

# SENSORS FOR THE PRINTING INDUSTRY



State-of-the-art printing presses require state-of-the-art sensing technologies. They demand rugged and versatile sensors that can function consistently in a variety of machines, applications, and environments.

Pepperl+Fuchs has a broad range of cutting-edge sensors that can stand up to the rigors of the printing industry. Whether it's sheet detection, ensuring consistent web tensioning, or measuring ink levels and monitoring stack height, Pepperl+Fuchs sensors excel at each stage of the process.

And because there's more than one way to solve a problem, we help you achieve your goals using the technology that's best for your unique requirements. From ultrasonic, photoelectric, and inductive sensing to rotary encoders and AS-Interface, solutions are available with advanced technologies for long life and increased performance.

With locations on six continents, a knowledgeable engineering and sales staff, high-tech manufacturing capabilities, and a product portfolio that's second to none, Pepperl+Fuchs has exactly what you need to make your process efficient and reliable—all from a single supplier!



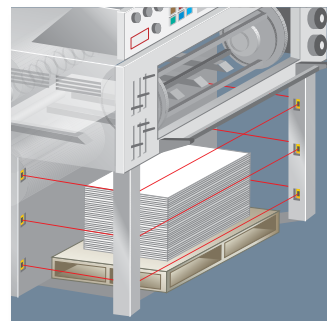
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## STACKER SAFETY

### SAFETY LIGHT CURTAINS SLCS, SLCT, SLP, SafeBox

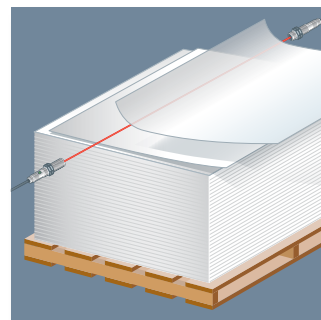
- Safety light curtains detect entry into hazardous areas
- Safety categories 2 and 4
- Narrow beams provide immunity to interference from reflective surfaces
- SafeBox modular safety controller connects all safety components into one unit



## SHEET COUNTING AT OUTPUT

### LASER THRU-BEAM SENSORS E18/EV18-LAS

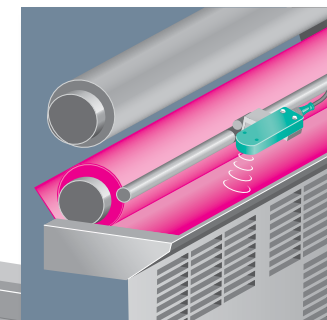
- High switching accuracy
- Automatic threshold adjustment for safe operation and dust insensitivity
- Eye-safe, laser Class 1



## INK LEVEL DETECTION

### ULTRASONIC SENSORS UC300-F43, UB300-18GM

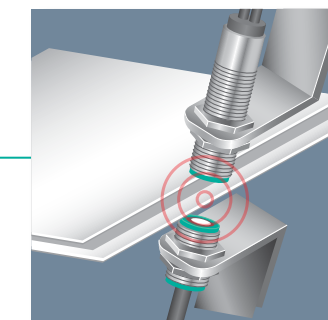
- Reliable ink level measurement
- Low-level alarm
- Chemically-resistant housings



## DOUBLE SHEET DETECTION

### ULTRASONIC SENSORS UDC-18GM

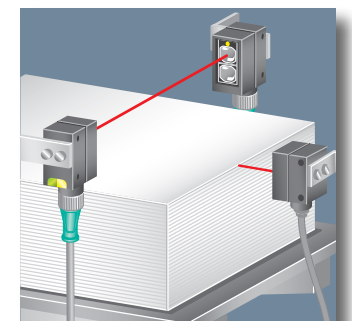
- Identifies zero, one, or multiple (overlapping) sheets
- Fast response time
- Extremely wide range of media, including fine papers, transparencies, cardboard, glossy surfaces, and metal foils



## STACK HEIGHT MONITORING AND ALIGNMENT

### THRU-BEAM AND DIFFUSE MODE SENSORS ML4.2, MLV41, MLV12

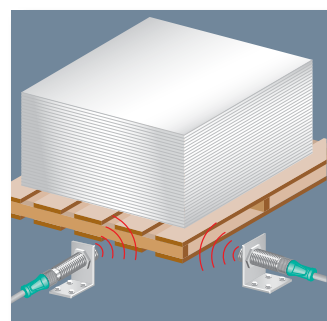
- Reliable detection due to small black-to-white difference
- Small, sharp light beam
- 4-in-1 output
- Antistatic lens repels paper dust



## PALLET DETECTION

### DISTANCE MEASUREMENT UB500-18GM, UB500-F54, UC500-L2, VDM28

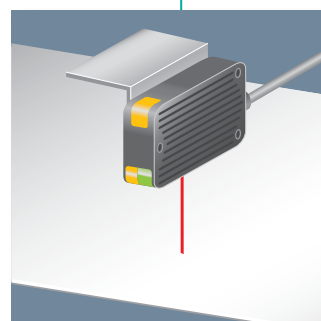
- Reliable detection of position regardless of pallet color or finish
- Analog and discrete outputs
- Ultrasonic and photoelectric solutions available



## SHEET PRESENCE

### DIFFUSE MODE SENSORS MLV41, MLV41-8-HV, ML4.2, R2

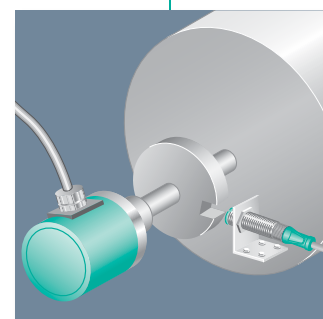
- Detects media directly while ignoring reflective surfaces close to the target
- Enhanced edge detection using background suppression sensors
- Fast response time



## CYLINDER AND PART POSITION

### INDUCTIVE SENSORS, ENCODERS

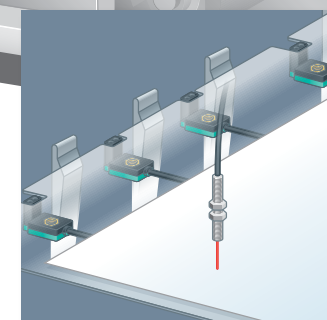
- Precise detection of metal gear teeth, notches, and cams
- Reduction factor 1 senses all metals at the same distance
- Wide variety of housings and sensing ranges



## SHEET ALIGNMENT (FRONT LAY, SIDE LAY)

### DIFFUSE MODE SENSORS ML10, KT10, ML4.2

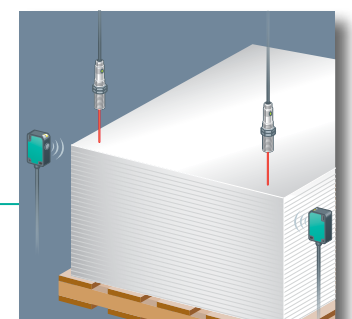
- Fast and accurate detection of a wide variety of media
- Small black-to-white difference with superior background suppression
- Wide variety of sensor styles for use in tight spaces
- Protected against paper dust and vibration
- 4-in-1 output minimizes inventory



## STACK CENTERING

### ULTRASONIC SENSORS, LASERPOINTER UB400-F77, M18...LAS-P

- Proper stack alignment
- Teach-in input
- Small blind range
- Small and miniature housings

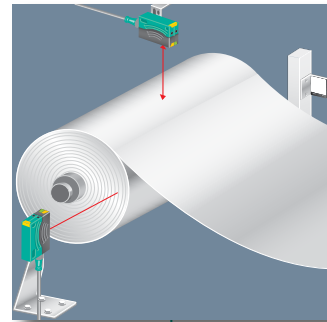




## LOW ROLL DETECTION

**DISTANCE MEASUREMENT DEVICES**  
VDM28, RL28, UB500-30GM, UB500-F54

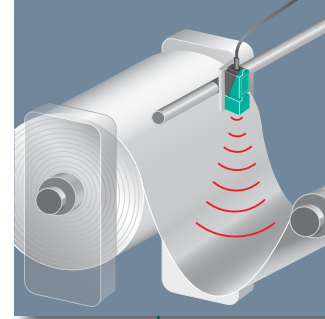
- Monitors web stock diameter
- Sends signal for automatic or manual splicing
- Insensitive to dust and vibrations
- Immune to roll color
- Analog and discrete outputs
- Photoelectric and ultrasonic solutions



