

JOFRA™

NEW SYSTEM A + B PUMPS
JOFRA IPI INDICATOR
INTRINSICALLY SAFE

Model IPI Industrial Pressure Calibrator

Pressure range

IPI030C	Vacuum to 2 bar / 30 psi
IPI100C	Vacuum to 7 bar / 100 psi
IPI300C	Vacuum to 21 bar / 300 psi
IPI500C	Vacuum to 35 bar / 500 psi
IPI015G	0 to 1 bar / 15 psi
IPI01KG	0 to 70 bar / 1,000 psi
IPI02KG	0 to 140 bar / 2,000 psi
IPI03KG	0 to 200 bar / 3,000 psi
IPI05KG	0 to 350 bar / 5,000 psi
IPI10KG	0 to 700 bar / 10,000 psi

High accuracy

±0.05% of F.S. for positive pressure
Vacuum ranges to 500 psi (35 bar)

High flexibility

Easily disassemble the test system and use the indicator for other tasks

True field indicator

Lightweight and portable with full temperature-compensation, long battery life and large display for easy visibility

Record min and max readings

Capture the min and max pressure readings for safety valve applications

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

Intrinsically safe

The IPI Indicator is ATEX and CSA certified and designed for use in potentially explosive environments



PRODUCT DESCRIPTION

JOFRA IPI indicators bring together the ease of an analog gauge with the accuracy and easy-to-read display of a digital calibrator.

Use the JOFRA IPI in applications from safety valve checks to system pressure verification.

Furthermore the IPI indicator is ATEX and CSA certified for use in potentially explosive environments such as oil refineries, chemical plants and offshore platform, where there is a risk of inflammable gases.



Features

This series is designed to meet your pressure measurement applications and make the tasks easier. The IPI offers 18 different pressure units, long battery life, high accuracy, and even serial communications. The accuracy of the IPI rivals that of a pressure calibrator and is temperature compensated for shop or in process applications. This versatile unit is available as a stand alone indicator or in a complete test system.

You can perform a calibration locally without returning the IPI unit to the manufacturer. All you need is an accurate pressure reference. If you do require factory calibration, the pump and indicator are independent and only the indicator needs to be returned.

The JOFRA IPI is available as an indicator or in one of 6 test ready systems that are complete and equipped to meet your pressure measuring or testing needs.

AMETEK®
CALIBRATION INSTRUMENTS

The JOFRA IPI digital pressure indicator takes the concept of an analog test gauge, and brings it to a new level. The IPI combines the accuracy of digital technology with the simplicity of an analog gauge, and achieves performance, ease-of-use, and a feature set unmatched in the pressure measurement world. Setup of the IPI is fast and straightforward, through a menu-driven display, with minimal text, and intuitive functions, that is simple enough to allow the indicator to be used anywhere in the world, without the need for multilingual displays.

ON / OFF

The IPI is delivered with the auto-shutoff active and set to 30 minutes: like many of our other instruments. This feature can be reduced from 30 minutes down to 1 minute in 1 minute increments. In cases where a constant reading is necessary, this can also be turned completely off to allow for continuous operation.

ZERO

Keep the high accuracy: ZERO the instrument before every test.

MAX / MIN

A MIN/MAX function reads the maximum and minimum pressure that have been automatically stored. Monitor a safety valve or look for pressure spikes in the process. The IPI also have the ability to check the minimum and maximum readings during the ransient.

Pressure connections

1/4" NPT male lower connection is standard. A 1/4" BSP male adapter is included. The IPI may be ordered with a back mounting configuration. This design has the 1/4 in. NPT male connection on the back of the case vice the lower manifold connection. This allows for use in panel mounted applications or in applications where flat mounting is necessary such as in an overhead. This configuration is not delivered with a protective boot.

External power

Sometimes it is more convenient to take advantage of an existing power source rather than using batteries. The IPI may be ordered with a 24 VDC power supply option. The unit has terminals to accept the positive and negative leads to allow for easy connection to the power supply. These units will not be supplied with batteries and batteries should not be installed when the unit is connected to 24 VDC power.

Protective boot

Standard configuration IPI units and those supplied with systems are delivered with a protective boot. Units with back mounting and the 24 VDC power supply are not delivered with the protective boot due to design limitations.

Clear dual line display

The IPI display does more than just show a pressure reading. The user can check temperature and exact battery voltage through the use of the keypad. The large, 5 1/2 digit, 0.65 in (1.65 cm) character display is large and easy-to-read; even from a distance. Icons are also included to indicate battery life, engineering units, and there is a bar graph that shows the percentage of scale reading. All of this information can be read in low light with the use of the backlight.

ENTER

Save selections and turn the backlight on and off.

