

IONIVAC ITR 90 ITR 90 P

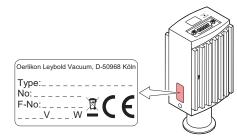
Instruction Sheet KA 09.420/3.02 Incl. Declaration of Conformity

Part Numbers 120 90 120 91 120 92 120 94 230 030 230 031



Product Identification

In all communications with Oerlikon Leybold Vacuum, please specify the information given on the product nameplate. For convenient reference transfer this information into the diagram below.



Validity

This document applies to products with the following part numbers:

ITR 90 Without display:

120 90 (DN 25 ISO-KF)

120 92 (DN 40 CF-R)

ITR 90 With display

120 91 (DN 25 ISO-KF) 120 94 (DN 40 CF-R)

- 120 94 (DN 40 CF-K)
- ITR 90 P (with Profibus interface and switching functions) 230 030 (DN 25 ISO-KF) 230 031 (DN 40 CF-R)

The part number (No) can be taken from the product name plate.

If not indicated otherwise in the legends, the illustrations in this document correspond to the gauge with part number 120 90. They apply to the other gauges by analogy.

We reserve the right to make technical changes without prior notice.

All dimensions in mm.

Intended use

The Hot Ion Combi Gauges ITR 90 and ITR 90 P have been designed for vacuum measurement of non-flammable gases and gas mixtures in a pressure range $5\times10^{-10}\ldots1000$ mbar. The gauges can be operated in connection with the COMBIVAC® IT23 or with another evaluation unit.

Functional Principle

Over the whole measurement range, the Hot Ion Combi Gauges have a continuous characteristic curve and its measuring signal is output as logarithm of the pressure.

The gauge functions with a Bayard Alpert hot cathode ionization measurement system (for p < 2.0×10^2 mbar) and a Pirani measurement system (for p > 5.5×10^3 mbar). In the overlapping pressure range of 2.0×10^2 ... 5.5×10^3 mbar a mixed signal of the two measurement systems is output. The hot cathode is switched on by the Pirani measurement system only below the switching threshold of 2.4×10^2 mbar (to prevent filament burn-out). It is switched off when the pressure exceeds 3.2×10^2 mbar.

Trademark

COMBIVAC[®] Oerlikon Leybold Vacuum

Safety

Symbols Used

STOP DANGER Information on preventing any kind of physical injury.

WARNING

Information on preventing extensive equipment and environmental damage.

Caution

Information on correct handling or use. Disregard can lead to malfunctions or minor equipment damage.

Personnel Qualifications

Skilled personnel

All work described in this document may only be carried out by persons who have suitable technical training and the necessary experience or who have been instructed by the end-user of the product.

General Safety Instructions

- Adhere to the applicable regulations and take the necessary precautions for the process media used.
 Consider possible reactions with the product materials.
 Consider possible reactions (e.g. explosion) of the process media due to the heat generated by the product.
- Adhere to the applicable regulations and take the necessary precautions for all work you are going to do and consider the safety instructions in this document.
- Before beginning to work, find out whether any vacuum components are contaminated. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.

Communicate the safety instructions to all other users.

Liability and Warranty

Oerlikon Leybold Vacuum assumes no liability and the warranty becomes null and void if the end-user or third parties

- · disregard the information in this document
- use the product in a non-conforming manner
- make any kind of changes (modifications, alterations etc.) to the product
- use the product with accessories not listed in the product documentation.

The end-user assumes the responsibility in conjunction with the process media used.

Transmitter failures due to contamination or wear and tear as well as expendable parts (filaments) are not covered by the warranty.

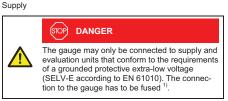
Technical Data

In some points, the technical data of ITR 90 P differ from those of ITR 90, which are given below (→ "Technical Data" in □ [1] and [2]).

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measurement units



Choosing the measurement unit \rightarrow [1]

mbar (default).

