

# **VISATRON**

Operating Instructions

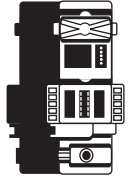
Article No.: 10980

Edition: 04 W

VN 115 / 93

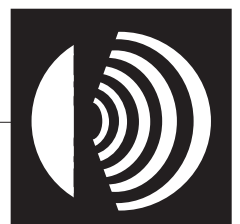
VN 116 / 93

VN 215 / 93



## **SCHALLER AUTOMATION INDUSTRIAL AUTOMATION TECHNOLOGY KG**

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## ***Declaration of Conformity***

**EMC-Directive : 89 / 336 / EEC**

We :

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declare on our own responsibility, that the products :

Kind of equipment : **OIL MIST DETECTOR**

Type - designation : **VN 115/93, VN 116/93, VN 215/93**

are in compliance with following norms :

**EN 50141 , ENV 50204 , EN 55011,  
EN 61000-4-2 , EN 61000-4-3 , EN 61000-4-4 , EN 61000-4-8**

D-66440 Blieskastel, 1997, the 30th of sept.

  
.....  
Schaller sen  
Managing Director



It is recommended to read this instruction manual before commencing the repair, assembly or commissioning of the oil mist detector system!

**CAUTION:** The manufacturer's warranty will become void if these instructions are not followed!

When oil mist shutdown on engine occurs, operator must follow engine maker's instruction!

Unless notified to the contrary, these operating instructions are applicable for:

VN 115 / 93

VN 116 / 93

VN 215 / 93

In case of an oil mist alarm, the oil mist detector (OMD) must be in condition to react within the next few seconds and shut down the engine, in order to minimise immediate or consequential damages!

More Information can be found in SCHALLER AUTOMATION' S Oil Mist Vademecum which SAB provides free of charge.



Safety Signs  
in general



Safety Signs  
electrical



Safety Signs  
parts are sensitive  
to electrostatic  
discharge



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## Product Description

Oil mist detectors protect large diesel engines of all applications from heavy consequential damage as a result of overheating.

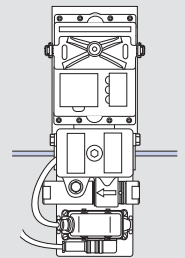
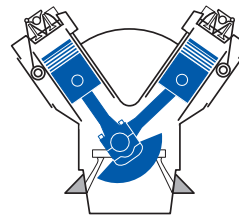
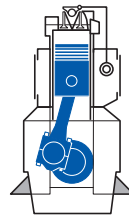
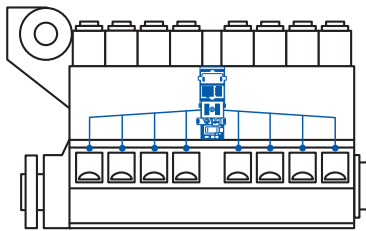
## Application

With the VISATRON oil mist detectors of the type VN 115 / 93 and 116 / 93, a header pipe sampling system is used for suction extraction of the crankcase atmosphere from each crankcase compartment; whereas an individual compartment suction pipe system is required for the type VN 215 / 93.

Application of the different VISATRON® devices and suction systems:

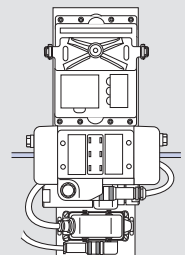
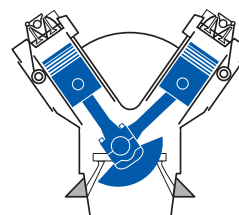
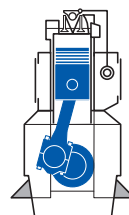
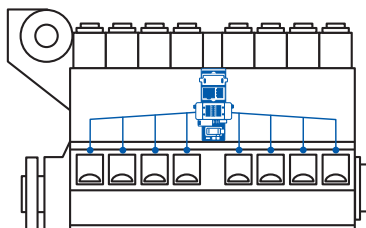
### VN 115 / 93

- Basic design, suitable for the monitoring of trunk piston diesel engines with in-line and V cylinder arrangements, running at medium and high speed.
- Damage detection through a header pipe sampling system without localisation of the point of damage.



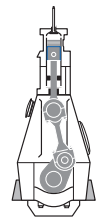
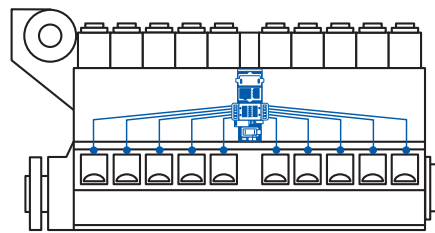
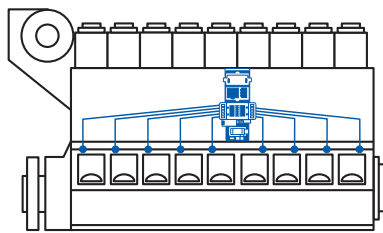
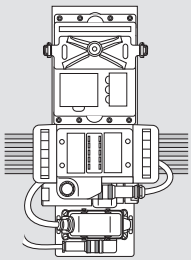
### VN 116 / 93

- Design with a higher sensitivity, suitable for the monitoring of trunk piston diesel engines with in-line and V cylinder arrangements, running at medium and high speed.
- Damage detection through a header pipe sampling system with a display of the crankcase compartment half (left or right side of the position of the detector) in which overheating damage has arisen.
- The header pipe sampling system is the same as in the VN 115 / 93, so the VN 116 / 93 can replace the VN 115 / 93 without modification of the suction system if localisation of damage (i. e. left or right side of engine) is called for.



**VN 215 / 93**

- Device with the highest sensitivity, suitable for the monitoring of large four stroke and crosshead engines running at medium and slow speed.
- Damage selection through the individual compartment suction pipe system, with display of the compartment with the overheating damage.

**Options**

Available for all devices as an option in the package (option must be ordered with the particular OMD, not separately)

- Serial RS 485 interface
- Built-in history storage device for storing events with the data and time

Connection to a PC is possible with this option. The trend of the opacity (oil mist concentration) can be graphically displayed through this PC with the DIEMOS software that can also be provided as an option.

Furthermore, the interface makes it possible to drive the remote display. The history storage device is for storing events in the detector, such as the appearance of an alarm with the date and time. These data can subsequently be read out through the serial interface.



## Function description

All VISATRON® devices continuously draw the atmosphere from every compartment in the crankcase area through the suction system. The suction vacuum required is generated through a wear- free air jet pump in the device, fed with compressed air (drive air), and is consequently independent of the power supply.

The sample flow, consisting of the sucked-in atmosphere of the crankcase compartment, is guided through an optical channel for measuring turbidity. The turbidity of the sample flow is measured by the absorption of infrared light.

% Opacity is used as the dimensional unit of the turbidity; 100% Opacity means total absorption, and 0% Opacity means no absorption. Oil mist becomes explosive from a concentration of approx. 50 mg of atomised oil in 1 litre of air and up, which corresponds to an opacity of approx. 40%.

The sensitivity, i.e. the opacity that is required to trigger an alarm, can be set at 10 different levels in all devices.

A slow increase in the operating opacity or the contamination of the optics is compensated in the microprocessor system up to a maximum safety alarm threshold.

The contamination is strongly limited through scavenging air chambers that are supplied with fresh air and are located in front of the optics.

The VN 93 series is distinguished from the VN 87 series through the following features:

- Scavenging air chambers are not supplied with fresh air from the engine room, but instead with forced air, so fumes from a fire in the machine room cannot lead to an alarm.
- The measuring head heating unit for the avoidance of precipitating condensation water in the device, which can be delivered as an option to the VN 87, is integrated in the measuring head of the VN 93.
- An optional RS 485 interface with a history storage device permits the connection of the VN 93 to the ship's computer or PC.
- A pre-alarm relay, programmable in the sensitivity, is activated before an engine stop will be triggered by a high concentration of oil mist.
- The possibility of a calibration with fresh air exists for the types VN 116 / 93 and VN 215 / 93. It permits the measurement of the absolute opacity.



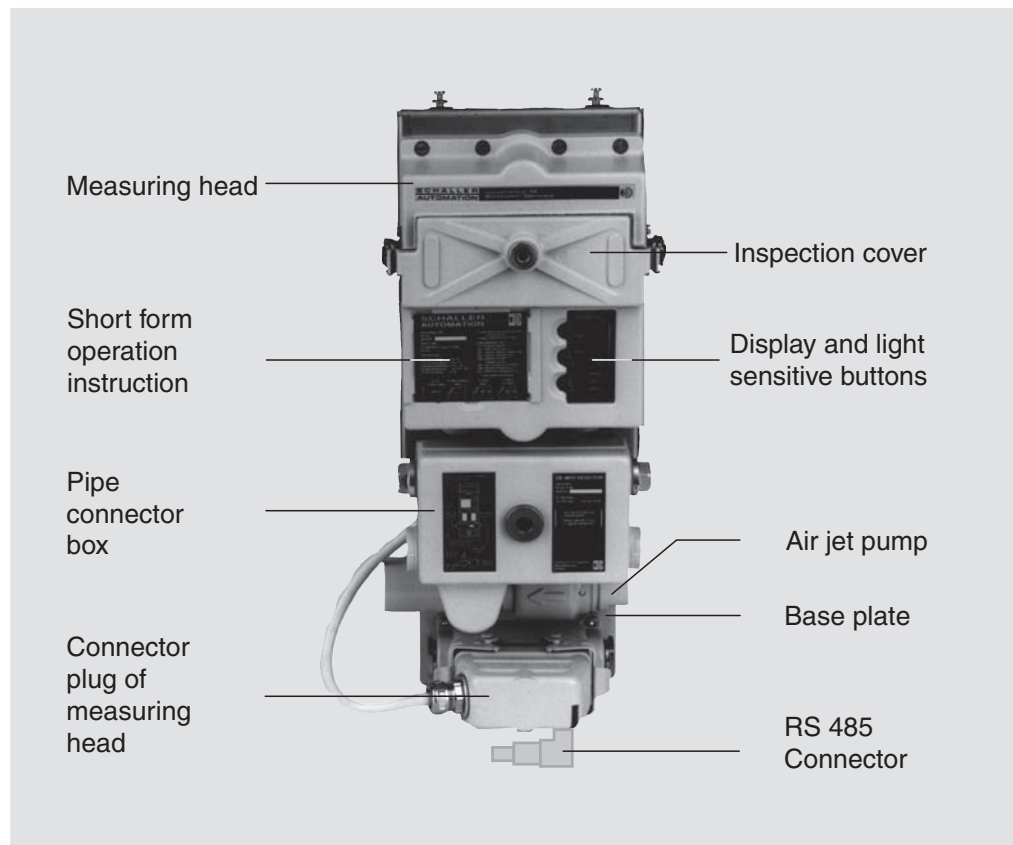
## Design

The air jet pump, the connector plug, the pipe connector box (VN 115 / 93) or the valve box (VN 116 / 93 and VN 215 / 93) and the shock-absorbing mounting plate for the actual measuring head are supported on a sturdy base plate.

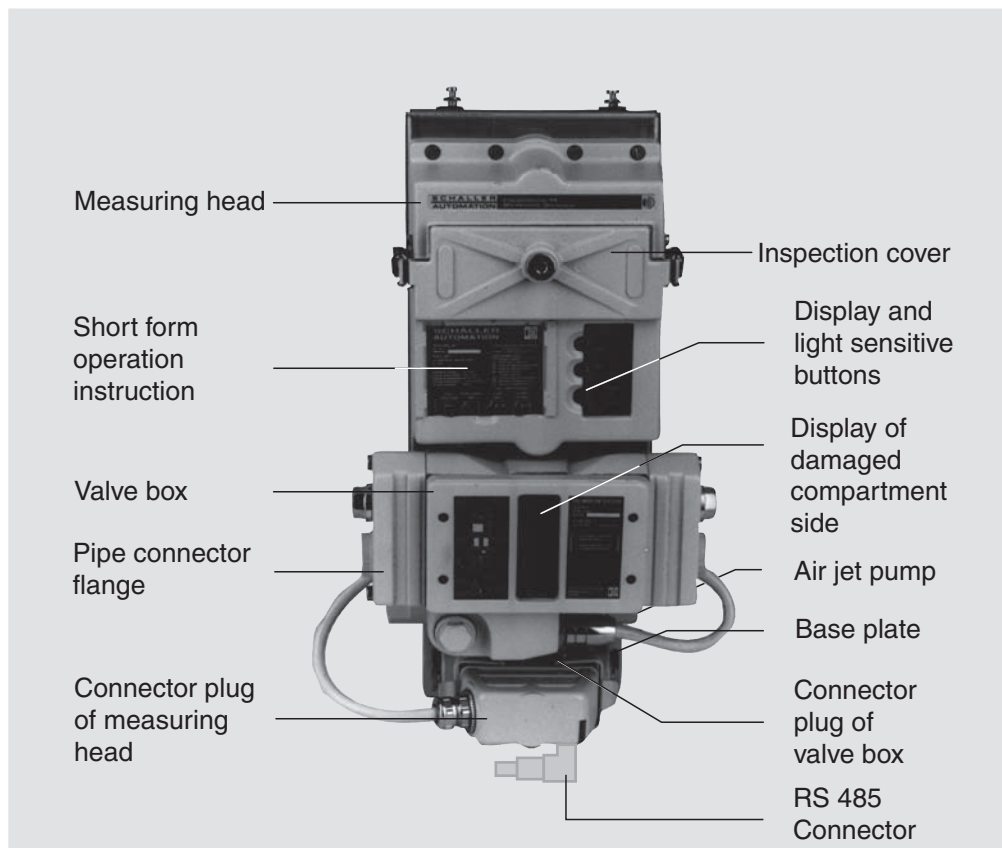
The opacity measurement path and the electronics with microprocessor control are located in the measuring head.

Three wear-free light sensitive buttons are provided for the operation and display: 2 pieces of 7-segment displays, each with 4 digits, 1 LED chain and 3 further LEDs to display the operating state.

**VN 115 / 93**

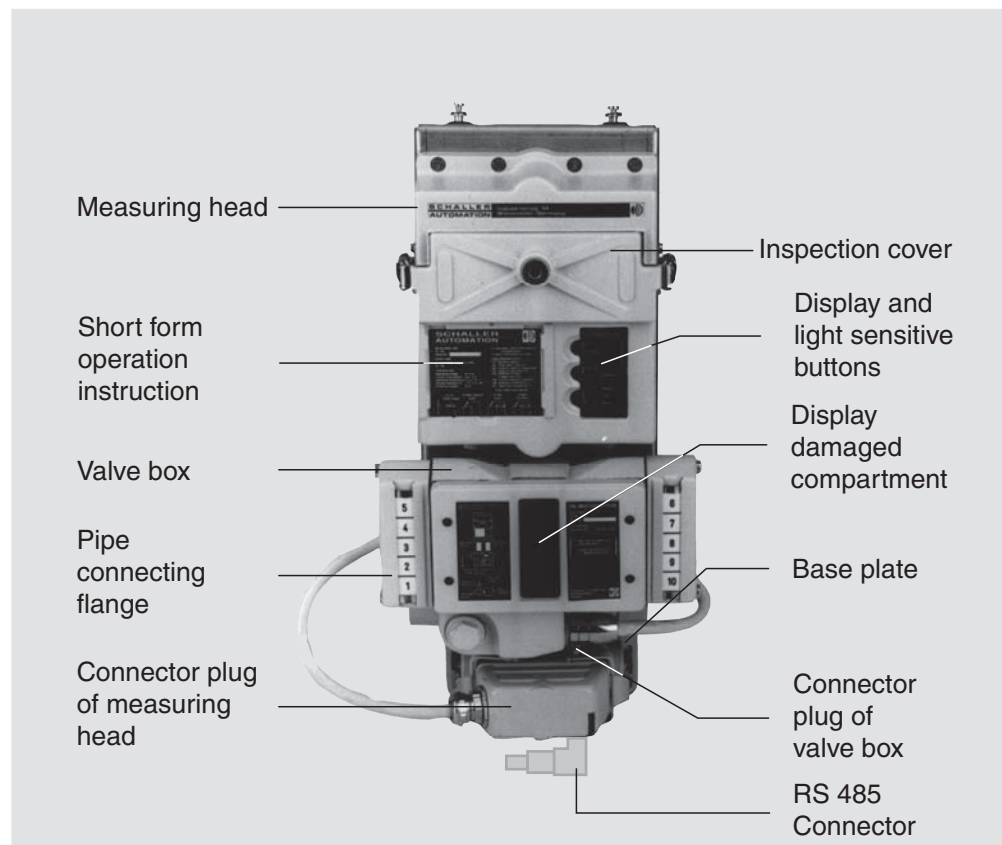


1. 04 / 1



**VN 116 / 93**

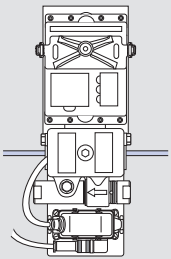
1. 05 / 1



**VN 215 / 93**

1. 05 / 2

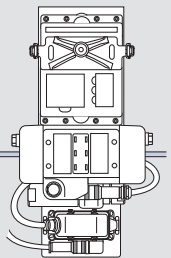


**VISATRON® VN 115 / 93**

The detection of damage takes place through a header pipe sampling system without localisation of the point of damage.

The mixture of atmosphere from the crankcase passes from all individual compartments via the header pipe through the detector's pipe connector box into the opacity measurement path in the housing of the measuring head.

The alarm threshold can be set at 10 levels, in a range from 0.5% to 25% Opacity.

**VISATRON® VN 116 / 93**

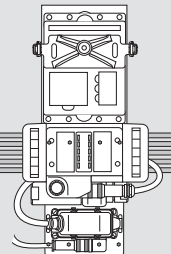
The detection of damage takes place through a header pipe sampling system with a display of the crankcase compartment half in which the overheating damage has arisen.

The mixture of atmosphere from the crankcase passes from all individual compartments via the header pipe through the valve box into the opacity measurement path, in the housing of the measuring head.

If the opacity of the mixture of atmosphere from the crankcase exceeds 10% of the alarm threshold that has been set, a so-called damage check starts. The valves in the valve box are switched over according to a certain algorithm during the damage check, until the half of the crankcase compartments with the overheating damage has been found.

The alarm threshold can be set at 10 levels, in a range from 0.7% to 28% Opacity.

The increased sensitivity, in comparison with the VN 115 / 93, results from the fact that an alarm is triggered if the difference in opacity, between the two halves of the crankcase compartment, exceeds 20% of the alarm threshold that has been set.

**VISATRON® VN 215 / 93**

Damage selection takes place through an individual compartment suction pipe system (the OMD is directly connected to each compartment) with a display of the compartment in which the overheating damage has arisen.

Damage selection takes place as in the VN 116 / 93. The wear and tear free reed valves are switched over according to a certain algorithm during the damage check, until the compartment with the damaged location has been found.



## Technical Data

### Suction System

The maximum number of sampling points for both systems (header pipe and individual) = 10. Suction pressure measured against atmospheric pressure is 60 - 80 mm. The measurement is performed with a U-pipe manometer on the measuring head. The U-pipe manometer is a component available on request.

VN 115 / 93, VN 116 / 93

2 header pipes (22 x 2 mm) with branch pipes (10 x 2 mm) to the crankcase compartments are to be installed for VN 115 / 93 and VN 116 / 93

VN 215 / 93

Individual pipes (14 x 2 mm) from each compartment to the OMD for VN 215 / 93

**VN 115 / 93**  
**VN 116 / 93**  
**VN 215 / 93**

**VN 115 / 93**  
**VN 116 / 93**

**VN 215 / 93**

### Sensitivity

VN 115 / 93

Alarm threshold 2% Opacity\* (see brief description of the VN 115 / 93), adjustable in 10 levels from 0.5% to 25% Opacity. (1% Opacity corresponds to approx. 0.2 mg of oil mist per litre of crankcase atmosphere; explosion limit 50 mg/l at ignition temperature of approx. 500 C)

\*Factory setting

**VN 115 / 93**

VN 116 / 93, VN 215 / 93

Damage Check-start threshold 0.24% Opacity\* (see brief description of the VN 116 / 93), adjustable in 10 levels from 0.07% to 2.8% Opacity. Differential alarm threshold 0.49% Opacity\* (see brief description of the VN 116 / 93), adjustable in 10 levels from 0.14% to 5.6% Opacity. Safety alarm threshold 2.44% Opacity\* (see column 5, brief description of the VN 115 / 93), adjustable in 10 levels from 0.7% to 28% Opacity.

