



Fig. 160530000

Operating manual

# Transshipment Terminals (Large Tank Installations) TS 1000

Item-No.: 160 500 000, 160 510 000, 160 520 000, 160 530 000,  
160 600 000, 160 610 000, 160 620 000, 160 630 000,  
160 640 000, 160 650 000

Translation of the  
original operating manual

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## **Important!**

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**The operating manual is always to be read before commissioning the equipment. No warranty claim will be granted for faults and damage to the equipment arising from insufficient knowledge of the operating manual.**

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### **Service Hotline      +49 1805 900 301**

(0,14 €/Min: on the German landline network, Mobile telephone max. 0,42 €/Min.)

**service@tecalemi.de**

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|-----------------------------|--------------------|
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## 1 Safety instructions

The device is a state of the art piece of equipment and has been constructed according to recognised safety specifications. It is nevertheless possible that use of the device will present hazards to the operator or to third parties, or may damage the device or other property. It is therefore essential to act in accordance with these safety instructions, and in particular with those sections identified as warnings.

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### Warning notices and symbols

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In the operating manual, the following signs are used for highlighting important information.



**Special information for economical use of the equipment.**



**Special information or "dos and don'ts" for damage prevention.**



**Information or "dos and don'ts" for the prevention of damage to persons or equipment.**

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### Intended use

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The device may only be used if it is in perfect condition, and then only for its intended purpose, in compliance with all safety regulations, with an awareness of the potential risks, and according to the operating manual. Any faults that may impair the safety must be rectified immediately.



The device and its components are only to be used for handling the liquids listed and the purpose described. Using the machine for any other purpose would constitute inappropriate use. The manufacturer is not responsible for any loss arising as a result of this, the risk for this is borne only by the operating company.

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### Organisational measures

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This operating manual should always be kept readily available at the site of operation! Each person concerned with the assembly, commissioning, maintenance and operation of the equipment must have read and understood the entire operating manual. It is essential that the type plate and the warning notices attached to the device are observed, and are maintained in a fully readable condition.

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### Qualified personnel

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The operating, maintenance and assembly personnel must be appropriately qualified for their work. The areas of responsibility, competences and supervision of the personnel must be precisely regulated by the operating company. If the personnel do not have the required knowledge, they must be trained and instructed. The operating company must also ensure that the contents of the operating manual are properly understood by the personnel.

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### Waters protection

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The device has been designed to handle water hazardous substances. The regulations on the operating place (e.g. Water Resources Act WHG, = ordinance on installations for handling of substances hazardous to water VAWS) must be adhered to.



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## Hydraulics

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Only persons with special knowledge and experience with hydraulic systems may carry out work on hydraulic parts and equipment. All lines, hoses and screw joints should regularly be checked for leaks and visible external damage. Any damage must be rectified immediately. Any oil spurting out can cause injuries and fire.

The relevant safety regulations for the product must be followed when handling oils, greases or other chemical substances!

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## Maintenance and Service

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According to the regulations of the water resources law only authorized services may work on devices for flammable and/or water endangering substances. During such works, appropriate tools are to be used (avoid sparking). Before any kind of work on the device, all fuel lines are to be completely emptied and aerated.

Do not make any changes. Modifications or additions to the device which may affect the safety cannot be carried out without consent of the manufacturer. Exclusively genuine spare parts made by the manufacturer may be used.

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## Electric power

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Work on the electrical equipment may only be carried out by a qualified electrician or by trained persons under the guidance and supervision of a qualified electrician according to electro-technical guidelines. Machine or system components, on which inspection, maintenance or repair work is to be carried out must be de-energised.

## 2 General information

### 2.1 Description / Intended use



**The circulating pump is suitable only for pumping heating and diesel oils from the hazard class AIII and RME.**

Additional media on request.



**The temperature range of the pumping fluid may not exceed +35°C or fall below -10°C.**



**Motor and switches are not explosion-proof.**



**Operation with fuels from the hazard classes AI, AII and B can cause explosions.**



**The circulating pump must not be operated in potentially explosive atmospheres.**

(Explosion-protected version can be supplied)

### 2.2 Product versions

| Item No.    | Type        |  | Item No.    | Type        |
|-------------|-------------|--|-------------|-------------|
| 160 500 000 | TS 1000/D1  |  | 160 600 000 | TS 1000/B1  |
| 160 510 000 | TS 1000/D2  |  | 160 610 000 | TS 1000/B2  |
| 160 520 000 | TS 1000/D1e |  | 160 620 000 | TS 1000/B1e |
| 160 530 000 | TS 1000/D2e |  | 160 630 000 | TS 1000/B2e |
| 160 640 000 | TS 1000/P1  |  | 160 650 000 | TS 1000/P1e |

#### 2.2.1 Explanation of Type Designation

TS = Tank installation with cabinet

1000 = Feed rate

D = Medium (D Diesel, B Biodiesel, P Vegetable Oil)

1 = Pump

2 = 2 Pumps

E = Delivery that can be calibrated

S = Hose assembly (for small and large scale delivery)

Z = Swinging delivery mast

ZV = Swinging delivery mast (full hose)

ST = Stand pipe

Exact identification is determined by the type plate located in the delivery cabinet.

