

# «POUMON»: R134a charging device SODEREL



*30 years at your service*



Version 07/2007

# Presentation

The «poumon»:

This device is made up of two variable volume chambers (the total volume remains constant). The separation between the two chambers is a stainless bellows, which ensures perfect tightness.

The internal chamber contains the nitrogen or the compressed air, which serves as counter-pressure force at constant pressure at the time of the vehicle charging.



Application: Air conditioning

Gas: R134a

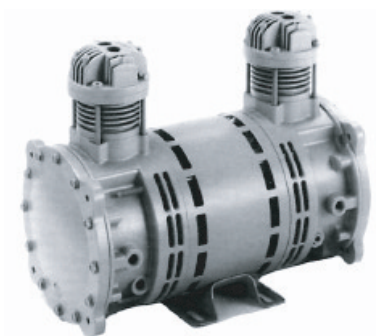
Material: stainless steel 304L

Reference: 998-300-000



Mass flowmeter  
Rheonik RHM 04

1 pulsation/0,1g (whatever the pressure and the temperature)



Double piston pump for the recovery of R134a  
THOMAS 2520CL60

From -800 mbar at the admission, to 14 bar at the repression



# Operating principle

## Filling of vehicle at constant pressure:

Before the charging phase of the vehicle, the «poumon» is filled with R134a. The R134a chamber is supplied by the factory network or by supercharger.

The charging is done by the pressurization of the nitrogen chamber at 13,5 bar.

The end of the «poumon» filling occurs if the «poumon» is in low position and if a pressure of 12 bar is detected in the R134a chamber.

The R134a contained in the hoses of the adapter is sucked in by the recovery pump. The recovered gas is sent in the «poumon». In order to permit a more effective recovery, the nitrogen chamber of the “poumon” is placed under a pressure of 4.5 bar.

The trap of degassing, assembled to the top of the “poumon”, permits to collect the non-condensable gases. These gases are evacuated, if the minimum level of the trap is reached (this phase is not systematic at each cycle). The evacuation stops when the high-level of the trap is detected.

Moreover, two safety valves calibrated at 16b permit to avoid excess pressure inside the «poumon» (one valve in nitrogen chamber and one valve R134a chamber).

## Measure of the delivered quantity:

The delivered quantity in the vehicles is measured by a mass flowmeter installed at the exit of the filling line, in very close range of the adapter. This measuring component instructs the locking of the filling valve of R134a.