\*Factory setting

**VN 116 / 93**  
**VN 215 / 93**

### Power Supply

#### Electric Power Supply

Voltage: 24 V DC + 30/- 25%, 24 V battery or power supply unit

Note: In case of battery operation, provide a direct power supply from the battery terminals to the VISATRON®- device!

Current consumption: max. 3 A, starting current 4 A, fuse 4 A semi time lag.

Electromagnetic compatibility: interference radiation EN 55011, resistance to interference EN 50082/2 (interference immunity industry).

#### Drive Air for the Suction System

Suction vacuum measured against the atmosphere of 60 - 80 mm is required.

The measurement is performed with a U- tube manometer on the measuring head.

The U- tube manometer is a component of the service box (see accessories).

Air pressure required at the inlet of the jet pump approx. 0.6 bar. Air consumption max. 1.0 Nm<sup>3</sup> / h (m<sup>3</sup> at atmospheric pressure). The drive air can be taken from the pneumatic engine control system or from the starting air system. A pressure regulation unit (see device list) can be delivered as an option for pressure reduction; max. primary air pressure 12 bar (additional 30 bar pressure regulator is also available).





## Signal Outputs and Displays

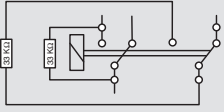
### MAIN ALARM

ADJUSTMENT RANGE FOR THE SENSITIVITY: can be set at 10 levels.

REMOTE SIGNALLING: relay with 2 potential-free switch-over contacts, excitation with a main alarm. Contact load max. 60V AC, 2 A, 120 VA / max. 60V DC, 2 A, 60 W.

WIRE- BREAK PROTECTION: bridging the contacts with 33 K ohm resistance. On request, resistance with other value is available. 1 contact as n.o., the other as n.c.

DISPLAY ON THE DEVICE: blinking- illuminated red ALARM LED.



### PRE-ALARM

ADJUSTMENT RANGE FOR THE SENSITIVITY: 40% to 100% of the main alarm threshold.

REMOTE SIGNALLING: relay with potential- free switch contact, opens for a pre-alarm. Contact load max. 60V AC, 2 A, 120 VA / max. 60 V DC, 2 A, 60 W.

DISPLAY ON THE DEVICE: permanently red alarm LED. The relay and LED switch off again when the opacity has gone below the pre- alarm threshold.



### FAIL - SAFE ALARM

REMOTE SIGNALLING: relay with potential-free switch-over contact, excitation when the device is functioning trouble free. Contact load max. 60V AC, 2 A, 120 VA / max. 60 V DC, 2 A, 60 W.

DISPLAY ON THE DEVICE: illuminated green READY - LED when the device is functioning trouble free.



### DISPLAYS

2 x 4 digit, 7 segment display for presentation of internal device measurement values.

### OPACITY DISPLAY

REMOTE SIGNALLING: By the remote indicator, driven through the optional RS 485 interface.

DISPLAY ON THE DEVICE: By LED chain with 12 LEDs, display of the opacity relative to the alarm threshold in 12 steps, i.e. the main alarm is triggered when the upper LED illuminates.

### OPERATING CONTROLS

3 wear-free reflection light buttons for operation of the device.

### SERIAL INTERFACE

Optional serial RS 485 interface for the output of operating data.

### CABLE CONNECTIONS

1 PG screwed connection for the cable connection of the relay contacts

1 PG screwed connection for the cable connection of the power supply

1 plug connector for connection of a serial interface.



**MECHANICAL DATA**

HOUSING AND BASE PLATE: cast aluminium.

SUPPORT PLATE FOR THE MEASURING HEAD: stainless steel plate with anti vibration suspension

ALL SURFACES: lacquered, RAL 7035.

SPRINGS, BOLTS ETC.: stainless steel.

RUBBER PARTS FOR VIBRATION REDUCTION AND SEALS: oil resistant. Built- in vibration reduction for protection of the electronics.

**WEIGHT**

**VN 115 / 93** Net: 9,0 kg, Gross with special packing: 12,5 kg

**VN 116 / 93** Net: 11 kg, Gross with special packing: 14,5 kg

**VN 215 / 93** Net: 11 kg, Gross with special packing: 14,5 kg

**Enviromental Conditions**

SYSTEM OF PROTECTION IP 44.

OPERATING RANGE: 0C to 70C with the highest humidity.

STORAGE TEMPERATURE: -25C to +85C

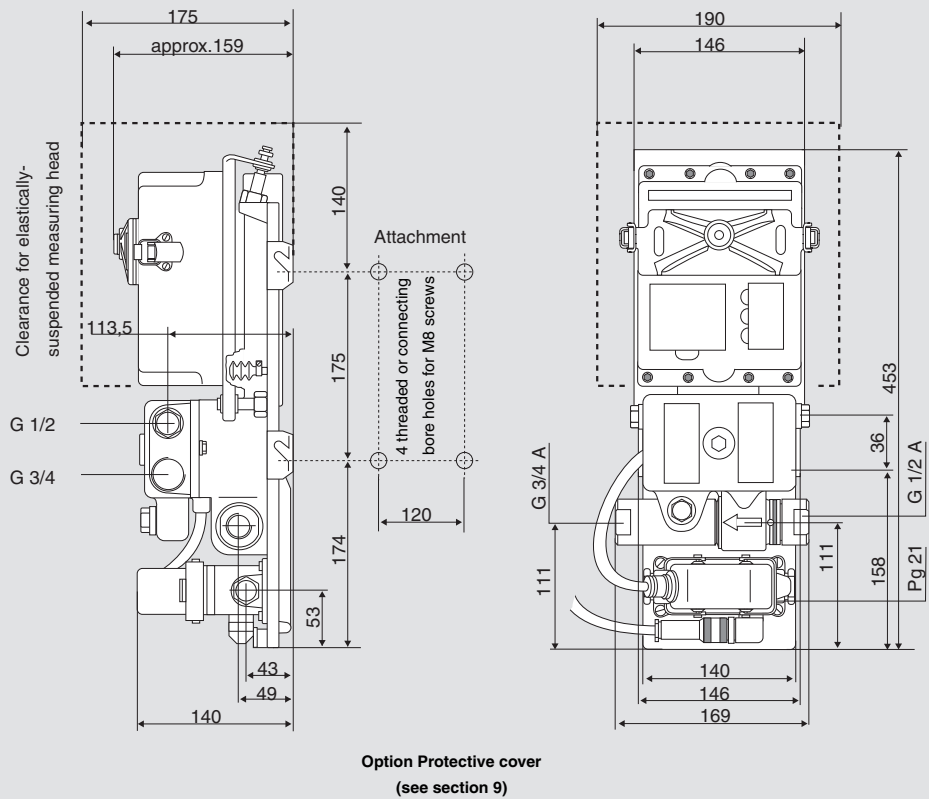
**Vibration:** 4 G at fastening points





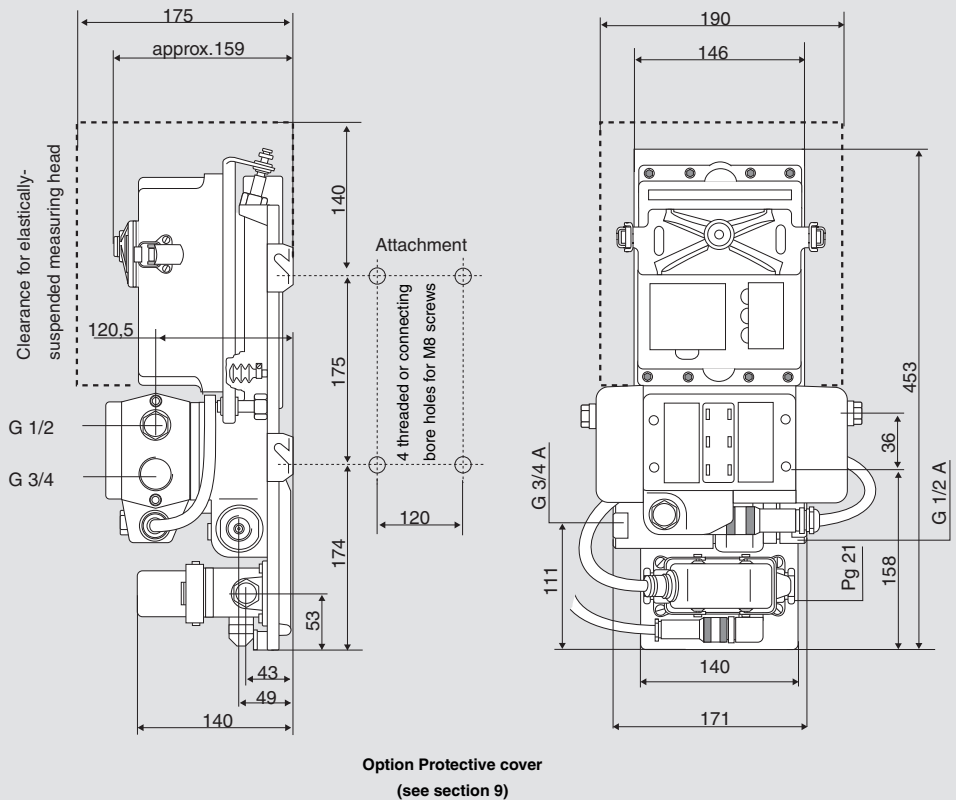
## Dimensional diagrams

### VN 115 / 93



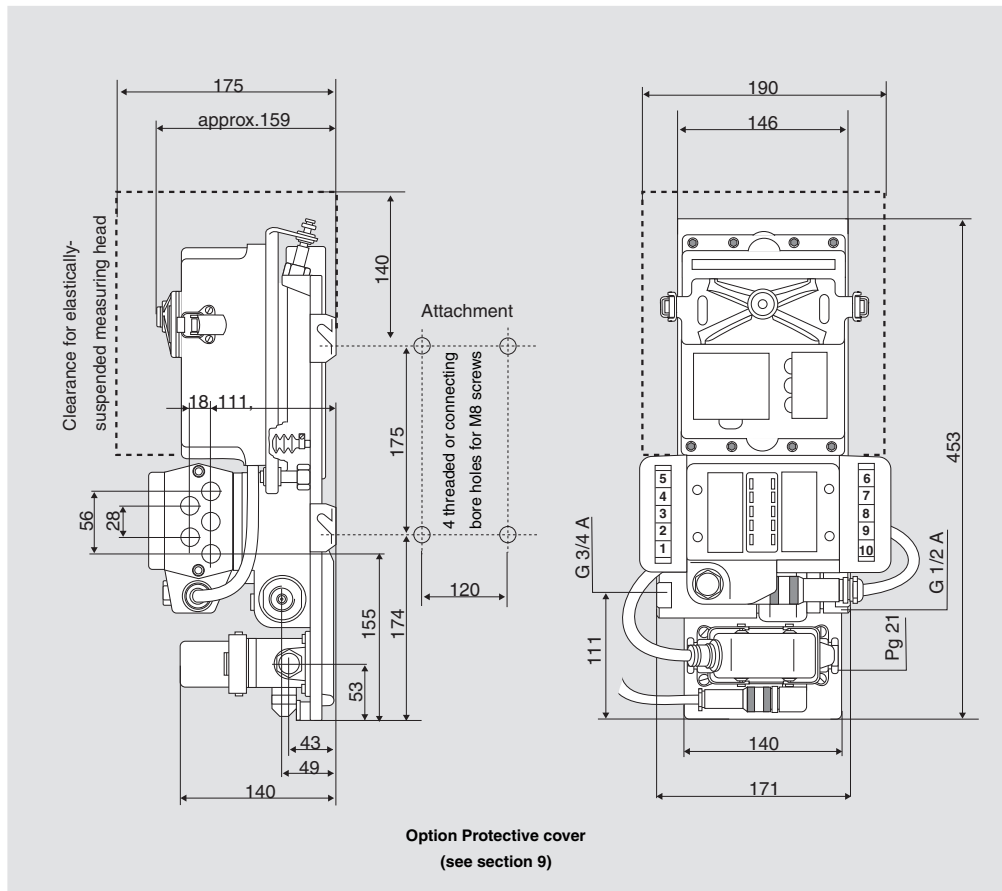
1. 10 / 1

### VN 116 / 93



1. 10 / 2





1. 11 / 1

## Dimensional diagrams

VN 215 / 93



## Installation

### General

It is important to emphasize cleanliness during the assembly work!

Clean pipelines and fastening parts before assembly.

Lay pipes in a stress- free manner!

### Installation position of the device:

Locate the oil mist detector in a vertical position!

Make sure not to install the device within the airflow of blowers or air deflectors.

### Suction pipes VN 115 / 93 and VN 116 / 93 (see Fig. 2.01 / 1)

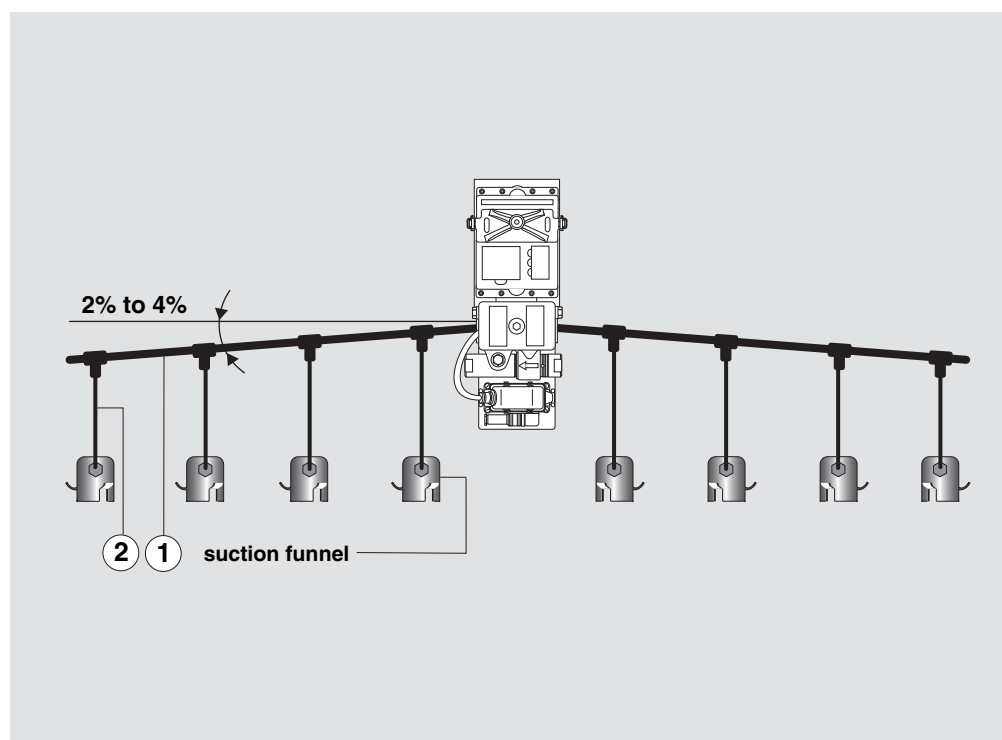
Material:       Seamless steel pipes,  
                   header (1) 22 x 2 mm (i.d. 18mm), max. length: 9 m  
                   suction pipes (2) 10 x 2 mm (i.d. not less than 6mm)

Pipe Laying:    Ascending to the device,  
                   ascending gradient 2% to 4%, without sagging, avoid oil collection  
                   (see Fig. 2.01 / 1)

**Ascending  
Gradient 2% to 4%!**

**Consider to avoid oil  
collection when laying  
the headers! Oil must  
always drain back to  
engine**

**VN 115 / 93  
VN 116 / 93**





VN 115 / 93

VN 116 / 93



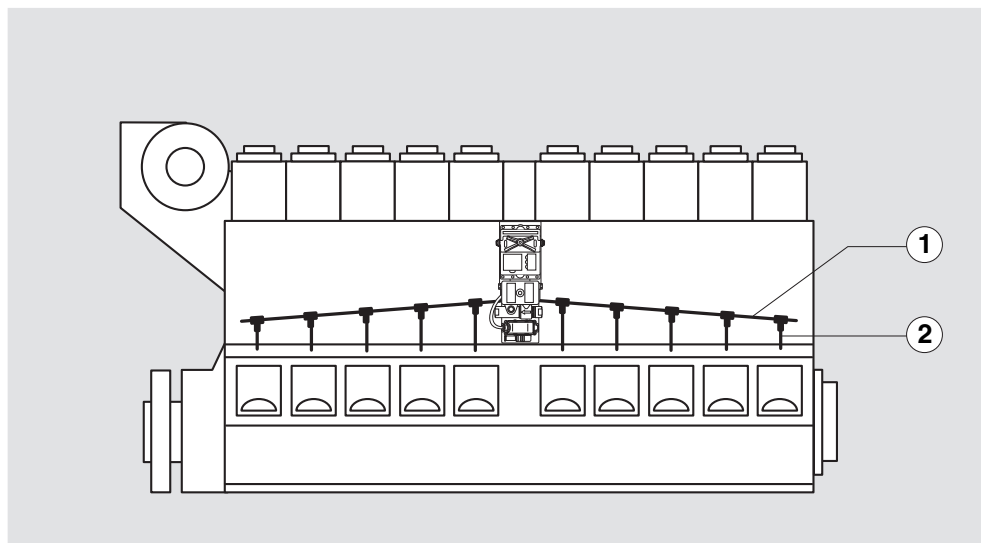
**without**  
**pipe end- siphon**

**Lay headers in**  
**ascending direction**  
**to the detector!**

**with**  
**pipe end- siphon**

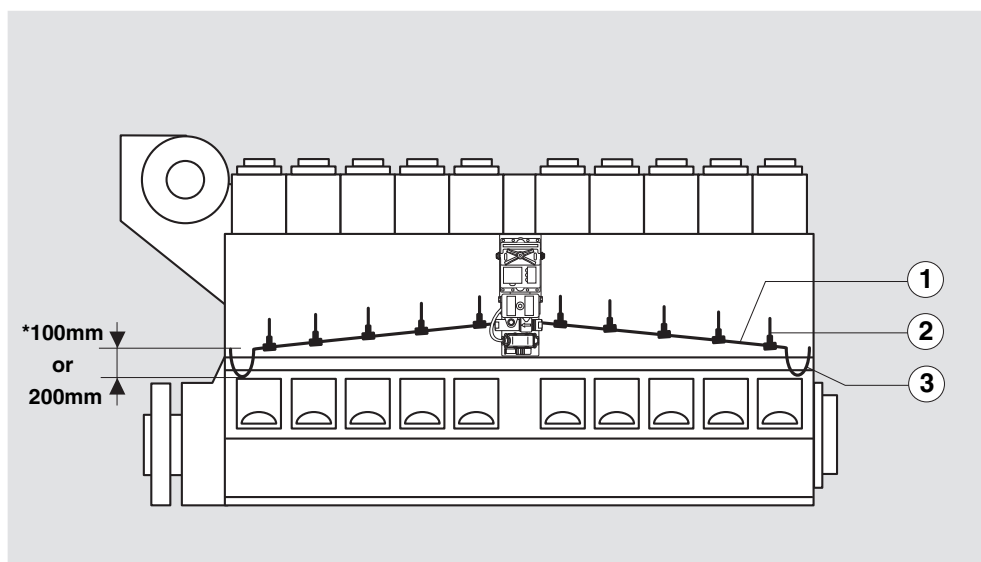
**Lay headers in**  
**ascending direction**  
**to the detector!**

### Headers above suction points for:



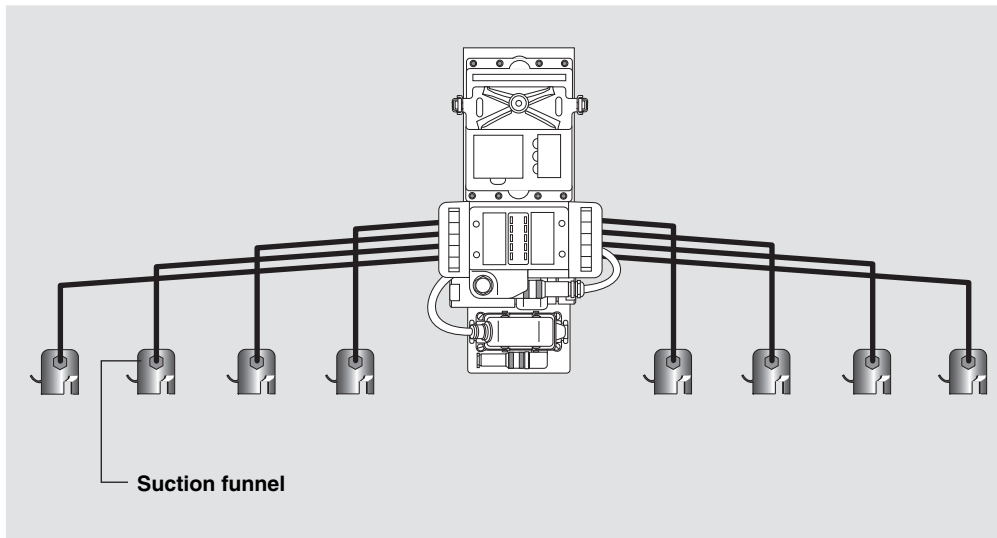
2. 02 / 1

### Headers below suction points:



2. 02 / 2

- ① Header pipe  $\varnothing 22 \text{ mm} \times 2 \text{ mm}$  (i.d. 18mm)
- ② Compartment suction pipes to header  $\varnothing 10 \text{ mm} \times 2 \text{ mm}$   
(i.d. not less than 6mm)
- ③ \*Pipe end-siphon 100 mm with oil return back to the engine,  
or 200 mm with oil discharge outside the engine