Torr. Pa

Voltage at gauge24 VDC $(20 \dots 28 \text{ VDC})$
 $(\leq ripple 2 V_{pp})^{2/}$ Power consumption
standard $\leq 0.5 \text{ A}$
degas
 $\leq 0.8 \text{ A}$
emissions start (200 ms)Power consumption
Fuse necessary ¹⁾ $\leq 1.25 \text{ AT}$

Oerlikon Leybold Vacuum controllers fulfill these requirements.

The minimum voltage of the power supply must be increased proportionally to the length of the measuring cable.

Electrical connection Sensor cable	Connection, D Sub 15 poles,			p :	= 10 ^{(U-7.75)/0.7}	5+c
for analog values only without degas-function	4 poles plus screening			U	р	с
for analog values				[V]	[mbar]	0
with degas-function	5 poles plus screening			[V]	[Pa]	2
all functions incl. RS232C interface	7 poles plus screening			[V]	[Torr]	-0.125
Cable length (24 VDC)	≤35 m (4/5/7x0.25 mm²) ≤50 m (4/5/7x0.34 mm²) ≤100 m (4/5/7x1.0 mm²)	where	p U c	pressure measuring constant (g signal pressure unit d	lependent)
For operation with RS232C						. ,
interface	≤30 m					

Gas	type	depend	lence
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г

For gases other than air, the pressure in the indication range $p < 10^{-3}$ mbar can be determined by a simple conversion:

$p_{eff} = K \times pressure indicated$					
Gas type	Calibrati factor (Gas type		oration tor C
He Ne Kr Ar	5.9 4.1 0.5 0.8		air, O ₂ , CO, N ₂ H ₂ Xe	2	.0 2.4 0.4

120 90, 120 91, 230030 120 92, 120 94, 230031 ≈34 cm³ Pressure ≤2 bar (absolute) Admissible temperatures storage –20 ... +70 °C 0 ... +50 °C operation 150 °C bake out (without electronics unit) Relative humidity ≤65% (no condensation) vear's mean during 60 days ≤85% (no condensation) Use indoors only atitude up to 2000 m Type of protection IP 30

stainless steel

glass

Мо

Ir,Y₂O₃

W. Cu

 $\approx 24 \text{ cm}^3$

NiFe nickel plated

Dimensions

side

screens

isolator

cathode

Internal volume

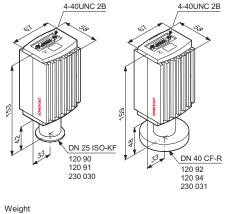
feedthrough

cathode holder

Pirani element

Materials on the vacuum

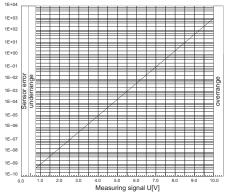
housing, supports,



Weight		
120 90,	120 91	285 g
120 92,	120 94	550 g
230030		430 g
230031		695 g

Measuring signal vs. pressure

Pressure p [mbar



Installation

Vacuum Connection



Caution: overpressure in the vacuum system >1 bar Injury caused by released parts and harm caused by escaping process gases can result if clamps are opened while the vacuum system is pressurized. Do not open any clamps while the vacuum system is pressurized. Use the type clamps which are suited to overpressure.

(STOP) DANGER

Caution: protective ground

DANGER

Incorrectly grounded products can be extremely hazardous in the event of a fault. The gauge must be electrically connected to the

grounded vacuum chamber. This connection must conform to the requirements of a protective connection according to EN 61010: · CF connection fulfill this requirement

For gauges with a KF flange, use a conductive metallic clamping ring

/!\ Caution

Caution: vacuum component Dirt and damages impair the function of the vacuum component.

When handling vacuum components, take appropriate measures to ensure cleanliness and prevent damages.

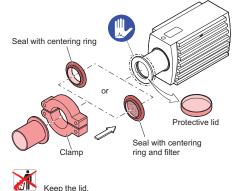
/! Caution Caution: dirt sensitive area

Touching the product or parts thereof with one's bare hands increases the desorption rate. Always wear clean, lint-free gloves and use clean tools when working in this area.

