



VACUUM MEASUREMENT



A new improved vacuum measurement product range: Adixen 2000 gauge series

Recognized technology, maximum efficiency.

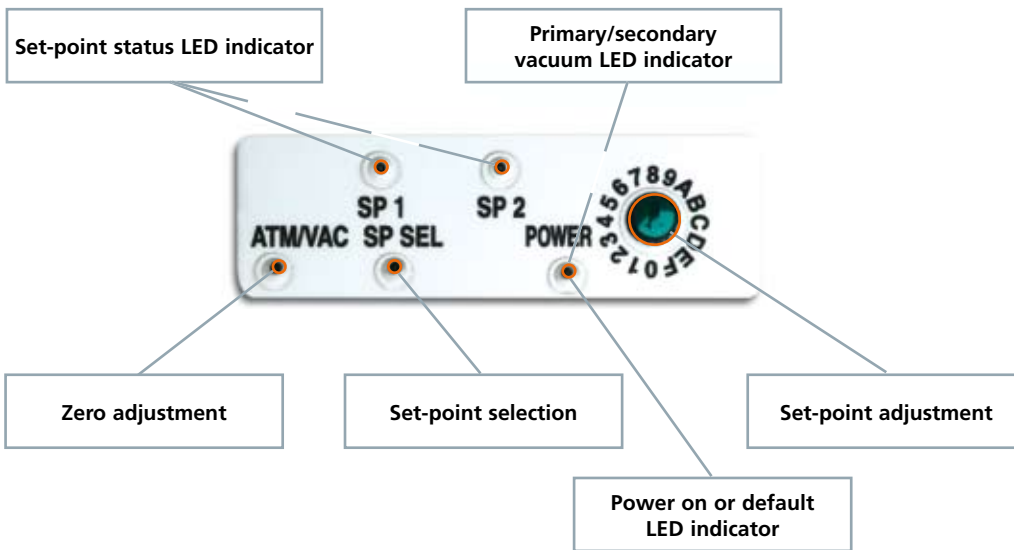
For many decades Alcatel Vacuum Technology has developed products dedicated to vacuum applications. As a result, Alcatel capitalizes on this experience to incorporate many advantages into its products.

Alcatel Vacuum Technology is proud to introduce the Adixen 2000 vacuum measurement series, blending experience and innovation.

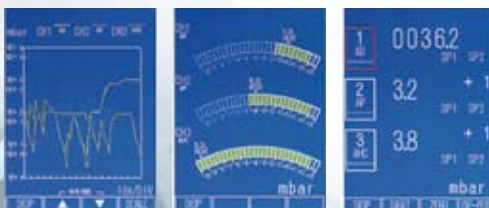


User-friendly and intelligent

The 2000 gauge series provides pressure measurement from atmosphere down to $4 \cdot 10^{-10}$ mbar. The Adixen gauges and controllers give you more than a simple pressure measurement, connected to a network with 2 set-points, 0-10 V or RS 485, the gauges can drive a production process or record the pressure trend and more.



The gauge controller provides a digital display of the pressure or historical data through the graph function. The controller can operate up to 3 gauges and has 2 set-points per channel.



Crystal measurement principle

The sensor of a crystal gauge is a quartz oscillator. The electrical impedance of the oscillation depends on the gas pressure. Friction between the quartz surface and gas molecules varies as the pressure changes. The crystal gauge measures the electrical impedance of the quartz oscillator and converts it to a pressure value.

The crystal gauge employs the stable friction phenomena as a basis of its measurement while pirani gauge is based on the thermal effect, for this reason the crystal gauge is an alternative to conventional pirani gauges and offers you a more reliable and more repeatable high pressure measurement of your vacuum system.



ADIXEN AHC 2010 GAUGE

Combination Hot cathode - Crystal gauge

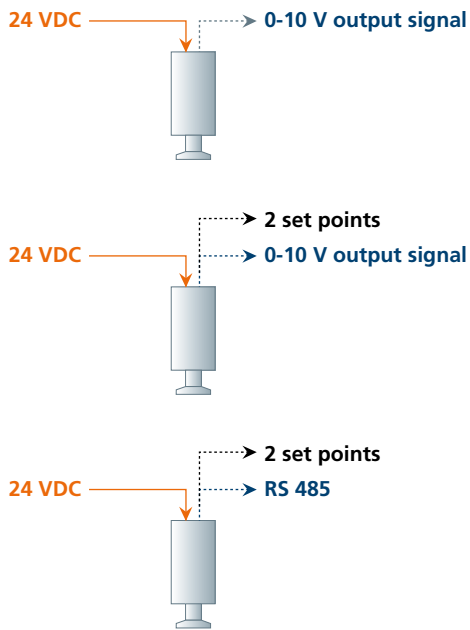
Reliable and repeatable vacuum measurement
from 10^{-10} mbar to atmospheric pressure.



