

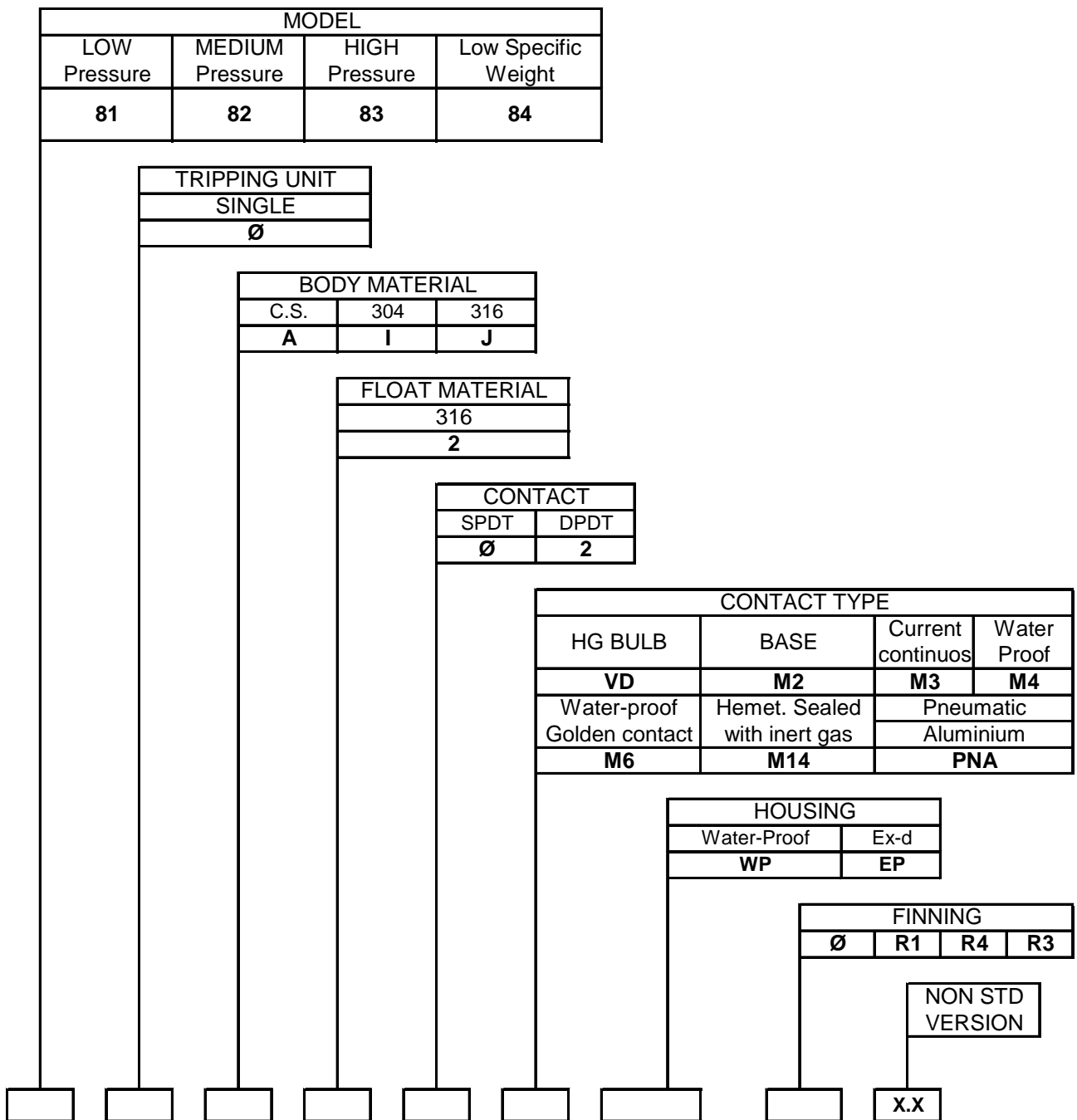


**USER'S MANUAL for LEVEL SWITCH  
of the metal electrical SERIES 80**

**1. INSTRUMENT DESCRIPTION**

Series 80 level switches have been designed to be fitted on the external sides of horizontally mounted pressure vessels. The models are equipped with a tripping unit, which can be provided with single (SPDT) or double (DPDT) switching contacts for low and high level control and/or alarms.