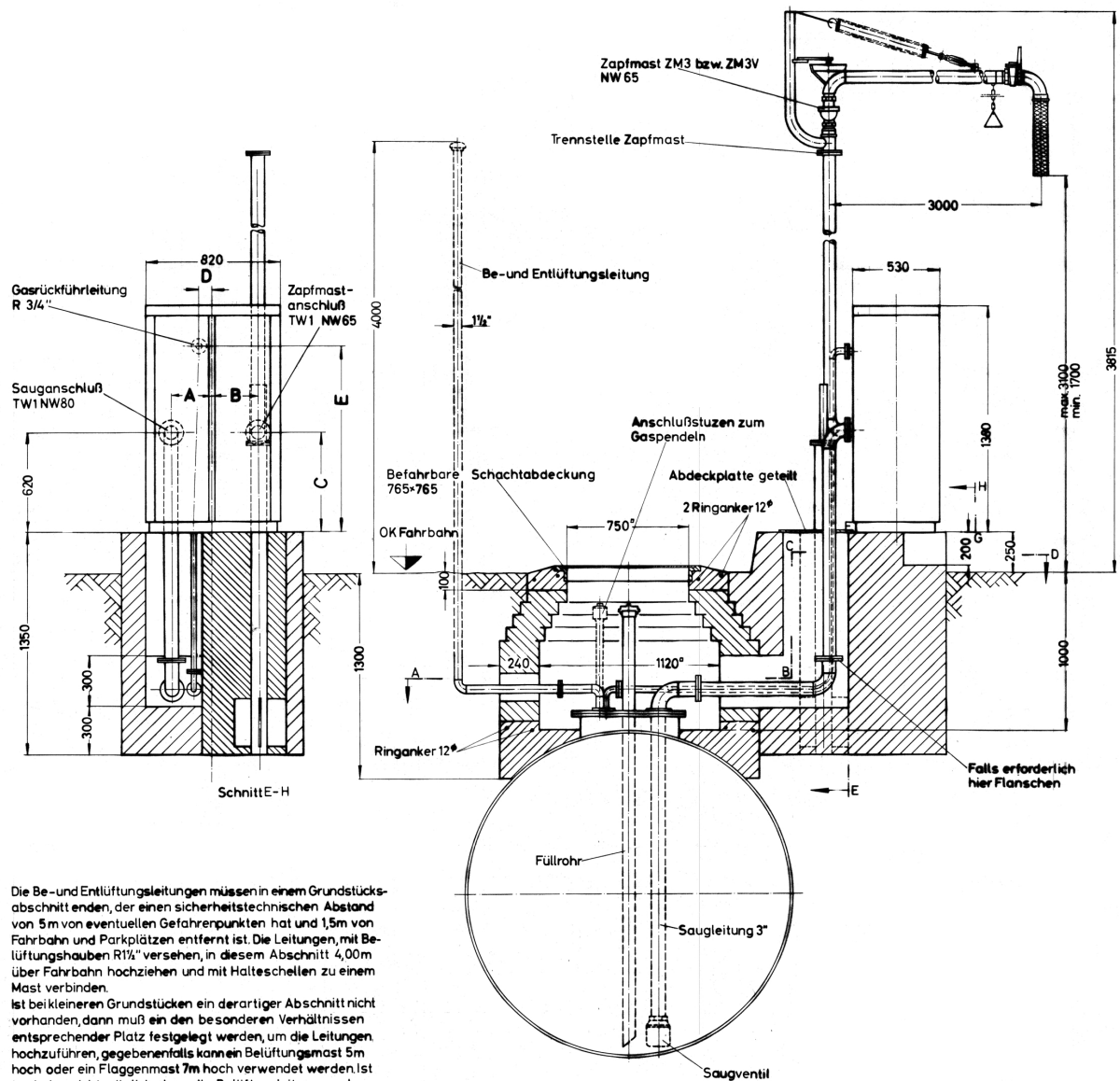
## 2.3 Technical data

|                          |            |                         |               |
|--------------------------|------------|-------------------------|---------------|
| Suction connection       | DN 100     | Protection class        | IP 44         |
| Pressure connection      | DN 80      | max. pressure           | 3,2 bar       |
| max. suction height.     | 4,5m       | max. operating pressure | 10 bar (PN10) |
| max. suction line length | 30m        | Power                   | 5,5 kW        |
| Pumping capacity         | 1000 l/min | Voltage                 | 400V          |

## 3 Installation instructions

1. Before starting installation, the large tank installation must be checked for completeness based on the delivery note.
2. In the case of underground installation, the installation should be placed on the pre-prepared foundations or plinth and fixed in position using anchor bolts or M 12 hexagonal head bolts.  
In the case of above-ground storage, proceed as appropriate or, depending on the design of tank, the installation can be mounted in accordance with the following sketches.
3. The connection sizes for the corresponding suction and pressure connections, the gas return pipe and cabinet mounting can also be taken from the drawings.

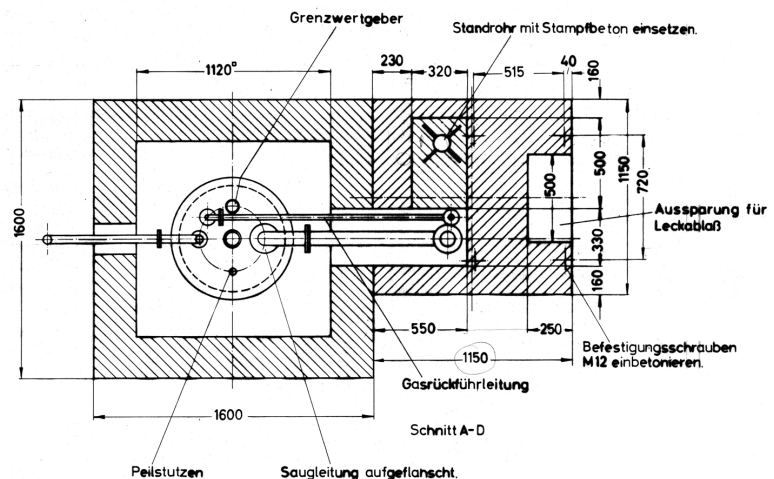
### 3.1 Foundation Drawing



Die Be- und Entlüftungsleitungen müssen in einem Grundstücksabschnitt enden, der einen sicherheitstechnischen Abstand von 5m von eventuellen Gefahrenpunkten hat und 1,5m von Fahrbahn und Parkplätzen entfernt ist. Die Leitungen, mit Belüftungshauben R1½" versehen, in diesem Abschnitt 4,00m über Fahrbahn hochziehen und mit Halteschellen zu einem Mast verbinden.  
Ist bei kleineren Grundstücken ein derartiger Abschnitt nicht vorhanden, dann muß ein den besonderen Verhältnissen entsprechender Platz festgelegt werden, um die Leitungen hochzuführen, gegebenenfalls kann ein Belüftungsmast 5m hoch oder ein Flaggenmast 7m hoch verwendet werden. Ist auch das nicht möglich, dann die Belüftungsleitung an den sicherheitstechnisch günstigsten Ort führen und Gaspdelt für die Befüllung vorschreiben. Anordnung des Hinweisschildes am Füllrohr.

