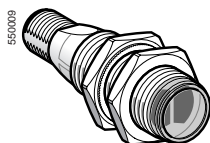


# Photo-electric sensors

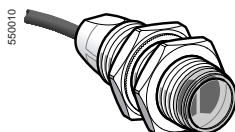
## OsiSense XU, single mode function

### Design 18, plastic

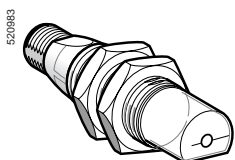
### Three-wire DC, solid-state output



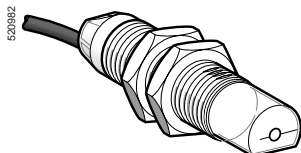
XUB●A●●NM12



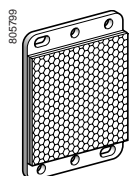
XUB●A●●NL2



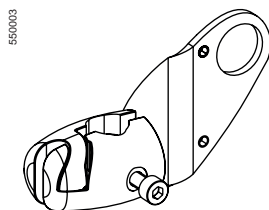
XUB●A●●WM12



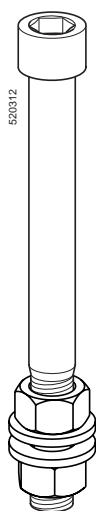
XUB●A●●WL2



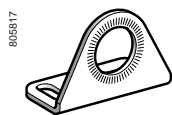
XUZC50



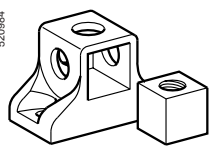
XUZB2003



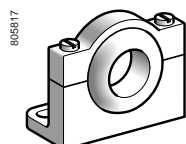
XUZ2001



XUZA118



XUZ2003



XUZA218

#### Connector

Sensing distance (Sn) m	Function	Output	Line of sight	Reference	Weight kg
<b>Diffuse system</b>					
0.1	NO	PNP	Along case axis	XUB4APANM12	0.040
			90° to case axis	XUB4APAWM12	0.040
	NPN	PNP	Along case axis	XUB4ANANM12	0.040
			90° to case axis	XUB4ANAWM12	0.040
	NC	PNP	Along case axis	XUB4APBNM12	0.040
			90° to case axis	XUB4APBWM12	0.040
NPN	PNP	Along case axis	XUB4ANBNM12	0.040	
		90° to case axis	XUB4ANBWM12	0.040	

#### Diffuse system with adjustable sensitivity

0.6	NO	PNP	Along case axis	XUB5APANM12	0.045
			90° to case axis	XUB5APAWM12	0.050
	NPN	PNP	Along case axis	XUB5ANANM12	0.045
			90° to case axis	XUB5ANAWM12	0.050
	NC	PNP	Along case axis	XUB5APBNM12	0.045
			90° to case axis	XUB5APBWM12	0.050
NPN	PNP	Along case axis	XUB5ANBNM12	0.045	
		90° to case axis	XUB5ANBWM12	0.050	

#### Polarised reflex system

2	NO	PNP	Along case axis	XUB9APANM12	0.040
			90° to case axis	XUB9APAWM12	0.040
	NPN	PNP	Along case axis	XUB9ANANM12	0.040
			90° to case axis	XUB9ANAWM12	0.040
	NC	PNP	Along case axis	XUB9APBNM12	0.040
			90° to case axis	XUB9APBWM12	0.040
NPN	PNP	Along case axis	XUB9ANBNM12	0.040	
		90° to case axis	XUB9ANBWM12	0.040	

Reflector  
50 x 50 mm

#### Reflex system

4	NO	PNP	Along case axis	XUB1APANM12	0.040
			90° to case axis	XUB1APAWM12	0.040
	NPN	PNP	Along case axis	XUB1ANANM12	0.040
			90° to case axis	XUB1ANAWM12	0.040
	NC	PNP	Along case axis	XUB1APBNM12	0.040
			90° to case axis	XUB1APBWM12	0.040
NPN	PNP	Along case axis	XUB1ANBNM12	0.040	
		90° to case axis	XUB1ANBWM12	0.040	

Reflector  
50 x 50 mm

#### Thru-beam system

<b>Transmitter</b>		–	–	Along case axis	XUB2AKSNM12T	0.040
<b>Receiver</b>		NO	PNP	Along case axis	XUB2APANM12R	0.040
15		NPN	PNP	Along case axis	XUB2APAWM12R	0.040
				90° to case axis	XUB2ANANM12R	0.040
15		NPN	PNP	Along case axis	XUB2ANAWM12R	0.040
				90° to case axis	XUB2ANBNM12R	0.040
15		NC	PNP	Along case axis	XUB2APBNM12R	0.040
				90° to case axis	XUB2APBWM12R	0.040
15		NPN	PNP	Along case axis	XUB2ANBNM12R	0.040
				90° to case axis	XUB2ANBWM12R	0.040

#### Fixing accessories (1)

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUB or XUZC50	XUZB2003	0.170
M12 rod	XUZ2001	0.050
Support for M12 rod	XUZ2003	0.150
Stainless steel fixing bracket	XUZA118	0.045
Plastic fixing bracket with adjustable ball-joint	XUZA218	0.035

#### Pre-cabled


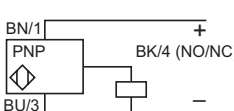
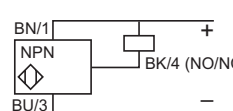
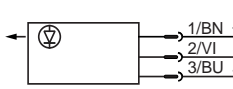
For a pre-cabled sensor, replace M12 by L2 for a 2 m long cable, or by L5 for a 5 m long cable. Example: XUB1APANM12 becomes XUB1APANL2 for a 2 m long cable and XUB1APANL5 for a 5 m long cable.

For availability, please consult our Customer Care Centre.

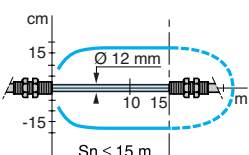
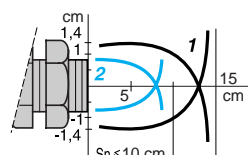
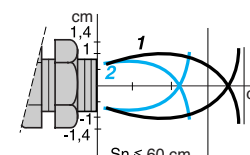
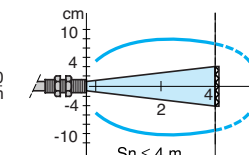
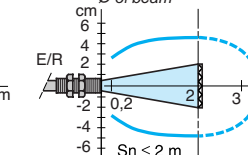
(1) For further information, see page 5/158.

Characteristics		XUB1, XUB2, XUB4, XUB5, XUB9	XUB1, XUB2, XUB4, XUB5, XUB9
Sensor type		UL, CSA, CE	
Product certifications		UL, CSA, CE	
Connection	Connector	M12	–
	Pre-cabled	–	Length: 2 m
Sensing distance nominal Sn / (excess gain = 1) maximum (excess gain = 2)		<b>0.1 / 0.15 diffuse</b>	
		<b>0.6 / 0.8 diffuse with adjustable sensitivity</b>	
		<b>2 / 3 polarised reflex</b>	
		<b>4 / 5.5 reflex</b>	
		<b>15 / 20 thru-beam</b>	
Type of transmission		Infrared, except polarised reflex (red)	
Degree of protection	Conforming to IEC 60529	IP 65, IP 67, double insulation ☐	
	Conforming to DIN 40050	IP 69K for connector versions	
Storage temperature		°C -40...+70	
Operating temperature		°C -25...+55	
Materials	Case	PBT	
	Lens	PMMA	
	Cable	–	PvR
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Indicator lights	Output state	Yellow LED (except for XUB2●●●●●T)	
	Supply on	Green LED (only for XUB2●●●●●T)	
Rated supply voltage		V --- 12...24 with protection against reverse polarity	
Voltage limits (including ripple)		V --- 10...36	
Current consumption, no-load		mA 35	
Switching capacity		mA ≤ 100 with overload and short-circuit protection	
Voltage drop, closed state		V 1.5	
Maximum switching frequency		Hz 500	
Delays	First-up	ms < 15	
	Response	ms < 1	
	Recovery	ms < 1	

## Wiring schemes

M12 connector	Pre-cabled	PNP	NPN	Transmitter
 <p>3 (-) 1 (+) 4 OUT/Output 2 Beam break input (1)</p>	<p>(-) BU (Blue) (+) BN (Brown) (OUT/Output) BK (Black) Beam break input (1) VI (Violet)</p>	 <p>BN/1 BK/4 (NO/NC) BU/3</p>	 <p>BN/1 BK/4 (NO/NC) BU/3</p>	 <p>1/BN + 2/VI 3/BU -</p> <p>Input 2/VI: - not connected: beam made - connected to -: beam broken</p>

## Detection curves

Thru-beam system	Diffuse system	Diffuse system with adjustable sensitivity	Reflex system	Polarised reflex system
 <p>Sn ≤ 15 m</p>	 <p>Sn ≤ 10 cm</p> <p>Object 10 x 10 cm; 1 White 90%; 2 Grey 18%</p>	 <p>Sn ≤ 60 cm</p>	 <p>Sn ≤ 4 m</p> <p>With reflector XUZC50</p>	 <p>Sn ≤ 2 m</p> <p>With reflector XUZC50</p>

## Dimensions

XUB	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
∅ 18, line of sight along case axis	46 (2)	28	60 (1)	28
∅ 18, line of sight 90° to case axis	62	28	76	28
∅ 18, line of sight along case axis XUB5	62	44	76	44
∅ 18, line of sight 90° to case axis XUB5	78	44	92	44

(1) Beam break input on thru-beam transmitter only.

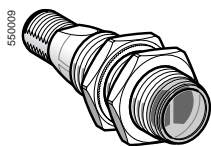
(2) For XUB9●●●●● (polarised reflex) 46 becomes 48 mm and 60 becomes 62 mm.

# Photo-electric sensors

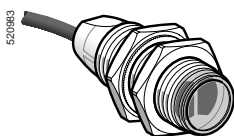
## OsiSense XU, single mode function

### Design 18, metal

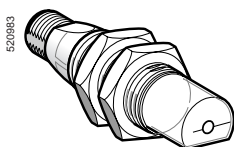
#### Three-wire DC, solid-state output



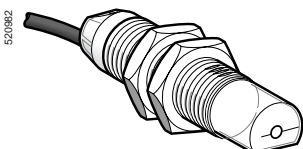
XUB•B••NM12



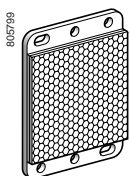
XUB•B••NL2



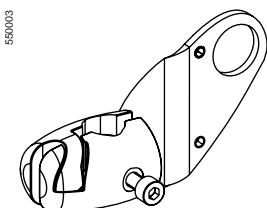
XUB•B••WM12



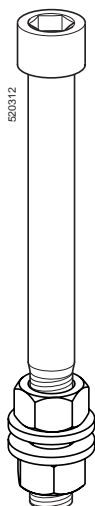
XUB•B••WL2



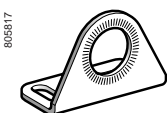
XUZC50



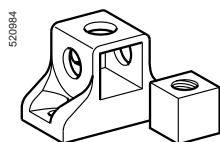
XUZB2003



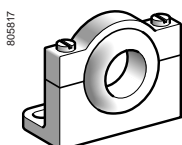
XUZ2001



XUZA118



XUZ2003



XUZA218

#### Connector

Sensing distance (Sn) m	Function	Output	Line of sight	Reference	Weight kg
<b>Diffuse system</b>					
0.1	NO	PNP	Along case axis	XUB4BPANM12	0.050
			90° to case axis	XUB4BPAWM12	0.050
	NPN	PNP	Along case axis	XUB4BNANM12	0.050
			90° to case axis	XUB4BNAWM12	0.050
	NC	PNP	Along case axis	XUB4BPBNM12	0.050
			90° to case axis	XUB4BPBWM12	0.050
NPN	PNP	Along case axis	XUB4BNBNM12	0.050	
		90° to case axis	XUB4BNBWM12	0.050	

#### Diffuse system with adjustable sensitivity

0.6	NO	PNP	Along case axis	XUB5BPANM12	0.055
			90° to case axis	XUB5BPAWM12	0.060
	NPN	PNP	Along case axis	XUB5BNANM12	0.055
			90° to case axis	XUB5BNAWM12	0.060
	NC	PNP	Along case axis	XUB5BPBNM12	0.055
			90° to case axis	XUB5BPBWM12	0.060
NPN	PNP	Along case axis	XUB5BNBNM12	0.055	
		90° to case axis	XUB5BNBWM12	0.060	