## WEB TENSIONING

**DISTANCE MEASUREMENT DEVICES**  
VDM28, UB500-F54

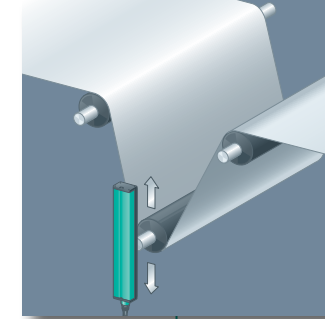
- Ensures consistent web tension
- Consistent end of roll/splice detection
- Unaffected by paper dust
- Versatile mounting
- Solutions include photoelectric or ultrasonic technologies



## WEB TENSION CONTROL

**INDUCTIVE POSITIONING SYSTEMS**  
PMI-F110, PMI-F90

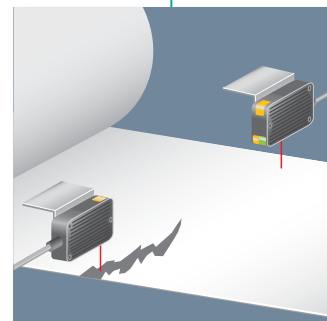
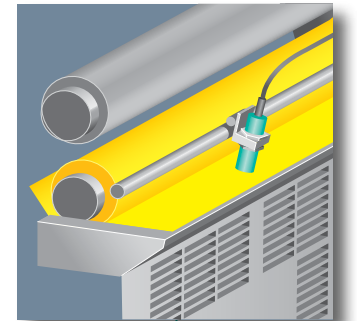
- Wear-free position detection
- Precise resolution
- Insensitive to dust, oil, and grease



## INK LEVEL DETECTION

**ULTRASONIC SENSORS**  
UC300-F43, UB300-18GM

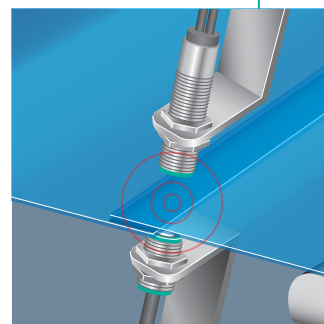
- Reliable ink level measurement
- Low-level alarm
- Chemically-resistant housings



## WEB BREAK MONITORING

**PHOTOELECTRIC AND ULTRASONIC SENSORS**  
MLV41-8-HV, UB120-12GM

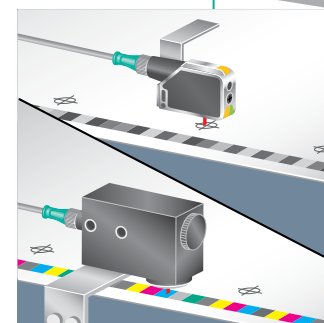
- Easy setup and diagnostics
- Reduces scrap
- Tamperproof or adjustable versions available
- Compact housings



## SPLICE DETECTION

**ULTRASONIC SENSORS**  
UGB-18GM

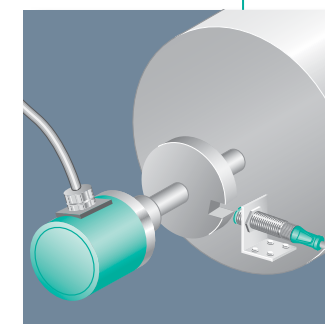
- Reduces waste by identifying web splices
- Accurately detects manufacturer's, automatic, and manual splices
- Capable of double layer and label detection
- Operates with printed, colored, and glossy surfaces
- Simple, quick alignment and setup



## PRINT MARK TRIGGER

**CONTRAST AND COLOR SENSORS**  
DK10, DK12, DK20/21, DK31/34

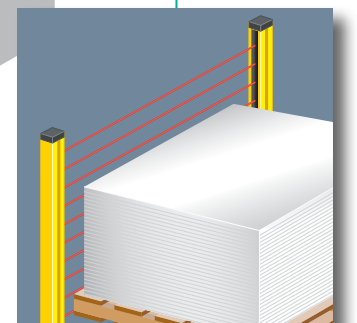
- Compact, rugged housings
- Adjustable connector positions
- High-visibility, dual-indicator LEDs
- Static and dynamic Teach-in
- 4-in-1 output minimizes inventory



## CYLINDER AND PART POSITION

**INDUCTIVE SENSORS, ENCODERS**

- Precise detection of metal gear teeth, notches, and cams
- Reduction factor 1 senses all metals at the same distance
- Wide variety of housings and sensing ranges



## SAFETY PROTECTION AT DELIVERY

**SAFETY LIGHT CURTAINS**  
SLCS, SLCT

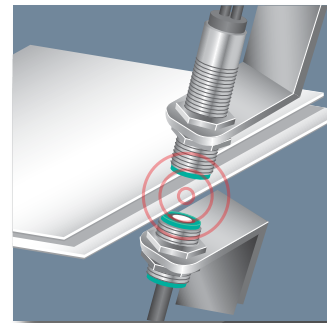
- Self-contained evaluation system
- Ultra-slim housing design
- SLCT Type 2, SIL2
- SLCS Type 4, SIL3



## DOUBLE SHEET DETECTION

### ULTRASONIC SENSORS UDC-18GM

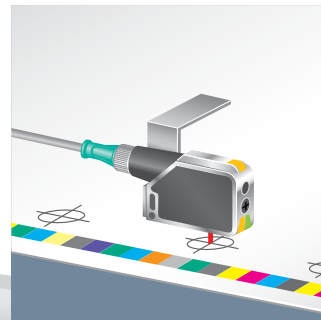
- Identifies zero, one, or multiple (overlapping) sheets
- Fast response time
- Extremely wide media spectrum, including fine papers, transparencies, cardboard, glossy surfaces, and metal foils



## PRINT MARK DETECTION

### CONTRAST AND COLOR SENSORS DK12, DF12

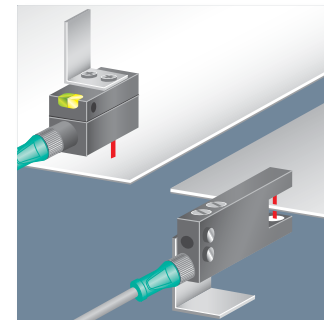
- Compact, rugged, die-cast housing
- Rotatable connector position
- High-visibility, dual-indicator LEDs
- Static and dynamic Teach-in
- 4-in-1 output minimizes inventory



## SHEET PRESENCE/EDGE DETECTION

### DIFFUSE MODE AND SLOT SENSORS GL, ML4.2, SU18, SU19

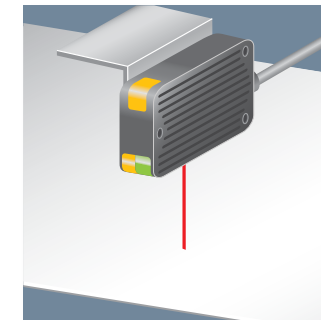
- Consistent front and lateral alignment
- Enhanced precision with background suppression sensors
- 4-in-1 output eliminates additional inventory
- Wide range of housing sizes available



## SHEET PRESENCE

### DIFFUSE MODE SENSORS MLV41, ML4.2, R2

- Reliable media detection due to low black-to-white difference and good background suppression
- Various housing shapes available
- Antistatic glass window prevents false switching due to dust



## SHEET VERIFICATION

### VISION SENSORS BIS510, VOS412-BIS

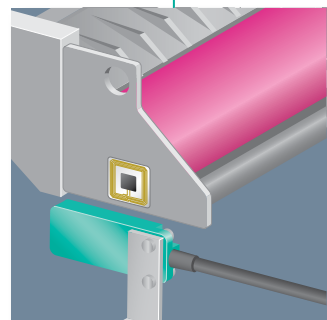
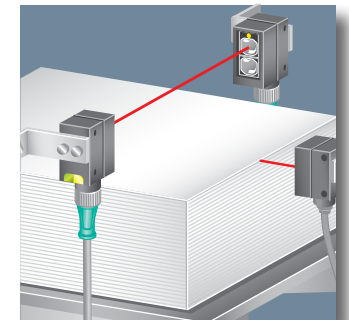
- Sheet verification by image comparison, barcode, and Data Matrix code reading in one sensor
- For high-speed applications
- Optimized illumination ensures reliable verification on reflective surfaces



