



# JOFRA™ ASC300

## Advanced Signal Calibrator

Process signal calibrator with superior accuracy.

### Multi-function signal calibrator

With high accuracy. Ideal for both field and maintenance shop use.

### Input and output

RTD: 14 different types  
TC: 13 different types  
Current 0-24 mA DC  
Voltage 0-20 V DC  
Frequency 0 to 10 KHz  
Pulse train output  
Resistance 5 to 4000 Ohm

### High level of protection

Fuse-less protection for internal circuitry - a common cause of failure in other units without this protection. Full fuse-less protection to 240 VAC.

### Simultaneous read-back

Including isolated read-back from device-under-test of mA, V, and pressure.

### Fast RTD simulation

This feature is fast enough to work with all pulsed transmitters.

### Calibrate pressure

At varying reference levels using external pressure modules with accuracies up to 0.01% F.S.

### Calibrate temperature

Using JOFRA dry-block calibrators with accuracies up to 0.04°C / 0.07°F.

### Multi-information

Graphical display for simultaneous reading of both output and read-back.

### Full remote control

Of all functions with the help of simple ASCII commands.

ISO 9001 Manufacturer

The ASC300 is substantial enough to cover all your needs for a process signal calibrator with superior accuracy and compact enough to fit into your tool box and operate with one hand for easy field calibration.

The ASC300 can change your entire calibration regimen for signal, pressure, and temperature. You can combine this versatile calibrator with the APM external pressure modules or a JOFRA dry-block calibrator to meet your calibration needs.



## PRODUCT DESCRIPTION

The JOFRA ASC300 combines a full numerical keypad with a series of function keys and a graphical user interface making it easy to perform various tasks in a short period of time. This advanced calibrator employs the latest technology in supporting your calibration needs.

The JOFRA ASC300 measures and sources: TCs, RTDs, current, voltage, frequency, and pulse trains. This instrument is also designed to be compatible with the JOFRA APM pressure modules and thus offering true multi-function operability. There are two channels of operation providing the user with an isolated read-back circuit. The graphical display makes it is easy to recognize the status of the instrument, take readings, and simulate different functions.

The JOFRA ASC300 has full fuseless protection to 240 VAC, which is an important feature as most failures in signal calibrators result from over-voltage conditions.

**AMETEK®**  
CALIBRATION INSTRUMENTS

## JOFRA ASC300 LAYOUT

### Read-back display

The upper half of the graphical display is dedicated to the read-back signal from the device-under-test. This input section is electrically isolated from the circuitry. You can also read pressure from the JOFRA APM pressure modules in this display section.

### Primary display

This part is used for all input or output combinations. The primary display plus the read-back display gives a full comprehensive and simultaneous input-output functionality and an excellent overview of the test in progress.

### Backlit display - ON/OFF

Turn the back light on in dark environments.

### Soft keys

Three navigation keys. Their function is clearly explained in the bottom of the display.

### Numeric keyboard

A full numeric keyboard gives you the absolute fastest way to reach your desired set values.

### Simultaneous input and output

The JOFRA ASC300 offers simultaneous input and output. This means that you can calibrate and adjust a temperature transmitter on the table with no other necessary instruments. Output the sensor signal and input the mA from the transmitter. If you select mA Loop the JOFRA ASC300 will also supply the 24 VDC for the loop. In the display you will see both your output temperature and the return mA from the transmitter. Enter the zero and full scale values and you can make quick 25% steps or go direct to zero or full span values. The JOFRA ASC300 has dedicated keys for this operation so adjustment on the transmitter is made easier.



### "Never get lost" - HOME key

This key sends you immediately back to the main operating display without making any changes to the setup.

