

APPLICATION NOTE

Document Title CDX Range - Combined Heat Detector (DCD)

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Hochiki's conventional combined heat detector (DCD) combines both fixed temperature and rate of rise elements in one detector. The detector is sealed against dirt, grease and dust giving long term reliability. The heat detector consists of two thermistors one inside the housing and one outside whose characteristics change according to temperature in a defined manner. The electronics monitors the signals from both the thermistors within the DCD and a fire alarm signal is generated when the difference between the two reaches the correct level. If the temperature rise is slow then the difference between the thermistors is small and detector will enter the alarm state when the fixed element is exceeded.

General Specification

The British Standard 5445 Part 5 dictates three grades for a fixed temperature of 60°C, the Hochiki DCD Range supports range 1 and 2, Range 3 is covered by the Hochiki DFJ range of fixed temperature heat detectors.

When the fixed temperature element is greater than 60°C then British Standard 5445 Part 8 specifies that detectors should be graded in four ranges, Hochiki DCD-R1E supports Range 1

Both DCD-1E and DCD-2E have a fixed temperature element of 60°C, the only difference is the response of the rate of rise element. The Response is defined as the time taken for the detector to enter into the alarm state at a given rate of temperature rise.

The DCD-R1E has a fixed temperature element of 90°C and is graded as Range 1.

Application/Selection

The DCD combined heat detector is particularly suited to environments where high ambient temperatures exist, and where smoke detectors are unsuitable due to the conditions i.e. steam in a kitchen.

The detector will respond to a fast change in ambient temperature or if the temperature exceeds the fixed element.

The selection of the appropriate heat detector is dependent upon ceiling height. Rapid Attendance relates to when the fire alarm panel is connected to the fire brigade directly or via central station, and is required as the fire will be larger before detection takes place due to the increased ceiling height.

Detector Type		Ceiling Heights	
		General Limit	Rapid Attendance
DCD-1E	Grade 1	9.0m	13.5m
DCD-2E	Grade 2	7.5m	12.0m
DFJ-60E	Grade 2	6.0m	10.5m
DCD-R1E	Range 1	6.0m	10.5m

Approvals

- DCD-1E EN54 Part 5
- DCD-2E EN54 Part 5
- DCD-R1E EN54 Part 8

The response times for Grade 1 and 2 DCD heat detectors;

DCD -1E Grade 1 Response Times

	Minimum		Maximum	
	Minutes	Seconds	Minutes	Seconds
1°C /min	29	0	37	20
3°C /min	7	13	12	40
5°C /min	4	09	7	44
10°C /min	-	30	4	2
20°C /min	-	22.5	2	11
30°C /min	-	15	1	34

Initial Temperature : 25°C, Air Velocity : 0.8m/sec

DCD -2E Grade 2 Response Times

	Minimum		Maximum	
	Minutes	Seconds	Minutes	Seconds
1°C /min	29	0	45	40
3°C /min	7	13	15	40
5°C /min	4	09	9	40
10°C /min	-	30	5	10
20°C /min	-	22.5	2	55
30°C /min	-	15	2	8

Initial Temperature : 25°C, Air Velocity : 0.8m/sec

DCD -R1E Range 1 Response Times

	Minimum		Maximum	
	Minutes	Seconds	Minutes	Seconds
1°C /min	29	0	45	40
3°C /min	7	13	15	40
5°C /min	4	09	9	40
10°C /min	2	0	5	10
20°C /min	-	59	2	55
30°C /min	-	39	2	8

Initial Temperature : 45°C, Air Velocity : 0.8m/sec

Electrical Specification

The general electrical characteristics for the DCD range of Heat Detectors are :-

Line Voltage - Nominal	24VDC
Operating Range	15 - 30VDC
Standby Current	35µA
Maximum Standby Surge Current	160µA
Maximum Alarm Current	250mA
Alarm Trip Current	6mA
Storage Temperature	-30°C to +70°C
Installation Temperature Range	DCD-1E: -10°C to +50°C DCD-2E: -10°C to +50°C DCD-R1E: -10°C to +70°C
Maximum Humidity	95%RH - Non Condensing at 40°C



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