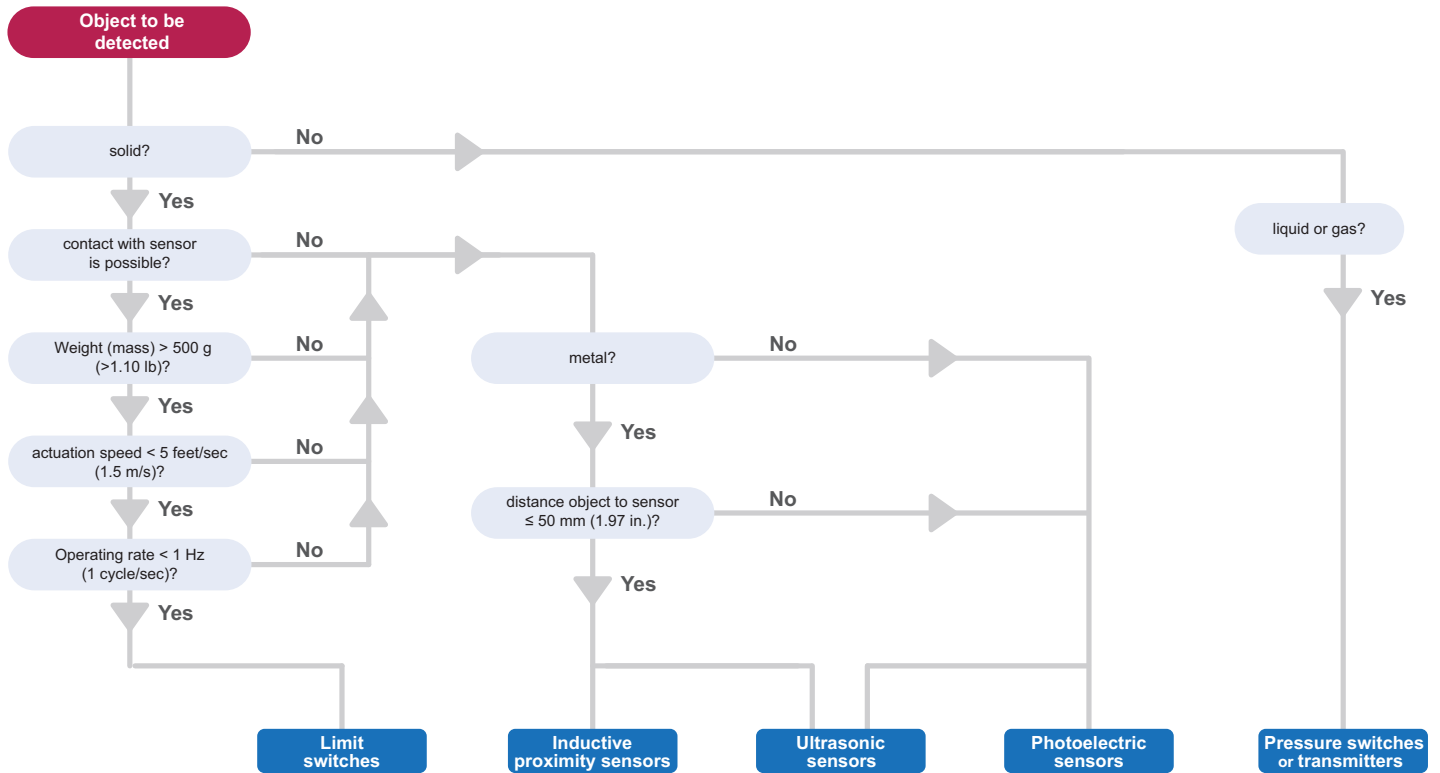







Telemecanique Sensors

Choose the right sensing solution




Industries	XC 	XS 	XX 	XU 	XM 
Machine tools	●	●	●	●	●
Food & beverage	●	●	●	●	●
Packaging	●	●	●	●	●
Hoisting	●	●	●	●	●
Conveying	●	●	●	●	●
Mobile equipment	●	●	●	●	●
Assembly	●	●	●	●	●
Wood industry	●	●	●	●	●
Automotive industry	●	●	●	●	●
Paper industry	●	●	●	●	●
Mines & minerals	●	●	●	●	●
Pumping & water treatment	●	●	●	●	●
Railroad & embedded vehicles	●	●	●	●	●
Lifts & escalators	●	●	●	●	●
Service industry & building	●	●	●	●	●

