Honeywell

SPM Flex SPECIFICATIONS

Chemcassette® Tape-Based Gas Detector

General Specifications	
Detection Technique	Chemcassette tape-based with advanced self monitoring optics design
Dimensions	Height: 13.2 in. (33.6 cm); Width: 7.2 in. (18.3 cm); Depth without handle: 6.4 in. (16.3 cm); Depth with handle: 9.5 in. (24.1 cm)
Weight	9.1 lbs. (4.1 kg)
Mounting screws	Concrete: $^{5}/_{16}$ in x 2 in vibration-resistant stud anchor for concrete (McMaster-Carr 94475A185 or equivalent), add 0.25 in. to length when mounting bracket with sun shield Wood: $^{5}/_{16}$ in. x 2 in. flange head lag screw for wood (McMaster-Carr 95526A375 or equivalent), add 0.25 in. to length when mounting bracket with sun shield
Battery type	Lithium ion
Battery life	Approximately 70% of its original capacity after 300 full charge/discharge cycles
Operating Temperature	0ºC to 40ºC for most gases/applications
Operating Humidity	0-100% RH for unit (Sample RH limited per tape/calibration). Sample line requires additional hardware to remove moisture in high RH conditions where condensing may occur. The sample must be non-condensing. Dry conditions may require humidification.
Flow System	Automatic flow control with bypass system, 250 or 500 cc/min at tape, higher flow at inlet to reduce sample time (internal bypass system); sample up to 100 ft
Local Alarms/Status	Visual: LEDs for alarm, normal condition and fault Audible: User selectable: Off, Low ~75 dB at 1 m, Medium ~85 dB at 1 m, High >90 dB at 1 m
Interface	4 large buttons, 3.5 in. Color LCD TFT display, web server
Data Logging	Rolling up to 3 months (15 sec. with no gas reading, 1 sec. when reading gas), Event history (1500 events – approx. 1 year)
Maximum inlet/ outlet pressure differential	The overall maximum load on the pump between the inlet and the exhaust should not exceed 10 inches H_2O
Relays	250 V, 6 A maximum
Wire gauges	Minimum: 24; Maximum: 14
USB	2.0 or later
Indoor/outdoor use?	Both (the power supply is indoor only)
Operating Altitudes	-1,000 to 3,000 ft. above sea level: standard; 3,000 ft. to 6,000 ft. above sea level: requires adjustment by Honeywell Analytics
Ingress Protection rating	IP65
External switch or circuit breaker requirement (description & location)	Meet or exceed all local codes and regulations
Ventilation requirements	Mount with no obstructions within 4 in. (10 cm) of either side or within 2 in. (5 cm) above and below the detector

Electrical	
Power supply	Universal Line powered (90-260 VAC 50/60 Hz) for battery charger & non-classified use. Battery: 6+ hours under typical conditions – acts as battery back-up in fixed applications
Power consumption	~1.9 A at 24 VDC (including battery-charging current)
Power adaptor	Manufacturer: FSP Group Model: FSP135-AAAN1 Input: 100-240 VAC, 2 A, 50-60 Hz Output: 24 VDC, 5.62 A CCN: QQGQ (E190414) Mark of conformity: UL listed
Communications	
	Relays: Alarm 1, Alarm 2, Fault (user configurable for normally open/closed) 4-20mA Ethernet (with Modbus TCP/IP and web server) USB port (for memory stick configuration/data transfer) Communications connector and optional communications cable: 60 V, 5 A maximum
4-20 mA Output Defaults and Ranges	
Inhibit	2 mA, programmable from 1.5-3.5 mA in 0.5 mA increments
Maintenance	3 mA, programmable from 1.5-3.5 in 0.5 increments
Instrument Fault	1 mA or less, not programmable (will be driven under 1 mA)
Over-Scale	21.5 mA, programmable 21-22 mA
4-20 mA Configurations	Sink, source, isolated
Storage Conditions	
Detector	0°C to 40°C, 0-100% RH non-condensing
Chemcassette cartridges	See the label on the Chemcassette cartridge for storage conditions
Certifications	
Detector	UL 61010-1, 3rd Edition, 2012-05 (ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL, AND LABORATORY USE - Part 1: General Requirements CAN/CSA-C22.2 No. 61010-1, 3rd Edition, 2012-05, (ELECTRICAL EQUIPMENT FOR MEASUREMENT, CONTROL, AND LABORATORY USE - Part 1: General Requirements) IEC 61010-1:2010, 3rd Edition FCC approval for RFID board + Canadian and European
Battery	UL/cUL Recognition to UL 2054 + 60950-1 IEC 62133 1st Edition CB Certification UN Test Report to UN 38.3
Self-declared European CE Mark on detector for:	EMC, LVD, ROHS, WEEE

