

OIL-MIST-DETECTOR

VISATRON

SYSTEM VN 215

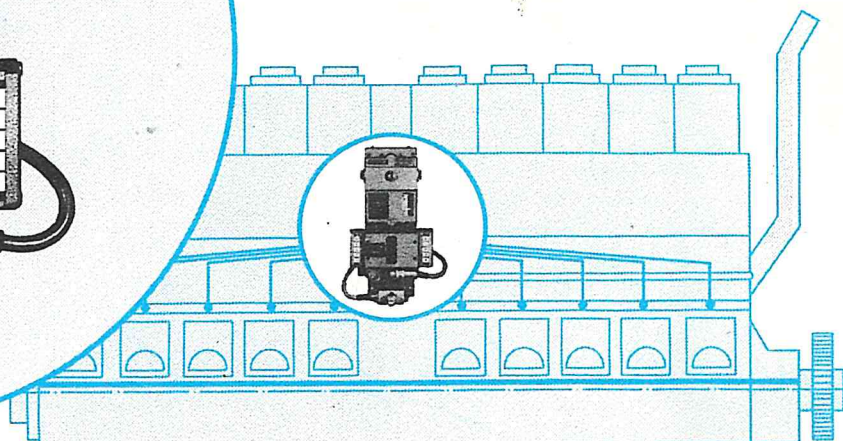
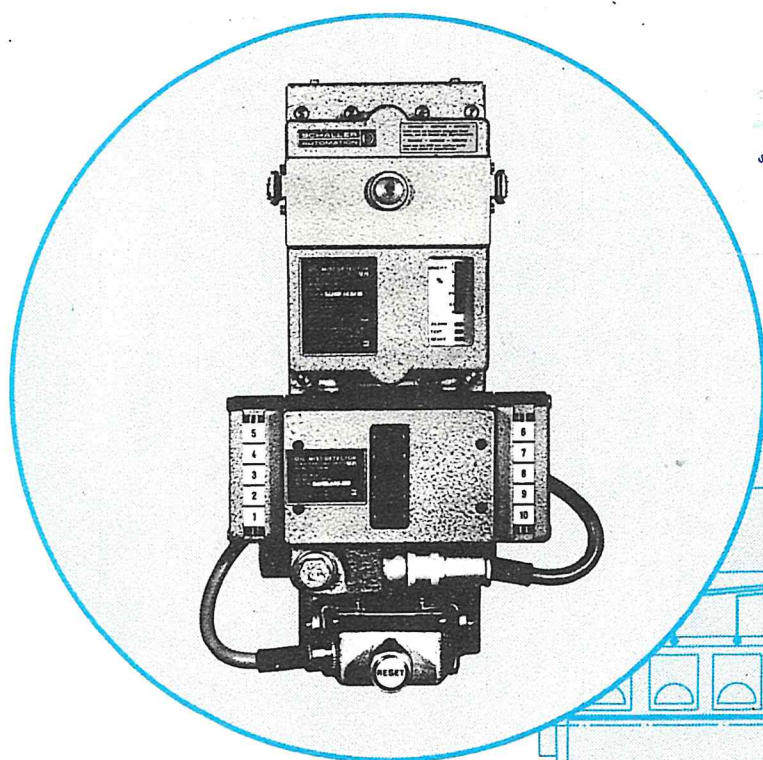
**Crankcase
supervisory device
for diesel engines**

MANUAL

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Industrielle Automationstechnik KG

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SCHALLER



AUTOMATION

bolts
measuring unit
total of 8

cover, measuring unit
with rapid look (clamps)

connection for U-pipe
pressure-gauge

measuring unit

bolts, measuring unit

connection for suction
pipes

flush fitting bolts
(cyl. bolts inner
hexagon socket) for
valve box
total of 4

connection for supply-
and alarm wires

(view) window
valve box

main plug, measuring
unit with RESET-button
for alarm turn-off

(view) window
measuring unit

opacity indicator

Alarm LED same

Test LED same

Ready LED same

valve box

connection for suc-
tion pipes-
total of 10

main plug,
valve box

connection for supply-
and alarm wires

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1. INTRODUCTION

The tendency of building ships with complete or partial watch-free operation as well as the increase in designing unmanned resp. remote controlled stationary diesel engine plants requires the use of suitable safety- and monitoring equipments. Such a monitoring equipment is the oil mist detector which checks the unallowed oil mist concentration in the crankcase atmosphere continuously.

The self monitoring crankcase surveillance system VN 215 described here is specially used to monitor the crankcases of two-stroke large diesel engines and of large medium speed trunk piston engines. The unit triggers an alarm reliably when exceeding a pre-determined oil mist concentration and stops resp. reduces the power output or the speed of the engine as far as a corresponding system is connected. A special advantage is the fact that the corresponding endangered compartment is indicated in the window of the valve box. So it is not necessary to waste time by opening all crankcase flaps, because the endangered compartment can be opened only after the required 10 minutes for cooling down.

2. REQUIREMENTS AND THEIR FULFILLMENT

Every combustion engine has a basic oil mist concentration in its crankcase which is caused by mechanical influence. Origin points are the timing gear during operation, bearing points, roller chains as well as all further moveable parts which are breaking the flow of supply oil, that comes through the lubricating points, mechanically and which distributes it in smallest droplets in the crankcase.

The dangerous oil mist however, which can cause crankcase explosions, results in shortness of lubrication at overheated engine parts. This generated oil vapour re-condensates in the very much colder crankcase atmosphere to oil mist which can be sampled and measured.

To sample the oil mist continuously, to analyse and give alarm if necessary, an oil mist detector must fulfill following requirements:

a. Reliability

This is guaranteed because a free of maintenance operation is performed for a longer period, pollution is controlled up to a fixed value. Besides that the VN 215 has an integrated self monitoring and an electronic unit suspended free of vibrations.

b. High sensitivity without false alarm

Is fulfilled due to the fact that the VN 215 is tuning up to the changing engine conditions automatically and during changes false alarm are excluded due to the "Damage Check" (see Functional Description 4D. page 3).

c. Short time of reaction

Is obtained by a constant parallel sampling from all measuring points so that unnormal values can be recognized, reported and localized exactly at once.

d. No influence caused by variations of pressure in the crankcase

Is obtained by integrated air draft pump with a constant sampling underpressure and inserted pressure blow throttle that a constant sampling and therewith the measuring is guaranteed by external negative or positive variations of pressure, too.

e. Compact construction type

The VN 215 is constructed compactly with a free of vibrations suspended electronic unit and is mounted to the engine directly. Thereby no different lengths of suction lines, hose connections and installation far from the engine are avoided.

