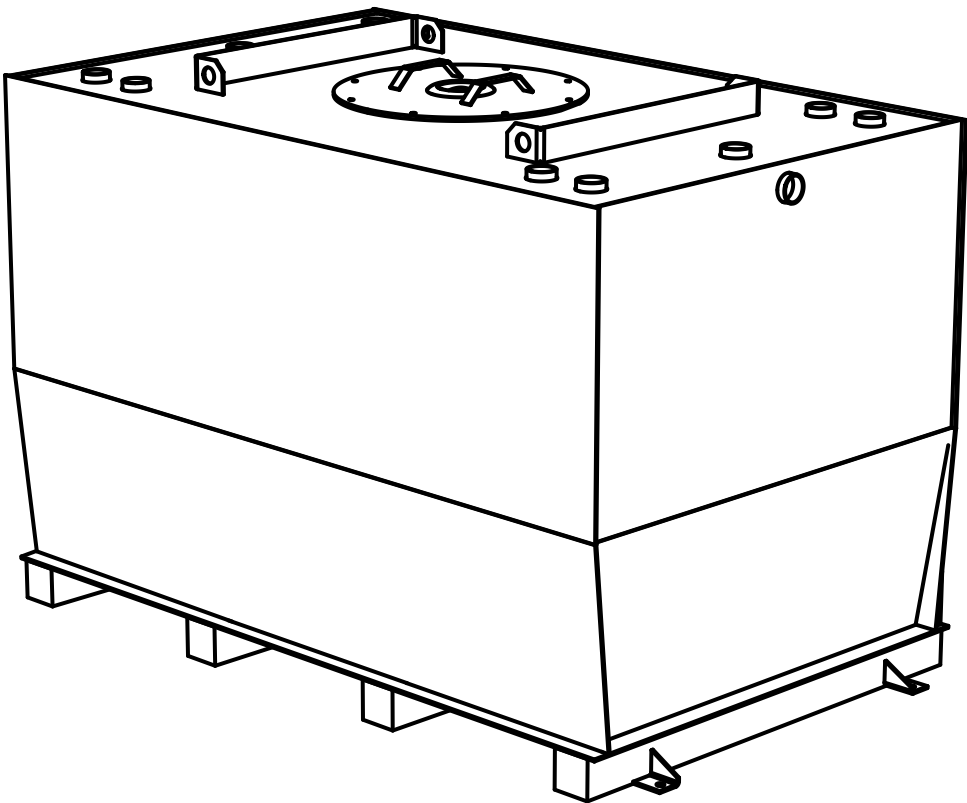


Operating and Assembly Instructions(BMA) TTE-XL
Day Tank single walled system for fuel or mineral
oil (fresh oil and used lubricating oil)

Kramptitz®



Tank type _____

Manufacturer No. _____

Construction year _____



- Read before use!
- Follow all safety instructions!
- Keep for future use!
- Passing on and duplication of these documents, utilization and communication of their contents are only permitted with our consent. Non-compliance obligates to compensation!

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PRELIMINARY NOTE

This technical operating and assembly instructions (BMA) describe the „TTE-XL - Single-walled day tank for diesel and mineral oil“. It contains descriptions and instructions which are necessary for the understanding of the operator and which guarantee the correct operation, proper care of the material and compliance with the safety and work safety regulations.

Name of the tank unit: TTE-XL Day tank single-walled for diesel and mineral oil is referred to as TTE-XL in the description and operation in the following for simplification.

The table of contents is an overview of the structure of the BMA and lists the main sections and subsections with page numbers.

Important instructions concerning technical safety and occupational safety are specially highlighted by the following symbols.

SIGNS AND SYMBOLS

Signs and symbols that indicate to the user where special attention should be paid are an important and helpful part of operating instructions. Additional signal words are used to point out possible dangers.

The following symbols are used in the operating instructions:



Caution! Risk of Injury!
This sign warns of hazards that can arise from mechanical or thermal effects.



Caution! Danger to life!
This warning sign warns of hazards that can be caused by electric current.



NOTE!
This mandatory sign indicates recommended use in compliance with the instructions.

The following signal words are used in the operating instructions:

- IMPORTANT** Technical requirements to which the user of the appliance must pay particular attention.
- ATTENTION** In case of non-observance or insufficient observance: There will be no damage to health, only damage to property.
- CAUTION** Failure to observe or insufficient observance: This can lead to reversible, minor personal injury.
- WARNING** In case of non-observance or insufficient observance: It will lead to damage to health or considerable damage to property.
- DANGER** Failure to observe this warning or to observe it sufficiently will result in death or serious damage to health.

ABBREVIATIONS

- TTE-XL

WHG

TRbF

BMA

VDE

VAwS
- Day tank single-walled

- Water Resources Management Act

- Technical rules for flammable liquids

- Operating and assembly instructions

- Electrical engineering association

- Ordinance on Installations for Handling Substances Hazardous to Water and on Specialized Companies
- VDS

NBR

WasgefStAnlV
- Association of property insurers

- Nitrile butadiene rubber

- Ordinance on Facilities for Handling Substances Hazardous to Water
- PE-HD
- High density polyethylene

1. SAFETY INSTRUCTIONS

1.1 Safety instructions and regulations



CAUTION
Maintenance and repair work on overfill protection and leakage warning devices may only be carried out by qualified personnel in accordance with the WHG.



DANGER
After connecting the electrical components to a power source, the system carries life-threatening voltages. Before starting work on the electrical components, the supply cable or the entire system must be disconnected from the power supply and, if necessary, secured against being switched on again.



WARNING
The TTE-XL has no entry as standard, only a hand hole for visual inspection.



WARNING
When using hot liquids, the following additional dangers exist: Formation of an ex-zone and risk of burns. These hazards must be considered additionally and effective protective measures must be provided.



ATTENTION
No work such as drilling, welding, burning or grinding may be carried out on the tank body (sheet metal enclosing the medium).



ATTENTION
Incorrect operation or failure to observe the information in the BMA and the health and safety regulations will result in damage to the unit, persons and the environment and will invalidate the guarantee/warranty.



ATTENTION
Due to its single-walled construction, the TTE-XL must be installed in an approved drip tray for the storage of water-polluting media.



NOTE
The TTE-XL as well as accessories and equipment parts must be checked again after initial commissioning.

1.2 Operating instruction

1.2.1 General code of conduct

- a. The operator must always take into account and comply with the obligations, in particular those resulting from the Water Resources Act (WHG), the respective ordinance for installations for water-endangering substances (VAwS), the ordinance on installations for handling water-endangering substances (WasgefStAnIV), the technical regulations for water-endangering substances (TRwS) as well as the general construction approval of the tank Z-38.11-127.
- b. The operator is obliged to maintain the TTE-XL for storing fuel or mineral oil in a proper condition, to carry out any necessary maintenance work without delay and to take any safety measures required under the circumstances.
- c. If the operator cannot assess the condition of the system himself and cannot remedy faults, he must seek advice from an expert or conclude a maintenance contract with an authorised specialist company.
- d. The system must not be operated if it has defects that could cause hazards.
- e. Measures must be taken immediately to eliminate or reduce the hazardous condition.
- f. Prescribed safety devices must be used.
- g. The safety equipment must be operated, maintained and serviced in such a way that their effectiveness is maintained.
- h. In particular, safety devices must not be bypassed or rendered partially or completely ineffective.
- i. Liquids hazardous to water may only be filled into containers that are approved for these liquids.
- j. The TTE-XL must be filled in such a way that overfilling does not occur. Before filling, the liquid level inside the tank of the TTE-XL must be determined. It must be determined how much liquid the TTE-XL can still hold.
- k. The filling and emptying process of the TTE-XL with a tanker or drum must be constantly monitored by the operator

1.2.2 General operating instructions

Installation

Tanks damaged during transport or assembly may not be used if the damage reduces the tightness or stability of the tanks. Measures to remedy damage must be taken in agreement with the expert in accordance with water law. The containers must be protected against damage by vehicles, e.g., by protected installation, impact protection or by installation in a suitable room. Tanks must be at such a distance from walls and other components and from each other that leak can be detected and their condition can be checked by visual inspection at any time. In addition, containers must be installed in such a way that there are sufficient fire-fighting facilities available.

Commissioning

Furthermore, the tank must be checked for leaks. It must be ensured that all lines, especially those at the bottom of the tank, are tightly connected. The ball valve for residual emptying must be tightly closed with the cap supplied.



NOTE

Before initial start-up, the TTE-XL and the associated equipment must be checked for externally visible damage.

Initial start-up

Before filling the TTE-XL for the first time, the following points must be checked:

- proper fastening or installation of the tank
- Tightness and strength of the pipe connections (sealing cap of the residual emptying)
- proper connection of sensors such as
 - level sensor
 - overflow protection
 - leakage warning probe
 - limit switch
- tight fit of the blanking plugs

Operation sequence

- Check the position of the ball valves. The ball valves on the machine feed and the residual discharge must be closed. The sight pipe must be open. The connection of the residual discharge is tightly screwed by cap or plug.
- Switching on the voltage: This starts up the sensors, sensors are put into operation.



ATTENTION

The existing overflow protection will signal an alarm in the first few seconds, since the PTC thermistor of the level sensor must first be heated up

Refueling by tank truck

- As the fill level increases, the switching of the level switch points can be checked (if present, these are: MIN-MIN, MIN, MAX, MAX-MAX).
 - If the limit switch to be used is wetted, refueling is automatically aborted.
- When refueling with the system's own pump, check the position of the pump ball valves.

Refueling with the system's own pump

- With increasing fill level, the switching of the level switching points can be checked (if available are: MIN-MIN, MIN, MAX, MAX-MAX).
 - In case of wetting of the installed overflow protection, the pump must be switched off automatically.
- Check the pipe connections for leaks.
 - Check the fill level of the contents display.
 - Open the „Machine feed“ ball valve.
 - TTE-XL is now ready for use.

Temperature

Die Betriebstemperatur darf nicht unter $-10\text{ }^{\circ}\text{C}$ fallen und die für das jeweilige Lagermedium in DIN 6601 ggf. genannte maximale Flüssigkeitstemperatur, höchstens jedoch $+50\text{ }^{\circ}\text{C}$, nicht überschreiten. Temperaturbegrenzungen in Hinblick auf den Explosionsschutz sind zu beachten! Haben Flüssigkeiten beim Zufluss höhere Temperaturen, ist eine geeignete Kühlung vorzuschalten.

Tank equipment

The conditions for the equipment of the containers and, if applicable, the collecting devices are to be taken from the water, occupational health and safety and building regulations. If there are no water or building re-

gulations for the equipment, the general building approval of the container Z-38.11-127 in conjunction with TRbF 20, section 9 must be observed.

Pipes

The pipelines must be designed and installed in such a way that impermissible constraint is avoided. When connecting pipelines, it must be ensured that no impermissible constraint is created and that no additional external loads act on the tank that are not provided for as planned.

Storage fluids

The containers may be used for pressure less, stationary, above-ground storage of liquids with a flash point higher than $+55\text{ }^{\circ}\text{C}$ and a density of maximum 1 kg/l , if the suitability of the liquid-material combination for the materials of the containers and collecting trays is proven according to the standard DIN 6601.

