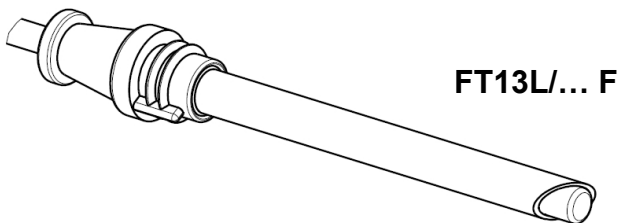
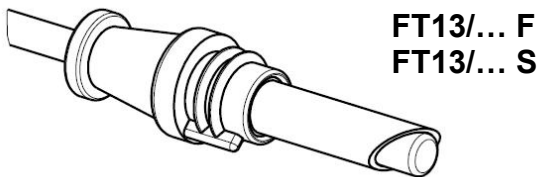
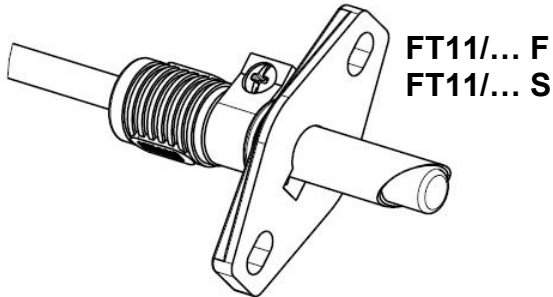


# PHOTOTRANSISTORS

## FT11, FT13

### FLAME SENSORS FOR OIL OR BIOMASS BURNERS



#### Introduction

Flame detection in oil burners occurs by means of sensors detecting the presence of flame through an electrical signal, which can be used by ignition and control devices.

FT use a phototransistor to detect the light generated by the flame and are in compliance with the directive RoHS 2011/65/EU and the delegated directive 2015/863EU known as RoHS III.

#### Description

These sensors, originally used for detecting the flame generated by oil burners, are also suitable for biomass burners (pellets, wood, seeds, etc). The sensing element changes its current according to the incident light and this property is exploited to detect the presence of flame in the burner.

Brahma phototransistors are available in two models, FT11 and FT13, which are distinguished by a different case.

A FT13L was created to expand this product portfolio: is equal to FT13 only has neck longer.

These sensors are designed to be coupled to Brahma control units and have been developed to replace previous photocells FC. For compatibility please refer to Table 3 and to the wiring diagrams. FT can be used with other controllers after a mandatory test of suitability.

The connection cable has a standard length of 620mm, the operating temperature range must be strictly between -20°C and + 70 ° C and the maximum operating voltage is +12Vdc.

#### Sensitivity

The sensitivity is within the range 300-750 nm, including thus the spectrum of visible light.

It is the installer's responsibility to place the phototransistor in a suitable and noise-free ambient light.

Given the many applications in which this sensor can be used it was thought to realize it with three different degrees of sensitivity, identified by the casing color: green for low sensitivity, red for medium sensitivity and blue for high sensitivity.

To connect FT11 - FT13 to controllers not made by Brahma refer to the data of Table 1 and verify the suitability.

Sensitivity		Low			Medium			High		
Colour		GREEN			RED			BLUE		
		Current [ $\mu$ A]			Current [ $\mu$ A]			Current [ $\mu$ A]		
$V_{DC}$	Lux	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max
5	0	0	0	0.05	19	20	21	37	38	39
	3	5	9	10	25	29	31	43	47	49
	10	18	30	34	38	50	55	56	68	73
10	0	0	0	0.05	39	40	41	75	76	77
	3	5	9	10	45	49	51	81	85	87
	10	18	30	34	58	70	75	93	106	111

Measurements performed at 25°C.

