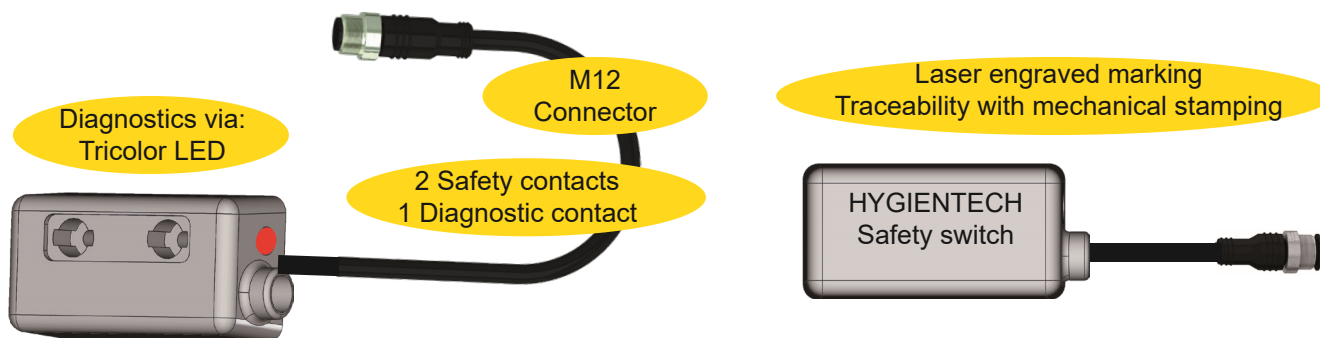


# Instruction Manual

Safety sensor guards for machines for  
food processing and "hygienic design"



## OTHER PRODUCTS: MAINTENANCE AND INTERLOCKING



## OTHER PRODUCTS: FORCE 0 AND IP69K TOUCH BUTTON



## COMITRONIC-BTI THE LEADER IN STAND-ALONE SAFETY SWITCHES



# SUMMARY of the instructions for the INOX316L range

## Safety and hygiene standards for food processing machines

1. Safety and hygiene of food processing machines	3
2. The design of food processing machinery	3
3. HYGHTECH: a hygienic design	4
4. Some recommendations for hygiene	5
5. Recommendations, What is IP 69K?, chemical degradation of cables	5

## HYGHTECH\_AV/AR\_MKT: safety sensor with "hygienic design"

1. Benefits	6
2. Installation principle	6
3. Main characteristics	7
4. Assembly instructions	7
4.1 AV Model layout (front mounting)	7
4.2 AR Model (rear mounting)	8
5 AV Model dimensions	8
6 AR Model dimensions	8

## M30-HY-MKT: M30 cylindrical safety sensor with "hygienic design"

1. Benefits	9
2. Installation principle	9
3. Main characteristics	10
4. Assembly instructions	10
5 Dimensions	10

## M18-HY-MKT: M18 cylindrical safety sensor with "hygienic design"

1. Benefits	11
2. Installation principle	11
3. Main characteristics	12
4. Assembly instructions	12
5 Dimensions	12

## EPINUS4K-HY-MKT: Safety sensor with hygienic design and 40 N magnetic hold

1. Benefits	13
2. Installation principle	13
3. Main characteristics	14
4. Assembly instructions	14
5 Dimensions	14

## The TRITHON series: very low cylindrical safety sensor and very high temperature

1. Benefits	15
2. Installation principle	15
3. Main characteristics	16
4. Assembly instructions	16
5. RV-MKTS dimensions	17
6. N-MKTS Dimensions	17
7. P-MKTS Dimensions	17

## The EPINUS 2K series: Safety sensor with magnetic side for closure

1. Benefits	18
2. Installation principle for Version 2K	18
3. Installation principle for Version 2K-NT-MKTS	19
4. Main features	19
5. Assembly instructions	20
6. Type 2K72 dimensions	20
7. Type 2K-NT-MKTS and DP handle dimensions	20

## T-SPLITTER: Automatic connection for connecting series of sensors

1. Benefits	21
2. List of compatible safety sensors	21
3. Electrical connection cables	21

## Principle of product cabling

## Compliance statements

CE Compliance statement	23
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The devices control series AWAX	24
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# Safety and hygiene standards for food processing machines

## 1. Safety and hygiene of agri-food processing machines: EN 12268

Machines subject to the European standard EN 12268 are intended to cut:

- bones;
- fresh or frozen meat with or without bones;
- fresh or frozen fish, whole or in fillets;
- blocks of frozen products;
- fresh or frozen vegetables;
- other products, such as pork fat or similar products.

The band saw machines covered under this European standard do not include band saws for the handling of wood and similar materials, and the requirements of EN 1807 do not apply. The material of the saw blade must meet the requirements for materials which come in contact with food products. Band saws for domestic use are not included in this European standard.

## 2. Food processing machine design: EN 1672-2

Specific standards, machine by machine, indicate constructive rules to ensure cleanability. Other specific standards relate to materials that are permitted to come into contact with food products.

Equipment is cleanable if it is designed and constructed to allow the removal of food soils and dirt by the recommended cleaning methods.

For designers, the most important aspect is the decomposition of a machine into three distinct areas, these are what will dictate the technological choices.

- The food zone, which is composed of surfaces that come in contact with food;
- The splash zone, which is composed of surfaces that may receive food that is not returned to the processed product;
- The non-food zone, which is composed of all other surfaces.

## Meat and poultry processing machines: NSF/ANSI/3-A 14159-1

**Plastic is to be banned as a general rule, with special exceptions.**

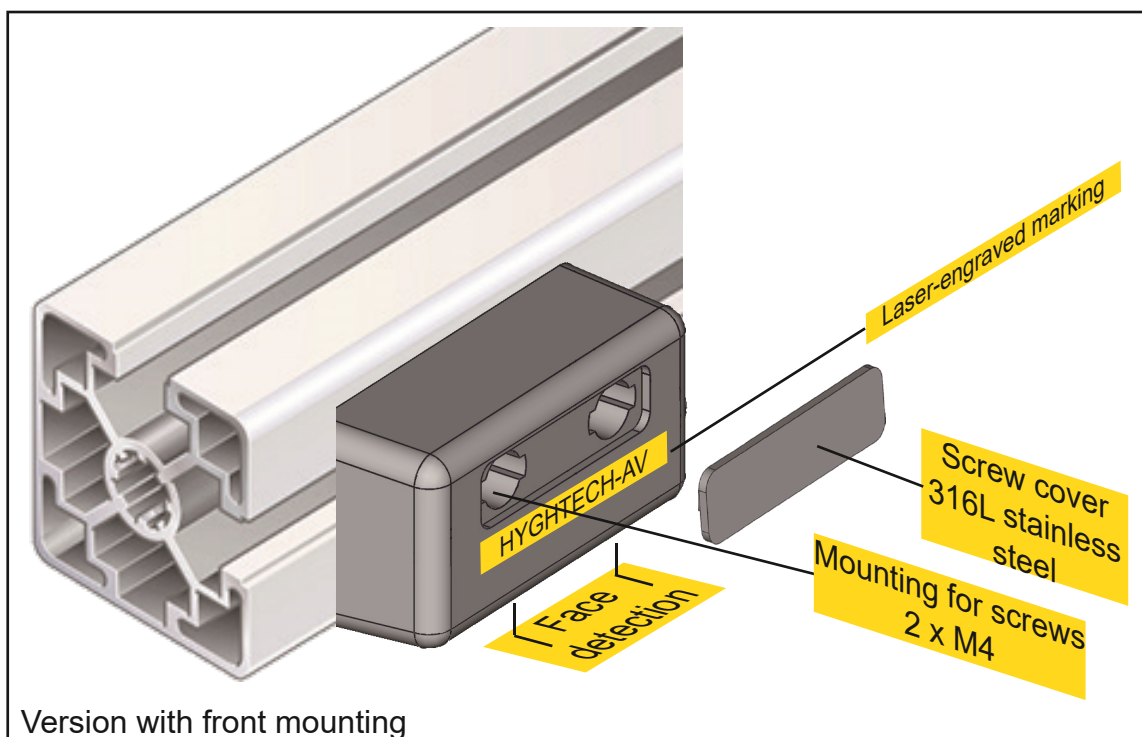
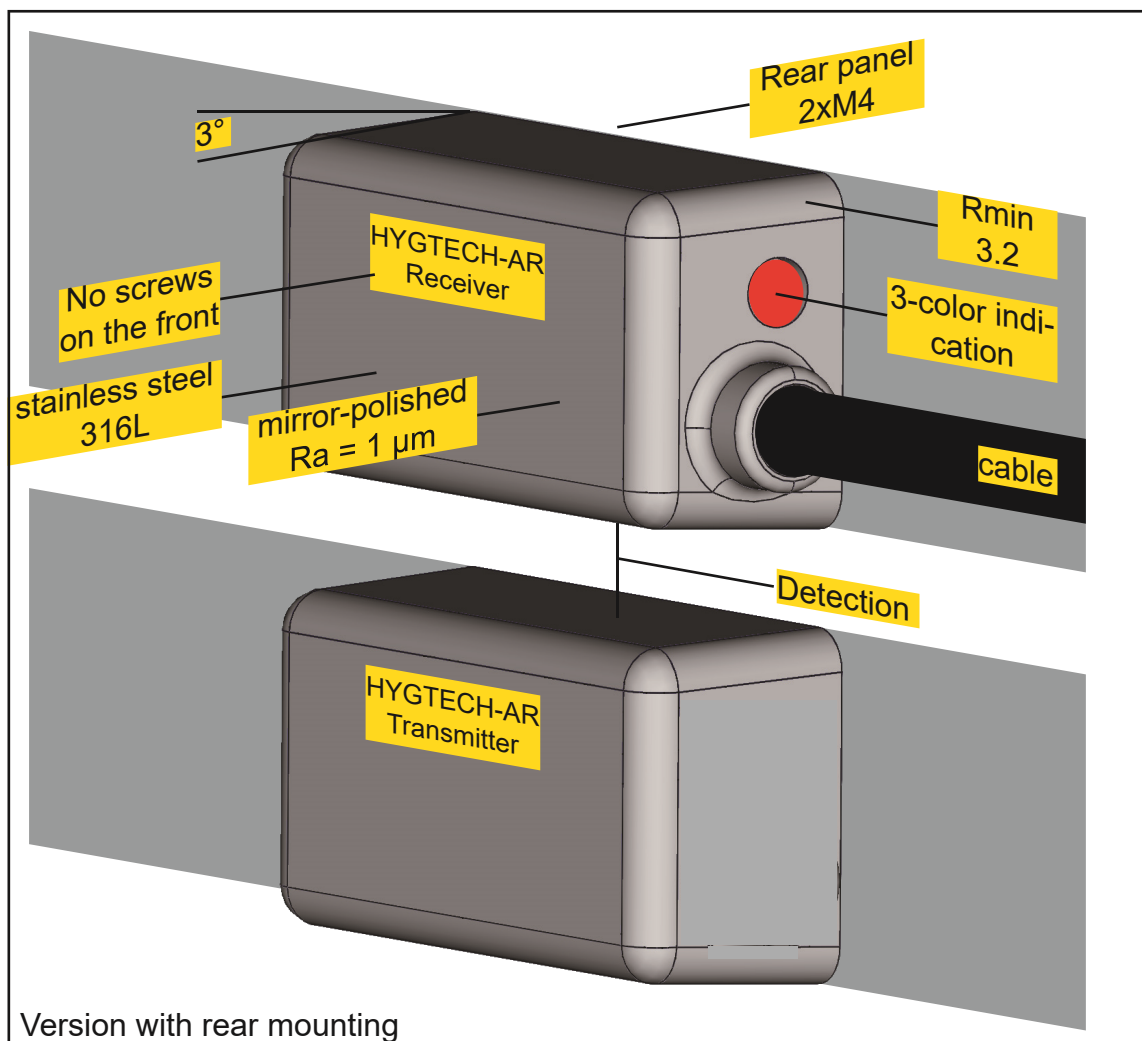
Directly or indirectly, it becomes a component of food or other item, affecting the characteristic of foods, including the transmission of a color, taste, or smell to foods.

### Product design

- Surface textures must have a maximum Ra of 32 µm
- Surfaces must be cleanable
- There must be no dead space, no possible intrusion
- angles of less than 135 ° in the contact areas of the product shall have a smooth and continuous radius of at least 3.2 mm.
- grooves must be wider than they are deep
- the material must have slopes to avoid water stagnation

# on-contact safety switch in INOX316L mirror-polished stainless steel for food processing machines

## 3. HYGTECH® : hygienic design





# Recommendations, IP 69K for food processing machines

## 4. Some recommendations for hygiene

Observe the instructions given in the instruction manual and especially, the section on how to clean the product and cleaning products. Do not use high-pressure jet cleaning, which can damage the product and disperse microorganisms into the air, and thus contaminate the environment.

The products of the HYGHECH range are designed to withstand severe environmental constraints.

## 5. What is IP 69K?

This is the resistance of electrical equipment to high-pressure water jet cleaning. This leads to requirements in terms of pressure, elevated temperature (warm water), and the use of strong detergents and disinfectants. In the food sector, this is generally combined with cleaning disinfection involving the use of strong additives. The electrical equipment in food processing facilities is particularly affected, especially sensors that are greatly exposed. In light of this fact, DIN Standard 40050 Part 9 describes a level of IP69K protection. The jet comes from a flat jet nozzle at a distance of 100 to 150 mm (4 to 6 in) at a temperature of  $80^{\circ} \pm 5^{\circ} \text{C}$  ( $176^{\circ} \pm 41^{\circ} \text{F}$ ), at a flow rate of 14 to 16 L/min (3.7 to 4.2 gal/min) under a pressure of 8,000 to 10,000 kPa.