Detectable Gases

Family	Gas	Range	TLV[1]		LAL	Default Alarm		Response Time (T50) at 2 TLV Gas Conc. (sec)	Max. Sample Tubing Length (m)	Sample Line Particulates Filter[2]	ChemCassette[10]					Optimum Temp Range (°C)	Optimum %RH Range for Best Accuracy[7,8]
						A1	A2				Name	P/N (14d)	P/N (30d)	P/N (90d)	Allowable Days After First Use[11]		
Hydrides	Arsine (AsH_3)	0.5-500ppb	5 ppb		1 ppb	2.5 ppb	5 ppb	55	30	A	Flex CC XP Hydrides	1265-4000	n/a	1265-3000	90	0-40	10-70% RH [4,6]
	Phosphine (PH_3)	3-3000 ppb	300 ppb		5 ppb	150 ppb	300 ppb	6									30-70% RH [4,6]
	Diborane (B_2H_6)	5-1000 ppb	100 ppb		10 ppb	50 ppb	100 ppb	14									30-70% RH [4,6]
	Silane (SiH_4)	0.03 - 50 ppm	5 ppm		0.05 ppm	2.5 ppm	5 ppb	13									34-50% RH [4,6]
	Germane (GeH_4)	50-2000 ppb	200 ppb		100 ppb	100 ppb	200 ppb	245									40-50% RH [4,6]
	Hydrogen Selenide (H_2Se)	2-500 ppb	50 ppb		5 ppb	25 ppb	50 ppb	14									10-60% RH [4,6]
	Hydrogen Sulphide (H_2S)	0.001-9.999 ppm	1 ppm		0.005 ppm	0.5 ppm	1 ppm	7									10-75% RH [4,6]
Mineral Acids	Hydrogen Fluoride (HF)	0.02-20 ppm	0.5 ppm	2 ppm STEL-C	0.03 ppm	1 ppm	2 ppm	7	5	B, C	Flex CC XP Mineral Acids	1265-4001	n/a	1265-3001	90	0-35	15-75% RH [5,6]
	Hydrogen Chloride (HCl)	0.02-20 ppm	2 ppm	STEL-C	0.03 ppm	1 ppm	2 ppm	5									30-50% RH [5,6]
	Hydrogen Bromide (HBr)	0.02-10 ppm	2 ppm	STEL-C	0.03 ppm	1 ppm	2 ppm	5									20-50% RH [5,6,9]
	Boron Trifluoride (BF_3)	0.05-10 ppm	1 ppm	2015 NIC (0.1ppm TWA; 0.7ppm STEL/C)	0.1 ppm	0.5 ppm	1.0 ppm	5									15-60% RH [5,6]
	Nitric Acid (HNO_3)	0.02-20 ppm	2 ppm	4 ppm STEL	0.05 ppm	1 ppm	2 ppm	15	3								40-50% RH [4,6]
	Sulfuric Acid (H_2SO_4)	5-750 ppb	50 ppb	0.2mg/m^3	10 ppb	25 ppb	50 ppb	2000	0.1	No filter							40-50% RH [4,6]
Mineral Acids (export unrestricted)	Hydrogen Fluoride (HF)	0.4-20 ppm	0.5 ppm	2 ppm STEL-C	0.4 ppm	1 ppm	2 ppm	7	5	B, C	Flex CC-U XP Mineral Acids	1265-4012	n/a	1265-3012	90	0-35	15-75% RH [5,6]
	Hydrogen Chloride (HCl)	0.02-20 ppm	2 ppm	STEL-C	0.03 ppm	1 ppm	2 ppm	5									30-50% RH [5,6]
	Hydrogen Bromide (HBr)	0.02-10 ppm	2 ppm	STEL-C	0.03 ppm	1 ppm	2 ppm	5									20-50% RH [5,6,9]
	Boron Trifluoride (BF_3)	0.05-10 ppm	1 ppm	2015 NIC (0.1ppm TWA; 0.7ppm STEL/C)	0.1 ppm	0.5 ppm	1.0 ppm	5									15-60% RH [5,6]
	Nitric Acid (HNO_3)	0.02-20 ppm	2 ppm	4 ppm STEL	0.05 ppm	1 ppm	2 ppm	15	3								40-50% RH [4,6]
	Sulfuric Acid (H_2SO_4)	5-750 ppb	50 ppb	0.2mg/m^3	10 ppb	25 ppb	50 ppb	2000	0.1	No filter							40-50% RH [4,6]
