

## pressure



### Accuracies to 0.01% of FS

Performance to meet most application requirements

### Dedicated ranges

Both imperial and metric ranges for worldwide use without conversions

### Several pressure references:

Gauge, differential, absolute, and vacuum references available

### Rugged construction

Engineered for use in the laboratory or in the field

### Plug and pressurize

Calibrators recognize range and reference of the modules for ease use

### Multiple applications

Use a module with one or more JOFRA calibrators or use one or more modules with one JOFRA calibrator

ISO 9001 Manufacturer

# JOFRA™ APM Series

## Advanced Pressure Module

Pressure modules adding functionality and flexibility to your JOFRA calibrator

The APM series of pressure modules offers you the functionality and flexibility you need to perform pressure calibrations with your multi-purpose or multi-function signal calibrator. Expand the ranges to meet all of your pressure calibration applications by using JOFRA APM modules.



### PRODUCT DESCRIPTION

The APM series of pressure modules by JOFRA are compatible with your AMC900, ASC300, or APC calibrators. These units are available in a series of ranges, units, and pressure references. From vacuum to absolute pressure, AMETEK has your application covered with the pressure modules to meet your calibration needs. There are different accuracies, ranges, and references designed to offer you the exact specifications you need for your pressure calibrations.

These rugged modules are engineered for in-plant, field, or laboratory use. They are ready-to-use with the JOFRA calibrators and the protocol allows for immediate recognition and use of the module once it is plugged into the calibrator. If you have pressure instrumentation, these modules are for you. When combined with the JOFRA calibrators and pump systems these modules make for a powerful arsenal of calibration tools. And, you can always add more as your needs change.

**AMETEK®**  
CALIBRATION INSTRUMENTS

# JOFRA™ APM Series

## Advanced Pressure Modules Series S

The JOFRA APM S series are industrial pressure modules with good accuracies. The modules are designed so that the cable is integrated into the module housing, and the overall profile allows for easy storage of multiple modules.



Resolution: ..... 5 digits (20 to 100 ppm depending on range)  
 Dimensions: ..... 2.4 x 1.8 x 3 in / 60 x 45 x 75 mm  
 Weight: ..... 0.77 lb / 350 g  
 Cable length: ..... 24 in / 60 cm  
 Pressure connections: ..... 1/4" NPT female  
 Conversion adapter to: ..... 1/4" BSP female  
 Electrical connection: ..... Lemo, 5-pole, male  
 Calibration certificate: ..... NIST traceable  
 Warm up: ..... 10 minutes to rated accuracy  
 Reading rate: ..... 50 per second  
 Display rate ASC300, AMC900 and APC: ..... 2 per second  
 Compliance - CE standards: ..... EN 50081-1, EN 50082-1  
 ..... EN 50081-2, EN 50082-2

