

FACTORY AUTOMATION MANUFACTURING SOLUTIONS

Our sensors
and switches
transform your
business further.

DISCOVER THE DIFFERENCE

Honeywell

Honeywell Factory Automation ebook was designed for the curious reader. Using the navigation bar at the top, explore the various factory automation solutions to learn more about Honeywell sensors, switches and controls.

Honeywell focus products are contained in a grey circle with red outline; there's a focused product overview on each. Supporting Honeywell products are contained in a grey circle; there's more information on them in the Product Quick Snaps section.

On these pages, the navigation icons will help the reader learn more about the products, as well as explore further on the product datasheet and web link.

PAGE NAVIGATION ICONS



What the product is.



What the product does.



Product innovation



Target applications



Product datasheet



Product web link

FACTORY AUTOMATION EXCELLENCE RIGHT DOWN THE LINE

Now more than ever, efficient automation of your factory is increasingly important – and increasingly challenging. The global pandemic and its aftermath created some issues and uncovered others that were already percolating. For example, with fewer available workers and many current folks planning to retire, the need to make your machinery work harder is no longer optional for increased output as well as improved cost competitiveness and delivery times. In the supply chain – now a regular topic on news programs where it received little attention in the past – manufacturers are facing raw materials and component shortages, extended lead times, and rising prices. Add surging energy costs and an explosion of new regulations around the world, and you've got your hands full...and then some.

That's where Honeywell delivers. With over a century of experience on the factory floor, our MICRO SWITCH limit switches – including HDLS Heavy Duty Limits, BZE6 Enclosed Limits, 914CE Limits, GLS Global Limits and NGC Limits – really have no limits when you need versatility, enhanced performance, productivity and increased safety in your limit switch applications. The same is true for our cable pulls, pressure switches and sensors, magnetic sensors, temperature sensors, force sensors and manual controls like toggle switches and pushbuttons. In basic switches, we invented the original MICRO SWITCH product and every year we manufacture over 120 million of these simple, superior, irreplaceable devices.

We can help ensure that your equipment works hard to keep your automated lines going strong. From CNC fabricating machines, conveyors, and pallet and packaging machinery to high-tech robotics and 3D printers, our vast product array and global engineering support can meet your harshest, most exacting sensing and switching requirements with precision, reliability, and industry-leading solutions. Whether you're bending, grinding, shaping, moving, cutting, mixing, batching, assembling, or testing, we have you covered because when it comes to factory automation, we can put it all on the line. Your line.

INDUSTRY TRACKS & TRENDS



According to a report by Markets & Markets, the industrial control and factory automation market size is projected to reach USD 218.8 billion by 2027 from an estimated USD 147.9 billion in 2022, at a CAGR of 8.2 % from 2022 to 2027¹. Their researchers cite drivers of an emergence of connected enterprises and requirement of mass manufacturing to products, along with government initiatives to promote industrial automation.

There's a significant opportunity in the industry regarding safety compliance. Industrial manufacturing inherently involves a number of hazardous processes. Safety compliance in automated processes help reduce the risk for accidents and loss of productivity.

Another area of opportunity surrounds 3D printers as this segment is projected to register the highest CAGR (29.48%) from 2021 to 2026². This segment is rapidly growing due to increased adoption in a number of industries, including aerospace and defense, food & beverage and electronics. The ability of 3D printers to replicate light-weight, cost-conscious parts with high precision makes them very appealing to aerospace and defense manufacturers.

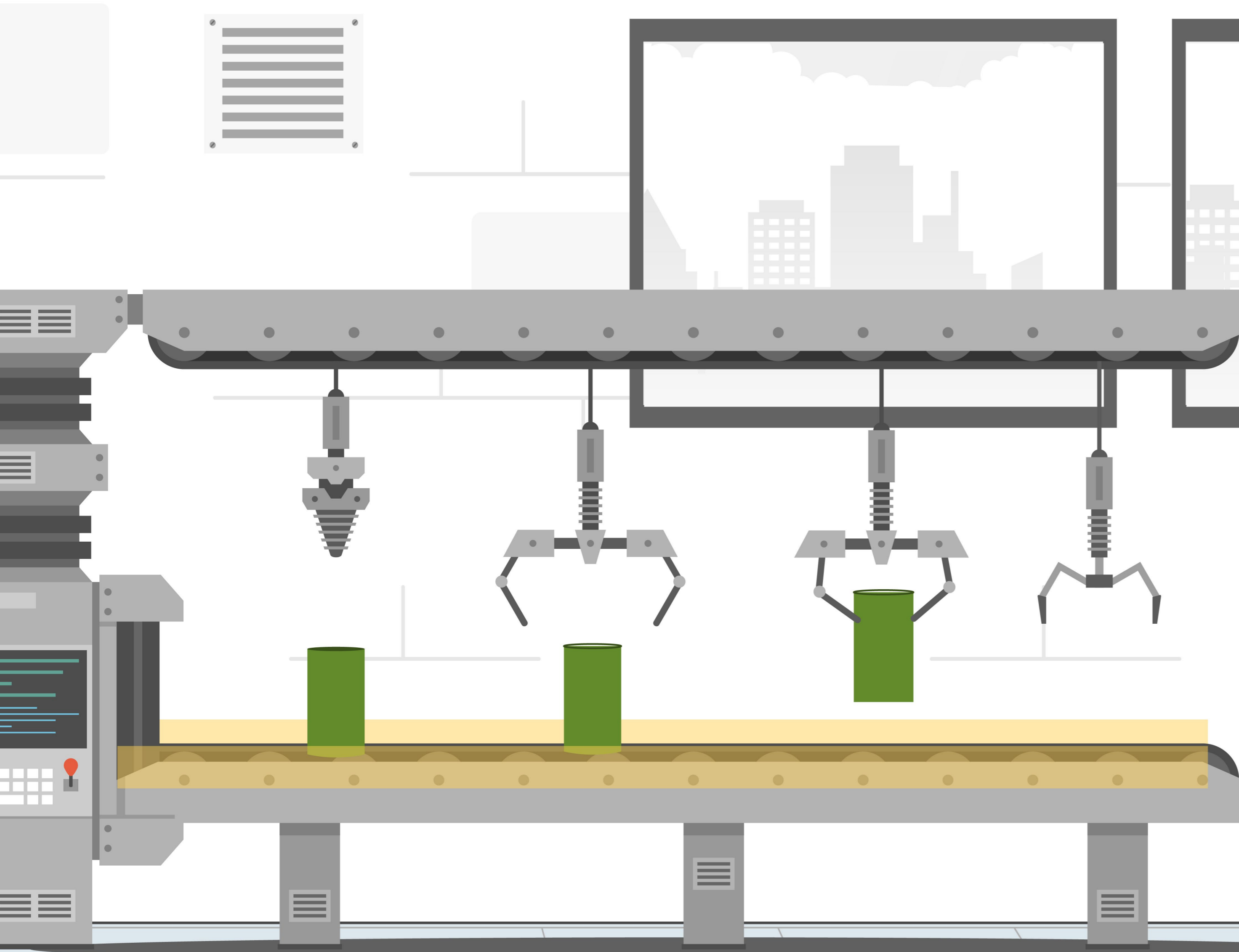
And then there's robotics... Statista examined the role of robotics in factory automation. Globally, there are 2.7 million industrial robots working; in 2028, the market size is projected to surpass 165 billion U.S. dollars³. Articulating robotic arms have been used for years in manufacturing environments but are now finding to be very useful in warehouse applications. The way forward is to combine the strength of robotics with human decision making and skills to create a collaborative workplace.

Honeywell is looking to the future and much further beyond. The future of factory automation continues to grow... and Honeywell will be strong and viable partner as these markets continue to evolve.

¹ <https://www.marketsandmarkets.com/Market-Reports/factory-industrial-automation-sme-smb-market-541.html>