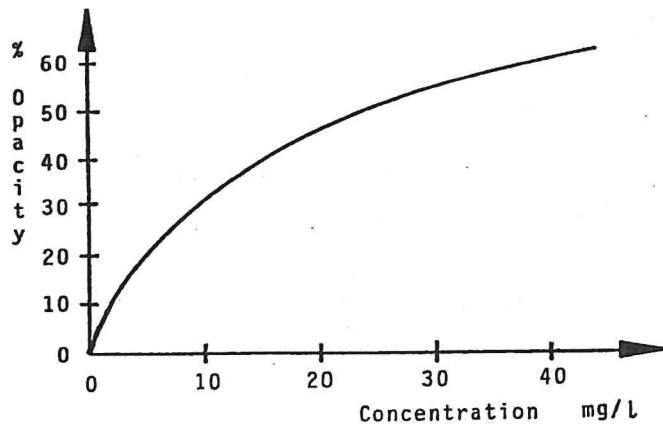
f. Easy handling

If required an exchange of the assembly group can be performed by untrained personnel due to a plugable electronic unit and the arrangement in measuring unit and valve box.

g. Simple, space saving sampling system

Can be fulfilled by using syphon mounting units with horizontal tubing. If there is sufficient space a normal, screwed tubeline which needs less space can be used as well due to the smaller tube diameters.

3. EXPLANATION OF THE RELATIONSHIP BETWEEN OIL MIST CONCENTRATION AND OPACITY



At a concentration of 50 mg/l and a simultaneous high temperature ($\geq 500^{\circ}$) danger of explosion is in force.

4. FUNCTIONAL DESCRIPTION (Electronical block circuit diagram see drawing annex as swing out sheet)

A. Suction System for Sampling of Crankcase Atmosphere to be Monitored

For sampling the suction tubes (2) are mounted at the single crankcase compartments of the engine (1) to be monitored. The suction tubes are mounted so that when oil mist develops caused by shortness of lubrication the oil mist will be sampled by at least one suction tube and fed to the unit. A maximum of 10 suction tubes (2 x 5) can be connected to the valve box. In the unit the suction tubes (2) lead to the valves (3) and end in the collecting chamber (40).

In the following separator (5) large oil particles are separated by the centrifugal force. Oil separated in the chamber (40) and the separator is discharged from the unit through the oil outlet tubes (6) to the air draft pump (7) directly. This a clogging with oil is avoided. To ensure a continuous sampling of the crankcase atmosphere out of all compartments during the damage check, at partially closed suction tubes and to avoid therewith a too strong oil mist fall out caused by a standstill of the flow, a minimum amount of crankcase atmosphere is led via the by-passes (4) and the chamber (42) into the air draft pump. The sampled atmosphere is fed from the separator (5) via the channel (8) to the optical measuring channel (9) in the measuring unit VN 215. To prevent soiling of the infrared filters (10) of the light channel by the crankcase atmosphere, a fixed amount of fresh air is sampled via the air filters (12) into both chambers (11). A soiling of the infrared filters by the crankcase atmosphere is avoided due to the fact that the gas flow of the crankcase atmosphere is stabilized by the parallel sampled fresh air so that a contact of the gas flow with the infrared filters is nearly impossible. The crankcase atmosphere flows through the channel (13) to the air draft pump (7). The expanded air (15), exhausted from the air draft pump, consists of crankcase atmosphere and leak oil coming from the separator and will be fed into the bilge or crankcase ventilation tube (depending on the kind of installation).

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24-hour Automatic Monitoring & Alarm

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B. Measuring the Oil Mist Concentration of the Crankcase Atmosphere and Oil Alarm Actuation

An infrared light emitting diode (LED) (18) belongs to the optical measuring channel (9), which produces a certain light intensity at the photodiode (19). The photodiode converts the light intensity to an electrical signal which is fed to the amplifier (20).

The crankcase atmosphere passing through the measuring channel absorbs light and acc. to the oil mist concentration the electrical signal increases or decreases. The brightness of the light source is not hold constant as usual, but influenced by a control system, consisting of the units 22, 24, 25, 26 and 27, in this manner that the light intensity which is generated at the photodiode (19) remains constant. Hereby the readjustment pulse is switched from slow to fast acc. to the speed of the change. The value of this readjustment is monitored by the main alarm counter (47) which actuates the Damage Check Start for the sequence control (58) at a determined threshold value (34) by means of a threshold value switch (35). The counter indication of the main alarm counter (47) is made visible with the opacity indication (44), in the lower range with a higher decomposition so that small opacity increases can be recognized.

C. Automatic Sensitivity Control

The brightness of the light source (18) changes also by influences as ageing and temperature drift of the construction elements as well as a pollution of the infrared filters (10) which cannot be excluded totally.

These influences will be eliminated by the readjustment which holds the generated light intensity of the photodiode (19) constantly. By means of the very slow pulse (45) a very slow readjustment of the light channel in the step (46) will be compensated for the main alarm counter due to the reason of a pollution. This readjustment will not take place during a sequence process and if the unit reports an oil mist alarm.

An unlimited follow-up is not possible, thus at a determined value via a contact the alarm "Oil Mist Detector Failed" is actuated, the ready lamp extinguishes and a cleaning becomes necessary.

When switching on the operation voltage the maximal brightness is adjusted generally, which then will be reduced to the correct value by the control system. Resulting in a starting period up to 30 sec. thereafter the unit is not ready for operation i.e. the lamp "READY" goes on first after reaching the correct brightness value.

D. Mode of Operation of the Valve Control for Selection of the Crankcase Compartment with increased Oil Mist Concentration

After an actuation the value for the quick readjustment of the optical measuring channel is provided to the left and right side of the valve box for comparison reasons, the so-called Damage Start Check, and to the sequence process counter (50) which manages the increase or decrease detection of the opacity (54) in reference of the crankcase section which have been selected last. So it is possible to detect the crankcase section with the highest opacity by means of a thoroughly determined selection method in a very short time, beginning with the basic position in which all sections will be sampled using the sequence control (58), sequence program (36), pulse generator (37), the amplifier (38) and the lines (39) to the valves (3) and the display in the valve box (43). It will be distinguished between great valve groups (comparison of both sides) and valve subgroups for the opacity increase detection by means of the quickacting value change over to avoid the searching of closed (not connected) tubes. The finally found valve position remains stored when oil mist alarm comes from the alarm store. There can be indicated as well as single sections, one half or at general increase of opacity all sections.