### Fast stepping keys

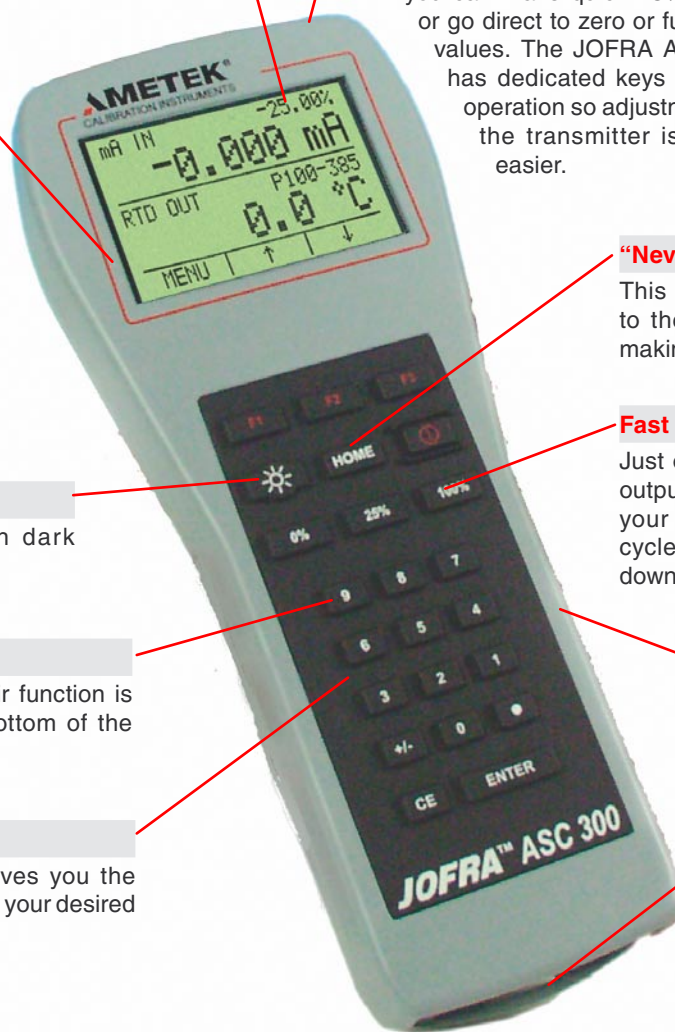
Just one push of a button and you can output null (0%) or full span (100%) of your desired range. The 25% button cycles the output in 25% steps up or down each time you push it.

### Communication connection

Small stereo jack connector for the serial communication interface.

### Pressure modules

LEMO connector in the bottom of the instrument to provide easy connection for the entire range of JOFRA APM pressure modules.



## JOFRA APM (Advanced Pressure Module)

The APM series of pressure modules offer the flexibility to perform pressure calibrations with the ASC300. The pressure modules are compatible with the JOFRA AMC900 bench top calibration system, the JOFRA ASC300 handheld multi-function calibrator and the JOFRA APC Advanced Pressure Calibrator. Independent of the engineering unit of the module you can change units on the ASC300 (11 different engineering units) at any time.

These rugged modules are engineered for both field and 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. All calibration data are stored in the modules. You only need to maintain the traceability of the modules - not the indicator, and, you can always add more as your needs change.

For use out-of-the-box any where in the world all units are supplied with a 1/4 in. NPT and a BSP female adapter.

Please see more about the APM series at page 6 and 7.



## Fuseless protection

The JOFRA ASC300 contains a very useful fuseless protection feature. The most common mistake is to connect the instrument to the mains supply - this normally means that you will have to send the instrument for an expensive repair and re-calibration. This is not the case with the JOFRA ASC300. This instrument is protected for up to 240 VAC on any combination of connections made on the test lead connectors. Just remove the test leads and the instrument is ready for operation after only 10 seconds.

## Useful soft case

The soft case that protects the instrument is engineered so that it becomes a useful part of the instrument. The soft case is designed for easy vertical operation so that when you open the case you will have easy access to all your test leads in the pocket. A flap in the top and an opening in the bottom provide access to the termination block and the pressure module connector. The soft case includes a shoulder strap for convenient transportation of the instrument when climbing ladders, etc.



At the back of this case you will also find a handy strap that fits your hand or makes it possible to hang the instrument on a pipe, ladder or the like while performing the calibration, test, or service task.