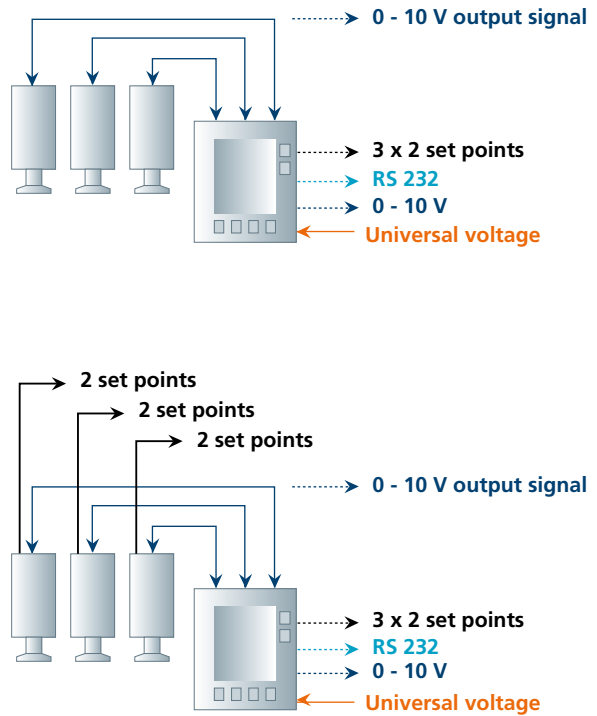
2000 series configurations

Information: All electrical connectors are standard SUB-D 9pin male.

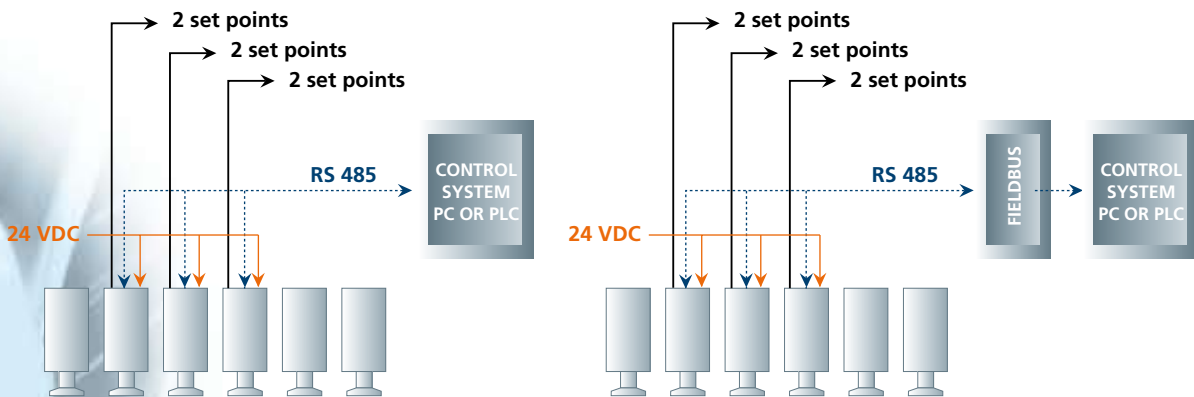
ACTIVE GAUGE



GAUGES AND CONTROLLER



SPECIAL GAUGE INTERFACING

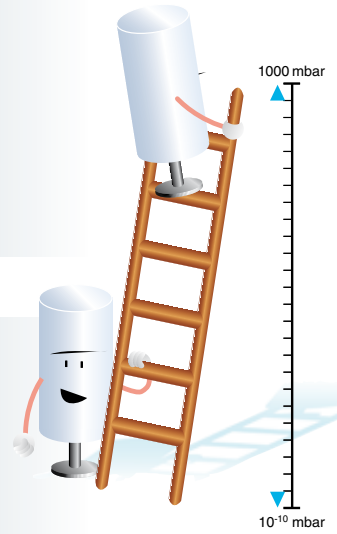


We understand customer applications... and we offer complete and customized solutions

Each customer's needs are unique. Alcatel continuously focuses on understanding these needs, and offers an adapted range of vacuum gauges:

EFFICIENT

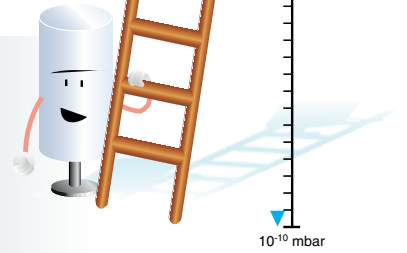
AP 2004
Pirani Gauge



2 GAUGES IN 1

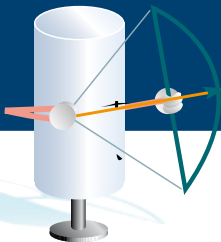
ACC 2009
Cold Cathode / Pirani Gauge

AHC 2010
Hot Cathode / Crystal Gauge



ACCURACY

ASD 2001... 2004
Capacitance Gauges




ACTIVE GAUGES

		MEASUREMENT RANGE	AVAILABLE FLANGES	ACCURACY REPEATABILITY	DEPENDENT ON GAS	PAGE
AP 2004 Pirani Gauges		5 · 10 ⁻⁴ - 1000 mbar	DN 16 ISO-KF DN 16 CF-F 1/8" NPT	15 % 2 %	Yes	08
ACC 2009 Cold Cathode Pirani Gauge		5 · 10 ⁻⁹ - 1000 mbar	DN 25 ISO-KF DN 40 ISO-KF DN 40 CF-F	30 % 5 %	Yes	09
AHC 2010 Hot Cathode Crystal Gauge		4 · 10 ⁻¹⁰ - 1000 mbar	DN 25 ISO-KF DN 40 ISO-KF DN 40 CF-F	15 % 5 %	Yes	10
ASD 2001... 2004 Capacitance Gauges		1 · 10 ⁻⁴ - 1000 mbar	DN 16 ISO-KF Cajon 8 VCR Female	0,5 % 0,2 %	No	11

DIGITAL CONTROLLERS

ACS 2000			ACM 2000		14-15
-----------------	---	--	-----------------	---	--------------

MECHANICAL PRESSURE GAUGES

		MEASUREMENT RANGE	AVAILABLE FLANGES	ACCURACY REPEATABILITY	DEPENDENT ON GAS	PAGE
BD 101 A BD 101 B BD 121		1 - 1000 mbar	DN 16 ISO-KF DN 25 ISO-KF DN 25 ISO-KF	25 mbar	No	16

AP 2004 Pirani Gauge

VACUUM MEASUREMENT	
Measurement principle	thermal conduction
Measurement range	5 · 10⁻⁴ - 1000 mbar
Accuracy	15 % of reading
Repeatability	2 % of reading
ELECTRICAL SPECIFICATIONS	
Power supply	
• Voltage	24 VDC (14 - 30 VDC) (tolerance ripple: below 2V p-p)
• Consumption max.	< 1 W
Analog output signal	
• Measurement range	2.2 V - 8.5 V
• Logarithmic	1 V / decade
• Error signal	< 0.1 V or = 0.4 V
• Minimum load	100 KΩ
• Cable length max.	200 m (0.34 mm ²)
• Type of protection	IP 40
ENVIRONMENTAL SPECIFICATIONS	
Temperature	
• Storage	- 20 °C / + 70 °C
• Operation	+ 5 °C / + 60 °C
• Bake out temperature	< 150 °C (without electronics)
Pressure max.	2 bar (CF-F)



- ROBUST EXCELLENT
- REPEATABILITY HIGH
- ACCURACY

Ordering information	AP 2004		
Output signal	0 - 10 V	0 - 10 V 2 set-points	RS 485 2 set-points
DN 16 ISO KF	112646	112649	112652
DN 16 CF-F	112647	112650	112653
1/8" NPT	112648	112651	112654

Accessories	P/N
Filter DN 16 ISO KF	305225

COMPATIBLE CONTROLLERS



ACS 2000



ACM 2000

ACC 2009

Combination Cold Cathode / Pirani Gauge

VACUUM MEASUREMENT	
Measurement principle	thermal conduction / cold cathode ionization - inverted magnetron
Measurement range	5 · 10⁻⁹ - 1000 mbar
Accuracy	30 % of reading
Repeatability	5 % of reading
ELECTRICAL SPECIFICATIONS	
Power supply	
• Voltage	24 VDC (15 - 30 VDC) (tolerance ripple: below 1 V p-p)
• Consumption max.	< 3 W
Analog output signal	
• Measurement range	1.8 V - 8.6 V
• Logarithmic	0.6 V / decade
• Error signal	< 0.1 V or = 0.4 V or = 9.5 V
• Minimum load	100 KΩ
• Cable length max.	300 m (1 mm ²)
• Type of protection	IP 40
ENVIRONMENTAL SPECIFICATIONS	
Temperature	
• Storage	- 20 °C / + 70 °C
• Operation	+ 5 °C / + 55 °C
• Bake out temperature	< 150 °C (without electronics and magnetic shielding)
Pressure max.	2 bar (CF-F)

Ordering information	ACC 2009	
Output signal	0 - 10 V 2 set-points	RS 485 2 set-points
DN 25 ISO KF	112655	112658
DN 40 ISO KF	112656	112659
DN 40 CF-F	112657	112660



