

COMPACT

EASY TO HANDLE

FLEXIBLE



# Beta

## TRANSMITTER

### For Ex-hazardous areas

Beta transmitter adapts to the application to make the process more efficient. This easy-to-use handheld remote control gives incomparable freedom of movement, high location accuracy and higher productivity while providing best operators' safety. With Beta transmitter, experience today's cutting-edge technology.

This transmitter is designed for use in potentially explosive gases atmospheres classified 0, 1, 2, dust classified 20, 21, 22 and mines.

#### MAIN FEATURES

- > Configurable, smart bi-directional radio link exchanges information while adapting to the radio environment.
- > User-friendly screen display for look-up, selection, validation, configuration...
- > Compact, easy-to handle casing for one-hand control.
- > Quick and easy setup for application configuration thanks to **iDialog** software (labels, feedback, alarms, mapping actuators/outputs, interlocks, network features, access by PIN codes).
- > Easy to maintain thanks to its diagnosis aid system (screen message, iDialog analysis software).



#### FULLY COMPLIANT WITH SAFETY AND SECURITY STANDARDS:

ATEX manufacturer  
2014/34/EU

EC type  
certificate  
issued by  
LCIE



Machinery directive 2006/42/EC:

Emergency stop

> SIL 3 per EN 61508

> Performance level PL e

per EN ISO 13849-1 and -2.

EC type certificate issued by TÜV  
NORD



Radio and telecommunication terminal  
equipment

(low voltage, electromagnetic  
compatibility, radio spectrum)

FCC part 15

ARCEP certificate

Radio Equipment Directive (RED)

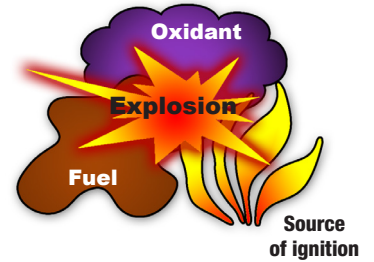


## DEFINITION OF A POTENTIALLY EXPLOSIVE ATMOSPHERE

### HOW AN EXPLOSION HAPPENS

An explosion is formed by an association of the following 3 elements:

- **An oxidant:**
  - ◆ in our case, the oxygen in the air.
- **A fuel:**
  - ◆ A gas (methane, acetylene, ...)
  - ◆ A fume (gasoline, solvent, ...)
  - ◆ A dust (wood, sugar, grain, ...).
- **A source of ignition:**
  - ◆ An electric arc
  - ◆ A mechanical spark
  - ◆ A high temperature



### CONSEQUENCES OF AN EXPLOSION

Explosions are responsible every year for around 6 deaths and 387 persons with permanent disability (IP) out of 379 accidents. These can produce major catastrophes, such as the explosion at the «AZF» plant at Toulouse (France) in 2001 or the «Blaye silo» near Bordeaux (France) in 1997, resulting in a large number of deaths and injuries, and destruction of the sites.

### PROTECTION AGAINST EXPLOSIONS

It is necessary to evaluate the specific hazards created by explosible atmospheres, keeping in mind :

- ◆ the probability that **explosible atmospheres will** occur and persist,
- ◆ the probability that **sources of ignition**, including **electrostatic discharges**, are present and will become active and effective,
- ◆ the **installations, substances and methods** used, and their possible **interactions**,
- ◆ the extent of the **foreseeable consequences**.

**The explosion hazards must be evaluated globally.**

**In practice, this requires:**

- ▣ Identification of zones representing a hazard and substances which could create explosible atmospheres.
- ▣ Classification of the explosive atmospheres in zones where there is an explosion hazard, assisted if necessary, by an outside organization.
- ▣ Definition of the equipment required to carry out the project.

With reference to user ATEX directive 99/92/CE.

The zones are standardised in accordance with their degree of dangerousness.

■ **Definition of explosion hazard zones linked to:**

#### GASES, FUMES AND FOG

**ZONE 0:** location where an explosive atmosphere, consisting of a mixture with the air of combustible material in the form of gases, fumes or fog, is present continuously or over extended periods of time, or frequently.

