

# HA University

**SPM**  
**Sales**







**Honeywell**

# Safety First!

➤ **The SPM Series equipment does have area within the equipment where safety precautions should be taken into consideration.**

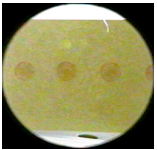
➤ **Precautions:**

- Shock hazards
  - 230VAC Voltage
  - 110VAC Voltage
- Hot surfaces
- Skin damage
  - Sharp edge warnings

	Caution – Refer to accompanying documents. Caution statements are used to indicate hazards or unsafe practices which could result in minor personal injury or product or property damage.
	Warning - Refer to accompanying documents. Warning statements are used to indicate hazards or unsafe practices which could result in severe personal injury or death.
	Warning - Potential electrical hazard, risk of electric shock.
	Hot surfaces exposed behind this panel. Use caution when opening and servicing this area.



# Technologies



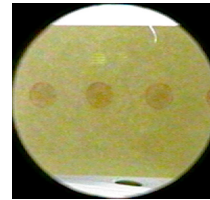
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# Sensing - Basic Technologies

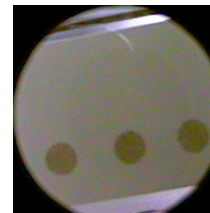
## Chemcassette®

- Colorimetric technology
- Commonly referred to as “Paper Tape”

Chemcassette® formulations provide a unique detection medium that is not only fast, sensitive and specific, but it is also the only available system which leaves physical evidence (i.e. the stain on the cassette tape) that a gas leak or release has occurred.

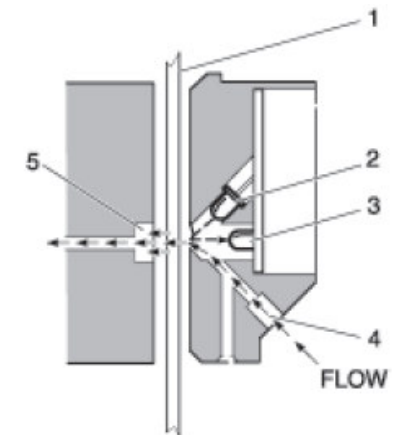


1 ppm  
Hydrogen Fluoride



25 ppb  
Arsine

The sample enters the inlet (4) and passes through the Chemcassette® tape (1) to the sample outlet (5). Target gas in the sample flow reacts with the Chemcassette® tape (1) and produces a stain density proportional to the gas concentration. An LED (2) in the detector head illuminates the sample stain. The detector (3) optically measures the stain.



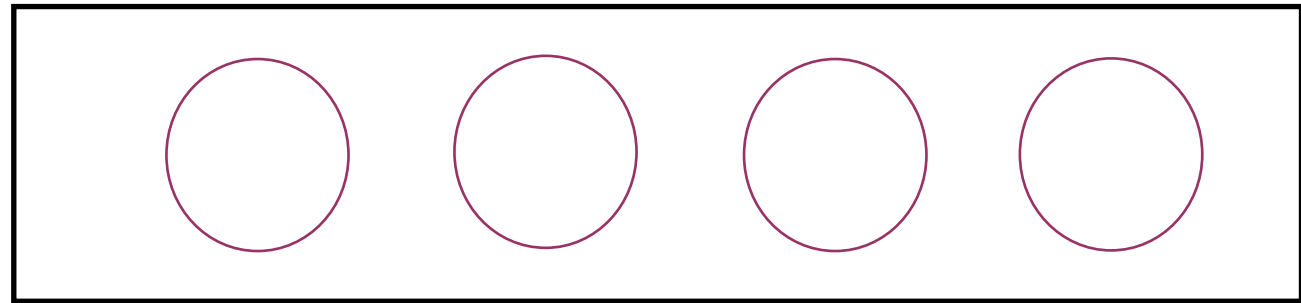
# Chemcassette® based products

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# SPM Window pattern


Tape advances after every window.



