

# ANATOMY OF A HEALTHY BUILDING

An analysis of the key performance indicators  
to help create healthier spaces

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TECHNICAL REFERENCE GUIDE

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**December 2020**

**Honeywell**

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# EXECUTIVE SUMMARY

Change has been a constant theme for the world in recent months. It's been business as unusual. Many of us have changed where we work, how we socialize, how our children learn, how we shop, and more. The full extent of our new normal is still unknown.

Change is also required to the way that we interact with, use and think of buildings in the future. Now more than ever, there is a need to create healthier built environments. From public health experts to building industry organizations, the call for change and investment in healthy buildings has been consistent.<sup>1</sup> Business owners, building owners and organizations worldwide – from schools to sports teams – are trying to answer one key question, “how do I get people safely back to buildings?”

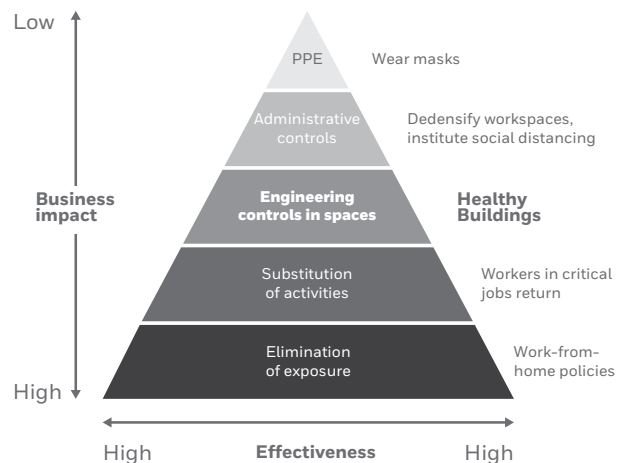
Traditionally, building system design emphasizes efficiency to minimize construction and operating costs. Given today's challenges, efficiency is now just one factor in building design. Creating safer, healthier environments that help to redefine how occupants experience and perceive a building will be critical. Leveraging existing building systems including Heating, Ventilation and Air Conditioning (HVAC) which provide and manage air quality and integrated security systems which govern the facility usage patterns, can play a vital role in reducing the risk of disease transmission and the spread of other pathogens.

Importantly, there isn't one single solution to creating a healthy environment. A “Swiss Cheese Model” needs to be taken to improve the safety and health of buildings. As James Reason, PhD, noted in 1990 when he introduced the model,<sup>2</sup> many risks aren't realized because there are safeguards in place to prevent them. These safeguards are represented in his model as multiple layers of Swiss cheese. A layering effect of safeguards within a building - from deploying integrated security systems in new ways to improving air quality and measuring success - is what can help to create a healthier environment.

Through this series of technical reference guides, *Anatomy of a Healthy Building*, we will examine the key factors related to creating a healthy building as well as evaluate the several available technologies in areas related to Safety & Security, Air Quality and Key Performance Indicators to help building owners to identify the layers that best suit their buildings.

## Minimizing Risk in the Workplace

Using a hierarchy of controls as a response framework, companies can take a range of actions, weighing the effectiveness and financial impact of each, to combat Covid-19 in their buildings.



Note: "PPE" stands for personal protective equipment.  
Source: Joseph Allen and John Macomber.  
Originally published in the Harvard Business Review<sup>1</sup>

# MAKING SENSE OF REGULATORY GUIDELINES

Organizations worldwide – from government agencies, non-government organizations (NGOs), industry organizations, professional organizations and individual experts – have issued information on mitigating the risk of pathogen transmission in a building environment.

The regulatory guidelines issued to date are broad in nature, primarily covering intent. This technical guide series delves deeper into the guidelines, intent and industry best practices, keeping in mind the present and future, long-term needs of a healthier facility. It aims to introduce facility owners, managers, operators and occupants to various concepts and best practices to potentially mitigate pathogen transmission risks through assessment, maintenance and modifications, to existing building systems, primarily integrated security and HVAC. It also explores future design needs of building systems to better manage contagious events with minimal business disruptions.

Although the principles apply primarily to buildings, they may also be applicable to other enclosed areas, such as mass transit systems or planes.

- Centers for Disease Control and Prevention (CDC)
- World Health Organization (WHO)
- American Industrial Hygiene Association (AIHA)
- Building Owners & Managers Association International (BOMA)
- Environmental Protection Agency (EPA)
- American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)
- Federation of European Heating, Ventilation and Air Conditioning Associations (REHVA)

# HOW TO CREATE HEALTHIER BUILDINGS

A healthy building environment starts with a baseline of understanding – what is the health of your building environment and where are opportunities for improvement. Conducting an audit of your building systems – from air quality, space management and integrated security – will identify potential upgrades and changes. The two primary systems for a healthy building are in air quality and safety and security.

**Below we review considerations and processes that help to create and manage a healthy building as well as specific areas for Safety & Security and Air Quality.**

## AUDIT

Conduct an audit of your building's current strengths, weaknesses and optimal next steps.

## PREVENT

Maintain operational parameters like temperature, humidity, pressurization, air changes and particle count at optimal ranges.

Enhance procedures and capabilities for surface cleaning and consider disinfection using UV light or similar techniques.

Minimize contact with frequently touched surfaces through frictionless access and monitor and manage occupancy of a specific building, area or zone.

## IDENTIFY AND ISOLATE

Use tools such as thermal imaging stations, contact tracing, mask detection and crowd counting to identify and isolate potential exposure.

## REPORT

Make the right data readily available to the right people, in the right time, through advanced, operational dashboards.

## ANALYZE

Use a combination of on-premise database and advanced cloud analytics.

## SAFETY & SECURITY RISK MANAGEMENT

### Thermal Screening

Employ thermal screening, a method to detect a person's initial body temperature, by various devices like thermal cameras, infrared thermometer, etc.