Usable container capacity

The permissible filling level of the containers must not exceed 95 % unless a different filling level has been approved or must be complied in accordance with TRbF 20. The overflow protection shall be set up accordingly.

Ready to operate

The system must be continuously monitored so that, if necessary, faults in the operating process can be detected as quickly as possible and further damage can be avoided. The monitoring, as well as the elimination of the malfunction or the source of the malfunction, must be carried out by trained, instructed personnel.

Temporary shutdown

For temporary decommissioning, the TTE-XL must be emptied, switched off or disconnected from the power supply.

Recommissioning

When the TTE-XL is put back into operation, it must be checked to ensure that it is in proper condition. The following equipment must be checked:

- the electrical connection
- check the tank and connection lines for leaks

Documentation

The operator of the container system shall be provided with at least the following documents:

- Reprint of the general technical approval No. Z-38.11-127
- Printout of the building authority certificate of usability of the limit value transmitter or overflow prevention device suitable for the application.
- Test certificate of the container with declaration of conformity
- Operating and assembly instructions for the container



NOTE

The provisions for the submission of documents according to other areas of law remain unaffected.

Operation

Before putting the tanks into operation, the operator must affix a sign in a suitable place a sign indicating the liquid stored, including its density and concentration. The labeling according to other areas of law remains unaffected.

Prior to filling, it must be checked whether the medium to be stored corresponds to the permissible medium and it must be determined how much liquid the container can still hold and whether the overflow protection/limit indicator is in proper condition.

The filling and emptying of the containers must be monitored by competent operating personnel and must be carried out in compliance with the load limits of the system and the safety devices, the maximum permissible operating temperature and, with ventilation ensured, via permanently

connected lines and only using an overfill protection device which automatically interrupts the filling process in good time before the permissible liquid level is reached.

Notwithstanding the above, the containers may be filled as follows:

- with an automatically closing dispensing valve with filling rates of no more than 200 l/min in the free outlet (only individual above-ground containers with a space content of no more than 1,250 l),
- from road tankers and demountable tanks with the use of a filling safety device (only containers for the storage of EL heating oil, diesel fuel and similar fuels, e.g., TBE).

After completion of the filling process, compliance with the permissible filling level must be checked and the closing cap of the filling nozzle must be closed. Dripping liquids must be collected. If the permissible usable volume is exceeded, the container must be emptied immediately.

Alternating filling of the containers with different media is not permitted.

When installing the unit, the extraction may only be carried out at the nozzles provided for this purpose.

1.2.3 Instruction of the operating personnel



NOTE
The operators must be familiar with the commissioning, the handling of the TTE-XL and the contents of the operating instructions.

The operators must be instructed about the dangers arising during the storage and filling of liquids hazardous to water as well as about the measures to be taken to prevent them before initial operation and at appropriate intervals thereafter, at least once a year.

1.2.4 Repair and maintenance

The maintenance, repair and cleaning of the containers may only be carried out by companies that are certified specialists for these activities in accordance with § 3 of the Plant Ordinance (WasgeStAnIV). The maintenance, repair and cleaning of the containers and, if applicable, of the catch basins may only be carried out by specialist companies in accordance with WHG or § 3 of the Plant Ordinance (WasgeStAnIV).

The activities do not have to be carried out by specialist companies if they are exempt from the obligation to use specialist companies in accordance with national regulations or if they are carried out by the manufacturer of the containers with competent personnel. The legal occupational health and safety requirements remain unaffected.

The operator must inspect the containers at least once a week for damage and leaks. If damage and/or leakage is detected, the container must be taken out of service.

Measures to eliminate damage must be clarified in consultation with the expert in accordance with water law. For an internal inspection, the tanks must be completely emptied and cleaned. The accident prevention rules and the regulations for the use of chemical cleaning agents and the disposal of any residues must be observed. No refueling or emptying operations may be carried out during the maintenance work. Before repairs to the electrical system, the supply line to the entire system must be disconnected from the power supply and, if necessary, secured against being switched on again.

1.2.5 Safety checks

If damage and/or leaks are detected, the system must be taken out of operation. Damaged tanks must be emptied if necessary. Measures to eliminate damage must be clarified in consultation with the expert in accordance with water law.

- a. The functional capability of the equipment used must be checked in accordance with the applicable building inspectorate certificate of usability.
- b. Recurring wall thickness measurements must be carried out by the expert in accordance with water law as part of the inspection intervals specified before commissioning or at least every 5 years under the operator's own responsibility (in the case of tanks not subject to inspection in accordance with the Plant Ordinance). The grid (position of the measuring points) must be determined and documented, taking into account all load-bearing tank components. The results are to be recorded, based on the net wall thicknesses and the corresponding corrosion allowances, the EContent of the statically required minimum wall thickness shall be checked.
- c. For tanks whose wall thickness has been reduced to the net wall thick-

Testing laboratory Designation	Performing person	Deadline	Proof of testing
Visual inspection for leaks of the tank and connections	Operator	weekly	Test confirmation
Visual inspection for cleanliness of the vent hood	Qualified company according to WHG / Operator	weekly	Test confirmation
Visual inspection for cleanliness of the collecting tray*	Operator	weekly	Test confirmation
Function check of the limit switch*	Qualified company according to WHG	annually	Certification
Function check of the oil warning probe*	Qualified company according to WHG	annually	Certification
Function check of the overfill protection*	Qualified company according to WHG	annually	Certification
Function check of the level sensor*	Electrical company or instructed personnel	annually	Certification
Wall thickness measurements of the load-bearing parts (bottom/side wall, console)	Operator	Inspection period as specified by the expert for water protection at Inspection before commissioning, at least every 5 years	Test report with location of measuring points

* if available - optional equipment

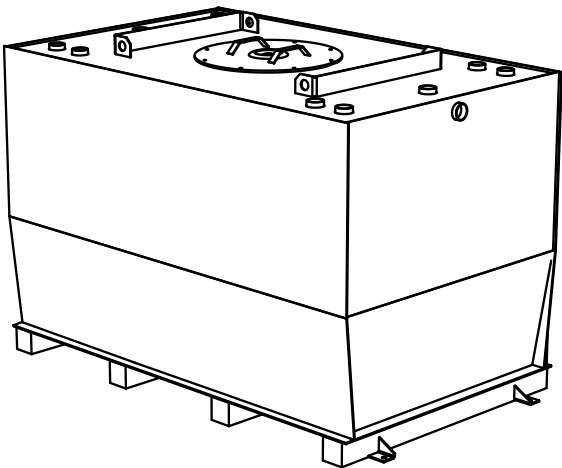
ness, the measures to be taken must be clarified with the expert in accordance with water law.

1.2.6 Handling fuel and mineral oil

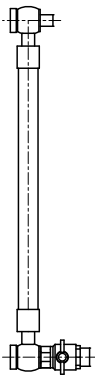
When handling fuel, mineral oil and other hazardous substances, the generally applicable safety regulations as well as the applicable regulations on occupational health and safety of the operator must be observed.

2. DESCRIPTION

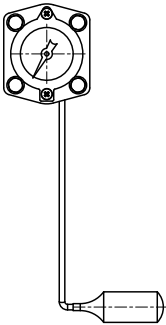
2.1 Visual representation of TTE-XL



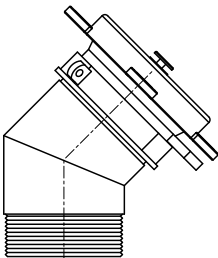
TTE-XL Day tank single-walled



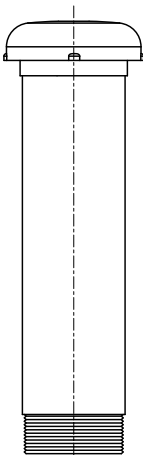
AM-011
Display tube



AM-004.1 und AM-002
Float level indicator

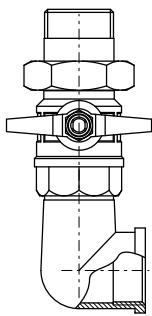


AM-912
Filling nozzle

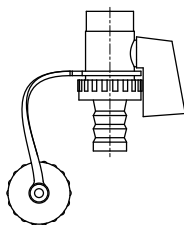


AM-911
Venting hood with pipe socket

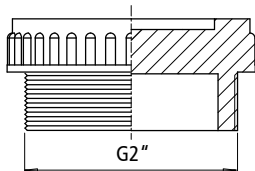
Technical changes reserved!



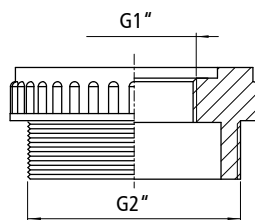
F-MS-34-032
Flow ball valve



AM-956
Residual drain



AM-KU-2-001
Blind plug AG 2"



AM-986
Gland packing AG 2" x 1" (IG)

2.2 Intended use of TTE-XL

The TTE-XL is primarily used as a day tank for supplying aggregates with fuel or lubricating oil. Other liquids are possible if the resistance is proven. The TTE-XL is also referred to as a submission tank. It is suitable for installation in buildings as well as in plant containers. The installation surface must be level and load-bearing. It must also serve as a drip tray.

If there is no collection space on site, a collection tray must be used. The installation is only carried out in areas without additional hazards or requirements.

For use under special conditions, e.g. in water protection areas or in Ex zones, the applicable valid regulations must be observed.

The cubic design of the TTE-XL guarantees optimum use of space. The installation is made above the aggregates, so that the liquid can flow to the aggregate by the static pressure via the machine flow.

No pump is required, provided the supply line is not routed in elevation changes or sharp bends. For emergency power systems, it is required that the height difference between the injection pump of an engine and the flow sleeve of the day tank is at least 500 mm.

The TTE-XL is manufactured in accordance with the general technical approval Z-38.11-127.

2.3 Technical data TTE-XL



ATTENTION

The TTE-XL may only be transported in an emptied and cleaned condition.



NOTE

Based on the general technical approval Z-38.11-127, the maximum filling volume is 95 % of the tank height.

The following connections are available on TTE-XL:

On top of the roof

Six connection sleeves 2" for optional installation of level sensors, overflow protection, machine return, filling by pump, filling by tank truck and venting. A burst protection made of NBR is centrally located. It serves as an overpressure protection. If the burst protection is removed, the opening can be used as a hand hole or inspection opening.

