Approved by: Drawing No.	
		Title Type System	
		Xflow Water Mist System Pump Unit Local Protection	
		Approved by:	

IFC6 with 1
nozzle NHP2

Appendix III



Nozzles(Pressure 6.7bar for NHP2)

[illegible]