R The gauge may be mounted in any orientation. To keep condensates and particles from getting into the measuring chamber preferably choose a horizontal to upright position and possibly use a seal with a centering ring and filter.

The gauge is supplied with a built in grid. For potentially con-taminating applications and to protect the electrodes against light and fast particles, installation of the optional baffle is recommended (\rightarrow [1]).

Remove the protective lid and install the product at the vacuum system.

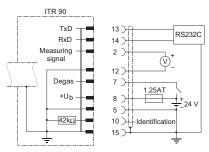


Power connection

P The following information on the electrical connection as well as the wiring diagram applies to ITR 90 only ($\rightarrow \square$ [1] and [2] for details on the electrical connection and additional functions of ITR 90 P).

PP Make sure the vacuum connection is properly made $(\rightarrow$ "Vacuum Connection").

A If no connection cable is available, make one according to the following diagram.

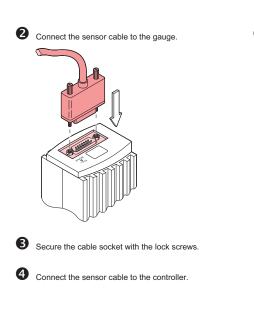


Electrical connection

LICCUIC	arconnection	
Pin 2	Signal output (measuring signal)	0 +10 V
Pin 5	Supply common, GND	
Pin 7	Degas on, active high	+24 VDC
Pin 8	Supply	+24 VDC
Pin 10	Gauge identification	
Pin 12	Signal common, GND	\frown
Pin 13	RS232C, TxD	
Pin 14	RS232C, RxD	g1
Pin 15	Shielding, housing, GND	Ŭ ∷
	3, 4, 6, 9 and 11 are	
not cor	nected internally.	15 + + 8



soldering side



Operation

When the voltage is supplied, the measuring signal is available between pins 2 and 12. (Relationship between measuring signal and pressure \rightarrow "Technical Data").

ITR 90 P can also be operated via the corresponding fieldbus interface ($\rightarrow \square$ [1] and [2] for further details and functions).

Allow for a stabilizing time of ≈ 10 minutes. Once the gauge has been switched on, permanently leave it on irrespective of the pressure.

Gas type dependence

The measurement value is gas dependent. The display applies to dry air, O₂, CO, and N₂. For other gases, it has to be converted (\rightarrow "Technical data").

Adjusting the gauge

The adjustment of ITR 90 P (\rightarrow \square [1] and [2]) is slightly different from the procedure for ITR 90, which is described below.

The gauge is factory calibrated. If used under different climatic conditions or in a different position, through ageing or contamination and after exchanging the sensor, the characteristic curve can be offset and readjustment can become necessary. Only the Pirani element can be adjusted and only at atmosphere.

Readjustment becomes necessary if

- at atmosphere the output voltage is <10 V or the display reading is <atmosphere
- when ventilating the vacuum system, the output voltage reaches 10 V before the measured pressure has reached atmosphere. (Gauges with display will show the error "5" at atmosphere (Pirani sensor warning).
- If you are using a seal with centering ring and filter, check that they are clean or replace them if necessary.



Operate the gauge for 10 minutes at atmospheric pressure. If the gauge was operated within Ioni range, a cooling-down time of approx. 30 minutes is to be expected (gauge temperature = environmental temperature).

