Test & Drain Valve
Model No.: LF-TND

Installation, Operation & Maintenance

In line with our policy of continuous product improvement LIFECO reserves the right to modify specifications without prior notice.

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1. GENERAL DESCRIPTION



The LIFECO LF-TND Test & Drain Valve is an inspector's test and drain valve for automatic sprinkler systems. It combines a single-handle, three-position ball valve, a calibrated test orifice and an integral sight glass in one cast brass body.

The valve has two functions:

- **Test** – flows water through a 1/2" orifice with a K-factor of 5.6 (80), simulating the discharge of a single sprinkler, so that the system water flow alarm devices (water flow indicator / switch, alarm check valve, pressure switch or water motor gong) can be tested.
- **Drain** – fully opens the valve to drain the system or zone it serves.

The flow of water can be seen through the sight glass on both sides of the valve, confirming that the valve is flowing during the test and that it is fully closed when returned to service.

1.1 Features

- Positive positioning of the handle for OFF, TEST or DRAIN.
- Large, integral sight glass on both sides.
- K-factor 5.6 (80) test orifice, 1/2".
- Single handle ball valve.
- UL Listed and FM Approved.

1.2 Technical Specification

Model	LF-TND
Sizes	1", 1-1/4", 1-1/2", 2"
Rated working pressure	300 PSI (21 bar)
Test orifice	1/2", K-factor 5.6 (80)
End connections	Female NPT (all sizes); female BSP thread (all sizes); grooved ends available for 1" and 2" sizes
Body material	Cast brass
Approvals	UL Listed – Drain Fittings, Special Type (VEHZ.EX16437) FM Approved – Sprinkler System Alarm Test Devices (FM 1625)

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2. DIMENSIONS AND MATERIALS

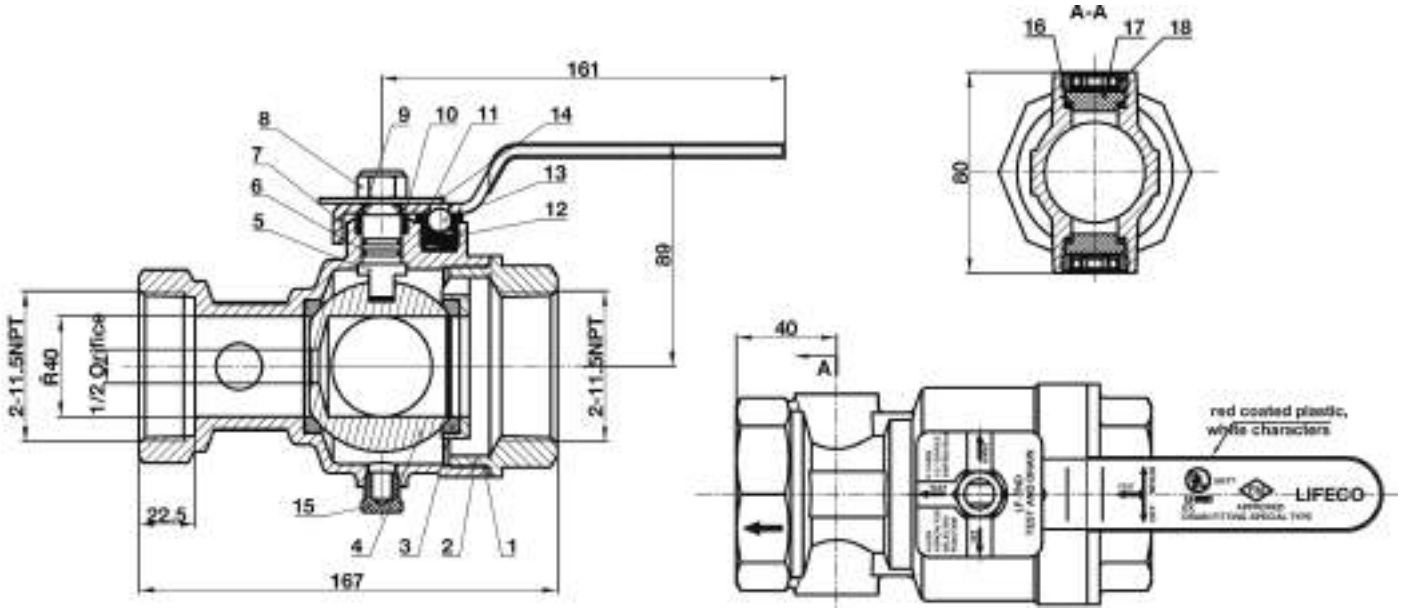


Figure 1 – LF-TND General Arrangement (2" size shown, dimensions in mm)