- 2 GAUGES IN ONE
- 12 DECADES OF MEASUREMENT
- IMPROVED MEAN TIME BEFORE MAINTENANCE

Accessories	P/N
Filter DN 25 ISO KF	305184
Filter DN 40 ISO KF	305185

COMPATIBLE CONTROLLERS



ACS 2000



ACM 2000

AHC 2010

Combination Hot Cathode / Crystal Gauge

VACUUM MEASUREMENT

Measurement principle	Quartz friction / Hot cathode ionization
Measurement range	4 · 10⁻¹⁰ - 1000 mbar
Accuracy	15 % of reading
Repeatability	5 % of reading

ELECTRICAL SPECIFICATIONS

Power supply	24 VDC (20 - 28 VDC) (tolerance ripple: below 2 V p-p)
• Voltage	
• Consumption max.	< 12 W
• Analog output signal	
• Measurement range	0.7 V - 10.0 V
• Logarithmic	0.75 V / decade
• Error signal	< 0.1 V or = 0.2 V or = 0.4 V
• Minimum load	100 KΩ
• Cable length max.	300 m (1 mm ²)
• Type of protection	IP 40

ENVIRONMENTAL SPECIFICATIONS

Temperature	
• Storage	- 20 °C / + 70 °C
• Operation	+ 5 °C / + 50 °C
• Bake out temperature	< 150 °C (without electronics)
Pressure max.	2 bar (CF-F)

Ordering information	AHC 2010	
Output signal	0 - 10 V 2 set-points	RS 485 2 set-points
DN 25 ISO KF	112661	112664
DN 40 ISO KF	112662	112665
DN 40 CF-F	112663	112666



- 2 GAUGES IN ONE
- 13 DECADES OF MEASUREMENT
- ACCURATE AT HIGH PRESSURE

Accessories	P/N
Filter DN 25 ISO KF	305184
Filter DN 40 ISO KF	305185

COMPATIBLE CONTROLLERS



ACS 2000



ACM 2000

ASD 2001... 2004

Capacitance Gauge

VACUUM MEASUREMENT	
Measurement principle	Capacitance diaphragm
Measurement range	10⁻¹ - 1333 mbar
	10⁻² - 133 mbar
	10⁻³ - 13 mbar
	10⁻⁴ - 1.3 mbar
Accuracy	0.25 % of reading

ELECTRICAL SPECIFICATIONS	
Power supply	
• Voltage	24 VDC (13.5 - 26.4 VDC)
• Consumption max.	< 1 W
Analog output signal	
• Measurement range	0-10 V
• Relationship signal-pressure	Linear
• Minimum load	100 KΩ
• Cable length max.	20 m
• Type of protection	IP 40

ENVIRONMENTAL SPECIFICATIONS	
Temperature	
• Storage	- 20 °C / + 70 °C
• Operation	+ 5 °C / + 50 °C
• Bake out temperature	+ 60 °C
Pressure max.	2 bar

Ordering info.	ASD 2001	ASD 2002	ASD 2003	ASD 2004
Full scale	1333 mbar	133 mbar	13 mbar	1.3 mbar
DN 16 ISO KF	112667	112671	112675	112679
8 VCR Female	112668	112672	112676	112680



- ACCURATE AND COMPACT
- ABSOLUTE PRESSURE MEASUREMENT
- GAS INDEPENDENT

Accessories	P/N
Filter DN 16 ISO KF	305225

COMPATIBLE CONTROLLERS



ACS 2000



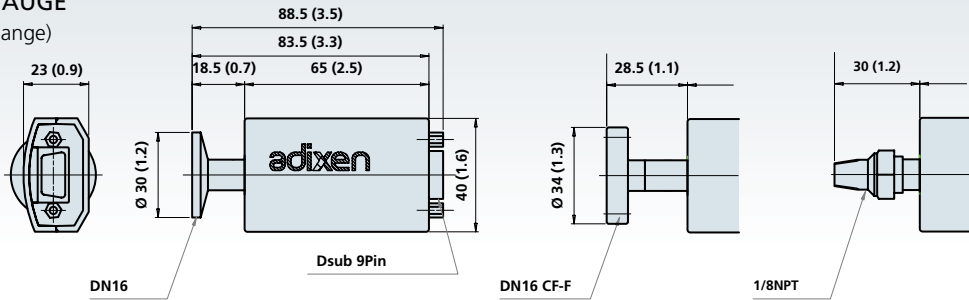
ACM 2000

Dimensions mm (inch)

Information: All flange coupling are 304 stainless steel.