## Temperature reading at reference level

The JOFRA ASC300 offers the possibility to characterize an RTD sensor. Use this feature to add a missing special curve or to characterize a reference RTD.

If you choose a reference RTD from the JOFRA STS100 series of high accurate and stable temperature sensors, they will be delivered with a traceable calibration certificate including the necessary Van Dusen coefficients. Enter the figures into the JOFRA ASC300 and you have a temperature reference. Complement this with a JOFRA dry-block temperature calibrator and your JOFRA ASC300 becomes the heart of your portable calibration lab.

## Documentation and verification of measuring data

The instrument features an RS232 serial data communication interface. This allows the ASC300 to be serially connected to a personal computer for data storage and reporting. The software is menu-driven and easy to use, with a complete software controlled calibration procedure, which saves time.

The JOFRACAL temperature calibration software is optional for the ASC-300.

For further information about JOFRACAL please see JOFRA specification sheet SS-CP-2510 at [www.jofra.com](http://www.jofra.com)



## SPECIFICATIONS

### Thermocouple - TC

TC types ..... B C E J K L N R S T U BP XK  
Cold junction compensation ON/OFF control..... Yes

| Thermocouple<br>mV | Range      |           | Accuracy ±<br>12 months |
|--------------------|------------|-----------|-------------------------|
|                    | min        | max       |                         |
| TC mV read         | -10.000 mV | 75.000 mV | 0.02% rdg +10µV         |
| TC mV source       | -10.000 mV | 75.000 mV | 0.02% rdg +10µV         |

Maximum current output is 1 mA with an output impedans of <= 1 ohm.

| Thermocouple<br>Cold junction | Range        |              | Accuracy ±<br>12 months |
|-------------------------------|--------------|--------------|-------------------------|
|                               | min          | max          |                         |
| CJC compensation              | 18°C<br>64°F | 28°C<br>83°F | 0.2°C<br>0.36°F         |
| CJC outside above             |              |              | 0.05°C/°C<br>0.05°F/°F  |

| Thermo-<br>couple | Range  |        | Accuracy ±<br>12 months |
|-------------------|--------|--------|-------------------------|
|                   | from   | to     |                         |
| B °C              | 600°C  | 800°C  | 1.2°C                   |
|                   | 800°C  | 1000°C | 1.3°C                   |
|                   | 1000°C | 1800°C | 1.5°C                   |
|                   | 1112°F | 1472°F | 2.15°F                  |
|                   | 1472°F | 1832°F | 2.34°F                  |
| °F                | 1832°F | 3272°F | 2.7°F                   |
| C °C              | 0°C    | 1000°C | 0.6°C                   |
|                   | 1000°C | 2316°C | 2.3°C                   |
|                   | 32°F   | 1832°F | 1.08°F                  |
| °F                | 1832°F | 4200°F | 4.14°F                  |
| E °C              | -200°C | -100°C | 0.6°C                   |
|                   | -100°C | 950°C  | 0.2°C                   |
|                   | -328°F | -148°F | 1.08°F                  |
| °F                | -148°F | 1742°F | 0.36°F                  |
| J °C              | -200°C | 0°C    | 0.4°C                   |
|                   | 0°C    | 800°C  | 0.2°C                   |
|                   | 800°C  | 1200°C | 0.3°C                   |
|                   | -328°F | 32°F   | 0.72°F                  |
|                   | 32°F   | 1472°F | 0.36°F                  |
| °F                | 1472°F | °F     | 0.54°F                  |
| K °C              | -200°C | 0°C    | 0.6°C                   |
|                   | 0°C    | 1000°C | 0.3°C                   |
|                   | 1000°C | 1370°C | 0.5°C                   |
|                   | -328°F | 32°F   | 1.08°F                  |
|                   | 32°F   | 1832°F | 0.54°F                  |
| °F                | 1832°F | 2498°F | 0.9°F                   |
| L °C              | -200°C | 0°C    | 0.25°C                  |
|                   | 0°C    | 900°C  | 0.2°C                   |
|                   | -328°F | 32°F   | 0.45°F                  |
| °F                | 32°F   | 1652°F | 0.36°F                  |
| N °C              | -200°C | 0°C    | 0.8°C                   |
|                   | 0°C    | 1300°C | 0.4°C                   |
|                   | -328°F | 32°F   | 1.44°F                  |
|                   | 32°F   | 2372°F | 0.72°F                  |

Does not include thermocouple wire error and CJC.

