TWO MACHINES TOGETHER

1. Fluidic Processing Machine and Cartridge Pouching
2. Labeling Machine with BeiJer X2pro System Controllers.

Components of TwoMachines Integrated:

1. **ONE Fluidic Processing Machine and**
2. **ONE Cartridge Pouching & Labeling Machine with BeiJer X2pro System Controllers.**

20-Bay Cartridge Housing Stacker with Denso HM-40702M-W 4-Axis 700mm SCARA Industrial Robot

Information about a 20-Bay Cartridge Housing Stacker system potentially utilizing a Denso HM-40702M-W 4-Axis 700mm SCARA Industrial Robot:

1. Denso HM-40702M-W Robot:

- Type: 4-axis SCARA (Selective Compliance Assembly Robot Arm) robot.
- Reach: 700mm.
- Payload: Can handle a maximum payload of 20 kg. Note: The specific model HM-4070* has a 10 kg maximum payload, while the HM-4A70* has a 20 kg payload.
- Key Features: Offers high speed and repeatability, making it suitable for tasks requiring precision and quick movements. It features a robust design with a high-power AC servo motor, contributing to its speed and controllability.
- Potential Options: Available in standard or dust- and mistproof (IP65) configurations.

2. 20-Bay Cartridge Housing Stacker:

- This part of the system would likely involve a conveyor or staging area where cartridge housings arrive.
- The system would need 20 bays for stacking the housings.
- The Denso HM-40702M-W robot would be used to pick and place the cartridge housings from the conveyor into the designated stacking bays.
- Benefits of using a SCARA robot for this application: SCARA robots are known for their speed, accuracy, and repeatability in pick-and-place tasks. They are particularly well-suited for assembly operations.
- The system would likely utilize a sophisticated control system to coordinate the movements of the robot, the conveyor, and the stacking bays.
- Advanced sensors and vision systems could be integrated to accurately identify, locate, and orient the cartridge housings before picking them up.

3. Cartridge Stacking Applications:

- SCARA robots are widely used in industrial settings for stacking and material handling, including handling delicate components in industries like electronics.
- While the exact type of cartridge is not specified, SCARA robots can handle diverse objects and stacking patterns, making them adaptable to various requirements.

4. Important Considerations:

- Payload Capacity: Ensure that the weight of the cartridge housings, plus any end-of-arm tooling (EOAT), does not exceed the maximum payload capacity of the Denso HM-40702M-W, which is up to 20kg.
- Reach and Workspace: The 700mm reach of the robot needs to be sufficient to access all 20 stacking bays effectively.
- Repeatability: The high repeatability of the Denso HM series ensures accurate and consistent stacking of the cartridge housings.
- Software and Integration: The ease of use and features of the robot's development software will be important for programming and integration.

This setup suggests a high-speed, automated system for stacking cartridge housings, leveraging the precision and efficiency of a Denso HM-40702M-W SCARA robot.

https://www.densorobotics.com/products/4-axis/hm-series/

TWELVE (12) Bimba Pneumatic Cylinders

IMI Bimba (now part of Norgren) is a prominent manufacturer of pneumatic cylinders. You're asking for information about "TWELVE (12) Bimba Pneumatic Cylinders," which could refer to a specific series or quantity of cylinders.

Bimba offers a wide variety of pneumatic cylinders, including:

- Original Line® Air Cylinders: Known for their durability and versatility with various bore sizes and mounting options.
- Original Line® All Stainless Steel: Designed for corrosive environments.
- Compact Cylinders: Space-saving design with various mounting options.
- Linear Thruster Cylinders: Rugged, guided actuators with an integral cylinder.
- Position Feedback Cylinders: For applications requiring precise position sensing.
- ISO Cylinders: Designed to be interchangeable globally according to ISO standards.
- Non-Rotating Cylinders: Feature a square piston rod to prevent rotation.
- Rodless Cylinders: More compact for the same stroke length and suitable for material handling and lifting.
- Twin Bore/Guided Cylinders: Provide accurate linear motion and high radial load capacity.

