LAKE
MONITORS

Flow Measurement Instrumentation for a Wide Range of Applications & Industries

Process Cooling • Fluid Power • Industrial Lubrication • Hydraulics • Factory Automation • Agricultural Vehicles
Construction Equipment • Pneumatics • OEM Manufacturing • Fire Equipment • Mining • Pulp & Paper Mills • Machining
Industrial Robotics • Steel Mills • Petrochemical • Industrial Maintenance • Machine Monitoring • Power Distribution
Casting & Foundry • Process Control • Trucking Fleets • Power Steering Analyzers • HVAC • Medical Equipment OEMs
Telecommunications • Chillers • Oil & Gas Exploration • Fuel Usage Monitoring • Paints & Coatings • Construction
Snow-Making • Aerospace • Reverse Osmosis Systems • Military • High Pressure Pipe Cleaning • Mixing Paints & Inks
Drilling • Grouting • Power Transmissions • Case Drains • Marine • General Industrial • Power

Excellence in Flow

Table of Contents

LAKE MONITORS

Lake Monitors
Basic In-line Liquid Flow Rate Monitors

FOR 1/8" – 2" PIPE SIZES

Ideal for monitoring case drain flows, pump performance and media flows through hydraulic circuits and sub-circuits

STYLE B

CHOICE OF THREE MATERIALS OF CONSTRUCTION

Select from aluminum, brass or stainless steel to meet system and media compatibility requirements.

UNRESTRICTED MOUNTING

Allows the designer to install the monitor in any orientation – horizontal, vertical or inverted.

SUPERIOR EXTERIOR DESIGN

Weather-tight for use outdoors and/or on systems where wash downs are required.

GOOD VISCOSITY STABILITY

A sharp-edged stainless steel orifice provides excellent measurement stability for viscosities from 0-500 SSU.

RUGGED AND RELIABLE

Designed as a hydraulic service tool, this monitor will provide years of maintenance-free performance.

HIGH PRESSURE OPERATION

The magnetically coupled follower and rigid pressure vessel design allows operation to 6000 PSIG and use with opaque liquids.

24 DIFFERENT PORTS AVAILABLE

Standard selection of NPT, SAE and BSP ports reduces the amount of adapters required for installation.

LOW COST ACCURACY

±2.5% of range accuracy in center third of scale; ±4% in upper and lower thirds.

BI-DIRECTIONAL AND REVERSE FLOW OPTION OFFERED

Basic in-line monitors are also available in bi-directional and reverse flow versions. Contact Lake Monitors for more information.

ENGINEERING SPECIFICATION

THE IN-LINE FLOW RATE MONITOR SHALL:

- Use the variable annular orifice technique with compression spring recoil.
- Not require inlet or outlet straight plumbing, or require vertical pipe mounting.
- Have a measuring accuracy of ±2.5% of full scale in the center third of the measuring range, and ±4% in upper and lower third.
- Have a stainless steel sharp-edged orifice.
- Have a weather-tight external construction.
- Be Lake Monitors No. B _ _ – _ _ _ – _ _

Basic In-line Liquid Flow Rate Monitors

MATERIALS OF CONSTRUCTION (WETTED COMPONENTS)

	ALUMINUM	BRASS	STAINLESS STEEL
High-pressure casing, end ports and tapered shaft	Aluminum	Brass	#303 Stainless Steel
Seals	Buna-N (STD), EPR, Viton® or Kalrez®	Buna-N (STD), EPR, Viton® or Kalrez®	Viton® with Teflon® backup (STD), Buna-N, EPR or Kalrez®
Transfer Magnet	Teflon® coated Alnico	Teflon® coated Alnico	Teflon® coated Alnico
Floating Orifice Disk	Stainless Steel	Stainless Steel	Stainless Steel
All other internal parts	Stainless Steel	Stainless Steel	Stainless Steel

Teflon is a registered trademark of DuPont de Nemours & Co.
Viton and Kalrez are registered trademarks of Dow DuPont Elastomers

MATERIALS OF CONSTRUCTION (NON-WETTED COMPONENTS)

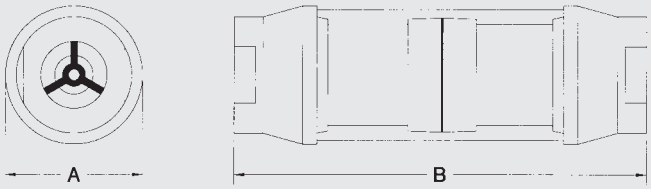
	ALUMINUM	BRASS	STAINLESS STEEL
Window Tube	Polycarbonate (STD)	Polycarbonate (STD)	Polycarbonate (STD)
Window Seals	Buna-N (STD), Teflon®	Buna-N (STD), Teflon®	Buna-N (STD), Teflon®

PERFORMANCE

Measuring accuracy*:	±2.5% of full-scale in the center third of the measuring range; ±4% in upper and lower thirds
Repeatability:	±1% of full-scale
Flow measuring range:	.05-150 GPM (0.2-560 LPM)
Pressure differential:	See graphs on the right for typical pressure differentials. For specific differential information, refer to Lake data sheet PDDS-404.
Maximum operating pressure:	aluminum and brass monitors: 3500 PSIG (240 Bar) stainless steel monitors: 6000 PSIG (410 Bar)
Maximum operating temperature:	240ºF (116ºC) Note: for operation to 600ºF (316ºC), see our High Temperature data sheet.
Standard calibration fluids:	Oil monitors: DTE 25® @ 110ºF (43ºC), 0.873 sg Water monitors: tap water @ 70ºF (21ºC), 1.0 sg
Filtration requirements:	74 micron filter or 200 mesh screen minimum

**Accuracy is ±4% Full-scale across entire range for "BI" option.*
TE 25 is a registered trademark of Exxon Mobil

MECHANICAL SIZE CODE



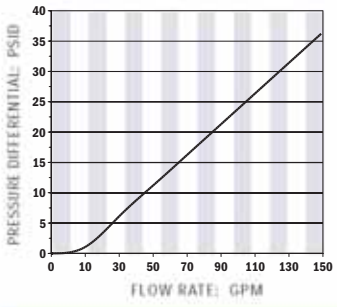
DIM	SERIES 2	SERIES 3	SERIES 4	SERIES 5	SERIES 5
A	1-1/4" (32mm)	1-7/8" (48mm)	2-3/8" (60mm)	3-1/2" (90mm)	3-1/2" (90mm)
B	4-13/16" (122MM)	6-9/16" (167MM)	7-5/32" (182mm)	10-1/8" (258mm)	12-5/8" (322mm)
Port Sizes	NPTF: 1/8", 1/4"	NPTF: 1/4", 3/8", 1/2" SAE: #6, #8, #10 BSP: 3/8", 1/2"	NPTF: 3/4", 1" SAE: #12, #16 BSP: 3/4", 1"	NPTF: 1-1/4", 1-1/2" SAE: #20, #24 BSP: 1-1/4", 1-1/2"	NPTF: 2" SAE: #32 BSP: 2"

Note: Consult factory for SAE brass monitor requirements.

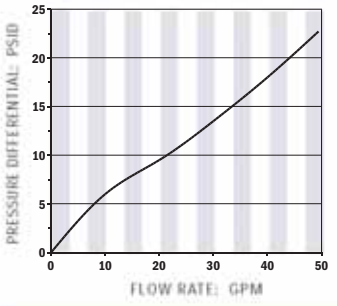
TYPICAL PRESSURE DIFFERENTIALS

For specific differential graphs, refer to Lake data sheet PDDS-404.

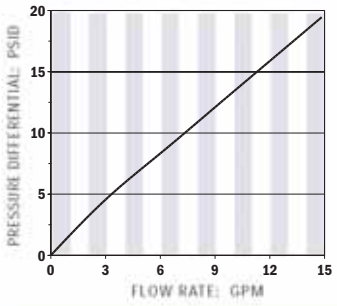
SERIES 5 MONITORS 1-1/4" - 2"



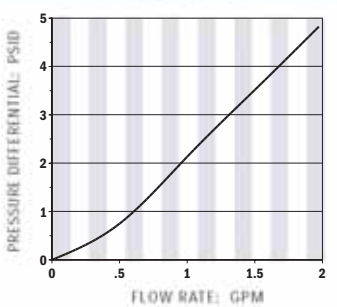
SERIES 4 MONITORS 3/4" - 1"



SERIES 3 MONITORS 1/4" - 1/2"



SERIES 2 MONITORS 1/8" - 1/4"



AW-LAKE COMPANY INC., *A TASI Group Company*, 8809 Industrial Dr., Franksville, WI 53126
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LAKE MONITORS

www.lakemonitors.com

Lake Monitors

ClearView™
VALUE FLOW METER

Economical way to monitor municipal pressure water flows, observe case drain flows and verify pump outputs.

FOR 1/2" – 1" PIPE SIZES

STYLE CV

For media compatibility, select from:

ClearView™ H_2O
VALUE FLOW METER

Polycarbonate body (ClearView H_20) or

ClearView™ +
VALUE FLOW METER

Polysulphone body (ClearView+).

UNRESTRICTED MOUNTING
Allows for horizontal, vertical or inverted installation of the meter.

COMPACT AND RUGGED DESIGN
Measures less than 8-1/4" long and 2-7/16" diameter with a rigid tube and union nut design.

VISUAL INSPECTION OF FLUID
The transparent body allows for visual inspection of fluid conditions. Diagnose problems at a glance.

MULTIPLE MATERIALS AND CALIBRATIONS AVAILABLE
With a variety of wetted materials of construction and media calibrations, the ClearView™ will be well suited to your process.

SENSING METHOD ASSURES ACCURACY
The proven variable-area piston metering assembly provides accurate, dependable flow rate indication.

SUPERIOR READABILITY
High contrast scale/indicator provides easy-to-read flow rate measuring resolution along with dual units of GPM and LPM.

MULTIPLE PORTING OPTIONS AVAILABLE
ClearView end ports are available in a variety of materials, sizes, and threading options to simplify installation.

LOW COST PRECISION
Measuring accuracy of ±5% of range and repeatability of ±1%.

ENGINEERING SPECIFICATION

THE CLEARVIEW FLOW METER SHALL:

- Use the variable area piston metering method to measure flow rate.
- Not require inlet or outlet straight plumbing, or require vertical pipe mounting.
- Have a measuring accuracy of ±5% of full scale with ±1% repeatability.
- Be Lake Monitors No. CV - _ _ - _ _

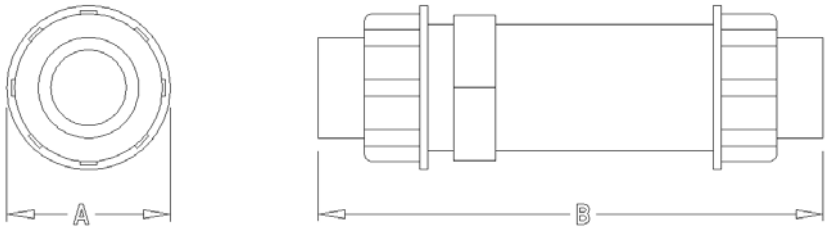
ClearView Flow Meter

MATERIALS OF CONSTRUCTION (WETTED COMPONENTS)

	ClearView H_2O	ClearView +
End Ports	Brass, Polysulphone	Brass, Polysulphone
Seals	Buna-N	Buna-N
Spring	Stainless Steel	Stainless Steel
Body	Polycarbonate	Polysulphone
Indicator	Polysulphone	Polysulphone

PERFORMANCE

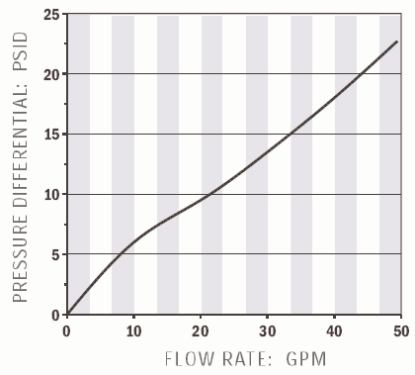
Measuring Accuracy:		±5% of full-scale
Repeatability:		±1% of full-scale
Flow Measuring Range:		1–30 GPM (5-110 LPM)
Turn Down Ratio (All Ranges):		10:1
Maximum operating pressure:		325 PSIG (22.4 Bar)
Maximum operating temperature:	ClearView H_2O	200°F (93°C)
	ClearView+	250°F (121°C)
Pressure Differential:		See graph on right
Filtration requirements:		74 Micron (200 U.S. mesh) minimum



MECHANICAL SIZE CODE

DIM	1/2" Female	3/4" Female	1" Female
A	2-7/16" (62mm)	2-7/16" (62mm)	2-7/16" (62mm)
B	7-5/32" (182mm)	7-9/16" (192mm)	7-9/16" (192mm)
Port Type	NPTF, BSPP	NPTF, BSPP	NPTF, BSPP

TYPICAL PRESSURE DIFFERENTIALS



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800.850.6110

Lake Monitors
High Temperature Flow Rate Monitors

FOR 1/8" – 2" PIPE SIZES

STYLE H & J

Enables flow monitoring of barrel heating fluids, thermal transfer fluids such as Syltherm® coolant flows through heat exchangers, as well as flows through hydraulic circuits and sub-circuits with elevated temps.

CHOICE OF THREE MATERIALS OF CONSTRUCTION

Select from aluminum, brass or stainless steel to meet system requirements.

UNRESTRICTED MOUNTING

Allows the designer to install the monitor in any orientation – horizontal, vertical or inverted.