Oxidizers	Chlorine (Cl_2)	0.005-5 ppm	0.5 ppm		0.02 ppm	0.25 ppm	0.5 ppm	7	30	B, C	Flex CC XP Chlorine	1265-4002	n/a	1265-3002	90	0-40	30-55% RH [4,6]
	Chlorine (Cl_2)	0.01-5 ppm	0.5 ppm		0.05 ppm	0.25 ppm	0.5 ppm	9	30	B, C	Flex CC Fluorine/Oxidizers	1265-4004	1265-3004	n/a	30	0-40	5-75% RH
	Fluorine (F_2)	0.01-10 ppm	1 ppm	0.1 ppm OSHA PEL	0.05 ppm	0.5 ppm	1.0 ppm	5	10								0-85% RH
	Nitrogen Dioxide (NO_2)	0.03-10 ppm	0.2 ppm		0.05 ppm	0.1 ppm	0.2 ppm	56	30								10-70% RH [5,6]
	Chlorine Dioxide (ClO_2)	20-1000 ppb	100 ppb		25 ppb	50 ppb	100 ppb	36	10								5-90% RH
Amines	Ammonia (NH_3)	0.01-150 ppm	25 ppm		0.05 ppm	12.5 ppm	25 ppm	5	30	B, C	Flex CC XP Ammonia	1265-4003	n/a	1265-3003	90	0-35	0-90% RH [4]
	Dimethylamine (DMA, H_2Cl_2Si)	0.5-50 ppm	5 ppm		0.1 ppm	2.5 ppm	5 ppm	10									5-90% RH [4]
	Tetrakis (Dimethylamido) Titanium (TDMAT, $C_8H_{24}N_4Ti$)	0.01-20 ppm	n/a		0.05 ppm	1 ppm	2 ppm	14									5-90% RH [4]
	Trimethylamine (TMA, C_3H_9N)	0.3-50 ppm	5 ppm		0.05 ppm	2.5 ppm	5 ppm	10									1-90% RH [4]
Phosgene	Phosgene ($COCl_2$)	2-2000 ppb	100 ppb		5 ppb	50 ppb	100 ppb	15	30	A	Flex CC XP Phosgene	1265-4007	n/a	1265-3007	90	0-40	1-95% RH
Diisocyanates	Toluene Diisocyanate (TDI, $C_9H_6N_2O_2$)	0.5-200 ppb	1 ppb	2015 NIC (1ppb TWA; 5ppb STEL)	0.6 ppb	1 ppb	2 ppb	10	0.15	no filter	Flex CC Diisocyanates	1265-4006	1265-3006	n/a	30	0-40	25-65% RH [4]
	Methylene Bisphenyl Isocyanate (MDI, $C_{15}H_{10}N_2O_2$)	0.5-200 ppb	5 ppb		0.6 ppb	2.5 ppb	5 ppb	10									5-80% RH
	Hexamethylene Diisocyanate (HDI, $C_8H_{12}N_2O_2$)	0.5-150 ppb	5 ppb		0.6 ppb	2.5 ppb	5 ppb	30									15-85% RH [4]
Hydrazines	Hydrazine (N_2H_4)	3-1000 ppb	10 ppb		5 ppb	5 ppb	10 ppb	220	3	no filter	Flex CC Hydrazines	1265-4008	1265-3008	n/a	30	0-40	15-90% RH
	Monomethyl Hydrazine (MMH, CH_6N_2)	3-2000 ppb	10 ppb		5 ppb	5 ppb	10 ppb	110	5								20-75% RH
	Dimethyl Hydrazine (UDMH, $C_2H_8N_2$)	3-2000 ppb	10 ppb		5 ppb	5 ppb	10 ppb	110	5								10-70% RH
Hydrogen Cyanide (HCN)		0.2-30 ppm	4.7 ppm		0.5 ppm	2.4 ppm	4.7 ppm	15	30	A	Flex CC Hydrogen Cyanaide	1265-4009	n/a	n/a	15	0-30	15-70% RH [4]
Sulphur Dioxide (SO_2)		10-2500 ppb	250 ppb		25 ppb	120 ppb	250 ppb	12	30	B, C	Flex CC Sulfur Dioxide	1265-4005	1265-3005	n/a	30	0-40	25-90% RH [4]
Ozone (O_3)		20-1000 ppb	100 ppb		25 ppb	50 ppb	100 ppb	55	5	no filter	Flex CC Ozone	1265-4011	1265-3011	n/a	30	0-40	15-90% RH
Hydrogen Peroxide (H_2O_2)		0.1-3 ppm	1 ppm		0.2 ppm	0.5 ppm	1.0 ppm	27	5	no filter	Flex CC Hydrogen Peroxide	1265-4010	1265-3010	n/a	30	0-40	35-50% RH [4]