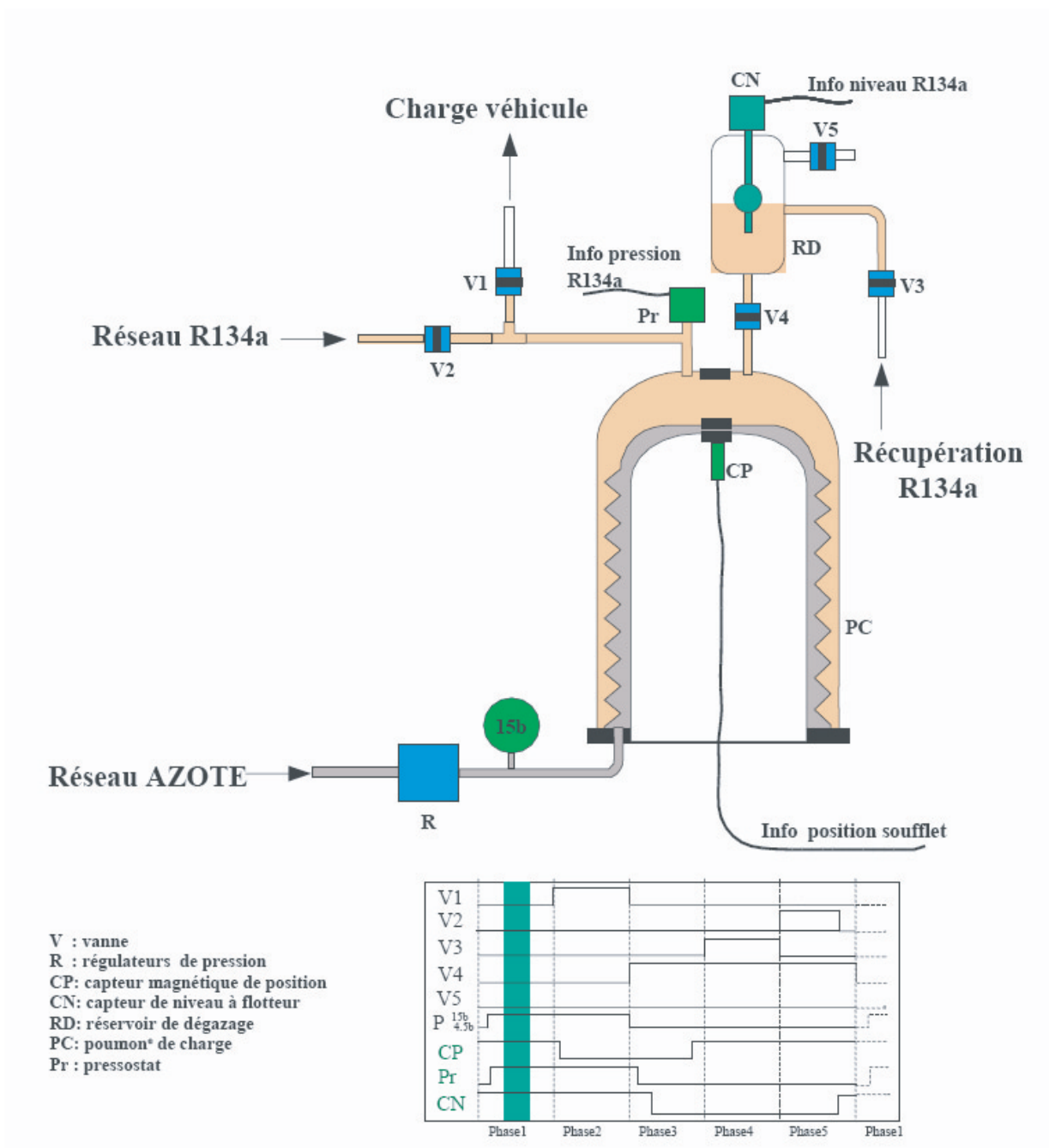
A second mass flowmeter in entry of installation allows to determine the R134a losses.