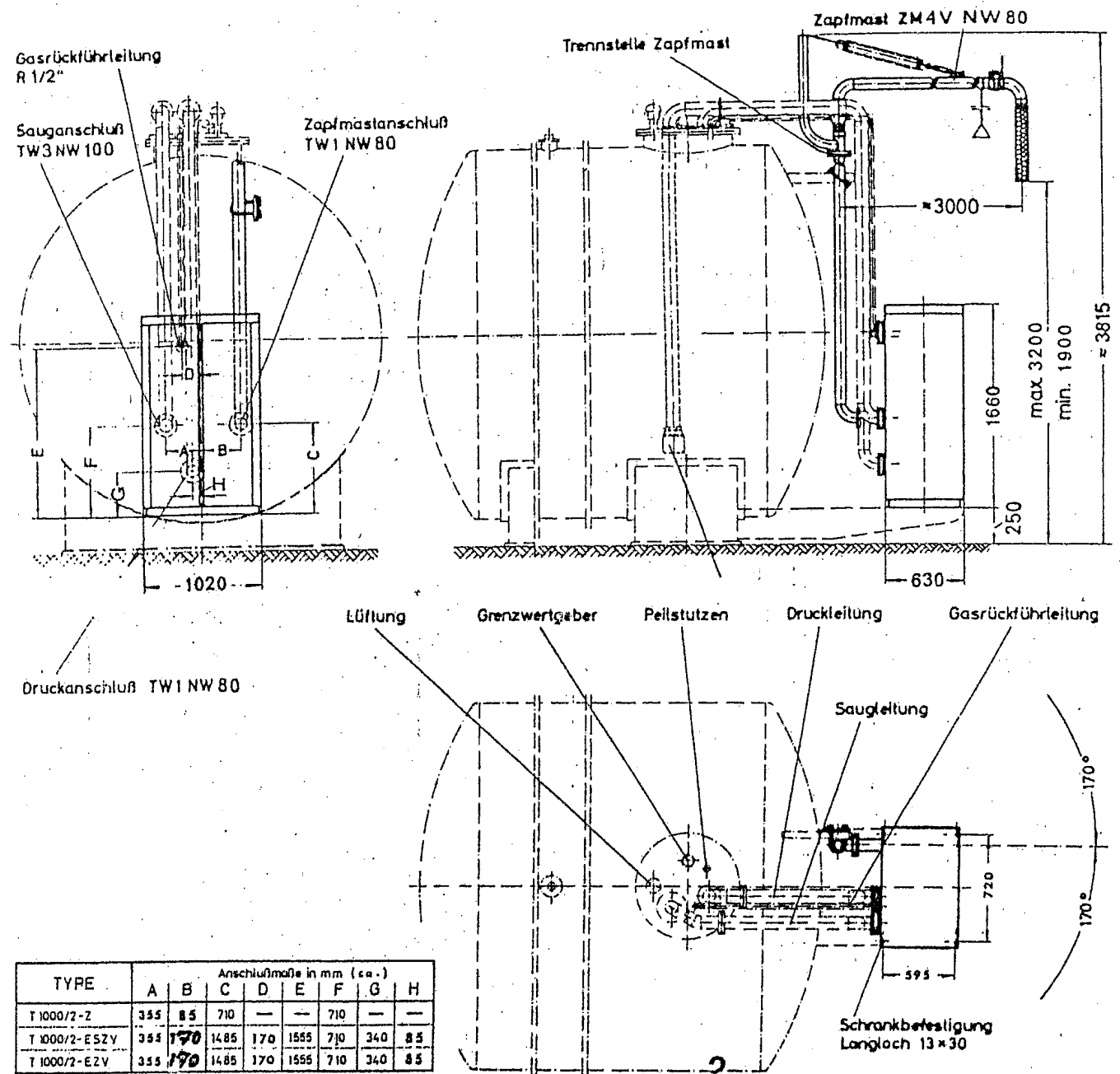
**Bemerkung zum Verlegen von Rohrleitungen:**  
Kurze Rohrstrecken festlegen, jedoch parallel zu Gebäudewänden und Tankinseln! Richtungsänderungen nur rechtwinklig unter Verwendung von Rohrbögen 90°! Rohrleitungen mit Gefälle zu den Behältern verlegen! Rohrleitungen nach der Druckprobe allseitig in steinfreiem Sand einbetten!

| TYPE        | Anschlußmaße in mm |     |      |     |      |
|-------------|--------------------|-----|------|-----|------|
|             | A                  | B   | C    | D   | E    |
| T 12/1-Z    | 240                | 280 | 620  | —   | —    |
| T 12/1-ESZ  | 240                | 280 | 620  | 160 | 1180 |
| T 14/1-ES   | 240                | 280 | 620  | 75  | 1150 |
| T 14/1-ESZ  | 240                | 280 | 620  | 75  | 1150 |
| T 14/1-EZV  | 240                | 67  | 1200 | 75  | 1150 |
| T 600/1-ES  | 315                | —   | —    | 75  | 1240 |
| T 600/1-EZV | 315                | 210 | 1235 | 75  | 1240 |