# Technology Comparisons

Technology	Advantages	Disadvantages
<b>Catalytic</b>	Simple, measures flammability of gases. Low cost proven technology.	Can be poisoned by lead, chlorine and silicones that remain an unrevealed failure mode. Requires oxygen or air to work. High power. Positioning critical.
<b>Electrochemical</b>	Measures toxic gases in relatively low concentrations. Wide range of gases can be detected. Very low power.	Failure modes are unrevealed unless advanced monitoring techniques used. Requires oxygen to work. Positioning critical.
<b>Point Infrared</b>	Uses a physical rather than chemical technique. Less sensitive to calibration errors. No unseen failure modes. Can be used in inert atmospheres.	Flammable gas detection only in %LEL range. Measures concentration of flammable gases which have then to be related to the flammability of the gas. Positioning critical. High/ medium power.
<b>Open Path Infrared</b>	Area coverage- best chance to see a leak. No unseen failure modes. Latest technology. Can detect low concentrations. Positioning not as critical. New toxic version as well as flammable.	Higher initial purchase cost. Not suitable for use in smaller areas. Detection path can be obscured.
<b>Semiconductor</b>	Mechanically robust, works well in constant high humidity conditions.	Susceptible to contaminants and changes in environmental conditions. Non linear response effects complexity.
<b>Thermal Conductivity</b>	Measures %V/V concentrations of binary gas mixtures even with the absence of oxygen.	High gas concentrations only. Limited range of gases. Cannot measure gases with conductivities close to air. Higher maintenance requirements.
<b>Paper Tape</b>	Highly sensitive and selective for toxic gases. Leaves physical evidence of the gas exposure. No false alarms.	Requires extraction system. May need sample conditioning.
<b>FTIR (Fourier Transform Infrared Spectroscopy)</b>	Most gases has a discrete absorbency pattern ("Fingerprint") within a light spectrum (band) that allows for distinguishing between different gases in a given sample.	FTIR sensitivity is based on IR cell length, many toxic and corrosive gases can not be detected to the exposure levels required (TLV and 1/2 TLV).

# Reference Material



Adobe Acrobat 7.0  
Document

*Double click to open the  
"Gas Book" by Honeywell  
Analytics*





# SPM Sales



**Honeywell**

# Applications

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- Outdoor locations
- Corrosive environments
- Remote sampling areas
- Gas storage areas
- Survey work
- Perimeter and fence lines
- Ventilation and exhaust systems
- Emergency response



# Specifications

Honeywell

- **Detection Technique**
  - Chemcassette® Detection System
- **Alarm Point**
  - Dual level alarms typically set at 1/2 TLV and TLV
- **Response Time**
  - As fast as 10 seconds
- **Alarm Indication**
  - Local audio/visual alarms
  - remote capability optional
- **Signal Outputs**
  - SPDT concentration alarm relays
  - SPDT fault relay
  - 4-20 mA
  - Digital display

Note: options may vary the specifications

# Specifications (Cont)

Honeywell

- **Relay Rating**
  - 120VAC@10amps
  - 240VAC@5amps
- **Operating Temperature Range**
  - 32° to 104°F (0° to 40°C) (basic unit)
  - heating/cooling are available (optional)
- **Power Requirements**
  - 115/230 VAC 50/60 Hz
  - battery operation version (optional)
- **Enclosure**
  - NEMA 4X fiberglass (basic unit)
- **Dimensions & Weight**
  - 12"(H) x 12"(W) x 7"(D) (30.5 x 30.5 x 17.8 cm) (basic unit)
  - 14.5 pounds (6.6 kg) (basic unit)

Note: options may vary the specifications

# SPM - Single Point Monitor

Honeywell

- **Factory Set alarm points-dual level**
  - Set at 1/2 TLV and TLV
- **4-20 mA output and digital display**
- **As low as a 10 second response time**
- **Up to 10 feet sampling distance**
  - **Extended Pump Option can extend to 100 feet**
    - ◆ Refer to manual for recommended distances
- **Local audio/visual alarms; remote alarm capability optional**
- **Chemcassette® Technology – SPM**
  - **Fast response**
  - **Gas sensitivity to ppb levels with physical evidence**
  - **More than 50 gas calibrations available**
  - **Run time (sizes) are based on the calibration or ChemKey selection**
    - ◆ SP – 7 day operation
    - ◆ EP – 30 day operation
    - ◆ XP – 90 day operation
- **Minimum maintenance and no dynamic calibration**
- **Customized for harsh industrial environments**



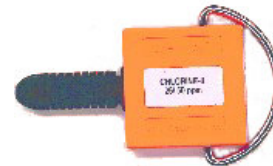
# Display Messages

- Normal monitoring
  - actual concentration in ppm or ppb
  - above full scale display shows xxx +ppx
- Verify Mode
- Instrument Fault
  - Fault (two digitally displayed code)
- Alarm Simulation for testing available