At the bottom

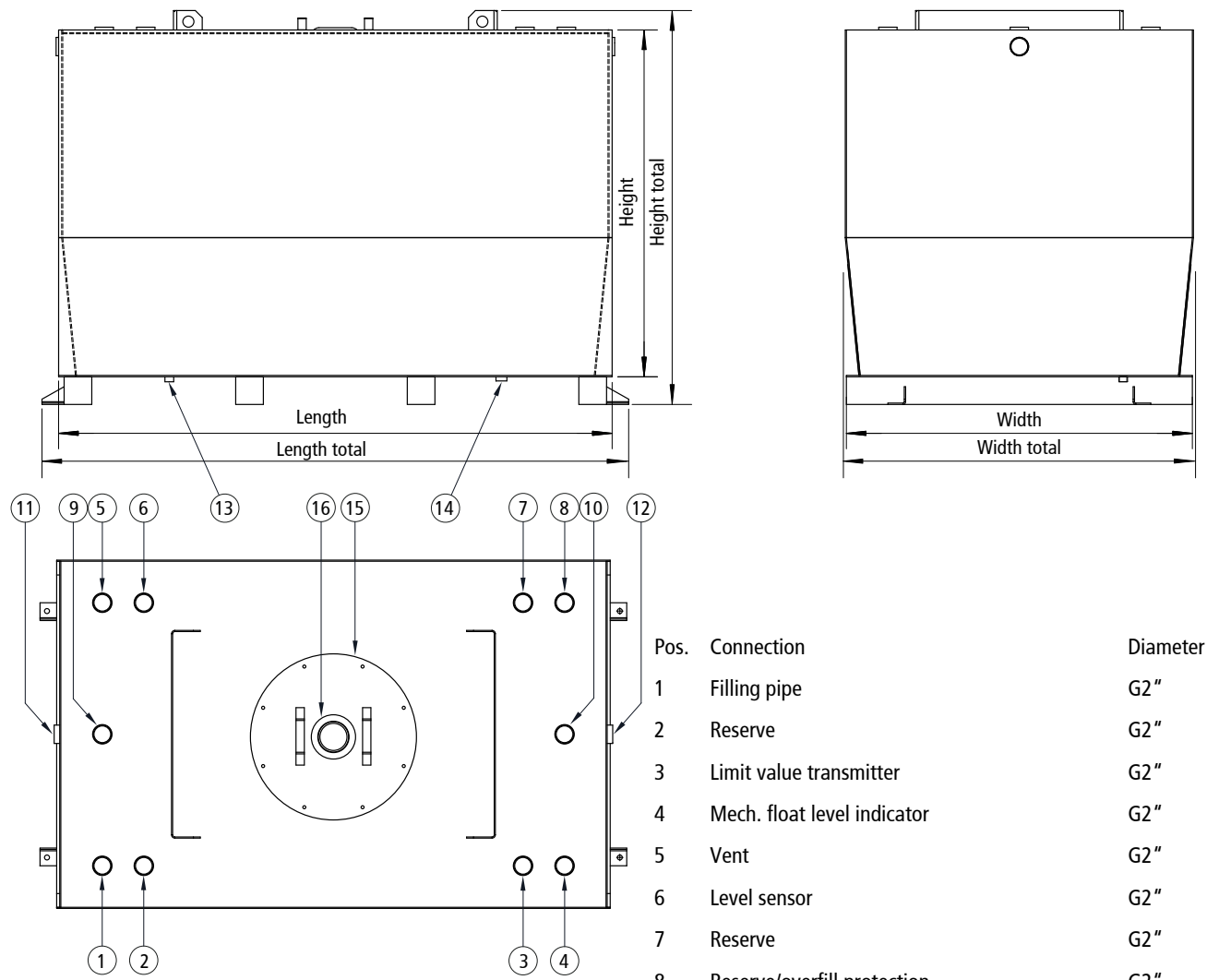
Two connection sleeves with the following functions: on the left, a 3/4" sleeve for connecting the machine flow, a nozzle protrudes approx. 10 mm into the tank bottom (protection against deposits and dirt) and on the right, a 1/2" sleeve for residual tank drainage.

Front side

On the left and right, centered on the upper edge, there is an overflow sleeve 2" for optional connection of an overflow pipe back to the storage tank. If the overflow pipe is not used, the corresponding connection sleeve must be sealed tightly with suitable blanking plugs. The overflow pipe is an inexpensive alternative to the overflow protection, whereby the storage tank must not be located more than five meters away from the day tank and not below the silhouette of the day tank.

Storage tanks are filled via the tank truck connection.

2.3.1 Technical illustration



2.3.2 Dimensions and weights

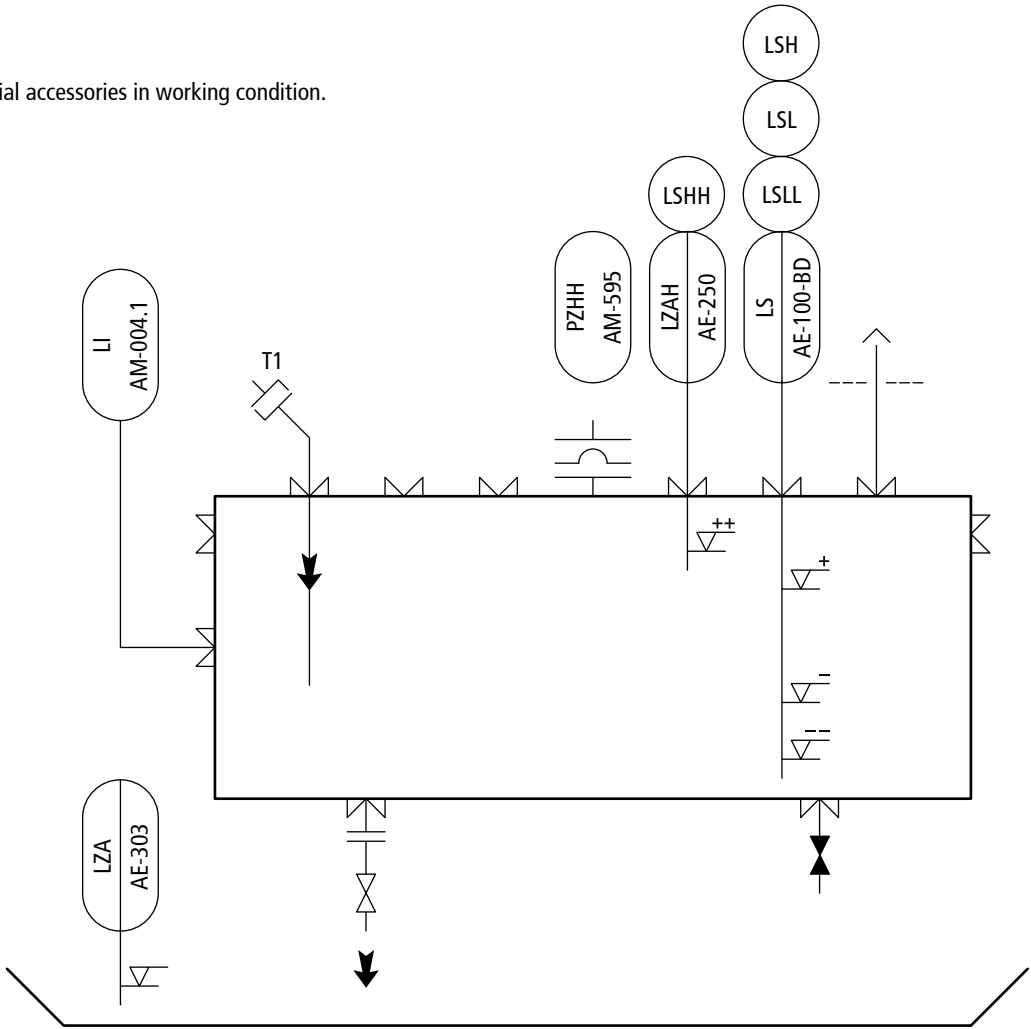
The TTE-XL is manufactured in four standard sizes. Special dimensions in length, width and height can be realized without any problems. The only limits are the transportability and the general technical approval No. Z-38.11-127.

The capacity of the individual tank types is shown in the following table. The number in the designation provides a reference value and identifies the type.

Tank type	Volume 100 %	Volume 95 %	Length	Length total	Width	Width total	Height	Height total	Weight
Item-No.	l	l	mm	mm	mm	mm	mm	mm	kg
TTE-XL-2500	2.900	2.800	2.000	2.135	1.250	1.260	1.250	1.450	530
TTE-XL-3000	3.400	3.300	2.000	2.135	1.500	1.510	1.250	1.450	595
TTE-XL-4000	4.200	3.950	2.000	2.135	1.500	1.510	1.500	1.700	660
TTE-XL-5000	5.300	5.000	3.000	3.135	1.500	1.510	1.250	1.450	810

2.3.3 System layout

Standard tank with tank fittings,
Tank with standard equipment and special accessories in working condition.



Graphic Symbols as per DIN EN 1861

	Pipes
	Flow, Movement in the direction of arrow
	Vave, general
	Vave, closed during normal operation
	Connection interface
	detachable connection
	Auslass zur Atmosphäre
	Tanker connection
	Burst protection the bulge is on the outlet side
	Level measurement, switching contacts for upper and lower limit value
	Tank, single-walled
	Drip tray, Catch basin

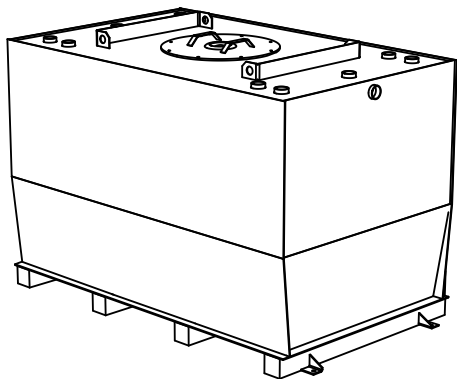
Graphical symbols for measurement, control and regulation

	Stand measurement with display Contents indicator AM-004.1 Float content indicator
	Safety pressure limiter for rising pressure AM-595 burst protection
	Overfill protection, safety switch, stand set point / alarm (MAX-MAX) AE-250 limit switch with type approval
	Leakage probe, safety switch, stand setting value / alarm AE-303 Oil warning probe incl. evaluation unit
	Level sensor, switch for level setting value (MIN and MAX) AE-100-BD float switch
	Standswitch, setting MIN-MIN
	Standswitch, setting MIN
	Standswitch, setting MAX
	Standswitch, setting MAX-MAX

2.4. Standard equipment

2.4.1 Tank container

The characteristic feature of the tank container is its single-walled and cubic design. This guarantees effective use of space. The tank container TTE-XL is made of steel (S235JR) and stainless steel (1,4301 and 1,4571).



2.4.2 Corrosion protection for indoor installation

Corrosion protection tank outer wall:

- L-A-1 Single layer coating for indoor installation

KTS- Standard coating system for corrosion protection of tanks for indoor installation

Corrosion protection for resistance when installed in unheated, non-permanently damp rooms or buildings with alternating atmospheric conditions. e.g., storageroom, machine room, etc.

Surface preparation:

- Cleaning (degrease)
- 2K-HS-PUR One-coat paint RAL 7032
- NDFT - Total layer thickness 80 µm

Corrosion protection tank inner wall:

- L-I-0-Öl corrosion protection inner tank

Surface preparation

- cleaning
- Spray all surfaces with diesel oil



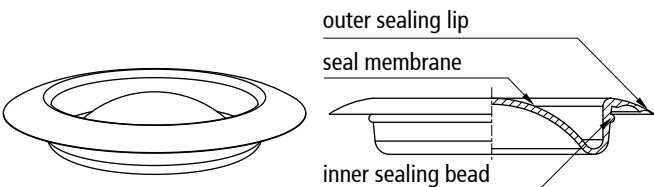
NOTE

The standard colour is RAL (7032 pebble grey). Other RAL colours are available on request at an extra charge.