**Warning :** IP 69K does not indicate "Absolute water tightness" and the exposure time is 30s.

## 6. List of chemical products not to use on cables

### PVC

Acetaldehyde, Acetamide, Amyl Acetate, Vinyl Acetate, Ethyl Acetate, Methyl Acetate, Acetone, Methyl Acetone, Acetic Acid, 20% Acetic Acid, Glacial Acetic Acid, Carboic Acid (Phenol), 100% Hydrochloric Acid, Chlorosulfonic Acid, 50% Chromic Acid, Cresylic Acid, Fluosilicic Acid, Sulfuric Acid (75-100%), ADBLUE; Alcohols: Benzyl, Benzoic Aldehyde, Butylamine, Amines, Acetic Anhydride, Dimethylaniline, Carbon Disulfide, Butyl Acetate, Methyl Ethyl Ketone, Ketones, Chlorine, Anhydrous Liquid, Chlorobenzene (Mono), Chlorobromomethane, Chloroform, Amyl Chloride, Lithium Chloride, Ethyl Chloride, Cresols, Barium Cyanide, Cyclohexane, Cyclohexanone, Diacetone Alcohol, Dichlorobenzene, Dichloroethane, Diethylamine, Lacquer Diluents, Ethanolamines, Ether, Diethyl ether, Ethyl ether, Fluorine, Dimethylformamide, Furfural; Oils: Aniline, Aromatic Hydrocarbons, Lacquers, Methylamine, Nitrobenzene, 100% Oleum, 25% Oleum, Diphenyl Oxide, Phenol (Carboic Acid), Pyridine, Turpentine, Tetrachlorethylene, Carbon Tetrachloride, Toluene (Toluol), Trichlorethylene, Varnish, Xylene.

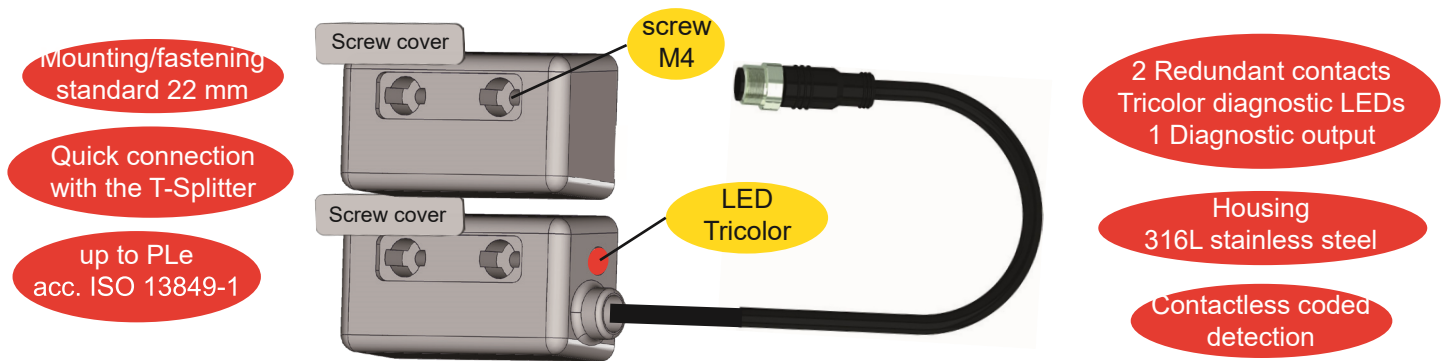
### PUR

Acetaldehyde, Acetamide, Amyl Acetate, Lead Acetate, Vinyl Acetate, Ethyl Acetate, Methyl Acetate, Acetone, Acetic Acid, 20% Acetic Acid, 80% Acetic Acid, Glacial Acetic Acid, Benzoic Acid, 100% Hydrobromic Acid, Butyric Acid, Carboic acid (Phenol), Chloroacetic acid, 100% Hydrochloric acid, 37% Hydrochloric acid, Chlorosulfonic acid, 10% Chromic acid, 30% Chromic acid, 5% Chromic acid, 50% Chromic acid, Cresylic acid, Cyanic acid, Fluoroboric Acid, Monochloroacetic Acid, 100% Hydrofluoric Acid, 20% Hydrofluoric Acid, 50% Hydrofluoric Acid, 75% Hydrofluoric Acid, Fluosilicic Acid, Formic Acid, Gallic Acid, Glycolic Acid, 100% Hydrofluorosilicic Acid, 20% Hydrofluorosilicic Acid, Maleic Acid, Nitric Acid (20%), Nitric Acid (5-10%), Nitric Acid (50%), Nitric Acid (Concentrate), Perchloric Acid, Phosphoric Acid (40%), Phosphoric Acid (> 40%), alkylbenzene sulfonic acid, Sulfuric Acid, Sulfuric Acid (10-75%), Sulfuric Acid (75-100%), Sulfuric Acid (<10%), Acrylonitrile, Methyl Alcohol 10%; Alcohols: Amyl; Alcohols: Benzyl; Alcohols: Butyl; Alcohols: Diacetone; Alcohols: Ethyl; Alcohols: Hexyl; Alcohols: Isobutyl; Alcohols: Isopropyl; Alcohols: Methyl; Alcohols: Octyl; Alcohols: Propyl; Benzaldehyde, Butylamine, 10% Ammonia, Liquid Ammonia, Anhydrous Ammonia, Acetic anhydride, Carbon dioxide (wet), Aniline, Dimethyl aniline, Antifreeze, Aqua Regia (80% HCl, 20% HNO<sub>3</sub>), Benzene, Benzol, Beer, Carbon Disulfide, Carbon Disulfide, Bromine, Butadiene, Butylacetate, Calgon, Calcium Carbonate, Methyl Ethyl Ketone, Ketones, Chlorobenzene (mono), Chlorobromomethane, Chloroform, Benzyl Chloride Lithium Chloride, Cider, Clorox (Bleach), Dyes, Cresols, Cyclohexanone, Diacetone Alcohol, Dichlorobenzene, Dichloroethane, Lacquer Thinner, Diphenyl, Ethanol, Ether, Ethyl Ether, Fuel Oil, Fluorine, 100% Formaldehyde, Dimethylformamide, Furfural, Gelatin, Glycerin, Diethylene Glycol, Oils: Aniline, Oils: Fuel (1, 2, 3, 5A, 5B, 6), Hydrazine, Aromatic Hydrocarbons, Barium Hydroxide, Calcium Hydroxide, Lithium Hydroxide, Calcium Hypochlorite, Sodium Hypochlorite (100%), Sodium Hypochlorite (<20%), Iodine, Grape Juice, Ketchup, Lacquers, Washing Detergents: Calcium Hydroxide Ca(OH)<sub>2</sub>; Washing Detergents: Potassium Hydroxide KOH, Methanol (Methyl Alcohol), Calcium Nitrate, Lead Nitrate, Nitrobenzene, Nitromethane, 100% Oleum, 25% Oleum, Oxide Diphenyl, Pentane, Perchlorethylene, Phenol (Carboic Acid), Dibutyl Phthalate, Pyridine, Furan Resin, Brine (Saturated NaCl), Ethyl Sulphate, Turpentine, Tetrachlorethylene, Carbon Tetrachloride, Carbon Tetrachloride (Wet), Tetrachloride

### SILICON

Amyl Acetate, Vinyl Acetate, Methyl Acetate, Acetone, 100% Hydrobromic Acid, 20% Hydrogen Bromide, Butyric Acid, Carboic Acid (Phenol), Chloroacetic Acid, 100% Hydrochloric Acid, 20% Hydrochloric Acid, Chlorosulfonic Acid, Cresylic Acid, 100% Hydrogen Fluoride, 20% Hydrogen Fluoride, 50% Hydrochloric Acid, 75% Hydrochloric Acid, Gallic Acid, 100% Hydrofluorosilicic Acid, 20% Hydrofluorosilicic Acid, 20% Nitric Acid, 50% Nitric Acid, Nitric Acid (Concentrate), Oleic Acid, Perchloric Acid, Phosphoric Acid (> 40%), Benzene Sulfonic Acid, Sulfuric Acid, Sulfuric Acid (10-75%), Sulfuric Acid (75-100%), Acrylonitrile, Alcohols: Amyl Alcohol; Alcohols: Butyl; Alcohols: Diacetone, Benzoic Aldehyde, Dimethyl Aniline, Aqua Regia (80% HCl, 20% HNO<sub>3</sub>), Asphalt, Benzene, Benzol, Bromine, Butadiene, Butylacetate, Butylene, Diesel Fuel, Methyl Ethyl Ketone, Chlorine, Anhydrous Liquid, Chlorobenzene (mono), Chlorobromomethane, Chloroform, Amyl Chloride, Benzyl Chloride, Ethyl Chloride, Cresols, Cyclohexane, Cyclohexanone, Diacetone Alcohol, Dichlorobenzene, Lacquer Thinner, Diphenyl, Stoddard Solvent, Chlorine, Essence (highly-aromatic), Leaded Gasoline (standard), Unleaded Gasoline, Ethane, Ether, Butyl Ether, Diethyl Ether, Ethyl Ether, Fuel Oil, Fluorine, Furfural, Fat, Heptane, Hexane, Oils: Aniline; Oils: Diesel Fuel (20, 30, 40, 50), Aromatic Hydrocarbons, Iso-octane, Jet Fuel (JP3, JP4, JP5), Kerosene, Lacquers, Lubricants, Naphtha, Nitrobenzene, Nitromethane, 100% Oleum, 25% Oleum, Pentane, Perchlorethylene, Petroleum, Phenol, Phenol (Carboic Acid), Pyridine, Furan Resin, Turpentine, Tetrachlorethylene, Carbon Tetrachloride, Carbon Tetrachloride (wet), Carbon Tetrachloride (dry), Toluene (Toluol), Trichlorethylene, Varnish, White Spirits, Xylene.

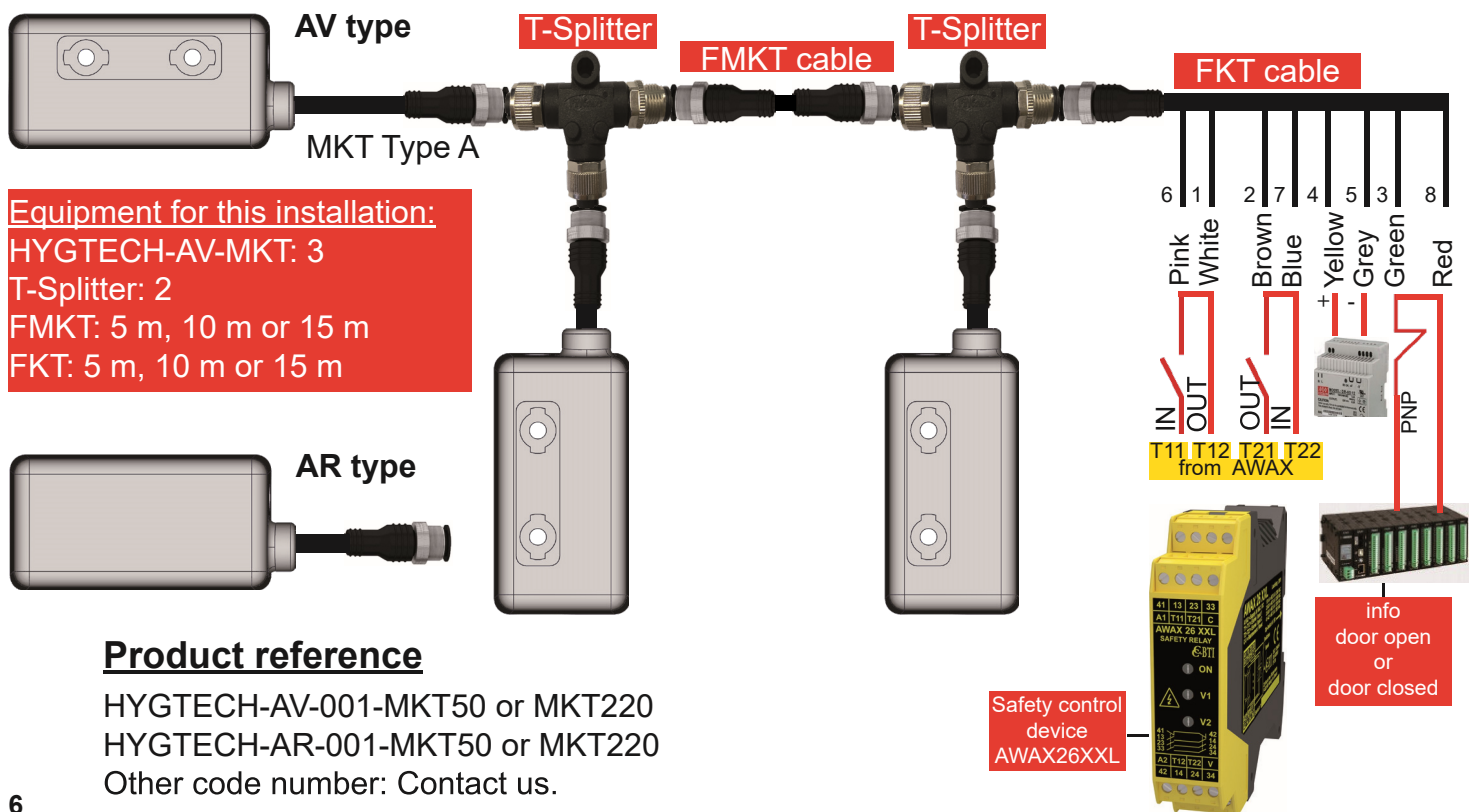
# HYGTECH®-AV/AR-MKT safety sensor for protection in a harsh and hygienic environment (agri-food, cosmetic, pharmaceutical, chemical)



