



TECHNICAL DATA

VSH1230 EXTINGUISHING AGENT CYLINDERS

The Viking Corporation | 210 N Industrial Park Drive | Hastings MI 49058

Viking Special Hazards | Technical Services: 877-384-5464 | Email: techsvcs@vikingcorp.com | www.vikinggroupinc.com

The technical data described herein is for components of the Viking VSH1230 Clean Agent Systems.

For design, installation, and operation instructions, refer to the latest edition of the original source documents as outlined below.

VSH1230: Installation and Service Manual (Part No. 932159), Design Manual (Part No. 932157), and Operation Manual (Part No. 932161).

Visit the Viking website for the latest edition of the technical manuals listed above.

1. DESCRIPTION

The Viking VSH1230 Fire Extinguishing System uses 3M™ Novec™ 1230 extinguishing fluid that is stored in the system's extinguishing agent container(s) until system activation. The container assembly includes a welded or seamless steel cylinder filled with Novec™ 1230 fluid, assembled with the following components:

- Cylinder valve with burst disc, pressure gauge, protective neck ring, protective cylinder cap and valve cap.
- Five cylinder sizes available for 360 psi (25 bar): 60, 140, 280, 390, and 500 lbs. (22, 52, 106, 147, and 180 l).
- Three cylinder sizes are available for 725 psi (50 bar): 220, 390, and 500 (80, 140, and 180 l)
- 280, 390, and 500 lbs. (106, 147, and 180 l) cylinders are available with Liquid Level Indicators for the 360 psi (25 bar) system.
- Cylinders are designed, manufactured, and labeled in accordance with the US Dept. of Transportation Standard DOT 4BW-500, DOT 3AA-910, and TC (Transportation Canada - 360 psi (25 bar) system only).
- Cylinders can only be installed in the upright position.
- To create the pressure necessary for the agent to be released, the extinguishing agent container is superpressurized with nitrogen at a pressure of 360 psi (25 bar) or 725 psi (50 bar).
- Cylinder fill density is dependent on the area of protection size. Agent concentration varies due to the expected class of fire (A, B, or C).

Each cylinder is equipped with a special pressure differential valve:

- Operates according to the differential pressure principle and has a piston and a brass housing.
- Includes a burst disc to protect from excessive pressure.
- Includes a pressure gauge for indication of the filling pressure.
- The valve is appropriate for high discharge rates and makes the extinguishant discharge possible within 10 seconds.
- Available in the nominal sizes 1-1/2" for the 60 lb and 140 lb. cylinder, and 2" for 220, 280, 390, and 500 lb. cylinders.

An optional manual release assembly with pneumatic discharge pressure switch can be ordered separately for installation in the piping:

- The pneumatic discharge pressure switch is required with manual release installation per NFPA 2001.
- The status of the pressure switch can be monitored by the fire agent release control panel.

A cylinder nameplate label is attached to the extinguishing agent container:

- Contains maintenance and filling information, as well as information about the filling quantity.
- A UL Listing label and FM Approval label are also attached to the cylinder.

Protective caps are used to protect sensitive components (e.g. valves) of the extinguishing agent containers:

- Protects the valves from damage during transport.

NOTE: The protective valve caps must be attached before each transport.

An installation clamp is required to be ordered with each container assembly (available separately):

- The cylinder must be attached to a wall using the designated installation clamp.

NOTE: System detection is controlled by an approved system release control panel with compatible detection.

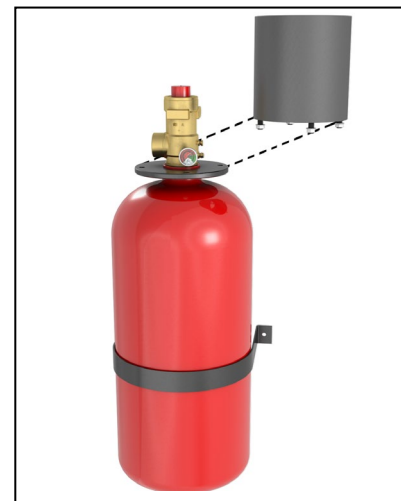
2. LISTINGS AND APPROVALS



UL Listed: Clean Agent Extinguishing System Unit



FM Approved: Clean Agent Fire Extinguishing System



WARNING: Cancer and Reproductive Harm-
www.P65Warnings.ca.gov



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3. TECHNICAL DATA

- Minimum and Maximum Agent Storage Temperatures: 0°F to 122°F (-18°C to 50°C)
- Minimum and Maximum Temperatures of Protected Spaces per UL and FM: 60°F to 80°F (15.6°C to 26.7°C)

Cylinder Specifications

- Fill Density: Min. 25 lb/ft³ (400 kg/m³), Max. 74.9 lb/ft³ (1200 kg/m³) at 69.8°F (21°C)

NOTE: The accurate filling quantity depends on the necessary extinguishant quantity and the layout of the piping.