GOOD VISCOSITY STABILITY

A sharp-edged stainless steel orifice provides excellent measurement stability for viscosities ranging from 0-500 SSU.

RUGGED AND RELIABLE

Designed as a hydraulic service tool, this monitor will provide years of maintenance-free performance.

HIGH PRESSURE OPERATION

The magnetically-coupled follower design allows operation to 6000 PSIG and use with opaque liquids.

24 DIFFERENT PORTS AVAILABLE

Standard selection of NPT, SAE and BSP ports reduces the amount of adapters required for installation.

LOW COST ACCURACY

±2.5% of range accuracy in center third of scale; ±4% in upper and lower thirds.

BI-DIRECTIONAL AND REVERSE FLOW OPTION OFFERED

High temperature monitors are also available in bi-directional and reverse flow versions. Contact Lake Monitors for more information.

ENGINEERING SPECIFICATION

THE HIGH TEMPERATURE IN-LINE FLOW RATE MONITOR SHALL:

- Use the variable annular orifice technique with compression spring recoil.
- Not require inlet or outlet straight plumbing, or require vertical pipe mounting.
- Have a measuring accuracy of ±2.5% of full scale in the center third of the measuring range, and ±4% in upper and lower thirds.
- Have a stainless steel sharp-edged orifice.
- Have a maximum temperature rating of: H-series 400ºF (204ºC) or J-series 600ºF (315ºC).
- Have a working pressure rating of 3500 PSIG.
- Be Lake Monitors No. H _ _ – _ _ _ – _ _ for 400ºF (204ºC) applications or J _ _ – _ _ _ – _ _ for 600ºF (315ºC) applications.

High Temperature Flow Rate Monitors

MATERIALS OF CONSTRUCTION (WETTED COMPONENTS)

	ALUMINUM	BRASS	STAINLESS STEEL
High-pressure casing, end ports and tapered shaft	Aluminum	Brass	#303 Stainless Steel
Seals H-Series (400ºF) J-Series (600ºF)	 Viton® w/Teflon® backup Kalrez® w/Teflon backup	 Viton® w/Teflon® backup Kalrez® w/Teflon backup	 Viton® w/Teflon® backup Kalrez® w/Teflon® backup
Transfer Magnet	Teflon® coated Alnico	Teflon® coated Alnico	Teflon® coated Alnico
Floating Orifice Disk	Stainless Steel	Stainless Steel	Stainless Steel
All other internal parts	Stainless Steel	Stainless Steel	Stainless Steel

Teflon is a registered trademark of DuPont de Nemours & Co.
Viton and Kalrez are registered trademarks of Dow DuPont Elastomers.

MATERIALS OF CONSTRUCTION (NON-WETTED COMPONENTS)

	ALUMINUM	BRASS	STAINLESS STEEL
Window Tube	Pyrex	Pyrex	Pyrex
Window Seals	Teflon®	Teflon®	Teflon®

Teflon is a registered trademark of DuPont de Nemours & Co.

PERFORMANCE

Measuring accuracy:	±2.5% of full-scale in the center third of the measuring range; ±4% in upper and lower thirds
Repeatability:	±1% of full-scale
Flow measuring range:	0.05-150 GPM (0.2 - 560 LPM)
Pressure differential:	See graphs on the right for typical pressure differentials. For specific differential information, refer to Lake data sheet PDDS-404.
Maximum operating pressure[1]:	aluminum and brass monitors: 3500 PSIG (240 Bar) stainless steel monitors: 6000 PSIG (410 Bar)
Maximum operating temperature:	H-Series 400ºF (204ºC) J-Series 600ºF (315ºC)
Standard calibration fluids:	Oil monitors: DTE 25® @ 110ºF (43ºC), 0.873 sg Water monitors: tap water @ 70ºF (21ºC), 1.0 sg Air monitors: air @ 70ºF (21ºC), 1.0 sg and 100 PSIG (6.8 Bar)
Filtration requirements:	74 micron filter or 200 mesh screen minimum

[1] *Note: Consult factory for Temperature/Pressure De-rating Chart.*
DTE 25 is a registered trademark of Exxon Mobil.

MECHANICAL SIZE CODE

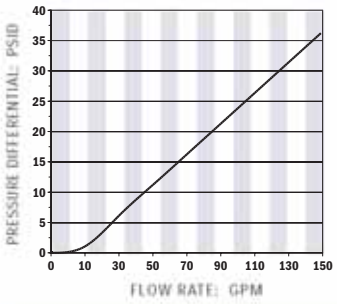
DIM	SERIES 2	SERIES 3	SERIES 4	SERIES 5	SERIES 5
A	1-1/4" (32mm)	1-7/8" (48mm)	2-3/8" (60mm)	3-1/2" (90mm)	3-1/2" (90mm)
B	4-13/16" (122MM)	6-9/16" (167MM)	7-5/32" (182mm)	10-1/8" (258mm)	12-5/8" (322mm)
Port Sizes	NPTF: 1/8", 1/4"	NPTF: 1/4", 3/8", 1/2" SAE: #6, #8, #10 BSP: 3/8", 1/2"	NPTF: 3/4", 1" SAE: #12, #16 BSP: 3/4", 1"	NPTF: 1-1/4", 1-1/2" SAE: #20, #24 BSP: 1-1/4", 1-1/2"	NPTF: 2" SAE: #32 BSP: 2"

Note: Consult factory for SAE brass monitor requirements.

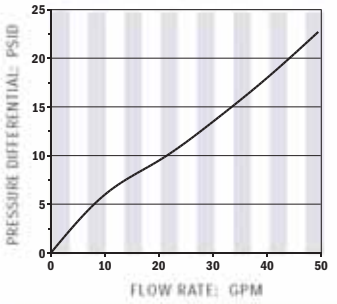
TYPICAL PRESSURE DIFFERENTIALS

For specific differential graphs, refer to Lake data sheet PDDS-404.

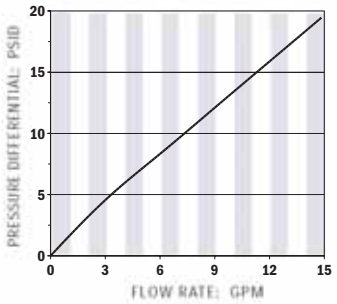
SERIES 5 MONITORS 1-1/4" - 2"



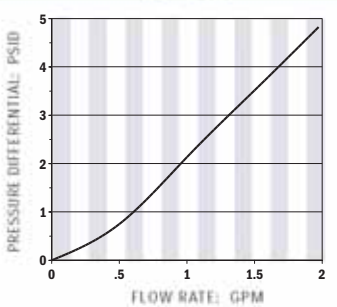
SERIES 4 MONITORS 3/4" - 1"



SERIES 3 MONITORS 1/4" - 1/2"



SERIES 2 MONITORS 1/8" - 1/4"



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HJDS-1106 7.5M MR / WGD / MAS

LAKE MONITORS

www.lakemonitors.com

NEW FROM LAKE MONITORS

LAKE MONITORS

Top Performance... bottom line sense.

Case Drain MONITOR

Available for 1/2" to 1" pipe sizes, Lake's new Case Drain Monitor is the perfect alternative to using a standard flow meter for case drain applications. And it's priced considerably less.

Designed for convenient vertical, horizontal or inverted installation, it provides dependable measuring accuracy of ±5% of range. Durable aluminum construction makes it ideal for outdoor/exposed applications and where frequent wash-downs are required. AW-Lake Company backs its Case Drain Monitors with a One-Year Warranty.

www.lakemonitors.com

Case Drain MONITOR

STYLE C

When ordering use Lake Monitors No.

C_ _ – _ _ _ – _ _

MATERIALS OF CONSTRUCTION

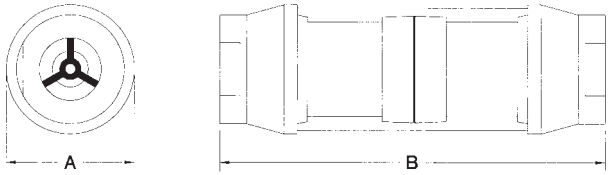
WETTED COMPONENTS

- High-pressure casing, end ports and tapered shaft: Aluminum
- Seals: Buna-N
- Transfer magnet: Teflon® coated Alnico
- Floating orifice disk: Stainless Steel
- All other internal parts: Stainless Steel

NON-WETTED COMPONENTS

- Window tube: Polycarbonate (STD)
- Window seals: Buna-N (STD), Teflon®

MECHANICAL SIZE CODE



SERIES 3	SERIES 4
Dimension A: 1-7/8" (48mm)	Dimension A: 2-3/8" (60mm)
Dimension B: 6-9/16" (167mm)	Dimension B: 7-5/32" (182mm)
Port Sizes (NPTF): 1/2"	Port Sizes (NPTF): 3/4" and 1"

SAE and BSP porting also available. Contact Lake for more information

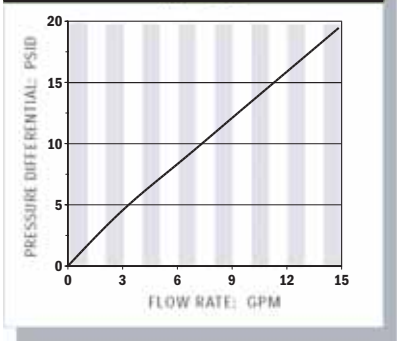
PERFORMANCE

- Measuring accuracy: ±5% of full-scale
- Repeatability: ±1% of full-scale
- Flow measuring range: .05-30 GPM
- Maximum operating pressure: 1000 PSIG (69 Bar)
- Maximum operating temperature: 240ºF (116ºC)
- Filtration requirements: 74 micron filter or 200 mesh screen minimum

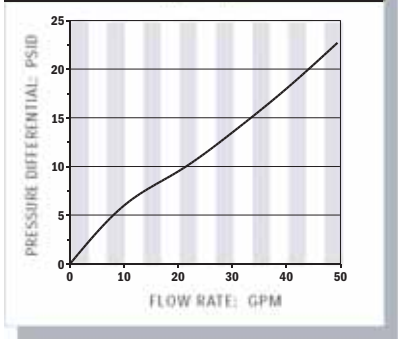
TYPICAL PRESSURE DIFFERENTIALS

For specific differential graphs, refer to Lake data sheet PDDS-404

SERIES 3 MONITORS 1/2"



SERIES 4 MONITORS 3/4" – 1



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800.850.6110

Lake Monitors
FreeFlow™ Sensor

"Accurate & Economic Flow Sensor"

FOR 3/8" – 3/4" PIPE SIZES

Minimally invasive, low cost segmented wedge flow sensor. Used to monitor and control process water.

STYLE FF

NO MOVING PARTS

The segmented wedge element provides a simple and reliable restriction for sensing flow as related to pressure differential.

UNRESTRICTED MOUNTING

Allows the designer to install the meter in any orientation – horizontal, vertical or inverted.

COMPACT AND RUGGED DESIGN

Measures less than 10" long and 3-1/2" wide, with a flanged mounting base for simple installation.

MULTIPLE FLOW RANGES AVAILABLE

The FreeFlow™ Sensor is offered with several ranges of calibration to accommodate the requirements typical to process water applications.

MULTIPLE PORT SIZES OFFERED

Standard selection of NPT ports reduces the amount of adapters required for installation.

LOW-COST PRECISION

Measuring accuracy of ±2% of range and repeatability of ±1/2%.

ENGINEERING SPECIFICATION

THE FREEFLOW SENSOR SHALL:

- Use the segmented wedge differential producer to measure flow rate as related to pressure.
- Not require inlet or outlet straight plumbing, or require vertical pipe mounting.
- Have a measuring accuracy of ±2% of full scale with ±1/2% repeatability.
- Be Lake Monitors No. FF– _ _ _– _ _ _– _ _

FreeFlow Sensor

MATERIALS OF CONSTRUCTION

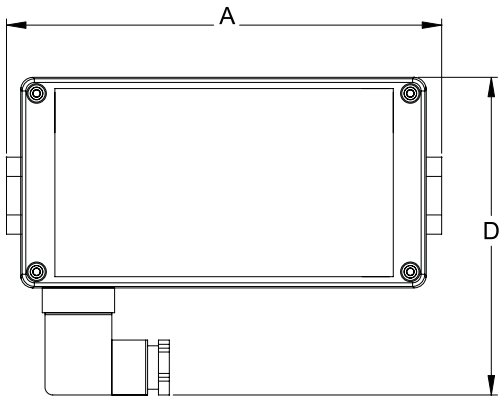
End Ports	PVC
Wedge Element	PVC
Pressure Sensor	Polyetherimide
Electrical Enclosure	Polycarbonate

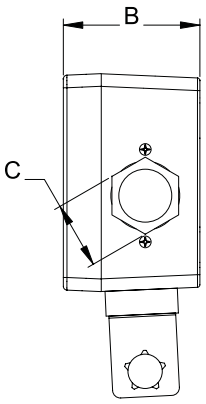
PERFORMANCE

Measuring Accuracy:	±2% of full-scale
Repeatability:	±1/2% of full-scale
Full Scale Flow Measuring Range:	5-15 GPM (19-57 LPM)
Turn Down Ratio (All Ranges)	8:1
Maximum Operating Pressure:	125 PSIG (8.6 bar)
Maximum Operating Temperature:	170°F (76°C)
Pressure Differential:	See graph on right
Standard Calibration Media:	Tap Water @ 70° F

ELECTRONIC SPECIFICATIONS

Electronic output:	0-5 VDC (Standard) - 0-10 VDC (Optional)
Power Requirements:	12-35 VDC
Maximum Current Consumption:	<50mADC
Minimum load resistance:	1000 Ohms
Maximum transmission distance:	≤ 200 feet
Resolution:	Infinite
Response Time:	<500 mS to 90% (step change)
Protection:	Short circuit, transient and reverse polarity

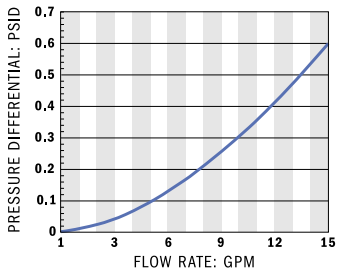




MECHANICAL SIZING CODE

DIM	3/8" Female NPTF	1/2" Female NPTF	3/4" Female NPTF
A	7-3/4" (197mm)	7-3/4" (197mm)	10" (254mm)
B	3-1/2" (89mm)	3-1/2" (89mm)	3-1/2" (89mm)
C	6-13/64" (158 mm)	6-13/64" (158 mm)	6-13/64" (158 mm)
D	2" (51mm)	2" (51mm)	2" (51mm)

FREEFLOW FLOW METER



LAKE MONITORS

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Lake Monitors
Pneumatic Flow Rate Monitors

FOR 1/8" – 2" PIPE SIZES

STYLE G

Ideal for monitoring air compressor outputs, pneumatic tool air consumption and industrial gas flows.