Table 1 – Dimension Table

A/B	Orifice	Port	C	D (ref.)	E	H
NPT 1"	1/2 (0.512)	1.024	5	2.76	5.16	1.65
NPT 1-1/4"	1/2 (0.528)	1.024	5	2.76	5.16	1.65
NPT 1-1/2"	1/2 (0.524)	1.575	6.57	3.5	6.34	2.28
NPT 2"	1/2 (0.524)	1.575	6.57	3.5	6.34	2.28

Table 2 – Material Description

Item	Name	Material	Item	Name	Material
1	Body	C37700	2	Cap	C37700
3	Seal	PTFE	4	Ball	C37700
5	Stem	C37700	6	O-Ring	NBR
7	Lever	Steel	8	Nut	Steel
9	Gland Packing	PTFE	10	Gland Ring	C37700
11	Gland Nut	C37700	12	Spring	304
13	Steel Ball	304	14	Indicator Plate	Steel
15	Plug	C37700	16	Washer	NBR
17	Sight Glass	Lexan	18	Retaining Ring	C37700

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3. SAFETY INFORMATION

WARNING

- The LF-TND must be installed, operated and maintained only by qualified persons, in accordance with this manual, NFPA 13, NFPA 25 and the requirements of the Authority Having Jurisdiction (AHJ).
- Do not exceed the rated working pressure of 300 PSI (21 bar).
- Operating the valve to TEST or DRAIN will cause a water flow alarm and may notify the fire brigade or monitoring station. Notify the monitoring station, building management and occupants before any test or drain operation, and again when it is complete.
- Before any work on the valve, close the system control valve, relieve the pressure and drain the water from the section of pipe concerned.
- The discharge from the valve is under pressure. Make sure the outlet is piped to a safe location able to accept the full flow without water damage or danger to people.

4. INSTALLATION

4.1 Before Installation

1. Check that the size, end connections and markings of the valve match the design drawings.
2. Inspect the valve for damage that may have occurred during transport. Check that the handle moves freely between OFF, TEST and DRAIN and that the sight glasses are clean and undamaged.
3. Flush the connecting pipework to remove scale, chips and other debris before the valve is fitted.

4.2 Location

1. Install the valve at the location shown on the approved sprinkler drawings. This is normally downstream of the water flow alarm device that is to be tested, for example on a floor or zone control assembly, or as the inspector's test connection.
2. Locate the valve where it is readily accessible for operation and where the handle position and sight glasses can be seen clearly.
3. Do not install the valve where it may be exposed to freezing temperatures, unless the system is designed for this.

4.3 Mounting

1. Install the valve with the flow arrow on the body pointing in the direction of flow, from the system (inlet) to the drain (outlet).
2. The valve may be installed with the pipework horizontal or vertical. Position it so that the handle can be turned through its full travel without obstruction.
3. For threaded connections, apply a suitable thread sealant (PTFE tape or pipe joint compound) to the male pipe threads only. Do not allow sealant to enter the valve.
4. When tightening, hold the valve with a wrench on the hexagon of the end being tightened. Do not use the handle, the sight glass housings or the opposite end of the valve as a lever.
5. For grooved connections, install the couplings in accordance with the coupling manufacturer's instructions.
6. Support the inlet and outlet pipework independently so that no pipe loads are carried by the valve.

4.4 Drain Piping

1. The drain outlet piping should not be smaller than the outlet of the valve.
2. Pipe the discharge to an open drain, to the outside of the building, or to another location that can accept the full flow of the valve in the DRAIN position without water damage, in accordance with NFPA 13 and the AHJ.
3. The end of the discharge pipe must be free of restrictions.

4.5 After Installation

1. Set the handle to OFF.
2. Fill and pressurise the system, then check all joints for leaks.
3. Check the sight glasses: no water should be flowing with the handle in the OFF position.