## 1. Benefits

- Compatible "hygienic design" thanks to the sloping sides of the casing, and the absence of cavities that prevent the retention of liquid and the adhesion of organic matter
- No adhesion of bacteria thanks to mirror-polished 316L stainless steel with laser engraved marking
- Controls the opening of doors and movable guards on dangerous machines
- This product is waterproof rated at IP69K and works without contact
- Each product can be concealed behind a 316L stainless steel or non-metallic wall
- Multi-mode technology with three different ranges (1 mm\*, 2 mm\*, 5 mm), standard 10 mm
- The low ranges are suitable for SAS equipped with compression seal, laser beam, chemical product, gas, etc.
- LED diagnostics: red = door open, green = door closed, orange = product or alignment fault
- Connection by M12 connector molded onto a 50 cm or 220 cm PUR cable
- Automatic sequencing thanks to the T-Splitter (AV or AR model)

## 2. Installation principle



# **HYGTECH<sup>®</sup>-AV/AR-MKT Safety sensor for protection in a harsh and hygienic environment (agri-food, cosmetic, pharmaceutical, chemical)**

## **3 . Main features**

Supply voltage	9 to 30 VDC
Current	55 mA at 30 VDC
Connection / Curvature radius	Cordon PUR 50 cm with M12-8 pins / 50mm
LED Lighting	red=door open green=door closed orange=product fault or alignment out of range
Contact specifications at -25 °C (-13 °F)	48 V / 400 mA, floating contact
Contact specifications at +60 °C (+140 °F)	48 V / 350 mA, floating contact
Contact specifications at +80 °C (+176 °F)	48 V / 250 mA, floating contact
Operating temperature	-25°C to +80°C (-13 to +176°F)
Detection distances according to IEC 60947-5-3 Codes from 001 to 008	Sao=9 mm (ensured activation distance) Sar=11 mm (ensured rupture distance) Offset = +/- 5 mm
Sealing	IP 69K housing, M12-8p IP 67 connector
Sensor material / cable / nut / washer	INOX 316L / PUR polyether / INOX A2 / INOX A2
Weight with packaging	MKT220: 320 grams and MKT50: 210 grams
Mounting with BH4 screws	2 x M4-20 mm
Vibration / shock	10 Hz to 55 Hz 1 mm / 30g 11 ms

## **4. Assembly instructions**

### **4.1 AV Model layout (front mounting)**

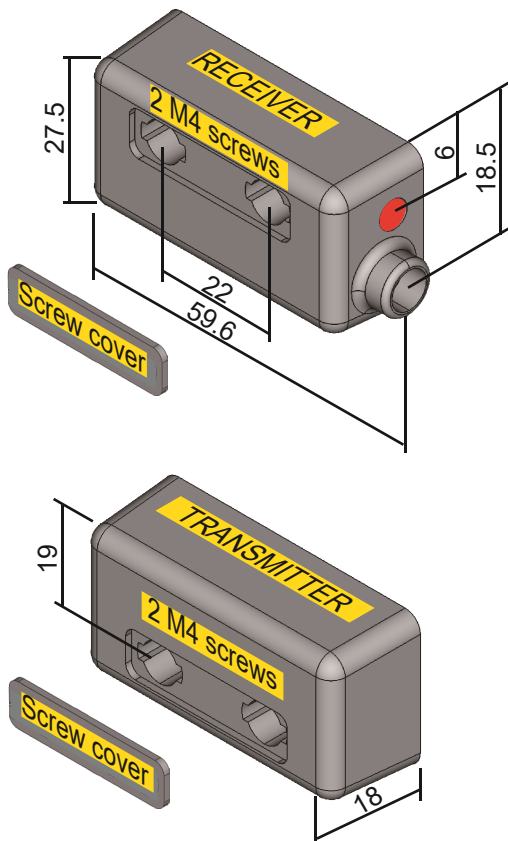
- a) Drill the holes of the mounting bracket at  $\Phi = 4.5$  mm, with a center distance of 22 mm.
- b) Use our stainless steel BH4-20 tamper-proof screws with the stainless washers (kit supplied) for mounting
- c) It is important to use the stainless steel washers supplied with the product.
- d) Once the door or casing is closed, the distance between the transmitter and the receiver must be at least 1 mm. This product should never be used as a mechanical stop.
- e) Our product can be concealed behind a 2 mm thick stainless steel wall
- f) The bending radius of the cable must be greater than 50 mm.
- g) Fit the screw cover on

# HYGTECH<sup>®</sup>-AV/AR-MKT Safety sensor for protection in a harsh and hygienic environment (agri-food, cosmetic, pharmaceutical, chemical)

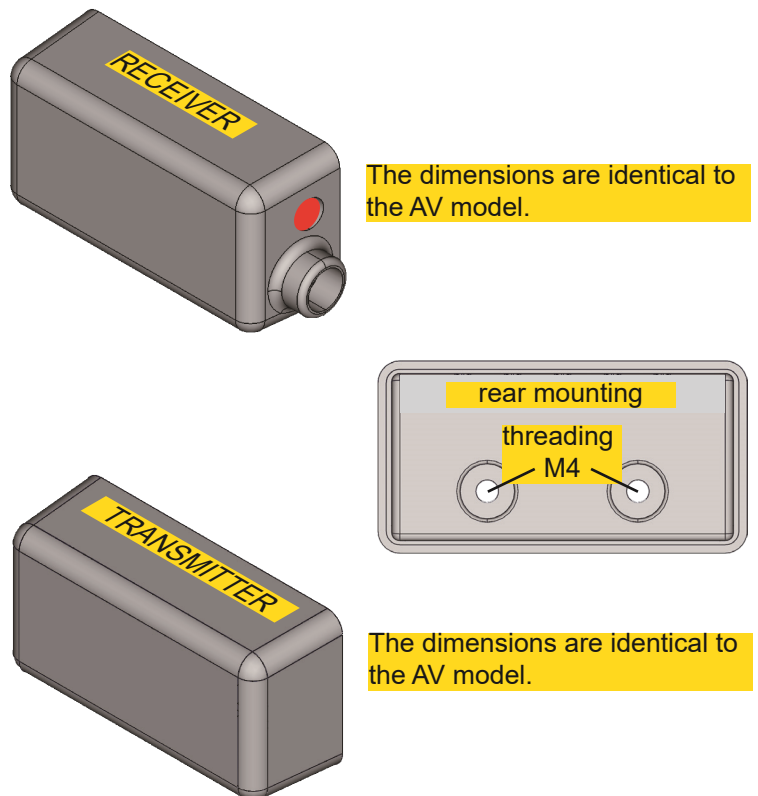
## 4.2 AR Model (rear mounting)

- a) Drill the holes of the mounting bracket at  $\Phi = 4.5$  mm, with a center distance of 22 mm.
- b) Use our stainless steel BH4-20 tamper-proof screws with the stainless washers (kit supplied) for mounting: there are M4 threaded holes on the housing.
- c) It is important to use the stainless steel washers supplied with the product.
- d) Once the door or casing is closed, the distance between the transmitter and the receiver must be at least 1 mm. This product should never be used as a mechanical stop.
- e) Our product can be hidden behind a wall (stainless steel, aluminum) of 2 mm thickness (code 001~008).
- f) The bending radius of the cable must be greater than 50 mm.

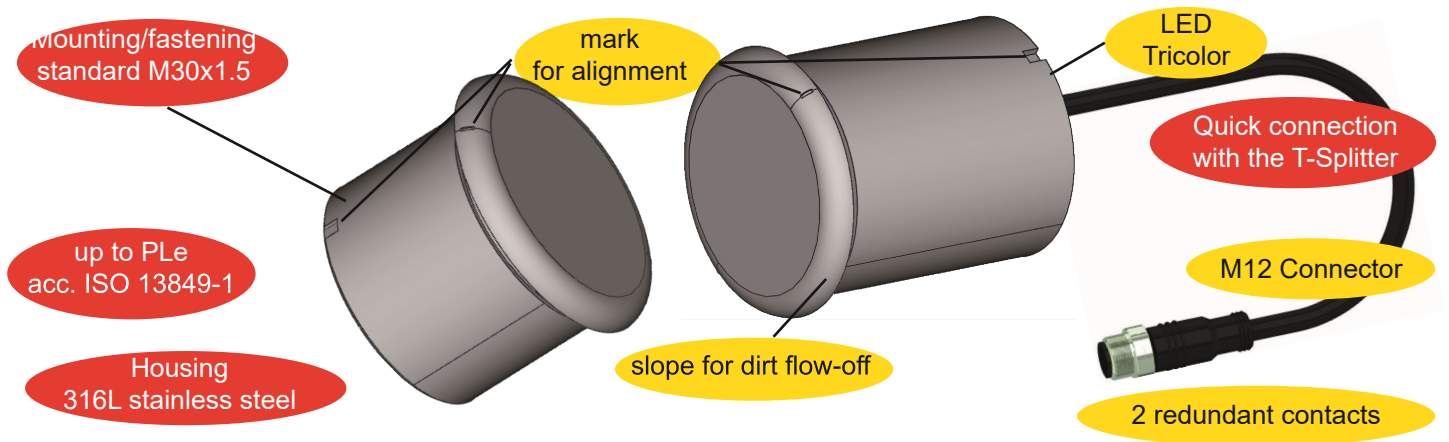
## 5. AV Model dimensions



## 6. AR Model dimensions



# M30-HY-MKT® Safety sensor for protection in a harsh and hygienic environment (agri-food, cosmetic, pharmaceutical, chemical)

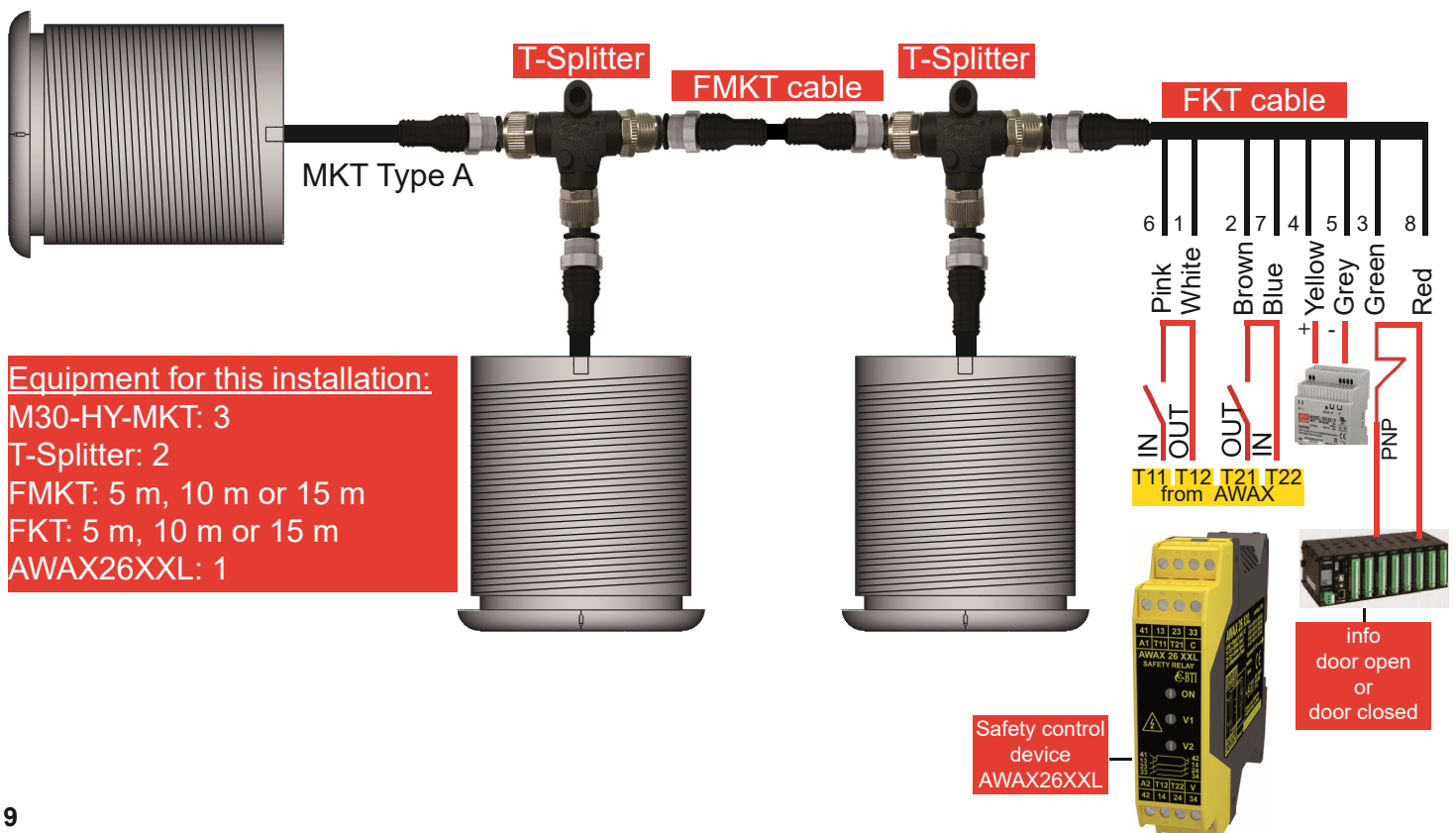


## 1. Benefits

**New product  
2018**

- Compatible "hygienic design" thanks to the sloping sides of the casing, and the absence of cavities that prevent the retention of liquid and the adhesion of organic matter
- No adhesion of bacteria thanks to mirror-polished 316L stainless steel 1 µm
- Controls the opening of doors and movable guards on dangerous machines
- This product is waterproof rated at IP69K and works without contact
- Food silicone seals with stainless steel nut supplied
- LED diagnostics: red = door open, green = door closed, orange = product or alignment fault
- Connection by M12 connector molded onto a 50 cm or 220 cm PUR cable
- Automatic sequencing thanks to the T-Splitter, up to 30 sensors in series

## 2. Installation principle





# M30-HY-MKT® Safety sensor for protection in in a harsh and hygienic environment (agri-food, cosmetic, pharmaceutical, chemical)