Range	Type	psi	bar	Pressure port* 2	Reference port* 2	Over-pressure* 3	Burst pressure* 4	Reference accuracy* 5	12 month accuracy* 6	Part number
1 psi*1	Gauge	1.0000	0.0689	DRY	DRY	x 5	x 10	0.15%	0.30%	APM001PNSG
5 psi*1	Gauge	5.0000	0.3447	DRY	DRY	x 5	x 10	0.05%	0.10%	APM005PNSG
15 psi*1	Gauge	15.0000	1.0342	DRY	DRY	x 4	x 6	0.025%	0.05%	APM015PNSG
1 psi	Gauge	1.0000	0.0689	316L SS	DRY	x 4	x 6	0.075%	0.15%	APM001PGSG
5 psi	Gauge	5.0000	0.3449	316L SS	DRY	x 2	x 3	0.025%	0.05%	APM005PGSG
15 psi	Gauge	15.0000	1.0342	316L SS	N/A	x 2	x 3	0.025%	0.05%	APM015PGSG
30 psi	Gauge	30.0000	2.0684	316L SS	N/A	x 2	x 3	0.025%	0.05%	APM030PGSG
100 psi	Gauge	100.00	6.8948	316L SS	N/A	x 2	x 3	0.025%	0.05%	APM100PGSG
200 psi	Gauge	200.00	13.790	316L SS	N/A	x 2.5	x 3.7	0.025%	0.05%	APM200PGSG
300 psi	Gauge	300.00	20.684	316L SS	N/A	x 1.6	x 2.5	0.025%	0.05%	APM300PGSG
500 psi	Gauge	500.00	34.486	316L SS	N/A	x 2	x 3	0.025%	0.05%	APM500PGSG
1000 psi	Gauge	1000.0	68.948	316L SS	N/A	x 2	x 3	0.025%	0.05%	APM01KPGSG
2000 psi	Gauge	2000.0	137.90	316L SS	N/A	x 2.5	x 3.7	0.025%	0.05%	APM02KPGSG
3000 psi	Gauge	3000.0	206.84	316L SS	N/A	x 1.6	x 2.5	0.025%	0.05%	APM03KPGSG
5000 psi	Gauge	5000.0	344.76	316L SS	N/A	x 1.5	x 2	0.025%	0.05%	APM05KPGSG
10000 psi <sup>15</sup>	Gauge	10000	689.48	316L SS	N/A	x 1.2	x 2	0.025%	0.05%	APM10KPGSG
±15 psi	Combination	±15.000	±1.0342	316L SS	DRY	x 2	x 3	0.035%*12	0.07%	APM015PCSG
-15 to 200 psi	Combination	-015.00 +200.00	-1.0342 +13.790	316L SS	N/A	x 2.5	x 3	0.025%*13	0.05%	APM200PCSG
5 psi*10	Differential	5.0000	0.3449	316L SS	DRY	x 2	x 3	0.035%	0.07%	APM005PDSG
100 psi*11	Differential	100.00	6.8948	316L SS	DRY	x 2	x 3	0.025%	0.05%	APM100PDSG
5 psi	Absolute	5.0000	0.3448	316L SS	N/A	x 6	x 9	0.035%	0.07%	APM005PASG
15 psi	Absolute	15.0000	1.0342	316L SS	N/A	x 2	x 3	0.025%	0.05%	APM015PASG
30 psi	Absolute	30.0000	2.0684	316L SS	N/A	x 2	x 3	0.025%	0.05%	APM030PASG
1 bar	Gauge	14.503	1.0000	316L SS	DRY	x 2	x 3	0.025%	0.05%	APM001BGSG
4 bar	Gauge	58.012	4.0000	316L SS	N/A	x 1.2	x 2.5	0.025%	0.05%	APM004BGSG
6 bar	Gauge	87.018	6.0000	316L SS	N/A	x 2.3	x 3.5	0.025%	0.05%	APM006BGSG
10 bar	Gauge	145.03	10.0000	316L SS	N/A	x 2	x 3	0.025%	0.05%	APM010BGSG
16 bar	Gauge	232.05	16.0000	316L SS	N/A	x 2.1	x 3.2	0.025%	0.05%	APM016BGSG
21 bar	Gauge	304.56	21.0000	316L SS	N/A	x 1.6	x 2.4	0.025%	0.05%	APM021BGSG
25 bar	Gauge	362.58	25.0000	316L SS	N/A	x 2.7	x 4.1	0.025%	0.05%	APM025BGSG
40 bar	Gauge	580.12	40.0000	316L SS	N/A	x 1.7	x 2.5	0.025%	0.05%	APM040BGSG
60 bar	Gauge	870.18	60.0000	316L SS	N/A	x 2.2	x 3.4	0.025%	0.05%	APM060BGSG
100 bar	Gauge	1450.3	100.00	316L SS	N/A	x 3.4	x 5	0.025%	0.05%	APM100BGSG
160 bar	Gauge	2320.5	160.00	316L SS	N/A	x 2.1	x 3.2	0.025%	0.05%	APM160BGSG
200 bar	Gauge	2900.6	200.00	316L SS	N/A	x 1.7	x 2.5	0.025%	0.05%	APM200BGSG
250 bar	Gauge	3625.8	250.00	316L SS	N/A	x 2	x 2.7	0.025%	0.05%	APM250BGSG
400 bar	Gauge	5801.2	400.00	316L SS	N/A	x 1.3	x 1.7	0.025%	0.05%	APM400BGSG
600 bar	Gauge	8701.8	600.00	316L SS	N/A	x 1.4	x 2.2	0.025%	0.05%	APM600BGSG
700 bar <sup>15</sup>	Gauge	10152	700.00	316L SS	N/A	x 1.2	x 2	0.025%	0.05%	APM700BGSG
±1 bar	Combination	±14.503	±1.0000	316L SS	DRY	x 2	x 3	0.035%*14	0.07%	APM001BCSG
-1 bar	Vacuum	-14.503	-1.0000	316L SS	DRY	2 bar	3 bar	0.035%	0.07%	APM001BVSG
7 bar	Absolute	101.52	7.0000	316L SS	N/A	x 2	x 3	0.025%	0.05%	APM007BASG
7 kPa	Gauge	1.0152	0.0700	316L SS	DRY	x 4	x 6	0.10%	0.20%	APM007KGSG
35 kPa	Gauge	5.0761	0.3500	316L SS	DRY	x 2	x 3	0.035%	0.07%	APM035KGSG
70 kPa	Gauge	10.152	0.7000	316L SS	N/A	x 2	x 3	0.035%	0.07%	APM070KGSG
160 kPa	Gauge	23.206	1.6000	316L SS	N/A	x 2	x 3	0.025%	0.05%	APM160KGSG
200 kPa	Gauge	29.006	2.0000	316L SS	N/A	x 2.1	x 3.1	0.025%	0.05%	APM200KGSG
250 kPa	Gauge	36.259	2.5000	316L SS	N/A	x 2	x 3	0.025%	0.05%	APM250KGSG
350 kPa	Gauge	50.761	3.5000	316L SS	N/A	x 2	x 3	0.025%	0.05%	APM350KGSG
-29 inHg	Vacuum	-14.243	-1.0342	316L SS	DRY	60 inHg	90 inHg	0.035%	0.07%	APM029HVSG
10 inH2O*1	Gauge	0.3612	0.0249	DRY	DRY	x 5	x 10	0.20%	0.30%	APM010WGS

