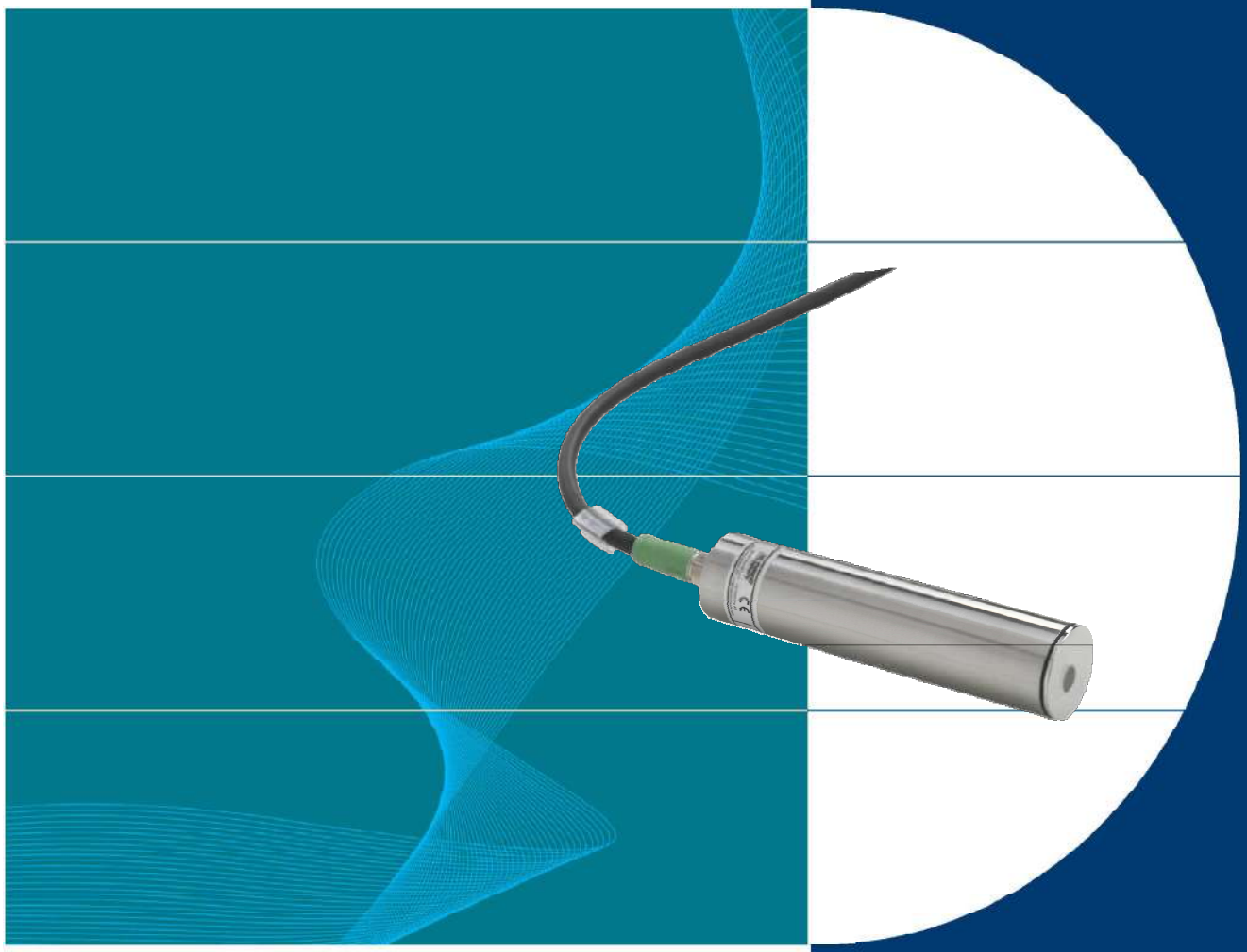
Refractometric Analysis Unit UR62

Installation and safety manual



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PROCESS ANALYZERS

THIS MANUAL SHOWS THE INSTRUMENT'S MAIN FEATURES. IT INCLUDES IMPORTANT INDICATION AND INSTRUCTIONS ON THE SAFETY OF USE, PROGRAMMING AND MAINTENANCE, THEREFORE IT MUST BE KEPT WITH CARE THIS MANUAL SHOWS THE INSTRUMENT'S MAIN FEATURES. IT INCLUDES IMPORTANT INDICATION AND INSTRUCTIONS ON THE SAFETY OF USE, PROGRAMMING AND MAINTENANCE, THEREFORE IT MUST BE KEPT WITH CARE NEAR THE INSTRUMENT, INSIDE A PROPER HOLDER, HOWEVER WELL PROTECTED FROM LIQUIDS AND OTHER THAT COULD COMPROMISE THE READING CONDITION.
THE MANUAL IS AN INTEGRAL PART OF THE INSTRUMENT AND IT MUST BE CAREFULLY READ BEFORE PERFORMING THE INSTALLATION, THE STARTUP AND USE OF THE SAME; THE MANUAL IS ADDRESSED TO THE OPERATOR AND TO QUALIFIED TECHNICIANS FOR MAINTENANCE.
USERS MUST NOT CARRY OUT OPERATIONS INTENDED FOR SERVICE MEN OR QUALIFIED TECHNICIANS.
PRIOR TO PERFORMING ANY OPERATION ON THE OPERATORS AND THE QUALIFIED TECHNICIANS MUST CAREFULLY READ THE INSTRUCTIONS CONTAINED IN THIS ISSUE.

MASELLI MISURE DECLINES ALL RESPONSABILITY OF ANY DAMAGE THAT MAY OCCUR BY A NON-CONFORMING USE OF THE EQUIPMENT, BY THE MISSED RESPECT OF THE DESTINATION OF USE AND INDICATED INSTRUCTIONS.

Maselli Misure S.p.A. 02-2012
For further information please call Maselli's Service/Representation network

Manual n° 01626C0021

S.N. _____

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1. APPLICATIONS AND USE

1.1 APPLICATIONS

The **Refractometric Analysis Unit UR-62** has been designed exclusively for continuously measuring the Refractive Index and consequently the concentration of liquid products in process lines in those refractometric applications where a continuous indication of the variable being monitored is required but which do not require a high level of accuracy; hence the sensor may not be used as a measuring element in a high-precision regulation loop but only in simple time proportioning ON/OFF control systems: any other use is to be considered improper.

The special construction technology used makes it possible to measure different types of product, even if they are opaque, dense or contain suspended particles; furthermore the measurement is not affected by the pressure or the speed of the product in the sampling point. For products with a high dirtying tendency, a special version is available with an integrated prism cleaning system.

The **UR-62** Analysis Unit is fitted with an internal precision sensor for detecting the temperature of the product directly on the production line. Being as the Refractive Index is affected by this parameter, special calculation algorithms are used to compensate temperature variations automatically, thus providing the user with a measurement which does not depend on the temperature of the product.

The main fields of application involve production processes for concentrating, diluting and mixing substances or titration procedures in the food, chemical, textile, petrochemical industries etc., for continuous or batch production lines.

The main features which differentiate this instrument from other Maselli Misure S.p.A. products are its extreme compactness and the excellent quality/performance/price ratio it offers.

A series of special fittings make it quick and easy to install directly on the process line or tank.

The Refractometer unit can be used as a Stand-Alone instrument by using the RS485 serial output or converting this signal by means of a special module in mA output. Alternatively when coupled with the special Receiver it can constitute an On Line measuring assembly.

1.2 ALLOWED USE, EXPECTED USE, USE NOT PERMITTED

1.2.1 ALLOWED USE

Maselli Misure informs the user of the special rules defined by the authorities concerned to safeguard the operators' health in the work areas. Access to the instrument's work area depends on the use of proper protections and will be limited to trained personnel, who are aware of the several risks to which they may be exposed and potentially subjected both near the equipment and during its use or service. Strictly abide by the legislation applicable in the country of use.

