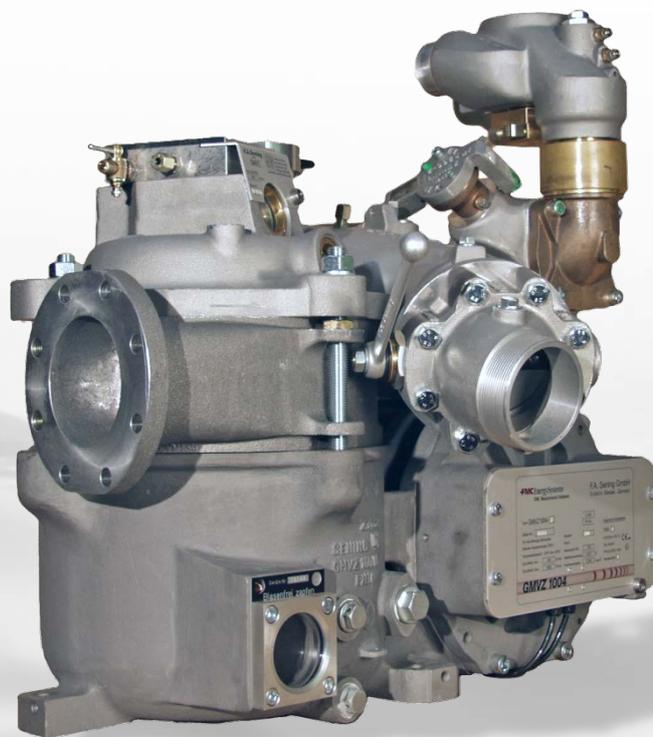


## Metering System **GMVZ 1004**



Further Dokumentation for this Product:

Description	Order No.
None	

## History

Revision	Date	Editor	Status	Description
Rev. 1.00	Juni 2003	HO	released	first edition
Rev. 1.10	June 2008	JP	released	format modifications / new Drawings

## Important

All information and technical specifications in this documentation have been carefully checked and compiled by the author. However, we cannot completely exclude the possibility of errors. **F.A.Sening GmbH** is always grateful to be informed of any errors.

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# 1 General Remarks

## 1.1 How to Use this Manual

This manual contains multiple information. In order to help you find the information you require, the following orientation aids have been used:

- **Icons**

The information in this manual ranges from absolutely required protective measures and standardised requirements to concrete operating steps and good advice. For easy reference the different types of information are marked by pictographs.

The intention is not only to increase the reader's attention, but also to help to identify the desired information quickly. For this reason the respective icon symbols are closely related to the contents of the text.

**In this manual you will find the following icons:**



**Danger!** In this case: Danger of explosion caused by highly inflammable gases or liquids.



**Environment protection;** recycling



**Threat of disruption.** Action that may damage the equipment.



**Legal information.** Actions that have legal consequences.



**Operation step,** concrete handling instruction, e.g. "Press the <Enter> Key".



**Feed-back positive,** e.g. "Now the main menu appears"



**Feed-back negative,** e.g. "If an error message appears ..."



**Additional information, advice, tip,** e.g. "Further details in chapter XX"



**Optional or special case**



**Function / Functional description**



**NOTE:** Indicate a special Situation



**IMPORTANT:** For strict observation

## 1.2 Safety instructions



**IMPORTANT:** Before starting up attention should be paid to the special details in the following.

### 1.2.1 To Avoid Accidents (Due to Gas Explosion)



The metering system type GMVZ 1004 has been designed for the flow measurement of flammable liquids in Classes AI and AIII on tank trucks. That means especially danger of explosions caused by flammable gases. Keep aware of the regulations for the EX protection.



**IMPORTANT:**  
The GMVZ 1004 with residual discharge system is only designed for flow measurement of combustible liquids of Hazard Class AIII on road tankers.

### 1.2.2 Particular attention



The GMVZ 1004 type metering equipment has precise and high quality components. Hence mechanical effects which are not due to operation ( e.g. shock loads during transport) are to be avoided.



The metering system to be subject to obligatory calibration. Every manipulation, intended or unintended, appears the soft seal has failed.



**Attention please that no mineral oil products flows in the ground.**

### 1.2.3 Appropriate use

- The metering system type GMVZ 1004 shall be installed on road tankers exclusively for the discharge of low viscosity mineral oil and bio- or a mixture of mineral and bio-products with a viscosity  $\eta$  0,3 to 20 mPa·s. The appropriate safety regulations (e.g. explosion protection) must be complied with.
- Using the device for any other purpose would constitute inappropriate use. The manufacturer will not be liable for any resulting damages.
- Appropriate use also includes compliance with the operation, installation and maintenance conditions specified by the manufacturer.
- The metering system type GMVZ 1004 must only be installed, operated, serviced and repaired by persons who are familiar with the device and have been briefed about the risks.
- Unauthorised alterations on the metering system GMVZ 1004 invalidate any liability by the manufacturer for any resulting damages.
- For custody transfer in the European Union and their associated member states the requirements of the MID and of the EU type examination approval for the complete measuring system has also be taken into account.

## 2 Structure and Method of Operation

The F.A. Sening GMVZ 1004 is a compact metering system for gravity and pump operation for flow rates up to 1000 L/min. The use of the unique Smith Meter® positive displacement meter (PD-meter) in conjunction with the well known F.A. Sening® gas separator and a flexible shut-off valve assembly combined in one housing gave the customer a well working metering system for long life time.

The PD-meter is fitted with an integrated pulse transmitter for direct connection to an electronic counter (e.g. MultiFlow). The shut-off valve control of the Type GMVZ 1004 metering system is implemented by the counter MultiFlow and, where it is required by national law, in combination with the overfill prevention amplifier type ASE-E-.. or ASE-D- ... a overfill prevention system can be easily set up.

### Advantages:

- Small, compact and light weight metering system
- Integrated pulse transmitter
- shut-off valve control by counter
- Gas extractor with integrated strainer for meter protection
- Curved path-controlled positive displacement meter
- High flow rate in pump and gravity operation
- Simple and inexpensive fitting

### Functional description:

- ☐ The measured liquid passes through the spout into the gas extractor.
- ☐ The measured liquid starts rotating as a result of the tangential orientation of the spout.
- ☐ Gases present in the liquid are thus separated (functional principle of the centrifuge).
- ☐ The gases rise up and gather in the gas extractor hood, which is fitted with an automatic venting system.
- ☐ The de-gassed measured liquid is passed by the sight-glass (at the bottom) into the measuring chamber of the PD-meter.
- ☐ The measured liquid leaves the GMVZ 1004 metering system via the shut-off valve mounted at the measuring chamber outlet.

## 2.1 Schematic Structure

In the following figures the metering system is fitted with a high/low flow shut-off valve for wet hose. The metering system equipment can be varied widely according to requirements:

### Gas extractor hood

- with/without pressure switch
- with/without supplementary ventilation

### Gas extractor

- with/without residual discharge

### Discharge shut-off valves

- Wet hose shut-off valve high/low flow
- single or dual wet hose
- for overfill prevention systems: Fitted with special low flow shut-off valve for fuel nozzles for barrel loading

2.1.1 View from the right

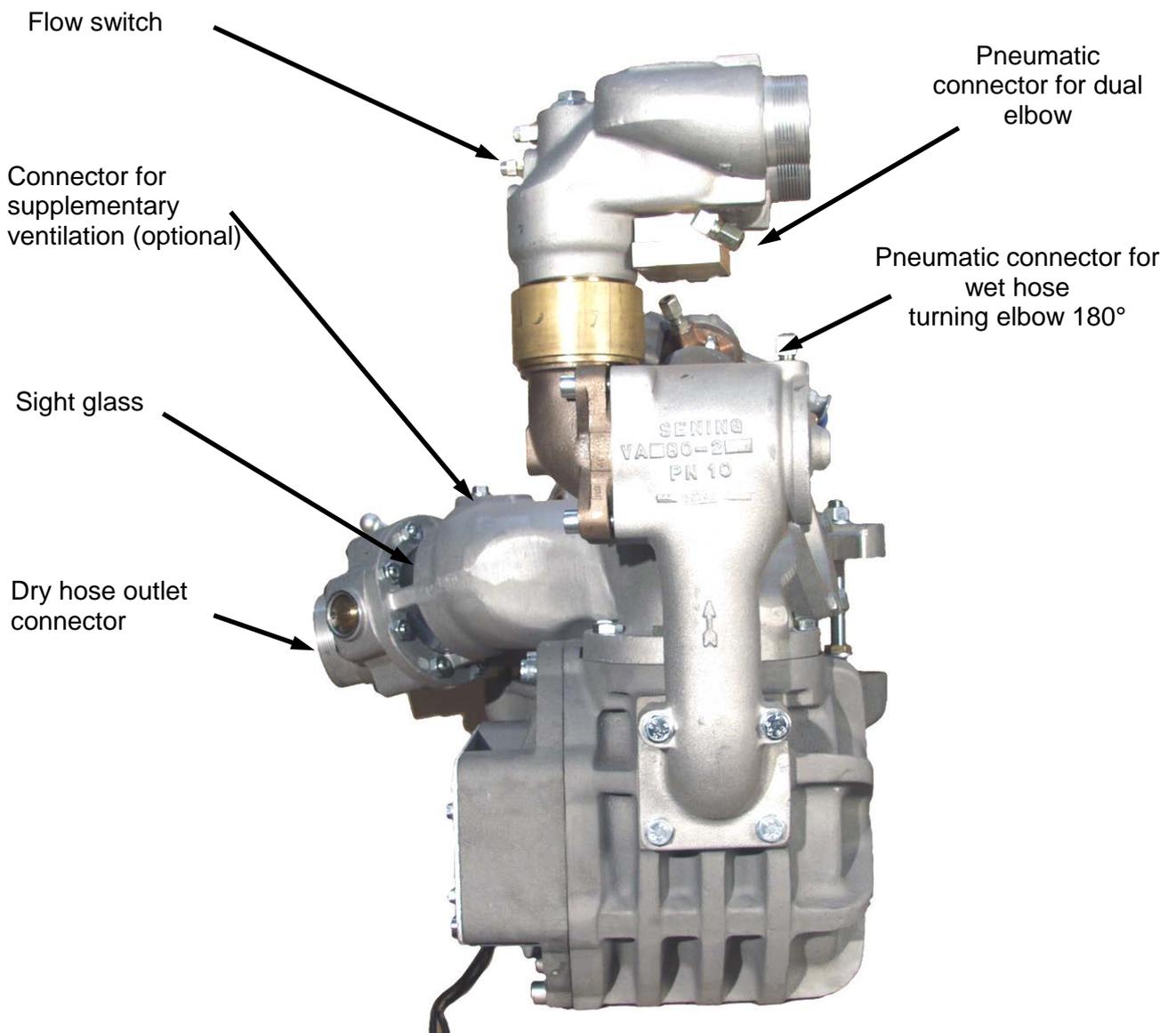
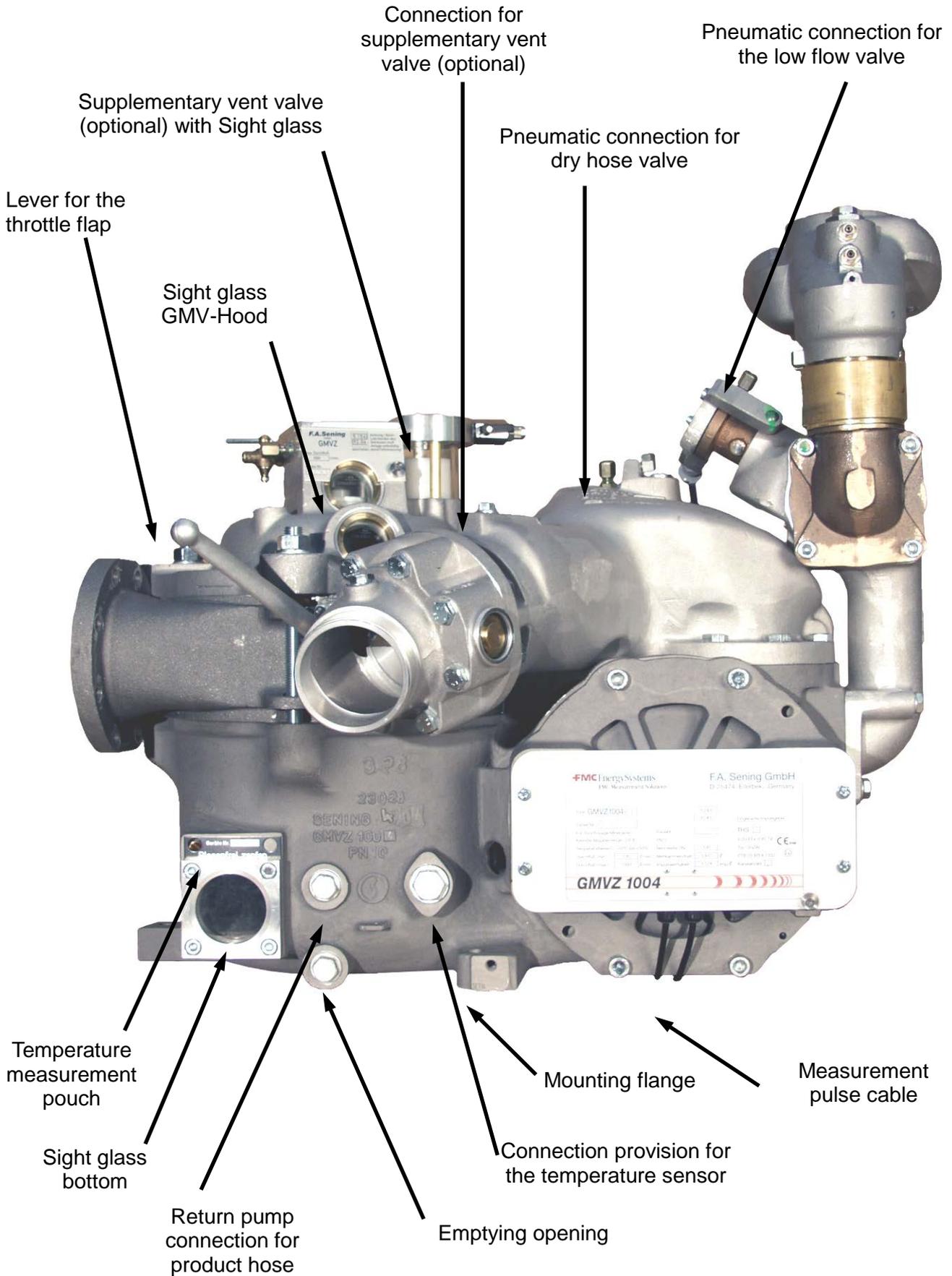
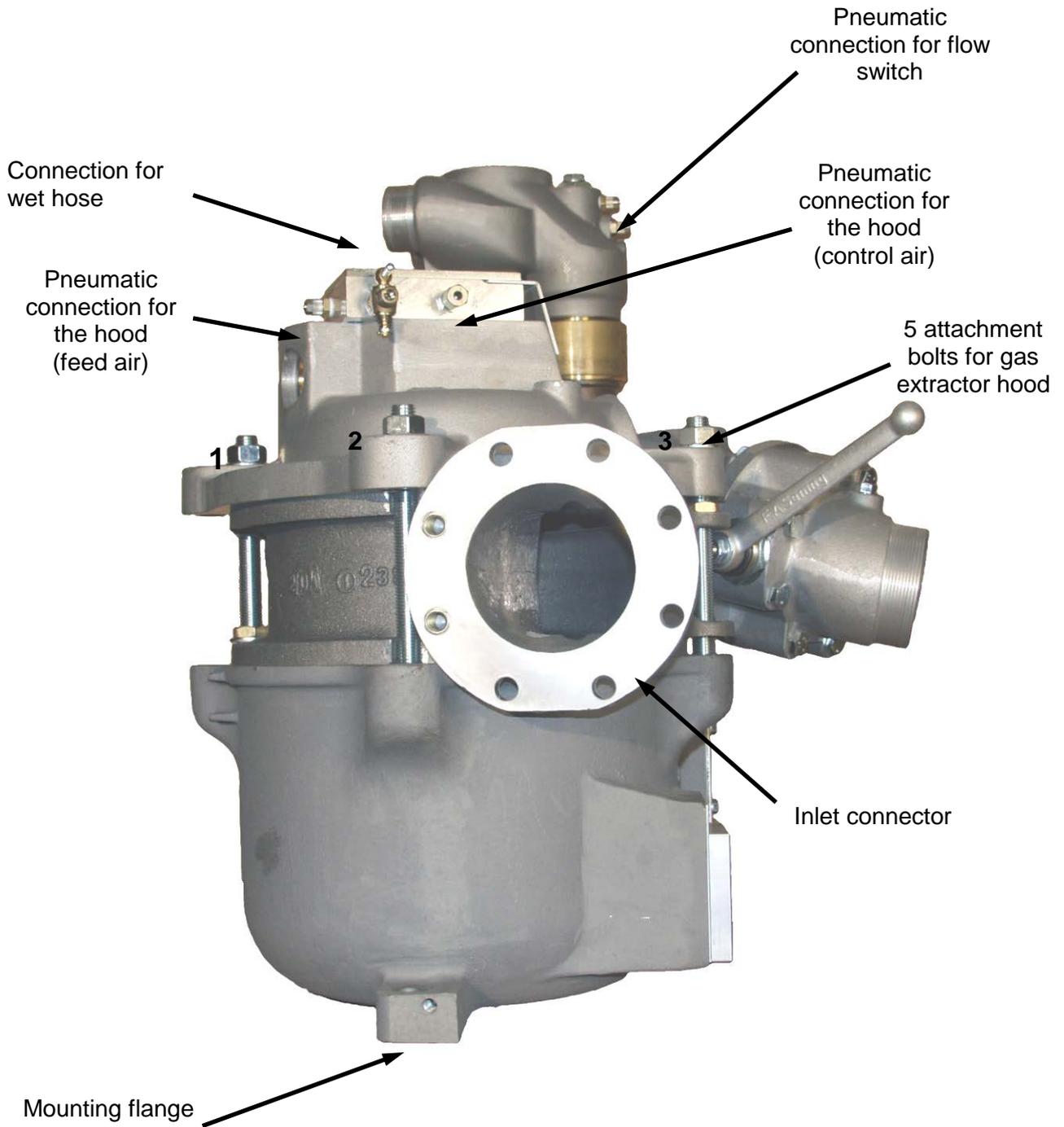