# JOFRA™ APM Series

## Advanced Pressure Modules Series H

The JOFRA APM H series are high accuracy laboratory units: 0.01% of F.S. The outstanding performance makes these modules perfect for use as an electronic pressure reference at the top of your calibration hierarchy. These modules are easy to work with and easy to transport.



Resolution: ..... 6 digits (2 to 10 ppm depending on range)  
 Dimensions: ..... 3.9 x 2.18 x 2.18 in / 99 x 55 x 55 mm  
 Weight: ..... 1 lb / 450 g  
 Pressure connections: ..... 7/16-20 SAE female  
 Conversion adapter to: ..... 1/8" NPT and BSP female  
 Electrical connection: ..... 9 pole D-sub, male  
 Communication cable: ..... module to ASC300/AMC900/APC  
 Cable length: ..... 24 in / 60 cm  
 Calibration certificate: ..... NIST traceable  
 Warm up: ..... 10 minutes to rated accuracy  
 Reading rate: ..... 50 per second  
 Display rate ASC300, AMC900 and APC: ..... 2 per second  
 Compliance - CE standards: ..... EN 50081-1, EN 50082-1  
 EN 50081-2, EN 50082-2

Range	Type	psi	bar	Pressure port*2	Reference port*2	Over-pressure	Repeatability*7	6 month Accuracy*8	Part number
15 psi*9	Gauge	15.0000	1.03427	DRY	DRY	x 1.5	0.003%	0.010%	APM015PGHG
50 psi	Gauge	50.0000	3.44756	DRY	DRY	x 1.5	0.003%	0.010%	APM050PGHG
100 psi	Gauge	100.0000	6.89512	DRY	DRY	x 1.5	0.003%	0.010%	APM100PGHG
500 psi	Gauge	500.0000	34.4756	DRY	DRY	x 1.5	0.003%	0.010%	APM500PGHG
1000 psi	Gauge	1000.00	68.9513	DRY	DRY	x 1.5	0.003%	0.010%	APM01KPGHG
15 psi*9	Absolute	15.0000	1.03427	DRY	N/A	x 1.5	0.003%	0.010%	APM015PAHG
50 psi	Absolute	50.0000	3.44756	DRY	N/A	x 1.5	0.003%	0.010%	APM050PAHG
100 psi	Absolute	100.0000	6.89512	DRY	N/A	x 1.5	0.003%	0.010%	APM100PAHG
500 psi	Absolute	500.0000	34.4756	DRY	N/A	x 1.5	0.003%	0.010%	APM500PAHG
1000 psi	Absolute	1000.00	68.9513	DRY	N/A	x 1.5	0.003%	0.010%	APM01KPAHG
3000 psi	Absolute	3000.00	206.854	DRY	N/A	x 1.25	0.003%	0.010%	APM03KPAHG

- Note \*1 Non isolated transducer - dry air or non-corrosive gas compatible media only
- Note \*2 Media compatibility on pressure or reference port side of the module - DRY indicates dry air or non-corrosive gas as compatible media. 316L SS indicates media compatible with type 316 stainless steel
- Note \*3 Applying steady pressure up to the specified overpressure will not destroy or change performance of the module
- Note \*4 Applying burst pressure (short pressure spikes) above the specified limit can destroy the module
- Note \*5 Reference accuracy is expressed as % F.S. and includes only linearity, hysteresis, and repeatability at laboratory conditions.
- Note \*6 12 month accuracy - expressed as % F.S. Includes linearity, repeatability, hysteresis, and temperature compensation 0 to 50°C (32 to 122°F).
- Note \*7 The closeness of agreement between independent test results obtained under laboratory conditions.
- Note \*8 6 month accuracy - expressed as % F.S. Includes linearity, repeatability, hysteresis, and temperature compensation 15 to 45°C (59 to 113°F).
- Note \*9 All ranges less than 30 psi (2 bar) specify physical orientation of use.
- Note \*10 5 psi module: Line pressure max. 10 psi
- Note \*11 100 psi module: Line pressure max. 200 psi
- Note \*12 F.S. = 30 psi
- Note \*13 F.S. = 215 psi
- Note \*14 F.S. = 2 bar
- Note \*15 10000 psi and 700 bar series S module is delivered with 1/8" NPT female pressure connection and 1/8" BSP female conversion adapter.