1.2.2 EXPECTED USE

Maselli Misure cannot foresee all the possible events that may cause potential risks, however remote, during the actual equipment operating conditions and use. For this reason the warnings included in this text and also indicated on the unit may not include all the eventual situations of potential danger. The unit is designed to measure a specific product in specific conditions, so it is not suitable for other purposes; every other use is to be considered as improper. Use the instrument according to its technical features, referring to the indications above for the operative specifications. ***Maselli Misure*** recommends that all the indications provided and the safety rules in this use and maintenance manual are strictly followed.
The apparatus must be installed, using the special accessory, directly onto the line or tank.
According to European Directive 97/23/EC (PED), regarding the technical requisites (art.3), relative to piping (point 1.3) meant for:
- GAS, "Para. a": these accessories are meant for use with "Fluids of Group 1 and 2", respectively, in conformity with Tables 6 and 7 of Annex II.

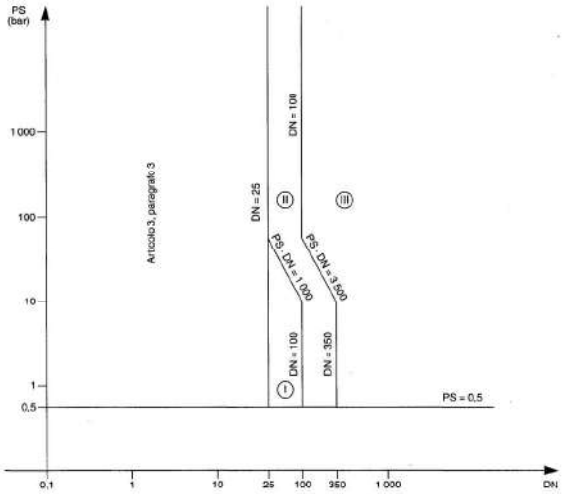


Table 6 annex II

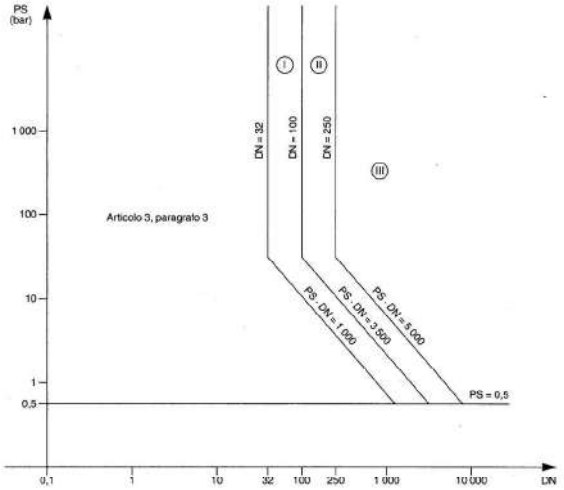


Table 7 annex II

- LIQUIDS, “Para. b”: these accessories are meant for use with “Fluids of Group 1 and 2”, respectively, in conformity with Tables 8 and 9 of Annex II.

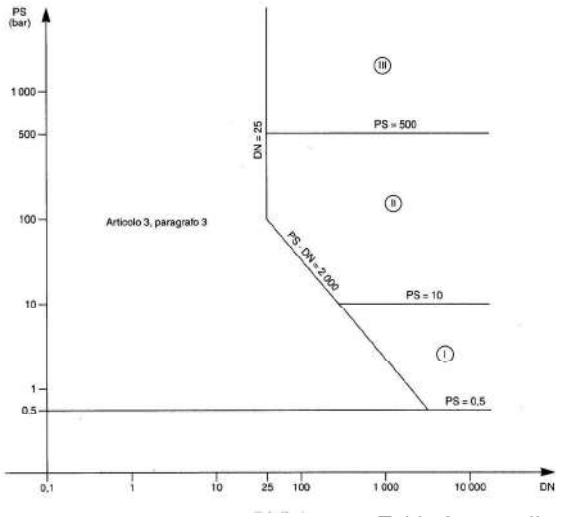


Table 8 annex II

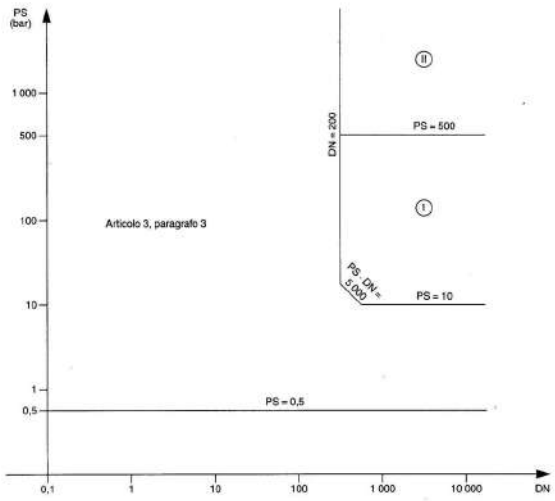


Table 9 annex II

In case of the “Gaseous” fluid state, installation can be done only with the specific accessory which satisfies the basic requisites in conformity Art.15; this accessory bears the “CE” marking.
For the classification of fluids, please refer to European Directive 92/32/EC.

1.2.3 USE NOT PERMITTED

Only the uses specified in paragraphs 1.3.1 and 1.3.2 are permitted; also:

- Before activating the instrument, make sure that all the electric hookups have been done according to state-of-the-art techniques, and that the equipment piping is not under pressure or with process phases enabled during the installation.
- Do not connect the appliance fitting to a production line transporting any fluids of a different nature and/or flow rate to those specified in the relative tables in this Manual.
- Do not replace the unit’s safety devices with elements other than those indicated and suggested.
- Do not move the unit version with the prism cleaning system if the power cable is connected.

2. GENERAL INFORMATION AND SAFETY

2.1 GENERAL INFORMATION

The **Refractometric Analysis Unit UR-62** with microprocessor is mechanically made up of a stainless steel cylindrical tube which can be installed directly on the production line by means of appropriate accessories.
The instrument continuously measures the refractive index executing compensation for temperature variations and transmits the relative concentration value in a proportional manner to be read by the user via the "RS485" serial interface.

The transducer system used makes the instrument insensitive to variations in the internal light source luminosity, slight dirtying or opacity of the measuring prism and the ageing process of the equipment components.

2.2 SAFETY

2.2.1 GENERAL PRECUATIONS

The personnel assigned to work on the instrument must carefully read the information given in this manual, with special attention to the safety precautions listed in this chapter. The operator must also follow the instructions below:

1) All the washing, inspection, removal or other operations carried out on the Analysis Unit must be done STRICTLY with the LINE STOPPED AND NOT PRESSURIZED and THE ELECTRIC POWER SUPPLY DISCONNECTED.

2) Keep the instrument and the work areas tidy and clean.
3) Wear suitable clothing to avoid impediment and/or dangerous tangling with the instrument.
4) Use the personal protection devices recommended by the instruction manual depending on the operations.
5) Do not remove or change the labels affixed on the instrument by the manufacturer.
6) Disconnect the mains power supply before removing the appliance; in the version with an incorporated cleaning system there is a risk of entanglement or of finger crushing in the event of automatic movements of the instrument.

2.2.2 ASSIGNED PERSONNEL

The instrument is designed for use by a number of operators.
The personnel assigned to operate on the unit must have (or acquire by proper training and practice) the requirements indicated below and sound knowledge of the contents of this manual and of all the information concerning safety:

1) Sufficient General and technical knowledge to understand the contents of the instruction manual and to correctly interpret Drawings and Schematics.

2) Knowledge of the main hygiene, work safety and technological regulations.
3) General knowledge of the production line and of the factory where the instrument is used.
4) Ability to maintain appropriate behavior in case of emergency, find personal protection devices and use them correctly.

In addition to the above-mentioned characteristics, the maintenance staff must have sufficient technical, electrical and mechanical skill.

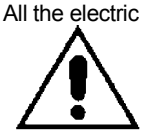
2.3 EMERGENCY OPERATIONS IN CASE OF EXPLOSION

The system is not designed, built or tested for use with explosive fluids and is not suitable for operating in explosive environments. In case of an explosion, refer to the safety standards in force in the work area.
There are no pressurized components in the instrument except for the hydraulic circuit through which the product flows at the process pressure when connected to the production line.

