



TECHNICAL DATA

THERMOSTATIC RELEASE MODEL C-2 CORROSION RESISTANT

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

Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

1. PRODUCT DESCRIPTION

The Viking Model C-2 Thermostatic Release is a corrosion resistant rate-of-rise releasing device for use on hydraulic and pneumatic release systems controlling operation of Viking deluge valves on deluge or preaction systems. When subjected to a temperature rise greater than 15 °F (8.3 °C) per minute, the Model C-2 Thermostatic Release opens to allow pressure in the release system to escape. The operating principle is based on metals expanding at unequal rates. The unit may also be equipped with a fixed temperature release that will release the system at a preset temperature regardless of the rate of temperature increase. The Model C-2 Thermostatic Release is designed for use outdoors or in open structures where sea water atmospheres are present. It may be used on either hydraulic or pneumatic release systems.

When using the release on pneumatic systems using nitrogen, order part number 10367 for a pneumatic release which is factory tested with nitrogen.

Avoid installing thermostatic releases in environments subject to large, rapid temperature fluctuations under normal conditions. When in doubt, consult the manufacturer.

Features:

- A. Rate-of-rise feature is self-resetting.
- B. Fixed temperature release 155 °F (68 °C) (glass bulb), wax coated.
- C. Standard ½" (15 mm) NPT inlet and outlet.
- D. 3/8" (9.52 mm) tap for hanger rod.
- E. Unlimited number of releases may be installed on a single release line.
- F. For use on hydraulic or pneumatic release systems.
- G. Optional operation indicators available.
- H. May be mounted at any angle.
- I. May be installed indoors or outdoors.



2. LISTINGS AND APPROVALS:

UL Listed - VLTR

3. TECHNICAL DATA

Specifications:

Setting: 0.018" (0.457 mm)

Maximum Spacing UL: 1600 square feet (148.6 square meters) - 40 ft x 40 ft (12.19 m x 12.19 m)

Ambient Temperature Range: Tested for use: -40 °F to 140 °F (-40 °C to 60 °C).

Water Working Pressure: Rated to 250 PSI (17.2 bar)

Body K-Factor: 5.5 (79 metric when pressure is measured in bar).

Material Specifications:

Refer to Figure 2.

Ordering Information:

Part No. 03991C - 18; for use on pneumatic release systems using air and hydraulic release systems. Available since 1979

Part number 10367; for use on pneumatic release systems using nitrogen. Available since 1998

Shipping Weight: 6 lbs. (2.72 kg)

Viking Technical Data may be found on
The Viking Corporation's Web site at
<http://www.vikinggroupinc.com>.
The Web site may include a more recent
edition of this Technical Data Page.

4. INSTALLATION (Refer to Figure 2.)

1. For release system design, and spacing of Model C-2 Thermostatic Releases, refer to "Deluge System Design" section of the *Viking Engineering Design Data* book. The maximum spacing allowed for Model C-2 Thermostatic Releases is 1600 square feet (148.6 square meters) - 40 ft x 40 ft (12.19 m x 12.19 m).
2. When installing Model C-2 Thermostatic Releases below ceilings, position the tube element no closer than 4" (100 mm) from adjacent walls, and no less than 4" (100 mm) below the ceiling. The distance below the ceiling shall not exceed the maximum distance allowed for the sprinkler used.
3. When installing Model C-2 Thermostatic Releases in open structures refer to "Deluge System Design" section of the *Viking Engineering and Design Data* book.
4. When installing Model C-2 Thermostatic Releases outdoors where direct sunlight could cause rapid temperature increases, consider installing a weather hood over the release. Refer to fabrication and installation instructions provided in the *Viking Engineering and Design Data* book.



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- Unless otherwise specified in the Technical Data, release piping should be ½" galvanized steel or hard copper piping. The interior of the ½" (15 mm) release line must be cleared of foreign material prior to release installation. Connect each thermostatic release to release piping using ½" (15 mm) NPT nipples as shown in Figure 1.

WARNING: DO NOT USE THE ELEMENT TUBE AS A LEVER WHEN INSTALLING THE THERMOSTATIC RELEASE. PERMANENT DAMAGE MAY RESULT.