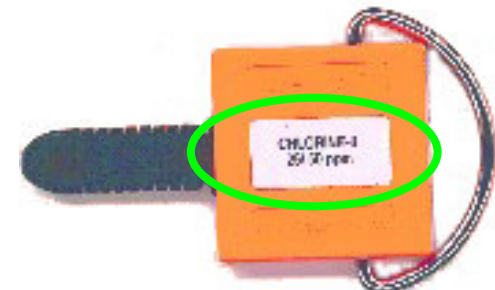
# SPM Calibration Configurations

- **SPM: Dedicated calibration**
  - Unit calibration and alarm levels are fixed in software
- **SPM ChemKey: Allow monitoring of different gases with one SPM unit**
  - Change gases by changing ChemKey and the Chemcassette
    - ◆ Gas information, alarm levels is all programmed into a memory chip sealed within the ChemKey



# Alarms

- **Factory set (by software or ChemKey)**
  - Non-user adjustable
- **2 Alarm levels: Factory set at 1/2 and 1 times TLV of target gas for gases, except Diisocyanates (5 ppb or 20 ppb)**
- **Alarm levels are indicated on faceplate of instrument or ChemKey**
- **Special ChemKeys are available for select gases with no alarms, special ranges, consult Honeywell Analytics**

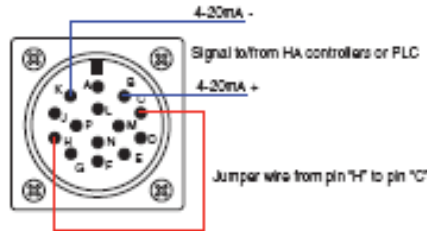




# Outputs

- **4-20 mA output**
  - Always active during monitoring
  - Updated end of each analysis period
  - Output held at last reported concentration value till updated at end of next sample period

*Note: To receive faults over the mA output the signal should be routed through the Fault Relay*



- **Relay Contacts**
  - 1 Low Level Gas Alarm Relay
  - 1 High Level Gas Alarm Relay
  - 1 Instrument Fault Relay
  - Alarm Levels are set by the ChemKey
- **RS422 (Optional)**
  - Digital output for data logging with a remote computer

Pin	Designation	Conditions
A	Instrument Fault	Normally Open
B	Instrument Fault	Common
C	Instrument Fault	Normally Closed
D	Gas Alarm 1	Normally Closed
E*	Remote Reset Option	
F	Gas Alarm 1	Common
G	Gas Alarm 1	Normally Open
H**	4-20 mA	(+)
J	Ground	
K**	4-20 mA	(-)
L	Gas Alarm 2	Normally Closed
M	Gas Alarm 2	Common
N*	Remote Reset Option	
P	Gas Alarm 2	Normally Open

# Sample Lines

- **Must be 1/8" ID x 1/4" OD FEP Teflon**
  - **Standard Sample pump**
    - ◆ Aromatic Amines\*, Hydrazines\*, Diisocyanates\* - 6" limit
    - ◆ Nitric Acid\* & Sulfuric Acid\* - 3' limit (1 meter)
    - ◆ All other gases - 10' limit (3 meters)\*
  - **Extended Pump (Option)**
    - ◆ High capacity pump allows sample points for up to 100 feet

*Note: Gases that have sample line restrictions can not be extended – Refer to manual listing for details*

Target Gas	Maximum Sample Line	
	Standard SPM	SPM fitted with Extended Sample Option
Aromatic Amines (PPD, MDA, TDA)	15 cm (6 in)	Not approved
Diisocyanates		
Hydrazines (N <sub>2</sub> H <sub>4</sub> , N <sub>2</sub> H <sub>2</sub> -low, MMH, MMH-low, UDMH)		
n-Butyl Amine	3 meters (10 ft)	8 meters (25 ft)
Chlorine Dioxide	3 meters (10 ft)	15 meters (50 ft)
Hydrogen Peroxide		
Hydrogen Bromide	3 meters (10 ft)	*
Hydrogen Iodide		
Nitric Acid	1 meter (3 ft)	Not approved

- **Exhaust port - 3/16" ID & 1/4" OD polypropylene tubing**
  - **Maximum of 10'**