#### Polarised reflex system

2	NO	PNP	Along case axis	XUB9BPANM12	0.050
			90° to case axis	XUB9BPAWM12	0.050
	NPN	PNP	Along case axis	XUB9BNANM12	0.050
			90° to case axis	XUB9BNAWM12	0.050
	NC	PNP	Along case axis	XUB9BPBNM12	0.050
			90° to case axis	XUB9BPBWM12	0.050
NPN	PNP	Along case axis	XUB9BNBNM12	0.050	
		90° to case axis	XUB9BNBWM12	0.050	

Reflector 50 x 50 mm – – – XUZC50 0.020

#### Reflex system

4	NO	PNP	Along case axis	XUB1BPANM12	0.050
			90° to case axis	XUB1BPAWM12	0.050
	NPN	PNP	Along case axis	XUB1BNANM12	0.050
			90° to case axis	XUB1BNAWM12	0.050
	NC	PNP	Along case axis	XUB1BPBNM12	0.050
			90° to case axis	XUB1BPBWM12	0.050
NPN	PNP	Along case axis	XUB1BNBNM12	0.050	
		90° to case axis	XUB1BNBWM12	0.050	

Reflector 50 x 50 mm – – – XUZC50 0.020

#### Thru-beam system

<b>Transmitter</b>					
15	–	–	Along case axis	XUB2BKSNM12T	0.050
			90° to case axis	XUB2BKSWM12T	0.050
<b>Receiver</b>					
15	NO	PNP	Along case axis	XUB2BPANM12R	0.050
			90° to case axis	XUB2BPAWM12R	0.050
	NPN	PNP	Along case axis	XUB2BNANM12R	0.050
			90° to case axis	XUB2BNAWM12R	0.050
	NC	PNP	Along case axis	XUB2BPBNM12R	0.050
			90° to case axis	XUB2BPBWM12R	0.050
NPN	PNP	Along case axis	XUB2BNBNM12R	0.050	
		90° to case axis	XUB2BNBWM12R	0.050	

#### Fixing accessories (1)

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUB or XUZC50	XUZB2003	0.170
M12 rod	XUZ2001	0.050
Support for M12 rod	XUZ2003	0.150
Stainless steel fixing bracket	XUZA118	0.045
Plastic fixing bracket with adjustable ball-joint	XUZA218	0.035

#### Pre-cabled

For a pre-cabled sensor, replace M12 by L2 for a 2 m long cable, or by L5 for a 5 m long cable. Example: XUB1BPANM12 becomes XUB1BPANL2 for a 2 m long cable and XUB1BPANL5 for a 5 m long cable.


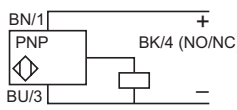
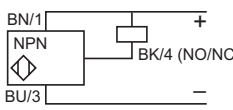
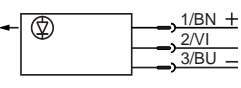
For availability, please consult our Customer Care Centre.

(1) For further information, see page 5/158.

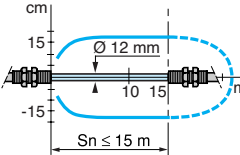
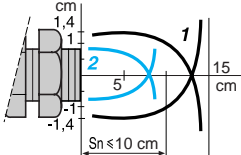
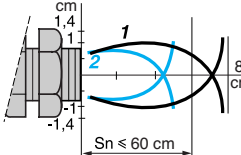
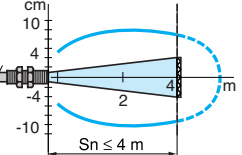
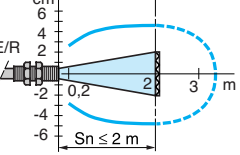
## Characteristics

<b>Sensor type</b>		<b>XUB1, XUB2, XUB4, XUB5, XUB9</b>	<b>XUB1, XUB2, XUB4, XUB5, XUB9</b>
<b>Product certifications</b>		UL, CSA, CE	
<b>Connection</b>	Connector	M12	–
	Pre-cabled	–	Length: 2 m
<b>Sensing distance</b> nominal Sn / maximum (excess gain = 2) (excess gain = 1)	<b>m</b>	<b>0.1 / 0.15 diffuse</b>	
	<b>m</b>	<b>0.6 / 0.8 diffuse with adjustable sensitivity</b>	
	<b>m</b>	<b>2 / 3 polarised reflex</b>	
	<b>m</b>	<b>4 / 5.5 reflex</b>	
	<b>m</b>	<b>15 / 20 thru-beam</b>	
<b>Type of transmission</b>		Infrared, except polarised reflex (red)	
<b>Degree of protection</b>	Conforming to IEC 60529	IP 65, IP 67, double insulation ☐	
	Conforming to DIN 40050	IP 69K for connector versions	
<b>Storage temperature</b>		°C	-40...+70
<b>Operating temperature</b>		°C	-25...+55
<b>Materials</b>	Case	Nickel plated brass	
	Lens	PMMA	
	Cable	–	PvR
<b>Vibration resistance</b>	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
<b>Shock resistance</b>	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
<b>Indicator lights</b>	Output state	Yellow LED (except for XUB2●●●●●T)	
	Supply on	Green LED (only for XUB2●●●●●T)	
<b>Rated supply voltage</b>		<b>V</b>	--- 12...24 with protection against reverse polarity
<b>Voltage limits (including ripple)</b>		<b>V</b>	--- 10...36
<b>Current consumption, no-load</b>		<b>mA</b>	35
<b>Switching capacity</b>		<b>mA</b>	≤ 100 with overload and short-circuit protection
<b>Voltage drop, closed state</b>		<b>V</b>	1.5
<b>Maximum switching frequency</b>		<b>Hz</b>	500
<b>Delays</b>	First-up	<b>ms</b>	< 15
	Response	<b>ms</b>	< 1
	Recovery	<b>ms</b>	< 1

## Wiring schemes

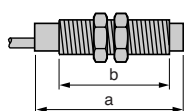
M12 connector	Pre-cabled	PNP	NPN	Transmitter
 <p>3 (-) 1 (+) 4 OUT/Output 2 Beam break input (1)</p>	<p>(-) BU (Blue) (+) BN (Brown) (OUT/Output) BK (Black) Beam break input (1) VI (Violet)</p>	 <p>BN/1 + BK/4 (NO/NC) BU/3 -</p>	 <p>BN/1 + BK/4 (NO/NC) BU/3 -</p>	 <p>1/BN + 2/VI + 3/BU -</p> <p>Input 2/VI: - not connected: beam made - connected to -: beam broken</p>

## Detection curves

Thru-beam system	Diffuse system	Diffuse system with adjustable sensitivity	Reflex system	Polarised reflex system
 <p>Sn ≤ 15 m</p>	 <p>Object 10 x 10 cm; 1 White 90%; 2 Grey 18%</p>	 <p>Sn ≤ 60 cm</p>	 <p>With reflector XUZC50</p>	 <p>With reflector XUZC50</p>

## Dimensions

### XUB



	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
Ø 18, line of sight along case axis	46 (2)	28	60 (1)	28
Ø 18, line of sight 90° to case axis	62	28	76	28
Ø 18, line of sight along case axis XUB5	62	44	76	44
Ø 18, line of sight 90° to case axis XUB5	78	44	92	44

(1) Beam break input on thru-beam transmitter only.

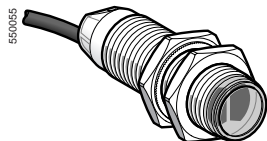
(2) For XUB9●●●●● (polarised reflex) 46 becomes 48 mm and 60 becomes 62 mm.

# Photo-electric sensors

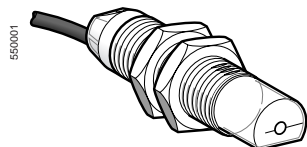
OsiSense XU multimode

Design 18, metal or plastic

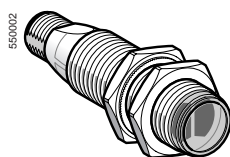
Three-wire DC, solid-state output



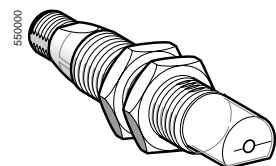
XUB0...NL2



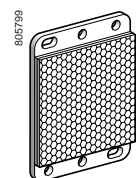
XUB0...WL2



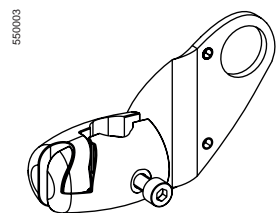
XUB0...NM12



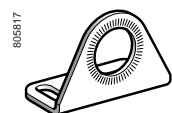
XUB0...WM12



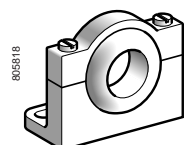
XUZC50



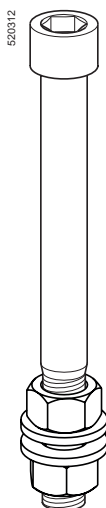
XUZB2003



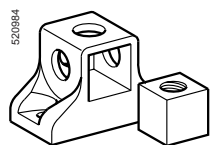
XUZA118



XUZA218



XUZ2001



XUZ2003

## Ø 18 metal

### Pre-cabled (1)

Sensing distance (Sn) (2) m	Function	Output	Line of sight	Reference	Weight kg
0...20 depending on whether accessories are used	NO or NC, by PNP programming	PNP	Along case axis	XUB0BPSNL2	0.105
			90° to case axis	XUB0BPSWL2 (3)	0.110
0...20 depending on whether accessories are used	NO or NC, by PNP programming	NPN	Along case axis	XUB0BNSNL2	0.105
			90° to case axis	XUB0BNSWL2 (3)	0.110

### M12 connector

0...20 depending on whether accessories are used	NO or NC, by PNP programming	PNP	Along case axis	XUB0BPSNM12	0.055
			90° to case axis	XUB0BPSWM12 (3)	0.060
0...20 depending on whether accessories are used	NO or NC, by PNP programming	NPN	Along case axis	XUB0BNSNM12	0.055
			90° to case axis	XUB0BNSWM12 (3)	0.060

### Accessories

Description	Connecti- on	Line of sight	Reference	Weight kg
Thru-beam transmitter	Pre-cabled (1)	Along case axis	XUB0BKSNL2T	0.105
		90° to case axis	XUB0BKSWL2T (3)	0.110
	M12 connector	Along case axis	XUB0BKSNM12T	0.055
		90° to case axis	XUB0BKSWM12T (3)	0.060
Reflector 50 x 50 mm	-	-	XUZC50	0.020

## Ø 18 plastic

### Pre-cabled (1)

Sensing distance (Sn) (3) m	Function	Output	Line of sight	Reference	Weight kg
0...20 depending on whether accessories are used	NO or NC, by PNP programming	PNP	Along case axis	XUB0APSNL2	0.095
			90° to case axis	XUB0APSWL2 (3)	0.100
0...20 depending on whether accessories are used	NO or NC, by PNP programming	NPN	Along case axis	XUB0ANSNL2	0.095
			90° to case axis	XUB0ANSWL2 (3)	0.100

### M12 connector

0...20 depending on whether accessories are used	NO or NC, by PNP programming	PNP	Along case axis	XUB0APSNM12	0.045
			90° to case axis	XUB0APSWM12 (3)	0.050
0...20 depending on whether accessories are used	NO or NC, by PNP programming	NPN	Along case axis	XUB0ANSNM12	0.045
			90° to case axis	XUB0ANSWM12 (3)	0.050

### Accessories

Description	Connecti- on	Line of sight	Reference	Weight kg
Thru-beam transmitter	Pre-cabled (1)	Along case axis	XUB0AKSNL2T	0.095
		90° to case axis	XUB0AKSWL2T (3)	0.100
	M12 connector	Along case axis	XUB0AKSNM12T	0.045
		90° to case axis	XUB0AKSWM12T (3)	0.050
Reflector 50 x 50 mm	-	-	XUZC50	0.020

### Fixing accessories (4)

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XUB or XUZC50	XUZB2003	0.170
M12 rod	XUZ2001	0.050
Support for M12 rod	XUZ2003	0.150
Stainless steel fixing bracket	XUZA118	0.045
Plastic fixing bracket with adjustable ball-joint	XUZA218	0.035

(1) For a 5 m long cable, replace L2 by L5.  
Example: XUB0BPSNL2 becomes XUB0BPSNL5.  
For availability, please consult our Customer Care Centre.

(2) For further information, see page 5/33.

(3) For line of sight 90° to case axis versions, see sensing distances on page 5/33.

(4) For further information, see page 5/158.