E. Oil Alarm Actuation and Report

Oil mist differential alarm in the alarm store can be actuated immediately after the comparison of both sides at an opacity difference (57) above the threshold (51) during two valve operations following each other by the main alarm counter (47) after a happened Damage-Check-Start. The main alarm counter (47) can also actuate an oil mist alarm in the alarm store by an unallowed general increase of the opacity in all sections (48) above the threshold (49) after the comparison of both sides. These oil mist alarms in the alarm store (53) will be transferred via the alarm logic (21) to the alarm LED (23) and simultaneously via relay contacts outwards, if there are no severe malfunctions. The oil mist alarm and the stored valve control can be cancelled via the reset-button (59) when at the inputs of the alarm store no alarm signal from the optical measuring channel is present.

F. Driving Air Connection

The vacuum necessary for sampling the oil mist out of the crankcase is generated by an air draft pump installed in the unit. The unit is fed with supply air (14) via a tube connection R 1/2". The driving air pressure for the air draft pump (see illustration) has to be adjusted so that in the measuring chamber of the VN 215 a vacuum of 60 till max. 80 mm water column is generated. This vacuum can be measured by connecting an U-tube gauge (contained in service-box, art.-no. 150 235 00) at the screw coupling specially provided at the valve box. The adjustment of the suction pressure by regulating the driving air pressure has to be done during stopped engine but with completely operated engine housing ventilation. An increasing or decreasing of the crankcase pressure during operation and its influence on the velocity of flow of the oil mist in the suction tubes is nearly compensated by the throttle channels installed in front of the valves (3) in the unit. (+25 mm W.C. in the crankcase against atmosphere provides an increase of the velocity of flow of the oil mist in the suction tubes of approx. 8 %, 50 mm W.C. of approx. 14 %, that can be ignored). This is important because a too high velocity of flow causes an increase of oil mist and the sensivity of the unit is reduced. The classification requirement of BV, after which in case of a defect pressure regulator no higher suction pressure (measured at the unit input, resp. at the measuring connection of the unit) as 25 mm W.C. may occur, is fulfilled reliably by using a special pressure reducer with integrated pre-throttle and filter.

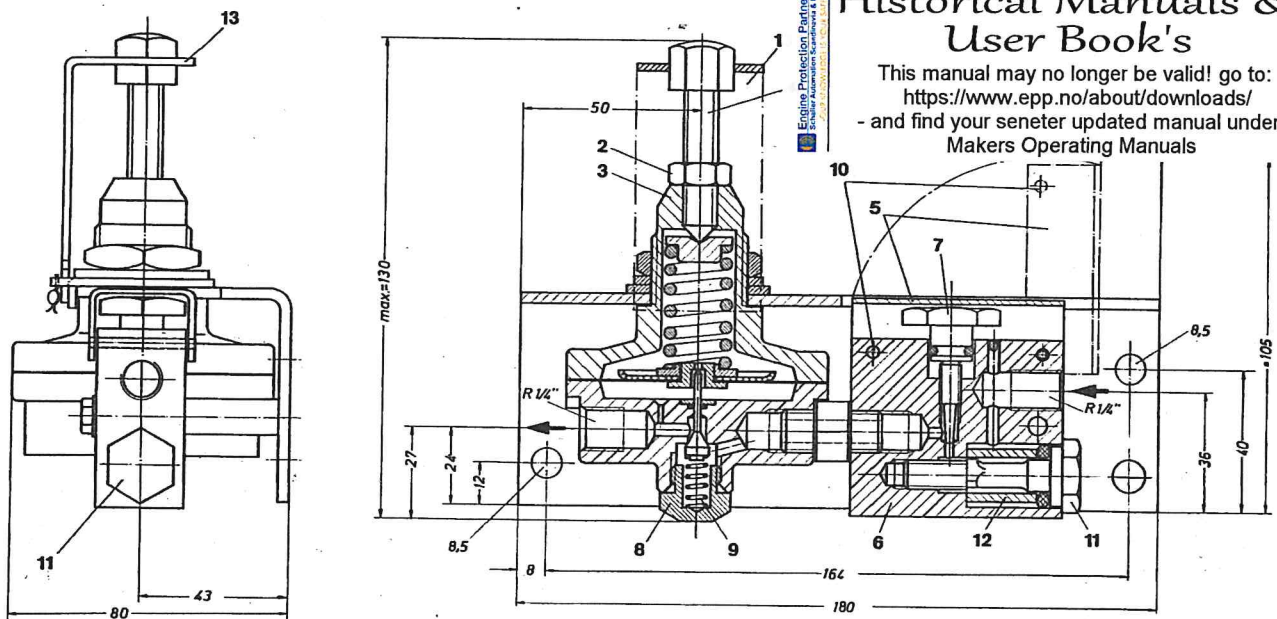


Illustration: Pressure Reducer with Throttle

Pressure reducer with throttle is adjusted acc. to following specification:

An U-tube manometer is connected at the screw coupling installed in the cap of the measuring unit for pressure measurement. The recognizable measuring height (difference between both W.C.'s) should be at least 100 mm. Afterwards loosen counter nut 2 at the pressure reducer 3 and turn setscrew clockwise until the torque increases evidently.

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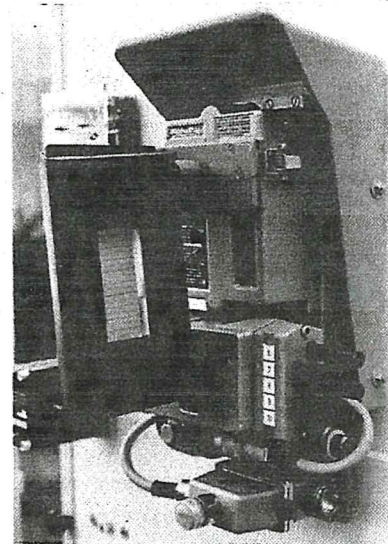
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Open locking plate 5 at throttle 6 and turn setscrew 7 clockwise by hand until an evident resistance can be recognized. Then apply compressed air with a prepressure of 2-12 bar. No deflection should occur at the U-manometer. Turn setscrew 7 anti-clockwise until vacuum of approx. 80 mm w.c. is indicated at the U-manometer. Turn setscrew 7 by a slight rotation so that locking plate 5 may be closed. Afterwards turn setscrew 4 anti-clockwise until the vacuum drops to a value of approx. 60 mm W.C. Fasten setscrew 4 by tightening the counter nut 2. For testing open locking screw 8 at the pressure reducer and remove the spring 9. The pressure reducer becomes ineffective. After closing the locking screw 8 - without spring - the vacuum in the measuring chamber must increase up to approx. 80 mm W.C. again. A correction with setscrew 7 has to be made eventually. At last insert the spring 9 and safe the locking plate 5 by a safety wire using the bores 10 against unallowed opening. The pressure reducer will be ensured by an adjustable locking (13) which has to be sealed then.