# Sample Line Filters

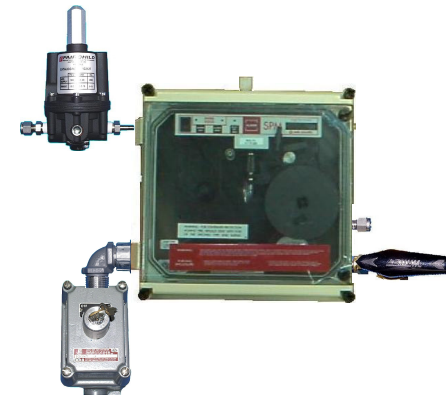
- End of Sample line Filter requirements
  - End of line particulate filters available – separate filter for corrosive gases (consult manual for correct filter type depending on gas)
    - ◆ Noncorrosive gases - particulate filter
      - Type A - Recommended six month replacement interval
    - ◆ Corrosive gases – corrosive filters:
      - Type B - Recommended rebuild (new membrane) monthly
      - Type C - Recommended six month replacement interval

Target Gas	Maximum Sample Line		Filter Type A	Filter Type B	Filter Type C
	Standard SPM	SPM fitted with Extended Sample Option			
Aromatic Amines (PPD, MDA, TDA)	15 cm (6 in)	Not approved	no filter		
Diisocyanates			no filter		
Hydrazines (N <sub>2</sub> H <sub>4</sub> , N <sub>2</sub> H <sub>2</sub> -low, MMH, MMH-low, UDMH)			no filter		
n-Butyl Amine	3 meters (10 ft)	8 meters (25 ft)	X		
Chlorine Dioxide	3 meters (10 ft)	15 meters (50 ft)		X	X
Hydrogen Peroxide			no filter		
Hydrogen Bromide	3 meters (10 ft)	*		X	X
Hydrogen Iodide			no filter		
Nitric Acid	1 meter (3 ft)	Not approved		X	X
Sulfuric Acid				X	X
Ammonia			X		

*Note: Acid Scrubbing filters are not to be used on sample inlet lines*

# Options

- **Z-Purge System**
  - housed in rugged NEMA 4X fiberglass enclosure
    - ◆ Complies to Class 1 Div II applications
  - designed to allow full utilization of monitoring capabilities
  - gasket sealed enclosure
  - large view through front window
  - swing open door
- **ChemKey**
  - allows monitoring of different gases with one SPM
  - states gas and alarm levels that are set.
- **Portable operation**
  - operate directly from battery charger assembly
  - incorporates a carrying handle and carrying strap.
- **Heater/Cooling option**
  - Allow for specific applications where the operational range does not meet the unit specification
    - ◆ Consult Honeywell Analytics for application review



# Options

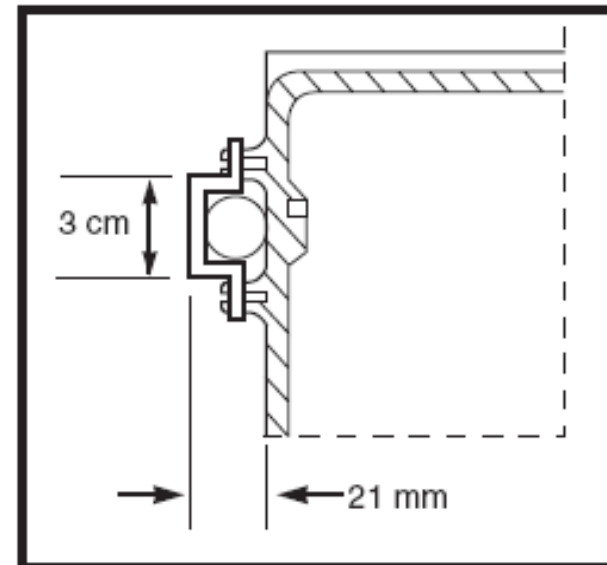
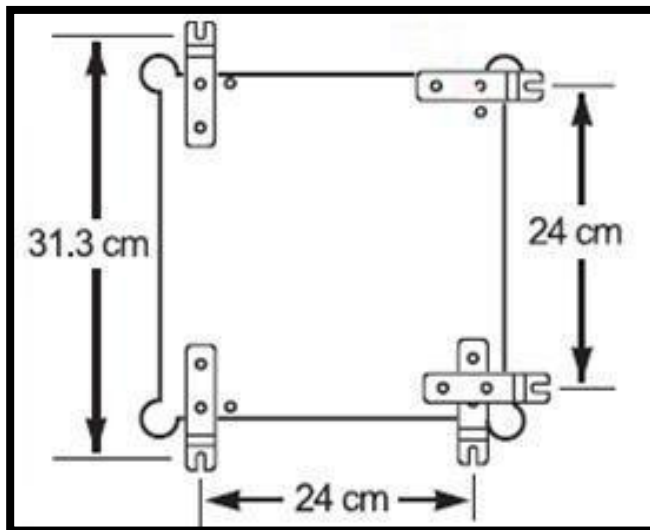
- **Dilution System**
  - operates on a gas dilution ratio, causes SPM to analyze on a fraction of actual gas concentration
  - software contains a multiplier-corrects for dilution
  - dilution ratio factory set
  