**ZONE 1:** location where an explosive atmosphere, consisting of a mixture with the air of combustible materials in the form of gases, fumes or fog, is likely to form occasionally under normal operation.

**ZONE 2:** location where an explosive atmosphere, consisting of a mixture with the air of combustible materials in the form of gases, fumes or fog, is not likely to form during normal operation, or should such a formation occur, is nonetheless only of short duration.

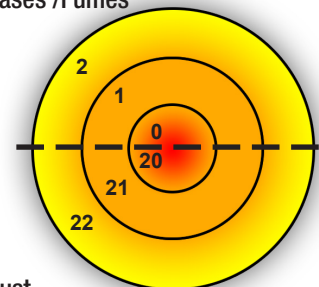
#### DUST

**ZONE 20:** location where an explosive atmosphere in the form of a cloud of combustible dust is present in the air continuously, or over extended periods of time, or frequently.

**ZONE 21:** location where an explosive atmosphere in the form of a cloud of combustible dust may occasionally form in the air during operation.

**ZONE 22:** location where an explosive atmosphere in the form of a cloud of combustible dust is not likely to form in the air during normal operation, or should such a formation occur, is nonetheless only of short duration.

#### Gases /Fumes



#### Dust


- Continuous hazard
- Hazard present during normal operating conditions
- Limited hazard in the event of failure of a system (limited in time)




DEFINITION OF MARKINGS ON  
ATEX - IECEx PRODUCTS

Since April 20, 2016, all Ex products must satisfy the requirements of the directive ATEX 2014/34/UE, the evolution of the standard 60079-0 leads to a new product marking presented in the following tables :

**Transmitter Beta ATEX:**



**Beta 2 ATEX**

CE 0081 

1 2 3  
**II 1 G D**

4 5 6 7  
**Ex ia IIB T4 or 145°C Ga (1)**

8 9 10 7  
**Ex ia IIIC T135°C or T145°C Da (1)**

1 2 3  
**II 2 G D**

4 5 6 7  
**Ex ia IIC T4 or 145°C Gb (1)**

8 9 10 7  
**Ex ia IIIC T135°C or T145°C Db (1)**

1  
**I M1**

**Ex ia I Ma**

11  
**LCIE 14 ATEX 3055 X**

12  
**IECEx LCIE 14.0049 X**

(1) Temperature classes depending on Tamb :  
-20°C ≤ Tamb ≤ +40°C, temperature classes are T4 for gas and T135°C for dust.  
+40°C ≤ Tamb ≤ +50°C, temperature classes are 145°C for gas and T145°C for dust.

Below are the tables to understand the ATEX marquing :

**1 Device group**

Device group	Application
Group I	Electrical devices intended for use in firedamp mines. (underground work in the mines and parts of ground installations) => Protection against firedamp
Group II	Electrical devices intended for all other explosible atmospheres than firedamp mines (ground industries) => Protection against explosions

**2 3 ATEX classification**

Category of equipment	Flammable substances	Degree of protection	Description
1	G Gas D Dust	Very high level	Devices capable of operating in the atmospheres where the risk of explosion is permanent or almost permanent (zones 0, 1, 2 and 20, 21, 22)
2	G Gas D Dust	High level	Devices capable of operating in the atmospheres where the risk of explosion is frequent (zones 1, 2 and 21, 22)
3	G Gas D Dust	Normal	Devices capable of operating in the atmospheres where the risk of explosion is occasional (zones 2 and 22)