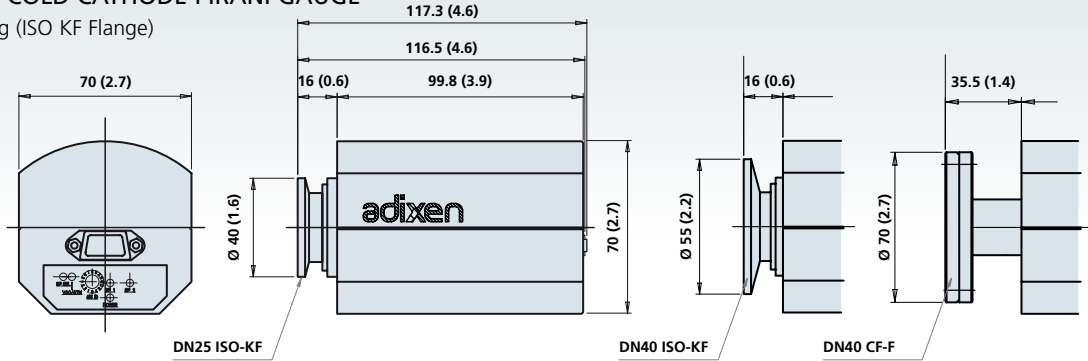
AP 2004 / PIRANI GAUGE

Weight: 80 g (ISO KF Flange)



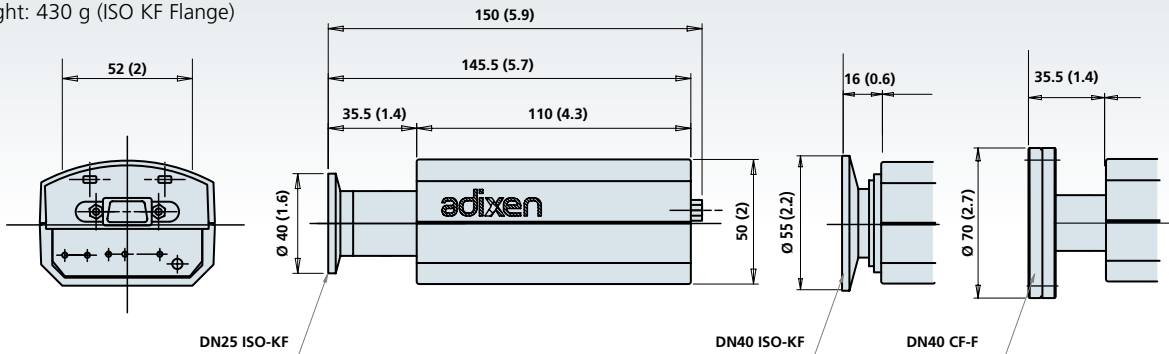
ACC 2009 / COLD CATHODE PIRANI GAUGE

Weight: 780 g (ISO KF Flange)



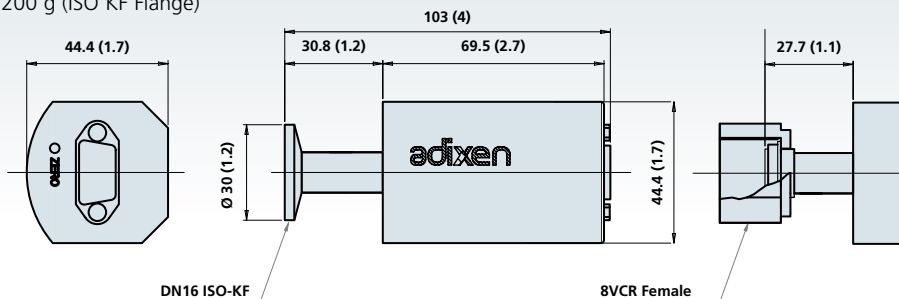
AHC 2010 / HOT CATHODE CRYSTAL GAUGE

Weight: 430 g (ISO KF Flange)



ASD 2001... 2004 / CAPACITANCE GAUGES

Weight: 200 g (ISO KF Flange)

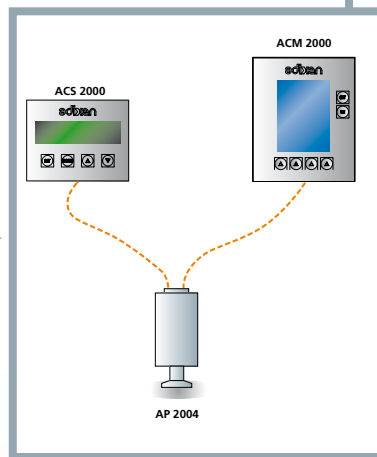
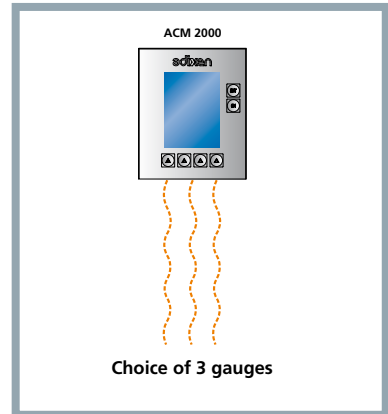
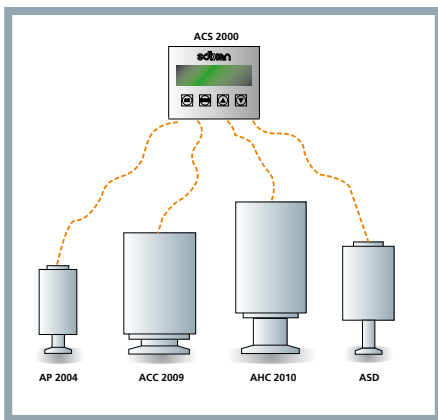


Active gauge controllers: up-to-date and competitive

Up-to-date and competitive, the Adixen controllers guarantee the supply and display functions for the complete active gauge range.