### Density/Occupancy Management

1. Identify ways to manage social distancing adherence and mask compliance.
2. Create awareness for facility managers regarding trends within a space on social distancing and mask compliance as well as deploy contact tracing to identify potential exposure.
3. Manage crowds using access control system and video analytics detection systems.
4. Use frictionless access control to limit interactions with frequently touched surfaces.
5. Explore the best frictionless access control strategies for your building such as touchless access readers and PIR sensors.

# AIR QUALITY & SPACE HEALTH MANAGEMENT

Indoor Air Quality (IAQ) depends on the presence and management of pollutants in the indoor environment that may cause harm. Indoor air quality is impacted by chemical and biological pollutants in gas, liquid or solid states in the indoor environment. When IAQ is poor, occupants can experience illnesses such as asthma, fatigue, irritation and headache.<sup>3</sup> Creating strategies to measure and improve indoor air quality is a key factor to a healthy building.

## Temperature and Relative Humidity

Maintain proper temperature to improve health as well as productivity. The right humidity range, typically between 40-60%,<sup>4</sup> is known to decrease occupant exposure and reduce viral transmission risks.

## Air Filtration, Cleaning and Disinfection

Use filtration as an effective defense against some airborne pathogens through its high capture efficacy.

## Ventilation

Increase ventilation in buildings to bring fresh air into a space from the outdoors to increase oxygen levels and dilute occupant-generated pollutants (e.g., carbon dioxide) and product-generated pollutants (e.g., volatile organic compounds).

## Pressurization

Control air flow direction between clean zone and contaminated zone using pressure by maintaining pressure gradient and pressure difference between different zones.

## Surface Cleaning and Disinfection

Consider the efficacy of surface disinfectants, including the mechanisms, action of the active substance and its interaction with the target organism. The purpose of routine or targeted disinfection of inanimate surfaces is the killing or inactivation of pathogens to an extent which mitigates the risk of subsequent infection transmission.

You can also access in-depth reviews of [Safety & Security: Risk Management](#) and [Air Quality](#) topics in the Anatomy of Healthy Building technical guide series.

# WHY HEALTHY BUILDINGS KPIs MATTER

## A RESEARCH COMPENDIUM

The concept of a healthy buildings isn't new but has become increasingly relevant as businesses look to come back to buildings and adjust to a new normal. Occupants will want healthier environments for the buildings they use for work, school, entertainment and travel. It's also critical to note that while every building has functions to address air quality, ventilation, relative humidity, filtration and pressurization as well as safety and security elements, they may not be optimized for building health.

For more than 50 years, countless studies have looked at the impact of the indoor environment on occupant wellness, productivity, safety, stress, ergonomics and beyond. Concurrently, the building industry has worked to increase energy and operational efficiency to help reduce the environmental impact of buildings – which account for more than 40% of the world's direct and indirect carbon dioxide (CO<sub>2</sub>) emissions.<sup>5</sup>

There is no widely adopted global industry standard when it comes to key performance indicators (KPIs) to creating a healthier building as well as tracking compliance to changing standards and regulations. The following pages feature third-party research that shows the value of creating standardized KPIs to educate people on related subjects like outdoor air quality to help change behavior and if needed, take appropriate action.

## AIR QUALITY INDICES

Several countries including the United States, India and China measure key air quality parameters and issue regular air quality updates. For example, the U.S. Environmental Protection Agency (EPA) issues an Air Quality Index (AQI). These indices help citizens understand levels of major pollutants, and the governing bodies issue alerts if air quality parameters are out of safe ranges.

**These alerts may recommend actions for vulnerable citizens if air quality parameters are poor.**

## GOVERNMENT AND MUNICIPALITY EFFORTS

In Beijing, the government's "war on pollution" campaign started in 2013 to help drive significant air quality improvement.<sup>6</sup> According to the city's ecology and environment bureau, the 2019 average PM<sub>2.5</sub> concentration of 42 µg/m<sup>3</sup> was 53% lower than the 2013 figure of 89.5 µg/m<sup>3</sup>. The effort is seen as a success due to new regulations and education efforts directed to both industries and citizens.



In early 2019, India released its much-anticipated National Clean Air Program (NCAP) which provides a roadmap to prevent, control and reduce unhealthy air pollution.<sup>7</sup> It is a time-bound, national strategy targeted to reduce particle air pollution (PM2.5 and PM10) by 20-30% by 2024 (compared to 2017 levels).<sup>8</sup> Under the NCAP, city-specific action plans will exist for all 102 cities that exceed national air quality safeguards as well as mitigation recommendations for key industries known to contribute to air pollution in many cities.

## **REGIONAL AND BUILDING INDUSTRY STANDARDS**

While building industry organizations like ASHRAE and REHVA have created guidelines on how to adjust building strategies to create a healthier and safer environment, there is no well-defined, global standard for healthy buildings. Some cities and countries have created healthy buildings standards and there is third-party performance testing, like the [WELL Certification](#).

Companies in recent years started paying more attention to occupant experience, including how they support the health of their workers, in part due to the battle to attract top talent. The COVID-19 pandemic is also changing building owner and occupant attitudes, perceptions and interest in building health and safety. Recent research by the commercial real estate company JLL shows that companies will want proof that a building is safer and healthier in order to confidently recommend occupants return to the workplace.<sup>9</sup> Some municipalities may also create their own healthy buildings standards like what's seen in Australia's NABERS IAQ, Singapore's Building and Construction Authority-Health Promotion Board's Green Mark for Healthier Workplaces or India's IGBC (Indian Green Building Council) that provide building health and wellbeing rates. In a survey by Uponor of more than 200 construction professionals revealed that 90% of those surveyed agreed that the built environment plays an important role in everyday well-being with the ventilation system seen as the most crucial (77.5%).<sup>10</sup>

**Collectively, these outlook changes may drive greater adoption of third-party performance testing or industry-wide standards as a business imperative to reassure employees that a building is safer.**

# THE VALUE OF HEALTHY BUILDINGS KPIs

As we've learned, there is a new set of expectations to create healthier and safer buildings. The ability to clearly demonstrate the health of your building will help to reassure occupants that it's safer to return and potentially even create greater resiliency for your building.

