



Primary Flow Signal, Inc.

Head Office: 81 Bleachery Court, Warwick RI USA 02886

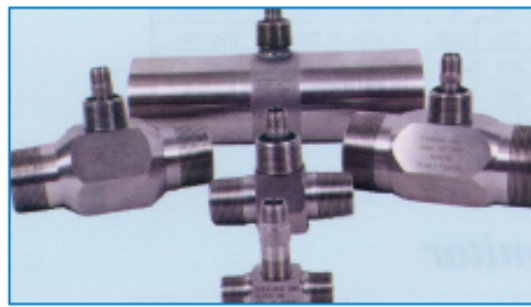
Beijing: B-1003, Meihui Building, #58-Dongzhong St., Beijing 100027, China

Tel: 0086-10-65545181, Fax: 0086-10-65545180

Web site: WWW.LDSL@LDSL.COM.CN E-mail: ldsl@ldsl.com.cn

PRIMARY FLOW SIGNAL, INC. TURBINE FLOW METERS

For applications where Turbine Style Flow Meters are Required, *Primary Flow Signal, Inc.* is proud to offer a line of precision manufactured, quality and cost effective *Turbine Flow Meters* which are available from stock in a wide range of sizes, and include a state of the art electronic flow monitor, along with standard retrofit kits for replaceable parts. Water, brine, and clean liquids up to 150cP can be measured with confidence. Each unit is factory calibrated for the optimum performance available in this meter type. **OIL AND GAS, IRRIGATION, INDUSTRY.**



PFS-TM Turbine Flow Meter Pressure Vessel Type

TYPICAL ACCURACY =
+/- 1.0% OR BETTER OF READING

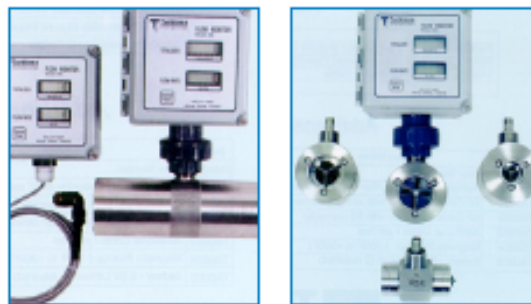
PFS, Inc. Offers a full line of turbine style flow meters ranging from 0.3 - 3 g.p.m. to 500 - 5,000 g.p.m. The PFS-TM series of turbine meters will work well for clean liquids such as brine and water, as well as a broad range of line fluids associated with industrial applications. With standard materials of construction being 316 SS body and 416 SS turbine blades, the integral magnetic pick-up senses revolutions of each blade which creates pulses directly related to fluid volume passing through the meter. Each meter is supplied with a calibrated *K-factor*. **SEE SPECS ON REVERSE SIDE.**



PFS-TW Wafer Turbine Flow Meter Pressure Vessel Type

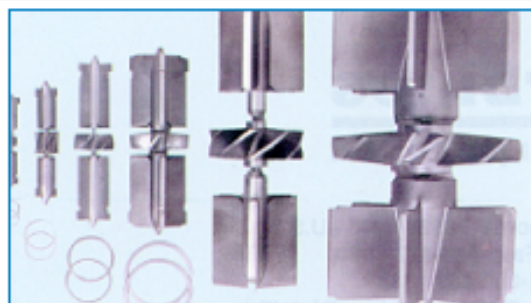
TYPICAL ACCURACY =
+/- 1.0% OR BETTER OF READING

PFS, Inc. Offers a full line of turbine style flow meters ranging from 0.3 - 3 g.p.m. to 500 - 5,000 g.p.m. The PFS-TM series of turbine meters will work well for clean liquids such as brine and water, as well as a broad range of line fluids associated with industrial applications. With standard materials of construction being 316 SS body and 416 SS turbine blades, the integral magnetic pick-up senses revolutions of each blade which creates pulses directly related to fluid volume passing through the meter. Each meter is supplied with a calibrated *K-factor*. **INSTALLED BETWEEN EXISTING FLANGES, LIKE ORIFICE PLATES. SEE SPECS ON REVERSE SIDE.**



PFS-MF Turbine Flow Monitor Battery Powered

This battery powered flow monitor provides rate of flow indication in units of choice, with reset totalizer feature. Each unit is factory calibrated to match the turbine *K-factor* of the counterpart meter. Output options such as 4-20mA together with 12-24 VDC power supply are readily available. The Flow Monitor is available as either meter mount or remote mount with cable extension. **SEE SPECS ON REVERSE SIDE.**



