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English Version

## Gas Infrastructure - CEN/TC 234 Pressure Definitions - Guideline Document

Infrastructures gazières - Définitions des pressions du  
CEN/TC 234 - Lignes directrices

Gasinfrastruktur - CEN/TC 234 Druckdefinitionen -  
Leitliniendokument

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## Foreword

This document (CEN/TR 16395:2012) has been prepared by Technical Committee CEN/TC 234 “Gas Infrastructure”, the secretariat of which is held by DIN.

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

Operating pressure levels of gas infrastructure differ from one country to another in the European Union. This is due to many different factors, such as the history of gas systems, technologies and materials used and technical constraints.

When beginning to draft the functional standards on gas infrastructure, CEN/TC 234 recognised various pressure levels and ranges in the European member countries, which are to some extent laid down in national laws.

To form a consensus for the standardisation work, all pressure levels used in Europe have been brought together and classified in ranges. This subdivision in pressure levels should permit the manufacturers of components to focus on a limited number of designs in order to reduce the costs.

## Introduction

### Background

The standards issued by CEN/TC 234 "Gas Infrastructure" contain a large number of definitions used for the design, testing and operation of the different parts of the gas infrastructure.

This document clarifies the CEN/TC 234 concept behind the definitions and advises how to use the definitions correctly and consistently. In order to further that goal, an inventory of existing definitions is compiled and the primary definitions are identified.

This document also gives guidance for the selection of components falling into the scope of the European Pressure Equipment Directive (PED) [15] and used in the gas infrastructure.

Apart from the issue of the consistency of the pressure definition in the standards, there is also the issue of the pressure rating of equipment and systems. Other classifications (e.g. PN or class) do not necessarily completely coincide with the classification as defined in the CEN/TC 234 standards.

### Concept of pressure conditions

On one hand, three different sets of pressure conditions are to be considered:

- conditions during testing and commissioning ( $P_1$ );
- conditions during exceptional operating circumstances ( $P_2$ );
- conditions during normal operation ( $P_3$ ).

where:

$$P_1 > P_2 > P_3$$

The maximum pressure levels related to these conditions are the topic of the primary definitions.

On the other hand, two other pressure conditions are used for specifying the system:

- pressure on which design calculations are based ( $p_A$ );
- pressure rating of the system ( $p_B$ ).

where

$$p_A > p_B.$$

The relationship between  $p_A$  and  $P_2$  or  $P_3$  is not uniform in the different CEN/TC 234 standards. This situation is confusing and undesirable. The recommended practice is stated in chapter 4.4 and 4.5 below and should be considered when revising standards or developing new standards.

**Piping versus pressure regulating installations**

Only two out of the three aforementioned conditions apply when specifying piping:

- conditions during testing and commissioning;
- operating conditions.

Normally for piping no distinction is made between normal operating conditions and exceptional operating conditions, as piping is a passive component. However, in gas infrastructure piping and pressure regulating installations both are present. This necessitates identification of the “normal operating conditions” and “exceptional operating conditions” of the pressure regulating installations and the “operating conditions” of the piping.

## 1 Scope

This Technical Report gives explanation on the pressure definitions used by the gas network operators with regard to the standards of CEN/TC 234 "Gas Infrastructure".

The European Standards of CEN/TC 234 comprise the functional requirements in the field of gas infrastructure from the input of gas into the on-shore transmission network up to the inlet connection of gas appliances, including transmission, distribution, storage, compression, pressure regulation and metering, installation, injection of non-conventional gases, gas quality issues and others.

## 2 Normative references

Not applicable.

## 3 Terms and definitions

### 3.1 Key pressure definitions used in CEN/TC 234 standards

#### 3.1.1

**design pressure**

**DP**

pressure on which design calculations are based

Note 1 to entry: A system designed for a design pressure (DP) can comprise components designed for a different maximum allowable pressure (PS).

#### 3.1.2

**maximum operating pressure**

**MOP**

maximum pressure at which a system can be operated continuously under normal operating conditions

Note 1 to entry: Normal operating conditions are: no fault in any device or stream.

Note 2 to entry: The set point of the regulator does not exceed MOP.

#### 3.1.3

**maximum incidental pressure**

**MIP**

maximum pressure which a system can experience during a short time, limited by the safety devices

### 3.2 Derived pressure definitions used in CEN/TC 234 standards

#### 3.2.1

**operating pressure**

**OP**

nominal pressure on which the system is operated

#### 3.2.2

**temporary operating pressure**

**TOP**

pressure at which a system can be operated temporarily under control of regulating devices