Measure vacuum as follows:

- Open cover and hinge aside.
- Take out the measuring cover unit from the service box and fix it (for new units take out screw union for connecting the U-type manometer with the cover, screw on connection nipple out of service box.
- Fill U-type manometer with water out of the service box and fit on.
- The pressure must amount approx. 60 mm W.C.

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G. Exhaust Air Connection

The mixture emerging from the exhaust side of the air draft pump (connection of the exhaust line via tube connection R 3/4") may be expelled into the atmosphere resp. bilge directly or connected to the crankcase ventilation via a tube (16) with an inside diameter of at least 24 mm (Depending on installation). However, the exhaust air has to escape without any counterpressure (17). In any case avoid oil sacks in tube (16).

H. Self Monitoring

In case of malfunctions of the power supply (29) or the air supply which are monitored with the flow control (30), the amplifier (31) and the Schmitt-Trigger (32), the alarm "Oil Mist Detector Failed" is actuated, i.e. the READY LED of the indication extinguishes and the READY-relay contact deenergizes. The test LED (33) simultaneously indicates an actuated oil mist alarm from the oil mist alarm store (53), but it is not transferred to outside. If the pollution limit of the optical measuring channel is obtained, and the alarm "Oil Mist Detector Failed" (READY LED out) is actuated, an oil mist alarm from the alarm store (53) generated by the alarm logic (21) is transferred to the oil mist alarm output (23).

At complete interruption of the optical measuring channel the oil mist alarm is activated at (23), the opacity indication (44) remains at the upper end of the indication scale and the LED's test (33) and READY (28) are out (see also function tests 7).

I. Remote Indication

The signals "Oil Mist Alarm" (23), "Oil Mist Detector Failed" (28), Oil Mist Opacity (44) and the crankcase section (36) pointed out after the Damage-Check can be activated (on request only) from the Multiplexer (61) via the Opto-coupling capacitor (60) as remote indication transmitted to the engine control room.

5. INITIAL OPERATION

For setting into operation open the driving air connection from of the supply air system and switch on the operating voltage.

Attention: The operation readiness is given first when the "Ready"-lamp lights. This can take up to 30 s.

Maintenance is not necessary during operation. Regularly checks are not necessary due to the construction of the apparatus and the automatic luminance control. The "Ready"-lamp goes out in case of malfunction that causes the deenergizing of the relay and the indication "Malfunction Oil Mist Detector" is actuated in the shipborne alarm system, depending on the kind of installation acoustical, too.

6. FUNCTION TESTS

A. Before starting the engine resp. before starting for sea

- Interrupt the operating voltage for a short time (for example, pull out the male connector and re-insert it).

Results: "Ready" lamp goes out and lights up after approx. 30 seconds again. The test- and alarm lamps should not.

- Open the cover of the measuring unit (quick closers).

Results: The "ready" lamp goes out after approx. 10 seconds. The "test" and "alarm" lamps may not light up.

- Close the cover of the measuring unit.

Results: The "ready" lamp will light up after approx. 30 seconds again. The "test" and "alarm" lamps may not light up.

A t t e n t i o n

The following test could result in an engine stop.

- Open the cover again and interrupt the optical measuring track with a non-transparent object or with a cloth so that the cover could be closed again but the optical measuring track remains interrupted completely. Opacity indication runs upwards. Test LED light up after approx. 6 s.

- Close the cover.

Result: Opacity indication runs from 0 % to max. and remains there. Test LED goes out. Alarm LED lights up after approx. 30 s (attention engine stop). Ready LED remains out. Valve box all 10 valves open.

- Open the cover.

Result: Alarm LED goes out after max. 10 s, test LED lights up.

- Optical measuring track is released.

Result: Indication runs to 0 % (attention: Optical measuring track has not reached the original working point at 0 % indication generally). Test LED remains on.

- Wait at least 20 s (readjustment at clean measuring track).
Press reset button as long as all valve indicators are visible in the window of the valve box.
Result: Test LED out.
- Close the cover.
Result: After max. 30 s READY LED on.

B. Function Test with Smoke (with stopped engine only) e.g. Steam Distillate
(Attention: Observe sticker on measuring unit)

Open one crankcase cover to reach a suction line. Fill the plastic bag being in the service box with smoke. Connect the filled plastic bag to the suction union and let the unit suck out of the bag for at least 20 s.

It depends on the smoke intensity and duration (at least 20 s) whether a search process with or without alarm is actuated and whether one half of the motor or the corresponding compartment is indicated. If the amount of smoke is not sufficient or too short suction time, a wrong indication in the valve box can be the result.

7. PUTTING OUT OF OPERATION



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Stopping the driving air supply by closing the air supply valve. The unit shall remain electrically switched on to avoid a penetration of humidity into the electronic components. Furthermore proceed working sequence acc. to point 8.

8. FAILURES

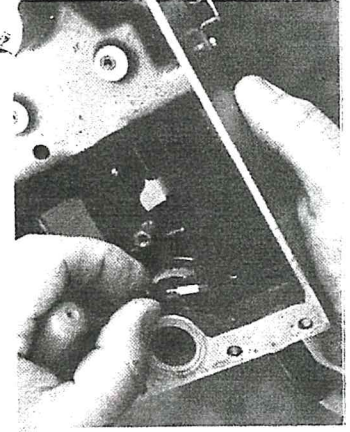
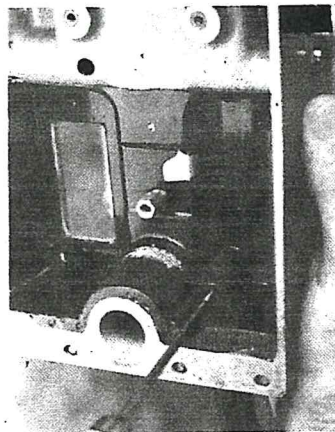
An appearing failure causes the going out of the lamp "Ready" and the alarm indication "Failure Oil Mist Detector" in the engine control room is actuated. Activated by:

- a. Voltage failure
- b. Short-time interruptions of the supply voltage > 5 msec
- c. Luminance control has compensated approx. 55 % pollution (cloudiness)
- d. Failure of the driving air supply
- e. Soiled air filter in the pressure reducer
- f. Opened cover at the measuring unit
- g. Soiled air filter in the measuring unit
- h. Untightnesses at the unit, (cover measuring unit sealing between ground plate of lower part and measuring unit, defective bellows)
- i. Failure flow control
- j. Defective electronic module resp. defective valve box
- k. Failure of external and internal fuses
- l. Damages to measuring unit (connection cable a.s.o.) or valve box.
- m. False alarm in case of fire with smoke within the engine room
- n. Longer lasting over-voltage actuates internal fuse (see techn. data).
- o. Furthermore failures

9. FAILURE ELIMINATION

a. Voltage Failure

- Reconnection of the supply voltage
- Replacing of the external fuse if necessary
- Replacing of the internal fuse by screwing out (bayonet) the cap of the fuse mount 90° (see photo) and inserting a new fuse (out of the service box).



