

TECHNICAL DATA

Fluke 787B and 789 ProcessMeter™


KEY DMM MEASUREMENTS

Measure ac and dc volts, ac and dc current, resistance, continuity, and frequency

KEY mA LOOP FUNCTIONS

20 mA current source/simulate, simultaneous mA and % scale readout, and 24 V loop power supply (789 only)

SAFETY RATED FOR INDUSTRIAL APPLICATIONS

CAT IV 600 V/CAT III 1000 V

Double the troubleshooting power so you can do more, while carrying a lot less

The Fluke 787B and 789 ProcessMeter™ double troubleshooting capabilities by combining the power of a safety rated digital multimeter and mA loop calibrator into a single, compact test tool. Whether you only need to source and simulate mA, or need a 24 V loop power supply, Fluke has a ProcessMeter™ test tool designed specifically to meet your needs. Based on the trusted measurement capabilities of the Fluke 87 DMM, the 787B and 789 add the ability to measure, source and simulate mA with the accuracy and resolution you would expect from a Fluke mA loop calibrator, giving you the ideal tool for troubleshooting and calibrating current loop applications.

With Fluke Connect™ mobile app and desktop software compatibility technicians can wirelessly monitor, log, and share data from the field with their team anytime, from anywhere*.

787B and 789 key features

- 20 mA dc current source/measure/simulate
- Simultaneous mA and % of scale readout
- DMM designed to meet 1000 volt IEC 61010 CAT III and 600 V CAT IV standards
- Fluke Connect® compatibility for wireless data logging (with IR3000FC module)*
- Precision 1000 V, 440 mA true-rms digital multimeter
- Frequency measurement to 20 kHz
- Min/Max/Average/Hold/Relative modes
- Diode test and continuity beeper
- Manual step (100 %, 25 %, Coarse, Fine) plus Auto Step and Auto Ramp
- Externally accessible battery for easy battery changes

789 additional features

- 24 V Loop power supply
- HART mode setting with loop power (adds 250 ohm resistor)

*Requires Fluke IR3000FC module (not included)

Not all models are available in all countries. Check with your local Fluke representative.

Measurement function	Range and resolution	Best accuracy (% of reading + LSD)
V dc	400.0 mV, 4.000 V, 40.00 V, 400.0 V, 1000 V	0.1 % + 1
V ac (true-rms)	400.0 mV, 4.000 V, 40.00 V, 400.0 V, 1000 V	0.7 % + 2
mA dc	30.000 mA	.05 % + 2
A dc	1.000 A (0.440 A continuous)	0.2 % + 2
A ac	1.000 A (0.440 A continuous)	1 % + 2
Resistance	400.0 Ohms, 4.000 k, 40.00 k, 400.0 k, 4.0 M, 40 M	0.2 % + 1
Frequency (0.5 Hz to 20 kHz)	199.99 Hz, 1999.9 Hz, 19.999 kHz	.005 % + 1
Diode test	2.000 V (shows diode voltage drop)	2 % + 1
Continuity	Beeps for resistance < approx. 100 ohms	



Output function	Range and resolution	Drive capability	Accuracy (% of span)
DC current output (Internal battery operation)	0.000 to 20.000 mA or 4.000 to 20.000 mA, (selectable at power-up) Over-range to 24.000 mA	24 V compliance or, 1,200 ohms, at 20 mA	.05 %
DC current simulate (Ext. 15 V to 48 V loop supply)	0.000 to 20.000 mA or 4.000 to 20.000 mA, (selectable at power-up) Over-range to 24.000 mA	1000 ohms, at 20 mA	.05 %
24 V loop supply*	Minimum 24 V	250 ohms at 20 mA	> 24 V
Current adjustment modes	Manual: Coarse, Fine, 25 % and 100 % step Automatic: Slow Ramp, Fast Ramp, 25 % step		

Temperature range of 18 °C to 28 °C, for one year after calibration

*24 V Loop Supply available on 789 ProcessMeter™ only

General specifications	
Maximum voltage applied between any jack and earth ground	1000 V RMS
Storage temperature	-40 °C to 60 °C
Operating temperature	-20 °C to 55 °C
Temperature coefficient	0.05 x (specified accuracy) per °C (for temperatures < 18 °C or > 28 °C)
Relative humidity	95 % up to 30 °C; 75 % up to 40 °C; 45 % up to 50 °C; 35 % up to 55 °C
Vibration	Random, 2 g, 5-500 Hz
Shock	1 meter drop test
Safety	IEC61010-1, Pollution Degree 2/IEC61010-2-033, CAT IV 600 V/CAT III 1000 V
Size (HxWxL)	50 mm x 100 mm x 203 mm (1.97 in x 3.94 in x 8.00 in)
Weight	600 g (1.3 lbs)
Battery:	Four AA alkaline batteries
Battery life	140 hours typical (measurement), 10 hours typical (sourcing 12 mA)
Warranty	Three years



