

signal



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

Complete marine program

Part of a complete program of marine approved temperature, pressure and signal calibrators; including temperature sensors See more at www.jofra.com

ISO 9001 Manufacturer

JOFRA™ ASC300

Advanced Signal Calibrator

Process signal calibrator with superior accuracy

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 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.

Terminal block

All input and output connectors are placed away from the display and keyboard to give you the maximum freedom to operate the unit.



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.

Soft keys

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

Backlit display - ON/OFF

Turn the back light on in dark environments.

Numeric keyboard

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

"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.



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.



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.



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.

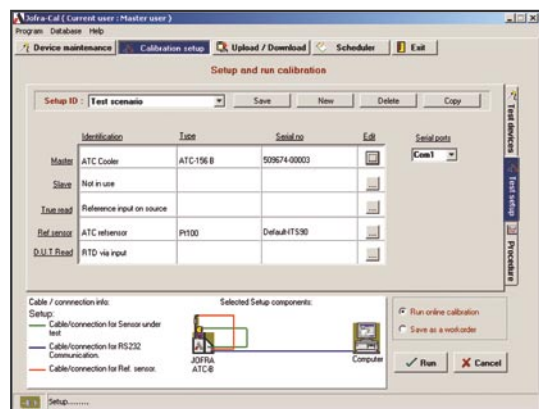
At the back of this case you will also find a handy strap that fits your hand or makes it possible to hang the instrument on a pipe, ladder or the like while performing the calibration, test, or service task.



Simplified temperature calibration documentation

The ASC300 features an RS232 serial data communication interface. This allows the instrument to be serially connected to a personal computer for data storage and reporting.

The JOFRACAL calibration software supports automatic calibration for all JOFRA temperature dry-block calibrators equipped with an RS232 serial data interface including the JOFRA DTI-1000 digital thermometer. For semi-automatic calibrations, the software also supports liquid baths, ice points, or other dry-block heating and cooling sources. Using the software's "SCENARIO" function allows for combining instruments in virtually any configuration, including using the ASC300 either as a temperature reference or as an input module for the sensor-under-test.



JOFRACAL calibration software is menu-driven and easy to use, with a complete software controlled calibration procedure, which saves time. This software allows the user to customize his or her calibration routines. The software is easy-to-use so you do not have to be a programmer to configure your own calibration procedures. The software features prompts, menus, and help functions that guide you through the configuration process.

Once all calibrations are completed the JOFRACAL calibration software can be used for post-processing and printing of certificates. The calibration data collected may be stored on the personal computer for later recall or analysis.

The JOFRACAL temperature calibration software is optional for the ASC300, but may be downloaded free of charge from our web-page www.jofra.com.

Please also see more about JOFRACAL calibration software in specification sheet SS-CP-2510, which can be found at 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 mV	Range		Accuracy ± 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 Cold junction	Range		Accuracy ± 12 months
	min	max	
CJC compensation	18°C 64°F	28°C 83°F	0.2°C 0.36°F
CJC outside above			0.05°C/°C 0.05°F/°F

Volt V	Range		Accuracy ± 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 Pulse	Range		Accuracy ± 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) 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.

Thermo- couple		Range		Accuracy ± 12 months
		from	to	
B	°C	600°C	800°C	1.4°C
		800°C	1000°C	1.5°C
		1000°C	1820°C	1.7°C
	°F	1112°F	1472°F	2.52°F
		1472°F	1832°F	2.7°F
C	°C	0°C	1000°C	0.8°C
		1000°C	2316°C	2.5°C
	°F	32°F	1832°F	1.44°F
E	°C	-250°C	-100°C	0.8°C
		-100°C	1000°C	0.4°C
	°F	-482°F	-148°F	1.44°F
J	°C	-210°C	0°C	0.6°C
		0°C	800°C	0.4°C
		800°C	1200°C	0.5°C
	°F	-346°F	32°F	1.08°F
		32°F	1472°F	0.72°F
K	°C	-200°C	0°C	0.8°C
		0°C	1000°C	0.5°C
		1000°C	1372°C	0.7°C
	°F	-328°F	32°F	1.44°F
		32°F	1832°F	0.9°F
L	°C	-200°C	0°C	0.45°C
		0°C	900°C	0.4°C
	°F	-328°F	32°F	0.81°F
N	°C	32°F	1652°F	0.72°F
		-200°C	0°C	1.0°C
	°F	0°C	1300°C	0.6°C
		-328°F	32°F	1.8°F
		32°F	2372°F	1.08°F

Does not include thermocouple wire error and CJC.

Thermo-couple		Range		Accuracy ± 12 months
		from	to	
R	°C	0°C	1767°C	1.4°C
	°F	32°F	3213°F	2.52°F
S	°C	0°C	1767°C	1.4°C
	°F	32°F	3213°F	2.52°F
T	°C	-250°C	0°C	0.8°C
		0°C	400°C	0.4°C
	°F	-328°F	32°F	1.44°F
		32°F	752°F	0.72°F
U	°C	-200°C	0°C	0.7°C
		0°C	600°C	0.45°C
	°F	-328°F	32°F	1.26°F
		32°F	752°F	0.81°F
XK	°C	-200°C	800°C	0.4°C
	°F	-328°F	1472°F	0.72°F
BP	°C	0°C	800°C	1.1°C
		800°C	2500°C	2.5°C
	°F	32°F	1472°F	1.98°F
		1472°F	4532°F	4.5°F

Does not include thermocouple wire error and CJC.