● Recommended ● Possible ● Unsuitable

Technologies


XC Limit switches



- Detection of all solid objects by contact
- Intuitive and easy to install
- Volt free and positive opening contact

- Head could be blocked by external materials (chips, sawdust, ...)
- Slow actuation speed (<1.5 m/s)
- Low operating ratings limited to 1 cycle/second (~1Hz) or slower
- Mechanical contact may result in wear


XS Proximity sensors



- Detection of metals (Fe, Al, Cu, ...) without contact (no touch)
- High operating ratings, fast response time
- Excellent resistance to industrial environments

Detects only metal objects
Short sensing distance -> 60 mm (2.36 in.)


XX Ultrasonic sensors



Detection of materials without contact (no touch)
Insensitive to color, transparency and coefficient of reflection
Very good resistance to industrial environments

Sensitive to high air flow, humidity or rapid changes of temperature
Sound-absorptive materials and oddly-shaped objects may be difficult to detect.


XU Photoelectric sensors



Detection of objects without contact (no touch), opaque, shiny or transparent. Direct detection of objects (cases, pallet), persons, vehicles (trolley, wagon)
Long ranges detection - > 100 m (328.08 ft)
High operating rate. Available with background suppression.

Not suitable for harsh environments: dirty, dusty
Temperature range limitations
To prevent interference between photocells, new XUM sensors with anti-interference mode must be used.

XM Pressure switches and transmitters




Detection of fluids in contact with air, water, hydraulic oils, and some corrosive fluids from -14.5 to 8,700 PSI (-1 to 600 bar)
Discrete or analog output used to control or monitor pressure or vacuum thresholds in a hydraulic or pneumatic circuit.

Not suitable for detecting solid objects

Choice criteria

1 - Choose the body

appropriate to the environment:
- Choose size, material and duty



2 - Choose a head

according to the object to be detected
Detection movement type:
- Linear
- Rotary
- Multidirectional Plunger
- Lever
- Spring rod or cat whiskers

3 - Choose the contact

according to the automation function to achieve
Snap action or slow break, 2, 3 or 4 contacts; NO, NC...

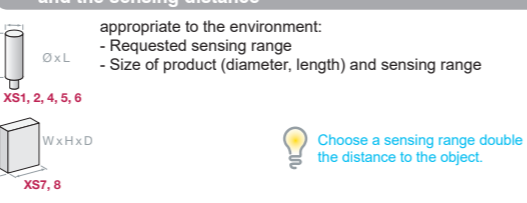
Snap recommended

4 - Choose the electrical connection

according to facility standards or machine requirements...
M12 connector or screw clamp terminal with different tapped cable entries

1 - Choose the body size and the sensing distance

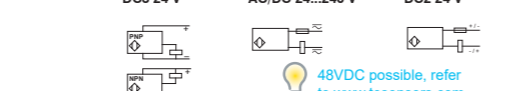
appropriate to the environment:
- Requested sensing range
- Size of product (diameter, length) and sensing range



Choose a sensing range double the distance to the object.

2 - Choose the output type

according to the load compatibility (contactor, PLC...)
DC3 wires 24V PNP, NPN, DC or AC/DC 2 wires 24-240V...
DC3 24 V AC/DC 24...240 V DC2 24 V



48VDC possible, refer to www.tesensors.com

3 - Choose the electrical connection

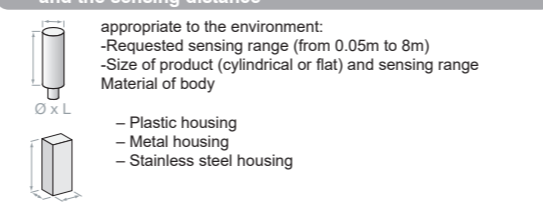
according to facility standards or machine requirements...
Cable, connector (M8, M12 in DC, 1/2 in AC/DC), screw clamp terminals.