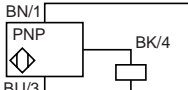
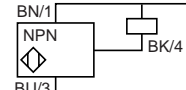
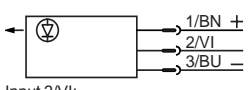
5



### Characteristics

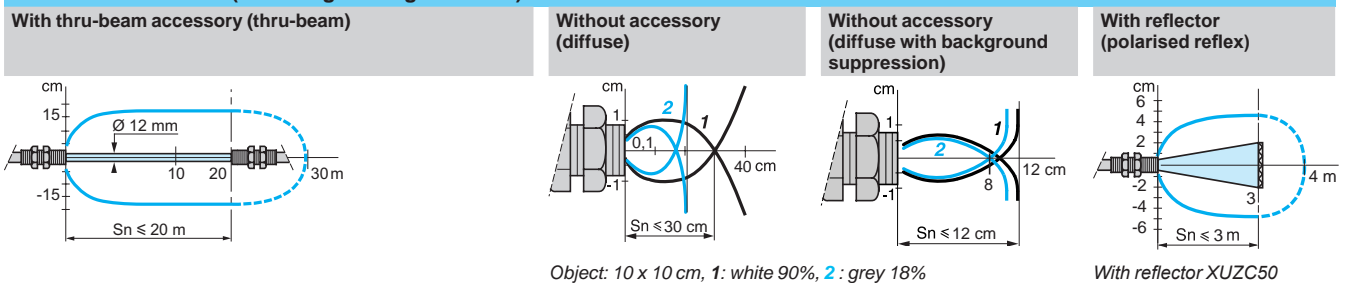
<b>Sensor type</b>		XUB0●●●●M12, XUB0●●●●M12T	XUB0●●●●L2, XUB0●●●●L2T
<b>Product certifications</b>		UL, CSA, CE	
<b>Connection</b>	Connector	M12	–
	Pre-cabled	–	Length: 2 m
<b>Sensing distance maximum</b> (excess gain = 1) <b>nominal Sn /</b> (excess gain = 2)		<b>Line of sight along case axis</b>	<b>Line of sight 90° to case axis</b>
		<b>Accessory</b>	
		<b>Without (diffuse with background suppression)</b>	
		<b>Without (diffuse)</b>	
		<b>With reflector (polarised reflex)</b>	
		<b>With thru-beam transmitter (thru-beam)</b>	
<b>Type of transmission</b>		Infrared, except for polarised reflex (red)	
<b>Degree of protection</b>	Conforming to IEC 60529	IP 65, IP 67, double insulation □	
	Conforming to DIN 40050	IP 69K for XUB0●●●●M12 and XUB0●●●●M12T	
<b>Storage temperature</b>		°C - 40...+ 70	
<b>Operating temperature</b>		°C - 25...+ 55	
<b>Materials</b>		Case: nickel plated brass for XUB0B or PBT for XUB0A; Lens: PMMA; Cable: PvR	
<b>Vibration resistance</b>	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
<b>Shock resistance</b>	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
<b>Indicator lights</b>	Output state	Yellow LED (transmission present for XUB0●●●●●T)	
	Supply on	Green LED	
	Optical alignment aid/dirty	Red LED (except for XUB0●●●●●T)	
<b>Rated supply voltage</b>		V --- 12...24 with protection against reverse polarity	
<b>Voltage limits (including ripple)</b>		V --- 10...36	
<b>Current consumption, no-load</b>		mA 35 (20 for XUB0●●●●●T)	
<b>Switching capacity</b>		mA ≤ 100 with overload and short-circuit protection	
<b>Voltage drop, closed state</b>		V < 1.5	
<b>Maximum switching frequency</b>		Hz 250 (200 for diffuse with background suppression)	
<b>Delays</b>	First-up	ms < 200	
	Response	ms < 2 (< 2.5 for diffuse with background suppression)	
	Recovery	ms < 2 (< 2.5 for diffuse with background suppression)	

### Wiring schemes

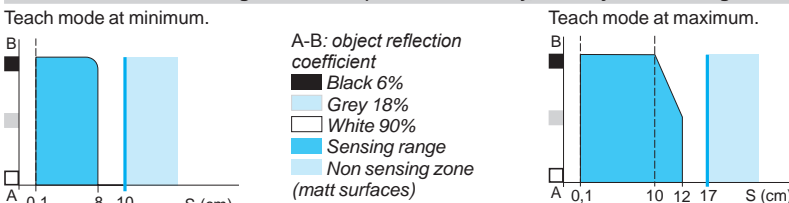
M12 connector	Pre-cabled	Receiver, PNP output	Receiver, NPN output	Thru-beam transmitter
 <p>3 (-) 1 (+) 4 OUT/Output 2 Beam break input (1)</p>	<p>(-) BU (Blue) (+) BN (Brown) OUT/Output BK (Black) Beam break input (1) VI (Violet)</p>	 <p>BN/1 + BK/4 BU/3 -</p>	 <p>BN/1 + BK/4 BU/3 -</p>	 <p>1/BN + 2/VI 3/BU -</p> <p>Input 2/VI: - not connected: beam made - connected to -: beam broken</p>

See connection on page 302 10/2.

### Detection curves (line of sight along case axis)



### Variation of usable sensing distance Su (without accessory, with adjustable background suppression)



### Dimensions

XUB	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
∅ 18, line of sight along case axis	64 (2)	44	78 (2)	44
∅ 18, line of sight 90° to case axis	78	44	92	44

(1) Beam break input on thru-beam transmitter only.

(2) For XUB0●●●●●T, 64 becomes 62 mm and 78 becomes 76 mm.

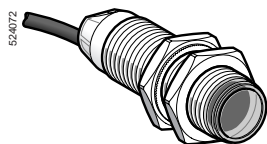
# Photo-electric sensors

OsiSense XU Application, packaging series

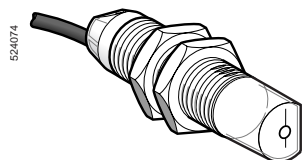
For detection of transparent materials

Design 18, plastic or stainless steel

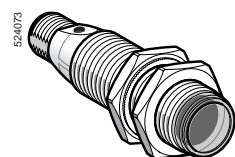
Three-wire DC, solid-state output



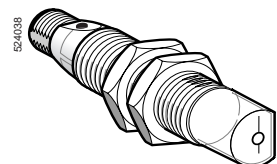
XUBT...NL2



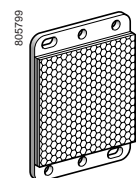
XUBT...WL2



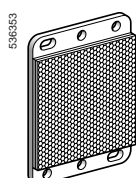
XUBT...NM12



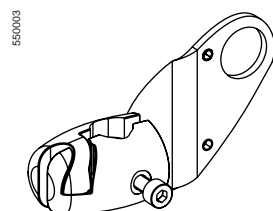
XUBT...WM12



XUZC50



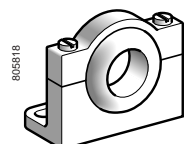
XUZC50HP



XUZH2003



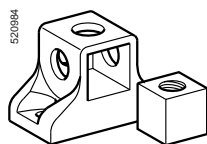
XUZA118



XUZA218



XUZZ2001



XUZZ2003

## Ø 18 plastic, coaxial polarised reflex with teach mode

Sensing distance (Sn) m	Function	Line of sight	Output	Reference	Weight kg
<b>Pre-cabled (2)</b>					
<b>0...1.4</b>	NO or NC, by programming	Along case axis	PNP	<b>XUBTAPSNL2 (1)</b>	0.110
With reflector XUZC50/C50HP			NPN	<b>XUBTANSNL2 (1)</b>	0.110
<b>0...0.8</b>	NO or NC, by programming	90° to case axis	PNP	<b>XUBTAPSWL2 (1)</b>	0.113
With reflector XUZC50/C50HP			NPN	<b>XUBTANSWL2 (1)</b>	0.113
<b>M12 connector</b>					
<b>0...1.4</b>	NO or NC, by programming	Along case axis	PNP	<b>XUBTAPSNM12 (1)</b>	0.045
With reflector XUZC50/C50HP			NPN	<b>XUBTANSNM12 (1)</b>	0.045
<b>0...0.8</b>	NO or NC, by programming	90° to case axis	PNP	<b>XUBTAPSWM12 (1)</b>	0.048
With reflector XUZC50/C50HP			NPN	<b>XUBTANSWM12 (1)</b>	0.048

## Ø 18 stainless steel, coaxial polarised reflex with teach mode

Sensing distance (Sn) m	Function	Line of sight	Output	Reference	Weight kg
<b>Pre-cabled (2)</b>					
<b>0...1.4</b>	NO or NC, by programming	Along case axis	PNP	<b>XUBTSPSNL2 (1)</b>	0.135
With reflector XUZC50/C50HP			NPN	<b>XUBTSNSNL2 (1)</b>	0.135
<b>0...0.8</b>	NO or NC, by programming	90° to case axis	PNP	<b>XUBTSPSWL2 (1)</b>	0.138
With reflector XUZC50/C50HP			NPN	<b>XUBTSNSWL2 (1)</b>	0.138
<b>M12 connector</b>					
<b>0...1.4</b>	NO or NC, by programming	Along case axis	PNP	<b>XUBTSPSNM12 (1)</b>	0.070
With reflector XUZC50/C50HP			NPN	<b>XUBTSNSNM12 (1)</b>	0.070
<b>0...0.8</b>	NO or NC, by programming	90° to case axis	PNP	<b>XUBTSPSWM12 (1)</b>	0.073
With reflector XUZC50/C50HP			NPN	<b>XUBTNSWM12 (1)</b>	0.073

## Ø 18 plastic, reflex with teach mode

Sensing distance (Sn) m	Function	Line of sight	Output	Reference	Weight kg
<b>Pre-cabled (2)</b>					
<b>0.1...0.8</b>	NO or NC, by programming	Along case axis	PNP	<b>XUBT1PSNL2</b>	0.103
With reflector XUZC50			NPN	<b>XUBT1NSNL2</b>	0.103
<b>M12 connector</b>					
<b>0.1...0.8</b>	NO or NC, by programming	Along case axis	PNP	<b>XUBT1PSNM12</b>	0.045
With reflector XUZC50			NPN	<b>XUBT1NSNM12</b>	0.045

## Accessories for XUBT..... (3)

Description	Dimensions	Reference	Weight kg
<b>Universal reflector</b>	50 x 50 mm	<b>XUZC50</b>	0.020
<b>Application reflector</b> (accuracy, detection sensitivity)	50 x 50 mm	<b>XUZC50HP</b>	0.020

## Fixing accessories (4)

Description	Reference	Weight kg
<b>3D fixing kit for use on M12 rod, for XUBT or XUZC50/C50HP</b>	<b>XUZH2003</b>	0.170
<b>M12 rod</b>	<b>XUZZ2001</b>	0.050
<b>Support for M12 rod</b>	<b>XUZZ2003</b>	0.150
<b>Stainless steel fixing bracket</b>	<b>XUZA118</b>	0.045
<b>Plastic fixing bracket with adjustable ball-joint</b>	<b>XUZA218</b>	0.035

(1) Application reflector XUZC50HP included with sensor.

(2) For a 5 m long cable, replace L2 by L5.

Example: XUBTAPSNL2 becomes XUBTAPSNL5.


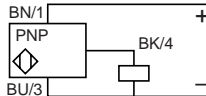
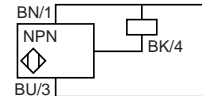
(3) For further information, see page 5/159.

(4) For further information, see page 5/158.

Characteristics		XUBT●●●●M12/XUBT●●●●L2	XUBT1●●●●M12/XUBT1●●●●L2
Sensor type			
Product certifications		UL, CSA, CE	
Connection	Connector	M12 (male)	
	Pre-cabled	Length: 2 m, wire c.s.a.: 3 x 0.34 mm <sup>2</sup>	
Nominal sensing distance Sn	Line of sight along case axis	m	0 to 1.4 with reflector XUZC50/C50HP
	Line of sight 90° to case axis	m	0 to 0.8 with reflector XUZC50/C50HP
Beam divergence		1.5° (Ø 37mm spot at 1.4 m)	
Blind zone		m	0
Preferred object approach direction		Any	Lenses on horizontal plane for horizontal passage of object
Type of transmission		Coaxial polarised red	
Degree of protection		Conforming to IEC 60529	IP 65, IP 67, double insulation □ IP 69K for connector version XUBT●●●●M12 (1)
Temperature	Storage	°C	- 40...+ 70
	Operation	°C	0...+ 55
Materials	Case	XUBTA and XUBT1 ●●●●: plastic PBT XUBTS●●●●: stainless steel (grade 304Cu)	
	Lens	PMMA	
	Cable	PvR	
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Indicator lights	Output state	Yellow LED	
	Supply on	Green LED	
	Stability	Red LED	Red LED for alignment only
Rated supply voltage		V	--- 12...24 with protection against reverse polarity
Voltage limits (including ripple)		V	--- 10...32
Current consumption, no-load		mA	45
Switching capacity		mA	≤ 100 with overload and short-circuit protection
Voltage drop, closed state		V	≤ 1.5
Maximum switching frequency		Hz	1000
Delays	First-up	ms	< 200
	Response and recovery	µs	< 500

(1) IP69K also available with PVC cable, please consult our Customer Care Center for specific adaptation.