- **Remote Reset Alarm**
  - allows remote resetting of the SPM when alarm or fault conditions occur
    - ◆ If the conditions are still valid then the SPM will re-activate the appropriate notification
  
- **Duty Cycle**
  - allows for sampling intervals in ½ minute increments from ½ to 17 minutes, which SPM performs one sampling cycle
  - during non-monitoring periods sample pump is off until 60 seconds before next period
  
- **Sample Humidifier / Dryer**
  - For monitoring in dry or high-humidity environments
    - ◆ Consult Honeywell Analytics for application review

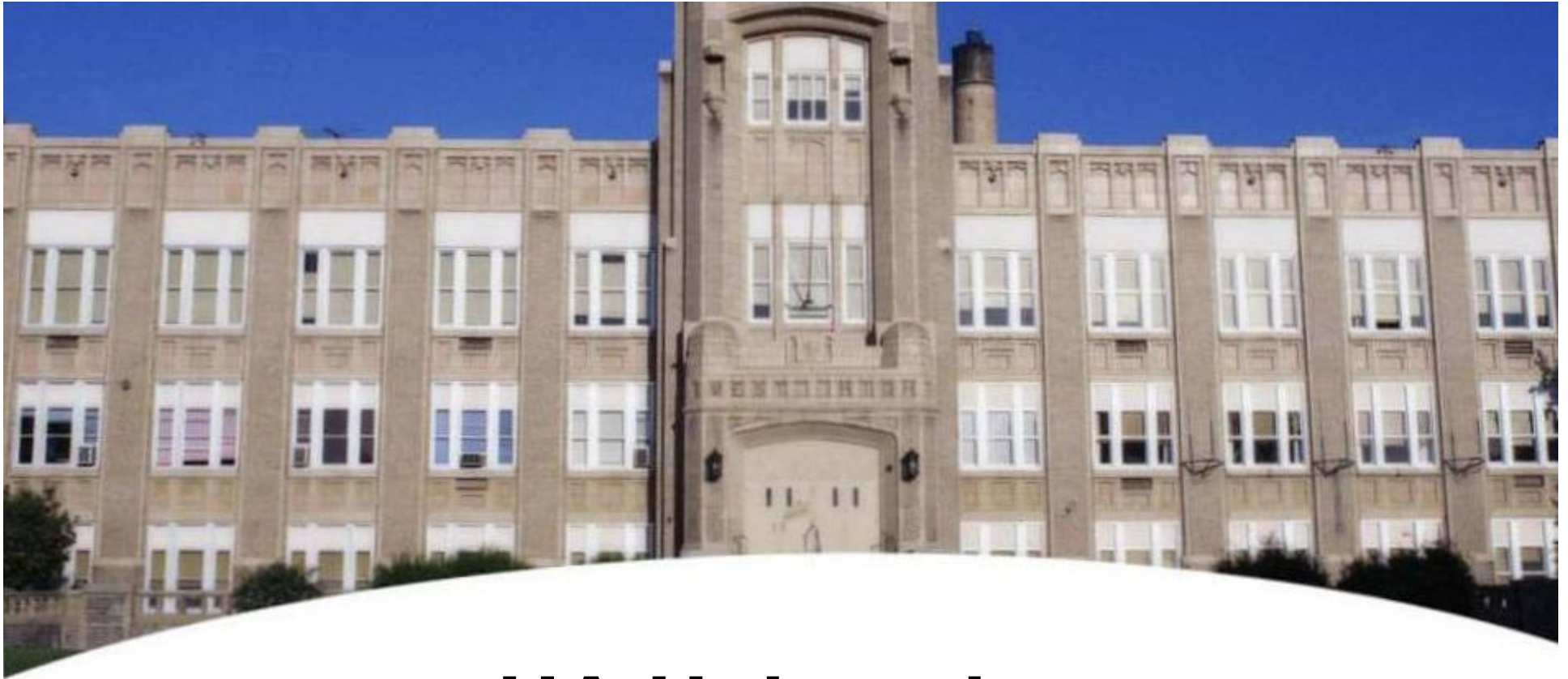
# Options (Cont.)

