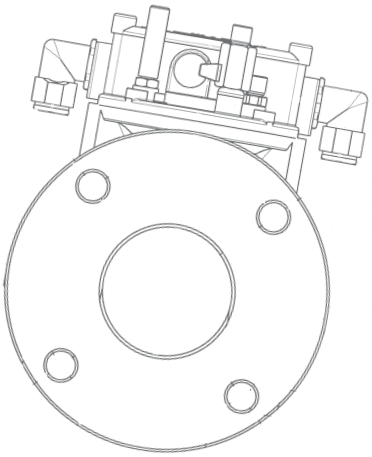
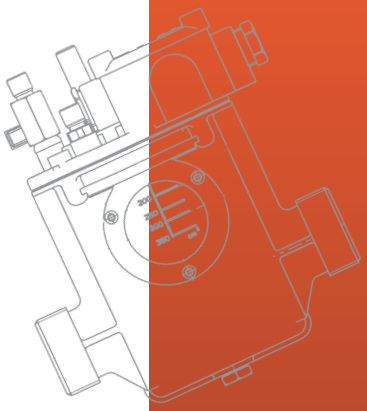


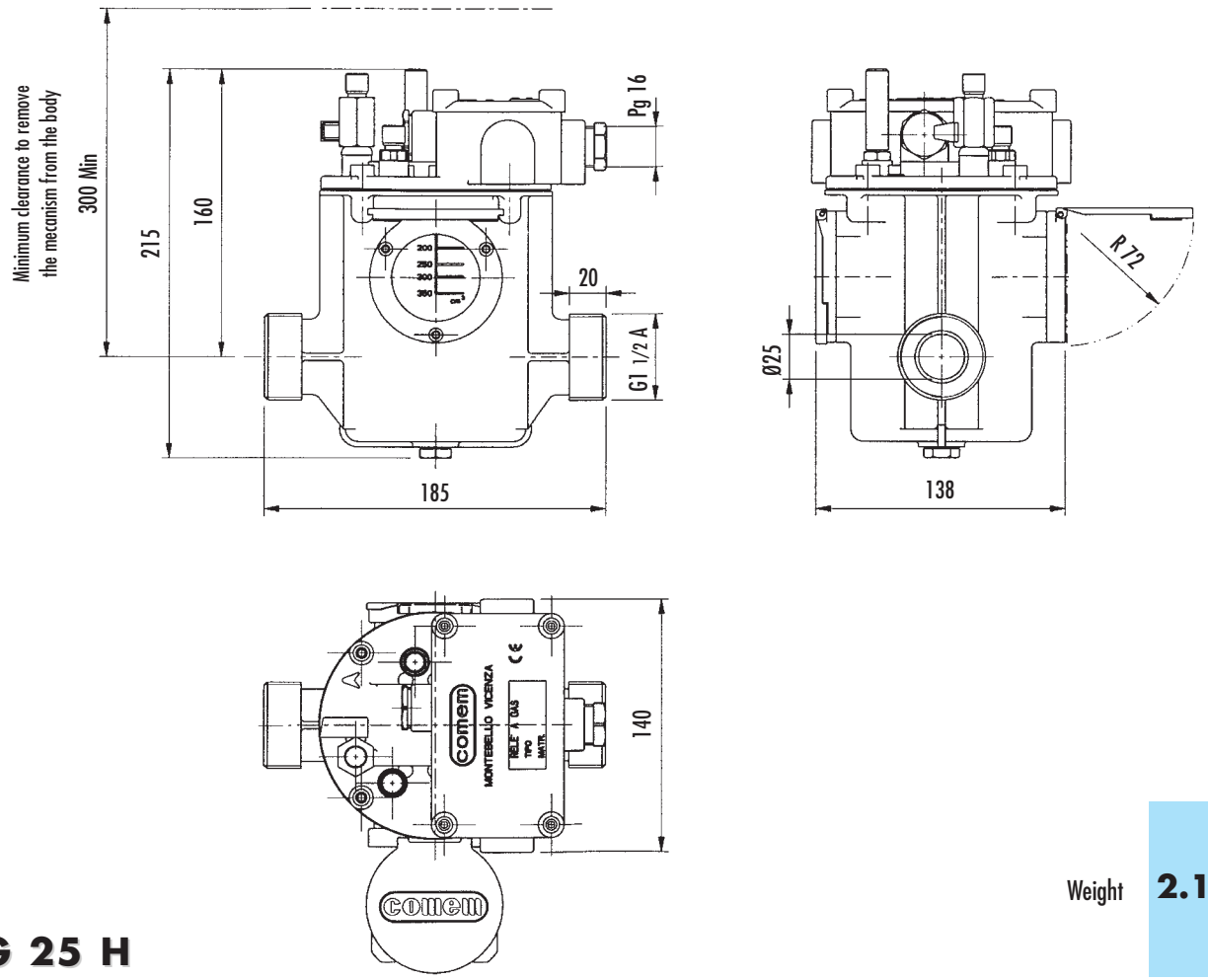


GAS-ACTUATED RELAYS
COMEM TYPE

comem®

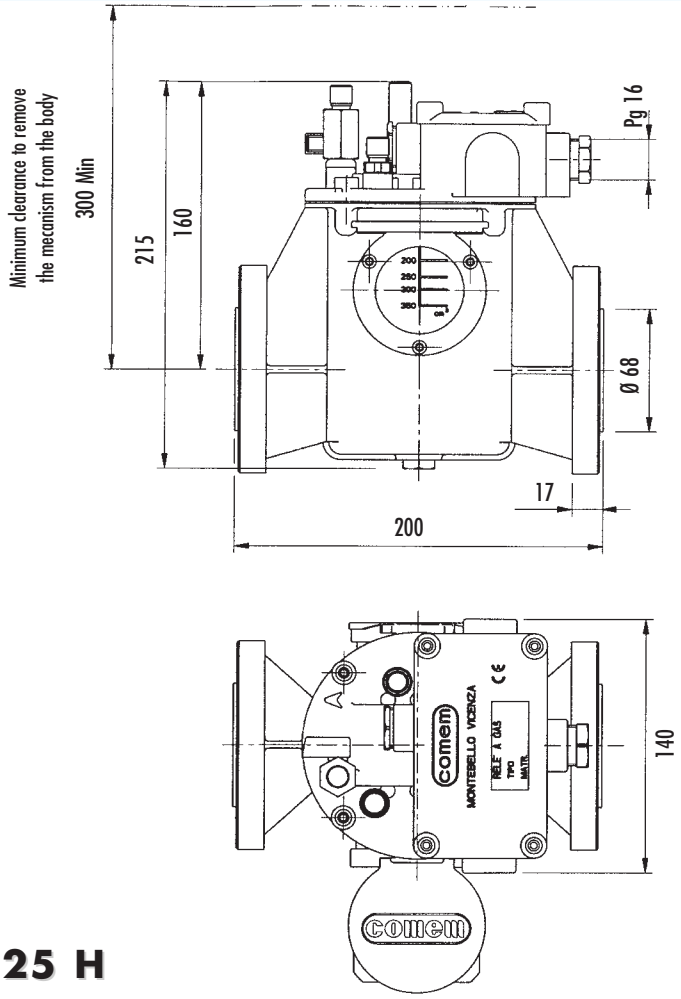
GAS-ACTUATED RELAYS COMEM TYPE

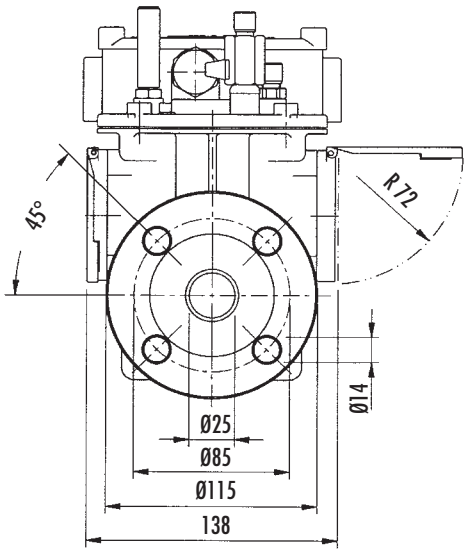
The range:



BG 25 H

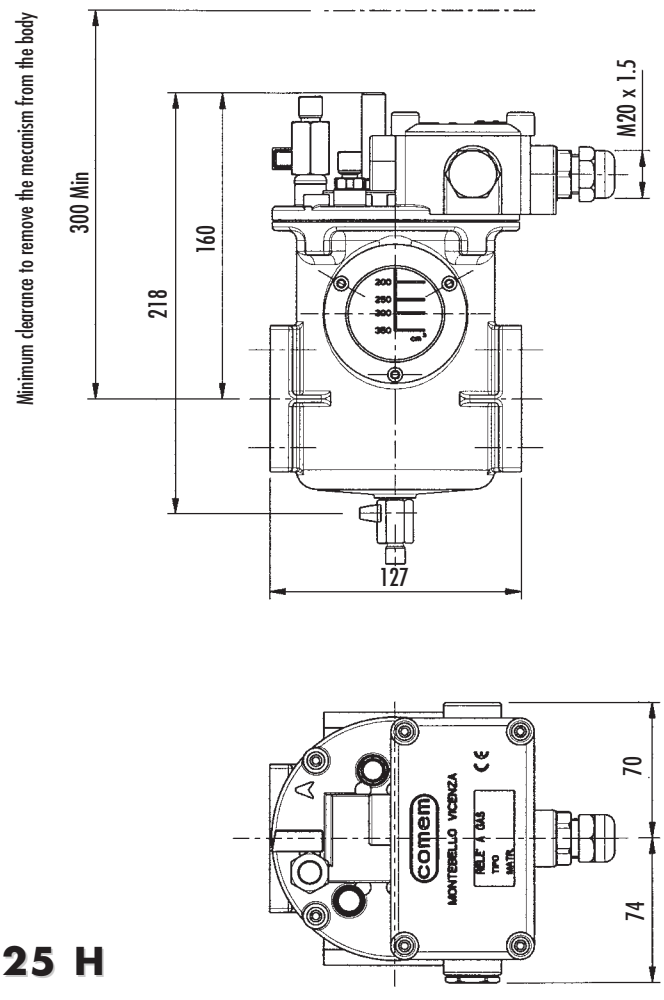
Weight **2.1 kg**

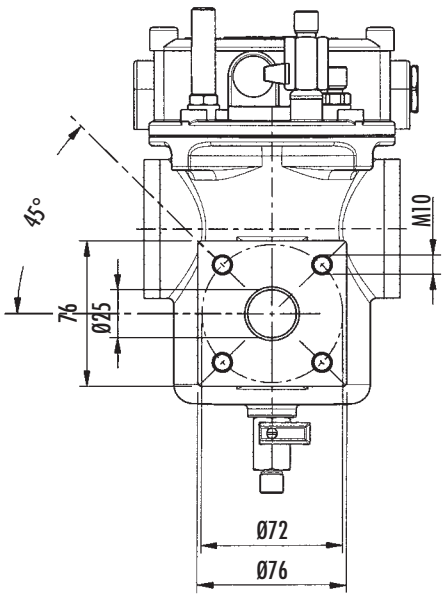




BR 25 H

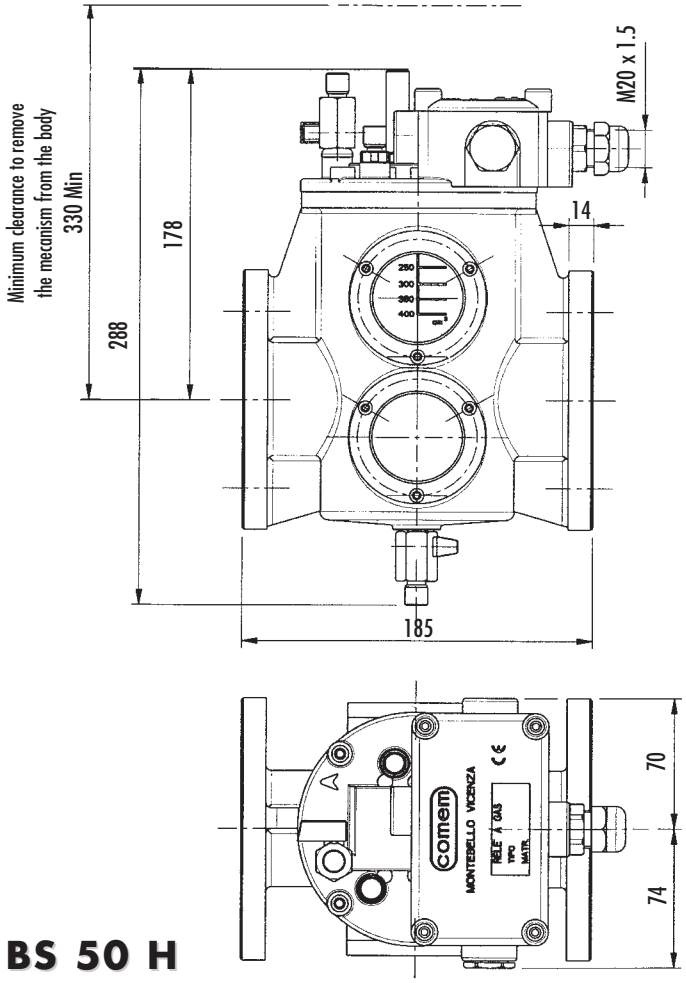
Weight **2.9 kg**

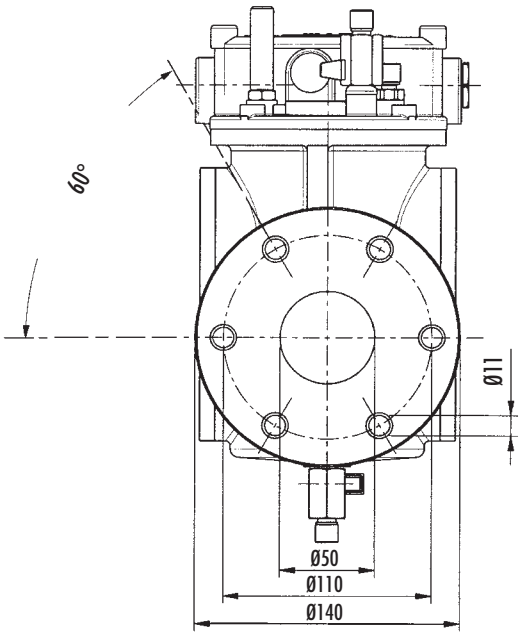




BS 25 H

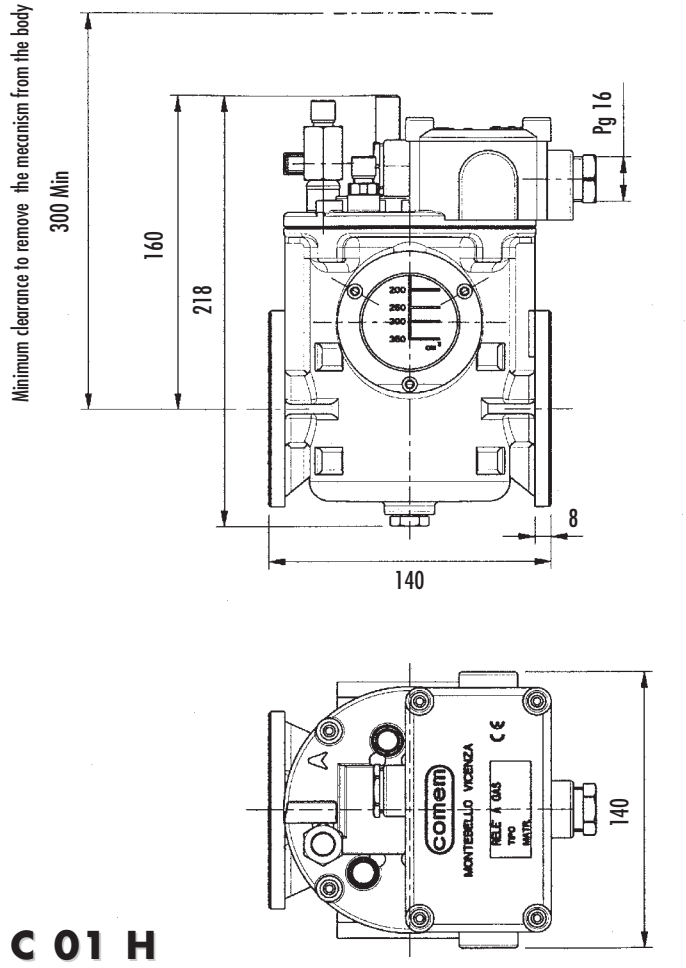
Weight **2.2 kg**

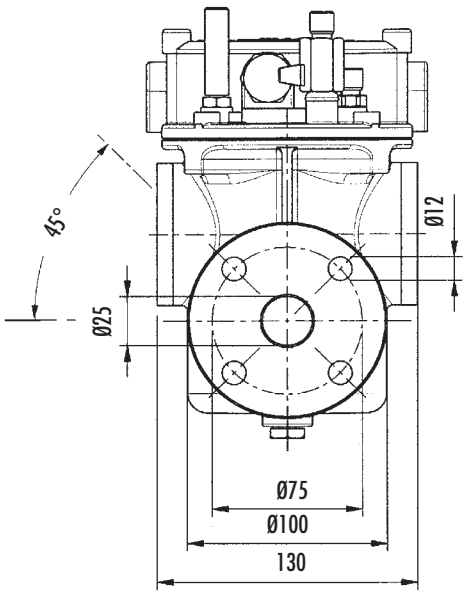




BS 50 H

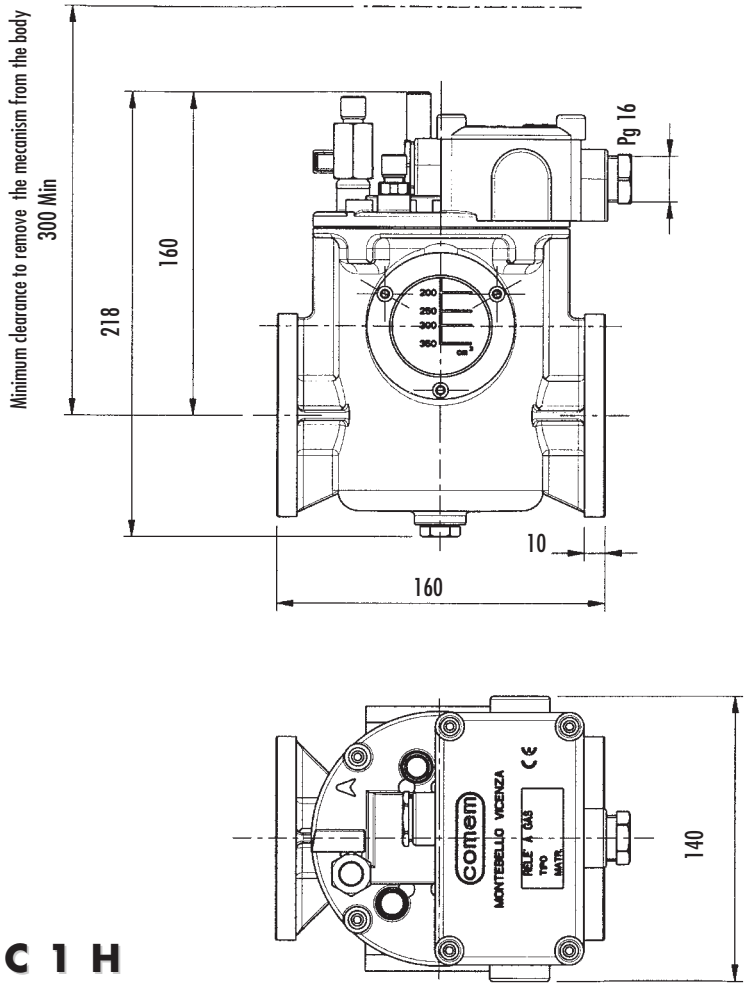
Weight **4.1 kg**





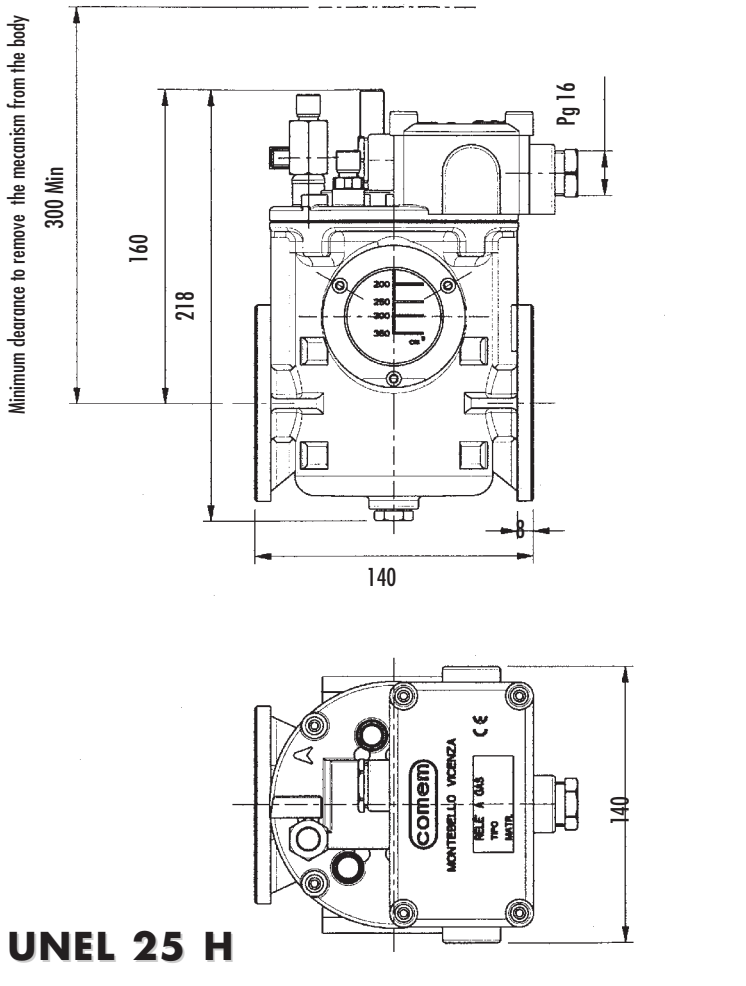