ATTENTION: Use in explosive or partially explosive atmospheres is forbidden.

2.4 EMERGENCY OPERATIONS IN CASE OF FIRE

In the **Refractometric Analysis Unit UR-62**, the causes of fire may be limited exclusively to the electric devices, and these are very remote, as the operating current and voltage used are extremely low.
In case of fire, operate, if possible, on the main sectioning switch that must be provided up line on the unit and extinguish the fire using powder extinguishers.
All the electric devices in the system are of the self-extinguishing, fireproof type.



ATTENTION: The client must provide for a suitable fire fighting system after evaluating the internal situation and in compliance with the laws applicable.

ATTENTION: In the event of a fire, turn off the main switch immediately to cut off the electricity.

7. INSTALLATION

7.1 INSTALLATION

Being as the **Refractometer Analysis Unit UR-62** has no moving parts and has a high degree of protection against external elements, it can be installed in various points on the system, however to avoid any operational problems and obtain maximum performance from the instrument, always observe the recommendations indicated below for the various installation options:

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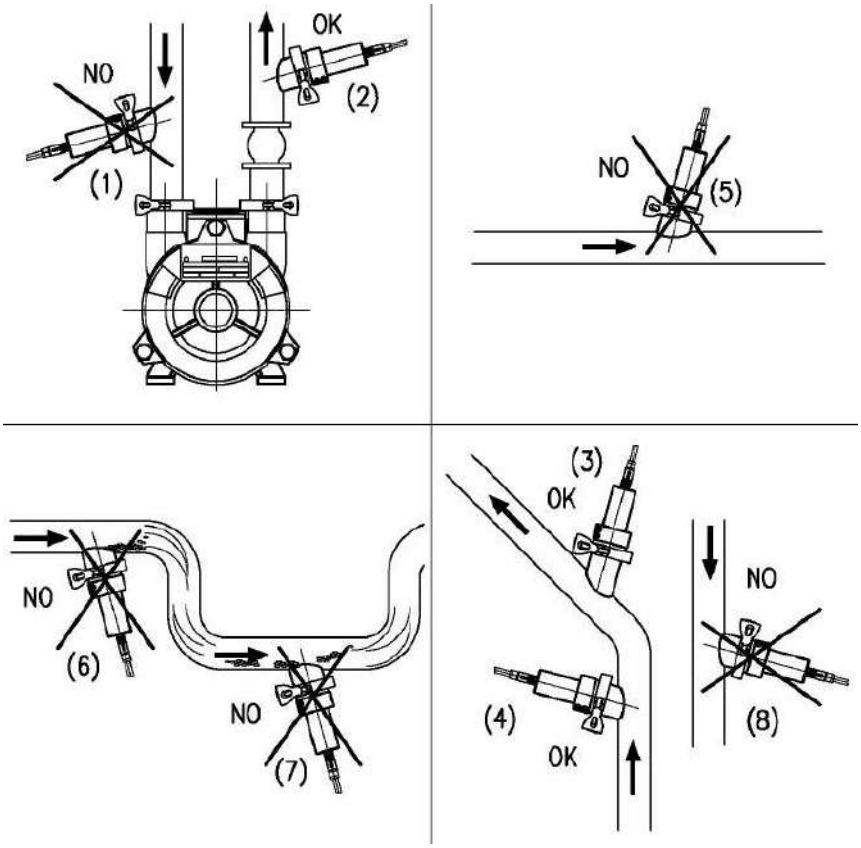
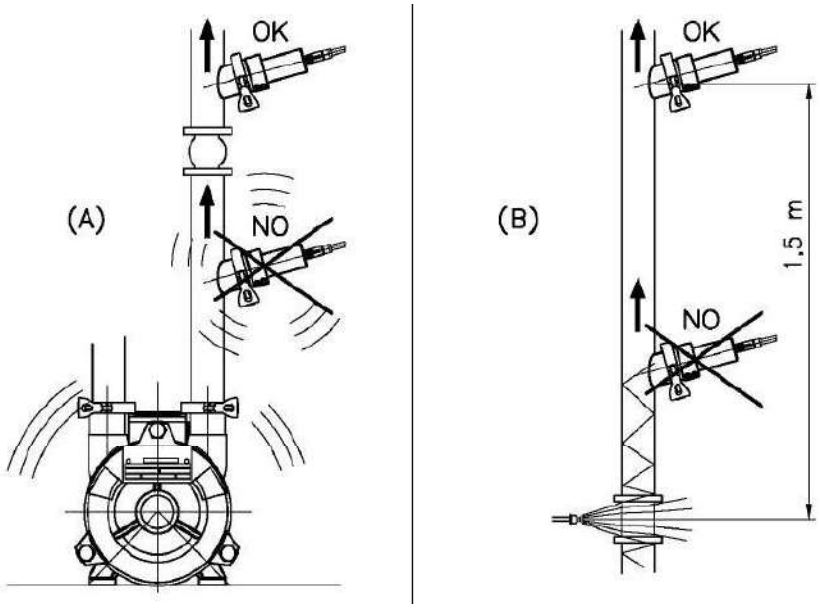
Installation on the piping:

- **DO NOT** install the refractometer unit near the suction point of pumps or turbines (1) as this could create product "gaps" in front of the measurement prism thus compromising stability of the measurement. In general it is preferable to install the unit somewhere along the delivery line of the pump (2).
- **DO NOT** install the unit in such a way that permanent air pockets may accumulate near the sensor prism. For the same reason, never install the sensor with the prism pointing downwards along horizontal piping (5).
- **DO NOT** install the unit with the prism pointing upwards along sections of piping where sediments may build up on the bottom (6,7). This recommendations only refers to applications where the product does in fact contain dispersed solids or particulate which is subject to sedimentation during interruptions in line flow.
- In general **it is preferable to select** an installation point somewhere along the vertical or oblique pipelines with an ascending flow 3, 4, 8).
- **Install** the refractometer with the prism always in counter-flow to the product in other words, the direction of product flow must always be such that it hits the prism head on.



- **DO NOT** install on piping characterized by the presence of constant strong vibrations: over time this could have a negative impact on the correct operation of the electronics or optics section. (A)
- **Make absolutely sure** that no light source can project its rays onto the refractometer prism as this would completely compromise measurement accuracy (the optical image of the refracted light gets added to the that produced by external rays). For this reason it is essential **to avoid** installing the instrument anywhere near inspection windows, especially it they are also backlit and/or the product being measured is transparent. (B) In general it is advisable to keep the instrument at least 1.5 m further down the pipe.

- When installing the instrument on pipelines made from transparent or translucent material, it is advisable to shield sections (at least 1.5 m in length) in an up- and downstream direction from the refractometer with a black covering.
- **Make sure** that the prism is always covered with product even during production stoppages, especially if stoppages are long: failure to observe this recommendation could result in the thin layer of liquid left on the prism drying out and in so doing depositing a patina of solid residue on the prism which may then be very difficult to remove.



For this reason installation (8) is not recommended as a vertical pipe with a downward flow is more likely to empty out during a production stoppage.