Figure 1: View from the right

2.1.2 View from in front



**2.1.3 View from the left**



## 2.2 Gas extractor

Metering is automatically interrupted if gases enter or are present in the metering system. The venting of the gas extractor’s housing that is required after shut-off and the subsequent continuation of the metering process are likewise carried out automatically.

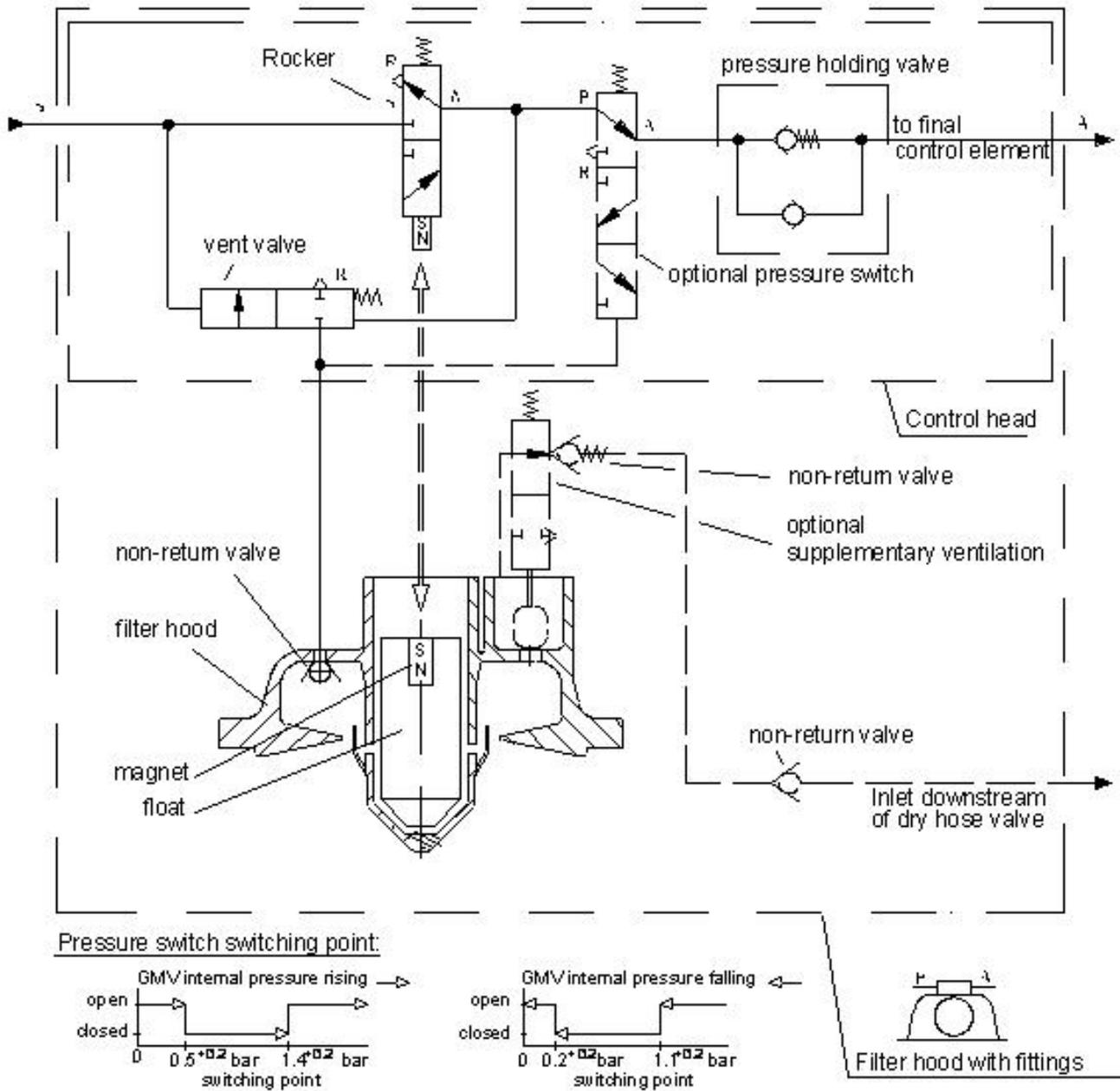


Figure 2: Schematic structure of gas extractor hood with control head

### 2.2.1 Venting

If the gas extractor hood is filled up to the upper edge of the Sight-glass with liquid (switch-on level), the float raised by the liquid and operates the 3/2-way pneumatic valve in the control head. The venting valve is thereby closed and the air pressure passes via Output A to the shut-off valve of the metering system. The liquid can now flow through the PD-meter.

If so much gas collects in the gas extractor hood that the liquid level sinks to the switch-off level, the 3/2-way pneumatic valve vents the shut-off valve, the shut-off valve is closed by spring force and the venting valve opens until the measured liquid in the gas extractor's hood has reached the switch-on level again.

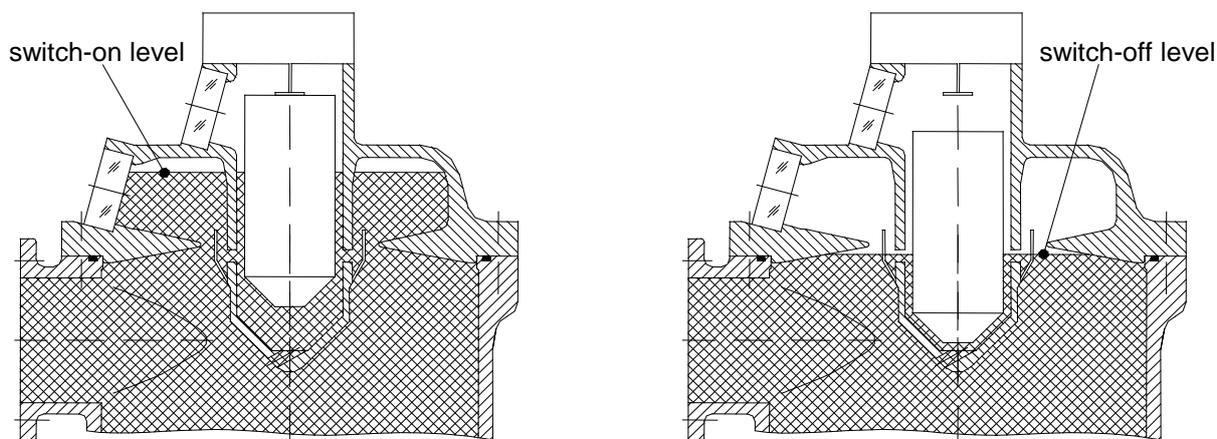


Figure 3: Switch-on and switch-off levels (static)

When gas is produced an automatic change takes place between venting with the shut-off valve closed and measurement with the standard venting closed. Venting takes place into the open air via a shut-off valve.

### 2.2.2 Additional ventilation (optional)

Additional ventilation is only required for gravity discharge with fluids  $< 1\text{mPas}\cdot\text{s}$  (petrol).

The additional ventilation is used in addition to standard ventilation and reduces the amount of switching of the gas extractor in the case of gravity discharge through continuous removal of the gases created. These gases are fed directly via the additional vent line and bypassing the volumetric flow meter behind the dry hose valve into the product line.

However the additional ventilation is ineffective during pump operation. A check valve at the end of the additional vent line ensures that no liquid can flow back through it. A stop cock installed in the additional vent line can also be closed if a backflow is found over this line. However this stop cock can normally be left open when the pump is running. The position of the stop cock does not have any influence on the standard ventilation.