## STACK HEIGHT MONITORING

### THRU-BEAM SENSORS MLV41, ML4.2, R2

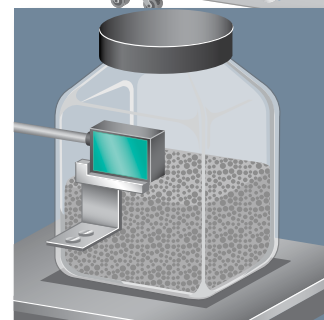
- Reliable detection due to small black-to-white difference
- Small, sharp light beam
- 4-in-1 output
- Antistatic lens repels paper dust



## CONSUMABLES IDENTIFICATION

### RFID

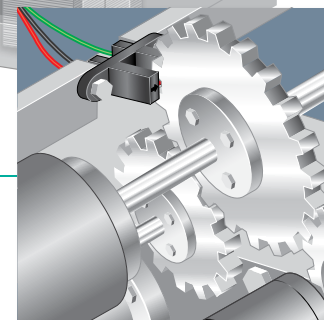
- RFID enables automatic identification of consumables
- Tracking and tracing
- Reliable identification in harsh environments



## TONER LEVEL

### CAPACITIVE SENSORS CBN12-F64, CBN10-F46

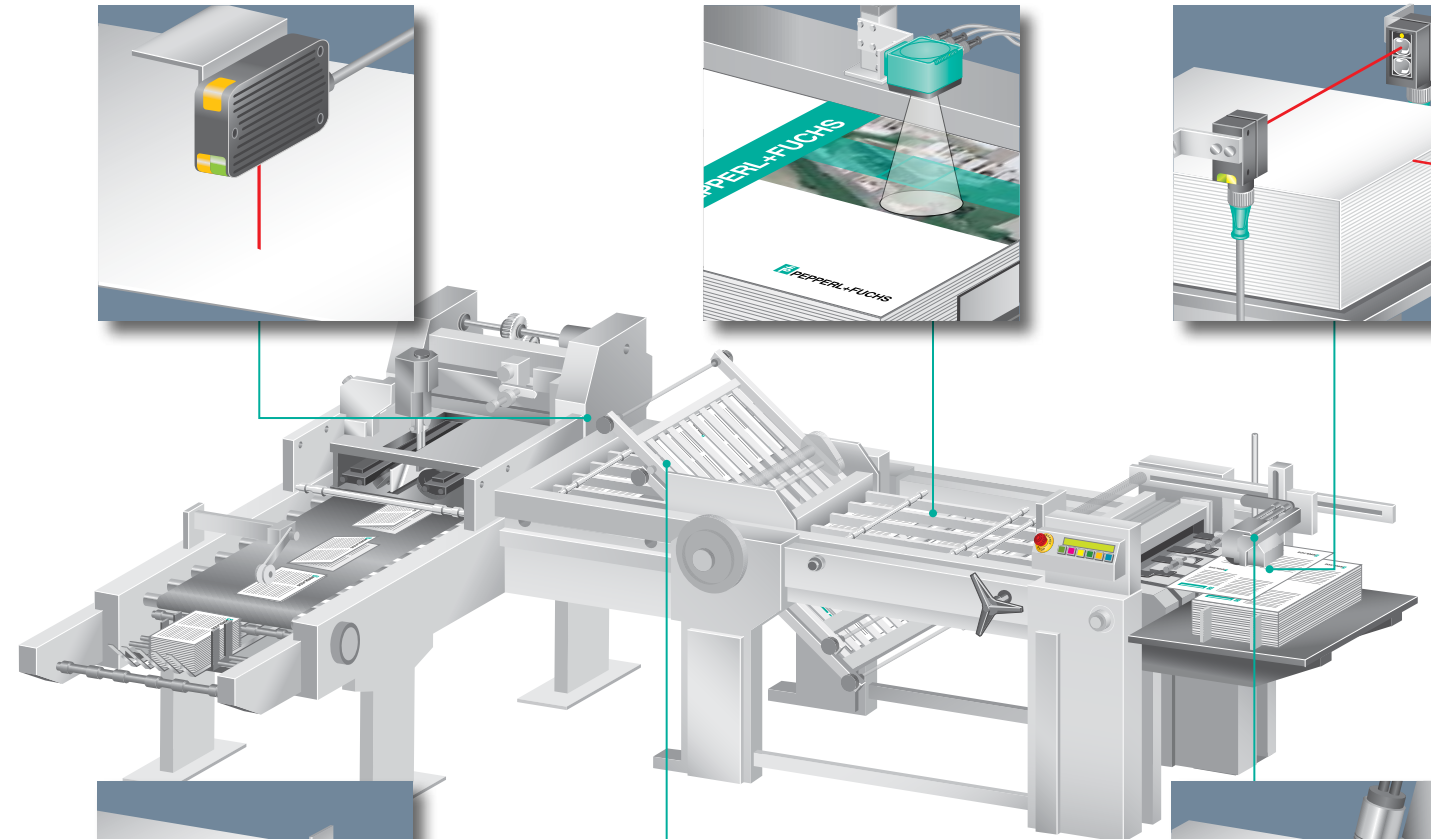
- Reliably detects granular or powdered ink substances
- Detect contents through toner cartridge/waste bottles
- Tried and tested technology



## LOW-COST POSITION FEEDBACK

### SLOT SENSORS GL2, GL3, GL5

- Compact, cost-effective, accurate
- Designed to fit in tight spaces
- Extremely fast response time
- Easy mounting
- Wide variety of housing styles



## SHEET EDGE TRIGGER/TRANSPARENT SHEET DETECTION

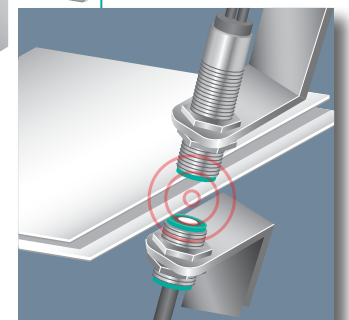
### DIFFUSE MODE AND RETROREFLECTIVE SENSORS ML4.2, ML4.2-54-G, R2