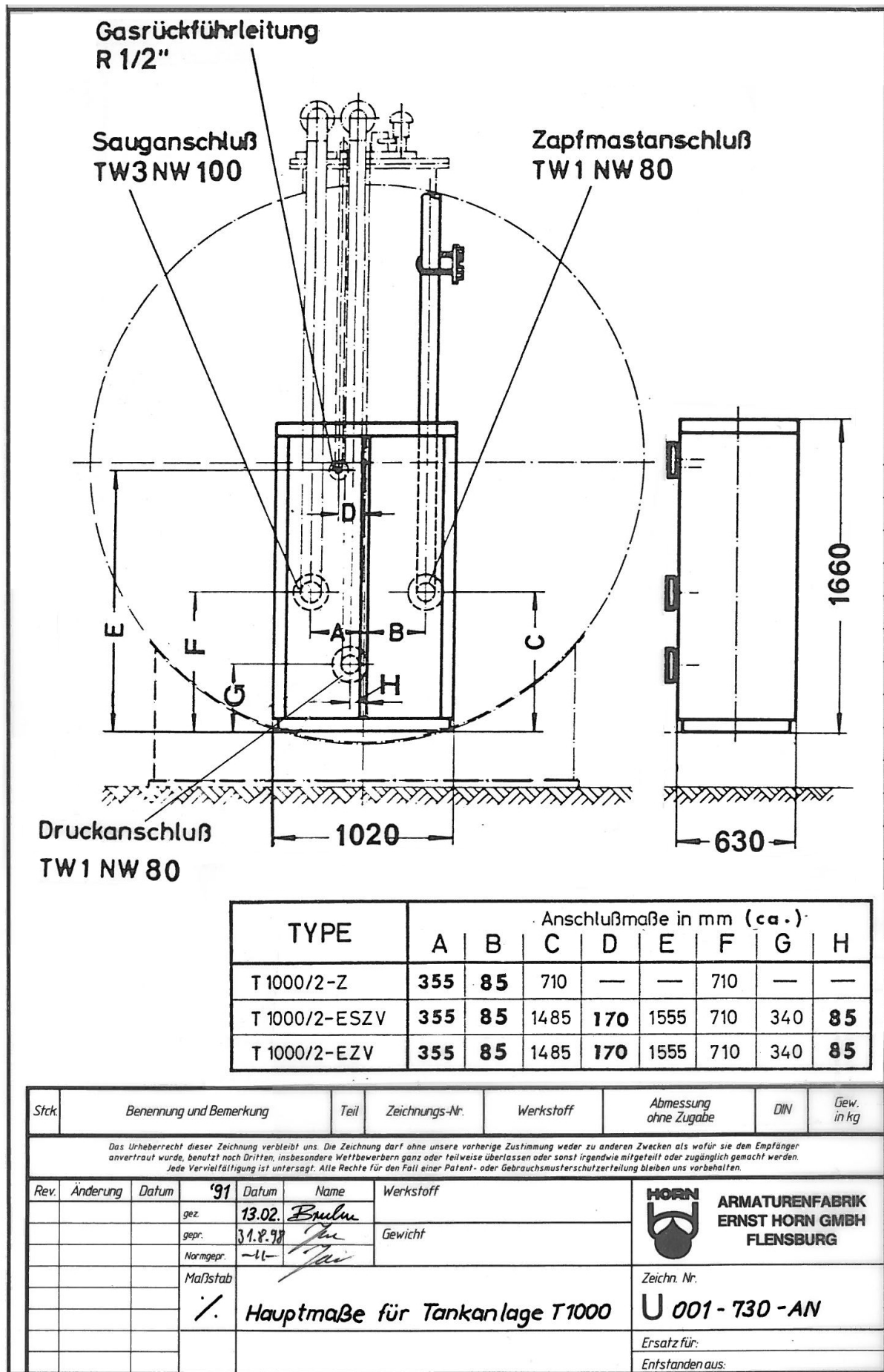


|         |      |                                   |         |
|---------|------|-----------------------------------|---------|
| 21 1040 | 1:10 | Fundamentzeichnung für Tankanlage | X32-875 |
|---------|------|-----------------------------------|---------|

