

Fig.1

**Programmable optical sensor for oil microfog**  
*Fog Flux Sensor - IFX-F (EU Patent Pending)*  
for pipes Ø 6, 8, 10, or 12 mm

**Application:**

For automatic control of flow rate in feeding pipes of oil microfog.  
E.g. in spindle lubrication by means of microfog (aerosol), in minimal lubrication of machine tools, etc.

- **Electronic and optical control through LED**
- **High measuring precision**
- **Outstanding response time**
- **Programmable by means of optical touch button, external terminal or application software**
- **Easy installation and compact construction.**
- **For pipes of external diameter Ø 6, 8,10 or 12 mm.**

**Function:**

The *IFX-F* sensor allows the immediate detection of lubricant flow rate relative to air flow in oil microfog lubrication systems.

The detection of pre-set value of flow rate causes the turning on of green LED. Any flow interruption or change (increase or decrease) in lubricant flow compared to the target value generates an error signal and a red LED light turns on.

The check reference flow rate is set at first programming stage; a programming software PC compatible can also be used (see optional).

The pipe in which the lubricant flows, must be put in the proper housing and fixed by means of an appropriate fixing clamp with two screws.

**Technical data:**

Output (pin 4): alarm signal (flow out of range)  
programmable output NO or NC  
or analogic signal 4-20 mA

Visual warning: 3 LED  
Connection: M12 x 5 poles  
Cable length: 100 cm  
Power supply voltage: 10÷35 VDC  
Max. absorption at 12 V: 45 mA  
Connection: PNP  
Installation: any position  
Tube material: PA 11 Polyamide neutral matt  
Operating temperature: +10 ÷ +60 °C  
Housing material: Aluminum  
Protection class (according to EN 60529): IP 67  
Fastening: hex key M4