4 - Choose the output signal & function

according to the automation function to achieve
Discrete (NO, NC, NO+NC), analogue 0-10V 4 20mA rotation monitoring ...

1 - Choose the body size and the sensing distance

appropriate to the environment:
- Requested sensing range (from 0.05m to 8m)
- Size of product (cylindrical or flat) and sensing range
Material of body



- Plastic housing
- Metal housing
- Stainless steel housing

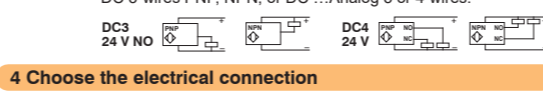
2 - Choose the output signal & function

according to the automation function to achieve
discrete (NO, NC, NO+NC)...or analog (0-10V, 4-20mA)

- Software configurable or only remote teach button

3 - Choose the output type

according to the load compatibility (contactor, PLC...)
DC 3-wires PNP, NPN, or DC ...Analog 3 or 4-wires.



4 - Choose the electrical connection

according to facility standards or machine requirements...
cable, connector (M8 or M12)

1 - Choose the body / the system and the sensing distance

appropriate to the environment and requested accuracy of detection. Find a balance between location to install with access to the object (one or two sides), type of object, sensing distance and accuracy of detection desired.

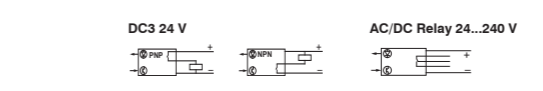
Size (mm)	ØxL	XUB	XUM	XUK	XUX
		Ø18x46	-	-	-
		-	10.8x31.5x19.5	18x50x50	30x92x71
Sensing range, m (ft.)		15 (49.21)	30 (98.42)	30 (98.42)	40 (131.23)
		4 (13.12)	8 (26.24)	7 (22.97)	14 (45.93)
		0.6 (1.97)	1.9 (6.23)	1 (3.28)	2.1 (6.89)

Thru beam Reflex Diffuse

2 - Choose the output type

according to the load compatibility (contactor, PLC...)
DC3 wires 24V PNP, NPN, AC/DC 5 wires relay 24-240V

DC3 24 V AC/DC Relay 24...240 V



3 - Choose the electrical connection

according to facility standards or machine requirements...
Cable, connector (M8, M12), screw clamp terminals (XUX)

4 - Choose the output signal & function

according to the automation function to achieve
Discrete (NO, NC, NO+NC)

1 - Choose the family

Choose the fluid, pressure range and fluid temperature

appropriate to the application.

If response time is not critical, consider
Electromechanical pressure switch with contacts

If response time is critical or you need to monitor pressure, consider
Electronic pressure sensor with solid-state or analog output

2 - choose the output type

according to the load compatibility (contactor, PLC)
Contact C/O, DC3-wire, PNP, NPN, DC NO or NC, analog, or 3 or 4-wire

3 - Choose the electrical connection

M12 connector, Packard Metri-Pack, DIN43650A or screw clamp terminals with a tapped cable entry

4 - Choose the fluid connection

according to facility standards or machine requirements...
1/4" NPT female, G 1/4 BSP female...

Details

	Presence of target for mechanical stop	Detection of machine internal pieces (cams, end stop...)		end plunger
	30° Cam Precise alignment with roller Plunger <1 mm (0.04 in.) Linear movement			roller plunger or roller lever
	30° Cam Alignment with roller lever ~5 mm (0.20 in.)	Direct detection of objects (in manufacturing or material handling process)		roller lever
	Plan face or cylindrical target Linear or angular movement Alignment with rod ~10 mm (0.39 in.)			rod lever
	Any moving part Multi-directional movement Alignment with whisker >10 mm (0.39 in.)			"Cat whiskers"