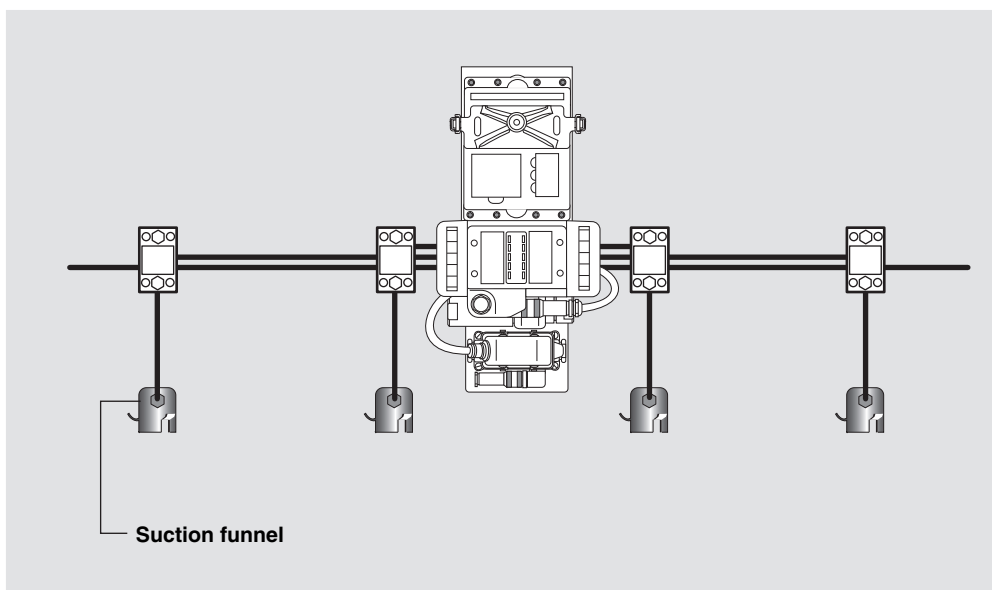


2. 03 / 1

### Suction pipes VN 215 / 93

Material: Seamless steel pipes, 14 mm x 2 mm (i.d. 10mm)

Pipe Laying: Ascending to the device, ascending gradient 2 - 4% (see Fig. 2. 03 / 1)



2. 03 / 2

VN 215 / 93



**Lay suction pipes in  
ascending direction  
to the detector**

**Siphon blocks**



**Pipes can be  
mounted horizontally**

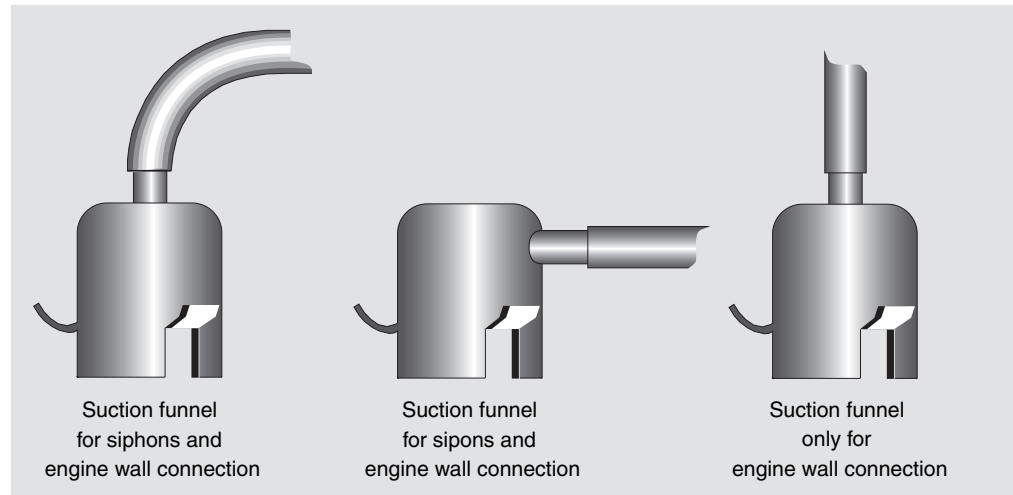
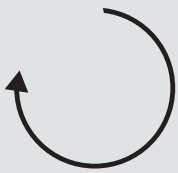
**Avoid sagging or  
oil collection**



### Suction funnel in the crankcase compartment

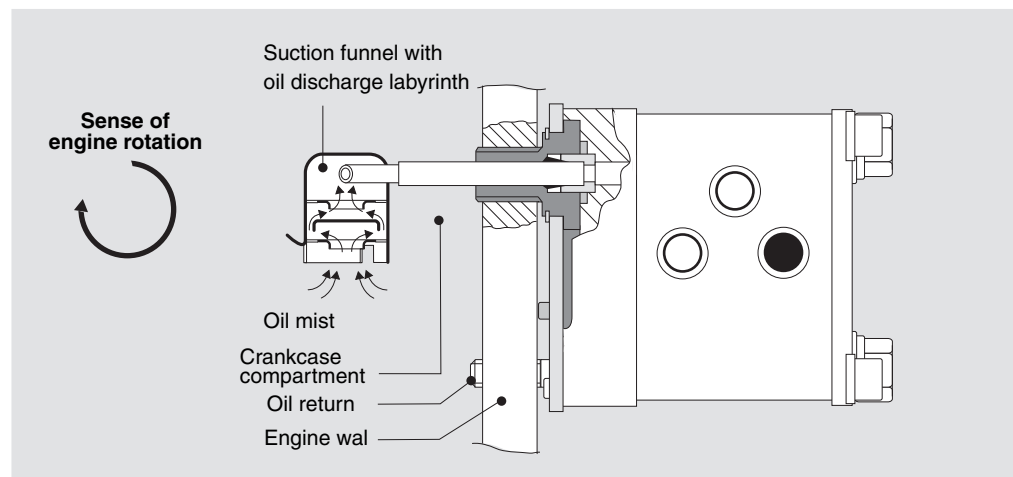
Suction funnels have the function to avoid the blockage of suction pipes by splashing oil. The suction funnels have to be fitted in such a way that flooding by splashing bearing oil or returning piston cooling oil is avoided (see Fig. 2. 04 / 1). Caution: Make sure funnels are not interfering with rotating or moving parts of the engine.

*Sense of  
rotation*



2. 04 / 1

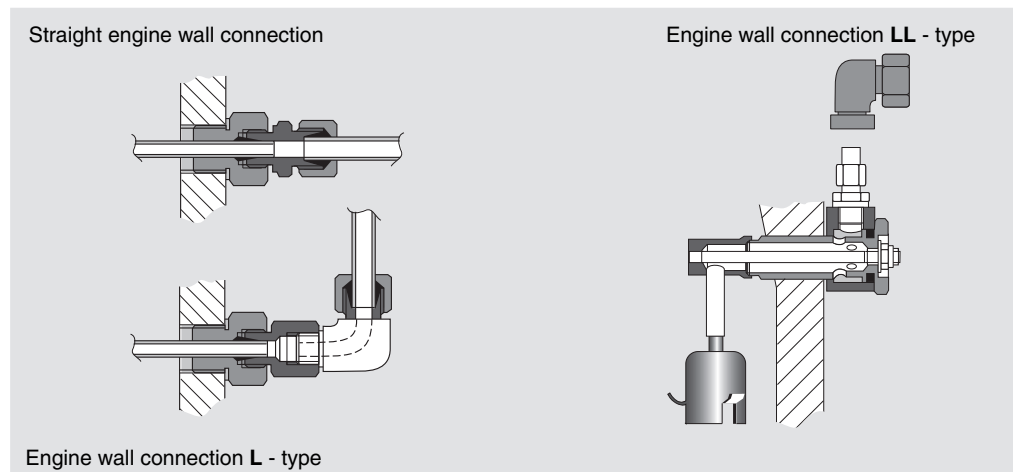
*Push in  
suction funnel pipe  
firmly to the stop  
during assembly!*



2. 04 / 2



*Observe mounting  
position!*

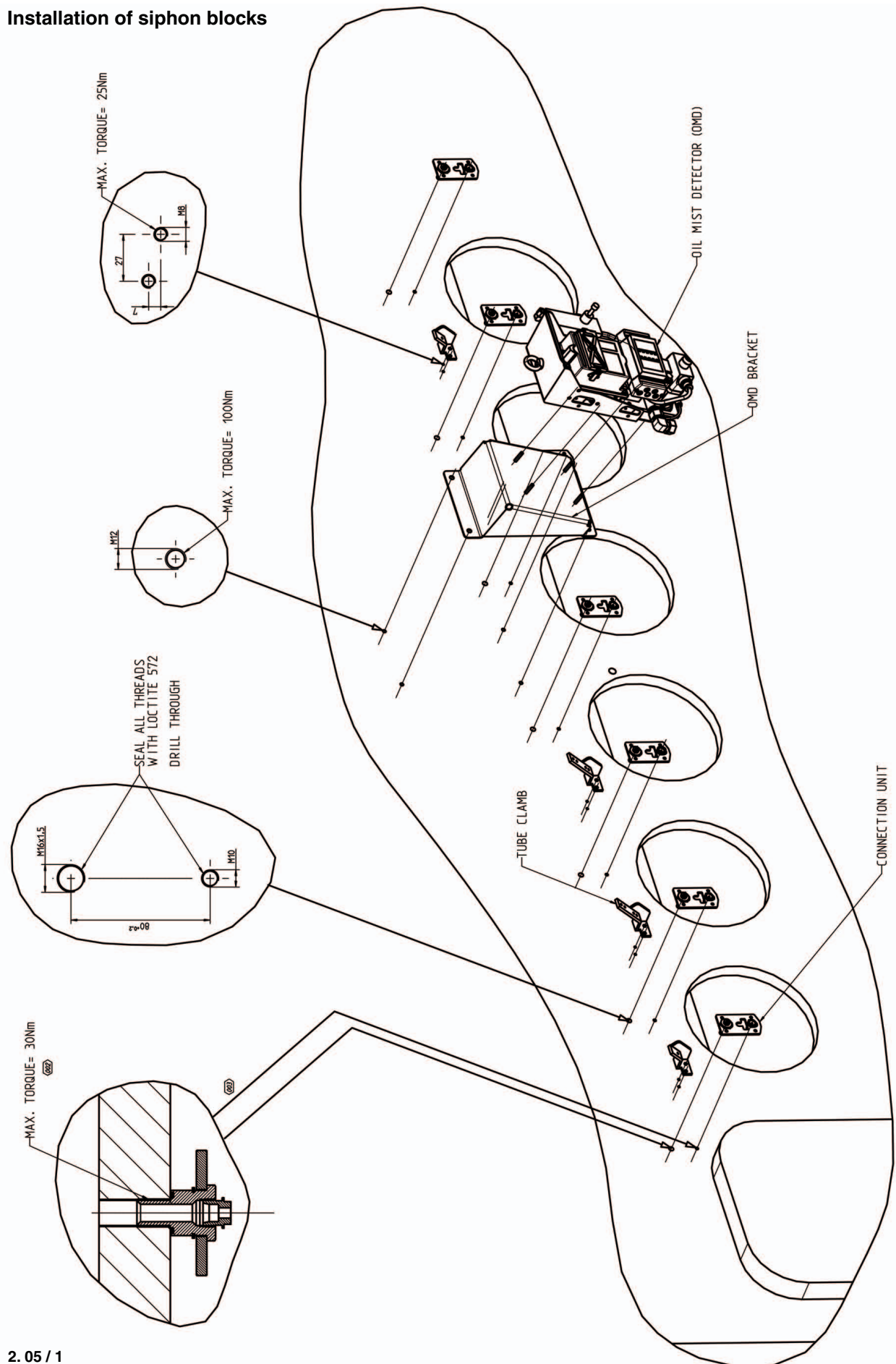


2. 04 / 3





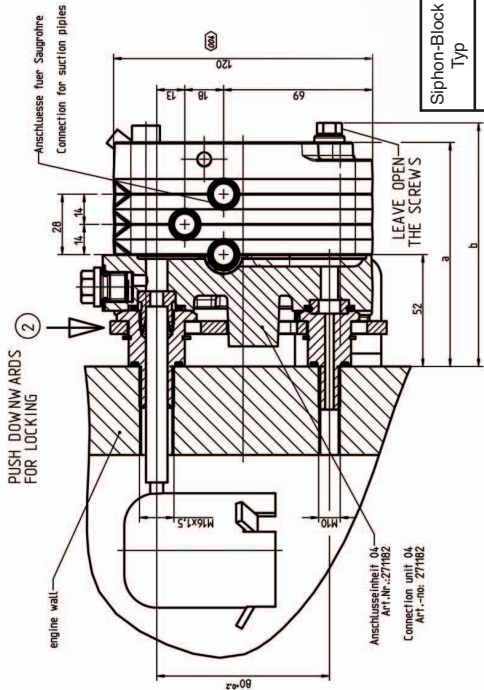
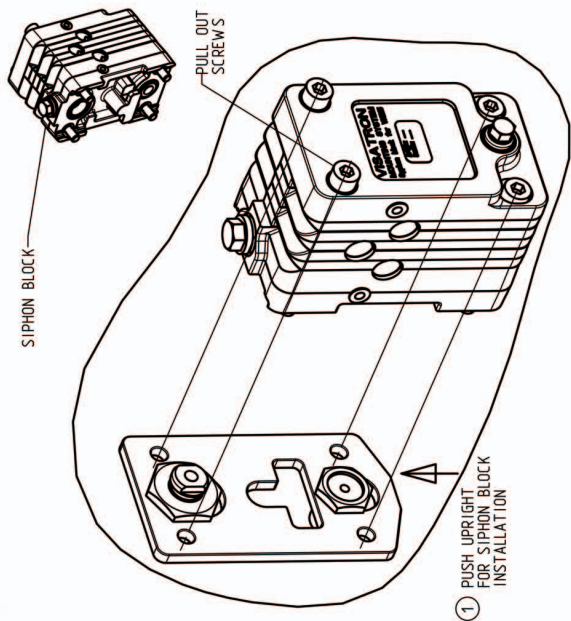
## Installation of siphon blocks



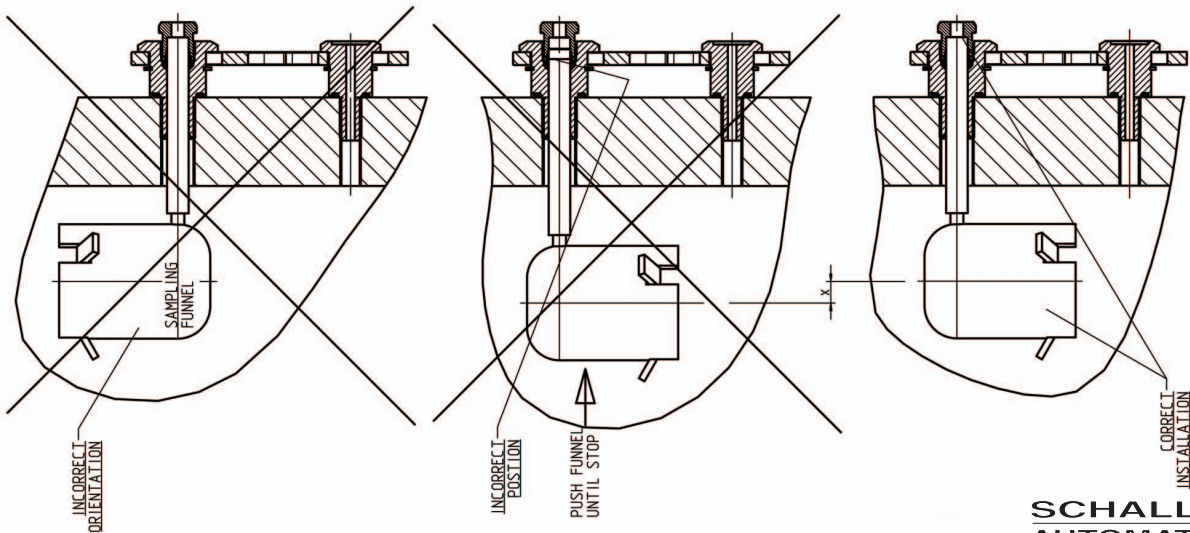
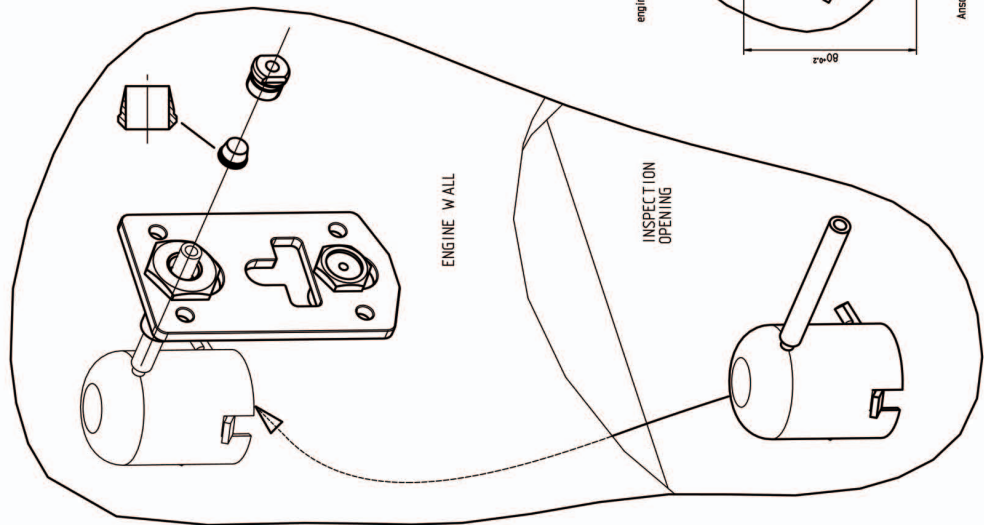