CHOICE OF THREE MATERIALS OF CONSTRUCTION

Select from aluminum, brass or stainless steel to meet system and media compatibility requirements.

UNRESTRICTED MOUNTING

Allows the designer to install the monitor in any orientation — horizontal, vertical or inverted.

SUPERIOR EXTERIOR DESIGN

Weather-tight for use outdoors and/or on systems where wash downs are required.

RUGGED AND RELIABLE

These monitors are constructed with all metal pressure vessels, allowing safe, permanent installation in industrial systems.

HIGH PRESSURE OPERATION

The magnetically coupled follower and rigid pressure vessel design allows operation to 1000 PSIG.

24 DIFFERENT PORTS AVAILABLE

Standard selection of NPT, SAE and BSP ports reduces the amount of adapters required for installation.

LOW COST ACCURACY

±2.5% of range accuracy in center third of scale; ±4% in upper and lower thirds

BI-DIRECTIONAL AND REVERSE FLOW OPTION OFFERED

Pneumatic monitors are also available in bi-directional and reverse flow versions. Contact Lake Monitors for more information.

ENGINEERING SPECIFICATION

THE PNEUMATIC IN-LINE FLOW RATE MONITOR SHALL:

- Use the variable annular orifice technique with compression spring recoil.
- Not require inlet or outlet straight plumbing, or require vertical pipe mounting.
- Have a measuring accuracy of ±2.5% of full scale in the center third of the measuring range, and ±4% in upper and lower thirds.
- Have a stainless steel sharp-edged orifice.
- Have a weather-tight external construction.
- Be Lake Monitors No. G _ _ – _ _ _ – _ _

Pneumatic Flow Rate Monitors

MATERIALS OF CONSTRUCTION (WETTED COMPONENTS)

	ALUMINUM	BRASS	STAINLESS STEEL
High-pressure casing, end ports and tapered shaft	Aluminum	Brass	#303 Stainless Steel
Seals	Buna-N (STD), EPR, Viton® or Kalrez®	Buna-N (STD), EPR, Viton® or Kalrez®	Viton® with Teflon® backup (STD), Buna-N, EPR or Kalrez®
Transfer Magnet	Teflon® coated Alnico	Teflon® coated Alnico	Teflon® coated Alnico
Floating Orifice Disk	Stainless Steel	Stainless Steel	Stainless Steel
All other internal parts	Stainless Steel	Stainless Steel	Stainless Steel

Teflon is a registered trademark of DuPont de Nemours & Co.
Viton and Kalrez are registered trademarks of Dow DuPont Elastomers.

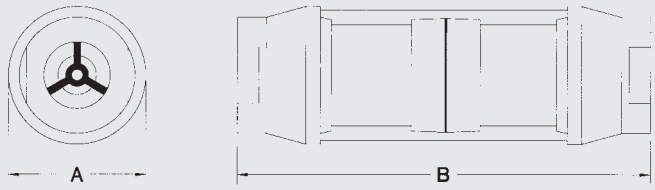
MATERIALS OF CONSTRUCTION (NON-WETTED COMPONENTS)

	ALUMINUM	BRASS	STAINLESS STEEL
Window Tube	Polycarbonate (STD) Pyrex	Polycarbonate (STD) Pyrex	Polycarbonate (STD) Pyrex
Window Seals	Buna-N (STD), Teflon®	Buna-N (STD), Teflon®	Buna-N (STD), Teflon®

PERFORMANCE

Measuring accuracy:	±2.5% of full-scale in the center third of the measuring range; ±4% in upper and lower thirds
Repeatability:	±1% of full-scale
Flow measuring range:	1.5-1300 SCFM @ 100 PSIG (1-610 LPS)
Pressure differential:	See graphs on the right for typical pressure differentials. For specific differential information, refer to Lake data sheet PDDS-404.
Maximum operating pressure:	aluminum and brass monitors: 600 PSIG (40 Bar) stainless steel monitors: 1000 PSIG (70 Bar)
Maximum operating temperature:	240ºF (116ºC) Note: For operation to 600ºF (316ºC), see our High Temperature data sheet.
Standard calibration fluids:	Air @ 70°F (21°C), 1.0 sg and 100 PSIG (6.8 Bar)
Filtration requirements:	74 micron filter or 200 mesh screen minimum

MECHANICAL SIZE CODE



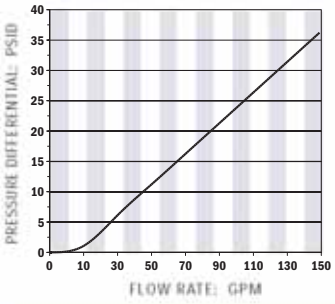
DIM	SERIES 2	SERIES 3	SERIES 4	SERIES 5	SERIES 5
A	1-1/4" (32mm)	1-7/8" (48mm)	2-3/8" (60mm)	3-1/2" (90mm)	3-1/2" (90mm)
B	4-13/16" (122mm)	6-9/16" (167mm)	7-5/32" (182mm)	10-1/8" (258mm)	12-5/8" (322mm)
Port Sizes	NPTF: 1/8", 1/4"	NPTF: 1/4", 3/8", 1/2" SAE: #6, #8, #10 BSP: 3/8", 1/2"	NPTF: 3/4", 1" SAE: #12, #16 BSP: 3/4", 1"	NPTF: 1-1/4", 1-1/2" SAE: #20, #24 BSP: 1-1/4", 1-1/2"	NPTF: 2" SAE: #32 BSP: 2"

Note: Consult factory for SAE brass monitor requirements.

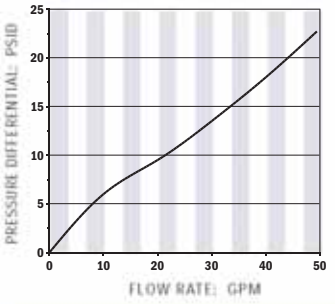
TYPICAL PRESSURE DIFFERENTIALS

For specific differential graphs, refer to Lake data sheet PDDS-404.

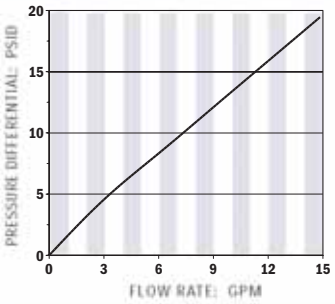
SERIES 5 MONITORS 1-1/4" - 2"



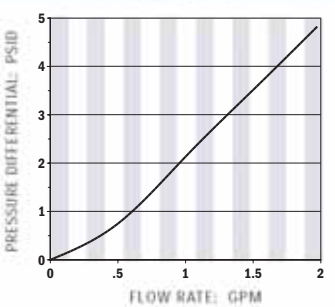
SERIES 4 MONITORS 3/4" - 1"



SERIES 3 MONITORS 1/4" - 1/2"



SERIES 2 MONITORS 1/8" - 1/4"



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LAKE MONITORS

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Lake Monitors
Pneumatic Monitor Uses and Operating Theory

Lake's rugged, high pressure, pneumatic monitors are designed for permanent installation in compressed gas systems. These products provide a low cost means to measure compressor volumetric outputs, pneumatic tool consumptions and other industrial gas flow rates.

Lake Monitors operate using the variable annular orifice method with compression spring return – the identical method used in our field proven liquid flow rate monitors. The product's follower, where the measurement is indicated, is magnetically coupled through a high pressure casing to the monitor's internal orifice assembly.

Benefits of these design features are:

- *high operating pressure*
- *linear displacement of the follower with respect to flow rate*
- *high turn-down ratios*
- *measuring accuracy within ±4% of full-scale*
- *operation in any mounting orientation*

Lake Monitors are available in three standard materials of construction:

- *aluminum for standard monitoring applications to 600 PSIG*
- *brass for media/material compatibility*
- *stainless steel for compatibility and operation to 1000 PSIG.*

Measuring ranges cover 1.5-12 SCFM through 150-1300 SCFM. Twenty-four port sizes from 1/8" through 2" in NPT, SAE and BSP can be ordered to meet specific plumbing requirements. Lake's pneumatic monitors are also available in alarm and transmitter configurations for electronic monitoring applications.

Standard Cubic Feet

Lake's monitors are calibrated to measure the flow of compressible media (gases) in SCFM – standard cubic feet per minute. A "standard" cubic foot is defined as a cubic foot of dry air at standard atmospheric conditions: 70ºF and 14.7 PSIA (0 PSIG) measured at sea level.

When a standard cubic foot of air is compressed, its actual volume will decrease proportionally as absolute pressure increases. For example, a standard cubic foot of air's actual volume will decrease by 50% and density will increase by 100% as the air is compressed from atmospheric pressure 14.7 PSIA (0 PSIG) to 29.4 PSIA (14.7 PSIG). See FIGURE 1 on back.

There are three factors that affect the Flow Meter Calibration: specific gravity, pressure and temperature. Lake Monitors are calibrated for air (specific gravity of 1.0) at 70ºF and 100 PSIG. Most low pressure rotameters are calibrated at 0 PSIG and require corrections for use at any other pressure.

Lake products are designed for pneumatic systems where pressures between 90-110 PSIG are used. In these common applications, a Lake monitor with a standard calibration can be read directly without applying corrections.

Correction Factors

If a Lake monitor is installed in a system where conditions differ from the standard listed above, correction factors will need to be applied to retain the design accuracy of the monitor. The appropriate correction factor equations are detailed in Chart 1 on the back of this page. To assure the best monitoring accuracy, pressure and temperature measurements should be taken directly at the monitor's inlet port.

Special Scales

Special calibrations can be performed by Lake Monitors to correct for the following system characteristics:

- *system pressure*
- *system temperature*
- *media specific gravity*
- *various measuring units (i.e. LPM, LPS, m3/hr, etc.)*
- *any combination of the above*

Consult Lake's factory or your distributor for details and prices.

Selecting the Proper Monitor

To order a pneumatic flow rate monitor the following information is required:

- *pipe size and port style*
- *media (air, nitrogen, argon, etc.) – for material compatibility and specific gravity considerations*
- *approximate flow range required*[1]
- *system pressure: nominal, maximum, minimum*
- *system temperature*

Pneumatic Monitor Uses and Operating Theory

Flow Range[1]

Estimating the flow rate in a compressed gas system may seem complicated, but with some research and a few simple equations an educated guess can be made. Two suggested methods are:

Method 1

A compressor is typically rated in SCFM output at a certain pressure and efficiency. If the rating cannot be located or is unknown, an estimate of compressor output can be obtained by the following formulas:

- **1-stage compressors**: motor HP/0.179 = SCFM @ 100 PSIG
- **2-stage compressors**: motor HP/0.164 = SCFM @ 100 PSIG
- **3-stage compressors**: motor HP/0.159 = SCFM @ 100 PSIG

Method 2

If all of the potential of a compressor is not being used (the unit cycles on and off) or if flow rate in excess of compressor capacity is being consumed (the compressor cannot meet the demand), a summation of machine usages can be totaled to determine the maximum flow rate. Most machine tools that use compressed air specify the maximum consumption of the tool.

INSTALLATION DOS AND DON'TS

To obtain satisfactory operation from a Lake pneumatic flow rate monitor, the following points should be considered:

DO…

- *install a pressure gauge near the inlet of the monitor*
- *place throttling valves at the outlet of the monitor*
- *use pipe sealer on the connections*
- *install a union on one side of the monitor for easy removal for maintenance and calibration*
- *install solenoid valves at the monitor outlet (as far downstream as possible)*
- *mount in any orientation: vertical, horizontal or upside down*

DO NOT…

- *install restrictions between pressure gauges and the monitor inlet*
- *install solenoid valves at the monitor inlet*
- *place restrictions between the monitor's pressure gauge and the monitor inlet*
- *use in systems where reverse flow is possible*
- *place monitor in non-aligned piping*
- *over-flow the monitor by more than 150% of maximum reading*
- *operate at pressures and temperatures greater than specified*

Density Correction Factors

SCFM (indicated) X (CF) = SCFM (actual) CF = (f_1) X (f_2) X (f_3) Note: all correction factors need not be used.