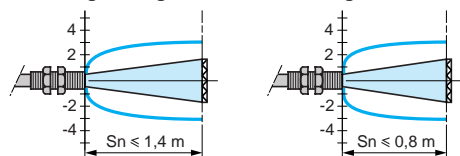
## Wiring schemes

M12 connector	Pre-cabled	PNP	NPN
 <p>4 3 3 (-) 1 (+) 4 OUT/Output 1 2 Not connected</p>	<p>(-) BU (Blue) (+) BN (Brown) OUT/Output BK (Black)</p>	 <p>BN/1 PNP + BK/4 BU/3 -</p>	 <p>BN/1 NPN + BK/4 BU/3 -</p>

## Detection curves

### With reflector XUZC50●●

Line of sight along case axis    Line of sight 90° to case axis



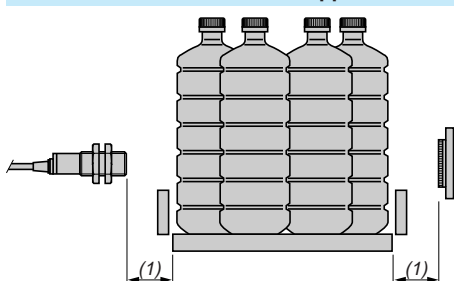
## Dimensions

### XUBT●●●●

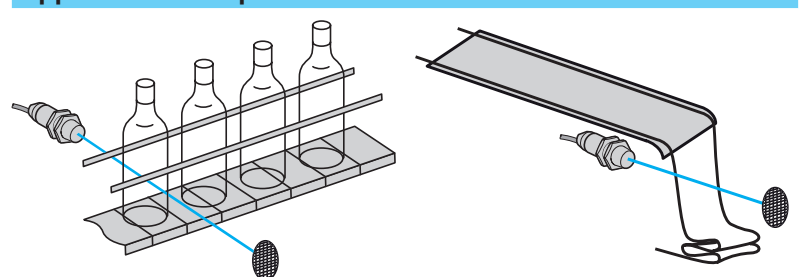
	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
Ø 18, line of sight along case axis	64	44	78	44
Ø 18, line of sight 90° to case axis	78	44	92	44

## Setting-up

### Recommended distances and application restraints



## Application examples

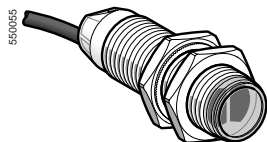


For precise detection or magnifying glass effect cases, it is advisable to use XUBT●●●●M12/L2.

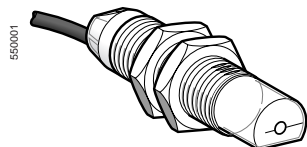


# Photo-electric sensors

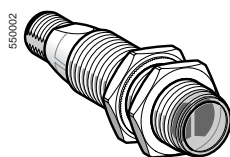
OsiSense XU Application, multimode food and beverage processing series  
Design 18, metal, stainless steel  
Three-wire DC, solid-state output



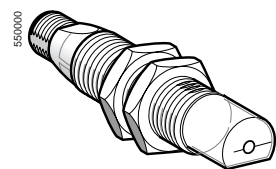
XUB0...NL2



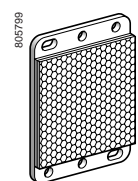
XUB0...WL2



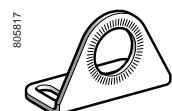
XUB0...NM12



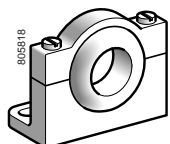
XUB0...WM12



XUZC50



XUZA118



XUZA218



XUZB2005

## Ø 18 stainless steel

### Pre-cabled (1)

Sensing distance (Sn) (2) m	Function	Output	Line of sight	Reference	Weight kg
0...20 depending on whether accessories are used	NO or NC, by programming	PNP	Along case axis	XUB0SPSNL2	0.105
			90° to case axis	XUB0SPSWL2 (3)	0.110
		NPN	Along case axis	XUB0SNSNL2	0.105
			90° to case axis	XUB0SNSWL2 (3)	0.110

### M12 connector

0...20 depending on whether accessories are used	NO or NC, by programming	PNP	Along case axis	XUB0SPSNM12	0.055
			90° to case axis	XUB0SPSWM12 (3)	0.060
		NPN	Along case axis	XUB0SNSNM12	0.055
			90° to case axis	XUB0SNSWM12 (3)	0.060

### Accessories

Description	Connecti-on	Line of sight	Reference	Weight kg
Thru-beam accessories (transmitter)	Pre-cabled (1)	Along case axis	XUB0SKSNL2T	0.105
		90° to case axis	XUB0SKSWL2T (3)	0.110
	M12 connector	Along case axis	XUB0SKSNM12T	0.055
		90° to case axis	XUB0SKSWM12T (3)	0.060
Reflector 50 x 50 mm	–	–	XUZC50	0.020

### Fixing accessories (4)

Description	Reference	Weight kg
Stainless steel fixing bracket	XUZA118	0.045
Plastic fixing bracket with adjustable ball-joint	XUZA218	0.035
Plastic fixing clamp, 24.1 mm centres with locking screw	XUZB2005	0.007

(1) For a 5 m long cable, replace L2 by L5.

Example: XUB0SPSNL2 becomes XUB0SPSNL5.


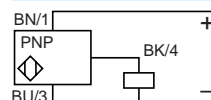
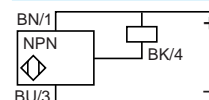
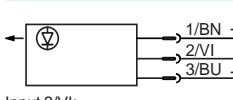
(2) For further information, see page 5/32.

(3) For line of sight 90° to case axis versions, see sensing distances on page 5/32.

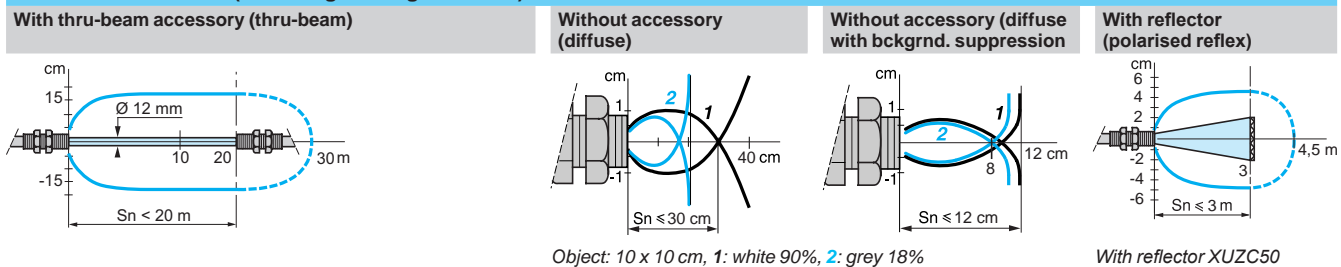
(4) For further information, see page 5/158.

Characteristics		XUB0●●●●M12, XUB0●●●●M12T	XUB0●●●●L2, XUB0●●●●L2T
Sensor type		XUB0●●●●M12, XUB0●●●●M12T	
Product certifications		UL, CSA, CE	
Connection	Connector	M12	–
	Pre-cabled	–	Length: 2 m
Sensing distance nominal $S_n$ / maximum (excess gain = 2) (excess gain = 1)		Line of sight along case axis	Line of sight 90° to case axis
	m	0.12 / 0.12	0.11 / 0.11
	m	0.3 / 0.4	0.2 / 0.3
	m	3 / 4.5	1.5 / 2
	m	20 / 30	10 / 14
Type of transmission	Infrared, except polarised reflex (red)		
Degree of protection	IP 65, IP 67 conforming to IEC 60529; IP 69K conforming to DIN 40050; double insulation II		
Storage temperature	°C -40...+70		
Operating temperature	°C -25...+55		
Materials	Case: stainless steel, grade 304CU; Lens: PMMA; Cable: PvR		
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Indicator lights	Output state	Yellow LED (transmission present for XUB0●●●●●●T)	
	Supply on	Green LED	
	Optical alignment aid / dirty	Red LED (except for XUB0●●●●●●T)	
Rated supply voltage	V --- 12...24 with protection against reverse polarity		
Voltage limits (including ripple)	V --- 10...36		
Current consumption, no-load	mA 35 (20 for XUB0●●●●●●T)		
Switching capacity	mA ≤ 100 with overload and short-circuit protection		
Voltage drop, closed state	V 1.5		
Maximum switching frequency	Hz 250 (200 for diffuse with background suppression)		
Delays	First-up	ms < 200	
	Response	ms < 2 (< 2.5 for diffuse with background suppression)	
	Recovery	ms < 2 (< 2.5 for diffuse with background suppression)	

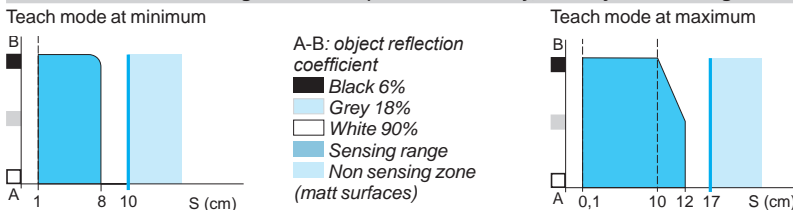
## Wiring schemes

M12 connector	Pre-cabled	PNP	NPN	Thru-beam accessory
 <p>3 (-) 1 (+) 4 OUT/Output 2 Beam break input (1) VI</p>	<p>(-) BU (Blue) (+) BN (Brown) OUT/Output BK (Black) Beam break input (1) VI (Violet)</p>	 <p>BN/1 BK/4 BU/3</p>	 <p>BN/1 BK/4 BU/3</p>	 <p>1/BN + 2/VI 3/BU -</p> <p>Input 2/VI: - not connected: beam made - connected to -: beam broken</p>

## Detection curves (line of sight along case axis)



## Variation of usable sensing distance $S_u$ (without accessory, with adjustable background suppression)



## Dimensions

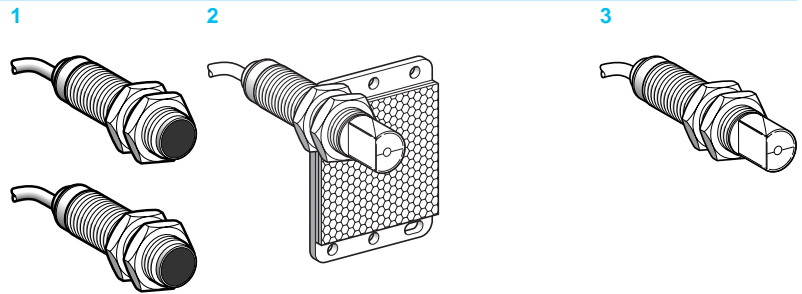
XUB	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
Ø 18, line of sight along case axis	64 (2)	44	78 (2)	44
Ø 18, line of sight 90° to case axis	78	44	92	44

(1) Beam break input on thru-beam transmitter only.  
(2) For XUB0●●●●●●T, 64 becomes 62 mm and 78 becomes 76 mm.