Installation of siphon blocks

2. 06 / 1

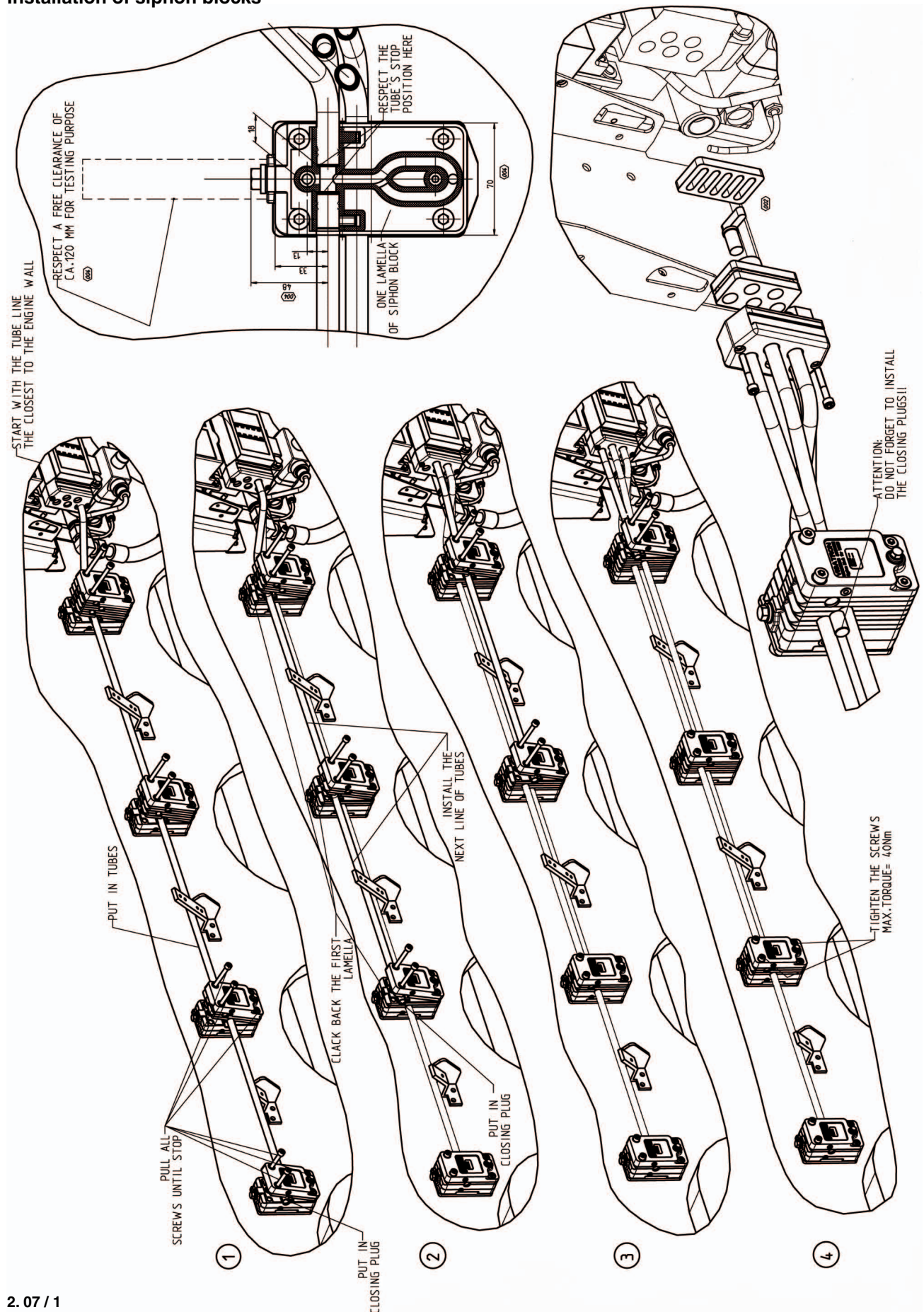


| Siphon-Block Typ | Anzahl Rohre quantity pipes | Maße measurements |     |
|------------------|-----------------------------|-------------------|-----|
|                  |                             | a                 | b   |
| SB1              | 1                           | 76                | 85  |
| SB2              | 2                           | 90                | 99  |
| SB3              | 3                           | 104               | 113 |
| SB4              | 4                           | 118               | 127 |
| SB5              | 5                           | 132               | 141 |





## Installation of siphon blocks



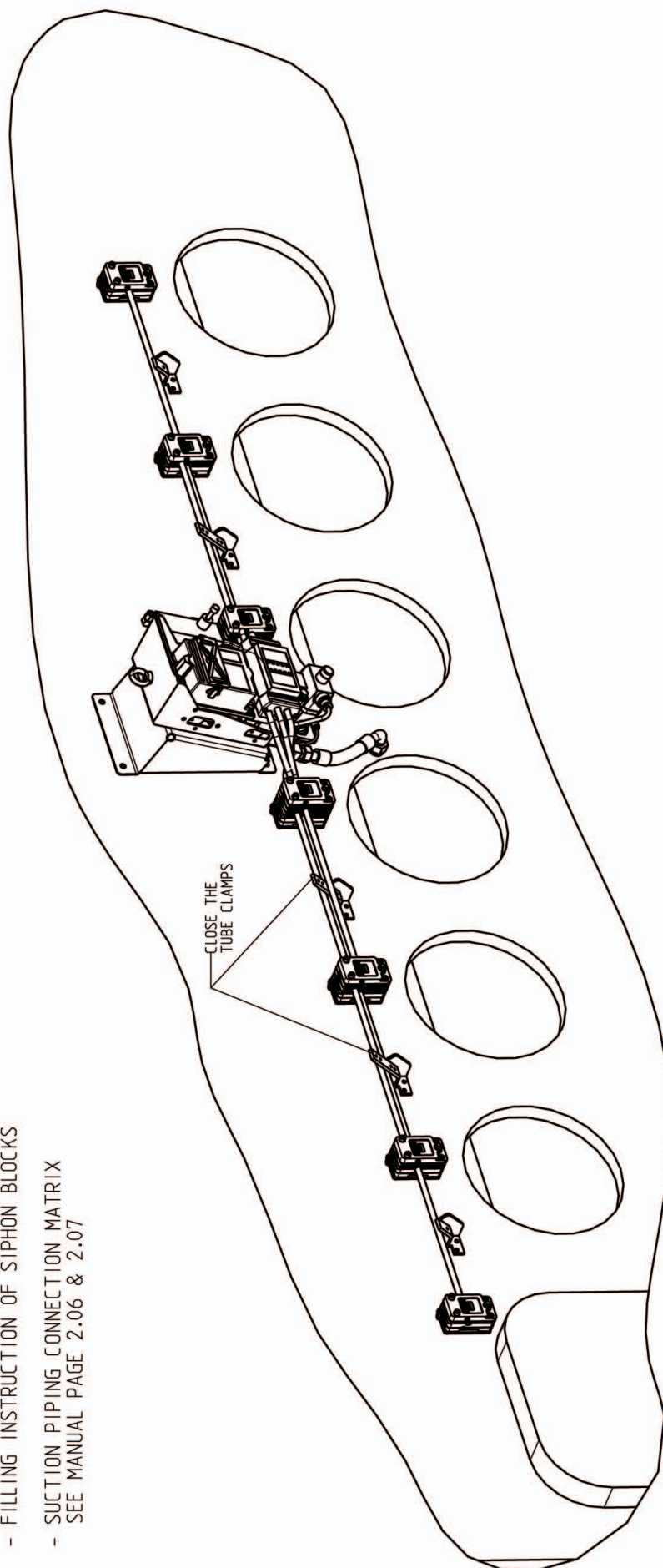


## Installation of siphon blocks

2. 08 / 1

PLEASE RESPECT

- FILLING INSTRUCTION OF SIPHON BLOCKS
- SUCTION PIPING CONNECTION MATRIX  
SEE MANUAL PAGE 2.06 & 2.07





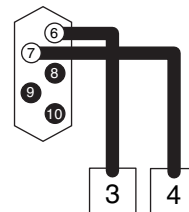
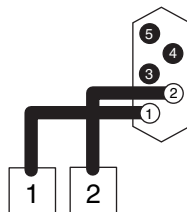
## Suction piping of VN 215 / 93

Connecting flange,  
Valve box

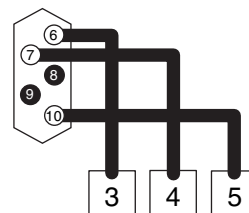
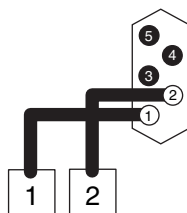
left

right

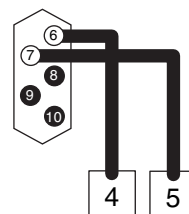
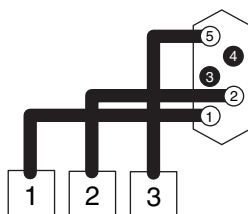
4 - suction points



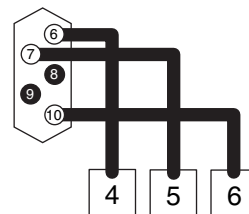
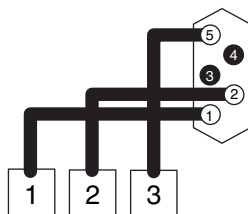
5 - suction points



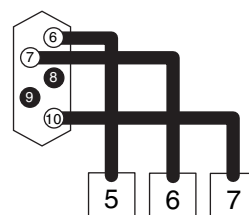
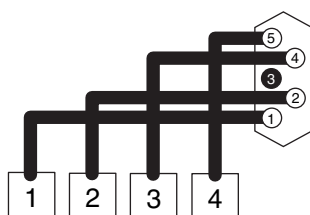
5 - suction points



6 - suction points



7 - suction points

⑤ Connection numbers  
to valve box● Closed by  
viton plug○ Connection for  
suction pipe

Unused pipe connection bores in flange are to be plugged  
with the supplied viton plugs.



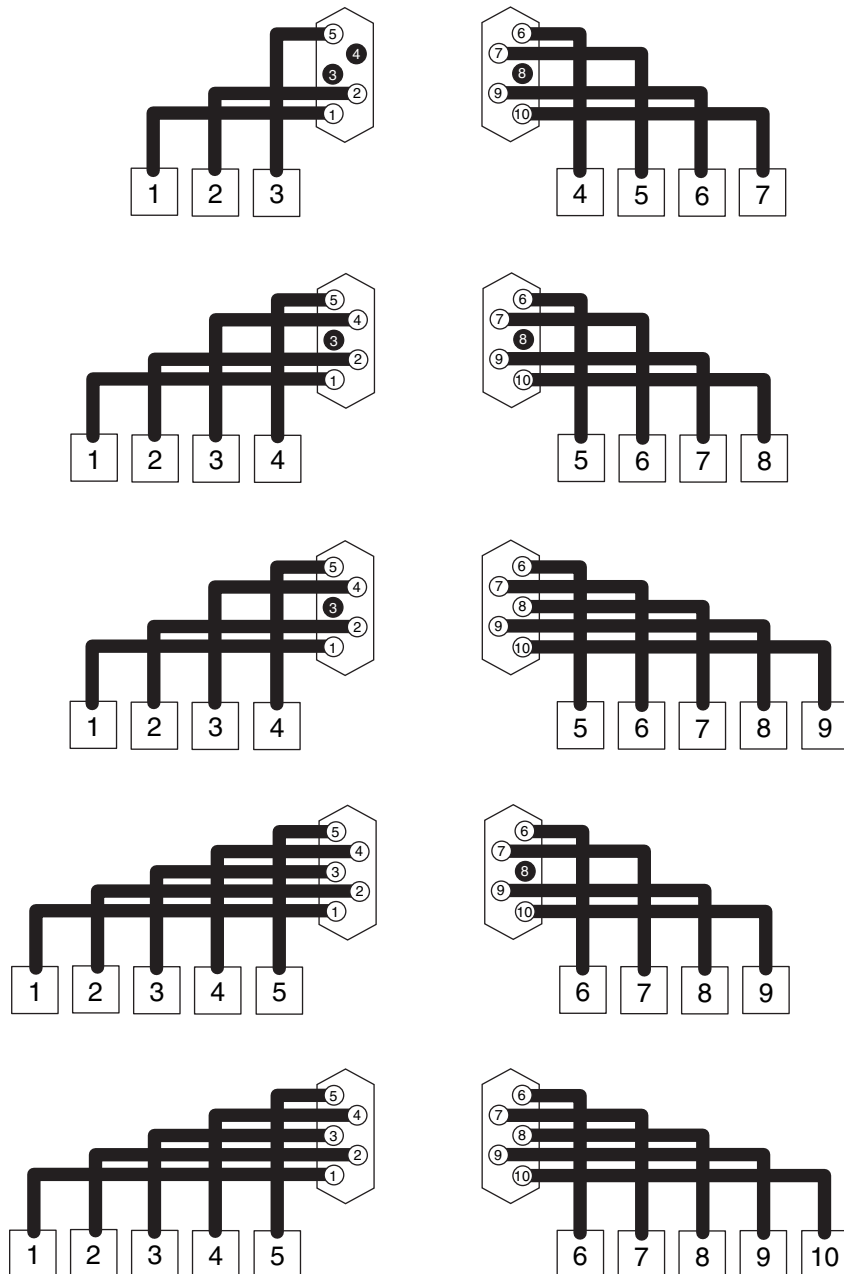


## Suction piping of VN 215 / 93

Connecting flange,  
Valve box

left

right

*7 - suction points**8 - suction points**9 - suction points**9 - suction points**10 - suction points*⑤ *Connection numbers  
to valve box*● *Closed by  
viton plug*○ *Connection for  
suction pipe*

Unused pipe connection bores in flange are to be plugged  
with the supplied viton plugs.



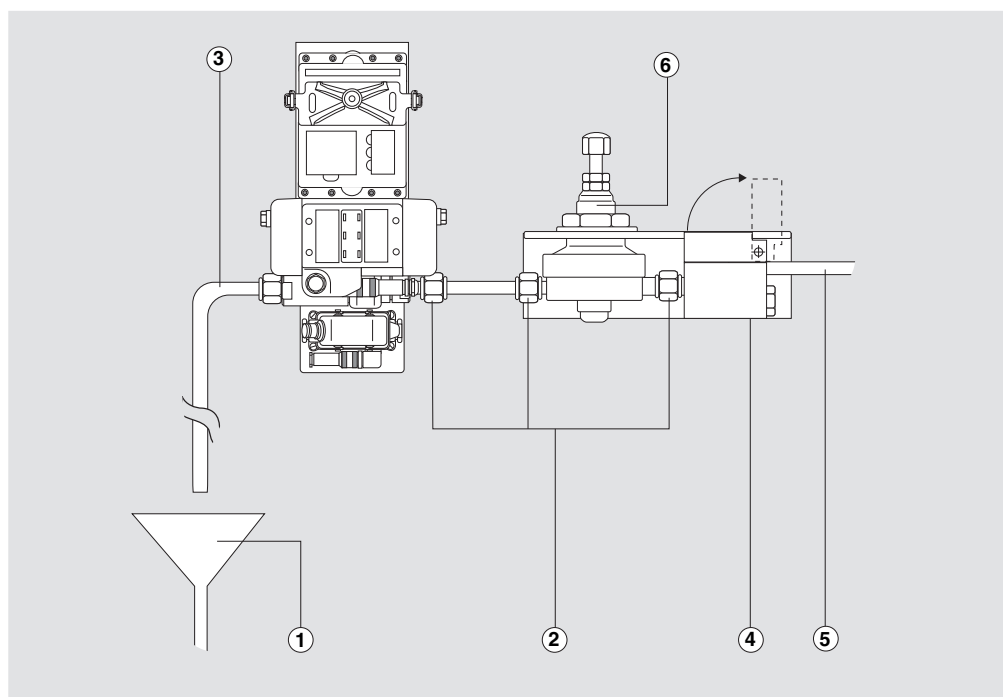


**No back pressure  
and no oil collection  
is allowed in  
exhaust air pipe!**

**Parts are not included  
in the scope of supply,  
but they can be  
purchased as an  
option!**



## Air supply



2. 11 / 1

- ① Discharge funnel (used by some engine makers)
  - ② Draft air connection set
  - ③ Exhaust air connection (design to be consulted with Schaller Automation)
- Pressure regulator unit consisting of:
- ④ Throttle block
  - ⑤ Pressure connection 2 - 12 bar
  - ⑥ Pressure regulator

If parts are not included in the scope of supply they can be purchased as an option!

To avoid backpressure, lay exhaust pipes without any reducers (DN 22).

Avoid sagging and oil collection in pipes (See drawing 2. 11 / 1)

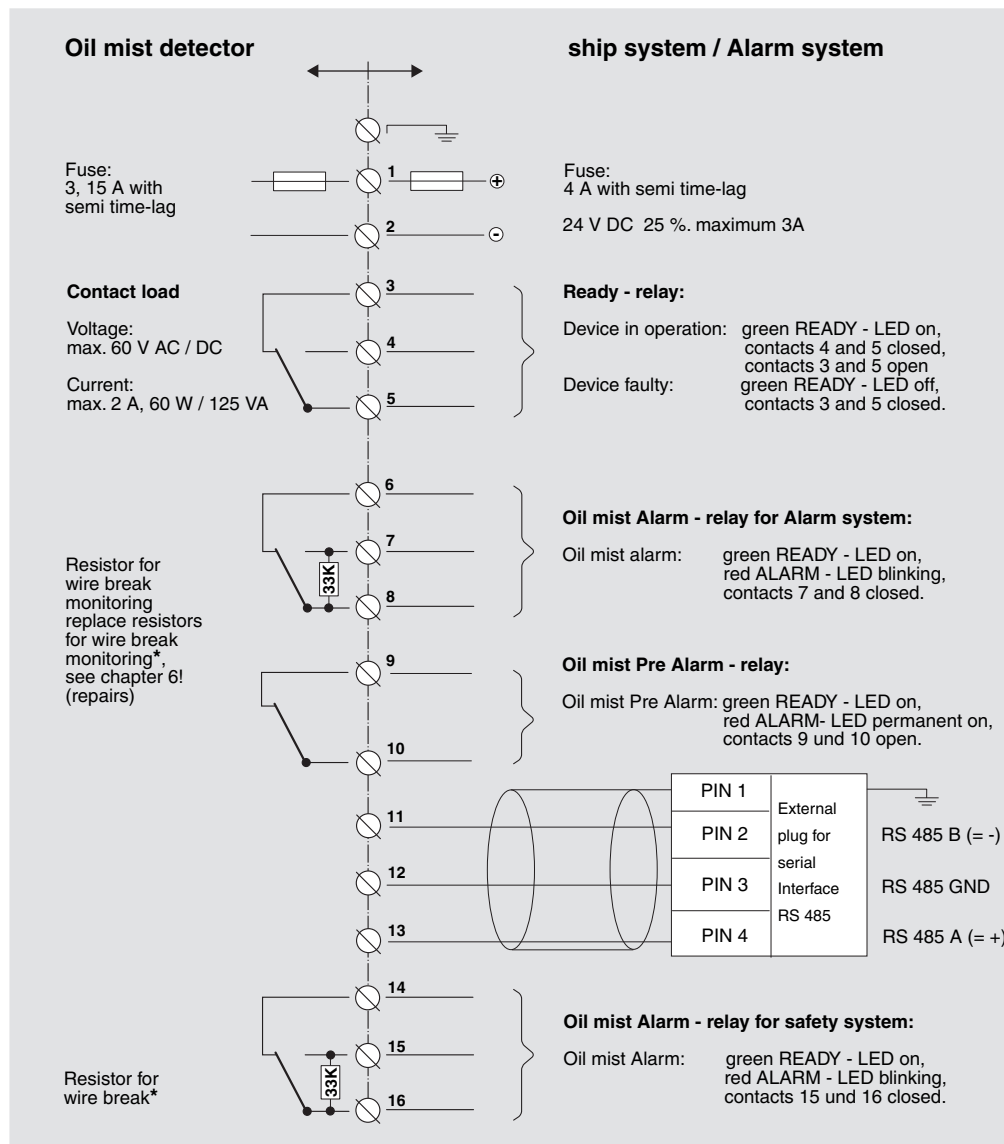
## Electrical connection (see Fig. 2. 12 / 1)

|                    |                        |
|--------------------|------------------------|
| Connection:        | 24 V DC                |
|                    | min. 18 V              |
|                    | max. 30 V              |
| Power consumption: | 3 A                    |
| Protection:        | 4 A with semi time-lag |

When power is supplied by batteries, charging voltages of more than 30 V might occur. These voltages are not permitted. Device will go into failure mode. Voltage limiters must be installed!