Valve Specifications

- Working Pressure: 360 psi (25 bar) or 725 psi (50 bar) at 70°F (21°C)
- Max. Working Pressure: 508 psi (35 bar) or 870 psi (60 bar) at 122°F (50°C)
- Response Pressure at Bursting Disc for 360 psi (25 bar) System: 900 psi (62 bar) at 68°F (20°C)
- Response Pressure at Bursting Disc for 725 psi (50 bar) System: 1276 psi (88 bar) for 2" valves, 1291 psi (89 bar) for 1-1/2" valves at 68°F (20°C)

Gauge Specifications

- FK-5-1-12 (Novec™ 1230)
- 360 psi (25 bar) system:
 - Maximum Pressure: 725 psi (50 bar)
 - Indicating Range: 0 to 508 psi (35 bar)
- 725 psi (50 bar) system:
 - Maximum Pressure: 1160 psi (80 bar)
 - Indicating Range: 0 to 870 psi (60 bar)
- Gauge Nominal Size: 2" (50 mm)
- Accuracy Class: 1.6

Material Standards

Cylinder: Welded Steel, Powder Coated Red, DOT Standard 4BW-500 or Seamless Steel, Powder Coated Red, DOT Standard 3AA-910/TPED

Protective Neck Ring: AISI 1015 Hot Rolled Steel, Powder Coated Black

Cylinder Valve:

- Housing, Adapter, Screws: Brass
- Seal Retainer: Brass
- O-ring/Seal of Seat: NBR
- Bursting Disk: Nickel
- Spring: Steel

Gauge: Aluminum

Liquid Level Indicator

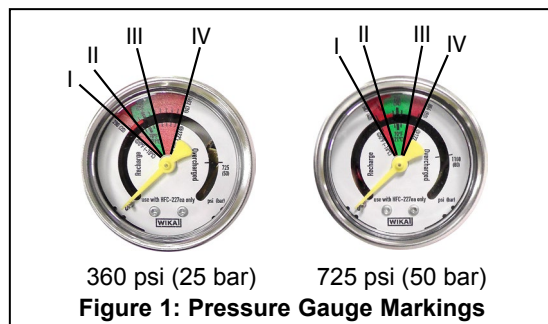
- Stem: Brass
- O-Ring: Buna N
- Float: Ceramic
- Protective Cap: PVC
- Tape: Painted Steel

Protective Cylinder Cap: AISI 1026, Hot Rolled Steel, Powder Coated Black

Installation Clamp: Steel

Ordering Information

The cylinders are filled according to the ordering designations. Extinguishant cylinders are completely assembled and filled. For a complete Single Container System, the following must be ordered separately: release devices, optional manual release assembly with pneumatic discharge pressure switch, discharge nozzles, hose or NPT connections, installation clamp, and warning signs. An approved release control panel with compatible detection system is also required.



Gauge Indicating Range:

- I. Pressure at minimum temperature 0°F (-18°C)
- II-III. Pressure from 90% to 110% from charging pressure at 70°F (21°C)
- IV. Pressure at max. temperature 122°F (50°C)

Gauge Color Marked:

- 0 to I.....Recharge
- I to II.....Red
- II to III.....Green
- III to IV.....Red
- IV to max....Overcharge



