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**8.1 List of Regulations****8.1.1 Standards****8.1.1.1 European Standards**

**EN 1012** Compressors and Vacuum Pumps - safety requirements

**EN 286-1** Simple Unfired Pressure Vessels Designed to Contain Air or Nitrogen -  
Part 1: Design, Manufacture and Testing

**EN 292-1** Safety of Machinery - basic terms, general principles for design - Part 1: Basic Terminology, Methodics

**EN 292-2** Safety of Machinery - basic concepts, general principles for design -  
Part 2: Technical Principles and Specifications

**EN 294** Safety of Machinery - safety distances to prevent danger zones being reached by upper limbs

**EN 349** Safety of Machinery - minimum distances to prevent crushing of body parts

**EN 378** Refrigeration Systems and Heat Pumps - requirements for safety and environment

**EN 418** Safety of Machinery - EMERGENCY STOP Systems - functional aspects; design principles

**EN 563** Safety of Machinery - Accessible Surface Temperatures - ergonomic specifications for determination of temperature limits for hot surfaces

**EN 626** Safety of Machinery - principles for machine manufacturers for reduction of health risks from dangerous substances emanating from machines

**EN 837-1** Pressure Gauges - Part 1: Bourdon Tube Pressure Gauges - dimensions, measurement techniques, requirements and testing

**EN 1127** Safety of Machinery - fire and explosion, Part 1: Explosive Protection

**EN 31688** Recommended Practice in Design - low noise machinery

**EN 50014** Electrical Components for Hazardous Locations - general rules

**EN 50081-2** Electromagnetic Compatibility - radiated electromagnetic interference suppression requirements -  
Part 2: Industrial Process Measurement and Control Equipment

**EN 50082-2** Electromagnetic Compatibility - received electromagnetic interference requirements -  
Part 2: Industrial Process Measurement and Control Equipment

**EN 50099-1** Safety of Machinery - basic principles for indicators, controls (adjustment) and identification, -  
Part 1: Visible, Acoustic and Tactile Signals

**ENV 1070** Safety of Machinery - terminology

**EN 953** Safety of Machinery - general requirements for the design and construction of isolating protection devices (fixed, portable)

**EN 60204-1** Safety of Machinery - electrical equipment of machines - Part 1: General Requirements

**8.1.1.2 International Standards**

**ISO 1217** Acceptance Tests for Positive Displacement Compressors

**ISO 7183** Compressed Air Dryers - specification and measurement

**ISO 8573** General Use of Compressed Air  
(contamination and quality classes)

**ISO 3266** Eyebolts for General Lifting Purposes

**ISO 3457** Construction Machines - protective devices, terms and requirements

**ISO 3864** Safety Colours and Safety Symbols

**ISO 3857-1 & 2** Compressors, Pneumatic Tools and Machines - terms,  
Part 1: General, Part 2: Compressors

**ISO 4126** Safety Valves, Part 1: General Requirements

**ISO 6743-3A** Lubricants, Oils and Related Products (class L) - classification -  
Part 3A: Family D (compressors)

**ISO 6743-3B** Lubricants, Oils and Related Products (class L) - classification -  
Part 3B: Family D (gas and refrigerant compressors)