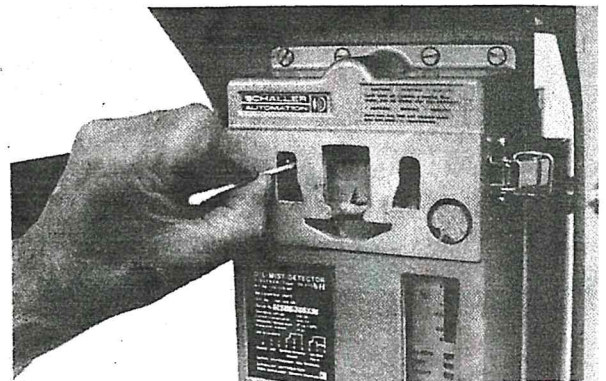
Attention: The E-module needs not to be taken out for replacing the fuse. It has been done in the illustration to make an easy presentation possible.

b. Short-Time Interruption of the Supply Voltage

- Stabilize supply voltage, eventual with a stabilizing module.
See technical data page 13.

c. Luminance Readjusting has Compensated approx. 55 % Pollution (Cloudiness) of the Infrared Filters

- Open cover measuring unit
- Soak wad tip in alcohol
- Clean the lenses with wad tip several times
- Polish with dry wad tip
- Close the cover again



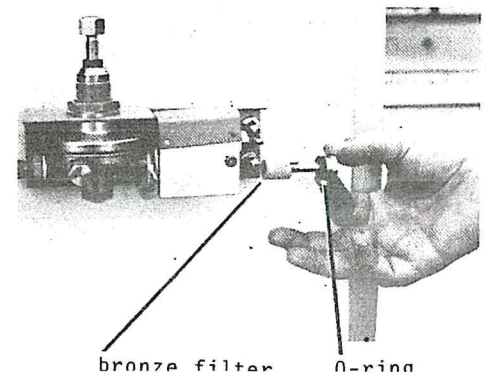
Attention: Perform cleaning procedure acc. to item c. always together with air filter replacement acc. to item g.

d. Failure of the Driving Air Supply

- Re-establish supply in the ship's network, drain the air lines if necessary and clean the eventual installed pre-filter.

e. Soiled Filter in the Pressure Reducer

- Renew the bronze filter in the pressure reducer
- Close the driving air supply
- Screw out the screw, install O-ring
- Screw in screw
- Open the air supply again



bronze filter O-ring

f. Opened Cover at the Measuring Unit

- Close the cover, but before check the cover sealing on unobjectional condition.

g. Soiled Air Filter in the Measuring Unit (valid for VN 115, VN 116 and VN 215)

- Remove securing ring

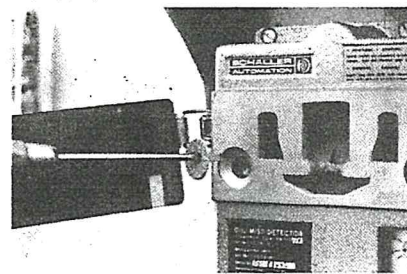
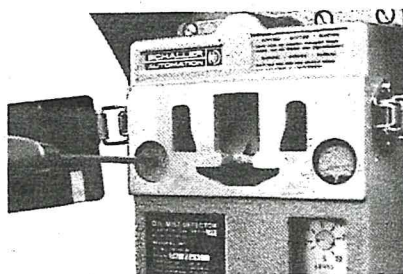
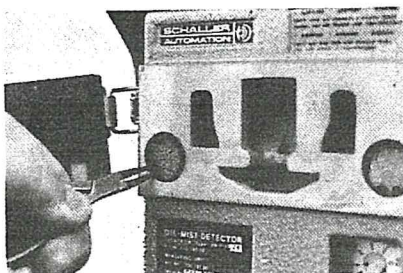
- Push out filter

- Take out filter

- Mount new filter
(both sides,
rough side to
outside)

- Insert securing rings

- Close cover



h. Untightnesses at the Unit

- Check connected tube lines and all sealings on untightnesses, renew damaged sealings, reseal untight tube lines.

i. Failure Flow Control

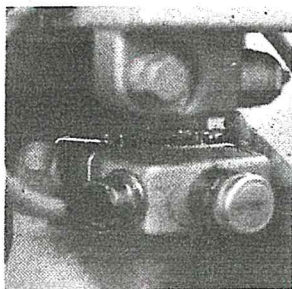
- Replace faulty flow control by a spare module.
Send faulty flow control for repair to Messrs. Schaller immediately.
- Dismounting and mounting of the new modul.
- Take out plug 1, and bend securing bow away and screw and pull out plug 2.

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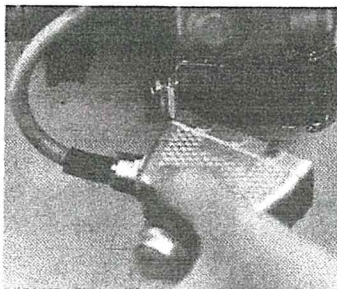
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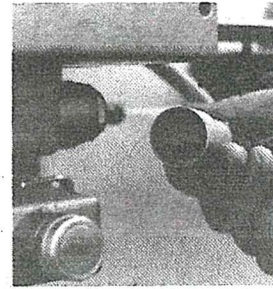
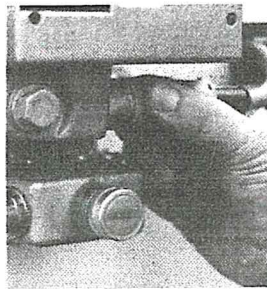
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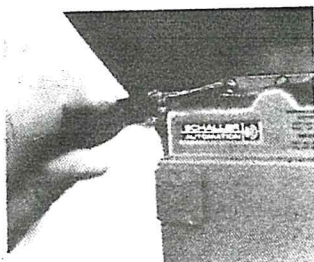
Plug 1



Plug 2



- Loosen screws (4 pieces above and 4 pieces below) at the measuring unit and take off measuring unit



upper screws (4)

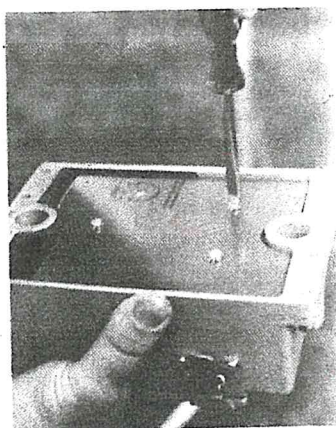


lower screws (4)