To understand what "12 series" or "12" refers to in relation to Bimba pneumatic cylinders, it is important to clarify:

- Specific Model Numbers: Bimba cylinder model numbers typically consist of three alphanumeric clusters indicating product type, bore size and stroke length, and options. For instance, a model number like "1212-R" designates a specific cylinder from the Original Line, 1-1/4" bore, 12" stroke, with a reverse single-acting pulling mechanism. Similarly, "1212-D" indicates a double-acting cylinder.
- A quantity of 12 cylinders: If it simply refers to a count, it would mean twelve units of a specific model or combination of models.

https://shop.adamscorp.com/

TWO (2.)Wax Dispense Assemblies with Denso HSR048A1-N17-W5N 4-Axis 480mm SCARA Industrial Robots Nordson EFD PICO Touch Controllers

1. Denso HSR048A1-N17-W5N 4-Axis 480mm SCARA Industrial Robot

- Type: 4-Axis SCARA robot.
- Arm Length: 480 mm.
- Axes: J1 (1st axis), J2 (2nd axis), Z (3rd axis), T (4th axis). This configuration allows for movement in the X, Y, and Z axes, as well as rotation around the vertical axis.
- Payload: Up to 8 kg.
- Key Features: High-speed performance, repeatability (±0.01 mm in Z axis, ±0.004 Degree in T axis), rigid design, and selective compliance for horizontal plane movement.
- Relevance to Wax Dispensing: The speed, precision, and repeatability of the Denso HSR048A1-N17-W5N make it well-suited for automated dispensing applications, including wax dispensing. The 4-axis configuration enables precise application of wax along defined paths.

2. Nordson EFD PICO Touch Controllers

- Type: Touchscreen controller designed for Nordson EFD's PICO Pµlse jet dispensing valve.
- Functionality:
- Precise control of dispensing parameters such as ramp open and close parameters, stroke control, and pulse time (down to 0.01 ms).
- Allows dispensing of various fluids and viscosities.
- Features a touchscreen interface for easy setup and programming.

Relevance to Wax Dispensing: The Nordson EFD PICO Touch controllers provide precise control over the dispensing process, which is critical for consistent wax deposition. The ability to adjust pulse time and set the valve operating temperature ensures accurate and repeatable wax dispensing.

Integration for Wax Dispense Assemblies

- Combining the Denso HSR048A1-N17-W5N SCARA robot with a Nordson EFD PICO Pµlse jet dispensing valve (controlled by the PICO Touch controller) creates a highly accurate and efficient automated wax dispensing assembly.
- The robot arm moves the dispense tip along the desired path, while the controller precisely controls the amount and timing of the wax dispensed.
- This setup minimizes manual handling, increases throughput, and improves product quality by ensuring uniform and consistent wax application.

https://www.denso-wave.com/en/robot/product/four/

Wax Reflow Assembly

Wax reflow assembly, in the context of printed circuit board (PCB) manufacturing, refers to a process where a wax pattern is created and then melted (reflowed) to define flow paths for fluids or other materials. This is particularly useful in the fabrication of paper-based microfluidic devices, where the

melted wax forms hydrophobic barriers on the hydrophilic cellulose fibers of the paper, guiding the fluid.

Here's a more detailed explanation:

1. Wax Patterning: A layer of wax is deposited on the substrate (e.g., filter paper).
2. Heating and Reflow: A heat source, like a laser, is used to selectively heat and melt the wax in specific areas.
3. Barrier Formation: As the wax melts and reflows, it penetrates the substrate, creating hydrophobic barriers on the surface.
4. Defining Flow Paths: These wax barriers define the paths for fluids to flow, creating a microfluidic network.
5. Applications: This technique is used in the creation of paper-based microfluidic devices for applications like point-of-care diagnostics.

In essence, the wax reflow process allows for the creation of precise, patterned structures on a substrate, enabling the controlled movement and interaction of fluids for various applications.

Wax Reflow Assembly: A Novel Technique in Microfluidics

Wax reflow assembly is a fabrication method utilized in the field of microfluidics, particularly for the creation of hydrophobic barriers on paper-based devices. This technique involves depositing a layer of wax onto a material (such as filter paper) and then applying heat to selectively reflow the wax, causing it to melt and penetrate through the material's thickness.

Mechanism and Process:

1. Wax Deposition: A layer of wax is applied to the surface of the material, often using methods like printing, stamping, or even hand-painting.
2. Selective Heating and Reflow: A heat source, such as a diode laser, is directed at specific areas from the opposite side of the material. The heat causes the wax at the irradiated spots to melt and penetrate through the material, creating hydrophobic barriers.
3. Barrier Formation: These wax barriers confine the flow of fluids within defined channels and reservoirs, enabling the creation of intricate microfluidic devices.