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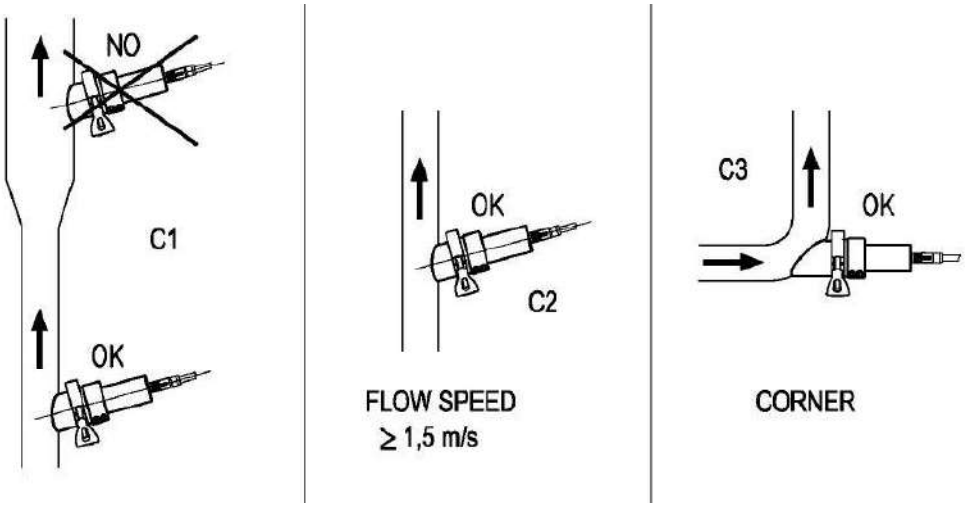
Flow conditions in the pipe:

- **Guarantee** a good flow speed in the pipe in order to ensure that product circulation speed in front of the prism is sufficient. This helps to prevent the formation of so-called "coatings" (typical of certain products), consequently the measurements of the product transiting along the pipe moment by moment are far more accurate. There is no universal rule for every type of product in every kind of flow condition, however, in general a minimum flow speed of 1.5 m/sec is recommended (reference category DN80 or higher) (C2).
- Within the range of the same line with equal operating conditions, always **favor** sections of the pipe with a lower diameter in order to make the most of the higher flow speed (C1).
- **Favor** installation on a bend as it makes it possible to expose the prism towards the central portion of the flow which in laminar motion conditions is faster. The larger the section of piping the more this indication is valid.



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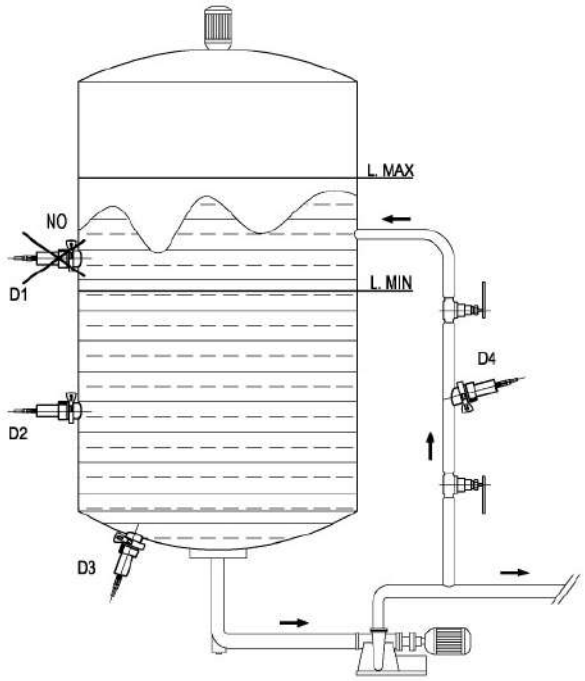
Installation on a tank:

- Take special care to **avoid** installing the instrument at a height where the surface of the prism might not always be covered by the liquid. Consequently, production process permitting, it is preferable to install the refractometer somewhere below the minimum level mark. (D1, D2).
- **Position** the refractometer at a height where whirling of the product brought about by the stirring system is at its maximum.
- **Always favor,** whenever possible, installation in a recirculation circuit outside the tank (D4).



Installation on the bottom of the tank is permitted as long as **care is taken** over the choice of installation accessory and the instrument is not positioned in a point where the turbulence created by the stirrer is insufficient for preventing the sedimentation of any solids which may be dispersed in the product (D3).

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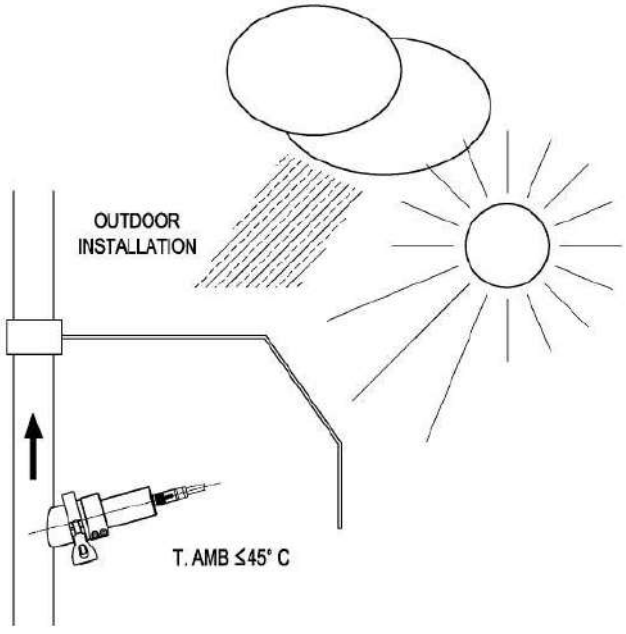
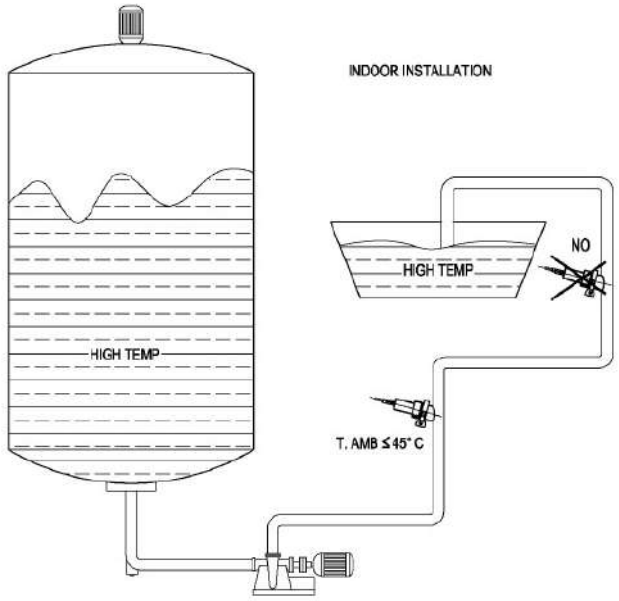
Ambient conditions:

- **Avoid** exposing the refractometer to direct sunlight and the elements. Although the instrument has been designed with a high degree of protection, it is still advisable to use a protective sheet metal cover if it is to be installed outside.



- **Install** the instrument in an area of the system where correct ventilation is not compromised, especially if the ambient temperature is particularly high.



General recommendations and safety regulations:

- **Make sure** that after installation the unit fixing screws and the clamps are securely tightened.

Please remember that instrument installation must be carried out by expert personnel only in safety conditions, avoiding all situations of potential danger for the technician and others.

In particular it is essential to:

* avoid working in unstable or precarious conditions,
* wear suitable clothing and any necessary PPE if the system temperature may in any way constitute a hazard,
* wear safety glasses and non-slip footwear.
* avoid the dispersion of polluting, toxic or hazardous substances into the environment.

For any other precautions not specified herein, always adhere to the Safety in the Workplace Regulations/Legislation currently in force in the country of use.

7.1.1 ASSESSMENT OF THE TYPES OF INSTALLATION

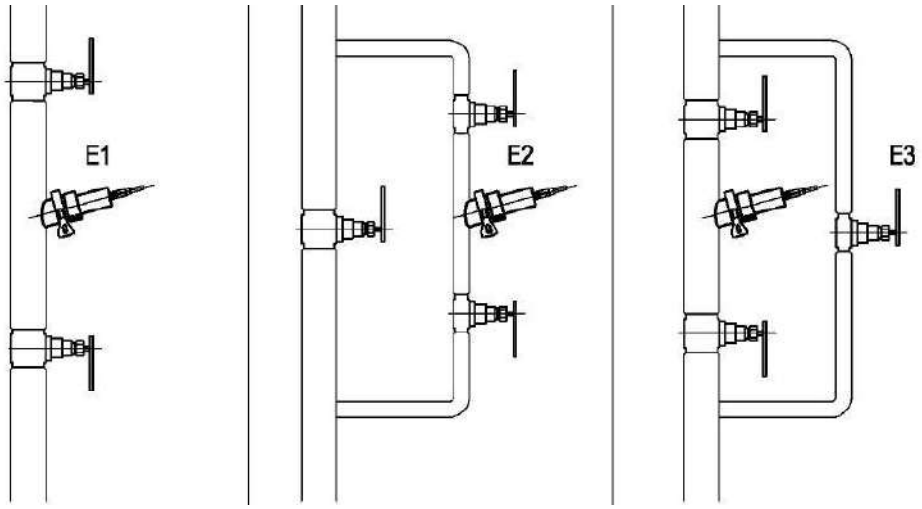
Installation of the **UR-62** can basically be carried out in four different ways:

a. *Directly on the main piping:* installation directly on the piping offers economic advantages in terms of installation but may create problems in term of maintenance: if it ever becomes necessary to intervene and remove the instrument from the line, even to carry out simple prism cleaning operations, production must be stopped before the operation can be performed. In this type of installation it is a good idea to use two shut-off valves to isolate the UR-62 from the production line during stoppages for when technical interventions need to be carried out (E1).