### 2.2.3 Pressure switch (optional)

During discharge pumping and air entry on the suction side the liquid pressure at the pressure side also breaks down. To avoid this and subsequent possible erroneous measurements it is possible to fit an additional pressure switch to the controller that monitors the undershoot of a minimum pressure. If a normal pressure of 1.1 bar is undershot, then the discharge is interrupted by means of stopping the compressed air supply by means of an integrated 3/2 way valve in the control head. If there is enough pressure the valve closes again and the discharge can start again. In case of gravity discharge (pressure typically = 0.2 bar) the pressure switch is automatically off and compressed air is supplied continuously.

## 2.3 Meter

The meter is a curved path-operated positive displacement meter (PD-meter) with integrated electrical pulse transmitter for connecting an electrical counter.

The blades of the PD- meter are controlled by an inside curved path. The blades of the PD meter thus run in the measuring chamber housing without contact to the walls of the housing. The robust meter is characterised by a low run-up resistance and a long operating life.

The integrated pulse transmitter converts the rotation of the positive displacement meter into electrical pulses. This non-contact process takes place in the measuring chamber. The pulse transmitter is connected directly to the counter MultiFlow.

## 2.4 Valves

### 2.4.1 Dry hose valve

The dry hose valve has a nominal diameter of 100 mm and can be optionally fitted with a check valve.

To open the dry hose valve, compressed air is supplied onto a drive piston, which is pressed to the end position against the spring force. The valve poppet is connected to the drive piston by a shaft and opens the valve outlet. To avoid the valve from being opened by liquid pressure, the valve poppet is formed as an annular piston so that all areas under fluid pressure don't result in any external forces (pressure balancing).

As an option the dry hose valve can be fitted with a manual throttle to reduce the flow.

### 2.4.2 Wet hose shut-off valve

A shut-off valve of 80 mm nominal size is used as a wet hose shut-off valve. In the case for only gravity discharge there is no non-return valve between the wet hose shut-off valve and the volume meter necessary.

Compressed air is applied to a piston to open the shut-off valve and the piston is forced into the end position against spring force. The shut-off valve cone is connected to the piston by means of a shaft. It carries out the same stroke and opens the shut-off valve outlet. The shut-off valve cone is constructed in the form of annular pistons such that all surfaces subjected to liquid do not result in outside forces (pressure-balanced) preventing the shut-off valve to be opened by the liquid pressure.

The wet hose shut-off valve can optionally be fitted with a manual throttle to reduce the flow.

### 2.4.3 Low flow valve

In the wet hose valves, that have a "B" on the type identification, there is also a low flow valve in addition to the main wet hose valve.

The compressed air drives a piston against the tappet of the low flow valve. Opening the valve (also called bypass or low flow valve) bypasses the wet hose valve and the liquid is fed downstream to the wet hose valve. The low flow valve is for controlling the preselected value by reducing the flow before the end of the discharge or used together with a nozzle for filling the container. Depending on the pump used the flow can be regulated to match the requirements by adjusting the pump flow rate via the pump speed.

There is a magnetically controlled switch (reed switch) cast into the cover of the low flow valve, whose open and closed switch positions can be controlled by a magnet in the piston. If the valve is closed then the switch is as well. The piston and magnet move due to activation of the valve controller. The valve opens and the reed switch opens due to the simultaneous movement of the magnet outside its switching range.

The valve's electrical contact may only be connected on an intrinsically safe circuit. For example it can also be used, to interrupt the intrinsically safe overfill sensor circuit of the overfill prevention.

### 2.4.4 Elbow

For wet hose valves it is necessary to mount a slewable outlet elbow with check valve on the wet hose side. The outlet elbow (type KR-2 / KR-3-ST) is fitted with a pneumatic valve for controlling the feed pump. The pneumatic switch is closed above a flow rate of about 40 L/min. The signal can then be used to match the pump speed and the output capacity of the pump to the increased flow rate.

A double elbow of type DKRSTD is used for systems with 2 hose reels. This double elbow also has the pump power controller. The switching between hose reel 1 and 2 has to take place with the valve closed whereby the full pump pressure (8 bar) can be present.

Both elbows can be swivelled steplessly by 360° degrees on the valve threaded connections, as well as about the longitudinal and vertical axis.

## 2.5 Pneumatic Control

All shut-off valves of the GMVZ 1004 metering system are arranged down-stream of the PD-Meter. As described in the sections before these are all pneumatically actuated shut-off valves. To guarantee a safe operation, all valves are closed by spring action in the pressure-free condition.

Pneumatic control of the shut-off valves takes place by means of solenoid valves which are controlled by an electronic flow computer, i.e. the counter MultiFlow

### 2.5.1 Control through mechanical activation block

The control of the metering system with pneumatic activation block is no longer supported in the case of metering system with MID. Control is made solely using solenoids. For additional functions, such as the control of a valve for example for a second unmeasured output, an activation block is still used. The wiring connections can be seen in the corresponding circuit diagram.

## 2.5.2 Control by Electronic counter

The pneumatic shut-off valves of the GMVZ 1004 metering system are controlled by the counter MultiFlow . The counter MultiFlow performs all locking functions that are required to control the metering system. For countries where an overfill prevention is statutory provision the counter in conjunction with an overfill prevention device secure the discharge. A special setup in the counter for first and subsequent verification helps to maintain the system if it is used in custody transfer.

Each shut-off valve of the GMVZ 1004 metering system has an associated solenoid valve and the selection of the hose path is made by the counter MultiFlow.

If a overfill prevention is mandatory, two options are possible depending upon the overfill prevention amplifier used.

1. Overfill prevention amplifier with extra solenoid valve
2. Integrated overfill prevention amplifier supplied by Sening (without extra solenoid valve)



Input S4 of the counter MultiFlow may be only connected to a Sening overfill prevention amplifier (ASE-E-MF, ASE-D-MF or ASE-M) or to a differential pressure switch (see electrical connection diagrams).

### Electrical Circuit Diagrams

AI Version	51.351189		AIII Version	51.351125
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**2.5.2.1 Counter and overfill prevention with solenoid valve**

The overfill prevention amplifier is fitted with a solenoid valve as its actuator. The solenoid valve overrides the pneumatic control of the metering system and interrupts the discharge when the tank reaches the max level height.

The overfill prevention amplifier from F.A.Sening with the type identification ASE-2, ASE-E-MV or ASE-D-MV for example which is suitable for this can be used. Alternatively an overfill prevention amplifier from F.A.Sening with the type identification ASE-M, which is connected using the NoMix-System to a solenoid valve, can be used.

A pressure switch, which is connected to the S4 inlet of the MultiFlow counter, monitors the release of the solenoid valve of the overfill prevention. The discharge can now be started manually on the MultiFlow counter the pressure switch being released. If the overfill prevention amplifier switches off, then the discharge is also interrupted at the MultiFlow counter via the pressure switch and the associated control valve is switched off. After the re-release by the pressure switch the discharge has to be restarted manually on the MultiFlow counter. This prevents automatic start of the discharge after release by the overfill prevention amplifier.

If there is no pressure switch input on the MultiFlow counter available then a control switch can be used instead. If the control switch is depressurised then this closes automatically and has to be activated again when the compressed air is back.

Pneumatic circuit diagrams / Control with electronic counter and overfill prevention amplifier with solenoid valve				
51.252087				

**2.5.2.2 Counter with overfill prevention amplifier without solenoid valve**

The electrical switching output of the overfill prevention amplifier is connected to the input of the MultiFlow counter. The input of the MultiFlow counter has an “intrinsically safe“ type of protection and hence the overfill prevention amplifier has to be compatible. The highest possible explosion proof characteristics of both devices have to be maintained. The F.A. Sening overfill prevention amplifiers are designed for connecting to MultiFlow Flow counters. The overfill prevention actuators are then the solenoid valves of the MultiFlow counter.

A suitable overfill prevention amplifier is the ASE-E-MF or ASE-D-MF type. Alternatively a overfill prevention amplifier from F.A.Sening with the type identification ASE-M, can be used in connection with the NoMix-System.

An additional control switch of type STB can be used as an option but is not necessary for function.

Pneumatic circuit diagrams / Control with counter overfill prevention amplifier without solenoid valve				
51.252088				

## 2.6 Order Codes

### 2.6.1 GMVZ 1004

Order Number	Description
<b>Meter</b>	
GMVZ 1004-J	GMVZ 1004 Meter with integrated pulse pick-ups
<b>Gas extractor head</b>	
FHP	Low head
FHP-D	Low head with pressure switch
FHPE	Low head with high capacity vent
FHPE-D	Low head with pressure switch and high capacity vent
<b>shut-off Valve L</b>	
LA100	Dry Hose shut-off Valve
LA100-RK	Dry Hose shut-off Valve with non-return valve
LA100-M	Dry Hose shut-off Valve with manual control valve
LA100-RK-M	Dry Hose shut-off Valve with non-return valve and manual control valve
LA-DO/3"	Discharge nozzle with throttle
<b>Valve V</b>	
VA80-2	Wet hose shut-off valve
VA80-2D	Wet hose shut-off valve with throttle
VA80-2M	Wet hose shut-off valve with manual control valve
<b>Valve V,B</b>	
VAB80-2	Wet hose shut-off valve with bypass
VAB80-2D	Wet hose shut-off valve with bypass and throttle
<b>Elbows</b>	
DKRSTP	Double elbow with controller
KR-2	Elbow
KR-3-ST	Elbow with controller
<b>Unmeasured</b>	
DV100-3	Line valve
SGA100/3"	Sight-glass outlet port

Table 1: Order Codes

## 3 Installation

### 3.1 General

- § Installation of the GMVZ 1004 metering system on road tankers may only be carried out by specialised workshops. (Qualified installers according national rules or defined as companies according to TRbF 180 Chapter no. 1.7.)
- § Extract from the TRbF (technical regulations for flammable liquids) 180, Chapter 1.7: *The operator is obliged only to use specialised companies that have the necessary devices, equipment and specialised staff for the safe execution of the work when it comes to setup, maintenance and cleaning of the system or its components.*

#### 3.1.1 Preventive measures

##### 3.1.1.1 For Accident Prevention

- The type GMVZ 1004 metering system is constructed only for the discharge of low viscosity fuel on road tankers. The appropriate safety regulations (e.g. explosion protection) must be complied with.
- All regulations and instructions in the manuals of the electronic equipment connected to the metering system must be considered (e.g. counter MultiFlow, overfill prevention amplifier).
- Instructions on all signs must always be observed.
- In case of a fault, the complete module must be replaced.

##### 3.1.1.2 To meet the requirements stipulated by standards

- All regulations, requirements and guidelines for the calibration of volume measuring instruments are to be considered. (see type examination approval).
- The overfill prevention device must correspond to the requirements of TRbF 512.
- The electrical installation must be carried out according to EN 60079-14; VDE 0165.
- For the use in custody transfer there could be special requirements defined in the type examination approval which has to be taken into account.

##### 3.1.1.3 To ensure trouble-free operation

- The hoses, pipelines and vehicle chambers must be carefully cleaned before assembly. The lines are to be screw-connected to the metering system without stresses.
- The metering system must be carefully filled with the measured liquid using the throttle (bottom valve open). Damage to the measuring chamber is avoided in this way.

- After pressure test with water or cleaning the metering system with water, the metering system must be filled with non-corrosive product (e.g. fuel oil). Damage to the measuring chamber by corrosion is avoided in this way.
- You should interrupt the electrical power supply (plus 24V and minus 24V) to all electronic components during welding work on the vehicle.
- Before the first time putting into use make absolutely sure that the shut-off valve setup in the flow computer is correct

#### 3.1.1.4 To make the job of the service personnel easier:

- Fit the metering system so that the gas extractor hood can be removed for cleaning the filter and the elbow or that the double elbow can be replaced without dismantling the metering system.
- Screw a pressure manometer into the feed line to the gas extractor for vehicles with pumps.
- Install electronics housings such that they are easily accessible.
- Slightly lubricate the fixing bolts of the covers prior to installation (copper paste, graphite grease). This prevents the bolts from corroding and becoming stuck after prolonged operation.

## 3.2 Installation

The metering system is to be installed horizontally. There are two options for fixing it in the cabinet:

- Attachment from below (through bores in the floor of the cabinet)
- Lateral attachment

Three threaded bores are fitted to the feet of the housing for both possibilities respectively (from below M12, from the side M10).

- ☞ The hoses and pipelines must be carefully cleaned before installation. They are to be screw-connected to the system without stresses.

When arranging the metering system, care should be taken that the switch-on point of the gas extractor hood is below the bottom valve seat in the distribution channel of the tank-vehicle. The switch-on point can be found in the quotation drawings. (See appendix).

The feed to the intake into the gas extractor should be installed with a slight downward gradient and with the minimum possible number of detours (tube bends). In this way the gravity fed discharge performance is increased.

### 3.2.1 Pneumatic Installation

The pneumatic lines are to be connected in the system in accordance with the circuit diagrams. The connections shown in the pneumatic circuit diagrams with a cross (X) must be implemented to be proof against manipulation.

