TORONTECH

LOCAL RESISTANCE LOSS TESTER

Local Resistance Loss Tester for Gas Fire Extinguishing System Components — ToronFT™ LRL

ToronFT™ LRL Local Resistance Loss Tester for Gas Fire Extinguishing System Components is a precision hydraulic measurement instrument designed for the local resistance loss characterization of gas fire extinguishing system components using the equivalent length test method. By measuring the hydraulic resistance introduced by container valves, selector valves, one-way valves, pipelines, and pipe fittings in carbon dioxide, heptafluoropropane (HFC-227ea), trifluoromethane (HFC-23), and inert gas fire extinguishing systems, the ToronFT™ LRL provides the component resistance data essential for accurate hydraulic system design and performance verification.

The local resistance loss tester employs the equivalent length method — expressing the local resistance of each component as an equivalent length of straight pipe — enabling engineers to incorporate measured resistance data directly into fire suppression system hydraulic calculations and design models.

APPLICATIONS

Local Resistance Loss Tester for Gas Fire Extinguishing System Components — ToronFT™ LRL Applications

- Gas fire extinguishing system designers: measurement of component local resistance data for hydraulic calculation and system design
- Component manufacturers: local resistance characterization of container valves, selector valves, one-way valves, and pipe fittings for product data sheets and certification
- Third-party certification and testing laboratories: equivalent length local resistance testing per ISO 14520 and related international standards

- System commissioning engineers: verification of as-installed component resistance values against design assumptions
- R&D departments: evaluation of new valve and fitting designs for hydraulic resistance optimization


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FEATURES

Local Resistance Loss Tester for Gas Fire Extinguishing System Components — ToronFT™ LRL Key Features

- Applies the equivalent length method — the internationally accepted approach for expressing component local resistance in gas fire suppression system design
- Covers CO_2, HFC-227ea, HFC-23, and inert gas fire extinguishing system components: container valves, selector valves, one-way valves, pipelines, and pipe fittings
- Stable flow tank: 25 L volume, 4 MPa pressure resistance — maintains steady-state upstream conditions for accurate pressure drop measurement
- Water pump: 90 W, 8 m lift, rated flow 10 L/min — providing consistent, controllable flow through the test component
- Standardized pipeline: 16 mm diameter, 180 mm length, 4 sections — repeatable, well-defined flow geometry for measurement consistency
- DN16 solenoid valve (AC220V) for automated flow switching and test sequence control
- Electromagnetic flowmeter for accurate, non-intrusive flow rate measurement — no moving parts, high reliability
- Compact, self-contained instrument for efficient laboratory integration

THEORY & METHOD

Theory and Method

The equivalent length method quantifies a component's local resistance by measuring the pressure drop it causes under defined flow conditions and expressing that pressure drop as the equivalent length of straight pipe of the same nominal

diameter that would produce the same pressure drop. This equivalent length is then used as a direct input to hydraulic calculation software and design models for gas fire suppression systems.

The ToronFT™ LRL circulates water through the test component using a 90 W water pump (rated flow: 10 L/min, lift: 8 m) through a standardized pipeline network (16 mm diameter, 180 mm length, 4 sections total). A DN16 solenoid valve (AC220V) controls flow, and an electromagnetic flowmeter measures flow rate with high accuracy. A stable flow tank (25 L volume, 4 MPa pressure resistance) maintains constant hydraulic conditions upstream of the test component, ensuring that pressure drop measurements are taken under fully developed, steady-state flow conditions.

TECHNICAL SPECIFICATIONS

Local Resistance Loss Tester for Gas Fire Extinguishing System Components — ToronFT™ LRL Technical Specifications

Parameter	Specification
Model	ToronFT™ LRL
Test Method	Equivalent length method
Applicable Components	Container valves, selector valves, one-way valves, pipelines, pipe fittings
Applicable Systems	CO_2, HFC-227ea, HFC-23, inert gas fire extinguishing systems
Stable Flow Tank Volume	25 L
Stable Flow Tank Pressure Rating	4 MPa
Water Pump Power	90 W
Water Pump Lift	8 m

Parameter	Specification
Water Pump Rated Flow	10 L/min
Pipeline Dimensions	Diameter 16 mm, Length 180 mm, 4 sections
Control Valve	DN16 solenoid valve, AC220V
Flow Measurement	Electromagnetic flowmeter

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