Standard features include:

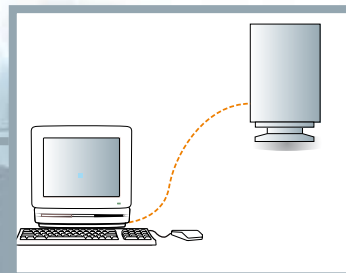
- Operating menu
- Universal voltage
- Compatible sensor cable
- Automatic gauge recognition with parameter settings
- Digital display
- Serial interface
- Control input
- Analog output signal
- Relay function for each gauge



Ordering information	P/N
Sensor cable 5 m	112752
Sensor cable 10 m	112753
Sensor cable 20 m	112754

Active gauge

If you have chosen to use an Adixen gauge without an Adixen controller, don't forget you have to build the sensor cable by yourself.



Ordering information	P/N
9pin SUB-D connector	114848

The sensor cables P/N 112752, 112753, and 112754 can only be used to connect the gauges to the active gauge controllers.

ACS 2000

Single Channel Controller

VACUUM MEASUREMENT	
Sensor connections	1
Measurement range	4 · 10⁻¹⁰ mbar - 1.2 bar
Set-points	2
ELECTRICAL SPECIFICATIONS	
Voltage	100 VAC - 240 VAC
Frequency	50 Hz - 60 Hz
Analog output signal	
• Measuring value	0 - 10 VDC
• Interface	RS 232C
Output relays	
• Switching voltage max.	125 VAC (0.3 A)
• Switching current max.	1 A (30 VDC)
Power consumption	< 50 VA
Protection	IP 30
ENVIRONMENTAL SPECIFICATIONS	
Temperature	
• Storage	- 20 °C / + 60 °C
• Operation	+ 5 °C / + 50 °C
Weight	1.3 kg



- DIGITAL DISPLAY
- OUTPUT RELAYS
- RS 232 INTERFACE
- UNIVERSAL VOLTAGE

Ordering information	P/N	Power cable	P/N
ACS 2000	112711	USA	103567
Sensor cable 5 m	112752	Europe	103566
Sensor cable 10 m	112753	UK	104411
Sensor cable 20 m	112754	Italy	104758
		Switzerland	103718

COMPATIBLE GAUGES



ACM 2000

Multi Channel Controller

VACUUM MEASUREMENT	
Sensor connections	3
Measurement range	4 · 10⁻¹⁰ mbar - 1.2 bar
Set-points	2/channel
ELECTRICAL SPECIFICATIONS	
Voltage	100 VAC - 240 VAC
Frequency	50 Hz - 60 Hz
Analog output signal	
• Measuring value	0 - 10 VDC
• Interface	RS 232C
Output relays	
• Switching voltage max.	125 VAC (0.3 A)
• Switching current max.	1 A (30 VDC)
Power consumption	< 100 VA
Protection	IP 30
ENVIRONMENTAL SPECIFICATIONS	
Temperature	
• Storage	- 20 °C / + 60 °C
• Operation	+ 5 °C / + 50 °C
Weight	2.1 kg



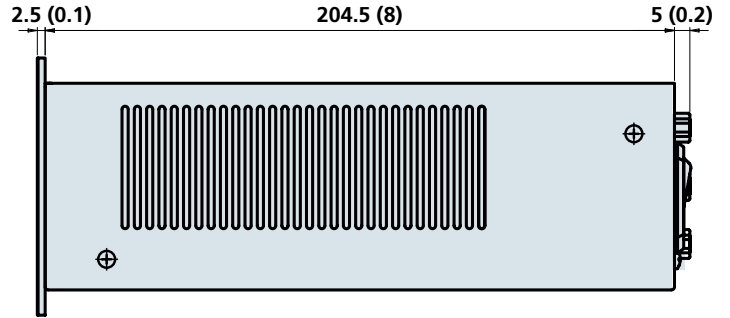
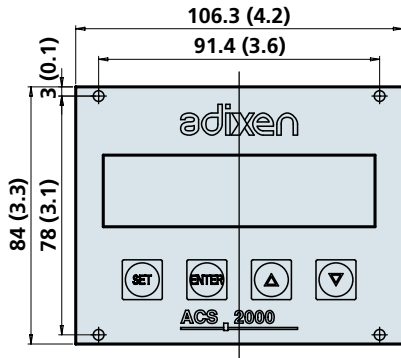
- DIGITAL AND GRAPH DISPLAY
- OUTPUT RELAYS
- RS 232 INTERFACE
- UNIVERSAL VOLTAGE