This is ensured by the use of 6x1 corrosion-resistant steel pipes, which are provided with connection security devices (Type VS) at both ends. If for example a flexible air line is required for the gas extractor hood, then a bend-proof hydraulic hose of 4 mm diameter with connection security devices must be used at both ends.

The line lengths given in the pneumatic circuit diagrams may not be exceeded. Lines without length data may not exceed 0.2 m. This is necessary to guarantee that the shut-off valves are closing fast enough in the case of a overfill signal from the overfill prevention system. Therefore the type of solenoid valves should not be changed because they are special chosen for this purpose.

### 3.2.2 Electrical installation

All electronic equipment and terminal boxes must be fixed in the cabinet in a stable and vibration-less manner.

All screws that are used for the attachment of all housings must be inserted with e.g. Molikote (graphite paste) or similar.

During assembly each metal housing must be connected with a reliable electrical connection to the vehicle chassis, using corrosion resistant screws (V2A).

All cables used must be fuel-resistant. The cable quality has to fulfil the general requirements of wiring in hazardous areas.

In order to be protected all cables are to be installed in such a way that they are not damaged by the actions (working habit) of the operator. Wire end sleeves, cable shoes etc. are to be used for clamping the cables. The cable screw connections are to be carefully tightened. Unused cable entries and cable glands are to be closed watertight with suitable blank screw connectors or suitable closure pins. Non-occupied terminal screws are to be tightened. The cover of the housing is to be carefully affixed after the connection work.

#### Electrical contact in low flow shut-off valve

The build-in electrical contact of the low flow shut-off valve has to be connected only to an intrinsically safe circuit. It could be used to disable the overfill prevention amplifier by interrupting the sensor circuit which is normally intrinsically safe.

### 3.2.3 Final testing

This qualified installer examines the complete system in accordance with the test criteria specified in the associated workshop, installation manuals and the requirements of the type examination approval (when there are any). Correct establishment is to be certified by stating the pneumatic control circuit diagram and the circuit diagrams of the electronic systems.

The following tests should be carried out on the vehicle:

	Test	Comment
1	Leak test of the entire metering system, e.g. hydraulic pressure test.	Completely remove water from the metering system after testing.
2	Functional and leak testing of the pneumatic installation.	

3

Functional testing of the electrical installation. (see appropriate manuals)

### 3.2.4 Legend of the pneumatic circuit diagrams

The circuit diagrams for a fully equipped metering system are shown in the drawings 51.252087, 51.252088 and 51.252089. Valves and solenoids can be omitted depending on the equipment of the metering system. In the case where twin solenoids are shown it is possible to then select comparable single ones for the setup.

#### Length of the pneumatic lines

For the use of the given solenoid valves and the maximum line lengths given on the drawing it is possible to close the valve within 3 secs. Lines without length details may not be longer than 0.2 m. (see also 3.2.1 for this)

#### Further notes

The following is to be noted when using counters other than the MultiFlow type or when changing the control:

- The control valve SV5 and SV6 would be switched on or off 10 s before and 10 s after the control valves of the wet hose valve.
- (only for 51.252087) If a pressure switch PS1 is used then the control switch CS1 can be omitted.
- (only for 51.252088) CS1 not needed for technical function, can be omitted
- All lines marked with X are to be made with 6x1 steel pipe and secured connections
- If the valves shown are not all used then the valves not used can be omitted.

#### Notes on pressure switch PS1

The discharge can then be started manually on the MultiFlow counter the pressure switch being released. If the overflow prevention amplifier switches off, then in addition to the interruption of the control air via the pressure switch contact, the discharge status of the MultiFlow counter is also interrupted and the associated control valve is switched off. After the re-release by the overflow prevention amplifier the discharge has to be restarted manually on the MultiFlow counter. This prevents automatic start of the discharge after release by the overflow prevention amplifier.

If there is no pressure switch input on the MultiFlow counter available then a control switch can be used instead. If the control switch is depressurised then this closes automatically and has to be activated again when the compressed air is back.

For the pneumatic Connection diagrams are following shortcuts used:

Identification	Acceptation
GMVp	spezial gas separator
SV10	solenoid from overfill prevention amplifier
SV20	Optional: shut-off valve from radio controlled start/stop
PWV	pneumatic switching valve
CS 1	Control switch
CS 2	Main control switch
CS 3	Control switch
CS 4	Control switch
sc1	speed control dry hose delivery
sc2	speed control wet hose delivery
V1	Shut-off valve unmetered
V11	shut-off valve unmetered
V2	high / low flow shut-off valve dry hose
V3	high / low flow shut-off valve wet hose
V4	Switching valve wet hose 1 + 2
Lf	Low flow
Hf	High flow
Ai	Air inlet
PS1	Pressure switch
Filter	Filter with water elimination
FS	Frost protection agent
S4	Electrical contact PS
DS1	Annunciater green
(1)	Shut-off valve for umetered delivery, can be peplaced by 51.252089
(2)	connection for speed control of the pump

**Solenoid valves identification:**

Solenoid valve	shut-off valve control (MultiFlow)	
	Standard	extended
SV1	Wet hose	Low flow wet hose
SV2	Dry hose	Low flow dry hose
SV3	-----	High flow wet hose
SV4	Low flow dry hose	High flow dry hose
SV5	Wet hose 2	Wet hoe 2
SV6	Wet hose 1	Wet hose 1
SV7	unmetered	unmetered
SV10	Solenoid valve from external overfill prevention amplifier	
SV20	Optional: Solenoid valve from radio controlled start/stop	

**Valves identification:**

Shut-off valve	Part number
V1,V11	E80-2, DV80-2, DV100-3
V2	LA100, LA100-RK, LA100-M, LA100-RK-M
V3	VAB-80-2, VAB80-2D,GVLB80, GLVB80-D
V4	DKRW, DKRSTp

**3.3 Commissioning**

After switching on the compressed air supply and enabling the counter the shut-off valve at the control head of the hood is to be opened. The associated shut-off valve is also to be opened for a system with supplementary ventilation.

The measured liquid is then to be fed to the system (bottom valve open). The system now vents until the measured liquid is at the upper edge of the gas extractor hood sight glass.

The vent valve then closes, the shut-off valve opens and filling of the measuring chamber, discharge shut-off valve and if appropriate the wet hoses starts. Filling of the measuring chamber must be carried out with a low flow rate (low pump power/ throttle closed).

If there are two wet hoses are then both hoses must be filled before the first measurement.

### 3.4 Calibration

The Type GMVZ 1004 metering system can only be operated with the counter type MultiFlow. Thus Weights and Measures calibration of the metering system is carried out by the counter.

Calibration is carried out by altering the meter factor (sometimes also called K factor). The new meter factor is computed as follows:

$$mf_{new} = \frac{ReadOut\ Proving\ Can}{ReadOut\ Counter} \times mf_{old}$$

Further data can be obtained from the associated manual.

There is a measurement pouch for the calibration thermometer on the cover of the lower monitoring sight-glass of the gas extractor.

Calibration testing must be carried out in accordance with the regulations and/or building and test provisions of the type examination approval. The sealing locations of the GMVZ 1004 metering system are to be taken from the attached sealing plans.



## 4 Operation

### 4.1 Control of the discharge via the counter

The control of the pneumatic shut-off valve is made via the MultiFlow electronic counter. If switching off at an exact litre qty is required then this can be made with the High-Flow/Low-Flow controller. It is possible to choose between two type of overfill preventions in countries where they are compulsory. Either a overfill prevention amplifier with integrated solenoid or switching output can be chosen.

If an overfill prevention amplifier with integrated solenoid is used as an actuator it is to be installed as per circuit diagram 51.252087. When setting up with the MultiFlow solenoids as actuator of the overfill prevention then the pneumatic circuit diagram 51.252088 is to be used. The electrical switching output of the overfill prevention amplifier is connected to the input of the MultiFlow counter for this. The exact connections and nature of the switching output can be found in the MultiFlow handbook. If the discharge is released by the overfill prevention the hose routes selected on the MultiFlow are released

#### 4.1.1 Discharge with overfill prevention

- Making of a hose connection from the selected discharge nozzle of the metering system to the filling nozzles of the customers storage tank concerned.
- Determination of the storage tank capacity
- Switching on of the overfill prevention amplifier and the counter. Making of the line connection from the overfill prevention amplifier to the overfill sensor of the concerned storage tank. Discharge can start after the release lamp on the overfill prevention amplifier lights up.
- Open the foot and distribution valves of the corresponding chamber of the tanker. Switch on the tanker pump if necessary.
- Select the discharge nozzle and enter the capacity of the storage tank as per the operating instructions of the counter. A change of the hose route selected is only possible if the counter display shows zero litres.
- Once the preselection data on the counter are entered then discharge starts when the start button is pressed. During discharge the hose route can non longer be changed.
- The presence of trapped gas in the liquid leads to automatic interruption of the discharge process by the gas extractor. Gas present is vented. Discharge continues automatically if the liquid level is high enough. The flow can be set to the required rate with the throttle on the shut-off valves.
- By pressing the stop button on the counter it is possible to interrupt the discharge at any time. The overfill prevention checks the allowed filling degree of the tank and when reached the discharge is automatically stopped
- The foot and distribution valves of the concerned chamber of the tanker are to be closed and the pump of the tanker switched off.
- The lines between the overfill prevention amplifier and the overfill sensor is to be rolled up. The filling hose is to be removed. With the printout of a voucher the counter is set to zero.
- Switching off the circuit amplifier and the electronic counter.

### 4.1.2 Low flow discharge

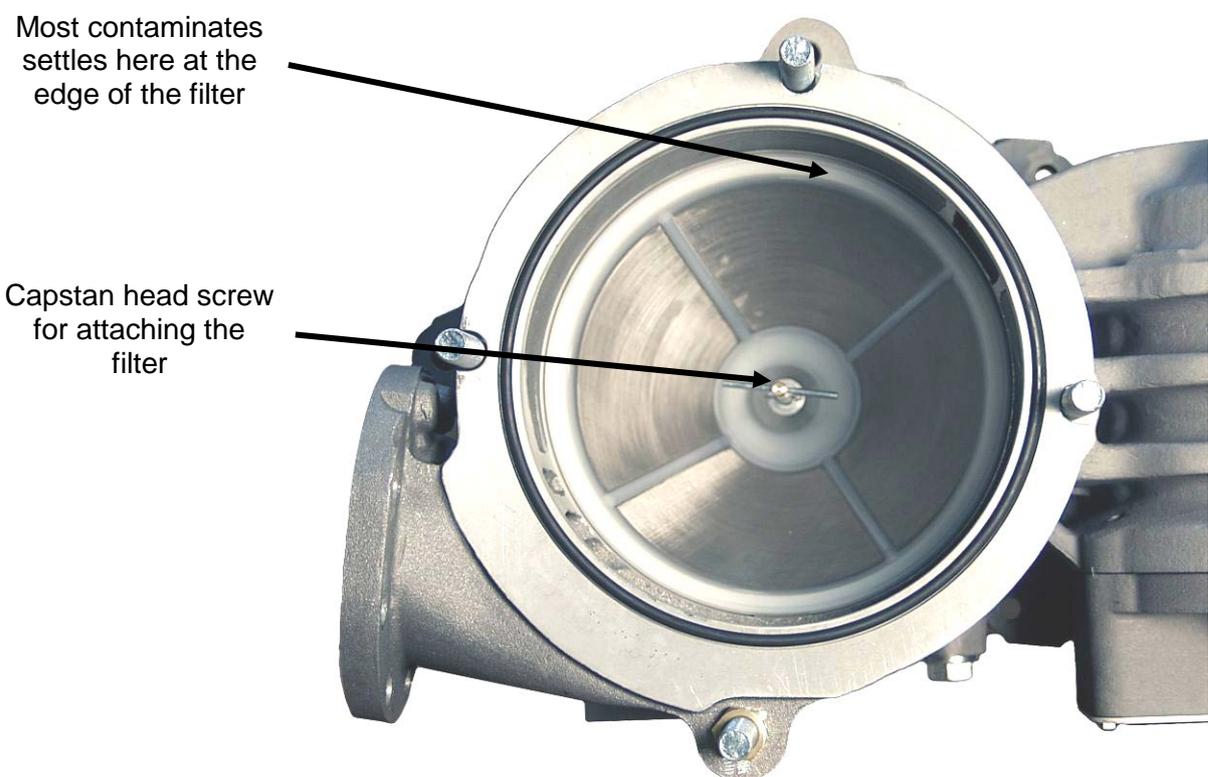
It is only possible to fill tanks with a capacity up to 1000 l or mobile machines without fixed filling nozzles, with heating oil, diesel or petrol, using the low flow valve without overfill prevention (bypass of the overfill prevention). The max flow has to be limited to 200 L/min.

Discharge with nozzles and without overfill prevention using the low flow valve is only possible with the use of the wet hose. You can choose between the two for vehicles with 2 wet hoses.

