



Certificate of Compliance

This certificate is issued for the following:

TYPHOON SERIES MONITOR ASSEMBLIES IN THE FOLLOWING CONFIGURATIONS: TYPHOON TILLER, TYPHOON TILLER WITH HANDWHEEL ELEVATION, AND TYPHOON DUAL HANDWHEEL

Prepared for:

Task Force Tips Inc
3701 Innovation Way
Valparaiso, IN 46383-9327
United States

Manufactured at:

Task Force Tips Inc
3701 Innovation Way
Valparaiso, IN 46383-9327
United States

FM Approvals Class: 1421

Approval Identification: 0003040178

Approval Granted: October 20, 2011

Said Approval is subject to satisfactory field performance, continuing follow-up Facilities and Procedures Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.

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A handwritten signature in dark ink, appearing to read 'Richard B. Dunne', is written over a horizontal line.

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APPROVAL REPORT

TYPHOON SERIES MONITOR ASSEMBLIES IN THE FOLLOWING CONFIGURATIONS: TYPHOON TILLER, TYPHOON TILLER WITH HANDWHEEL ELEVATION, AND TYPHOON DUAL HANDWHEEL

Prepared for:

**Task Force Tips
3701 Innovation Way
Valparaiso, IN 46383**

Project ID: 3040178

Class: 1421

Date of Approval: October 20, 2011

Authorized by:



Richard Dunne, Manager – Fire Protection

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**TYPHOON SERIES MONITOR ASSEMBLIES IN THE FOLLOWING CONFIGURATIONS:
TYPHOON TILLER, TYPHOON TILLER WITH HANDWHEEL ELEVATION, AND
TYPHOON DUAL HANDWHEEL**

from

**Task Force Tips
3701 Innovation Way
Valparaiso, IN 46383**

I INTRODUCTION

- 1.1 Task Force Tips requested the examination of the Typhoon Series Monitor Assemblies for compliance with FM 1421 Approval Standard for Monitor Assembly.
- 1.2 This report may be freely reproduced only in its entirety and without modification.
- 1.3 **Standards**

Title	Class Number	Date
Approval Standard for Monitor Assembly	1421	June 2007

- 1.4 **Listing:** The product will appear in the Approval Guide, an online resource of FM Approvals, in the following directory:
- Fire Protection - Hydrants & Hoses – Monitors – Task Force Tips – Typhoon Series Monitor Assemblies
- 1.5 The Typhoon Series Monitor Assembly has a maximum rated pressure of 200 psi (14 bar), and a maximum flow of 1500 gal/min (5678 L/min). The configurations Approved under this examination are the Typhoon Tiller, Typhoon Tiller with Handwheel Elevation, and the Typhoon Dual Handwheel.

II DESCRIPTION

- 2.1 The Typhoon Series are monitors designed to flow water at a rate up to 1500 gal/min (5678 L/min) at 200 psi (14 bar). Various other manufacturer set inlet and outlet adapters are available as options described in Sections 2.4 and 2.5 of this report.
- 2.2 The datasheet LIY-050 Manual: Typhoon & Typhoon RC Monitor describes the Typhoon Series Monitors. The RC version of the Typhoon Monitor has not been examined for FM Approval, as indicated in LIY-050.

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- 2.3 The Typhoon Series Monitor Assemblies can be configured with one of three of the following vertical and horizontal movement options: Typhoon Tiller, Typhoon Tiller with Handwheel Elevation, or the Typhoon Dual Handwheel.
- 2.4 The Typhoon Series Monitor Assemblies can be configured with any of the following base inlet options: 3" ANSI 150, 4" ANSI 150, DN80 PN16, DN100 PN16, 3" NPT Female, 4" NPT Female, 3" BSP Male, 4" BSP Male, 4.5" NH Quick Connect for VUM, 4.5" Quick Connect with 4" ANSI 150, or 4.5" Quick Connect with 4" NPT Female
- 2.5 The Typhoon Series Monitor Assemblies can be configured with any of the following manufacturer set inlet adapter options: 3.5" – 6 NH Male, 3.5" – 11 BSP Male, 3.5" – 8 NPSH Male, or 4" – 11 BSP Male.