# Photo-electric sensors

OsiSense XU Application, single mode  
food and beverage processing series  
Stainless steel case M18 x 1  
DC. Solid-state output

## Design 18



System		Thru-beam 1	Reflex 2	Polarised reflex 2	Diffuse 3
Type of transmission		Infrared	Infrared	Red	Infrared
Sensing distance	Nominal Sn (excess gain = 2)	15 m	4 m	2 m	0.10 m
	Maximum (excess gain = 1)	20 m	5.5 m (with 50 x 50 mm reflector)	3 m (with 50 x 50 mm reflector)	0.15 m

### References of pre-cabled versions (1)

3-wire, PNP NO or NC programmable function	Line of sight along case axis	XU2N18PP341 (2)	XU1N18PP341 (3)	XU9N18PP341 (3)	XU5N18PP341
	Line of sight 90° to case axis	XU2N18PP341W (2)	XU1N18PP341W (3)	XU9N18PP341W (3)	XU5N18PP341W
3-wire, NPN NO or NC programmable function	Line of sight along case axis	XU2N18NP341 (2)	XU1N18NP341 (3)	XU9N18NP341 (3)	XU5N18NP341
	Line of sight 90° to case axis	XU2N18NP341W (2)	XU1N18NP341W (3)	XU9N18NP341W (3)	XU5N18NP341W
Weight (kg)		0.270	0.155	0.155	0.135

### References of connector versions

3-wire, PNP NO or NC programmable function	Line of sight along case axis	XU2N18PP341D (2)	XU1N18PP341D (3)	XU9N18PP341D (3)	XU5N18PP341D
	Line of sight 90° to case axis	XU2N18PP341WD (2)	XU1N18PP341WD (3)	XU9N18PP341WD (3)	XU5N18PP341WD
3-wire, NPN NO or NC programmable function	Line of sight along case axis	XU2N18NP341D (2)	XU1N18NP341D (3)	XU9N18NP341D (3)	XU5N18NP341D
	Line of sight 90° to case axis	XU2N18NP341WD (2)	XU1N18NP341WD (3)	XU9N18NP341WD (3)	XU5N18NP341WD
Weight (kg)		0.130	0.085	0.085	0.065

### Fixing accessories (4)

Description	Reference	Weight kg
Stainless steel fixing bracket	XUZA118	0.045
Plastic fixing bracket	XUZA218	0.035
Set of 2 stainless steel nuts	XSZE318	0.020
Set of 2 plastic nuts	XSZE218	0.004

(1) Sensors available with 5 m long cable: To order, add L5 to the end of the reference selected from above.

Example: sensor XU1N18PP341 with 5 m cable becomes XU1N18PP341L5.

(2) Reference for both transmitter and receiver for thru-beam system sensors.

(3) 50 x 50 mm reflector included with reflex system sensors.

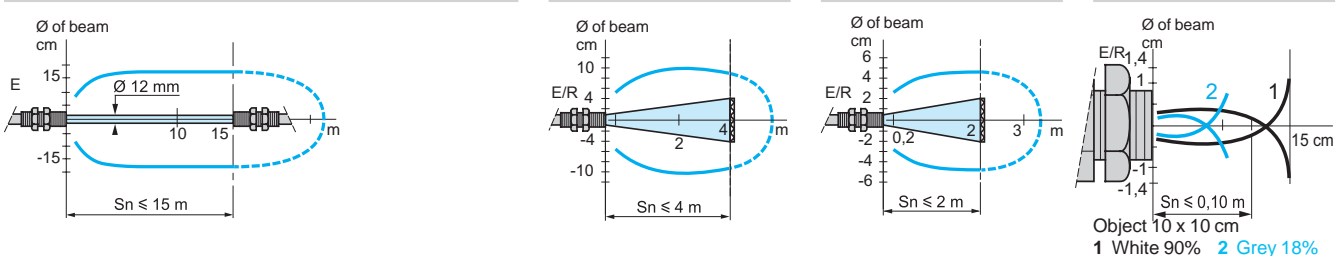
(4) For further information, see page 5/160.

Characteristics	
<b>Product certifications</b>	CE, UL, CSA
<b>Ambient air temperature</b>	For operation: - 25...0...+ 55 °C. For storage: - 40...+ 70 °C
<b>Vibration resistance</b>	Conforming to IEC 60068-2-6 25 gn, amplitude ± 1.5 mm (f = 10...55 Hz)
<b>Shock resistance</b>	Conforming to IEC 60068-2-27 30 gn, duration 11 ms
<b>Degree of protection</b>	Conforming to IEC 60529 IP 67
<b>Connection</b>	Pre-cabled Connector M12 male connector, 4-pin (suitable female connectors, including pre-wired versions, see page 5/28)
<b>Materials</b>	Case Lenses Cable Food and beverage processing stainless steel, grade 304 Cu PMMA PvR
<b>Rated supply voltage</b>	12...24 with protection against reverse polarity
<b>Voltage limits</b>	10...30 V (including ripple)
<b>Switching capacity (sealed)</b>	≤100 mA with overload and short-circuit protection
<b>Voltage drop, closed state</b>	≤ 1.5 V
<b>Current consumption, no-load</b>	≤ 30 mA (reflex and diffuse), ≤ 50 mA (thru-beam)
<b>Maximum switching frequency</b>	500 Hz
<b>Delays</b>	First-up Response Recovery ≤ 15 ms ≤ 1 ms ≤ 1 ms
<b>Indicator lights</b>	Supply on Output state Green LED, on transmitter only Yellow LED, on receiver only

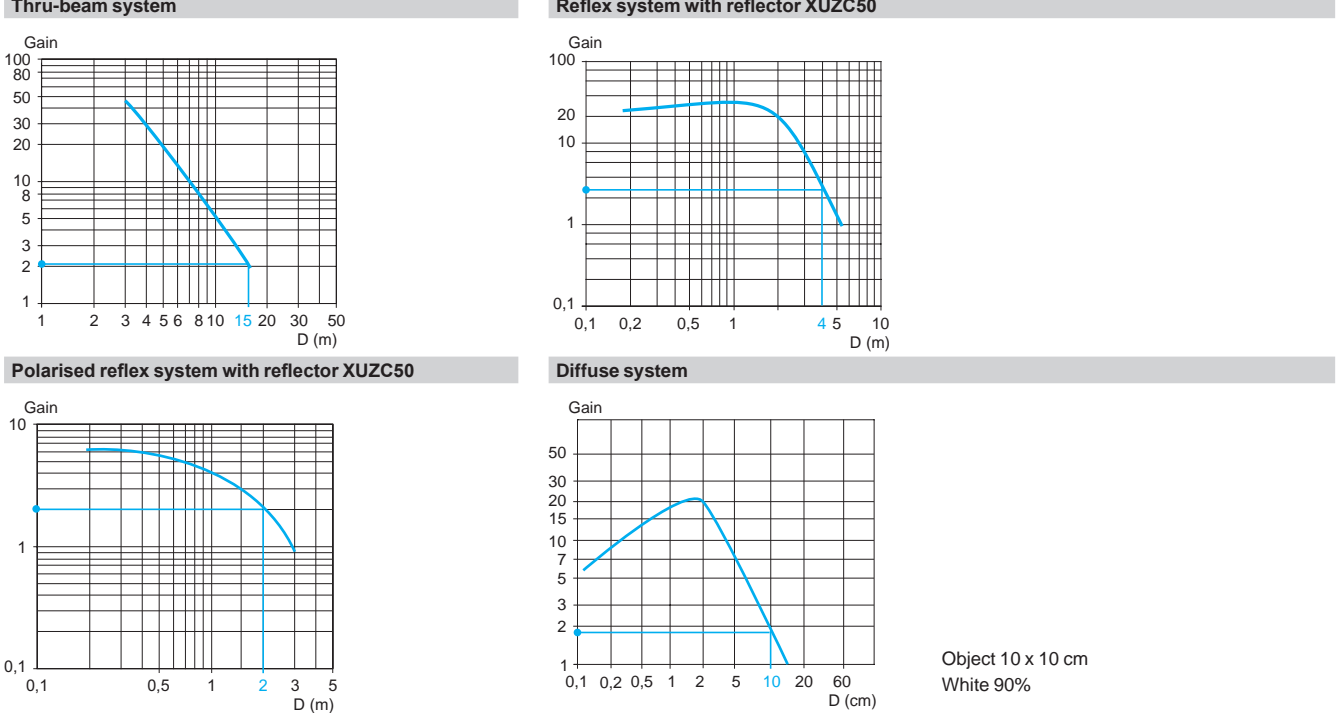
(1) Sensors available with 5 m long cable: To order, add L5 to the end of the reference selected from above.  
Example: sensor XU1N18PP341 with 5 m cable becomes XU1N18PP341L5.

## Curves

Detection curves	Reflex system with reflector XUZC50	Polarised reflex system with reflector XUZC50	Diffuse system
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## Excess gain curves (ambient temperature: + 25 °C)



Accessories:  
page 5/158

# Photo-electric sensors

OsiSense XU Application, single mode

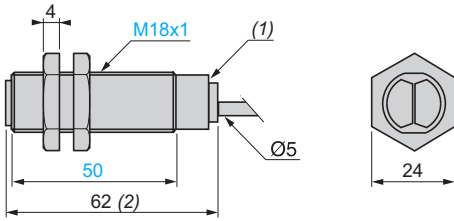
food and beverage processing series

Stainless steel case M18 x 1

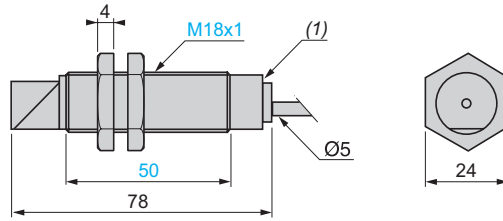
DC. Solid-state output

## Dimensions

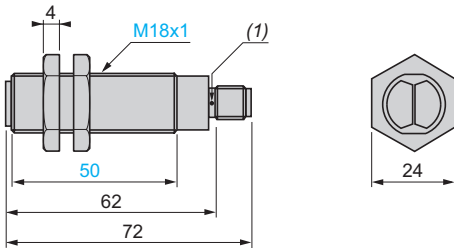
XU●N18●●341



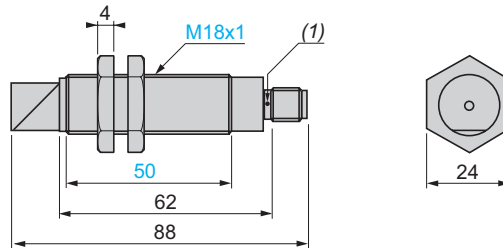
XU●N18●●341W



XU●N18●●341D



XU●N18●●341WD



(1) LED

(2) 64 for XU9N18●●341

Fixing nut tightening torque: < 15 N.m

Connector tightening torque: 2 N.m

5

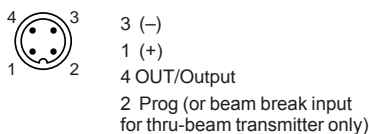


# Photo-electric sensors

OsiSense XU Application, single mode  
 food and beverage processing series  
 Stainless steel case M18 x 1  
 DC. Solid-state output

## Wiring schemes

### M12 connector

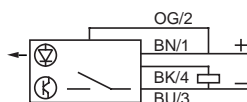


### Pre-cabled

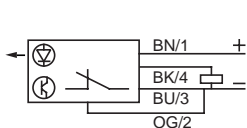
(-) BU (Blue)  
 (+) BN (Brown)  
 (Out/Output) BK (Black)  
 (Prog) OG (Orange)  
 (Beam break input) VI (Violet) on thru-beam transmitter only

## Wiring schemes - diffuse

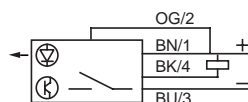
### PNP NO



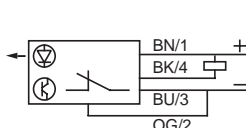
### PNP NC



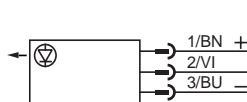
### NPN NO



### NPN NC

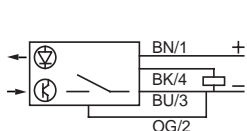


### Transmitter

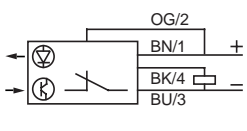


## Wiring schemes - reflex and thru-beam

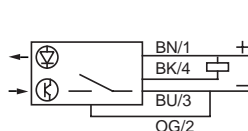
### PNP NO



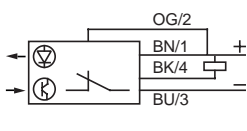
### PNP NC



### NPN NO

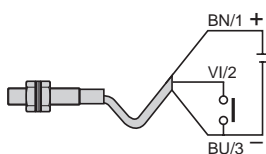


### NPN NC

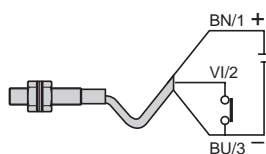


## Beam break input on thru-beam transmitter only

### Beam made



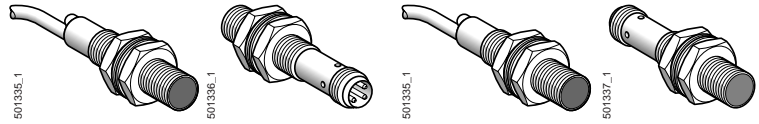
### Beam broken



# Photo-electric sensors

OsiSense XU Application, assembly series  
Metal case, cylindrical, threaded M8 x 1  
DC supply. Solid-state output

## Design 8



Connection	Pre-cabled	■	—	■	—
	Connector	—	■	—	■
System		Thru-beam	Thru-beam	Diffuse	Diffuse
Type of transmission		Infrared	Infrared	Infrared	Infrared
Nominal sensing distance (Sn)		2 m	2 m	0.05 m	0.05 m