A healthy buildings reflects a holistic view of the building environment and the people who use it. That means indoor air quality that promotes health and safety, as well as security protocols to manage and minimize risk. Understanding, and clearly communicating, the efforts to improve air quality and safety and security factors are also key to demonstrating compliance to new and changing regulations.

Establishing and tracking healthy buildings KPIs can provide value to building owners as the control compliance, reassure occupants and build resiliency in uncertain environments.

## Control Compliance

Building owners can gain more control over critical health, safety and security factors to sustain compliance with changing building standards, safety guidelines, government-issued regulations and a company's risk management policies. Real-time and actionable analytics give building owners the ability to minimize risk as they adapt to an evolving new normal.


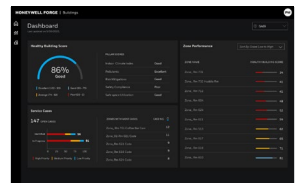
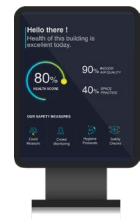

## Reassure Occupants

Reassure occupants with visible, transparent data on the health of the building. A curated, simplified view of a #HealthyBuildings Score can be shared anytime and anywhere via a mobile app. A real-time dashboard can also be displayed via monitors across a building site such as the entrance lobby, elevators or cafeteria.

## Build Resiliency

Make your building more resilient in uncertain times with Healthy Buildings KPIs that allow you to know the status of air quality and safety and security parameters, deviations, troubleshooting and standard operating procedures (SOPs) for loop closure. These parameters and compliance tracking will allow building owners and operators to quickly identify and resolve issues before they escalate and to use this data to inform current and potential occupants the status of the health of the building.

## Creating Continuous Healthy Buildings Operations

<p><b>ENTERPRISE MULTI-SITE</b></p> 	<p><b>1 DIRECTOR/ C-SUITE</b> Support occupant comfort and minimize risk more easily and efficiently</p> <p><b>Actionable insights with Healthy Building Score Portfolio Analytics</b></p>		
<p><b>MEDIUM/LARGE BUILDINGS</b></p> 	<p><b>2 DIRECTOR/ C-SUITE</b> Support occupant comfort and minimize risk more easily and efficiently</p> <p><b>Track, Monitor, Report With Facility KPIs and trends</b></p>	<p><b>3 BUILDING/SECURITY OPERATOR</b> Take timely actions more easily &amp; quickly</p> <p><b>Guided Resolution With Alarms and SOPs</b></p>	<p><b>4 OCCUPANTS</b> Feel safer &amp; secure more confidently and reliably</p> <p><b>Occupant Reassurance With Healthy Building Score &amp; compliance information</b></p>

# ESTABLISHING A HEALTHY BUILDINGS BASELINE

## Why it matters

It's important that facility managers and operators not only know how to adjust or supplement their building systems to create a healthier environment but also establish a clear set of targets to determine compliance with changing building standards, safety guidelines, government-issued regulations and a company's risk management policies. Real-time and actionable analytics can give building owners the ability to minimize risk as they adapt to an evolving new normal.

Previously, building owners and operators focused on KPIs focused on comfort, space utilization, and security. In the new normal, Healthy Buildings Key Performance Indicators (KPIs) can help evaluate, consolidate and aggregate a building's environmental, safety and security data to provide actionable insights to facility managers and operators.

New KPIs that measure air quality, personal protective equipment (PPE) detection, social distancing, health screening, cleaning procedures, lockdown management and more can help building owners and operators quickly address non-compliance issues or deal with potential exposure-related incidents and communicate building health metrics to occupants. This greater awareness into building health KPIs can also help to reassure occupants that a building is safer and healthier with insight into the health of a building.

Below is a look at how building KPIs are changing in the new normal:

Healthy Building Key Performance Indicators			
PRE-COVID 19	Occupant Comfort	Space Utilization	Building Security
DURING COVID 19	Building Environmental Compliance	Social Distancing	PPE Detection
POST-COVID 19	Building Environmental Compliance & Comfort	Social Distancing & Space Utilization	Building Security & PPE Detection

## Healthy Buildings KPIs can be categorized into two segments

**Environmental Health & Safety** monitors building health based on air quality, relative humidity, indoor temperature, CO<sub>2</sub> level, air balance, and proportional airflow.

**Risk Compliance** includes video surveillance, PPE detection, crowd incidents, occupant access, social distancing and standard operating procedure (SOP) compliance using video and access management systems.

## Environmental Health & Safety KPIs

Type of KPI	Potential KPI Outcome
Relative Humidity	Maintain relative humidity (RH) within the range of 40-60%.
CO <sub>2</sub> Level (PPM)	Maintain indoor CO <sub>2</sub> level either below the range of 800-1,000 PPM or less than outdoor CO <sub>2</sub> +500 PPM. Regularly review HVAC system's operating sequence and measure indoor and outdoor CO <sub>2</sub> levels to meet the desired range.
Air Changes Per Hour	Meet regulatory body recommendations for air changes per hour based on the type of building, climate and region.
Occupancy Percentage	Set occupancy levels based on square footage needed for social distancing and local occupancy parameters (i.e., up to 50%) to adjust HVAC system controls based on occupancy.
PM2.5 (µg/m3)	Set PM2.5 goal to meet World Health Organization recommendations for your region.
TVOC (mg/m3)	Set TVOC levels for your building and measure how your system meets these parameters.

