

1276 Series: *Intrinsically Safe Acoustic Emission Products certified for use in hazardous and gaseous environments*

... Acoustic Emission products for explosive environments. . .

Some applications require Acoustic Emission (AE) equipment to be connected within hazardous gaseous environments, where there is risk of ignition or explosion. It is important to have AE monitoring equipment that has been certified as Intrinsically Safe (IS) for use in these environments. **Physical Acoustics Corporation's 1276** family of products have been certified to operate within the highest and most hazardous gas groups, allowing them to be used in any hazardous environment requiring IS certified instruments acoustic emission products.

1276 Intrinsically Safe Product Series

The 1276 Series of intrinsically safe products series includes 9 certified sensors, a preamplifier, an ASL 4-20ma output subsystem and IS barrier, providing a complete AE monitoring solution for hazardous environments. These products carry an ATEX certification "II (1) G D" and a certification of EEx ia IIC-T4, meaning that the products are certified to be used in locations where explosive gas/air and ignitable dust mixtures are always present. These gases include hydrogen and acetylene, the most easily ignitable gases.

The 1276 family of products can be broken down into two applications:

- ♦ **AE Continuous Monitoring:** The 1276-1 Series, when used with an IS barrier and any one of 9 certified IS sensors, provides an ASL (Average Signal Level) 4-20 milliamp output for (3 wire) direct connection to process control equipment for detecting leaks in piping, plant and valves, and monitoring process conditions throughout the plant. The 1276-1 provides an ASL output throughout the standard Acoustic Emission dynamic range of 0 – 100dB.
- ♦ **AE Preamplifier/Sensor for use with traditional AE Equipment for inspection and on-line monitoring:** The 1276-2 is an IS preamplifier which is used with an IS barrier and any one of 9 certified IS sensors which is connected to standard AE Instruments (which are located outside the hazardous area for conducting traditional periodic AE testing and evaluation of plant equipment or for use in permanent on-line monitoring applications.

Model 1276-1 / 1276-2 Intrinsically Safe Subsystem and Preamplifier

Both units are enclosed in an IP65 rated cases with gland connectors on both the input and output and are available with a wide variety of intrinsically safe sensors and

selectable filters. The electronics are housed in a shielded metal case that results in a very low noise operation. It is also compatible for use with commercially available barriers and cables. The Subsystem also contains a low noise internal preamplifier and a 4-20mA current loop output.



Features

- ♦ Intrinsically safe
- ♦ Low noise
- ♦ Input protection
- ♦ Work with 9 different frequency range IS sensors
- ♦ Wide dynamic range
- ♦ High input impedance
- ♦ Selectable filter ranges

Intrinsically Safe Sensors

PAC's intrinsically safe sensors were designed specially to meet Intrinsic Safety (IS) requirements and IP65 environmental requirements. These sensors are fully insulated and an epoxy coating with a standard one-meter long integral cable. They have similar frequency response as other standard sensors. The maximum operating

Type	Model	Description
ASL Subsystem	1276-1	ASL (Average Signal Level) 4-20 mA current loop output
Preamplifier	1276-2	Low noise, 20/40 dB gain
Sensors	ISR.45	3 - 30 kHz operating frequency
	ISR1.5	5 - 20 kHz operating frequency
	ISR3	20 - 55 kHz operating frequency
	ISR6	35 - 100 kHz operating frequency
	ISR15	50 - 200 kHz operating frequency
	ISR30	100 - 400 kHz operating frequency
	ISR50	100 - 700 kHz operating frequency
	ISWD	Wideband, 100 - 1000 kHz operating frequency
	ISD9203B	150 - 1000 kHz operating frequency
Barrier	1276B	Barrier
Cable	1276C	Provides connection between 1276 and barrier in hazardous area