- Determination of the capacity of the customer tank to be filled.
- Connect self closing nozzle with TW coupling onto the wet hose.
- Enter the preselection data as per the operating instructions of the flow computer
- Open the foot and distribution valves of the corresponding chamber of the tanker. Switch on the tanker pump if necessary.
- Select the corresponding discharge route "B" or "B1" or "B2" on the flow computer and start the discharge.
- The wet hose valve at the end of the hose has to be open and locked in position before filling. The filling process is now controlled by the manually operated nozzle.
- The overfill prevention is not operational and no automatic switching off occurs in case the tank is overfilled. The filling process has to be watched closely.
- Trapped gas in the liquid leads to interruption due to the gas extractor. Discharge continues automatically after venting of the gas extractor.
- The presence of trapped gas in the liquid leads to automatic interruption of the discharge process by the gas extractor. The gas is vented and discharge continues again automatically.
- The nozzle is closed to end the discharge and the stop button on the MultiFlow counter has to be pressed to close the low flow valve.
- Before closing the wet hose valve at the end of the hose, open the nozzle briefly again to relieve the hose. The remainder is filled in the customer tank.
- Before winding up the wet hose remove the nozzle by releasing the TW coupling.
- Close the foot and distribution valves of the corresponding chamber of the tanker. Switch off the tanker pump if necessary.
- The display on the MultiFlow counter is set to zero when a voucher is printed.
- Switch off the circuit amplifier and the MultiFlow counter, and the NoMix system if necessary.

## 5 Maintenance

The filter, which is located before the inlet of the measured liquid into the volume flow meter, is to be cleaned regularly (under normal operation at least once every year, and more frequently for contaminated liquid). Proceed as follows:



- ☞ Dismantle gas extractor hood  
(To do so loosen the five hexagonal bolts)  
Remove impurities from the filter's edge with a brush.



**IMPORTANT:**  
No dirt must pass into the space below the filter.  
Dirt inevitably damages the meter!

- ☞ Remove and clean filter (also loosen the toggle bolt).  
Clean gas extractor hood and housing floor.  
Ensure clean flange surfaces and correct O-ring seating for assembly.
- ✘ When discharging with a pump same can be damaged.



## 6 Trouble shooting

§ The replacement or repair of components of the GMVZ 1004 metering system on road tankers may only be performed by qualified installers. [Qualified installers are defined as companies according to TRbF 180 Chapter no. 1.7.]

Fault	Possible Cause	Measure
No flow	No control air, or air pressure too low	Check compressed air supply
	Pressure switch in gas extractor has not enabled (only for GMV D)	Increase pump pressure / slightly close throttle on shut-off valve
	Solenoid valve defective / electronic device not connected	Check solenoid valve / replace if necessary / check electronic device
	Liquid level in head too low	Check inlet flow
	Vent valve closed	Open vent valve
	Filter in GMV filter pot blocked / dirty	Clean filter (see Maintenance)
	Float of gas extractor defective/ jammed Control head defective	Replace float with control head (always replace both parts together)
	The shut-off valve (V,L or B) does not open	Replace shut-off valve if compressed air present
Flow too low	Rotor of volume meter jammed	Replace measuring chamber Make rotor operable (remove impurities) *)
	Filter in GMV filter pot dirty	Clean filter (see Maintenance)
	Throttle on shut-off valve closed	Open throttle
Output shut-off valve does not open	Pressure upstream of metering system too low (only for pump operation)	Check feed to metering system pump) (pump is drawing air on the suction side)
	No control air or air pressure too low	Check compressed air supply
	Defective shut-off valve insert	Replace appropriate shut-off valve if compressed air present

Fault	Possible Cause	Measure
		*) only by factory-trained qualified installers
Flow switch in elbow joint does not switch	No control air or air pressure too low	Check compressed air supply
	Defective flow switch	Replace elbow if compressed air present
Mineral oil emanates from venting control switch or solenoid valve off	For a shut-off valve the seal leaks to the compressed air side	Determine defective shut-off valve and replace (e.g. connect transparent PA air hose and deliver by pump) *)
Electronic flow computer gives false indication	Erroneous calibration	Recalibration / New calibration (see operating manual)
	Rotor of volume meter is running tight	Replace measuring chamber Make rotor operable (remove impurities) *)
Supplementary vent valve (optional) is not venting	Vent valve closed	Open vent valve
	Defective non-return valve on dry hose connector	Replace non-return valve
Supplementary vent valve (optional): a large quantity of mineral oil is sucked through the hose	Discharge taking place by pump	Close venting valve
	Defective venting valve	Replace supplementary ventilation

Table 2: Trouble shooting

## 7 Technical Data

Nominal size:	DN 100
	Dry hose: DN 100
	Wet hose: DN 100
Materials:	Housing: Aluminium
	Rotor: Grey cast iron
	also glass, POM, Viton, NBR, brass, high-grade steel
Weight:	approx. 70-80kg
Rated pressure:	10 bar (PN 10)
Pneumatics:	Working pressure $p = 3 - 7.5$ bar (45 to 110 psi)
Rated flow:	1000 l/min
Minimum flow:	100 l/min
Smallest discharge quantity:	200 litres
Meter accuracy:	$\pm 0,15\%$ rel.
Measuring chamber volume:	3,437 litres
Discharge temperature:	-10°C to +50°C (Measured liquid temperature)
Measured liquid:	Mineral oils and mineral oil products with a viscosity
	$\eta < 1$ mPa•s to 20 mPa•s
Connection dimensions:	see appendix drawing number E61.250611
Licenses:	<u>PTB</u>
	Gas extractor: License number 5.154 / 92.04
	Positive displacement meter: License number 5.243 / 97.43
	<u>TÜV-Nord</u>
	Overfill prevention device: Certificate from 17.08.1999 / 2543 ru

**Table 3: Technical Data**



## 8 Warranty and Service

**In addition to the dealer's legal warranty in the purchase agreement** we grant the end user a warranty for this device on the following conditions:

1. The warranty period is twelve months and starts at the time of delivery of the device by F. A. Sening. With electronic products the registration form must have been received at Sening fully completed and signed by the installation department.
2. The warranty includes the rectification of all device damage or defects occurring within the warranty period and which can be shown to be due to material or production faults.

The warranty does not include:

- slight deviations from the intended quality which are insignificant for the value or usefulness of the device,
  - damage or defects due to connection other than as specified, improper handling or non-observance of the installation guidelines and instructions for use,
  - damage caused by the chemical and electrochemical effects of water or other liquids, electrical or electromagnetic influences and or caused by abnormal ambient conditions in general,
  - damage due to external effects such as damage in shipment, damage due to shock or impact, the effects of the weather or other natural phenomena.
3. The right to claim under warranty becomes invalid if repairs or tampering have been carried out by persons not authorised by us for the work or if our devices have been fitted with supplementary parts or accessories which are not suitable for our devices and not released by us for that purpose.
  4. The warranty service is carried out, free of charge and according to our choice, by repairing defective parts or replacing them by perfect parts. Replaced parts become our property.
  5. During the first six months of the warranty period the warranty service is carried out without billing. Thereafter, travelling times, travelling costs and working time for the service staff and any transport costs occurred are billed or not reimbursed.
  6. Work under warranty does not imply any extension of the warranty period nor does it initiate a further period of warranty. The warranty period for installed replacement parts terminates with the end of the warranty period for the complete device.
  7. Any more extensive or additional claims, in particular those for compensation of damages or consequential damages occurred outside of the device are expressly excluded, provided no liability is deemed mandatory in law.



## 9 Address and Contact

### Important Note

All explanations and technical details given in this documentation have been produced and edited by the author with the greatest care. However the possibility of errors cannot be completely eliminated. We would be very grateful for the notification of any errors found.

Our service department would be pleased to advise and help you.  
They can be reached under:

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## **Measurement Solutions**

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Web: [www.fmctechnologies.com/measurementsolutions](http://www.fmctechnologies.com/measurementsolutions)



# 10 Keyword Index

<b>A</b>	<b>G</b>	<b>S</b>
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### Sealing Arrangement

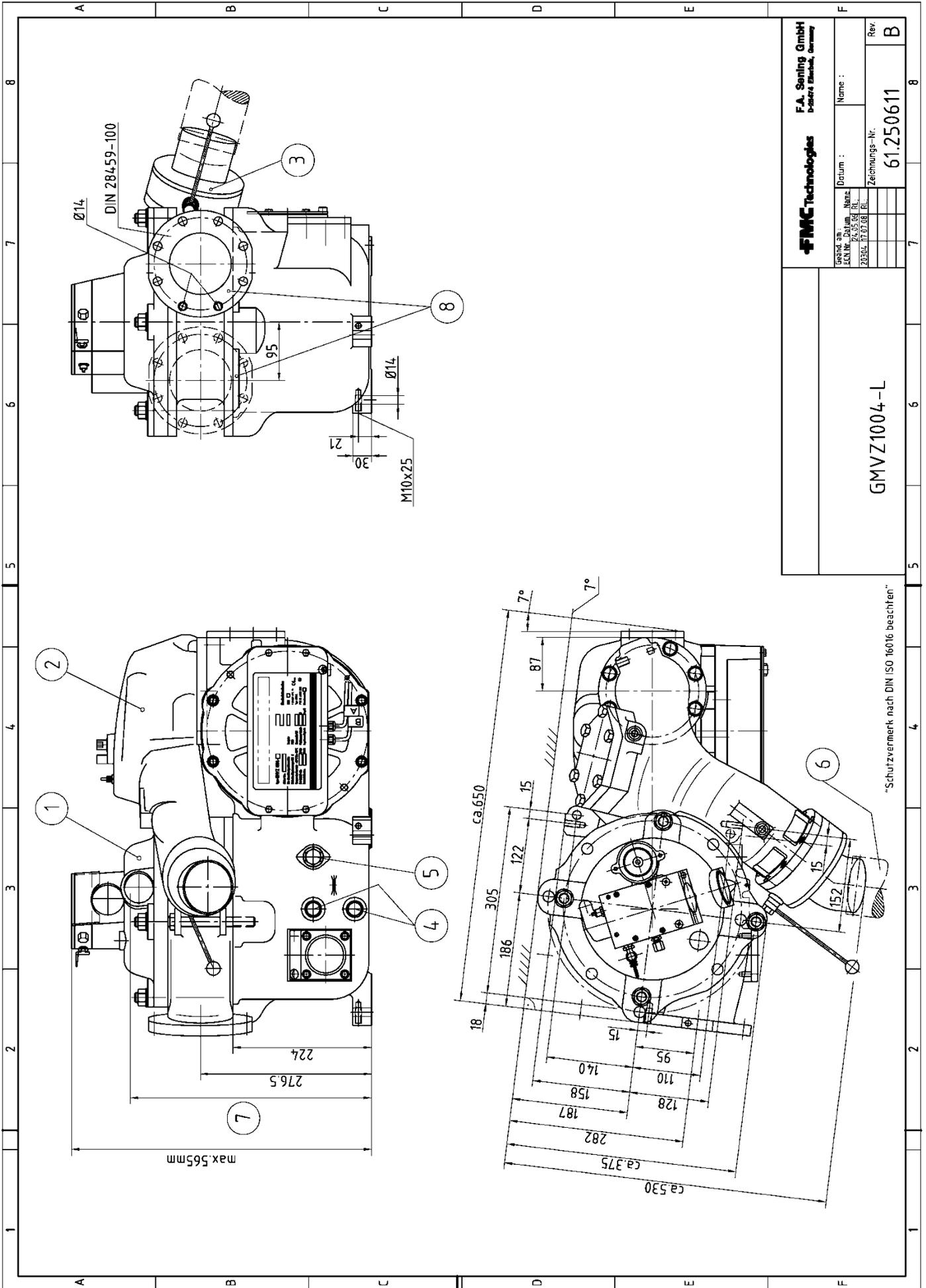
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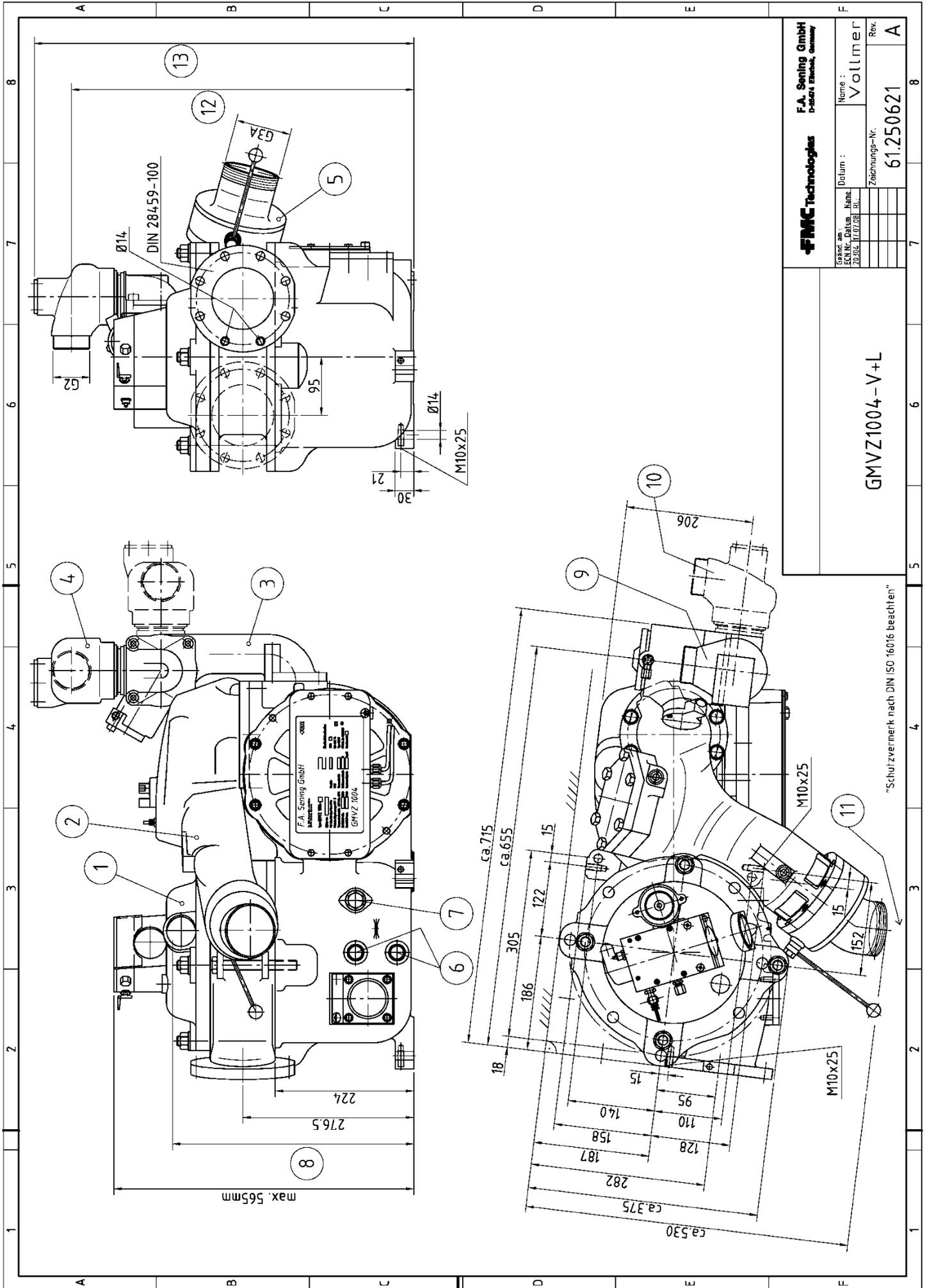
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D-52074 Esch, Germany