Advantages and Applications:

- Simplicity and Cost-Effectiveness: Wax reflow assembly can be performed using low-cost instruments and common materials like filter paper and wax, making it accessible for resource-limited settings and point-of-care testing.
- Simultaneous Patterning and Reflow: Laser-induced selective reflow allows for wax patterning and barrier formation in a single step, streamlining the fabrication process.
- Versatility: The technique is adaptable to different types of paper and wax, and the laser power and scan speed can be adjusted for varying material properties.
- Potential in Point-of-Care Diagnostics: The simplicity and low cost of wax reflow assembly make it a promising method for developing portable and affordable diagnostic devices.

Comparison to Other Methods:

Compared to conventional two-step approaches like wax printing or photolithography, wax reflow assembly, particularly with laser induction, offers a simpler and more direct way to fabricate paper-based microfluidics. While its resolution may be lower than photolithography, its advantages in terms of cost and ease of use make it a viable alternative for many applications.

In summary, wax reflow assembly is a useful technique for fabricating microfluidic devices, especially paper-based platforms. Its simplicity, low cost, and potential for use in point-of-care diagnostics contribute to its growing importance in the field of microfluidics

https://www.sfcircuits.com/pcb-production-capabilities/pcb-assembly/pcb-reflow-soldering

Leak Test Station with Zaxis Leak Detector

A Zaxis leak detector integrated into a leak test station is a system used for air leak testing in various manufacturing and laboratory applications.

Key features and capabilities:

- High test stability and repeatability: Zaxis leak testers, such as the Isaac HD, are engineered for precise and consistent leak detection.
- Multiple test types: Zaxis detectors can perform various air leak tests, including pressure decay, vacuum decay, mass flow, chamber tests, and more, all potentially within a single machine like the Isaac HD.
- Modular design: This allows for customization and upgrades to suit different test types and channel requirements.
- Small internal volume: This feature is important for minimizing testing variability, such as thermal drift.
- User-friendly interface: Zaxis testers, like the PD model, have intuitive interfaces and touchscreens for easy setup and operation.
- Automatic pressure control: This feature allows for running multiple tests at various pressures without manual adjustments.
- Communication options: Many models offer various communication options like USB, RS232, I/O, and Ethernet for integration and data collection.

Types of Zaxis leak detectors:

Zaxis offers a range of air leak testers, including:

- Isaac HD: A modular, multi-function leak tester known for its versatility and performance, capable of concurrent or sequential testing. Note that orders for the Isaac HD were expected to be discontinued as of 12/31/24, replaced by the Z5.
- Zaxis PD: A basic, entry-level pressure decay leak tester with a compact size, suitable for manufacturing cell configurations.
- Zaxis Z5/Z8: Newer modular leak testers offering multiple channels and user-friendly touch screens.
- Zaxis 7i: Another modular leak tester. Note that orders for the 7i were expected to be discontinued as of 9/30/24, replaced by the Z8.
- Zaxis iKit: A semi-modular, automation-focused leak tester. Note that orders for the iKit were expected to be discontinued as of 03/31/25, replaced by the Z1.

Applications:

Zaxis leak detectors are used in various industries for quality control and product integrity verification, such as:

- Automotive: Testing assemblies, components, and electronics.
- Consumer Goods: Ensuring waterproofing and IP ratings for products like smartphones and watches.
- Electronics: An essential step in electronics manufacturing.
- Medical: Testing devices and equipment to meet strict standards.
- Packaging: Testing sealed packaging and devices.

In essence, a leak test station equipped with a Zaxis leak detector offers a reliable and customizable solution for detecting leaks in a wide range of products and applications.

https://www.zaxisinc.com/

Printex G8-100/115 3-Position Pad Printer with Mitsubishi GOT2000 Graphic Operation Terminal

The Printex G8-100/115 is a versatile pad printing machine that can be configured to perform single-color, two-color, four-color, and even long format printing through various optional accessories. It is equipped with a programmable controller and a user-friendly touchscreen interface, which is stated to be a Mitsubishi PLC and HMI.

Key Features of the Printex G8-100/115 include:

- Modular design for easy customization with plug-and-play accessories.
- A touchscreen interface for machine functions, setup parameters, production modes, and job settings.
- A pin registered/zero adjust plate adapter and an XY adjustable pad mounting system for simplified setup and alignment.
- An adjustable XYZ work table for easy print placement.
- Automation readiness, functioning as a host or slave in automated environments.
- Standard expandable I/O capability.
- A 19-pin quick connect electrical port for easy connection to accessories or host systems.
- Integration with a Mitsubishi PLC and HMI for control and monitoring.