C 01 H

Weight **2.2 kg**



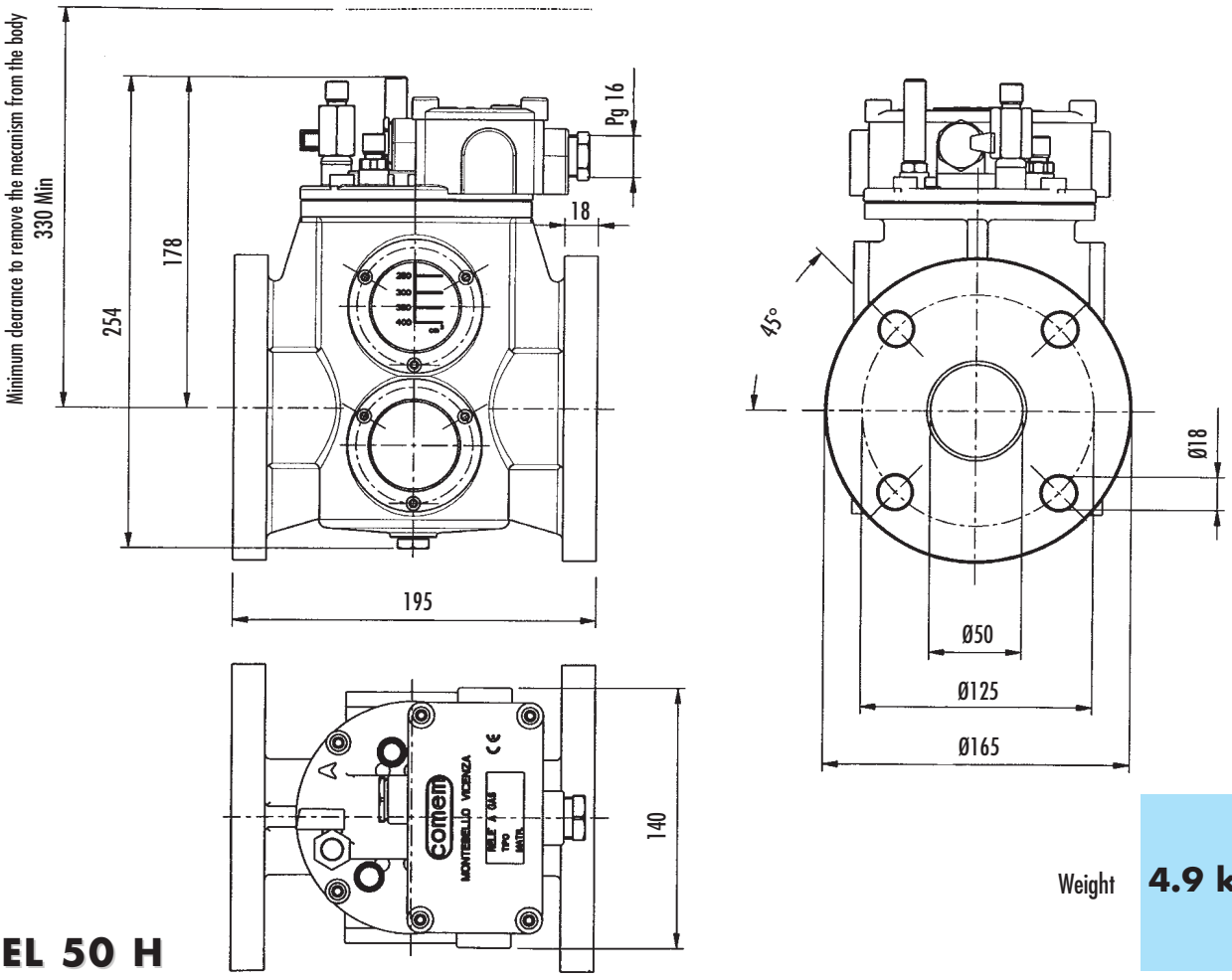
C 1 H

Weight **2.3 kg**



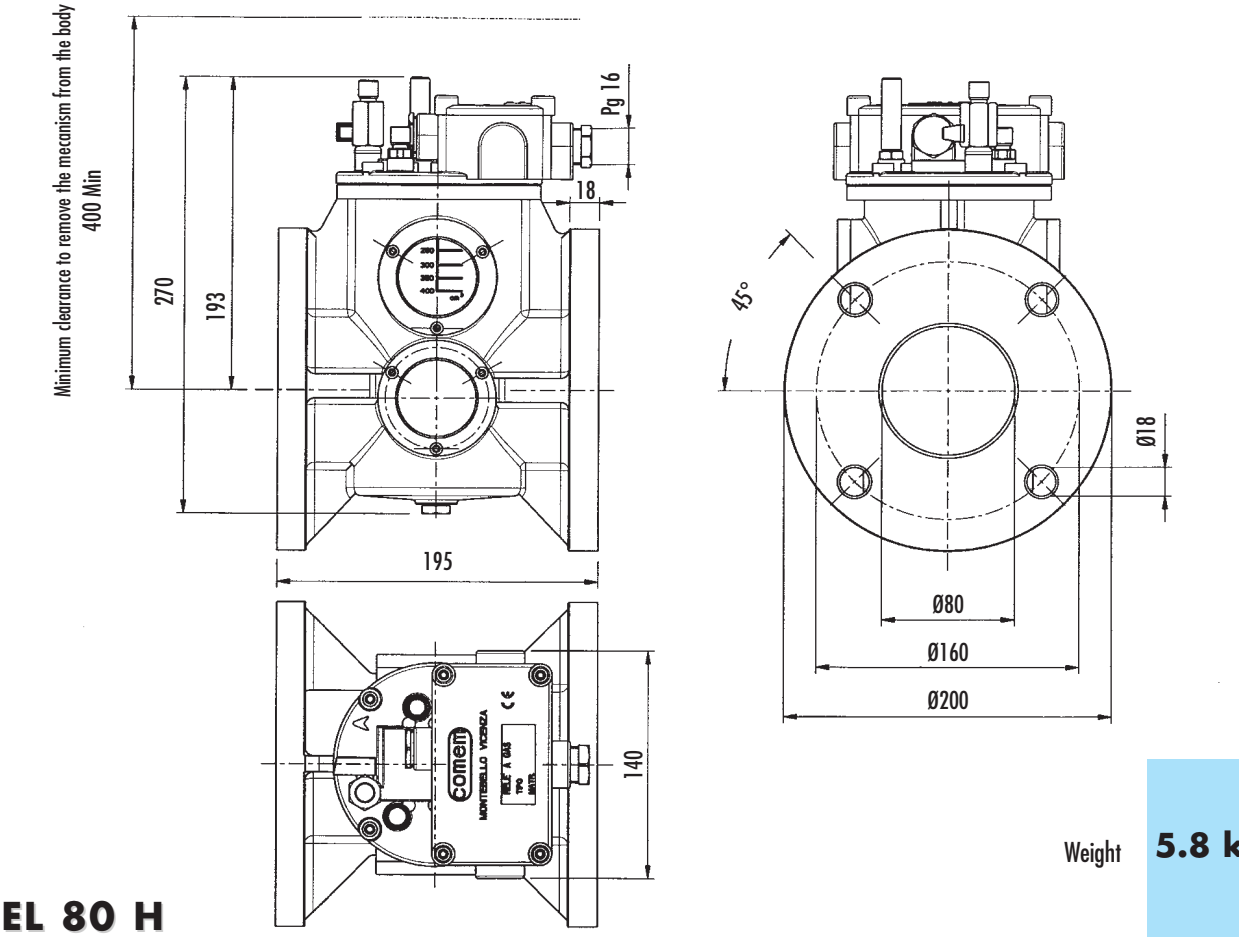
UNEL 25 H

Weight **2.4 kg**



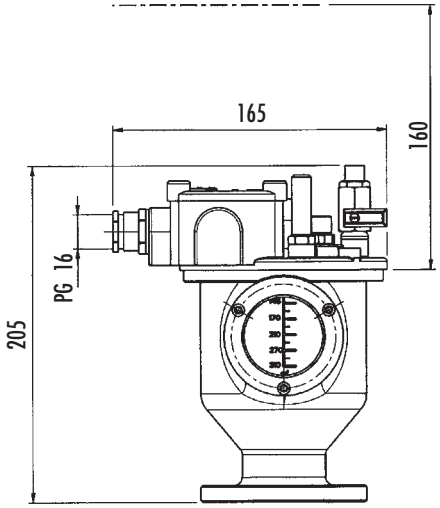
UNEL 50 H

Weight **4.9 kg**

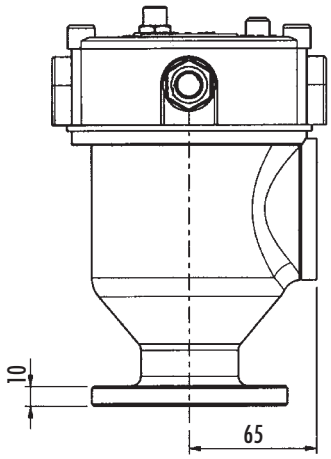


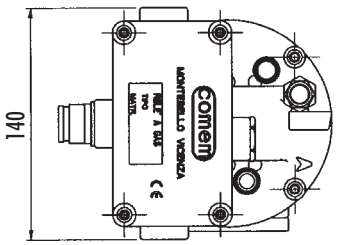
UNEL 80 H

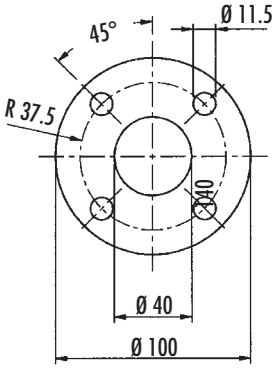
Weight **5.8 kg**