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				61.250611		B	

GMVZ1004-L

"Schutzvermerk nach DIN ISO 16016 beachten"

8	variable Inlet flange		
7	Dk-Switch-on level approx. 380mm		
	VK-Switch-on level approx. 390mm		
6	installation space for MK- with VB-coupling DIN28450 DN80		
5	locking screw G3/4		
4	locking screw G1/2		
3	outlet connector with throttle DN100	1	LA-Do/3"
2	dry hose	1	LA100-RK
	dry hose	1	LA100
1	hood with supplementary ventilation and pressure switch	1	FHpE-D
	Hood with supplementary ventilation	1	FHpE
	Hood with pressure switch	1	FHp-D
	Hood	1	FHp
<b>Pos.</b>	<b>description</b>	<b>piece</b>	<b>Part-No.</b>



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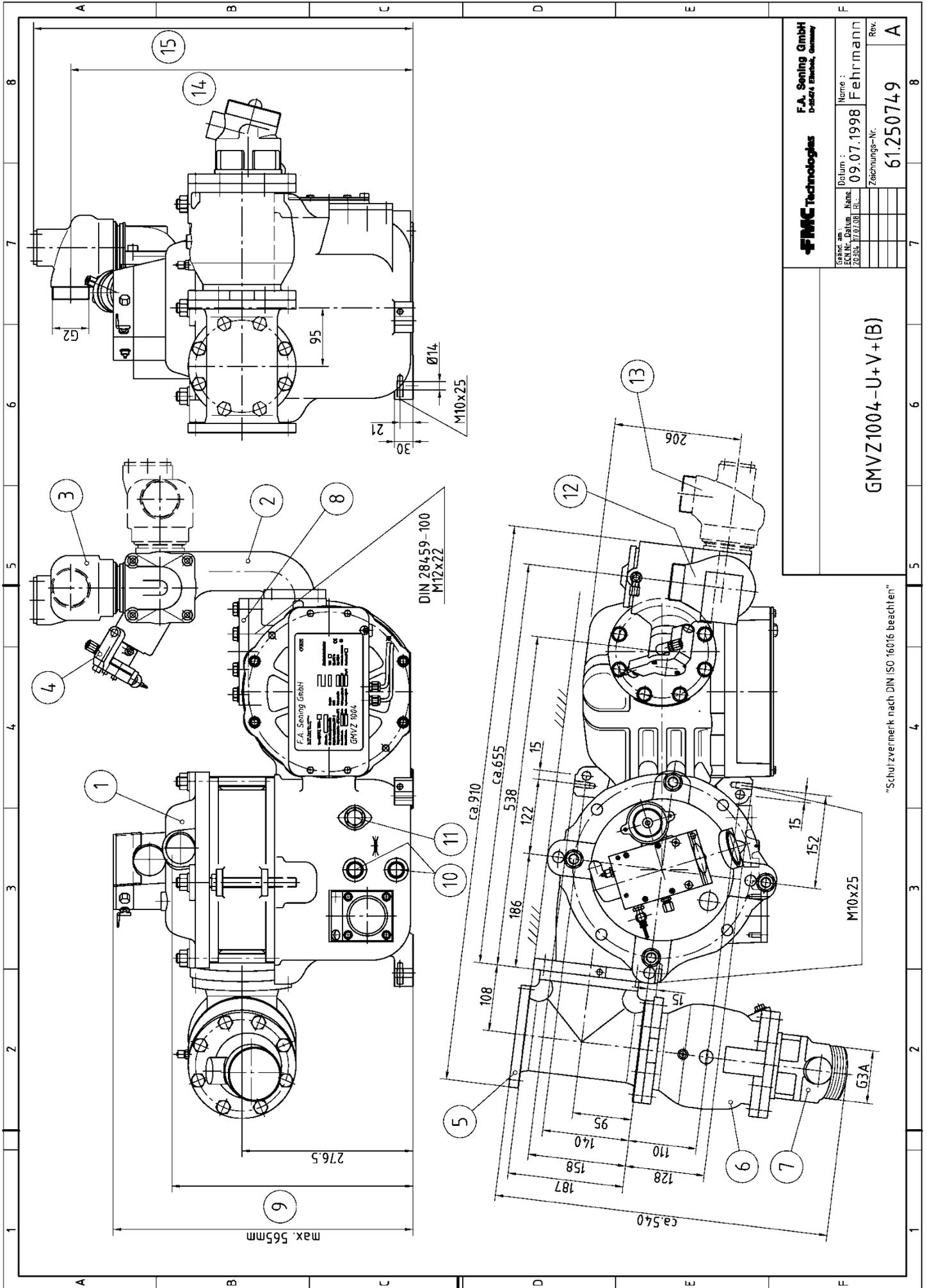
GMVZ1004-V+L

"Schutzvermerk nach DIN ISO 16016 beachten"

13	Approx. 610 with elbow KR3-St		
	Approx. 660 with dual elbow		
12	Center G2 approx. 545		
11	installation space for MK- with VB-coupling DIN28450 DN80		
10	another assembly for the elbow (360° turnable round the center-line)		
9	360° turnable round the vertical axis		
8	Dk-Switch-on level approx. 380mm		
	VK-Switch-on level approx. 390mm		
7	locking screw G3/4		
6	locking screw G1/2		
5	outlet connector with throttle	1	LA-Do/3"
4	dual hose outlet nozzle with pneumatic control valve	1	DKRSTp
	Elbow with valve gear	1	KR-3-ST
3	wet hose with by-pass and throttle	1	VAB 80-2D
	wet hose with by-pass	1	VAB 80-2
	wet hose with throttle	1	VA 80-2D
	wet hose	1	VA 80-2
2	dry hose	1	LA100-RK
1	hood with supplementary ventilation and pressure switch	1	FHpE-D
	Hood with supplementary ventilation	1	FHpE
	Hood with pressure switch	1	FHp-D
	Hood	1	FHp
<b>Pos.</b>	<b>description</b>	<b>piece</b>	<b>Part-No.</b>



17	Center G2 approx. 605		
16	installation space for MK- with VB-coupling DIN28450 DN80		
15	Approx. 60° turnable round the vertical axis		
14	center of rotation		
13	Dk-Switch-on level approx. 380mm		
	VK-Switch-on level approx. 390mm		
12	another assembly for the elbow (360° turnable round the center-line)		
11	locking screw G3/4		
10	locking screw G1/2		
9			
8			
7			
6			
5	outlet connector with throttle	1	LA-Do/3"
4	dual hose outlet nozzle with pneumatic control valve	1	DKRSTp
	extension (piece)	1	22821
3	wet hose with by-pass and throttle	1	VAB 80-2D
	wet hose with by-pass	1	VAB 80-2
	wet hose with throttle	1	VA 80-2D
	wet hose	1	VA 80-2
2	dry hose	1	LA100-RK
1	hood with supplementary ventilation and pressure switch	1	FHpE-D
	Hood with supplementary ventilation	1	FHpE
	Hood with pressure switch	1	FHp-D
	Hood	1	FHp
<b>Pos.</b>	<b>description</b>	<b>piece</b>	<b>Part-No.</b>

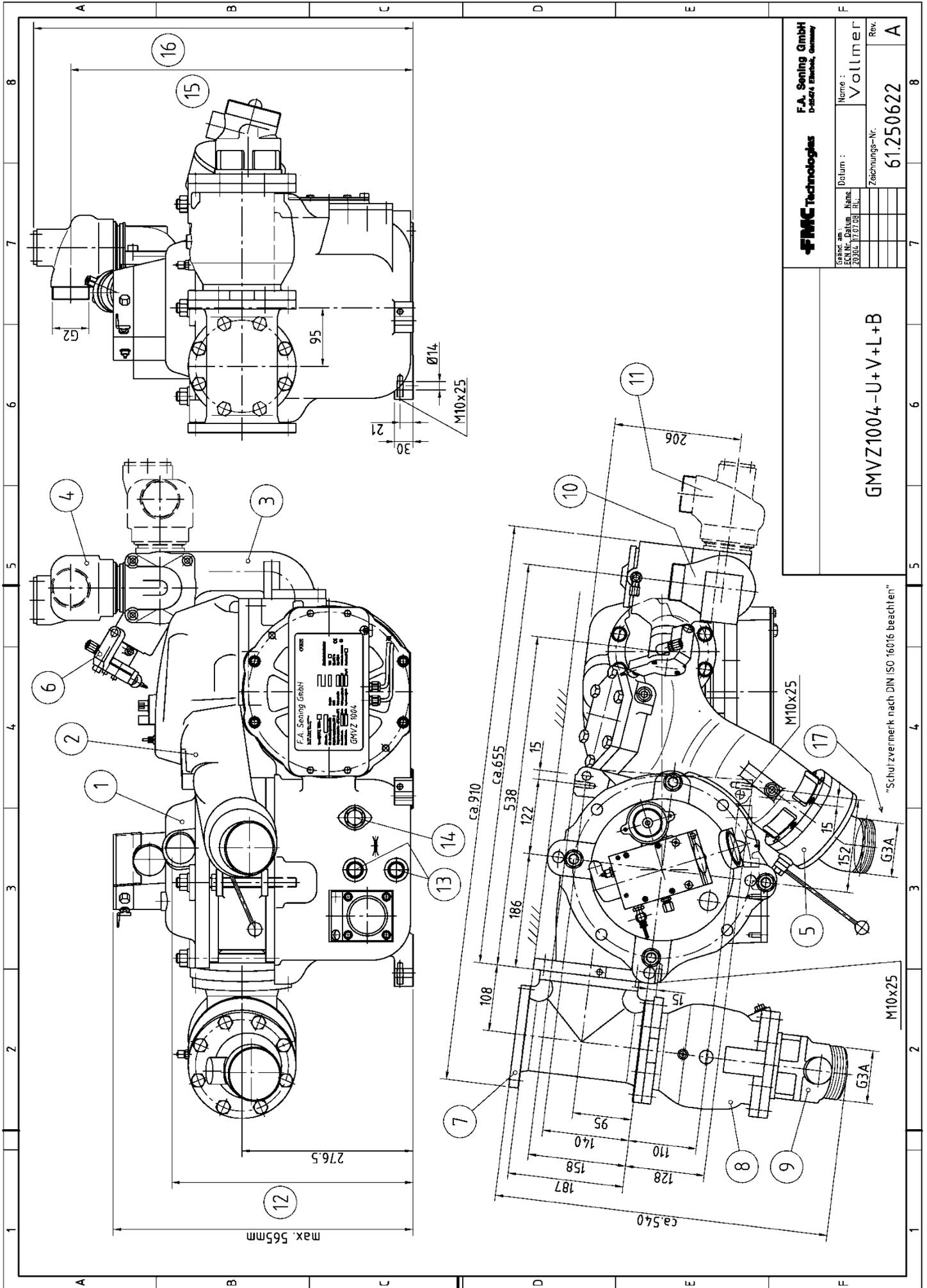


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Z0-B04:	17.07.08:		
		Zeichnungs-Nr.:	61.250749
		Rev.:	A

GMVZ1004-U+V+(B)

"Schulzvermerk nach DIN ISO 16016 beachten!"

