

IE414 & IE514 Sensors

Passive Gauge for IM540 Controller

The IE414 and IE514 are high-end vacuum sensors based on hot cathode ionization effect. The IE414 is a Bayard-Alpert gauge while the IE514 is based on the extractor principle. These passive gauges are combined and controlled by the IM540 vacuum gauge controller. Thanks to the modulation of the cathode emission current, their measurement range spans over 10 decades from 1×10^{-2} mbar down to 1×10^{-12} mbar (extractor).

ADVANTAGES

- High accuracy of the measurements due to individually calibrated sensing system
- Exchangeable cathode
- High temperature bake-out 400 °C

IE414

- Bayard-Alpert sensing principle
- Measurement range to 2×10^{-11} mbar (1.5×10^{-11} Torr)
- Protection shield welded in place

IE514

- Extractor sensing principle
- Reliable to 1×10^{-12} mbar (0.75×10^{-12} Torr)
- Significant reduction of X-ray and ion desorption effects

APPLICATIONS

- Scientific and R&D applications requiring precise vacuum measurement in the ultra-high vacuum range and high temperature bake-out

OPERATING UNITS

- Vacuum Gauge Controller IM540



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ORDERING INFORMATION

Type	IE414	IE514
Sensor DN 40 CF	399-661	399-676
Replacement cathode	399-663	399-677

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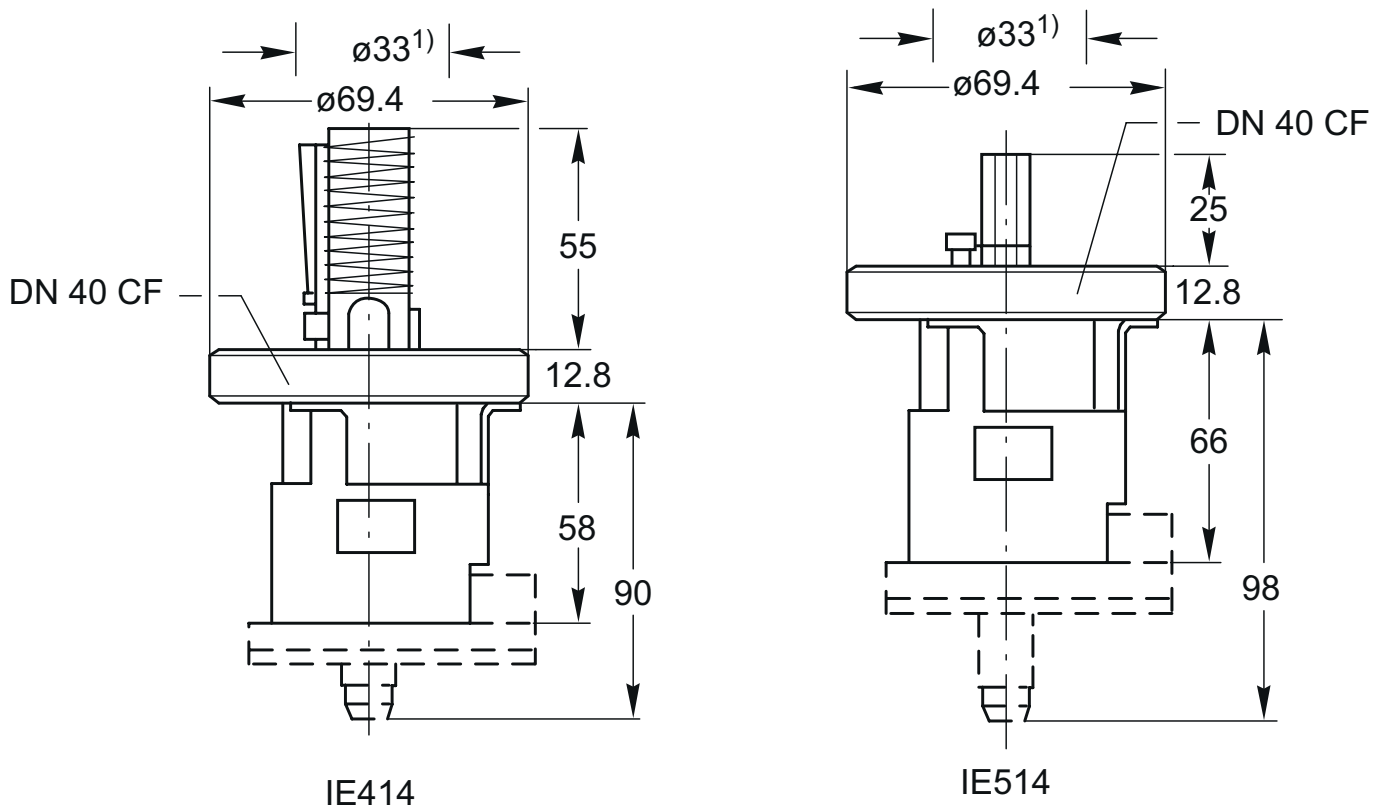
SPECIFICATIONS

Type	IE414	IE514
Materials		
Lead-in pins	NiFe	NiFe
Insulator	Al ₂ O ₃ ceramic	Al ₂ O ₃ ceramic
Pin sealing plate	NiFe	NiFe
Flange	stainless steel	stainless steel
Cathode	iridium with yttrium oxide coating	iridium with yttrium oxide coating
Anode	Pt/Ir 90/10 and Mo/Pt wrapped wire	Mo and CoNiCr
Collector	tungsten	tungsten
Reflector	NiFe	NiFe
Flange connection	DN 40 CF	
Electrode system configuration	Bayard-Alpert	Extractor system
Ambient temperature during operation	+20 ... +80 °C	
Max. flange temp. with gauge head cable	250 °C	
Max. bake-out temperature without plug	400 °C	
Storage temperature	+20 ... +50 °C	
Relative humidity		
Annual average	≤65% (non-condensing)	
On 60 days	≤85% (non-condensing)	
Use	within indoor rooms only, altitude up to 2000 meters above sea level	
X-ray limit	<1 × 10 ⁻¹¹ mbar	<1 × 10 ⁻¹² mbar
Upper limit of measuring range	1 × 10 ⁻² mbar	1 × 10 ⁻⁴ mbar
Lower limit of measuring range	2 × 10 ⁻¹¹ mbar	2 × 10 ⁻¹² mbar
Heat resistant gauge head cable		
Max. bake-out temperature	200 °C (250°C at the gauge head flange)	
Insulation materials used	PTFE, PEEK	
Length	5 m	
Collector potential	0 V	
Cathode potential	+80 V	+100 V
Anode potential	220 V	
Reflector potential	-	+205 V
Emission current range	0.1 ... 10mA	1.6 mA
Cathode heater		
current	1.5 A	1.5 A
voltage	3 V	3.7 V
Sensitivity for nitrogen	17 mbar	6.25 mbar
Max. power when baking out	90 mA / 480 V	45 mA / 480 V

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DIMENSIONS

[mm]



- 1) Diameter electrical feedthrough vacuum side.