- Apply a small amount of pipe-joint compound or tape to the external threads of all pipe connections required. Take care not to allow any compound, tape, or other foreign matter inside the openings.
 - The thermostatic release must be protected from mechanical damage. If the element tube becomes dented or bent, the release must be replaced.
- DO NOT plug the bottom drain outlet of the release*. The thread protector, installed for shipping, must be removed from the outlet for proper operation. *Viking Operation Indicator, Part No. 02944A, may be installed in the drain outlet of the release. The Indicator is designed so the cap will blow open at 2 PSI (.14 bar) when the release operates.
 - Support thermostatic releases with 3/8" (9.52 mm) rod from a suitable building member in the same manner as branch line piping.
 - When using the thermostatic release on a pneumatic release system, provide an automatic air supply set at 30 PSI (2.1 bar) for system water pressures up to 175 PSI (12.1 bar), or 50 PSI (3.5 bar) for system water pressures up to 250 PSI (17.2 bar), using:
 - A plant air system, an air maintenance device, and a dehydrator;
 - A self-contained air compressor, with an air maintenance device, and a dehydrator; or
 - A suitable dry compressed gas supply and air maintenance device.

THE DELUGE VALVE MUST BE EQUIPPED WITH A VIKING PNEUMATIC ACTUATOR AND A VIKING PRESSURE OPERATED RELIEF VALVE (PORV).

- When installing the thermostatic release on a hydraulic release system, do not exceed the maximum elevation allowed for hydraulic release piping above the deluge valve. Refer to Technical Data for the valve used.
 - Remove any air trapped in the release piping.

WARNING: DO NOT PAINT THE THERMOSTATIC RELEASE.

- Place the system in service. Refer to Viking System Data for the system used and Viking Technical Data for the valve used.
 - Verify that all valves are in their normal operating position.

5. OPERATION (Refer to Figure 2.)

Pressurized air, nitrogen, or water supplied to the release system flows into the inlet and through a small hole in diaphragm (16). The pressure is trapped above diaphragm (16) by the closed schrader valve (11), forcing clapper (20) to close against seat (26). When the thermostatic release is subjected to a temperature rise greater than 15 °F (8.3 °C) per minute, the element tube (2) expands more rapidly than the rod element (3) to exert a pulling force on lever arm (6). As lever arm (6) pivots on pivot pin (5), socket screw (9) depresses the operating stem of Schrader valve (11). When the schrader valve stem is depressed, it rapidly vents pressure from above diaphragm (16) faster than the pressure can be replaced through the small hole in the diaphragm. Higher pressure in the release system pushes clapper (20) off seat (26) and is vented to atmosphere through the drain outlet.

6. INSPECTION, TESTS, AND MAINTENANCE

NOTICE: THE OWNER IS RESPONSIBLE FOR MAINTAINING THE FIRE PROTECTION SYSTEM AND DEVICES IN PROPER OPERATING CONDITION.

Viking thermostatic releases must be kept free of foreign matter, corrosive atmospheres, contaminated water supplies, and any condition that could impair its operation or damage the device.

WARNING: ANY SYSTEM MAINTENANCE WHICH INVOLVES PLACING A CONTROL VALVE OR DETECTION SYSTEM OUT OF SERVICE MAY ELIMINATE THE FIRE PROTECTION CAPABILITIES OF THAT SYSTEM. PRIOR TO PROCEEDING, NOTIFY THE AUTHORITY HAVING JURISDICTION. CONSIDERATION SHOULD BE GIVEN TO EMPLOYMENT OF A FIRE PATROL IN THE AFFECTED AREAS.

It is imperative that the release system be inspected and tested on a regular basis. The frequency of the inspections may vary due to contaminated water supplies, corrosive water supplies, and corrosive atmospheres. For minimum maintenance and inspection requirements, refer to NFPA 25. In addition, the Authority Having Jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed. The following recommendations are minimum requirements.

A. Inspection

Visual inspection of thermostatic releases is recommended semiannually and/or any time changes are made to the building, occupancy, or environment that might affect operation of the release.

- Verify that the bottom drain outlet is not plugged. If operation detectors have been installed, verify that the plastic cap is in place.



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2. Verify that no changes have been made to the building, occupancy, or any other conditions that would affect operation of the unit.
3. Check for signs of mechanical damage, and/or corrosive activity. If detected, perform maintenance as required, or if necessary, replace the device. Painted thermostatic releases must be replaced.

