

This is a preview of "ISO 9300:2005". [Click here to purchase the full version from the ANSI store.](#)

Second edition
2005-08-15

Measurement of gas flow by means of critical flow Venturi nozzles

Mesure de débit de gaz au moyen de Venturi-tuyères en régime critique



Reference number
ISO 9300:2005(E)

© ISO 2005

This is a preview of "ISO 9300:2005". [Click here to purchase the full version from the ANSI store.](#)

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO 2005

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

This is a preview of "ISO 9300:2005". Click here to purchase the full version from the ANSI store.

Contents

Page

Foreword.....	iv
1 Scope	1
2 Terms and definitions.....	1
2.1 Pressure measurement	1
2.2 Temperature measurement.....	2
2.3 Venturi nozzles.....	2
2.4 Flow.....	2
3 Symbols	5
4 Basic equations	6
4.1 State equation	6
4.2 Flow-rate under ideal conditions	6
4.3 Flow-rate under real conditions	6
4.4 Critical mass flux	7
5 Applications for which the method is suitable	7
6 Standard critical flow Venturi nozzles (CFVN).....	7
6.1 General requirements.....	7
6.2 Design	8
7 Installation requirements	11
7.1 General.....	11
7.2 Upstream pipeline.....	11
7.3 Large upstream space.....	12
7.4 Downstream requirements	12
7.5 Pressure measurement	12
7.6 Drain holes	13
7.7 Temperature measurement.....	13
7.8 Density measurement.....	13
7.9 Calculated density	14
8 Calculation methods.....	14
8.1 Mass flow-rate	14
8.2 Discharge coefficient, $C_{d'}$	14
8.3 Critical flow function, C_* , and real gas critical flow coefficient, C_R	15
8.4 Conversion of measured pressure and temperature to stagnation conditions.....	15
8.5 Maximum permissible downstream pressure.....	16
9 Uncertainties in the measurement of flow-rate	17
9.1 General.....	17
9.2 Practical computation of uncertainty	18
Annex A (normative) Venturi nozzle discharge coefficients	19
Annex B (normative) Tables of values for critical flow function C_* — Various gases.....	21
Annex C (normative) Computation of critical mass flux for natural gas mixtures.....	28
Annex D (normative) Mass flow correction factor for atmospheric air	32
Annex E (normative) Computation of critical mass flux for critical flow nozzles with high nozzle throat to upstream pipe diameter ratio, $\beta > 0,25$.....	33
Bibliography	36

This is a preview of "ISO 9300:2005". [Click here to purchase the full version from the ANSI store.](#)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 9300 was prepared by Technical Committee ISO/TC 30, *Measurement of fluid flow in closed conduits*, Subcommittee SC 2, *Pressure differential devices*.

This second edition cancels and replaces the first edition (ISO 9300:1990), which has been technically revised.