**2. MODEL IDENTIFICATION**



**3. OPERATING PRINCIPLE**

The operating principle is based on the hydrostatic principle (Archimedes's law).

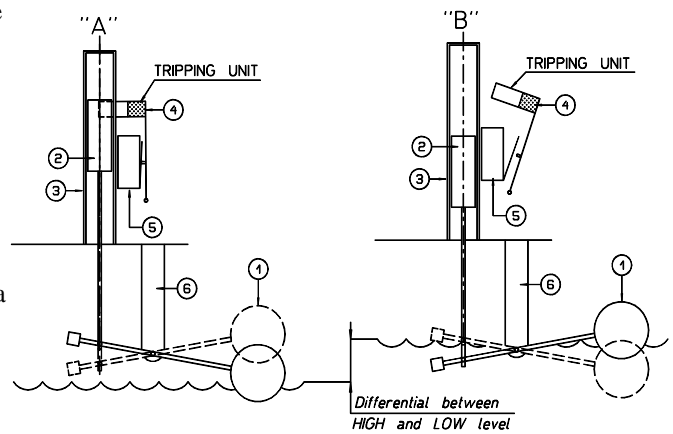
The float (1) is mounted on a rod resting on the bearing (6) equipped with a balance weight, whose function is to compensate the weight of the float. Close to the balance weight, by means of a stem, a small piston (2) made from magnetic stainless steel is fitted.

This piston lodges in a pit (3) made from an a-magnetic material. The pit (3) bears on top a tripping unit, which is schematised in the diagram, composed of a magnet (4) and a miniature switch (5) that are connected to one another by means of levers.

In low level "A" condition, the magnet (4) is drawn by the piston (2), and this causes the actuation of the miniature switch (5).

When the level rises – high level "B" condition, the float (1) that follows the level causes the piston (2) to lower. The magnet (4) and the miniature switch (5) switch to the quiescent position.

The difference in height between low level and high level of the fluid is called "tripping differential".



**4. INSTALLATION**

**4.1 FITTING ON THE SYSTEM**

Before installing the unit, check the vessel connections and those of the instrument for compatibility.

Burdening the instrument with external loads is strictly forbidden and it is the user's duty to protect it from stress; using the system as a rest point is strictly forbidden.

To avoid the effects of galvanic corrosion, no use of materials featuring different electrochemical potential is allowed.

The user shall apply all the technical expedients that are aimed at safeguarding the unit from such occurrence.

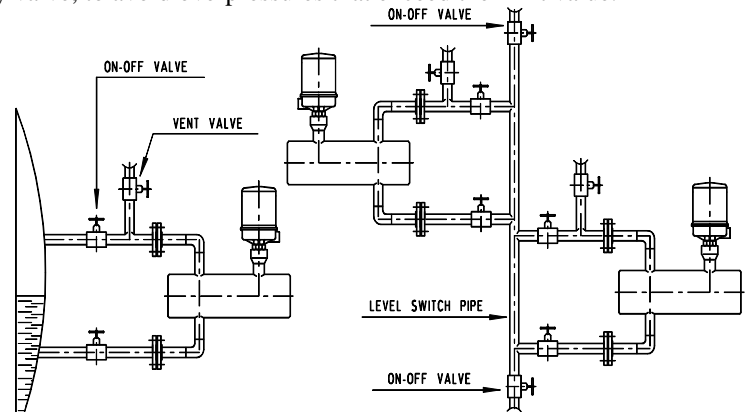
The system shall be equipped with the prescribed safety valve, to avoid overpressures that exceed the limit value.

We suggest you use on-off valves that allow for an easy disassembling of the unit, and bleeder valves to let out any deposits possibly found inside the instrument.

If you expect the formation of air or steam bubbles, apply air valves to the upper connections.