Table 1. **(f_1) PRESSURE CORRECTION FACTORS** (inlet pressure)

psig	25	50	75	100	125	150	175	200
f_1	.56	.75	.88	1.0	1.11	1.2	1.29	1.37

$$f_1 = \sqrt{\frac{14.7 + \text{psig}}{114.7}}$$

Table 2. **(f_2) TEMPERATURE CORRECTION FACTORS**

°F	10°	30°	50°	70°	90°	110°	130°	150°
f_2	1.08	1.04	1.02	1.0	.98	.96	.95	.93

$$f_2 = \sqrt{\frac{530}{460 + °F}}$$

Table 3. **(f_3) SPECIFIC GRAVITY CORRECTION FACTOR**

$$f_3 = \sqrt{\frac{1}{\text{Sp. Gr.}}}$$

f_1 = correction factor for other than 100 PSI inlet.

f_2 = correction factor for other than 70° F.

f_3 = correction factor for other than air at 1.0 Sp. Gr.

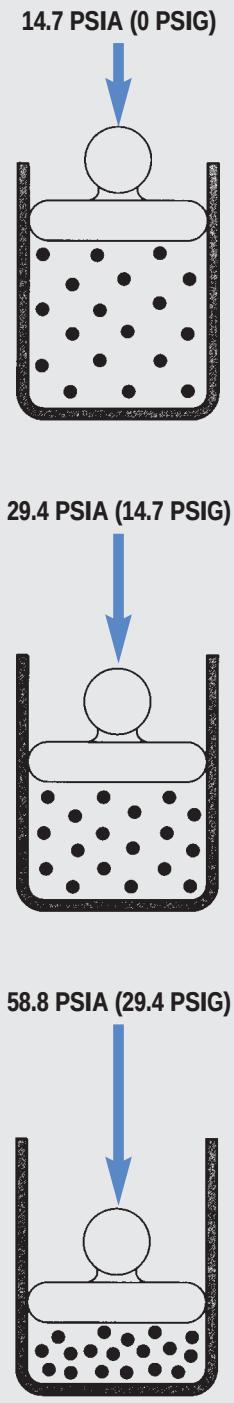

FIGURE 1.
A diagram illustrating the effect of different pressures on the volume of gas.

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GOTS-1106 7.5M MR / WGD / MAS

LAKE MONITORS

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Lake Monitors
Phosphate Ester Flow Rate Monitors

FOR 1/8" – 2" PIPE SIZES

STYLE P

Compatible with aviation lubricants such as Skydrol®, as well as fire-retardant fluids such as Pydraul®, Fyrquil® and Houghton 900 series.

CHOICE OF THREE MATERIALS OF CONSTRUCTION

Select from aluminum, brass or stainless steel to meet system requirements.

UNRESTRICTED MOUNTING

Allows the designer to install the monitor in any orientation — horizontal, vertical or inverted.

MULTI-USE

Factory calibrated for phosphate esters, these versatile monitors can be used to verify hydraulic power unit outputs, as well as test machinery and tools for proper fluid flow rates.

RUGGED AND RELIABLE

These monitors are constructed with all metal pressure vessels that allow safe, permanent installation in industrial systems.

HIGH PRESSURE OPERATION

The magnetically coupled follower design allows operation to 6000 PSIG.

24 DIFFERENT PORTS AVAILABLE

Standard selection of NPT, SAE and BSP ports reduces the amount of adapters required for installation.

LOW COST ACCURACY

±2.5% of range accuracy in center third of scale; ±4% in upper and lower thirds.

BI-DIRECTIONAL AND REVERSE FLOW OPTION OFFERED

Phosphate ester monitors are also available in bi-directional and reverse flow versions. Contact Lake Monitors for more information.

ENGINEERING SPECIFICATION

THE PHOSPHATE ESTER IN-LINE FLOW RATE MONITOR SHALL:

- Include a direct-reading scale corrected for phosphate ester media.
- Use the variable annular orifice technique with compression spring recoil.
- Not require inlet or outlet straight plumbing, or require vertical pipe mounting.
- Have a measuring accuracy of ±2.5% of full scale in the center third of the measuring range, and ±4% in upper and lower thirds.
- Have a stainless steel sharp-edged orifice.
- Be Lake Monitors No. P _ _ – _ _ _ – _ _

Phosphate Ester Flow Rate Monitors

MATERIALS OF CONSTRUCTION (WETTED COMPONENTS)

	ALUMINUM	BRASS	STAINLESS STEEL
High-pressure casing, end ports and tapered shaft	Aluminum	Brass	#303 Stainless Steel
Seals	EPR, w/Teflon® backup Virton® or Kalrez®	Teflon® coated Alnico	EPR, w/Teflon® backup Virton® or Kalrez®
Transfer Magnet	Teflon® coated Alnico	Teflon® coated Alnico	Teflon® coated Alnico
Floating Orifice Disk	Stainless Steel	Stainless Steel	Stainless Steel
All other internal parts	Stainless Steel	Stainless Steel	Stainless Steel

Teflon is a registered trademark of DuPont de Nemours & Co.
Viton and Kalrez are registered trademarks of Dow DuPont Elastomers.

MATERIALS OF CONSTRUCTION (NON-WETTED COMPONENTS)

	ALUMINUM	BRASS	STAINLESS STEEL
Window Tube	Pyrex	Pyrex	Pyrex
Window Seals	Teflon®	Teflon®	Teflon®

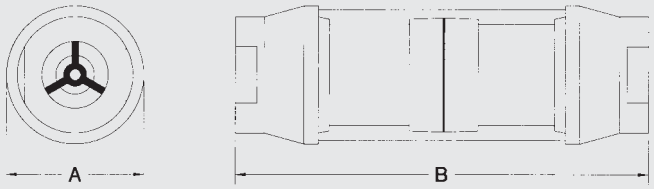
PERFORMANCE

Measuring accuracy:	±2.5% of full-scale in the center third of the measuring range; ±4% in upper and lower thirds
Repeatability:	±1% of full-scale
Flow measuring range [1]:	0.1-130 GPM (0.4 – 490 LPM)
Pressure differential:	See graphs on the right for typical pressure differentials. For specific differential information, refer to Lake data sheet PDDS-404.
Maximum operating pressure:	aluminum and brass monitors: 3500 PSIG (240 Bar) stainless steel monitors: 6000 PSIG (410 Bar)
Maximum operating temperature:	240ºF (116ºC) Note: For operation to 600ºF (316ºC), Note: For operation to 600°F (316°C) alternate o-ring material will be required.
Standard calibration fluids:	DTE 25® @ 110ºF (43ºC), 0.873 sg Monitors are density corrected to 1.15 sg
Filtration requirements:	74 micron filter or 200 mesh screen minimum

*[1] To determine approximate measuring ranges multiply the range listed in the Liquid Flow Rate section of Lake's Guide to standard monitor numbers by 0.93. For example, a P3A6WB10 would have a scale range to 10 GPM *0.93 = 9.3 GPM at full scale.*

DTE 25 is a registered trademark of Exxon Mobil.

MECHANICAL SIZE CODE



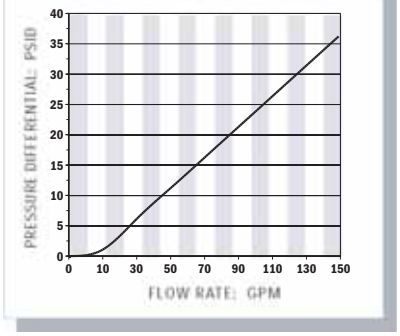
DIM	SERIES 2	SERIES 3	SERIES 4	SERIES 5	SERIES 5
A	1-1/4" (32mm)	1-7/8" (48mm)	2-3/8" (60mm)	3-1/2" (90mm)	3-1/2" (90mm)
B	4-13/16" (122mm)	6-9/16" (167mm)	7-5/32" (182mm)	10-1/8" (258mm)	12-5/8" (322mm)
Port Sizes	NPTF: 1/8", 1/4"	NPTF: 1/4", 3/8", 1/2" SAE: #6, #8, #10 BSP: 3/8", 1/2"	NPTF: 3/4", 1" SAE: #12, #16 BSP: 3/4", 1"	NPTF: 1-1/4", 1-1/2" SAE: #20, #24 BSP: 1-1/4", 1-1/2"	NPTF: 2" SAE: #32 BSP: 2"

Note: Consult factory for SAE brass monitor requirements.

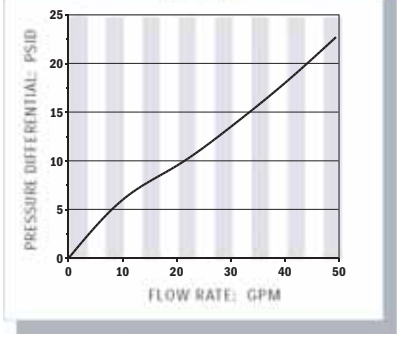
TYPICAL PRESSURE DIFFERENTIALS

For specific differential graphs, refer to Lake data sheet PDDS-404.

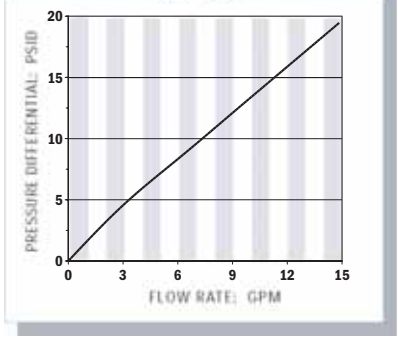
SERIES 5 MONITORS 1-1/4" - 2"



SERIES 4 MONITORS 3/4" - 1"



SERIES 3 MONITORS 1/4" - 1/2"



SERIES 2 MONITORS 1/8" - 1/4"

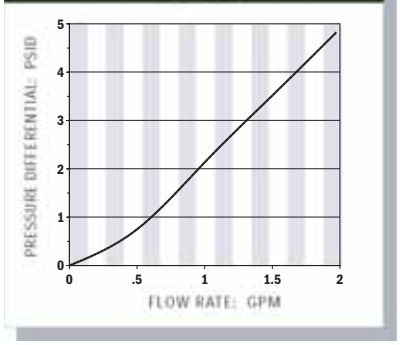


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Table of Contents

LAKE MONITORS

Lake Monitors
Flow Rate Transmitters

FOR 1/4" – 2" PIPE SIZES

Ideal for batching, industrial process control, mobile hydraulic equipment and computer/PLC-controlled hydraulic system monitoring applications.

STYLE R

SIMPLE TO INSTALL

All transmitters are factory calibrated and ship fully assembled. Simply install the transmitter into your system and apply power.

INDUSTRY STANDARD OUTPUTS

Transmitters provide proportional analog outputs of 4-20mA, 0-5 Vdc and 1-5 Vdc[1], 20-2000 Hz square-wave pulse. These outputs will drive popular data acquisition devices, meters and analog input cards.

DIRECT READING

All transmitters provide a visual indication of flow rate integral to the transmitted output.

WEATHER-TIGHT CONSTRUCTION

The rugged cast aluminum NEMA type 4X enclosure allows installation in outdoor applications and in environments where liquid tight seals are required.

RUGGED AND RELIABLE

Without delicate internal components to break, abrade or corrode, the Lake flow transmitter will provide many years of low-maintenance service.

COMPATIBLE WITH LAKE MONITORS' R/T100 AND R100 FLOW ANALYZERS

The Lake flow rate transmitter combines with these Lake analyzers to make a powerful flow instrument capable of remote monitoring of rate and total flows.

[1]The 1-5Vdc output requires an external 249 ohm resistor (not included with transmitter) to be wired at the receiving device.

ENGINEERING SPECIFICATION

THE IN-LINE FLOW RATE MONITOR/ TRANSMITTER SHALL:

- Be factory calibrated for 4-20mA, 0-5Vdc, 1-5Vdc, and square wave pulse outputs.
- Use the variable annular orifice technique with compression spring recoil.
- Not require inlet or outlet straight plumbing, or require vertical orientation.
- Have a measuring accuracy of ±2.5% of full scale in the center third of the measuring range, and ±4% in upper and lower thirds.
- Have a stainless steel sharp-edged orifice
- Have a maximum working pressure rating of 3500 or 6000 PSIG for liquids.
- Have a maximum working pressure rating of 600 or 1000 PSIG for gasses.
- Have a weather-tight external construction.
- Be Lake Monitors No. R _ _ – _ _ _ – _ _.

Flow Rate Transmitters

MATERIALS OF CONSTRUCTION (WETTED COMPONENTS)

	ALUMINUM	BRASS	STAINLESS STEEL
High-pressure casing, end ports and tapered shaft	Aluminum	Brass	#303 Stainless Steel
Seals	Buna-N (STD), EPR, Viton® or Kalrez®	Buna-N (STD), EPR, Viton® or Kalrez®	Viton® with Teflon® backup (STD), Buna-N, EPR or Kalrez®
Transfer Magnet	Teflon® coated Alnico	Teflon® coated Alnico	Teflon® coated Alnico
Floating Orifice Disk	Stainless Steel	Stainless Steel	Stainless Steel
All other internal parts	Stainless Steel	Stainless Steel	Stainless Steel

Teflon is a registered trademark of DuPont de Nemours & Co.
Viton and Kalrez are registered trademarks of Dow DuPont Elastomers.

MATERIALS OF CONSTRUCTION (NON-WETTED COMPONENTS)

	ALUMINUM	BRASS	STAINLESS STEEL
Enclosure & Cover	Aluminum	Aluminum	Aluminum
Seals	Buna-N	Buna-N	Buna-N
Window	Pyrex®	Pyrex®	Pyrex®
Din Connector	Polyamide	Polyamide	Polyamide

Pyrex is a registered trademark of Corning Inc.