² <https://www.mordorintelligence.com/industry-reports/3d-printing-market>

³ <https://www.statista.com/topics/1476/industrial-robots/>



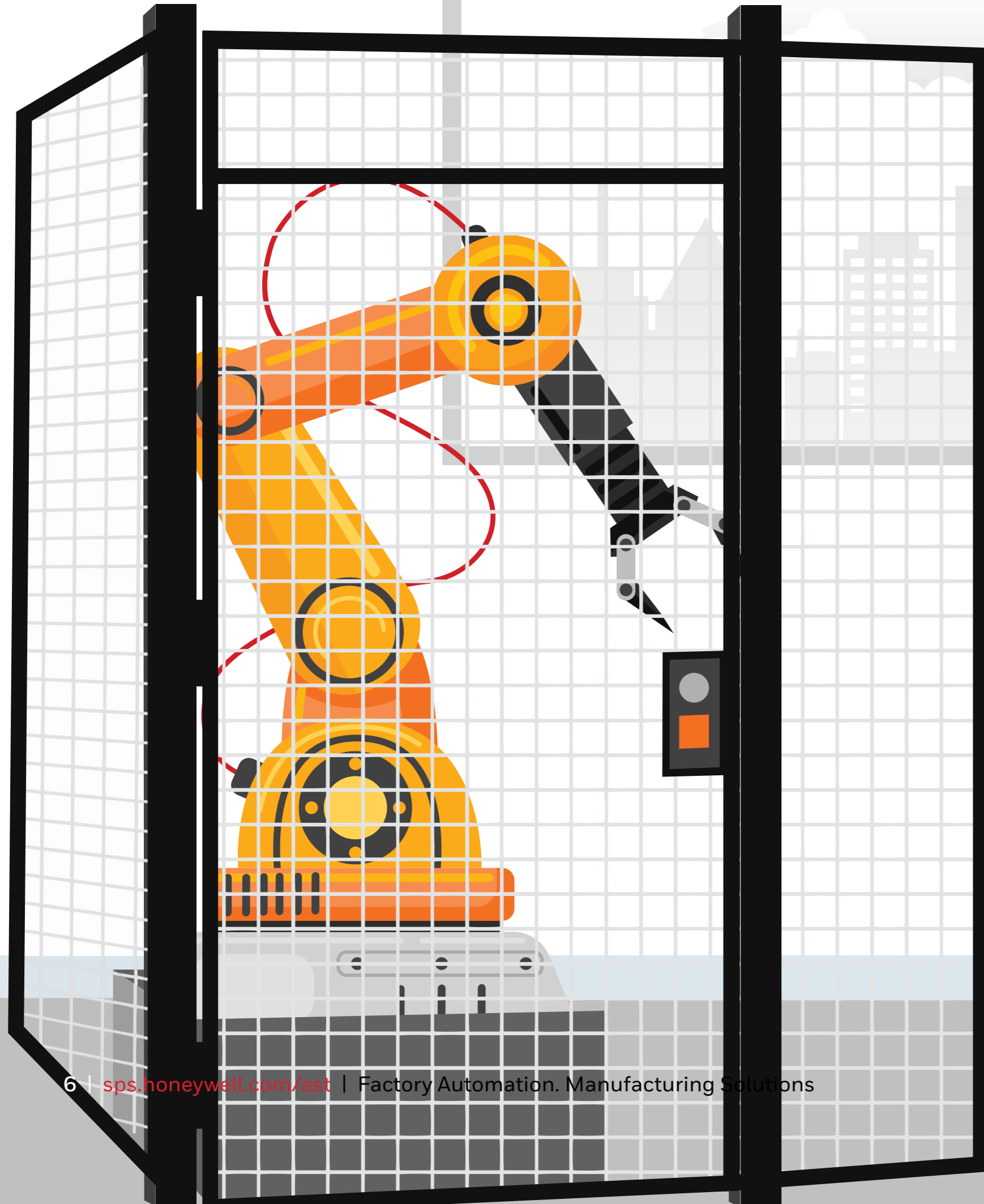
 A collection of seven circular callouts, each containing an image of a specific Honeywell product. The products are:

- Cable Pull Safety Switch**: A red and black rectangular switch with a pull cable.
- 914CE Limit Switch**: A small, grey rectangular limit switch.
- Global Limit Switch**: A blue rectangular limit switch.
- HDLS Heavy Duty Limits Switch**: A blue rectangular heavy-duty limit switch.
- Pressure Sensors**: A small, black cylindrical sensor with a threaded base.
- Pressure Switches**: A larger, silver cylindrical pressure switch.
- Pushbutton Switches**: A black and yellow pushbutton switch.

CONVEYOR SOLUTIONS

Factories, warehouses, and distribution centers often encounter temperature variations due to the number of machines running and the weather conditions outside. **Equipment must adjust for these temperature variations to maintain safe and efficient operations. Honeywell MICRO SWITCH cable-pull switches can adapt to these variations** to keep conveyor lines running smoothly and safely.

ROBOTICS SOLUTIONS



NGC Limit
Switch



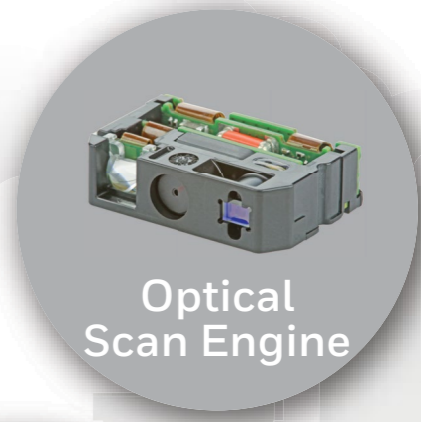
914CE Limit
Switch



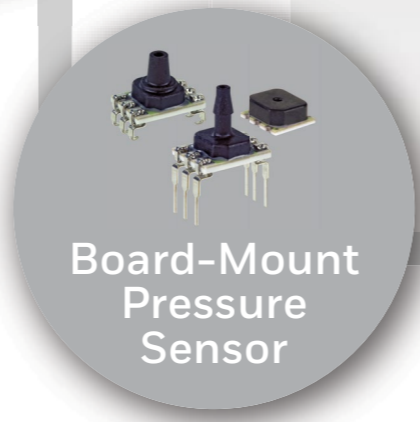
BZE6 Enclosed
Limit Switch



Cable Pull
Safety
Switch



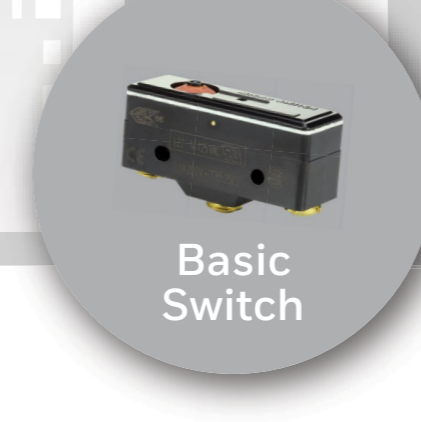
Optical
Scan Engine



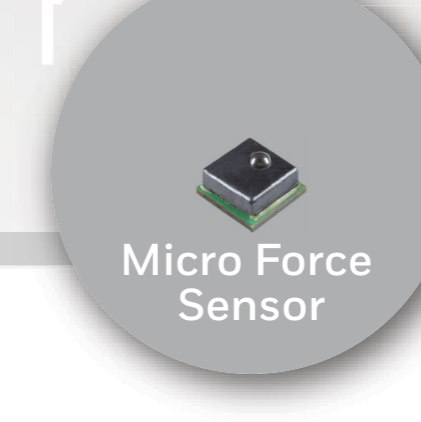
Board-Mount
Pressure
Sensor



Safety
Interlock



Basic
Switch



Micro Force
Sensor

According to the Bank of America, it is estimated that by 2025, 45% of all manufacturing tasks will be executed by robotic technology⁴. If the packaging sector hadn't been an early adopter of automation, it would have struggled through the pandemic. That's not to say that the situation has been easy, but it could've been much worse without robotics. Facilities that took full advantage of automation have fared best. Robotics use cases in the warehousing and packaging industry have helped to protect workers, uphold efficiency, decreased errors and made facilities more flexible.

⁴ <https://money.cnn.com/2016/01/15/news/economy/smart-robots-stealing-jobs-davos/index.html>

PALLET & PACKAGING MACHINE SOLUTIONS



NGC Limit Switch



914CE Limit Switch



BZE6 Enclosed Limit Switch



Heavy-Duty Limit Switch



Toggle Switch



E-stop Switch



Key Switch



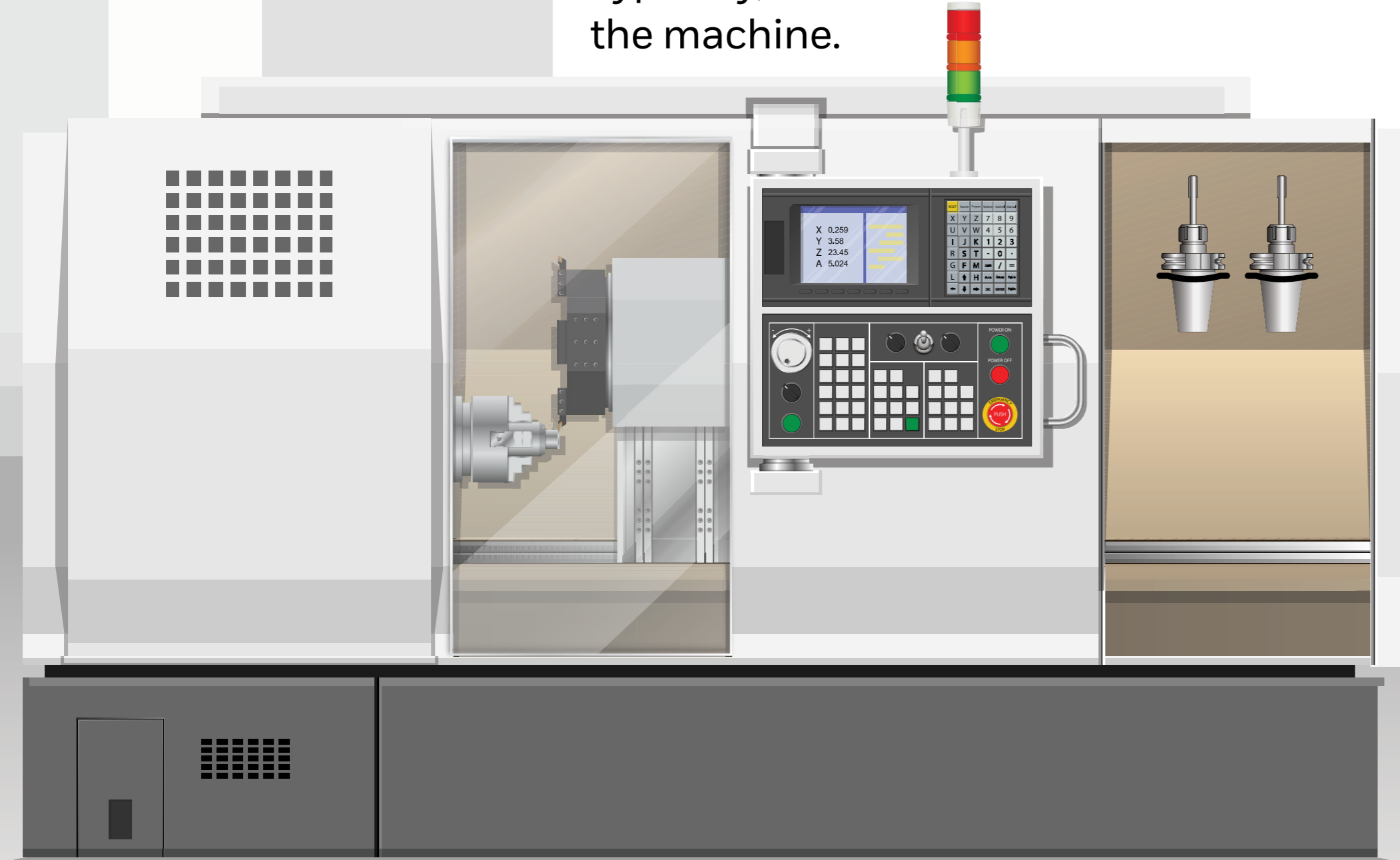
Increasing customer demands for quality, speed and security across supply chains has driven optimization in packaging operations. According to Future Market Insights, in 2022, the global market stood at USD 412.5 Million and is estimated to reach a valuation of more than USD 509.9 Million by end of the forecast period (2027)⁵. Packaging and pallet equipment must be able to perform in harsh, temperature-varying environments with high levels of shock, force and vibration.