III EXAMINATIONS AND TESTS

- 3.1 Samples as detailed below were submitted for examination and testing. The samples were considered to be representative of the product line and were examined, tested, and compared to the manufacture's drawings.
- 3.2 All data for this project is on file under PI 3040178 at FM Approvals along with other documents and correspondence applicable to this program.
- 3.3 The Typhoon Series Monitors described in this report were examined and tested at FM Approvals, located in West Glocester, Rhode Island, and at Task Force Tips, Inc. located in Valparaiso, Indiana.
- 3.4 Two configurations of Typhoon Monitor Assembly were examined as part of PI 3040178, and are considered representative of the FM Approved assembly options for the Typhoon Monitor. These two configurations are the Typhoon Tiller configuration and the Typhoon Dual Handwheel configuration.
- 3.5 The following tests were performed on the Typhoon Monitor in order to evaluate compliance to FM 1421.
 - 3.5.1 FM 1421 Section 4.1: Examination

One sample of the Typhoon Monitor was examined and compared to the manufacturer's drawings (Y5-D21A Rev. 1 For Dual Handwheel, and Y5-M21A Rev. 1 for Handwheel and Tiller Bar) and specifications, and to FM Approvals requirements stated in FM 1421 Section 3.0: General Requirements. The samples were found to match with manufacturer drawings and meet the requirements of this Section with satisfactory results.

The results of this examination are satisfactory.

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3.5.2 FM 1421 Section 4.2: Hydrostatic Proof-Pressure

One sample of the Typhoon Monitor was pressurized to 400 psi (28 bar) and held at that pressure for a period of one minute. No ruptures, noticeable distortions, or other failures that would impair function were observed

One sample of the Typhoon Monitor was pressurized to 800 psi (55 bar) and held at that pressure for a period of one minute. No ruptures, noticeable distortions, or other failures that would impair function were observed

The results of this examination are satisfactory.

3.5.3 FM 1421 Section 4.3: Operation and Freedom of Movement

One sample of the Typhoon Monitor (with handwheel) was hydrostatically pressurized to 200 psi (14 bar) for a period of 10 minutes. While under this pressure the monitor was operated throughout the entire range of both the horizontal and vertical planes. The same sample was then subjected to 100 psi while flowing, and again operated throughout the entire range of both the horizontal and vertical planes.

One sample of the Typhoon Monitor (with tiller bar) was hydrostatically pressurized to 200 psi (14 bar) for a period of 10 minutes. While under this pressure the monitor was operated throughout the entire range of both the horizontal and vertical planes. The same sample was then subjected to 100 psi (7 bar) while flowing, and again operated throughout the entire range of both the horizontal and vertical planes.

No ruptures, noticeable distortions, or other failures that would impair function were observed.

The results of this examination are satisfactory.

3.5.4 FM 1421 Section 4.4: Pressure Versus Flow Rate

One Typhoon Monitor was subjected to five flow rates; the pressure differential between the inlet and the outlet of the monitor was recorded. Various nozzles were utilized to achieve the specified flow rates. The five tests are depicted in the following table:

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Model	Flowrate (gal/min)	Flowrate (L/min)	Nozzle	Inlet Pressure (psi)	Outlet Pressure (psi)	Pressure Differential (psi)	Pitot Tube Reading (psi)
Typhoon	200	757	1" smooth bore	72	72	0	65
Typhoon	518	1961	1.5" smooth bore	65	64	1	60
Typhoon	850	3218	2" smooth bore	106	102	4	105
Typhoon	1165	4410	2.25" smooth bore	50	42	8	45
Typhoon	1500	5678	2.25" smooth bore	115	97	18	100

The results from this examination are satisfactory.