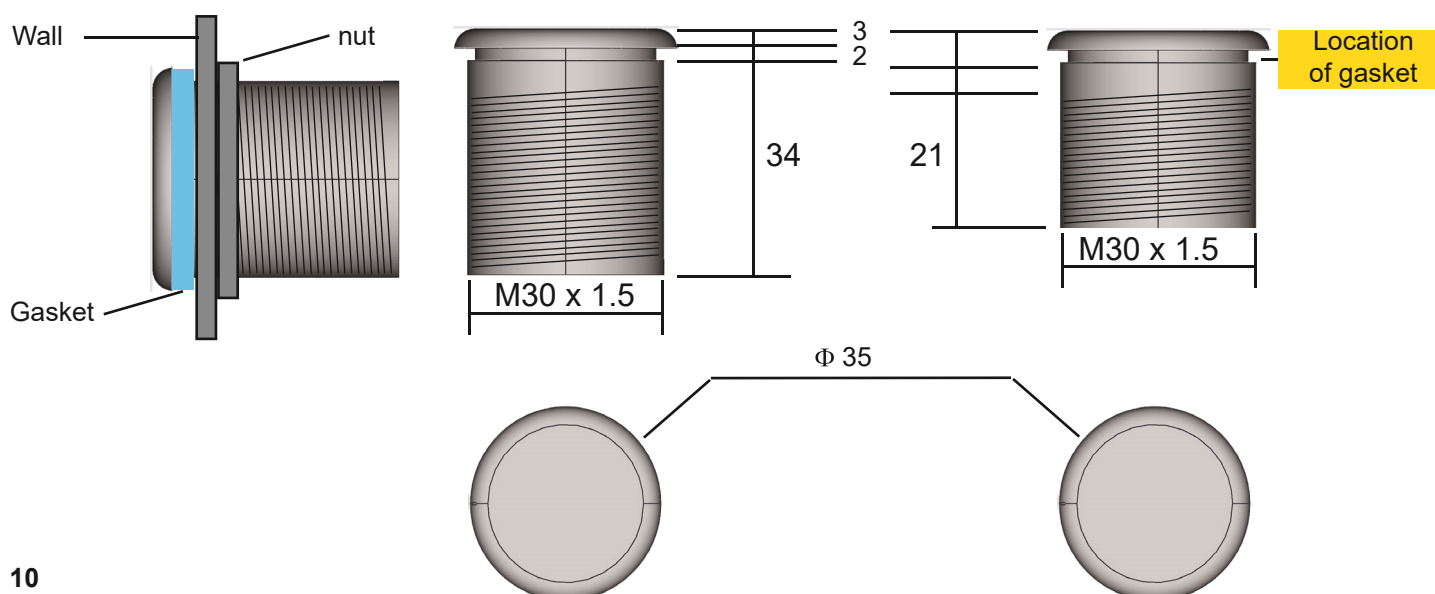
## 3. Main features

Supply voltage	20 to 30 VDC
Current	50 mA maximum
Connection / Curvature radius	Cordon PUR 50 cm with M12-8 pins / 50mm
LED Lighting	red=door open green=door closed orange=product fault or alignment out of range
Contact specifications at -25 °C (-13 °F)	48 V / 400mA, floating contact
Contact specifications at +60 °C (+140 °F)	48 V / 350mA floating contact
Contact specifications at +80 °C (+176 °F)	48 V / 250mA floating contact
Operating temperature	-25°C to +80°C (-13 to +176 °F)
Detection distances according to IEC 60947-5-3 (See §8)	Sao = 6 mm (ensured activation distance) Sar=8 mm (ensured rupture distance) Max axial rotation = +/- 15 ° Max translation offset = +/- 3 mm
Sealing	IP 69K housing, M12-8p IP 67 connector
Sensor material / cable / nut / seal	316L Stainless steel / PUR polyether / A2 Stainless steel / Silicon
Weight with packaging	MKT220: 320 grams and MKT50: 210 grams
Fastening / seal	Nut and gasket provided
Vibration / shock	10 Hz to 55 Hz 1 mm / 30g 11 ms

## 4. Assembly instructions

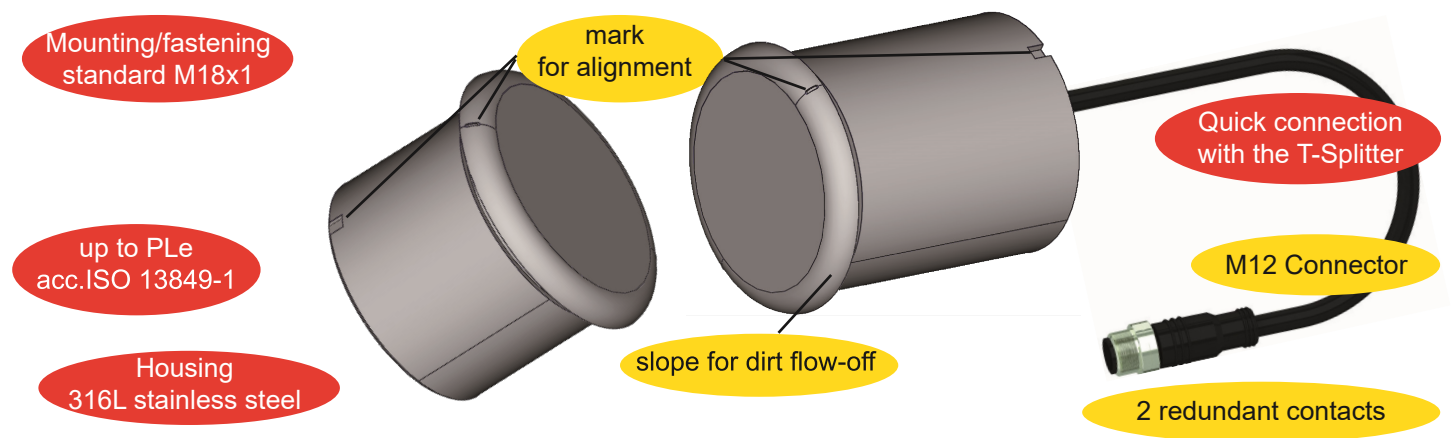
- Drill the holes of the mounting bracket at  $\Phi = 30.5$  mm or M30x1.5.
- Fasten the sensor using the nut, the gasket is placed under the ring.
- Align the "Transmitter" and "Receiver" marks and tighten the nut.
- Once the door or casing is closed, the distance between the transmitter and the receiver must be at least 1 mm. This product should never be used as a mechanical stop.
- Our product can be made invisible, behind a wall (stainless steel, aluminum) of 3 mm maximum thickness. In this case the sensor is screwed directly into the profile, previously threaded for M30x1.5.
- The bending radius of the cable must be greater than 50 mm; the product must not be used as a mechanical stop.

## 5. Dimensions





# M18-HY-MKT® Safety sensor for protection in in a harsh and hygienic environment (agri-food, cosmetic, pharmaceutical, chemical)

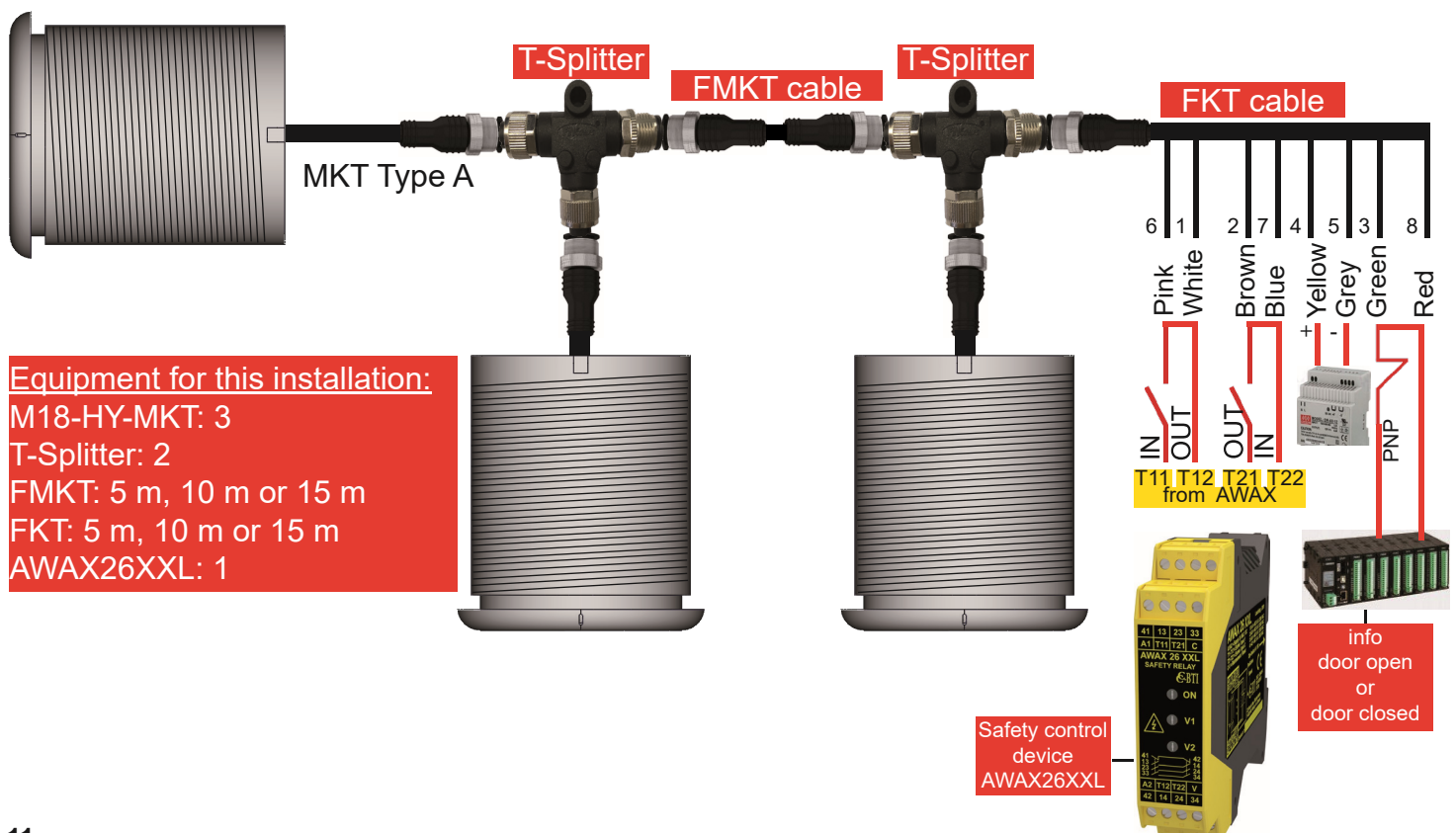


## 1. Benefits

**New product  
2018**

- Compatible "hygienic design" thanks to the sloping sides of the casing, and the absence of cavities that prevent the retention of liquid and the adhesion of organic matter
- No adhesion of bacteria thanks to mirror-polished 316L stainless steel 1 µm
- Controls the opening of doors and movable guards on dangerous machines
- This product is waterproof rated at IP69K and works without contact
- Food silicone seals with stainless steel nut supplied
- Connection by M12 connector molded onto a 50 cm or 220 cm PUR cable
- Automatic sequencing thanks to the T-Splitter, up to 30 sensors in series

## 2. Installation principle



# M18-HY-MKT® Safety sensor for protection in in a harsh and hygienic environment (agri-food, cosmetic, pharmaceutical, chemical)

## 3. Main features

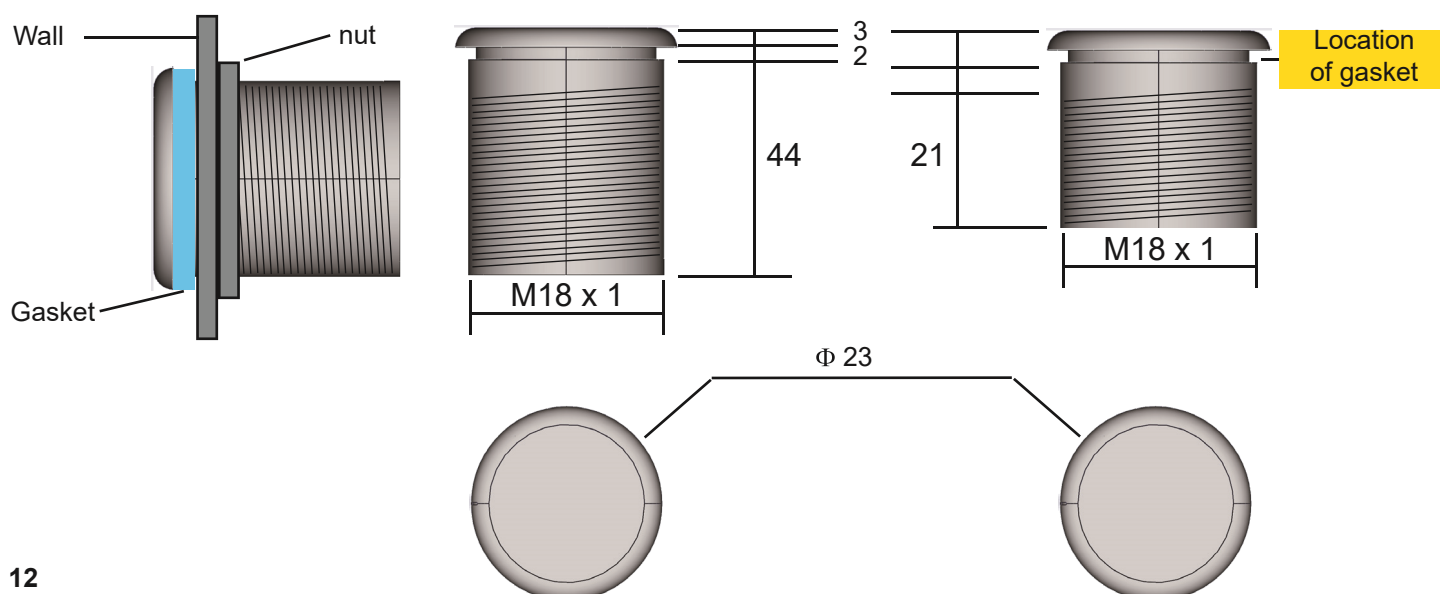
Supply voltage	24 VDC max
Current	50 mA
Connection / Curvature radius	Cordon PUR 50 cm with M12-8 pins / 50mm
LED Lighting	red=door open green=door closed orange=product fault or alignment out of range
Contact specifications at -25 °C (-13 °F)	48 V / 400mA, floating contact
Contact specifications at +60°C (+140 °F)	48 V / 350mA, floating contact
Contact specifications at +80°C (+176 °F)	48 V / 250mA, floating contact
Operating temperature	-25°C to +80°C (-13 to +176°F)
Detection distances according to IEC 60947-5-3 (See §8)	Sao=4 mm (ensured activation distance) Sar=8 mm (ensured rupture distance) Max axial rotation = +/- 5 ° Max translation offset = +/- 2 mm
Sealing	IP 69K housing, M12-8p IP 67 connector
Sensor material / cable / nut / seal	316L Stainless steel / PUR polyether / A2 Stainless steel / Silicon
Weight with packaging	MKT220: 320 grams and MKT50: 210 grams
Fastening / seal	Nuts and gasket provided
Vibration / shock	10 Hz to 55 Hz 1 mm / 30g 11 ms