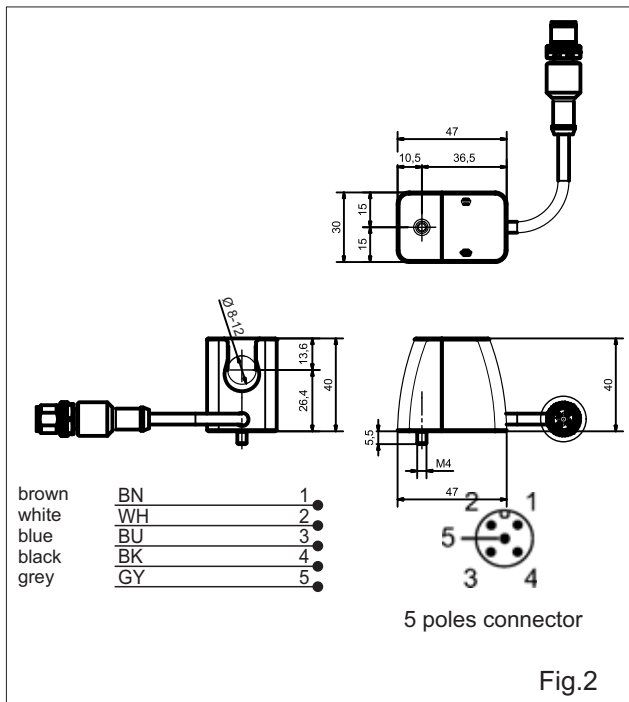


Fig.2

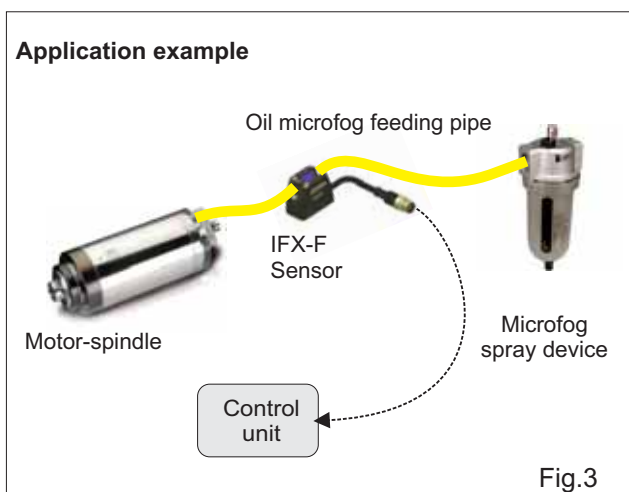


Fig.3

- Subject to changes without notice -

**Connection scheme**

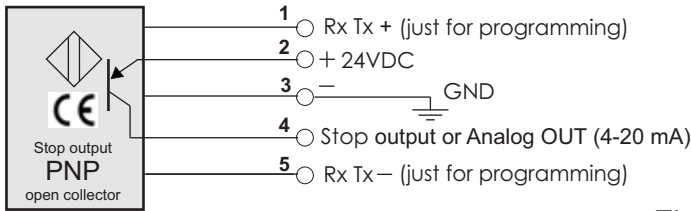


Fig.4

**Output signal to PIN 4**







Sensor condition	Segnalazioni luminose			STOP output (4) PNP		STOP output (4) PNP Analog Out 4 ÷ 20 mA
	green	red	yellow	NO	NC	
Normal flow	ON	OFF		Open	+ 24 V	
Fault signal	OFF	ON		+ 24 V	Open	
Turning on	ON	ON	ON			

**Analog signal**

The analog signal output is in proportion to the oil flow rate in accordance with the scheme:

- Flux = 0 ; output current = 4 mA
- Flux = calibration nominal value -100%; output current = 14 mA
- Output current proportional to flow according to the formula:  
 $I [mA] = 4 + 10 * (\text{Detected flow} / \text{Nominal flow})$
- Flux >= than 160% of nominal calibration value ; output current = 20 mA (amplitude saturation of signal)

**Explanation of LED signals**

 Three LEDs on	- Turning on (check) - During software update - Sensor "blocked"
 Green LED steady on	Normal operation condition. Feeding of the set lubricant flow rate within the preset upper and lower values. No error message detected.
 Green LED flashing	Numbering stage of several sensors.
 Yellow LED flashing	Calibration stage : - Zero value - Reference value
 Red LED flashing	Reference value exceeded slow flashing: low flow quick flashing : high flow
 Red and green LED flashing	Calibration failed: Repeat the procedure

**Electric connections:**

**Attention: connect always the clamp (3) to ground (GND).**

**Explanation of light signals:**

Sensors have three light signals (green LED, red LED and yellow LED), whose behavior is described into the table beside. Sensors have also a button "Touch Light" by means of it is possible to make the automatic numbering of the sensors (in case of use of several sensors).

In this case a dedicated PC programming software it is necessary (see options).



Fig.5



Fig.6

**Accessories for programming with PC:**

Connection KIT for single sensor with Software PC-LINK FLUX2  
Complete with Software on CD ROM, hardware key CVUSB – RS485/9,  
for control and programming  
As per parts list: Lm180790

**For connection to modules with sockets M12-5 poles**

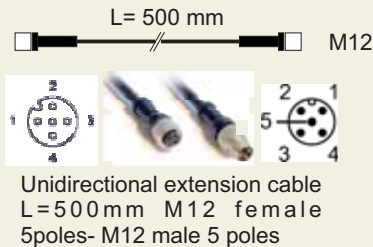


Fig.7

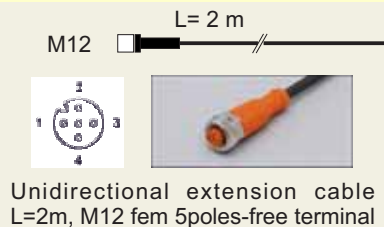


Fig.8



Fig.9

**Accessories for electric connection and pipes:**

**Extension cable** **N860094**  
M12x1 female 5 p./free terminal  
PUR L=2 m

**Interface 8 input module** **N860048**  
M12x1 female 5 poles  
straight connector M23 male 19 poles

**Shielded cable L= 5 m** **N860206**  
straight connector M23 female 19 poles  
cable PUR (UL 300V)  
(combined with N860048)