⁵ <https://www.futuremarketinsights.com/reports/pallet-stretch-wrapping-machines-market>

CNC MACHINE SOLUTIONS

Mordor Intelligence reports, “The Computer Numerical Controls (CNC) Market was valued at USD 7.87 billion in 2020 and is expected to reach USD 9.53 billion by 2026, at a CAGR of 3.3 %. The increase in demand for productions efficiency will drive the market in the forecast period.”⁶ CNC Machines are a vital piece of automation equipment. The environment around the machining process is generally very dirty. Often cutting fluids are splattered about, and debris from the machining process are thrown from the work pieces as they are being processed. Typically, there is a lot of vibration and shock associated with the moving parts of the machine.



HDLS Heavy Duty Limits Switch



914CE Limit Switch



Global Limit Switch



NGC Limit Switch



Magnetic Sensor IC

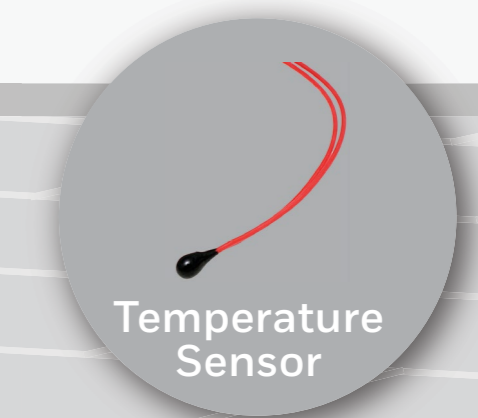


NT Toggle Switch

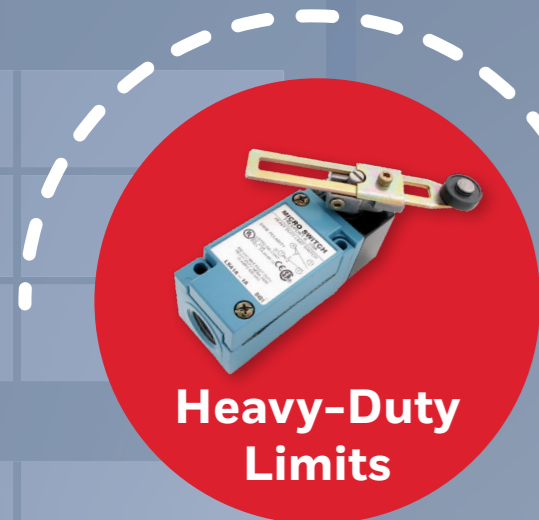
⁶ <https://www.mordorintelligence.com/industry-reports/computer-numerical-controls-market>

3D PRINTER SOLUTIONS

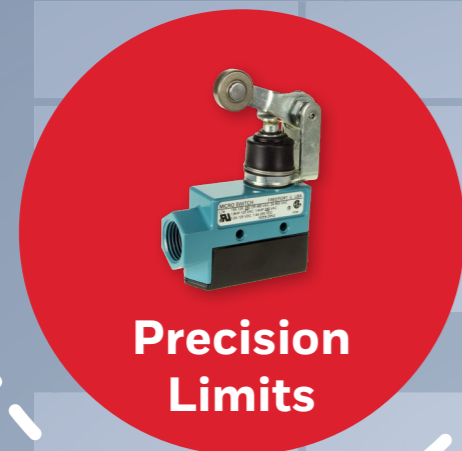
Industrial 3D printing technology is moving from just prototyping to high-volume production. Morder reports that the 3D printing market was valued at USD 13.7 billion in 2020, and it is expected to reach a value of USD 63.46 billion by 2026, at a CAGR of 29.48 %⁷. To meet with demanding conditions and environments, 3D printers require small but reliable switches and sensors. Long life and precision are required to perform in these applications.



ADVANCING & ACCELERATING FACTORY AUTOMATION



Heavy-Duty Limits



Precision Limits



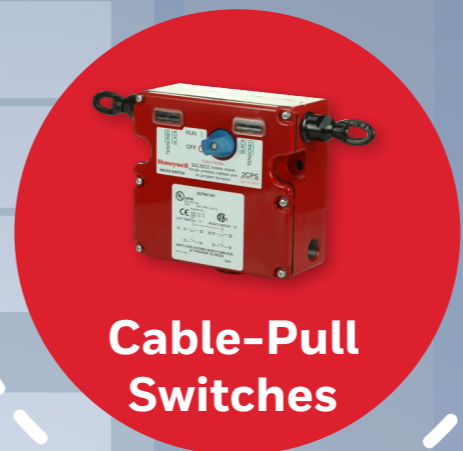
Miniature Limits



Global Limits



Miniature Limits



Cable-Pull Switches



Product Snaps

To view more details on Honeywell factory automation focus products, please click on the product(s) above you wish to explore more.



What the product is.



What the product does.



Product innovation



Target applications



Product datasheet



Product web link

PAGE NAVIGATION ICONS



HEAVY-DUTY LIMIT SWITCH HDLS SERIES



Ideal for many applications with demanding indoor and/or outdoor environments, where they may be subjected to shock or vibration from equipment, temperature extremes, dust, splashing water, coolant, and/or hose-directed water



- Position sensing for various moving parts to indicate end of travel
- Sense the presence of moving parts
- Indicate position for system controls



- Sintered bronze bearing on 303 stainless steel operating shaft for enhanced mechanical life (up to 50 million actuation cycles) and operational reliability

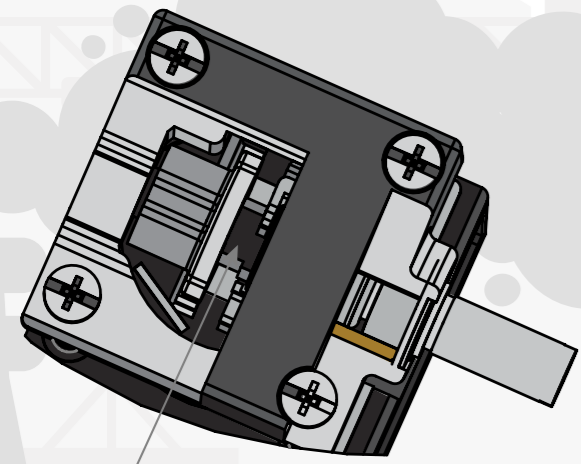


- Machine tools
- Material handling
- Conveyors
- Valves
- Automotive machine tools
- Outdoor electromechanical structures
- Food and beverage

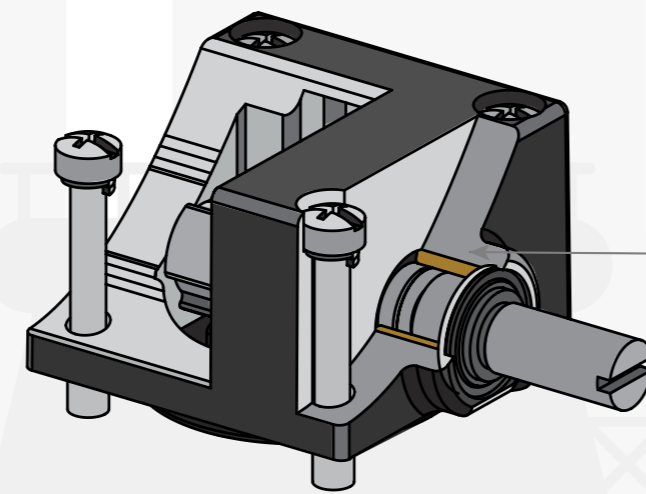
EXPLORE MORE



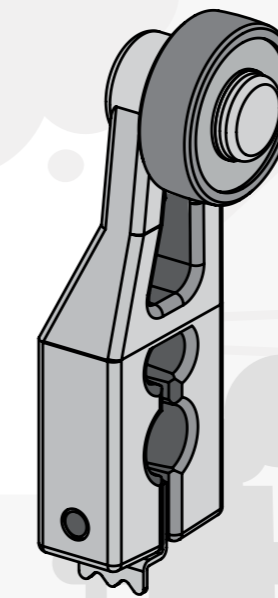
HDLS SWITCHES IT'S WHAT'S INSIDE THAT COUNTS.