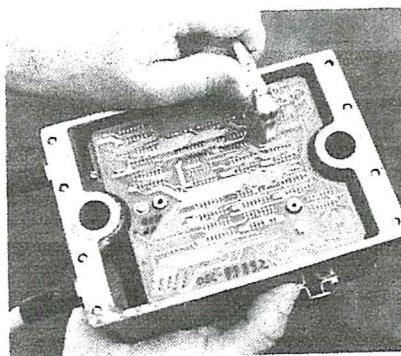


take off measuring unit

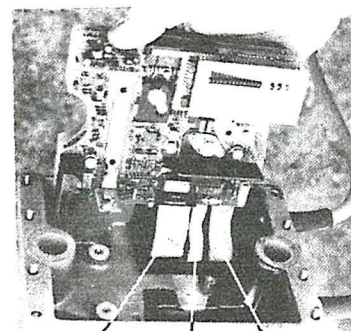
- Take out electronic module, for that loosen screw (3 pieces), remove cover plate, remove fixing screws at the module (3 pieces) shake out module, draw off plug 1,2,3



remove cover plate
(3 screws)

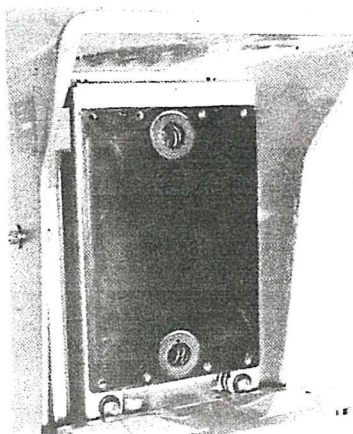


remove fixing screws

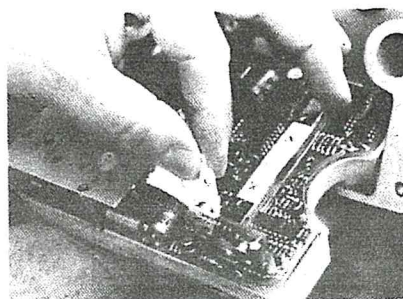


plug 1 plug 2 plug 3

- Clean lenses of optical track with tissue handkerchief before mounting the spare module. Plug in spare module (VN 115 or VN 215 depending on the equipment) (at module VN 115 screw in the plug at the position of plug 1), mount cover plate and measuring unit again and tighten crosswisely, keep care on unobjectionable sealing, check the bellows on unobjectionable seat (above and below).



gasket with bellows

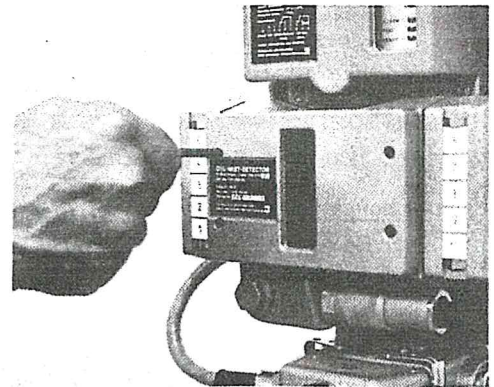
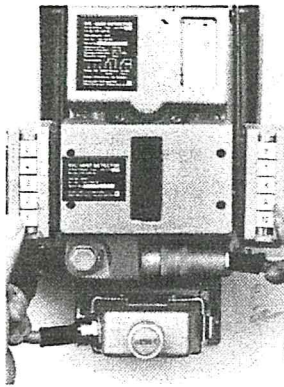
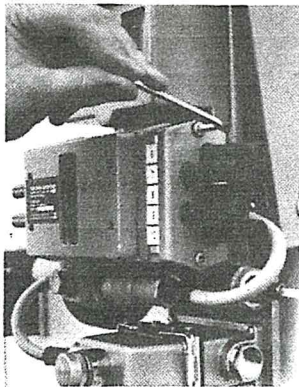


lenses cleaning

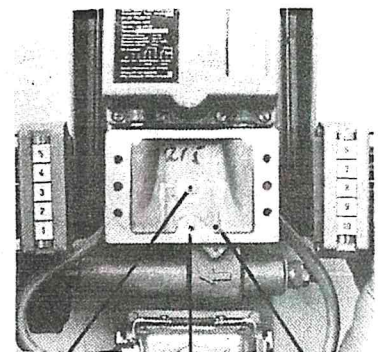
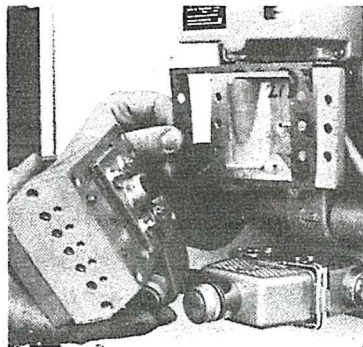
j. Defective Electronic Module resp. Defective Valve Box

Replace faulty units by the spare module. Instructions, see item i.

- Defective valve box
- Loosening of the suction line connections right and left
- Bend away the connections with lines, to make the valve box accessible
- Loosen the 4 screws of the valve box and screw out the plug



- Take off the valve box and remove the valve box sealing
- Check the boxes 1, 2 and 3 on free passage by blowing through with working air
- Clean the lower part from oil



hole 1 hole 2 hole 3



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Mounting has to be done in reverse order. Insert a new valve box sealing generally.

k. Failure of the Internal and External Fuses

Replacing of fuses, external fuses acc. to the position in the ship's network, internal fuses acc. to item a. of this failure elimination list.

Attention: The electronic module needs not to be taken out for replacing the fuse. It has been done in the illustration to make an easy presentation possible.

1. Replacing the Complete Measuring Unit in Case of Damages

- For the measuring unit proceed acc. to item i; but after taking off the defective measuring unit stop repair works and fit new unit.
- For the valve box - see procedure under item j.

Attention: Send defective parts for repair to Messr. Schaller immediately

m. False Alarm in Case of Fire with Smoke within the Engine Room

In case of a fire with smoke within the engine room a false alarm cannot be avoided. The smoke will penetrate via the scavenge air filter into the measuring track simulating an opacity which will release the oil mist alarm.

n. Longer Lasting-Over Voltage

- Internal or external fuse is released. Proceed acc. to item a.

o. Further Failure Possibilities:

- By suddenly appearing misalarm in very warm or extremely cold areas, water can fall out due to remaining below the dewpoint and that can cause misalarms.