**ISO 7000** Graphical Symbols for Equipment;  
index and listing

**ISO 3753** Vacuum technology - graphical symbols

**IEC 417** Graphical Symbols for Equipment - list of terms,  
outline and summary of individual sheets

**8.1.1.3 British Standards**

**BS 1042** Methods of Measurement of Fluid Flow in Closed Conduits

**BS 1123** Specification for Safety Valves, Gauges and other  
Fittings for Air Receivers (ISO 4126)

**BS 1571** Specification for testing of Positive Displacement  
Compressors and Exhausters (ISO 1217)

**BS 1710** Identification of Pipelines (ISO/R 508)

**BS 1780** Bourdon Tube Pressure and Vacuum Gauges

**BS 2917** Specification for Graphical Symbols used on Diagrams for  
Fluid Power Systems and Components (ISO 1219)

**BS 5169** Fusion-Welded Air Receivers

**BS 5344** Methods for Acceptance Tests for Rotary  
and Percussive Pneumatic Tools (ISO 2787)

**BS 5500** Unfired Fusion-Welded Pressure Vessels (ISO/DIS 2694)

**BS 5791** Glossary of Terms for Compressors,  
Pneumatic Tools and Machines (ISO 3857)

**BS 6244** Code of Practice for Stationary Air Compressors  
(ISO 5393)

**BS 5543** Vacuum technology - graphical symbols

#### **8.1.1.4 German Standards**

**DIN 1945** Acceptance Tests for Positive  
Displacement Compressors

**DIN 1952** Flow Measurement Standards

**DIN 45635** Sound Measurement

**DIN 2481** Thermal Plants

**DIN 43903** Humidity in Compressed Air

**DIN 51506** Lubricating Oils for Compressors

**DIN 3188** Compressed Air for Breathing Apparatus

**DIN 13260** Supply Systems for Medicinal Gases

**DIN 43668** Interlocks for Cell or Cabinet Doors of  
Electrical Equipment

#### **8.1.2 Directives**

**VDI 2040/41** Basic Principles of Flow Measurement

**VDI 2045** Acceptance and Performance Tests

**VDE 0100** Regulations for the Construction of Power Plant  
with Rated Voltages up to 1000 Volt

**VDE 0105** Regulations for the Operation of Power Plant

**VDMA 4362** Small Reciprocating Compressors up to 2.0 m<sup>3</sup>/min  
Determination of the air delivery (capacity)

**89/392/EEC** Machinery Directive  
Annex IIA: Declaration of Conformity  
Annex IIB: Manufacturer's Declaration

**72/23/EEC** Low-Voltage Directive

**84/404/EEC** Directive for Simple Unfired Pressure Vessels

**89/336/EEC** Directive for Electromagnetic Compatibility

**84/533/EEC** Permissible Sound Power Level for  
Combustion Engine Driven Compressors

### **8.1.3 Recommendations (Pneurop)**

**PN 8 NT C 2.2** Measurement of Sound from Compressors  
and Vacuum Pumps

**PN 2 CPT C1** Acceptance Specification for Positive Displacement  
Compressor Elements

**PN 2 CPT C2** Acceptance Specification for Electrically Driven  
Positive Displacement Compressor Packages

**PN 2 CPT C3** Acceptance Specification for Combustion Engine Driven  
Positive Displacement Compressor Packages

### **8.1.4 German Regulations**

**VBG 4** Accident Prevention Regulation 7.0 of the German Employer's  
Liability Insurance Association: Electrical and Operating Equipment

**VBG 1** Compressors (APR 13.4)

**VBG 20** Refrigeration Equipment, Heat Pumps and Cooling Apparatus

**DruckbehV** Pressure Vessel Act

**TRB** Technical Regulations for Pressure Vessels

**GSG(V)** Regulations of the Equipment Safety Act

**BImSchV** Regulations of the Federal Emission Act

**WHG** Federal Water Protection Act

### **8.1.5 Associations**

**PNEUROP** European Committee of Manufacturers of  
Compressors, Vacuum Pumps and Pneumatic Tools

**CAGI** USA Compressed Air and Gas Institute

**VDMA** German Machinery and Plant Association

## 8.2 The CE Mark



CE = Communautés Européennes

Meaning: the product conforms to the corresponding directives

Valid from 1 January 1995

## 8.3 General Safety Regulations

Sufficient cooling must be ensured at all times. The conditions for installation laid down by the manufacturer must be observed.

No dangerous additives, e.g. toxic or hazardous gases, dust or other pollutants may be present. No open flame or sparks may occur.

The operating, maintenance and servicing instructions of the manufacturer must be kept to. Such work may only be carried out by trained or specialized personnel.

### **Preventive fire-fighting measures:**

A separate compressor space is recommended for compressors of drive power greater than 40 kW or multiple compressor installations.

Flooring, ceiling, enclosing walls and apertures in the compressor space must be fire resistant (constructed to fire resistance class F30).

No inflammable installation components (e.g. cable ducts) should be located above the compressor.

Provision for capturing leaking oil must be made.

No inflammable materials may be stored within a radius of 3 metres from the compressor.

If the exhaust cooling air is used for space heating, self-closing fire resistive flaps must be incorporated in the air ducting (DIN 4102, Part 6).