Minimum clearance to remove the mecanism from the body



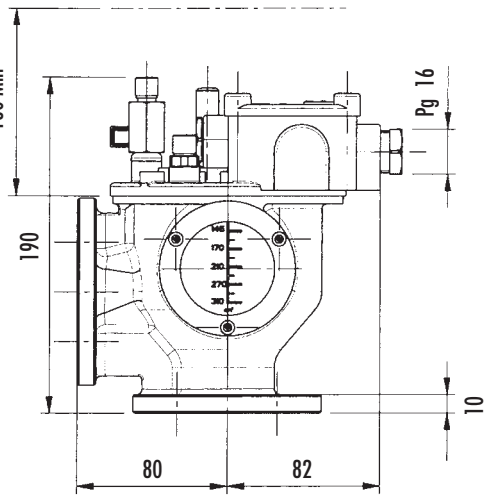


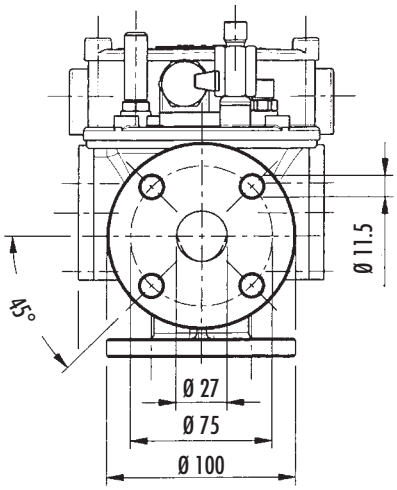


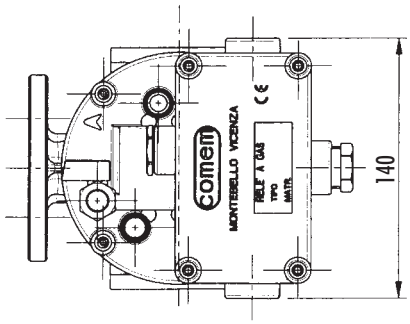
R 1 H (mercury switches)
R 1 M(magnetic switches)

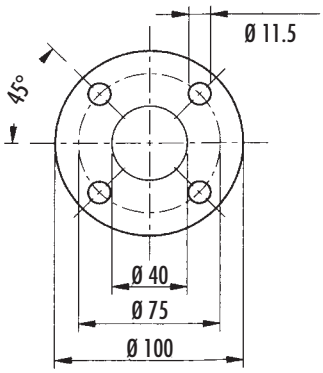
Weight **1.9 kg**

Minimum clearance to remove the mecanism from the body









RF 1 H (mercury switches)
RF 1 M(magnetic switches)

Weight **2.2 kg**

COMEM GAS-ACTUATED RELAY
