Focus tecnico

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Pneumatica EN ISO 4414

Info generali
e
Modulo raccolta dati per la

Estratto EN ISO 4414:2010

Pneumatica
Regole generali e requisiti di sicurezza
per i sistemi e i loro componenti

EN ISO 4414:2010
Pneumatica
Regole generali e requisiti di sicurezza
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La norma specifica le regole generali e i requisiti di sicurezza per i sistemi pneumatici e i loro componenti utilizzati sul macchinario come definito nella EN ISO 12100.
Essa tratta tutti i pericoli significativi associati ai sistemi pneumatici e specifica i principi da applicare al fine di evitare tali pericoli quando i sistemi sono installati per l'uso previsto.

This European Standard was approved by CEN on 6 November 2010.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Annex ZA
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 2006/42/EC on machinery.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements, except Essential Requirements 1.5.8 and 1.7.4.2 u), of that Directive and associated EFTA regulations.

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

6 Verification of safety requirements and acceptance testing

The pneumatic system shall be subjected to a combination of inspection and testing to verify that the identification of systems and components conforms to the system's specifications; the connection of components in the system complies to the circuit diagram; the system, including all safety components, functions correctly; there is no audible leakage, with the exception of functional air consumption, after the system is subjected to the maximum pressure that can be sustained under all conditions of intended use; leakage in a pneumatic system should be overcome by the observance of proper installation procedures.

NOTE
Because a pneumatic system might not be a complete machine, many verification procedures cannot be carried out until the pneumatic system is incorporated into the machine.

The results of verification by inspection and testing shall be documented.

B.2.3 Directional control valves; see 5.4.3

This category includes solenoid operated, air pilot operated, mechanically operated, manually operated, non-return (check), shuttle and other types.

Item number	Type	Rated pressure kPa (bar)	Rated flow rate $l \cdot min^{-1}$	Applicable standards	Supplier

B.2.4 Quick-exhaust valves; see 5.4.3

Item number	Type	Rated pressure kPa (bar)	Rated flow rate l·min–1	Applicable standards	Supplier

B.2.5 Miscellaneous valves; see 5.4.3

This category includes flow control, lockout, two-hand non-tie-down, press clutch safety, pressure relief, sequence, time-delay and slow-start/soft-start types.

Item number	Type	Rated pressure kPa (bar)	Rated flow rate l·min−1	Applicable standards	Supplier

B.2.6 Air preparation components; see 5.4.4

Filters (particulate, coalescing or vapour-removal type)
☐ with manual drains ☐ with automatic or semi-automatic drains

Item number	Type	Rated pressure kPa (bar)	Rated flow rate $l \cdot min^{-1}$	Applicable standards	Supplier

Regulators (relieving or non-relieving type) ☐ with pressure gauge ☐ without pressure gauge

Item number	Type	Rated pressure kPa (bar)	Control pressure range kPa (bar)	Maximum temperature °C	Applicable standards	Supplier

Lubricators

Item number	Type	Rated pressure kPa (bar)	Maximum temperature **°C**	Applicable standards	Supplier

Filter-regulators and filter-regulator-lubricator (FRL) units
☐ combine where practical ☐ keep units separate

B.2.7 Piping; see 5.4.5

Plastic piping ☐ not permitted

☐ permitted below…….kPa (…….bar)

Item number	Material	Maximum rated pressure kPa (bar)	Applicable standards	Supplier
Plastic piping, including tubes, connectors and supports				
Rigid piping, including tubes (steel and copper), connectors, supports, rotating joints, valve mounting manifolds, circuit manifolds				
Flexible piping, including hoses and hose fittings				

B.2.8 Auxiliary compressors

Item number	Type and description	Pressure kPa (bar)	Applicable standards	Supplier

B.2.9 Accessories

This category may include receivers, silencers, pressure switches, gauges, quick-action couplings, etc.

Item number	Type and description	Rated pressure kPa (bar)	Applicable standards	Supplier

B.2.10 Other components

Item number	Type and description	Applicable standards	Supplier

B.2.11 Component reliability

Where component reliability is required for safety-related parts of control systems, ISO 19973 can be useful. The system supplier may request the following information from the component manufacturer.

Item number	Component	MTTF[a]	B10 life[b]

[a] MTTF is the characteristic life for a Weibull distribution.
[b] B10 life may be specified for either the median life or the 95 % confidence level.

Bibliography

[1] *ISO 3740, Acoustics — Determination of sound power levels of noise sources — Guidelines for the use of basic standards*

[2] *ISO 3744, Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane*

[3] *ISO 3746, Acoustics — Determination of sound power levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane*

[4] *ISO 5782-1, Pneumatic fluid power — Compressed-air filters — Part 1: Main characteristics o be included in suppliers' literature and product marking requirements*

[5] *ISO 6301-1, Pneumatic fluid power — Compressed-air lubricators — Part 1: Main characteristics to be included in supplier's literature and product-marking requirements*

[6] *ISO 6953-1, Pneumatic fluid power — Compressed air pressure regulators and filter-regulators — Part 1: Main characteristics to be included in literature from suppliers and product-marking requirements*

[7] *ISO/TR 11688-1, Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning*

[8] *ISO 13732-1, Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces*

[9] *ISO 13849-1, Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

[10] *ISO 13849-2:2003, Safety of machinery — Safety-related parts of control systems — Part 2: Validation*

[11] *ISO 14121-1, Safety of machinery — Risk assessment — Part 1: Principles*

[12] *ISO 19973-1, Pneumatic fluid power — Assessment of component reliability by testing — Part 1: General procedures*

[13] *ISO 19973-2, Pneumatic fluid power — Assessment of component reliability by testing — Part 2: Directional control valves*

[14] *ISO 19973-3, Pneumatic fluid power — Assessment of component reliability by testing — Part 3: Cylinders with piston rod*

[15] *ISO 19973-4, Pneumatic fluid power — Assessment of component reliability by testing — Part 4: Pressure regulators*

[16] *IEC 60204-1:2009, Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

[17] *IEC 61000-6-2, Electromagnetic compatibility (EMC) — Part 6-2: Generic standards — Immunity for industrial environments*

[18] *IEC 61000-6-4, Electromagnetic compatibility (EMC) — Part 6-4: Generic standards — Emission standard for industrial environments*

[19] *IEC 61310-3, Safety of machinery — Indication, marking and actuation — Part 3: Requirements for the location and operation of actuators*