MONITOR PERFORMANCE

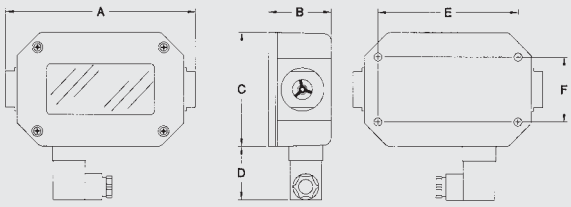
Measuring accuracy:	±2.5% of full-scale in the center third of the measuring range; ±4% in upper and lower thirds
Repeatability:	±1% of full-scale
Flow measuring range:	0.05-150 GPM (0.2-560 LPM); 1.5-1300 SCFM (0.75-610 SLPS)
Maximum operating pressure:	aluminum and brass monitors: 3500 PSIG (240 Bar) Stainless steel monitors: 6000 PSIG (410 Bar)
Maximum operating temperature:	media: 240ºF (116ºC), ambient: 180ºF (82ºC)
Pressure differential:	Liquid: see graphs. Gases: see Pneumatic data sheet
Standard calibration media:	Oil monitors: DTE 25® @ 110ºF (43ºC), 0.873 sg Water monitors: tap water @ 70ºF (21ºC), 1.0 sg Air monitors: air @ 70ºF (21ºC), 1.0 sg and 100 PSIG (6.8 Bar)
Filtration requirements:	74 micron filter or 200 mesh screen minimum

DTE 25 is a registered trademark of Exxon Mobil.

ELECTRONIC TRANSMITTER PERFORMANCE

Power requirements:	12-35 Vdc
Load driving capacity:	4-20mA: Load resistance is dependent on power supply voltage. Use the following equation to calculate maximum load resistance: Max Loop Load (Ω) = 50(Power supply volts – 12). 0-5 VDC: Minimum load resistance 1000Ω. 1-5 VDC: Minimum load resistance 25 K Ω Square Wave Pulse: Minimum load resistance 1000 Ω
Transmission distance:	4-20mA and 1-5 VDC are limited only by wire resistance and power supply voltage. <200 feet recommended for 0-5 VDC and square wave pulse.
Over-current protection:	self limiting at 35mA
Resolution:	10 bit (0.1%)
Isolation:	Inherently isolated from the process
Response time:	<100 milliseconds

MECHANICAL SIZE CODE



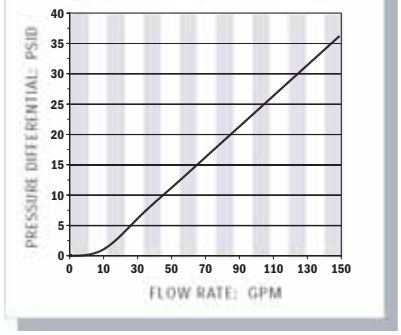
DIM	SERIES 3	SERIES 4	SERIES 5	SERIES 5
A	6-9/16" (167mm)	7-5/32" (182mm)	10-1/8" (258mm)	12-5/8" (322mm)
B	2-3/16" (56mm)	2-15/16" (75mm)	3-13/16" (97mm)	3-13/16" (97mm)
C	4" (101mm)	4-1/2" (114mm)	5-5/16" (135 mm)	5-5/16" (135mm)
D	1-7/8" (47mm)	1-7/8" (47mm)	1-7/8" (47mm)	1-7/8" (47mm)
E	4-7/8" (128mm)	5" (127mm)	6-3/4" (172mm)	6-3/4" (172mm)
F	2-1/4" (57mm)	2-7/8" (73mm)	3-3/4" (95mm)	3-3/4" (95mm)
Port Sizes	NPTF: 1/4", 3/8", 1/2" SAE: #6, #8, #10 BSP: 3/8", 1/2"	NPTF: 3/4", 1" SAE: #12, #16 BSP: 3/4", 1"	NPTF: 1-1/4", 1-1/2" SAE: #20, #24 BSP: 1-1/4", 1-1/2"	NPTF: 2" SAE: #32 BSP: 2"

Note: Consult factory for SAE brass monitor requirements.

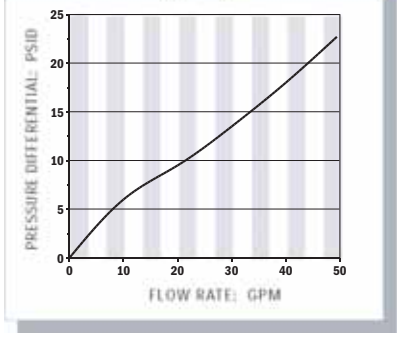
TYPICAL PRESSURE DIFFERENTIALS

For specific differential graphs, refer to Lake data sheet PDDS-404.

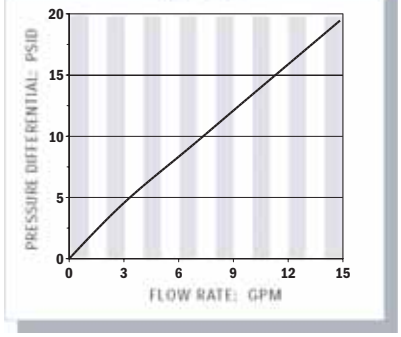
SERIES 5 MONITORS 1-1/4" - 2"



SERIES 4 MONITORS 3/4" - 1"



SERIES 3 MONITORS 1/4" - 1/2"



LAKE MONITORS

www.lakemonitors.com

AW-LAKE COMPANY
A TASI Group Company
8809 Industrial Dr., Franksville, WI 53126
262.884.9800 / Fax: 262.884.9810
800.850.6110

RDS-1106 7.5M MR / WGD / MAS

Lake Monitors
Flow Rate Alarms

FOR 1/4" – 2" PIPE SIZES

Utilized in applications such as mobile hydraulic equipment and industrial process control, ensures sufficient flows of coolants and lubricants.

STYLE M & N

FIELD ADJUSTABLE ALARM SETTING

Only an allen wrench is required to change the flow alarm setting.

WEATHER-TIGHT CONSTRUCTION

Rugged cast aluminum NEMA type 4X enclosure allows installation in outdoor applications and in environments where liquid tight seals are required.

SIMPLE ON/OFF LOGIC

Positive alarm points using 10 A., dry-contact, SPDT switches, reduce the complexity found in standard rotameter OFF/ON/OFF circuits.

PRE-WIRED WITH CABLE DISCONNECT

The standard Hirschmann interconnection provides easy installation and maintenance of the FLOW ALARM and the system it is a part of.

UNRESTRICTED MOUNTING

Allows the designer to install the monitor in any orientation – horizontal, vertical or inverted.

ECONOMICAL PROTECTION

This monitor rapidly pays for itself as it “sounds the alarm” on incorrect pneumatic, lubrication or cooling volumes, protecting expensive equipment and reducing downtime.

QUALITY ASSURANCE

Can be an integral part of a quality control system, yielding consistent system operation.

ENGINEERING SPECIFICATION

THE IN-LINE FLOW RATE MONITOR/ALARM SHALL:

- Have field adjustable, dry-contact, alarm setting(s).
- Use the variable annular orifice technique with compression spring recoil.
- Not require inlet or outlet straight plumbing, or require vertical pipe mounting.
- Have a measuring accuracy of ±2.5% of full scale in the center third of the measuring range, and ±4% in upper and lower thirds.
- Have a maximum working pressure rating of 3500 or 6000 PSIG for liquids.
- Have a maximum working pressure rating of 600 or 1000 PSIG for gasses.
- Have a stainless steel sharp-edged orifice.
- Have a weather-tight NEMA type 4X external construction.
- Be Lake Monitors No. M _ _ – _ _ _ – _ _ for single alarm applications, or N _ _ – _ _ _ – _ _ for dual alarm applications.

Flow Rate Alarms

MATERIALS OF CONSTRUCTION (WETTED COMPONENTS)

	ALUMINUM	BRASS	STAINLESS STEEL
High-pressure casing, end ports and tapered shaft	Aluminum	Brass	#303 Stainless Steel
Seals	Buna-N (STD), EPR, Viton® or Kalrez®	Buna-N (STD), EPR, Viton® or Kalrez®	Viton® with Teflon® backup (STD), Buna-N, EPR or Kalrez®
Transfer Magnet	Teflon® coated Alnico	Teflon® coated Alnico	Teflon® coated Alnico
Floating Orifice Disk	Stainless Steel	Stainless Steel	Stainless Steel
All other internal parts	Stainless Steel	Stainless Steel	Stainless Steel

Teflon is a registered trademark of DuPont de Nemours & Co.
Viton and Kalrez are registered trademarks of Dow DuPont Elastomers

MATERIALS OF CONSTRUCTION (NON-WETTED COMPONENTS)

	ALUMINUM	BRASS	STAINLESS STEEL
Enclosure & Cover	Aluminum	Aluminum	Aluminum
Seals	Buna-N	Buna-N	Buna-N
Window	Pyrex®	Pyrex®	Pyrex®
Din Connector	Polyamide	Polyamide	Polyamide

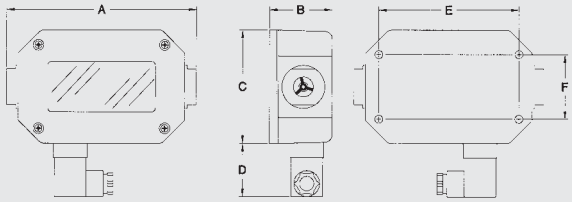
Pyrex is a registered trademark of Corning Inc.

PERFORMANCE

Measuring accuracy:	±2.5% of full-scale in the center third of the measuring range; ±4% in upper and lower thirds
Repeatability:	±1% of full-scale
Flow measuring range:	0.05-150 GPM (0.2-560 LPM); 1.5-1300, SCFM (0.75-610 SLPS)
Maximum operating pressure:	aluminum and brass monitors: 3500 PSIG (240 Bar) stainless steel monitors: 6000 PSIG (410 Bar)
Maximum operating temperature:	media: 240ºF (116ºC), ambient: 180ºF (82ºC)
Pressure differential:	See graphs on the right for typical pressure differentials.
Standard calibration fluids:	Oil monitors: DTE 25® @ 110ºF (43ºC), 0.873 sg Water monitors: tap water @ 70ºF (21ºC), 1.0 sg Air monitors: air @ 70ºF (21ºC), 1.0 sg and 100 PSIG (6.8 Bar)
Enclosure:	NEMA type 4X (UL Approved)
Alarm switch dead-band:	4% of full scale
Alarm switch contacts:	SPDT (dry contact), UL/CSA rating: 10 amps and 1/4 hp, 125 or 250 VAC. 1/2 amp, 125 VDC; 1/4 amp, 250 VDC; 3 amps, 125 VAC "L" (lamp load)
Filtration requirements:	74 micron filter or 200 mesh screen minimum

DTE 25 is a registered trademark of Exxon Mobil

MECHANICAL SIZE CODE



DIM	SERIES 3	SERIES 4	SERIES 5	SERIES 5
A	6-9/16" (167mm)	7-5/32" (182mm)	10-1/8" (258mm)	12-5/8" (322mm)
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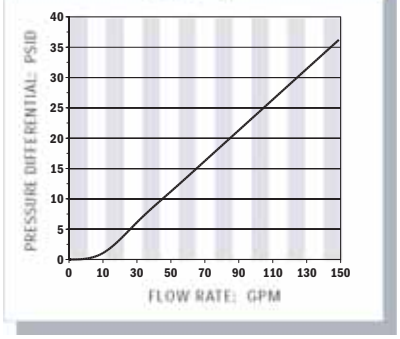
C	4" (101mm)	4-1/2" (114mm)	5-5/16" (135 mm)	5-5/16" (135mm)
D	1-7/8" (47mm)	1-7/8" (47mm)	1-7/8" (47mm)	1-7/8" (47mm)
E	4-7/8" (128mm)	5" (127mm)	6-3/4" (172mm)	6-3/4" (172mm)
F	2-1/4" (57mm)	2-7/8" (73mm)	3-3/4" (95mm)	3-3/4" (95mm)
Port Sizes	NPTF: 1/4", 3/8", 1/2" SAE: #6, #8, #10 BSP: 3/8", 1/2"	NPTF: 3/4", 1" SAE: #12, #16 BSP: 3/4", 1"	NPTF: 1-1/4", 1-1/2" SAE: #20, #24 BSP: 1-1/4", 1-1/2"	NPTF: 2" SAE: #32 BSP: 2"

Note: Consult factory for SAE brass monitor requirements.

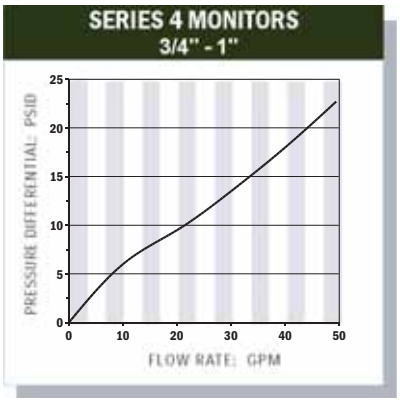
TYPICAL PRESSURE DIFFERENTIALS

For specific differential graphs, refer to Lake data sheet PDDS-404.

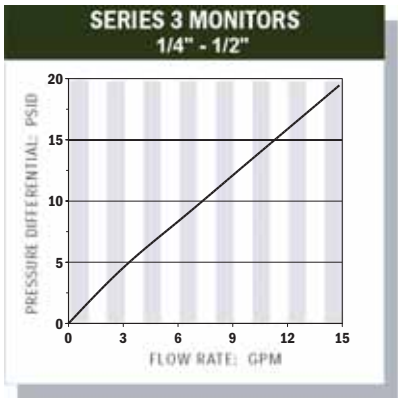
SERIES 5 MONITORS 1-1/4" - 2"



SERIES 4 MONITORS 3/4" - 1"



SERIES 3 MONITORS 1/4" - 1/2"



LAKE MONITORS

www.lakemonitors.com

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A TASI Group Company
8809 Industrial Dr., Franksville, WI 53126
262.884.9800 / Fax: 262.884.9810
800.850.6110

MNDS-1106 7.5M MR / WGD / MAS

Table of Contents

LAKE MONITORS

NEW FROM LAKE MONITORS

A Flow Sensor that's compatible with your Application and your Budget.

