

Pumping Hazardous Substances

With Teledyne ISCO HazLoc Syringe Pumps

Syringe Pump Technical Bulletin
Sept 2020, TB16

Overview

Teledyne ISCO's HLf Series syringe pumps are rated for use in Class I, Division 2, Groups A, B, C, and D, T4; and Zone 2 EEx nC IIC T3 hazardous locations, and non-hazardous locations only.

The hazardous location rating is achieved through internal design modifications including the use of brushless DC motors.

CAUTION

Syringe pump applications and operation are the responsibility of the user. Use of non-certified substances may void HL certification.

DANGER

Teledyne ISCO syringe pumps are intended for use with fluids and liquefied gases. Users are responsible for any fluids not on the list of certified fluids in this bulletin.

Pump Specifications

Available models and their basic specifications are listed in the table at the top of this page. For complete specifications, refer to Teledyne ISCO's [Series HLf Hazardous Location Pumps](#) web page.



Figure 1: Single HL Series pump (Model 500HLf shown)

Model	Capacity	Pressure Range	Flow Rate Range
1000HLf	1015 mL	0.69 to 137.9 bar	0.01 µL/min to 244 ml/min
500HLf	507 mL	0.69 to 258.6 bar	0.01 µL/min to 122 ml/min
260HLf	266 mL	0.69 to 517.1 bar	0.01 µL/min to 64 ml/min
100HLf	102.93 mL	0.69 to 689.5 bar	0.01 µL/min to 25 ml/min

Installation Precautions

It is the user's responsibility to take proper pre-cautions when setting up and operating Teledyne ISCO's HLf Series syringe pumps.

- Slight seal leakage is typical during operation. Always install in a properly ventilated area.
- Ensure that the location provides adequate protection against entry of any foreign materials or substances.

Compatible Substances

WARNING

Pumping fluids not compatible with HL Series Pumps may damage critical components, resulting in property damage, personal injury, or even death. Users who pump fluids other than those listed here do so at their own risk.

The fluid-contacting materials of the HLf Series Syringe Pump have been tested and certified to be compatible with the following fluids:

• ethane	• ethylene	• propane	• propylene
• butane	• butadiene	• hexane	• gasoline
• diesel fuel	• jet fuel	• ammonia	• methanol
• isopropanol	• acetone	• acetonitrile	• heptane
• benzene	• ethylbenzene	• methane	

Consult Teledyne ISCO before using any chemical not listed here.

Electrical Connection

HL pump installations require hardwire electrical connections. All connections between the pump and controller must be made **before** the pump is connected to mains power. All input and output circuits must be wired using Division 2 wiring methods as specified in Article 501-4(b) of the National Electrical Code, NFPA 70 for installations.

Connect the AC mains power wiring from the rear of the pump to an AC power source via the type OE outlet box for hazardous locations (see Figure 2) included in the pump accessory package.

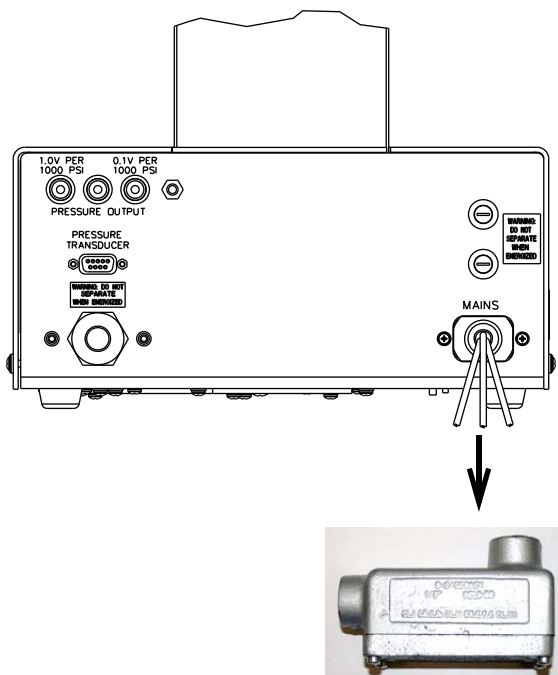


Figure 2: AC Mains power connection

Other Considerations

UL (Underwriters Laboratories) has certified the HLf Series pumps using only Isco provided seals. Any substitution of these seals will void the certification.

For component dimensions and distances, refer to [TB13 Installation Considerations: Dimensions, Distances, & Environment](#).

Detailed steps for verifying pump cylinder soundness can be found in [TB05 Field Verification Procedures](#).

Options and Accessories

The options and accessories listed below are intended for use with Teledyne ISCO Hazardous Location Series pumps.

Note

Use of equipment not specified here, such as electric valves, will compromise safety and zone certifications.

- Hastelloy C-276 cylinder for added corrosion resistance
- Temperature control jacket (i.e. cylinder cooling for filling with liquefied gas)
- High-temperature pressure transducers (200°C maximum)
- High-precision pressure transducers (0.1% linear accuracy)
- Drivers for LabVIEW - National Instruments
- 4-20mA input for flow rate control and pressure control
- Dual pump continuous flow system (air valves)

Continuous Flow Available

A continuous flow pumping system consists of two syringe pumps and a valve package regulated by one controller. This system allows continuous delivery of liquefied gas or liquid under constant flow or constant pressure mode.

Complete systems, or separate air valve/check valve packages are available from Teledyne ISCO. HLf Series pumps should never be used with electric valves.

For installation and plumbing connections, refer to [TB01 Multiple Pump Systems for Continuous Flow or Independent Modes](#).



Figure 3: Dual pump system for continuous flow (A500HLf with air valves shown)

Wetted Materials

Wetted materials are compatible with most aqueous and organic liquids, corrosive solutions, heated fluids, liquefied gases, viscous fluids, or slurries and pastes. If needed, optional materials such as Hastelloy C-276 are available upon request.

HL Pump materials in contact with the pumped fluids are listed in the following table:

Pump	Air Valves	Check Valves
Nitronic 50, Graphite filled PTFE, TFE, Hastelloy C-276, titanium, gold	Valves: Hastelloy, PEEK, and PTFE. Tubing and Fittings: SST316, gold	Valves: SS316, Sapphire, Ruby, PEEK, PTFE. Tubing and Fittings: SST316, gold

Repair/Return Policy

General maintenance tasks, such as lubrication and seal cleaning/replacement, can be performed on-site following proper procedures as described in the *Pump Maintenance & Repair* section of the HL Pump user manual. All other repairs must be performed at the factory.

Any modification or deviation from the certified original equipment design will void UL certification.

If the pump has been used for pumping a hazardous or potentially lethal material:

- **Do not return the pump without contacting the Teledyne ISCO Service Department.**
- **Do not return the pump without first providing written guarantee that it has been decontaminated of hazardous or potentially lethal materials.**
- **Teledyne ISCO reserves the right to refuse shipment if no decontamination assurance has been provided prior to shipment. Failure to decontaminate a pump may result in legal action.**

Service Contact Information

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Teledyne ISCO is continually improving its products and reserves the right to change product specifications, replacement parts, schematics, and instructions without notice.