3.5.5 FM 1421 Section 4.5: Weatherability

One Typhoon Monitor had its inlet and outlet connections plugged, and was subjected to a full water immersion bath for 5 minutes. No water collected inside of the assembly during this time. The monitor was then conditioned in an environmental chamber set at -40 °F for 24 hours. Immediately upon removal, the unpressurized monitor assembly was tested for proper function of the controls, by operating it throughout its entire range of horizontal and vertical movement.

The results from this test are satisfactory.

3.5.6 FM 1421 Section 4.6: High Temperature Exposure

One Typhoon Monitor was placed in an environmental chamber and subjected to a temperature of 135 °F for 24 hours. Immediately upon removal, the unpressurized monitor assembly was tested for proper function of the controls, by operating it throughout its entire range of horizontal and vertical movement.

The results from this test are satisfactory.

3.5.7 FM 1421 Section 4.7: Durability

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One Typhoon Monitor with tiller bar was operated throughout its entire range of horizontal and vertical movement for 500 full cycles. The sample operated freely after the 500 cycles, and no post tests were necessary.

One Typhoon Monitor with handwheel was operated throughout its entire range of horizontal and vertical movement for 500 full cycles. The sample operated freely after the 500 cycles, and no post tests were necessary.

The results from this test are satisfactory.

IV MARKING

The following information appears on the apparatus identified in Section 1.5 and meets Standard requirements:

- Manufacturer's name and contact information
- Model Number
- Serial Number
- FM Approval Mark

V FACILITIES AND PROCEDURES AUDIT

- 5.1 The monitor assemblies described in this report are FM Approved only when manufactured at the following location:

Task Force Tips, Inc.
3701 Innovation Way
Valparaiso, IN 46383

- 5.2 The manufacturing facility has previously been subjected to an initial facilities and procedures audit, the monitor assemblies described by this report will be added to the current audit program in place at the above facility, and are subject to follow-up audit inspections.

VI MANUFACTURERS RESPONSIBILITIES

- 6.1.1 Documentation considered critical to this Approval is on file at FM Approvals and listed in Section VII, Documentation, of this report. No changes of any nature shall be implemented unless the notice of the proposed change has been provided to, and written authorization obtained from, FM Approvals. The Approved Product Revision Report, Form 797, must be forwarded to FM Approvals as notice of proposed changes.

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- 6.2 As part of the Approval requirements, FM Approvals requires assurance that subsequent equipment produced will present the same quality and reliability as the specified samples examined. The manufacturer shall maintain a Quality Assurance program, which includes as a minimum: incoming, in process, and final inspection and testing, equipment calibration, and drawing change control.
- 6.3 Task Force Tips, Inc. must subject 100 percent of production monitor assemblies to a pressure of 500 psi (35 bar) for one minute. Ruptures, leakage, or noticeable distortions must not occur. While subjected to this pressure, the monitor assembly must be operated in both the horizontal and vertical planes. The monitor assembly must operate freely with no binding.

VII DOCUMENTATION

The following drawings describe the Typhoon Monitor Assembly and are filed under Project 3040178.

Drawing No.	Revision Level	Drawing Title
A1306	1	Name Label BIV
A1512	1	Knob
A1513	1	Crank Bushing - Saw Cut
A13530	0	Thin Washer
A1547	0	Crank Bushing - Machined
A1559-1	0	Crank - Machined
A1559	1	Crank - Hardcoat
ASM0051	0	Assembly Instruction
ASM0060	0	ASM INST: HANDWHEEL SUB ASSY
ASM0176	0	ASM INST: SWIVEL PULL PIN
ASM0279	0	ASM INST: TYPHOON MONITOR
ASM0317	0	ASM INST: QUICK CONNECT BASE
LIY-050	0	MANUAL: TYPHOON & TYPHOON RC MONITOR
LIY-250	0	MANUAL: T4.5" Quick Connect Inlets for Elbows and Monitors
TST0118	0	TEST INST: TYPHOON AND TORNADO MONITOR
VM4250	4	1/2-28 X 1/2 BUTTON HEAD - NYLOK PATCH
W08-0013	3	FINAL INSPECTION AND TESTING PLAN 100% TEST AND FINAL INSPECTION
X225	2	WORM KEY
X350	1	PULL PIN HOUSING - HARDCOAT
X350-1	3	PULL PIN HOUSING
X362	2	PEG - HARDCOAT
X362-1	3	PEG - MACHINED
XX341	1	PULL KNOB - ELECT. NICKEL
XX341-1	3	PULL KNOB - MACHINED
XXL340	0	PULL PIN - MACHINED
Y2316-1	0	TILLER HANDLE - MACHINED