If for adjustment-related reasons two or more instruments need to be installed, we suggest you fit them on a level holding pipe.

For installation on vessels that are exposed to strong vibration, please contact our customer service department.



**4.2 ELECTRICAL WIRING**

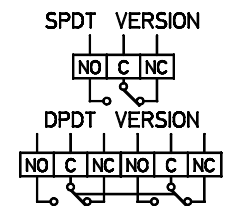
The instrument is equipped with a terminal block located inside the housing.

For connections (NC - C - NO), please refer to the drawing provided on this page.

Make sure the housing lid is closed before injecting voltage.

The user shall provide for suitable ground connections to protect the working staff And any other equipment possibly present.

The NC-C-NO contact is referred to an instrument completely filled with fluid



NO=NORMALLY OPEN  
C=COMMON  
NC=NORMALLY CLOSED

## 5. SETTING AT WORK

Make sure that the use of the instrument does not exceed the intended conditions of use (higher temperature and pressure values, lower specific weight) and that the applied electrical rated value complies with the rating plate values. Verify that the instrument operates a correct switchover, by making the fluid level vary a few times.

## 6. CALIBRATION

The instrument is factory-set and does not require any adjustment to be made on site.

In cases when an adjustment or a setting is required, please refer to the maintenance paragraph (setting the operation point).

## 7. MAINTENANCE

We suggest carrying out a periodic routine servicing (once every 6 months approximately) to ascertain the correct service state of the instrument.

All maintenance actions need to be carried out when the instrument is switched off, depleted of pressure and fluid, at room temperature (in the event of units working at high or low temperature) and disconnected from the contact feeding voltage.

### 7.1 WARNINGS

- NEVER open the lid without being sure that voltage has been discontinued;
- NEVER leave the case without its lid for longer than the inspection time;
- NEVER use the instrument at a temperature or a pressure that exceeds the values specified on the rating plate;
- NEVER use the instrument at an electrical rating that exceeds the value specified on the rating plate;
- NEVER perform settings or replace parts without having read the instructions beforehand; in case of doubts, please contact our customer service department;
- NEVER lubricate any part of the instrument;
- IN cases when the instrument is used at high temperature values, always take all the precautionary measures required to safeguard the working staff during the maintenance work stages.

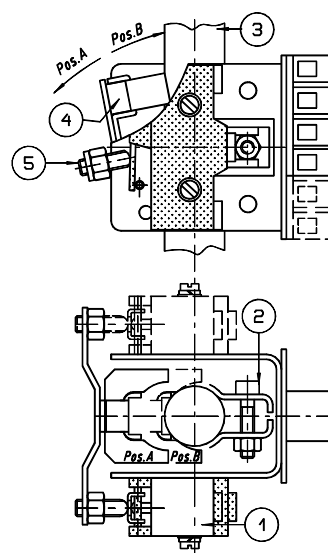
### 7.2 ROUTINE CHECKS ON CONTACTS

Discontinue the voltage supply.

With the lid open, perform a sight check to ensure that the tripping unit does not have damaged or aged parts, manually actuate the magnet to test whether the miniature switch correctly performs the switchover.

