



**HOSE MONSTER**  
COMPANY

# **FIRE PUMP TESTING**

*Application Catalog*



# ABOUT HOSE MONSTER

## HOSEMONSTER IS THE ONE-SOURCE SOLUTION FOR ALL OF YOUR TESTING NEEDS!

Our business was launched in 1996 with our flagship product, the Hose Monster®. It was the first flow-measuring device to enable safe discharge of high-flowing water, minimizing property damage and traffic interference.

The professionals at Hydro Flow Products understand the industries and sectors in which our clients operate. We turn our practical knowledge into clear advice and find solutions that nobody else can provide. When you face unique and challenging testing situations, our knowledgeable staff stands ready to find the best equipment and procedural solutions for you. Your satisfaction is the truest mark of our excellence.

- HYDRANT FLOW TESTING
- FIRE PUMP TESTING
- STANDPIPE TESTING
- MAIN FLUSHING
- APPARATUS TESTING
- DECHLORINATION
- SOFTWARE

### HOW TO ORDER

**Online:** Go to [www.hosemonster.com](http://www.hosemonster.com) and click on the products

**Phone:** Call 1.888.202.9987 to speak with one of our helpful Customer service representatives

**Purchase Order:** Send to [service@flowtest.com](mailto:service@flowtest.com) or fax to 847.434.0073

*(Note: Requires a credit account with HFP)*

## FIRE PUMP TESTING

Fire pumps provide water to fire protection systems where the water supply and pressure is too low to meet the demand of the system. Water is supplied to the pump from underground mains, tanks, reservoirs or other static water sources, powered by either electric or diesel engines. A fire pump acceptance test is conducted after the pump is installed to demonstrate that the pump performs according to the manufacturer's specification.

After the pump is installed, it should be flow tested annually in order to identify deterioration of the components or impairments to the water supply. The Hose Monster® product line makes testing safe, simple, and accurate. Tests can be conducted on gravel surfaces, lawns or landscaping with minimal environmental impact. All our Hose Monsters and Pitotless Nozzles are FM-approved laboratory tested for accuracy.

### HOW OFTEN DO I TEST A FIRE PUMP?

According to NFPA, fire pumps are flow tested after initial installation according to the field acceptance test procedure (NFPA 20, 14.2, 2016). Thereafter, the fire pump test shall be performed annually (NFPA 25, 8.3.3.1, 2014).

### WHERE DO I FIND MORE INFORMATION ON FIRE PUMPS?

- NFPA 20 — For Installation of pumps and field acceptance tests
- NFPA 25 — For Inspection, testing, and maintenance of pumps; annual tests

### SOFTWARE FOR FIRE PUMP TESTING

Use Fire Pump Tester Software™ (FPT) to collect fire pump test results professionally, comprehensively and easily. FPT stores all of your fire pump information, calculates flow-rates and graphs pump test curves. [www.hosemonster.com/testing-software/](http://www.hosemonster.com/testing-software/)

# FREQUENTLY ASKED QUESTIONS

## HOW MANY HOSE MONSTERS DO I NEED FOR MY PUMP TEST?

Pump capacity, hose length, and GPM should be considered when deciding how many hoses are needed. Luckily, we've created the Pump Test Hose Calculator to answer this exact question! Go to [www.hosemonster.com/resources](http://www.hosemonster.com/resources) to see this and other resources.

## WHY SHOULD I USE THE MONSTER TESTER™?

Typically, Fire pump tests require multiple gauges and multiple people to take individual readings and adjust water flow. Not only is this inconvenient, it also causes errors due to poor communication.

With the Monster Tester — One gauge is needed to take accurate readings of each individual pitot/nozzle. The Monster Tester can be remotely located at the test header so that one person can adjust the water flow and keep an eye on the pressure.

## WHAT EFFECT DOES FLOWING UPHILL OR DOWNHILL WITH THE HOSE MONSTER HAVE?

As long as you achieve your required flow (100%, 150%), the pump's net pressure (discharge minus suction) shouldn't be affected. When flowing uphill, you might have to use either more hose lines or shorter hose due to the extra work the pump has to do.

## MY PRESSURE READING FROM THE HOSE MONSTER IS OUTSIDE THE RANGE OF THE PUBLISHED FLOW CHART. WHAT IS MY FLOW-RATE?

All of our flow-rate measuring devices are tested extensively at FM Approvals. Based on what we learn in those tests, a pressure and flow-rate range is chosen that is repeatable and accurate to within 2.5%. If a reading falls outside of the published range, it is not accurate to the tolerance we have established. The best solution is to switch to a smaller or larger nozzle size.