Ordering information	P/N	Power cable	P/N
ACM 2000	112712	USA	103567
Sensor cable 5 m	112752	Europe	103566
Sensor cable 10 m	112753	UK	104411
Sensor cable 20 m	112754	Italy	104758
		Switzerland	103718

COMPATIBLE GAUGES

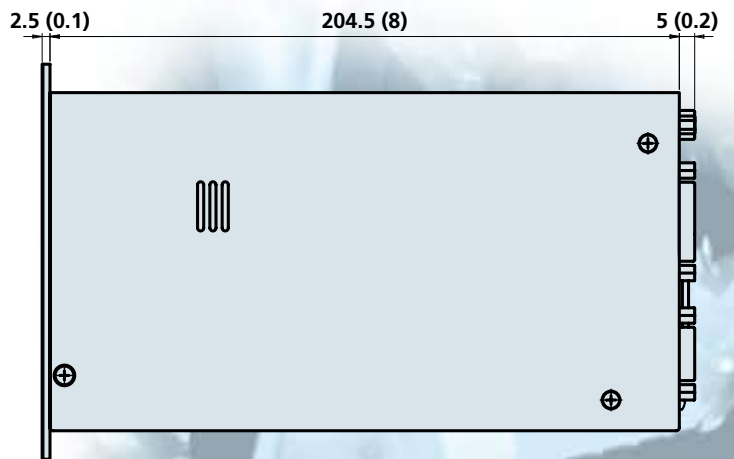
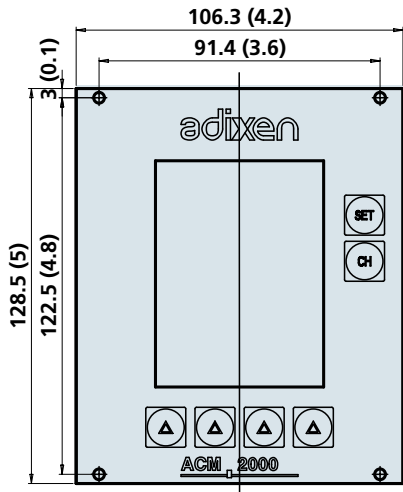


Dimensions ACS 2000



Dimensions mm (inch)

ACM 2000



Dimensions mm (inch)

BD 101A - BD 101B - BD 121

Mechanical Pressure Gauges

		STAINLESS BOURDON PRESSURE GAUGES		
Model		BD 101A	BD 101B	BD 121
Pressure range	mbar	1 - 1000	1 - 1000	1 - 1000
Dial diameter	mm	57	100	100
Set-points		0	0	2
Non inductive contact ratings	mm	-	-	30 VA
Pneurop standard fitting	DN ISO-KF	16	25	25
Weight	kg	0,16	0,65	0,8
Class		2,5	1,6	2,5
Accuracy	mbar	25	16	25



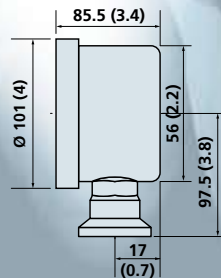
- TOTAL PRESSURE MEASUREMENT
- CORROSION RESISTANT
- ROBUST
- SET POINT

	PART NUMBER		
Model	BD 101A	BD 101B	BD 121
Manometer only	786408	786409	786410

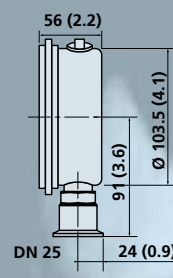


These manometers cover the pressure range from 1 to 1000 mbar. These models of Bourdon pressure gauges with analog display are available:

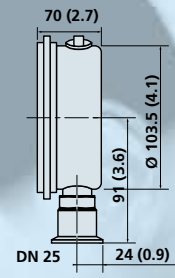
- **BD 101A** with stainless steel case and moving parts.
- **BD 101B** with stainless steel case and moving parts, adjustable travel and linearity.
- **BD 121** with stainless steel case and moving parts, adjustable travel and linearity, and two set points.



DN 16 ISO-KF
BD 101A



DN 25 ISO-KF
BD 101B



DN 25 ISO-KF
BD 121

Dimensions mm (inch)

The main technologies of vacuum measurement

There are a large range of vacuum measurement principles, but the most common are the following:

Gas dependant pressure gauges

Pirani gauge

A very fine wire stretched in a tube is heated by a current. It forms one arm of a Wheatstone bridge. When the pressure decreases, the cooling effect of the surrounding gas decreases. This effect causes an imbalance in the Wheatstone bridge which is adjusted to maintain the filament at a constant temperature. The voltage received is a function of the pressure.