- **Options (peripheral devices)**
  - Printer
    - ◆ **Provides hard copy record of measured gas readings**
  - Remote reset
    - ◆ **Reset alarms and faults from a remote location**
  - Remote display, Remote indicator, Remote annunciator
    - ◆ **Provides remote digital display of concentration, or illuminated or audible indicator of alarm conditions**
  - mA Data Logger
    - ◆ **Provides data logging capabilities utilizing the mA output of the SPM**

# Options

- Options (general)
  - Mounting Options
    - ◆ Wall mounted
    - ◆ Pole mount (optional)





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Exercise

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# Ordering Exercise

## Build a system:

Portable SPM, ChemKey option, Extended Pump option, Duty Cycle option, Pole Mount option, Data Logger, 2 BF3 Low Level ChemKeys, AsH3 XP ChemKey and 3 H2S ChemKeys.

**Double click icon for Price Book**

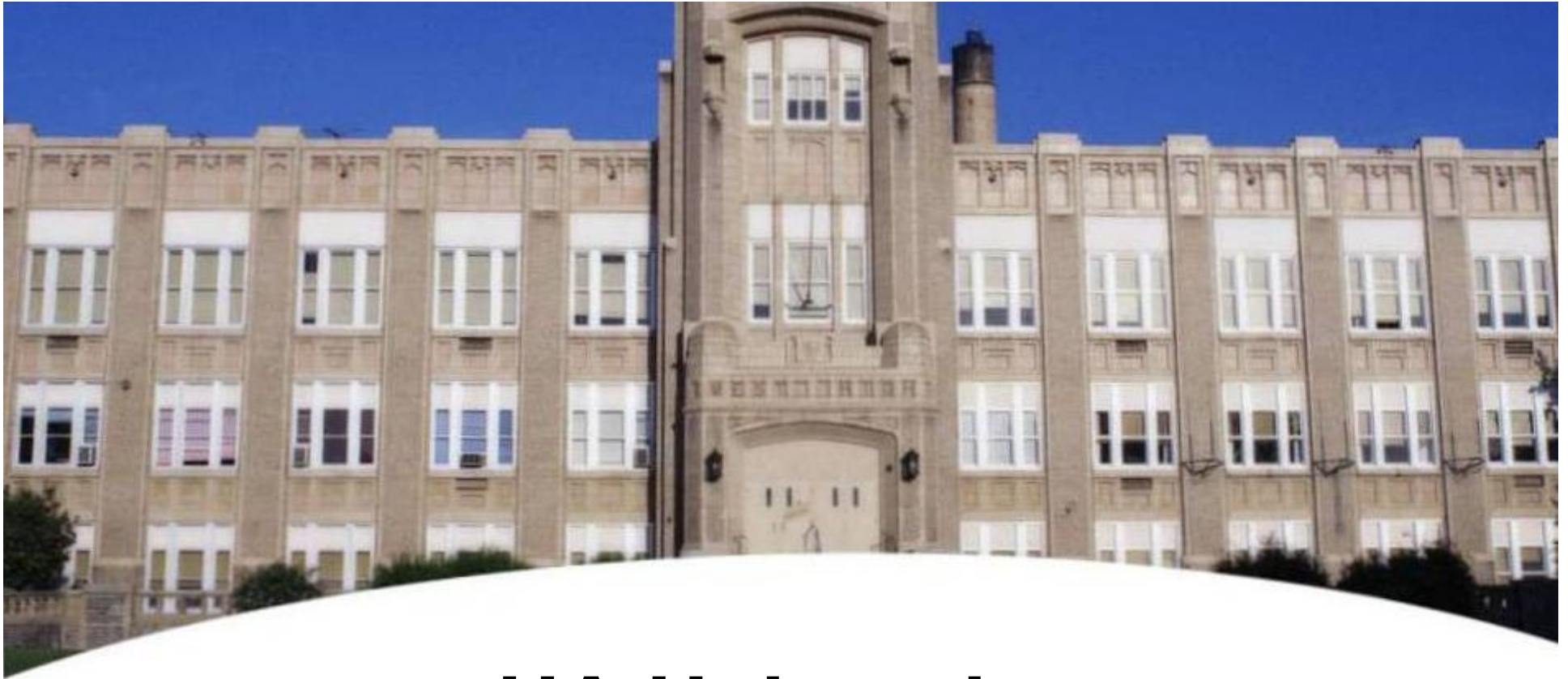


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## Competitive Data

**Honeywell**

# Competitive Data

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