Table 1

**NOTE:** Possible customizations of the output current are available according to customer's requirements.

### Flame detection

Both FT11 and FT13 can see the flame from different view. The Front and the Side view includes a protective cap for the sensor. Possible realizations are:

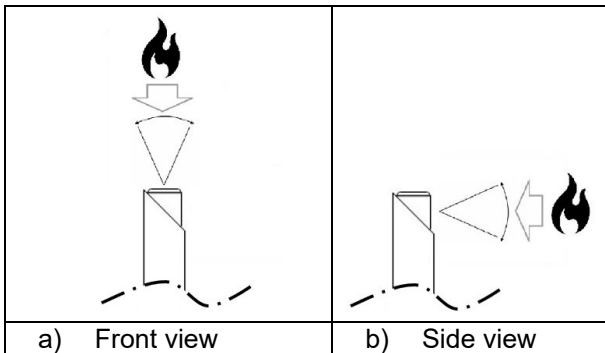


Table 2

### Installation

As the phototransistor is polarized it is important to connect the light blue wire to the neutral of the control unit.

For a correct phototransistor-to-device coupling please refer to Table 2 below, to the technical documentation of the devices using these sensors and to the wiring diagrams.

Brahma control units that can be coupled to FT sensors
EUROOIL: VM440 / VM450
DIGITAL MICROFLAT "N": NDMxx and DMNxx
KOMPACT SERIES: TGRx (analog) and TGRDxx (digital)
OIL-SYSTEM SERIES: OS1 OS2
EUROOIL S10:
GR1 GR1/Z GR2
OR1 OR1/Z OR2 OR3/B
DIGITAL EURO-OIL: DR1 / DR2
EURO-OIL: BT..O

Table 3

For the use of the FT with other control units not manufactured by Brahma it is necessary to make a verification of suitability.

### Overall dimensions (mm)

- FT11 /... F
- FT11 /... S

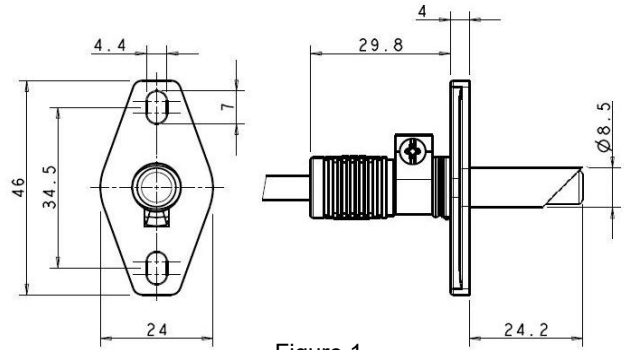


Figure 1

- FT13 /... F
- FT13 /... S

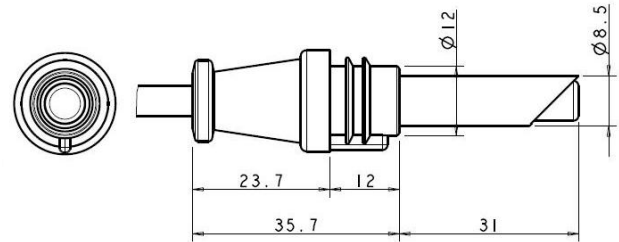


Figure 2

Only with front view is available FT13L: this fit in burner with the flame far away from the hole of insertion of phototransistor. See realization in figure 3

- FT13L /... F

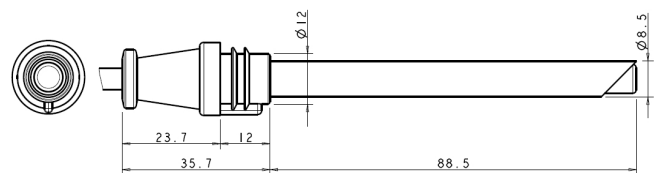
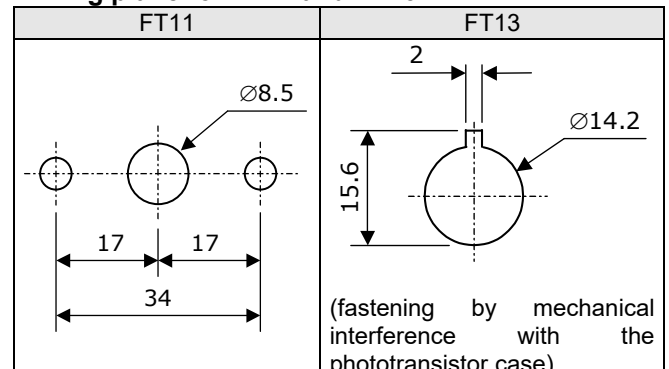