The Mitsubishi GOT2000 Graphic Operation Terminal (HMI):

The Mitsubishi GOT2000 series are HMIs designed to serve as a gateway to other industrial automation devices, aiming to improve productivity and efficiency. Mitsubishi Electric states that they offer advanced functionality and user-friendly features. Key features include a high-resolution touchscreen, multi-touch gestures (on the GT27 model), high-speed processing, expanded memory, diverse communication protocols, and remote management capabilities.

In summary, the Printex G8-100/115 pad printer combined with the Mitsubishi GOT2000 HMI offers a powerful and flexible solution for various printing applications, supporting both manual and automated operations

https://printexusa.com/applications/

Print Check Vision System

A print check vision system is an automated quality control system that uses machine vision to inspect printed materials for defects, ensuring accuracy and consistency. These systems can be integrated with printing, labeling, and packaging machines to verify printed content, including text, barcodes, and other markings, against predefined standards. They are crucial in various industries to maintain product quality, meet regulatory requirements, and prevent costly errors.

Key features and benefits of print check vision systems:

- **Automated Defect Detection:**

  They automatically detect a wide range of print defects, such as missing or smeared text, incorrect barcodes, color variations, and misaligned elements.

- **High-Speed Inspection:**

  These systems can operate at high speeds, inspecting a large volume of printed material in a short amount of time.

- **Improved Quality Control:**

  They enhance the accuracy and consistency of print quality, reducing manual inspection efforts and minimizing errors.

- **Cost Reduction:**

  By identifying defects early in the production process, these systems help prevent costly rework, material waste, and customer dissatisfaction.

- **Regulatory Compliance:**

  Print check vision systems ensure that printed materials comply with industry regulations and standards.

- **Data Analysis and Traceability:**

  Many systems offer data logging and analysis capabilities, allowing for tracking and reporting on print quality trends.

- **Integration with Production Lines:**
  They can be easily integrated with existing printing, labeling, and packaging machines.

Examples of applications:

- **Pharmaceutical Industry:**

  Ensuring accurate printing of expiration dates, lot numbers, and other critical information on medication packaging.

- **Food and Beverage Industry:**

  Verifying ingredient lists, allergy information, and nutritional labels on food packaging.

- **Cosmetics Industry:**

  Confirming correct product details and branding on cosmetic products.

- **General Manufacturing:**

  Inspecting barcodes, serial numbers, and other printed information on various products.

  Technologies used:

  - **Cameras:** High-resolution cameras capture images of the printed material.
  - **Lighting:** Specialized lighting systems illuminate the printed material for optimal image acquisition.
  - **Vision Software:** Sophisticated software algorithms analyze the captured images to identify defects.
  - **Processors:** Powerful processors handle the image processing and analysis tasks.

  By utilizing print check vision systems, manufacturers can achieve significant improvements in product quality, production efficiency, and overall cost-effectiveness.

  https://antaresvisiongroup.com/lifescience/products/print-check-advanced-vm0200/

CVF IN060 Vibratory Feeder [no bowl]; Offload - Reject Stations

1. CVF IN060 Vibratory Feeder (No Bowl):

- Function: This unit acts as a vibratory feeder without a bowl. Vibratory feeders are used to transfer materials from a hopper or other source to a receiving device uniformly and continuously in a production flow. They achieve this by using controlled vibrations and gravity to move and position materials.
- "No bowl": This signifies the unit is a basic feeder mechanism without the part-orienting bowl typically used in vibratory bowl feeders. It likely has a simple tray or trough to convey materials.
- Model Name: The "CVF IN060" is likely a manufacturer-specific model designation. Further detailed information like a specification sheet or parts manual would be required to get its specific characteristics like feeding size or production capacity.

2. Offload and Reject Stations:

- Offload: The offload station refers to the point where the vibratory feeder discharges the materials onto the next stage of the production line. This could be a conveyor belt, another feeder, or a different piece of machinery.
- Reject Station: A reject station is designed to remove faulty or off-spec products from the production line after they pass through an inspection point (often using a checkweigher). It receives products from the feeder or a conveyor and diverts the rejects.
- Types of Reject Stations: Several types exist, depending on factors like product weight and production speed:
- Air Jet Reject: Uses a stream of air to blow lighter products off the line.
- Bopper Reject: Uses a cylindrical mechanism to quickly push products off the conveyor.
- Pusher Reject: Utilizes a pneumatic cylinder with a plate to push heavier products off the line.
- Swing Gate/Diverter Reject: Diverts products off the main line using a toggling gate mechanism.
- Drop Belt Conveyor Reject: Lowers the conveyor belt to drop faulty products into a reject bin or onto the floor.