### 7.3 REPLACING THE UNIT AND/OR MICRO-SWITCH

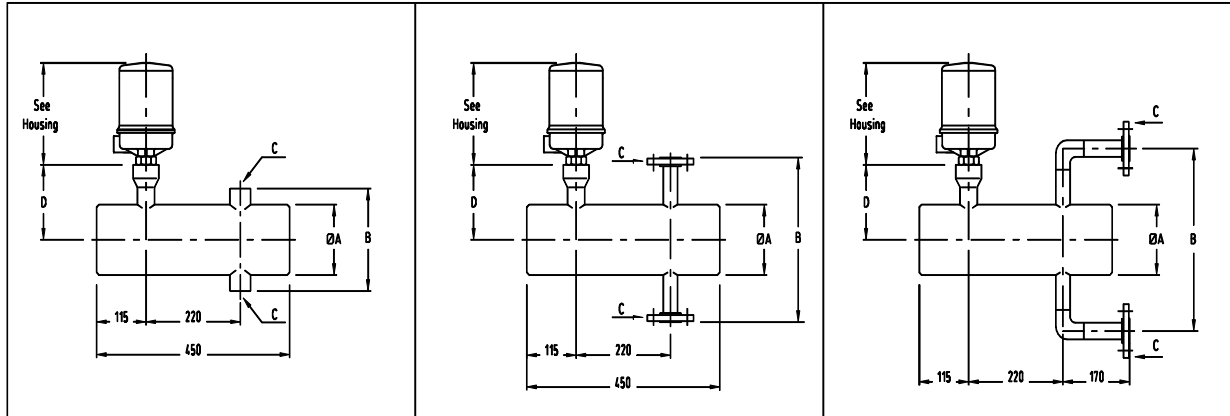
- a - use a gauge to measure the position of the switch unit;
- b - disconnect the wires from the terminal board (make a note of the original connections) and remove the switch unit by loosening the screw (2);
- c -replace the micro-switch (1);
- d -return the switch unit in the sump (3) in exactly the same position as before;
- e-adjust the tripping position by manually moving the magnet (4) against the sump (3), tighten grub screw (5) until the micro-switch trips and allow for one extra turn before locking the grub screw;
- f - check that the micro-switch (1) works efficiently using an ohmmeter and a few manual tripping checks;
- g - reconnect the wires to the terminal board as per point b.



### 7.4 SETTING THE OPERATION POINT

The instrument's operation point *o* is located astride of its horizontal axis, and such point cannot be changed.

**8. DIMENSIONAL DRAWING OF THE BODY**



Dimensioning values specified on the order  
**A**=body pipe **B** = range **C** = connections

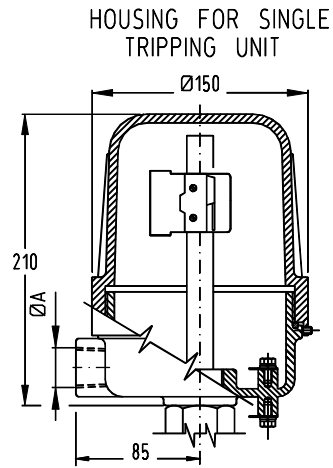
Model	ØA	D
81	141.3 (Ø 5")	155
82	141.3 (Ø 5")	155
83	141.3 (Ø 5")	155
84	168.3 (Ø 6")	165

**9. DIMENSIONAL DRAWINGS OF THE HOUSING**

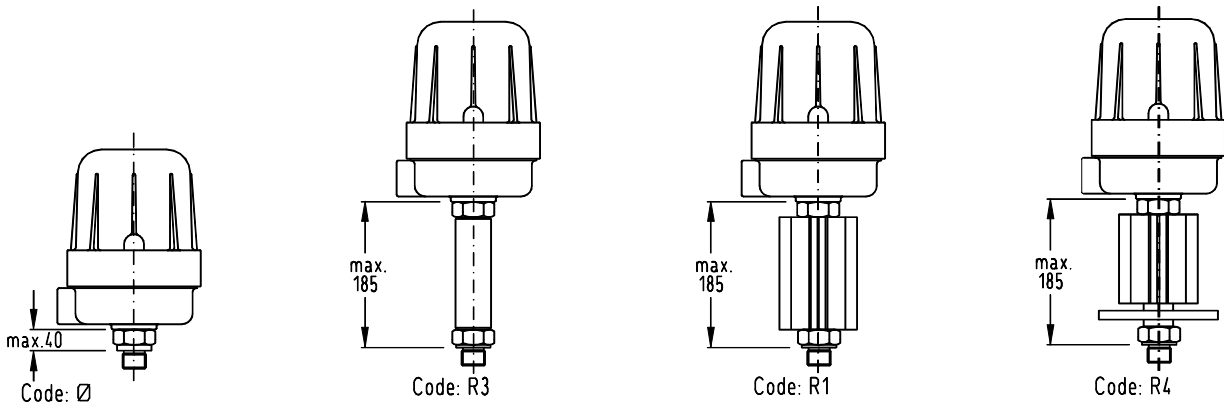
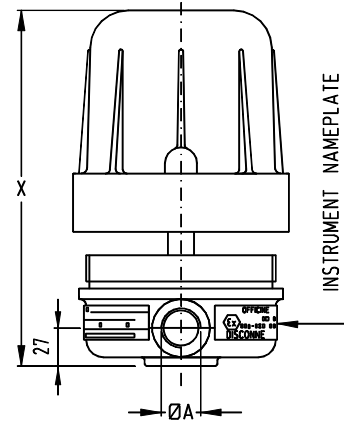
CODE	FLUID TEMPERATURE
Ø	-10÷+135
R3	-11÷-80
R1	+136÷+250
R4	+251÷+500