CONFIG

This is the key to access all user-settable functions. The CONFIG key is used in conjunction with the ▼ and ▲ functions on the ZERO and MAX/MIN keys to select and change different functions.

You can set one of 20 engineering units, change the auto-shutoff function setting, display the actual battery voltage, display the actual temperature (in °C or °F), turn the dampening on or off, change the sample rate, and set the Tare value. In addition to the 20 available engineering units on the IPI, you can create your own unit to meet your measurement need. For example, if you need to take a level measurement, simply determine the pressure that equates to one unit of that measurement and set that as your engineering unit. The application may require gallons, feet, inches, meters, liters, or similar; with the IPI you can take the measurement.

Serial communications

The IPI has a serial port that is accessible though the back of the case. This feature uses standard ASCII commands to allow for extraction of data from the IPI while taking readings. This requires the optional serial cable.



Hazard location information / approvals

An explosive atmosphere is defined as a "mixture with air, under atmospheric conditions, of flammable substances in the form of gases, vapours, mists or dusts in which, after ignition has occurred, combustion spreads to the entire unburned mixture".



The primary intrinsically safe standard in the European Union has been set with the 9/94/EC Directive, commonly called ATEX ("Atmosphères Explosibles," French for explosive atmospheres).

The JOFRA IPI Industrial Pressure Indicator is ATEX approved by KEMA as complying with the Essential Health and Safety Requirements related to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II in the directive, and with the following rating: II 3 G EEx nA IIB T6 (Ta=-10°C... +55°C).



The JOFRA IPI Industrial Pressure Indicator is also certified by CSA as conforming to relevant Canadian and USA standards with the following rating: Class 1, Div. 2, Groups A-D.

See the definitions regarding hazardous locations in NFPA 70, Article 500 or CSA C22.1 Section 18. NFPA 70, Article 500 and CSA C22.1 Section 18.

Field recalibration

The IPI does not need to be returned to the factory for calibration. If you have a reliable and accurate pressure reference or a local laboratory, you may re-calibrate the IPI locally. This feature is password protected.

Sampling rate

The IPI sampling rate is user selectable. If you want to capture fast system transients, the IPI can take a reading 10 times per second. Conversely, you may want to conserve battery life and only need periodic samples. Then, you can select 1 sample per every 2 seconds. This works well for in process and panel mounted applications. You can also choose the accepted instrument sampling rate of 3 samples per second for normal use or to allow for filtering, you can select 1 sample per second.

Damping adjustment

The damping function can be turned on or off on the IPI. This allows for readings to be integrated, which accounts for momentary changes such as those from pulsing sources.

Tare

Beyond zeroing the IPI, you may have to account for residual pressure. The Tare feature allows you to take care of that error and prevent the manual calculation of the difference. This can be used in combination with the custom engineering units to make the level measurements easier.

Temperature display and compensation

Because the IPI is designed for in-process tasks, temperature compensation is included to make the job easier. This allows the IPI to maintain accuracy over the measurement range. The measured temperature may be checked from the keypad.

JOFRACAL CALIBRATION SOFTWARE

JOFRACAL calibration software ensures easy calibration of RTD's, thermocouples, transmitters, thermoswitches, pressure gauges and pressure switches. JOFRACAL can be used with JOFRA DPC-500, APC, CPC and IPI pressure calibrators, all JOFRA temperature calibrators, as well as JOFRA AMC910, ASC300 multi signal calibrator and ASM-800 signal multi scanner. When used with JOFRA ASM-800 signal multi scanner, JOFRACAL can perform a simultaneous semi automatic calibration on up to 24 pressure and/or temperature devices under test in any combination.

JOFRACAL software controls the complete calibration procedure, stores the results and provides a calibration audit trail through hard-copy certificates. All calibration data are stored for each sensor to monitor drift and optimise recalibration intervals. A scheduler feature allows planning of future calibrations.

Please find more information about JOFRACAL calibration software in specification sheet SS-CP-2510, which may be found at www.jofra.com

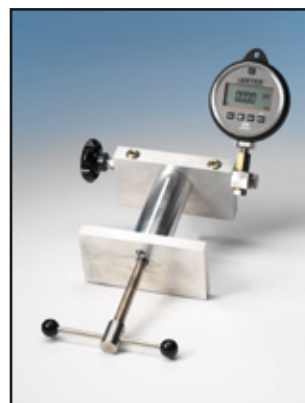
REQUIREMENTS JOFRACAL

Minimum hardware requirements:

- Intel® Pentium® II 1.4 GHz processor.
- 64MB RAM (128MB recommended)
- 80MB free disk space on hard disk (120MB recommended) prior to installation
- Standard VGA (800x600, 256 colours). 1024x768 recommended.
- CD-ROM drive for installation of program
- 1 or 2 free RS-232 serial ports, depending on configuration