## Specification Sheet

SS-CP-2350-US

| Thermo-couple |    | Range  |        | Accuracy ±<br>12 months |
|---------------|----|--------|--------|-------------------------|
|               |    | from   | to     |                         |
| <b>R</b>      | °C | -20°C  | 0°C    | 1.8°C                   |
|               |    | 0°C    | 1750°C | 1.2°C                   |
|               | °F | -4°F   | 32°F   | 3.24°F                  |
|               |    | 32°F   | 3182°F | 2.16°F                  |
| <b>S</b>      | °C | -20°C  | 0°C    | 1.8°C                   |
|               |    | 0°C    | 900°C  | 1.2°C                   |
|               | °F | -4°F   | 32°F   | 3.24°F                  |
|               |    | 32°F   | 1652°F | 2.16°F                  |
| <b>T</b>      | °C | -200°C | 0°C    | 0.6°C                   |
|               |    | 0°C    | 400°C  | 0.2°C                   |
|               | °F | -328°F | 32°F   | 1.08°F                  |
|               |    | 32°F   | 752°F  | 0.36°F                  |
| <b>U</b>      | °C | -200°C | 0°C    | 0.5°C                   |
|               |    | 0°C    | 400°C  | 0.25°C                  |
|               | °F | -328°F | 32°F   | 0.9°F                   |
|               |    | 32°F   | 752°F  | 0.45°F                  |
| <b>XK</b>     | °C | -200°C | 800°C  | 0.2°C                   |
|               | °F | -328°F | 1472°F | 0.36°F                  |
| <b>BP</b>     | °C | 0°C    | 800°C  | 0.9°C                   |
|               |    | 800°C  | 2500°C | 2.3°C                   |
|               | °F | 32°F   | 1472°F | 1.62°F                  |
|               |    | 1472°F | 4532°F | 4.14°F                  |

Does not include thermocouple wire error and CJC.

| Volt V              | Range   |          | Accuracy ±<br>12 months |
|---------------------|---------|----------|-------------------------|
|                     | min     | max      |                         |
| Read (Isolated)     | 0.000 V | 30.000 V | 0.015% rdg +2mV         |
| Read (non-isolated) | 0.000 V | 20.000 V | 0.015% rdg +2mV         |
| Source              | 0.000 V | 20.000 V | 0.015% rdg +2mV         |

Maximum current output in voltage ranges is 1 mA with an output impedance of <= 1 ohm.

| Frequency<br>Pulse                         | Range |        | Accuracy ±<br>12 months |
|--------------------------------------------|-------|--------|-------------------------|
|                                            | min   | max    |                         |
| CPM read                                   | 2.0   | 600.0  | 0.05% rdg +0.1CPM       |
| Hz read                                    | 1.0   | 1000.0 | 0.05% rdg +0.1Hz        |
| KHz read                                   | 1.00  | 10.00  | 0.05% rdg +0.01KHz      |
| CPM source                                 | 2.0   | 600.0  | 0.05%                   |
| Hz source                                  | 1.0   | 1000.0 | 0.05%                   |
| KHz source                                 | 1.0   | 10.0   | 0.125%                  |
| Pulse (source only)<br>Rate: 2CPM to 10KHz | 1     | 30000  |                         |

Input voltage amplitude range on frequency is 1 to 20 V zero based square wave only.

Output amplitude is adjustable from 1 to 20 V and is a square wave with a 50% duty cycle.