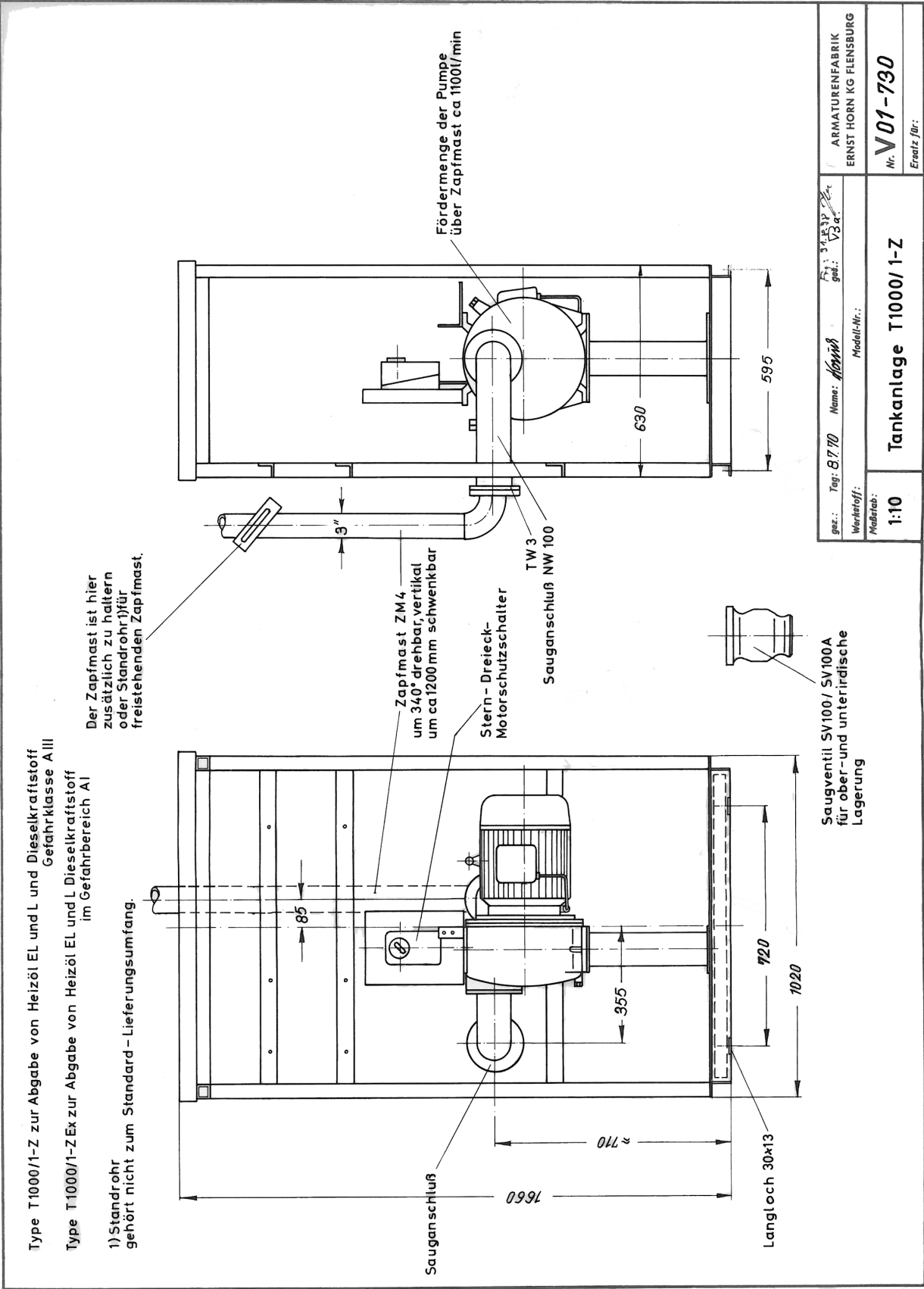
## 3.2 Assembly Drawing



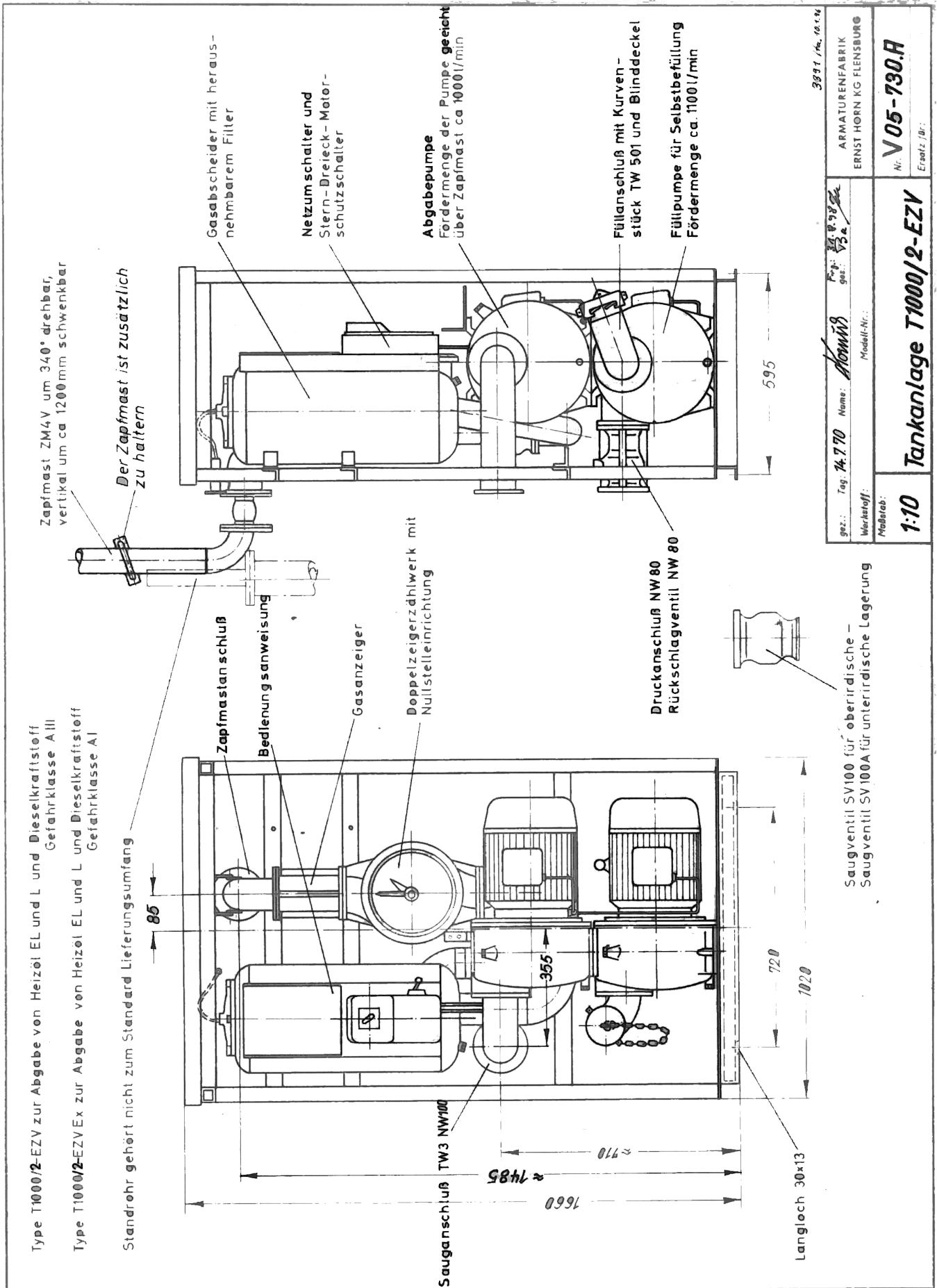
### 3.3 Main Dimensions



3.4 Dimension Drawing T1000/1

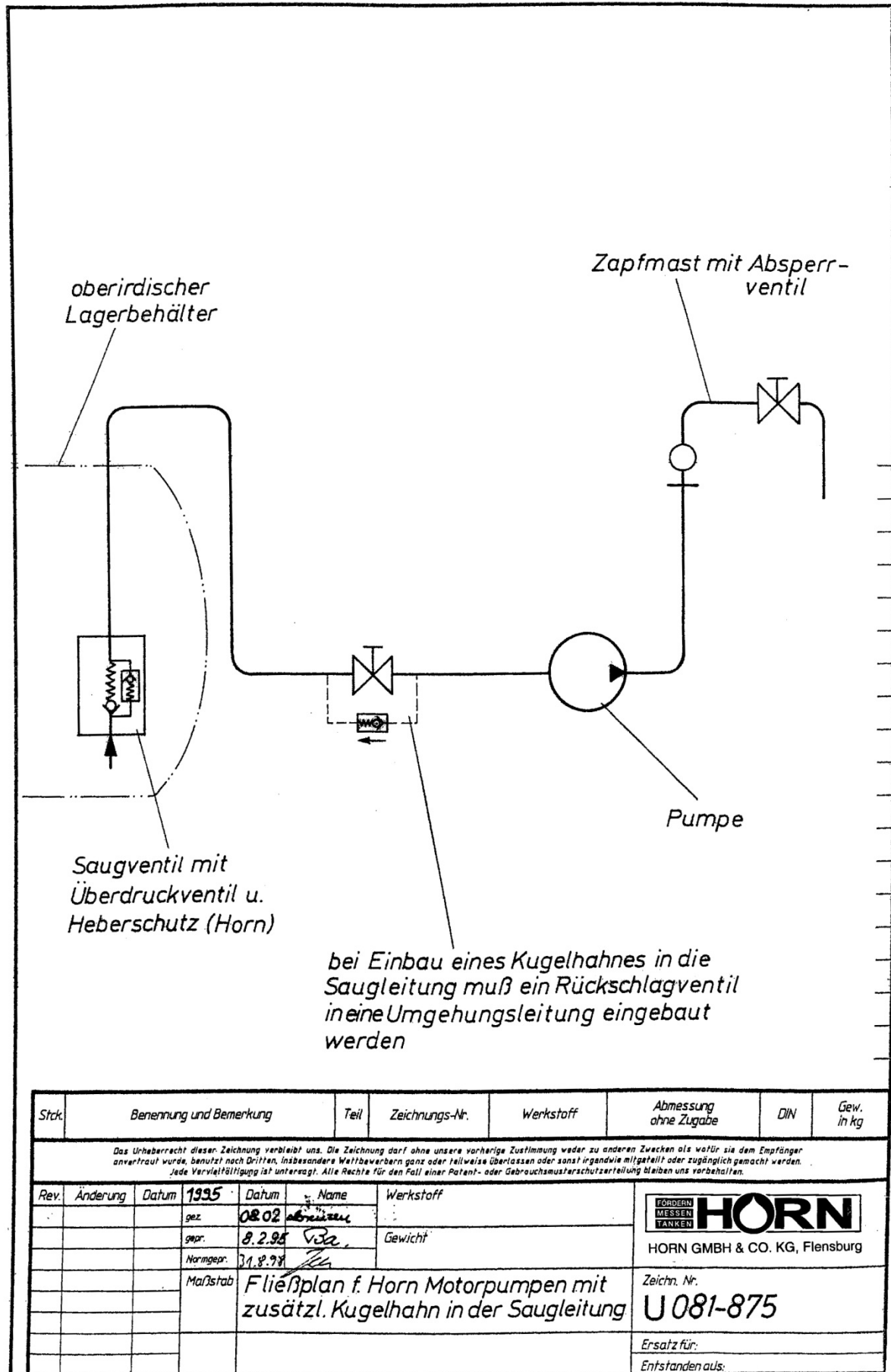


## 3.5 Dimension Drawing T1000/2





### 3.6 Flow Schematic



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### 3.7 Pressure Balancing

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The pumps are designed for a max. pressure of 10 bar.

When installing the pumps you should always make sure that an over-pressure valve with an opening pressure in the range of 4 to 8 bar is mounted in the suction or pressure pipe in order to avoid prohibited pressure spikes caused by temperature fluctuations.

If you fit HORN suction or non-return valves with pressure balancing, then it is not necessary to fit an over-pressure valve.

Isolating fittings must not be mounted in the pipe between the pump and the over-pressure valve or HORN suction valve.

Also, isolating fittings must not be fitted downstream of the suction valve to the tank to be able to allow pressure balancing.

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### 3.8 Pipe Installation

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The pipes must be cleaned before fitting. If there are any interruptions in the installation of the piping, the pipes must be closed off to prevent any foreign bodies from entering. The corresponding mating flanges for suction and pressure pipes form part of the delivery scope.