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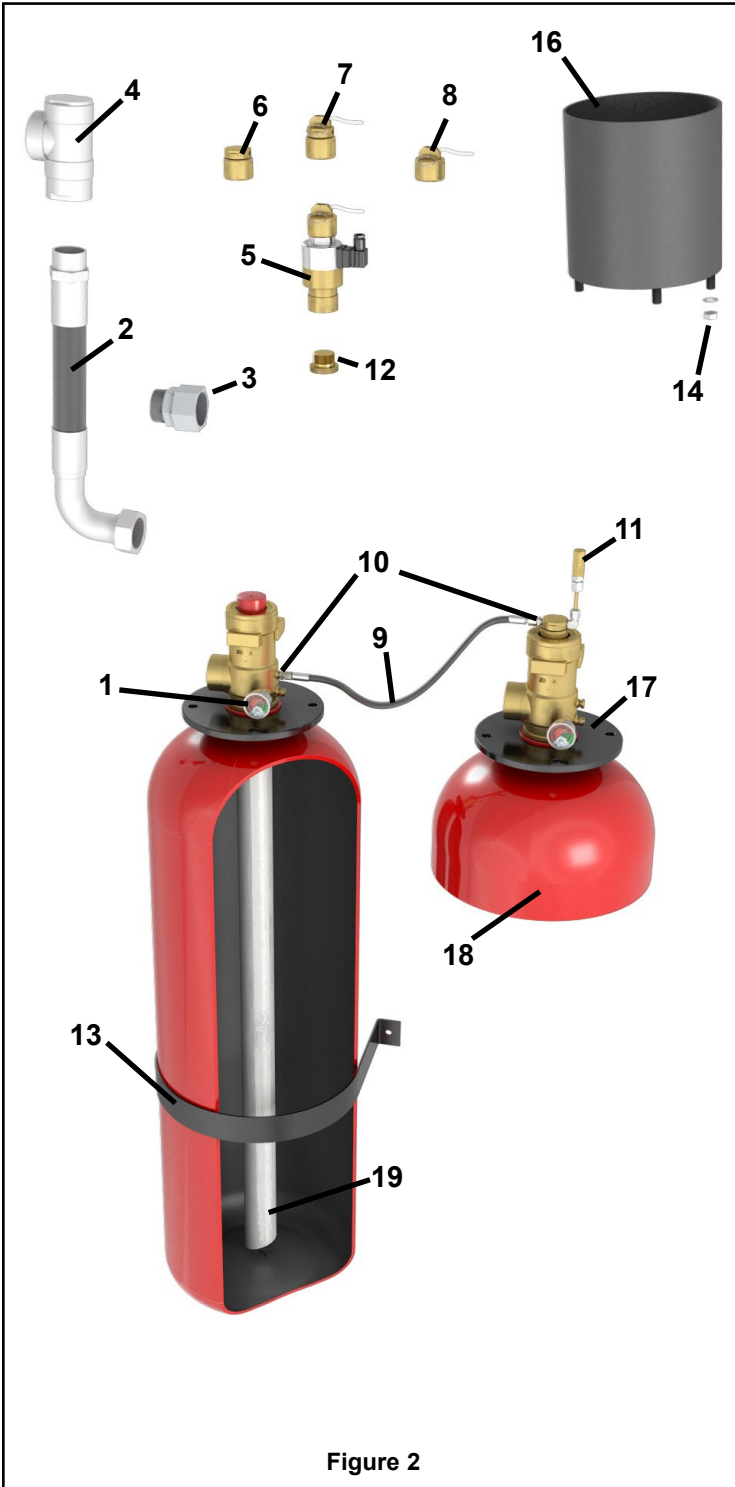


Figure 2

TABLE 1: VSH1230 Fire Extinguishing System Components

| Item No. | Description | Part No. | |
|----------|---|-----------------------------------|----------|
| 1 | Contact Pressure Gauge/ Low Pressure Switch (N.O. under pressure) | 360 psi (25 bar) | 88 9303 |
| | | 725 psi (50 bar) | 88 9305 |
| | Pressure Gauge Only-Optional | 360 psi (25 bar) | 91 2097 |
| | | 725psi (50 bar) | 91 2099 |
| 2 | Hose | 1-1/2" 90° Bend | 91 2075 |
| | | 2" 90° Bend | 91 2076 |
| 3 | Swivel Adaptor | 1-1/2" NPT | 17562 |
| | | 2" NPT | 17563 |
| 4 | Check Valve | 2" | 91 2071 |
| 5 | Electric Release Device | | 88 9323 |
| 6 | Pneumatic Release Device | | 88 7669 |
| 7 | Pneumatic/Manual Release Device | | 88 7670 |
| 8 | Manual Release Device | | 88 7668 |
| 9 | Pilot Hose | 24" | 88 7834 |
| | | 39" | 88 7835 |
| | | 59" | 88 7836 |
| 10 | Pilot Hose Adaptor | | 88 7644 |
| 11 | Pressure Malfunction Safety Assembly | | 16010 |
| 12 | Screw Reset Tool | | 17096 |
| 13 | Clamp for Extinguishing Agent Cylinder | 60 lb / 140 lb | 19368W/B |
| | | 280 lb / 390 lb / 220 lb / 500 lb | 88 7639 |
| 14 | Locknut, flange head | | 18046 |
| 16 | Protection Cap | | 16353W/B |
| 17 | Ring-Protection Cap | | 16539 |
| 18 | Extinguishing Agent Cylinder | | Varies |
| 19 | Siphon Tube | 2.0 inch | 16355 |
| | | 1.5 inch | 16354 |