3. Integration:

The CVF IN060, as a feeder without a bowl, would be integrated into a larger system including offload and reject stations. It would feed material to an offload point, and potentially downstream equipment (like a checkweigher) could trigger a reject station to remove any substandard items.

In summary, you are describing a component of an automated production line where the CVF IN060 vibratory feeder (without a bowl) would move items to an offload point, and a separate reject station would remove any defective or undesirable items from the flow

https://all-fill.com/

THREE (3) Denso VS050A3-AV6-NNN 6-Axis Articulated Robots

Key Features:

- Compact Design: The robot's base and arm width are compactly designed for flexible movement in small spaces.
- High Speed and Repeatability: The VS series offers fast performance and accurate positioning. The VS-050 has a cycle time of 0.35 seconds (RC8 controller) and repeatability of ±0.02 mm.
- Payload: The VS-050 has a maximum payload of 4 kg.
- Reach: The arm reach of the VS-050 is 505 mm.
- Installation Options: Can be mounted on the floor, ceiling, or wall without special hardware.
- Optional Communication Cable Flange: Allows for easy connection of devices like electric hands and cameras directly to the flange.
- Environmental Resistance: Available in various protection grades, including IP67 dust- and waterproof.
- Applications: Suitable for a wide range of industries and tasks, including assembly, inspection, material handling, packaging, and palletizing.

https://www.densorobotics-europe.com/

Stacker Carousel

A stacker carousel is a type of storage system that utilizes a rotating carousel to bring items to an operator, often in a warehouse or laboratory setting. It's a dynamic storage solution that can make efficient use of vertical space and is known for its "goods to man" principle.

Key Features and Benefits:

- **Vertical Space Optimization:**

  Stacker carousels can store a large volume of items in a relatively small footprint by utilizing vertical space.
- **"Goods to Man" Principle:**

Instead of operators moving to find items, the carousel brings the desired items to the operator at a convenient pick window, improving efficiency and ergonomics.

- **Increased Security:**

  Some models come with lockable panels, providing increased security for stored items and protecting them from dust.

- **Automated Operation:**
  Many stacker carousels are automated, which further enhances speed and efficiency.
  Applications:

- **Warehousing and Distribution:**

  Used for storing and retrieving a variety of items in warehouses and distribution centers.

- **Laboratory Automation:**

  In labs, they can be used to store and retrieve microplates, petri dishes, and other labware.

- **Manufacturing:**
  Can be used in manufacturing settings for storing components and materials.
  Types:

- **Vertical:** Shelves rotate vertically, making the most of vertical space.
- **Horizontal:** Shelves rotate horizontally, offering flexibility in storage and access.

https://peakrobotics.com/product/carousel-6-capacity/

SIX (6) Cognex Digital Cameras

Six Cognex digital cameras are integrated with a fluidic processing machine and cartridge pouching system, as well as a labeling machine controlled by a Beijer X2pro system.

Explanation:

- **Cognex Digital Cameras:**

  These are industrial cameras used in machine vision systems. They capture images of objects or processes, which are then analyzed by software to perform tasks like inspection, identification, and measurement.

- **Fluidic Processing Machine and Cartridge Pouching:**

  This refers to a system that likely handles the precise movement and packaging of fluids (liquids or gases) within cartridges or pouches. The cameras could be used to monitor fluid levels, check for leaks, verify pouch sealing, or ensure proper placement of components.

- **Labeling Machine:**

  This machine is responsible for applying labels to products. The Cognex cameras would likely be used to ensure accurate label placement, check for label presence and defects, and potentially verify the information printed on the labels.

- **Beijer X2pro System Controllers:**

These are human-machine interface (HMI) panels used for controlling and monitoring industrial equipment. The X2pro series offers a range of features, including high-performance processors, various screen sizes, and connectivity options, making it suitable for demanding automation applications. The cameras will be integrated with the X2pro system to provide visual feedback for the operator or to trigger automated actions based on the camera's analysis

https://www.cognex.com/en-in/products/machine-vision

Multiple Festo Stepper Motors / Handlers / Actuators

Festo offers a variety of stepper motors, handlers, and actuators for automation applications. Their stepper motors, like the EMMS-ST, are designed for simple positioning tasks and come in various sizes. Festo also provides 2-axis handling modules with stepper motors for precise workpiece and carton handling. Additionally, they offer electric cylinders and other linear actuators that can be paired with stepper motors for diverse applications.