2.4.3 AM-595 Burst protection (fitted)

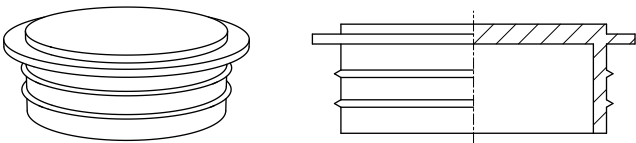
The burst protection prevents damage to the tank if the venting fails or if the volume flow is too high. The burst protection consists of an oil and ageing resistant special rubber and may only be used indoors.

The upper part of the burst protection is designed as a suction lip. By engaging the rubber bead on the inner edge of the opening, a tension is created on the suction lips, which ensures that the rubber is tight against the sheet metal opening. In this way, the burst protection seals the interior gas- and moisture-tight.



2.4.4 AM-948 Transport plugs (fitted)

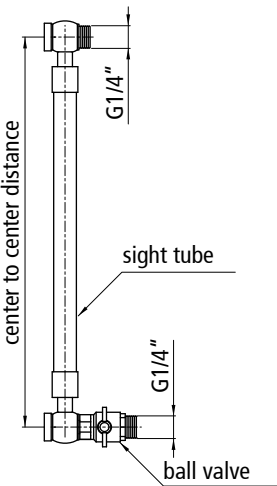
The plastic transport plugs are driven into all sockets of the tank container. They protect against corrosion during transport. Before installing the fittings, commissioning the TTE-XL or its fittings, all transport plugs must be removed. Unused sockets must be sealed with blanking plugs (see point 2.5.2).



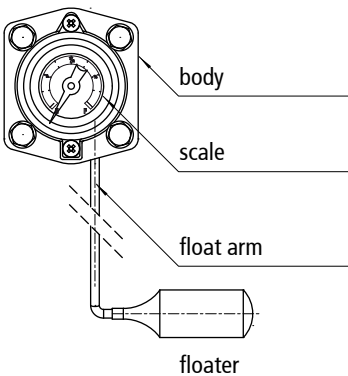
2.4.5 Content display

In accordance with TRbF, each tank must be equipped with a device for determining the liquid level. The mechanical contents gauge with an adjustable float is mounted on the tank by the manufacturer. The float arm is adjusted according to the indication range.

AM-011 Side content display, sight tube with ball valve



AM-004.1 float content indicator

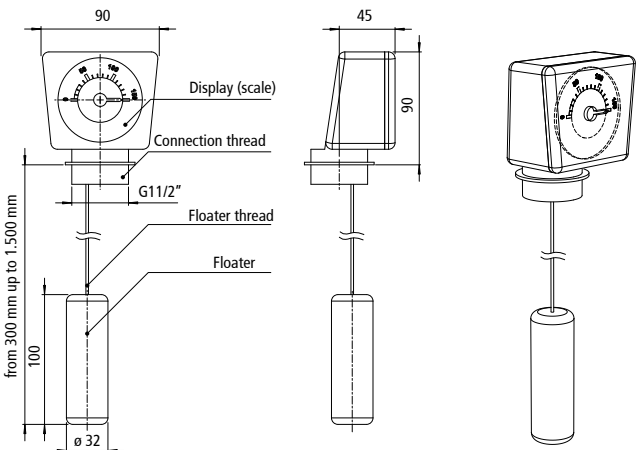


NOTE

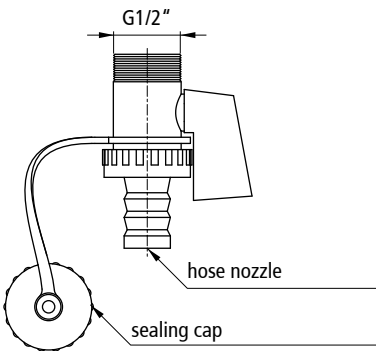
The lateral content indicator with the ball valve may only be opened to check the fill level in the tank and must be closed again after checking.

AM-002 Float content indicator

Universal, mechanical level measuring device with infinitely adjustable turning scale.

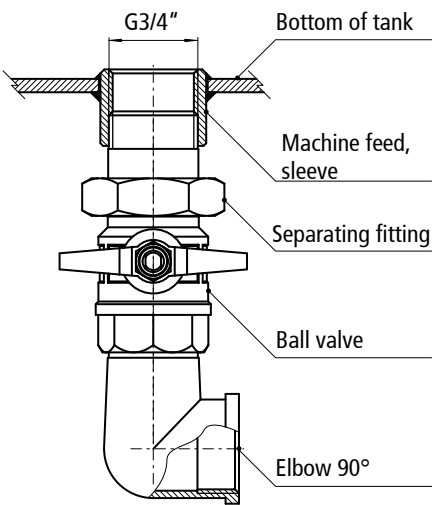


2.4.6 AM-956 Residual drain (not mounted)



The enclosed ball valve for draining with sealing cap must be installed on site in the residual drain 1/2" located in the tank bottom. For this purpose, the enclosed V-10-001 Krampitz Sealfix must be used and it must be checked that the sealing cap is screwed on tightly at the end of the installation.

2.4.7 F-MS-34-032 Flow ball valve (only supplied)



The enclosed flow ball valve (ball valve with separating screw connection and 90° angle) must be installed on site in the machine flow 3/4" arranged in the tank bottom. The feed ball valve can be rotated through 360° via a separating screw connection. This allows a trouble-free installation according to the local conditions. During installation V-10-001 Krampitz Sealfix to be used.

2.4.8 V-10-001 Krampitz Sealfix

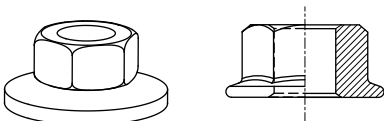
Krampitz Sealfix is a thread sealant for oil-resistant threaded connections. Sealfix is applied to the cleaned thread section. The threaded connection is closed. After 15 to 30 minutes Sealfix is hand-tight. Example: Bottle with 10 ml content.



NOTE
The cleaned thread section must be absolutely free of grease and oil.

2.4.9 Krampitz special-nut

Krampitz tank systems are equipped with special nuts for fast and safe assembly. In contrast to conventional connecting elements, the washer of the Krampitz special nut is captively connected to the nut. This means that a permanent connection can be made quickly and securely.



2.4.10 Manufacturer's label

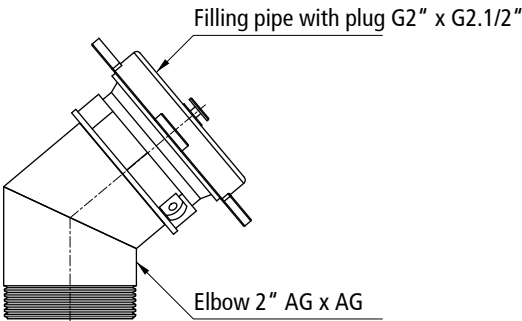
 Z-38.11-127 TÜV Nord Systems GmbH & Co. KG Made in Germany	Hersteller-Nr. serial no.	
	Baujahr year of manufacture	
	Rauminhalt bei zulässiger Füllhöhe (m³) capacity of permissible filling level	
	zulässiger Füllungsgrad permissible fill factor	(%)
	Werkstoff material	
	Gefahrenklasse danger classification for flammable liquids	
	zulässige Dichte permissible density	(kg/ltr.)
	Prüfdruck Lagerraum test pressure for tank	(mWs)
	max. Temperatur max. temperature	(°C)
	Medium medium	
Achtung! Betriebsdruck atmosphärisch! Es dürfen nur Flüssigkeiten entsprechend des Tankschildes mit der zulässigen Dichte gelagert werden! Attention! Operating pressure: atmospheric! Only fluids according to the identification plate with the permissible density.		

On each day tank TTE-XL there is a manufacturer's plate in accordance with the general technical approval Z-38.11-127. The logo of the manufacturer, Krampitz Tanksystem GmbH, is shown on the right-hand side of the plate. In the middle, all relevant data for this tank are noted (manufacturer's number, year of manufacture, test pressure, volume, material, etc.).

On the left-hand side, the mark of conformity (Ü mark) is affixed in accordance with the Ordinance on Marks of Conformity of the German Federal States (Übereinstimmungszeichen-Verordnung der Länder) as proof of conformity with the requirements of the building approval. The name of the manufacturer, the number of the general building approval and the organisation that monitors the manufacturer are also listed here. The manufacturer's plate is attached to the long side of the tank. Once the test has been passed, the manufacturer's plate is given the mark of the factory inspector in accordance with DIN 6600.

2.5 Connection set

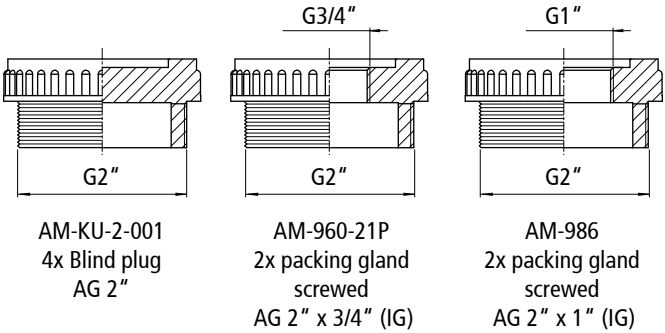
2.5.1 AM-912 Filling nozzle with filling pipe plug



Each TTE-XL must be provided with connections for a filling line or a filling connection (see also TRbF 20). The tank truck connection socket 2 x 2.1/2" is installed in a 2" sleeve in the tank roof by a 45° elbow AG/AG. If this connection is laid out of the genset room by the customer, the connection can also be mounted on the outside of a wall.

2.5.2 Adapter set

The adapter set ensures the inclusion of sensor technology. The Adapter set consists of:



The blind plugs and stuffing box glands are made of PE-HD. The sealing of the plug is done by a flat gasket. The plug is firmly sealed by simply screwing it hand-tight into the corresponding 2" socket on the tank roof. The plug is knurled on the outer edge for optimum handling.



NOTE

The adapter set must not be used for a fixed pipe installation and as a permanent closure of the two lateral overflow sockets.

2.5.3 Machine return

The machine return can easily be installed in one of the 2" sleeves located in the roof.

2.5.4 AM-911 Air vent with hood

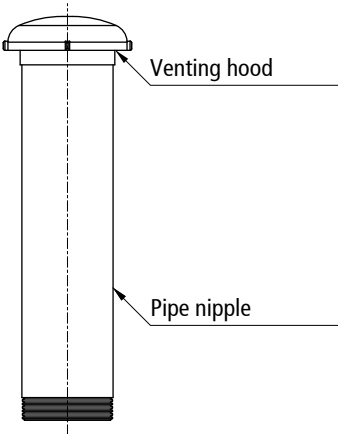
The vent pipe 2" is installed in a connection sleeve in the tank roof. If the tank is filled via the tanker connection from a road tanker, the vent pipe must have at least the same height above the tank roof as the connection for filling by road vehicles.



NOTE

The vent pipe must not end in closed rooms. Exception: Above-ground individual tanks for diesel and heating oil smaller than 1,000 litres.

In the case of tanks which are installed below ground level (for example, in the basement), the vent must be extended to at least 500 mm above the connection for filling by road tankers and mm 500 above ground level.