	Sensing Range 0 to 20 mm (0 to 0.79 in.)	Detection of machine internal pieces (cams, end stop, gears)		XS cylindrical
	Sensing Range 0 to 40 mm (0 to 1.57 in.)	Detection link to material handling (trolley, wagon) Direct detection of objects (metallic: engine block)		XS cubic or limit switch style
	Sensors suitable for flush mounting in metal: - No clearance required <i>The common choice</i>			
	Sensors not suitable for flush mounting in metal: - Side clearance required - Sensing distance greater than that of a standard flush mountable model			
	Sensors suitable for flush mounting by teaching the maximum sensing range according to the environment. Background suppression is possible.			

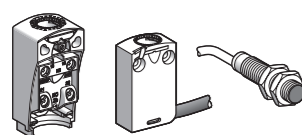
	For detection of hard objects with flat surface perpendicular to the detection axis up to 8 m (26.25 ft)	Diffuse (proximity) mode	
	For detection of irregular objects: According to angle of reflection, sound could be reflected outside the sensor's receiver. In this case, use the sensor in a reflex (reflective) mode. NO product becomes a NC product.	Reflex mode (eg.1)	
	For detection of sound absorbing object use the sensor in a retroreflective mode. NO product becomes a NC product.	Reflex mode (eg.2)	
	For detection any object regardless of shape or position.	Thru-Beam	

	Opaque target - Sensing range up to 100 m (328.08 ft) - Requires an emitter and receiver	Thru beam or multimode + emitter	
	Opaque and non-shiny target - Sensing range up to 14 m (45.0 ft) - Requires photoelectric sensor and reflector accessory	Retroreflective or multimode + reflector	
	Opaque and shiny target - Sensing range up to 70 m (229.65 ft) - Requires polarized photoelectric sensor and polarized reflector accessory	Polarized retroreflective or multimode + reflector	
	Opaque and non-shiny target - Sensing range up to 2 m (6.5 ft) depending on target color	Diffuse or multimode	
	Opaque target - Short range up to 2 m (6.56 ft) - Ignore objects located beyond suppression limit	Diffuse with background suppression or multimode	
	Very small target - Limited available space - High accuracy (< mm)	XU Fork	

	Detection of thresholds with no response time constraints Fixed or adjustable differential -14.5 to 7,250 PSI (-1 to 500 bar)	XMLA/B	
	Detection of thresholds requiring quick response time Adjustable differential -14.5 to 8,700 PSI (-1 to 600 bar)	XMLR ZMLP	
	Transmission of continuous pressure variation with adjustment -14.5 to 8,700 PSI (-1 to 600 bar)		
	Transmission of continuous pressure variation without adjustment	XMLG -14.5 to 8,700 PSI (-1 to 600 bar)	
		XMLK 0 to 300 PSI (0 to 25 bar)	
		XMLP 0 to 10,000 PSI (0 to 600 bar)	

Electrical connections

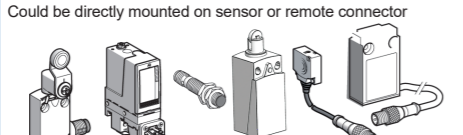
Sensors with a cable or terminal



Be sure to follow the instruction sheet for proper electrical connection.

Sensors with a connector

Could be directly mounted on sensor or remote connector



Want easier maintenance? Try sensors with a connector or terminal.

Connector types

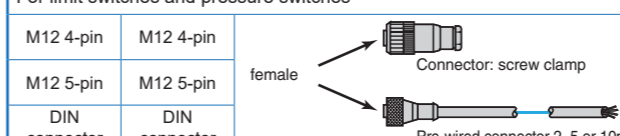
Different types of connectors are available. They vary for function, number of wires, size of sensor, facility standards or machine requirements.