Elimination:

- Adjust the suction pressure to minimum value
- If there are fans which are directed at the unit and its suction lines turn them away resp. install shields to hold the detector and its lines outside the airflow.

- Clogging of Siphons at Siphon Fitting Works

Blow through the siphons with working air of max. 2 bar all 6 - 8 weeks to avoid a clogging.

- False Alarm after Longer Operation Time

In any case perform works acc. to item c. and g. due to increasing oil mist sensitivity by clogging air filters.

10. TECHNICAL DATA

Construction:	Compact instrument suitable for direct engine mounting, consisting of lower part (with air draft pump, valve box and connection plug) for all pipe lines and electrical connections fitted. Measuring unit screwed onto the vibration damped ground plate of the lower part.
Operating voltage:	18-30 V DC (suitable to be supplied by the 24 V battery) or transformer supply voltage/ 24 V AC - 50/60Hz, with rectifier and smoothing capacitor 4700 uF/50V.
Permissible rest ripple:	The supply voltage may not decrease 18 V and not increase 30 V.
Overvoltage protection:	Incorporated and effective up to 60 V for 1 second, up to 250 V for 5 ms, Thermo-switch actuates fuse at a slow over-voltage for values above 36 V.
Reverse polarity protection:	By means of an incorporated diode up to 400 V.
Current consumption:	Max. 0,8 Amp during the search run, approx. 0,1 Amp by normal operation.
Excess current protection:	By means of an external 2,0 Amp quick-action fuse located at the outlet of the current supply or distribution. Additional protection is provided by an internal 2,0 Amp medium-acting fuse installed in the unit.
Suction system:	Single suction pipes (R 1/4"/external diameter 14,0 mm) are connected to each individual crankcase sections. Max. number of suction pipes = 10. This permits monitoring of engines with up to 10 crankcase sections by 1 unit.
Depression for suction:	60-80 mm water column in the measuring chamber measured against atmosphere; generated by an air draft pump.
Supply air for the air draft pump:	Required air pressure approx. 0,3 to 0,5 bar gage pressure, pressure reducing valve at an air regulator set Pabs from 2 to 12 bar. Air draft pump consumption approx. 0,5 Nm ³ /h.
Indication of the faulty compartment:	In the window of the valve box is indicated which compartment, at least which side is faulty. The indication remains stored, until the reset-key is pressed, if the then measured opacity is sunk under the permissible limit value of 3 % resp. 1 % difference. All are indicated at a simultaneous increase in all compartments.

Sensitivity (fixed adjusted):

First (quick) alarm level at 0,1 mg oil mist/l (0,5 % opacity) starts the hot spot damage check. Alarm generated for difference of 0,2 mg oil mist/l (1 % opacity) between the two compartment groups of the first step check. Second (safety) alarm level at 0,7 mg oil mist/l (3 % opacity) in the whole crankcase or in one or more single compartments. (Lower limit for explosive mixture at approx. 50 mg oil mist/l, ignition point at approx. 500°C).

Response time until the alarm:

≥ 6 seconds

Response time for compartment identification:

Search run for compartment identification max. 20 s for 10 suction points at the motor.

Signal outputs:

Oil mist alarm eventually with automatic engine stop resp. automatic load or speed reducing (acc. to kind of system):

1 potential-free relay change-over contact; normally open contact bridged with 33 kOhm resistor achieving an external line break detection. Mode of operation: relay is energized for oil mist alarm condition. An oil mist alarm is cancelled by pressing the reset key, if the measured opacity is sunk under the permissible values at this time. Relay of onboard alarm system must not have a time delay.

Oil mist detector ready for operation (Ready):

1 potential-free relay change-over contact. Mode of operation: relay is deenergized when the oil mist detector is not more ready for operation. (The relay reports an operation voltage failure at the unit, too, important for the monitoring unit: Action delay, max. 30 s, for that must be considered the automatic adjustment.

Contact load:

Voltage : max. 60V AC/DC
Current : max. 1A AC/DC
(with inductive load L/R max. 40 ms)
Power : max. 30 W / 60 VA (sufficient for auxiliary contactors up to approx. 8 VA holding power)

Permissible operating temperature: 0 to + 70°C

Permissible temperature of aspirated oil mist:

Max. + 70°C at instrument inlet.
(The temperature of the crankcase atmosphere lies normally around 70°C. Additional cooling takes place in the suction lines).

Permissible storage temperature: - 25 to 85°C

Humidity: Tested up to 90 % relative humidity, no condensation. (At 100 % R.H., the detector should always be on).

Protective system: IP 54 according to IEC 144 (dust-and splash proof)

Materials: Lower part with valve box and measuring unit housing: cast aluminium; vibration damped ground plate of lower part made of zinc-and chrom-plated steel sheet.

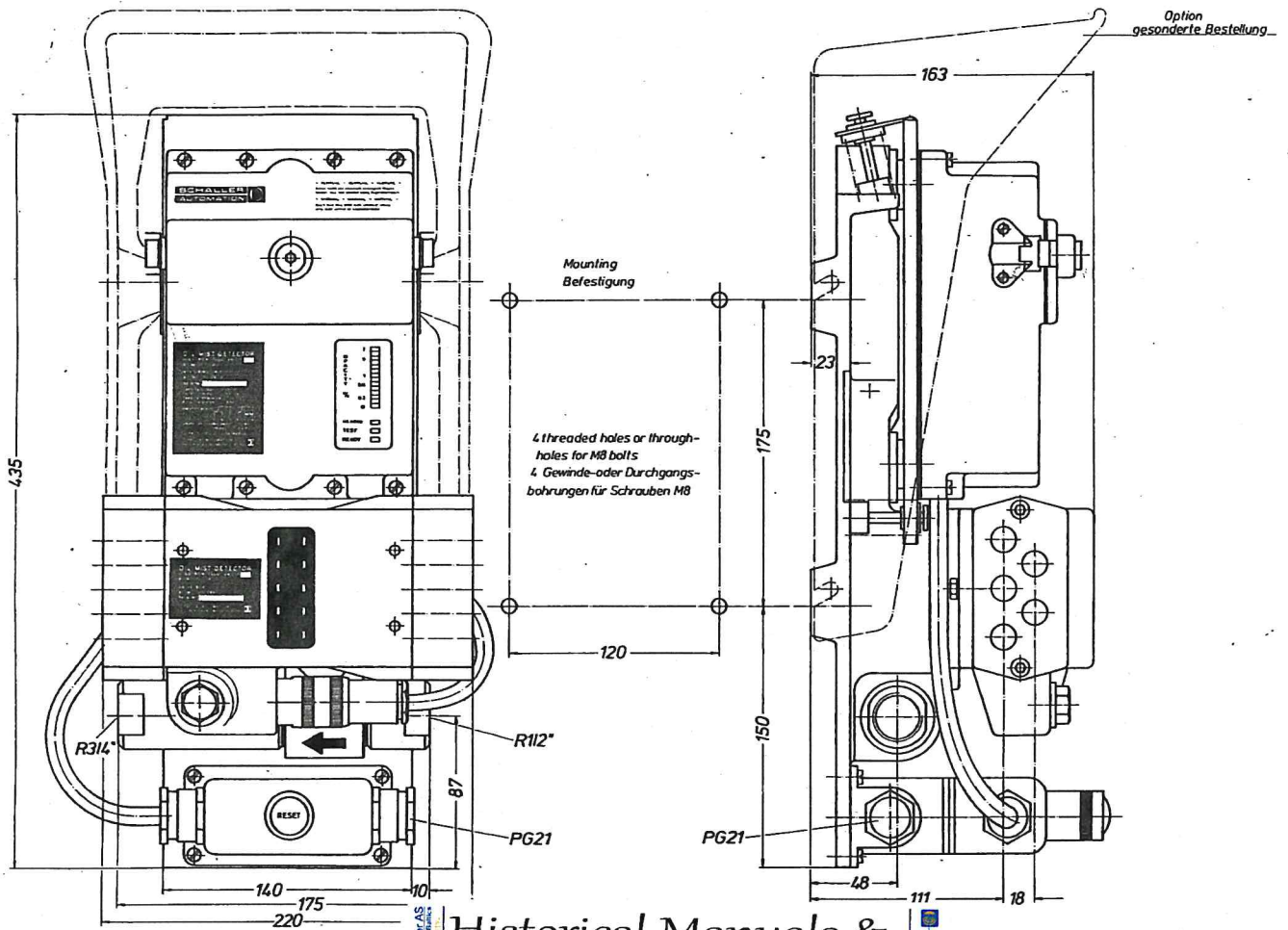
Surface: Hammertone enamel; color : aluminium