Here's a more detailed look at the Festo offerings:

Stepper Motors:

- **EMMS-ST:**

  This stepper motor is part of Festo's Core Range and is suitable for basic positioning tasks. It utilizes hybrid technology and is available in different sizes (28, 42, 57, and 87 flange dimensions). It can optionally include a holding brake.
- **EMMT-ST:**
  This stepper motor features a single cable connector for both motor power and encoder signals, with a swivel connector for flexible cable orientation.

Handlers and Actuators:

- **2-axis handling module:**

  This module combines a stepper motor for the x-axis with a pneumatic cylinder for the z-axis, enabling precise handling of workpieces and cartons.
- **Electric Cylinders:**

  Festo electric cylinders, like the EPCC series, are designed for precision motion control and can be paired with stepper motors or servo motors. They feature ball screw drives, proximity switches for position detection, and are suitable for both horizontal and vertical load applications.
- **Pneumatic Cylinders:**
  Festo also offers a wide range of pneumatic cylinders for various automation tasks, including clamping, part handling, and material transport.

Key Features and Applications:

- **Precision:**

  Festo stepper motors and actuators are designed for precise positioning and repeatable movements.

- **Flexibility:**

  Festo's actuators can be integrated with different motor types and are suitable for a variety of applications.
- **Industries:**
  Festo products are used across various industries, including automotive, electronics, food & beverage, and logistics.

Choosing Between Stepper Motors and Servo Motors:

- **Stepper Motors:**

  Stepper motors are generally more cost-effective and suitable for applications requiring precise positioning and holding torque, but they may not offer the same speed and dynamic performance as servo motors.
- **Servo Motors:**
  Servo motors are preferred when high speed, dynamic precision, and closed-loop control are required.

Festo provides detailed information and support for their products, including CAD models, pricing, and technical specifications, on their website

https://www.festo.com/in/en/c/products/motors-and-servo-drives/stepper-motors-id_pim102/

SMC Pneumatics

1. Fluidic Processing Machine and Cartridge Pouching

- Fluid Handling: SMC offers a wide range of products for fluid control and handling, which are crucial for fluidic processing machines. This includes valves compatible with various fluids (e.g., 2-Port Valves), industrial filters, pumps (like diaphragm pumps for high-purity chemicals), and temperature control systems.
- Pneumatic Automation: SMC provides a range of components essential for automating various movements in both fluidic processing and cartridge pouching machines, such as:
- Air Cylinders: For linear motion and tasks like pressing, lifting, transferring, positioning, clamping, stopping, pick-and-place operations, and sorting.
- Rotary Actuators & Grippers: For smooth rotation and secure gripping solutions.
- Vacuum Equipment: For tasks like material handling or transfer, including suction cups and vacuum generators.
- Static Control: SMC offers static neutralization equipment (e.g., ionizers) to prevent damage caused by electrostatic discharge, which can be critical in sensitive processes like fluid handling or packaging.
- Air Preparation Equipment: To ensure the proper functioning and longevity of pneumatic components, SMC provides various air preparation units like filters, regulators, and lubricators.

2. Labeling Machine with Beijer X2pro System Controllers

- Pneumatic Actuation for Labeling: SMC's pneumatic actuators and cylinders can be used for precise movements in labeling applications, such as positioning labels, applying pressure, or controlling the dispensing mechanism.
- Beijer X2pro System Controllers: The Beijer X2pro system controllers, acting as HMIs, can be integrated with various automation equipment, including SMC's pneumatic components, to control and monitor the labeling machine's operation.
- Connectivity: The Beijer X2pro controllers offer various connectivity options, including Ethernet and CANopen, making it possible to integrate them with SMC's fieldbus solutions (like the EX260 series) for controlling directional control valves and other components.
- Static Neutralization: Static electricity can interfere with label placement and adhesion. SMC's ionizers are available to mitigate these issues in labeling applications.

In summary:

SMC Pneumatics offers a comprehensive range of products, including actuators, valves, vacuum equipment, and air preparation units, which are suitable for fluidic processing, cartridge pouching, and labeling machines. The Beijer X2pro controllers can provide a human-machine interface and control platform to manage these SMC components, facilitating the automation of these processes. You can explore specific product series based on the required precision, speed, and environmental conditions of your application by consulting the SMC website or product catalogs

https://www.smcin.com/products#:~:text=SMC%20provides%20a%20wide%20range,%2C%20plastics%2C%20and%20semiconductor%20manufacturing.