b. *In secondary by-pass with circulation guaranteed by the effect of the pressure differences between the take-up points:* installation in by-pass without the aid of a circulation pump is only possible when the circuit can withstand the friction loss created by the membrane or the throttling valve installed on the piping. This type of installation envisages the installation not only of a throttling valve but also two by-pass shut-off valves needed to isolate the refractometer from the line to allow maintenance operations to go ahead without having to stop production. This type of installation may be useful when the size of the main piping is very large or when the flow speed is low and needs to be slightly speeded up for the refractometer. In the event of maintenance on the instrument, continuous production is not compromised (E2).

c. *On the main piping with service by-pass:* installation on the main line makes it possible to have maximum flow rate available at all timed. Also with this type of installation it is necessary to install two shut-off valves which, however, must be installed along the main pipe. The by-pass will only be opened when maintenance needs to be carried out on the refractometer, also in this case continuous production is not compromised (E3).

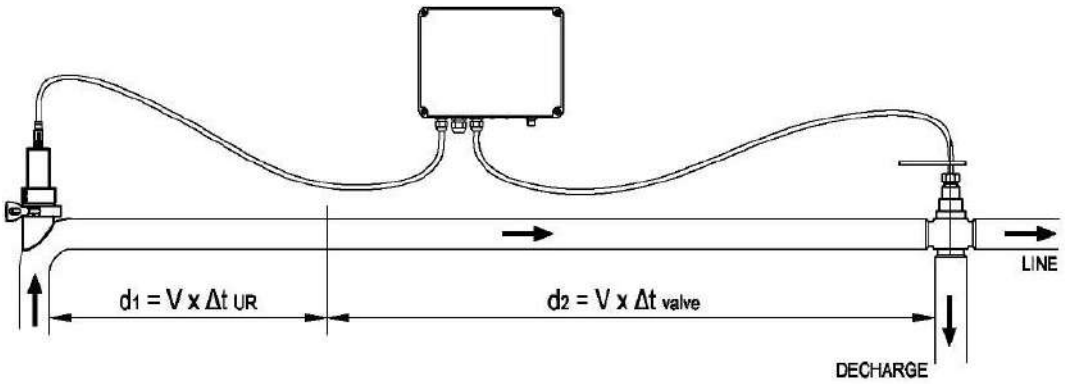
d. *Directly on the tank:* in this last type of installation it is necessary to guarantee continuous recirculation of the product in front of the prism, avoiding any possible formation of stagnation in any areas of the tank. It is also important to pay attention to any scrapers or stirrers (when installed), making sure that they cannot in any way damage the measurement prism (D1, D2, D3). As previously mentioned, however, the possibility of having a recirculation circuit outside the tank can always be taken into consideration as it offers all the best fluid-dynamic conditions which are typical of a pipeline installation.



7.1.2 MANAGEMENT OF THE LIQUID INTERFACES

One of the most widespread applications of the instrument consists in the management of so-called interfaces. This refers to those cases in which a liquid, usually water, is used to "push" the product out of the piping during washing and sanitization procedures. Theoretically, during this phase the process drains should be opened, but this would involve wasting all the volume of product held in the process piping. In order to recover at least a part of useful product, the refractometer is used as an instrument which provides a rapid response: as soon as the refractometer detects a sharp drop (or increase) in concentration, it sends a signal to the drain valve piloting system to divert the flow immediately from recovery to the drain outlet.

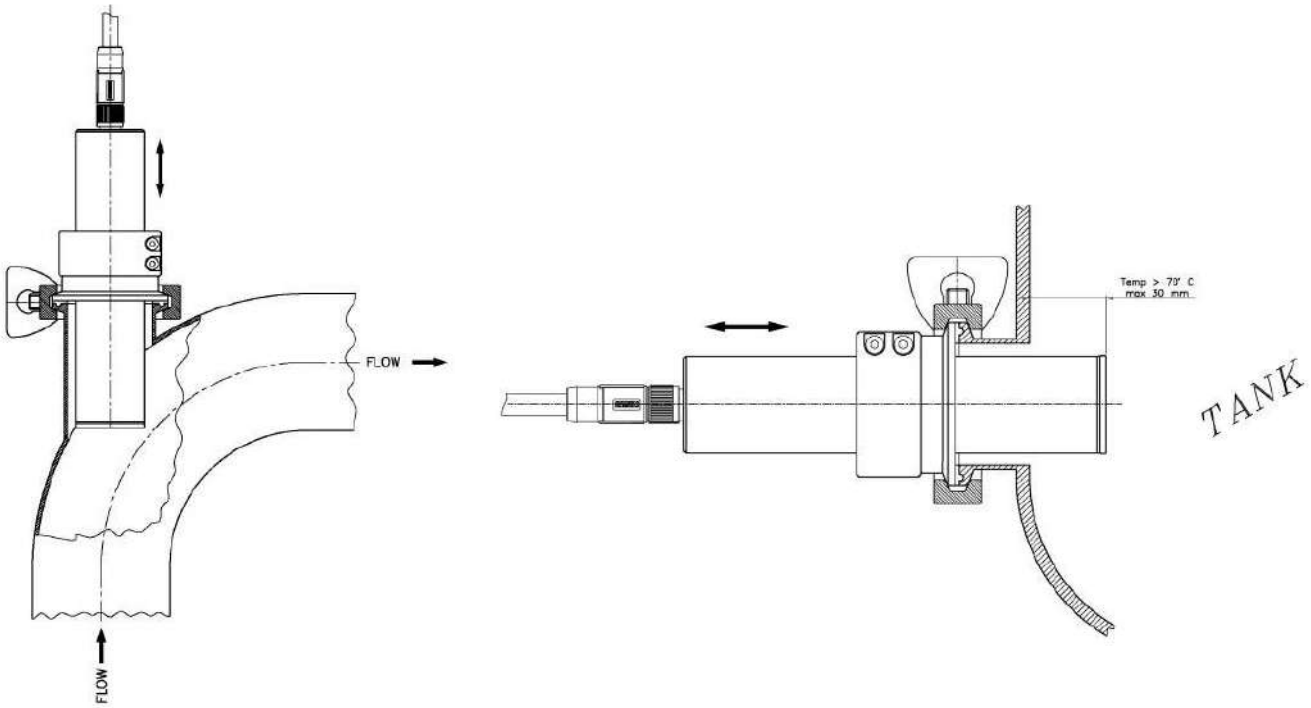
To pinpoint the most favorable position for the refractometer on the pipeline, it is always necessary to take into account both the refractometer response time, Δt_{UR} (equal to 1 second) and the reaction time of the actuation system, Δt_{VALV}. If the speed of the flow is not constant, it is obviously important to take into consideration the maximum value, whereas if the interface, i.e. where the water meets the product, is not a very net separation but characterized by an ample front, then it is necessary to move the refractometer back away from the valve by a further distance at least equal to the length of the interface front.