#### 4 Protection modes for electrical equipment in gaseous atmospheres

Protection mode		Standard	Basic principle	Application in ZONE		
				0	1	2
d	Explosion proof enclosure	EN/IEC 60079-1	The extremely heavy duty enclosure contains the explosion inside the device. The explosion proof seals of the device prevent any propagation of the flame outside the enclosure. The seals are regularly serviced.		●	●
e	Enhanced safety	EN/IEC 60079-7	The components inside the enclosure must not produce arcs, sparks or dangerous temperatures under normal utilization conditions. The enclosure must be tight to IP 54 and withstand impacts.		●	●
i	Intrinsic safety	ia	EN/IEC 60079-11	The actual design of the circuit, where the energy is limited at the entry by a Zener barrier or a galvanic insulator makes it impossible for arcs or electrical sparks to form, subdivided into "ia" resists 2 defects: suitable for zone 0, and "ib" resists 1 defect: suitable for zones 1 and 2.	●	●
		ib	EN/IEC 60079-11	The actual design of the circuit, where the energy is limited at the entry by a Zener barrier or a galvanic insulator makes it impossible for arcs or electrical sparks to form, subdivided into "ia" resists 2 defects: suitable for zone 0, and "ib" resists 1 defect: suitable for zones 1 and 2.		●
m	Encapsulation	EN/IEC 60079-18	For this protection mode, all the electronics is encapsulated in an insulating material to prevent electrical arcs or electrical sparks.		●	●
n	Zone 2	EN/IEC 60079-15	This protection mode is only suitable for devices intended for zone 2 where the risk of explosion is low. It combines the enhanced safety mode "e" with lower protection requirements.			●
o	Immersion in oil	EN/IEC 60079-6	The material or the electrical circuit is immersed in oil. The explosive mixture is located above the liquid and cannot be ignited by the electrical circuit.		●	●
p	Internal overpressure	EN/IEC 60079-2	A pressurized gas is introduced in the enclosure to prevent the possibly-explosive surrounding atmosphere from entering the enclosure.		●	●
q	Powdery filler	EN/IEC 60079-5	For this protection mode, all the electronics is encapsulated in an inert powdery material to prevent electrical arcs or electrical sparks.		●	●

#### 5 Classification of gases and fumes by explosion groups (non-exhaustive list)

Group IIA		Group IIB		Group IIC
Propane	Acetone	Ethylene	Ethyl oxide	Acetylene
Ethane	Hexane	Diethylene	Sulphuretted hydrogen	Hydrogen
Butane	Methanol	Ethyl ether	Ethanol	Carbon disulfide
Benzene	Paint thinners	Cycloprodene		
Pentane	Natural gas	Butadiene 1-3		
Heptane		Propylene oxide		

#### 6 Gas temperature classes

The safe use of equipment in dangerous areas requires knowledge of the gas group and compare the temperature auto-ignition of gaseous mixtures treated to the temperature of equipment marking.

The maximum surface temperature of the material must always be less than the autoignition temperature of the gas present in the dangerous area.

Temperature class	MAXIMUM surface temperature of electrical equipment	Ignition temperatures of FLAMMABLE materials
T1	450°C	> 450°C
T2	300°C	> 300°C
T3	200°C	> 200°C
T4	135°C	> 135°C
T5	100°C	> 100°C
T6	85°C	> 85°C



### 7 Equipment protection level (EPL)

Traditional relationship between level of protection and areas / categories (without additional risk assessment).

Equipment protection level (EPL)	Normal range of application	Category (2014/34/UE)
Ga	0 (and 1 and 2)	1G
Gb	1 (and 2)	2G
Gc	2	3G
Da	20 (and 21 and 22)	1D
Db	21 (and 22)	2D
Dc	22	3D
Ma / Mb	mines	M1 / M2

### 8 Protection modes for electrical equipment in dusty atmospheres

Protection mode			Standard	Basic principle	Application in ZONE		
					20	21	22
i	Intrinsic safety	ia	EN/IEC 60079-11	The actual design of the circuit, where the energy is limited at the entry by a Zener barrier or a galvanic insulator makes it impossible for arcs or electrical sparks to form, subdivided into "ia" resists 2 defects: suitable for zone 0, and "ib" resists 1 defect: suitable for zones 1 and 2.	●	●	●
		ib	EN/IEC 60079-11	The actual design of the circuit, where the energy is limited at the entry by a Zener barrier or a galvanic insulator makes it impossible for arcs or electrical sparks to form, subdivided into "ia" resists 2 defects: suitable for zone 0, and "ib" resists 1 defect: suitable for zones 1 and 2.	●	●	●
m	Encapsulation	EN/IEC 60079-18	For this protection mode, all the electronics is encapsulated in an insulating material to prevent electrical arcs or electrical sparks.	●	●	●	
p	Internal overpressure	EN/IEC 60079-2	A pressurized gas is introduced in the enclosure to prevent the possibly-explosive surrounding atmosphere from entering the enclosure.	●	●	●	
t	Explosion proof enclosure	EN/IEC 60079-31	The extremely heavy duty envelope contains the explosion inside the device. The explosion proof seals of the device prevent any propagation of the flame outside the enclosure. The seals are regularly serviced.	●	●	●	