PFS-TK Turbine Retrofit Replacement Kit Regular or Wafer Style

PFS, Inc. provides precision machined retrofit replacement kits for all PFS Turbines as well as certain models made by others. These kits include the rotor vane supports, rotor, and appropriate snap rings, complete with its own *K-factor*, plus easy to follow field installation instructions. Use these replacement kits to economically extend the life of your turbine flow meter and take advantage of PFS, Inc. Quality and Workmanship at the same time. **SEE SPECS ON REVERSE SIDE.**

PROUDLY MADE IN U. S. A.

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PFS PUBLICATION #: 1004-A / PFS Turbine Flow Meters

PFS PFS PFS PFS PFS PFS PFS PFS PFS PFS PFS PFS PFS PFS PFS
THE LEADER IN RELIABLE FLOW MEASUREMENT
PRIMARY FLOW SIGNAL, INC.

The **ALTUS-XL/PLUS** High Performance FLOW Monitor

Product Data Sheet Document 4008 - Rev00



STANDARD POWER OPTIONS

Internal Battery:

2 C size Lithium batteries in non-hazardous configuration. Average service life of 1-1/2 years; 10years if loop powered. Low battery warning feature.

External Power Input:

Voltage: 8.5 to 30 VDC.
Current: Less than 5mA; Reverse polarity protection on DC input.

Loop Powered:

Voltage: 8.5 to 30 VDC; Reverse polarity protection on current loop.
Loop Burden: 8.5 Volt maximum.

DISPLAY

Rate Display:

Selectable decimal; 4.5 digits (59999), 0.35" tall;
Display updates every two seconds.
Rate Descriptors: /MIN, /HR, /DAY.
*Minimum Input Frequency: 0.125 Hz to 10 Hz.

Totalizer Display:

Selectable Decimal; 8 digits, 0.20" tall.
Rate Descriptors: GAL, BBLS, MCF, M3. Descriptor can be left blank.

Environmental:

Operating Temperature:

-22 degrees F to + 158 degrees F.
-30 degrees C to +70 degrees C.

Humidity:

0 - 90% Non-condensing.

Accuracy:

0.01% Reading, +/- 1 count.

Inputs:

Magnetic Pickup Input

Frequency Range: 0 to 3500Hz

Trigger Sensitivity: 30mV p-p.

Opto-Insulated DC Pulse Input

High(logic1): 4 - 30 VDC.
Low(logic 0): Less than 1 VDC.
Frequency Range: 0 to 5 kHz.
Minimum Pulse Width: 0.1 msec.

Contact Closure Input

closure to common

High(logic1): Open or 4-30VDC.
Low(logic0): Less than 0.5VDC.

Reset Input

closure to common

High(logic1): Open or 4-30VDC.
Low(logic0): Less than 0.5VDC.
Minimum On: 25msec.

K-Factor

Range: 0.001 to 59999(59999000 with factor multiplier.)
Decimal Point Locations: XX.XXX to XXXXX

10 Point Linearization

This feature allows operator to enter up to 10 distinct frequencies with their corresponding K-factors to permit linearization of non-linear signals.

Analog Output

Type: 4-20mA follows rate display.
Two wire hookup.
Accuracy: 0.15% Full Scale at 20 Deg. C.
Reverse polarity protected.
NOTE: The Altus-LX requires loop power source in the event this option is selected.

Pulse Output

Advances with the least significant digit of the totalizer.
Can be divided by 10 or 100.
Opto Isolated
Max voltage off state: 30 VDC.
Open Collector Type 10mA maximum.

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PRIMARY FLOW SIGNAL CANADA INC.
THE LEADER IN RELIABLE FLOW METERING

PO BOX 4083 EDMONTON, ALBERTA T6E 4S8

The **ALTUS-XL** High Performance Flow Monitor Provides a Multi-Function Feature Set in an Economical Unit with Explosion Proof Case.

The **Altus-XL/PLUS** High Performance flow monitor provided by **Primary Flow Signal CANADA, Inc.** combines a multi-function feature set in an extremely cost effective package with Explosion proof housing suitable for some of the most demanding service that the Canadian market can dish out.