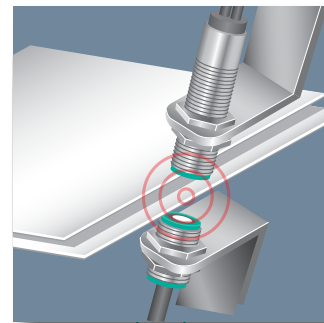
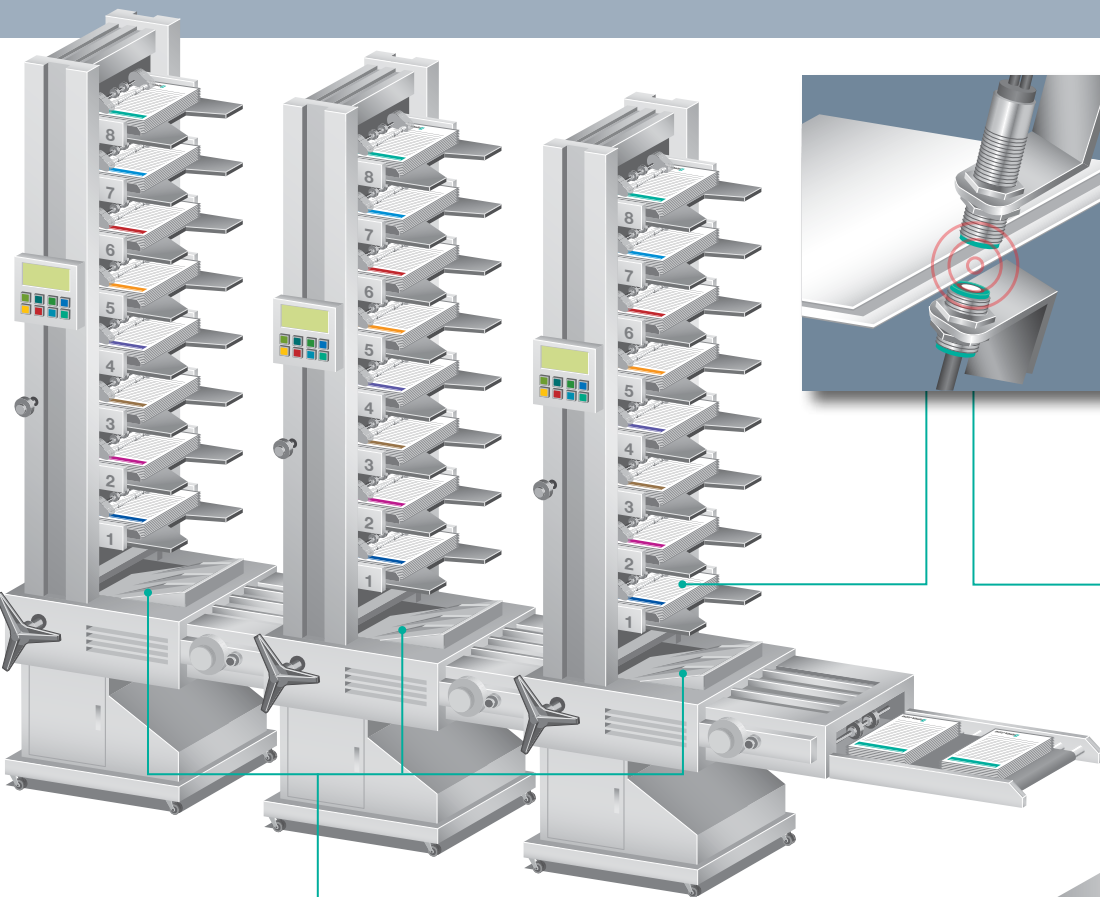
- Consistent front and lateral alignment
- Enhanced precision with background suppression sensors
- Protected against paper dust and vibration
- 4-in-1 output eliminates additional inventory
- Transparent sheet detection

## DOUBLE SHEET DETECTION

### ULTRASONIC SENSORS UDC-18GM

- Identifies zero, one, or multiple (overlapping) sheets
- Fast response time
- Extremely wide media spectrum, including fine papers, transparencies, cardboard, glossy surfaces, and metal foils





## DOUBLE SHEET DETECTION

### ULTRASONIC SENSORS UDC-18GM

- Identifies zero, one, or multiple (overlapping) sheets
- Fast response time
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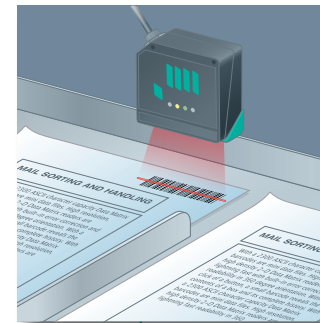
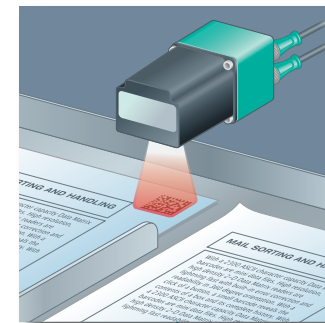
## CODE READING

### VISION SENSORS OPTICAL PRINT INSPECTOR

- High-speed reading of 1-D and 2-D codes
- Multicode reading
- Code quality output
- Reads very long barcodes by taking several images
- Logo comparison

### LASER BARCODE SCANNER VB14N

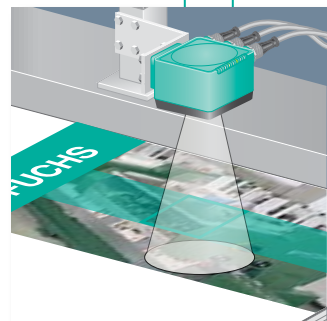
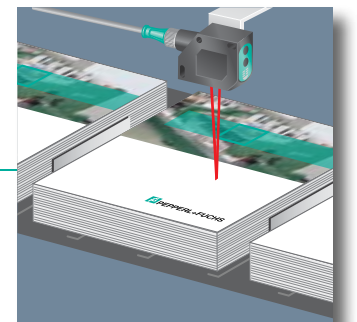
- Reads all popular 1-D codes
- Raster scanner option
- Advanced code reconstruction algorithm
- Quick and easy programming and setup



## BOOKLET THICKNESS

### DISTANCE MEASUREMENT DEVICES VDM18, VDM28

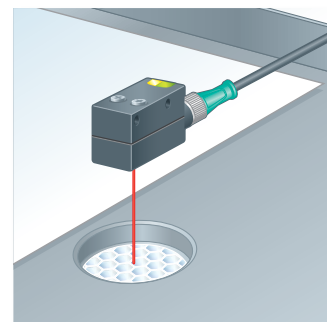
- Precise detection of stack or booklet height
- High-resolution laser triangulation ensures all pages have been assembled
- Accurate height detection regardless of media color



## SHEET VERIFICATION

### VISION SENSORS BIS510, VOS412-BIS

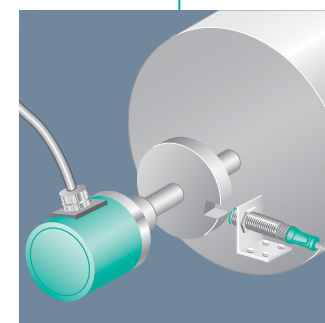
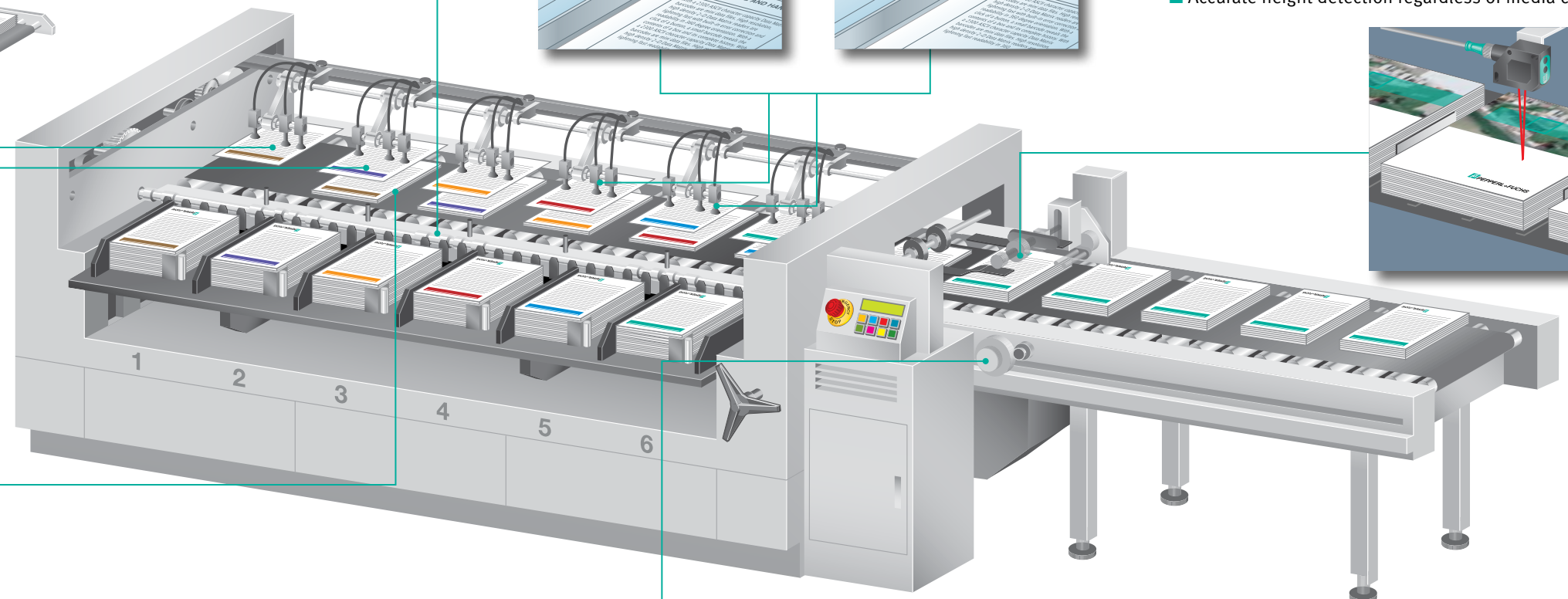
- Sheet verification by image comparison, barcode, and Data Matrix code reading in one sensor
- For high-speed applications
- Optimized illumination ensures reliable verification on reflective surfaces