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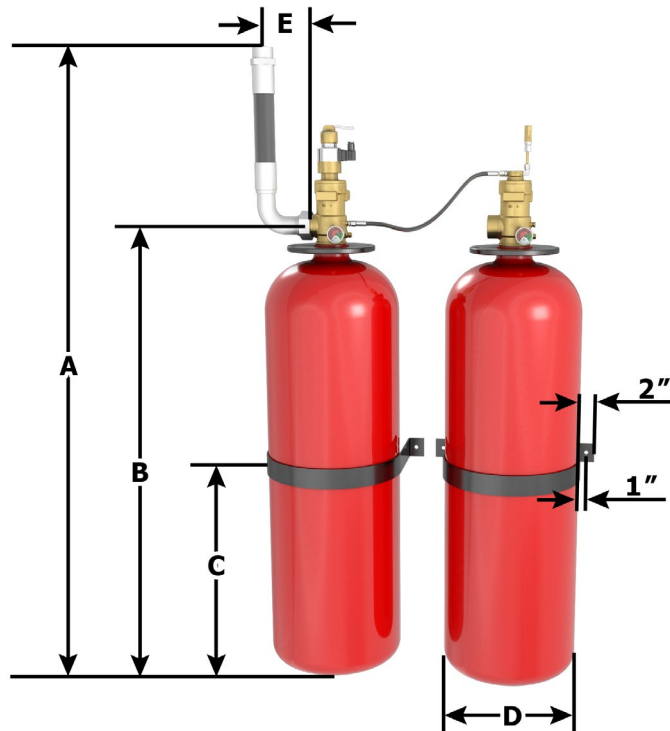


Figure 3

TABLE 2: VSH1230 Cylinder Part Numbers and Dimensions^{1,2}

| PRESSURE AT 70° F (20° C) | Nominal Volume | Part No. Valve Type A / A25 | A (in.) | B (in.) | C (in.) | D (in.) | E (in.) | Amount Filled | | Empty Weight |
|------------------------------------|----------------|-----------------------------|---------|---------|---------|---------|---------|---------------|---------|--------------|
| | | | | | | | | Min. | Max. | |
| 360 PSI (25 bar) | 60 lb | 91 4147 | 40.8 | 23.2 | 15.8 | 10 | 4.75 | 20 lbs | 58 lbs | 88 lbs |
| | 140 lb | 88 9109 | 65.4 | 47.8 | 27.5 | 10 | 4.75 | 46 lbs | 137 lbs | 108 lbs |
| | 280 lb | 88 9111 | 61.4 | 40.9 | 27.5 | 16 | 6 | 94 lbs | 280 lbs | 190 lbs |
| | 390 lb | 88 9113 | 74.5 | 54.0 | 41.1 | 16 | 6 | 130 lbs | 388 lbs | 229 lbs |
| | 500 lb | 91 0510 | 86.0 | 65.5 | 51.2 | 16 | 6 | 159 lbs | 476 lbs | 313 lbs |
| 725 PSI (50 bar) | 220 lb | 88 8591 | 55.4 | 34.9 | 23.6 | 16 | 6 | 71 lbs | 211 lbs | 218 lbs |
| | 390 lb | 88 8593 | 74.3 | 53.8 | 41.4 | 16 | 6 | 124 lbs | 370 lbs | 289 lbs |
| | 500 lb | 88 8595 | 88.0 | 67.5 | 51.2 | 16 | 6 | 159 lbs | 476 lbs | 395 lbs |
| With Liquid Level Indicator | | | | | | | | | | |
| 360 PSI (25 bar) | 280 lb | 91 4151 | 61.4 | 40.9 | 27.5 | 16 | 6 | 94 lbs | 280 lbs | 210 lbs |
| | 390 lb | 91 4152 | 74.5 | 54.0 | 41.4 | 16 | 6 | 130 lbs | 388 lbs | 251 lbs |
| | 500 lb | 91 4153 | 86.0 | 65.5 | 51.2 | 16 | 6 | 159 lbs | 476 lbs | 286 lbs |

¹ Extinguishing agent cylinder complete with valve, siphon tube, ring and protection cap, without extinguishing agent.

² All dimensions are approximate, variations due to manufacturing tolerances are possible.