### 9 Classification of dust by explosion groups

Explosion groups	Type of dust	Fundamental principle
Group IIIA	Combustible dust in suspension	Very fine solid particles of nominal size of about 500 microns or less, can be suspended in the air, which can be deposited because of their own weight and that can burn or be consumed in the air and are susceptible to form explosive mixtures with air under conditions of atmospheric pressure and normal temperature.
Group IIIB	Non-conductive dust	Combustible dust electrical resistivity greater than 10 <sup>3</sup> Ω.m. Size < 500 μm
Group IIIC	Conductive dust	Combustible dust electrical resistivity at or below 10 <sup>3</sup> Ω.m. Size < 500 μm

### 10 Maximum surface temperature for dusty atmospheres

### 11 LCIE : certificate of EC type examination number

### 12 LCIE : IECEx certificate number

TRANSMITTER  
Beta ATEX



OPTIONAL  
PUSHBUTTON



OPTIONAL  
M12 INDUSTRIAL  
CONNECTOR FOR  
CONNECTING TWO DRY  
CONTACTS



OPTIONAL  
BNC ANTENNA  
CONNECTOR

OR

BREATHABLE  
MEMBRANE  
TO PREVENT  
CONDENSATION



OPTIONAL  
BUZZER 80 DBA



BIDIRECTIONAL  
RADIO LINK

INTEGRATED  
REINFORCED ABS  
AND PROTECTIVE FOAM

SEALS

NAVIGATION  
BUTTONS

CASING SHAPED  
TO PREVENT  
UNINTENTIONAL ACTIONS



2+4 model

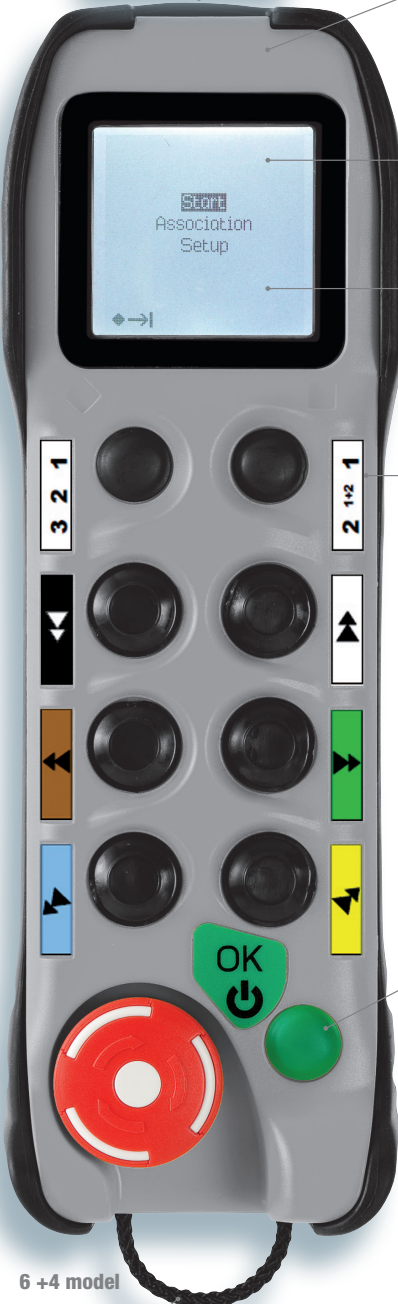
EMERGENCY STOP  
PALMSWITCH  
SIL 3 - PL e

OPTION  
AUTOMATIC  
DETECTION OF INACTIVITY  
«DEAD MAN»

TOUGH BACKLIT SCREEN  
WITH  
ANTI-REFLECTION,  
SHOCK-PROOF,  
ANTI-SCRATCHING  
FEATURES

MULTIMODES  
OPTION

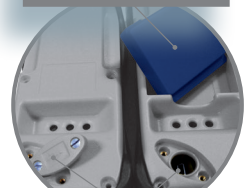
LABELS FOR IDENTIFYING  
FUNCTIONS



6+4 model

ON / VALIDATION BUTTON

HIGH-CAPACITY  
PLUG-IN BATTERY  
(6+4 MODEL)