## SHEET PRESENCE/TRANSPARENT SHEET DETECTION

### RETROREFLECTIVE SENSORS ML4.2, ML4.2-54-G, ML6, ML6-54-G, R2

- Fast and accurate detection of a wide variety of media
- Reliable detection of transparent materials
- Precise sheet edge detection
- Adjustable contrast, no blind range
- 4-in-1 output minimizes inventory



## CYLINDER AND PART POSITION

### INDUCTIVE SENSORS, ENCODERS

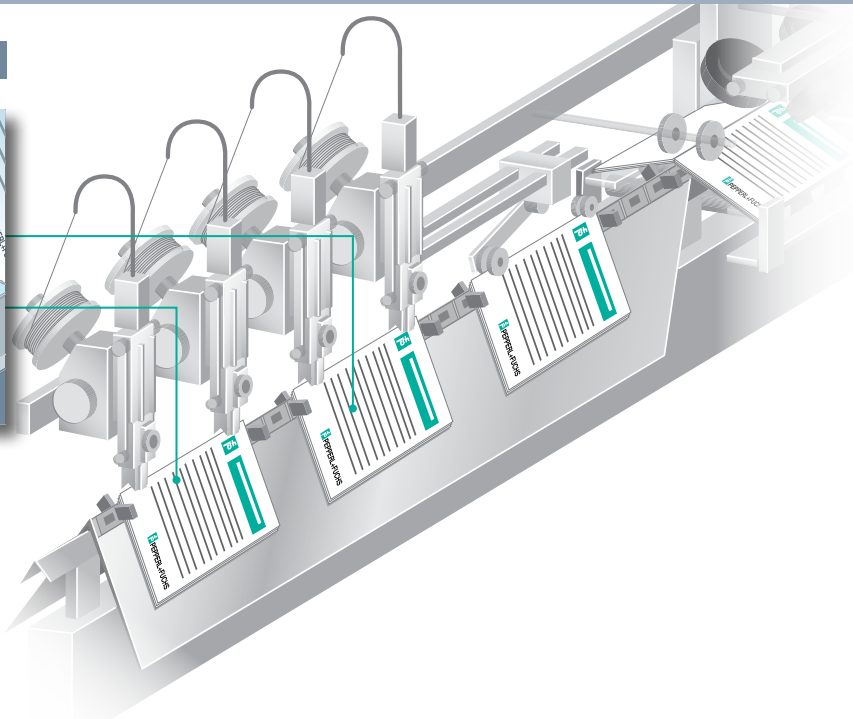
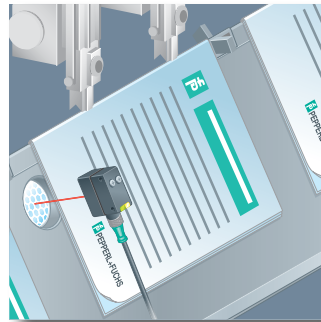
- Precise detection of metal gear teeth, notches, and cams
- Reduction factor 1 senses all metals at the same distance
- Wide variety of housings and sensing ranges



## STITCHING TRIGGER POSITION

### RETROREFLECTIVE SENSORS ML4.2

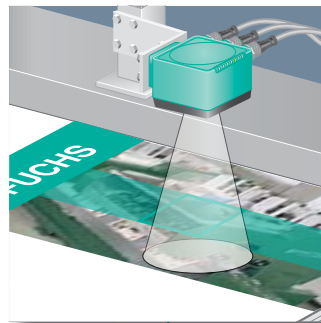
- Detection of collated signatures for proper stitching
- No blind range
- High switching accuracy
- Scratch-resistant glass lens



## SHEET VERIFICATION

### VISION SENSORS BIS510, VOS412-BIS

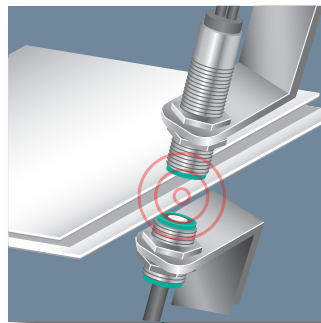
- Sheet verification by image comparison, barcode, and Data Matrix code reading in one sensor
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## DOUBLE SHEET DETECTION

### ULTRASONIC SENSORS UDC-18GM

- Identifies zero, one, or multiple (overlapping) sheets
- Fast response time
- Extremely wide media spectrum, including fine papers, transparencies, cardboard, glossy surfaces, and metal foils



## BOOK POSITION

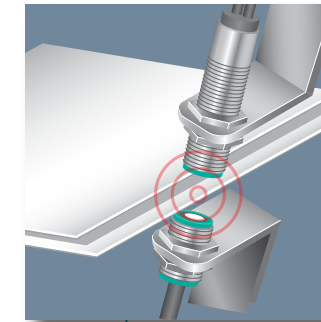
### THRU-BEAM AND SLOT SENSORS E18/EV18-LAS, GL

- Checks booklet edge to ensure all pages are properly bound
- Narrow laser beam detects hanging sheets due to improper binding

## DOUBLE SHEET DETECTION

### ULTRASONIC SENSORS UDC-18GM

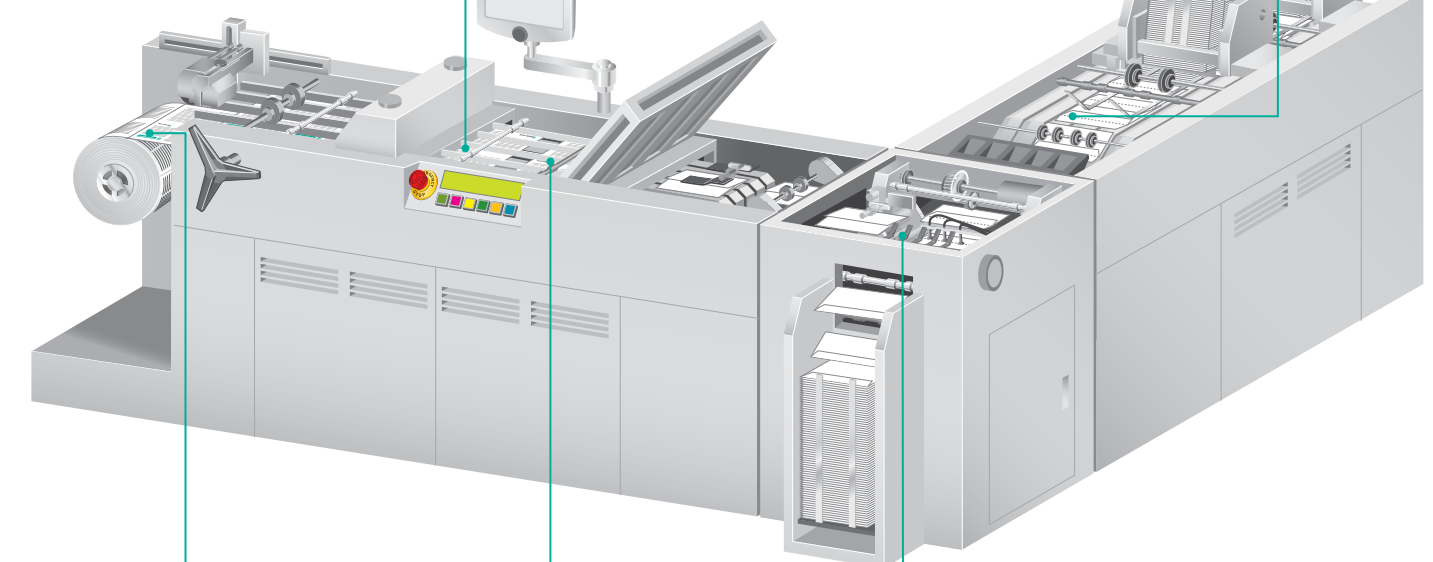
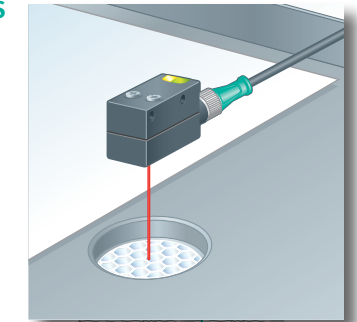
- Identifies zero, one, or multiple (overlapping) sheets
- Fast response time
- Extremely wide media spectrum, including fine papers, transparencies, cardboard, glossy surfaces, and metal foils



