

# ISO 7240-27:2025-04 (E)

## Fire detection and alarm systems - Part 27: Point type fire detectors using a smoke sensor in combination with a carbon monoxide sensor and, optionally, one or more heat sensors

### Contents

Page

- Foreword..... vii
- Introduction..... viii
- 1 Scope..... 1
- 2 Normative references..... 1
- 3 Terms and definitions..... 2
- 4 General requirements..... 2
  - 4.1 Conformance..... 2
  - 4.2 Response threshold value of detectors using scattered or transmitted light..... 2
  - 4.3 Individual alarm indication..... 2
  - 4.4 Connection of ancillary devices..... 3
  - 4.5 Monitoring of detachable detectors..... 3
  - 4.6 Manufacturer’s adjustments..... 3
  - 4.7 On-site adjustment of response behaviour..... 3
  - 4.8 Protection against the ingress of foreign bodies..... 3
  - 4.9 Rate-sensitive CO response behaviour..... 3
  - 4.10 Smoke response to slowly developing fires..... 4
  - 4.11 Requirements for software-controlled detectors..... 4
    - 4.11.1 General..... 4
    - 4.11.2 Software design..... 4
    - 4.11.3 Storage of programs and data..... 4
- 5 Test methods..... 5
  - 5.1 General..... 5
    - 5.1.1 Atmospheric conditions for tests..... 5
    - 5.1.2 Operating conditions for tests..... 5
    - 5.1.3 Mounting arrangements..... 5
    - 5.1.4 Tolerances..... 5
    - 5.1.5 Measurement of smoke response threshold value..... 5
    - 5.1.6 Measurement of CO response threshold value..... 6
    - 5.1.7 Measurement of heat response value..... 6
    - 5.1.8 Provision for tests..... 7
    - 5.1.9 Test schedule..... 7
    - 5.1.10 Test report..... 9
  - 5.2 Repeatability of smoke response..... 9
    - 5.2.1 Objective of the test..... 9
    - 5.2.2 Test procedure..... 9
    - 5.2.3 Requirements..... 9
  - 5.3 Repeatability of CO response..... 9
    - 5.3.1 Objective of the test..... 9
    - 5.3.2 Test procedure..... 9
    - 5.3.3 Requirements..... 9
  - 5.4 Directional dependence of smoke response..... 9
    - 5.4.1 Objective of the test..... 9
    - 5.4.2 Test procedure..... 10
    - 5.4.3 Requirements..... 10
  - 5.5 Directional dependence of CO response..... 10

5.5.1	Objective of the test.....	10
5.5.2	Test procedure.....	10
5.5.3	Requirements.....	10
5.6	Directional dependence of heat response (optional function).....	10
5.6.1	Objective of the test.....	10
5.6.2	Test procedure.....	10
5.6.3	Requirements.....	11
5.7	Lower limit of heat response (optional function).....	11
5.7.1	Objective of the test.....	11
5.7.2	Test procedure.....	11
5.7.3	Requirements.....	11
5.8	Reproducibility of smoke response.....	11
5.8.1	Objective of the test.....	11
5.8.2	Test procedure.....	11
5.8.3	Requirements.....	12
5.9	Reproducibility of CO response.....	12
5.9.1	Objective of the test.....	12
5.9.2	Test procedure.....	12
5.9.3	Requirements.....	12
5.10	Reproducibility of heat response (optional function).....	12
5.10.1	Objective of the test.....	12
5.10.2	Test procedure.....	12
5.10.3	Requirements.....	12
5.11	Exposure to chemical agents at environmental concentrations.....	13
5.11.1	Objective of the test.....	13
5.11.2	Test procedure.....	13
5.11.3	Requirements.....	13
5.12	Long-term stability of CO response.....	14
5.12.1	Objective of the test.....	14
5.12.2	Test procedure.....	14
5.12.3	Requirements.....	14
5.13	Saturation.....	14
5.13.1	Objective of the test.....	14
5.13.2	Test procedure.....	14
5.13.3	Requirements.....	15
5.14	Variation in supply parameters.....	15
5.14.1	Objective of the test.....	15
5.14.2	Test procedure.....	15
5.14.3	Requirements.....	15
5.15	Air movement.....	16
5.15.1	Objective of the test.....	16
5.15.2	Test procedure.....	16
5.15.3	Requirements.....	16
5.16	Dazzling.....	17
5.16.1	Objective of the test.....	17
5.16.2	Test procedure.....	17
5.16.3	Requirements.....	17
5.17	Dry heat (operational).....	17
5.17.1	Objective of the test.....	17
5.17.2	Test procedure.....	17
5.17.3	Requirements.....	18
5.18	Dry heat (endurance).....	18
5.18.1	Objective of the test.....	18
5.18.2	Test procedure.....	18
5.18.3	Requirements.....	19
5.19	Cold (operational), smoke.....	19
5.19.1	Objective of the test.....	19
5.19.2	Test procedure.....	19
5.19.3	Requirements.....	19
5.20	Cold (operational), CO.....	20
5.20.1	Objective of the test.....	20
5.20.2	Test procedure.....	20
5.20.3	Requirements.....	20
5.21	Damp heat, cyclic (operational).....	20
5.21.1	Objective of the test.....	20
5.21.2	Test procedure.....	21
5.21.3	Requirements.....	21