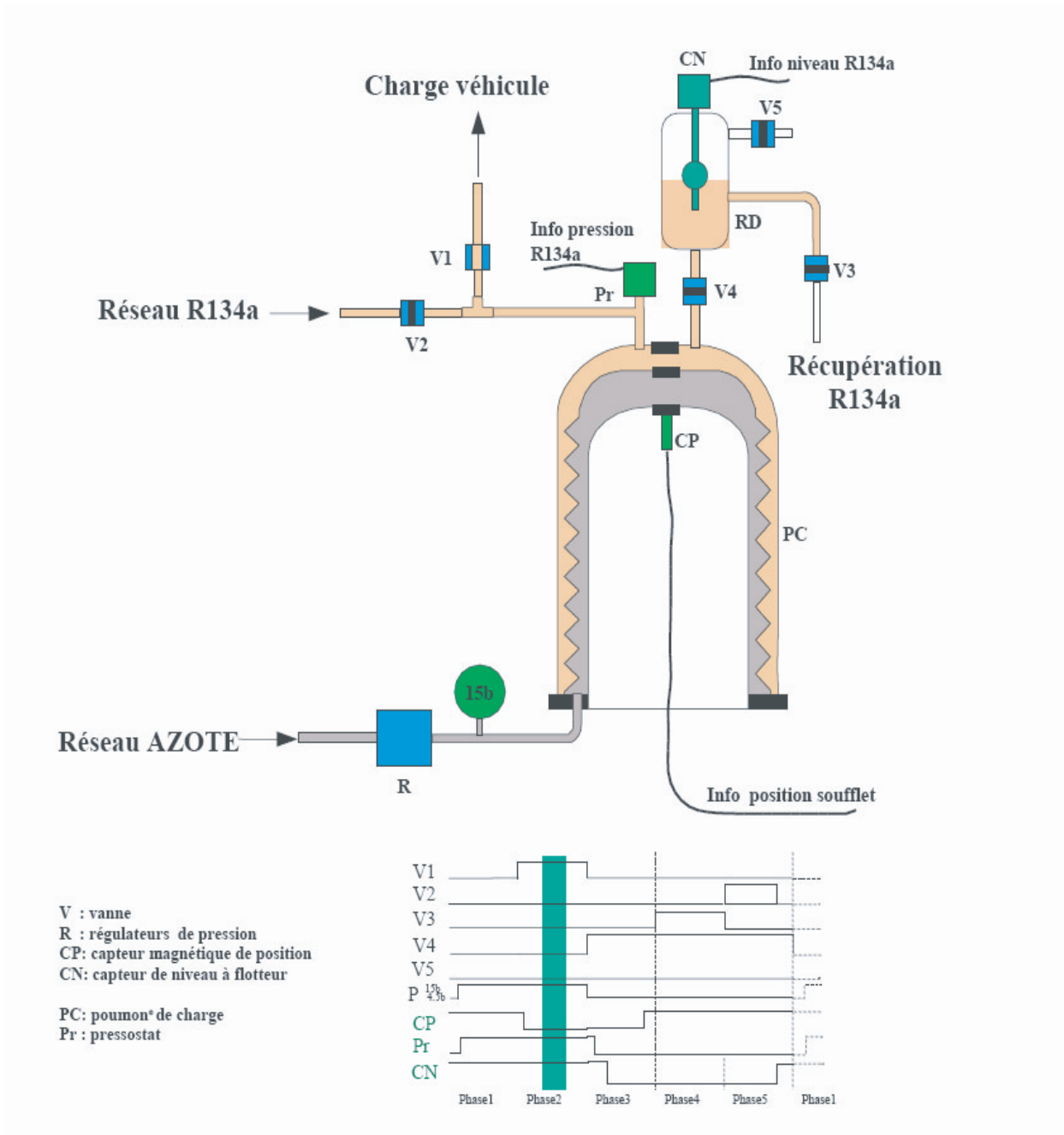


# Stages of the operating cycle of the «poumon»

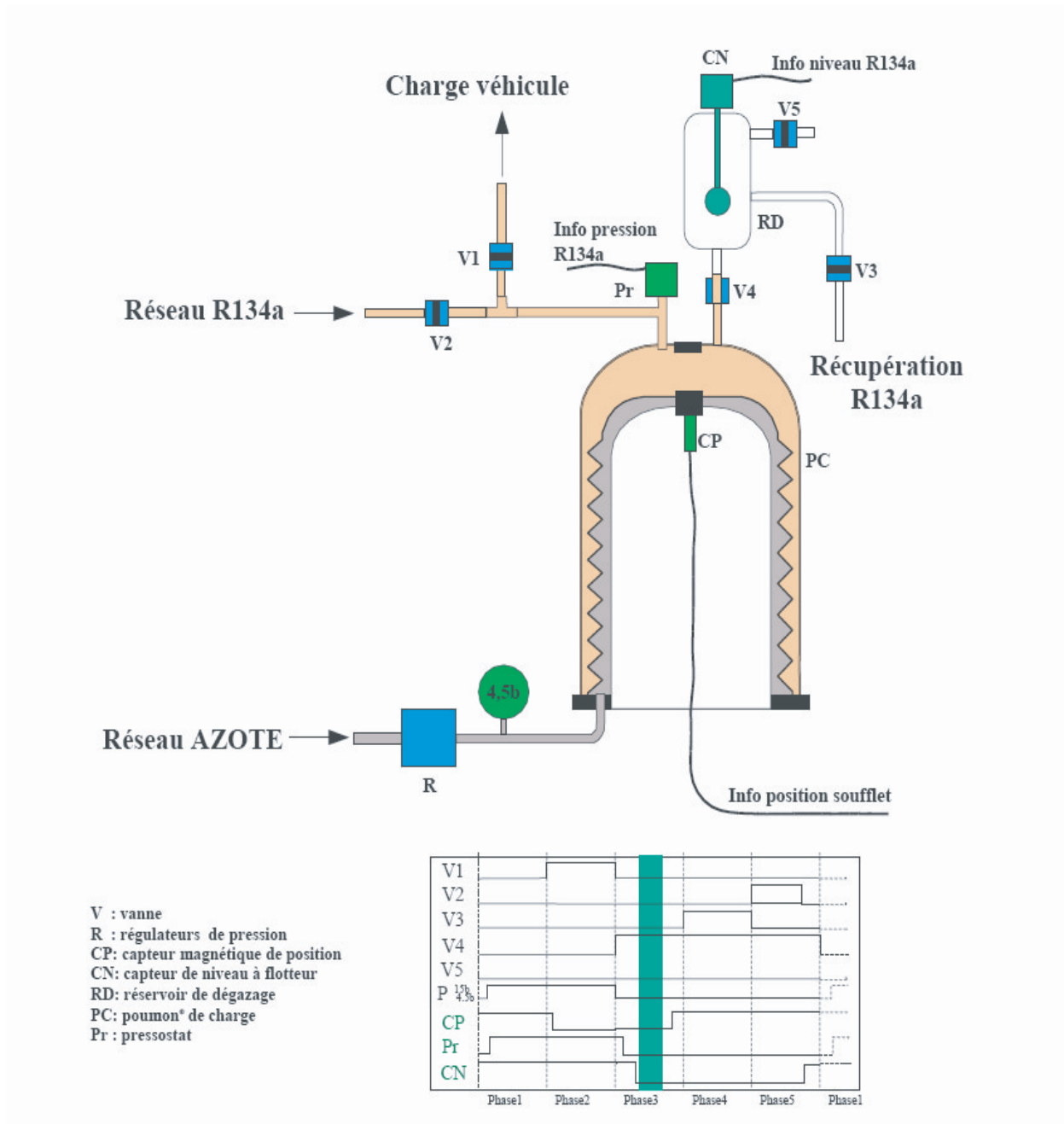