Whether it's a unique flow monitoring application, a limited budget or both, the FlowStat ES is a perfect fit. A new addition to Lake's line of popular FlowStat® Sensors, the ES version features a durable polypropylene body for cost savings and compatibility with a variety of fluids. The ES sensor also offers a flow measuring accuracy of ±2% of full scale, and is capable of handing pressures up to 150 PSIG and temperatures up to 150°F. For additional compatibility, the FlowStat ES Sensor offers 4-20 mA, 0-5 VDC, pulse or relay outputs. And like most of its products, AW-Lake Company backs the FlowStat ES/Economy Flow Sensor with a 5-year warranty.

www.lakemonitors.com

FlowStat ES / Economy Flow Sensor

FlowStat® ES/Economy Series

MATERIALS OF CONSTRUCTION

WETTED COMPONENTS:	Sensor Body:	Glass-Filled Polypropylene
	Cover:	Clear Polycarbonate
	Seal:	Buna-N (standard)
	Turbine:	Acetal Copolymer
	Bearing:	PEEK
	Shaft:	Stainless Steel
NON-WETTED:	Encapsulant:	Epoxy
	Strain Relief:	Nylon
	Lock Ring:	Glass-Filled Polypropylene
	Wire Insulation:	High-Temperature PVC

PERFORMANCE

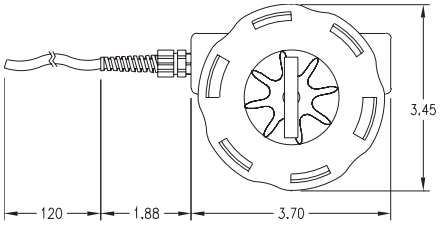
Measuring Accuracy:	± 2% of full-scale
Repeatability:	± 0.5% of full-scale
Turndown ratio:	10:1
Flow Measuring Range:	0.5-15 GPM (2-60 LPM) With optional low-flow adapter: 0.1-4.0 GPM (0.4-15 LPM)
Temperature Range:	20-150°F
Maximum Pressure:	150 PSIG
Pressure differential:	See graph on right
Standard calibration media:	Tap water @ 70°F Temperature

ELECTRONIC SPECIFICATIONS

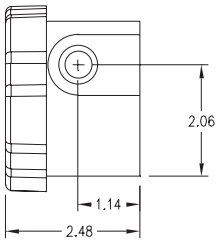
4-20 mA version:	Power Requirements:	12-35 VDC, loop powered
	Load driving capacity:	1150 Ohms maximum
	Maximum transmitting distance:	Limited only by wire resistance & supply voltage
	Response time:	2 seconds to 90% (step change)
	Resolution:	Infinite
	Over-current limit:	Self limiting at 35 mA
	Other protection:	Reverse polarity
0-5VDC Version:	Power Requirements:	12-35 VDC
	Maximum current:	25 mA DC
	Minimum load resistance:	1000 Ohms
	Maximum transmission distance:	200 feet recommended
	Resolution:	Infinite
	Response time:	< 5 seconds to 90% (step change)
Pulse Output Version:	Power Requirements:	5-24 VDC
	Response Time:	< 100 mS
	Maximum current:	25 mA DC
	Maximum transmission distance:	200 feet recommended
	Minimum load resistance:	1000 Ohms
	Protection:	Short circuit & reverse polarity
Relay Output:	Power Requirements:	12-35 VDC
	Maximum transmission distance:	200 feet recommended
	Switch Contact:	Form C, 5A max @120 or 240 VAC
	Hysteresis:	5% of set point maximum
	Set point repeatability:	1% of full scale

NOTE: *Standard Interface for all version is a 10' pigtail, 22 AWG multi-conductor cable (electrical connector optional)*

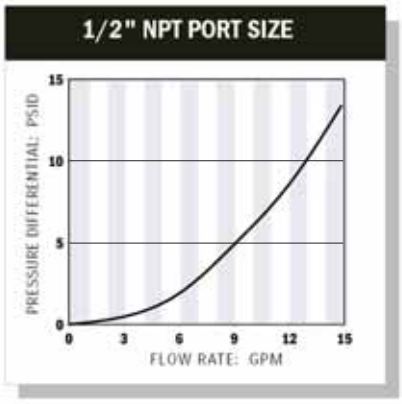
For ordering information refer to Lake's current Price and Part Number Guide, which is available on-line or by calling Lake Monitors.



Measurements shown are in inches.



PRESSURE DIFFERENTIAL



LAKE MONITORS

www.lakemonitors.com

AW-LAKE COMPANY
A TASI Group Company
8809 Industrial Dr., Franksville, WI 53126
262.884.9800 / Fax: 262.884.9810
800.850.6110

Lake Monitors
FlowStat® –Turbine Flow Sensor

Perfect monitoring solution for Chillers/Cooling Circuits, HVAC, Medical Equipment, Batching and Industrial process control applications.

FlowStat®
Flow Sensor

CHOICE OF THREE PORT SIZES

Select from 1/2" , 3/4" or 1" porting to meet system requirements.

EASY MAINTENANCE AND CLEANING

Has only one moving component, the impeller. Cleaning and maintenance may be performed without removing the sensor from the piping.

HERMETICALLY ENCAPSULATED CIRCUITRY

Withstands the harshest environments.

SEVERAL OUTPUTS AVAILABLE

The standard interface is a 2-wire, 4-20mA current loop. Sensor signal may be transmitted on a low cost wire without degradation. Pulse and 0-5 VDC are also available.

CONNECTS DIRECTLY TO YOUR FLOW MONITORING INSTRUMENTS

Can be connected directly to analog acquisition cards, chart recorders or other monitoring instruments, without external signal conditioning.

SIMPLY PLUMB AND APPLY POWER

Comes factory calibrated to your flow range specifications.

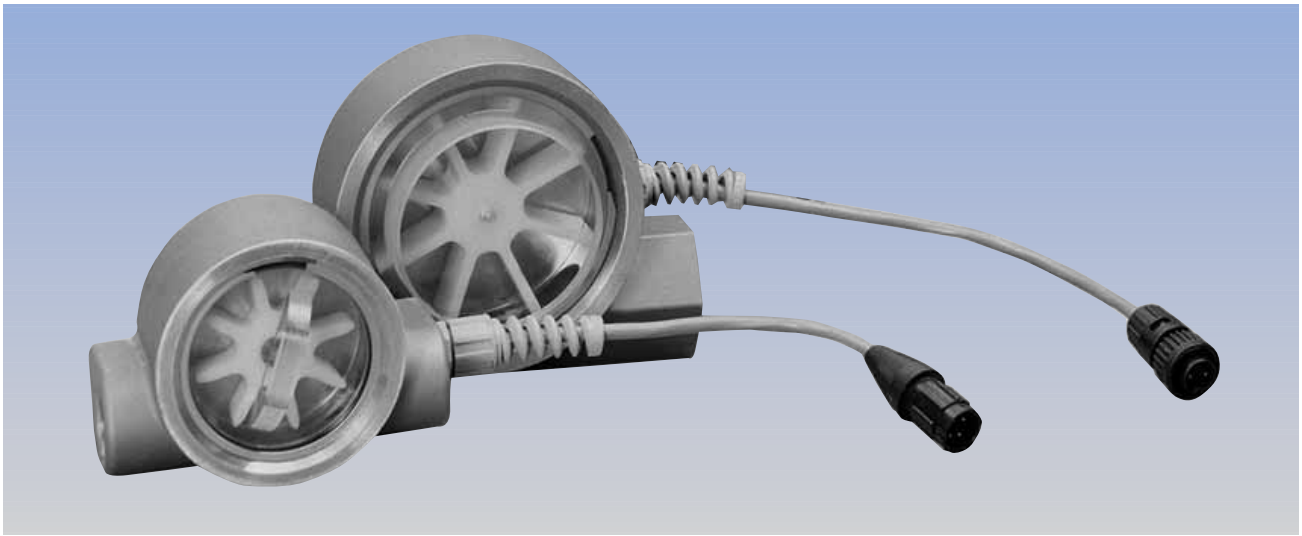
VALUE PRICING

Combined with low cost operation and maintenance, equals better bottom line savings for your operation.

ENGINEERING SPECIFICATION

THE FLOWSTAT SENSOR SHALL:

- Have only one moving component.
- Be calibrated to user specified flow range.
- Have a measuring accuracy of 2% of full scale.
- Have hermetically encapsulated circuitry.
- Be Lake Monitors Number C_ _ - _ _ - _ _ for the Current output, Number P_ _ - _ _ - _ _ for the pulse Output version, and Number V_ _ - _ _ - _ _ for the 0-5 VDC option.



FlowStat® – Turbine Flow Sensor

MATERIALS OF CONSTRUCTION

WETTED COMPONENTS:	Casing:	Stainless Steel #316
	Cover:	Stainless Steel #316 (optional clear polycarbonate)
	Seal:	Buna-N (other options available)
	Turbine:	Acetal copolymer
	Bearing:	PEEK (Polyetheretherketone)
	Shaft :	Stainless steel
NON-WETTED COMPONENTS:	Encapsulant:	Epoxy
	Strain relief:	Nylon
	Lock Ring:	Stainless steel
	Wire insulation:	High temperature PVC

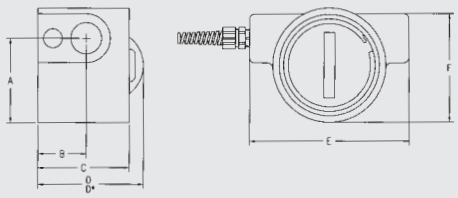
PERFORMANCE

Measuring accuracy:	±2% of full-scale
Repeatability:	±0.5% of full-scale
Flow Measuring Range:	1/2" porting, 0.5–15 GPM [2–60 LPM]
	3/4" – 1" porting, 1.5–50 GPM [60–200 LPM]
Turndown Ratio:	10:1
Temperature Range:	20-225ºF [-7 to 107ºC]
Pressure Range:	to 500 PSIG [34 bar]
W/optional clear cover	to 200 PSIG [14 bar]
Pressure Differential:	See graphs on the right for typical pressure differentials.
Filtration requirements:	150 micron filter recommended

ELECTRONIC SPECIFICATIONS

4-20 mA VERSION:	Power Requirements: 12–35 VdC, loop-powered
	Load driving capacity: 1150 Ohms max
	Maximum transmitting distance: Limited only by wire resistance & supply voltage
	Response time: 2 seconds to 90% (step change in flow rate)
	Resolution: Infinite
	Over-current limit: Self limiting at 35mA
	Other protection: Reverse polarity
0-5 VDC VERSION:	Power Requirements: 12-35 VDC
	Maximum Current: 25 mA DC
	Minimum Load Resistance: 1000 Ohms
	Maximum transmission distance: ≤200 ft. recommended
	Resolution: Infinite
	Response time: 2 seconds to 90% (step change in flow rate)
PULSE OUTPUT VERSION:	Type: 3 wire, hall effect
	Power Requirements: 5-24 VDC
	Maximum current: 25mADC
	Maximum transmission distance: ≤200ft. recommended

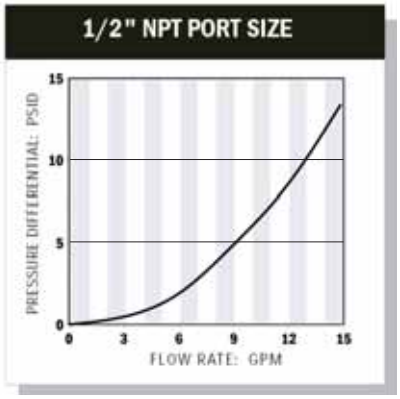
MECHANICAL

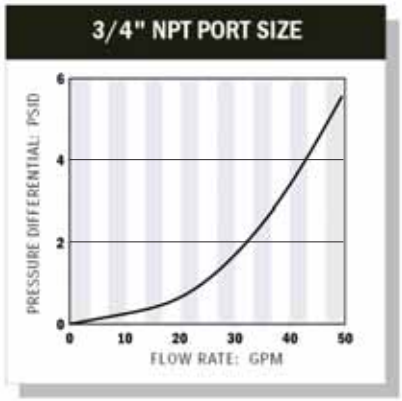


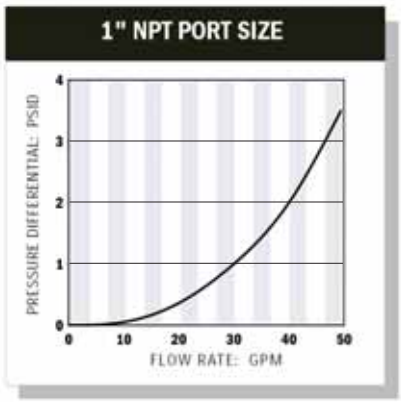
DIM	1/2" NPTF	3/4" NPTF – 1" NPTF
A	1.94" (49mm)	3.06" (78mm)
B	1.13" (29mm)	1.33" (34mm)
C	2.00" (51mm)	2.46" (62mm)
D	2.45" (62mm)	2.78" (71mm)
D*	2.45" (62mm)	2.88" (73mm)
E	3.70" (94mm)	5.25" (133mm)
F	2.63" (67mm)	3.80" (97mm)

** Dimensions with optional clear polycarbonate cover installed.*

TYPICAL PRESSURE DIFFERENTIALS







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800.850.6110

Table of Contents

LAKE MONITORS

Lake Monitors
Hydraulic System Test Analyzers

FOR 3/8" – 1-1/2" PIPE SIZES

STYLE K Flow & Pressure

STYLE T Flow, Pressure & Temperature

Used to diagnose faults in hydraulic circuits, determine horsepower and test for component wear such as hydraulic valve and cylinder leakage.