with mercury switches

The generation of gas in an oil filled trasformer is a clear indication of a problem. The gas may be a result of the following:
- Decomposition/degradation of solid, or liquid insulation inside the transformer due to overheating, or arcing.
- From the outside tawards the pipeline.
- From the oil itself due to unsatisfactory de-gassing prior to filling.

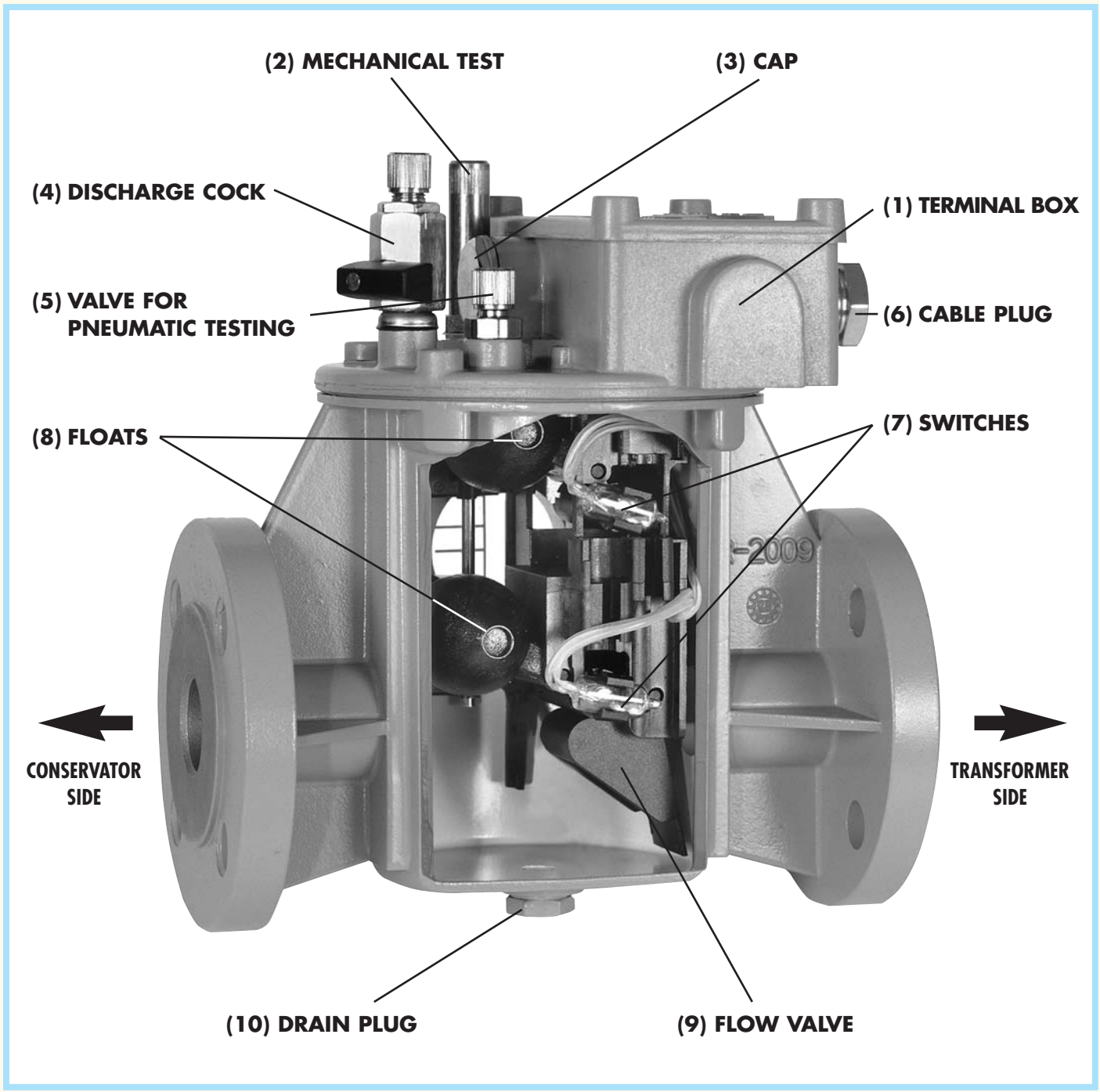
Rapid oil movement in the pipeline towards the conservator is caused by an internal arc, short circuit, or hot spot which must be correctely addressed.
Oil leaks from the transformer are environmentally unacceptable and a fire hazard will lead to transformer failure.
To indicate any of the above malfunctions, thanks to its 40 years experience with these products, Comem has developed a new gas relay which incorporates the very latest technology in its construction.