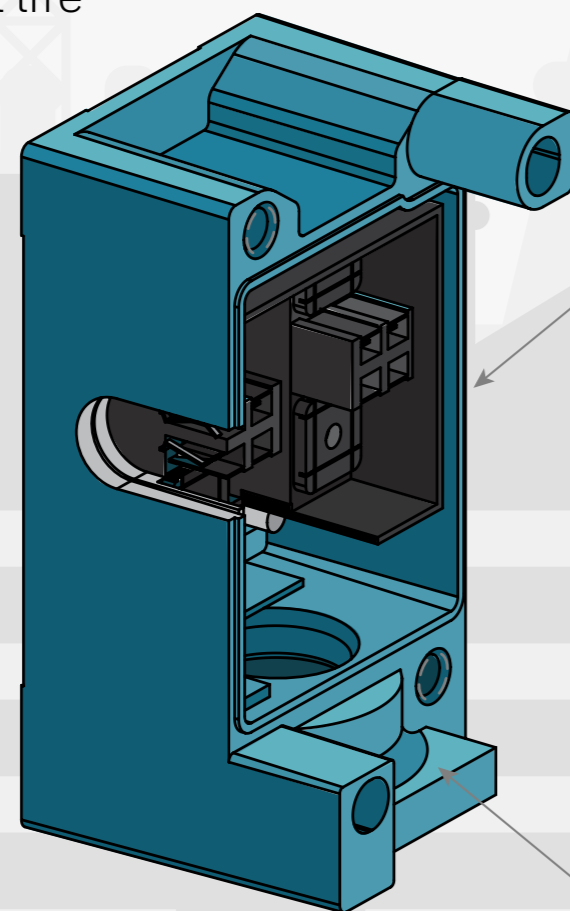
Dual bearings deliver enhanced mechanical life



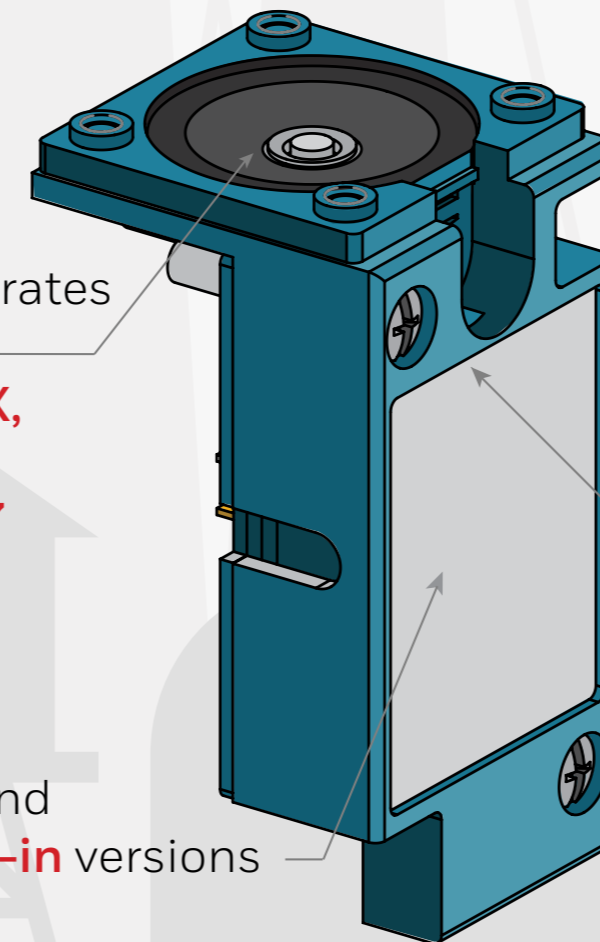
Bronze bearing on operating shaft for enhanced mechanical life



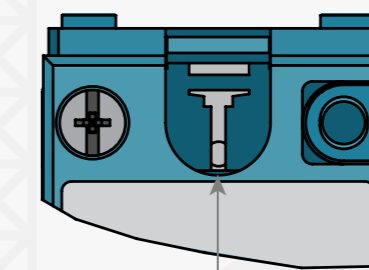
Exclusive teller tab ensures proper torque



One-piece flat gasket



Diaphragm separates head and body
NEMA 1, 3, 4, 4X, 6, 6P, 12, 13 and IP65/66/67



Unique, all-metal drive train

Metric and standard unit conduit threads available

Plug-in and non-plug-in versions available

Rugged housing, superior switch

- Boss-and-socket head design for **secure head-to-body retention**
- Self-lifting pressure plate terminals **save wiring time**
- **Twin shaft seals** for an extra measure of protection. Optional fluorocarbon or fluorosilicone seals.

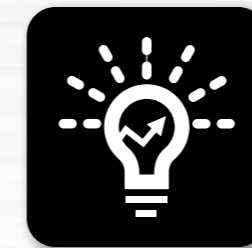
COMPACT PRECISION LIMIT SWITCH BZE6 SERIES



Preferred for applications where there could be exposure to liquid and/or particulate environments. The compact size of these sealed limit switches permits installation where there is limited space available on equipment



- Position sensing for various moving parts to indicate end of travel
- Sense the presence of moving parts
- Indicate position for system controls



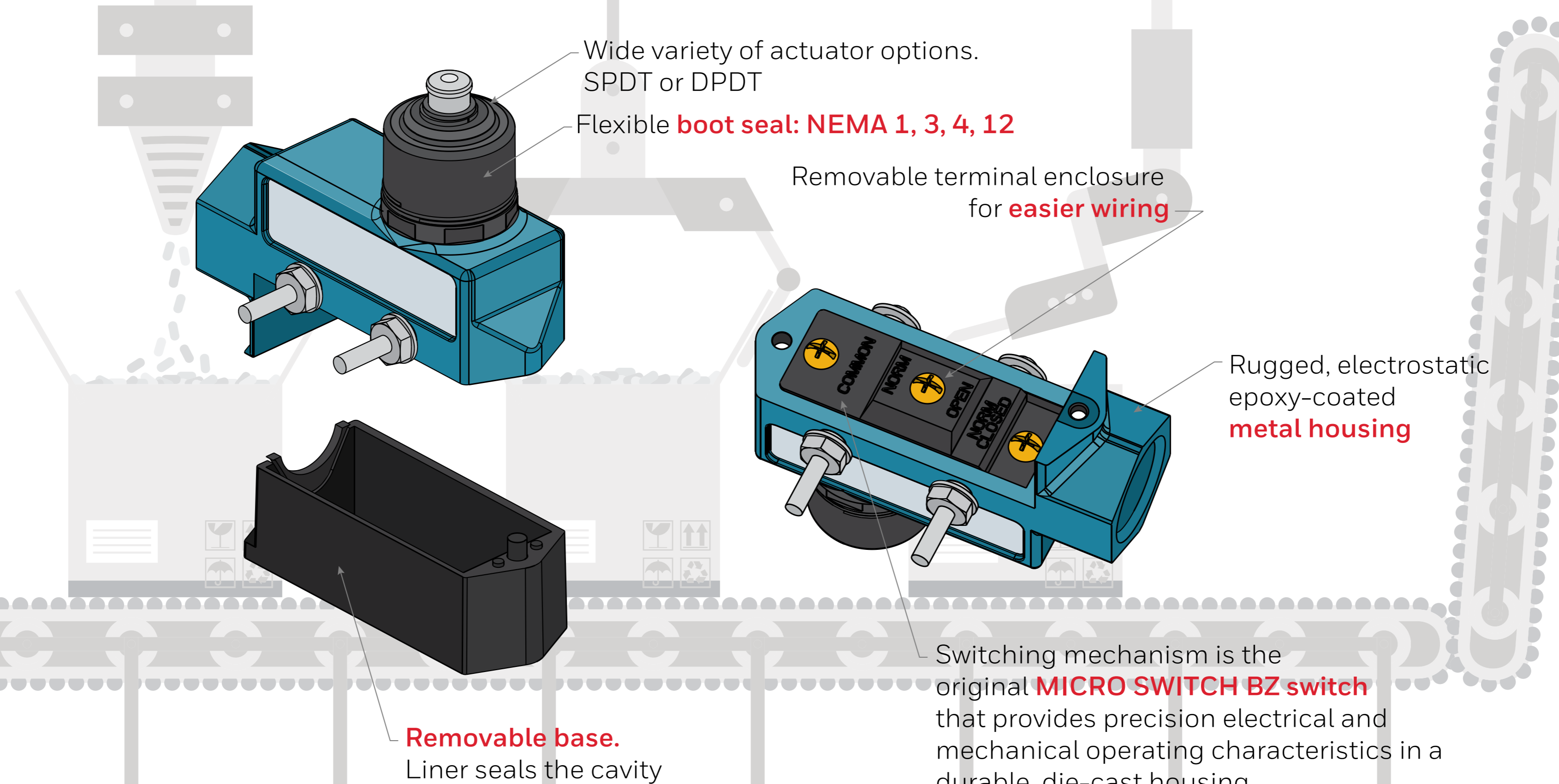
Designed with MICRO SWITCH BZ, BM or DT basic switches to deliver precise switching of electrical and mechanical operating characteristics



- Packaging equipment (balers, door interlocks)
- Air curtains (control of air movement)
- Conveyors (diverters, gates)



E6/V6 SWITCHES IT'S WHAT'S INSIDE THAT COUNTS.