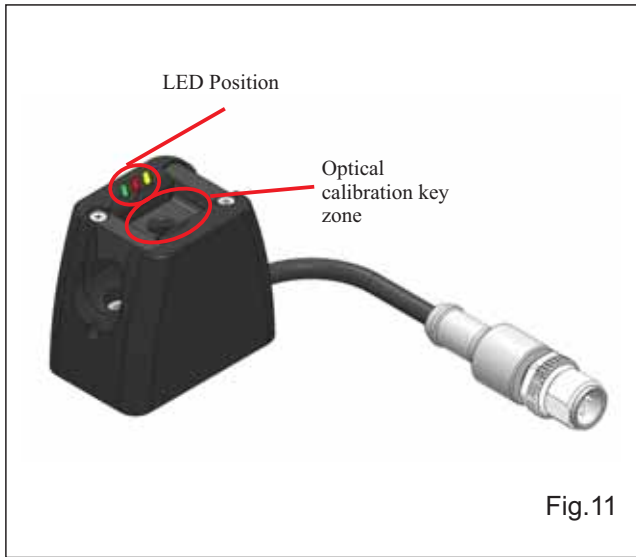
**Tubi lineari flessibili J 970**  
Flexible thermoplastic pipes fit to low pressure, in  
pneumatic and lubricating application, made in:  
RILSAN® Pa11, DIN 74324.

**Type :**  
Matte neutral pipe Ø 6/4 **J976000**  
Matte neutral pipe Ø 8/6 **J978000**  
Matte neutral pipe Ø 10/8 **J978200**  
Matte neutral pipe Ø 12/10 **J978153**



Fig.10

- Subject to changes without notice -



## Instruction for sensor programming

### Manual calibration instruction:

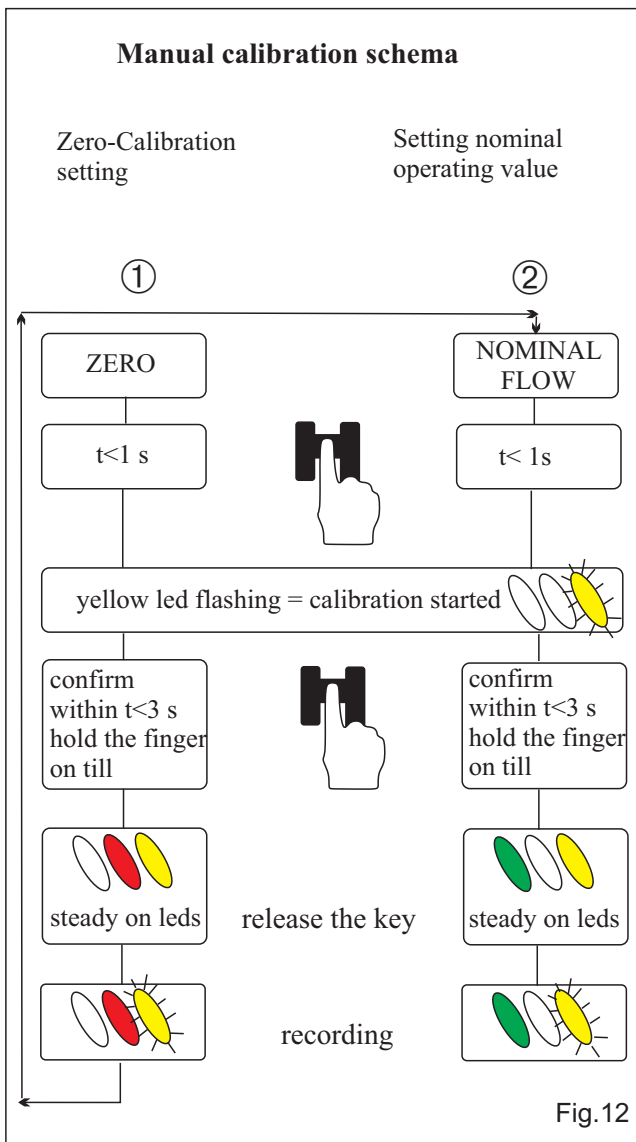
Through an optical key (approaching the finger to the sensor) it is possible to initiate the calibration procedure to set manually the two values of 'zero= lubricant flow is absent' and '100%= working condition nominal flow'.

The alarm thresholds are set as factory default on  $\pm 20\%$  deviation from the nominal value.