## 4. Assembly instructions

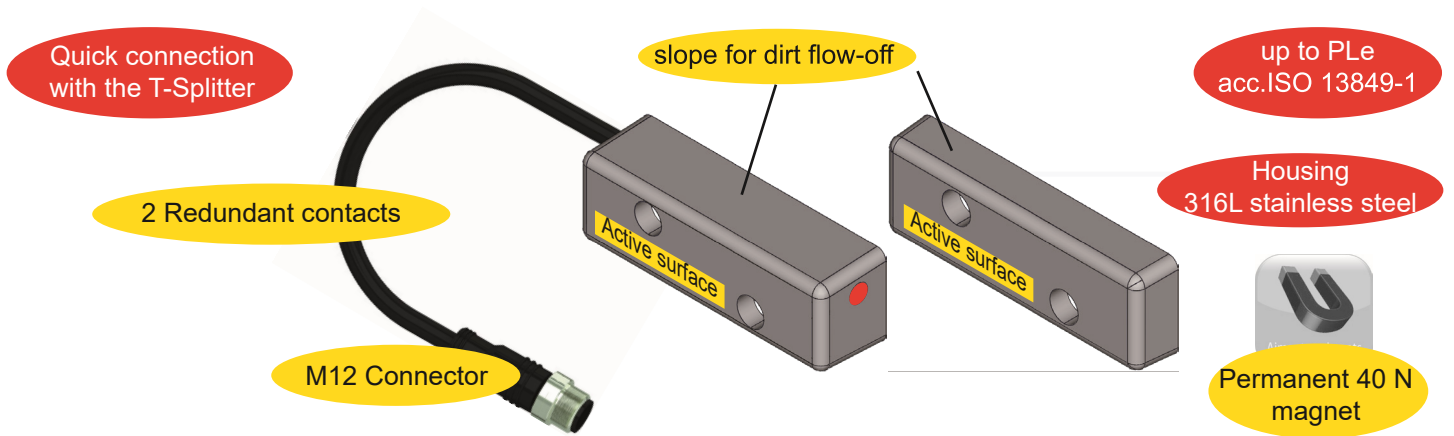
- Drill the holes of the mounting bracket at  $\Phi = 18.5$  mm or M18x1
- Fasten the sensor using the nut, the gasket is placed under the ring.
- Align the "Transmitter" and "Receiver" marks and tighten the nuts.
- Once the door or casing is closed, the distance between the transmitter and the receiver must be at least 1 mm. This product should never be used as a mechanical stop.
- Our product can be made invisible, behind a wall (stainless steel, aluminum) of 1 mm maximum thickness. In this case the sensor is screwed directly into the profile, previously threaded for M18x1.
- The bending radius of the cable must be greater than 50 mm; the product must not be used as a mechanical stop.

## 5. Transmitter Dimensions

## Receiver Dimensions



# EPINUS 4K-HY-MKT Safety sensor for protection in a harsh and hygienic environment with magnetic hold 40 N

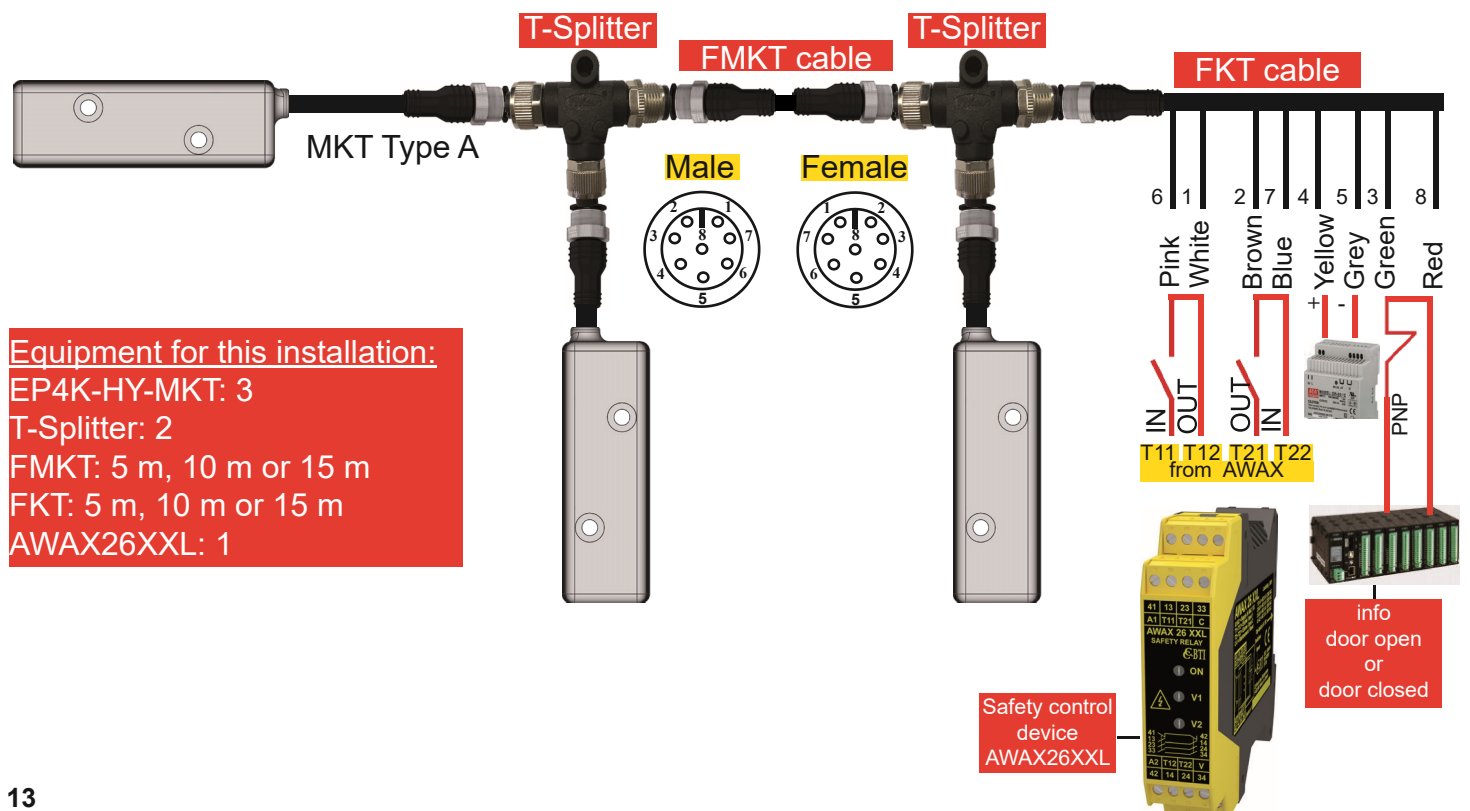


## 1. Benefits

**New product  
2018**

- Compatible "hygienic design" thanks to the sloping sides of the casing, and the absence of cavities that prevent the retention of liquid and the adhesion of organic matter
- No adhesion of bacteria thanks to mirror-polished 316L stainless steel  $R_a = 1 \mu m$
- Controls the opening of doors and movable guards on dangerous machines
- This product is waterproof rated at IP69K and the detection surfaces are magnetic for 40 N
- LED diagnostics: red = door open, green = door closed, orange = product or alignment fault
- Connection by M12 connector molded onto a 50 cm or 220 cm PUR cable
- Automatic sequencing thanks to the T-Splitter
- DP version: transmitter with invisible M8 screws compatible with EPB antibacterial handle

## 2. Installation principle



# EPINUS 4K-HY-MKT Safety sensor for protection in a harsh and hygienic environment with magnetic hold 40 N

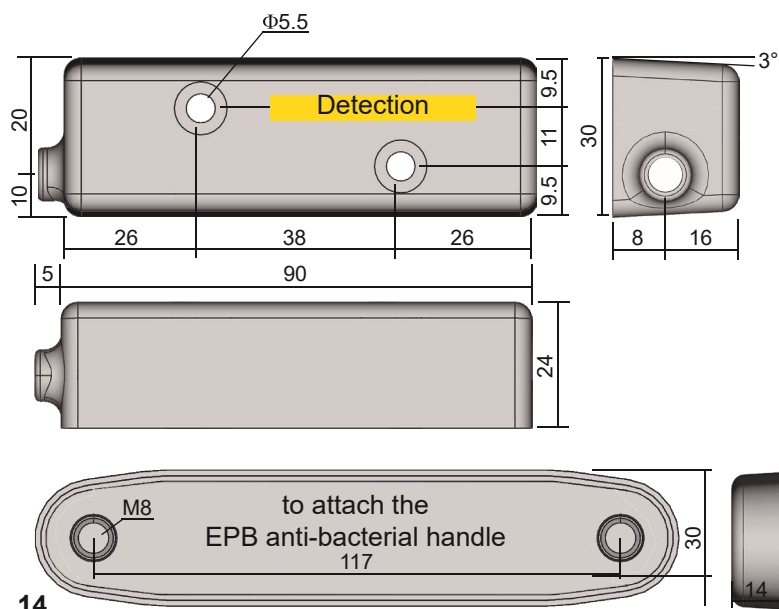
## 3 . Main features

Supply voltage	20 to 30 VDC
Current	55 mA at 30 V
Connection / Curvature radius	Cordon PUR 50 cm with M12-8 pins / 50mm
LED Lighting	red=door open / green=door closed orange=product fault or alignment out of range
Contact specifications at -25 °C (-13 °F)	48 V / 400mA, floating contact
Contact specifications at +60 °C (+140 °F)	48 V / 350mA, floating contact
Contact specifications at +80 °C (+176 °F)	48 V / 250mA, floating contact
Operating temperature	-25 °C to +80 °C (-13 to +176 °F)
Detection distances according to IEC 60947-5-3	Sao=5 mm (ensured activation distance) Sar=6 mm (ensured rupture distance) Length/height offset = +/- 3 mm
Sealing	IP 69K housing, M12-8p IP 67 connector
Sensor material / cable / nut / washer	INOX 316L / PUR polyether / INOX A2 / INOX A2
Weight with packaging	MKT220: 320 grams and MKT50: 210 grams
Mounting/fastening	BH5-30 (M5 x 30) + washers provided
Vibration / shock	10 Hz to 55 Hz 1 mm / 30g 11 ms

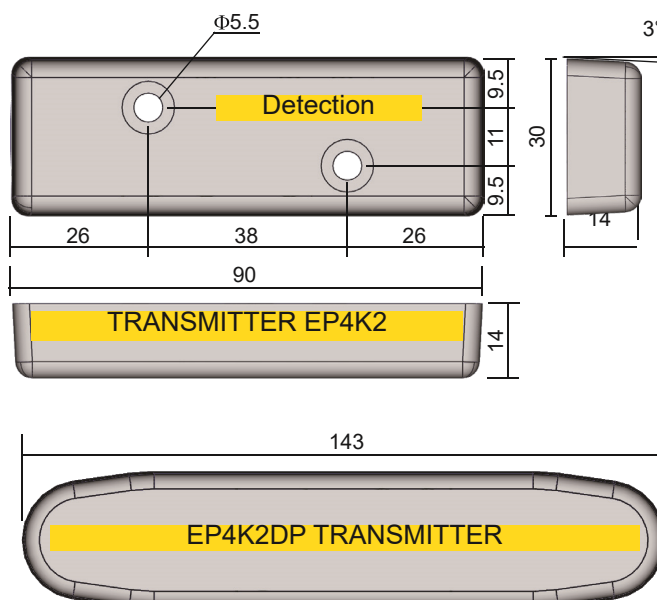
## 4. Assembly instructions

- Drill the holes of the mounting bracket at  $\Phi = 5.5$  mm, with a center distance of 38 mm x 11 mm.
- Use our stainless steel BH5-30 tamper-proof screws with the stainless washers (kit supplied) for mounting
- It is important to use the stainless steel washers supplied with the product.
- Once the door or casing is closed, the distance between the transmitter and the receiver must be 0.
- The bending radius of the cable must be greater than 50 mm.