### APM ORDER NUMBER STRUCTURE

**Order No. Description**

**Pressure module - 1st thru 3rd characters**  
 APM Advanced pressure module

**Pressure range - 4th thru 6th characters**  
**Engineering unit - 7th character**

P psi  
 B bar  
 K KPa  
 W inH2O  
 H inHg

**Pressure reference - 8th character**

G Gauge  
 N Gauge (Non-isolated transducer)  
 A Absolute  
 D Differential  
 V Vacuum  
 C Combined vacuum and pressure

**Accuracy family - 9th character**

S Standard industrial accuracy  
 H High laboratory accuracy

**Certificate - 10th character**

G NIST traceable calibration certificate  
 H Accredited calibration certificate

**Sample order number**  
 APM015PGSG

### APM ACCESSORIES

**Number Description**

SPK-APM-001 APM H communication cable to JOFRA APC, ASC300 and AMC900

SPK-APM-002 Communication kit for PC  
 Pressure port fitting:  
 12-90135 APM H to 1/8" in male NPT  
 T-786 APM S to 1/4" in female BSP  
 60R115 APM S to 1/4" in male BSP

AMETEK offers the user several solutions for pressure generation. This line spans from a small pneumatic "bicycle" type pump to a hydraulic pump that generates up to 15,000 psi / 1,000 bar. These are durable pumps with features such as vernier valves, vent valves, manifold connections, swivel fittings, and optional O-ring materials and fittings making the pumps flexible to meet your calibration and testing applications.

Please see the individual pump descriptions at the next page.



## PRESSURE SOURCES

The flexible pressure solution: A JOFRA APM pressure module and an indicator (ASC300 / AMC900 / APC) combined with one of the AMETEK pressure pumps below, gives you a complete pressure test and calibration system. If future tasks require other pressure ranges, just complement your system with an extra module and/or a pressure source.



The T-730 / 40 / 50 series of rugged pneumatic hand pumps for pressure up to 21 bar / 300 psi or down to -0.850 bar / 25 inHg.



The T-910 pump is an easy-to-use, single-hand operation pneumatic pump featuring both vacuum and pressure generation up to 40 bar / 580 psi.



The T-620 / T-620H is small, lightweight, and convenient portable hydraulic pump. Medium is oil. Pressure generation up to 350 bar / 5,000 psi.



The screw pump is designed for very easy tabletop operation and offers exceptional pressure control. Generates up to 350 bar / 5,000 psi. Medium is water or oil.



This hydraulic pump is designed for high pressure oil applications. The small size and weight makes it a good rugged portable solution. Pressure up to 700 bar / 10,000 psi.



The type T pump is designed for high pressure applications up to 1000 bar / 15,000 psi with either water, hydraulic oil, or Skydrol as pressure medium. All wetted parts are stainless steel.



### AMETEK

#### Calibration Instruments

offers a complete range of calibration equipment for pressure, temperature, and signal - including software.

#### JOFRA Temperature standards

Portable precision thermometer. Dry-block calibrators: 4 series, more than 20 models - featuring speed, portability, accuracy, and advanced documenting functions.

#### JOFRA Pressure standards

Convenient electronic systems ranging from -1 to 700 bar (25 inHg to 10,000 psi) - multiple choices of pressure ranges, pumps, and accuracies, fully temperature-compensated for problem-free and accurate field use.

#### JOFRA Signal calibration

Process signal measurement and simulation for easy control loop calibration and measurement tasks - from handheld field instruments for multi or single signals to laboratory reference level bench top instruments.

#### M&G Primary pressure standards

Pneumatic floating-ball or hydraulic piston deadweight testers - easy-to-use with accuracies up to 0.015% of reading.

#### Frode Pedersen sensors

AMETEK Denmark A/S are producing and selling temperature sensors for industrial and marine use under the brand name Frode Pedersen.

#### JF Marine Instruments

AMETEK offers a complete range of calibration equipment for temperature, pressure, and signal approved for marine use.

*...because calibration is  
a matter of confidence*

**AMETEK**<sup>®</sup>  
CALIBRATION INSTRUMENTS

AMETEK Calibration Instruments is one of the world's leading manufacturers and developers of calibration instruments for temperature, pressure and process signals as well as for temperature sensors both from a commercial and a technological point of view.

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