Ordering information

789 ProcessMeter
787B ProcessMeter

Included

TL71 Premium Test Lead Set plus AC175 Alligator Clips, Four AA alkaline batteries (installed), and Quick Reference Guide

Optional accessories

IR3000FC Fluke Connect® Adapter
80TK Thermocouple Module
TL20/TL220/TL224/TL26A/TL28A/TL40 Test Lead Sets
AC120/AC220 Clips
TP220 Industrial Test Probes
i400 AC Current Clamp*
i410 AC/DC Current Clamp**
i1010 AC/DC Current Clamp**
C25/C100 Cases
PV350 Pressure Vacuum Module
TPAK ToolPak Meter Hanging Kit

*Above 50 A ac

**Above 1 A dc or 20 A ac



Preventive maintenance simplified. Rework eliminated.

Save time and improve the reliability of your maintenance data by wirelessly syncing measurements using the Fluke Connect® system.

- Eliminate data-entry errors by saving measurements directly from the tool and associating them with the work order, report or asset record.
- Maximize uptime and make confident maintenance decisions with data you can trust and trace.
- Access baseline, historical and current measurements by asset.
- Move away from clipboards, notebooks and multiple spreadsheets with a wireless one-step measurement transfer.
- Share your measurement data using ShareLive™ video calls and emails.
- 787B and 789 ProcessMeter is part of a growing system of connected test tools and equipment maintenance software. Visit the website to learn more about the Fluke Connect® system.

Find out more at



All trademarks are the property of their respective owners. WiFi or cellular service required to share data. Smartphone, wireless service and data plan not included with purchase. First 5 GB of storage is free. Phone support details can be viewed at

Smart phone wireless service and data plan not included with purchase. Fluke Connect is not available in all countries.

Fluke. Keeping your world up and running.®



ACCURACY—PRESSURE MEASUREMENT

0 to 110% of Range: $\pm(0.05\%$ of Reading + Floor Term)

Floor Term: **0.005% of FS or display resolution, whichever is greater**

Vacuum: $\pm(0.25\%$ of Reading + Vacuum Floor Term)

Vacuum Floor Term: **0.004 psi for 16 and 36 psi**
0.01 psi for 300 psi

Includes all effects of linearity, hysteresis, repeatability, temperature, and stability for one year.

All models indicate vacuum, but vacuum specification applies to 16 psi, 36 psi, and 300 psi models only.

Not recommended for continuous use below -14.5 psi. Refer to [XP2i-DP data sheet](#) for gauges that are intended for continuous high vacuum use.

ACCURACY—MILLIAMPERES

Accuracy: $\pm(0.025\%$ of Reading + 0.001 mA)

Range: **0 to 55 mA**

Resolution: **0.001 mA**

Connection: **4 mm jacks, 19 mm (0.75") spacing**

Includes all effects of linearity, hysteresis, repeatability, temperature, and stability for one year.

mA can be displayed as a percentage, where 0 to 100% corresponds to either 4 to 20 mA or 10 to 50 mA.

Jacks are compatible with safety sheathed banana plugs.

OPERATING TEMPERATURE

Temperature Range: **0 to 50° C (32 to 122° F)**

Non-condensing. No change in accuracy over operating temperature range. Gauge must be zeroed to achieve rated specification.

DISPLAY

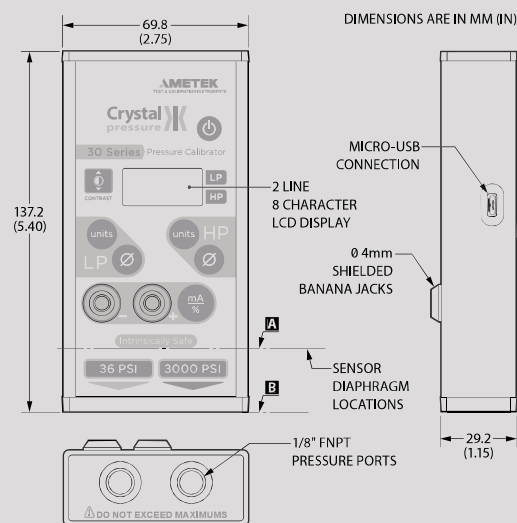
Screen: **2 lines of up to 6 digits, 5 mm (0.2") high**

Display Rate: **2 readings/second (Adjustable to 1, 3, or 3.7 readings/second)**

LCD readable in sunlight.

Changes to reading rate requires software: ConfigM30 is a free download from ametekcalibration.com.

30 Series Calibrator psi



PRESSURE PORT VOLUMETRIC DATA:

LP distance to diaphragm (A to B): 22.4 (0.88")

LP volume: 2 ml (0.13 cubic inches)

HP distance to diaphragm (A to B): 17.8 (0.70")

HP volume: 1 ml (0.06 cubic inches)

POWER

The 30 Series is Intrinsically Safe only if powered by one of the following battery types.