2.6 Special equipment



NOTE

Installation and electrical connection of the following electrically operated items must be carried out in accordance with the product description and manufacturer-specific installation instructions.

2.6.1 AE-303 Oil warning sensor

The oil detector is an approved leak warning device. It is installed in the collection space of the day tank. Up to two probes can be connected to an evaluation unit. The oil detector is used for the rapid detection of leaking water-endangering substances in accordance with VAWs. If a probe is immersed in liquid, the signal unit detects the changed probe signal and gives a visual and acoustic alarm and also actuates the relay for the output signal.

The probe of the oil detector detects the different optical behaviour of air and liquids. It is mounted at the lowest point of the interstitial space. The integrated signal unit constantly monitors the electrical output signal of

the probe. When ready for operation, the green operating lamp lights up.

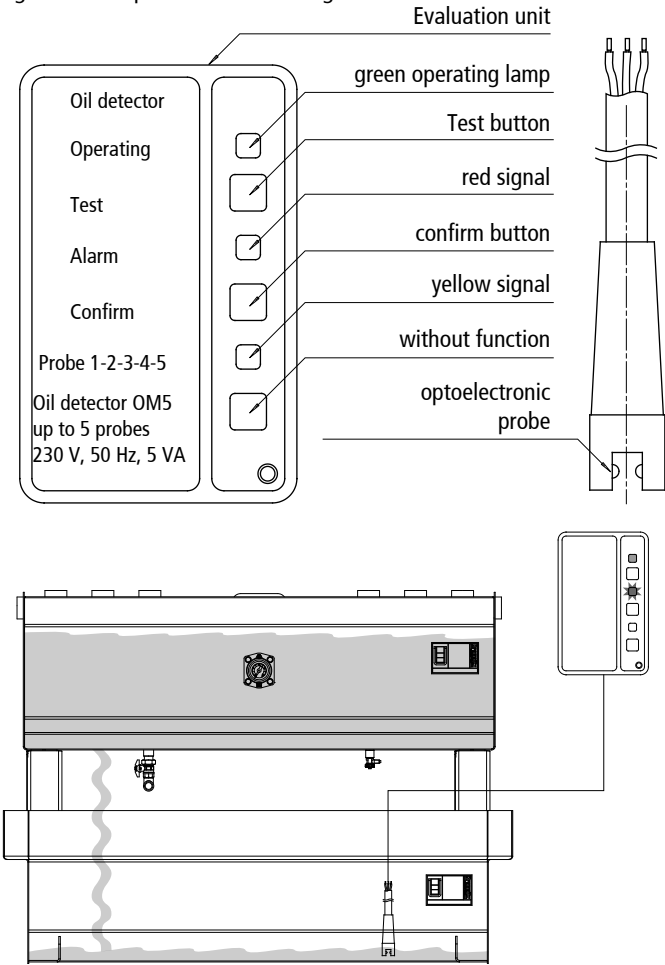
If the probe is in air, the signal part signals trouble-free operation: the green ready lamp is on, the red alarm lamp is off, the relay has dropped out. If the probe is immersed in oil, the signal unit signals a leak (alarm): the red alarm light and the audible alarm are activated. In the event of an alarm, the acoustic alarm can be switched off by pressing the „Acknowledge“ key. It is switched on again by pressing the button again.

When using several probes on one evaluation unit, the number of flashing pulses of the yellow control lamp can be used to close the respective probes. The duration of the successive flashing sequences is approximately three seconds.

The green operating lamp turns on as soon as the oil detector is supplied with power. The test button enables a function check by simulating the alarm case.

Structure (oil detector)

The oil detector consists of a signal section and up to five probes. The signal section and probes are connected to each other by a three-core signal line of up to 10 meters in length.



The probe of the oil detector consists of an infrared transmitter and an infrared receiver, which are fixed at a certain distance from each other. Both parts together form a light barrier. If there is air between the transmitter and receiver, most of the infrared radiation generated by the transmitter reaches the receiver. The principle of the optocoupler is used.

The signal part contains in an impact resistant plastic housing the display and operating elements as well as all electronic components for evaluating and converting the probe signal into a digital output signal. The output signal is available as a potential-free relay contact (changeover contact).

2.6.2 Level sensor

2.6.2.1 AE-100-E Level sensor



ATTENTION
Level sensor AE-100-E is not biodiesel resistant.

Scope of application:

- AE-100-E level sensor is designed for realization of level-dependent switching points in non-flammable liquids.
- Mineral oil, water, glycols, diesel/heating oil without vegan parts, etc.

This enables the automatic control of electrical components such as pumps. This would be the case with an automatic request or shutdown of pumps when the level falls below or exceeds predefined fill level points. Furthermore, remote signaling or automatic emergency shutdowns can be implemented, e.g., in the case of lower level deviation.

The AE-100-E is a flexible level sensor attached to a cable with electrical insulation made of plastic. A switch head made of stainless steel serves as the sensor, in which a short sliding tube is incorporated. The float with integrated magnetic ring slides on the sliding tube, in which a reed contact is incorporated. The switching contact of the reed switch is actuated by the magnetic ring of the float sliding over the reed contact and thus opening or closing it depending on the position.

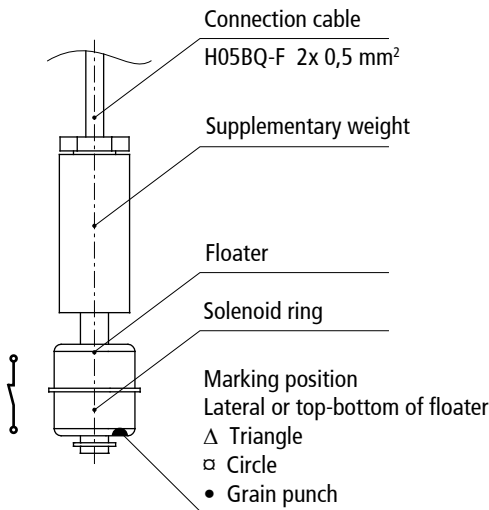
The level sensor does not require approval, as it is only used as a normally open contact within tank systems, such as for pump control „pump on“ (minimum contact) or „pump off“ (maximum contact). The level sensor can also be used for simple leakage detection.



NOTE
Only approved overfill prevention devices may be used for the „Overfill (MAX-MAX)“ alarm switching point.

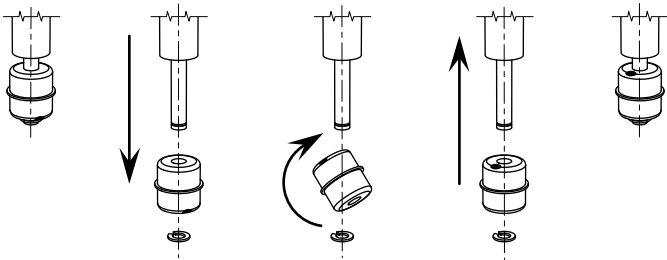
Default delivery:

Normally closed, contactor opens when level rises.
NC (Normally Closed)



Simple function change

By pulling off the floater and turning it by 180°, the „normally closed“ function becomes the „normally open“ function.



The level sensor is made of stainless steel and is equipped with a flexible, oil-resistant cable. The permissible temperature range for the cable is between -5 °C and +50 °C. The five metre long connection cable is installed directly on the control unit of the system.

Technical data:

- Float body: stainless steel 1.4571
- Cable: 2x 0.5 mm² H05BQ-F, PUR
- Cable length: 5m
- Output type: Reed contact
- Contact resistor: max. Ω 20,1
- Current: max. 0.5 A
- Voltage: max. 250 V
- Capacity: max. 10 VA
- Protection: IP68 per DIN VDE T10470
- Pressure: max. 5 bar
- Medium temperature: max. +50°C

The permissible temperature range for the static cable is between -30 °C and +50 °C and for the flexible cable between -5 °C and +50 °C.

Resistance according to VDE 0282: The cable is resistant to oils, greases, diesel/heating oil made of 100 % mineral oil, to water and atmospheric influences, ozone and oxygen as well as UV rays.

The resistance to vegan components in fuels and lubricants has not been proven. This must be taken into account when determining the test intervals for the AE-100-E.

2.6.2.2 AE-100-BD Level sensor, biodiesel resistant

Scope:

- AE-100-BD level sensor is intended for the realization of level-dependent switching points in non-flammable liquids.
- Mineral oil, heating oil, biodiesel, diesel with vegan components, water, glycols, etc.

This enables the automatic control of electrical components such as pumps. This would be the case for an automatic request or shutdown of pumps when a predetermined fill level is exceeded or not reached. Furthermore, remote signaling or automatic emergency shutdowns can be implemented, e.g., in the event of minimum level deviations.

The AE-100-BD is a flexible level sensor attached to a cable with electrical insulation made of plastic. The sensor is a stainless steel switch head, in which a short sliding tube is incorporated. The floater with integrated magnetic ring slides on the sliding tube, in which a reed contact is incorporated. The switching contact of the reed switch is actuated by the magnetic ring of the float sliding over the reed contact and thus opening or closing it depending on the position.

The level sensor does not require approval, as it is only used as a working contact within tank systems, such as for pump control „pump on“ (minimum contact) or „pump off“ (maximum contact). The level sensor can also be used for simple leakage detection.



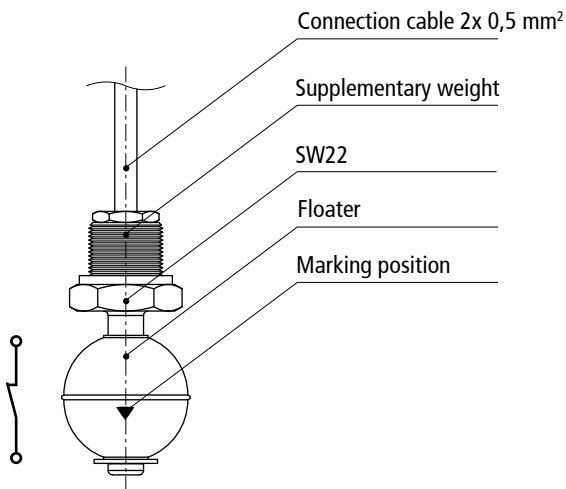
NOTE

Only approved overfill prevention devices may be used for the „Overfill (MAX-MAX)“ alarm switching point.

Default delivery:

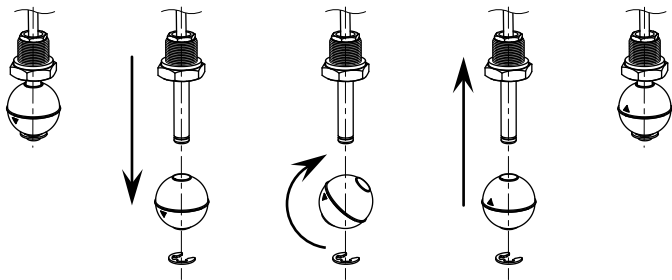
Normally closed, contactor opens when level rises.

NC (Normally Closed)



Simple function change

By pulling off the floater and turning it by 180°, the „normally closed“ function becomes the „normally open“ function.