A COMPLETE TROUBLESHOOTING SYSTEM

The analyzer consists of a flow meter, glycerine-filled pressure gauge (Style "K"), bi-metal temperature gauge/dry pressure gauge (Style "T") and a precision needle-type load valve. A comprehensive operator's manual describes testing of various system components.

MATERIALS OF CONSTRUCTION

Kits offer choice of flow meters in aluminum for pressure up to 3000 PSIG or stainless steel for pressures up to 5000 PSIG. All stainless steel #303/304 kits available for pressure up to 6000 PSIG. *Contact Lake for more information.*

PLANNED COMPONENT REPAIRS

This system analyzer can be part of a predictive maintenance program, allowing strategized pump, valve, motor and cylinder rebuilding.

COMPACT AND RUGGED

The complete hydraulic system test analyzer is small enough to fit in a tool box and built to withstand rigorous industrial use.

NON-ELECTRICAL

Without batteries to fail or other electrical power connections to make, this system will provide a lifetime of simple and reliable operation.

METRIC AND US / STANDARD MEASURING RANGES

These multi-measurement analyzers simultaneously measure flow in GPM and LPM, pressure in PSIG and Bar, and temperature in degrees F and C.

UNRESTRICTED MOUNTING

Accurate measurements can be taken in any mounting orientation, without the straight pipe required with other analyzer systems.

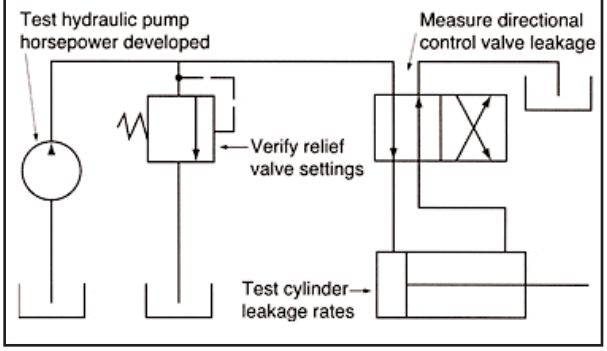
SYSTEM PROBLEMS PIN-POINTED

The hydraulic system analyzer and comprehensive troubleshooting manual will save time and money by testing discrete components within the system, eliminating trial and error approaches.

REVERSE FLOW OPTION AVAILABLE

Built-in reverse bypass mechanism prevents potential damage from mis-installation or backflow.

Hydraulics Diagnostics Tool Kit Applications



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LAKE MONITORS

Hydraulic System Test Analyzers

MATERIALS OF CONSTRUCTION

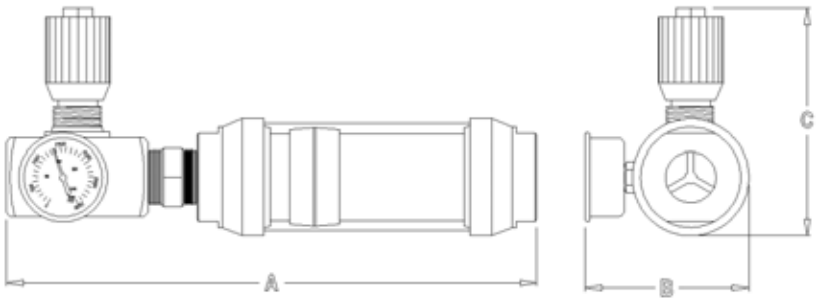
WETTED COMPONENTS		NON-WETTED COMPONENTS	
COMPONENT	MATERIALS	COMPONENT	MATERIALS
High-pressure casing, end ports and tapered shaft	Aluminum (3000 PSIG version Stainless Steel (5000 PSIG version)	Window Tube	Polycarbonate
Seals	Buna-N (STD), Viton, EPR, Neoprene optional	Window TubeSeals	Buna-N
Transfer Magnet	Teflon® coated Alnico	Gauge Window	Acrylic
Floating Orifice Disk	Stainless Steel		
All other internal parts	Stainless Steel		
Needle Valve	Carbon Steel (Stainless optional)		
Gauge	Brass and Stainless Steel		

Teflon is a registered trademark of DuPont de Nemours & Co.

PERFORMANCE

Measuring Accuracy:	Flow: ±4% of full-scale (±2.5% in center third of measuring range); Pressure: ±2.5% of full-scale; Temperature: ±2.5% of full-scale
Repeatability:	±1% of full-scale – all measurements
Measuring Range:	Flow: 0.05–150 GPM (0.2-560 LPM) See guide to standard meters for specific ranges; Temperature: 0–250°F (-20–120°C)
Maximum Operating Pressure:	Aluminum meters: 3000 PSIG (200 Bar); Stainless Steel Meters: 5000 PSIG (340 Bar); All stainless version: 6000 PSIG (410 Bar)
Maximum Operating Temperature:	240ºF (116ºC)
Standard Calibration Fluids:	Oil meters: DTE 25® @ 110ºF (43ºC), 0.873 sg
Filtration Requirements:	74 micron filter or 200 mesh screen minimum

DTE 25 is a registered trademark of Exxon Mobil.



MECHANICAL SIZE CODE

DIM	SERIES 3	SERIES 3	SERIES 4	SERIES 4	SERIES 5	SERIES 5
Port Sizes	3/8" NPTF	1/2" NPTF	3/4" NPTF	1" NPTF	1-1/4" NPTF	1-1/2" NPTF
A	9-1/2" (242mm)	10-1/8" (257mm)	11-1/8" (283mm)	12-1/2" (318mm)	15-5/8" (397mm)	15-25/32" (401mm)
B (K-Style)	3-1/2" (89mm)	3-9/16" (91mm)	4-1/16" (103mm)	4-1/8" (105mm)	4-7/8" (124mm)	5-3/32" (130mm)
B (T-Style)	3-7/32" (82mm)	3-5/16" (85mm)	3-25/32" (96mm)	3-7/8" (99mm)	4-5/8" (118mm)	4-13/16" (123mm)
C	3-5/8" (92mm)	4-3/16" (107mm)	4-31/32" (127mm)	6-1/4" (159mm)	7" (178mm)	7-3/16" (183mm)

DIM	SERIES 3	SERIES 3	SERIES 4	SERIES 4	SERIES 5	SERIES 5
Port Sizes	#6 SAE	#8 SAE	#12 SAE	#16 SAE	#20 SAE	#24 SAE
A	9-7/16" (240mm)	9-9/16" (243mm)	11-3/32" (282mm)	12-9/32"(312mm)	15-3/8" (391mm)	15-3/8" (391mm)
B (K-Style)	3-1/2" (89mm)	3-19/32" (92mm)	4-1/16" (103mm)	4-1/8" (105mm)	4-29/32" (127mm)	5-3/32" (130mm)
B (T-Style)	3-7/32" (82mm)	3-5/16" (85mm)	3-25/32" (96mm)	3-7/8" (99mm)	4-5/8" (118mm)	5-13/16" (148mm)
C	3-5/8" (92mm)	4-3/16" (107mm)	4-31/32" (127mm)	6-1/4" (159mm)	7" (178mm)	7-3/16" (183mm)

LAKE MONITORS

www.lakemonitors.com

AW-LAKE COMPANY
A TASI Group Company
8809 Industrial Dr., Franksville, WI 53126
262.884.9800 / Fax: 262.884.9810
800.850.6110

Lake Monitors
Hydraulic Diagnostic Tool Kit with Bi-Directional Flow Meter

FOR 1/2" PIPE SIZES

STYLE BBK

Diagnose faults in hydraulic circuits, determine horsepower and test for component wear such as hydraulic valve and cylinder leakage. Ideal for large-scale use in hydrostatic applications.

A COMPLETE TROUBLE-SHOOTING SYSTEM

The tool kit consists of a bi-directional flow needle-type meter, glycerin-filled pressure gauges and a precision needle load valve. A comprehensive operator's manual describes testing of various system components.

PLAN COMPONENT REPAIRS

This tool kit can be part of a predictive maintenance program, allowing strategized pump, valve, motor and cylinder rebuilding.

COMPACT AND RUGGED

The complete hydraulic diagnostic tool kit comes with a variety of fittings and a rugged case to simplify use and safely transport the device.

NON-ELECTRICAL

Without batteries to fail or other electrical power connections to make, this system will provide a lifetime of simple and reliable operation.

METRIC AND US/STANDARD MEASURING RANGES

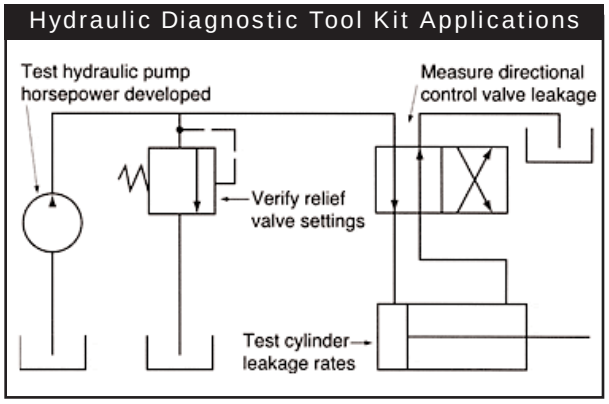
This multi-measurement diagnostic device simultaneously measures flow in GPM and LPM, and pressure in PSIG and Bar.

COMPREHENSIVE FITTING KIT

The standard fitting kit offers the ability to adapt the kit for use with NPT, JIC, SAE-ORB and O-Ring Face Seal process connectors. The standard kit provides two male fittings for each variety offered.

PIN-POINT SYSTEM PROBLEMS

The hydraulic diagnostic tool kit and comprehensive diagnostic manual will save time and money by testing discrete components within the system, eliminating trial and error approaches.



Hydraulic Diagnostic Tool Kit

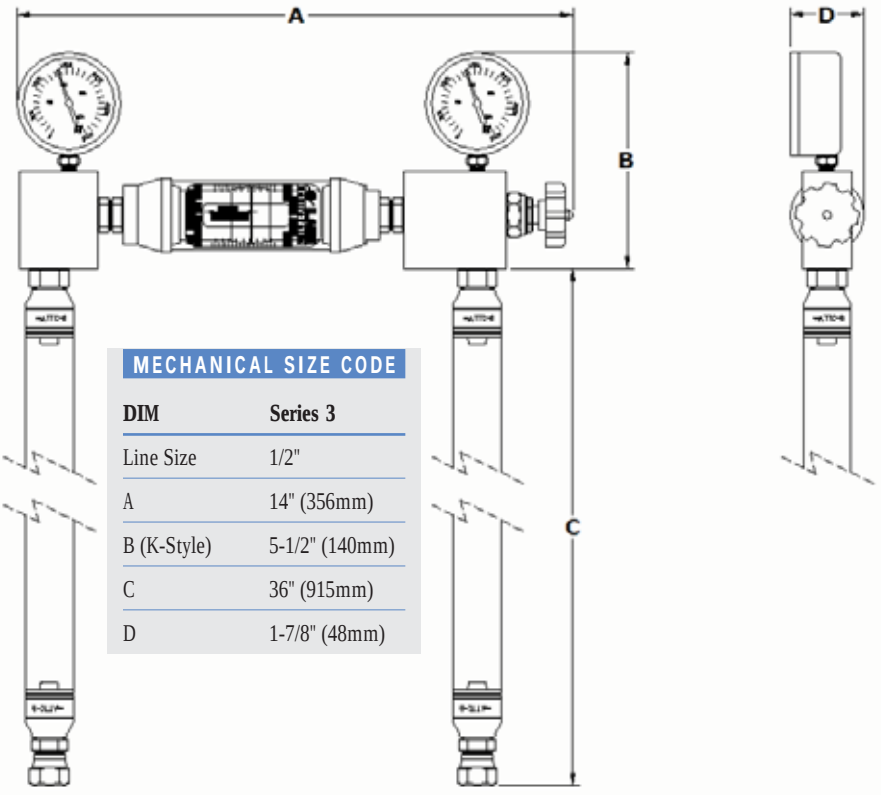
MATERIALS OF CONSTRUCTION

WETTED COMPONENTS		NON-WETTED COMPONENTS	
COMPONENT	MATERIALS	COMPONENT	MATERIALS
High-pressure casing, end ports and tapered shaft	Aluminum and Stainless Steel	Window Tube	Polycarbonate
Seals	Buna-N (STD)	Window Tube Seals	Buna-N
Transfer Magnet	Teflon® coated Alnico	Gauge Window	Acrylic
Floating Orifice Disk	Stainless Steel		
All other internal parts	Stainless Steel		
Needle Valve	Carbon Steel		
Gauge	Brass and Stainless Steel		
Hose Lengths, Fittings	SBR Rubber, Zinc Plated Steel		

PERFORMANCE

Measuring Accuracy:	Flow: ±4% of full scale (±2.5% in center third of measuring range); Pressure: ±2.5% of full scale
Repeatability:	±1% of full scale – all measurements
Measuring Range:*	Flow: 0.05–50 GPM (0.2-57 LPM) See guide to standard meters for specific ranges; Pressure: 0–3000 PSIG (0–200 Bar)
Maximum Operating Pressure:	Aluminum meters: 3000 PSIG (200 Bar)
Maximum Operating Temperature:	240ºF (116ºC)
Standard Calibration Fluids:	Oil meters: DTE 25® @ 110ºF (43ºC), 0.873 sg
Filtration Requirements:	74 micron filter or 200 mesh screen minimum

**Please consult the Lake factory for flow rates greater than 15 GPM or line sizes greater than 1/2".*
DTE 25 is a registered trademark of Exxon Mobil.