Crystal gauge

The sensor of a crystal gauge is a quartz oscillator. The electrical impedance of the oscillation depends on the gas pressure. Friction between the quartz surface and gas molecules varies as the pressure changes. The crystal gauge measures the electrical impedance of the quartz oscillator and converts it to a pressure value.

Cold cathode or Penning gauge

This sensor works by ionizing the gas whose pressure is being measured. The ions, which are subject to the combined influences of an electrical field and a magnetic field, are collected by an anode; they generate an electrical current which is a function of the pressure.

Hot cathode or Bayert-Alpert gauge

The heated filament in a Bayert-Alpert gauge emits electrons which ionize gas molecules by colliding with them. The ions are then gathered by a collector and the current is a function of the pressure.

Absolute pressure gauges

Bourdon manometer

Mechanical pressure gauges or absolute pressure gauges measure the pressure directly using the force it exerts against a surface. In the Bourdon pressure gauge, the force exerted by the pressure is used to deform a tube.

Capacitance gauge

The principle on which this type of sensor works is based on the elastic distortion of a flat circular diaphragm. 2 metallic electrodes on the diaphragm form a capacitor. The charge of the capacitor varies depending on the distance electrodes/diaphragm. The distortion generates a current in proportion to the pressure.



Some vocabulary

Direct sensors and indirect sensors

Direct or absolute pressure sensors measure the actual force exerted by the gas. Thus their measurement is independent of the type of gas.

Indirect pressure sensors measure an effect that is the result of a change in pressure, thus their measurements depend on the properties of the gas being measured. These gauges are calibrated to dry nitrogen, and the actual pressure of other gasses (He, Ne, Kr, ...) can be easily displayed by applying a correction factor.

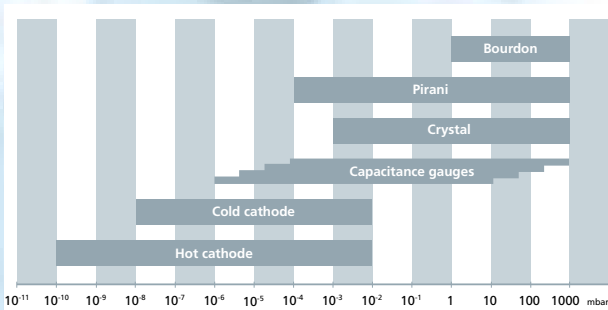
Active gauges

Active gauges have on-board electronics to allow the gauge to be used without a controller. They can send the pressure signal directly to a controller or data collection system using 0-10 V, set-points or RS 485. This saves cost and footprint in many installations.

The digital display is available, if needed to display the pressure or provide power to the gauges.

Combined gauge

The combined gauge uses 2 or more sensor technologies in one gauge head. This allows a wider range of pressure measurement than can be achieved with any single gauge technology.



**China**

Alcatel Vacuum
Technology Shanghai
Tel: (8621) 5027 0628
Fax: (8621) 3895 3815

Italy

Alcatel Vacuum
Systems S.p.A.
Tel: (39) 039 686 3855
Fax: (39) 039 667 125

Netherlands

Alcatel Vacuum
Technology Netherlands
Tel: (31) 345 478 400
Fax: (31) 345 531 076

Taiwan

Alcatel Vacuum
Technology Taiwan
Tel: (886) 3 5599 230
Fax: (886) 3 5599 231

France

Alcatel Vacuum
Technology France
Tel: (33) 04 50 65 77 77
Fax: (33) 04 50 65 77 89

Japan

Alcatel-Lucent Japan Ltd
Tel: (81) 3 6431 7130
Fax: (81) 45 544 0049

Singapore

Alcatel-Lucent Singapore
Tel: (65) 6254 0828
Fax: (65) 6254 7018

United Kingdom

Alcatel Vacuum
Technology (U.K.)
Tel: (44) 1 506 418 000
Fax: (44) 1 506 418 002

Germany

Alcatel Hochvakuum
Technik GmbH
Tel: (49) 9342 96 10 0
Fax: (49) 9342 96 10 30

Korea

Alcatel Vacuum
Technology Korea
Tel: (82) 31 206 6277
Fax: (82) 31 204 6279

Sweden

Adixen Sensistor AB
Tel: (46) 13 35 59 00
Fax: (46) 13 35 59 01

USA

Alcatel Vacuum
Products
Tel: (1) 781 331 4200
Fax: (1) 781 331 4230

Alcatel Vacuum Technology France
98, avenue de Brogny - BP 2069 - 74009 ANNECY CEDEX - FRANCE - Tel.: (33) (0) 4 50 65 77 77 - Fax: (33) (0) 4 50 65 77 89
www.adixen.com

An Alcatel-Lucent Company