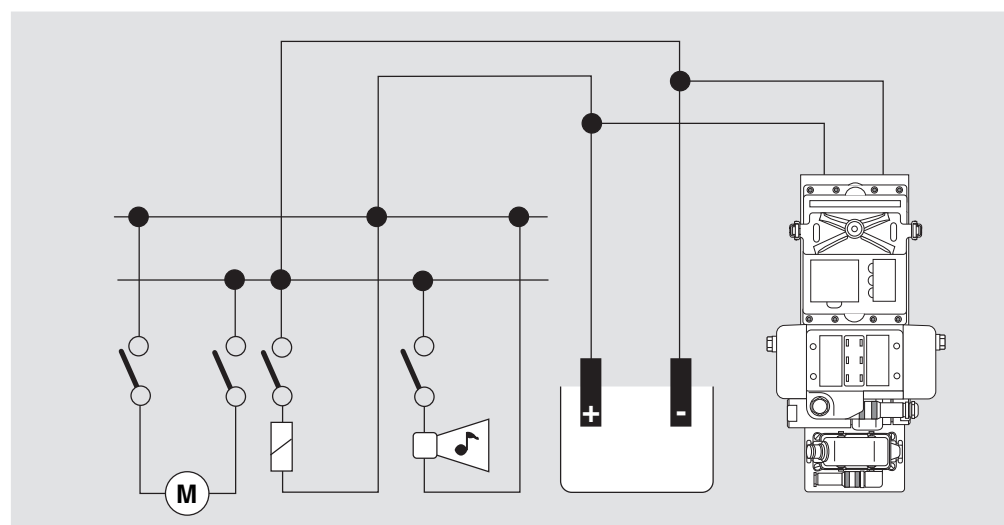
## Terminal Plan VN 93



*\*other values  
available*

2. 12 / 1

## Power supply connection for battery supply



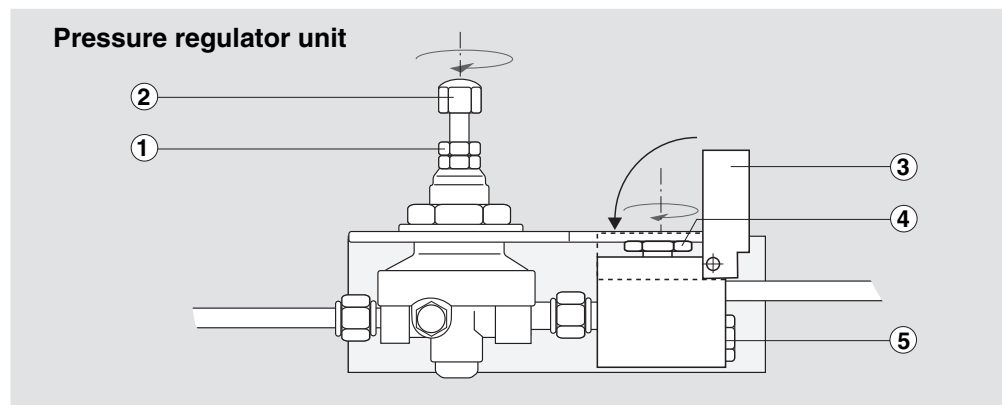
2. 12 / 2

## Commissioning

### Adjust suction pressure

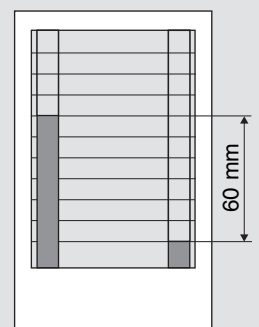
The suction pressure must be calibrated by adjusting the pressure regulator when the engine is at a standstill. Make sure ventilation of the engine room is in operation (pressure difference in room). An increase or decrease of the pressure in the crankcase compartment during operation and its effect on the flow velocity of the oil mist in the suction pipes, is largely compensated by the internal restriction integrated in the device. (e.g., +25 mm W. G. in the crankcase compartment against the atmosphere account for an increase of the oil mist flow velocity in the suction pipes of approx. 8%; +50 mm W. G. of approx. 14%, a negligible figure).

This is important because precipitation of minute oil droplets of the oil mist increases with a too high flow rate, thus reducing the sensitivity of the device.



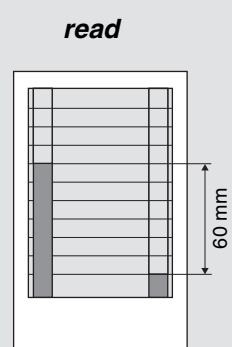
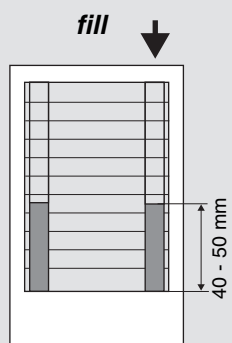
3. 01 / 1

1. Connect U-tube manometer with quick connection at inspection cover (see Fig. 3. 02 / 1).
2. Pour water inside the U- tube manometer utilizing bottle (Pos. 13 from Servicebox). Both tubes shall be filled to the half of the scale of the manometer. Both columns should be on the same level when U-tube manometer is not connected to Oil Mist Detector and in vertical position.
3. Loosen nut (1) and turn setscrew (2) in clockwise direction gently up to the stop.
4. Open safety cover (3) at the throttle (5) and manually turn setscrew (4) in clockwise direction gently up to the stop.
5. Switch on compressed air supply with inlet pressure (range 2 to 12 bar). The U-tube manometer should now read zero pressure.
6. Turn setscrew (4) in counterclockwise direction until the U-tube manometer indicates a negative pressure of 80 mm W. G
7. Close safety cover.
8. Turn setscrew (2) in counterclockwise direction until the negative pressure is only 60 mm W. G.
9. Tighten counter nut (1).
10. Disconnect U-tube manometer, insert and tighten plug screw again.

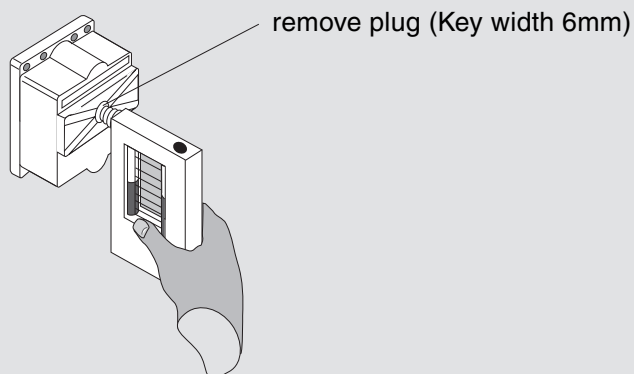


**Adjust 60 mm W. G.!**

**After adjustment,  
remove U-tube  
manometer  
and screw in the  
previously removed  
plug**



### Exhaust air connection



3. 02 / 1

### Filling of siphons (Fig. 3. 02 / 2)

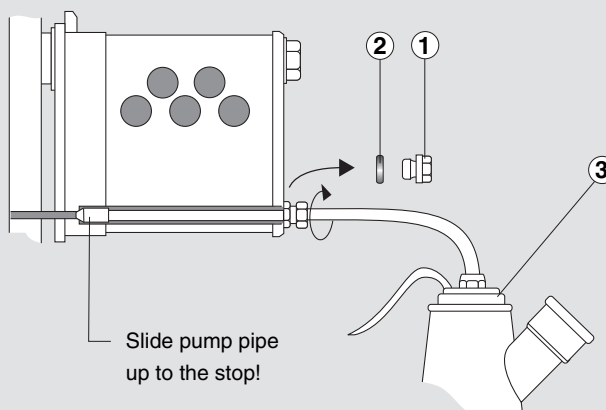
1. Remove plug (1) and seal ring (2).
2. Introduce filling pump (3) against the stop.
3. Secure filling pump with fitting and slightly tighten union nut.
4. Pump 10 to 12 times with fast strokes, valid for siphon blocks VISATRON VN 115/116.

Valid for siphon blocks VISATRON VN 215:

|                                                       |              |
|-------------------------------------------------------|--------------|
| SIPHON VN215/87-93 1-Tube                             | = 10 strokes |
| SIPHON VN215/87-93 1-Tube with measurement connection | = 10 strokes |
| SIPHON VN215/87-93 2-Tubes                            | = 12 strokes |
| SIPHON VN215/87-93 3-Tubes                            | = 14 strokes |
| SIPHON VN215/87-93 4-Tubes                            | = 16 strokes |
| SIPHON VN215/87-93 5-Tubes                            | = 20 strokes |

5. After the filling process has been completed, remove pump and tighten plug (1) and seal ring (2).

### Filling of siphons



3. 02 / 2

### Apply power supply

Switch on power supply after checking the wiring.





## Operating

### Operating and Display Elements

The VISATRON Display window consists of the following display elements:

Display (4 digits) "CODE"

Display (4 digits) "VALUE"

LED- Chain (12 LED's) "OPACITY".

LED at the bottom = 0 % opacity read, LED on top = Alarm level reached

LED green "READY"

LED red "TEST"

LED red "ALARM"

The Display window also contains the following operating elements:

Light sensitive button "UP"

Light sensitive button "DOWN"

Light sensitive button "RESET / ENTER"

When commissioning is completed and the electrical power supply is switched on the device is passing through the following set-up phases :

Test of the display

For the duration of 5 seconds the following display appears:

Display "CODE" : 8888

Display "VALUE" : 8888

LED - Chain all 12 LED's on

LED "READY": on

LED "TEST": on

LED "ALARM": on



### Self calibration of the electronic module during set-up period

When the power supply is switched on the following display appears during the first 30 seconds:

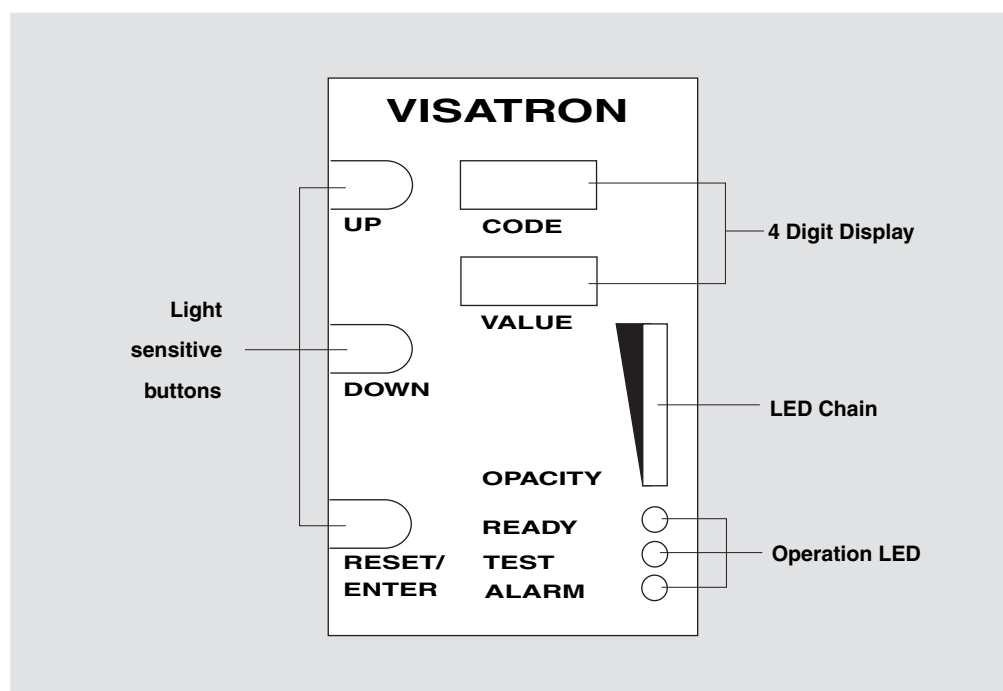
|                   |                                                                                |
|-------------------|--------------------------------------------------------------------------------|
| Display "CODE" :  | -215 (-116) (-115) representing the type of device<br>VN 215, VN 116 or VN 115 |
| Display "VALUE" : | starting with 29 counting down to 0 in 1 second steps                          |
| LED - Chain       | bottom LED on, all others off                                                  |
| LED "READY":      | off                                                                            |
| LED "TEST":       | off                                                                            |
| LED "ALARM":      | off                                                                            |

When the self calibrating procedure is completed the device is in normal operation mode

A manipulation or operation becomes necessary only if:

- an oil mist alarm occurs
- a device failure is being recognised
- maintenance of the oil mist detector has to be performed
- the factory default settings of the parameters must be changed.

### VISATRON display window



**Display and function during normal operation of the engine**

|                   |                                                                                |
|-------------------|--------------------------------------------------------------------------------|
| Display "CODE" :  | -215 (-116) (-115) representing the type of device<br>VN 215, VN 116 or VN 115 |
| Display "VALUE" : | 0                                                                              |
| LED - Chain       | bottom LED on, all others off                                                  |
| LED "READY":      | on                                                                             |
| LED "TEST":       | off                                                                            |
| LED "ALARM":      | off                                                                            |

All valves of the valve box are open, when the red symbols at the display window of the valve box can be seen (VN 116 / 93 , VN 215 / 93).

**VN 116 / 93**  
**VN 215 / 93**

**Display of operating and parameter values**

In normal operation mode of the device the following values are displayed:

|                    |                                |
|--------------------|--------------------------------|
| "CODE" indicates:  | -215 (-116) (-115)             |
| "VALUE" indicates: | The measured value of %Opacity |

To display the operating and parameter values proceed as follows:

Touch the button "UP" or the button "DOWN" for more than 3 seconds. IN "CODE" the number "-001" or "-026" is indicated and in "VALUE" the corresponding value will be indicated. By short touches on the buttons "UP" or "DOWN" the following code will be displayed with its corresponding value in "VALUE" (see Table 1).

To leave the parameter value mode choose the code number of the VISATRON device -215 (-116) (-115). Alternatively, if no button is touched for 1 minute it will return by itself to normal operation mode.

**see Table 1**



Table "code of the operating and parameter values:"

TABLE 1

| CODE                     | Designation                                                                                                                              | VALUE        | Unit, hint                                     |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------------------------------------|
| -215<br>(-116)<br>(-115) | VISATRON device type 215<br>116 or 115 (normal operation mode)                                                                           | 0 to 100     | % Opacity                                      |
| -001                     | Oil mist main Alarm level                                                                                                                | 0,5 to 25    | % Opacity                                      |
| -002                     | Measured opacity relative<br>to alarm level                                                                                              | 0 to 100     | %                                              |
| -003                     | Measured opacity compared to<br>fresh air (only when fresh air<br>calibration is activated)                                              | 0 to 100     | %                                              |
| -004                     | pollution of light measuring track                                                                                                       | 0 to 100     | %                                              |
| -005                     | Negative pressure inside<br>measuring head                                                                                               | 0 to ca. 350 | % of minimum<br>required switch-on<br>pressure |
| -006                     | Temperature of ambient air                                                                                                               | 0 to 70      | ° C                                            |
| -007                     | Temperature inside measuring head                                                                                                        | 0 to 75      | ° C                                            |
| -008                     | Time                                                                                                                                     |              | hh . mm                                        |
| -009                     | Date                                                                                                                                     |              | dd . mm                                        |
| -010                     | Adjusted alarm level<br>(Factory setting: 4)<br>see also table 4!                                                                        | 1 to 10      | --                                             |
| -011                     | Pre-alarm level relative to main<br>alarm level (Factory setting: 100%)                                                                  | 40 to 100    | % of main<br>alarm level                       |
| -012                     | Time interval of fresh air calibration<br>(0 = no fresh air calibration)<br>optional available on device<br>VN 116/93 and VN 215/93 only | 1 to 24      | hour                                           |
| -020                     | Digital value of opacity                                                                                                                 | 0 to 4095    | for service<br>personal only                   |
| -021                     | Digital value of air flow sensor                                                                                                         | 0 to 4095    |                                                |
| -022                     | Digital value of ambient<br>air temperature sensor                                                                                       | 0 to 4095    |                                                |
| -023                     | Digital value of measuring head<br>temperature sensor                                                                                    | 0 to 4095    |                                                |
| -024                     | Digital value of internal<br>power supply                                                                                                | 0 to 4095    |                                                |
| -025                     | Digital value of light measuring<br>track against fresh air                                                                              | 0 to 4095    |                                                |
| -026                     | Digital value of relative opacity                                                                                                        | 0 to 4095    |                                                |
| -027                     | Seconds of internal clock                                                                                                                | 0 to 59      |                                                |



### Rise of opacity higher than damage check level

- Display "CODE" : -215 (-116) (-115)  
representing the type of device VN 215, VN 116 or VN 115
- Display "VALUE" : Value is higher than zero and represents the opacity
- LED - Chain with increasing opacity the illuminated LED is moving upwards
- LED "READY": on
- LED "TEST": off
- LED "ALARM": off
  
- Devices VN 215 / 93 and VN 116 / 93 only : The valves in the valve box will be activated according to a special algorithm to identify the side of the engine with the highest opacity (on VN 116 / 93) or the compartment with the highest opacity on devices VN 215 / 93

***VN 116 / 93  
and  
VN 215 / 93  
only***

### Rise of opacity higher than main alarm level

- Display "CODE" : -215 (-116) (-115)  
representing the type of device VN 215, VN 116 or VN 115
- Display "VALUE" : On devices VN 116 / 93 and VN 215 / 93 :  
represents the opacity in the compartment which is indicated by the red symbol of the valve box  
  
On devices VN 115 / 93 : Average value of the opacity of all compartments.
- LED - Chain with increasing opacity the illuminated LED is moving upwards
- LED "READY": on
- LED "TEST": off
- LED "ALARM": on
- ALARM - Relay will be activated
  
- VN 116 / 93 :  
The side of the engine (left or right) where the highest opacity occurred will be indicated by 3 red symbols shown above each other on the valve box.  
It can be assumed that the engine damage is located on that side.
  
- VN 215 / 93 :  
The compartment where the highest opacity occurred will be indicated by one red symbol. It can be assumed that the engine damage is located in that compartment!

***VN 116 / 93***

***VN 215 / 93***



Subsequently, the following is displayed at the display window:

- Display "CODE" : -215 (-116) (-115)  
representing the type of device VN215, VN116 or VN115
- Display "VALUE" : 0
- LED - Chain bottom LED on, all others off
- LED "READY": on
- LED "TEST": off
- LED "ALARM": off

- On devices VN 215 / 93 and VN 116 / 93 only:  
All valves in the valve box will be opened, all 10 red symbols are visible.

In case that the opacity is still higher than the damage check level (after resetting the device) the damage check will start again.

### Display and function in case of malfunction

In case of a malfunction the following is displayed at the display window:

|                   |                               |                                                             |
|-------------------|-------------------------------|-------------------------------------------------------------|
| Display "CODE" :  | Exxx                          | (xxx = error code e.g. E 014)                               |
| Display "VALUE" : | yyyy                          | (yyy = value giving detailed information to the error code) |
| LED - Chain       | bottom LED on, all others off |                                                             |
| LED "READY":      | off                           |                                                             |
| LED "TEST":       | off                           |                                                             |
| LED "ALARM":      | off                           |                                                             |

For more information please refer to chapter 5 "Malfunction" !

**see Table 2**



Table for Error Codes:

TABLE 2

| CODE  | Designation<br>Description                                        | VALUE          | READY<br>LED | READY<br>Relay | Device<br>monitors<br>the<br>engine | Trouble<br>shooting                                                                   |
|-------|-------------------------------------------------------------------|----------------|--------------|----------------|-------------------------------------|---------------------------------------------------------------------------------------|
| E001  | Not used                                                          | -----          | -----        | -----          | -----                               | Change measuring head                                                                 |
| E002  | Digital value for negative pressure sensor too high               | 0 to 4095      | off          | n.e.           | no                                  | Change measuring head                                                                 |
| E003  | Digital value for negative pressure too low                       | 0 to 4095      | off          | n.e.           | no                                  | Change measuring head                                                                 |
| E004  | Failure digital value-light measuring track                       | 0 to 4095      | off          | n.e.           | no                                  | Change measuring head                                                                 |
| E005  | Not used                                                          | -----          | -----        | -----          | -----                               | Change measuring head                                                                 |
| E006  | Voltage too high (> 32V)                                          | blank          | off          | n.e.           | no                                  | Check voltage                                                                         |
| E007  | Light sensitive button(s) defect                                  | blank          | on           | e.             | yes                                 | Clean display window or change measuring head                                         |
| E008  | Temperature inside the device too high >75 C                      | -25 to 100 (C) | off          | n.e.           | no                                  | If ambient temperature around the device is below 70C, change measuring head          |
| E009  | Temperature inside the device below 0 C                           | -25 to 100 (C) | off          | n.e.           | no                                  | Avoid direct cold air flow from blowers and fans to the device                        |
| E010  | Ambient temperature too high                                      | -25 to 100 (C) | off          | n.e.           | no                                  | Protect the device against heat sources. Ensure supply of cooling air (fan,blower)    |
| E011  | Ambient air temperature too low                                   | -25 to 100 (C) | off          | n.e.           | no                                  | Avoid direct cold air flow from blowers and fans to the device                        |
| E012  | Checksum error                                                    | blank          | off          | n.e.           | no                                  | Repeat parameter adjustment                                                           |
| E013  | Light measuring track polluted, transmitting factor < 40%         | blank          | on           | e.             | yes                                 | Clean infrared lenses of the light measuring track **)                                |
| E014  | Negative pressure/air flow too low                                | 0 to 100 mm WG | off          | n.e.           | no                                  | Check negative pressure (-60 to -80 mm WG) check air supply. Change fresh air filters |
| E015  | Light measuring track heavily polluted, transmitting factor < 30% | blank          | off          | n.e.           | no                                  | Clean infrared lenses of the light measuring track **)                                |
| E016  | Electronic module defective                                       | 0 to 100 (%)   | off          | n.e.           | yes                                 | Change measuring head                                                                 |
| E017  | Failure of electronic module                                      | blank          | off          | n.e.           | no                                  | Change measuring head                                                                 |
| E018  | Voltage of battery too low *)                                     | blank          | on           | e.             | yes                                 | Change measuring head                                                                 |
| blank | Supply voltage too low                                            | LP             | off          | n.e.           | no                                  | Check electrical power supply?                                                        |

**e.= Relay energized.  
That means Relay in  
position "Device ok"**

**n.e.= Relay  
not energised. That  
means Relay in position  
"Device failure"**

**\*) = available on devices  
with the option history  
memory, clock and serial  
interface only**

**\*\*)= Caution:  
use only soft, non  
scratching material of  
Servicebox**





### Function of the Relay outputs

#### Function of the READY - Relay

(Corresponds to condition indicated by the READY - LED)

The Relay will be activated, when the oil mist detector is in normal operation state and functioning trouble free.