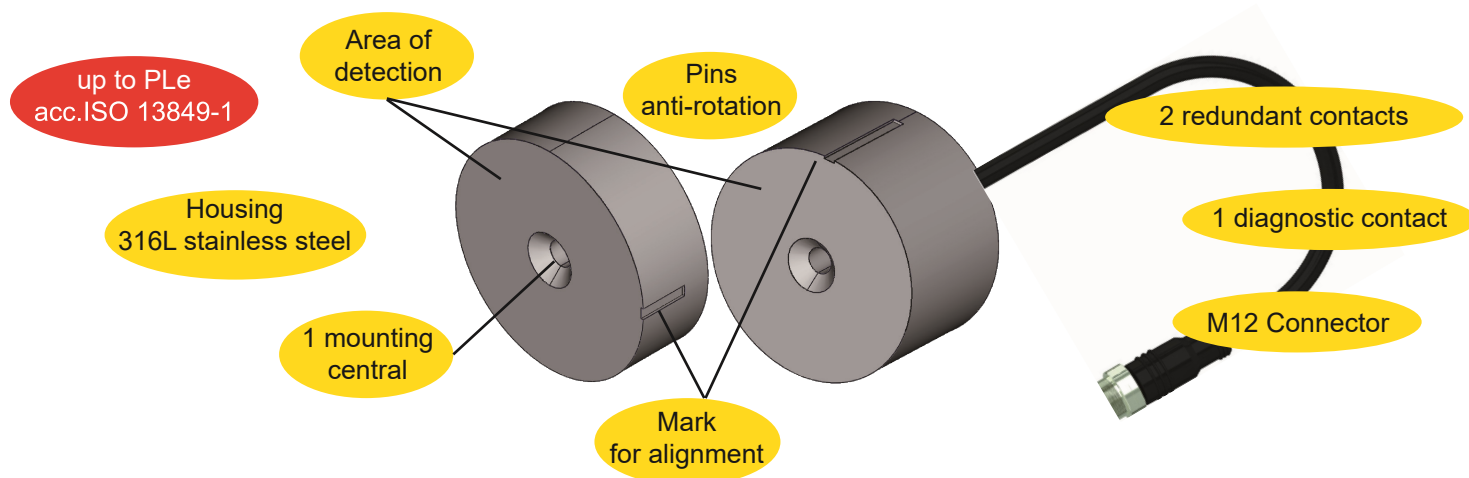
## 5. Transmitter dimensions



## Receiver dimensions



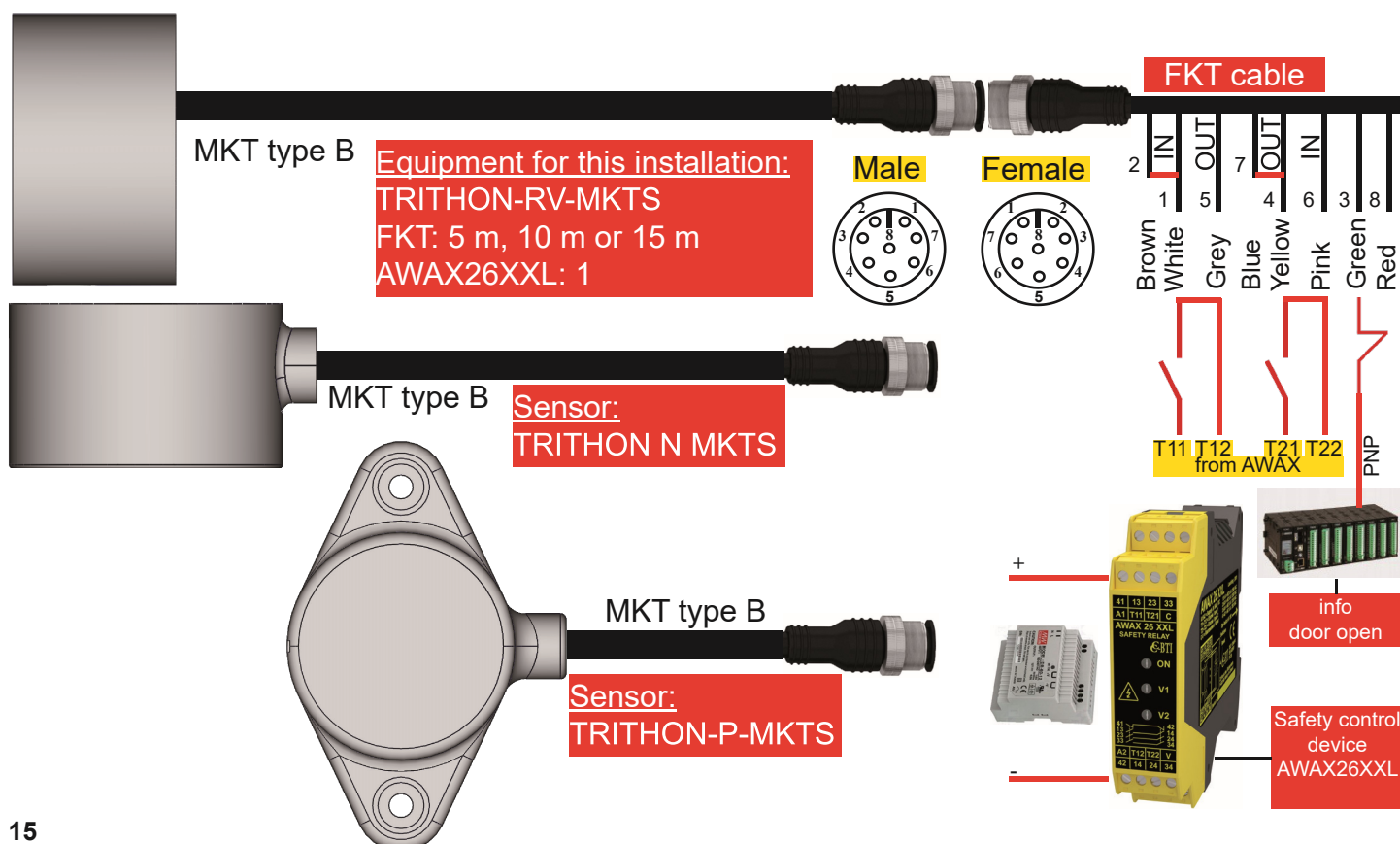
# The TRITHON series Safety sensor for protection in a dangerous machinery environment that is harsh, hygienic and has high temperatures



## 1. Benefits

- No adhesion of bacteria thanks to mirror-polished 316L stainless steel  $R_a = 1 \mu m$
- Controls the opening of doors and movable guards on dangerous machines
- This product is waterproof rated at IP69K and the detection surfaces are magnetic for 40 N
- Diagnostics with a PNP contact
- Connection by M12 connector molded onto a 50 cm or 220 cm PUR cable
- TRITHON-RV-MKTS Version: rear cable outlet, 1 central mounting
- TRITHON-N-MKTS Version: side cable outlet, 1 central mounting
- TRITHON-P-MKTS Version: side cable output, 2 mounts on the side tabs

## 2. Installation principle



# The TRITHON series Safety sensor for protection in a dangerous machinery environment that is harsh, hygienic and has high temperatures

## 3 . Main features

	N-MKTS	P-MKTS	RV-MKTS
Supply voltage	24 VDC max		
Current	35 mA		
Connection	Silicone cable 50 cm with M12-8 pins		
Cable diameter in mm	7 (M12 connector)		
Cable bend radius	> 50 mm		
Contact specifications at -30 °C (-22 °F)	24 V / 1.5 A, polarized		
Contact specifications at +60 °C (+140 °F)	24 V / 1.1 A, polarized		
Contact specifications at +110 °C (+230 °F)	24 V / 1 A, polarized		
Detection/hysteresis in mm	7 / 1		
Rotation tolerance	+/- 30 °		
Operating temperature	-30°C to +110°C (-22 to +230 °F)		
Housing water tightness	IP 69K		
Water tight connector	IP 67		
Weight with packaging	400 gr		
Vibration / shock	10 Hz to 55 Hz 1 mm / 30 g 11 ms		

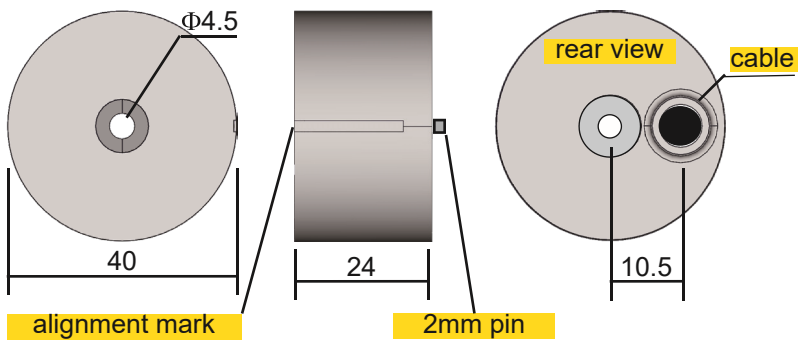
## 4. Assembly instructions (see §5, 6, 7)

- Type RV and N: drill the hole of the mounting bracket at  $\Phi = 4.5$  mm, drill the hole for the pin at 2.5 mm.
- Type P: drill the 2 holes of the mounting bracket at  $\Phi = 4.5$  mm.
- Type RV and N: set in the pin provided, use a countersunk M4 stainless steel screw for mounting.
- Type P: use 2 x M4 BH4 stainless steel screws for mounting, put on the screw covers.
- Align the engraved marks.
- Once the door or casing is closed, the distance between the transmitter and the receiver must be a minimum of 1 mm. The product should not be used as a mechanical stop.
- The bending radius of the cable must be greater than 50 mm.
- Type P: Fit on the 2 screw covers.

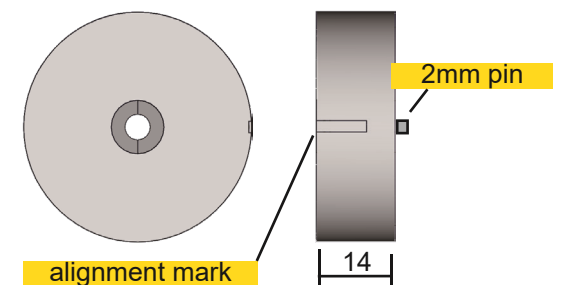


# The TRITHON series Safety sensor for protection in a dangerous machinery environment that is harsh with high temperatures