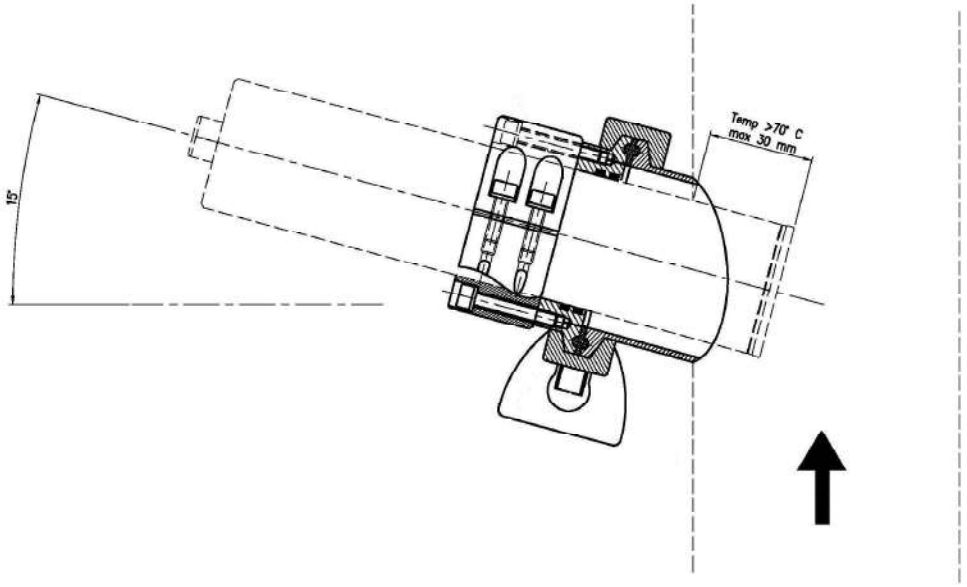


The instrument can be cleaned and sterilized using the methods used to clean the piping on which it is installed. Installation of the UR-62 on the piping or in the tank must be executed using the relative installation accessories described in the following heading.

7.2 INSTALLATION ACCESSORIES

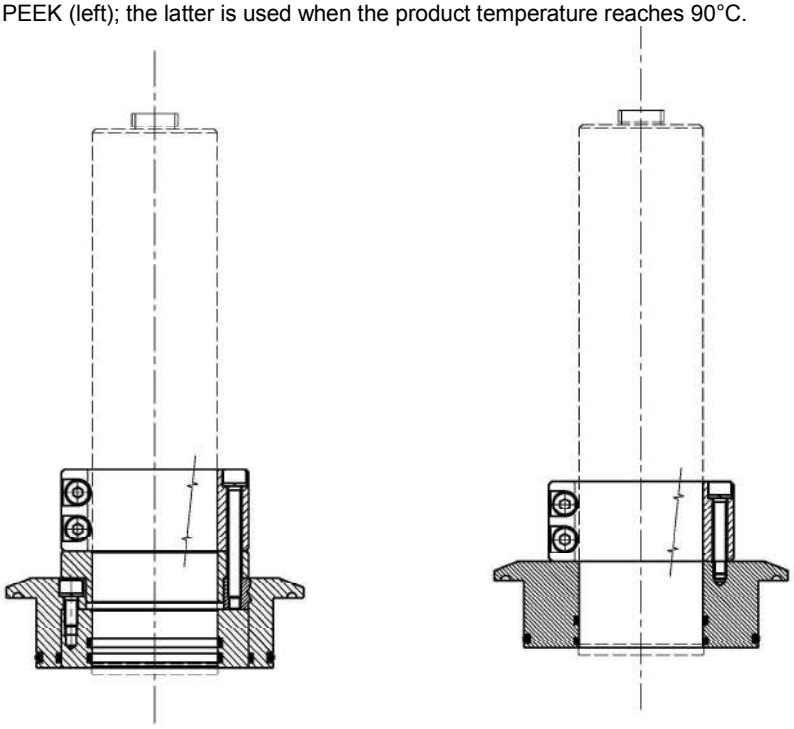
1) To insert the Analysis Unit in the system when installing the unit on **the direct or by-pass piping, on a curved or straight section, or on the tank**, a 2" stub pipe to be welded directly onto the line is provided. The appliance is fixed to the connector using the relative fitting which makes it possible to adjust insertion. It is essential for the product temperature be >70°C with instrument insertion not > 30mm.
When mounting on vertical piping weld the stub pipe on a slant of at least 15".





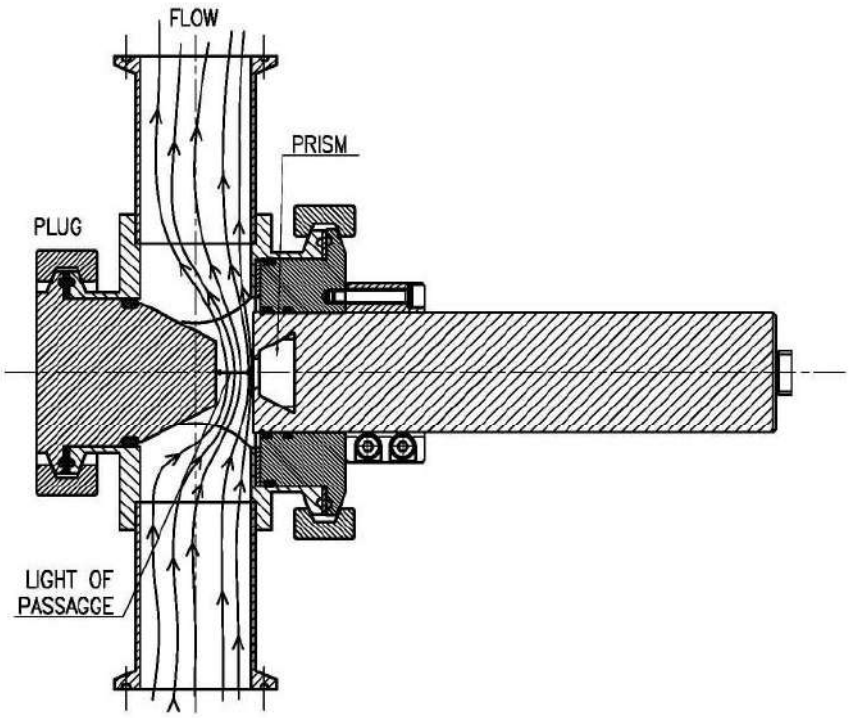
2) It is also possible to install the equipment on the variable cap deflectors in the DF15 series. Depending on the temperature of the system two types of adapter are available. With this type of installation it is important that the unit does not protrude by more than 1.5 mm from the adapter clamp.

There are two versions of the adapter in question: one made completely from steel (right) and one with a central body made from PEEK (left); the latter is used when the product temperature reaches 90°C.



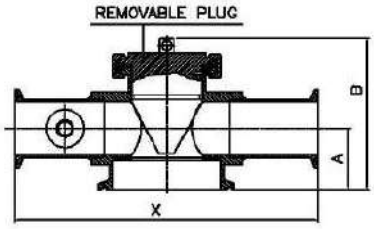
Installation of the instrument using the so-called "deflector" offers three main advantages:
1 – it allows for better adaptability to the production line piping,
2 – it offers the possibility to adjust the passage section on the prism and hence the speed of product flow (self-cleaning),
3 – it renders the prism an instrument which is much more accessible consequently facilitating inspection and any cleaning operations.
As already mentioned, the passage section on the prism is regulated by the distance existing between the lower surface of the removable plug and the prism itself; at the time of ordering, if flow rate data is provided (recommended) the plug is sized and made so as to create optimum product flow over the surface of the prism.

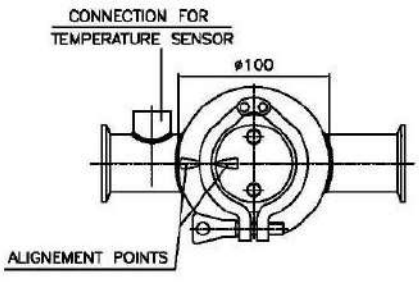
WARNING: ***IT IS IMPORTANT TO REFER TO THE "INSTALLATION GUIDE" FOR THE ACCESSORY remembering that the reference arrows indicated on the deflector and the plug must be aligned when installation has been completed. Do not replace the deflector plug with any other you happen to have as the characteristics may be different.***



The total length of the deflector L=200 mm is consistent with both the Tri-Clamp® connector and the connectors which have to be welded.