For output frequency, a slight negative offset of approximately -0.1 V is present to assure zero crossing.

| Ohm                                   | Range |        | Accuracy ±<br>12 months |
|---------------------------------------|-------|--------|-------------------------|
|                                       | min   | max    |                         |
| Ohm read (low)                        | 0.00  | 400.00 | 0.025% rdg +0.05 ohm    |
| Ohm read (high)                       | 0.00  | 4000.0 | 0.025% rdg +0.5 ohm     |
| Ohm source (low)<br>@ 0.1 to 0.5 mA   | 5.0   | 400.0  | 0.025% rdg +0.1 ohm     |
|                                       | 5.0   | 400.0  | 0.025% rdg +0.05 ohm    |
| Ohm source (high)<br>@ 0.05 to 0.8 mA | 400   | 1500   | 0.025% rdg +0.5 ohm     |
|                                       | 1500  | 4000   | 0.025% rdg +0.5 ohm     |

Unit is compatible with pulsing transmitters.

Pulse response is <= 5 mSec.

### Resistance - RTD

RTD types ..... Pt10 Pt25 Pt50 Pt100 Pt200 Pt500 Pt1000

..... Cu10 Cu50 Cu100 Ni120 YSI400

Response time ..... Less than 5 mSec.

Connection ..... 2, 3 and 4-wire

| RTD                         |    | Range  |        | Accuracy ±<br>12 months |
|-----------------------------|----|--------|--------|-------------------------|
|                             |    | from   | to     |                         |
| <b>Pt10</b><br>Alpha 385    | °C | -200°C | 100°C  | 1.4°C                   |
|                             |    | 100°C  | 300°C  | 1.6°C                   |
|                             |    | 300°C  | 600°C  | 1.8°C                   |
|                             |    | 600°C  | 800°C  | 2.0°C                   |
|                             | °F | -328°F | 212°F  | 2.5°F                   |
|                             |    | 212°F  | 572°F  | 2.9°F                   |
|                             |    | 572°F  | 1112°F | 3.2°F                   |
| <b>Pt50</b><br>Alpha 385    | °C | -200°C | 100°C  | 0.4°C                   |
|                             |    | 100°C  | 300°C  | 0.5°C                   |
|                             |    | 300°C  | 600°C  | 0.6°C                   |
|                             |    | 600°C  | 800°C  | 0.7°C                   |
|                             | °F | -328°F | 212°F  | 0.72°F                  |
|                             |    | 212°F  | 572°F  | 0.90°F                  |
|                             |    | 572°F  | 1112°F | 1.08°F                  |
| <b>Pt100</b><br>Alpha 385   | °C | -200°C | 100°C  | 0.2°C                   |
|                             |    | 100°C  | 300°C  | 0.3°C                   |
|                             |    | 300°C  | 600°C  | 0.4°C                   |
|                             |    | 600°C  | 800°C  | 0.5°C                   |
|                             | °F | -328°F | 212°F  | 0.36°F                  |
|                             |    | 212°F  | 572°F  | 0.54°F                  |
|                             |    | 572°F  | 1112°F | 0.72°F                  |
| <b>Pt100</b><br>Alpha 3926  | °C | -200°C | 100°C  | 0.2°C                   |
|                             |    | 100°C  | 300°C  | 0.3°C                   |
|                             |    | 300°C  | 630°C  | 0.4°C                   |
|                             | °F | -328°F | 212°F  | 0.36°F                  |
|                             |    | 212°F  | 572°F  | 0.54°F                  |
|                             |    | 572°F  | 1166°F | 0.72°F                  |
| <b>Pt1000</b><br>Alpha 3916 | °C | -200°C | 100°C  | 0.2°C                   |
|                             |    | 100°C  | 300°C  | 0.3°C                   |
|                             |    | 300°C  | 630°C  | 0.4°C                   |
|                             | °F | -328°F | 212°F  | 0.36°F                  |
|                             |    | 212°F  | 572°F  | 0.54°F                  |
|                             |    | 572°F  | 1166°F | 0.72°F                  |

Read accuracy is based on 4 wire input.