## Risk Compliance KPIs

Type of KPI	Potential KPI Outcome
Occupancy Level	Manage occupancy levels based on local occupancy parameters (i.e., up to 50%) to control people flow in particular areas of the building.
Density (people per sq. ft)	Set density level to not exceed local regulations (i.e., not exceed a specific percentage of people per square feet).
Crowd Incidents per day (8 or more people)	Set standard operating procedure (SOP) to manage sudden crowd incident (i.e., more than eight people) in a space at any given time.
Health Compliance SOP Closed (%)	Create a SOP close rate based on time to manage incidents and effectively implemented procedures.
Mask or PPE Compliance	Set 100% occupant compliance for mask or PPE.
Elevated Skin Temperature Incidents (%)	Track number of pre-screened elevated skin temperatures during a specific time period. Set and track SOPs on access control and further health and safety procedures if required.
Social Distancing (using video analytics)	Track social distancing compliance goals during specific time frames and spaces.
People Potentially Exposed (via contact traces)	Measure potential exposures over specific time periods. Set and track SOPs to contact trace, quarantine and access control.

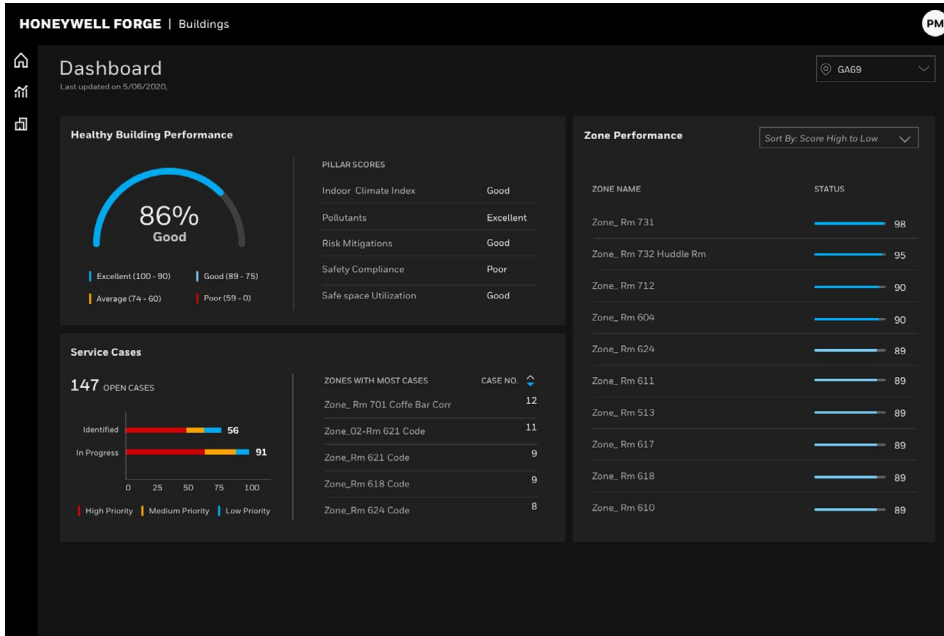
## Environmental Health & Safety Score

Honeywell created its Healthy Buildings Score to provide actionable insights to facility managers and operators to help improve operations.

The Healthy Buildings Score is derived using [Honeywell's proprietary algorithm \(Patent Pending\)](#) which can be used at a building, campus or across a building portfolio even across regions.

# Recommendations and Response to Healthy Buildings Operational Insight

Honeywell offers integrated systems including building management systems (BMS), Commercial Security offerings and Honeywell Forge enterprise performance management platform that are hardware and vendor agnostic to provide a holistic view of a building's operations to help create a safer and healthier environment.



## SUMMARY

While no industry-wide standard exists for healthy buildings, there is still a need to educate building owners and occupants on the health of the built environment. A healthy buildings dashboard summarizes KPIs for key building parameters, across building zones or areas or even building portfolios to track benchmark data, track compliance, refine processes and procedures and adjust to new regulations. It's possible for building owners to deploy and share how a specific site is meeting its set KPIs or may need improvement. Easily understandable and customizable KPIs are achievable for any facility no matter the vertical or size and can even be adjusted to address evolving guidelines and regulations.

# APPENDIX

## HONEYWELL HEALTHY BUILDINGS KPI DASHBOARDS

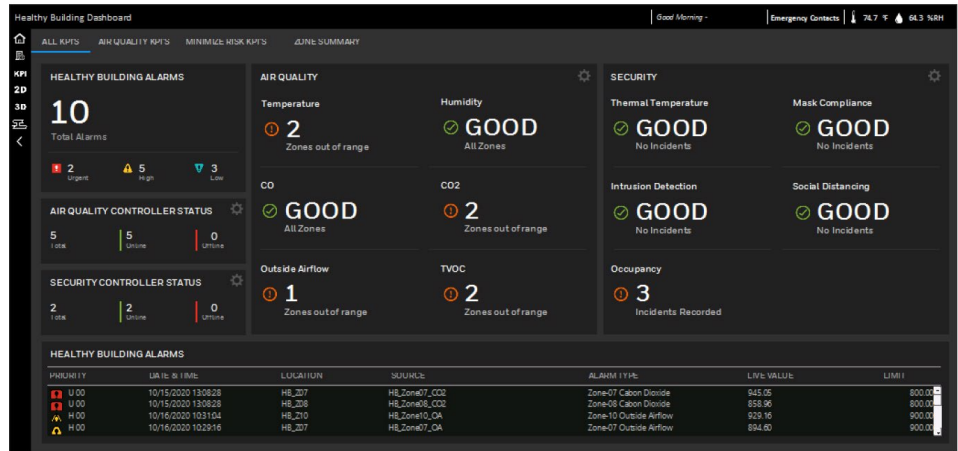
Honeywell's Healthy Buildings KPI dashboards can measure Air Quality and Safety & Security elements. These dashboards provide operators with a consolidated view of various Healthy Buildings operating standards and parameters. An operator can easily identify the root cause of an alarm by tracking KPIs and using an intuitive navigation to drill down to floorplan and equipment level.