MECHANICAL SIZE CODE

DIM	Series 3
Line Size	1/2"
A	14" (356mm)
B (K-Style)	5-1/2" (140mm)
C	36" (915mm)
D	1-7/8" (48mm)

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800.850.6110

LAKE MONITORS

STYLE BBK

Hydraulics Diagnostic Tool Kit with Bi-Directional Flow Meter

FOR 1/2" PIPE SIZES

Used to diagnose faults in hydraulic circuits, determine horsepower and test for component wear such as hydraulic valve and cylinder leakage. The bi-directional flow monitoring capability is ideal for large scale use in hydrostatic applications.

A COMPLETE TROUBLE-SHOOTING SYSTEM

The tool kit consists of a bi-directional flow meter, glycerin-filled pressure gauges and a precision needle load valve. A comprehensive operator's manual describes testing of various system components.

PLAN COMPONENT REPAIRS

This tool kit can be part of a predictive maintenance program, allowing strategized pump, valve, motor and cylinder rebuilding.

COMPACT AND RUGGED

The complete hydraulics diagnostic tool kit comes with a variety of fittings and a rugged case to simplify use and transport the device.

NON-ELECTRICAL

Without batteries to fail or other electrical power connections to make, this system will provide a lifetime of simple and reliable operation.

METRIC AND US/STANDARD MEASURING RANGES

This multi-measurement diagnostic device simultaneously measures flow in GPM and LPM, and pressure in PSIG and Bar.

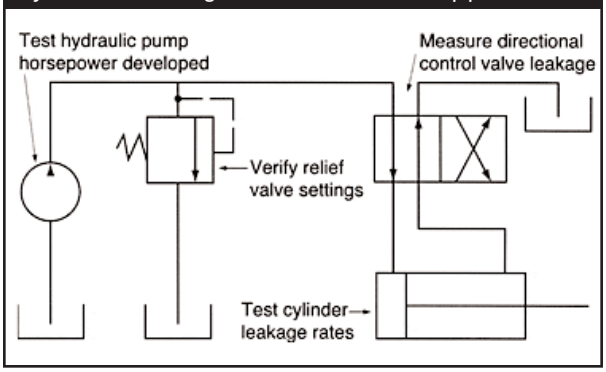
COMPREHENSIVE FITTING KIT

The standard fitting kit offers the ability to adapt the kit for use with NPT, JIC, SAE-ORB and O-Ring Face Seal process connectors. The standard kit provides two male glands for each variety offered.

PIN-POINT SYSTEM PROBLEMS

The hydraulics diagnostic tool kit and comprehensive diagnostic manual will save time and money by testing discrete components within the system, eliminating trial and error approaches.

Hydraulics Diagnostics Tool Kit Applications



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Division of Total Automated Solutions, Inc.

www.lakemonitors.com

Hydraulics Diagnostic Tool Kit

MATERIALS OF CONSTRUCTION

WETTED COMPONENTS		NON-WETTED COMPONENTS	
Component	**Materials**	**Component**	**Materials**
High-pressure casing, end ports and tapered shaft	Aluminum and Stainless Steel	Window Tube	Polycarbonate
Seals	Buna-N (STD)	Window Tube Seals	Buna-N
Transfer Magnet	Teflon® coated Alnico	Gauge Window	Acrylic
Floating Orifice Disk	Stainless Steel		
All other internal parts	Stainless Steel		
Needle Valve	Carbon Steel		
Gauge	Brass and Stainless Steel		
Hose Lengths, Fittings	SBR Rubber, Zinc Plated Steel		

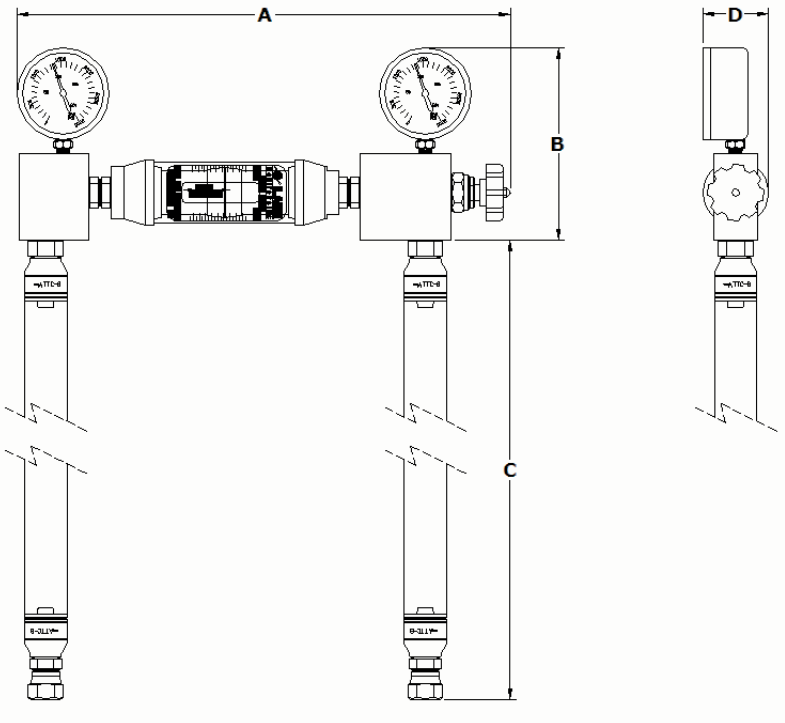
PERFORMANCE

Measuring Accuracy:	Flow: ±4% of full-scale (±2.5% in center third of measuring range); Pressure: ±2.5% of full-scale
Repeatability:	±1% of full-scale - all measurements
Measuring Range:	Flow: 0.05-50 GPM (0.2-57 LPM) See guide to standard meters for specific ranges; Pressure: 0-3000 PSIG (0-200 Bar)
Maximum Operating Pressure:	Aluminum meters: 3000 PSIG (200 Bar);
Maximum Operating Temperature:	240°F (116°C)
Standard Calibration Fluids:	Oil meters: DTE 25® @ 110°F (43°C), 0.873 sg
Filtration Requirements:	74 micron filter or 200 mesh screen minimum

DTE 25 is a registered trademark of Exxon Mobil

MECHANICAL SIZE CODE

DIM	Series 3
Line Size	1/2"
A	14" (356 mm)
B (K-Style)	5-1/2" (140 mm)
C	36" (915 mm)
D	1-7/8" (48 mm)



LAKE MONITORS, 2013 South 37th Street, Milwaukee, WI 53215
414.671.3577 / 800.850.6110 / Fax: 414.671.5253

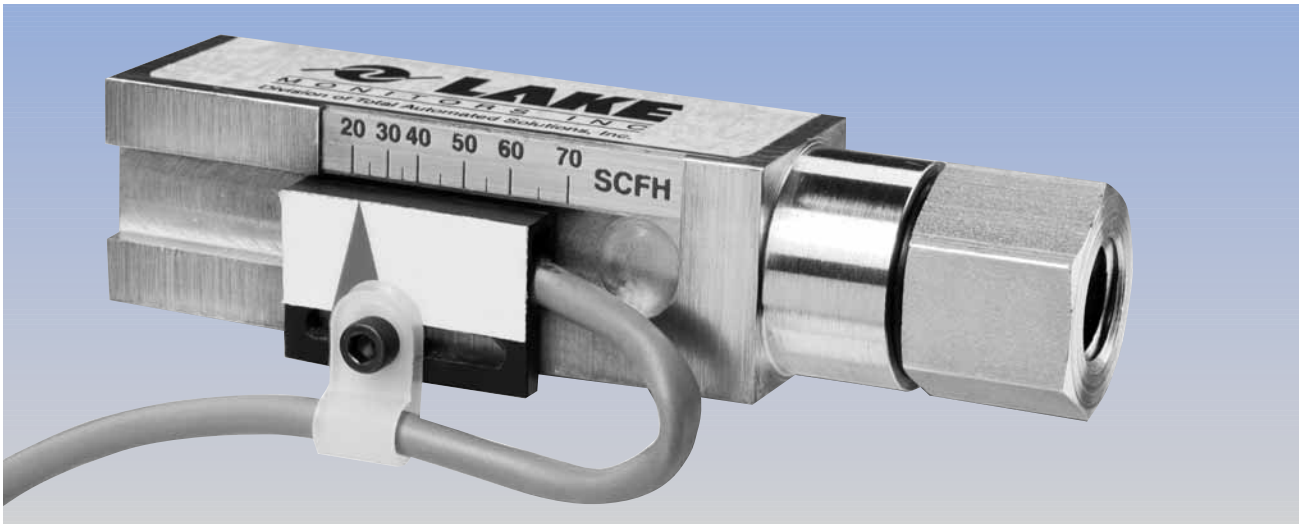
LAKE MONITORS INC
Division of Total Automated Solutions, Inc.

www.lakemonitors.com

Lake Monitors
Weld Shield Gas Flow Switch

FOR 1/2" – 3/8" PIPE SIZES

Used to detect insufficient flow conditions for automated or controlled shielded welding processes.



AN APPLICATION SPECIFIC PRODUCT OFFERING

Lake's Weld Shield Gas Flow Switch has been developed specifically for use in harsh welding applications and will hold up to the typical conditions of the welding environment.

DETECT SYSTEM FLOW PROBLEMS

Use the Weld Shield Gas Flow Switch to give your PLC or control system a signal that allows for simple detection of flow problems.

FIELD ADJUSTABLE

The Weld Shield Gas Flow Switch has a low/no flow "fault" indicator set-point that is adjustable within the lower two thirds of the range in question.

NON-POWERED

Without batteries to fail or other electrical power considerations, the switch will provide a lifetime of simple and reliable operation.

METRIC AND US / STANDARD INDICATING RANGES

These indicators are offered with metric and standard units of measure.

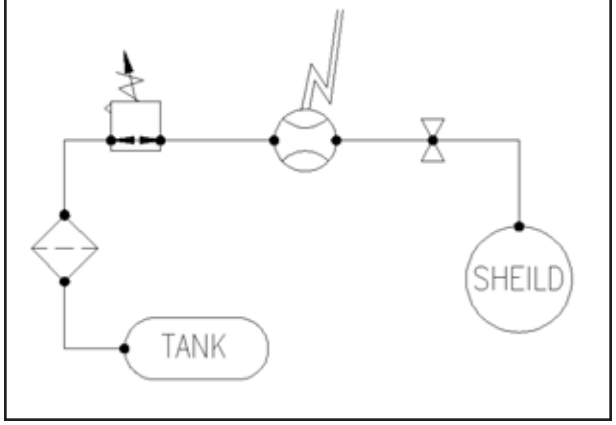
MULTIPLE CALIBRATIONS AVAILABLE

This blind switch is offered with various gas calibrations and in two ranges to complement the variety of shielding gases and flow rates commonly used.

UNRESTRICTED MOUNTING

Accurate detection can be achieved in any mounting orientation, without the straight pipe required with other analyzer systems.

WELD GAS SWITCH APPLICATION



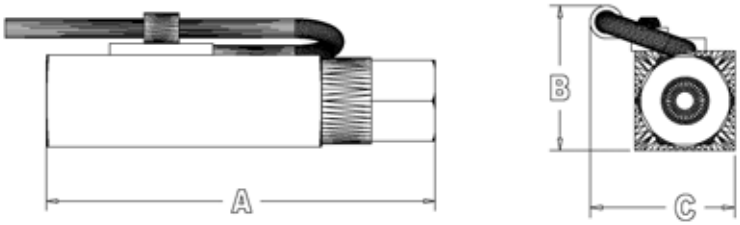
Weld Shield Gas Flow Switch

MATERIALS OF CONSTRUCTION

WETTED COMPONENTS		NON-WETTED COMPONENTS	
COMPONENT	MATERIALS	COMPONENT	MATERIALS
Casing	Brass CA360	Switch Element	ABS / Epoxy
Seal	Buna-N (STD)	Cable	PVC
Transfer Magnet	Bonded PPS / Ferrite	Cord Grip	Nylon
Floating Orifice	Brass CA360	Retainer Screw	Stainless Steel
All other internal parts	Stainless Steel	Scale	Brass / Epoxy

PERFORMANCE

Flow Measuring Accuracy:	±5% of range
Repeatability:	±2% of range
Flow Measuring Range:	See Lake's guide to standard flow meters for specific range
Maximum Operating Pressure:	150 PSIG (10.3 Bar)
Maximum Operating Temperature:	240ºF (116ºC)
Standard Calibration Fluids:	Nitrogen, CO_2, Argon C25 @ 70°F (43ºC), 30 PSIG
Filtration Requirements:	74 micron filter or 200 mesh screen minimum
Response Time:	<50 mS
Switch Type:	Reed, Form A
Switch Logic:	Fault Open
Maximum Switch Current:	1A



DIMENSIONS

DIM	1/4" NPTF	3/8" NPTF
A	4.28" (109 mm)	4.43" (113 mm)
B	1.48" (38 mm)	1.48" (38 mm)
C	1.42" (36 mm)	1.48" (36 mm)

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