## References

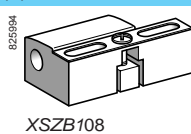
3-wire, PNP	NO function	XUAH0214	XUAH0214S	XUAH0515	XUAH0515S
	NC function	XUAH0224	XUAH0224S	XUAH0525	XUAH0525S
3-wire, NPN	NO function	XUAJ0214	XUAJ0214S	XUAJ0515	XUAJ0515S
	NC function	XUAJ0224	XUAJ0224S	XUAJ0525	XUAJ0525S
Transmitter		XUAH0203	XUAH0203S	—	—
Weight (kg)		0.050	0.015	0.50	0.015

## Characteristics

Product certifications		CE, cULus			
Ambient air temperature	For operation	- 25...+ 55 °C			
	For storage	- 30...+ 70 °C			
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1 mm (f = 10...55 Hz)			
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms			
Degree of protection	Conforming to IEC 60529	IP 67 - IP 65	IP 65	IP 67 - IP 65	IP 65
Connection	Pre-cabled	Ø 3.5 mm, length 2 m, wire c.s.a.: 3 x 0.14 mm <sup>2</sup>			
	Connector	M8 female connectors, 3-pin, see page 5/28			
Materials	Case	Nickel plated brass			
	Cable	PvR	—	PvR	—
	Lenses	PMMA			
Rated supply voltage		⎓ 12...24 V with protection against reverse polarity			
Voltage limits (including ripple)		⎓ 10...30 V			
Switching capacity (sealed)		≤ 100 mA with overload and short-circuit protection			
Voltage drop, closed state		≤ 1 V			
Current consumption, no-load	Transmitter	≤ 15 mA			
	Receiver	≤ 10 mA			
	Diffuse	≤ 25 mA			
Maximum switching frequency		2000 Hz		1000 Hz	
Delays	First-up	≤ 20 ms			
	Response and recovery	≤ 0.25 ms		≤ 0.5 ms	

Function table	Function	Diffuse or through beam system	
		No object present in the beam	Object present in the beam
Output state (PNP or NPN) indicator: yellow LED (illuminated when sensor output is ON)	NO		
	NC		

## Fixing accessories (1)



Description	Reference	Weight kg
Plastic fixing clamp with locking screw	XSAZ108	0.007
Plastic fixing clamp for sensor replacement without adjustment	XSZB108	0.006

(1) For further information, see page 5/160.

# Photo-electric sensors

OsiSense XU Application, assembly series

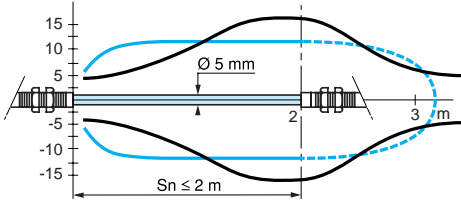
Metal case, cylindrical, threaded M8 x 1

DC supply. Solid-state output

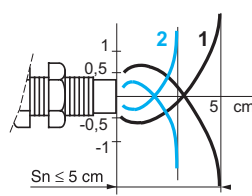
## Curves

### Detection curves

#### Thru-beam system



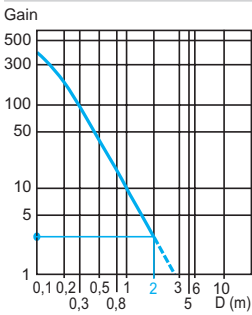
#### Diffuse system



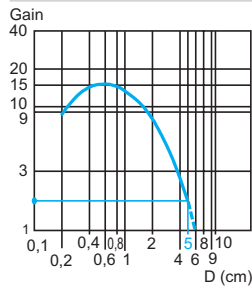
Object 5 x 5 cm; 1 White 90%; 2 Grey 18%

### Excess gain curves (ambient temperature: ± 25 °C)

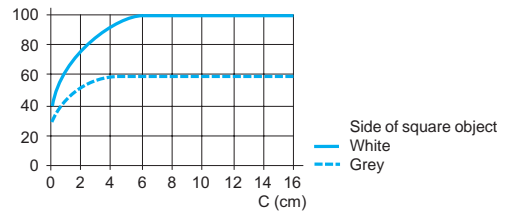
#### Thru-beam system



#### Diffuse system



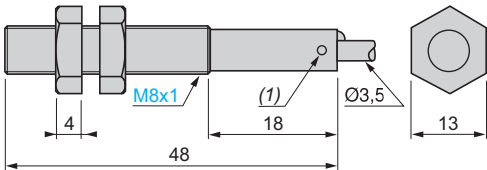
#### Variation of sensing distance Sn



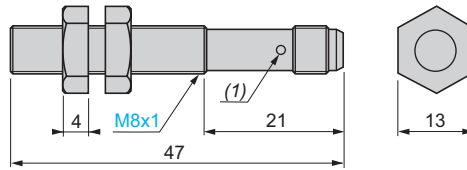
Detection differential (H) when object approaches from the front:  $H \leq 25\% \text{ of } S_n$

## Dimensions

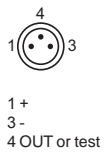
### XUA



### XUA●●●●●S



### M8 connector



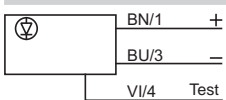
(1) LED, 4 viewing ports at 90°.

(1) LED, 4 viewing ports at 90°. **Note:** fixing nut tightening torque: < 2 N.m

## Wiring schemes (3-wire ---)

### XUA

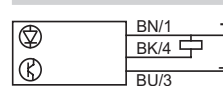
#### Transmitter



#### PNP

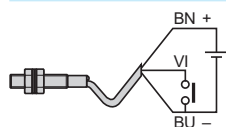


#### NPN

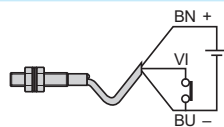


## Beam break test

### For thru-beam transmitter XUAH0203 only

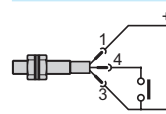


Beam made  
LED on (steady light)

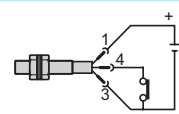


Beam broken  
LED flashing

### For thru-beam transmitter XUAH0203S only



Beam made  
LED on (steady light)

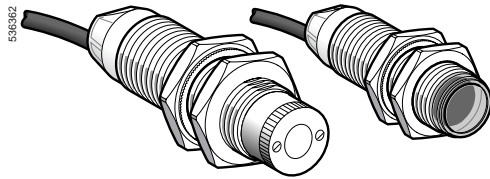


Beam broken  
LED flashing

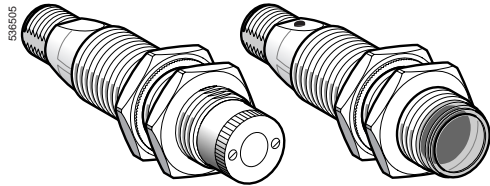
# Photo-electric sensors

OsiSense XU Application, material handling series

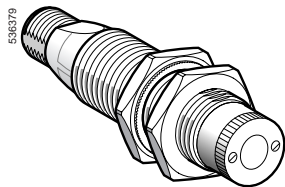
Laser transmission. Design 18, plastic or metal  
Three-wire DC. Solid-state output



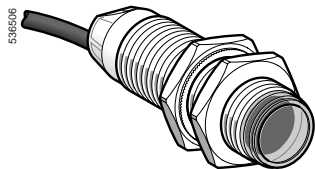
XUBL●●CNL2



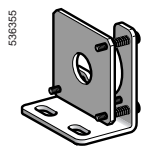
XUBL●●CNM12



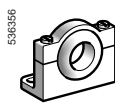
XUBL●●CNM12T



XUBL●●CNL2R



XUZA318



XUZA218



XUZA118

## Ø 18, plastic, thru-beam system with teach mode, laser transmission (Transmitter + receiver)

Sensing distance (Sn) m	Function	Connection	Output	Reference	Weight kg
0...100	NO or NC, by programming	Pre-cabled	PNP	XUBLAPCNL2	0.180
			NPN	XUBLANCNL2	0.180
		M12 connector	PNP	XUBLAPCNM12	0.078
			NPN	XUBLANCNM12	0.078

## Ø 18, metal, thru-beam system with teach mode, laser transmission (Transmitter + receiver)

Sensing distance (Sn) m	Function	Connection	Output	Reference	Weight kg
0...100	NO or NC, by programming	Pre-cabled	PNP	XUBLBPCNL2	0.230
			NPN	XUBLBNCNL2	0.230
		M12 connector	PNP	XUBLBPCNM12	0.130
			NPN	XUBLBNCNM12	0.130

## Separate components

### Ø 18 transmitter

Description	Connection	Output	For use with	Reference	Weight kg
Plastic	Pre-cabled	-	XUBLA●●CNL2	XUBLAKCNL2T	0.090
	M12 connector	-	XUBLA●●CNM12	XUBLAKCNM12T	0.040
Metal	Pre-cabled	-	XUBLB●●CNL2	XUBLBKCNL2T	0.110
	M12 connector	-	XUBLB●●CNM12	XUBLBKCNM12T	0.060

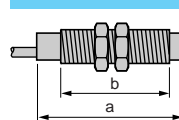
### Ø 18 receiver

Description	Connection	Output	For use with	Reference	Weight kg
Plastic	Pre-cabled	PNP	XUBLAPCNL2	XUBLAPCNL2R	0.090
		NPN	XUBLANCNL2	XUBLANCNL2R	0.090
	M12 connector	PNP	XUBLAPCNM12	XUBLAPCNM12R	0.040
		NPN	XUBLANCNM12	XUBLANCNM12R	0.040
Metal	Pre-cabled	PNP	XUBLBPCNL2	XUBLBPCNL2R	0.120
		NPN	XUBLBNCNM12	XUBLBNCNL2R	0.120
	M12 connector	PNP	XUBLBPCNM12	XUBLBPCNM12R	0.070
		NPN	XUBLBNCNM12	XUBLBNCNM12R	0.070

## Fixing accessories for XUBL● (1)

Description	Reference	Weight kg
Precision fixing bracket with micrometric adjustment	XUZA318	0.170
Plastic fixing bracket with adjustable ball-joint	XUZA218	0.035
Stainless steel fixing bracket	XUZA118	0.045

## Dimensions



	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
Receiver (2)	62	44	76	44
Transmitter (3)	52	28	66	28

(1) For further information, see page 5/158

(2) Yellow, green and red LED on receiver

(3) Green LED on transmitter

Note: fixing nut tightening torque: < 4 Nm

# Photo-electric sensors

OsiSense XU Application, material handling series

Laser transmission. Design 18, plastic or metal  
Three-wire DC. Solid-state output

## Characteristics

Sensor type		XUBL●●●●M12	XUBL●●●●L2
Product certifications		UL, CSA, CE	
Connection	Connector	M12	-
	Pre-cabled	-	Length: 2 m
Nominal sensing distance Sn	m	0...100, excess gain 70...3	
Blind zone		0	
Preferred object approach direction		Any	
Type of transmission		Red laser, wavelength 670 nm	
Transmission power		Power < 1 mW, class 1 conforming to IEC 60825-1	
Degree of protection	Conforming to IEC 60529	IP 67, double insulation	
Temperature	Storage	°C -40... +70	
	Operation	°C -10... +45	
Materials	Case	XUBLA●●●●●: PBT; XUBLB●●●●●: nickel plated brass	
	Lens	PMMA	
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Indicator lights	Output state and alignment aid	Yellow LED	
	Supply on and teaching	Green LED	
	Stability	Red LED	
Rated supply voltage	V	- 12...24 with protection against reverse polarity	
Voltage limits (including ripple)	V	- 10...30	
Current consumption, no-load	mA	25 for transmitter or receiver	
Switching capacity per output	mA	≤ 100 with overload and short-circuit protection	
Voltage drop, closed state	V	≤ 1.5	
Maximum switching frequency	Hz	1500	
Delays	First-up	ms < 80	
	Response and recovery	ms < 0.4	

## Wiring schemes

### M12 connector

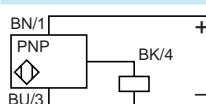


3 (-)  
1 (+)  
4 OUT/Output  
2 Beam break input

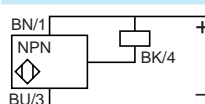
### Pre-cabled

(-) BU (Blue)  
(+) BN (Brown)  
OUT/Output BK (Black)  
Beam break input VI (Violet)

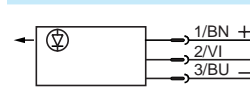
### PNP



### NPN



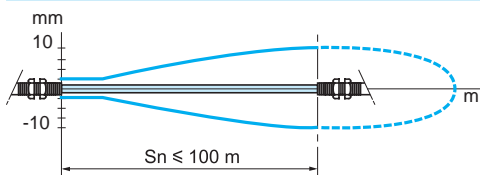
### Transmitter



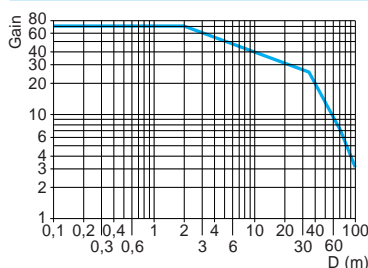
Input 2/VI:  
- not connected: beam made  
- connected to -: beam broken

## Curves

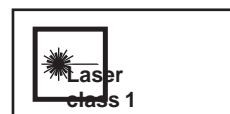
### Detection curve (set to infinity)



### Excess gain curve

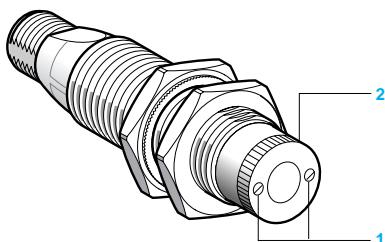


## Operating precautions

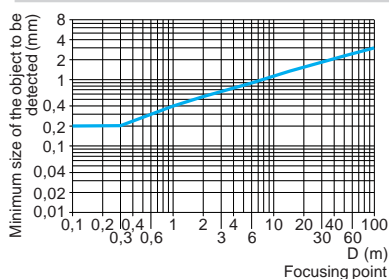


Laser class 1,  
conforming to  
IEC 60825-1.