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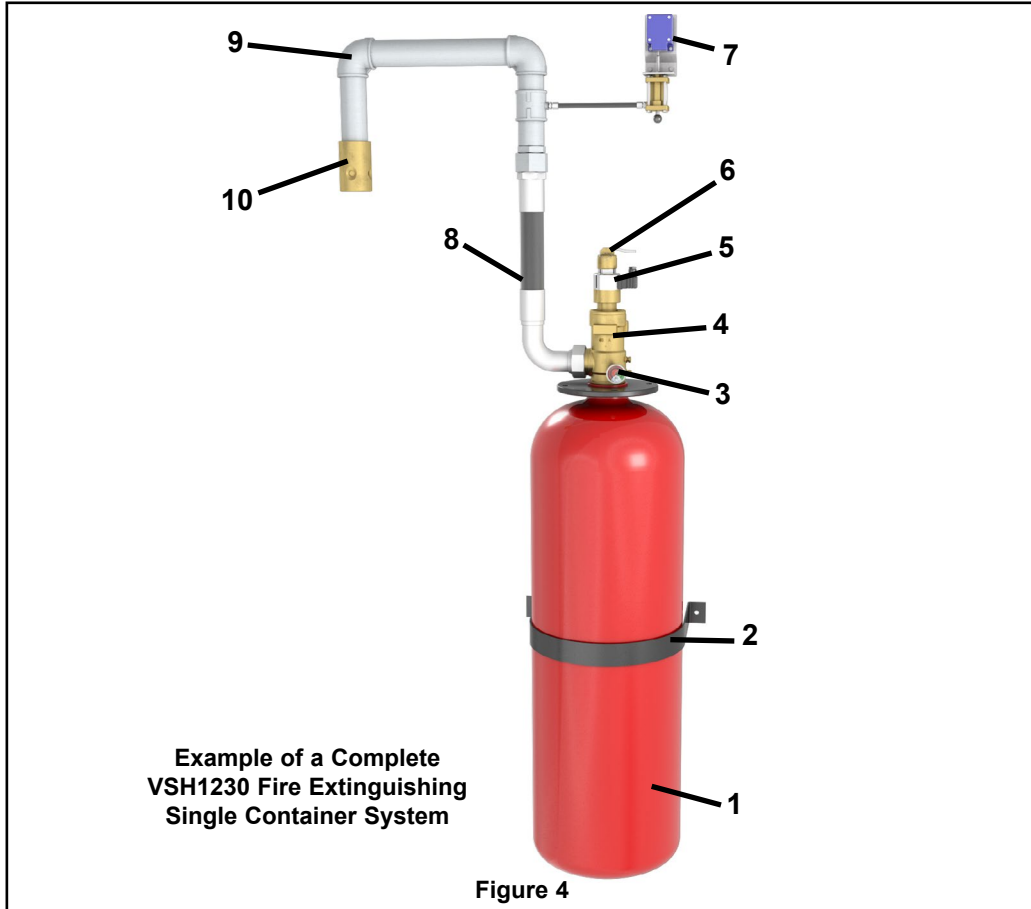


TABLE 3: SYSTEM COMPONENTS FOR A COMPLETE VSH1230 SINGLE CONTAINER SYSTEM WITH ELECTRIC RELEASE DEVICE

| Item No. | Description |
|----------|--|
| 1 | Extinguishing Agent Container |
| 2 | Installation Clamp** |
| 3 | Pressure Gauge |
| 4 | Cylinder Valve with Burst Disc |
| 5 | Release Device, Electric** |
| 6 | Release Device, Manual (optional, also see Item 9)** |
| 7 | Pneumatic Discharge Pressure Switch (optional)**† |
| 8 | Hose (90° Shown)** |
| 9 | Pipeline** |
| 10 | Discharge Nozzle** |

**Ordered separately.

† Required if manual release device is installed (available as part of the manual release assembly).

NOTE: Additional components are required for a Multi Container System.



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Figure 5: Example of a Complete VSH1230 Fire Extinguishing Multi Container System

TABLE 4: ADDITIONAL SYSTEM COMPONENTS REQUIRED FOR A VSH1230 MULTI CONTAINER SYSTEM***

| Item No. | Description |
|----------|--|
| 1 | Pneumatic Release Device |
| 2 | Check Valve |
| 3 | Pilot Line |
| 4 | Pilot Line Adapter (one required for connecting each pilot line end and for connecting each pilot line safety valve) |
| 5 | Pressure Malfunction Safety Assembly |

***Components required in addition to the items indicated in Figure 3 for a Single Container System.