

# SYSTEM FOR CONTROLLING THE FERMENTATION PROCESS

# IF 01

The **IF-01** system has been designed and constructed to monitor fermentation processes for wines (both red and white) and beer. The measuring element (**UR-61**) is an extremely compact, high-precision refractometric unit.

## Measurement principle

By detecting the variations in the nD (refractive index) of a fermenting solution it is possible to accurately calculate the alcohol and sugar variation which brought it about.

Basically, by setting the system at the beginning of fermentation, entering the alcohol content and the nD (automatically detected by the analysis unit), from that moment to each successive nD variation it is possible to calculate the variation in alcohol and sugars which brought it about, allowing the system to work out a curve showing the increase in alcohol and the decrease in sugars which has occurred since fermentation began.

The unit is installed directly onto the body of the fermenter and is capable of measuring Real Alcohol (or Alcohol Content), sugars and Non-reducing Extract (ENR) in real time, thus rendering control over alcoholic fermentation in musts completely automatic.

The unit is connected by a RS485 serial connection to a receiver (**FM-01**) on which dedicated Maselli software is installed. The values measured by the unit are processed by the software, stored in the database and displayed in the form of a graph (fermentation curves) for quick and immediate interpretation.

Furthermore, this automatic monitoring system makes it possible to swiftly detect any anomalies, for example any deceleration or stoppage in the fermentation process, and send out the relative alarm messages.



### TECHNICAL FEATURES

**Application:**

Measurement of natural musts during fermentation.

**Type of measurement:**

Temperature-compensated refractometric measurement and conductimetric measurement

**Measurement limits:**

0...400 g/l for Sugars  
 0...30% v/v for Real Alcohol (or Alcohol Content)  
 0...40 g/l for Non-reducing Extract (ENR)  
 0...5 mS/cm for Conductivity

**Accuracy:**

>2 g/l for Sugars  
 >0.2% v/v for Real Alcohol (or Alcohol Content)  
 >2 g/l for Non-reducing Extract (ENR)  
 >0.05 mS/cm for Conductivity

**Product temperature:**

5...50 °C (41...122 °F)  
 with automatic compensation for temperature measured by internal Pt1000 Temperature Probe, Class "A".

**Interfaces**

**Serial:**

**Ethernet:** RJ-45 for export data to an Ethernet network.

**Usb:** Tipo A for Input / output service  
**Modbus RTU:** (integrated) in additional optional plastic box

**Outputs:**

N°3 relays outputs dedicated to signaling the alarms adjustable on the base of the fermentation trend, with contact rating of maximum DC/AC 24V/500mA.

**Relative line pressure:**

max. 10 bar (145 psi) at 20 °C (68 °F).  
 max. 8 bar (116 psi) at 100 °C (212 °F).

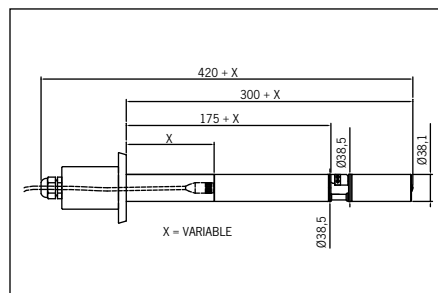
**Electrical power supply:**

AC 100...240V ±10% 50...60Hz 250VA  
 Connection by means of cable with SP7748 (EEC-7) 10A/250V plug for EC versions or with P620 15A/125V plug for USA versions.

**Duration of cycle:**

Settable measurement interval.

**Sensor UR-61 measurements**



### CONSTRUCTION FEATURES

**MEASUREMENT SYSTEM UR-61**

**Execution:**

- AISI 316 stainless steel Enbloc casing.
- Direct installation onto the fermenter body
- Degree of protection: IP67 (EN60529)

**Measurement prism:**

- In spinel
- The prism is equipped with a cleaning system with electric actuator.

**Light source:**

High efficiency LED diode

**Refractometric measurement element:**

2546-pixel CCD (Charged Couplet Device)

**Temperature measurement element:**

Internal Pt1000

**Electronic section:**

- Central "CPU" unit with microprocessor which can be programmed with the special "Utility Software"
- Internal temperature/humidity sensor with relative alarm signaling.

**Materials in contact with the fluid:**

- Structure in AISI 316 stainless steel
- O-ring in Kalrez 6230, Viton FKM 75.5.
- Spinel measurement prism
- EPDM cleaner brush

**RECEIVER FM-01**

**Execution:**

- AISI 304 stainless steel Enbloc casing
- Degree of protection: IP52 (EN60529)

**Electronic section:**

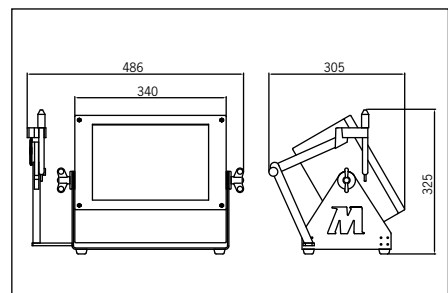
- Microprocessor-controlled industrial "CPU" monoboard.
- Graphic display on LCD touch screen 800x600 10.4" monitor.
- 512 MB Flash memory.
- External transformer in the event of connecting more than one UR-61 Units.
- It is possible to connect up to 32 Refractometric Units by using the special adapters (RS485). The maximum distance between the Refractometric Units and the Monitor is 500 m.
- Possibility to carry out "Batch Management" by recording all the operations and analysis to be executed periodically for each vat or tank in fermentation.

**Dimensions and weight:**

**Sensor UR-61:** ø38.5 (b) x 290 (d), 830 g for standard length

**Receiver FM-01:** 420 (b) x 280 (h) x 200 (d), 12.5 kg.

**Receiver FM-01 measurements**



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