stage 1: Charge waiting time



## Stage 2: Filling of the vehicle

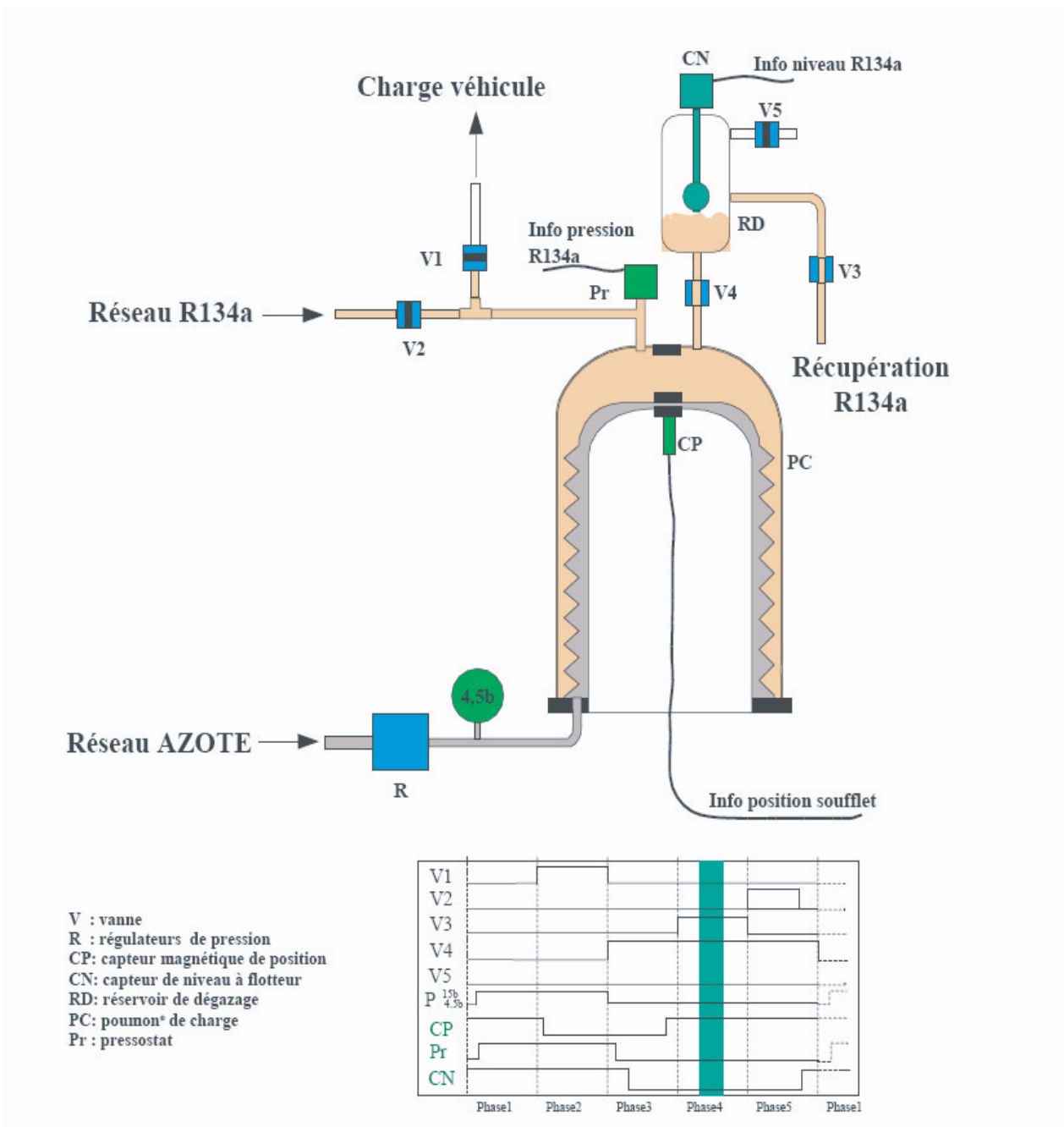