Honeywell's Healthy Buildings KPI dashboards feature the following areas:

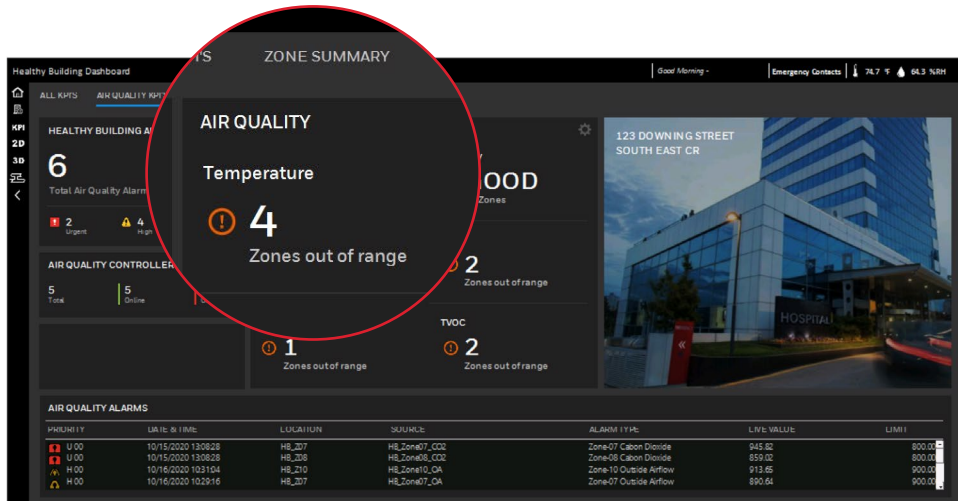


### All KPIs Dashboard

The dashboard uses existing data available for Air Quality and Safety & Security KPIs.



### Air Quality KPIs Dashboard Workflow



The below figure shows an example zone-specific status of Air Quality parameters like temperature, humidity, outside airflow, CO<sub>2</sub>, CO and TVOC. Each tile can show the number of zones that are outside the desired range. It will also show “All Zone are Good” if all the zones are within the desired range.

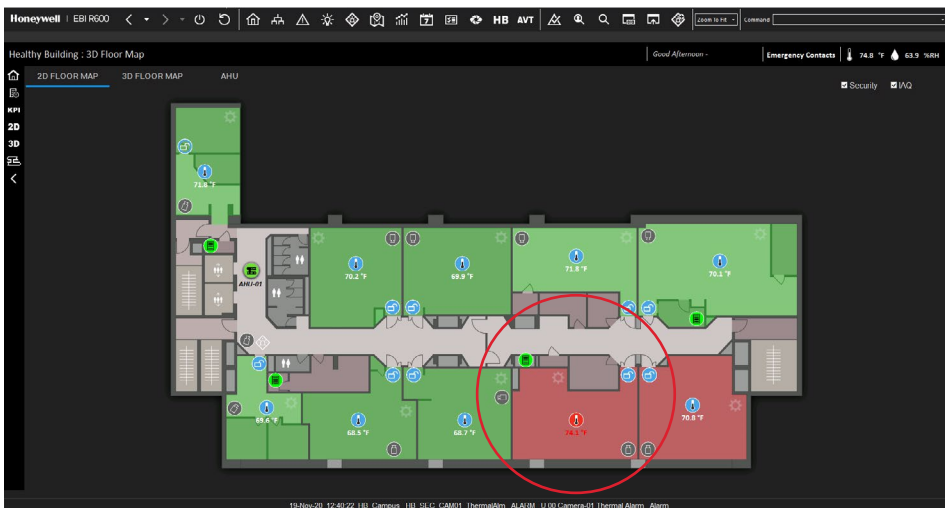
Clicking on any tile redirects to a customized Healthy Buildings Alarm Page for that AQ parameter. For example, clicking on temperature tile redirects you to Healthy Buildings Temperature Alarms page.

The Healthy Buildings Alarms table shows only Healthy Buildings related alarms. This helps the operator to focus only on healthy buildings related issues rather than having hundreds of alarms popping up in the standard alarm summary.

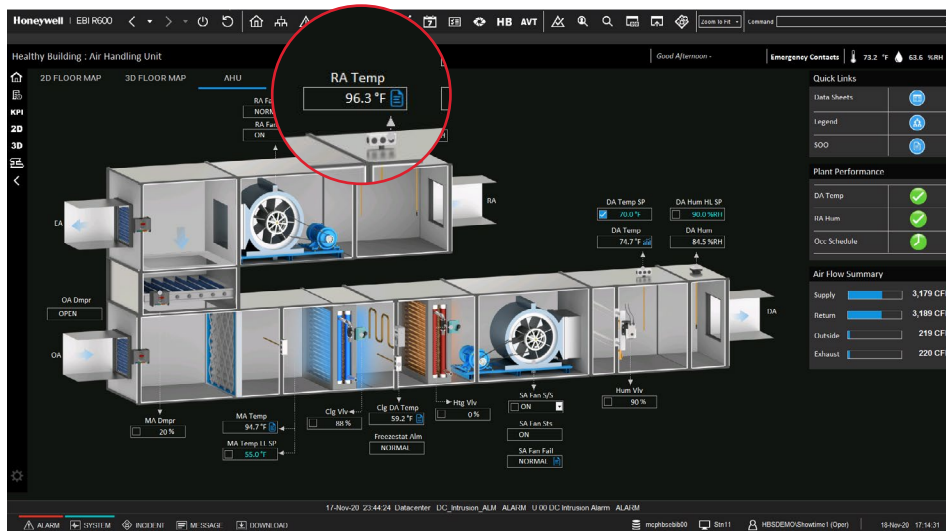
Operator can click on the Alarm Row and select option to acknowledge the alarm or to go to associated display for drilling down to further details.