### Step 1. Zero-calibration setting

The setting has to be performed with sensor installed on the tube. Assure the absence of oil in the duct.

- Touch shortly the optical key ( $t < 1s$ ) and release.
- The yellow led flashing confirms that the sensor has initiated the calibration procedure. Other leds are off.
- Within three seconds touch the key and hold the finger on to initiate the value storage. The yellow led will stay on, when after a while the red led will turn on, release the key.
- Wait for the recording of the zero value: at this stage the yellow led is flashing and the red one is steady on.



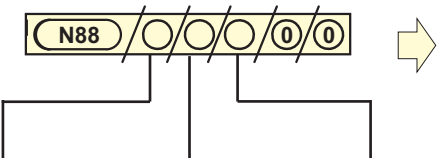
### Step 2. Setting of the nominal flow rate

Once finished step 1, set the steady condition of the oil mist flow necessary to the normal operating condition, than:

- Touch shortly the optical calibration key ( $t < 1s$ ) and release.
- The yellow led flashing confirms that the sensor has initiated the calibration procedure. Other leds are off.
- Within three seconds touch the key and hold the finger on to initiate the value storage. The yellow led will stay on, wait for the lighting of the green led and then release the key.
- During the recording of the nominal value the yellow led is flashing and the green one is steady on.

The sensor returns to normal operating mode.

**Note:** Led green+red contemporary flashing lampeggianti means that calibration procedure has been unsuccessful, repeat both steps 1 and 2 assuring the working conditions are correct and steady.



Pipe Diameter	Output 4	Electric connection
① 6 or 8 ② 10 or 12	① STOP NC ② STOP NO ③ Analog. 4-20 mA	① PNP

**Order designation:**

Optical sensor for oil microfog - IFX-F

**Application example:**

Optical sensor for oil microfog for pipe ext. diam. 8 with STOP output normally closed (NC) in flow presence, PNP connection.

Type IFX-F08 (for pipes Ø 6 or 8) Code MWM N8811100

**Standard versions:**

Type IFX-F08 (for pipes Ø 6 or 8) Code MWM N8811100

Type IFX-F12 (for pipes Ø10 or 12) Code MWM N8821100

Further versions are available on request.

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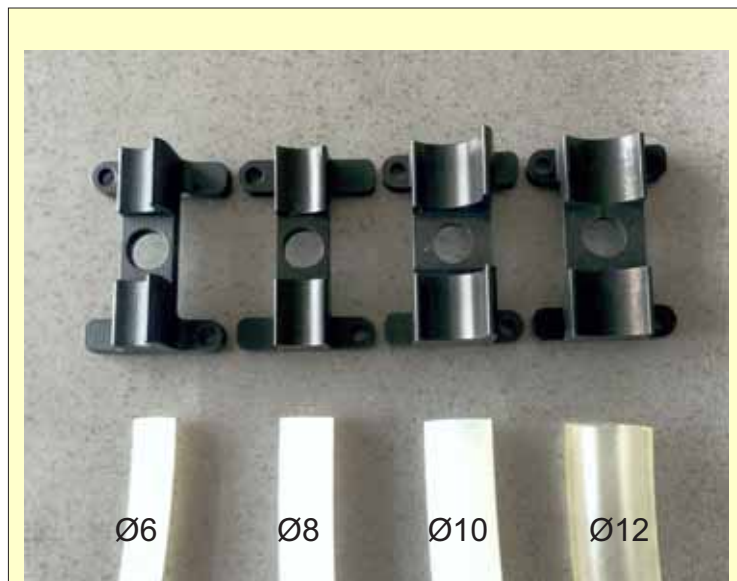


Fig.13

**Pipe locking clamps:**

Each sensor is supplied with two types of clamps for the correct locking of pipe 6 or 8 mm diameter in case of the IFX-F08 type sensor, or 10 or 12 mm diameter in case of IFX-F12 type sensor.

Item codes

Pipe Ø 6mm

N881006

Pipe Ø 8mm

N881008

Pipe Ø 10mm

N882010

Pipe Ø 12mm

N882012

Required material for pipes: matte neutral polyamide PA 11



Fig.14