### Stage 3: Relaxation of the «Poumon»



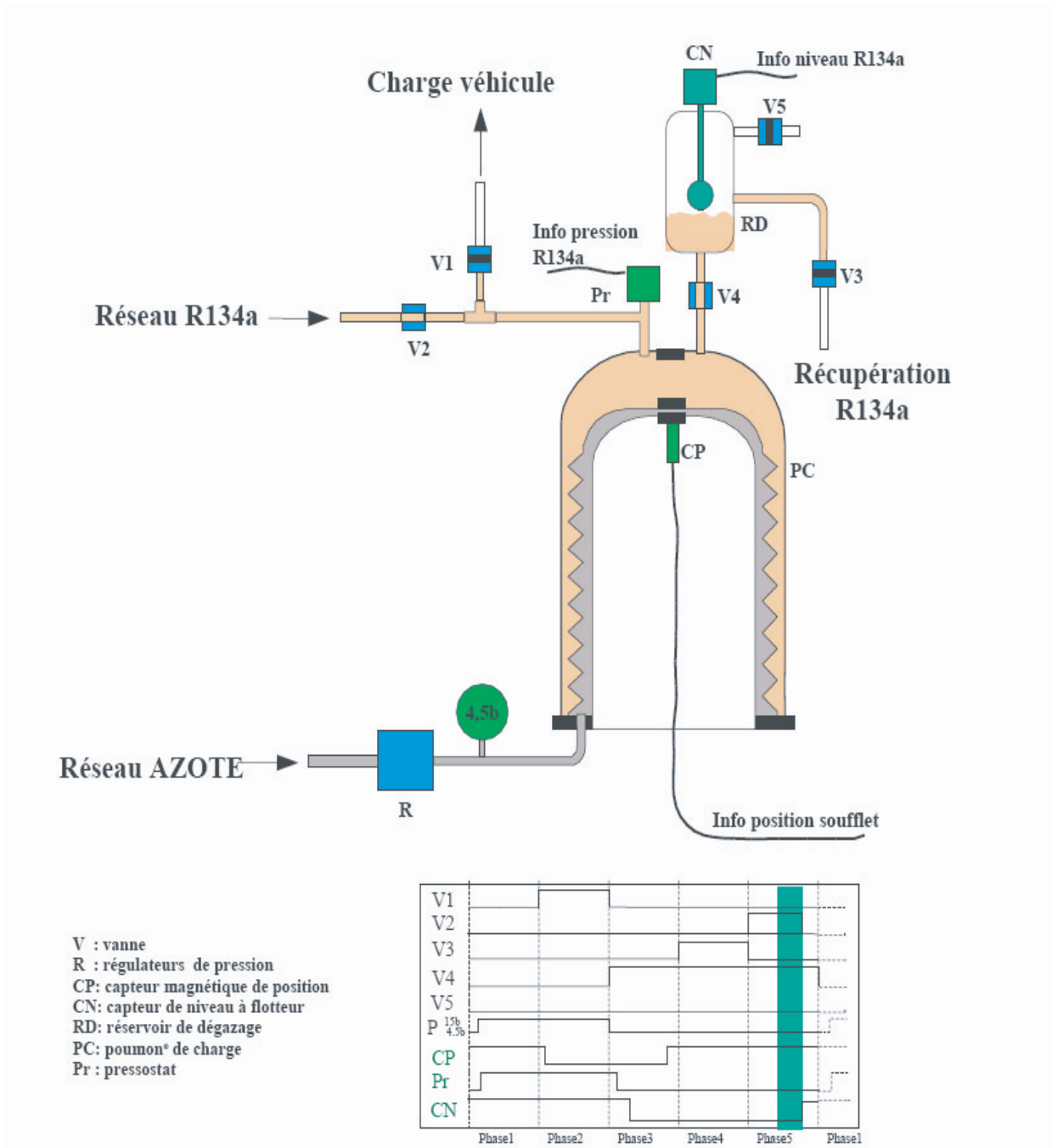


## Stage 4: Recovery