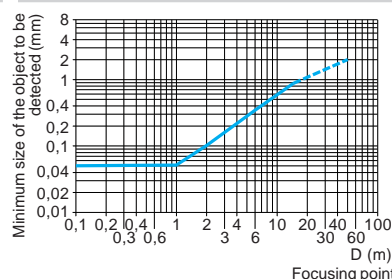
## Adjustment



### Standard curve



### Detection limit curve



The adjustment of the focusing point enables the detection of objects down to a size of < 0.2 mm.

After slackening the fixing screws 1, adjust the focusing point of the laser beam by rotating the serrated sleeve 2 located on the face of the sensor. Re-tighten fixing screws.

**Note:** fixing bracket XUZA218 with ball-joint and, in particular, bracket XUZA318 with precise micrometric adjustment and locking by 6 screws, are specially suited for mounting the sensor and adjusting beam alignment when the sensing range is several tens of metres (see page 5/158).



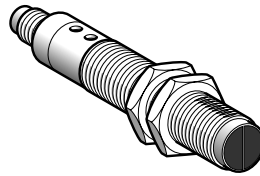
# Photo-electric sensors

OsiSense XU Application, material handling series

With analogue output signal 4...20 mA (1)

DC supply

## Design 18



System	Diffuse
Type of transmission	Infrared
Nominal sensing distance (S <sub>n</sub> )	5...40 cm

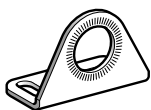
## References

3-wire, PNP	XU5M18AB20D
Weight (kg)	0.075

## Characteristics

Product certifications	CE, CSA, UL
Ambient air temperature	For operation: - 25... + 55 °C. For storage: - 40... + 70 °C
Vibration resistance	Conforming to IEC 60068-2-6 25 gn, amplitude ± 2 mm (f = 10...55 Hz)
Shock resistance	Conforming to IEC 60068-2-27 30 gn, duration 11 ms
Degree of protection	Conforming to IEC 60529 IP 67
Connection	M12 male connector, 4-pin (suitable female connectors, including pre-wired versions, please refer to our catalogue "Cabling accessories OsiSense XZ")
Materials	Case: nickel plated brass, lens: PMAA
Rated supply voltage	--- 12...24 V with protection against reverse polarity
Voltage limits	--- 10...30 V (including ripple)
Output current	Maximum <b>20 mA</b> Minimum <b>4 mA</b>
Output current drift in relation to temperature	< 10% between - 25 and + 55 °C, < 5% between 0 and + 40 °C
Output current drift in relation to supply	< 3%
Current consumption, no-load	≤ 30 mA
Maximum switching frequency	20 Hz (for an output current variation of 10 mA)
Delays	First-up: ≤ 50 ms
Indicator light	The brightness of the green LED is proportional to the output current I <sub>e</sub> = 20 mA: indicator light at maximum intensity I <sub>e</sub> = 4 mA: indicator light at minimum intensity

## Fixing accessory (2)



XUZA118

Description	Reference	Weight kg
Stainless steel fixing bracket	XUZA118	0,045

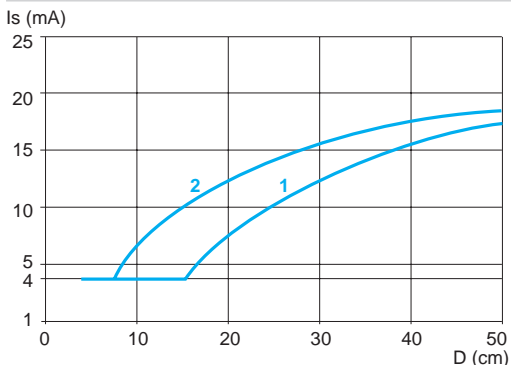
(1) Applications: position control, monitoring concentricity or eccentricity, closed loop regulation, monitoring displacement, etc.

(2) For further information, see page 5/158.

## Curves

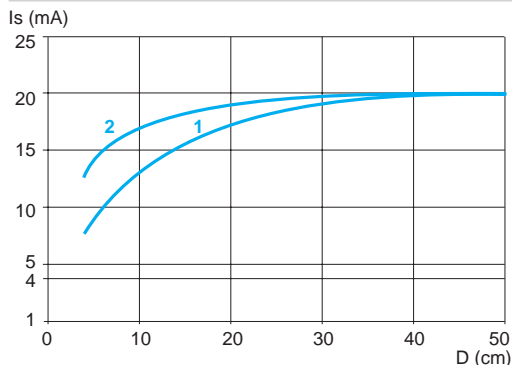
Output signal (related to distance of object)

Potentiometer set at maximum



- 1 White 90% object
- 2 Grey 15% object

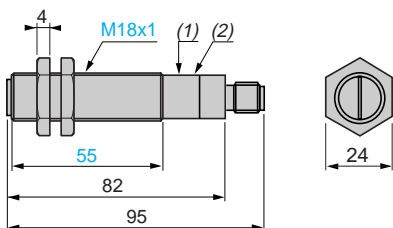
Potentiometer set at minimum



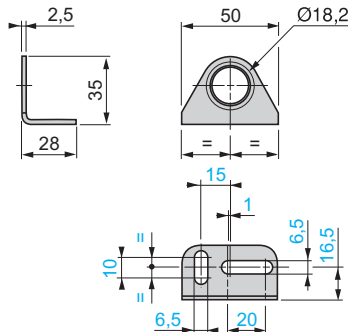
- 1 White 90% object
- 2 Grey 15% object

## Dimensions

Sensor XU5M18AB20D



Fixing bracket XUZA118



(1) Potentiometer.

(2) Green LED.

Fixing nut tightening torque: 15 N.m.

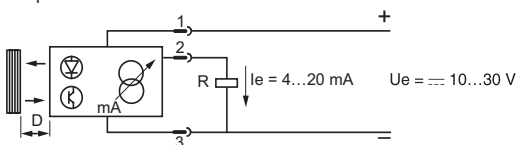
Connector tightening torque: 2 N.m.

## Schemes

Wiring schemes

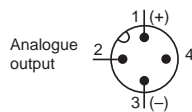
Diffuse system

Output current



Connector scheme

Sensor connector pin view



For suitable female connectors, including pre-wired versions, please refer to our catalogue "Cabling accessories OsiSense XZ".

## Load characteristics (R)

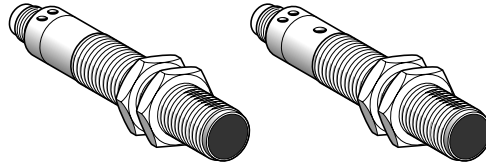
The output current varies between 4 and 20 mA, depending on the distance of the object, and therefore, the load must be less than 800 Ω for a 24 V supply and less than 300 Ω for a 12 V supply.

# Photo-electric sensors

OsiSense XU Application, material handling series

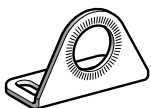
Through beam system with high "excess gain" <sup>(1)</sup>  
Solid-state output and analogue output 4...20 mA

## Design 18



<b>System</b>		<b>Thru-beam</b>
<b>Type of transmission</b>		Infrared
<b>Nominal sensing distance (Sn) / maximum</b>		<b>50 m / 70 m</b> (transmitter + receiver)
<b>References</b>		
<b>3-wire, PNP</b>	NO (object detection) + analogue output	<b>XU2M18AP20D (2)</b>
<b>Weight (kg)</b>		0.155
<b>Characteristics</b>		
<b>Product certifications</b>		CE, CSA, UL
<b>Ambient air temperature</b>	For operation	-25...+55 °C
	For storage	-40...+70 °C
<b>Vibration resistance</b>	Conforming to IEC 60068-2-6	25 gn, amplitude ± 2 mm (f = 10...55 Hz)
<b>Shock resistance</b>	Conforming to IEC 60068-2-27	30 gn, duration 11 ms
<b>Degree of protection</b>	Conforming to IEC 60529	IP 67
<b>Connection</b>		M12 male connector, 4-pin (suitable female connectors, including pre-wired versions, please refer to our catalogue "Cabling accessories OsiSense XZ")
<b>Materials</b>	Case	Nickel plated brass
	Lenses	PMMA
<b>Rated supply voltage</b>		<b>12...24 V with protection against reverse polarity</b>
<b>Voltage limits</b>		10...30 V (including ripple)
<b>Solid-state digital output</b>	Switching capacity (sealed)	<b>≤100 mA with overload and short-circuit protection</b>
	Voltage drop, closed state	≤ 1.5 V
	Maximum switching frequency	30 Hz
	First-up delay	≤ 50 ms
	Response delay	≤ 15 ms
	Recovery delay	≤ 15 ms
<b>Analogue output</b>	Output current	<b>4...20 mA</b> Drift < 5% for temperature between 0 and + 40 °C
	Delay	≤ 15 ms
<b>Current consumption, no-load</b>		≤ 55 mA (transmitter + receiver)
<b>Indicator lights</b>	Transmitter	Green LED, supply on Yellow LED illuminated = beam transmission
	Receiver	Yellow LED illuminated = solid-state output ON = object detected within beam Green LED: the brightness of the LED is proportional to the output current: - for I = 20 mA, object slightly opaque, intensity at maximum, - for I = 4 mA, object completely opaque, intensity at minimum.

## Fixing accessory (3)



XUZA118

Description	Reference	Weight kg
<b>Stainless steel fixing bracket</b>	<b>XUZA118</b>	0,045

(1) Applications: detection of objects in spite of a difficult environment (smoke, dust, mist, etc.), detection of objects inside packaging, etc.

**Example of values:**

Object: white sheets of 80 gsm paper. Transmitter-receiver distance = 10 cm				
Number of sheets	1	11	27	31
Analogue output current (mA)	17.3	12	6	5

(2) Reference for both transmitter and receiver for thru-beam system.

(3) For further information, see page 5/158.

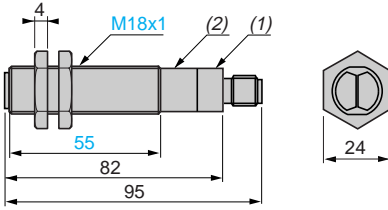
# Photo-electric sensors

OsiSense XU Application, material handling series

Through beam system with high "excess gain"

Solid-state output and analogue output 4...20 mA

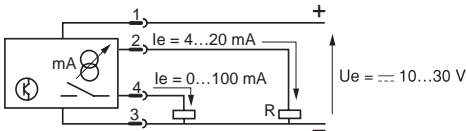
## Dimensions



(1) LEDs  
(2) Potentiometer (only on receiver)  
Fixing nut tightening torque: 15 N.m  
Connector tightening torque: 2 N.m

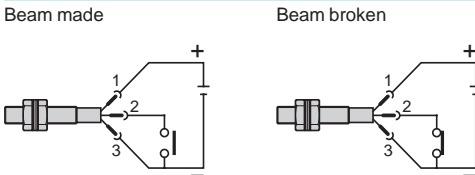
## Wiring schemes

### Receiver



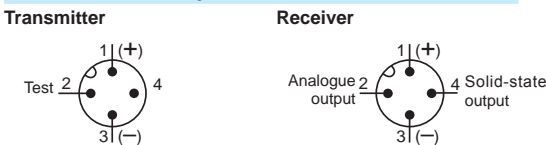
$R_{max} < 800 \Omega (U_e = 24 V), < 300 \Omega (U_e = 12 V)$

### Beam break test (only on transmitter)



## Connector scheme

### Sensor connector pin view

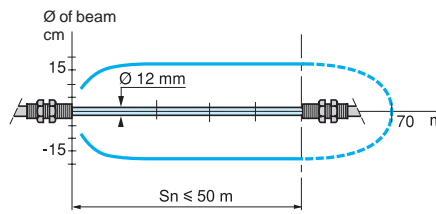


For suitable female connectors, including pre-wired versions, please refer to our catalogue "Cabling accessories OsiSense XZ".