Technical data

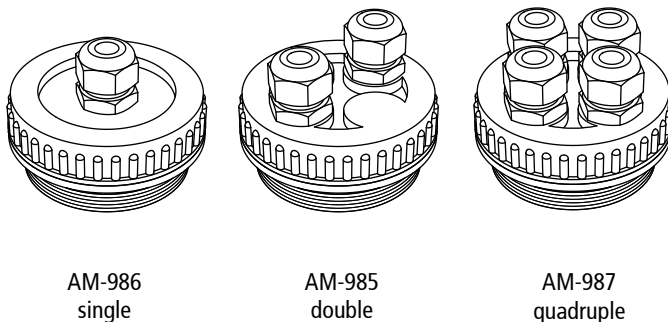
- Float body: stainless steel 1.4571
- Cable: 2x 0.5 mm² ÖLFLEX® ROBUST 210
- Cable length: 5 m
- Output type: reed contact
- Contact resistance: max. 0.1 Ω
- Switching current: max. 0.5 A
- Switching voltage: max. 250 V
- Switching capacity: max. 10 VA
- Protection class: IP68 according to DIN VDE 0470 T1
- Operating pressure: max. 5 bar
- Ambient temperature: -5 °C to +70 °C
- Medium temperature: -5 °C to +70 °C

The permissible temperature range for the static cable is between -30 °C and +50 °C and for the flexible cable between -5 °C and +50 °C.

Resistance according to VDE 0282: The cable is resistant to oils, greases, diesel/heating oil made of 100 % mineral oil, to water and atmospheric influences, ozone and oxygen as well as UV rays.

2.6.2.3 Stuffing box gland with cable gland

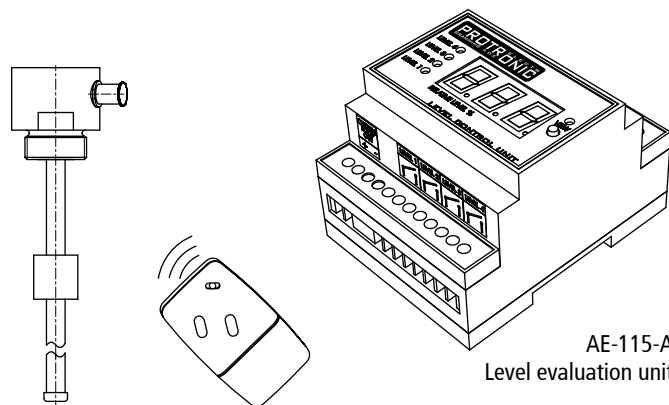
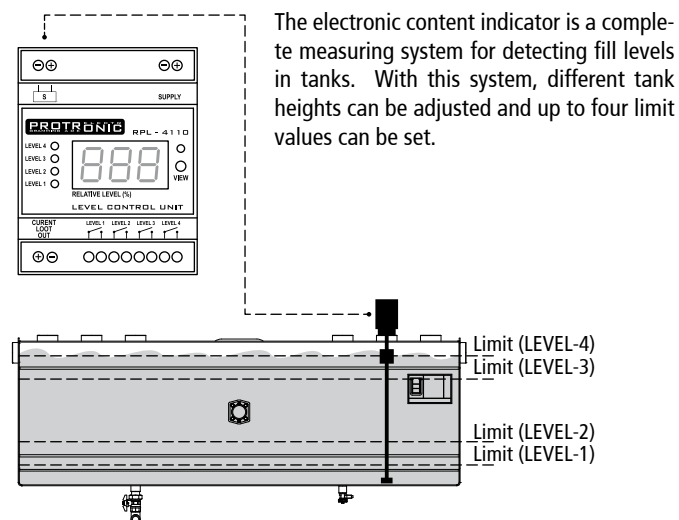
Problem-free installation of up to four switching points in a stuffing box gland with 4-fold cable gland. By means of the cable glands mounted in the stuffing box gland, the level transmitter can be set to the desired level and fastened accordingly.



2.6.3 AE-115-VII Electronic content display

Level control Type LC Series VII consisting of:

- AE-115-A Filling level evaluation unit
- AE-115-VS-xxxx* Level probe (level transmitter)
- AE-115-7 Power supply (optional)



AE-115-VS-xxxx* Level rod probe (*length rod probe: 500, 750, 1.000, 1.500 und 2.000 mm) and AE-115-VI-F infrared remot control for zero point („MIN“) and end value („MAX“) (optional).

The level evaluation unit AE-115-A is a process-controlled tank level indicator with limit value detection. It is an easy-to-operate unit that can also be used for other measuring tasks. The prerequisite for this is a 4-20 mA sensor, for example for pressure, temperature or flow measurement. The evaluation unit has been designed as a series installation device for mounting on DIN rails.

Thereby a problem-free integration into existing control systems is guaranteed. The relay contacts are galvanically isolated from the system. The system displays the fill level in percent on the evaluation unit.

Key features:

- Level switches/indicators and transmitters for difficult to access measuring points
- analog input signal (galvanically isolated): 4-20 mA with
- Input filter and measuring circuit monitoring
- Scaling for zero point and full scale, disconnectable power supply for the level rod probe
- three-digit 10 mm high LED display for the filling level in „%“.
- Display indicators: LEDs for measuring circuit monitoring and limit values LEVEL 1-4 (display of switching status)
- 4x independent switching points for limit value adjustment in the entire measuring range
- 4x potential-free relay contacts
- analog output signal: 4-20 mA (galvanically isolated)

2.6.4 Overfill prevention

Every tank for the storage of diesel fuel or heating oil which is filled via a tank truck connection, with the exception of above-ground tanks with a volume of not more than 1,000 litres, which are filled manually with a nozzle without a fixed line, must be equipped with an overfill protection device which interrupts the filling process or triggers an acoustic alarm in good time before the permissible filling level is reached.

Tanks with a volume of more than 1,000 litres for the storage of diesel fuel or heating oil which are filled from road tankers or demountable tanks shall be equipped with a limit value transmitter which enables the function of a filling safety device on road tankers or demountable tanks (see also TRbF § 20,9.3). Tanks for the storage of other liquids hazardous to water and flammable substances, such as mineral oil, which are filled automatically shall be equipped with an approved overfill protection system.



NOTE
The overfill protection must not be used as an operational switching point for controlling the refilling device.



NOTE
The overfill protection device used must be approved for the respective storage medium.



NOTE
Tanks may only be filled to the extent that corresponds to the permissible degree of filling. The permissible degree of filling depends on the medium (cubic expansion coefficient; see also TRbF § 20,9.3) and for the Krampitz day tank system is 95 % of the tank height inside.

2.6.4.2 AE-250 Level limiter (GWG 12 K/1)

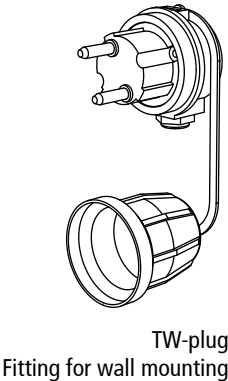
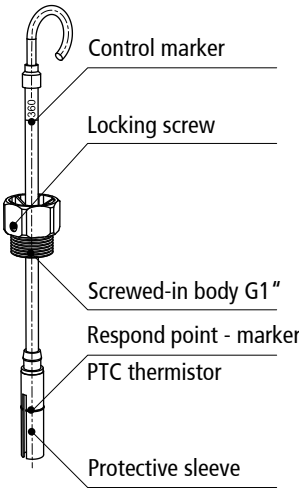
The level limiter is exclusively suitable for preventing overfilling of containers as part of a control chain for filling safety devices.

The level limiter consists of a probe, a screw-in body G1", a fitting for wall mounting and a cable between probe and fitting. At the lower end of the probe there is a protected PTC resistor.

The limit switch is height-adjustable and protrudes into the tank. As soon as the PTC thermistor is immersed in liquid, it changes its resistance abruptly. This change in resistance causes the tank truck's filling safety device to automatically interrupt the filling process.

Fixed tanks for the storage of diesel fuel or heating oil which are filled from a road tanker shall be equipped with a limit value transmitter. Exception: Tanks smaller than 1000 litres volume, which are filled manually with a tap valve without a fixed lead.

The level limiter must be adapted to the max. permissible filling level of the tank. (Also see installation instructions for limit switches).



2.6.4.1 Possible switching points and control commands

Symbol	Description	Filling level in percent	Type of level sensor	Control command
	MAX-MAX	95	Level limiter Overfill prevention	Overfill alarm: pump off
	MAX	70	Level sensor	Break contact: pump off
	MIN	40	Level sensor	Break contact: pump on or signal for reordering fuel
	MIN-MIN	10	Level sensor	Undersupply alarm: pump/engine off

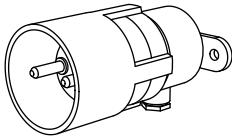
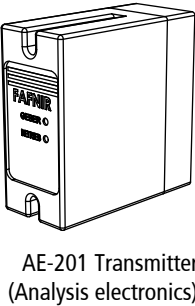
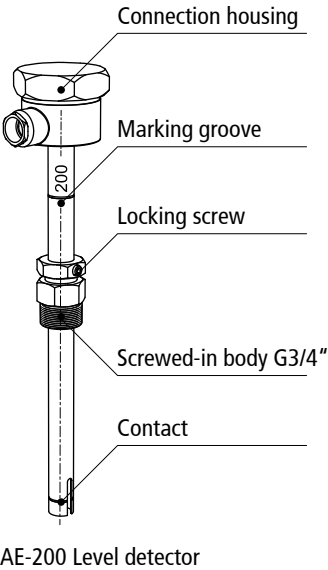
2.6.4.3 AE-200 Level detector overflow protection

The overflow protection is a device which interrupts the filling process of a tank with water-polluting liquid before the permissible filling level (limit level) is reached or triggers a visual and acoustic alarm. Stationary non-pressurised tanks for the storage of water-polluting liquids must be equipped with an approved overflow protection when filled mechanically by pumps. (Also see installation instructions for overflow protection).

The operating principle of the level detector is based on the different heat dissipation of a liquid or gaseous medium. An encapsulated PTC thermistor in the tip of the level detector is heated in the non-wetted state by the signal current of the transmitter until a sudden increase in its electrical resistance occurs. As soon as this tip is immersed in a liquid and thus cools down, the resistance falls back to its original value. The signal current is so limited that in this state (immersed) reheating is not possible. In a gaseous environment, the heating time of the PTC resistor is between 15 seconds (at +60 °C ambient temperature) and two minutes (at -20 °C ambient temperature).

In the transmitter, the resistance changes of the PTC thermistor are converted into relay circuits with a binary signal output. The function of the PTC thermistor is continuously monitored via the scanner integrated in the transmitter. The characteristics of the PTC resistor (heating and cooling behavior) are checked several times a second without influencing the current measuring process. This ensures that PTC thermistors which are no longer safe to operate, e.g., due to external influences (corroded sensor sleeve), are immediately detected and signaled by triggering the alarm device of the overflow protection. Since the energy supplied to the PTC resistor is precisely controlled via the scanner, maximum operational reliability and service life are guaranteed.

The relay drops out when the level detector tip has cooled down and also in the event of a power failure or a short circuit or line break in the connection between the level detector and the measuring transducer. A green LED indicates that the transmitter is ready for electrical operation. A relay failure is indicated on the measuring transducer by a yellow LED going out.



