

TECHNICAL DATA DOCUMENT

Electric Drain Valve (EDV)

Danfoss EV220BSS

IHC Part #95001



KEY SPECIFICATIONS

Type	2/2-way solenoid
Configuration	Normally Open (NO)
Body Material	Stainless steel
Seals & O-rings	NBR/FKM (nitrile/Viton)
Main Diaphragm	High grade elastomer
Port Size	1/4" FNPT
Coil Voltage	24V / 110V / 220V
IP Rating	IP65 (w/ DIN)
Max Pressure	1000 psi
Overall Height	140-160 mm
Total Weight	0.6-0.8 kg
IHC Part #	95001

Specifications

01 • Specifications

The Electric Drain Valve is a Danfoss 2/2-way stainless steel solenoid valve that uses an electromagnetic coil to open or close, enabling automatic depressurization of the high-pressure system when the pump stops: when the coil is de-energized as the pump shuts off, the valve opens and the high-pressure lines depressurize immediately.

Key Functions Summary

- Automatically opens on pump shutdown to depressurize system
- Enables mechanical closing of the stainless-steel nozzles
- Drains residual high-pressure water to prevent nozzle dripping
- Maintains system pressure during operation when energized
- Provides fail-safe depressurization on power loss
- Works in coordination with the PLC-controlled pump and fan sequence

PART FAMILY



EDV Base Valve (Part #95001)

Danfoss Part #EV220BSS 2/2-way electric solenoid valve — stainless steel, 1/4" FNPT, configured for Normally Open (NO) operation.



Coil

Part #95003 24 Volt Coil used with #95001

Part #95004 110 Volt Coil used with #95001

Part #95005 220 Volt Coil used with #95001



4 Spade DIN Plug Connector

Part #95002.DIN used with #95001

Installation Requirements

- Mount vertically or horizontally on the high-pressure manifold
- Ensure adequate clearance for coil removal and electrical connection
- Connect the outlet port to a 3/8" drain line routed to a floor drain, water treatment storage tank, or bladder tank
- Maintain a minimum 3" elevation loop in the drain line above the highest point of the high-pressure tubing to minimize water loss

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General Description & Function

02 • Description & Function

The Electric Drain Valve (EDV) is a Danfoss stainless steel, 2/2-way solenoid valve (IHC Part #95001) specifically configured for Normally Open (NO) operation. It is installed on the high-pressure discharge side of the FanMist Pump Station and is controlled by the system PLC. The valve serves as a critical safety and performance component, automatically managing system depressurization at the end of each operating cycle.

The electric solenoid drain valve is an electromechanical device that converts electrical energy into linear mechanical motion. It consists of a coil of wire (the solenoid coil) wound around a ferromagnetic core (plunger or armature). When electric current flows through the coil, it creates a magnetic field that pulls or pushes the plunger, producing linear movement. In the FanMist system, this mechanism enables the solenoid to automatically open or close the valve. The 2/2-way design features two ports (one inlet and one outlet) and two positions (fully open or fully closed), making it well-suited for simple, reliable on/off control of the drain path.

The primary function of the EDV is to rapidly release high-pressure water from the system when the high-pressure pump stops. By opening on command, the valve allows system pressure to drop quickly below the mechanical closing threshold of the stainless-steel nozzles (approximately 300 psi). This enables the nozzles to close instantly while simultaneously draining residual water from the high-pressure lines (approximately ¼ gallon per cycle). As a result, the system achieves a clean shutdown with no post-operation dripping from the nozzles.

During normal operation, the Pump Station PLC energizes the EDV coil to hold the Normally Open valve in the closed position. This allows the system to build and maintain full operating pressure (1000 psi) for effective atomization. When the humidistat is satisfied or the system initiates a shutdown sequence, the PLC de-energizes the coil. Because the valve is Normally Open, it opens immediately, releasing pressure through the dedicated drain line. This coordinated action between the pump, fans, and EDV ensures controlled depressurization while the fans continue running briefly to clear residual mist.

Fail-Safe Design

In the event of a power loss, the valve automatically opens (de-energized state), allowing the system to depressurize and preventing pressure from remaining trapped in the lines.

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KEY SPECIFICATIONS

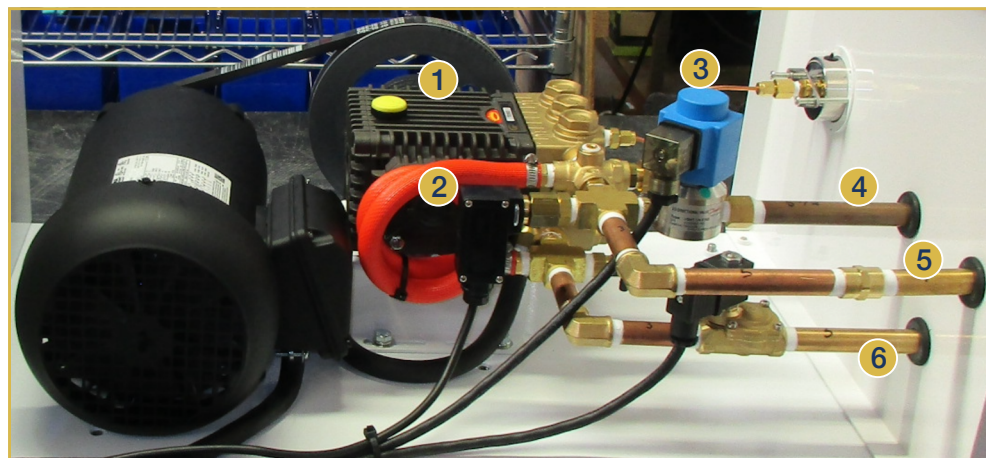
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EDV Physical Integration

03 • Physical Integration

The Electric Drain Valve (EDV) is mounted directly onto the high-pressure manifold of the FanMist Pump Station, immediately downstream of the pump discharge. This location enables rapid depressurization of the system when the valve opens. The EDV is a critical component that works in coordination with the pump and fans to ensure clean system shutdowns.