Wide variety of actuator options.
SPDT or DPDT

Flexible **boot seal: NEMA 1, 3, 4, 12**

Removable terminal enclosure
for **easier wiring**

Rugged, electrostatic
epoxy-coated
metal housing

Switching mechanism is the
original **MICRO SWITCH BZ switch**
that provides precision electrical and
mechanical operating characteristics in a
durable, die-cast housing
Also, the switch is **replaceable**

Removable base.
Liner seals the cavity

- **Small** package size
- Proven **reliability**
- Designed for industrial applications
- Precise switching mechanism for **increased repeatability**

MINIATURE PRECISION LIMIT SWITCH 914CE SERIES



Rugged and versatile switches which can be applied indoors in many harsh factory floor applications, as well as on outdoor equipment in extreme temperatures. A full range of actuators are available



- Position sensing for various moving parts to indicate end of travel
- Sense the presence of moving parts
- Indicate position for system controls



- Delivers consistent performance in many demanding environments where petroleum, synthetic, or water-based fluids are present



- Machine tools
- Material handling
- Access and mobility solutions
- Robotics
- Print trade machinery
- Off-road equipment
- Dock locks and dock levelers
- Textile machinery
- Packaging equipment
- Agricultural machinery

EXPLORE MORE



914CE SWITCHES IT'S WHAT'S INSIDE THAT COUNTS.

25 mm mounting
hole pattern

Gang-mountable
and stackable

Plunger o-ring
sealed

Potted, epoxy-coated,
metal housing,
sealed to **IP67**

Side- and bottom-
exit cable or connectors

Switching mechanism is the **MICRO SWITCH SM switch** that provides precision electrical and mechanical operating characteristics in a durable, die-cast housing

- **Compact switch housing** for application adaptability
- Multitude of actuating options
- Cable length variations
- Designed for Industrial applications and **for where space is at a premium**
- **UL, CSA, CE**

GLOBAL LIMIT SWITCH GLS SERIES



Modular design (heads/actuators, bodies, and contact blocks) of the limit switch allows for rapid response to meet customer applications



- Position sensing for various moving parts to indicate end of travel
- Sense the presence of moving parts
- Indicate position for system controls



Side rotary actuator incorporates dual bearing design which prevents side loading during operation. Modular design of limit switch (heads/actuators, bodies, and contact blocks) allows for rapid customization and delivery

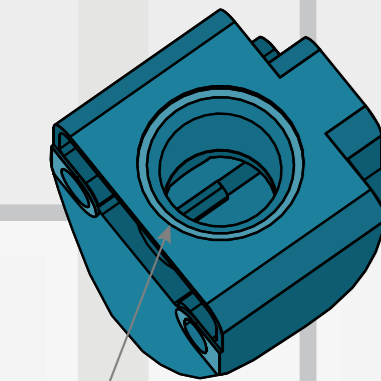
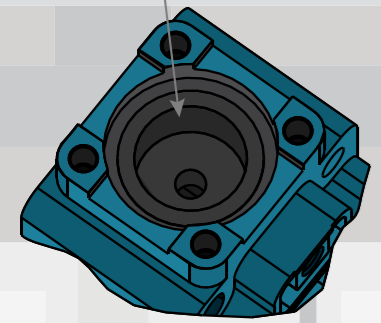


- Automotive assembly lines and machining centers
- Agriculture equipment
- Doors and apertures
- Machine tools
- Valves
- Machine tool equipment
- Conveyors
- Material handling
- Scissor/platform lifts
- Material handling

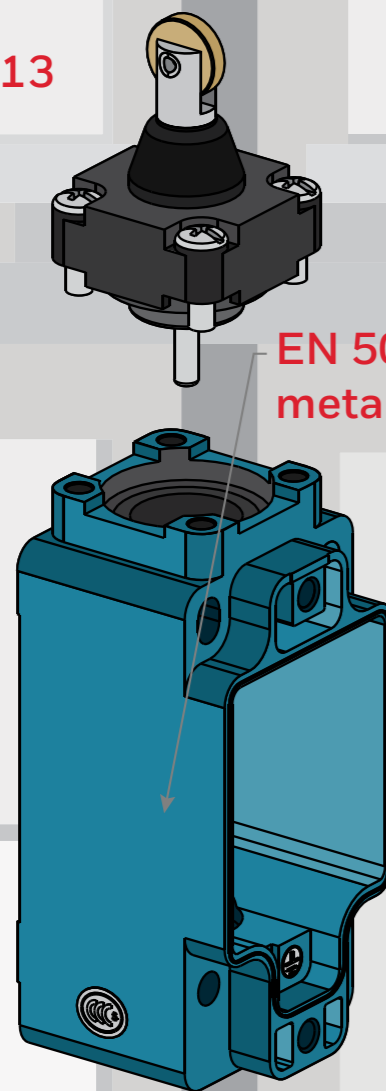


GLS SWITCHES IT'S WHAT'S INSIDE THAT COUNTS.

Complies with
NEMA 1, 3, 4, 6P, 12, 13



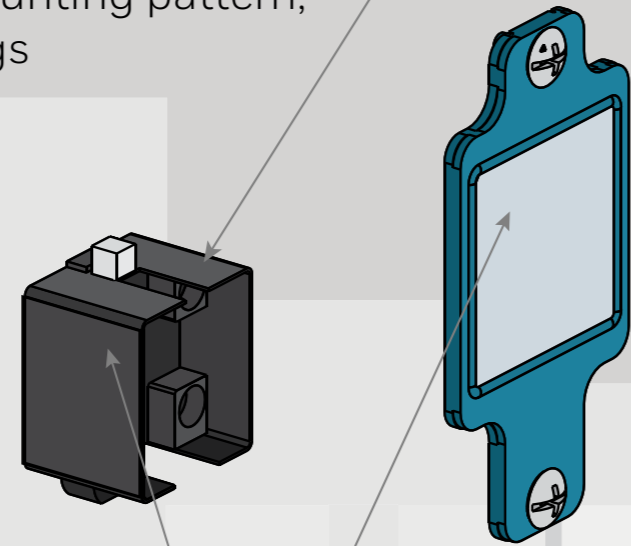
Conduit threads:
1/2-14 NPT, 20 mm,
and **PG13.5**



GLA

EN 50041 mounting pattern,
metal housings

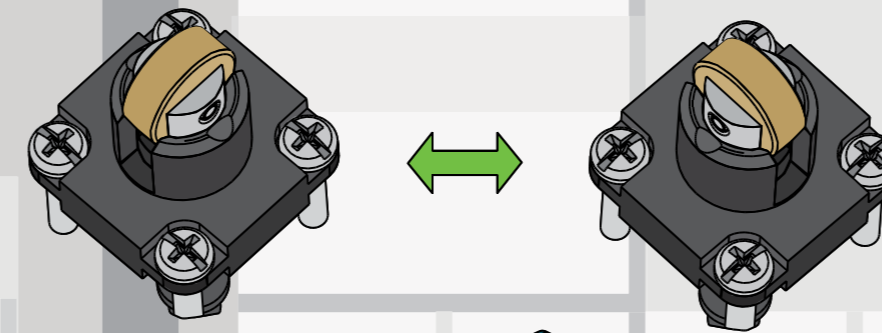
Removeable contact block
for **easy wiring**



Direct-acting
contact options

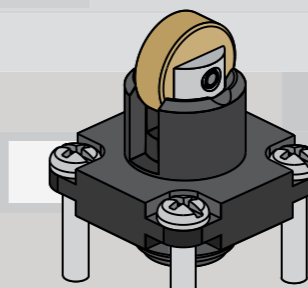
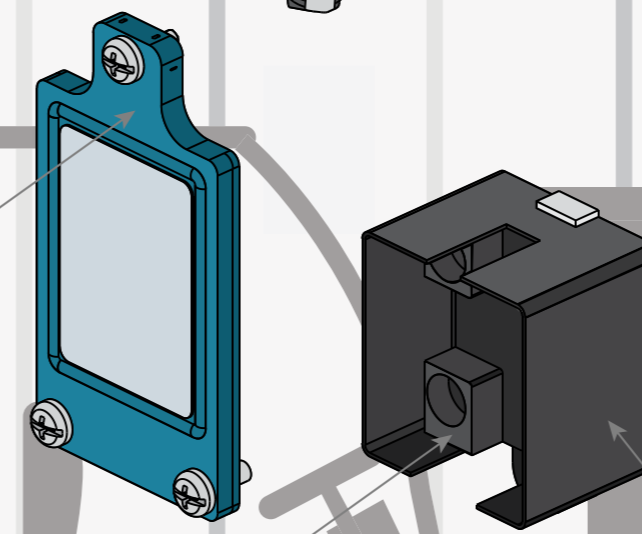
Rugged with durable
gasket to **IP65/66/67**
sealing

