Vacuum Pumps | Instrumentation | Fittings and Valves

LEYBOLD

LEYBOLD VACUUM

GA 09.309 / 4.02

PR 25
PR 35, PR 36
Gauge head

Cat. No.
157 52 ; 157 51 ; 157 53

Operating Instructions

LEYBOLD-Service

If a gauge head is returned to LEYBOLD VACUUM GmbH, indicate whether the gauge head is free of substances damaging to health or whether it is contaminated. If it is contaminated also indicate the nature of hazard. LEYBOLD must return any gauge head without a declaration of contamination to the sender's address.

General Note

The right of alterations in the design and the technical data is reserved.
The illustrations are not binding.

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1 Description

1.1 General

These Operating Instructions contain important information on the start-up, operation and maintenance of the PENNINGVAC gauge heads.

Important remarks concerning operational safety and protection are emphasized as follows:

Warning Indicates procedures that must be strictly observed to prevent hazards to persons.

Caution Indicates procedures that must be strictly observed to prevent damage to, or destruction of, the PENNINGVAC gauge heads.

Note
Indicates special technical requirements that the user must comply with.

The references to diagrams, e.g. (3/8), consist of the Fig. No. and the Item No. in that order.

Unpack the PENNINGVAC gauge head immediately after delivery, even if it is to be put into operation at a later date. The gauge head has to be visually examined in a very careful way.

Before doing so, examine the shipping container for any damage. Then completely remove the packaging materials.

Note
The shipping container and packaging must be kept in case of complaints.

If any damage is discovered, report it immediately to the forwarding agent and insurer. If the damaged part has to be replaced, please get in touch with the orders department.

1.1.1 Purpose

The PENNINGVAC gauge heads are operated with the corresponding operating units PENNINGVAC PM 31, COMBIVAC CM 31, 32, 33 for the measurement of pressures according to the technical data.

The PENNINGVAC gauge heads can be connected to the PENNING transmitter PTR 100.

The PENNINGVAC gauge heads can also be connected to older operating units such as COMBITRON CM 330, CM 350 / CM 351 and PENNINGVAC PM 310.

1.2 Technical Data

Measurement principle	gas discharge
Measurement range	$1 \cdot 10^{-9}$ to 10^{-2} mbar
Permissible gases	all gases which will not attack Cr, Mo, Nb, NiFe, NiCr, glass and ceramics
Permissible overpressure	10 bar abs. (26 bar testing pressure)
Ambient temperature	80 °C
Measurement volume	
PR 25	approx. 21 cm^3
PR 35, PR 36	approx. 18 cm^3
Vacuum connection	
PR 25	DN 25 KF
PR 35	DN 40 KF
PR 36	DN 40 CF
Dimensions	see Figs. 1 and 2
Weight	
PR 25, PR 35	0.75 kg
PR 36	0.80 kg

1.3 Technical Description

The PENNINGVAC gauge heads consist of a housing with a DN 25 KF, DN 40 KF resp. DN 40 CF connection flange, a permanent magnet and a protection cap. The actual measurement chamber of the gauge head contains the anode ring with the anode pin and the cathode plate.

Measurement chamber, cathode plate (PR 35 and PR 36) and anode ring are made of non-magnetic stainless steel. The anode pin is made of NiCr. The anode ring of the PR 25 is equipped with an additional ignition aid. The cathode plate of the PR 25 is made of titanium for a longer service life especially for argon operation.

On the cathode plate of thePR 35 / PR 36 there are two circulat areas which have been blast-cleaned and which - when built-in - exactly face the anode ring. This improves the ignition capability of the gauges in the medium pressure range.

Because of the smaller vacuum opening the PR 25

gauge head has a specially shaped cathode plate made of titanium which also acts as a baffle.

The current leadthrough of the gauge heads are made of ceramics. In order to protect the heads against dirt, a ceramics disc with a hole is pushed over the leadthrough pin.

1.4 Equipment

1.4.1 Scope of delivery

	Cat. No.
Gauge head PR 25	157 52
Gauge head PR 35	157 51
Gauge head PR 36	157 53
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1.4.2 Accessories

Baffle for PR 35	Ref. No. 411 78 105

1.4.2.1 Gauge head cables

	Cat. No.
Gauge head cable 5 m	162 88
Gauge head cable 10 m	162 89
Gauge head cable 20 m	157 56

1.4.2.2 Vacuum accessories for PR 25 and PR 35

	Cat. No.
Small flange DN 25 KF, steel, with long tubulation	183 95
Small flange DN 40 KF, steel, with long tubulation	183 96
Small flange DN 25 KF, stainless steel, with long tubulation	868 53
Small flange DN 40 KF, stainless steel, with long tubulation	868 55
Centering ring DN 25 KF, aluminium, with Perbunan gasket	183 27
Centering ring DN 40 KF, aluminium, with Perbunan gasket	183 28
Centering ring DN 25 KF, stainless steel with Vitilan gasket	883 47
Centering ring DN 40 KF, stainless steel with Vitilan gasket	883 48
Clamping ring DN 25 KF	183 42
Clamping ring DN 40 KF	183 43
Ultra sealing ring DN 40 KF	883 18
Clamping ring for ultra sealing ring DN 40 KF	882 78