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Y2316	0	TILLER HANDLE - HARDCOAT
TY2317	0	HANDLE BUSHING
Y3110A-1	0	LOWER SECTION RC - HARDCOAT
Y3110A-3	6	LOWER SECTION RC - MACHINED
Y3110A-ARED	1	LOWER SECTION RC - POWDERCOAT
Y3110A	0	LOWER SECTION RC - POWDERCOAT
Y3124-FM	0	NAME LABEL: TYPHOON - FM APPROVED
Y3124	1	NAME LABEL: TYPHOON
Y3146	1	TRAVEL ADJUSTMENT DISC - MACHINED
Y3160-1	0	DRIVE SHAFT - MACH
Y3160	0	DRIVE SHAFT - HARDCOAT
Y3162	0	BUSHING - MACH
Y3190	1	CLAMP SHIELD - MACHINED
Y3191	0	BAND CLAMP - EVERLUBE
Y3192	0	PLUG - MACH
Y3193-1	0	LOCKING SHAFT - MACHINED
Y3193	0	LOCKING SHAFT - HARDCOAT
Y3194-1	0	RETAINER - MACHINED
Y3194	0	RETAINER - HARDCOAT
Y3310A-1	0	ELBOW 3 1/2" - HARDCOAT
Y3310A-3	1	ELBOW 3 1/2" - MACHINED
Y3310A-ARED	1	ELBOW 3 1/2" - RED POWDERCOAT
Y3110A	0	ELBOW 3 1/2" POWDERCOAT
Y3315A-1	0	TILLER ELBOW 3 1/2" NH - HARDCOAT
Y3315A-3	1	TILLER ELBOW 3 1/2" - MACHINED
Y3315A-ARED	1	TILLER ELBOT 3/12" - RED POWDERCOAT
Y3315A	1	TILLER ELBOW 3 1/2" NH - POWDERCOAT
Y4145	2	STOP BOLT
Y4150	0	SPACER - MACHINED
Y4176	0	OVERRIDE KNOB LABEL
Y4330ABN	0	THREAD ADAPTER 3.5" BSP - HARDCOAT
Y4330AIN-1	2	THREAD ADAPTER 3.5" NSPH ALUM - MACHINED
Y4330AIN	0	CODE-IN THREAD ADAPTER - HARDCOAT
Y4334ABP-1	0	CODE-BP THREAD ADAPTER ALUM - MACH
Y4334ABP	0	THREAD ADAPTER 4.0"BSP ALUM - HARDCOAT
Y4400A-1	4	BASE CODE-RPF 4" ALUM - MACHINED
Y4400A`	2	BASE CODE-RPF 4" ALUM - HARDCOAT
Y4410A-1	1	BASE SHORT CODE-RPF 4" ALUM - MACHINED
Y4401A	1	BASE SHORT CODE-RPF 4" ALUM - HARDCOAT
Y4402A-1	2	TILLER BASE CODE-RPF 4" ALUMINUM - MACHINED
Y4402A	1	BASE CODE-RPF 4" ALUMINUM - HARDCOAT
Y4403A-1	0	BASE FOR VUM - MACHINED
Y4403A	0	BASE FOR VUM - HARDCOAT
Y4404A-1	0	TILLER BASE FOR VUM - MACHINED
Y4404A	0	TILLER BASE FOR VUM - HARDCOAT
Y4405A-1	3	BASE CODE-RLF 3" ALUM - MACHINED