## TRANSPARENT SHEET DETECTION

### RETROREFLECTIVE SENSORS ML4.2-54-G, ML6-54-G, MLV41-54-G

- Reliable detection of transparent materials
- No blind range
- Adjustable contrast
- 4-in-1 output eliminates additional inventory



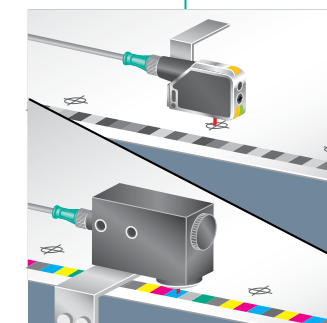
## CODE READING

### VISION SENSORS OPTICAL PRINT INSPECTOR

- High speed reading of 1-D and 2-D codes
- Multicode reading
- Code quality output
- Reads very long barcodes by taking several images
- Logo comparison

### LASER BARCODE SCANNER VB14N

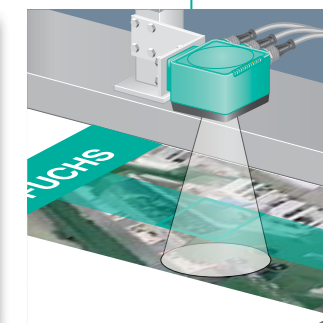
- Reads all popular 1-D codes
- Raster scanner option
- Advanced code reconstruction algorithm
- Quick and easy programming and setup



## PRINT MARK TRIGGER

### CONTRAST AND COLOR SENSORS DK10, DK20/21, DK31/34

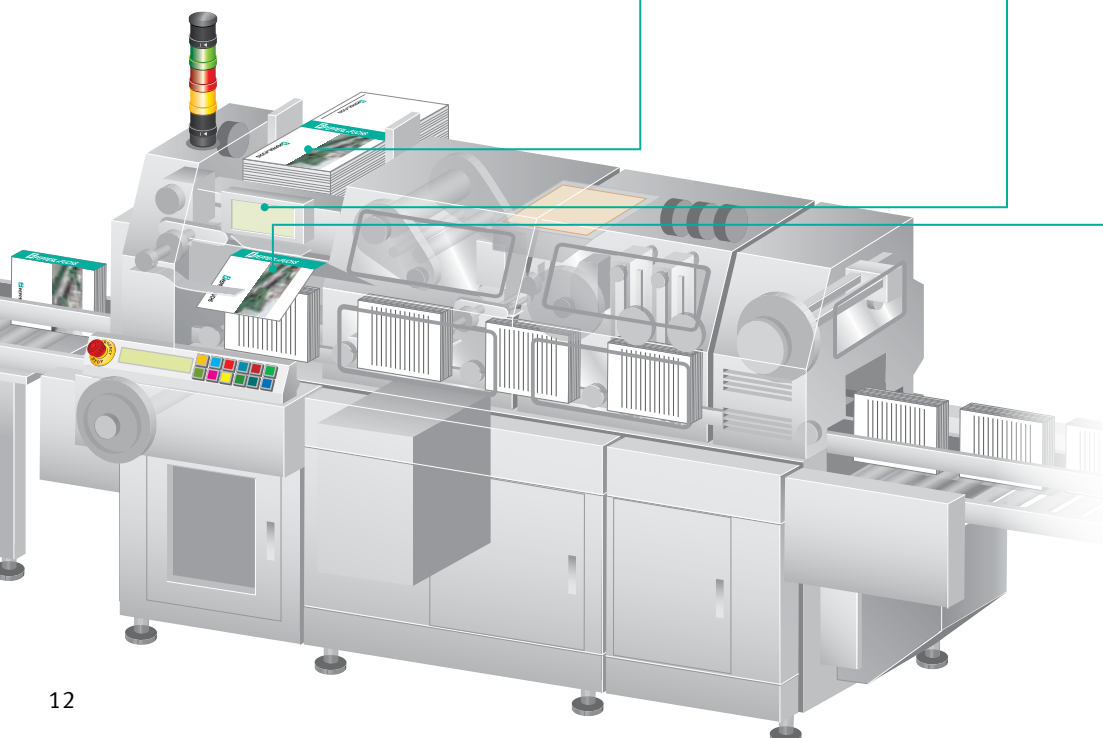
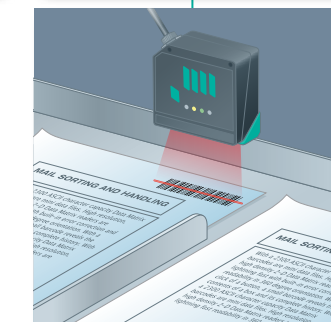
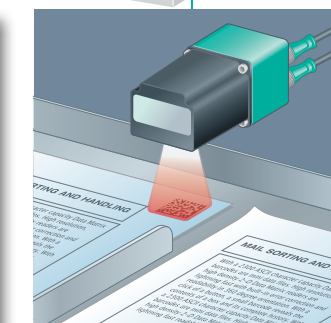
- Compact, rugged, die-cast housing
- Adjustable connector position
- High-visibility, dual-indicator LEDs
- Static and dynamic Teach-in
- 4-in-1 output minimizes inventory



## SHEET VERIFICATION

### VISION SENSORS BIS510, VOS412-BIS

- Sheet verification by image comparison, barcode and Data Matrix code reading in one sensor
- For high-speed applications
- Optimized illumination ensures reliable verification also on reflective surfaces

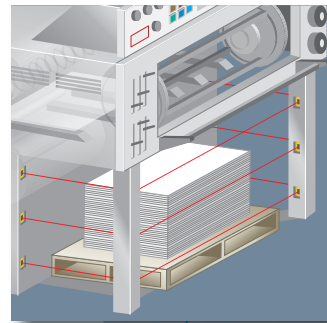




## STACKER SAFETY

### SAFETY LIGHT CURTAINS SLCS, SLCT, SLP, SafeBox

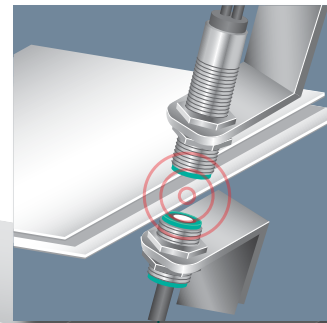
- Safety light curtains detect entry into hazardous areas
- Safety categories 2 and 4
- Narrow beams provide immunity to interference from reflective surfaces
- SafeBox modular safety controller connects all safety components into one unit



## DOUBLE SHEET DETECTION

### ULTRASONIC SENSORS UDC-18GM

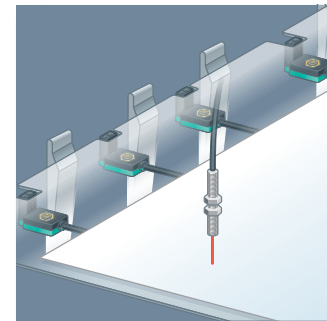
- Identifies zero, one, or multiple (overlapping) sheets
- Fast response time
- Extremely wide media spectrum, including fine papers, transparencies, cardboard, glossy surfaces, and metal foils