For 3-wire input add ±0.005 ohm assuming all three RTD leads are matched.

## Specification Sheet

SS-CP-2350-US

| RTD                           | Range  |       | Accuracy ±<br>12 months |
|-------------------------------|--------|-------|-------------------------|
|                               | from   | to    |                         |
| <b>Pt200</b> °C<br>Alpha 385  | -200°C | 100°C | 0.8°C                   |
|                               | 100°C  | 300°C | 0.9°C                   |
|                               | 300°C  | 630°C | 1.0°C                   |
|                               | -328°F | 212°F | 1.44°F                  |
|                               | 212°F  | 572°F | 1.62°F                  |
| <b>Pt500</b> °C<br>Alpha 385  | -200°C | 100°C | 0.4°C                   |
|                               | 100°C  | 300°C | 0.5°C                   |
|                               | 300°C  | 630°C | 0.6°C                   |
|                               | -328°F | 212°F | 0.72°F                  |
|                               | 212°F  | 572°F | 0.90°F                  |
| <b>Pt1000</b> °C<br>Alpha 385 | -200°C | 100°C | 0.2°C                   |
|                               | 100°C  | 300°C | 0.3°C                   |
|                               | 300°C  | 630°C | 0.4°C                   |
|                               | -328°F | 212°F | 0.36°F                  |
|                               | 212°F  | 572°F | 0.54°F                  |
| <b>Cu10</b> °C                | -80°C  | 260°C | 1.4°C                   |
|                               | -112°F | 500°F | 2.52°F                  |
| <b>Cu50</b> °C                | -180°C | 200°C | 0.4°C                   |
|                               | -292°F | 392°F | 0.72°F                  |
| <b>Cu100</b> °C               | -100°C | 200°C | 0.3°C                   |
|                               | -148°F | 392°F | 0.54°F                  |
| <b>Ni120</b> °C               | -80°C  | 260°C | 0.2°C                   |
|                               | -112°F | 500°F | 0.36°F                  |
| <b>YSI400</b> °C              | 15°C   | 50°C  | 0.1°C                   |
|                               | 59°F   | 122°F | 0.18°F                  |

Read accuracy is based on 4 wire input.

For 3 wire input add ±0.005 ohm assuming all three RTD leads are matched.

### Current - mA and loop

Range mA ..... 0 to 24 (-25% to 125%)  
 Loop power for transmitters ..... Yes, 24 VDC  
 Isolated input ..... Yes

| Current mA          | Range    |           | Accuracy ±<br>12 months |
|---------------------|----------|-----------|-------------------------|
|                     | min      | max       |                         |
| Read (Isolated)     | 0.000 mA | 24.000 mA | 0.015% rdg +2µA         |
| Read (non-isolated) | 0.000 mA | 24.000 mA | 0.015% rdg +2µA         |
| Source              | 0.000 mA | 24.000 mA | 0.015% rdg +2µA         |

Max. load on mA source is 1000 ohms

Voltage input range on simulation mode is 5 to 30 V

### Temperature stability - unless other specified

Operating temperature ..... -10 to 50°C / 14 to 122°F  
 Storage temperature ..... -20 to 70°C / -4 to 158°F  
 All specifications specified  
 at ambient temperature: ..... 23°C ±5°C / 73°F ±9°F  
 Outside ambient 23°C ±5°C ..... ±0.005% rdg/°C  
 Outside ambient 73°F ±9°F ..... ±0.0028% rdg/°F

### Power specifications

Batteries ..... 4 x AA batteries  
 ..... Re-chargeable battery pack optional  
 Low battery warning ..... Yes

### RS232 communication interface

Connector: ..... Stereo jack  
 Communication rate ..... 9600 baud, ASCII  
 Electrical interface ..... ±5 V non isolated

### Miscellaneous

CE - EMC ..... EN50082-1: 1992 and EN55022: 1994 Class B  
 Safety: ..... CSA C22.2 No. 1010.1: 1992