## Curves

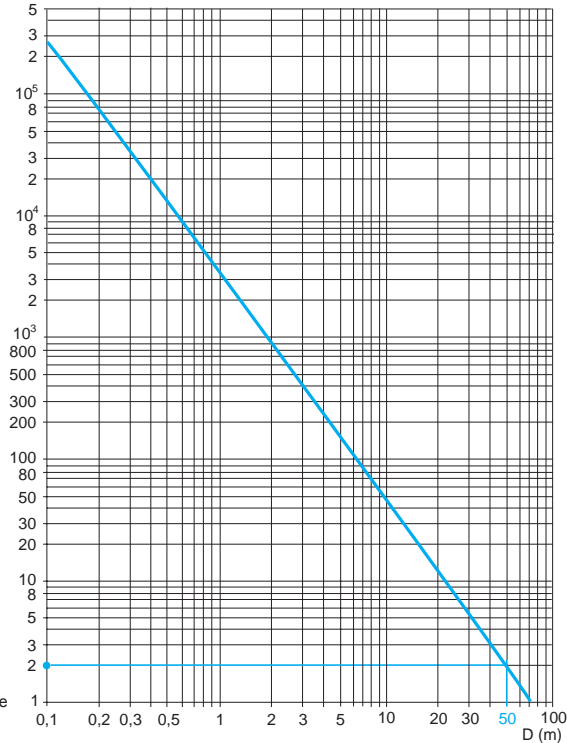
### Detection curve

#### Thru-beam system

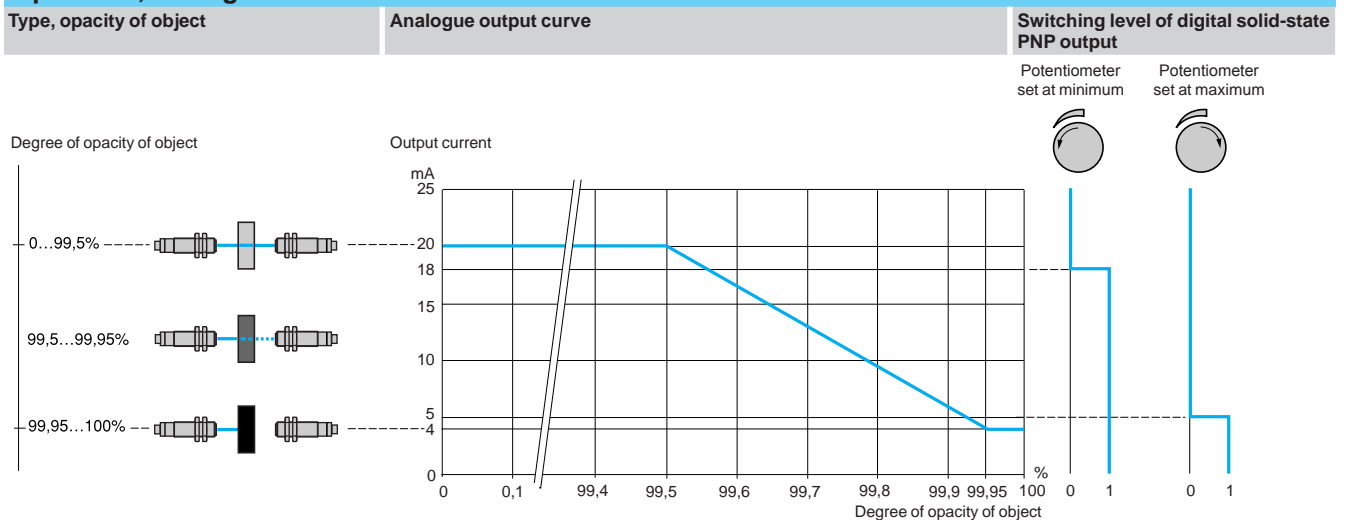


### Excess gain curve (ambient temperature: + 25 °C)

#### Thru-beam system



## Operation, settings

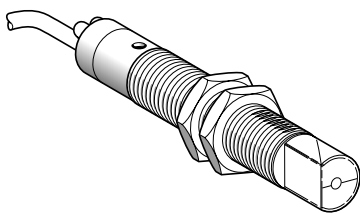


# Photo-electric sensors

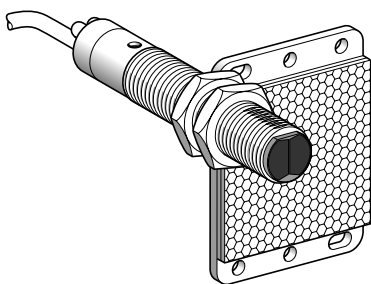
## OsiSense XU Application

### Design 18

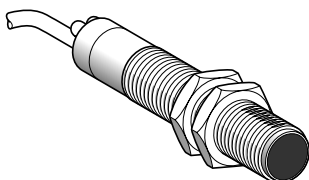
Two-wire AC <sup>(1)</sup> or DC, solid-state output with adjustable sensitivity



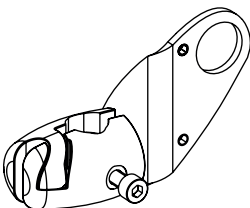
XU5M18M230W  
XU8M18M230W



XU9M18M230



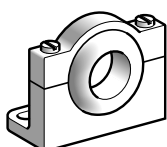
XU2M18M230



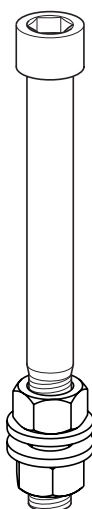
XUZF2003



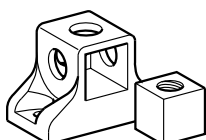
XUZA118



XUZA218



XUZ2001



XUZF2003

#### Diffuse system with adjustable background suppression

Sensing distance (Sn) m	Function	Line of sight	Connection	Reference	Weight kg
0.12	NO	Along case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU8M18MA230	0.150
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU8M18MA230K	0.075
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU8M18MA230WK	0.150
	NC	Along case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU8M18MB230	0.150
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU8M18MB230K	0.075
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU8M18MB230WK	0.150

#### Diffuse system

Sensing distance (Sn) m	Function	Line of sight	Connection	Reference	Weight kg
0.40	NO	Along case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU5M18MA230	0.150
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU5M18MA230K	0.075
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU5M18MA230WK	0.150
	NC	Along case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU5M18MB230	0.150
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU5M18MB230K	0.075
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU5M18MB230WK	0.150

#### Polarised reflex system <sup>(3)</sup>

Sensing distance (Sn) m	Function	Line of sight	Connection	Reference	Weight kg
2	NO	Along case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU9M18MA230	0.170
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU9M18MA230K	0.090
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU9M18MA230WK	0.170
	NC	Along case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU9M18MB230	0.170
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU9M18MB230K	0.095
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU9M18MB230WK	0.170

#### Thru-beam system <sup>(4)</sup>

Sensing distance (Sn) m	Function	Line of sight	Connection	Reference	Weight kg
15	NO	Along case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU2M18MA230	0.285
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU2M18MA230K	0.155
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU2M18MA230WK	0.285
	NC	Along case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU2M18MB230	0.285
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU2M18MB230K	0.155
		90° to case axis	Pre-cabled (L = 2 m) (2) 1/2"-20UNF	XU2M18MB230WK	0.285

#### Fixing accessories <sup>(5)</sup>

Description	Reference	Weight kg
3D fixing kit for use on M12 rod, for XU●M18 or XUZF50	XUZF2003	0.170
M12 rod	XUZ2001	0.050
Support for M12 rod	XUZF2003	0.150
Stainless steel fixing bracket	XUZA118	0.045
Plastic fixing bracket with adjustable ball-joint	XUZA218	0.035

<sup>(1)</sup> These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a 0.4 A "quick-blow" fuse in series with the load.

<sup>(2)</sup> For a 5 m long cable add L5.

Example: XU2M18MA230 becomes XU2M18MA230L5.

<sup>(3)</sup> 50 x 50 mm reflector XUZF50 included with polarised reflex system.

<sup>(4)</sup> Comprising both thru-beam transmitter and receiver.

<sup>(5)</sup> For further information, see page 5/158.


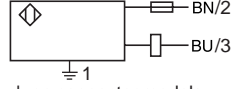
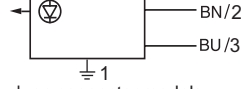


### Characteristics

Sensor type		XU2M, XU5M, XU8M, XU9M	XU2M, XU5M, XU8M, XU9M●●●●●●●●●●K
Product certifications		UL, CSA, CE	
Connection	Connector	-	1/2"-20UNF
	Pre-cabled	Length: 2 m	-
Sensing distance nominal Sn / maximum (excess gain = 2) (excess gain = 1)	m	0.12 / 0.12 diffuse with background suppression	
	m	0.4 / 0.6 diffuse	
	m	2 / 3 polarised reflex	
	m	15 / 20 thru-beam	
Type of transmission		Infrared, except XU9 (red)	
Degree of protection	Conforming to IEC 60529	IP 67, double insulation □	IP 67
Storage temperature		°C -40...+70	
Operating temperature		°C -25...+55	
Materials		Case: nickel plated brass; Lens: PMMA; Cable: PvR	
Vibration resistance	Conforming to IEC 60068-2-6	7 gn, amplitude ± 1.5 mm (f = 10 to 55 Hz)	
Shock resistance	Conforming to IEC 60068-2-27	30 gn, duration 11 ms	
Indicator lights	Output state	Yellow LED	
	Stability	Red LED (for reflex and thru-beam only)	
Rated supply voltage	V	~/- 24...240	
Voltage limits (including ripple)	V	~/- 20...264	
Residual current, open state	mA	< 1.5	
Switching capacity	mA	10...200 (1)	
Voltage drop, closed state	V	6	
Maximum switching frequency	Hz	25	
Delays	First-up	ms	< 300
	Response	ms	< 20
	Recovery	ms	< 20

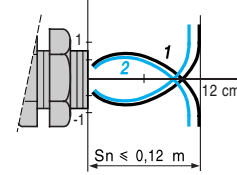
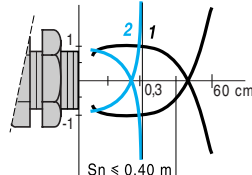
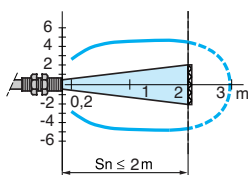
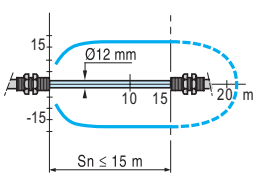
(1) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a 0.4 A "quick-blow" fuse in series with the load.

### Wiring schemes

Connector	Pre-cabled	2-wire ~ or -	Transmitter
1/2"-20UNF 	(~) BU (Blue) (~) BN (Brown)	 ⊕ on connector models	 ⊕ on connector models

### Detection curves

Thru-beam system	Polarised reflex system	Diffuse system	Diffuse system with adjustable background suppression
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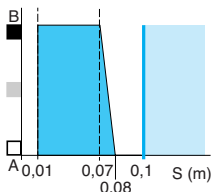


With reflector XUZC50

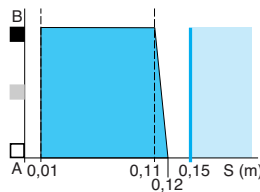
Object 10 x 10 cm; 1 White 90%; 2 Grey 18%

#### Variation of usable sensing distance Su

Potentiometer set at minimum



Potentiometer set at maximum

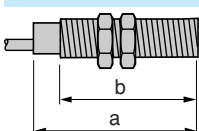


A-B: object reflection coefficient

- Black 6%
- Grey 18%
- White 90%
- Sensing range
- Non sensing zone (matt surfaces)

### Dimensions

XU●



	Pre-cabled (mm)		Connector (mm)	
	a	b	a	b
Ø 18, line of sight along case axis	82	55	95	55
Ø 18, line of sight 90° to case axis	97	55	110	55