## DOES LENGTH OF HOSE IN A FIRE PUMP TEST AFFECT THE ACCURACY OF THE READINGS?

The accuracy of readings are not affected by the hose length. The pump's net pressure (discharge minus suction) takes into account the extra work needed to pump through longer hose. When discharging water away from buildings or landscaping (over 50 feet of hose), friction loss may overcome the pump's ability to force enough water through the hoses. Additional hoses will solve this problem. If the flow-rate per hose is low enough, a smaller nozzle size may be necessary.

## WHAT IS THE MAXIMUM HOSE LENGTH ALLOWED?

NFPA doesn't have a required minimum or maximum hose length.

## HOW MANY HOSES DOES NFPA REQUIRE TO BE USED?

NFPA 20 Table 4.26 provides a required number of hose valves and the minimum hose valves size (typically 2½") for installation of pumps. However, we've verified with the NFPA that the table does not require a specific number of hoses to be used during a flow test.

## CAN HOSE MONSTER™ BE USED ON A ROOFTOP STANDPIPE TEST?

Yes. A Hose Monster unit allows a rooftop flow test to be conducted any time of day because water is not dispersed over the side of the building. The Little Hose Monster with a 1¾" Pitotless Nozzle or the 2½" Hose Monster with an FM Nozzle Insert are often used. Either one is placed directly on the roof.

## WHAT ARE THE EFFECTS OF DISCHARGING TO A HIGHER OR LOWER ELEVATION?

Elevation does not effect the accuracy of the Pitotless Nozzle/Hose Monster. Flow rates are read as they discharge through the nozzle. The exact amount of water that flows into the hose flows out at the discharge end. This is what is measured.

However, the greater the increase in elevation, the greater the discharge pressure that the pump must overcome.

Flowing from high to low elevation through a flexible hose increases the accuracy of the reading hose by decreasing demand on the pump.

## WHAT ARE THE EFFECTS OF ELEVATION DIFFERENTIAL BETWEEN THE GAUGE AND THE PITOTLESS NOZZLE/HOSE MONSTER WHEN USING THE MONSTER TESTER OR REMOTE READER?

The gauge position relative to the nozzle has an effect of .043 PSI per foot of elevation difference. Here is when it matters:

### Example:

Little Hose Monsters are flowing 25 feet from the test header and the Monster Tester is at the test header. The distance has no effect and makes no difference, (could be 10, 50 or 100 feet) but if the Monster Tester is 3 feet higher than the Little Hose Monster, it will read 1.3 PSI LESS (3 feet x 0.433 PSI) than the pressure at the nozzle. That difference must be added to the actual gauge reading to convert to an accurate flow rate.

Gauge reading = 20 PSI

Correct for elevation of 3 feet = 1.3 PSI

Use 21.3 PSI to convert the flow rate.

# ALL-IN-ONE TESTING BUNDLES

To make your job simpler, we bundle our products for ease of use, transportation, and storage. The following bundles are our recommended set-ups for Fire Pump Testing and Fire Flow Testing. Actual equipment needed may vary depending on intended use and preferences. Each component is sold as a separate line item and can be substituted for the equipment best suited for your job. Contact Hose Monster today to determine the best configuration, the best equipment, and the best setup for your testing operation.

*NH threaded coupling is standard. Other thread types are available by request.*

## FIRE PUMP TEST BUNDLE 750

**#FPTK750** - Recommended for pumps up to 750GPM

Item #	Qty	Description
HML	2	Little Hose Monster™
PN1.75GRV	2	1¾" Pitotless Nozzle, FM Approved (337 to 1011 GPM per nozzle)
H2H.25	2	2½" x 25' Hose
HMRR40	2	Remote Reader Assembly, ¼" x 12' tube, two quick-connect adapters
STK	1	Little Hose Monster Stabilizer for stacking HML, includes Tie Down
CASE2719FPT	1	Equipment Case, 27" x 19" x 10", special padding for HML Pump Test Kit
WSPA101	1	Spanner Wrench, lightweight aluminum alloy
GK60D4	2	Pressure Gauge, 4" dial, 0.5% accuracy rated, 0 to 60 psi



## FIRE PUMP TEST BUNDLE 1000

**#FPTK1000** - Recommended for pumps up to 1000GPM

Item #	Qty	Description
HML	3	Little Hose Monster™
PN1.75GRV	3	1¾" Pitotless Nozzle, FM Approved (337 to 1011 GPM per nozzle)
H2H.25	3	2½" x 25' Hose
HMMT	1	Monster Tester™ with tube set and gauge, 0 to 60 psi
STK	1	Little Hose Monster Stabilizer for stacking HML, includes Tie Down
CASE2719FPT	1	Equipment Case, 27" x 19" x 10", special padding for HML Pump Test Kit
WSPA101	1	Spanner Wrench, lightweight aluminum alloy