ATEX/IECEx:	Approved Battery Type	Ta=	Marking
	Duracell Alkaline 9V, MN 1604	0 to 50° C	Ex ia IIC T4 Gb
	Energizer Alkaline 9V, 522		
	Energizer Lithium 9V, L522		
	Varta High Energy Alkaline 9V, 4922	0 to 45° C	

CSA:	Approved Battery Type	Marking
	Duracell Alkaline 9V, MN 1604	Class I, Division 1, A, B, C, D T4
	Energizer Alkaline 9V, 522	
	Energizer Lithium 9V, L522	
	Varta High Energy Alkaline 9V, 4922	Class I, Division 1, A, B, C, D T3C

1 x 9V: **90 hours, typical**

Uses one alkaline 9V battery. Use of USB interface reduces operating time.

For hazardous location product warnings, refer to the operation manual.

DATA/COMMUNICATION

Digital Interface: **micro-USB**

Free Labview drivers available online.

For hazardous location product warnings, refer to the operation manual.

ENCLOSURE

Model 31 ≤300 psi: **342 g (12.0 oz)**

Weight includes batteries.

* Model 31 ≤300 psi: **428 g (15.0 oz)**

*SPSS optional manifold.

Model 31 ≥1500 psi: **360 g (13.0 oz)**

Model 33: **400 g (14.0 oz)**

* Model 33: **485 g (17.0 oz)**

Housing: **Extruded aluminum**

Keypad and Labels: **UV resistant polyester**

CERTIFICATIONS



II 2G Ex ia IIC T4
FTZU 06 ATEX 0010X



II 2G Ex ia IIC T4 Gb
IECEx FTZU 10.0018X



Exia Intrinsically Safe and Non-incendive for Hazardous Locations: Class I, Division 1, Groups A, B, C and D, Temperature Code T4 or T3C. For hazardous location product warnings, refer to the operation manual.



30 Series complies with the Electromagnetic Compatibility and the Pressure Equipment Directives.



30 Series complies with the Australian Radiocommunications (Electromagnetic Compatibility) Standard 2008



30 Series is approved for use as a portable test instrument for Marine use and complies with Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Offshore Standards.

SENSOR $\geq$ 1500 psi

Wetted Materials: **316 stainless steel** *All welded with a permanently filled diaphragm seal.*
 Diaphragm Seal Fluid: **Silicone Oil**
 Connection: **Bottom, 1/8" female NPT**

SENSOR $\leq$ 300 psi

Wetted Materials: **316 stainless steel, Viton® (o-ring)** *Viton o-ring is internal.*
Anodized aluminum penetrated with PTFE (polytetrafluoroethylene) *All welded with a permanently filled diaphragm seal.*
 Diaphragm Seal Fluid: **Silicone Oil**
 Connection: **Bottom, 1/8" female NPT**

STORAGE TEMPERATURE

Temperature Range: **-20 to 70° C (-4 to 158° F)** *Batteries should be removed if stored for more than one month.*

SPECIAL FEATURES

The following requires the use of [ConfigM30](#) software

User Defined Unit: **Allows the user to define and display any pressure units not included, or to use the gauge to display force, level, or other pressure related parameters. Reduce or increase displayed resolution.**

Remove: **Unwanted pressure units from Units button.**

Password Protect: **Changes to configuration or userspan calibration factor(s).**

Save: **Configuration to a file.**

Copy: **Configuration to other calibrators.**

STANDARD DELIVERY

- 30 Series Calibrator
- CD Manual
- ISO 17025 Accredited Calibration Certificate, NIST Traceable

ACCESSORIES

Magnetic Hanging Strap [P/N 5203](#)

Test Lead Kit [P/N 1351](#)

USB A to Micro USB Cable [P/N 4431](#)

Waterproof Carrying Case [P/N 2888](#)

COMPLEMENTARY PRODUCTS

Crystal Engineering offers a wide range of products that work with the 30 Series:

- [Fittings that connect without tools, safely and without leaks](#)
- [Lightweight, super flexible high pressure hoses](#)
- [Pneumatic hand pumps](#)
- [Hydraulic hand pumps](#)
- [Portable pressure comparators](#)
- [Software, for the quickest way to calibrate pressure transmitters and gauges](#)

Viton is a registered trademark of DuPont Performance Elastomers.