Netweight: Approx. 9,6 kg

Maximum: Width 220 mm, Height 435 mm, Depth 150 mm without cover
Width 230 mm, Height 471 mm, Depth 170 mm with cover

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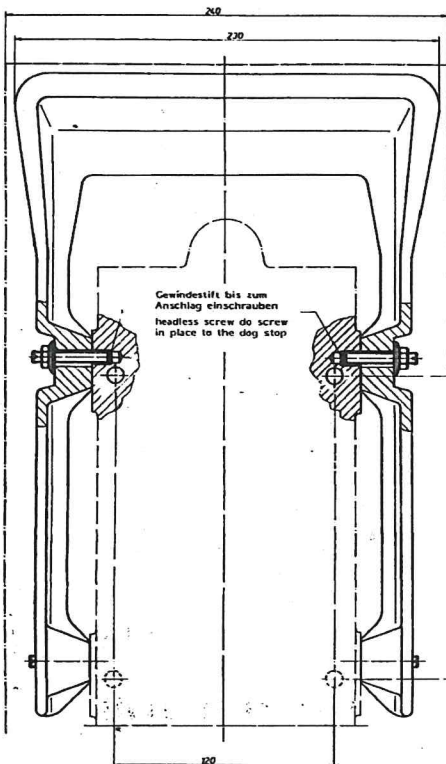


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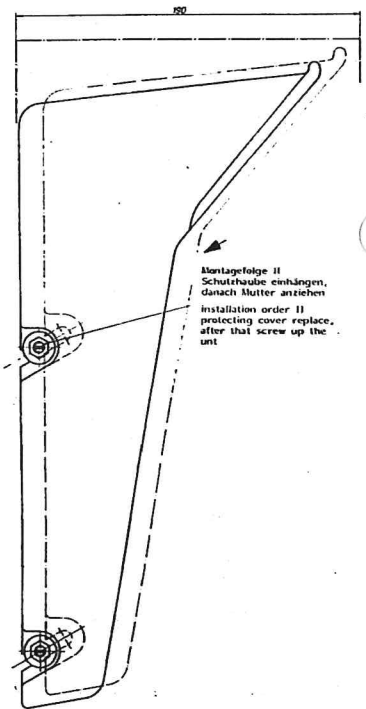
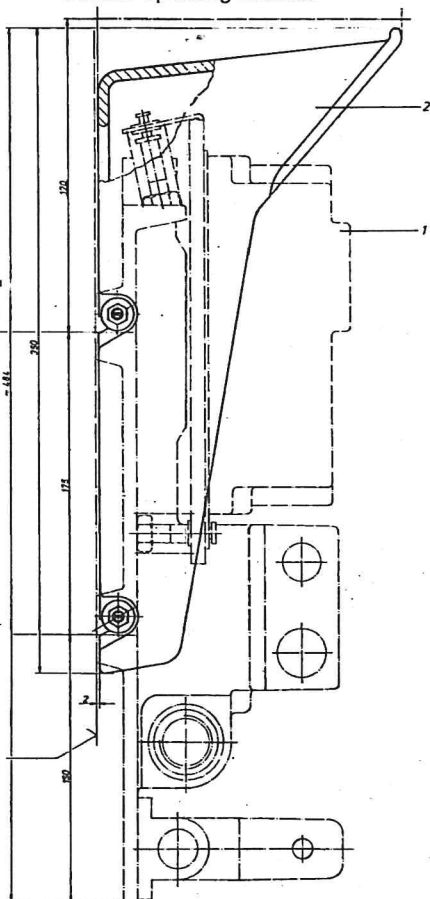


Montagefolge I
installation order I

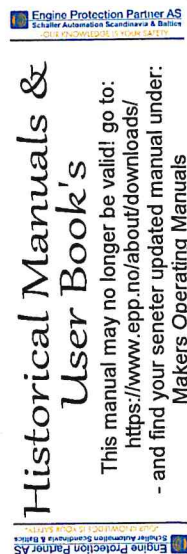
Befestigungslöcher
mounting holes


Auflagefläche des VN-Gerätes
contact surface of the VISATRON-Set

zur Montage der Schutzhaube
benötigter Freiraum
necessary free space for the
mounting of the protecting cover



Pos. 1 VISATRON-type VN 115, 116, 215
 Pos. 2 Protecting cover





SCHALLER

AUTOMATION

BLIESKASTEL/SAAR-W.GERMANY

Tel.: (06 842) 3041

Telex: 04 4685

082 123

Bl.Nr. 1

Ausg. 01D

SCHALLER - VISATRON

Klemmenplan VN 116, VN 215

Connection diagram VN 116, VN 215

Elektronisches Blockdiagramm
Electronic Blockdiagramm
schéma de bloc modulaire