## FIRE PUMP TEST BUNDLE 2000

**#FPTK2000** - Recommended for pumps up to 2000GPM

Item #	Qty	Description
HML	6	Little Hose Monster™
PN1.75GRV	6	1¾" Pitotless Nozzle, FM Approved (337 to 1011 GPM per nozzle)
H2H.25	6	2½" x 25' Hose
HMMT	1	Remote Reader Assembly, ¼" x 12' tube, two quick-connect adapters
STK	2	Little Hose Monster Stabilizer for stacking HML, includes Tie Down
CASE2719FPT	2	Equipment Case, 27" x 19" x 10", special padding for HML Pump Test Kit
WSPA101	1	Spanner Wrench, lightweight aluminum alloy



## FIRE PUMP TEST BUNDLE 1500

**#FPTK1500** - Recommended for pumps up to 1500GPM

Item #	Qty	Description
HML	4	Little Hose Monster™
PN1.75GRV	4	1¾" Pitotless Nozzle, FM Approved (337 to 1011 GPM per nozzle)
H2H.25	4	2½" x 25' Hose
HMMT	1	Remote Reader Assembly, ¼" x 12' tube, two quick-connect adapters
STK	2	Little Hose Monster Stabilizer for stacking HML, includes Tie Down
CASE2719FPT	1	Equipment Case, 27" x 19" x 10", special padding for HML Pump Test Kit
WSPA101	1	Spanner Wrench, lightweight aluminum alloy



## FIRE PUMP TEST BUNDLE 4000

**#FPTK4000** - Recommended for pumps up to 4000GPM

Item #	Qty	Description
HML	12	Little Hose Monster™
PN1.75GRV	12	1¾" Pitotless Nozzle, FM Approved (337 to 1011 GPM per nozzle)
H2H.25	12	2½" x 25' Hose
HMMT	2	Monster Tester™ with tube set and gauge, 0 to 60 psi
STK	4	Little Hose Monster Stabilizer for stacking HML, includes Tie Down
CASE2719FPT	3	Equipment Case, 27" x 19" x 10", special padding for HML Pump Test Kit
WSPA101	1	Spanner Wrench, lightweight aluminum alloy





# HYDRAULICS & ENGINEERING INFORMATION

## K-Factor Table for Various Flow Devices

### Pitotless Nozzle™

Device	K-factor	Orifice Diameter	psi Range	Flow Range GPM
2" Pitotless Nozzle + Little Hose Monster™	156.0	2"	10-70	493-1305
2" Pitotless Nozzle + 2½" Hose Monster	164.8	2"	10-70	521-1379
2" Pitotless Nozzle + Open Atmosphere	167.2	2"	10-70	529-1399
1¾" Pitotless Nozzle + Little Hose Monster	104.7	1.75"	10-90	331-993
1¾" Pitotless Nozzle + 2½" Hose Monster	106.6	1.75"	10-90	337-1011
1¾" Pitotless Nozzle + Open Atmosphere	109.7	1.75"	10-90	347-1041
1½" Pitotless Nozzle + Little Hose Monster	37.2	1.125"	5-90	83-353
1½" Pitotless Nozzle + 2½" Hose Monster	37.4	1.125"	5-90	84-355
1½" Pitotless Nozzle + Open Atmosphere	37.0	1.125"	5-90	83-351

### In-line Pitotless Nozzle™

Device	K-factor	Orifice Diameter	psi Range	Flow Range GPM
2" In-line Pitotless Nozzle	165.3	2"	10-75	523-1432
1¾" In-line Pitotless Nozzle	109.9	1.75"	5-80	246-983
1½" In-line Pitotless Nozzle	38.4	1.125"	5-70	86-321
1½" In-line Pitotless Nozzle	31.7	1.0"	2-90	45-301

### BigBoy Hose Monster™

Device	K-factor	Orifice Diameter	psi Range	Flow Range GPM
4 to 10 psi (BigBoy Hose Monster)	382.9	3.05"	4-10	766-1211
11 to 36 psi (BigBoy Hose Monster)	376.0	3.05"	11-36	1247-2256
37 to 53 psi (BigBoy Hose Monster)	372.0	3.05"	37-53	2263-2708

Note: Due to the shape and size of the BigBoy Pitotless Nozzle, the BigBoy Hose Monster uses three different K-factors over its operating range.