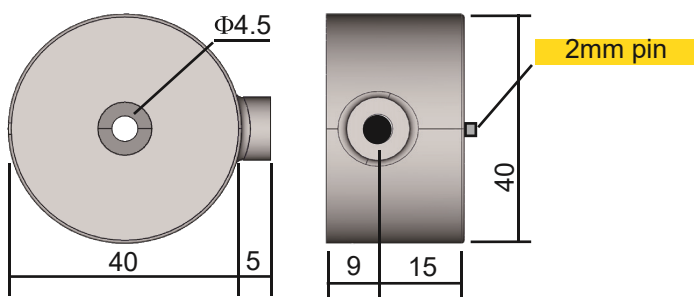
## 5. RV Type Receiver Dimensions



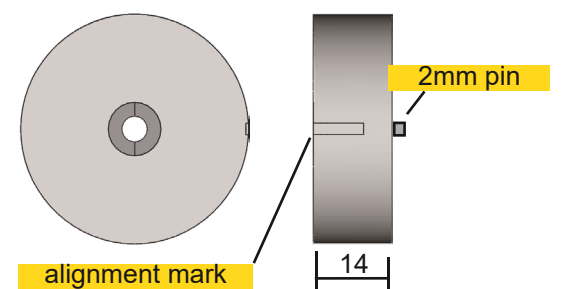
## RV Type Transmitter Dimensions



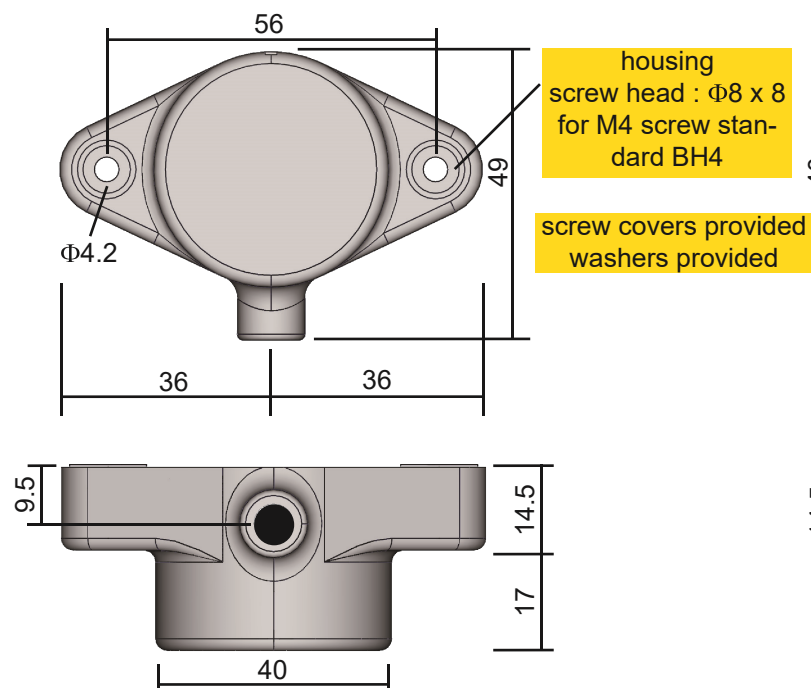
## 6. N-MKTS Type Receiver Dimensions



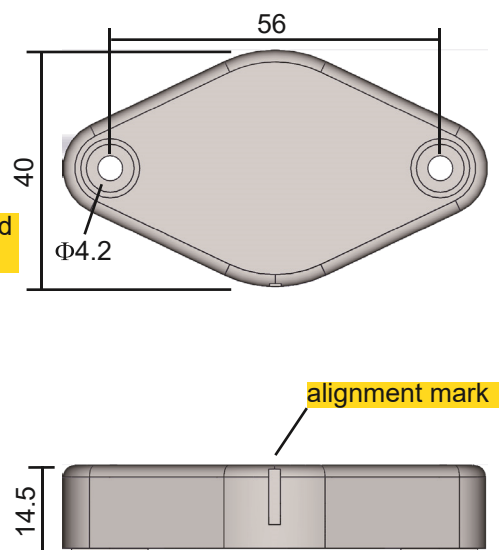
## N-MKTS Type Transmitter Dimensions



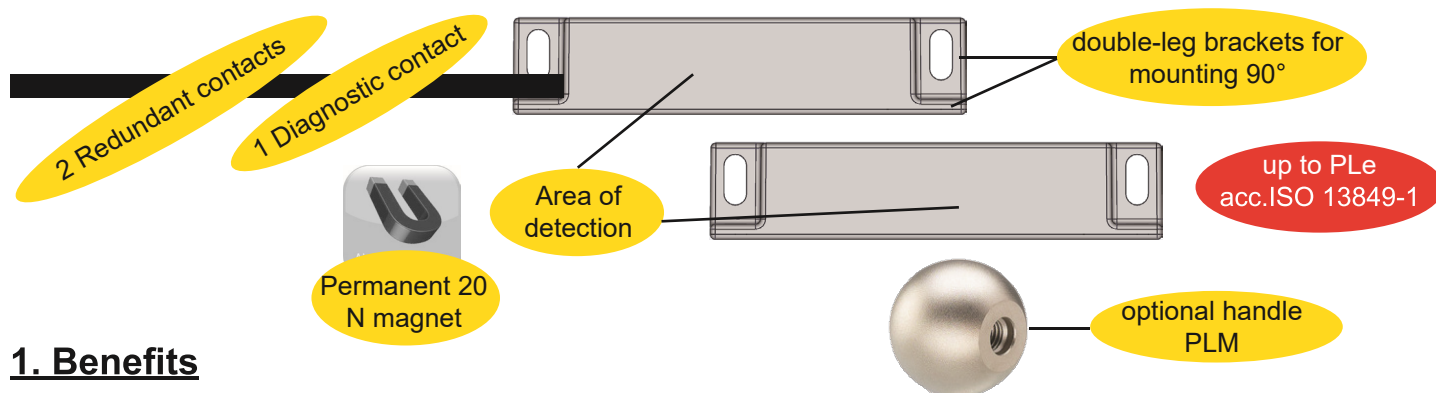
## 7. P-MKTS Type Receiver Dimensions



## P-MKTS Type Transmitter Dimensions



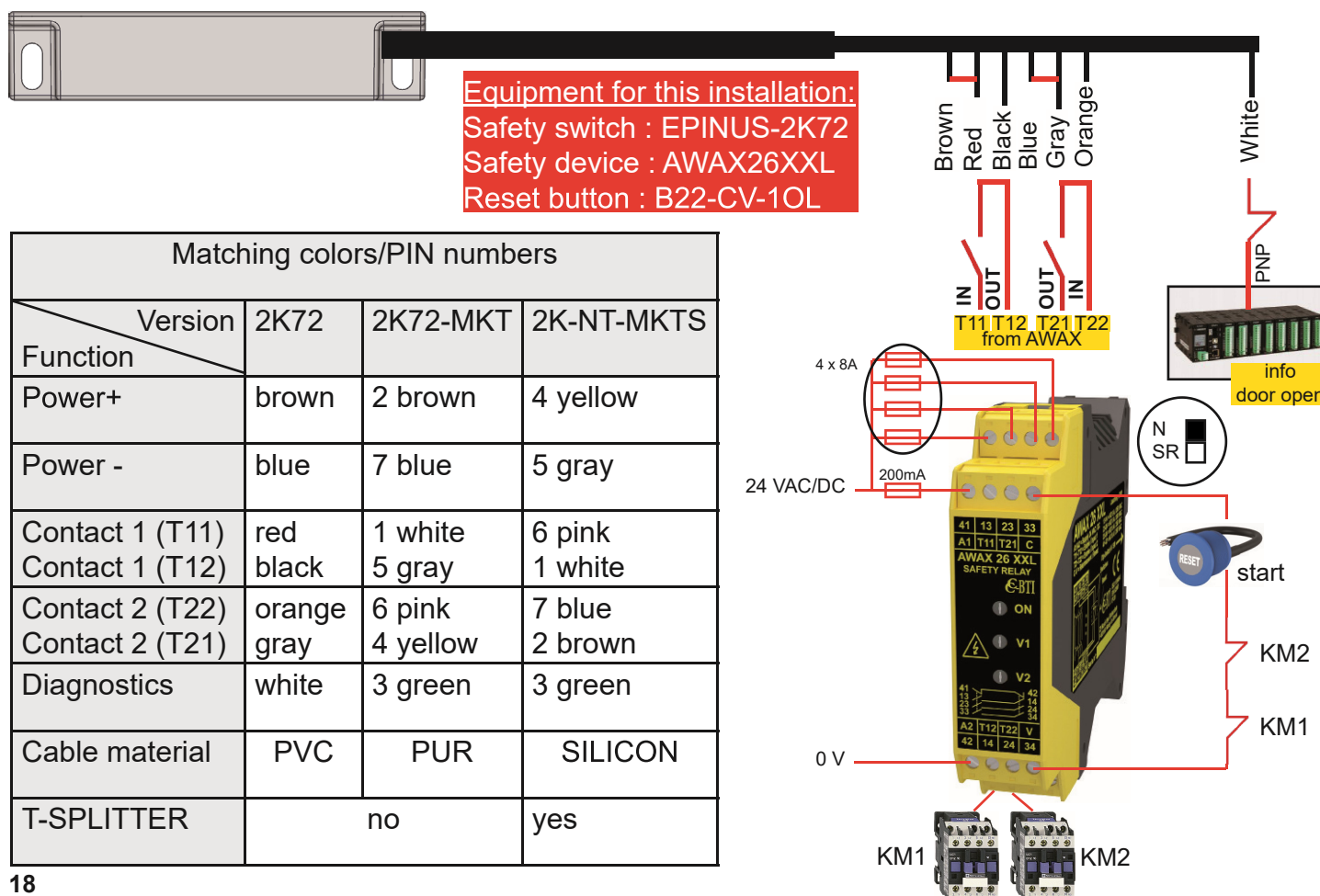
# The EPINUS 2K series Safety sensor for protection with magnetic hold 20 N



## 1. Benefits

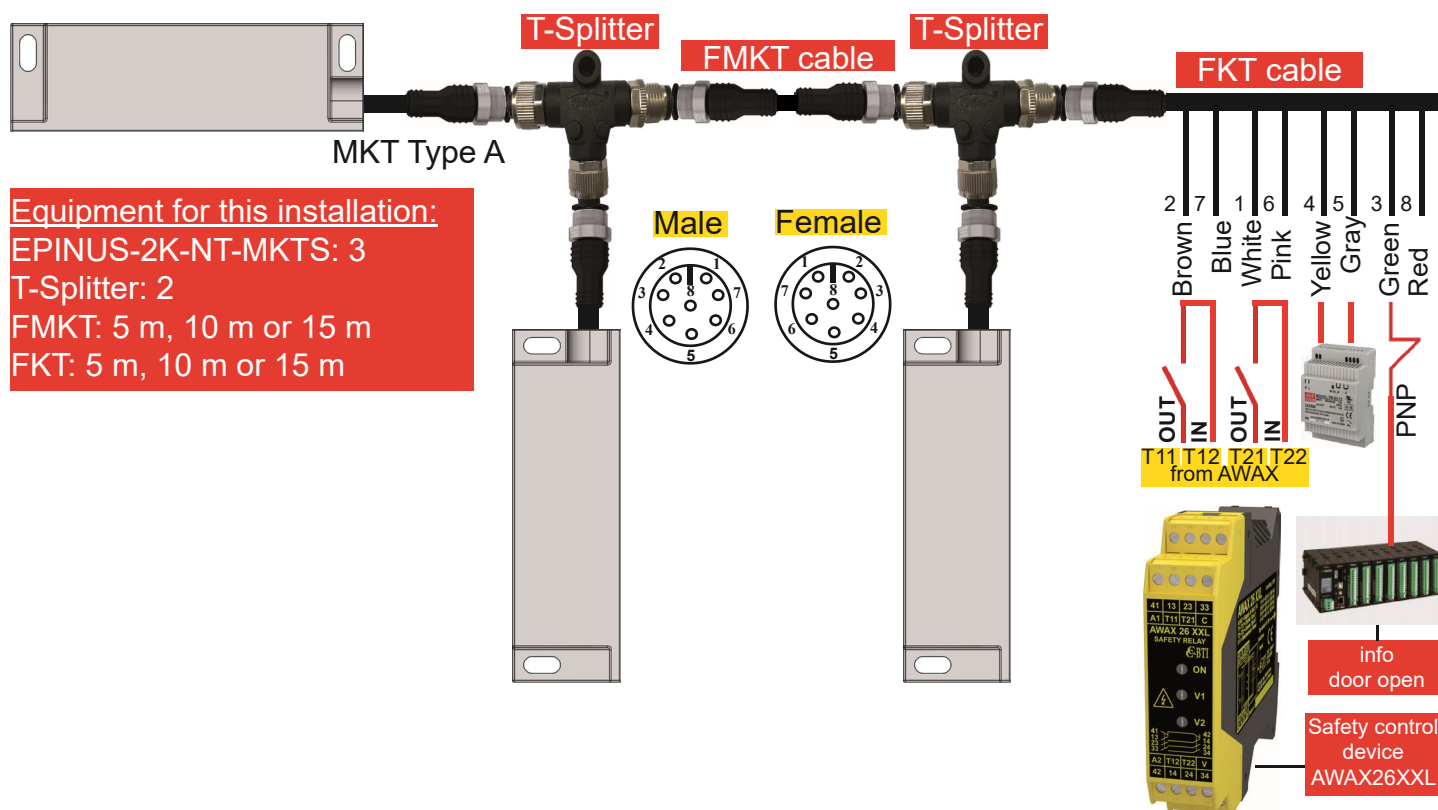
- Control the opening of doors and movable guards of dangerous machinery with shocks and vibrations
- This product is waterproof rated at IP69K and the detection surfaces are magnetic for 20 N
- Diagnostics with a PNP contact
- Version 2K72: PVC cable 3m, 6m, or 12m (consult us for other lengths)
- Version 2K72-MKT: PUR cable M12/8p 50 cm or 220 cm
- Version 2K-NT-MKTS: Silicone cable M12/8p 50 cm, automatic sequencing with T-SPLITTER
- Optional handle PLM : smooth surface of the PLM ball handles allows an excellent product cleaning

## 2. Installation principle for Version 2K72



# EPINUS 2K Series Safety sensor for protection in a harsh environment with magnetic hold 20 N

## 3. Installation principle for Version 2K-NT-MKTS



## 4. Main features

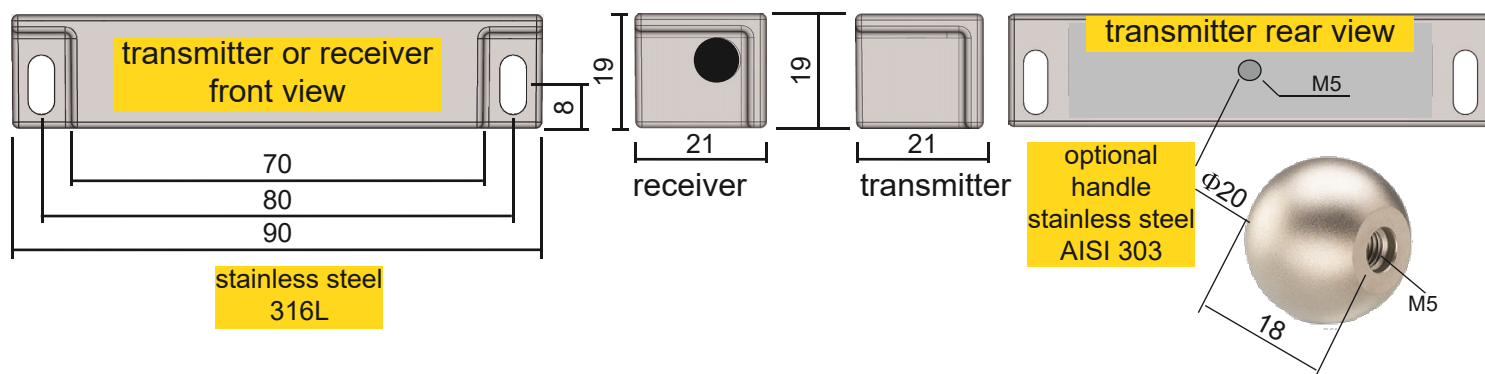
	2K72	2K-NT-MKTS
Supply voltage	20 to 28 VDC	20 to 30 VDC
Current	40 mA	50 mA
Cable connection version	PVC 7 x 0.25mm <sup>2</sup>	-
MKT cable connection version	PUR 50cm+M12-8 pins	SIL 50cm+M12-8 pins
Cable diameter	5.5 mm	7 mm
Cable bend radius	> 50 mm	
Specifications of contacts at -40 °C (-40 °F)	-	24 V / 2 A, polarized
Specifications of contacts at -25 °C (-13 °F)	48 V / 400 mA, floating contact	24 V / 2 A, polarized
Specifications of contacts at +60 °C (-140 °F)	48 V / 350 mA, floating contact	24 V / 1.5 A, polarized
Specifications of contacts at +80 °C (+176 °F)	48 V / 250 mA, floating contact	24 V / 1.3 A, polarized
Specifications of contacts at +125 °C (+257 °F)	-	24 V / 0.7 A, polarized
Detection/hysteresis in mm	3 / 2	2 / 1
Operating temperature	-25 °C to +80 °C (-13 to +176 °F)	-40 °C to +125 °C (-40 to +254 °F)
Sealing housing	IP 69K	
Sealing connector	IP67	
Weight with packaging	3 m: 440 grams	460 gr
Vibration / shock	10 Hz to 55 Hz 1 mm / 30 g 11 ms	

# EPINUS 2K Series Safety sensor for protection in a harsh environment with magnetic hold 20 N

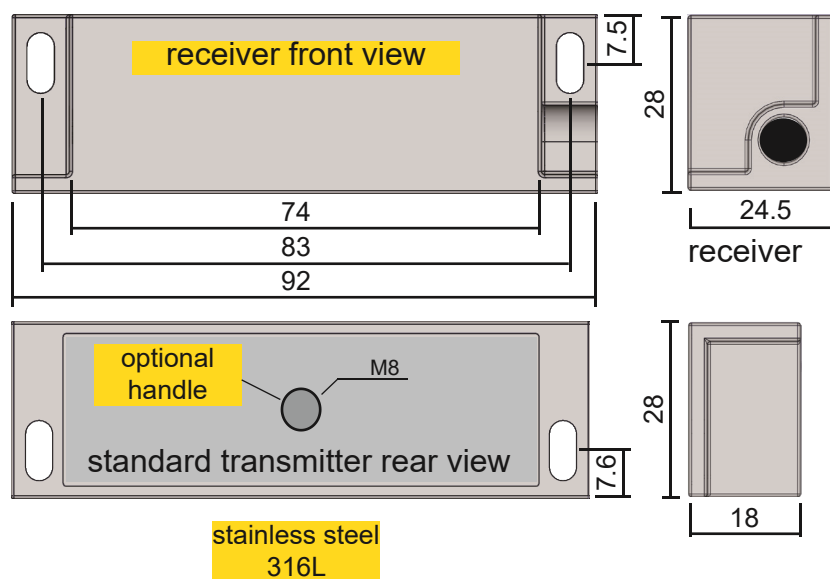
## 5. Assembly instructions

- Type 2K and 2K72: Drill the holes of the mounting bracket to  $\Phi = 4.5$  mm, center distance 80 mm
- Type 2K-NT-MKTS: Drill the holes of the mounting bracket to  $\Phi = 4.5$  mm, center distance 83 mm
- Use our stainless steel BH4-20 tamper-proof screws (optional) with the stainless washers (supplied) for mounting
- It is important to use the stainless steel washers supplied with the product.
- Once the door or casing is closed, the distance between the transmitter and the receiver must be 0.
- The bending radius of the cable must be greater than 50 mm.