HEALTHY BUILDING ALARMS						
PRIORITY	DATE & TIME	LOCATION	SOURCE		ALARM TYPE	LIVE
H00	12/17/2020 20:17:12	HB_Campus	HB_Zone01	Alarm	Zone-01 Temperature	75%
H00	12/17/2020 20:16:51	HB_Z02	HB_Zone02	Acknowledge alarm	Zone-02 Humidity	44%
H00	12/17/2020 20:16:40	HB_Campus	HB_Zone01	Detail display	Zone-01 Temperature	75%
H00	12/17/2020 20:16:40	HB_Z04	HB_Zone04	Associated display	Zone-04 Temperature	72%
H00	12/17/2020 20:16:29	HB_Z01	HB_Zone01	Alarm	Zone-01 Humidity	48%
H00	12/17/2020 20:16:29	HB_Z03	HB_Zone03	Alarm	Zone-03 Humidity	44%
H00	12/17/2020 20:16:25	HB_Z01	HB_Zone01	Alarm	Zone-01 Humidity	48%

This navigates to the floorplan graphics from where the alarm was triggered. The floorplan graphic can use existing site graphics or can be designed from scratch as per the site requirement.



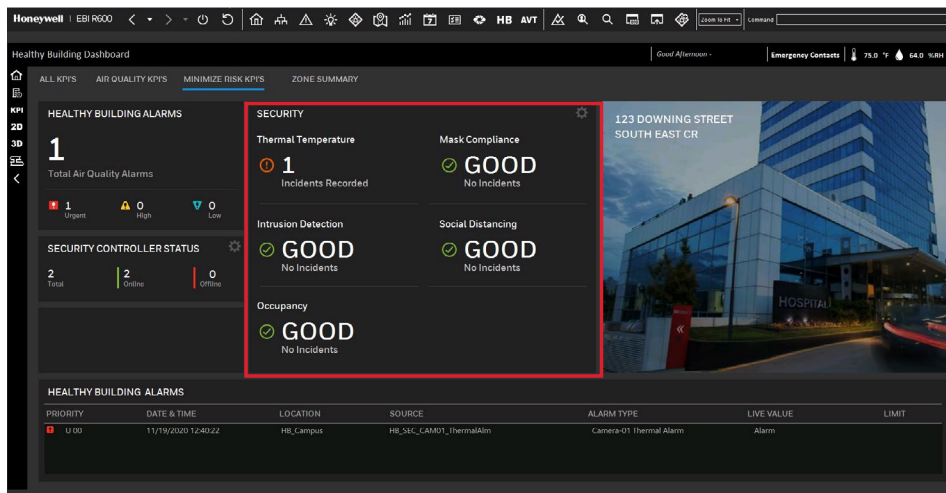
The floorplan has dynamic icons for different equipment like air handling unit (AHU), fan coil unit (FCU), temperature sensors, etc. These icons change color based on the status, alarm points of associated equipment. Clicking on these icons navigates to the equipment schematic page for the same.



Operator can drill down further to access troubleshooting documentation by clicking on the document icon available adjacent to different alarming points.

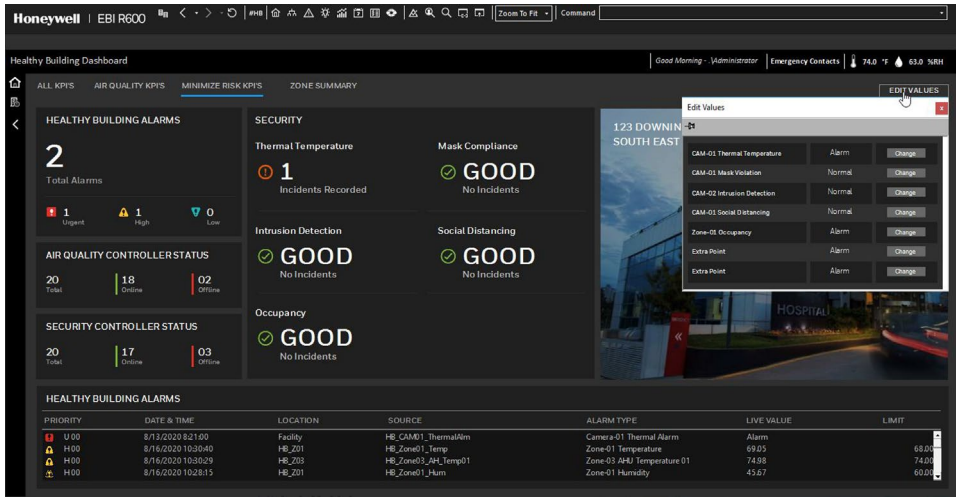
Operator can also navigate to the full Healthy Buildings KPIs graphics by clicking on #HB icon in header.

## Safety & Security KPIs Dashboard Workflow



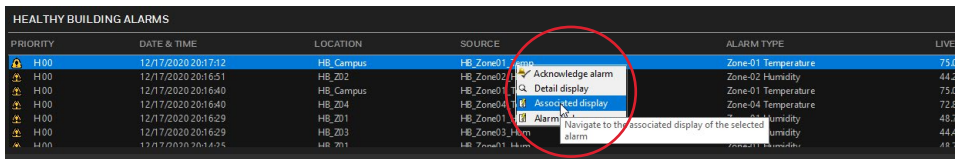


The below figure shows an example of specific zone violations of various healthy buildings parameters like thermal temperature, mask compliance, intrusion detection, social distancing and occupancy. Each tile will display the count of zones that are have violations and can show an “All Zones are Good” message if there are no violations in any zone.