The **Altus-XL/PLUS** flow monitor gives continuous digital instantaneous flow rate, as well as totalized flow indication of liquid or gaseous flow in pressurized piping. When installed with a **Turbines, Inc.** turbine flow meter, the resulting system will result in an accurate flow rate meter and flow totalizer.

The low power micro-processor technology inherent with the **Altus-XL/PLUS** assures long service life and consistent reliability.

It is easily programmable using the four front facing buttons on the keypad. The programming options include a broad range of units of measure for the flow rate and totals indication.

A diversity of packaging and mounting options are further made available to facilitate numerous installation requirements including those unique to outdoor and/or hazardous environment applications.

Features and specifications are offered below or for further information contact your knowledgeable Primary Flow Signal CANADA, Inc. applications specialist for friendly and efficient service.

FEATURES

- Magnetic Pickup Input.
- Contact Closure Input.
- DC Pulse Input (optically isolated.)
- Displays Rate and Total Simultaneously.
- 4.5 Digit Rate Display.
- 4 to 20mA Analog Output.
- Isolated Scaled Pulse Output.
- Powered from Internal Battery, External DC



Supply or 4 - 20mA Output Loop.

-10 Point Linearization.

PACKAGING

- Explosion Proof,
Class I, Groups B, C, D.
Class II, Groups E, F, G.
Class III
- NEMA 4X.

PFS Primary Flow Signal, Inc / USA 美国PFS 公司涡轮流量计

1. Turbine flow meter (液体涡轮流量计)

PFS公司生产的涡轮流量计性能稳定，可靠性高，适用于水，石油产品，化工产品等清洁介质，最小口径 3/8"，最小可测流量 1.14 l/m (0.068m³/n)，最大口径 10"，可测最大流量 18926.5l/m (1136m³/n)，介质粘度≤5mm²/s (cst)。

1.1 性能指标:

- (1) 精度: ±0.25%, ±0.5%, ±1% 可选。
- (2) 重复性: ±0.01% F.S。
- (3) 过程连接: MNPT 螺纹, 夹装, 法兰任选。

法兰标准: ANSI B16.5, 密封面 RF。

压力等级: ANSI150#、300#、600#、900#、1500# 和 2500# 任选。

- (4) 材质: 表体: 碳钢或 316SS, 转子: 416SS, 转轴及轴承: 碳化钨合金。

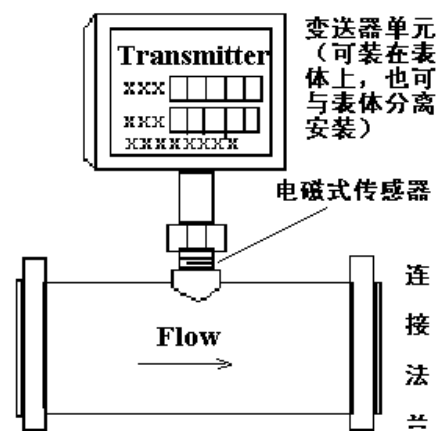
1.2 流量计型号, 口径及流量

表 1: 螺纹及法兰式流量计 (口径小于 2" 者, 可根据用户要求供法兰式) (最高压力等级 ANSI2500#)

Turbine part No.	Line Size (inches)	End Connection Specification	Flow Rate (l/m)	Max. Pres. (PSI)
PFS-TM0038	3 / 8 "	1 " × 1 " Male NPT	1.14 - 1.36	5,000
PFS-TM0050	1 / 2 "	1 " × 1 " Male NPT	2.84 - 28.39	5,000
PFS-TM0075	3 / 4 "	1 " × 1 " Male NPT	7.57 - 56.78	5,000
PFS-TM0078	7 / 8 "	1 " × 1 " Male NPT	11.3 - 113.56	5,000
PFS-TM0100	1.0 "	1 " × 1 " Male NPT	18.93 - 189.27	5,000
PFS-TM 0150	1 - 1 / 2 "	1-1/2 " × 1-1/2 " Male NPT	56.78 - 681.35	5,000
PFS-TM 0200L	2.0 "	2.0 " × 2.0 " Male NPT	56.78 - 681.35	5,000
PFS-TM0200	2.0 "	2.0 " × 2.0 " Female NPT	151.41 - 1514.12	5,000
PFS-TM0300	3.0 "	3.0 " Flange ANSI300RF	227.12 - 2271.18	800
PFS-TM0400	4.0 "	4.0 " Flange ANSI300RF	454.24 - 4542.36	800
PRS-TM0600	6.0 "	6.0 " Flange ANSI300RF	757.06 - 7570.60	800
PFS-TM0800	8.0 "	8.0 " Flange ANSI300RF	1324.86 - 13248.55	800
PFS-TM1000	10.0 "	10.0 " Flange ANSI300RF	1892.65 - 18926.50	800