#### Function of the Alarm Relay

- The relay will be activated when the measured opacity has exceeded the adjusted alarm level. The relay will be deenergized by resetting the device as described in 3.08.
- Wire break monitoring by the alarm system is made possible by wire break resistors installed between contacts 7 and 8 as well as between contacts 15 and 16 of the pre-alarm relay. Factory standard supply is with resistors 33 kOhm.
- For changing the wire break resistors to other required values refer to chapter 6.

#### Function of the Pre-Alarm Relay

The pre-alarm relay has the same function as the alarm relay for an earlier warning before main alarm. The difference is that a lower alarm level can be adjusted by the parameter adjustment. The pre-alarm level can be adjusted from 40% to 100% of the main alarm level by authorised personnel only.

The pre-alarm relay will be deenergized when the measured opacity is below the pre-alarm level.

#### Attention :

**In case of an oil mist alarm, the oil mist detector (OMD) must be in condition to react within the next few seconds and shut down the engine, in order to mini-mise immediate or consequential damages. The corresponding relay contacts are instantly connected to trigger the alarm safety system (no time delay).**

#### Parameter adjustment

By the parameter adjustment function the factory pre-settings of the parameters can be displayed and changed, by authorised personnel only. Permission by the operator's management is required.

In case that the factory pre-set parameters are changed by the operator, he takes over the responsibility for the correct monitoring of the engine what the oil mist detector concerns.





### Procedure for parameter adjustment

- The "UP" and "DOWN" light sensitive buttons have to be touched simultaneously for more than 3 seconds. The following display appears:

- Display "CODE" : P000 (=parameter code )
- Display "VALUE" : blank
- LED - Chain bottom LED on, all others off
- LED "READY": no change
- LED "TEST": no change
- LED "ALARM": no change

The following choice can be made now:

The parameters can be displayed or the parameters can be displayed and changed.

The display will set itself back into its basic state if no input is made for more than 60 seconds.

### Display of parameters only

By touching the light sensitive button "UP" the parameter code will be increased.

By touching the light sensitive button "DOWN" the parameter code will be decreased.

Meaning of parameter codes, refer to table 3.

***see Table 3***

In the display "VALUE" appears the value of the corresponding parameter.

Leaving the parameter adjustment function, is achieved:

- By touching the "UP" and "DOWN" light sensitive buttons simultaneously for more than 3 seconds,
- Or automatically if no inputs are made with the light sensitive buttons for more than 60 seconds.

**Display during change of parameters:**

**Attention.** While performing parameter adjustment the engine is not monitored by the oil mist detector. This will be indicated by the READY-LED being off and the not energised READY-Relay!

- Display "CODE" : P000 (=parameter code)
- Display "VALUE" : blank
- LED - Chain bottom LED on, all others off
- LED "READY": no change
- LED "TEST": no change
- LED "ALARM": no change

By touching the light sensitive button "RESET/ENTER" the READY-LED goes off. The READY-Relay changes to position "Device failure" and the following display appears:

- Display "CODE" : P000 (=parameter code)
- Display "VALUE" : 0000 (the digit of the right side is blinking)
- LED - Chain bottom LED on, all others off
- LED "READY": off
- LED "TEST": off
- LED "ALARM": off

**passcode**  
**4711**

At "VALUE" a passcode now has to be entered. If the passcode is e.g. **4711** :

- Touch the light sensitive button "UP" or "DOWN" to increase or decrease the number of the blinking digit at "VALUE".
- Touch the buttons until the required value is set at the blinking digit.
- Touch the button "RESET/ENTER" once.
- Now the next digit on left side is blinking. The digit which was blinking before is now illuminated constantly.
- Continue with this procedure until the number 4711 is entered.
- When the last number (4) is entered, touch "RESET/ENTER" and the following display appears:

- Display "CODE" : P000 (=parameter code)
- Display "VALUE" : 4711
- LED - Chain bottom LED on, all others off
- LED "READY": off
- LED "TEST": off
- LED "ALARM": off

**see Table 3**

By touching the light sensitive button "UP" the parameter code will be increased. By touching the light sensitive button "DOWN" the parameter code will be decreased. Meaning of parameter codes refer to table 3.

- When the required parameter code has been selected touch the button "RESET/ENTER" to change parameter.
- The corresponding value is blinking and can be changed with the buttons "UP" and "DOWN"
- To confirm the modification touch the button "RESET/ENTER".





### Leaving of the parameter adjustment function

- By touching the "UP" and "DOWN" light sensitive buttons simultaneously for more than 3 seconds.
- Automatically if no inputs are made by the light sensitive buttons for more than 60 seconds.

Table with parameter codes

TABLE 3

| CODE | designation                                                                                                                 | range of possible values | factory presettings | unit                  |
|------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------|-----------------------|
| P001 | Main Alarm level in steps 1 to 10<br>(see Table 4)<br>1=most sensitive level<br>10= least sensitive level                   | 1 to10                   | 4                   | -----                 |
| P002 | Time delay for fresh air calibration?<br>(0 = no fresh air calibration)                                                     | 0 to 24                  | 0                   | hour                  |
| P003 | Options for authorized personal only                                                                                        | Standard:<br>0000        |                     |                       |
| P004 | Pre- Alarm level as percentage of the main alarm level. At 100% pre- alarm level= main alarm level                          | 40 to 100                | 100                 | % of main alarm level |
| P005 | Adress of RS 485-interface*)                                                                                                | 1 to 99                  | 1                   | -----                 |
| P006 | Adjust the factory pre- settings<br>0=values can be adjusted individually; 1=all parameters will be set to "default" values | 0 or 1                   | 0                   | -----                 |
| P050 | Date *)                                                                                                                     | 01.01 to 31.12           |                     | dd . mm               |
| P051 | Date *)                                                                                                                     | 1990 to 2010             |                     | JJJJ                  |
| P052 | Time *)                                                                                                                     | 00.00 to 23.59           |                     | hh . mm               |

**\*) = with the option  
history memory, clock,  
serial interface only**





TABLE 4

| Level of sensitivity | Alarm level (% Opacity) VN 115 / 93 | Alarm level (% Opacity) VN 116 / 93 and VN 215 / 93 |
|----------------------|-------------------------------------|-----------------------------------------------------|
| 1                    | 0,5                                 | 0,7                                                 |
| 2                    | 1,0                                 | 1,1                                                 |
| 3                    | 1,5                                 | 1,6                                                 |
| 4                    | 2,0                                 | 2,4                                                 |
| 5                    | 3,0                                 | 3,7                                                 |
| 6                    | 5,0                                 | 5,5                                                 |
| 7                    | 7,0                                 | 8,2                                                 |
| 8                    | 10,0                                | 12,4                                                |
| 9                    | 15,0                                | 18,5                                                |
| 10                   | 25,0                                | 27,8                                                |



## Performance test

### Attention !

During this test the engine is not monitored by the oil mist detector !

- Open the control cover of the measuring head
- Wait until the READY-LED is switched off (approx. after 10 seconds)
- The following display appears:

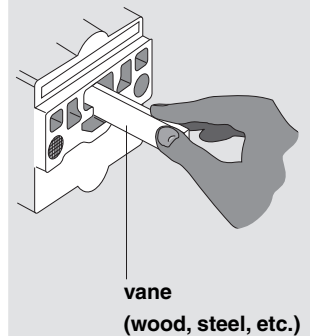
- Display "CODE" : E 014
- Display "VALUE" : decreasing to values below the adjusted "minimum value for negative pressure" (P003)
- LED - Chain bottom LED on, all others off
- LED "READY": off
- LED "TEST": off
- LED "ALARM": off

- Blind the light beam of the measuring track with a wooden vane or similar object.
  - At devices VN 116 / 93 and VN 215 / 93 the damage check starts, as described in chapter 3.07.
  - When the alarm level is reached the TEST-LED lights up (TEST-Alarm). To set back the TEST-Alarm touch the "ENTER/RESET" button for more than 1 second. TEST-LED goes off.
  - Close the control cover of the measuring head. At "VALUE" the increasing value of the negative pressure is displayed. When the minimum negative pressure is exceeded the device set-up will be started.
  - After approx. 15 seconds the device is in basic operation mode again.
- The following display appears:

- Display "CODE" : -215 (-116) (-115)
- Display "VALUE" : 0
- LED - Chain bottom LED on, all others off
- LED "READY": on
- LED "TEST": off
- LED "ALARM": off

### Attention !

After the test is completed successfully it is imperative to close the control cover of the measuring head again to ensure that the engine will be monitored by the oil mist detector!





**Additional functions in connection with the History memory**

The following package is available as an option:

- clock, powered by battery
- History memory, for collection of events being recognised by the VISATRON oil mist detector also during power supply failure (see below table 5).
- serial data interface for data link of the VISATRON to a personal computer, connecting cable with interface adapter RS 485 / RS 232
- PC- Software for readout of the history memory.

An operating instruction explaining the connection of the VISATRON to the PC and the data readout of the history memory is supplied with the software-diskette.

The following events are stored by the history memory with indication of date and time:

**TABLE 5**

| designation                          | value                           |
|--------------------------------------|---------------------------------|
| electrical power supply switched on  | date, time                      |
| electrical power supply switched off | date, time                      |
| Alarm level has been changed         | date, time, new alarm level     |
| Pre-alarm level has been changed     | date, time, new pre-alarm level |
| READY switched on                    | date, time                      |
| READY switched off                   | date, time, Error code          |
| Main alarm released                  | date, time                      |
| Main alarm off                       | date, time                      |
| Pre-alarm released                   | date, time                      |
| Pre-alarm switched off               | date, time                      |



### Shut Down

- Stop drive air supply
- Do not switch off the power supply

### Storage

In closed rooms

T min                    -25C

T max                    +80C

Maximum air humidity    85%

***Avoid  
humidity  
condensation!***





## Performance Test / Maintenance

### Performance test

(To be preformed before the engine is started):

- Pull out the main connector plug,  
green READY LED will go off
- Re- install main connector plug,  
LED No. 1 is blinking for about 30 seconds, then:  
the green READY LED and chain LED No. 1 light up.  
Device is ready for operation.
- Open inspection cover at the measuring head.  
After about 15 seconds the green READY LED turns off and  
Display "CODE" E 014 is on.  
Display "VALUE": negative pressure in the measuring head is showing a low value.
- Close inspection cover at the measuring head again.  
Negative pressure at measuring head is increasing (displayed at "VALUE").  
The green READY LED subsequently switches on.  
Device is ready for operation.

### Performance test with cigarette smoke or SCHALLER AUTOMATIONS OIL MIST SIMULATOR (Part No. 10353) (to be performed only when engine is not running)

- Open crankcase-cover of a compartment in order to access  
a suction pipe or sampling funnel.
- Fill the plastic bag (found in the service box) with cigarette smoke by use of the  
mouth piece or use OIL MIST SIMULATOR.
- Affix the plastic bag to suction pipe or sampling funnel.
- Allow the oil mist detector to draw in the distillate vapour for  
a minimum of 20 seconds.

It depends on the vapour density and suction time (at least 20 seconds):

- 1 - whether an oil mist alarm is triggered, or
- 2 - oil mist alarm is triggered, and a search run is started, or during  
the search run only one half or the engine is indicated, or the  
affected compartment is indicated.  
(If the amount of vapour is insufficient or the suction time is too short, a wrong  
compartment may be indicated in the display window of the valve box.)



**Damage- Check:**

**VN 116 / 93  
and  
VN 215 / 93**



**Rough filter side  
outwards!**

**Use cotton sticks only,  
otherwise the glasses  
may be damaged!**

**Maintenance work to be carried out regularly. In case of non-compliance, the manufacturer's liability expires. Maintenance work has to be documented.**

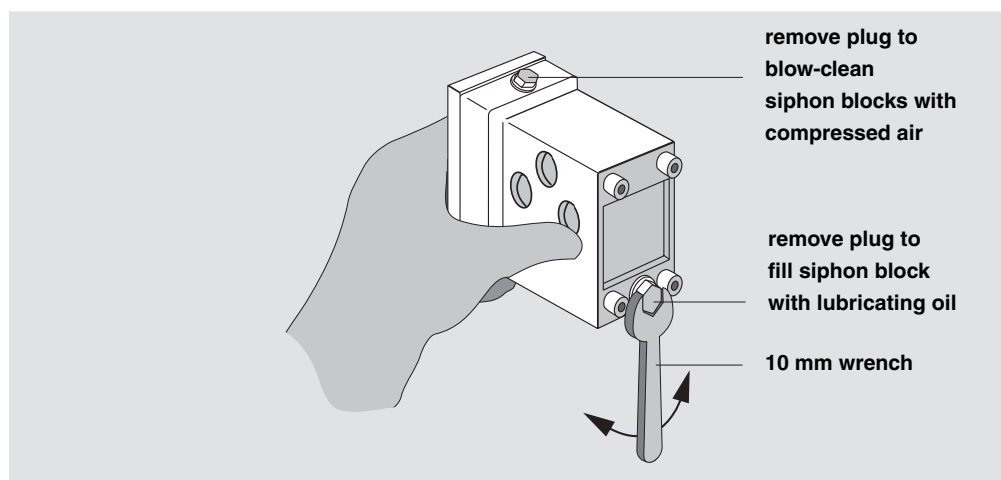
**Monthly:** Check the negative pressure in the measuring head  
(range 60 - 80 mm H<sub>2</sub>O, see 3. 01)

**Quarterly:** Replace the sintered bronze filter in the measuring head.  
(see 5.03/1)

**Attention: Filters cannot be cleaned.**

Clean the infrared filter glasses in the measuring head  
(see Fig. 5. 05 / 1)

**Every 6 months:** Only with siphon block assembly system,  
optional for all OMD device types.



4. 02 / 1

In order to do so:

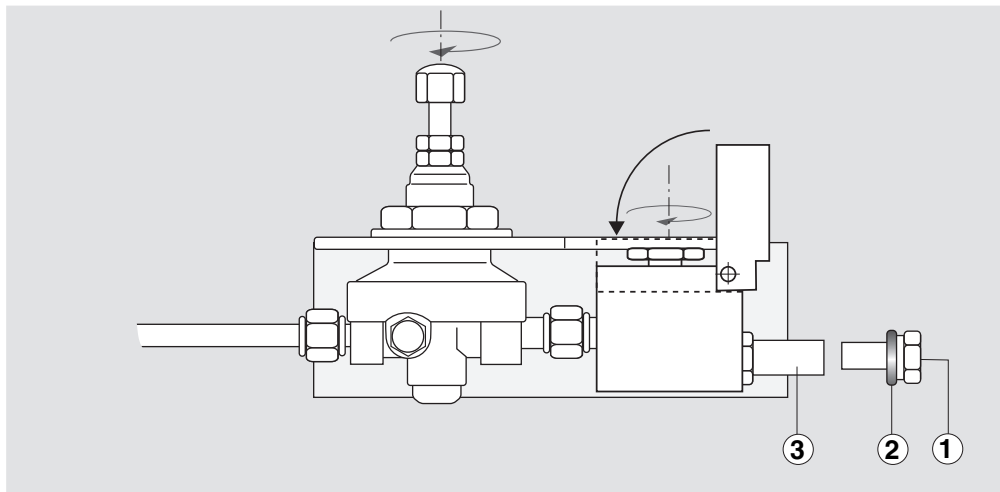
Remove header pipes from the connecting box,  
(VN 115 / 93) or from the valve box of VN 116 / 93, or individual  
pipes from valve box of VN 215 / 93 (to ensure that the device is  
not contaminated during the cleaning operation).

Remove siphon block plug, blow-clean the siphons with  
compressed air (max. 7 bar), mount the header or the individual  
suction pipes and siphon block plug, tighten accordingly.

Subsequently fill the siphon blocks with lubricating oil  
(see Fig. 4. 02 / 1) according filling instruction in chapter 3.02



**Yearly:** Replace the sintered bronze filter in the pressure reducer  
(see Fig. 4. 03 / 1)



4. 03 / 1

In order to do so:

Turn off drive air supply, remove plug (1) with O- ring (2),  
detach sintered bronze filter (3), insert new filter, install and  
tighten plug (1) with O-ring (2) and turn on the drive air supply.



**Turn off  
drive air supply  
(control air)**





## Malfunctions

### Failures and corrective action

A malfunction of the oil mist detector has occurred if:

- the green READY LED is off – or
- all displays are blank, all LED's are off

A pending oil mist alarm will be reset automatically when malfunction occurs.

### Failure:

**No display in the inspection window, all LEDs off.**

#### Possible cause:

Breakdown of power supply  
or voltage too low

#### Remedy:

Check power supply  
by: pulling off the main connector plug.  
Between terminals 1 and 2 in the socket  
on the base plate, check if min.18V to  
max. 30V is available.  
Push on main connector plug and lock into  
place. Make sure that the power supply  
does not break down under the load of the  
oil mist detector.  
(voltage not to be below 18V)

**min. 18V**  
**max. 30V**

Fuse in the measuring head  
defective (see Fig.5. 06 / 1)

Replace fuse in the measuring head  
(3,15 A, semi time lag)  
by: pulling off the main connector plug.  
Detach measuring head (8 screws)  
Replace fuse by a new one.  
Mount measuring head into position.  
Push on main connector plug  
and lock into place.

Should there still be no  
READY LED indication

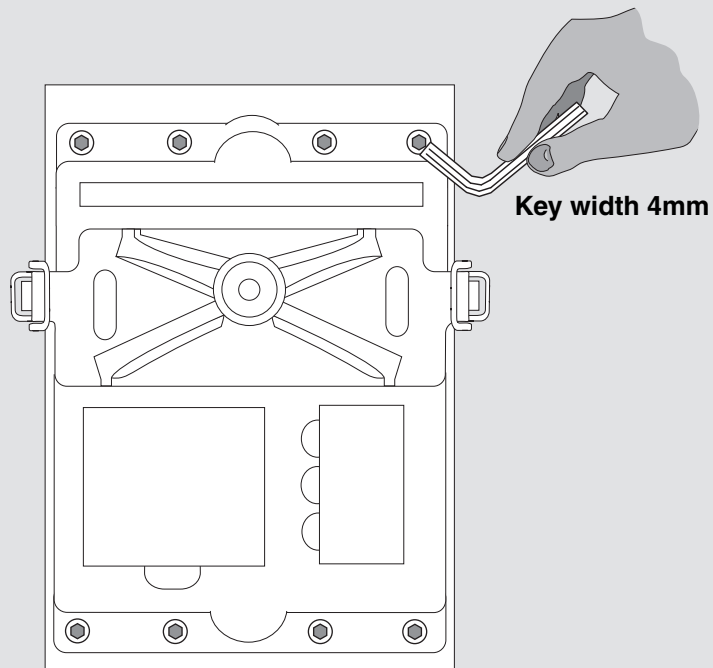
Replace the measuring head  
(see Fig. 6. 02 / 1)





**Remove  
measuring head**

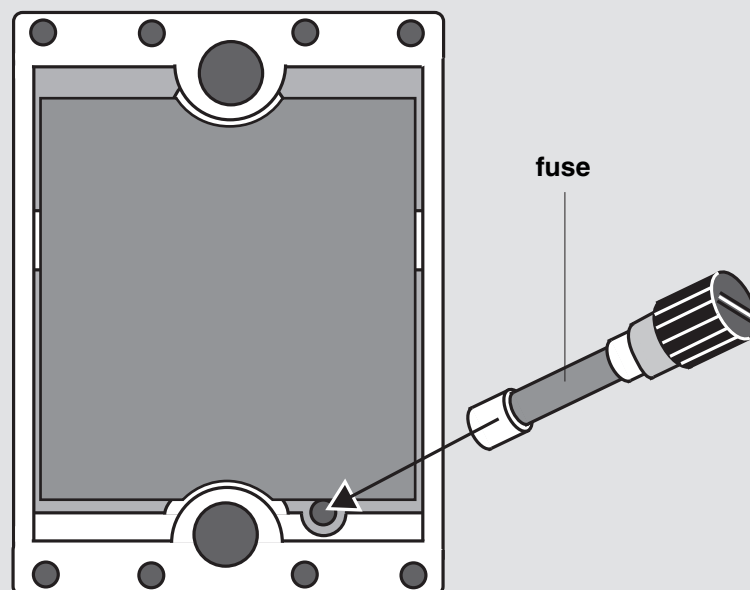
Front view



5. 02 / 1

**Replace  
fuse in the  
measuring head**

Rear view



5. 02 / 2



## Failure

Display " CODE": E 014, **-Negative pressure in the measuring head too low.**

### Possible causes:

### Remedy:

Open inspection cover

Close inspection cover

Filter or water separator in the air supply system clogged or filled

Clean accordingly, empty if necessary

Pressure reducer misadjusted by vibration

Readjust (see chapter 3. 01)

Pressure throttle misadjusted by vibration

Readjust (see chapter 3. 01)

Sintered bronze filter in the pressure reducer clogged

Replace bronze filter  
(see Fig. 4. 03 / 1)

Sintered bronze filters in the measuring head clogged

Replace sintered bronze filters  
(see Fig. 5. 03 / 1)  
by: opening the inspection cover.