Model 1276 Series of Intrinsically Safe Acoustic Emission Products

Sensor Model	Dimensions	Weight w/ Cable (gm)	Peak Sensitivity Ref (V/(m/s) [V/mbar])	Frequency Range (kHz)
ISR.45	1.3"Dx1.7"H 3.3cmx4.32cm	155	87 [N/A]	3 - 30
ISR1.5	1.3"Dx1.4"H 3.3cmx3.56cm	120	87 [N/A]	5 - 20
ISR3	1.3"Dx1.4"H 3.3cmx3.56cm	120	62 [-65]	100 - 170
ISR6	0.9"Dx0.8"H 2.3cmx2.03cm	33	76 [-63]	35 - 100
ISR15	0.9"Dx0.8"H 2.3cmx2.03cm	27	69 [-62]	50 - 200
ISR30	0.9"Dx0.8"H 2.3cmx2.03cm	27	58 [-64]	100 - 400
ISR50	0.9"Dx0.8"H 2.3cmx2.03cm	27	62 [-65]	100 - 700
ISWD	0.9"Dx0.8"H 2.3cmx2.03cm	27	55 [-63]	100 - 1000
ISD9203B	0.9"Dx0.8"H 2.3cmx2.03cm	27	65 [-60]	150 - 1000

1276-2 IS Preamplifier Specifications

- **Dynamic Range:** > 90 dB @ 20 dB gain
- **Noise:** < 2 mV RTI
- **Output:** 2 V p-p into 50 Ω
- **Power:** 11 – 11.5 VDC
- **Operating Current:** 20 mA
- **Operating Temp.:** -40°C to +70°C



temperature is 125 °C.

Sensor Features

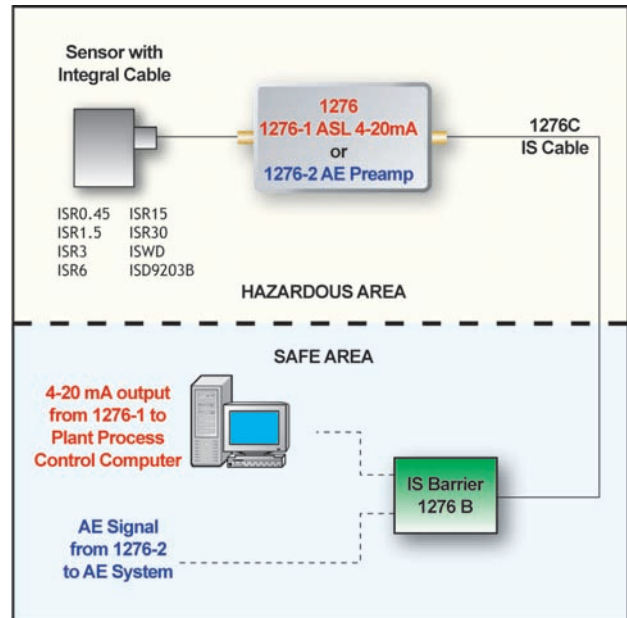
- ◆ Intrinsically Safe
- ◆ Insulated epoxy case
- ◆ Pigtail connector for direct connect to 1276
- ◆ Insulated ceramic face

Subsystem and Preamplifier Barrier and Cable Requirements:

- **Barrier Requirements:** $10\text{ V} \leq V_o \leq 12\text{ V}$, $I_o \leq 163\text{ mA}$, $P_o \leq 0.49\text{ W}$
- **Suggested Barrier:** 1276B
- **Cable Requirements:** Total capacitance $\leq 0.2\mu\text{F}$, L/R Ratio $\leq 75\ \mu\text{H}/\text{ohm}$
- **Suggested Cable:** 1276C

1276-1 IS Subsystem Specifications

- **Dynamic Range:** > 90 dB
- **Noise:** < 2 mV RTI
- **Output:** 4-20 mA ASL based output corresponding to 0 - 100dB AE
- **Power:** 11 – 11.5 VDC
- **Operating Current:** 35 mA
- **Operating Temp.:** -40°C to +70°C
- **Dimension:** 5.92" L x 2.5" W x 1.38" H
15.04 cm x 6.35 cm x 3.50 cm
- **Weight:** 0.81 lb. (360 grams)



Ordering Information

1276-1 - ☒ - ☒ and 1276-2 - ☒ - ☒

50	kHz LP filter	[1]	3	kHz HP filter	[1]
100	kHz LP filter	[2]	10	kHz HP filter	[2]
200	kHz LP filter	[3]	30	kHz HP filter	[3]
400	kHz LP filter	[4]	100	kHz HP filter	[4]
1000	kHz LP filter	[5]	200	kHz HP filter	[5]



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