Ohm	Range		Accuracy ± 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) @ 0.1 to 0.5 mA @ 0.5 to 3 mA	5.0	400.0	0.025% rdg +0.1 ohm
	5.0	400.0	0.025% rdg +0.05 ohm
Ohm source (high) @ 0.05 to 0.8 mA @ 0.05 to 0.4 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 ± 12 months
		from	to	
Pt10 Alpha 385	°C	-200°C	100°C	1.4°C
		100°C	300°C	1.6°C
		300°C	600°C	1.8°C
	°F	600°C	800°C	2.0°C
		-328°F	212°F	2.5°F
		212°F	572°F	2.9°F
Pt50 Alpha 385	°C	572°F	1112°F	3.2°F
		1112°F	1472°F	3.6°F
		-200°C	100°C	0.4°C
	°F	100°C	300°C	0.5°C
		300°C	600°C	0.6°C
		600°C	800°C	0.7°C
Pt100 Alpha 385	°C	-328°F	212°F	0.72°F
		212°F	572°F	0.90°F
		572°F	1112°F	1.08°F
	°F	1112°F	1472°F	1.26°F
		-200°C	100°C	0.2°C
		100°C	300°C	0.3°C
Pt100 Alpha 3926	°C	300°C	600°C	0.4°C
		600°C	800°C	0.5°C
		-328°F	212°F	0.36°F
	°F	212°F	572°F	0.54°F
		572°F	1112°F	0.72°F
		1112°F	1472°F	0.90°F
Pt100 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

Read accuracy is based on 4 wire input.
 For 3-wire input add ±0.005 ohm assuming all three RTD leads are matched.

RTD	Range		Accuracy ± 12 months	
	from	to		
Pt100 °C Alpha 3916	-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	
Pt200 °C Alpha 385	572°F	1166°F	0.72°F	
	-200°C	100°C	0.8°C	
	100°C	300°C	0.9°C	
	300°C	630°C	1.0°C	
	°F	-328°F	212°F	1.44°F
Pt500 °C Alpha 385	212°F	572°F	1.62°F	
	572°F	1166°F	1.80°F	
	-200°C	100°C	0.4°C	
	100°C	300°C	0.5°C	
	300°C	630°C	0.6°C	
Pt1000 °C Alpha 385	°F	-328°F	212°F	0.72°F
	212°F	572°F	0.90°F	
	572°F	1166°F	1.08°F	
	-200°C	100°C	0.2°C	
	100°C	300°C	0.3°C	
Cu10 °C	300°C	630°C	0.4°C	
	°F	-328°F	212°F	0.36°F
Cu50 °C	212°F	572°F	0.54°F	
	572°F	1166°F	0.72°F	
Cu100 °C	-80°C	260°C	1.4°C	
	°F	-112°F	500°F	2.52°F
Ni120 °C	-180°C	200°C	0.4°C	
	°F	-292°F	392°F	0.72°F
YSI400 °C	-100°C	200°C	0.3°C	
	°F	-148°F	392°F	0.54°F
YSI400 °C	-80°C	260°C	0.2°C	
	°F	-112°F	500°F	0.36°F
YSI400 °C	15°C	50°C	0.1°C	
	°F	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 mA0 to 24 (-25% to 125%)
Loop power for transmitters Yes, 24 VDC
Isolated input..... Yes

Current mA	Range		Accuracy ± 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

SPECIFICATIONS

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
DNV Marine Approval, Certificate no.: A-9557

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 for JOFRACAL calibration software.

- INTEL™ 486 processor (PENTIUM™ 800 MHz recommended)
- 32 MB RAM (64 MB recommended)
- 80 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 (Advanced Pressure Module)

The APM series of pressure modules offer the flexibility to perform pressure calibrations with the ASC300. Independent of the engineering unit of the module you can change units on the ASC300 (11 different engineering units) at any time.



The APM series of pressure modules by JOFRA are compatible with your ASC300, AMC900 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.

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 in specification sheet SS-CP-2190 at www.jofra.com

The JOFRA APM S series are industrial pressure modules with good accuracies up to ±0.05% of F.S. 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.



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.



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 more at www.jofra.com

ORDERING INFORMATION

JOFRA ASC300 Advanced Signal Calibrator

Order No.	Description
	Base model number (1st thru 6th characters)
ASC300	Handheld calibrator
	Certificate (7th character)
	Options: 9th thru 10th characters
G	NIST traceable certificate (standard)
H	Accredited certificate (optional)
ASC300G	Sample order number
	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
124915	CD-rom with JOFRACAL temperature calibration software
123958	Serial communication cable for the ASC300 unit
124716	4 x 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.



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.

JOFRA & 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[®]
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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