### 2½" Hose Monster®

Device	K-factor	Coefficient	Orifice Diameter	psi Range	Flow Range GPM
2½" Hose Monster	168.67	0.906	2.5"	10-75	533-1460
1¾" Nozzle Insert	89.04	0.975	1.75"	10-75	282-771
1½" Nozzle Insert	37.36	0.99	1.125"	10-75	118-324

### 4" and 4½" Hose Monster®

Device	K-factor	Orifice Diameter	psi Range	Flow Range GPM
4½" Hose Monster	331.07	4.5"	10-75	1047-2867
4" Hose Monster	339.65	4"	10-75	1074-2941

# CALCULATING FLOW RATES

## K-FACTOR FORMULA

Computes a flow-rate in GPM given a psi and a K-factor of the flow device.

$$Q = \sqrt{P \times K}$$

Q = flow-rate in GPM

P = velocity pressure in psi

K = K-factor of flow device

## THEORETICAL DISCHARGE THROUGH CIRCULAR ORIFICES FORMULA

Computes a flow-rate in GPM given a psi and coefficient of the flow device.

$$Q = 29.84 \times \sqrt{P \times D^2 \times C}$$

Q = flow-rate in GPM

P = velocity pressure in psi

D = orifice diameter in inches

C = coefficient of flow device

## US/METRIC CONVERSIONS

### FLOW-RATE:

US Gallons/Minute x 3.785 = Liters/Minute  
Liters/Minute x 0.264 = US Gallons/Minute

US Gallons/Minute x 0.1337 = Feet<sup>3</sup>/Minute  
Feet<sup>3</sup>/Minute x 7.481 = US Gallons/Minute

### WEIGHT OF WATER:

US Gallons of Water x 8.3454 = Pounds  
Feet<sup>3</sup> of Water x 62.42796 = Pounds

### VOLUME:

US Gallons x 3.785 = Liters  
Liters x 0.264 = US Gallons

US Gallons x 0.8327 = Imperial Gallons  
Imperial Gallons x 1.201 = US Gallons

Feet<sup>3</sup> x 7.48051945 = US Gallons  
US Gallons x 0.1337 = Feet<sup>3</sup>

### LENGTH:

Meters x 3.2808 = Feet  
Feet x 0.3048 = Meters

### Pressure:

psi x 0.0689 = Bars  
Bars x 14.5038 = psi

psi x 6894.757 = Pascals  
Pascals x 0.000145 = psi

Bars x 100,000 = Pascals  
Pascals x 0.00001 = Bars

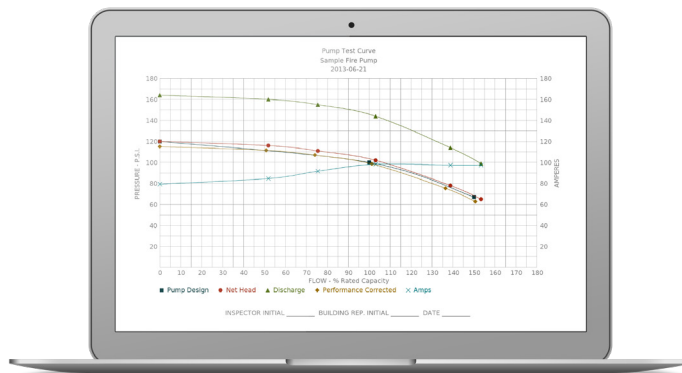


# FIRE PUMP TESTER SOFTWARE

## THE BEST EQUIPMENT DEMANDS THE BEST SOFTWARE

### ABOUT THE SOFTWARE

The best Fire Pump Testing equipment demands the best Fire Pump Testing software. Download a PDF of our User's Guide and Sample Report for more information about the software at [www.hosemonster.com/testing-software](http://www.hosemonster.com/testing-software)



## SOFTWARE FEATURES



### COLLECT PUMP INFORMATION

Record and store your fire pump technical specifications such as: job-site location, pump manufacture and model, rated capacity, pressures, and speed, driver, controller, and jockey pump information, and much more. Create custom fields to store information that matters to you.



### SIMPLIFY FIRE PUMP TESTING

FPT aims to make fire pump testing as easy as possible. All the difficult and cumbersome calculations are done automatically by the program. All you need to do is enter the fire pump nameplate data and test results. Our software program does the rest.



### PRODUCE PUMP TEST REPORTS

NFPA 25 requires records to be kept by property owners for all inspections, tests, and maintenance of the fire pump system. Our software produces professional PDF reports that can be printed or emailed to customers. Reports include a title page, fire pump specifications, results, and test curves.



### COMPARE PUMP TEST CURVES

FPT generates graphs with the Pump Design Curve, Net Head Curve, Discharge Curve, Performance Corrected Curve, and Ampere Curve. The graphs make it easy to compare and visualize the pump performance compared to several different criteria.



### STORE DATA IN THE CLOUD

All past and current testing data is securely stored in cloud servers. Testing data can be accessed from any internet enabled device by multiple users within your company. All software updates and new features are automatically implemented to the system without need for update management.



### SECURE YOUR DATA

We host our data on the Amazon Web Services cloud infrastructure. AWS is one of the most secure cloud computing environments available which helps keep your data both incredibly secure and easily accessible..



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