The "Tri-Clamp®" connectors and relative pipes for connection to the central body of the deflector are made from INOX AISI 316 or other specific material. If there is a fitting for a thermometric probe, close the hole with the relative plug





DIMENSIONS WITH TRI-CLAMP 1" FITTINGS:
A=33.5mm B=88mm

DIMENSIONS WITH TRI-CLAMP 1"1/2 FITTINGS:
A=39.75mm B=100mm

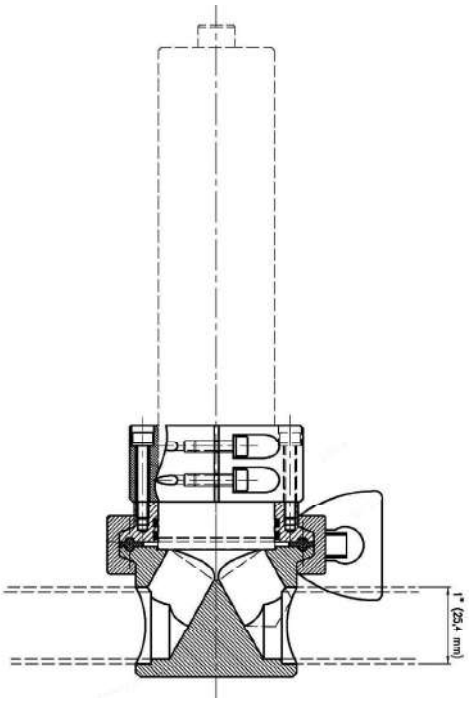
DIMENSIONS WITH TRI-CLAMP 2" FITTINGS:
A=46mm B=112mm

DIMENSIONS WITH TRI-CLAMP 2" AND 2"1/2 FITTINGS:
A=39.75mm B=100mm

DIMENSIONS WITH TRI-CLAMP 3" FITTINGS:
A=46mm B=112mm

DEFLECTOR LENGHT
X=200mm STANDARD VERSION
X=250mm "3A" SANITARY VERSION

3) In particular applications installation on the special deflector is also possible without the plug. The deflection effect of the product flow is exactly the same as with series DF15 deflectors but the width of the light passage cannot be modified. It is more simple and consequently cheaper but only suitable for a limited range of flow rates.



8. ELECTRICAL CONNECTIONS

8.1 ELECTRICAL CONNECTIONS

For connection to the power supply, the **Refractometric Analysis Unit UR-62** is fitted with a 5-m long multipolar shielded twisted pair cable (12 x 0.14 mm) prewired with a waterproof, molded connector.
The equipment must be supplied with power using either of the following specifications:

- AC 24V ±10% 50...60Hz, 80mA or
- DC 24V ±10% 80mA.

If the appliance is powered by an "AC" current UNDER NO CIRCUMSTANCES CARRY OUT the connection between the power supply's neutral and the PE. Furthermore, if the power supply is provided by a transformer, make sure that connection to earth of a pole of the secondary winding is not required.

Failure to observe this warning may lead to serious damage of the appliance.

We recommend to use only the supplied cable, and to connect it to an interconnection terminal board as shown by the relative connection schematics.

Optionally, can supply a waterproof plastic interconnection box, pre-connected to the cable. If needed, the interconnection box can also be supplied including a power supply transformer for the following:

- AC 85…264V ±10%, 50...60Hz, 24W.

We recommend to correctly insert the connector, paying careful attention to the orientation tab and, in order to maintain the proper degree of protection, to tighten them correctly. To avoid short circuits and/or dangerous electrical discharges that may injure the operator and/or damage to the equipment, do not make connections or touch the terminal blocks with voltage connected to the line.

Electrical connections must always be made by qualified personnel, in accordance with local safety regulations. Refer to the appropriate connection schematic, corresponding to the version supplied.

Before supplying power to the instrument, we recommend that you reconfirm the unit's type, features and supply voltage, as well as the proper wiring per current regulations, in order to avoid an improper installation which might result in serious injury to personnel or equipment damage.

If power supply requirements are not respected, either in overload or short circuit, the cable and/or instrument could be so damaged that an adequate safety can no longer be guaranteed.

To assure the unit's optimal operation and compliance with the rules for radio interference, we recommend the use of shielded cables where it is indicated, and to not exceed the indicated lengths.
It is also recommended to install an overload switch in series with the main supply. If the unit is supplied with more than 50VAC voltage to interconnection box, protection against direct or indirect electrical short circuits is mandatory.

If the Maselli interconnection box is used, install it in a location adequately protected from the weather, and follow these recommendations:

- After making the connections, carefully tighten the cover's screw.
- Properly tighten the cables in their cable strain reliefs.
- Do not remove the original protection plugs from those cable strain reliefs not used.
- Do not remove the protection plugs from the RS485 and USB connectors if they are not being used.

8.2 ALARM/CLEANING DEVICE CONTACT CONNECTION

The **Refractometric Analysis Unit UR-62** is equipped with two relay output contacts which may be connected to signaling or acoustic alarm devices to alert operating personnel if the Brix reading goes out of the set measurement range.
These contacts are voltage free and consequently need a connection which includes an external power supply (optionally this can also be provided by an external connection box). A third relay output contact can be used, by acting on the software settings, to manage an external prism cleaning device.
The output contacts of the Refractometric Analysis Unit UR-62 may be used not only for activating an acoustic or visual warning device but also for activating a block of the production line. All contacts have a load of DC/AC 24V/500mA.

8.3 ANALOG OUTPUT CONNECTION

An analog 4…20mA output channel (optional) is available by means of a RS485/mA Converter Module, which can be installed in the connection box or supplied separately, for repetition of the measurement. *The available RS482/mA Converter Module which can be powered with a 24VDC voltage only.*

8.4 SERIAL CONNECTION

A two-wire RS485 serial output is envisaged on the **Refractometric Analysis Unit UR-62** to be used for configuration operations when setting values and alarm modes and for calibrating and selecting the measurement scale via a Personal Computer, Mini PC configurator or specific digital Receiver (optionals). On the connection box (optional) said RS485 serial output is always available on a 4-pole connector while any USB output with the same function for configuring the alarms/cleaner can be inserted in the box as an optional by using a RS485/USB Converter Module (which can also be supplied separately without the connection box).
The RS485 connector and the USB connector are located on the long side of the box, on the same side as cable input: to gain access to them unscrew and remove the watertight protection plugs.