Balluff BGL001J Photoelectric Sensors

The Balluff BGL001J is a photoelectric fork sensor belonging to the BGL series, known for its reliable object detection and fine detail distinction in automation applications.

Here's a summary of its key features and specifications:

Type and Operation:

- Sensor Type: Through-beam
- Principle of Operation: Fork sensor
- Principle of Optical Operation: Through-beam sensor
- Beam Characteristic: Divergent
- Light Type: LED, red light
- Operating Mode: Normally Open (NO) or Normally Closed (NC), adjustable (light-ON/light-OFF setting)
- Output: PNP normally open/normally closed (NO/NC)

Mechanical Specifications:

- Dimensions: 10 x 70 x 88 mm
- Fork Opening: 50 mm
- Housing Material: Zinc, Die casting, Painted
- Material Sensing Surface: Glass
- Connection: Connector, M8x1-Male, 3-pin
- Mounting: Surface with through-holes (M4 screw)

Electrical Data:

- Operating Voltage: 10-30 VDC
- Switching Frequency: 1500 Hz / 1.5kHz max
- Rated Operating Current: 200 mA
- Rated Operating Voltage: 24 V DC
- Short-circuit protection: Yes

- Polarity reversal protected: Yes
- Protected against miswiring: Yes

Other Features:

- Adjustable Sensitivity: Yes
- Light Spot Size: Ø 1.5 mm
- High Resolution: Yes
- Rugged Metal Housing: Yes
- IP Protection: IP67

Typical Applications:

- Parts sensing on conveyor belts
- Label sensing on transparent backing material
- Part dimension checking
- Counting parts in assembly lines
- Position checking
- Feed control on automatic assembly equipment
- Checking for completeness (e.g., connector pins)
- Handling and assembly

https://shop.proautocon.com/products/BGL001J#:~:text=/%2024Vdc%20nom.)-,Frequency,DE

Banner Q4X Series Photoelectric Sensors

he Banner Q4X Series Photoelectric Sensors are Class I laser CMOS measuring sensors. They are designed for applications needing precise distance measurement and object detection, even with challenging targets.

Key features and capabilities of the Q4X series:

Features:

- Superior Performance: The Q4X series offers high reliability and precision. It can detect sub-millimeter distance changes and continuously measure various targets, from dark to reflective, within a range of 25 mm to 610 mm (depending on the specific model).
- Versatile Functionality: Different models are available within the Q4X series, including:
- Discrete models: Provide a simple on/off output based on distance.
- Analog models: Offer a 0 to 10 V or 4 to 20 mA output that corresponds to the measured distance.
- Clear object models: Designed for detecting clear or transparent materials, often without needing a retro-reflector.
- IO-Link models: Allow for enhanced connectivity and data exchange with industrial networks.
- Dual Teach Mode: This feature allows the sensor to be taught based on both intensity and distance. It is ideal for error-proofing applications and for reliable detection of challenging targets, such as clear packaging.
- Robust Construction: The Q4X sensors are housed in FDA-grade stainless steel with an IP69K rating. This provides resistance to harsh environments, including high-pressure, high-temperature washdown and chemical exposure.
- Simplified User Interface: The sensors feature an angled four-digit display for clear distance readout and responsive buttons for easy setup and adjustment.
- Enhanced Features: The Q4X also offers superior ambient light resistance and a robust construction that resists mechanical impact, overtightening, and extreme vibration.

Applications:

The Banner Q4X series is used in various industrial applications, including:

- Distance-based object detection: Reliably detecting objects based on their distance from the sensor, regardless of color or surface properties.

- Error proofing: Ensuring correct assembly or presence of parts in automated manufacturing lines.
- Clear object detection: Detecting transparent objects like bottles or trays in washdown environments.
- Level measurement: Measuring the fill level of liquids or granular materials.
- Stack height detection: Verifying the height of stacked products or materials.
- Package counting: Counting reflective and irregularly shaped packages on a conveyor.

In summary, the Banner Q4X Series offers a versatile and robust solution for challenging industrial applications requiring precise distance measurement and reliable object detection in demanding environments

https://www.bannerengineering.com/us/en/products/sensors/photoelectric-sensors/q4x-laser-distance-sensor.html#sort=relevancy

Keyence SR-2000 1D/2D Code reader

The Keyence SR-2000 series is a high-speed 1D/2D code reader designed for industrial applications where precise and rapid code reading is crucial.