Fig. 1 — Location of the Electric Drain Valve (EDV) in the Pump Station Enclosure



- 1 High-Pressure Pump
- 2 By-pass Hose
- 3 Electric Drain Valve (EDV)
- 4 Drain Line
- 5 High-Pressure Outlet Line
- 6 Inlet Water Supply Line to the Solenoid Valve

Key Installation Notes

- Mounted directly on the high-pressure manifold after the pump discharge
- Connected to a dedicated 3/8" drain port on the pump station
- Controlled by the PLC via the blue solenoid coil
- Opens automatically on pump shutdown for system depressurization
- Enables mechanical closing of the misting nozzles
- Provides fail-safe operation (opens on power loss)
- Works in sequence with the pump and fans during startup and shutdown cycles

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Operating Sequence & Timing

04 • Sequence & Timing

NORMAL OPERATING CYCLE



Note: the 10-second fan overrun after pump shutdown helps to clear residual mist from the space.

PLC CONTROL LOGIC

- **During Operation:** The PLC energizes the EDV coil, holding the valve closed at 1000 psi.
- **On Shutdown:** PLC stops the pump and de-energizes the coil; the valve opens immediately.
- **Fail-Safe:** Power loss de-energizes the coil, opening the valve to depressurize.
- **Interlocks:** Coil state is interlocked with pump to prevent pressure buildup if the valve fails to close.

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Maintenance

Maintenance guidelines and troubleshooting procedures for the Electric Drain Valve (EDV) installed on the FanMist Pump Station. Proper maintenance ensures reliable automatic depressurization, prevents nozzle dripping, and extends the service life of the valve.

Recommended Maintenance Schedule

FREQUENCY	TASK	ACTION REQUIRED
Every 500 hrs	Visual inspection of EDV & connections	Check for leaks, corrosion, or damage
Every 500 hrs	Test valve operation	Verify valve opens on pump shutdown
Annually	Inspect and test coil	Check electrical connections & resistance
Annually	Inspect drain line	Clear any blockages or restrictions
Every 2 yrs	Replace seals and diaphragm (if accessible)	Preventive replacement
As needed	Clean valve internals	Remove debris from orifice and seat

MAINTENANCE PROCEDURES

1. Visual Inspection

- Inspect the valve body, coil, and all connections for signs of leakage, corrosion, or physical damage.
- Check the DIN connector and wiring for looseness or wear.
- Verify that the drain line is clear and properly routed with the required elevation loop.

2. Functional Test

- With the system running, manually initiate a shutdown through the control panel.
- Confirm that the EDV opens immediately when the pump stops.
- Listen for the sound of water draining and verify that system pressure drops rapidly.
- Ensure the nozzles close mechanically with no visible dripping after shutdown.

3. Coil Inspection

- Disconnect power before inspection.
- Check coil resistance using a multimeter (compare with nominal values for the specific voltage).
- Inspect the coil housing for cracks, discoloration, or overheating signs.
- Ensure the DIN plug is securely fastened and free of moisture.

4. Cleaning (When Required)

- Isolate and depressurize the system before servicing.
- Remove the valve from the manifold if internal cleaning is needed.
- Flush the valve body and orifices with clean water to remove debris.
- Reassemble using new seals if original seals show wear.

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Troubleshooting Guide

SYMPTOM	POSSIBLE CAUSE	RECOMMENDED ACTION
EDV does not open on shutdown	Coil remains energized	Check PLC output signal and wiring to the coil
EDV does not open on shutdown	Faulty coil	Test coil resistance and replace if defective
EDV leaks when closed	Worn or damaged seals / diaphragm	Inspect and replace seals or diaphragm
EDV leaks when closed	Debris trapped in valve seat	Clean valve internals or replace valve
Slow or incomplete depressurization	Clogged drain line or restricted orifice	Inspect and clear the drain line and valve orifice
Coil overheating or burning smell	Incorrect voltage supplied to coil	Verify correct coil voltage matches power supply
Coil overheating or burning smell	Continuous duty beyond rating	Confirm coil is rated for continuous operation
No pressure build-up in system	EDV stuck in open position	Check if coil is energized; inspect for mechanical binding or debris
Valve chatters or vibrates	Low voltage to coil or unstable power supply	Check voltage supply and connections
Valve fails to close during operation	PLC not energizing coil	Verify PLC program and output signal to the EDV coil
Water dripping from nozzles after shutdown	EDV not opening properly	Perform functional test and inspect valve and drain line

When to Replace the EDV

Replace the entire valve assembly (IHC #95001) if:

- Internal components are heavily worn or corroded.
- The valve fails to operate correctly after cleaning and coil replacement.
- There is visible damage to the stainless steel body.
- Leakage persists after seal replacement.