RANGE & RESOLUTION TABLE

			Display Resolution										
P/N	Range (psi)	Over-pressure	psi	in H ₂ O	in Hg	mm Hg	mm H ₂ O	cm H ₂ O	kg/cm ²	bar	mbar	kPa	MPa
16	16	6.5 x	0.001	0.01	0.001	0.01	1		0.0001		0.1	0.01	
36	36	3.0 x	0.001	0.01	0.001	0.01	1		0.0001		0.1	0.01	
300	300	2.0 x	0.01	0.1	0.01	0.1		1	0.001	0.001		0.1	
1500	1500	2.0 x	0.1					0.01	0.01	1		0.001	
3000	3000	1.5 x	0.1				0.01	0.01	1	0.001			
5000	● 5000	1.5 x	0.1				0.01	0.01	1	0.001			

Model 31 calibrators are not available in this range.

DUAL PRESSURE SENSORS

Model 33 calibrators have dual pressure sensors. This chart shows all of the available sensor combinations.

First Pressure Ranges	Second Pressure Ranges			
	300 psi	1500 psi	3000 psi	5000 psi
	16 psi			
36 psi				

ORDERING INFORMATION

Intrinsic Safety	Model	1st Pressure Range P/N	2nd Pressure Range P/N	Pressure Unit	Pressure Manifold
IS				PSI	
	Single Sensor...31				Standard.....(omit)
	Dual Sensor...33				Stainless Steel...SPSS

SAMPLE PART NUMBERS

IS31-36PSI Calibrator with one sensor (36 psi).
IS33-16/1500PSI-SPSS Calibrator with two sensors (16 psi and 1500 psi) with two stainless steel manifolds.
IS33-36/3000PSI-SPSS-HOX-W Calibrator with two sensors (36 psi and 3000 psi) and two stainless steel manifolds with a System H pump system and a waterproof carrying case.

Ordering a Pump System Only

Any pump system, carrying case, and connection fittings for a 30 Series calibrator may be ordered separately from the calibrator. Enter IS30-NONE followed by the Pump System part number and the Carrying Case option code.

SAMPLE PART NUMBER

IS30-NONE-HOX-W System H pump system with a waterproof carrying case.

Pump System*	Carrying Case~
No Pump.... (omit)	
System A.... -AXX	Aluminum ... (omit)
System A.... -AHX	Waterproof..... -W
System B.... -BXX	
System B.... -BHX	
System C.... -CXX	
System C.... -CHX	
System D.... -DOX	
System D.... -DWX	
System E.... -EOX	
System F.... -FOV	
System F.... -FWV	
System G.... -GOX	
System G.... -GWX	
System H.... -HOX	

The Waterproof Case is an option for Systems A, B, and C only.
The Waterproof Case is the only option for Systems G and H.

AMETEK offers a variety of solutions for pressure generation and measurement. Our line of products for pressure generation includes everything from small pneumatic hand pumps to a precision, hydraulic pressure comparator capable of generating up to 15 000 psi/ 1000 bar/ 100 MPa.

All of our pumps may be ordered as part of a Pump System, complete with a 30 Series and delivered in a sturdy carrying case with custom insert.

* Refer to the following page for a more detailed description of each pump system.

PUMP SYSTEMS OVERVIEW

Pump System	Part Number	Pressure Range	Pneumatic	Hydraulic	Hand Pump	Bench Top	Included Pump	Case Options	
								Aluminum	Waterproof (Pelican Case)
System A	AXX	0 to 30psi / 2 bar	■		■		 T-960-CPF	■	■
	AHX	0 to 580 psi / 40 bar	■		■		 T-970-CPF	■	■
System B	BXX	-25 inHg to 30 psi / -0.85 to 2 bar	■		■		 T-965-CPF	■	■
	BHX	-27 inHg to 580 psi / -0.91 to 40 bar	■		■		 T-975-CPF	■	■
System C	CXX	0 to 3000 psi / 200 bar		■ (Oil)	■		 T-620-CPF	■	■
	CHX	0 to 5000 psi / 350 bar		■ (Oil)	■		 T-620H-CPF	■	■
System D	DOX	0 to 5000 psi / 350 bar		■ (Oil)		■	 P-018-CPF	■	
	DWX	0 to 5000 psi / 350 bar		■ (Water)		■	 P-014-CPF	■	
System E	EOX	0 to 10 000 psi / 700 bar		■ (Oil)		■	 T-1-CPF	■	
System F	FOV	0 to 15 000 psi / 1000 bar		■ (Oil)		■	 GaugeCalHP	■	■
	FWV	0 to 15 000 psi / 1000 bar		■ (Water)		■	 GaugeCalHP	■	■
System G	GOX	0 to 15 000 psi / 1000 bar		■ (Oil)		■	 T-975-CPF		■
	GWX	0 to 15 000 psi / 1000 bar		■ (Water)		■	 T-620H-CPF		■
System H	HOX	-27 inHg to 580 psi / -0.91 to 40 bar	■		■		 T-975-CPF		■
		0 to 5000 psi / 350 bar		■ (Oil)	■		 T-620H-CPF		■