Figure 3

**Note:** to remove FT from its burning position pull always from the sleeve / housing and never from the cable.

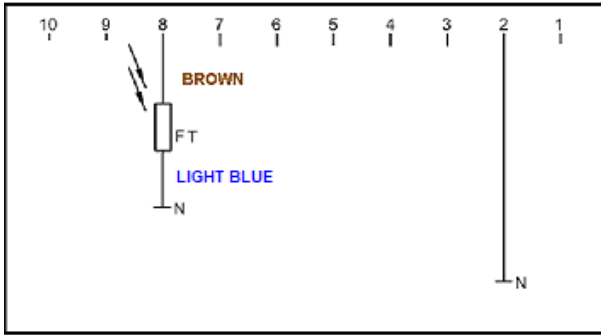
### Drilling plane for FT11 and FT13



Ø4mm screws are recommended to fasten FT11 flame sensors.

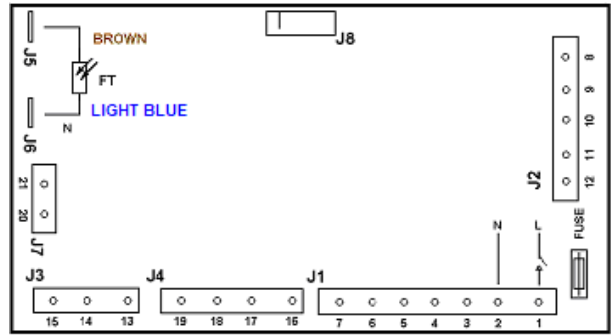
**WIRING DIAGRAMS**

**EURO-OIL SERIES**



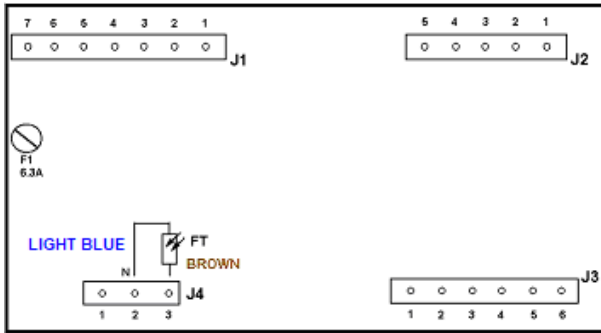
TYPE VM440 VM450

**DIGITAL MICROFLAT "N" AND NEW DIGITAL MICROFLAT SERIES**



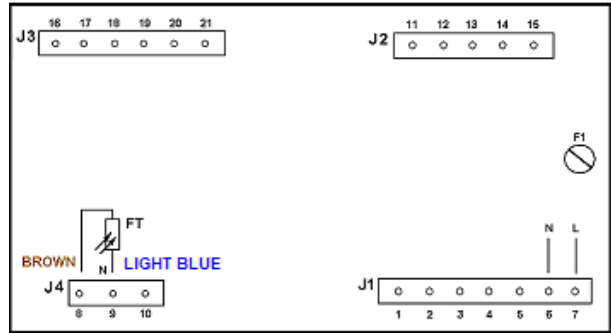