You can start the installation of the piping on the suction or pressure sides of the pumps. The suction and pressure pipes must be laid so that no tensions are transmitted to the pump. The installation is not to be considered as a fixed point for the piping. In order to ensure tension-free connection to protect the fittings you must always provide resilient pipe connectors according to the nominal sizes.

In addition, it is necessary to operate the large tank installations only with HORN suction or non-return valves with pressure balancing. When installing underground the non-return valve must be mounted vertically. If our installation is operated with valves not of our supply, we cannot accept liability for fault-free operation.

Important: When fitting the suction pipes in combination with underground and over-ground storage tanks, vacuum sealed pipe fitting must always be observed.

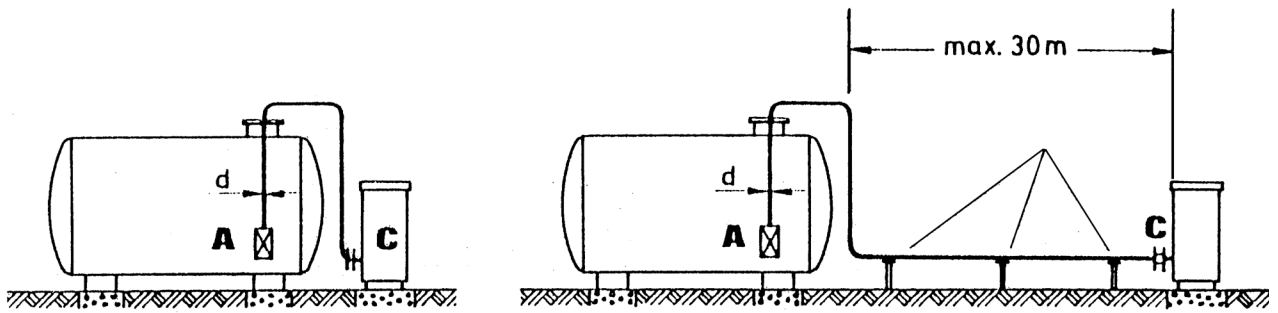
In other cases, the technical regulations covering flammable fluids are definitively applicable. In accordance with the VbF, the installations for storage, delivery and transporting of flammable fluids must comply with the requirements of this decree, and, in addition, must be installed and operated in accordance with the generally accepted rules of technology.