Minimum software requirements:

- Microsoft Windows® 98, Microsoft Windows® NT 4.0, Microsoft Windows® 2000, Microsoft Windows® ME, Microsoft Windows® XP, Vista.
- System fonts: MS Sans Serif and Arial



FUNCTIONAL SPECIFICATIONS

Pressure range

psi.....vacuum to 30, 100, 300, 500
barvacuum to 2, 7, 21, 35
psi..... 0 to 15, 1,000, 2,000, 3,000, 5,000, 10,000
bar 0 to 1, 70, 140, 200, 350, 700

Engineering units

User defined..... One user-definable unit
User selectable..... 20 units

(PSI, Bar, kg/cm², inH₂O (4 °C, 20 °C or 60 °F), ftH₂O (4 °C, 20 °C or 60 °F), mmH₂O (4 °C and 20 °C), cmH₂O (4 °C and 20 °C), mH₂O (4 °C and 20 °C), KPa, mBAR, inHg, mmHg, Torr)

Not all units are available in all ranges.

Pressure accuracy

Pressure ±0.05% F.S.
Full temperature compensation 0 to 50°C / 32 to 122°F
Vacuum (30, 100, 300, 500 psi indicator) ±0.25% F.S.
Vacuum (2, 7, 21, 35 bar indicator)..... ±0.25% F.S.

Including non-linearity, hysteresis, repeatability, and temperature effect.

F.S. (full scale) = maximum gauge pressure in psi

Serial communication interface

Connector Stereo jack
Serial 0-3 VDC, 9600 baud, 8 data, no parity, 1 stop
Protocol ASCII command language

Media compatibility

Liquids and gasses compatible with 316 stainless steel.

Environmental

Storage temperature -20 to 70°C / -4 to 158°F
Operating temperature -10 to 55°C / -14 to 131°F

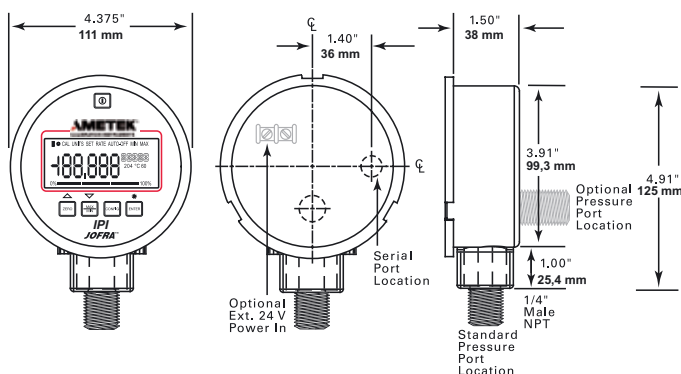
Pressure connection

All ranges 1/4" NPT male

Adapters to 1/4" BSP male are included as standard

Pressure overload

1 to 35 bar / 15 to 500 psi.....3X range
70 to 350 bar / 1,000 to 5,000 psi2X range
700 bar / 10,000 psi 1.5X range
Overload alarm OL on display
Overload alarm range 1.2X range



Display

Display..... Backlight, blue
Display resolution 5 digit floating decimal
Bar graph..... 20 segment, 0 to 100%
Display indicators.....Engineering units icon
.....Low battery indication icon
..... Battery life indication utilizing bar graph
..... Measured temperature display
Display update twice per second

Power supply

Battery (3) AA Alkaline
Battery life 1500 operational hours without backlight
Battery life 2000 operational hours without backlight
.....at low sampling rate
Battery life150 operational hours with backlight
Low battery indicatorat 3 VDC
Optional input port 24 VDC connection 1) 2) 3)

1) Units delivered with 24 VDC power supply connection are not supplied with batteries

2) Batteries should not be installed when using 24 VDC power supply as damage to the IPI may occur

3) Units with 24 VDC power supply connection cannot be ordered with the protective boot option

Instrument dimensions

Indicator LxWxH..... 125 x 111 x 38 mm / 4.9 x 4.4 x 1.5 in
Indicator weight (including battery)..... 1.6 lb / 0.7 kg
Input port..... 1/4" NPT Male lower connection
Optional input port 1/4" NPT Male back connection 1)

3) Units with back connection cannot be ordered with the protective boot option

Shipping dimensions

Indicator LxWxH... 250 x 160 x 100 mm / 9.8 x 6.3 x 3.9 in
Indicator weight..... 1.8 lb / 0.8 kg

Instrument case

Rating NEMA 4/IP65 1)

1) Does not apply if the serial connection is in use or if the external 24 VDC power option is used.