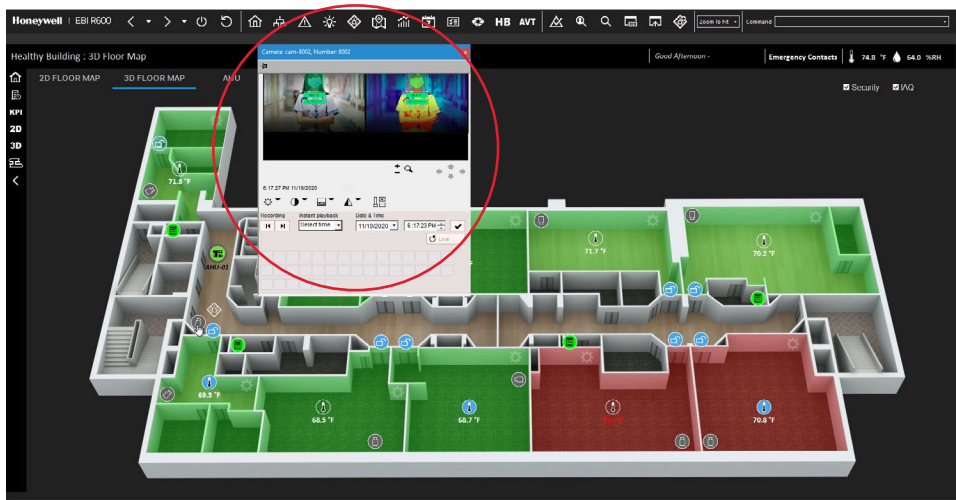
Once an alarm is triggered, it appears in the Healthy Buildings Alarms table on the bottom of the graphics page. Right clicking on any Alarm row will show various alarm actions like Acknowledge Alarm, Detail Display and Associated Display.

Clicking on the Associated Display redirects you to floorplan having device associated with that alarm.



Security Floorplan has dynamic icons for different devices like cameras, doors, card readers, intercoms, etc. These icons change color based on the status and alarm points of associated equipment.

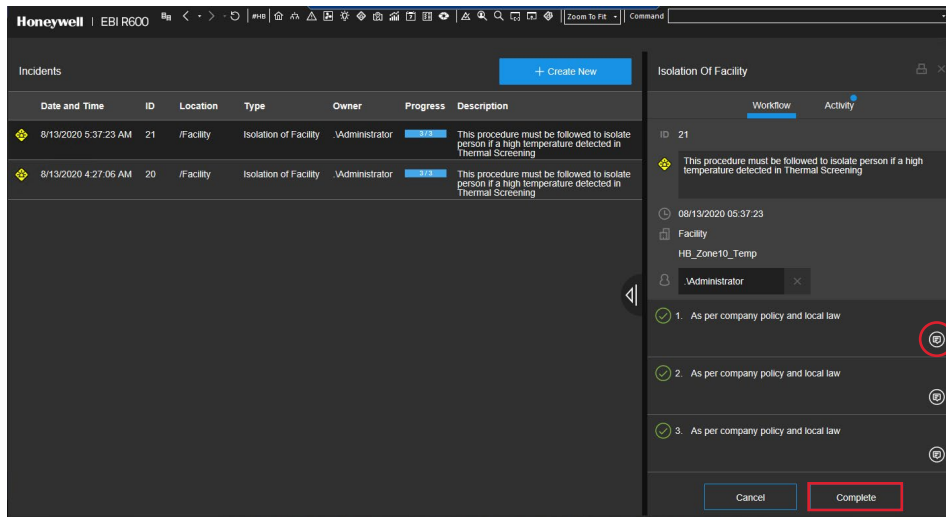
Clicking these icons open the standard popup for associated point. Clicking on camera icon opens the standard digital video manager (DVM) interface with live video.



This is the default interface for the camera and provides functions like play, pause, change settings and date and time selection.

Incident Workflow as an additional feature helps an operator to understand what steps or actions should occur in case of a specific alarm scenario. There can be one incident for each alarm type, for example, all the body temperature detection alarms have one incident attached to them while there can be another incident for emergency scenarios in case of fire alarm.

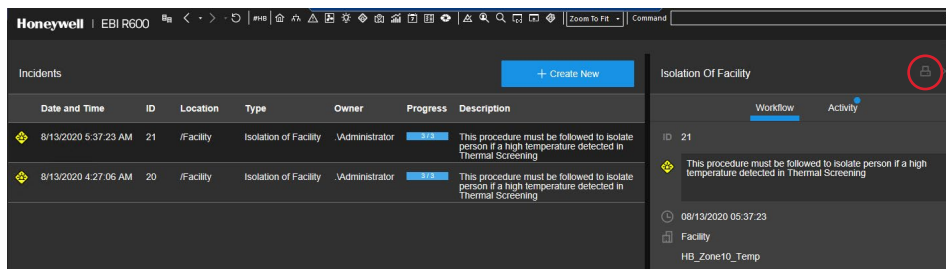
In the demonstration graphics, incident icon is shown next to the camera having alarm. Clicking on this icon opens Incident Workflow page, all the open incidents are listed here. Clicking on any incidents will open that incident in the right side of that page.



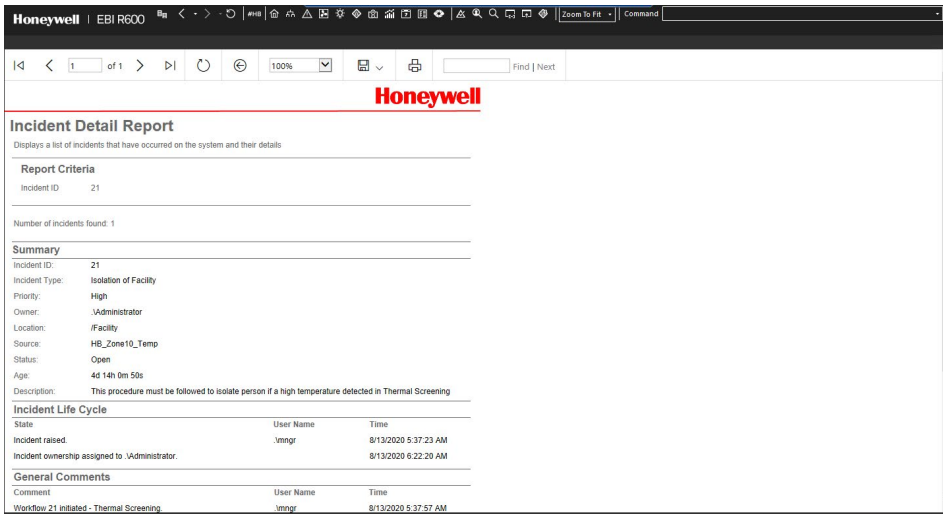
An operator can perform the steps mentioned in the workflow section and manually review the checkpoints. Custom text can be added in the comments section by clicking the comments button on the right pane.