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Y4405	2	BASE CODE-RLF 3" ALUM - HARDCOAT
Y4406A-1	1	TILLER BASE CODE-RLF - MACHINED
Y4406	1	TILLER BASE CODE-RLF - HARDCOAT
Y4407A-1	0	BASE 4.5" QUICK CONNECT - MACHINED
Y4407	0	BASE QUICK CONNECT 4" ALUMINUM - HARDCOAT
Y4408A-1	0	BASE 4.5" QUICK CONNECT - MACHINED
Y4408A	0	BASE QUICK CONNECT 4" ALUMINUM - HARDCOAT
Y4409-1	0	FLANGE VUM FOR LARGE MONITORS - MACHINED
Y4409	0	FLANGE VUM FOR LARGE MONITORS - HARDCOAT
Y4410A-1	2	FLANGE 3" ANSI150 X CODE-RLM ALUM
Y4410A	2	FLANGE 3" ANSI150 X CODE-RLM ALUM
Y4412A-1	0	BASE CODE-RRM 3.65" ALUMINUM - MACHINED
Y4412A	0	BASE CODE0RRM 3.65" ALUMINUM - HARDCOAT
Y4413A-1	0	TILLER BASE CODE-RRM 3.65" ALUM. - MACH
Y4413A	0	TILLER BASE CODE-RRM 3.65" ALUM. - HARD
Y4415A-1	3	FLANGE ALUM 4" ANSI X CODE-RPM - MACHINED
Y4415A	1	FLANGE ALUM 4"ANSI X CODE-RPM - HARDCOAT
Y4417A-1	2	FLANGE ALUMINUM 6" ANSI X CODE-RPM - MACH
Y4417A	1	FLANGE ALUM 6" ANSI X CODE-RPM - HARDCOAT
Y4420A-1	1	INLET 3.0"BSPM X CODE-RLM - MACHINED
Y4420A	2	INLET 3.0"BSPM X CODE-RLM - HARDCOAT
Y4423A-1	1	FLANGE ALUM DN80 X 3"RLM - MACHINED
Y4423A	1	FLANGE ALUM DN80 X 3"RLM - HARDCOAT
Y4425A-1	1	DN100 FLANGE X CODE-RPM - MACHINED
Y4425A	1	DN100 FLANGE X CODE-RPM - HARDCOAT
Y4426A-1	0	OSC. BASE INNER ALUM - MACHINED
Y4426A	0	OSC. BASE INNER ALUM - HARDCOAT
Y4427A-1	0	OSC. BASE FLANGE ALUM. - MACHINED
Y4427A	0	OSC. BASE FLANGE ALUM. - HARDCOAT
Y4428A-1	0	OSC. BASE WORM OUTER ALUM. - MACHINED
Y4428A	0	OSC. BASE WORM OUTER ALUM. - HARDCOAT
Y4429A-1	0	OSC. BASE TILLER OUTER ALUM. - MACHINED
Y4429A	0	OSC. BASE TILLER OUTER ALUM. - HARDCOAT
Y4430A-1	1	INLET 4.0"BSPM X CODE-RPM - MACHINED
Y4430A	2	INLET 4.0"BSPM X CODE-RPM - HARDCOAT
Y4435-1	0	4" MONITOR BASE CLAMP - MACHINED
Y4435	0	4" MONITOR BASE CLAMP - HARDCOAT
Y4436-1	1	3" MONITOR BASE CLAMP - MACHINED
Y4436	1	3" MONITOR BASE CLAMP - HARDCOAT
Y4437	0	CYLINDER NUT - MACHINED
Y4440NL-1	1	INLET 3.0"NPTF X CODE-RLM - MACHINED
Y4440NL	2	INLET 3.0"NPTF X CODE-RLM - HARDCOAT
Y4450NP-1	1	INLET 4.0"NPTF X CODE-RPM - MACHINED
Y4450NP	2	INLET 4.0"NPTF X CODE-RPM - HARDCOAT
Y4480-1	0	COUPLING 4.5"NHF QUICK CONNECT - HARDCOAT
Y4480-2	0	COUPLING 4.5"NHF QUICK CONNECT - MACHINED