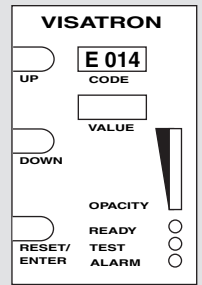
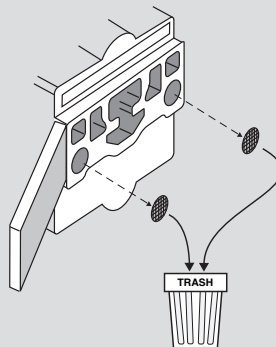
Remove circlips.

Insert new filters ( always on both sides, rough side outwards),

insert circlips,

close cover.

### Replace the two sintered bronze filters in the measuring head



***Do not clean filters, but always replace by new ones!***

***Close inspection cover after replacement!***



**Possible cause:****Remedy:**

Leakage at the device

Check all pipes and seals

by: checking flexible expansion bellows  
(accessible after the measuring head  
has been detached) Replace damaged  
seals or expansion bellows

Exhaust air pipe malfunction

Eliminate blockage of the exhaust air pipe,  
the air must flow without restriction!

**Failure**

Display "CODE": E 013 or E 015, - **Infrared filter clogged**

**Possible causes:**

Infrared filter lenses clogged

**Remedy:** (see Fig. 5. 05 / 1)

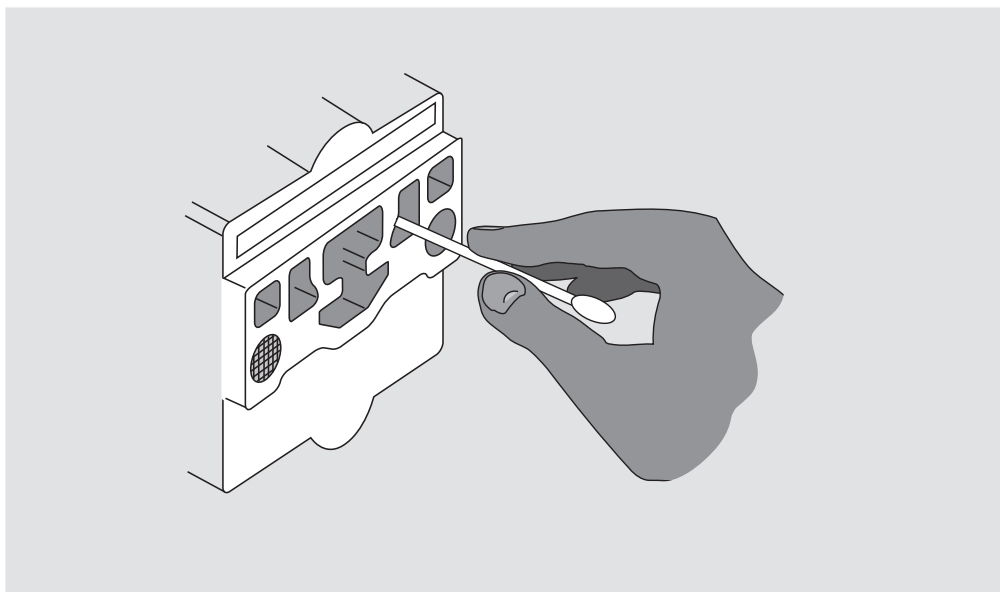
Clean infrared filter lenses  
by: opening the inspection cover.

Use item 7 and 8 in service box.

Soak cotton stick (8) (plastic only!) with  
alcohol (7). Clean infrared filter with  
cotton stick several times.

Rub infrared filter dry by means of  
cotton stick. Make sure no fluff remains on  
the infrared filter lenses

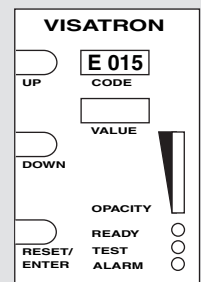
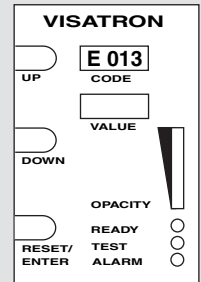
Close inspection cover again.



5. 05 / 1

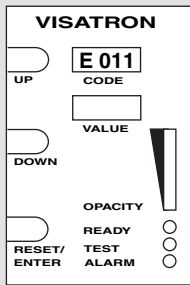
If failure continues:

Replace measuring head  
(see chapter 6 "Repair")



***Do not use hard  
objects like  
screw-drivers for  
cleaning.  
The infrared filter  
lenses can be  
scratched and will be  
damaged!***



**Failure:**

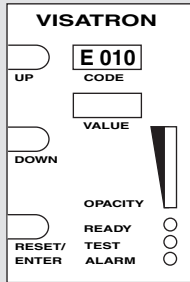
Display "CODE": E 011, **-Ambient temperature below 0 C**

**Possible causes:**

Engine room ventilator  
blows cold air onto the device.

**Remedy:**

Change blowing direction of ventilator,  
away from oil mist detector.

**Failure:**

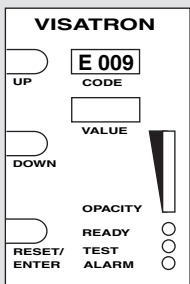
Display "CODE": E 010, **-Ambient temperature above 70 C**

**Possible causes:**

Source of heat radiates  
on the device.

**Remedy:**

Protect device against sources of heat,  
ensure an improved fresh air circulation.

**Failure:**

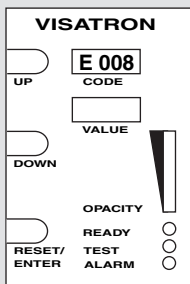
Display "CODE": E 009, **- Electronics temperature below 0 C**

**Possible causes:**

Engine room ventilator blows  
cold air onto the device.

**Remedy:**

Change blowing direction of the ventilator to ensure  
that cold air it is not directed to the oil mist  
detector.

**Failure:**

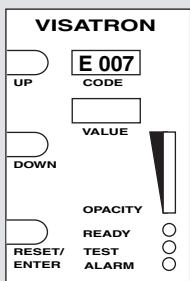
Display "CODE": E 008, **- Electronics temperature above 70 C**

**Possible causes:**

Source of heat radiates  
on the device

**Remedy:**

Protect device against sources of heat,  
improve fresh air circulation.

**Failure:**

Display "CODE": E 007, **- Light sensitive button defect**

**Possible causes:**

Display window dirty

**Remedy:**

Clean display window, if failure continues:  
change measuring head.

**Failure**

Display "CODE": E 002, E 003, E 004, E 017,

**Possible causes:**

Electronics defect

**Remedy:**

Replace measuring head (see fig. 6. 01 / 1).

**Failure**

Display "CODE": E 012, **-Checksum error**

**Possible causes:**

Heavy interferences on  
electrical power supply

**Remedy:**

Repeat parameter adjustment, if it occurs  
frequently, check power supply for  
interferences.

**Further possible failures**

Sudden false alarms in very warm or cold climatic areas can be triggered by humidity (in the crankcase) falling below the dew point:

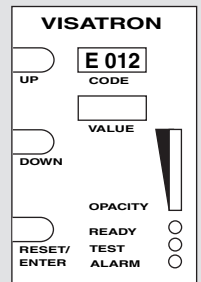
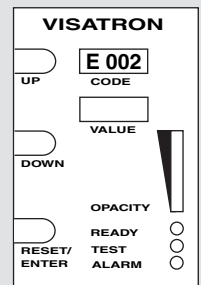
Water droplets passing the measuring track or dew on the filter glasses may trigger a false alarm.

**Remedy:** Check negative pressure and calibrate to 60 mm W. G., if required.

Ventilation air fans, if any, blowing towards the device and its suction pipes.

Change blowing direction (install deflectors) of the ventilator to ensure that cold air it is not directed to the oil mist detector or suction pipes.

Check VISATRON heating system (the heating element is located inside the top of the measuring head), the surface should be fairly warm.





## Repairing

### Replace measuring head

#### Procedure

- Loosen clamps on the main connector plug
- Pull off the main connector plug
- Dismantle the measuring head (8 screws, see fig. 6. 01 / 1)
- Examine if the measuring head is equipped with the correct factory supplied (or the one required for the system) wire break resistor values.

To change the wire break resistors, see instructions on the protecting cover on the back side of the measuring head. (see fig. 6. 02 / 1)

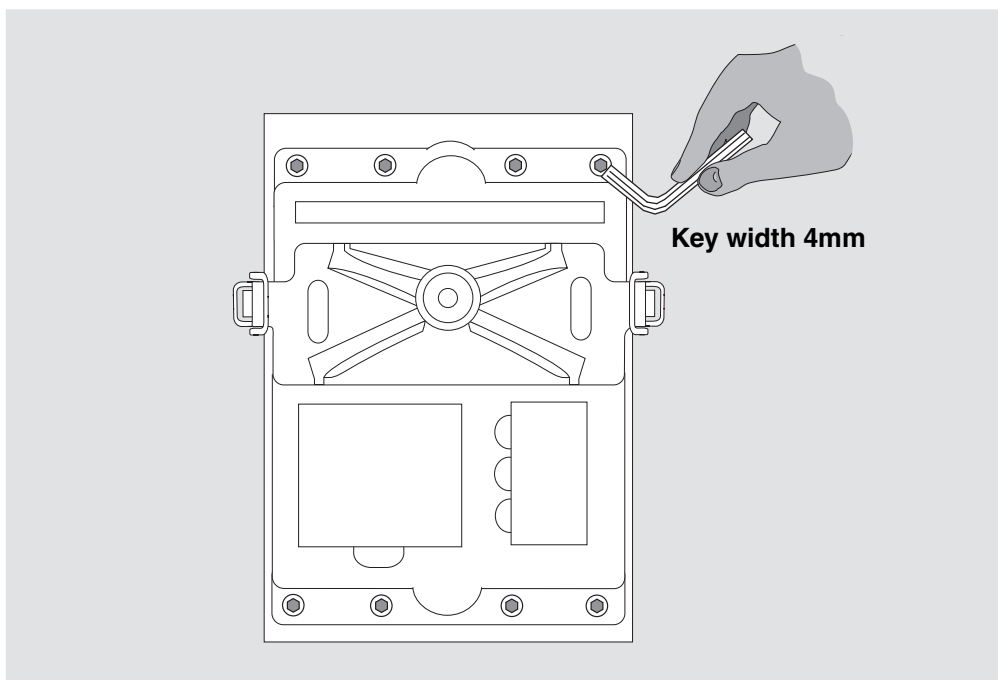
More information can be found in chapter 2, installation, under "electrical connection".

In case that the value of the wire break resistors do not match your installation :

- Change the wire break resistors of the new measuring head. The resistors are designed as plug-in resistors and can be replaced without soldering !
- Fasten measuring head, tighten 8 screws moderately
- Push on main connector plug
- Lock into place
- Carry out performance test according chapter 4

#### Attention!

**replacement of wire break resistors must only be done by skilled and trained personnel!**



6. 01 / 1



***Examine module or spare when received from shipment.***

***If you return the  
electronic module,  
ensure that the  
completed form***

***„Why do you declare  
this unit faulty?“  
from chapter 10 is  
included***

***On principle, use  
new connecting box  
gasket!***

Type

VN 115/93

VN 116/93

VN 215/93

Serial No.

RS 485

M / V

Oilmist - detector mounted on

Main engine

Aux. engine

Adjustment by manufacturer:

Resistor between alarm contact 7 - 8

Resistor between alarm contact 15 - 16

k Ohm

k Ohm

Altered adjustment for H / V:

Resistor between alarm contact 7 - 8

Resistor between alarm contact 15 - 16

k Ohm

k Ohm

14

15

16

7

8

R1

R2

R2

R1

6.02 / 1

### Leaks or failure of the connecting box of VN 115 / 93

Remedy: (see Fig. 6. 02 / 2)

Disconnect header pipes on the left and right side of connecting box (1), push pipes aside to get free access.

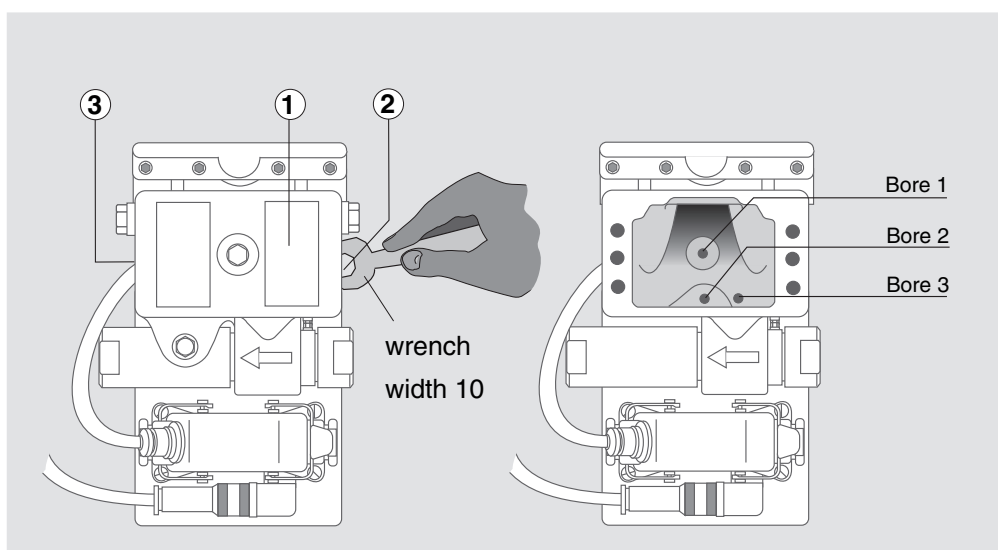
Loosen the two screws (2) and (3) of the connecting box.

Detach the connecting box and remove the gasket.

Check if bores 1, 2 and 3 are free from dirt, clean if necessary.

Clean the base plate cavity from oil.

Assembly in reverse order, utilising new gasket.



6.02 / 2



### Leaks or failure of the valve box of VN 116 / 93

Remedy: (see Fig. 6. 03 / 1)

Dismantle the pipe connector flange (1) and (2) with the headers on the right and left side.

Push away the header pipes for free access to the valve box.

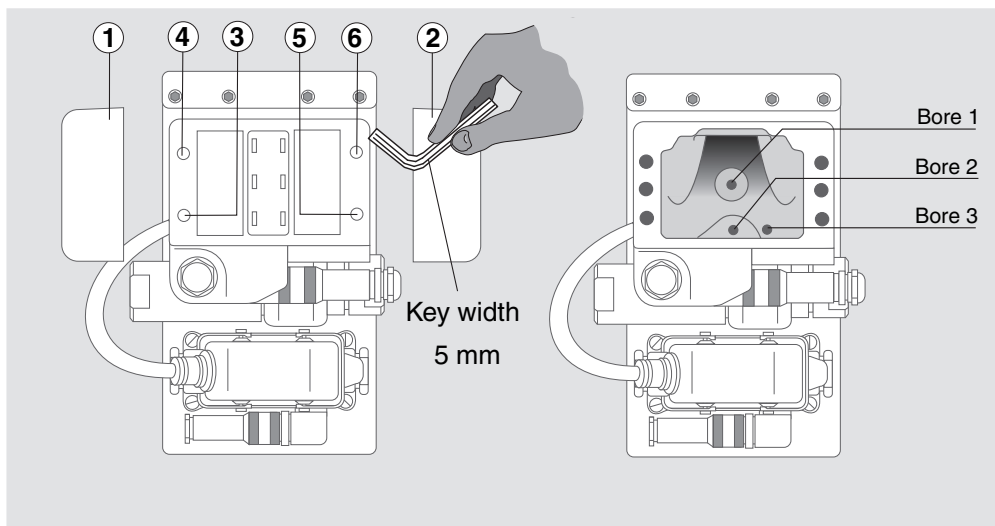
Unscrew the connector plug of valve box and loosen the four screws (3), (4), (5) and (6) of the valve box.

Detach valve box and remove seal.

Check if bores 1, 2 and 3 are free from dirt, clean if necessary

Clean the base plate cavity from oil.

Assembly in reverse order, utilising new seals and gasket.



6. 03 / 1

### Leak or failure of the valve box of VN 215 / 93

Remedy: (see Fig.. 6. 04 / 1)

Release the pipe connector flange (1) and (2) on the right and on the left side.

Push away both connector flanges with individual suction pipes for free access to the valve box.

Unscrew connector plug of valve box and loosen screws (3), (4), (5) and (6) of the valve box.

Detach valve box and remove seal.

Check if bores 1, 2 and 3 are free from dirt, clean if necessary.

Clean the base plate cavity from oil.

Assembly in reverse order, on principle, use new valve box seals and gasket.

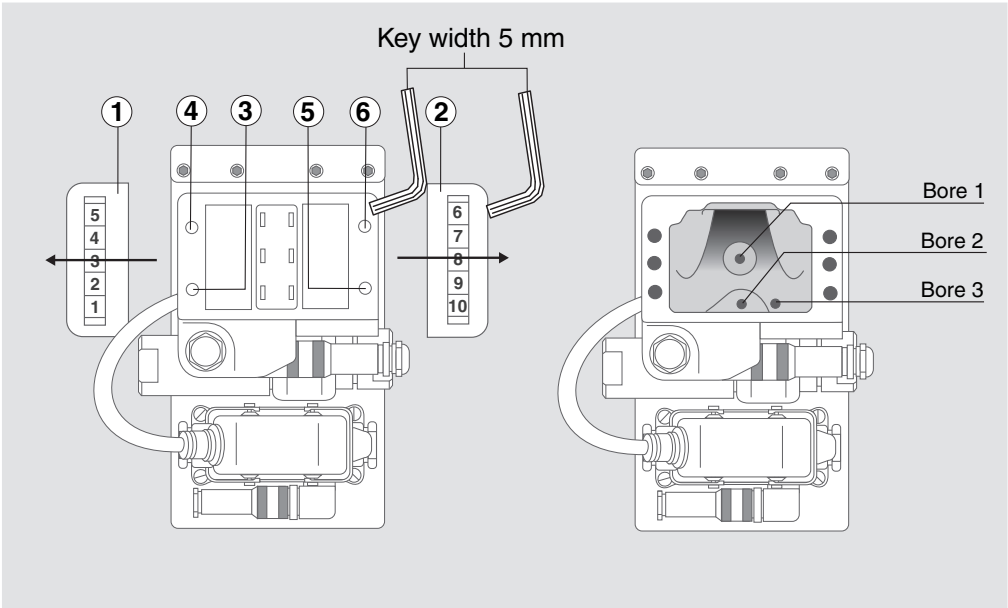
***On principle, use new valve box seals!***