The individual country decrees covering the storage of water-endangering materials (storage tank decree VLwS) must also be complied with.

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### 3.8.1 Suction lines for above-ground storage tanks

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A = Suction valve SV 100  
with counter-flange

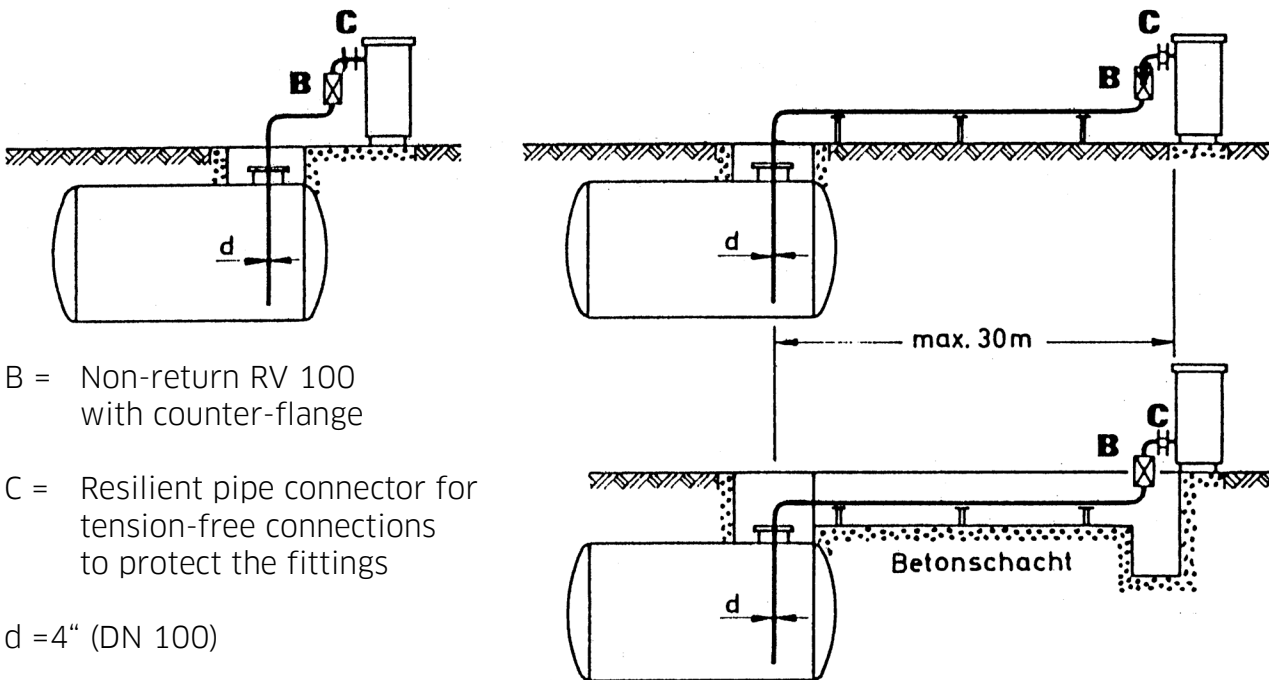
C = Resilient pipe connector for  
tension-free connections  
to protect the fittings

d = 4" (DN 100)

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### 3.8.2 Suctionlines for underground storage tanks

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B = Non-return RV 100  
with counter-flange

C = Resilient pipe connector for  
tension-free connections  
to protect the fittings

d = 4" (DN 100)

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### 3.8.3 High-level tanks

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Large tank installations which are used in combination with high-level tanks should also be fitted with an isolating slide valve on the suction side in order to be able to reduce the inlet pressure, depending on the requirements. This can counteract severe noise development (cavitation).

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### 3.9 Dispensing mast assembly (optional)

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The dispensing mast must be held or mounted by means of an additional standpipe. The outlet pipe to the dispensing mast may on no account be considered to be a supporting structure for the dispensing mast. Pumps used in conjunction with overhead tanks should additionally be fitted with a shut-off valve on the suction side in order to be able to throttle the inlet pressure depending on requirements. Excess noise development (cavitation) can be counteracted in this way.

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### 3.10 Electrical connection

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1. The large tank installations are fitted with a thermal motor protection unit in the factory. In the case of installations with 2 pumps, a motor switch-over is allocated to the thermal motor protection switch.
2. Care must be taken that the rotational direction of the motor, which is denoted by the direction arrow, is complied with - clockwise as viewed from the ventilation cap of the motor.



**The electrical connections may only be carried out by a qualified electrician. The relevant regulations must be complied with.**

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## 4 Operation

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### 4.1 Commissioning and re-commissioning

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#### 4.1.1 Filling the suction line

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#### **Dry running will destroy the pump.**

Before starting delivery, the pump or the pumps must be filled with approx. 5 l of the de-livery fluid. To do this, release the filling screwed fitting and then close again tightly after filling. The filling of the lower pump can also take place by self-filling. This is done by coupling the hose to the TKW and the filling spigot of the lower pump; then open the TKW valves and slightly release the filling screwed fitting so that the air can escape from the pump casing through the threads. Tighten the filling screwed fitting again only after fluid starts to come out.

Dry running of the rotary pump must be avoided at all cost, since otherwise the slide ring seal in the rotary pump can be destroyed.

Once having filled the pump it is always ready for operation.

The entire installation should be checked for leaks after commissioning, and if necessary the connection points should be tightened.

