

---

---

**Cryogenic vessels — Pilot operated  
pressure-relief devices —**

**Part 4:  
Pressure-relief accessories for  
cryogenic service**

*Réipients cryogeniques — Dispositifs de sécurité pour le service  
cryogénique —*

*Partie 4: Dispositifs de sécurité pour la pression à pilotage automatique*



This document is a preview generated by EVS



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2012

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](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

Foreword .....	iv
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions .....	1
4 Requirements .....	3
4.1 General .....	3
4.2 Design .....	3
4.3 Materials .....	4
5 Qualification and testing .....	5
5.1 Type approval .....	5
5.2 Type approval tests .....	6
5.3 Production testing .....	8
6 Determination of the certified coefficient of discharge ( $K_{dr}$ ) .....	8
7 Set pressure tolerances .....	8
8 Re-seating pressure .....	8
9 Cleanliness .....	8
10 Marking .....	8
10.1 Marking on the shell body of the main valve .....	8
10.2 Marking on the body of the pilot valve .....	8
10.3 Marking on an identification plate .....	9
10.4 Additional marking .....	9
11 Sealing .....	9
Bibliography .....	10

## 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 21013-4 was prepared by Technical Committee ISO/TC 220, *Cryogenic vessels*.

ISO 21013 consists of the following parts, under the general title *Cryogenic vessels — Pressure-relief accessories for cryogenic service*:

- *Part 1: Reclosable pressure-relief valves*
- *Part 2: Non-reclosable pressure-relief devices*
- *Part 3: Sizing and capacity determination*
- *Part 4: Pressure-relief accessories for cryogenic service*

# Cryogenic vessels — Pilot operated pressure-relief devices —

## Part 4:

## Pressure-relief accessories for cryogenic service

### 1 Scope

This part of ISO 21013 specifies the requirements for the design, manufacture and testing of pilot operated pressure-relief valves for cryogenic service, i.e. for operation with cryogenic fluids in addition to operation at temperatures from ambient to cryogenic. This part of ISO 21013 is restricted to valves not exceeding a size of DN 300 designed to relieve single phase vapours, gases, or mixtures of gases and/or vapours.

This part of ISO 21013 does not provide methods for determining the capacity of relief valve(s) for a particular cryogenic vessel. Such methods are provided in ISO 21013-3.

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4126-4:2004, *Safety devices for protection against excessive pressure — Part 4: Pilot operated safety valves*

ISO 15761, *Steel gate, globe and check valves for sizes DN 100 and smaller, for the petroleum and natural gas industries*

ISO 21010, *Cryogenic vessels — Gas/materials compatibility*

ISO 21028-1, *Cryogenic vessels — Toughness requirements for materials at cryogenic temperature — Part 1: Temperatures below – 80 °C*

ISO 21028-2, *Cryogenic vessels — Toughness requirements for materials at cryogenic temperature — Part 2: Temperatures between – 80 °C and – 20 °C*

ISO 23208, *Cryogenic vessels — Cleanliness for cryogenic service*

ASME B16.34, *Valves flanged, threaded and welding end*

EN 12516-2:2004, *Industrial valves — Shell design strength — Part 2: Calculation method for steel valve shells*

EN 12516-3:2002, *Valves — Shell design strength — Part 3: Experimental method*

EN 12516-4:2008, *Industrial valves — Shell design strength — Part 4: Calculation method for valve shells manufactured in metallic materials other than steel*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

#### 3.1

##### **valve**

complete assembly consisting of the main valve and its pilot valve