### Physical specifications

Instrument LxHxW ..... 235x53x95 mm / 9.3x2.1x3.7 in  
 Weight inclusive batteries ..... 510 g / 1.1 lb

Instr. in soft case LxHxW .... 250x95x110 mm / 9.8x3.7x4.3 in  
 Weight incl. test leads and shoulder strap ..... 950 g / 2.1 lb

Shipping cargo box size LxHxW ..... 285x110x160 mm  
 ..... 11.2x4.3x6.3 in  
 Shipping weight ..... 1300 g / 2.9 lb

### Pressure specifications

The JOFRA ASC300 can read out pressure from the JOFRA APM series of modules in any of the below mentioned engineering units.

psi ..... pound per square inch  
 inH2O4°C ..... inches of water at 4°C  
 inH2O20°C ..... inches of water at 20°C  
 cmH2O4°C ..... centimeters of water at 4°C  
 cmH2O20°C ..... centimeters of water at 20°C  
 BAR ..... bars  
 mBAR ..... millibars  
 KPAL ..... kilopascals  
 inHG 0°C ..... inches of mercury at 0°C  
 mmHG 0°C ..... millimeter of mercury at 0°C  
 Kg/cm2 ..... kilograms per square centimeter

### JOFRACAL software

Minimum hardware requirements:

- INTEL™ 486 processor  
(PENTIUM™ 200 MHz recommended)
- 16 MB RAM (32 MB recommended)
- 40 MB free disk space on hard disk prior to installation
- Standard VGA (800 x 600, 16 colors) compatible screen  
(1024 x 786, 256 colors recommended)
- CD-ROM drive for installation of the program
- 1 free RS232 serial port

# JOFRA™ APM Series

## Advanced Pressure Modules Series S

### Specification Sheet

SS-CP-2350-US

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        | 15.000             | 1.0342             | DRY             | N/A              | 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        | 15.000             | 1.0342             | 316L SS         | N/A              | x 2             | x 3              | 0.025%               | 0.05%               | APM015PGSG  |
| 30 psi         | Gauge        | 30.000             | 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%               | APM101KPGSG |
| 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      | 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         | N/A              | x 2             | x 3              | 0.035%*12            | 0.07%               | APM015PCSG  |
| -15 to 200 psi | Combination  | -015.00<br>+200.00 | -1.0342<br>+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     | 15.000             | 1.0342             | 316L SS         | N/A              | x 2             | x 3              | 0.025%               | 0.05%               | APM015PASG  |
| 30 psi         | Absolute     | 30.000             | 2.0684             | 316L SS         | N/A              | x 2             | x 3              | 0.025%               | 0.05%               | APM030PASG  |
| 1 bar          | Gauge        | 14.503             | 1.0000             | 316L SS         | N/A              | 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             | 10.000             | 316L SS         | N/A              | x 2             | x 3              | 0.025%               | 0.05%               | APM010BGSG  |
| 16 bar         | Gauge        | 232.05             | 16.000             | 316L SS         | N/A              | x 2.1           | x 3.2            | 0.025%               | 0.05%               | APM016BGSG  |
| 21 bar         | Gauge        | 304.56             | 21.000             | 316L SS         | N/A              | x 1.6           | x 2.4            | 0.025%               | 0.05%               | APM021BGSG  |
| 25 bar         | Gauge        | 362.58             | 25.000             | 316L SS         | N/A              | x 2.7           | x 4.1            | 0.025%               | 0.05%               | APM025BGSG  |
| 40 bar         | Gauge        | 580.12             | 40.000             | 316L SS         | N/A              | x 1.7           | x 2.5            | 0.025%               | 0.05%               | APM040BGSG  |
| 60 bar         | Gauge        | 870.18             | 60.000             | 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        | 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         | N/A              | 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%               | APM010WGSG  |