M8 3 or 4-pin in DC			1/2" 3-pin in AC or AC/DC	
M12 4 or 5-pin in DC			DIN connector in hydraulic	

Choose a female connector or female pre-wired connector

Selected sensors	Choose in table
M12 4-pin	M12 4-pin
M12 5-pin	M12 5-pin
DIN connector	DIN connector

female



Connector: screw clamp
Pre-wired connector 2, 5 or 10m



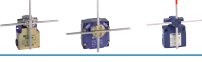

For inductive sensors		For photoelectric sensors		For ultrasonic sensors	
Selected sensor	Choose in the table	Selected sensor	Choose in the table	Selected sensor	Choose in the table
XS...M8	M8 3-pin	XU...M8	M8 4-pin	XX...M8	M8 3-pin
XS...M12	M12 4-pin	XU...M12	M12 4-pin	XX...M8	M8 4-pin
XS...U20	1/2" 3-pin	XUR...M8	M8 3-pin	XX 4-pin	M12 4-pin

Be sure to follow the instruction sheet for proper electrical connection.






Applications

For more complex sensing needs, refer to www.tesensors.com or the Telemecanique Sensors Essentials Catalog for information relative to the sensors described below.

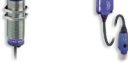




XC for special applications

One of the most comprehensive offering of special limit switches dedicated to severe environments and heavy duty service. Mainly for: hoisting, handling, mining, minerals and metals and other harsh environmental constraints (foundry, welding and automotive industries etc...)	
Severe duty for hoisting and material handling applications	
Specifically designed products for belt shift monitoring	
Cross Limit Switches - Dedicated products for overhead cranes and block hoists for end of travel control	
Robust Mill & Foundry Switch	

Safety detection





One of the most comprehensive offerings of industrial safety switches on the market, complemented by a range of safety light curtains and safety mats for dangerous machines in industrial segments. Example: packaging, handling, robotics, machines tools, presses, automotive market.	
Detection of gates or cover openings	
Guard switches with mechanical actuator	
Rotary lever and spindle-operated guard switches for hinge guards	
Coded magnetic guard switches	
Safety RFID switches	
Detection of operators in free access zone	
Safety light curtains	

XS for special applications




One of the most comprehensive offerings of inductive sensors for general purpose as well as assembly machines, robotics, machine-tools, machining, packaging, materials handling, conveying and food and beverage industry.	
Rotation control, ferrous/non-ferrous detection	
Plastic case sensors for double insulation and chemical environment compliance	
Miniature cylindrical format plain, smooth barrel 4 mm and 6.5 mm or M5 for assembly applications	
Stainless steel and plastic housings for dedicated food & beverage applications	
Capacitive sensors XT range for detection of insulating or conductive materials	

The information and dimensions in this catalog are provided for the convenience of our customers. While this information is believed to be accurate, Schneider Electric reserves the right to make updates and changes without prior notification and assumes no liability for any errors or omissions.

XU for special applications

A dedicated offering of application specific products for packaging, handling, assembly, conveying, food & beverage, complete the general purpose offer.	
Detection of transparent materials	
Mark readers, luminescence sensors, color sensors	
Label detection	
Laser technology sensors	

XG RFID inductive identification system

With OsiSense XG, discover a complete RFID system comprised of 13.56 MHz smart antennas, electronic tags and network connection accessories. OsiSense XG simplifies access to tag data with automatic adaptation to the protocol and speed of the network used (Ethernet IP, ModbusTCP/IP, Modbus RTU, Uni-Telway and Profibus DP). With a broad line of RFID tags and accessories, OsiSense XG is the ideal choice for manufacturing track, trace and control applications.	
Compact stations with integrated controller and antenna, now with integrated Ethernet IP and Modbus TCP/IP.	
13.56 MHz electronic tags	
Portable RFID terminal and network connection boxes	

Cabling Accessories

High-performance, quick and easy connectors to all our sensors are available in our XZ range. Reference identification and the connection processes are user friendly.	
Pre-wired connectors	
Jumper cables	
Connectors	

For our complete selection of sensor solutions, visit www.tesensors.com

Schneider Electric Industries SAS

Head Office
35, rue Joseph Monier – CS 30323
F92506 Rueil-Malmaison Cedex
FRANCE

www.tesensors.com

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