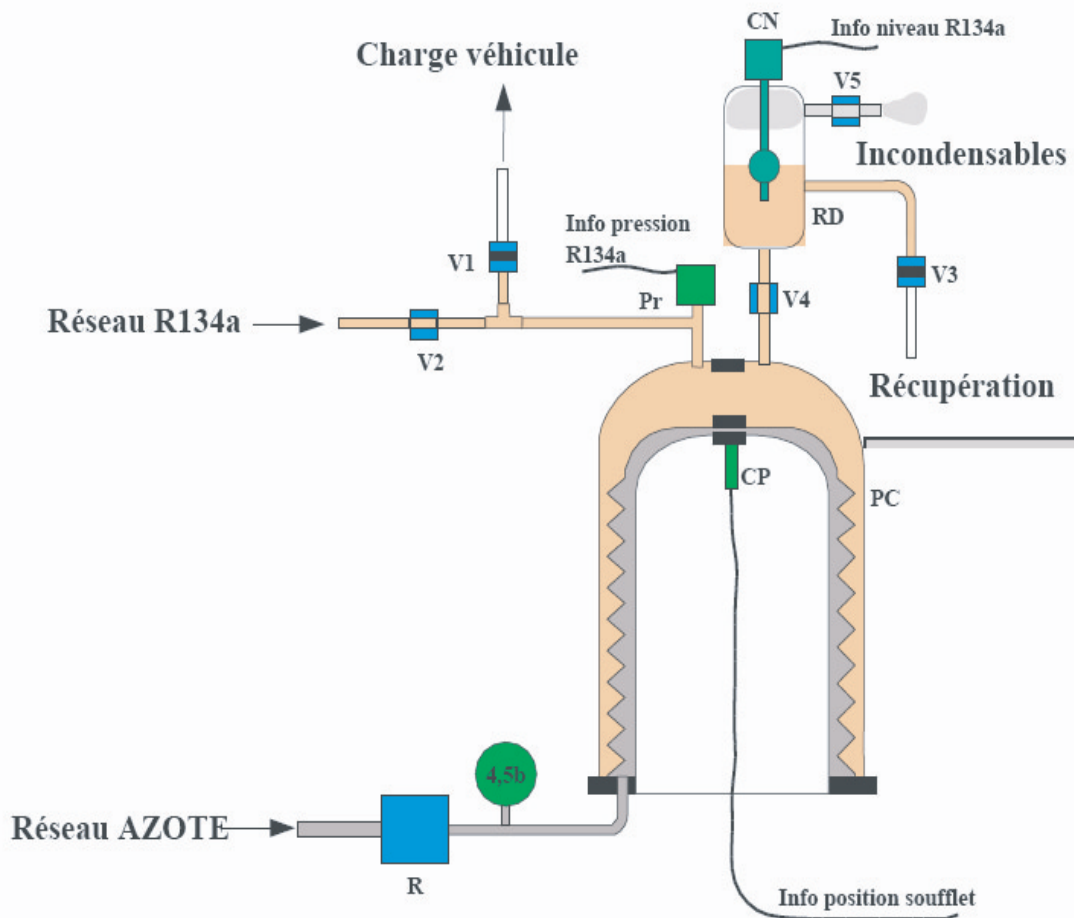




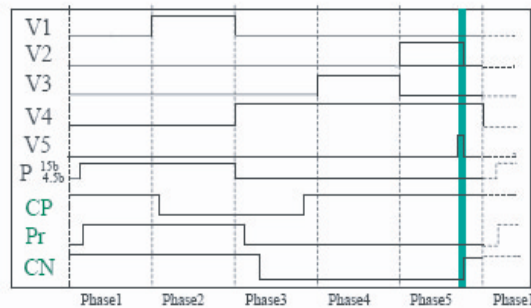
## Stage 5: Filling of the «Poumon»