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4. Carry out a water flow alarm test as described in Section 5.2 to confirm correct installation and alarm operation.

5. OPERATION

5.1 Handle Positions

The handle has three positive positions, shown on the indicator plate. Align the arrow on the handle with the selected function.

Position	Function
OFF	Valve closed. This is the normal position when the system is in service.
TEST	Water flows through the 1/2" K5.6 test orifice, simulating the flow from a single sprinkler, to test the water flow alarm devices.
DRAIN	Valve fully open for draining the system or zone.

5.2 Water Flow Alarm Test

1. Notify the monitoring station, building management and occupants that an alarm test is to be carried out.
2. Make sure the drain outlet is clear and able to accept the flow.
3. Turn the handle from OFF to TEST.
4. Check through the sight glass that water is flowing.
5. Confirm that the water flow alarm device operates, that the local alarm sounds and that the alarm signal is received at the fire alarm control panel and monitoring station. Record the time taken for the alarm to operate. NFPA 72 requires the water flow alarm signal to be indicated within 90 seconds of the start of a flow equal to or greater than that of a single sprinkler of the smallest orifice size installed.
6. Turn the handle back to OFF.
7. Check through the sight glass that the flow has stopped, and confirm that the alarm devices have reset.
8. Notify all parties that the test is complete and record the results.

5.3 Draining the System

1. Notify the monitoring station, building management and occupants.
2. Close the control valve supplying the system or zone to be drained, if the system is to be emptied.
3. Turn the handle to DRAIN and allow the system to drain completely. Open auxiliary drains and vents as required.
4. When draining is complete and any work has been finished, turn the handle to OFF.

5.4 Returning to Service

1. Make sure the handle is in the OFF position.
2. Slowly open the system control valve and refill the system, venting air as required.
3. Check through the sight glass that no water is flowing past the valve, and check the valve for leaks.
4. Check that all control valves are fully open and secured, and that all alarms have reset.
5. Notify all parties that the system has been returned to service.

6. INSPECTION, TESTING AND MAINTENANCE

The sprinkler system and the LF-TND must be inspected, tested and maintained in accordance with NFPA 25 and the requirements of the AHJ. The following points apply to the valve:

1. Inspect the valve regularly for leaks, external damage and corrosion. Check that the handle is in the OFF position and that the sight glasses are clean and show no flow.
2. Use the valve to test the water flow alarm devices at the frequency required by NFPA 25 and the AHJ.
3. Operate the valve through its full travel during each test to make sure the handle moves freely and locates positively in each position.
4. If the valve leaks through to the drain with the handle in the OFF position, if the sight glasses become cloudy or damaged, or if the handle does not locate positively, take the valve out of service and repair or replace it.
5. Before any maintenance, close the control valve, relieve the pressure and drain the pipework (see Section 3).

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6. Use only genuine LIFECO replacement parts. Contact LIFECO for spare parts and service.

7. TROUBLESHOOTING

Problem	Possible Cause	Action
Water flowing through the sight glass with the handle in OFF	Handle not fully in the OFF position; debris on the ball or seat; worn seat	Turn the handle fully to OFF. Operate the valve to TEST and back to OFF to flush debris. If leakage continues, repair or replace the valve.
No flow in the sight glass in TEST	System control valve closed; test orifice or drain line blocked	Check that the control valve is open. Clear the orifice and the drain line.
Water flow alarm does not operate, or operates late	Fault in the alarm device, retard setting or alarm wiring	Check the water flow device, its time delay setting and the alarm circuit. Retest.
Leakage at the stem or handle	Loose gland nut; worn gland packing or O-ring	Tighten the gland nut. If leakage continues, replace the packing or O-ring, or replace the valve.
Leakage at a sight glass	Damaged sight glass or seal	Replace the sight glass and seal, or replace the valve.
Handle stiff or does not locate in position	Damaged positioning spring or ball; debris	Repair or replace the valve.

8. TRANSPORT AND STORAGE

Store the valves in their original packaging, indoors, in a clean, dry place, protected from impact, dirt and freezing. Keep the valve ends protected until installation.

For further information about this product, please contact Lichfield Fire & Safety Equipment Co. Ltd (LIFECO), sales@lifeco-uk.com, www.lifeco-uk.com.

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