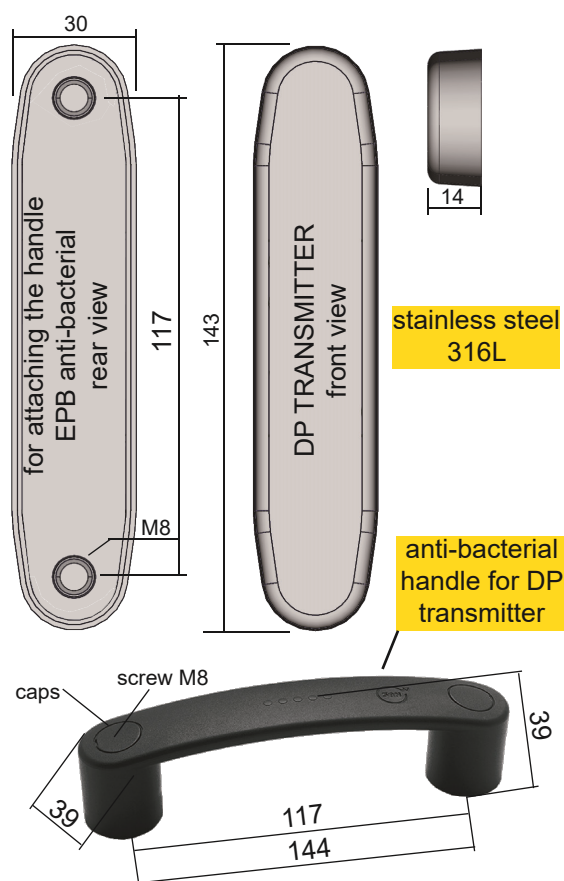
## 6. 2K72 Type Dimensions



## 7. 2K-NT-MKTS Type Dimensions

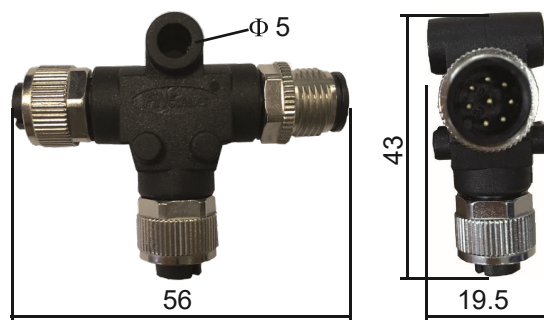


## 8. DP transmitter EPB handle



# THE IDEA! T-SPLITTER

## Plug & play connection



**INNOVATION FOR A SIMPLE, FAST, AND ECONOMIC CONNECTION**  
for the serialization of the safety sensors for mobile guards on dangerous machines

### 1. Benefits

- M12 connection system for automatic serialization of safety contacts and grouping of diagnostic outputs and safety sensors from the COMITRONIC-BTI brand
- The products to be connected are those which are labelled "Connector MKT type A"

### 2. List of "MKT type A" safety sensors for machine guards (non-exhaustive)

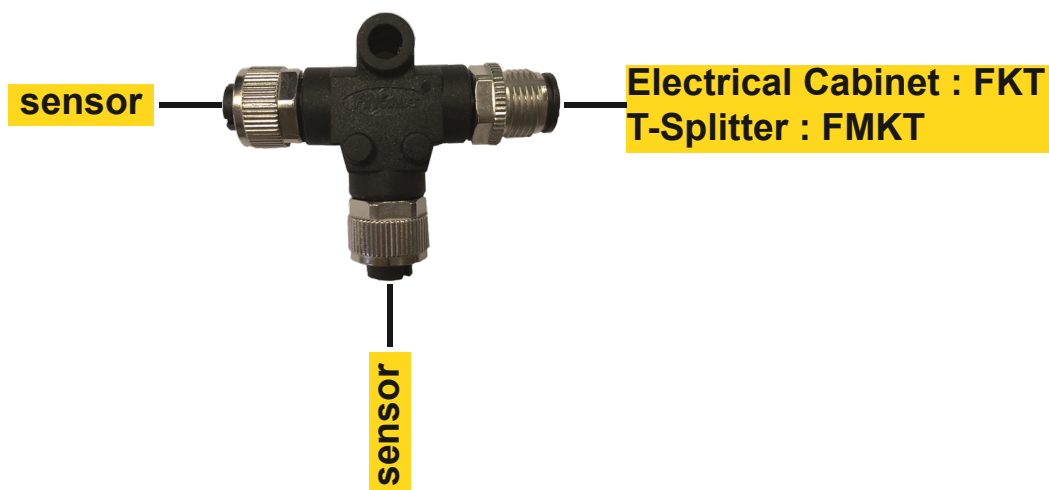
AMX5-MKT  
ANATOM78S-MKT  
M30-HY-MKT  
EPINUS2K-NT-MKTS

XORF-SAT  
ANATOM78S-485-MKT220  
XORF-SA-MKT

EPINUS4K-MKT  
HYGTECH-AV/AR-MKT  
M18-HY-MKT

### 3. Electrical connection cables

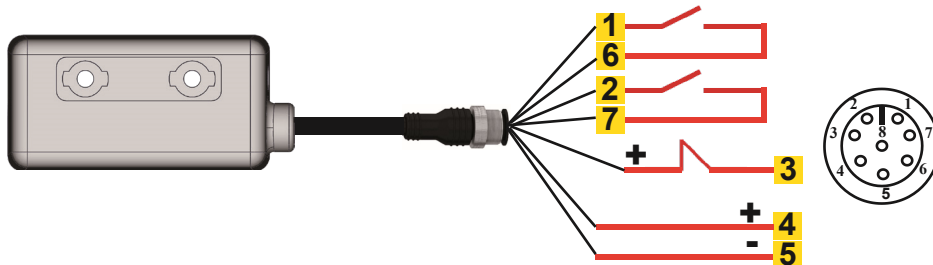
FKT-5M: PUR cable, length 5m, M12/8p female connection  
FKT-10M: PUR cable, length 10m, M12/8p female connection  
FMKT-5M: PUR extender, length 5m, male/female M12/8p connection  
FMKT-10M: PUR extender, length 10m, M12/8p male/female connection



# Principle of wiring of product

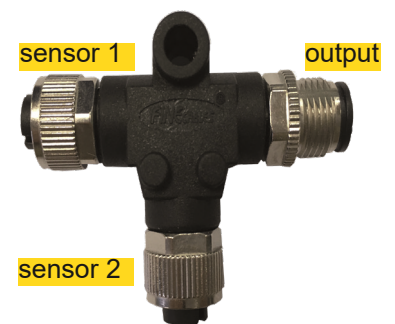
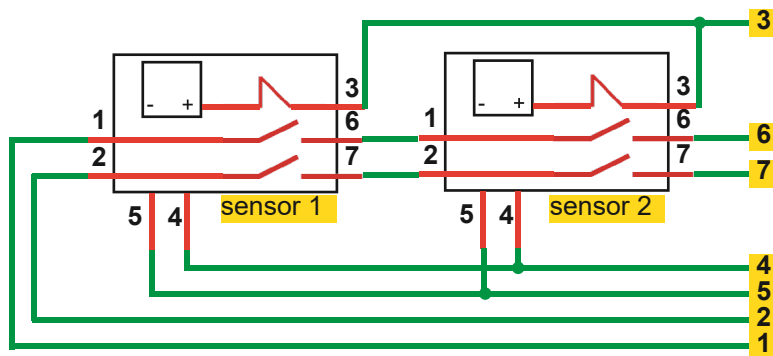
## 1. Principle of wiring of product

### 1.1 The product alone

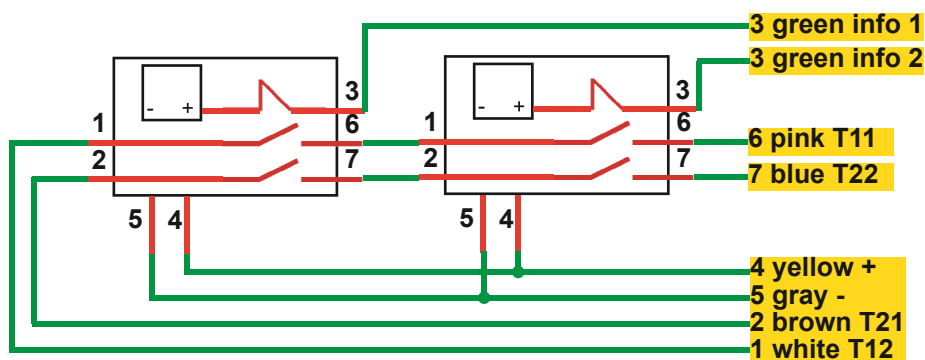


Broaching/Machining					
1	white	NO1 output	5	gray	0V
2	brown	NO2 output	6	pink	NO1 input
3	green	AUX	7	blue	NO2 input
4	yellow	+24V	8	red	nc

### 1.2 Principle of automatic connection with T-SPLITTER



### 1.3 Principle of connection on our AWAX box and separate door info







## EU DECLARATION OF CONFORMITY

This document is the conformity declaration concerning safety switches conforming to the Machine Directive 2006/42/CE, EMC Directive 2014/30/UE, RoHS2 Directive 2011/65/EU

### SAFETY SWITCHES

PRODUCT	ISO 13849-1	IEC 60947-5-3	ISO 14119
HYGTECH series	up to PLe with safety module	M3D6028AD2 / PDDB	TYPE 4 mid level
M30-HY-MKT		M3A30AD2 / PDDB	TYPE 4 low level
M18-HY-MKT	AWAX series or safety PLC	M3A18AD2 / PDDB	TYPE 4 low level
EPINUS4K-HY-MKT		M3D9530AD2 / PDDB	TYPE 4 mid level
EPINUS2K-NT-MKTS	MTTFd = 100y	M3C9228AD2 / PDDB	TYPE 4 low level
EPINUS2K/2K72	Proof test each 6 months	M3C9019AD1 / PDDB	TYPE 4 low level
TRITHON		M3B40AD1 / PDDB	TYPE 4 low level
TRITHON N MKTS	TM = 20y	M3B40AD2 / PDDB	TYPE 4 low level
TRITHON-P-MKTS		M3B40AD2 / PDDB	TYPE 4 low level
TRITHON-RV-MKTS		M3B40AD2 / PDDB	TYPE 4 low level

List of Test Standards (IEC 60947-5-3)			
EMC	Vibration	Shock	Temperature
IEC 61000-4-2	IEC 60068-2-6	IEC 60068-2-27	IEC 60068-2-14
IEC 61000-4-3			IEC 60068-2-30
IEC 61000-4-4			
IEC 61000-4-6			
IEC 61000-4-8			
IEC 61000-4-11			
IEC 61000-4-13			

Coded safety switch with Acotom process<sup>®</sup> to detect the position of the doors. The products are designed and manufactured according to UL508 /CSA C22.2 Regulation. Safety switches must be used following the diagram and directives described in our manual.

Place and date of issue: Noisy, August 11, 2018

Authorized signature:

Christophe Pays

Technical Manager

## Les boîtier de surveillance de la série AWAX



## Machine safety management system with decoding of the diagnostic outputs of the Modbus network

### The technological advantages

- Monitoring of sensor safety contacts for access control
- Connection to plug-in terminals
- Master management of the Modbus network of sensors for ANATOM78S-485-MKT diagnostic outputs
- Two redundant inputs for sensor safety monitoring
- Two connections for ModBus
- A connection for configuration
- 3 safety lines and one auxiliary line NF: model 26XXL=8A/250V, model 26XXL-T6=6A/250V
- 12 PNP/200 mA outputs for the status of each sensor + alarm

## Machine safety management system with redundant inputs and DLC short-circuit protection

### The technological advantages

- Monitoring of the safety contacts of ACOTOM® process sensors for access control
- Compatible with mechanical switches and emergency stops
- Suitable for dusty environments
- Redundant inputs with low power consumption 18.5 mA
- Channel status signalling: diagnostic aid by high brightness LEDs
- Dip switch for selecting manual or automatic reset mode
- 50% reduction in power consumption in the "work" position
- Version T6: detachable screw terminals with copper contacts
- Version T6C: Plug-in (screwless) push-pull terminals
- Rapid detection of short circuits in cables by the DLC\* circuit
- Automatic or controlled manual reset), selectable by dip-switch (N/SR)
- 3 NO safety lines and one auxiliary line NF 6A/250V