Approvals - IPI system

CE Conformity EN61326: 1998, EN60079-0: 2006,
..... EN60079-15:2005

The JOFRA IPI systems are type approved by Det Norske Veritas. Find the certificate at www.jofra.com

Approval, Certificate no.A-10549

Ex approvals - IPI indicator only



CSA Class 1, Div. 2, Groups A-D 1)
ATEX..... II 3 G EEx nA IIB T6 (Ta=-10°C... +55°C) 1)

1) The 24 volt version is not CSA or ATEX approved

JOFRA IPI PRESSURE RANGES

This table shows the resolutions that can be obtained by the IPI indicators throughout all engineering units.

Resolution obtained by the IPI indicator	IPI30C Vacuum to 30 psi Vacuum to 2 bar		IPI100C Vacuum to 100 psi Vacuum to 7 bar		IPI300G Vacuum to 300 psi Vacuum to 21 bar		IPI500G Vacuum to 500 psi Vacuum to 35 bar	
Imperial ranges								
psi	-12.000	30.000	-12.000	100.00	-12.000	300.00	-12.00	500.00
inH2O@4°C	-332.17	830.42	-332.2	2768.1	-332.2	8304.2	-332	13840
inH2O@20°C	-332.76	831.89	-332.7	2773.0	-332.7	8318.9	-333	13865
inH2O@60°F	-332.50	831.24	-332.5	2770.8	-332.5	8312.4	-332	13854
ftH2O@4°C	-27.681	69.202	-27.68	230.67	-27.68	692.02	-27.7	1153.4
ftH2O@20°C	-27.730	69.324	-27.73	231.08	-27.73	693.24	-27.7	1155.4
ftH2O@60°C	-27.708	69.270	-27.71	230.90	-27.71	692.70	-27.7	1154.5
inHg@0°C	-24.432	61.081	-24.43	203.60	-24.43	610.81	-24.4	1018.0
Torr	-620.6	1551.5	-620.6	5171.5	-620	15514	-621	25858
Metric ranges								
bar	-0.8300	2.0000	-0.8300	7.0000	-0.8300	21.000	-0.8300	35.000
mbar	-830.0	2000.0	-830.0	7000.0	-830.00	21000	-830	35000
kPa	-83.00	200.00	-83.00	700.00	-83.0	2100.0	-83.0	3500.0
kg/cm2	-0.8464	2.0394	-0.8464	7.1380	-0.846	21.414	-0.846	35.690
cmH2O@4°C	-846.4	2039.5	-846.4	7138.2	-846	21415	-846	35691
cmH2O@20°C	-847.9	2043.1	-847.9	7150.8	-847	21452	-848	35754
mH2O@4°C	-8.464	20.395	-8.464	71.382	-8.46	214.15	-8.46	356.91
mH2O@20°C	-8.479	20.431	-8.479	71.508	-8.48	214.52	-8.48	357.54
mmHg@0°C	-622.6	1500.1	-622.6	5250.4	-622	15751	-623	26252

Resolution obtained by the IPI indicator	IPI015G 0 to 15 psi 0 to 1 bar	IPI01KG 0 to 1,000 psi 0 to 70 bar	IPI02KG 0 to 2,000 psi 0 to 140 bar	IPI03KG 0 to 3,000 psi 0 to 200 bar	IPI05KG 0 to 5,000 psi 0 to 350 bar	IPI10KG 0 to 10,000 psi 0 to 700 bar
Imperial ranges						
psi	15.000	1000.0	2000.0	3000.0	5000.0	10000
inH2O@4°C	415.21	27681	55361	83042	N/A	N/A
inH2O@20°C	415.95	27730	55459	83189	N/A	N/A
inH2O@60°F	415.62	27708	55416	83124	N/A	N/A
ftH2O@4°C	34.601	2306.7	4613.5	6920.2	11534	23067
ftH2O@20°C	34.662	2310.8	4621.6	6932.4	11554	23108
ftH2O@60°C	34.635	2309.0	4618.0	6927.0	11545	23090
inHg@0°C	30.540	2036.0	4072.1	6108.1	10180	20360
Torr	775.73	51715	N/A	N/A	N/A	N/A
Metric ranges						
bar	1.0000	70.000	140.00	200.00	350.00	700.00
mbar	1000.0	70000	N/A	N/A	N/A	N/A
kPa	100.00	7000.0	14000	20000	35000	70000
kg/cm2	1.0197	71.380	142.76	203.94	356.90	713.80
cmH2O@4°C	1019.7	71382	N/A	N/A	N/A	N/A
cmH2O@20°C	1021.5	71508	N/A	N/A	N/A	N/A
mH2O@4°C	10.197	713.82	1427.6	2039.5	3569.1	7138.2
mH2O@20°C	10.215	715.08	1430.2	2043.1	3575.4	7150.8
mmHg@0°C	750.06	52504	N/A	N/A	N/A	N/A