
INTERNATIONAL STANDARD



4010

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Road vehicles — Calibrating nozzle, delay pintle type

Véhicules routiers — Injecteur d'essai du type à téton et à étranglement

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4010 was developed by Technical Committee ISO/TC 22, *Road vehicles*, and was circulated to the member bodies in February 1976.

It has been approved by the member bodies of the following countries :

Australia	Iran	South Africa, Rep. of
Austria	Italy	Spain
Belgium	Japan	Sweden
Bulgaria	Mexico	Switzerland
Czechoslovakia	Netherlands	Turkey
France	New Zealand	United Kingdom
Germany	Poland	U.S.A.
Hungary	Romania	Yugoslavia

No Member Body expressed disapproval of the document.

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Road vehicles – Calibrating nozzle, delay pintle type

1 SCOPE

This International Standard specifies a nozzle intended for the testing and setting of injection pumps on injection pump test benches.

2 FIELD OF APPLICATION

The exact limit of the field of application depends upon the test values specified for the injection pump. The applicability is to be verified in each case by the pump manufacturer and stated on the pump test specification for each pump. The probable range goes up to 150 mm³/stroke.

NOTE – A new calibrating nozzle type is under consideration to cover the whole range up to 300 mm³/stroke.

3 REFERENCE

ISO 2697, *Road vehicles – Fuel injection nozzles – Size "S"*.

4 DESIGNATION OF THE CALIBRATING NOZZLE

The nozzle designation shall be marked on that part of the shank protruding beyond its cap nut. This designation is the number of this International Standard.

5 DIMENSIONS

See figure 1.

The clearance of the valve in its guide shall be the minimum which allows free working of the valve when the nozzle is used for pump testing and setting purposes.

All other dimensions of the nozzle are those of type B of ISO 2697. However, the two dowel holes are dropped.

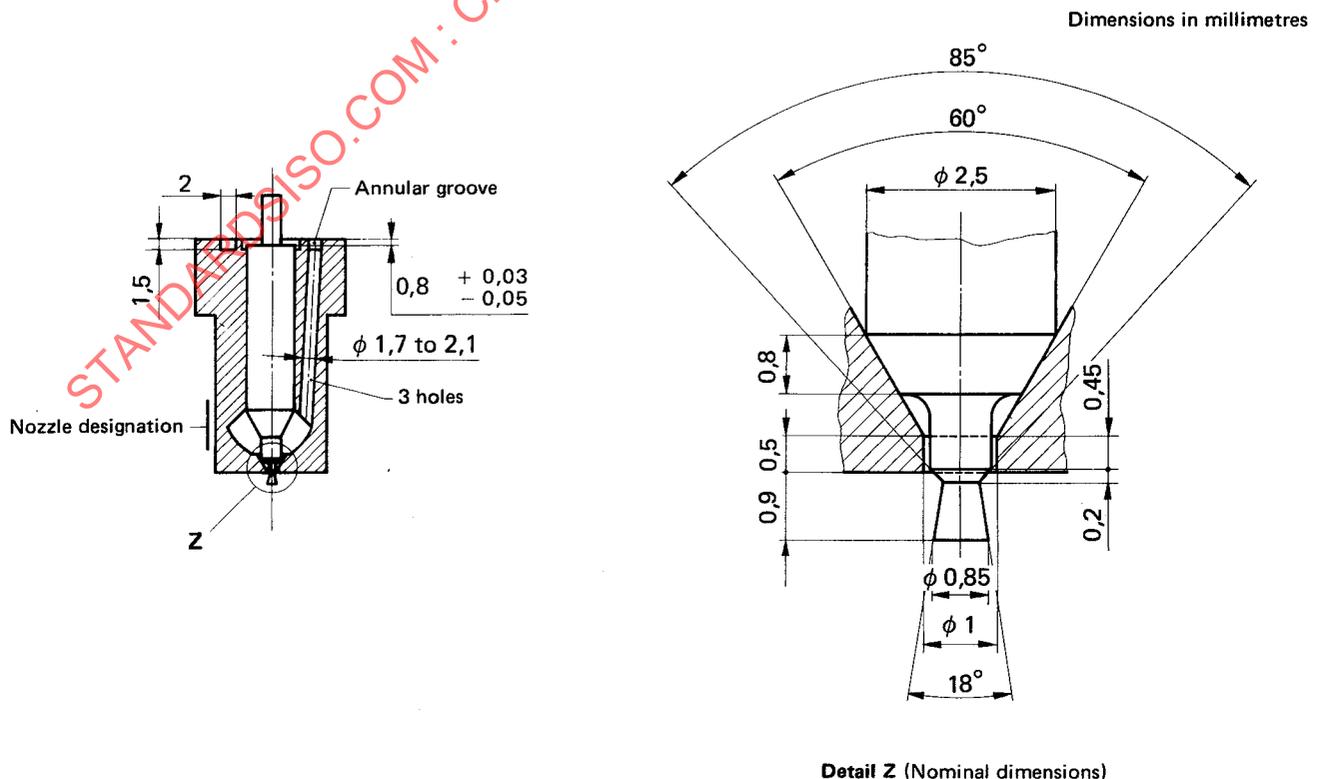


FIGURE 1 – Nozzle cross-section

6 FLOW CHARACTERISTICS FOR AIR

The tolerance values indicated are based on

- an ambient pressure of 0,98 bar;¹⁾
- an ambient air temperature of + 20 °C.