# JOFRA™ APM Series

## Advanced Pressure Modules Series H

## Specification Sheet

SS-CP-2350-US

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    | 500.000  | 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 | 100.000  | 6.89512 | DRY             | N/A              | x 1.5         | 0.003%          | 0.010%             | APM100PAHG  |
| 500 psi  | Absolute | 500.000  | 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

## APM ORDER NUMBER STRUCTURE

### Order No. Description

|            |                                           |
|------------|-------------------------------------------|
| APM        | Pressure module - 1st thru 3rd characters |
|            | Advanced pressure module                  |
|            | Pressure range - 4th thru 6th characters  |
|            | Engineering unit - 7th character          |
| P          | psi                                       |
| B          | bar                                       |
| K          | KPa                                       |
| W          | inH <sub>2</sub> O                        |
| 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        |
| APM015PGSG | Sample order number                       |

## APM ACCESSORIES

### Number

### Description

|             |                                                           |
|-------------|-----------------------------------------------------------|
| SPK-APM-001 | APM H communication cable to JOFRA APC, ASC300 and AMC900 |
| SPK-APM-002 | Communication kit for PC                                  |

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 in our JOFRA APC (Advanced Pressure Calibrator) specification sheet SS-CP-2181 at [www.jofra.com](http://www.jofra.com)



## ORDERING INFORMATION

### JOFRA ASC300 Advanced Signal Calibrator

| Order No. | Description                                            |
|-----------|--------------------------------------------------------|
|           | <b>Base model number (1st thru 6th characters)</b>     |
| ASC300    | Handheld calibrator                                    |
|           | Certificate (7th character)                            |
|           | <b>Options: 9th thru 10th characters</b>               |
| G         | NIST traceable certificate (standard)                  |
| H         | Accredited certificate                                 |
| ASC300G   | <b>Sample order number</b>                             |
|           | JOFRA ASC300 with standard NIST traceable certificate. |

### Standard delivery

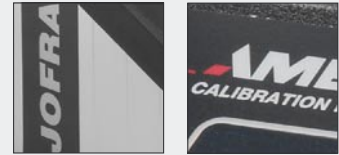
- JOFRA ASC300 instrument
- Battery set (4 x AA)
- Manual
- Set of test leads
- Soft carrying case and shoulder strap
- NIST traceable certificate

## ACCESSORIES

| Part No.          | Description                                                                       |
|-------------------|-----------------------------------------------------------------------------------|
| 120517            | Thermocouple plug for type K (Yellow)                                             |
| 120515            | Thermocouple plug for type T (Blue)                                               |
| 120514            | Thermocouple plug for type N (Orange)                                             |
| 2206011           | Thermocouple plug + K wire + alligator clips in type K material                   |
| 65-PT100-LB-CABLE | LEMO to banana plugs with 1 m / 3 ft. cable                                       |
| 104203            | Test lead kit                                                                     |
| 124915            | CD-rom with JOFRACAL temperature calibration software                             |
| 123958            | Serial communication cable for the ASC300 unit                                    |
| 124716            | 4x 1,5 Volt rechargeable batteries for a standard ASC300                          |
| 124718            | Charger for 124716 batteries - 115/230 VAC                                        |
| SPK-ASC-002       | Special Rechargeable Battery Pack *                                               |
| SPK-ASC-003       | Charger for rechargeable battery pack (SPK-ASC-002) - 115/230 VAC (115/230 VAC) * |

\* REMARK: You can only order the special rechargeable battery pack with a new ASC300 unit after which you can not use normal / standard batteries with that unit.

temperature  
software  
pressure  
signal



### 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.

#### M&G Primary pressure standards

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

#### 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.

...because calibration is  
a matter of confidence



[www.ametekcalibration.com](http://www.ametekcalibration.com)  
[www.jofra.com](http://www.jofra.com)

AMETEK is a leading global manufacturer of electrical and electromechanical products for niche markets. AMETEK's annual sales exceed \$1 billion. NYSE (AME) since 1930. Operations are in US, Europe and Asia, with about 1/3 of sales to markets outside the US.

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ISO 9001 Manufacturer

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