Key Features:

- Reads 1D and 2D Codes: Supports various codes like QR, DataMatrix, Code 128, and more.
- Ultra-Wide Field of View: Enables reading multiple codes at once across a large area.
- Deep Depth of Field: Allows reading codes at varying distances and angles.
- High-Speed Processing: Designed for fast reading, making it suitable for high-speed production lines.
- Automatic Features: Includes automatic focus adjustment and image optimization for stable reading even with damaged or low-contrast codes.
- Robust Design: Features an IP65-rated housing, providing resistance to dust and water in industrial environments.
- Easy Integration: Offers various connectivity options such as Ethernet and RS-232, simplifying integration with industrial systems.
- User-Friendly Software: Provides user-friendly software for easy setup and monitoring.

Specifications (for model SR-2000N):

- Sensor: CMOS Image Sensor
- Number of Pixels: 2048 x 1536
- Minimum Resolution (2D code): 0.040 mm
- Reading Distance: 100 to 2000 mm
- Field of View (at 800 mm): 263 mm x 197 mm
- Power Voltage: 24 VDC ±10%
- Enclosure Rating: IP65

- Weight: Approx. 300 g

  Applications:

  The Keyence SR-2000 series is suitable for a wide range of industrial applications, including:

- Manufacturing and Assembly Lines
- Logistics and Warehousing
- Automotive and Electronics industries
- Pharmaceuticals and Food Processing industries

  Models:

  The SR-2000 series includes different models, such as the SR-2000N (full range type) and the SR-2000WN (super wide-view type

  https://www.keyence.co.in/products/barcode/barcode-readers/sr-2000/models/sr-2000n/#:~:text=1D/2D%20Code%20reader%20%2D%20SR,0.2%20mA

Modular Enclosures with Omron D4JL-2NFA-C5 Basic / Snap Action Lock Switches

Understanding the Omron D4JL-2NFA-C5 Safety Door Switch in Modular Enclosures

The Omron D4JL-2NFA-C5 is a basic/snap-action solenoid lock safety door switch, a critical component for safeguarding hazardous areas in industrial settings. Modular enclosures are often utilized to house and integrate these switches into a comprehensive safety system.

Key Features of the Omron D4JL-2NFA-C5:

- Door Lock and Release: Mechanical lock and 24 VDC solenoid release mechanism.
- Safety Circuit Contacts: Offers various monitoring patterns thanks to 2 circuits + 2 contacts in the safety circuit.

- Contact Configuration: 3PST (3 Position Single Throw). Specifically, the "N" in the model number D4JL-2NFA-C5 denotes a configuration of 2NC/1NO + 2NC/1NO (slow-action contacts).
- Holding Force: 3,000 N, making it suitable for large, heavy doors.
- Indicator: Green LED indicator.
- Actuator Type: Panel Disconnect. Specifically, it is designed for use with an operation key, with options for front or top insertion.
- Ingress Protection (IP) Rating: IP67, indicating dust-tight and waterproof capabilities.
- Connection: G1/2 conduit outlet.
- Special Release Key: The "5" in the model number indicates a special release key.
- Operating Temperature Range: -10°C to +55°C.

Modular Enclosures:

Modular enclosures provide a flexible and robust solution for housing critical electrical components like the D4JL-2NFA-C5. They offer:

- Protection: Shield equipment from environmental hazards, accidental damage, and unauthorized access.
- Customization: Can be tailored to meet specific requirements with adjustable sizes and configurations.
- Scalability: Easy to expand or reconfigure as needs change.
- Ease of Installation: Prefabricated modules simplify the assembly process.

Integrating the D4JL-2NFA-C5 into Modular Enclosures:

The Omron D4JL-2NFA-C5 is designed to be chassis mounted within the enclosure. The G1/2 conduit outlets allow for secure wiring within the enclosure.

Safety Considerations:

- Risk Assessment: A thorough risk assessment of the equipment and application is necessary before integrating the switch.
- Safety Circuit Configuration: Appropriate relay units and other safety circuits should be configured for proper use.
- Compliance: The D4JL-2NFA-C5 meets various safety standards such as CCC, CE, cULus, and TUV.

Note: The D4JL-2NFA-C5 utilizes a mechanical lock with a solenoid release, which cannot be combined with a trapped key or a special release key with rear release buttons.

https://assets.omron.eu/downloads/latest/datasheet/en/d4jl_d4jl-sk40_guard_lock_safety-door_switch_slide_key_datasheet_en.pdf