## SHEET ALIGNMENT (FRONT LAY, SIDE LAY)

### DIFFUSE MODE SENSORS ML10, KT10, ML4.2

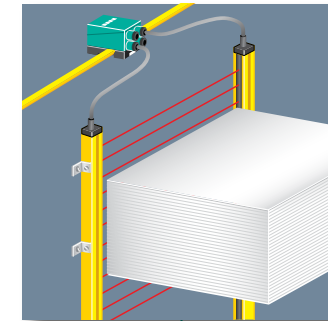
- Fast and accurate detection of a wide variety of media
- Small black-to-white difference with superior background suppression
- Wide variety of sensor styles for use in tight spaces
- Protected against paper dust and vibration
- 4-in-1 output minimizes inventory



## OPERATOR SAFETY PROTECTION

### SAFETY LIGHT CURTAINS SLCS, SLCT, SLP, SafeBox AS-INTERFACE SAFETY AT WORK

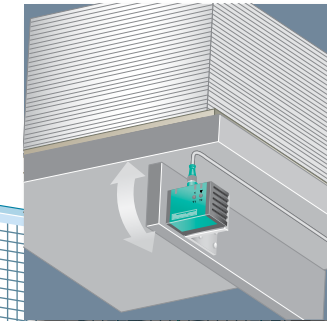
- Monitors status of the safety inputs with one relay
- Network all e-stops, door interlocks, light curtains, etc. on one cable
- Significantly simplifies cabling



## INCLINATION MEASUREMENT

### INCLINATION SENSORS F99

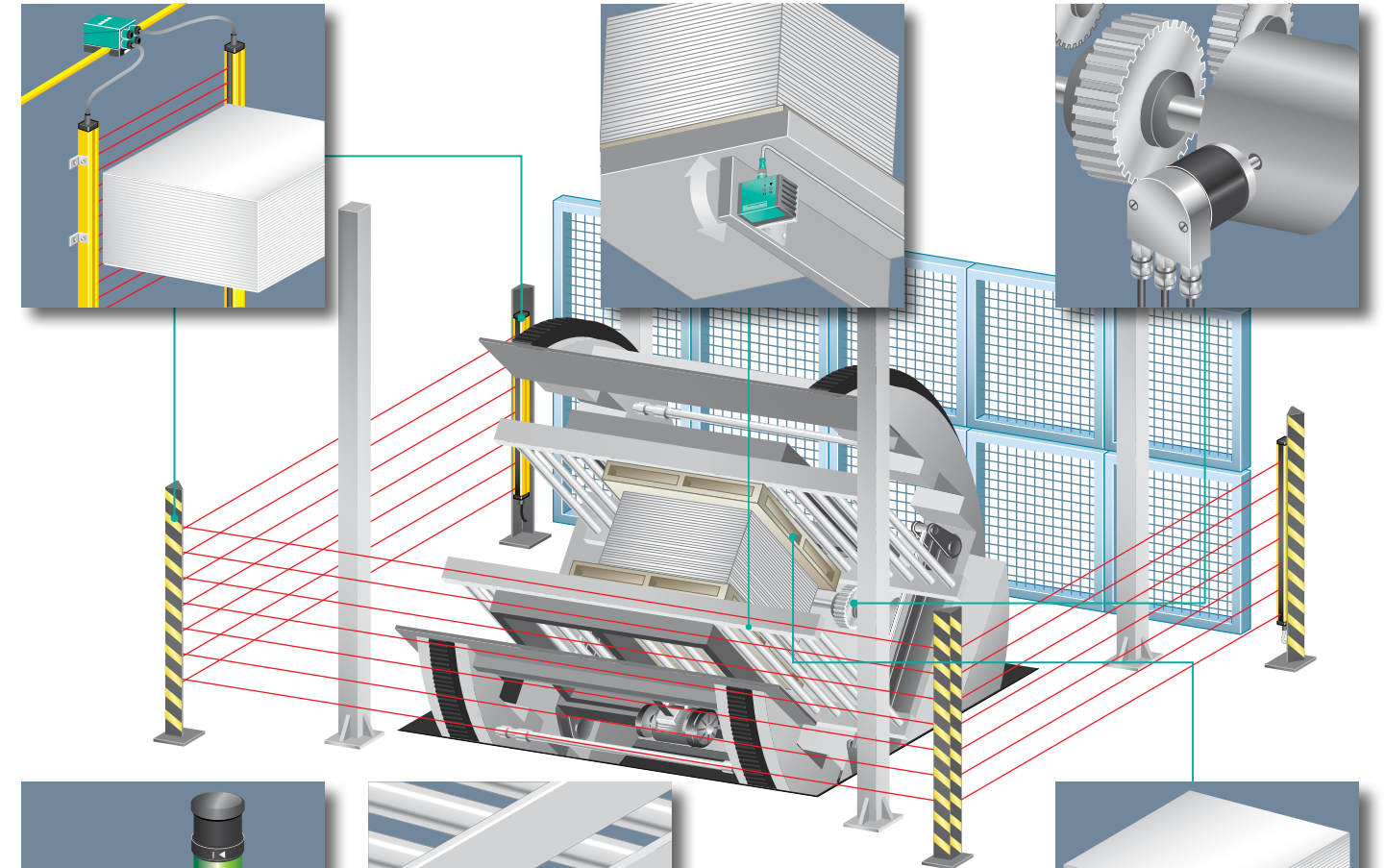
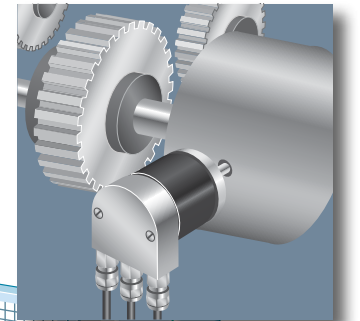
- Noncontact sensing of the inclination angle in one or two axes
- Angular resolution 0.1°
- Both analog and switching outputs
- Two adjustable switching points



## ROTATION CONTROL

### ENCODERS, POSITIONING SYSTEMS PMI360

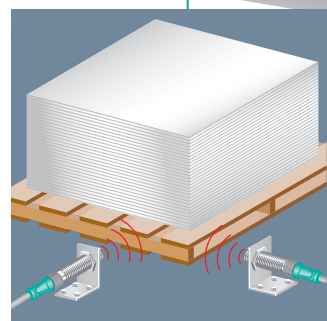
- Precise product positioning
- Compact encoder for tight spaces
- Ultrafast response time



## PALLET DETECTION

### DISTANCE MEASUREMENT DEVICES UB500-18GM, UB500-F54, UC500-L2, VDM28

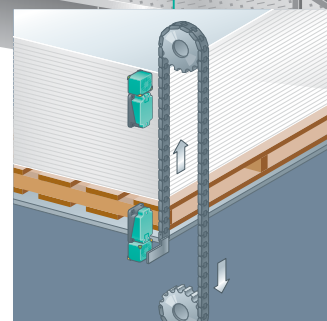
- Precise detection of position regardless of pallet color or finish
- Analog and discrete outputs
- Ultrasonic and photoelectric solutions



## STACK LIMIT DETECTION

### INDUCTIVE SENSORS LIMIT SWITCH STYLE

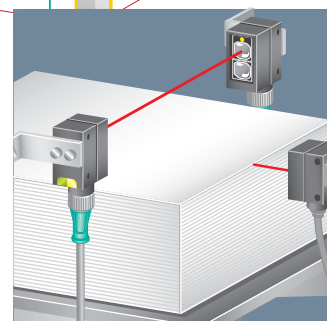
- Reliable detection of stack lift
- Insensitive to paper dust and lubricants
- Compact housing, wear-free detection



## STACK HEIGHT MONITORING

### THRU-BEAM SENSORS ML4.2, MLV41, MLV12

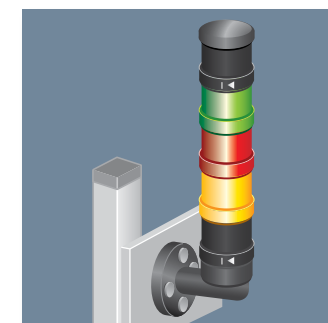
- Reliable detection due to small black-to-white difference
- Small, sharp light beam
- 4-in-1 output
- Antistatic lens repels paper dust