TYPE NDTMxxO DTMNxxO

**KOMPACT SERIES (TGRx)**



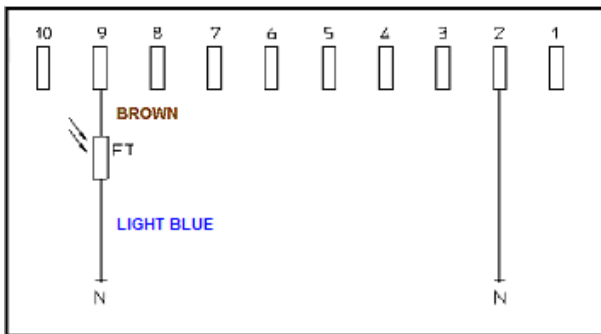
TYPE TGRx

**KOMPACT SERIES (TGRD)**

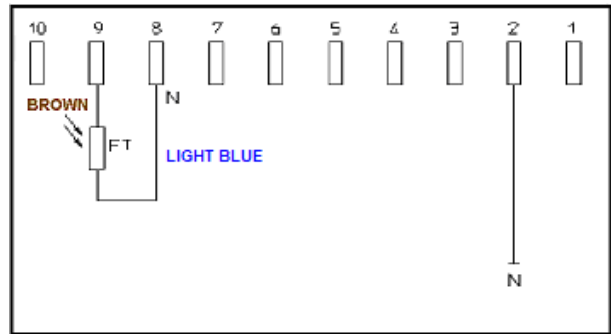


TYPE TGRD7x TGRD9x

**EURO-OIL CONTROLS SERIES 10**

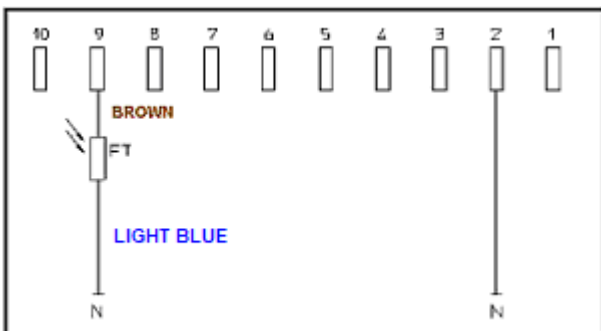


TYPE GR1 GR2 GR1/Z OR3/B



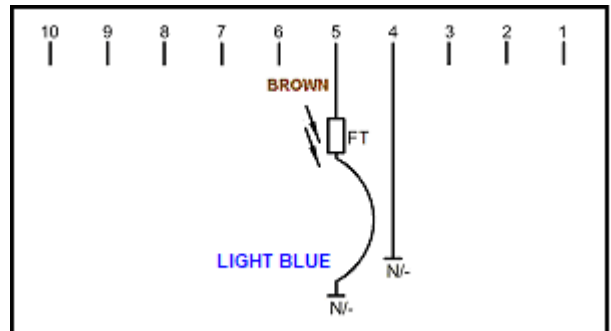
TYPE OR1 OR1/Z OR2

**DIGITAL EURO-OIL CONTROLS**



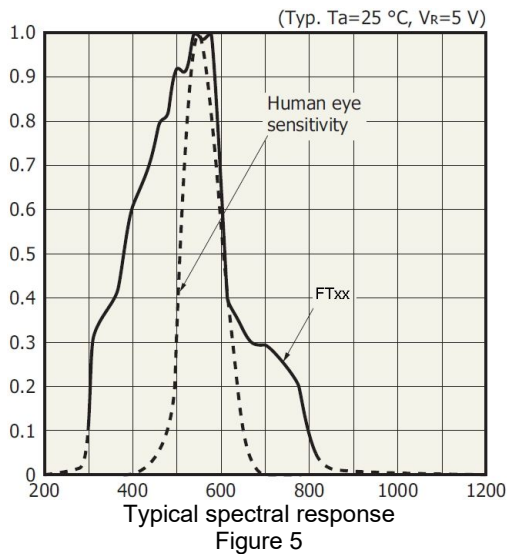
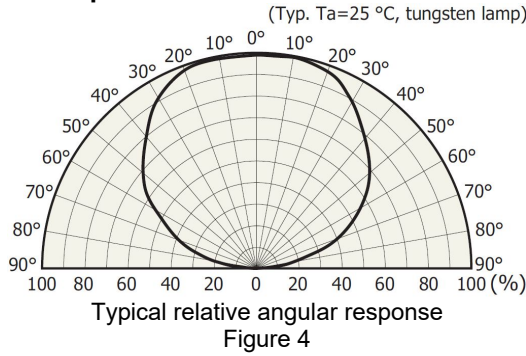
TYPE DR1 / DR2