Head positionable in
90° increments



NEMA 1, 3, 4, 6P,
12, 13 sealing

Removeable contact block
for **easy wiring**



Sealed to
IP65/66/67

Metal and **plastic**
housings available

GLD

Direct-acting contacts

- Designed to **IEC standard** for world-wide applications
- **Modular construction** reduces maintenance parts costs
- Engineered for **ease of installation**
- Variety of basic switches and actuators

MINIATURE LIMIT SWITCH NGC SERIES



Configurable platform of medium-duty switches that allow the customer to choose SPDT or DPDT circuitry while maintaining the same housing and mounting footprint



- Position sensing for various moving parts to indicate end of travel
- Sense the presence of moving parts
- Indicate position for system controls



- Can be configured more than 380,000 ways, carries global approvals and are sealed to IP67 for potential use in indoor and outdoor applications

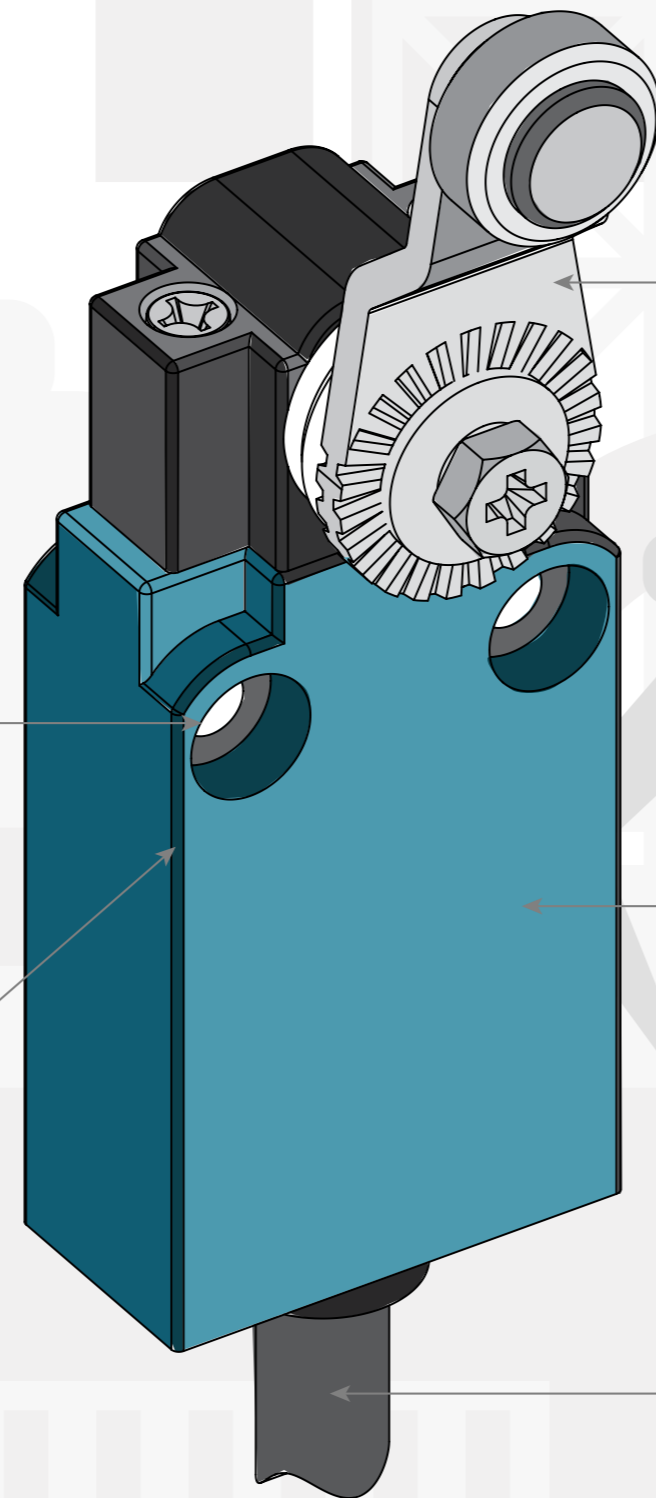


- Boom position detection
- Machine tools
- Mobile light towers
- Packaging equipment
- Doors
- Scissor lifts

EXPLORE MORE



NGC SWITCHES IT'S WHAT'S INSIDE THAT COUNTS.



20 mm mounting
hole pattern

Snap-action
and slow-action
contacts

Lever arms adjustable
360°

Potted, epoxy-coated,
metal housing,
sealed to IP67

Side- and bottom-
exit cable or connectors

- **Direct-acting** contacts
- **UL, CSA, CE**
- **Compact** switch for application versatility
- Versatile, **indoor and outdoor** use
- Used on many applications ranging from industrial floor to solar power devices.

SAFETY CABLE-PULL SWITCHES CPS SERIES



Provides a readily accessible emergency stop signal, a cost-effective means compared to using multiple emergency stop push-buttons



- Are used to provide required emergency stop signaling along the conveyor line for personal safety protection
- Performs perimeter guarding around the work cell to provide emergency stop protection



- Cost-effective means of providing an emergency stop signal compared to multiple emergency stop push buttons
- Capability enhances productivity by minimizing nuisance stops due to variations in temperature, stretch of cable over time, or other application variables



- Long conveyor systems found in warehouses & distribution centers
- Conveyor systems with a high amount of vibration and/or experience wide temperature swings
- Long conveyor systems where easy-through wiring, or highly visible trip status, is required
- Perimeter guarding in hose-down conditions
- Packaging equipment
- Assembly lines

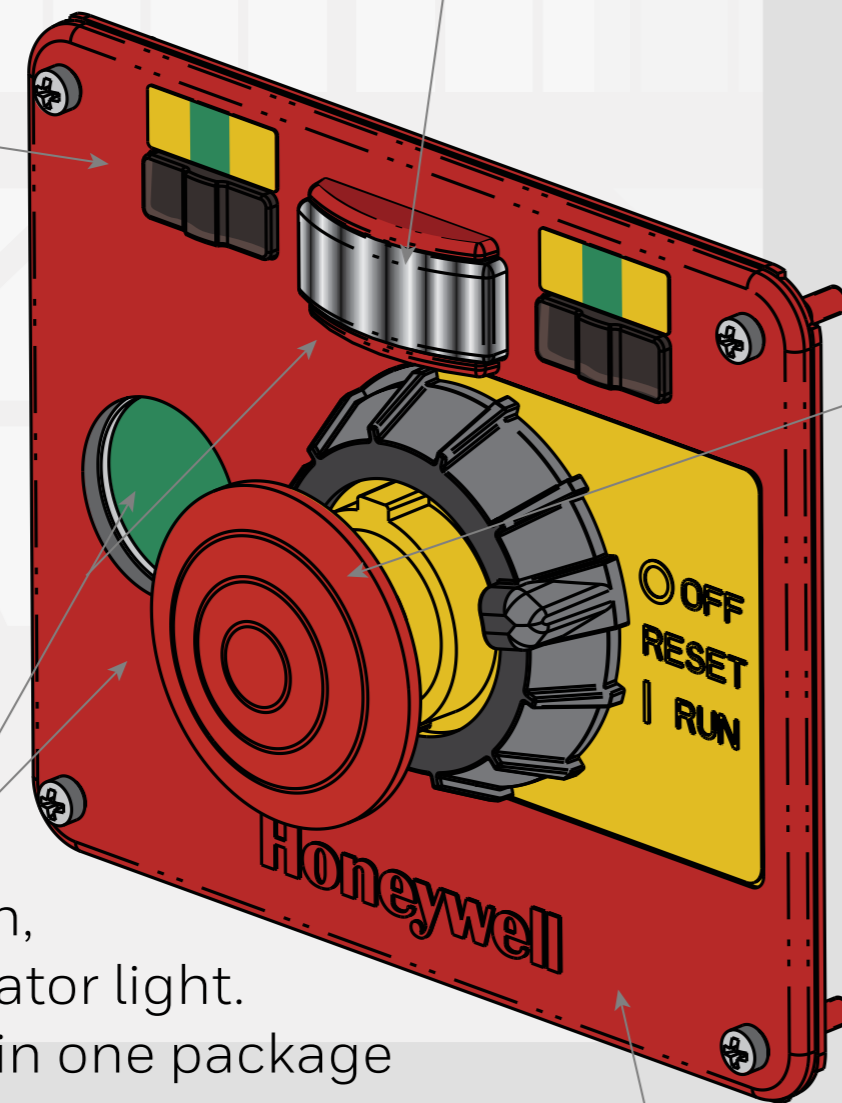


2CCP SWITCHES IT'S WHAT'S INSIDE THAT COUNTS.

Redesigned cable tension
window clearly indicates
proper cable tension

Wide tolerance zone for
cable tensioning reduces
nuisance unit trips caused
by expansion and
contraction of the cable.