表 2 夹装式 (wafer) 流量计 (最高压力等级 ANSI 1500#)

Turbine Part No:	Meter size (inches)	Flow Rate (l/m)	Flow Rate Barrels per Day	Maximum Pressure(PSI)
PFS - TW0038	3/8 " × 1.0 "	1.14 - 11.36	10 - 100	3,700
PFS - TW0050	1/2 " × 1.0 "	2.84 - 28.39	25 - 250	3,700
PFS - TW0075	3/4 " × 1.0 "	7.57 - 56.78	68 - 514	3,700
PFS - TW0078	7/8 " × 1.0 "	11.36 - 113.56	100 - 1,000	3,700
PFS - TW0100	1.0 " × 1.0 "	18.93 - 189.27	170 - 1,700	3,700



PFS-TW0100×2	1"×2"	18.93 – 189.27	170 - 1,700	3,700
PFS-TW0150×2	1-1/2"×2.0"	56.78 – 681.53	515 - 6,000	3,700
PFS-TW0200×2	2.0"×2.0"	151.41 – 1514.12	1300 - 13,000	3,700
PFS-TW0300×2	3.0"×3.0"	227.12 – 2271.18		3,700

PFS - TW 型最高工作压力 (PSI) (常温下)

Flange Rating	碳钢	不锈钢
ANSI 150	285	230
ANSI 300	740	600
ANSI 600	1480	1200
ANSI 900	2220	1800
ANSI 1500	3705	3000

1.3 转换器及累积器

(1) PFS-MF 系列电池供电就地显示器

PFS - MF0208 直接装于流量计上的一体化显示器，就地累计（可清零）、瞬时流量指示，隔爆式；电池供电（每两年更换一次电池），也可采用外来供电(12-24Vdc)，输出 4-20mA dc，二线制；隔爆式 (NEC: Div1, Cls1, Grp B, C, D)，安装于流量计本体上，电缆接口：3/4"NPT。

PFS - MF0208R 分离式就地显示器（带 3 米电缆及直通或弯通接头），其他同上；

PFS - MF-2 就地流量双累计器，可分别做长期累计（可清零）和阶段累计（按钮开始、按钮清零），流量指示；专为油品装车计量而设计；可直接安装于流量计本体上，也可与流量计分离安装，其他同上。

(2) PFS -TA 系列远传前置放大器及变送器

PFS -TA0009 4 - 20mA dc.变送器 (供电 12—24Vdc) 防尘防水型；

PFS -TA0010 0—5V/ 0—10V 变送器 (供电 12 - 24Vdc)，防尘防水型；

PFS -TA 0011 前置放大器。输入灵敏性：5mVp-p，输出信号：10Vp-p 脉冲，频率：0-10kHz，前置放大器至信号检测器最大距离：150m，供电：10-26Vdc，耗电量：15mA，工作温度：-20-160°C。防尘防水型。接线：输出 3 线：(1) Power、(2) Com、(3) Pulse out；输入 2 线：(4)检测器+、(5)检测器-。电缆接口：1/2"NPT。

PFS -TA 0011-EX 防爆型前置放大器。性能指标同 PFS-TA0011，经 UL 和 CSA 认证，可用于 Class I Group C, D、Class II Group E, F, G 和 Class III 爆炸危险场所。