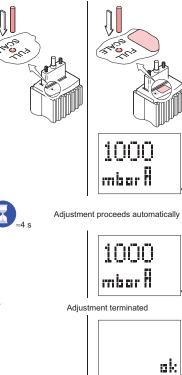


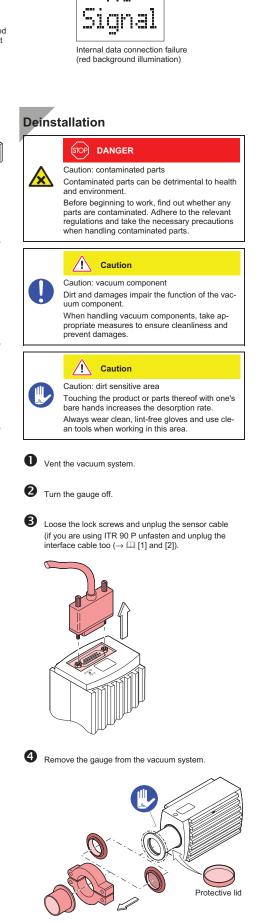
120 90 120 91

ITR 90 Without display ITR 90 With display

120 92 120 94

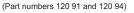
Insert a pin (~ α 1.3×50mm) through the opening marked <FULL SCALE> and push the button inside for at least 5 seconds.

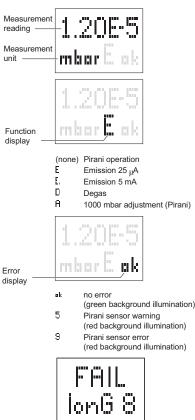




F"11"1

Display





ā

loni sensor error (red background illumination)

Maintenance, Repair

In case of severe contamination or a malfunction, the sensor can be replaced ($\rightarrow \square$ [1]).

Transmitter failures due to contamination or wear and tear as well as expendable parts (filaments) are not covered by the warranty.

Returning the Product

nation

WARNING

Caution: forwarding contaminated products Contaminated products (e.g. radioactive, toxic, caustic or microbiological hazard) can be detrimental to health and environment. Products returned to Oerlikon Leybold Vacuum should preferably be free of harmful substances. Adhere to the forwarding regulations of all involved countries and forwarding companies and enclose a duly completed declaration of contami-

Products that are not clearly declared as "free of harmful substances" are decontaminated at the expense of the customer.

Products not accompanied by a duly completed declaration of contamination are returned to the sender at his own expense.

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	Caution: contaminated parts Contaminated parts can be detrimental to health and environment. Before beginning to work, find out whether any parts are contaminated. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.	The r of an which to he
	WARNING	
	Caution: substances detrimental to the environ- ment Products or parts thereof (mechanical and elec- tric components, operating fluids etc.) can be detrimental to the environment. Dispose of such substances in accordance with the relevant local regulations.	
After disa	ng the components issembling the product, separate its components g to the following criteria:	
Conta biolog ance v	minated components minated components (radioactive, toxic, caustic, or ical hazard etc.) must be decontaminated in accord- with the relevant national regulations, separated ling to their materials, and recycled.	T Lega
Such	components components must be separated according to their ials and recycled.	We he comp costs patch Organ
Furth	er Information	Addre Post o
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[3]	www.oerlikon.com
	Interface Manual
	IONIVAC
	SB 09.421/1.02
	Oerlikon Leybold Vacuum GmbH, D-50968 Köln

Declaration of Contamination

The service, repair, and/or disposal of vacuum equipment and components will only be carried out if a correctly completed declaration has been submitted. Non-completion will result in delay. This declaration may only be completed (in block letters) and signed by authorized and qualified staff.

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Legally binding declaration:



This form can be downloaded from our website

Copies: Original for addressee 1 copy for accompanying documents 1 copy for file of sender

Declaration of Conformity

We, Oerlikon Leybold Vacuum, hereby declare that the equipment mentioned below complies with the provisions of the Directive relating to electrical equipment designed for use within certain voltage limits 2006/95/EC and the Directive relating to electromagnetic compatibility 89/336/EEC.

IONIVAC ITR 90 ITR 90 P

Part numbers

120 90	
120 91	
120 92	
120 94	
230 030	
230 031	

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Standards

Harmonized and international/national standards and specifications:

EN 61010	(Safety requirements for electrical equip- ment for measurement, control and laboratory use)
EN 61000-6-2	(Electromagnetic compatibility generic immunity standard)
EN 61000-6-3	(Electromagnetic compatibility generic emission standard)

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