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Y4480	0	COUPLING 4.5"NHF QUICK CONNECT - LASER
Y4481	0	BEARING RING - MACHINED
Y4482-1	0	QUICK CONNECT 4"ANSI X 4.5"NHM - MACHINED
Y4482	0	QUICK CONNECT 4"ANSI X 4.5"NHM - HARDCOAT
Y4483-1	1	QUICK CONNECT 4"NPTF X 4.5"NHM - MACHINED
Y4483	0	QUICK CONNECT 4"NPTF X 4.5"NHM - HARDCOAT
Y4486-1	0	QUICK CONNECT CODE-RPF X 4.5"NHM - MACH
Y4486	0	QUICK CONNECT CODE-RPF X 4.5"NHM - HARD
Y4487-1	0	QUICK CONNECT CODE-RLF X 4.5"NHM - MACH
Y4487	0	QUICK CONNECT CODE-RLF X 4.5"NHM - HARD
Y5-D FM	0	TYPHOON DUAL HNDWHEEL INLET AND OUTLET OPTIONS
Y5-D21A	1	TYPHOON DUAL HNDWHL 4" ANSI INLET
Y5-DQ1A	0	TYPHOON DUAL HWHL 4.5"NHF QUICK CONNECT
Y5-DR1A	0	TYPHOON DUAL HNDWHL 4.5"QC 4"ANSI INLET
Y5-DS1A	0	TYPHOON DUAL HWHL 4.5"QC 4"NPTF INLET
Y5-DT1A	0	TYPHOON DUAL HWHL 4.5"QC CODE-RLF INLET
Y5-DU1A	0	TYPHOON DUAL HWHL 4.5"QC CODE-RPF INLET
Y5-M FM	0	TYPHOON HANDWHEEL/TILLER
Y5-M21A	1	TYPHOON HNDWHL/TILL 4"ANSI INLET
Y5-MQ1A	0	TYPHOON HNDWHL/TIL 4.5"NHF QUICK CONNECT
Y5-MR1A	0	TYPHOON HNDWHL/TIL 4.5"QC 4"ANSI INLET
Y5-MS1A	0	TYPHOON HANDWHL/TIL 4.5"QC 4"NPTF INLET
Y5-MT1A	0	TYPHOON HNDWHL/TIL 4.5"QC CODE RLF INLET
Y5-MU1A	0	TYPHOON HNDWHL/TIL 4.5"QC CODE-RPF INLET
Y5-T FM	0	TYPHOON TILLER INLET AND OUTLET OPTIONS
Y5-TQ1A	0	TYPHOON TILLER 4.5"NHF QUICK CONNECT
Y5-TR1A	0	TYHPOON TILLER 4.5"QC 4"ANSI INLET
Y5-TS1A	0	TYPHOON TILLER 4.5"QC 4"NPTF INLET
Y5-TT1	0	TYPHOON TILLER 4.5"QC CODE-RLF INLET
Y5-TU1A	0	TYPHOON TILLER 4.5"QC CODE-RPF INLET
Z245	4	LOCKING KNOB - MOLDED

VII CONCLUSION

The apparatus described in 1.5 meets FM Approvals requirements. Since a duly signed Master Agreement is on file for this manufacturer, Approval is effective the date of this report.

EXAMINATION AND TESTING BY:

**Robert M. Cordell
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John Normington
Task Force Tips Staff**

PROJECT DATA RECORD:

P.I. 3040178

ORIGINAL TEST DATA:

P.I. 3040178

FM APPROVALS
PROJECT ID: 3040178

ATTACHMENTS:

none

REPORT BY:

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