ELECTRICAL CONNECTIONS Ø A	
EP	WP
1/2" NPT	1/2" NPT
3/4" NPT	3/4" NPT
1/2" UNI 6125	1/2" (GAS) ISO 228/1
3/4" UNI 6125	3/4" (GAS) ISO 228/1
ISO M20x1.5	1/2" UNI 6125
	ISO M20x1.5

## EP HOUSING (EEx-d IIC T6)

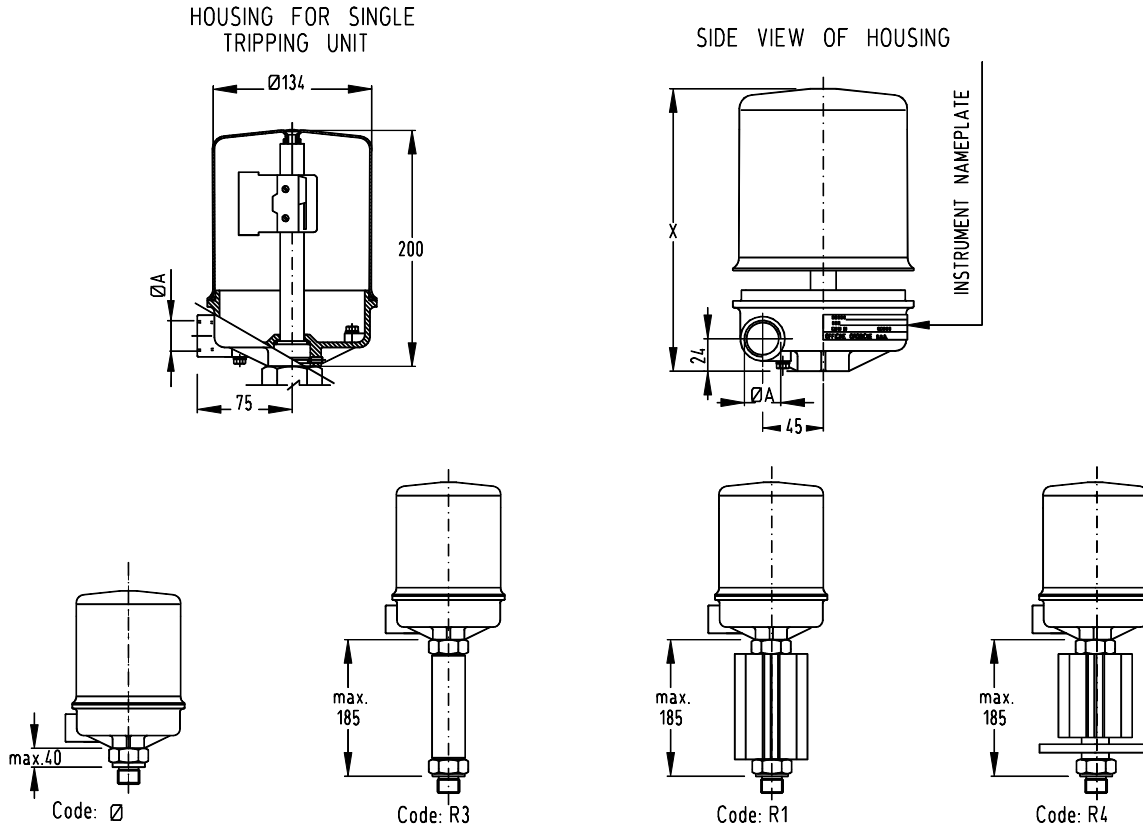


SIDE VIEW OF HOUSING