Once all the steps are completed, the operator can click on the complete button on the workflow pane. This will mark the incident as completed and it will be taken out from the current Incidents list.

There is a reporting functionality which shows the detailed report of an incident. Reports can be accessed by clicking on the report icons on top right of Incident title.



Incident Detail Report shows all the details including Alarm Summary, Incident Life Cycle and workflow action with operator details and date-time stamp. This report provides standard options like save, print and search as well.



## Zone Summary

Zone Summary provides consolidated summary of various zone parameters like temperature, humidity, CO<sub>2</sub>, outside air, CO, TVOC and occupancy. The first column shows the zone status dynamic shape, this shape shows values as 'GOOD' or 'OUT OF RANGE' based on the alarms associated with that zone.

Healthy Building Dashboard

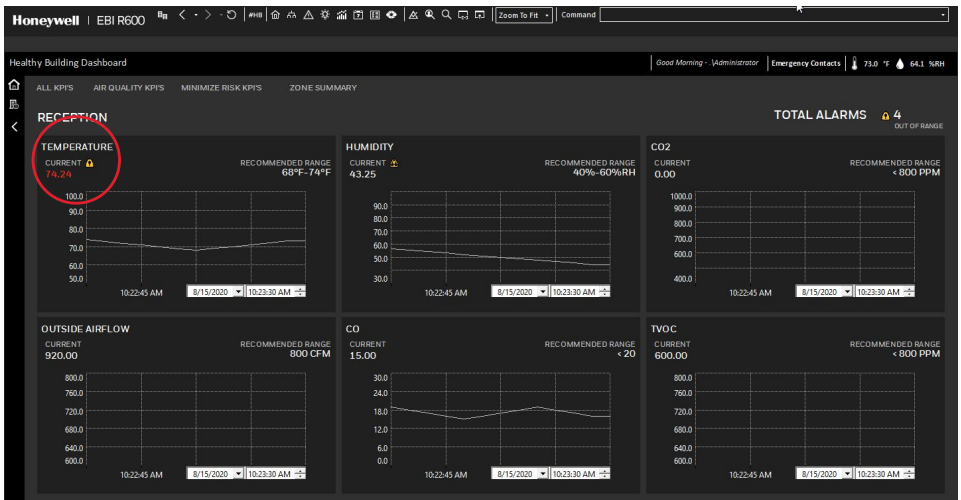
ALL KPIs AIR QUALITY KPIs MINIMIZE RISK KPIs **ZONE SUMMARY**

Zones Overview

STATUS	ZONE NAME	TEMP	HUMIDITY	CO	CO2	TVOC	PM 2.5	OA FLOW	OCC	
		RECOMMENDED VALUES	68-74 °F	40-60%RH	<20 PPM	< 800 PPM	< 1 mg/m <sup>3</sup>	< 12 µg/m <sup>3</sup>	> 900 CFM	< 50%
GOOD	Zone 1 - Reception	69.9 °F	47.6 %RH	4.4 ppm	674 ppm	2.45 mg/m <sup>3</sup>	10.9 µg/m <sup>3</sup>	1,151 cfm	22 %	
GOOD	Zone 2 - 1st Floor Main Lab	71.3 °F	54.9 %RH	4.5 ppm	689 ppm	2.78 mg/m <sup>3</sup>	10.7 µg/m <sup>3</sup>	1,058 cfm	24 %	
GOOD	Zone 3 - 2nd Floor R&D Lab	70.1 °F	54.8 %RH	4.1 ppm	641 ppm	2.7 mg/m <sup>3</sup>	11.3 µg/m <sup>3</sup>	992 cfm	34 %	
GOOD	Zone 4 - 3rd Floor East Wing	70.1 °F	54.1 %RH	4.4 ppm	438 ppm	2.8 mg/m <sup>3</sup>	11.7 µg/m <sup>3</sup>	1,110 cfm	25 %	
GOOD	Zone 5 - 3rd Floor West Wing	69.8 °F	54.3 %RH	4.5 ppm	588 ppm	2.8 mg/m <sup>3</sup>	10.9 µg/m <sup>3</sup>	1,191 cfm	36 %	
GOOD	Zone 6 - 4th Floor East Wing	70.1 °F	54.3 %RH	4.8 ppm	464 ppm	2.6 mg/m <sup>3</sup>	11.8 µg/m <sup>3</sup>	922 cfm	33 %	
GOOD	Zone 7 - 4th Floor West Wing	70.3 °F	54.4 %RH	5.0 ppm	463 ppm	2.4 mg/m <sup>3</sup>	10.0 µg/m <sup>3</sup>	1,190 cfm	25 %	
OUT OF RANGE	Zone 8 - 5th Floor East Wing	71.6 °F	54.9 %RH	4.6 ppm	539 ppm	2.9 mg/m <sup>3</sup>	4.0 µg/m <sup>3</sup>	1,065 cfm	33 %	
OUT OF RANGE	Zone 9 - 5th Floor West Wing	75.0 °F	54.3 %RH	4.2 ppm	546 ppm	1.8 mg/m <sup>3</sup>	8.8 µg/m <sup>3</sup>	1,171 cfm	16 %	
GOOD	Zone 10 - 6th Floor East Wing	71.1 °F	54.4 %RH	4.5 ppm	748 ppm	2.1 mg/m <sup>3</sup>	11.7 µg/m <sup>3</sup>	908 cfm	26 %	

The above table shows text color animation for different columns, the points in alarm are shown in red. This helps to identify which parameter of that zone is out of range.

# Air Quality Trends



Each zone will have SHOW TREND button, this opens the zone trend page for Air Quality parameters of that zone. This can be customized to suite the site requirement. Any parameter that is out of range will be shown in red color and alarm indicator will be shown next to it

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## Honeywell Building Technologies

715 Peachtree St NE  
Atlanta, Georgia 30308  
honeywell.com

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