15	Approx. 610 with elbow KR3-St		
	Approx. 660 with dual elbow		
14	Center G2 approx. 545		
13	another assembly for the elbow (360° turnable round the center-line)		
12	360° turnable round the vertical axis		
11	locking screw G3/4		
10	locking screw G1/2		
9	Dk-Switch-on level approx. 380mm		
	VK-Switch-on level approx. 390mm		
8	TW- blank cover	1	5300018
7	Sight glass - outlet connector	1	SGA 100/3“
6	pneumatic line valve	1	DV 100-3
5	T-piece	1	RO102
4	Low flow (by-pass valve)	1	B200-2
	dual hose outlet nozzle with pneumatic control valve	1	DKRSTp
3	Elbow with valve gear	1	KR-3-ST
	wet hose with by-pass and throttle	1	VAB 80-2D
2	wet hose with by-pass	1	VAB 80-2
	wet hose with throttle	1	VA 80-2D
	wet hose	1	VA 80-2
	hood with supplementary ventilation and pressure switch	1	FHpE-D
1	Hood with supplementary ventilation	1	FHpE
	Hood with pressure switch	1	FHp-D
	Hood	1	FHp
<b>Pos.</b>	<b>description</b>	<b>piece</b>	<b>Part-No.</b>



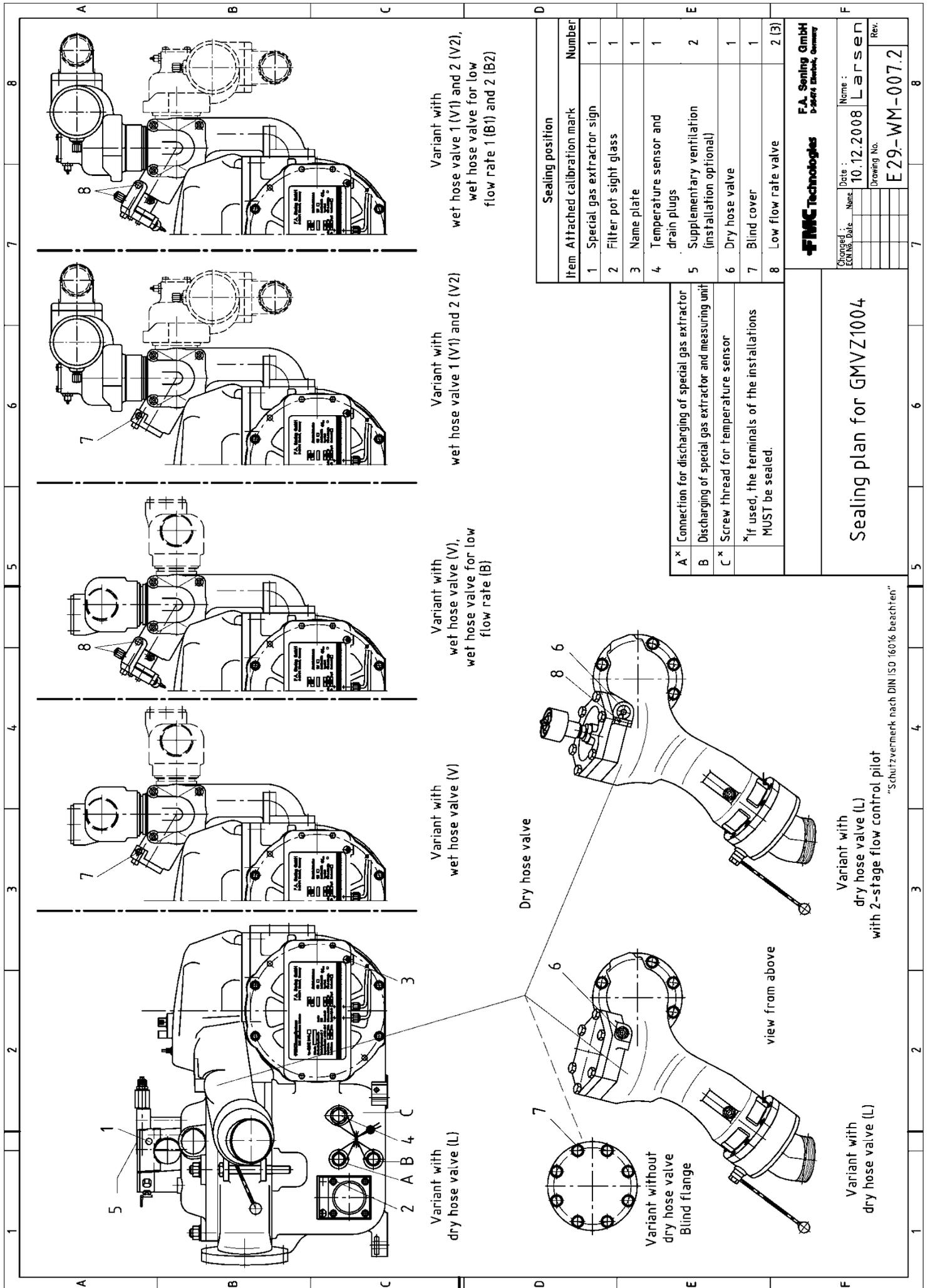
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**F.A. Sening GmbH**  
 Industriestraße, Germany

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ECON Nr.:	20.06.17.07.09	Vollmer	A
Zählungs-Nr.:	61.250622		

GMVZ1004-U+V+L+B

"Schutzvermerk nach DIN ISO 16016 beachten"

17	installation space for MK- with VB-coupling DIN28450 DN80		
16	Approx. 610 with elbow KR3-St		
	Approx. 660 with dual elbow		
15	Center G2 approx. 545		
14	locking screw G3/4		
13	locking screw G1/2		
12	Dk-Switch-on level approx. 380mm		
	VK-Switch-on level approx. 390mm		
11	another assembly for the elbow (360° turnable round the center-line)		
10	360° turnable round the vertical axis		
9	Sight glass - outlet connector	1	SGA 100/3"
8	pneumatic line valve	1	DV 100-3
7	T-piece	1	RO102
6	Low flow (by-pass valve)	1	B200-2
5	outlet connector with throttle	1	LA-Do/3"
4	dual hose outlet nozzle with pneumatic control valve	1	DKRSTp
	Elbow with valve gear	1	KR-3-ST
3	wet hose with by-pass and throttle	1	VAB 80-2D
	wet hose with by-pass	1	VAB 80-2
	wet hose with throttle	1	VA 80-2D
	wet hose	1	VA 80-2
2	dry hose	1	LA100-RK
1	hood with supplementary ventilation and pressure switch	1	FHpE-D
	Hood with supplementary ventilation	1	FHpE
	Hood with pressure switch	1	FHp-D
	Hood	1	FHp
<b>Pos.</b>	<b>description</b>	<b>piece</b>	<b>Part-No.</b>



Variant with  
wet hose valve 1 (V1) and 2 (V2),  
wet hose valve for low  
flow rate 1 (B1) and 2 (B2)

Variant with  
wet hose valve 1 (V1) and 2 (V2)

Variant with  
wet hose valve (V),  
wet hose valve for low  
flow rate (B)

Variant with  
wet hose valve (V)

Variant with  
dry hose valve (L)

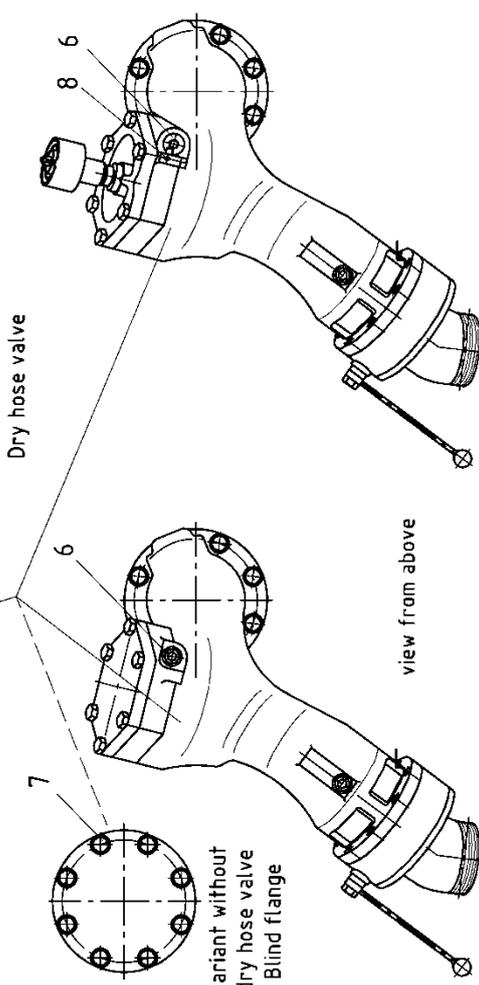
Sealing position	
Item	Number
1 Special gas extractor sign	1
2 Filter pot sight glass	1
3 Name plate	1
4 Temperature sensor and drain plugs	1
5 Supplementary ventilation (installation optional)	2
6 Dry hose valve	1
7 Blind cover	1
8 Low flow rate valve	2 (3)

A x Connection for discharging of special gas extractor  
 B Discharging of special gas extractor and measuring unit  
 C x Screw thread for temperature sensor  
 x if used, the terminals of the installations MUST be sealed.

Sealing plan for GMVZ1004

**FMC Technologies**  
 F.A. Seuling GmbH  
 D-34471 Bielefeld, Germany

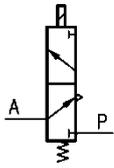
Changed by:	Date:	Name:
LEGN	10.12.2008	Larsen
Drawing No.:	E29-WM-007.2	
Rev.:		



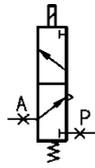
Variant with  
dry hose valve (L)  
with 2-stage flow control pilot

Variant with  
dry hose valve (L)

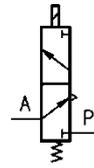
"Schutzvermerk nach DIN ISO 16016 beachten"