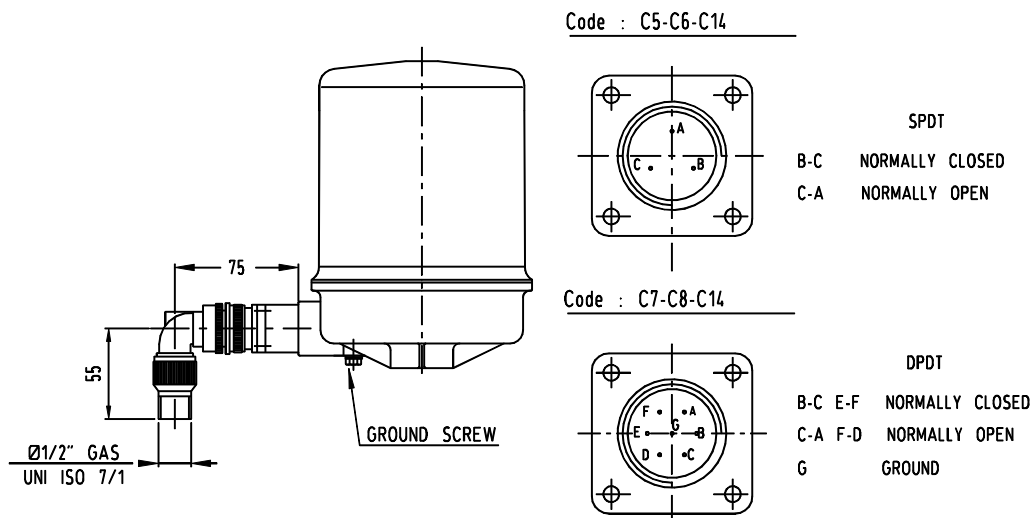
SPACE REQUIRED TO DISMONT HOUSING COVER : X = 340 HOUSING WITH SIGLE TRIPPING UNIT

## WP HOUSING (WATER PROOF IP66)



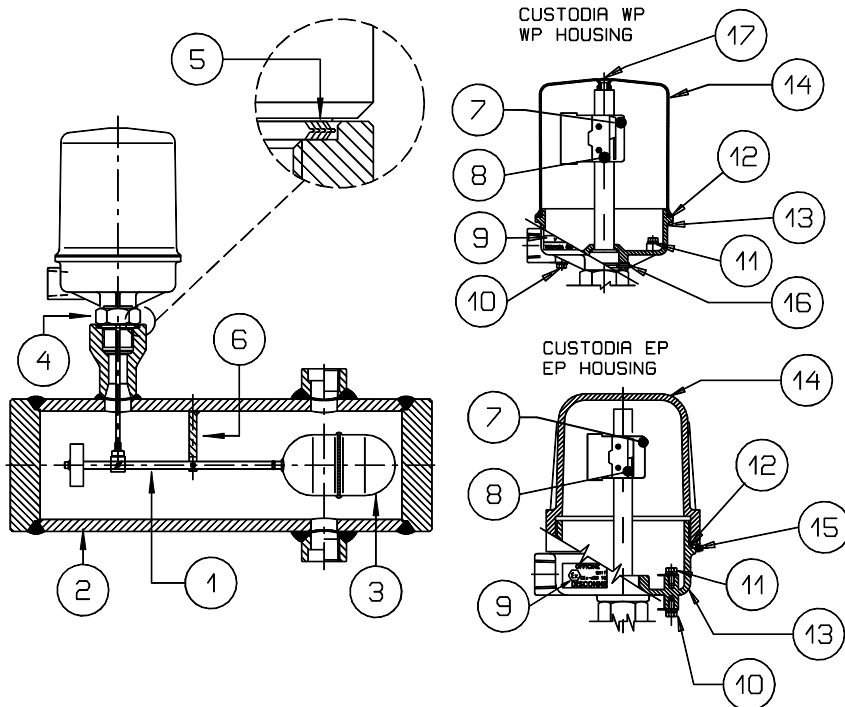
SPACE REQUIRED TO DISMONT HOUSING COVER : X = 320 HOUSING WITH SIGLE TRIPPING UNIT