**VN 116 / 93**

***On principle, use new valve box seals and gasket!***

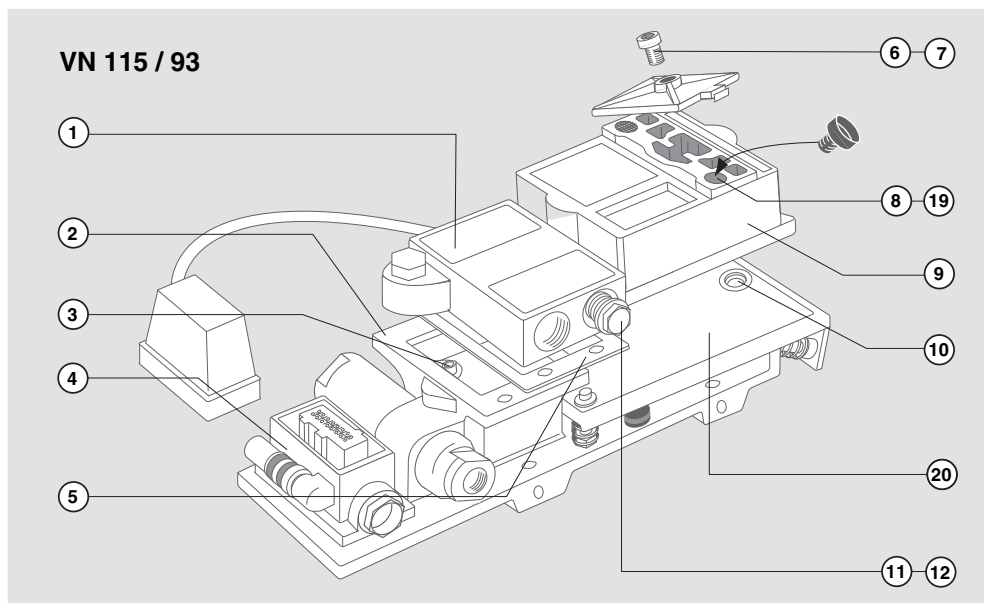


VN 215 / 93

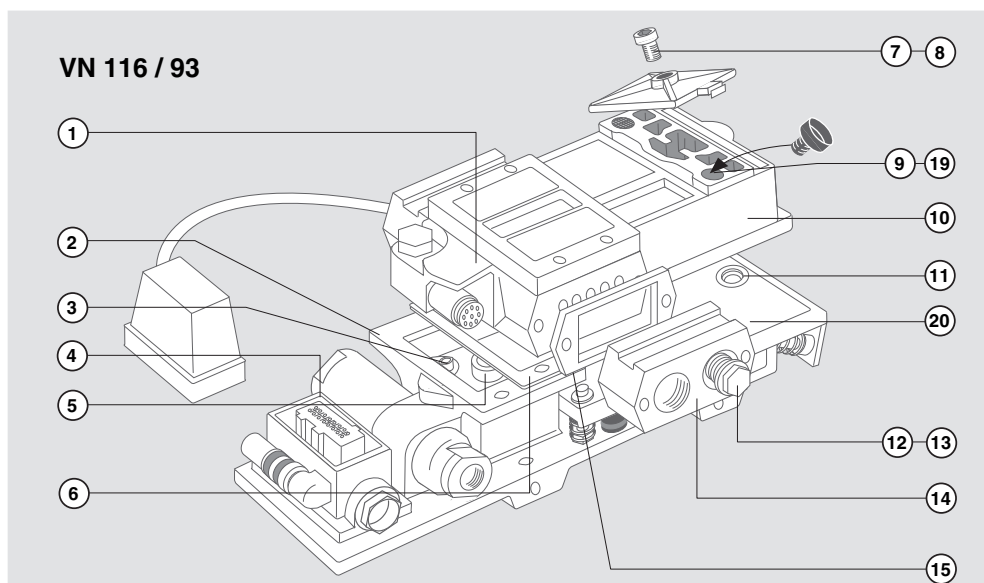




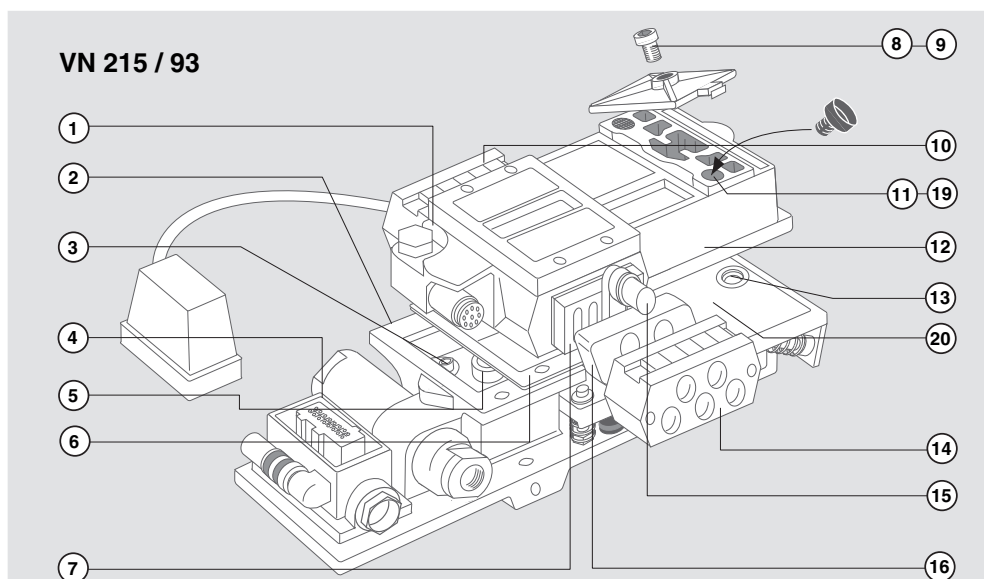
# Visatron Parts



7. 01 / 1

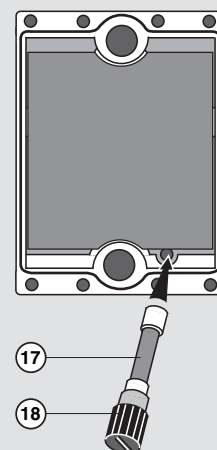
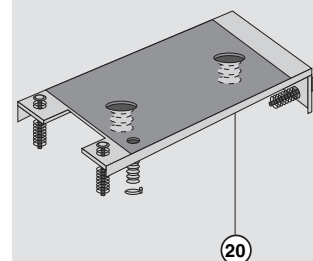


7. 01 / 2



7. 01 / 3

06. 04

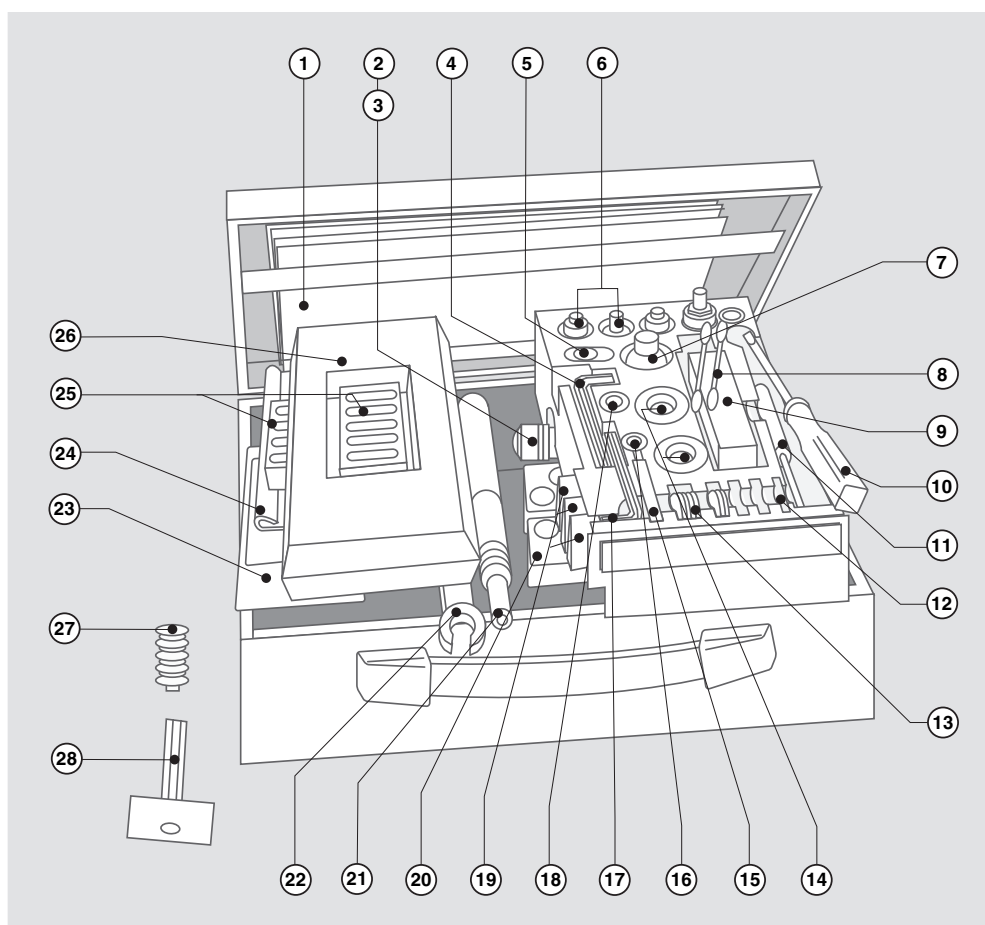




| Item               | Description                           | Article No. | No. of<br>pieces | Item | Description                    | Article No. | No. of<br>pieces |
|--------------------|---------------------------------------|-------------|------------------|------|--------------------------------|-------------|------------------|
| <b>VN 115 / 93</b> |                                       |             |                  |      |                                |             |                  |
| 1.                 | Pipe connector box                    | 11232       | 1                | 12.  | Screw plug seal                | 10209       | 3                |
| 2.                 | Base plate                            | 11233       | 1                | 17.  | Fuse 3,15 A                    | 10973       | 1                |
| 3.                 | Seal                                  | 10206       | 1                | 18.  | Fuse cap                       | 10087       | 1                |
| 4.                 | Connector socket                      | 10905       | 1                | 19.  | Fresh air restrictor           | 10992       | 2                |
| 5.                 | Gasket                                | 10049       | 1                | 20.  | mounting plate                 | 10991       | 1                |
| 6.                 | Plug seal                             | 10054       | 2                |      |                                |             |                  |
| 7.                 | Screw plug R 1/4"                     | 10083       | 1                |      |                                |             |                  |
| 8.                 | Scavenging air filter (sinter bronze) | 10042       | 2                |      |                                |             |                  |
| 9.                 | Measuring head for VN 115/93          | 11201       | 1                |      |                                |             |                  |
| 10.                | Expansion bellows                     | 10023       | 2                |      |                                |             |                  |
| 11.                | Screw plug R 1/2"                     | 10208       | 3                |      |                                |             |                  |
| <b>VN 116 / 93</b> |                                       |             |                  |      |                                |             |                  |
| 1.                 | Valve box VN 116 / 93                 | 11432       | 1                | 14.  | Pipe connecting flange         | 10993       | 2                |
| 2.                 | Base plate                            | 10904       | 1                | 15.  | Seal for connecting flange     | 10313       | 2                |
| 3.                 | Oil drain seal                        | 10306       | 1                | 17.  | Fuse 3,15 A                    | 10973       | 1                |
| 4.                 | Connector socket                      | 10905       | 1                | 28.  | Fuse cap                       | 10087       | 1                |
| 5.                 | Oil mist seal                         | 10307       | 1                | 19.  | Fresh air restrictor           | 10992       | 2                |
| 6.                 | Valve box gasket                      | 10405       | 1                | 20.  | mounting plate                 | 10991       | 1                |
| 7.                 | Screw plug R 1/4"                     | 10083       | 1                |      |                                |             |                  |
| 8.                 | Plug seal                             | 10082       | 2                |      |                                |             |                  |
| 9.                 | Scavenging air filter (sinter bronze) | 10042       | 2                |      |                                |             |                  |
| 10.                | Measuring head VN 116 / 93            | 10301       | 1                |      |                                |             |                  |
| 11.                | Expansion bellows                     | 10023       | 2                |      |                                |             |                  |
| 12.                | Screw plug R 1/2"                     | 10208       | 2                |      |                                |             |                  |
| 13.                | Screw plug seal                       | 10209       | 2                |      |                                |             |                  |
| <b>VN 215 / 93</b> |                                       |             |                  |      |                                |             |                  |
| 1.                 | Valve box VN 215 / 93                 | 10902       | 1                | 14.  | Pipe connecting flange, right  | 10995       | 1                |
| 2.                 | Base plate                            | 10904       | 1                | 15.  | Drain plug for pipe connection | 10412       | 6                |
| 3.                 | Oil drain seal                        | 10406       | 1                | 16.  | Rubber sleeve                  | 10411       | 2                |
| 4.                 | Connector socket                      | 10905       | 1                | 17.  | Fuse 3,15 A                    | 10973       | 1                |
| 5.                 | Oil mist seal                         | 10407       | 1                | 18.  | Fuse cap                       | 10087       | 1                |
| 6.                 | Valve box gasket                      | 10405       | 1                | 19.  | Fresh air restrictor           | 10992       | 2                |
| 7.                 | Clamping plate for pipe connection    | 10409       | 2                | 20.  | mounting plate                 | 10991       | 1                |
| 8.                 | Screw plug R 1/4"                     | 10083       | 1                |      |                                |             |                  |
| 9.                 | Plug seal                             | 10082       | 2                |      |                                |             |                  |
| 10.                | Pipe connecting flange, left          | 10994       | 1                |      |                                |             |                  |
| 11.                | Scavenging air filter (sinter bronze) | 10042       | 2                |      |                                |             |                  |
| 12.                | Measuring head for VN 215 / 93        | 10901       | 1                |      |                                |             |                  |
| 13.                | Expansion bellows                     | 10023       | 2                |      |                                |             |                  |



## Service box



**Re - order  
spare parts  
taken out!**

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Weight of box: ca. 4 kg





| Item | Art. No. | Quantity | Designation                                                      |
|------|----------|----------|------------------------------------------------------------------|
| 1.   | 10980    | 1        | Manual in English                                                |
| 2.   | 10053    | 1        | Quick connecting for U- tube manometer                           |
| 3.   | 10054    | 1        | Gasket                                                           |
| 4.   | 10047    | 1        | Hexagon wrench                                                   |
| 5.   | 10002    | 1        | Filter for pressure reducer                                      |
| 6.   | 10975    | 2        | Air restrictor                                                   |
| 7.   | 10035    | 1        | Bottle with alcohol                                              |
| 8.   | 10036    | 5        | Cottonstick for cleaning of infrared filters                     |
| 9.   | 10040    | 1        | Bottle with slacked water                                        |
| 10.  | 10354    | 1        | Screwdriver                                                      |
| 11.  | 10038    | 1        | Screwdriver                                                      |
| 12.  | 10039    | 1        | Coloured glas, 5%                                                |
| 13.  | 10042    | 6        | Fresh air filter                                                 |
| 14.  | 10023    | 2        | Flexible bellow for connection of measuring head with base plate |
| 15.  | 10973    | 10       | Fuse 2A / semi time- lag                                         |
| 16.  | 10406    | 1        | Oil return gasket VN 116 / 87 - EMC, VN 116 / 87                 |
| 17.  | 10044    | 1        | Hexagon wrench for valve box mounting                            |
| 18.  | 10407    | 2        | Oil mist gasket valve box VN 116, and VN 215                     |
| 19.  | 10412    | 3        | Lockplug for not connected tube at VN 215                        |
| 20.  | 10411    | 2        | Rubberplate for tube connection at VN 215                        |
| 21.  | 10045    | 1        | Mouth piece for cigarette burner                                 |
| 22.  | 10356    | 1        | Wrench                                                           |
| 23.  | 10049    | 1        | Gasket for valve / box connecting frame / connecting cover       |
| 24.  | 10050    | 1        | Plastic bag for cigarette smoke                                  |
| 25.  | 10409    | 2        | Clamp plate for tube connection at VN 215                        |
| 26.  | 10046    | 1        | U- tube manometer                                                |
| 27.  | 10990    | 2        | Flexible bellow for air scavenging                               |
| 28.  | 10355    | 1        | T-shape hexagon wrench                                           |



## VISATRON - Service Facility Adresses

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## Options

### List of Options for VN 93

As an option, the following accessories can be supplied for the oil mist detectors of series 93:

| Item | Description                                 |
|------|---------------------------------------------|
| 1    | Protecting cover                            |
| 2    | Pressure regulator unit with throttle block |
| 3    | Siphon block assembly system                |
| 4    | Monitoring software                         |
| 5    | Oil mist simulation unit                    |
| 6    | Service box                                 |

### Description of the Individual Items

#### Item 1, Protecting cover (Art. No. 10015)

The protecting cover can easily be mounted on the four provided threads on the base plate of the VN device. It serves to protect the device against mechanical damage and contamination.

#### Item. 2. Pressure regulator unit (Art. No. 10001)

The pressure reducer unit consists of a pressure reducer and a throttle block. Both parts are mounted together on a frame which is fastened by 3 screws, M8. The pressure reducer device is especially designed to supply the draft air to the VISATRON (VN) device. The throttle block ensures that the negative pressure in the VN is limited and does not surpass 25% above of the calibrated negative pressure, should a failure occur in the pressure reducer (e. g. rupture of the diaphragm, etc.).

In addition, the throttle block is equipped with a filter to retain impurities from the plant air supply.

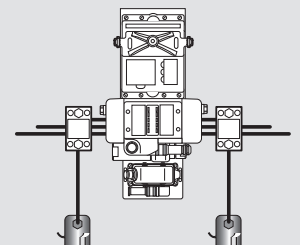
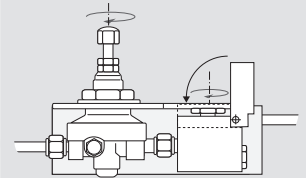
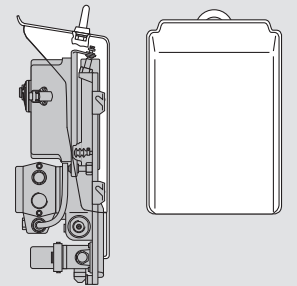
#### Item 3, Siphon block assembly systems (Art. No. depends on the type of engine)

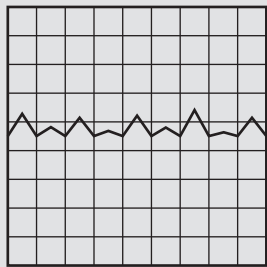
Siphon blocks are devices which enable to drain the accumulated oil, from the oil mist suction pipes, directly back to the engine crankcase. The siphon blocks allow a horizontal suction pipe installation, from compartment to compartment. For consultation, please contact our service department.

Conventional suction pipe systems, without siphon blocks, require to be installed with a gradient of 2% to 4% ascending to the VN device, in order to drain the precipitated oil back to the engine.

It is imperative to drain the oil to the crankcase and avoid potential clogging.

Special engine-oriented assembly systems in modular design are available for VISATRON Oil Mist Detectors for a large number of two- and four- stroke engine types, of various manufacturers.





#### Item 4 - Monitoring Software (available on request)

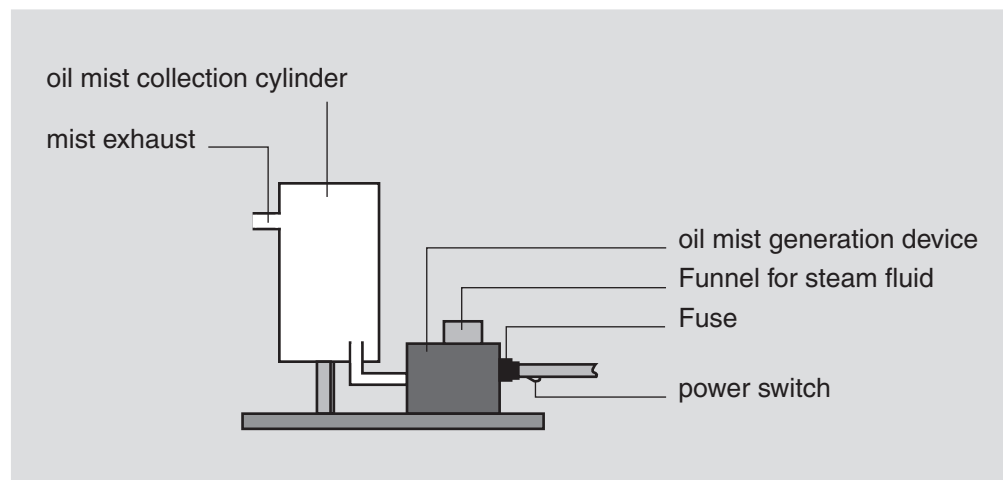
A Software is available to allow a remote monitoring of measured Opacity values of every detector. The Software is able to handle signals from up to 9 pcs. VISATRON Oil Mist Detectors and indicates Opacity over time.

Min. requirement Pentium II Processor, 350 MHz or higher. Supports WIN NT4 or later systems. Free RS 232 interface required (e.g. COM1 / COM2)

An appropriate touchscreen PC for heavy duty panel built-in is also available from SCHALLER Automation.

#### Item 5 - Oil Mist Simulation unit (part No. 10353)

The Oil Mist Simulation unit is designed for simulation of oil mist being generated inside a Diesel engine during e.g. a bearing damage. It enables you to check a proper functionality of all VISATRON Oil Mist Detectors.



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#### Item 6 - Service box

(see 7. 03, 7. 04)



**Brochures, Leaflets, etc.**



## General Information

## Recycling

## Forms:

## Error descriptions:



Notes



Notes



Notes



Notes