## Stage 6: Evacuation of non-condensable gases



V : vanne  
 R : régulateurs de pression  
 CP: capteur magnétique de position  
 CN: capteur de niveau à flotteur  
 RD: réservoir de dégazage  
 PC: poumon\* de charge  
 Pr : pressostat



# Advantages of the system

## Advantages of the R134a pressurization by «poumon»:

- . Filling of the vehicle at constant pressure thanks to a dynamic management of the counter-pressure during the charging (maximal counter-pressure: 13.5 bar),
- . Facilitated R134a recovery in the hoses of the adapter thanks to a dynamic management of the counter-pressure during this phase (reduced counter-pressure: 8 bar),
- . Tightness of 100% thanks to the use of a flexible stainless membrane,
- . Maximum volume of injection of 1.8 liter adapted to the whole light vehicles of the market (standard part),
- . Instrumented «Poumon» (indication, if the “poumon” is full and analogical pressure controller with digital display),
- . Principle of «Poumon» filling guaranteeing the absence of product in gas phase,
- . The installation does not generate any water-hammer on the network
- . Two years lifetime guaranteed

## Advantages of the charging by mass flowmeter:

- . Possible display of the mass of delivered product
- . Measuring accuracy of 0.2% of the delivered quantity (measurement in g)
- . Simple regulation (an received impulse on the counting board is equivalent to 0.1 g)
- . Measure of the quantity of R134a in liquid and gas phase (the mass flowmeter is the only one technology allowing to ensure biphasic measurements)
- . Measurement remains precise for variable pressures and temperatures of the fluid
- . Two flowmeters are installed: one in installation entry and one on the filling line of each unit. This makes it possible to measure the losses of the installation.

## Advantages of the recovery:

The recovery pump is an electrical pump. Its principal advantage is to obtain a depression lower than 250mb on the level of the hoses of the adapter.



# A network

## WEST Area

Rennes

Fax. +33(0)299 771 290

agence.rennes@soderel.com

## EAST Area

Sochaux

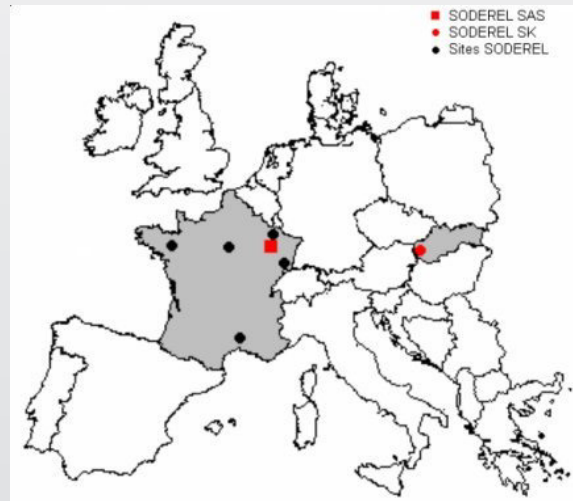
Fax. +33(0)381 945 280

agence.sochaux@soderel.com

Pont -à-Mousson

Fax. +33(0)383 812 567

e.girardot@soderel.com



## ILE DE FRANCE

Aulnay-sous-Bois

Fax. +33(0)148 657 045

agenceparis@soderel.com

## SODEREL SAS

10, rue du coteau - Z.I. Ouest

F- 54180 Heillecourt

Tel. +33(0)383 55 66 66

Fax. +33(0)383 55 66 67

## SOUTH Area

Tarascon

Fax. +33(0)490 915 389

agence.sud@soderel.com

## SODEREL SK

(Slovakia)

Modra

Tél. +421 336 474 341

Fax. +421 336 474 378

soderel.sk@soderel.com