# ISO 21622-2:2023-07 (E)

## Irrigation techniques - Remote monitoring and control for irrigation - Part 2: Tests

## Contents

Page


Foreword ..... v

Introduction ..... vi

1 Scope ..... 1

2 Normative references ..... 1

3 Terms,definitionsandsymbols ..... 1
3.1 Terms and definitions ..... 1
3.2 Symbols ..... 2

4 Functionality ..... 2
4.1 General ..... 2
4.2 Power tests ..... 3
4.2.1 Consumption ..... 3
4.2.2 Power loss ..... 4
4.3 Solenoid valve outputs ..... 8
4.3.1 Opening/closing solenoid valves ..... 8
4.3.2 Voltage and current, simulating SV ..... 9
4.3.3 Solenoid valve pulse width duration ..... 10
4.3.4 Short circuit and open circuit ..... 11
4.3.5 Remote unit operation with real solenoids ..... 13
4.3.6 Association of sensors with solenoid valve outputs ..... 14
4.4 Counter entries ..... 16
4.4.1 Sensor power supply ..... 16
4.4.2 Flow calculation ..... 16
4.4.3 High flow alarm ..... 17
4.4.4 Low flow alarm ..... 17
4.4.5 Hardware pulse filtering -- Maximum pulse rate and minimum pulse width ..... 17
4.4.6 Maximum frequency between pulses ..... 17
4.4.7 Minimum frequency between pulses ..... 18
4.4.8 Pulse filtering by software with fixed time ..... 18
4.4.9 Software pulse filtering with configurable time ..... 18
4.4.10 Minimum time between pulses ..... 19
4.4.11 Maximum time between pulses ..... 19
4.4.12 "Open contact" test ..... 20
4.4.13 "Closed contact" test ..... 20
4.4.14 Random pulse counting test ..... 21
4.4.15 Concurrent pulse count test ..... 21
4.4.16 Counter events and alarms ..... 21
4.5 Analogue inputs ..... 22
4.5.1 General ..... 22
4.5.2 Measurement accuracy ..... 23
4.5.3 Events and alarms generated by the analogue input ..... 24
4.6 Other inputs and outputs ..... 27
4.6.1 Purpose of the test ..... 27
4.6.2 External signals ..... 27
4.6.3 Internal signals ..... 29
4.7 Operating logic ..... 29
4.7.1 General ..... 29
4.7.2 Low supply voltage safety interlock (lockout) test ..... 30

4.7.3 Low-pressure safety lockout test ..... 30
4.7.4 Excess flow (flow rate) safety shutdown test ..... 30

5 Robustness ..... 31
5.1 Environmental conditions ..... 31
5.1.1 General ..... 31
5.1.2 Solenoid valve actuation (SV) ..... 32
5.1.3 Counter pulses ..... 32
5.1.4 Analogue readout ..... 33
5.2 Power supply ..... 33
5.2.1 Polarity reversal in main power supply ..... 33
5.2.2 Short-circuit at the SV solenoid valve output ..... 33
5.3 Accidental wiring errors on inputs and outputs ..... 34
5.3.1 Purpose of the test ..... 34
5.4 Analogue input ..... 35
5.4.1 Overvoltage (analogue voltage input) ..... 35
5.4.2 Overcurrent (analogue input by current) ..... 35
5.4.3 Short circuit ..... 36
5.5 Communications ..... 37
5.5.1 Antenna short circuit test ..... 37
5.5.2 Antenna open circuit test ..... 37
5.6 Long-term behaviour ..... 37
5.6.1 Purpose of the test ..... 37
5.6.2 Test procedure ..... 37
5.6.3 Acceptance criteria ..... 38

Annex A (Informative)Questionnairefortestingirrigationcontrolsystems ..... 39

Bibliography ..... 52