Additional device type 907-W can be connected as an additional control device to enable connection to a road tanker with filling system.

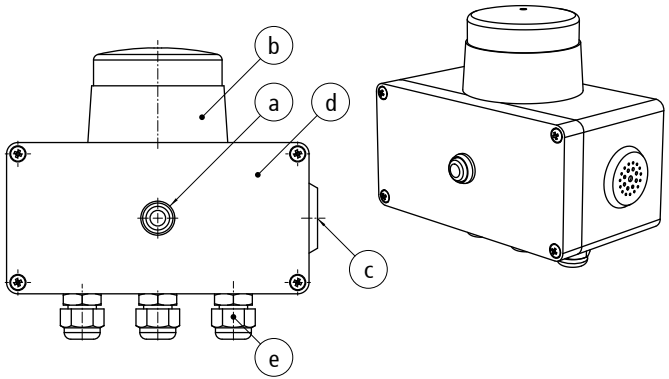
The overflow protection releases the delivery and at the same time a voltage is applied to the additional device via the output of the transmitter. This switches a PTC thermistor located inside the 907-W into the circuit of the two connector pins of the 907-W. The switching amplifier located in the tank truck evaluates the PTC thermistor like a limit value sensor. The switching device in the tank truck evaluates the PTC thermistor like a limit value sensor and releases the TKW delivery.

2.6.4.4 B-AE-110 Overflow receipt box

The overflow receipt box is used to signal or alarm the overflow protection to the tanker driver during filling. The tank truck driver switches off the tank truck pump manually. The horn is switched off by means of a confirmation button when the overflow protection is activated. The flashing light turns off automatically when the overflow protection is not activated.

Range of use:

- Optical and acoustic alarm box for wall mounting
- Protect against splashing water, installation in dry rooms
- Must not be used in potentially explosive atmospheres!



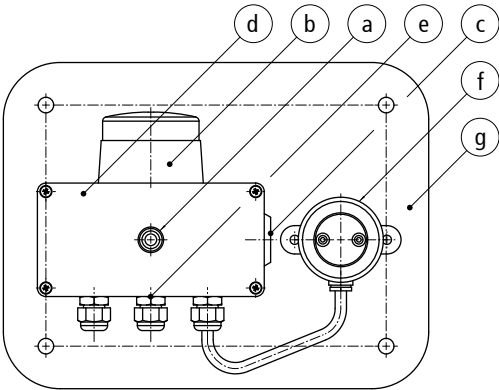
Pos.	Description
a	Confirmation button
b	Flash light - Flash power 1 Joule
c	Horn - noise level 95 dB
d	Housing - Protection class IP 54
e	3x cable gland M16 x 1,5

2.6.4.5 B-AE-907-W Overfill receipt box with tanker shutdown system

- Pre-assembled safety equipment consisting of:
- B-AE-110 Overfill receipt box
 - AE-MS-24-001 Level limiter fitting Type 907-W
 - Base plate

The overfill receipt box with tanker shutdown system is used to automatically switch off the pump of the tanker or to signal the tanker driver when the tank is being filled. The horn is switched off by means of the confirmation button when the overfill protection is activated. The flashing light turns off automatically if the overfill protection is not activated.

- Range of use:
- Visual and audible alarm box for wall mounting with automatic shut-down of the tanker's pump
 - Protect against splash water, installation in dry rooms
 - Must not be used in potentially explosive atmospheres!

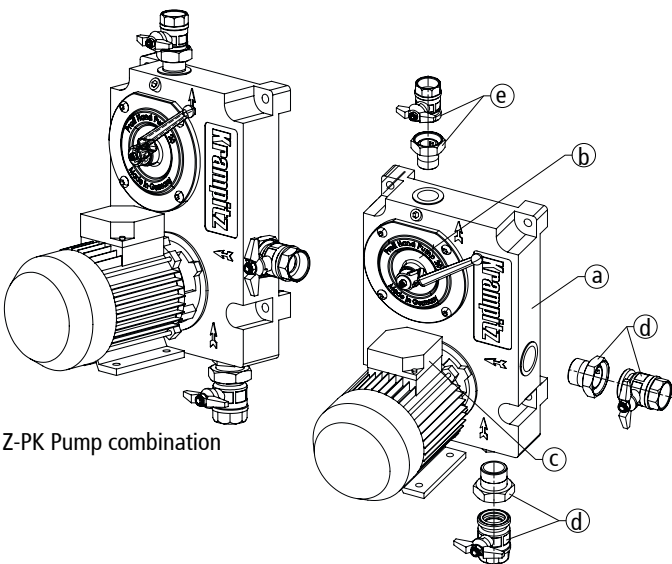


B-AE-907-W	B-AE-110	Pos.	Description
		a	Confirmation button
		b	Flash light - Flash power 1 Joule
		c	Horn - noise level 95 dB
		d	Housing - Protection class IP 54
		e	3x cable gland M16 x 1,5
		f	• Level limiter fitting Type 907-W
		g	Base plate

2.6.5 System pumps for fuels and engine oils

2.6.5.1 Z-PK Pump combination

The pump combination is used to supply decentralized day tanks from a storage tank. The pump combinations Z-PK-2020 (230 V) and Z-PK-2021 (400 V) are used exclusively for pumping diesel fuel and EL heating oil. A wide field of application results from the good delivery rate up to approx. 35-40 l/min at approx. m5 delivery head (5 l/min at approx. 35 m height). The pump combination combines an electric pump and a hand pump in one housing. In the event of a malfunction or defect of the electric pump, the hand pump ensures the continued operation of the system and also serves to vent the suction line (for further information, see the operating instructions for the pump combination).



Z-PK Pump combination

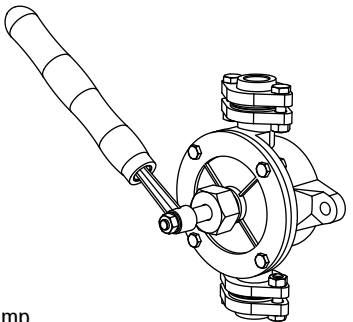
Pos.	Description	Connection
a	Twin pump body (grey cast iron)	-
b	Hand vane pump	Flange
c	electric centrifugal pump	Flange
d	2x KH with separating screw	G1" (AG/IG)
e	1x KH with separating screw	G3/4" (AG/IG)

KH = Ball valve with separating screw connection, conical sealing with O-ring and butterfly handle

2.6.5.2 PH-30-001 Double-acting hand vane pump

The simple and robust construction, the quality of the materials and the machining guarantee a long and effective life. These pumps are suitable for clear and light liquids such as water, petrol, diesel and other fuels, paraffin, alcohol, light chemical solutions, cooking oils, etc. and are the only hand pumps suitable for use with very hot liquids up to 80°C.

The pump is actuated by the movement of the swivel, in which the shaft and the wing piston - with flap valves - half-rotate in the pump. The pump body further houses the suction plate provided with flaps. A gland sleeve compressed by a gland ring and nut acts as a seal between the shaft and the pump cover.



Example: PH-30-001 Hand vane pump

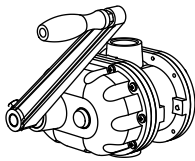
Item no.	Output	Double strokes*	per double stroke
	l/min (appr.)	per minute	l (appr.)
PH-30-001	17,0	60	0,28
PH-40-001	22,0	55	0,42

*Average value

2.6.5.3 PH-100-001 Hand crank pump

The hand crank rotary pump is suitable for thin-bodied, non-flammable media: diesel, heating oil, gear oil, hydraulic oil, machine oil, mineral oil, engine oil, etc.

- Material: Aluminium and galvanized steel
- Delivery rate: appr. 100 l/min
- Flow rate: appr. 1 l/spin
- Connection: G1"
- Conveying height: 10 m
- Suction height: 4m
- Seals: NBR

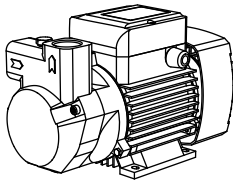


2.6.5.4 PK-80 Centrifugal pump

Recommended for pumping diesel/heating oil and liquids which do not chemically attack the pump materials (e.g., diesel). The centrifugal pump PK-80 is a compact pump which is used for sparse, irregular flow or pumped medium mixed with air.

PK-80-015 1-phase 230 V, 50 Hz
PK-80-016 3-phase 400 V, 50 Hz

- Flow rate: up to 50 l/min
- Conveying height: up to 40 m

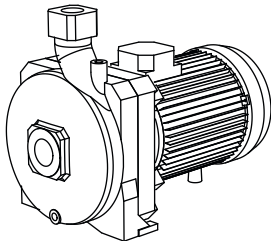


2.6.5.5 PK-170-11 Centrifugal pump

Recommended for pumping diesel/heating oil and liquids that do not chemically attack the pump materials (e.g., diesel). The centrifugal pump PK-170-11 is a compact pump, which is used for sparse, irregular flow or pumped medium mixed with air.

PK-170-011 3-phase 400 V, 50 Hz

- Flow rate: up to 120 l/min
- Conveying height: up to 35 m

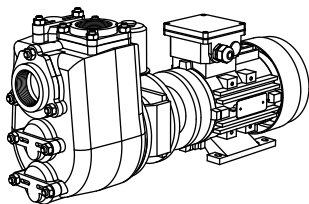


2.6.5.6 TP-K-600-DK Transfer pump

Recommended for pumping diesel/fuel oil and liquids with viscosity up to 50 mm2/s (cSt), which do not chemically attack the pump materials. The transfer pump is a compact centrifugal pump used for sparse, irregular flow or pumped medium mixed with air.

TP-K-600-DK 3-phase 400 V, 50 Hz

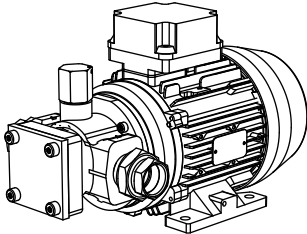
- Flow rate: up to 730 l/min
- Conveying height: up to 18 m



2.6.5.7 PG Gerotor pumps

Gerotor pumps are suitable for pumping liquid media that have some lubricity, with a viscosity of 50-500 mm/s2 (cSt) and contain no solid impurities.

The compact design without coupling saves considerably on overall length compared to conventional designs. The gerotor gear system has become established worldwide in automotive engineering as a lubrication pump. To protect the electric motor from overload, a bypass valve (pressure relief valve) is always integrated in the pump.



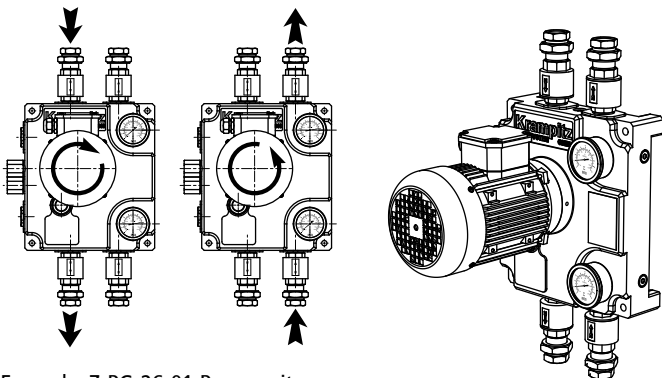
Example: PG-26-115 Pump unit

Item no.	Flow rate	Pumping pressure	Voltage
	l/min	bar	~ V
PG-26-114	26	6,0	230
PG-26-115			Y 400 / Δ 230

2.6.5.8 Z-PG Pump unit

Suitable for the oil supply of industrial combustion engines. Recommended for pumping non-flammable, lubricating liquids such as mineral oil and liquids with a viscosity of 50 to 500 mm2/s(cSt) which do not chemically attack the pump materials.