B. Operational Test

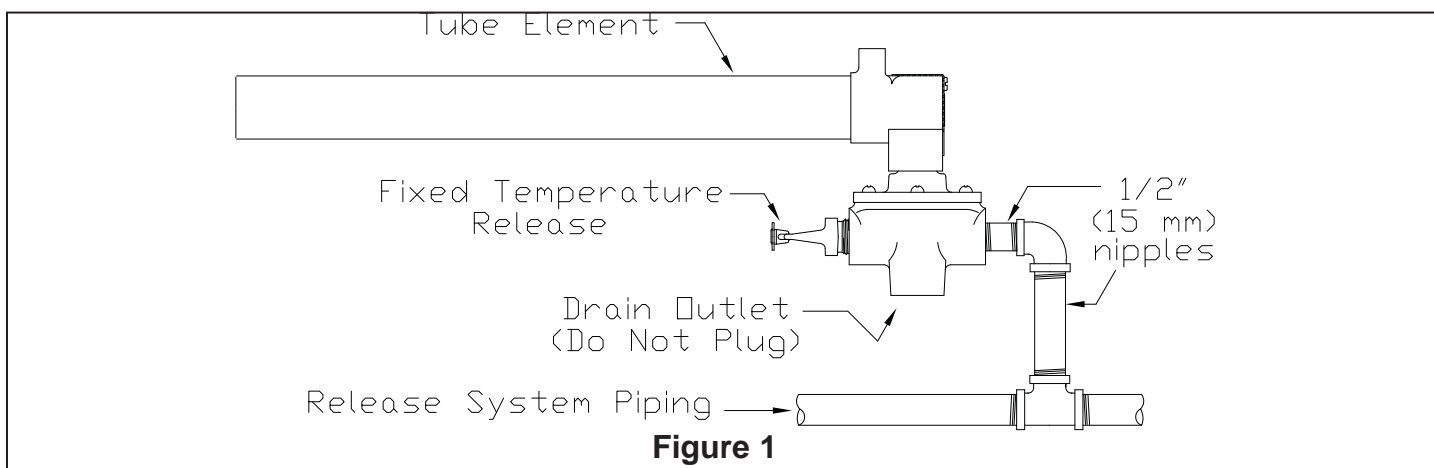
Each thermostatic release should be operated annually. An acceptable heat source is required (refer to step 5 below). Also, refer to Technical Data for the valve and system used.

1. Notify the Authority Having Jurisdiction and those in the area affected by the test.
2. To prevent operation of deluge or preaction systems, close the main water supply control valve. (See WARNING in INSPECTIONS, TESTS, AND MAINTENANCE paragraph above.)
3. Keep the priming valve open.
4. For pneumatic release systems, keep the air supply to the release system in service.
 - a. Low-air alarms controlled by air supervisory switches installed on the pneumatic release system will activate during the test unless they are taken out of service during testing.
5. Place an acceptable heat source over or next to the element tube. An acceptable heat source is one that will evenly distribute sufficient heat over the element tube to simulate a rise in ambient temperature greater than 15 °F (8.3 °C) per minute. A hot cloth wrapped around the element tube is an example of an acceptable heat source. DO NOT use a torch directly on the element tube.
 - a. If the thermostatic release is equipped with a fixed temperature release, use care not to heat the fixed temperature release above the recommended maximum ambient temperature for the temperature rating used.
 - b. The thermostatic release must be protected from mechanical damage. If the element tube becomes dented or bent, the release must be replaced.
6. Verify that the thermostatic release operates in an acceptable period of time.
 - a. On hydraulic release systems, water will flow from the drain outlet on the bottom of the thermostatic release.
 - b. On pneumatic release systems, air will flow from the drain outlet on the bottom of the thermostatic release. Low-air alarms may activate unless they have been taken out of service for the test.
7. After the release operates:
 - a. Remove the heat source.
 - b. Allow the thermostatic release to cool and reset.
 - c. Allow the release system to re-pressurize.
8. Repeat steps 5 through 7 for each thermostatic release being tested.
9. When testing is complete:
 - a. For pneumatic release systems: If low-air alarms were taken out of service for the test, return them to service.
10. Place the system back in service. Refer to Viking System Data for the system used and Viking Technical Data for the valve used.
 - a. Verify that all valves are in their normal operating position.
11. Notify the Authority Having Jurisdiction and those in the area affected by the test that the system is back in service.

C. Maintenance (Refer To Figure 2.)

Installation of replacement Sub-assemblies or a replacement valve core (11) requires disassembly and adjustment of the thermostatic release. Viking Tool Kit Part No. 01714A is required.