## STACK LIGHT/E-STOP

### AS-INTERFACE SAFETY AT WORK STACK LIGHT

- Compatible with AS-Interface
- Various color configurations and mounting options
- Audible alarms



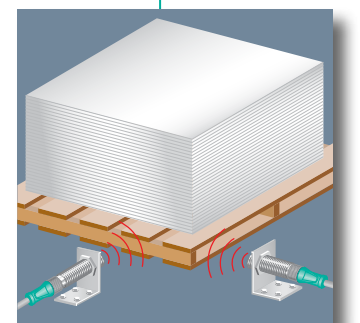
- Illuminated and non-illuminated versions
- Integrated AS-Interface Safety at Work technology
- Twist and pull release



## PALLET POSITIONING

### DISTANCE MEASUREMENT DEVICES UB500-18GM, UB500-F54, UC500-L2, VDM28

- Precise detection of position regardless of pallet color or finish
- Analog and discrete outputs
- Ultrasonic and photoelectric solutions





## SHEET VERIFICATION AND CODE READING

### NUMBER ONE FOR SHEET VERIFICATION

The powerful BIS510 sensor is the number one sensor for sheet verification in all common collating, folding, and binding machines. The vision sensor ensures safe sheet verification in high-speed applications using image comparison and 1-D and 2-D code reading.

- Automatic Teach-in of reference sheets
- Reliable detection of misfed sheets in sheet sequences
- Safe detection even on reflective surfaces
- Innovative image processing technology ensures reading of very large barcodes



### FAST AND VERSATILE CODE READING

The Optical Print Inspector from Pepperl+Fuchs is the versatile solution for code reading in the paper, printing, and packaging industry.

It offers a number of powerful functions:

- Multicode reading
- Code quality output
- Match code function
- Logo comparison

The sensor reads Data Matrix, Code 2/5, Code39, Code128, and Pharmacode symbologies at high speeds of up to 10 m/s at 30 readings/s.

It can also reliably capture and read very long barcodes by taking several images. The large depth of focus of 120 mm allows code reading for varying distances with one setting.



## SHEET DETECTION AND ALIGNMENT

### ULTRASONIC DOUBLE SHEET DETECTION

Double sheet detection using the UDC-18GM Series ultrasonic sensors has proven itself in the printing and packaging industry. Printing machine downtime and high repair costs can now be eliminated with double sheet detection. Ultrasonic double sheet detection UDC-18GM sensors provide enhanced machine run time and minimize material waste.

- Insensitive to printing, colors, and reflective surfaces
- Robust and insensitive to dust
- No Teach-in required
- Fast response time
- Great mounting flexibility, easily fits into tight spaces

With the software tool (Device Type Manager of UDC-18GM), process and diagnostic data can be monitored if a double sheet is detected. The amplitude response allows the user to evaluate the sensor signals.



### PHOTOELECTRIC MINIATURE PRECISION SENSORS

Our photoelectric product portfolio of miniature precision sensors range from background suppression to retroreflective sensors and measurement sensors. The miniature sensors are used for precise sheet alignment, sheet presence, and edge detection in prepress, press, or postpress machines.

Detectable targets range from deep black and reflective to transparent materials. Infrared light and the triangulation principle guarantee switching accuracy, even under heavy dust. The switching accuracy has a direct impact on the laser-engraving process, the print result, or the die-cutting precision.

- Very high degree of switching accuracy
- Precise object and edge detection
- Miniature housing easily fits into tight spaces



		Sheet Fed Printing	Web Printing	Digital Printing	Folding	Collating	Stitching, Binding	Mailroom	Die Cutting	Stack Turners
PHOTOELECTRIC	ML4.2									
	ML6									
	R2									
	MLV12									
	MLV41									
	RL28									
	KT10									
	M18...LAS-P									
	E18/EV18-LAS									
	SU18									
	SU19									
	DK10, DK12, DK20/21, DK31/34									
	DF12, DF20									
	ML10 + SU100/ SU180									
	GL2 .. GL5									
	VDM18									
	VDM28									
	SLCT									
	SLCS									
	SLP, SLPCM									
	SafeBox									
VISION	SLA12-LAS									
	Optical Print Inspector									
	VOS412-BIS									
	BIS510									
INDUCTIVE	Barcode VB14N									
	M4									
	M5									
	M8									
	M12									
	M18									
	M1K									
	F1 Cube									
	F2 Cube									
	F79									
	V3									
	FP									
	PMI									
CAPACITIVE	F99 Inclination Sensor									
	CBN12-F64									
	CBN10-F46									
ULTRASONIC	CBN15-30GK									
	UC500-L2									
	UC300-F43									
	UB500-F54									
	UB400-F77									
	UDC-18GM									
	UGB-18GM									
	UB120-12GM									
	UB500-18GM									
OTHERS	UB500-30GM									
	Encoders									
	RFID									
	AS-Interface Safety									
	Cordsets									

PRECISION PHOTOELECTRIC SENSORS

SERIES ML10, ML4.2, ML6, MLV41, R2

- Precise, noncontact object and edge detection
- Sharp background suppression sensors
- Retroreflective and Thru-beam sensors
- Wide range of housing sizes



OPTICAL IDENTIFICATION

OPTICAL PRINT INSPECTOR, BIS510, VOS412-BIS, VB14N

- High-speed reading of 1-D and 2-D codes
- Sheet verification for collating, folding, and binding machines
- Reads very large barcodes
- Powerful functions like multicode reading, code quality output, match code function, and logo comparison



CONTRAST SENSORS AND COLOR SENSORS

SERIES DK, DF

- Reliable registration and color mark detection
- Splice detection
- Sorting, positioning, quality control
- Very high switching frequency
- Large variety of models, including versions with interchangeable lenses



INDUCTIVE SENSORS

SERIES M4, M5

- Robust and miniature design
- Precise detection of metal
- Wide variety of models



CAPACITIVE SENSORS

SERIES F46, F64, M12, M18, M30

- Detection of metal, plastic, liquid, or granular materials
- Adjustable sensitivity for more flexibility in application
- Wide variety of models



ULTRASONIC SENSORS

SERIES F43, F54, F77, M12, M18, M30

- Noncontact distance measurement
- Insensitive to material, colors, and reflective surfaces
- Immune to dust
- Analog or switching outputs



ULTRASONIC DOUBLE SHEET AND SPLICE DETECTION

UDC-18GM, UGB-18GM

- Ultrasonic Thru-beam sensors detect double sheets and splices
- High-speed detection
- Insensitive to material, colors, and reflective surfaces
- Immune to dust



PHOTOELECTRIC SAFETY SENSORS

SLCS AND SLCT SAFETY LIGHT CURTAINS SERIES, SAFEBOX

- From single-beam safety Thru-beam sensors to multi-beam machine protection
- Finger protection, hand protection, and body protection
- Integrated evaluation or evaluation using SafeBox



INDUCTIVE POSITIONING SYSTEM

PMI

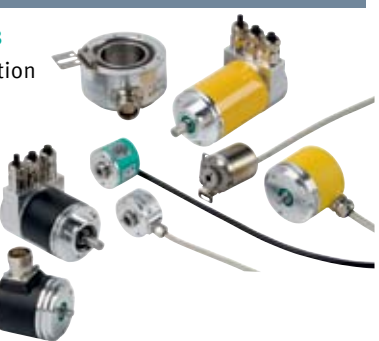
- Precise positioning
- Linear position measurement or rotation angle measuring
- Wear-free, robust, and immune to dust and noise



ROTARY ENCODERS

SERIES RV158, RV558S, CVM58

- Positioning tasks and detection of rotational movements
- Incremental and absolute rotary encoders
- Single-turn and multiturn versions
- Certified functional safety for plants up to SIL3 and PLe





# FACTORY AUTOMATION – SENSING YOUR NEEDS



Pepperl+Fuchs sets the standard in quality and innovative technology for the world of automation. Our expertise, dedication, and heritage of innovation have driven us to develop the largest and most versatile line of industrial sensor technologies and interface components in the world. With our global presence, reliable service, and flexible production facilities, Pepperl+Fuchs delivers complete solutions for your automation requirements—wherever you need us.

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