SEALED USB  
INTERFACE FOR  
DIAGNOSIS,  
CONFIGURATION

CARRYING  
STRAP

# TRANSMITTER Beta ATEX



## DESCRIPTION

The transmitter comes in two versions:

> « **2+ 2(a)** »<sup>(a)</sup> transmitter with 2 function buttons<sup>(b)</sup>:

- 2 single-action pushbuttons
- OR** 2 double-action pushbuttons

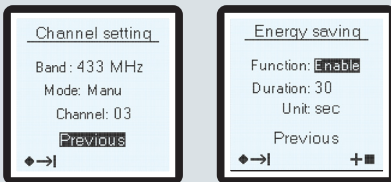
> « **6 + 2** »<sup>(a)</sup> transmitter with 6 function buttons<sup>(b)</sup>:

- 6 single-action pushbuttons
- OR** 6 double-action pushbuttons
- OR** 4 double-action pushbuttons + 2 single-action pushbuttons (under the navigation buttons)

<sup>(a)</sup> Each version has 2 navigation pushbuttons

<sup>(b)</sup> The single-action pushbuttons can be configured as selectors for 2, 3 or «n» positions with status indication on the screen.

The screen on the transmitter allows configuring easily and choosing items such as:



- > Screen language
- > Receiver which you want to use
- > Radio transmit frequency and power
- > Duration of the « standby » time delay (Automatically stops operator module and associated receiver if not used for a defined period of time)
- > Operating modes of the equipment (32 max.)

### It also displays:

- Battery charge level
- Radio communication
- Equipment labels and controlled functions (max 96 different labels for selectors)
- Equipment feedback (16 feedbacks max with 10 labels / feedback - 48 labels max in total)
- Alarms (8 for application use + 8 for system)

### Compatibility:

These transmitters work with Elio, Alto, Timo, Nemo receivers to be defined according the application.

## TECHNICAL CHARACTERISTICS

### MECHANICAL CHARACTERISTICS AND ENVIRONMENTAL WITHSTAND CAPACITY

Housing material	shock-resistant reinforced ABS with anti-static charge
Water tightness	IP65
Weight (with battery)	2 + 4 buttons: 400 g 6 + 4 buttons: 485 g
Dimensions	2 + 4 buttons: 182 x 75 x 50 mm 6 + 4 buttons: 235 x 75 x 50 mm
Storage	2 + 4 buttons: on charger support for transmitter 6 + 4 buttons: on mechanical support
Carrying	by 2-point shoulder strap

### ENVIRONMENTAL WITHSTAND CAPACITY

Operating temperature	-20°C to + 50°C
Storage temperature without battery	-20°C to + 70°C
Battery storage temperature	-20°C to + 50°C

### ELECTRICAL AND RADIO CHARACTERISTICS

Power supply	Li-Ion battery 2 + 4 buttons: internal battery 6 + 4 buttons: plug-in battery
Mode de charge de la batterie	2 + 4 buttons: on charger support for transmitter 6 + 4 buttons: on charger for battery
Autonomy (25°C) radio radio activated	100% time 10 hours
Frequency selection	64 frequencies for 433-434 MHz 12 frequencies for 869 MHz 64 frequencies for 911-918 MHz
Manual / automatic	
Emission power	< 10 mW (license free)
Range limitation	Selectable 10 levels of power
Modulation	FM
Average range <sup>(1)</sup>	100 m in industrial environment <sup>(1)</sup> 300 m in open space <sup>(1)</sup>
Charging time (autonomy > 80%)	3 hr (20 mn of charge provides 1 hr autonomy)
Charging temperature range	0°C to + 40°C

### FUNCTIONAL CHARACTERISTICS

Display	Backlit LCD display, 128 x 128 pixels 42mm (W) x 40mm (H) Black / White
USB interface for configuration and diagnostics	mini-B 5-point USB connector Easy access in a compartment on the backside of transmitter
Operating indications	Displayed on screen (radio link status, battery status, status of buttons, information feedbacks...)
Function buttons	2 or 6 pushbuttons (available as single or double-action buttons and configurable as selectors with n positions)
Navigation and startup buttons	2 pushbuttons to configure the product 1 On / Validation button (for startup and validation of menus on screen)
Emergency stop	2 positions with rotary unlock system
Standby function	User-defined time delay (from 1 s to infinity)

<sup>(1)</sup> Range varies according to environment conditions around transmitter and reception antenna (steel works, metal walls, etc.).