NOTE: PARTS (1) THROUGH (7) MAY NOT BE REMOVED OR REPLACED. THE TUBE ELEMENT (2) AND ROD ELEMENT (3) ARE FACTORY SET. THEY ARE NOT ADJUSTABLE AND CANNOT BE REPLACED.





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D. Disassembly and Installation of Replacement Parts (See WARNING in INSPECTIONS, TESTS, AND MAINTENANCE)

1. To prevent operation of deluge or preaction systems, close the main water supply control valve.
2. De-pressurize the release system.
3. To remove or replace the schrader valve core:
 - a. Remove the two screws (10) from the back of the cover (13) using a Phillips head screwdriver and separate the cover from the housing.
 - b. Remove the socket set screw (9) from the lever arm (6) using one end of the schrader valve core tool.
 - c. Remove the schrader valve core (11) from the assembly using the opposite end of the schrader valve core tool.
4. To remove the fixed temperature release (23):
 - a. Unthread the fixed temperature release (23) from the body (22) using fixed temperature release wrench part no. 10896.
5. With the cover (13) separated from the body (22), the spring (14), seal ring (17), spring retainer (15), diaphragm (16), screen (18), clamp plate (19), clapper (20), and button head screw (21) can be removed.
6. To replace the body assembly (22, 26), remove the screws (24) using a Phillips head screwdriver to separate the body (22) from the cover (13).
7. Install the new parts into the body (22):
 - a. Install the spring retainer (15), diaphragm (16), screen (18), clamp plate (19), clapper (20), and button head screw (21) into the body (22).
 - b. Install the seal ring (17) and then install the spring (14) into the spring retainer (15).
8. Install the cover (13) onto the body (22):
 - a. Make sure the element tube (2) is in line with the outlet for the fixed temperature release (23).
 - b. Line up the holes and install the screws (24) using a Phillips head screwdriver.
9. To install the new fixed temperature release (23):
 - a. With the protective shield covering the operating element, thread the new release (23) into the body (22) using wrench 10896. NOTE: After the fixed temperature release is installed, remove the protective shield from the operating element.
10. Install the schrader valve core (11) into the thermostatic release using the schrader valve core tool.
11. Partially install the socket set screw (9) into the lever arm (6) using the opposite end of the schrader valve core tool.
NOTE: This requires use of the adjustment kit:

E. Adjustment

1. Prior to using the adjustment kit (if the release is still installed on the pilot line):
 - i. Verify that the main water supply control valve of the deluge or preaction systems is closed.
 - ii. Allow the thermostatic release to adjust to ambient temperature of the area where the adjustment will be performed (60 minutes minimum).
 - iii. While performing the following adjustment steps, DO NOT place hands on element tube (2) to ensure that the temperature of the tube is not altered.
 - iv. Pressurize the release line inlet: For pneumatic release systems, pressurize to 30 PSI (2.1 bar) air or nitrogen pressure for system water pressures up to 175 PSI (12.1 bar), or 50 PSI (3.4 bar) air or nitrogen pressure for system water pressures up to 250 PSI (17.2 bar). For hydraulic release systems, pressurize to the relevant water pressure for the system.
2. Once the pilot line is pressurized, insert the feeler gauge (provided in the adjustment kit) between the schrader valve core (11) and the socket set screw (9), using care not to bend the schrader valve core (11).
3. Use the schrader valve core tool to tighten the socket set screw (9) until it contacts the feeler gauge and opens the release.
4. Remove the feeler gauge from the release and verify that the release closes.
5. With the thermostatic release now set to the proper adjustment, install the cover (13) back onto the housing (7):
 - i. Install the two screws (10) into the cover (13) using a Phillips head screwdriver.
6. Perform OPERATIONAL TEST described in INSPECTION, TESTS, AND MAINTENANCE paragraph 6-B to verify proper operation of the thermostatic release.

7. AVAILABILITY

The Viking Model C-2 Thermostatic Release is available through a network of domestic and international distributors. See the Viking Corp. Web site for closest distributor or contact The Viking Corporation.

8. GUARANTEES

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.