Optional E-stop button,
reset button and Indicator light.
Many configurations in one package



Improved indicator light
provides more intensity and
better side viewing

Latches on both
slackened and
pulled cable

Note: Reset knob
will be blue on
production version

Front cover made of
plastic for **less costly**
replacement if unit is
damaged

Support cable runs of **500 ft**
(250 ft each direction)

Three voltage options for
indicator light.
24 V, 120 V, 240 V

Added an optional rear
conduit port for **easier wiring**.
Eliminates looping cable
that's prone to damage

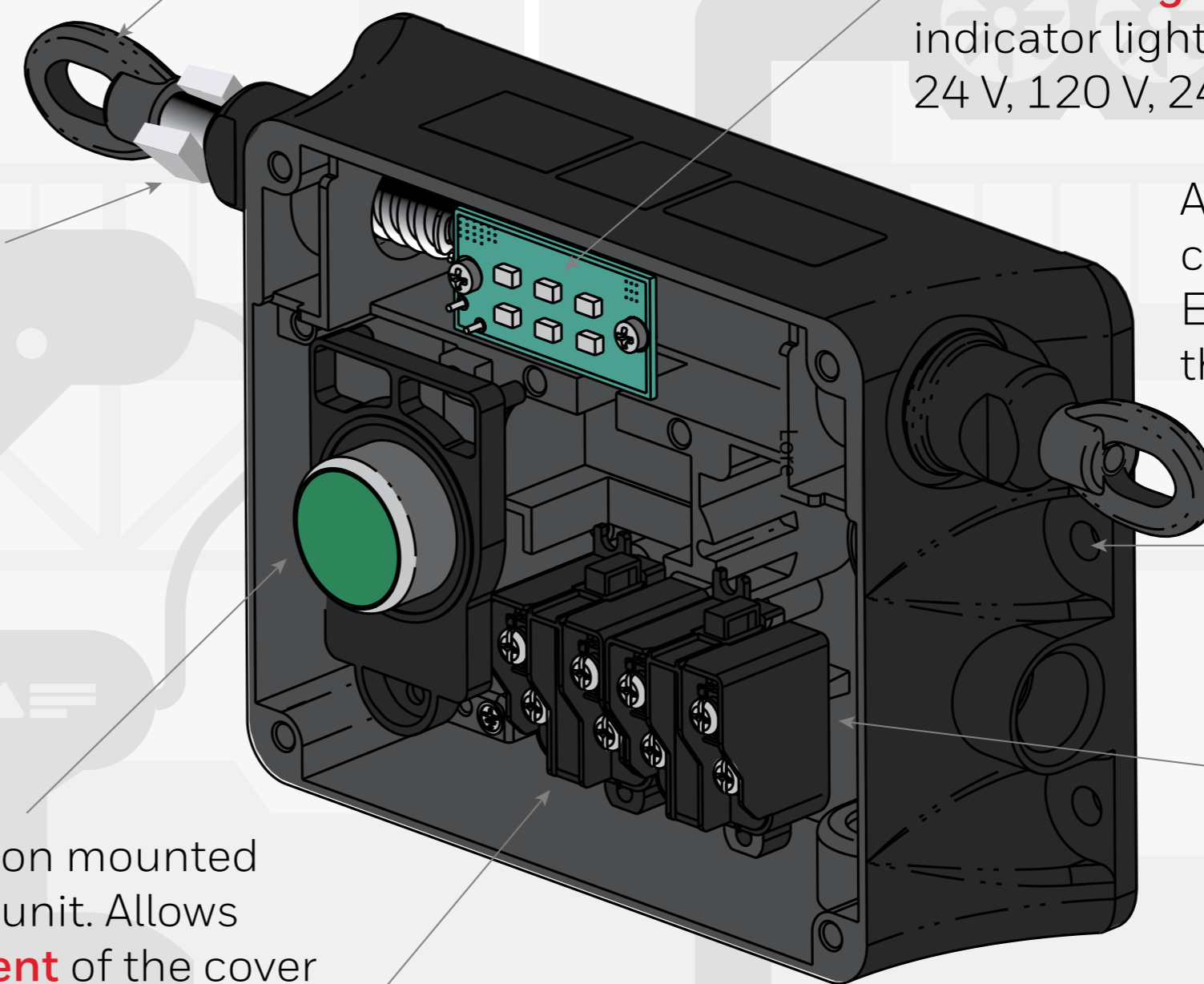
External mounting holes
for **easy installation** and
maintenance access.

Large wiring cavity with
straight-through wiring

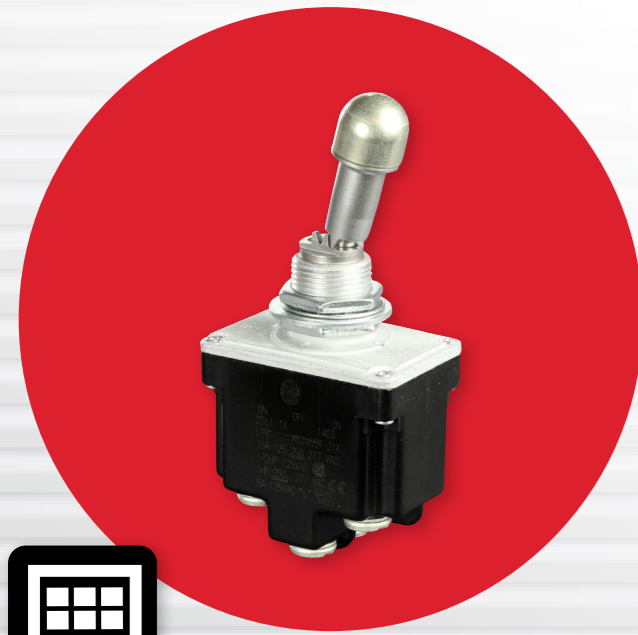
Reset button mounted
to base of unit. Allows
replacement of the cover
without any rewiring.

Direct opening, snap-action contacts
Configurations for 2NO/2NC, 1NO/3NC
and 4NC contacts

Robust, electrostatic, epoxy-coated,
die-cast aluminum housing



INDUSTRIAL SWITCHES



TOGGLE SWITCHES

- Used for operator controls where momentary or maintained switching action is needed for precise control of the system



E-STOP SWITCHES

- Used for operator control assemblies and custom-operator interfaces



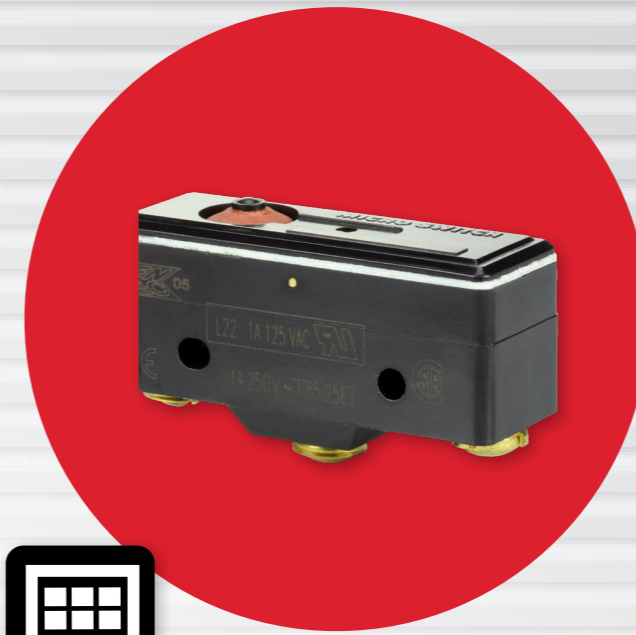
KEY & ROTARY SWITCHES

- Used for operator control assemblies and custom-operator interfaces



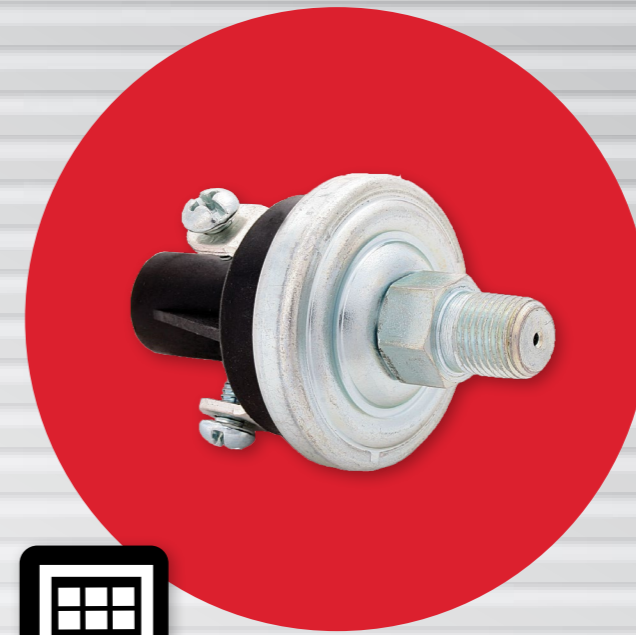
PUSHBUTTON SWITCHES

- Used for operator control assemblies and custom-operator interfaces



BASIC SWITCHES

- Can be used as access panel interlocks. If an access panel is open, the switch can prevent the machine from operating.
- Indicates end of travel
- Used for operator control assemblies in the form of pushbuttons and custom-operator interfaces
- Can be used to count packages as they pass on conveyors



PRESSURE SWITCHES

- Monitors lubricating oil lines to ensure they are full and at the right pressure