PRINCIPLE OF OPERATION

The gas relay is fitted in the pipeline between the transformer and its conservator and is filled with oil during normal transformer operation. When gas is generated in the transformer it rises towards the conservator and collects in the upper chamber of the relay. The oil level drops and the top float triggers alarm switch.
Gas shall not freely pass from the relay body and escape into the pipework before the alarm contact has operated. The trip contact shall operate at a steady oil flow.
This operation shall not be adversely affected when the alarm contact has already closed and gas is escaping freely.
In the event of an oil leak, the gas relay will only operate after the conservator has exhaustet all of its oil. In order to check this eventuality it is recommended that an RDR Mk II automatic shutter valve is fitted between the relay and the conservator Specific information on this product is available on request (R1 and RF1 excluded).

CONSTRUCTION

The new Comem relay is an assembly of two machined aluminium alloy castings that effect a perfect oil seal.
1) The main body of the relay is fitted with tempered glass inspection windows with graduated scale markings in cubic centimetres to indicate the internal volume. The oil drain plug is located at the bottom of the main body (except R1 and RF1).
2) The top cover carries the frame which contains the moving parts of the relay. These comprise the two floats (one for R1 and RF 1 type) and their associated mercury switches encapsulated in glass bulbs and one calibrated flow valve (except R1 and RF1). For R1 and RF 1 magnetic switches are also available.
The cover also carries:
(4) a gas discharge valve with G1/8″ in male thread with protective cap.
(5) A valve for pneumatically testing (OK) the alarm and tripping circuits, with protective cap.
(2) A push rod for mechanically tripping the alarm and the tripping circuits, with protective cap.
A terminal box containing 4 numbered M6 terminals and one earth terminal.



EXTERNAL COATING AND PROTECTION

To the external aluminium alloy parts is given a phosphate treatment prior to applying one coat of vinyl enamel, colour RAL 7001.
This treatment has proved more than satisfactory over the years for the majority of applications including desert and tropical situations. However, in particularly severe applications (>500h salty fog) such as applications in corrosive atmospheres (acids) a suitable epoxy primer is recommended. (This should be discussed at the time of selection).
All external brass fittings are plated and all nuts are made in stainless steel.

RELAY SELECTION

The size and type of relay to be used depends on the transformer rating and oil volume. Suggestions are given in the following table but the final choice is often a result of the transformer manufacturers experience.

MVA TRANSFORMER POWER	NOMINAL DIAMETER
Up to 5	25
From 5 up to 20	50
over 20	80

tab. 1

TECHNICAL DATA

- The relay pipeline is typically mounted at 2.5 degrees to the horizontal.
- Operating pressure is 1 bar, but the device has been tested at 2.5 bar for 2 minutes at 100 deg C.
- Gas volume to trip alarm:

RELAY TYPE	GAS VOLUME NECESSARY TO TRIP THE ALARM
R1 H, R1 M, RF1 H, RF1 M	75 cm^3
BG 25 H, BR 25 H, C 01 H , C 1 H, UNEL 25 H	135 cm^3
UNEL 50 H, UNEL 80 H	200 cm^3
BS 25 H	230 cm^3
BS 50 H	300 cm^3

tab. 2

- Rate of oil flow: **1m/s** to trip.
- The relay operates within 0,5 seconds.
- Oil temperature between -25 and +115 deg C.
- Ambient temperature between -25 and +60 deg C.
- Degree of Protection IP65 to EN 60529.
- Gasket type: NBR.

SWITCH ELECTRICAL DATA

Rated switch current is **2 A r.m.s.** with max. **10 A r.m.s.** as short term 30 ms current value.
Breaking power is specified in the following table:

VOLTAGE	CURRENT	BREAKING POWER	
127 V d.c. (min. 12V)	2 A	250 W	L/R < 40 ms
230 V a.c. (min. 12V)	2 A	400 VA	cos φ > 0.5

tab. 3

Minimum switch life 1000 maneuvers.

Dielectric contact voltage as specified in the following table:

	SHORT TERM INDUSTRIAL FREQUENCY LEAKAGE TEST kV/1 min. (r.m.s)	RESISTANCE VOLTAGE PER PULSE kV (peak)
Between circuits and ground	2.5	5
Across open contacts	1	3

tab. 4

TESTING

The following Type Tests have been performed on the relay.
- Measurement of the volume of gas necessary to trip the alarm.
- 500 hr salty fog test.
- Pressure Withstand Test 2.5 bar for 2 minutes with oil at 100 deg C.
- Vacuum Withstand Test of 2500 Pa for 24 hrs.
- Rate of flow test to operate trip contact: **1 m/s.**
- Electrical tests as per table 4.

ROUTINE TESTS

The following Routine Tests are applied to all relays.
- Hydraulic seal test in mineral oil at 90 deg C and 100 kpa pressure for 30 minutes.
- Contact operation via mechanical push rod.
- Contact operation by lowering the oil.
- Electrical withstand test between contacts (as table 4).
- Electrical withstand test between contacts and earth (as table 4).