1.4.2.3 Vacuum accessories for PR 36

	Cat. No.
CF flange DN 40 CF with stainless steel tubulation	835 53
Gasket for CF flange made of Cu (Set of ten)	839 43
Screws for CF flange (Set of screws, nuts and washers)	839 01

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2 Operation

The dimensions of the PENNINGVAC gauge heads are given in Figs. 1 and 2.

2.1 Vacuum connection

The gauge head is connected via a DN 25 KF / DN 40 KF small flange with centering and clamping ring to the vacuum system. In the case of CF flanges a copper gasket must be inserted between the flanges.

All gauges should be located as close as possible to the point where the pressure is to be measured.

Except in cases where there is the risk of considerable contamination of the gauge head, the gauge head shoud be mounted a short distance away (behind a bend).

In the case of long and narrow connections the measured pressure will be too low, mainly because of gas consumption by the gauge head. The gauge head may be mounted in any position, but preferably not at the lowest

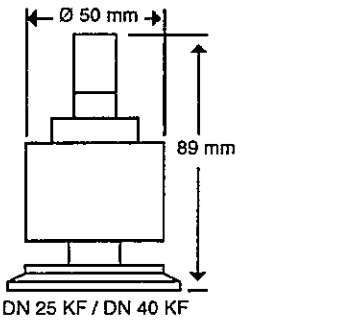

Fig. 1 Dimensional drawing PR 25 and PR 35

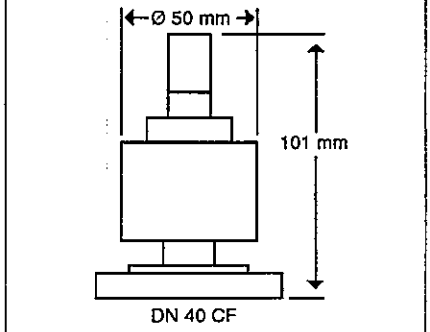

Fig. 2 Dimensional drawing PR 36

point of the vacuum system, so that the gauge head is not contaminated by any occurring condensates.

2.2 Electrical connection

Caution When connecting the gauge head cable **special care must be taken** to plug the cable end equipped with the **socket contact** onto the pins of the gauge head connector.

The knurled screw on the plug is used to lock the connection.

3 Maintenance

3.1 Cleaning of the gauge head

To clean the gauge, pull out anode ring (3/3), ceramic disc (3/4) and cathode plate (3/8) inside the housing (see Section 3.2). If required, clean the anode ring with abrasive emery cloth. Do **not** treat cathode plates with circular blast-cleaned areas with abrasive emery cloth since this may reduce the ignition capability of the gauge.

Note
Dirty cathode plates must be exchanged.

In order to provide protection against soiling of the bushing, the gauge heads will be supplied, from now on, with a ceramic disk between the anode ring and the bushing.

The position of the disk is shown in Fig. 3.

The ceramic disk must be cleaned or replaced every time the anode ring is cleaned or replaced, or every time the gauge heads are cleaned.

No cleaning is required when exchanging the cathode plate and the anode ring. Refer to Section 3.2.

Cleaning with the usual solvents such as benzine, alcohol, carbon tetrachloride or trichlorethylene is only successful with moderately contaminated gauge heads.

After removing the emery paper residues and reassembly of the components, any fingerprints and other residues have to be removed by rinsing the gauge head with a solvent, followed by a drying period.

For thorough cleaning of the gauge head cell it is recommended to dismantle the permanent magnets. Only then it is possible to flush out from the measuring chamber any iron filings attracted by the magnets.

Key to Fig. 3

1 Small flange DN 25 KF; DN 40 KF; DN 40 CF
2 Gauge head body
3 Anode ring with ignition pin
4 Ceramic disc
5 Current leadthrough
6 Connection socket
7 Anode pin
8 Cathode plate