SAFETY INTERLOCK LIMIT SWITCHES

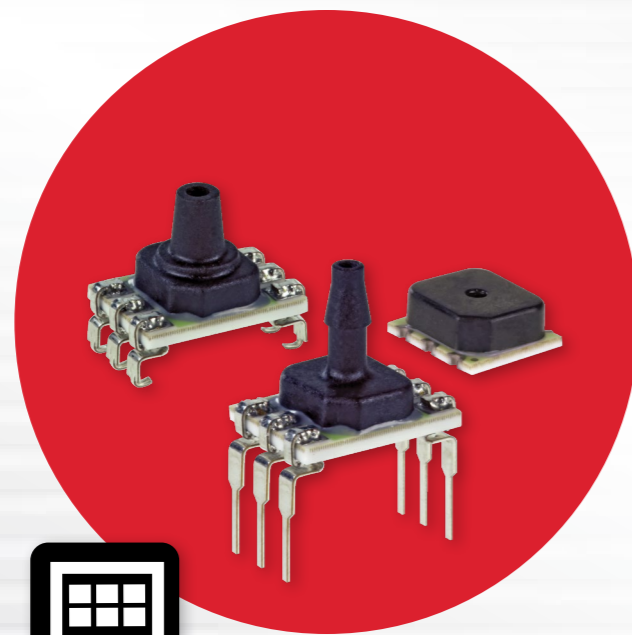
- Provide required emergency stop signaling along the conveyor line for personal safety protection

INDUSTRIAL SENSORS & OPTICAL ENGINES



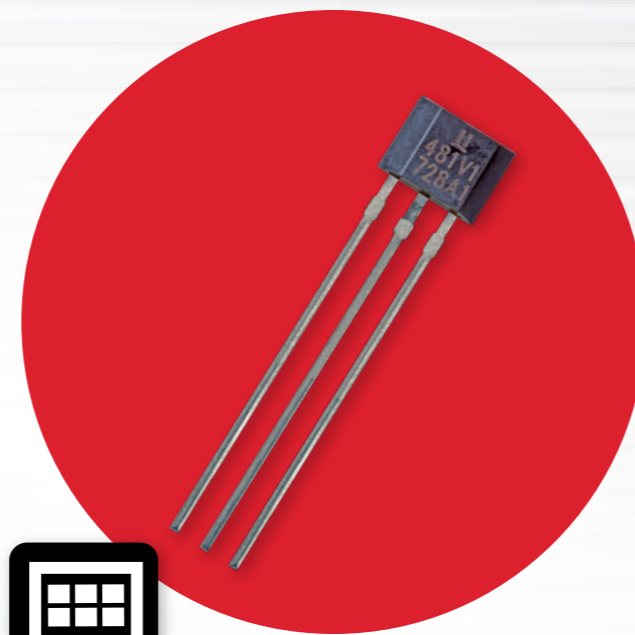
HEAVY-DUTY PRESSURE TRANSDUCERS

- Monitors lubricating oil lines to ensure they are full and at the right pressure
- Control the direction of packages coming down the conveyor



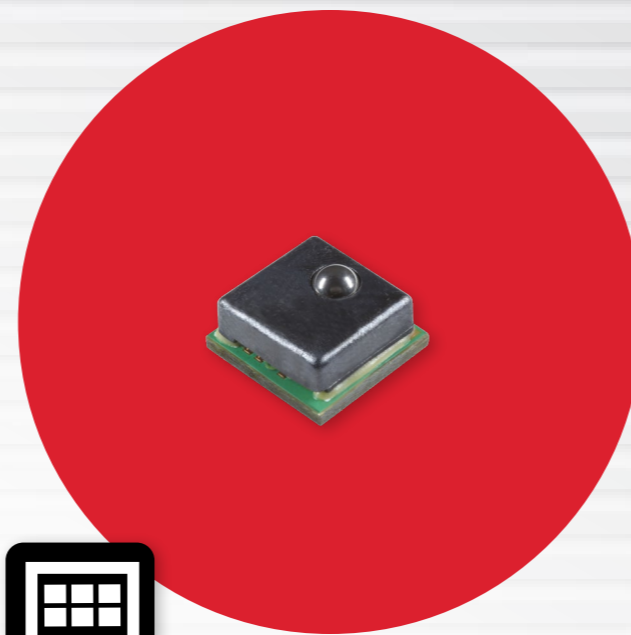
BOARD-MOUNT PRESSURE SENSORS

- Measure the pressure of the air or fluid in the lines that are used to lubricate or provide power to robotic equipment
- Monitor pneumatic pressures to ensure the system is at specified operating level



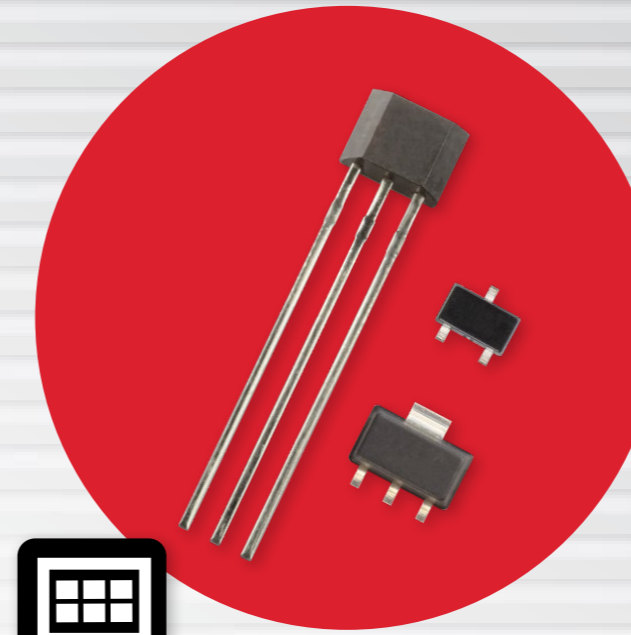
BACK-BIASED HALL- EFFECT SENSORS

- Detects the speed of a ferrous gear-tooth target wheel or ferrous disk with a hole pattern
- Often used to determine position and control fan
- Position and fan applications



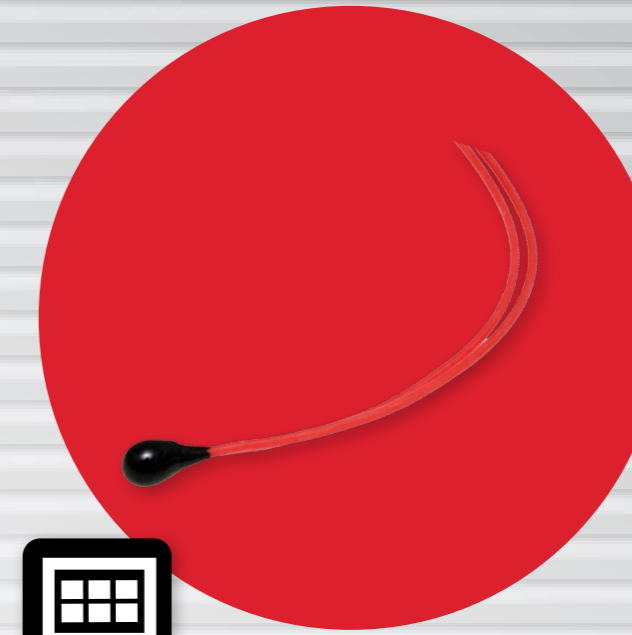
FORCE SENSORS

- Robotic equipment
- Force/grip measuring equipment
- Load and compression sensing
- Touch panels
- Switch replacement
- Weight measurement



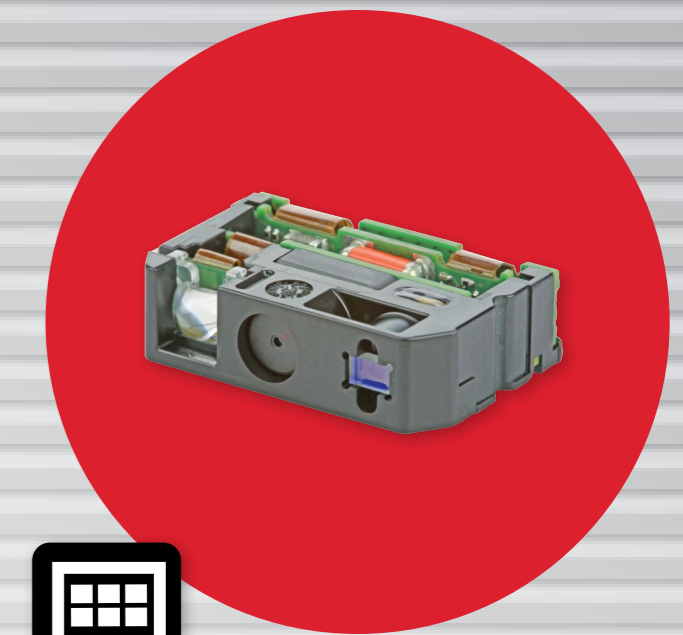
HALL-EFFECT MAGNETIC ICs

- Speed and position indicators
- Linear and angular position sensing
- Help maintain a high level of accuracy and precision
- Sensing of motor/fan control



THERMISTORS

- Provide temperature measurement to ensure operating conditions are at adequate levels
- Integrated into temperature chambers for product testing to ensure temperature is maintained at proper levels
- May be used on extrusion nozzles to ensure they are within operating condition and requirements



OPTICAL SCAN ENGINES

- Identify and track processed parts
- Can be used to support the automatic calibration of tools
- Enable robots to track and trace the manufacturing of subassemblies and goods on manufacturing lines
- With software, they automatically identify, read and transmit barcode information of goods on the conveyor



For more information
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WARRANTY/REMEDY

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