# ISO 9110-1:2020-05 (E)

## Hydraulic fluid power - Measurement techniques - Part 1: General measurement principles

## Contents

Page


Foreword ..... iv

Introduction ..... vi

1 Scope ..... 1

2 Normative references ..... 1

3 Terms and definitions ..... 1

4 Uncertainty of limit specifications ..... 2
4.1 General aspects ..... 2
4.2 Classes of measurement accuracy ..... 2

5 General measurement considerations and requirements ..... 2
5.1 Calibration ..... 2

6 Complete calibration procedure ..... 5
6.1 Selection of reference standard ..... 5
6.2 Procedure ..... 5

7 Instrument calibration uncertainty models ..... 6
7.1 General ..... 6
7.2 General procedure ..... 6
7.3 First order uncertainty model ..... 7
7.4 First order calibration uncertainty evaluation ..... 7
7.5 Second order uncertainty model ..... 7
7.6 Second order calibration uncertainty evaluation ..... 8
7.7 Third order uncertainty model ..... 8
7.8 Third order calibration uncertainty evaluation ..... 9

8 Readability uncertainty evaluation ..... 10
8.1 General ..... 10
8.2 Analog readout devices ..... 10
8.3 Digital readout devices ..... 12
8.4 Readout device records ..... 12

9 Assurance control techniques ..... 13

10 Total measurement uncertainty ..... 13
10.1 Determination of measurement system uncertainty ..... 13

Annex A (informative) Measurement system acceptance designated information sheet ..... 14

Annex B (informative) Uncertainty propagation ..... 15

Annex C (informative) Best practices tutorial ..... 16

Bibliography ..... 20