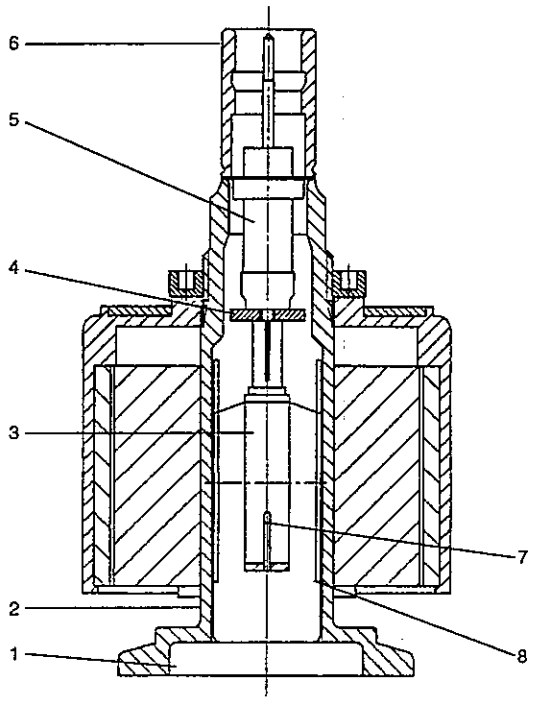

Fig. 3 Sectional view of the PENNINGVAC gauge head PR 25

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Caution It is not permitted to clean the gauge heads by means of wet blasting, as the ceramic bushing is able to absorb water. The leakage current which results then causes the pressure to be shown on the operating device as higher than it actually is.

3.2 Mechanical maintenance

3.2.1 Removing the anode ring and the cathode plate

With a pair of flat nose pliers it is possible to remove the anode ring and the cathode plate (3/8) fixed elastically in the measurement chamber from the measurement chamber.

Replace or clean the removed parts (see Section 3.1).

After having inserted the anode ring it should be strictly observed that the two open sides of the anode ring are equally distant from the cathode plate and that the ignition pins don't touch the chamber (distance approx. 1 mm)

Note
The ceramics disc (3/4) must be exchanged each time the anode ring or the cathode plate is exchanged or cleaned.

3.2.2 Detaching the permanent magnet

Detach the gauge head cable.

Unscrew and remove the nut on the protection cap.

Remove the protection cap and the magnet.

Clean as described in Section 3.1.

Reassemble in the reverse order.

3.3 Service at LEYBOLD's

If you send a gauge head to LEYBOLD VACUUM GmbH indicate whether the gauge head is free of substances damaging to health or whether it is contaminated. If it is contaminated also indicate the nature of hazard. To do so, you must use a preprinted form which we shall send to you upon request.

A copy of this form is printed at the end of the Operating Instructions: „Declaration of Contamination of Vacuum

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Equipment and Components".

Either fasten this form at the gauge head or simply enclose it to the gauge head.

This declaration of contamination is necessary to comply with legal requirements and to protect our staff. LEYBOLD must return any gauge head without a declaration of contamination to the sender's address.

4 Spare parts list

Gauge head Cat. No.	PR 25 157 52	PR 35 157 51	PR 36 157 53
Set of stainless steel cathode plates (10 pcs.) and ceramic discs (10 pcs.)	--	162 94	162 94
Set of titanium cathode plates (5 pcs.) and ceramic discs (5 pcs.)	162 91	--	--

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Declaration of Contamination of Vacuum Equipment and Components

The repair and/or service of vacuum equipment and components will only be carried out if a correctly completed declaration has been submitted. Non-completion will result in delay. The manufacturer could refuse to accept any equipment without a declaration.
This declaration can only be completed and signed by authorized and qualified staff.

1. Description of Vacuum Equipment and Components

- Equipment type/model: _____
- Code No.: _____
- Serial No.: _____
- Invoice No.: _____
- Delivery date: _____

2. Reason for Return

_____
_____
_____
_____
_____
_____

3. Condition of the Vacuum Equipment and Components

- Has the equipment been used?
  yes ☐ no ☐
- What type of pump oil/liquid was used? _____
- Is the equipment free from potentially harmful substances?
  yes ☐ (go to Section 5)
  no ☐ (Go to Section 4)

4. Process related Contamination of Vacuum Equipment and Components:

- toxic	yes ☐	no ☐
- corrosive	yes ☐	no ☐
- explosive*)	yes ☐	no ☐
- biological hazard*)	yes ☐	no ☐
- radioactive*)	yes ☐	no ☐
- other harmful substances	yes ☐	no ☐

*) Vacuum equipment and components which have been contaminated by biological explosive or radioactive substances, will not accepted without written evidence of decontamination!

Please list all substances, gases and by-products which may have come into contact with the equipment:

Trade name Product name Manufacturer	Chemical name (or Symbol)	Dangerous material class	Measures if spillage	First aid in case of human contact
1.				
2.				
3.				
4.				
5.				

5. Legally Binding Declaration

I hereby declare that the information supplied on this form is complete and accurate. The despatch of the contaminated vacuum equipment and components will be in accordance with the appropriate regulations covering Packaging, Transportation and Labelling of Dangerous Substances.

Name of organisation or company: _____

Address: _____ Post code: _____

Tel.: _____

Fax: _____ Telex: _____

Name: _____

Job title: _____

Date: _____ Company stamp:

Legally binding signature: _____

Order No.: 2121

Copies: Page 1 (white) to manufacturer or representative - Page 2 (yellow) attach to consignment packaging securely - Page 3 (blue) copy for file of sender

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