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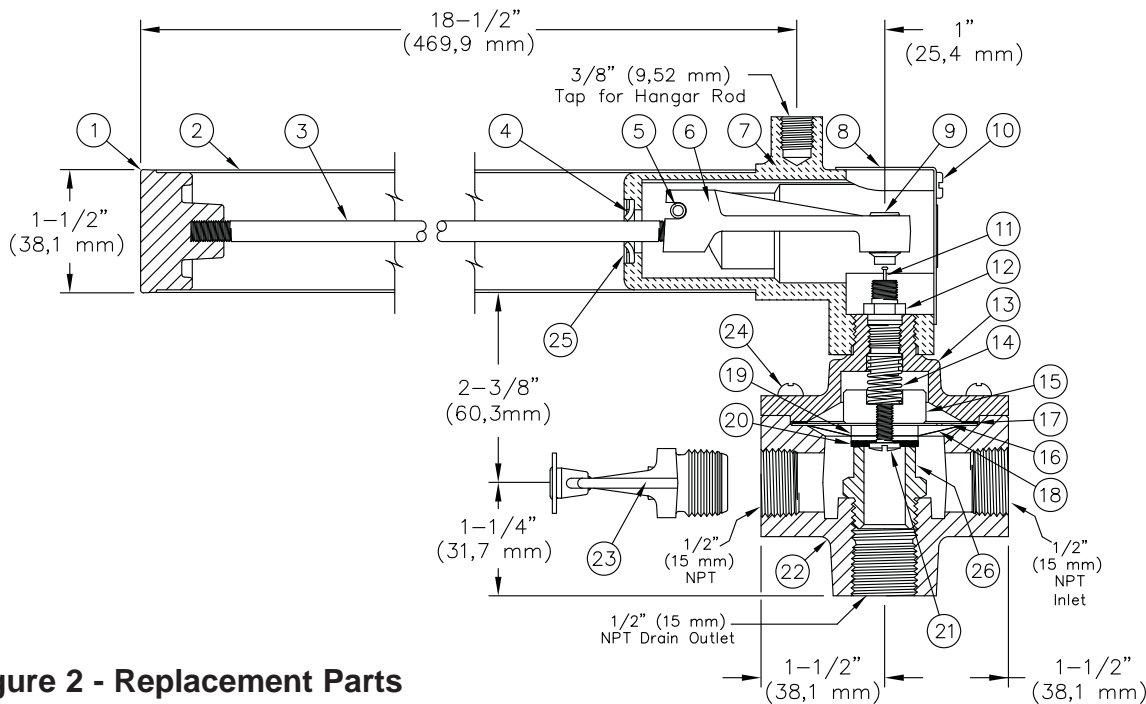


Figure 2 - Replacement Parts

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	NO. REQ'D
1	--	End Cap	Cast Bronze	1
2	--	Element Tube	Cupro-Nickel coated with Flat black Epoxy	1
3	--	Element Rod	Cupro-Nickel	1
4	--	Rod Seal	Neoprene	1
5	--	Pivot Pin	Stainless Steel	1
6	--	Lever Arm	Cast Bronze	1
7	--	Housing	Cast Bronze	1
8	--	Housing Cover/Label	Stainless Steel/Vinyl	1
9	01440A	Screw, Socket Set 3/8-24 x 5/8" lg.	Stainless Steel/Nylok	1
10	05108A	Screw, R.H. Machine #8-32 x 1/4" lg.	Stainless Steel	2
11	01718A	Schrader Valve Core	Brass, Nickel Plated	1
12	--	Schrader Valve Body	Brass, Nickel Plated	1
13	--	Cover	Cast Bronze	1
14	06177A	Spring	Stainless Steel	1
15	*	Spring Retainer	Brass	1
16	*	Diaphragm	Fairprene	1
17	01604A	Seal Ring	Neoprene	1
18	*	Screen	Monel	1
19	*	Clamp Plate	Brass, Nickel Plated	1
20	*	Clapper	Brass with Bonded EPDM	1
21	*	Screw, B.H. 10-24 x 1/2" lg.	Brass	1
22	*	Body	Cast Bronze	1
23	07848CB	Fixed Temperature Release, 155 °F (68 °C)	Various	1
24	04505A	Screw, R.H. Self-tap #10-24 x 5/8" lg.	Stainless Steel	6
25	--	Seal Retainer	Brass	1
26	*	Seat	Brass	1

--Indicates replacement part not available

* Indicates replacement part only available in Sub-Assembly listed below

SUB-ASSEMBLIES

11, 14-21, 23, 24	12616	Maintenance Kit - Includes Adjustment Kit
--	01714A	Adjustment Kit (consists of a feeler gauge, wrench and 5 schrader valve cores)
22, 26	03706B	Body Assembly

Note: DO NOT replace Item No. 11 with a part from other sources. This is a special valve core available only from The Viking Corporation.

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