## ADVANCED OPTIONS

### M12 INDUSTRIAL CONNECTOR FOR 2 DRY CONTACTS

- 4 connection terminals
- switching capacity < 10 mA
- male socket
- supplied with cap

ACCESSORIES



Standard charger support for Beta 2+2 transmitter

Standard version references

PWCB020  
Dimensions: 220 x 82 x 76 mm  
Power supply: 12/24 Vdc  
Power: 7 W

References for version with 2 relays + 1 logic input + buzzer

PWCB021

References version with 1 relay + 4 logic inputs + buzzer

PWCB022



Battery charger

Reference: PWC  
Dimensions: 170 x 65 x 36 mm  
Power supply: 12/24 Vdc  
Power: 7 W

Plug-in Li-ion battery for Beta 6+2 transmitter

Reference: PYB  
Dimensions: 57 x 56 x 16 mm  
Voltage: 3,7 V  
Capacity: 1900 mAh  
Technology: lithium Ion



IMPORTANT

The battery shall not be charged in potentially explosive area.



Mains power adapter for battery charger

Reference: UBCU  
Dimensions: 41 x 72 x 39 mm  
Power supply: 100-240 Vac  
Output: 12 Vdc  
Power: 7 W



Cigarette lighter plug adapter for battery charger

Reference: PWA4  
Dimensions: 90 x 20 x 20 mm  
Power supply: 12-24 Vdc  
Output: Power supply



Removable 2-point shoulder strap

Reference: PYM110

M12 female 4/5 points cable

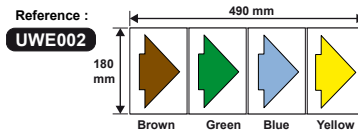
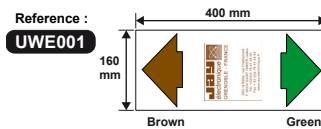
Reference: PWM201  
Length: 2 m



Mechanical support for Beta 6+2 transmitter

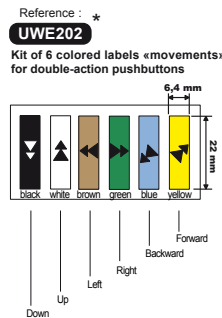
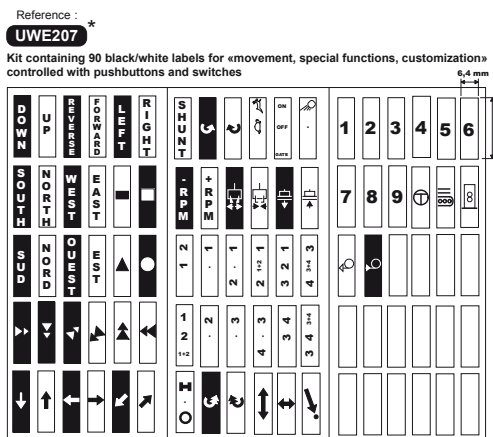
Reference: PWCB06M  
Dimensions: 272 x 82 x 76 mm

Sheet of adhesive labels for 5 mobile equipment

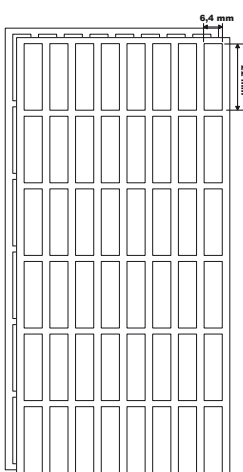


Sheet of adhesive labels for transmitters

The buttons function are identified by adhesive labels in the recesses in the transmitter casing next to the pushbuttons.



Reference :  
**UWE205**



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A company of



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