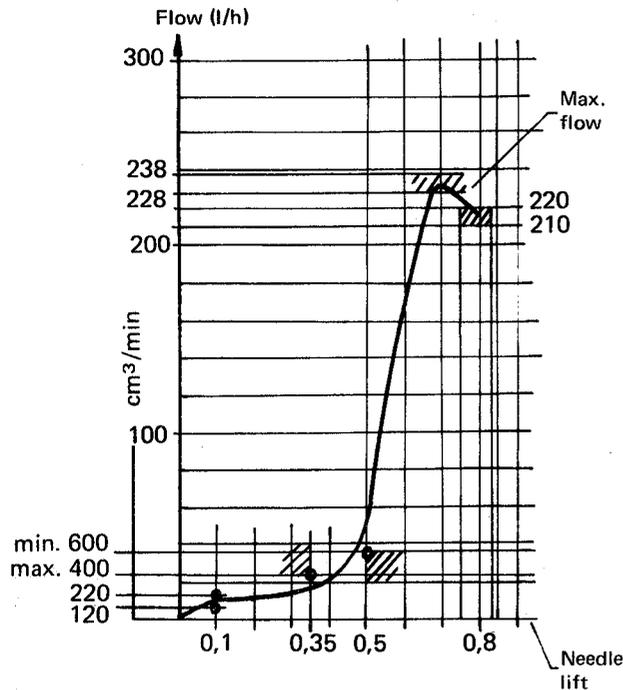


FIGURE 2 – Flow diagram

TABLE – Control values

Needle lift mm	Flow	
	cm ³ /min	l/h
0,1	120 to 220	
0,35	< 400	
0,5	> 600	
Lift at maximum flow		228 to 238
End of lift		210 to 220

Calibrated measuring tubes with a measuring precision of ± 0,5 % of the value indicated shall be used.

7 MEASURING CONDITIONS

The flow indicated by the measuring device is proportional to the effective cross-section of the nozzle ($Q \sim A$), if sound velocity is reached respectively in the effective cross-section and at the outlet of the nozzle.

In order to ensure that this always happens in practice, a pressure (p_e) of at least 0,6 bar below the ambient pressure (p_a) must always be available at the nozzle outlet when measuring.

The value indicated by the flowmeter depends upon the actual ambient conditions at the measuring site during the measurement (pressure, air temperature).

To obtain comparable results, the reading of the flowmeter must be corrected to the calibrating conditions of the flowmeter manufacturer. This corrected value must, in addition, be corrected to the conditions of this International Standard upon which the diagram in figure 2 is based (pressure 0,98 bar, temperature 20 °C) according to the laws of thermodynamics.

1) 1 bar = 10⁵ N/m²

8 MEASURING DEVICE (SCHEMATIC) FOR MEASURING THE AIR FLOW WITH A FLOATING BODY FLOWMETER

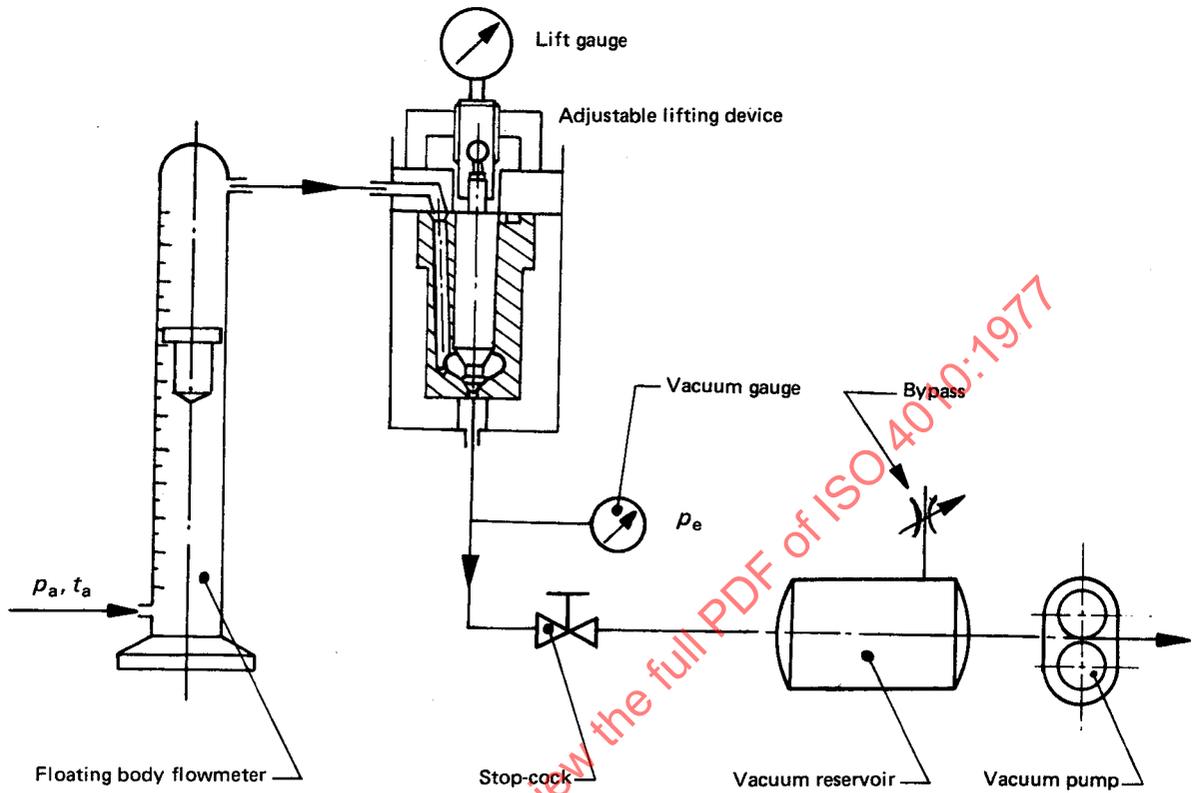


FIGURE 3 — Measuring installation (schematic)

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