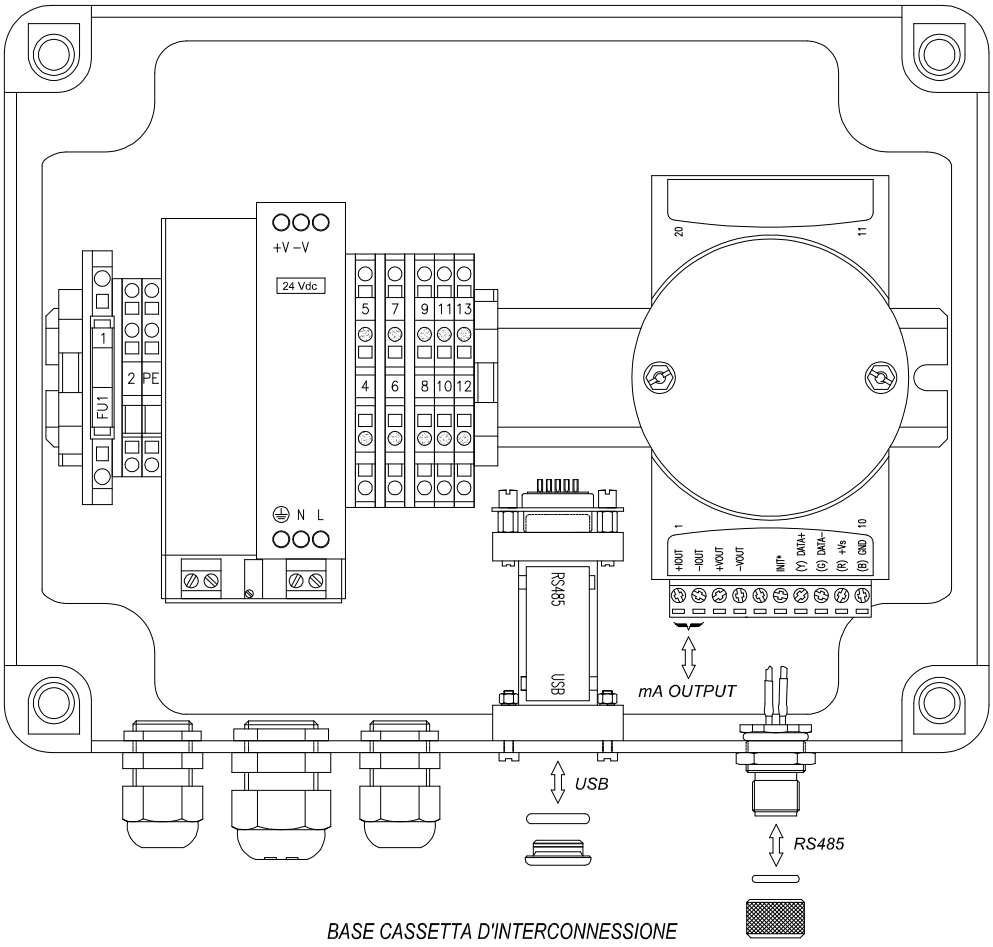


Figure 8.4.a – RS485-USB outputs on the UR-62 connection box

THE SERIAL CONNECTION CABLES, THE ANALOG (mA) AND DIGITAL (INPUT AND OUTPUT) SIGNAL CABLES, THE LENGTH OF WHICH MUST NOT EXCEED THE MAXIMUM INDICATED ON THE DRAWINGS, MUST BE OF THE SHIELDED TYPE AND MUST HOWEVER, COMPLY WITH THE RADIO INTERFERENCE RULES; THE CABLE SHIELD MUST BE CONNECTED INSIDE THE JUNCTION BOX IN THE EQUIPOTENTIAL GROUND BAR NODES PROVIDED (YELLOW-GREEN TERMINALS).

10. START-UP

10.1 START-UP

All Maselli instruments are assembled, carefully tested and calibrated by highly trained personnel, according to a "Quality Standard" conforming to ***"ISO 9001-VISION 2000"***, Certification and do not require any special procedures for the start-up. If specific working characteristics of the instrument are required at the time of order, they will be pre-programmed and tested at the factory and documented on the "Calibration Specification" sheet supplied with the instrument.

Always verify the following before starting up the instrument:

* The electrical connections listed in Chapter 8 were made correctly.
* The power supply voltage is within the specified range:
  AC 24V ±10%, 50...60Hz, 80mA or alternatively
  DC 24V ±10%, 80mA
  L/N/PE AC 85…264V 50…60Hz 24W with Interconnection box.

In any case check that the voltage corresponds to the one indicated on the identification label on the instrument or on the interconnection box

* If the appliance is installed on a deflector of the DF15 series, check that the removable plug on the mounting fitting is installed in the proper orientation. The plug reference arrow should be aligned with the reference arrow on the mounting fitting body.
* The product flows continuously across the prism surface.
* The product velocity across the prism is sufficient to continuously keep the prism surface clean.
* The prism remains flooded with product or water at all times, even during a pause in production.
* The coupling screws and clamps are securely tightened.
* If the system is used to measure food products, perform sanitization as envisaged by the production line procedures.

Referring to Chapter 9 Programming, also verify that:

* The **"Relay Function" (9.11.2)** and **"Alarm Type" (9.8.1)**, as described in Level 2 mode is set properly as desired.
* The **"Alarm Settings"**, as described in Level 1 (**9.8.1** and **9.10.2**) are correctly set.
* If using the prism wash timer described in Level 1 **(9.10.3)**, define the wash time (**Washing Time**) and the pause time **(Measure Time)**, and activate the prism wash function (**Washing**).
* The temperature compensation **(Temp. Comp.)**, described in Level 2 **(9.11.3)** is included and the displayed value is correct.
* In case of product instability or gas bubbles, a value for averaging of the measure **(Integrations)** is programmed, described in Level 1 **(9.10.1)**, sufficient to make the reading stable.
* If using the serial output, the relative communication parameters **(Function, Baud Rate, Address)**, as described in Level 2 **(9.11.4)** are properly set.
* The desired temperature units are displayed **(Temperat. Unit)** as described in Level 2 **(9.11.2)**.
* If the mA output is used, the desired configuration **(mA Range Type)** and the defined scale range **(Start Range** and **END Range)** are set in Level 2 **(9.11.2)**.

13. MAINTENANCE

13.1 MAINTENANCE

The **Refractometric Analysis Unit UR-62** does not normally require regular maintenance. However, periodically or if the performance degrades, check the following:

- The “External Gaskets” and “O-Rings” and the brush on the cleaner (if installed) are in good condition.
- The "Measurement Prism” is clean.
- The unit coupling screws and clamps are securely tightened,
- If the deflector cap has been removed during specific configuration operations that it has been correctly replaced with the reference arrows duly aligned,
- Use only a damp cloth to clean the exterior of the unit. Avoid using solvents or detergents that could damage.

According to the measurement’s detection, it is advisable to periodically check the Zero (see charter 12-Calibration).

We remind that such interventions must, however, be carried out by qualified personnel on switched off equipments, disconnected from the power supply line, insulated from the production line (if not in other way indicated), under safety conditions and areas, avoiding any potential dangerous situation for oneself and others.

In particular it will be necessary to:

- avoid operating in unstable equilibrium conditions and however insecure;
- use suitable clothes and protection if the equipment’s temperature could be a potential danger;
- eventually use protection glasses and gloves, and nonslip rubber shoes.
- Avoid dispersion in the ambient of polluting, tossic or noxious substnaces.

For all what unspecified, follow the working safety standards/Rules in force in the Country of use.

17. GENERAL INFORMATION

17.1 STORAGE

The **Refractometric Analysis Unit UR-62** can be stored without problems; for best results follow these suggested procedures:

- If possible, store the instrument and all accessories in the original packaging.
- If the refractometer has been used, remove it from the fitting and clean both parts completely.
- Install the protective cover end cap for the prism, removing it only when ready to install the instrument.
- Protect the refractometer from humidity (the value should not exceed 95% relative humidity).
- Ambient storage temperature for the refractometer in its container should be between –10 °C e +45 °C *(+14 °F e +113 °F).*

17.2 SCRAPPING AND DISPOSAL

We'd like to remind that in case the equipment is no longer used, it is important to make it inoperative by removing the power supply cable.
We wish to underline that the appliance DOES NOT fall within the field of application of Directives 2002/95/EC, 2002/96/EC and 2003/108/EC, concerning the reduction in the use of harmful substances in electrical and electronic equipment, nor the disposal of waste products, as the finished product is part of a fixed installation.
The User must therefore dispose of the appliance in accordance with the relative legislation currently in force in the country of disposal; relative sanctions will be imposed on the User if the apparatus is disposed of illegally.
We'd like to remind that suitable differential refuse collection of the equipment, in view of successive recycling and environmentally friendly disposal, contributes to avoiding possible negative effects on man or the environment and favours the recycling of the materials from which the equipment is made.
Scrap deriving from demolition of the instrument must be disposed off in accordance with safeguarding the environment, without polluting the ground, air and water.
During demolition, separate the parts according to the materials used for construction.
General indications for proper disposal of machinery are given below.

Metals (Steel, Copper, Aluminum etc.) **Recycle**
To be sent to special authorized centers.

Plastics (PVC, Nylon, resins, etc.) **Recycle**
To be sent to special authorized centers.

Lubricants (Oil, Grease, Solvents, etc.) **Disposal**

Components electrical and electronic **Disposal**
To be consigned to an authorized collection centre in accordance with the specific Directive.

Other **Disposal**
Urban wastes can be disposed off at dumps.

17.3 SAFETY REGULATIONS

Unqualified personnel must not be allowed to carry out maintenance operations on the instrument; make sure the personnel involved are familiar with all the instructions to be followed and the precautions to be adopted for maintenance of the instrument concerned, and have read and understood the contents of the Manual.
While carrying out maintenance operations, use safety clothing, including gloves, safety footwear or other equipment necessary for personal protection to prevent injury.