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#### 4.1.2 Method of functioning

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After starting up, the pump first pumps a mixture of air and liquid, formed from the filling reserve in the pump housing and the air in the suction line. The air part is separated out of the mixture in the pump pressure chamber and fed to the pressure line. The liquid part is fed back via a return flow aperture from the pump housing to the spiral and combines once again with air from the suction line to form a mixture. The suction line is bled of air by the continuation of this circulation. The pumping fluid

rises in the suction line. As soon as it reaches the pump impeller wheel, the suction process is ended and the pump begins to pump. The maximum suction height is 4.50 m. The achievable suction height depends on pipe friction losses, air pressure and evaporation point, ambient temperature and the viscosity of the pumped medium. The suction line length must not exceed 30 metres. Depending on the length of the pipe, the suction time can be up to 30 minutes (at first commissioning).

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#### **4.1.3 Venting the large and small delivery calibrated (if fitted)**

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1. In order to check the installation, place the full hose delivery valve in a metal container or vessel.
2. Switch motor pump "1" on
3. Open the delivery valve
4. Maintain operation of the installation until there are no more visible bubbles in the gas display (sight glass).
5. If necessary, vent the installation by opening the venting valve on the gas display.
6. Close the delivery valve and switch the motor pump "1" off.

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## **4.2 Normal operation**

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**!** Avoid dry running.

## **5 Service and maintenance**

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### **5.1 Maintenance of the installation**

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The large tank installation is a sturdy structure and does not need any specific maintenance.

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#### **5.1.1 Cleaning the filter on calibrated large and small delivery**

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The filter must be cleaned in accordance with the individual requirements. When using contaminated mineral oils and at low temperatures cleaning must be carried out more frequently.

Before cleaning the filter, the cabinet top must be removed by releasing the two wing bolts at the top of the frame at the back wall and one of the wing bolts front centre under the cabinet roof.

The filter is located in the upper section of the cylinder of the gas separator.

The filter can be lifted out upwards by unscrewing the cap or releasing the wing nuts and lifting the filter cap.

Cleaning the filter is best carried out by flushing out in benzine. Do not use any sharp instruments. If the filter gauze is damaged the filter insert must be replaced immediately since otherwise the counter could be damaged by foreign bodies.

Replace the filter after cleaning and fit in reverse order. In doing so you must ensure that the seal ring or the O-ring is carefully inserted between the cap and the cylindrical section of the gas separator; if necessary the seal ring must be replaced.

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## 5.2 Faults and their rectification

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1. Pump not providing suction
  - Pump not filled: fill the pump with approx. 5 l of the delivery fluid.
  - The suction pipes are leaking: tighten the flange connections. Check the seals, hoses and couplings, if necessary carry out a pressure test.
  - The suction pipe is blocked: release flange connection, clean the suction pipe and flush it out.
  - The suction head is too great: max. suction head approx. 4.50 m. Suction time, depending on the length of the suction pipe, can be up to 30 minutes (when installing for the first time). The achievable suction head depends on the frictional pipe losses, the air pressure, the vapourisation point, the ambient temperature and the viscosity of the delivery medium.
2. Pump output falls off
  - Filter in gas separator is contaminated: clean the filter.
  - Suction valve or non-return valve is blocked dismantle suction valve or non-return valve and check, remove any existing foreign bodies.
  - Otherwise as per 1.
3. Pump leaking from axial slide ring seal
  - (detected by dripping fluid between the motor and the pump. Slight dripping is possible with new pumps. The slide ring seal needs to bed in and will seal itself.): Replace the axial slide ring seal complete with opposing running ring.
4. Column of fluid reduces
  - Check the suction valve or non-return valve for leaks and twisting. Pressure test the suction pipe (remove tensions by fitting a resilient pipe connector) .

## 6 Disposal

The device is to be emptied completely and the liquids properly disposed of in case it is taken out of service.

The equipment is to be disposed of properly when taken permanently out of service:



- Return old metal for recycling.
- Return plastic parts for recycling.
- Return electronic waste for recycling.



**The water legal regulations are to be followed.**

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### 6.1 Return of batteries

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Batteries must not be disposed of with the domestic waste. Batteries can be returned free of charge via a suitable collecting point or to the dispatch stores. Consumers are legally obliged to return used batteries.

Batteries that contain harmful substances are marked with a crossed out dustbin (see above) and the chemical symbol (Cd, Hg or Pb) of the heavy metal that is decisive for the classification as containing harmful substances:

1. "Cd" stands for cadmium.
2. "Pb" stands for lead.
3. "Hg" stands for mercury.



## Konformitätserklärung *Declaration of Conformity*

Hiermit erklären wir, dass die Bauart  
*We herewith declare that the construction type*

|              |   |
|--------------|---|
| Typ:         | <b>TS 1000</b> /D1, /D2, /D1e, /D2e,    |
| Type:        | /B1, /B2, /B1e, /B2e, /P1, /P1e         |
| Bezeichnung: | <b>Umschlaganlage</b>                   |
| Designation: | <b><i>Transshipment Terminals</i></b>   |
| Artikel-Nr.: | <b>160500000, 160510000, 160520000,</b> |
| Item No.:    | <b>160530000, 160600000, 160610000,</b> |
|              | <b>160620000, 160630000, 160640000,</b> |
|              | <b>160650000</b>                        |

in der von uns gelieferten Ausführung folgenden einschlägigen Bestimmungen entspricht:  
*in the form as delivered by us complies with the following applicable regulations:*


- Maschinenrichtlinie 2006/42/EG  
*Machinery safety 2006/42/EC*
- EMV-Richtlinie 2004/108/EG  
*Electromagnetic compatibility 2004/108/EC*
- Niederspannungsrichtlinie 2006/95/EG  
*Low voltage equipment 2006/95/EC*

Angewendete harmonisierte Normen:  
*Applied harmonised standards:*

EN ISO 12100-1, -2    EN 60204-1    EN 60034-1

EG-Dokumentationsbevollmächtigter: Jörg Mohr      Horn GmbH & Co. KG  
EC official agent for documentation: Munketoft 42  
24937 Flensburg

04.11.2010  
Datum  
*Date*

  
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