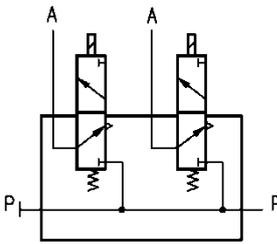
MVS1-E11-12



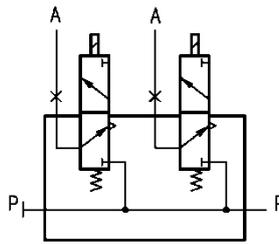
MVS1-E11-122  
MVS1-E11-262



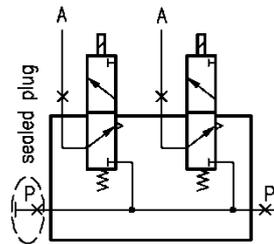
MVS1-S11-12K  
MVS1-S11-24K



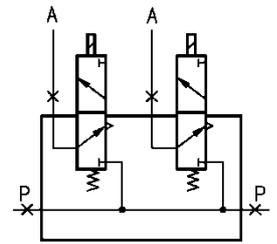
MVS2-E12-12



MVS2-E12-122



MVS2-E12-123  
MVS2-E12-263



MVS2-E12-124  
MVS2-E12-264

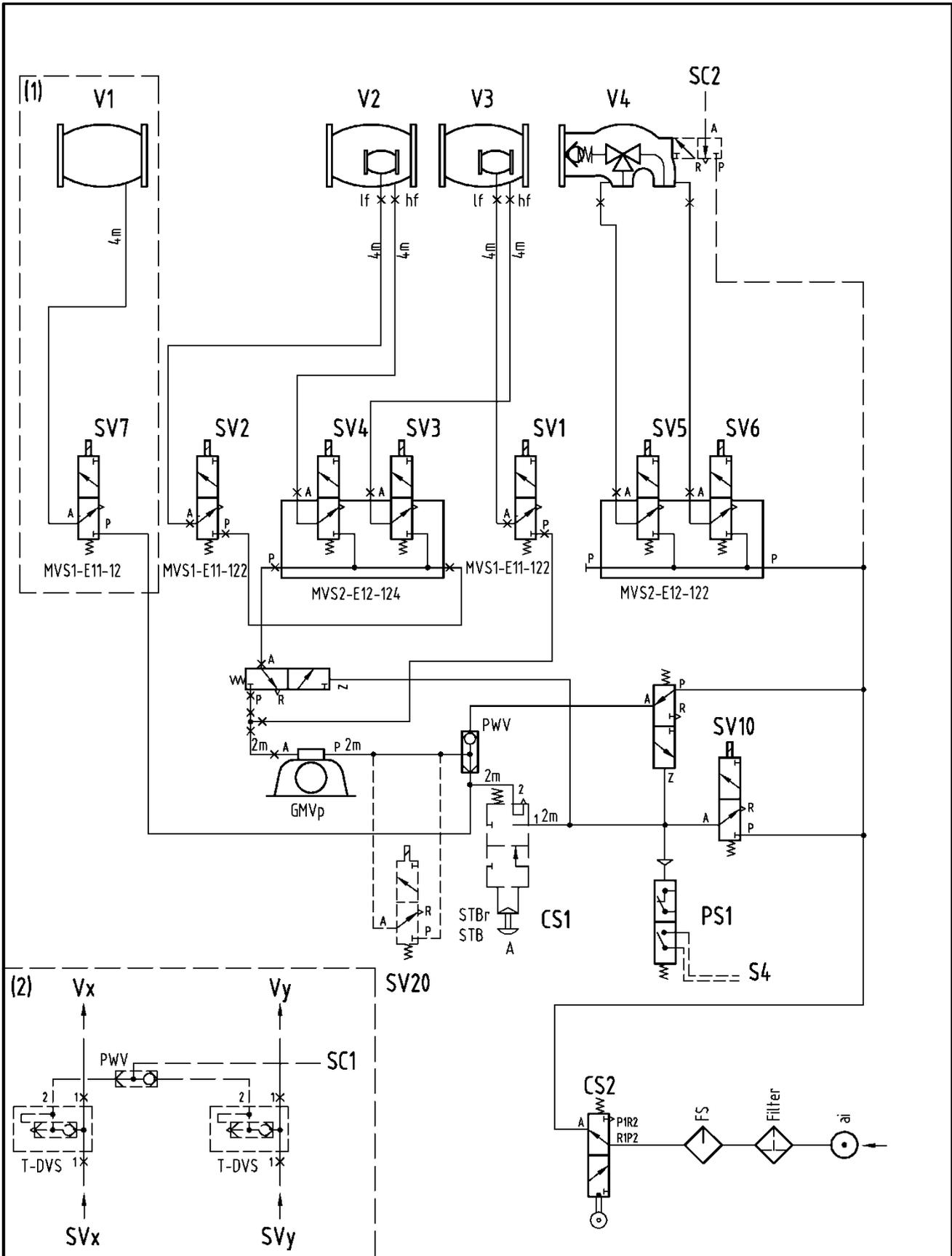
without  
 with  
 Swirlling screw-fitting (e.g. Ermeto)

MVxx-xxx-xxx

- ↑ Optional: Number of swirlling screw-fittings (e.g. Ermeto)  
K = no screw fitting
- ↑ Solenoid voltage 26 = 26 Volt      24 = 24 Volt  
12 = 12 Volt  
06 = 6 Volt
- ↑ Number of air outputs
- ↑ Number of air inputs
- ↑ Explosion protection (E=EX; S=Standard)
- ↑ Number of solenoid valves
- ↑ S = Standard (without manual operation)  
N = Emergency operation (with manual operation)

"Schutzvermerk nach DIN 34 beachten"

<h2>Solenoid valves</h2> <h3>Connection diagrams &amp; Order codes</h3>		<b>FMC EnergySystems</b> <small>FMC Measurement Solutions</small>		<b>F.A. Sening GmbH</b> <small>D-25474 Ellerbek, Germany</small>	
		Changed : 28.09.04 NB;	Date : 27.07.2004	Name : H. Oelting	
		Drawing No. <b>E51.351740</b>			



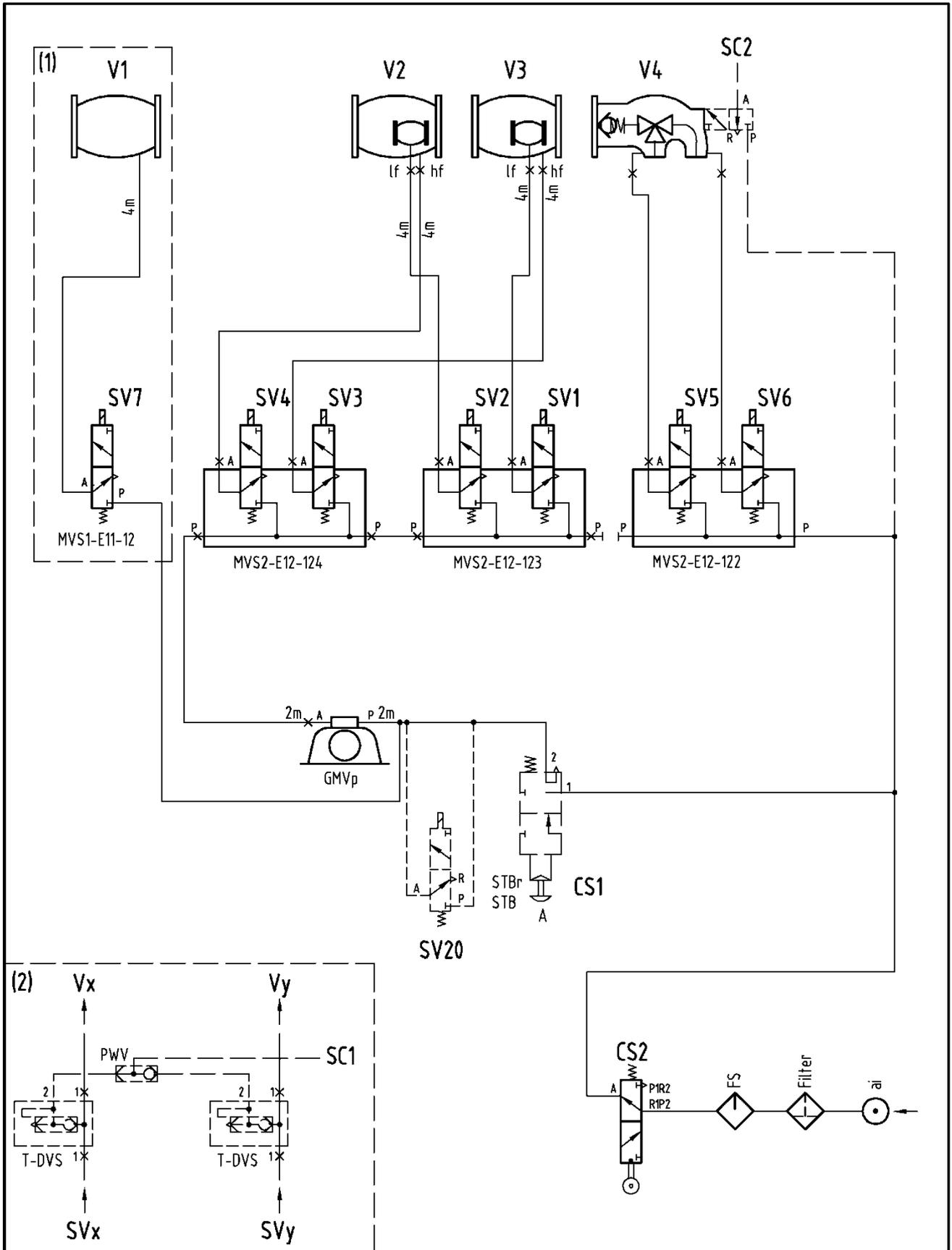
"Schutzvermerk nach DIN ISO 16016 beachten"

Pneumatic diagram  
Metering system control  
with external overfill amplifier

**FMC Technologies**

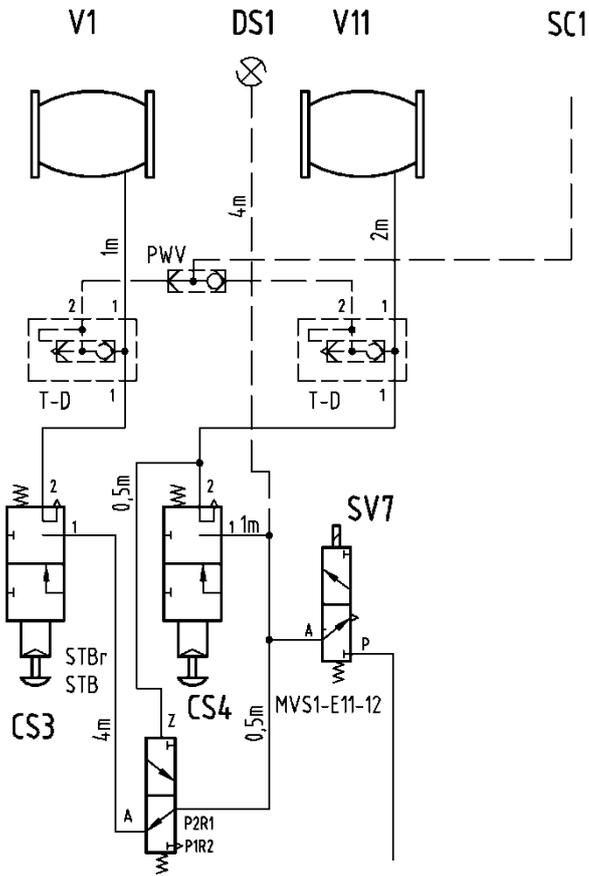
**F.A. Sening GmbH**  
D-25474 Eilerbek, Germany

Geänd. am :	Datum :	Name :
ECN Nr. Datum Name	20.06.2008	Larsen
	Zeichnungs-Nr.	Rev.
	E51.252087	



"Schutzvermerk nach DIN ISO 16016 beachten"

<p><b>Pneumatic diagram</b> Metering system control without overfill amplifier or integrated overfill amplifier</p>	<p><b>FMC Technologies</b>      <b>F.A. Sening GmbH</b> D-28474 Eilerbek, Germany</p>	
	<p>Geänd. am : ECN Nr. Datum Name</p>	<p>Datum : <b>20.06.2008</b></p>
		<p>Zeichnungs-Nr. <b>E 51.252088</b></p>
		<p>Rev.</p>



"Schutzvermerk nach DIN ISO 16016 beachten"

Pneumatic diagram  
unmetered with 2 outlets

**FMC Technologies**

**F.A. Sening GmbH**  
D-25474 Eilerbek, Germany

Geänd. am :	ECN Nr.	Datum	Name

Datum :  
20.06.2008

Name :  
Larsen

Zeichnungs-Nr.  
E51.252089

Rev.

# EG - Konformitätserklärung

## EC - Declaration of Conformity

im Sinne der EG-Richtlinie über explosionsgeschützte Geräte  
nach 94/9/EG (ATEX)  
*as defined by non-electrical explosion protected Equipment Directive 94/9/EC*

Der Hersteller / *The Manufacturer*

**Smith Meter GmbH, Regentstraße 1, D-25474 Ellerbek**

erklärt hiermit, dass das (die) explosionsgeschützte(n) Gerät(e)  
*herewith we declare, that the explosion protected Equipment*

Produktbezeichnung: <i>Product:</i>	Zündschutzart: <i>Type of protection:</i>	EG – Baumusterbescheinigung* <i>EC – Type Test Approval</i>
Device: PMHS-AB-2 Type: SG3/45	 II 2 G EEx d IIC T4	PTB 03 ATEX 1032
Device: Magnetic Switch Type: SG5/43 – MS 1	 II 2 G EEx d IIC T4	
Device: THS-J / -O Type: SG2AL	 II 2 G EEx d IIC T4	
Device: PT100 Type: PT100SG4/43 -...	 II 2 G EEx d IIC T4	

*einschließlich aller Ergänzungen / including all supplements*

in der gelieferten Ausführung den folgenden Sicherheitsanforderungen entspricht (entsprechen):  
*Corresponds to following safety requirements in the delivered implementation:*

Grundlegende Normen / CENELEC: ..... EN 50 014: 1997 + A1 + A2, EN 50 018: 2000  
*Basic norms:*

Angewandte harmonisierte Normen, insbesondere: .....  
*Applied harmonized standards, in particular:*

Andere angewandte Bestimmungen / EG-Richtlinien: .....  
*Other applied appointments / EC-Directives:*

Benannte Stelle / Produktionsüberwachung: ..... Physikalisch-Technische Bundesanstalt  
*Notified Body Production control* PTB 99 ATEX Q001; CE 0102

Prüfungen/Überwachung/Kontrollen während der Fertigung: ..... Hersteller  
*Examination/inspection/tests during manufacturing:* *Manufacturer*

Die zugehörige Betriebsanleitung enthält wichtige sicherheitstechnische Hinweise und Vorschriften für die  
Aufstellung, Inbetriebnahme, Wartung und Instandhaltung der (s) Gerät(es).  
*The appropriate operator's manual contains important safety technical notes and regulations for the installation, placing into  
operation, maintenance and maintenance of the equipment.*

Ort und Datum: Ellerbek, den 30.11.2005  
*Location and date*

Geschäftsführer  
*General Manager*



(H. Short)





The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

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