An individual copy of routine Test Report is provided with each relay

RELAY OPERATING TEST

The following Site Tests can be performed when the relay is installed on the transformer
The Alarm and Trip contacts can be tested either manually by the push rod (2) - mechanical test; only the alarm can be tested by the introduction of air into the relay through valve (5) - pneumatic test.
A bicycle pump can be utilised for this test or a kit article n° **5400806002** is available from Comem.
To effectively test the rate of flow of oil is a complex test requiring specialised equipment. Should this test be required other than as a type test then Comem can perform this on request at the time of the order.

INSTALLATION INSTRUCTIONS

The following installation procedures must be observed for proper relay operation:
- The red arrow on the relay must point towards the conservator.
- The relay must always be full of oil, which means that the minimun oil level in the conservator must be higher than the relays breather valve.
- The recommended inclination of the relay pipeline is 2.5 degrees from the horizontal.
- The pipe from the transformer to the relay must exit the transformer at the highest point.
- The pipeline upstream from the relay has to be straight and with a length equal to **5-10 times** the pipeline diameter (transformer side), at least.
  Downstream from the relay, pipeline length has to be **3 times** the pipeline diameter at least. It must rise up towards the conservator.

RELAY ORDER FORM

Electric contact layout (meaning with relay filled with oil and operating):

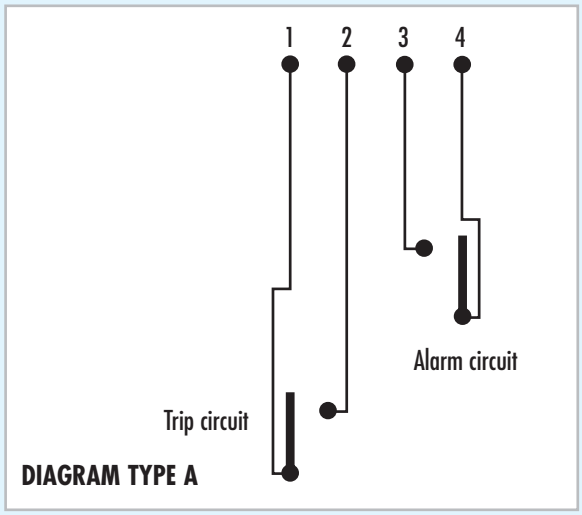


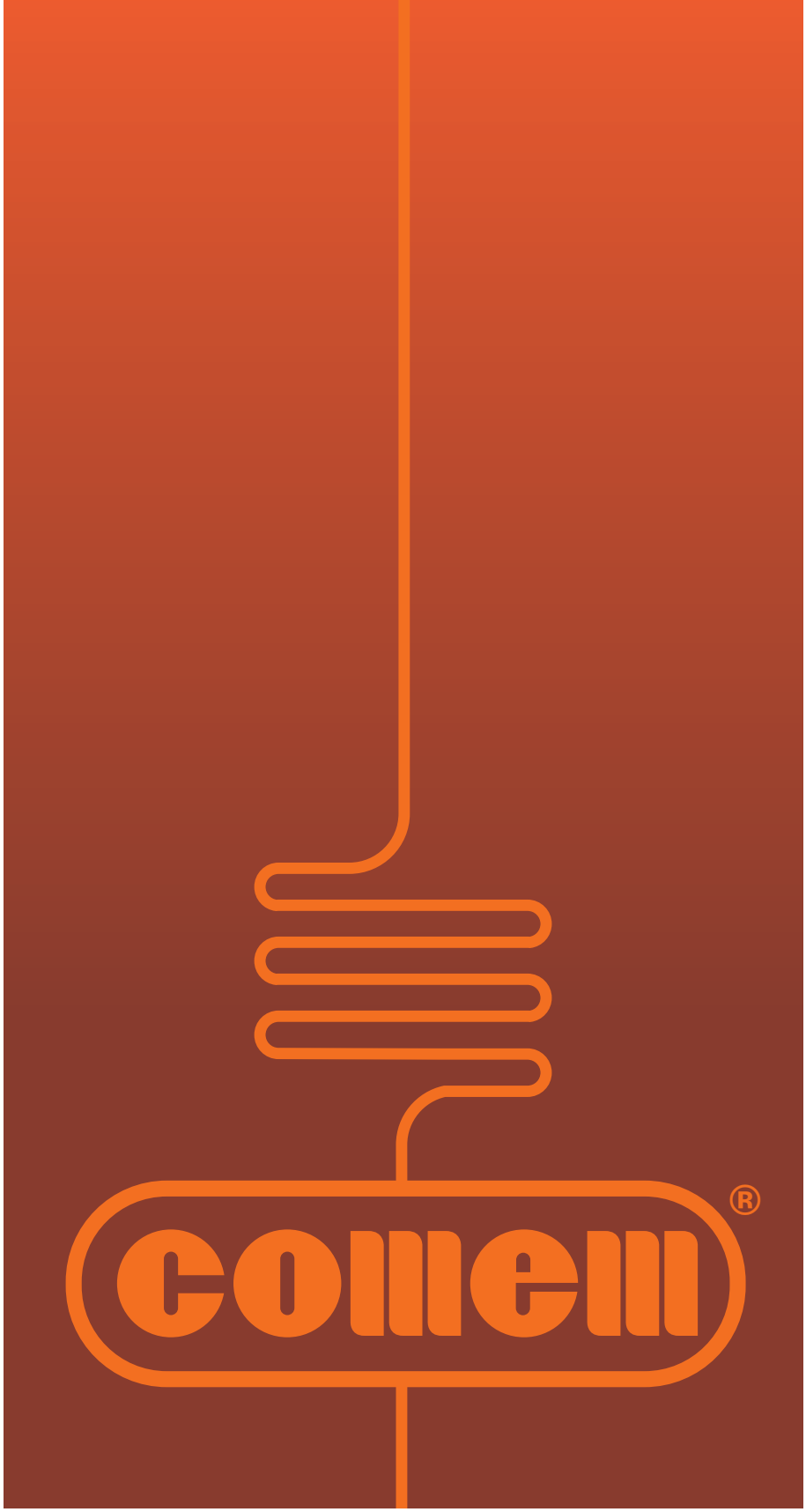
DIAGRAM TYPE A

Chosen size and model (see drawings and table 1):

☐ BG 25 H	☐ BR 25 H	☐ BS 25 H
☐ BS 50 H	☐ UNEL 25 H	☐ UNEL 50 H
☐ UNEL 80 H	☐ C 01 H	☐ C 1 H
☐ R 1 H*	☐ R 1 M°	☐ RF 1 H*
☐ RF 1 M°		

* mercury switches
° magnetic switches

☐ standard paint ☐ corrosive environments paint



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