5.22	Damp heat, steady state (operational)	22
5.22.1	Objective of the test	22
5.22.2	Test procedure	22
5.22.3	Requirements	22
5.23	Damp heat, steady state (endurance)	23
5.23.1	Objective of the test	23
5.23.2	Test procedure	23
5.23.3	Requirements	23
5.24	Low humidity, steady state (endurance)	24
5.24.1	Objective of the test	24
5.24.2	Test procedure	24
5.24.3	Requirements	24
5.25	Sulfur dioxide SO <sub>2</sub> corrosion (endurance)	24
5.25.1	Objective of the test	24
5.25.2	Test procedure	24
5.25.3	Requirements	25
5.26	Shock (operational)	25
5.26.1	Objective of the test	25
5.26.2	Test procedure	25
5.26.3	Requirements	26
5.27	Impact (operational)	26
5.27.1	Objective of the test	26
5.27.2	Test procedure	26
5.27.3	Requirements	27
5.28	Vibration, sinusoidal (operational)	27
5.28.1	Objective of the test	27
5.28.2	Test procedure	27
5.28.3	Requirements	28
5.29	Vibration, sinusoidal (endurance)	28
5.29.1	Objective of the test	28
5.29.2	Test procedure	29
5.29.3	Requirements	29
5.30	Electromagnetic compatibility (EMC) immunity tests (operational)	29
5.30.1	Objective of the test	29
5.30.2	Test procedure	30
5.30.3	Requirements	30
5.31	Fire sensitivity	30
5.31.1	Objective of the test	30
5.31.2	Test procedure	30
5.31.3	Requirements	32
<b>6</b>	<b>Test report</b>	<b>32</b>
<b>7</b>	<b>Marking</b>	<b>32</b>
<b>8</b>	<b>Data</b>	<b>33</b>
8.1	Hardware documentation	33
8.2	Software documentation	33
<b>Annex A (normative)</b>	<b>Gas test chamber for CO response threshold value and cross sensitivity measurements</b>	<b>35</b>
<b>Annex B (normative)</b>	<b>Construction of the heat tunnel</b>	<b>36</b>
<b>Annex C (normative)</b>	<b>Apparatus for dazzling test</b>	<b>39</b>
<b>Annex D (normative)</b>	<b>Apparatus for impact test</b>	<b>40</b>
<b>Annex E (normative)</b>	<b>Fire test room</b>	<b>42</b>
<b>Annex F (normative)</b>	<b>Smouldering (pyrolysis) wood fire (TF2)</b>	<b>44</b>
<b>Annex G (normative)</b>	<b>Glowing smouldering cotton fire (TF3)</b>	<b>47</b>
<b>Annex H (normative)</b>	<b>Flaming plastics (polyurethane) fire (TF4)</b>	<b>50</b>
<b>Annex I (normative)</b>	<b>Liquid (heptane) fire (TF5)</b>	<b>53</b>
<b>Annex J (normative)</b>	<b>Low temperature black smoke (decalene) liquid fire (TF8)</b>	<b>56</b>
<b>Annex K (informative)</b>	<b>Information concerning the construction of the gas test chamber</b>	<b>59</b>
	<b>Bibliography</b>	<b>61</b>