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Pneumatic fluid power — Assessment of component reliability by testing —

Part 5:

Non-return valves, shuttle valves, dual pressure valves (AND function), one- way adjustable flow control valves, quick-exhaust valves

*Transmissions pneumatiques — Évaluation par essais de la fiabilité
des composants —*

*Partie 5: Clapets anti-retour, vannes sélecteur de circuit, distributeurs
à deux pressions (fonction AND), limiteurs de débit réglable
monodirectionnel, purge rapide*



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Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Symbols and units	2
5 Test equipment	2
5.1 Basic test equipment.....	2
5.2 Connecting piping and volumes.....	5
6 Test conditions	5
6.1 General test conditions.....	5
6.2 Initial condition.....	5
6.3 Cycling frequencies.....	5
6.3.1 Non-return valves and one-way adjustable flow control valves.....	5
6.3.2 Pilot-operated non-return valves.....	6
6.3.3 Quick-exhaust valves.....	7
6.3.4 Shuttle valves and dual pressure valves (AND function).....	8
7 Test procedure	10
7.1 Timing of checks and measurements.....	10
7.2 Type and scope of checks and measurements.....	10
7.2.1 Functional check.....	10
7.2.2 Measurement of leakage.....	10
7.2.3 Measurement of shifting pressures.....	11
7.3 Recording of test data.....	11
8 Failure criteria and threshold levels	12
8.1 General.....	12
8.2 Functional failure.....	12
8.3 Failure due to leakage.....	12
8.4 Failure due to shifting pressures.....	12
8.5 Customised agreements.....	12
9 Data analysis	12
10 Test report	13
11 Identification statement (reference to this part of ISO 19973).....	13
Annex A (informative) Test data sheet	14
Bibliography	18

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.

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The committee responsible for this document is ISO/TC 131, *Fluid power systems*.

ISO 19973 consists of the following parts, under the general title *Pneumatic fluid power — Assessment of component reliability by testing*:

- *Part 1: General procedures*
- *Part 2: Directional control valves*
- *Part 3: Cylinders with piston rod*
- *Part 4: Pressure regulators*
- *Part 5: Non-return valves, shuttle valves, dual pressure valves (AND function), one-way adjustable flow control valves, quick-exhaust valves*

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Introduction

In pneumatic fluid power systems, power is transmitted and controlled through a gas under pressure within a circuit. Pneumatic fluid power systems are composed of components and are an integral part of various types of machines and equipment. Efficient and economical production requires highly reliable machines and equipment. This part of ISO 19973 is intended to provide requirements and test conditions that permit the assessment of the inherent reliability of pneumatic *non-return valves, shuttle valves, dual pressure valves (AND function), one-way flow control valves, quick-exhaust valves*.

It is necessary that machine producers know the reliability of the components that make up their machine's pneumatic fluid power system. Knowing the reliability characteristic of the component, the producers can model the system and make decisions on service intervals, spare parts inventory and areas for future improvements.

There are three primary levels in the determination of component reliability:

- a) preliminary design analysis: finite element analysis (FEA), failure mode and effect analysis (FMEA);
- b) laboratory testing and reliability modelling: physics of failure, reliability prediction, pre-production evaluation;
- c) collection of field data: maintenance reports, warranty analysis.

Each level has its application during the life of a component. A preliminary design analysis is useful to identify possible failure modes and eliminate them or reduce their effect on reliability. When prototypes are available, in-house laboratory reliability tests are run and initial reliability can be determined. Reliability testing is often continued into the initial production run and throughout the production lifetime as a continuing evaluation of the component. Collection of field data are possible when products are operating and data on their failures are available.