## WP HOUSING (WITH CONNECTOR OUTLET)



**10. SUGGESTED SPARE PARTS (\*)**

POS	DESCRIPTION
1	Float bar assembly
2	Body instrument
3	Float
4	Coupling
(*) 5	Gasket
6	Fulcrum
(*) 7	Switch assembly
(*) 8	Micro switches
9	Instrument nameplate
10	External grounding unit
11	Internal grounding unit
(*) 12	Housing gasket
13	Housing base
14	Housing cover
15	EP housing cover fastening group screw
16	WP housing base fastening group screw
17	WP housing cover fastening group screw



Always mention the instrument serial number in your request for spare parts.

This number is provided on the instrument rating plate that is fastened to the housing (see Pos.9) and is a five-digit number preceded by the letter "F"(e.g.:F45678).

**11. FAULT FINDING**

Level switches of the 80 series are not normally exposed to faults.

In cases when the level switch does not operate the switching, carry out the test on the float and on the miniature switch as indicated in paragraph 7, MAINTENANCE.

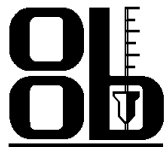
**12. DISPOSAL**

When the instruments have come to the end of their service life, they need to undergo disposal. Always comply with the applicable regulations in force.

All metal parts, after the removal of seals and gaskets, special protective coatings requested by the customer and all other plastic parts, can be recycled.

**WARNING:**

If the installed miniature switches are of the mercury bulb type (code VD), they must undergo disposal in compliance with the regulations currently in force for harmful poisonous materials. Other types of miniature switches are not subject to these regulations.



**13. GUARANTEE**

All the switches parts of the 80 series are guaranteed to be free from manufacturing faults over a period of 12 months from the date of shipment.

In the event of failures, implying return of goods within the limit specified above, OFFICINE OROBICHE will replace (shipment fees not included) all damaged parts free, provided that the failure does not ensue from incorrect use.

OFFICINE OROBICHE shall never be held responsible for any incorrect use of their products when these are used for purposes other than those mentioned in the specifications approved at the order stage.

In these cases, no complaints will ever be taken into consideration.

No damage and/or fee, whether direct or indirect, ensuing from an incorrect installation or use shall ever be debited to OFFICINE OROBICHE.

The instrument can be used for a maximum life period of 10 years dating from delivery.

When this period is over, there are two alternative options:

- 1) Replace it with a new instrument.
- 2) Have the old instrument overhauled by OFFICINE OROBICHE.

**INSTRUMENT RETURN PROCEDURE**

The instrument returning to the factory shall bear, in attachment, the following data:

- 1) Buyer's name.
- 2) Description of the material.
- 3) Detected fault.
- 4) Process data.
- 5) Specification of the fluids that have been used with the instrument.

The instrument shall be returned perfectly clean and free from dust or deposits. Otherwise, OFFICINE OROBICHE reserve the right not to carry out the servicing and return the instrument to the sender.

**FINAL REMARKS**

Each instrument is supplied fully assembled and equipped with all the needed accessories.

Some parts are sold separately under special circumstances only.

Therefore, we warn you to carefully inspect the supply and notify us at once if discrepancies are found.

**N.B. IN CASES WHEN THE INSTRUMENTS ARE MEANT TO BE USED IN AREAS FEATURING POTENTIALLY EXPLOSIVE ATMOSPHERES, THE USER SHALL COMPLY WITH THE ADDITIONAL SAFETY INSTRUCTIONS ATTACHED TO THE STANDARD ONES.**