1 Source: ACGIH 2014.

2 A = 780248 (disposable), B = 1830-0055 (filter membrane 0235-1072 must be replaced every 30 days), C = 1991-0147 (disposable)

Outside of RH range:

3 Tends to have lower response at higher humidities.

4 Tends to increase sensitivity at higher humidities (due to the chemistry of the reaction).

5 Tends to under-report at higher humidities (typically >75% RH) due to the gas characteristics to adhere or decompose on contact with water/moisture. The response seems to be lower but the actual gas concentration under these high humidity conditions will be lower than expected.

6 Tends to under-report in dry conditions (<25-30% RH).

7 Depending on the combination of temperature and humidity, even within the ranges specified above, a unit's performance efficiency can be influenced due to condensation, physical tape material changes, or optical changes. Consult Honeywell Analytics' Service Department.

8 Refer to TechNotes 971131 (Chemcassette®-based Instrument Accuracy and Precision) and 1998-0219 (Protocol for Testing Gas Detectors).

9 Prolonged exposure to high levels of HBr (2xTLV or above) can condense in the system and may require purging with dry gas.

10 For information about the expiration date of the ChemCassette, refer to the *Review > Chemcassette* section on page 36 of the SPM Flex User Manual.

11 The number of days elapsed from the Chemcassette cartridge's installation. When that limit is reached, the detector will issue a maintenance fault. Honeywell Analytics recommends then replacing the cartridge. However, if it has been removed and properly stored in the interim, the user has the option of clearing the maintenance fault and continuing to use the cartridge. Advance the tape two turns when resuming monitoring.

Honeywell Analytics Gas Detection Offerings

Honeywell Analytics gas detectors protect people, assets and environment from toxic and combustible gas hazards, helping to create safer, more comfortable, secure and productive environments. Our strength derives from Honeywell's leadership in sensor technology; in fact Honeywell operates four sensor manufacturing plants, supplying an entire industry with its core detective element.

Commercial

Gas detection from standalone units to fully engineered, multi-point systems, all offering cost-effective regulatory compliance.

» Applications: parking structures, chillers, mechanical rooms, office towers, commercial buildings, shopping centers, swimming pools, golf courses, schools and universities, laboratories

Industrial

Renowned Sieger and Manning gas detection systems with advanced electrochemical, infrared and open path sensing technologies.

» Applications: oil and gas, cold storage, water/wastewater treatment, chemicals, engine rooms, plastics and fibers, agriculture, printing and light industrial

Portables

Single or multi-gas detectors ranging from compact, lightweight designs for personal protection to systems-based, networkable instrumentation for industrial hygiene.

» Applications: underground utility and electricity ducts, boiler rooms, post-fire sites, sewers, industrial plants, industrial hygiene, first responder teams, remote fleets

High Tech/Government

Reliable gas and chemical detection including infrared spectroscopy (MST) with no cross interference, to Chemcassette paper-based solutions (MDA Scientific) offering detection down to parts per billion.

» Applications: semiconductor manufacturing, aerospace propulsion, specialty chemicals industry, research laboratories, emergency response

Technical Services

24/7 global network includes post-sales service and Systems Integration teams.

» Emergency call out, service contracts, on/off-site repair, training and commissioning

» Complete range of spares, consumables and accessories

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SS01138-EN_v5 10/15

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