**EURO-OIL CONTROLS SERIES BT**



TYPE BT..O

## Typical response



## Part reference

### Phototransistor FTX /Y Z MMjjj O

- X 11:** Phototransistor type FT11 (fig 1)  
**13:** Phototransistor type FT13 (fig 2)  
**13L:** Phototransistor type FT13L (fig 3) – Available only with front view
- Y** Case color:  
**V:** Green / Low sensitivity  
**R:** Red / Medium sensitivity  
**A:** Blue / High sensitivity
- Z F:** FT with front view (Tab.2 fig. a)  
**S:** FT with side view (Tab.2 fig. b)
- jjj** Cable length (mm)
- O** Cable termination. See Table 4.  
 Performing other finishes according to customer requirements



**NOTES ABOUT PRODUCT DISPOSAL** The device contains electronic components and cannot therefore be disposed of as normal household waste. For the disposal procedure, please refer to the local rules in force for special waste.

### BRAHMA SpA

Via del Pontiere,31  
 37045 Legnago (VR)  
 Tel. +39 0442 635211 – Telefax +39 0442 25683  
 http:// www.brahma.it  
 E – mail: brahma@brahma.it

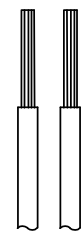
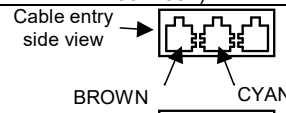
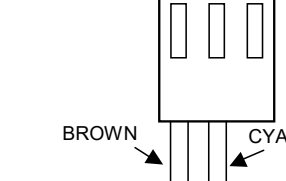
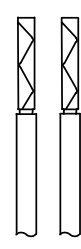
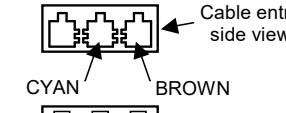
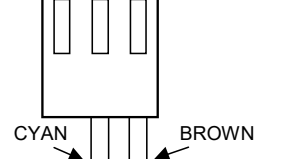
CABLE TERMINATION		
Identification letter	Z	J1 Specific for TGRx
Description	Stripped cable	Crimp terminal + crimp terminal housing molex (series 3001-03 ÷ PN 10011034)
		 
Identification letter	W	J2 Specific for TGRD
Description	Spliced connector	Crimp terminal + crimp terminal housing molex (series 3001-03 ÷ PN 10011034)
		 

Table 4

### Example:

- PHOTORANSISTOR FT11 /R F MM620 W**  
**Phototransistor FT11** Phototransistor type FT11  
**R** Red case (medium sensitivity)  
**F** Front view  
**MM620** Cable length 620 mm  
**W** Spliced connector
- PHOTORANSISTOR FT13 /V S MM620 Z**  
**Phototransistor FT13** Phototransistor type FT13  
**V** Green case (low sensitivity)  
**S** Side view  
**MM620** Cable length 620 mm  
**Z** Stripped
- PHOTORANSISTOR FT13L /A F MM620 J1**  
**Phototransistor FT13L** Phototransistor type FT13  
**V** Green case (low sensitivity)  
**F** Front view (**F is the only possible for FT13L**)  
**MM620** Cable length 620 mm  
**J1** Cable termination type J1

**ATTENTION** -> Company Brahma S.p.A. takes no responsibility for any damage resulting from Customer tampering with the product.

22/04/2022 Subject to amendments without notice