(3) 可选附件

PFS -TA0001 3m 电缆组件，带直通终端接头；

PFS -TA0002 3m 电缆组件，带 90°终端接头；

PFS -TA0003 附加电缆（用户指定长度）；

PFS -TA0004 电磁信号检出器 (38°C~150°C) ；

PFS -TA0005 3.6V 锂电池（需 2 只）；

PFS -TA0006 高温电磁信号检出器 (-73°C~+250°C)，温度高于 230°C时，配特制高温检测器（价格增加 \$200 美圆）；

PFS - TA0007 3m 高温电缆组件；

PFS - TA0012 12~24VDC 电源（为 PFS-TA 009~PFS-TAO11 供电用）。

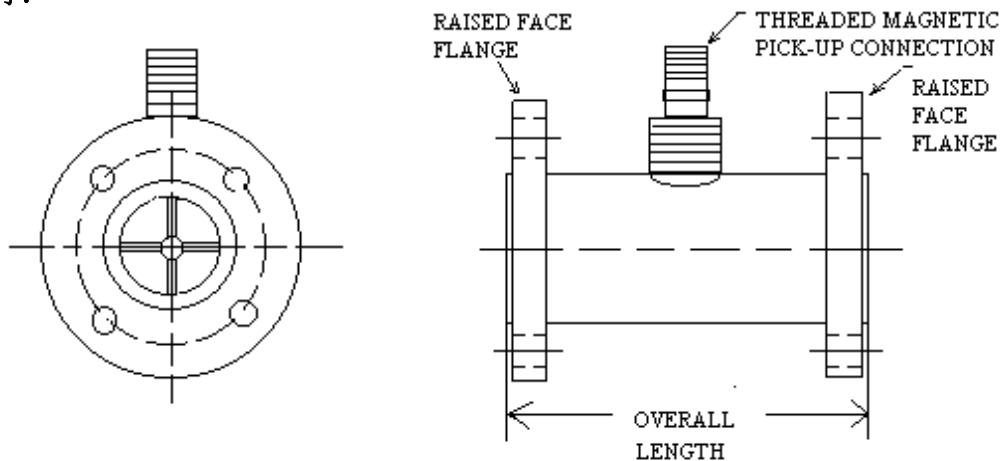
(4) FW0110 型防爆式就地流量指示（累积）及变送器，功能如下：

- 满足 NEC Area Division 1, class 1, Group B, C, D, 气体爆炸危险环境防爆要求；
- 输出信号：4-20mA_{dc}（2 线制），供电 13~24vdc；
- 可装于流量计本体，也可采用分离式安装。
- 流量指示（液晶显示式）。

可选功能：

- 本质安全型 4-20mA_{dc} 输出
- 本质安全型脉冲信号输出
- RS232/RS485 通讯接口
- 流量累计指示
- 电气导管接口：3/4"NPT

1.4.安装尺寸：



TURBING PART NUMBER	LINE SIZE	OVERALL LENGTH	ANSI 150# RATING			ANSI 300# RATING		
			FLANGE O.D.	(#)HOLES HOLE SIZE	BOLT CIRCLE	FLANGE O. D.	(#)HOLES HOLE SIZE	BOLT CIRCLE
PFS-TM0036-F	3/8"	6"	4.25"	(4).62"DIA.	3.12"	4.88"	(4).75"DIA	3.50"
PFS-TM0050-F	1/2"	6"	4.25"	(4).62"DIA.	3.12"	4.88"	(4).75"DIA	3.50"
PFS-TM0075-F	3/4"	6"	4.25"	(4).62"DIA.	3.12"	4.88"	(4).75"DIA	3.50"
PFS-TM0078-F	7/8"	6"	4.25"	(4).62"DIA.	3.12"	4.88"	(4).75"DIA	3.50"
PFS-TM0103-F	1.0"	6"	4.25"	(4).62"DIA.	3.12"	4.88"	(4).75"DIA	3.50"
PFS-TM0150-F	1 1/2"	7"	5.00"	(4).62"DIA.	3.88"	6.13"	(4).88"DIA	4.50"
PFS-TM0200L-F	2.0"	7"	5.00"	(4).62"DIA.	3.88"	6.13"	(4).88"DIA	4.50"
PFS-TM0200-F	2.0"	8.5"	6.00"	(4).75"DIA	4.75"	6.50"	(4).88"DIA	5.00"
PFS-TM0300-F	3.0"	10.0"	7.50"	(4).75"DIA	6.00"	8.25"	(4).88"DIA	6.62"
PFS-TM0400-F	4.0"	12.0"	9.00"	(4).75"DIA	7.50"	10.0"	(4).88"DIA	7.88"
PFS-TM0600-F	6.0"	SPECIAL						
PFS-TM0800-F	8.0"	SPECIAL						
PFS-TM1000-F	10.0"	SPECIAL						