The Z-PG pump unit enables the oil change or oil supply of industrial combustion engines. The simple mode of operation of the pump enables the two required delivery paths to be switched by simply changing the direction of rotation of the electric motor. Each direction of rotation is secured by a non-return valve. For pressure control the pump is equipped with two pressure gauges and additionally with a sight glass for visual control. To protect the electric motor from overload, a bypass valve is always integrated in the pump for each delivery path.

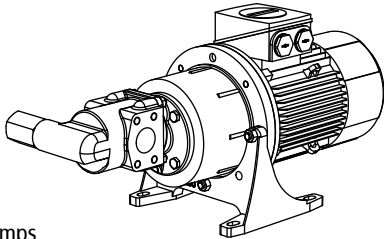


Example: Z-PG-26-01 Pump unit

Item no.	Flow rate	Pump pressure	Voltage
	l/min	bar	V
Z-PG-26-01	26,0	< 7,0	Y 400 / Δ 230

2.6.5.9 PZ Gear pumps

Gear pumps are particularly suitable for pumping media which do not contain solids, guarantee a minimum lubricity and do not chemically attack the pump materials. The standard version is supplied with the direction of rotation „clockwise“. We supply the pumps with a built-in, adjustable pressure relief valve, for short-term protection against pressure peaks, in the housing.



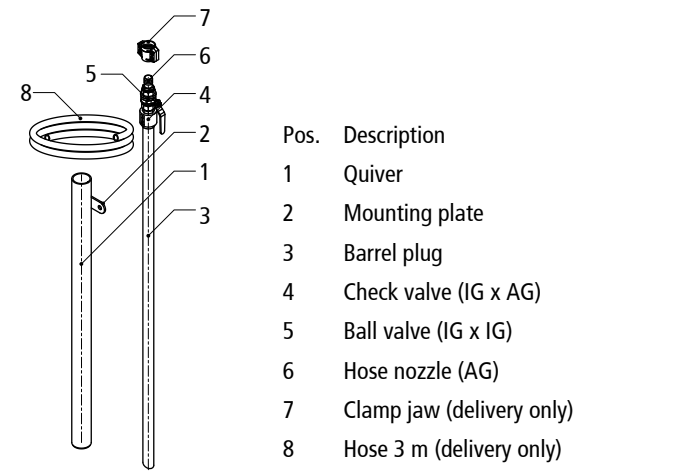
Example: PZ-100-121 Gear pumps

Item no.	Flow rate	Pumping pressure	Voltage
	l/min	bar	~ V
PZ-100-121	appr. 110	6,0	Y 400 / Δ 230
PZ-200-122	appr. 200	6,0	Y 400 / Δ 230

2.6.6 AM-1200 Barrel plug with quiver

Suction pipe with non-return valve and ball valve incl. quiver and Hose.

AM-1200 Barrel plug 3/4" with sleeve and hose DN 19 x 4 mm
AM-1201 Barrel plug 1" with sleeve and hose DN 25 x 5 mm



2.6.7 AE-802 Tank heater

The use of the tank heater reliably prevents paraffin separation from diesel fuel and EL heating oil at falling temperatures and maintains the pumping and nozzle viscosity of the oil in the intake area. The automatic temperature control is between +8 °C and +12 °C. The built-in safety temperature limiter is set in such a way that the fuel cannot be heated above the flash point of +55 °C. A sleeve 2" is required to insert the tank heater into the tank. To ensure that the fuel can be heated in the intake area, the heater should be placed as close as possible to the intake pipe. The tank heater must be inserted into the tank so that the full length of the radiator rests on the tank bottom.

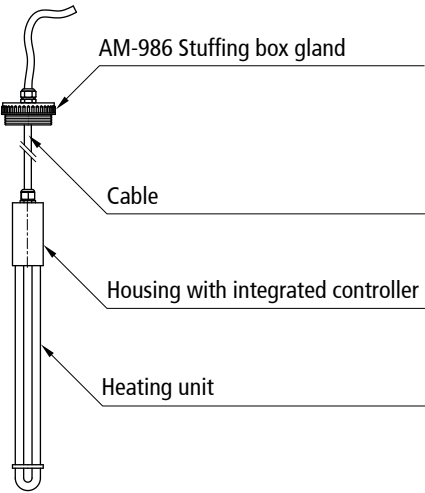


NOTE
The connection line of the tank heater must be connected to a main switch with a control light.

The required capacity of the tank heater to be used depends on the type of tank, its installation location and other criteria that have to be taken into account specifically for each application.

AE-802 Tank heater for tank volume up to 2000 litres incl. AM-986 stuffing box gland with 1-fold cable gland

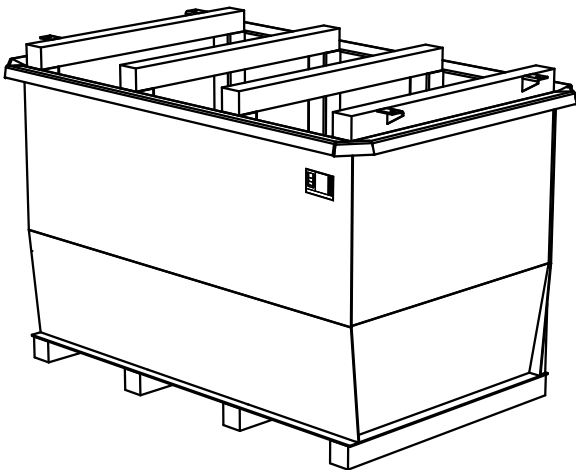
Surface load: 0.8 W/cm²
Power: 220 W
Voltage: 230 V
Length: 466 mm
Diameter: 44 mm
Connection length: 4 m



2.6.8 TW-XL Collecting trays

The collection tray is used to retain water-endangering substances that could escape from leaks in the tank or leaking connection pipes. If there is no collection space available on site for the day tank, a cubic collection tray, single-walled made of steel, available in all standard sizes of the TTE-XL, must be used. The Collecting tray is also built in accordance with the building authority approval Z-38.11-127.

Two support brackets for the day tank are integrated in the collection tray, each of which is provided with an M 10 x 30 welding stud on the support corners. The day tank with the collection tray is fastened to these bolts by means of four M 10 nuts with captive washers. When using the wall bracket on the day tank, the collection tray hangs directly under the day tank. When using the feet or the pedestal, the drip tray stands on the feet or on the pedestal and the day tank stands on the drip tray.



Example: TW-XL-2500 Collection tray

2.6.9 ST Stand columns

The stand column consists of two stand constructions made of a square tube 100 x 100 x 3 mm. These uprights are bolted with a cross member to two head plates, each with four nuts. Then the collection tray or the day tank is lifted onto the stand column, placed on the corresponding welding studs, fastened with four M10 nuts and captive washers. Finally, the square tube openings are closed with the enclosed sealing caps.

It is possible to produce the stand columns in the sizes and 500 mm, 1,000mm and 1,500 mm.

Item-no.	Length	Length total	Width	Width total	Height	Height total	Weight
	mm	mm	mm	mm	mm	mm	kg
TW-XL-2500	2,000	2,220	1,250	1,470	1,275	1,460	530
TW-XL-3000	2,000	2,220	1,500	1,720	1,275	1,460	595
TW-XL-4000	2,000	2,220	1,500	1,720	1,525	1,710	660
TW-XL-5000	3,000	3,220	1,500	1,720	1,275	1,460	810
TW-XL-6000	3,000	3,220	1,500	1,720	1,525	1,710	885
TW-XL-7000	3,500	3,720	1,500	1,720	1,525	1,710	998
TW-XL-8000	4,000	4,220	1,500	1,720	1,525	1,710	1,115
TW-XL-9000	4,500	4,720	1,500	1,720	1,525	1,710	1,260

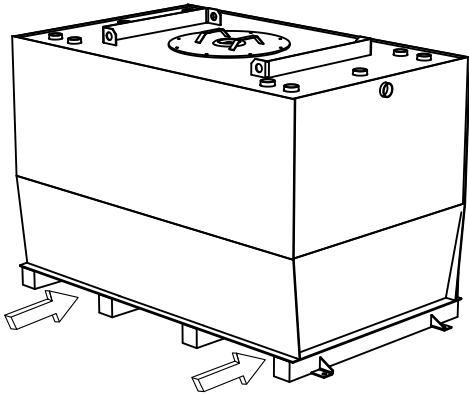
3. TRANSPORT AND ASSEMBLY

The TTE-XL can easily be transported by forklift, pallet truck or crane.



ATTENTION

During transport, the applicable, valid safety regulations must be observed and damage must be avoided. In the event of paint damage, the corrosion protection must be properly restored.



Drive direction



ATTENTION

Transport only in emptied and cleaned condition!

4. DOCUMENTATION

Documentation consisting of the following components is supplied with the day tanks:

- Test certificate and declaration of conformity
- WHG and ISO 9001 certificates
- Overview drawing
- Approval booklet of the general technical approval Z-38.11-127 (simple)
- Operating instructions and data sheets of the individual module components such as level sensor, overfill protection and pump combination.

The documentation is sent to the customer by email. Only the delivery bill is enclosed with the tank on delivery, so no important documents can get lost on a construction site etc.

The approval booklets contain a test table for the respective tank. In this test table, the tank dimensions, the tank type, the date of the initial test and the further test dates are noted. The person carrying out the test can confirm the further tests here.

5. WARRANTY

General Terms and Conditions Rev.: May 2020

§ 6 Passage of Risk – Transport Insurance

- 1) Unless otherwise specified, the goods are delivered "ex works" (EXW Incoterms® 2020) : KRAMPITZ Maschinentank GmbH, Henningen 78, 29410 Salzwedel, Germany. In the case of sale to destination according to customer's instructions the goods will be delivered free carrier (FCA Incoterms® 2020).
- 2) On customer's request we will arrange the transport and provide transport insurance. The costs associated with these services will be borne by the customer and charged separately.

§ 7 Customer's Complaints

- 1) Liability for defects is governed primarily by the written agreement regarding quality of goods. We are not liable for any public statements of third parties who do not act on our behalf.
- 2) Liability for defects does neither cover normal wear and tear, nor any damage or loss that has occurred after passage of risk due to improper treatment or use, excessive load, inappropriate tools, inappropriate construction work or subgrade. Liability is also excluded when the claimed defect is due to improper changes or repair and maintenance jobs carried out by the customer or third parties.
- 3) The assertion of claims for defects requires that the customer has complied with his inspection and notification duties defined in Section 377 HGB (German Commercial Code). The customer is obliged to inspect the goods immediately to the extent this is appropriate in the due course of business, and inform us immediately if a defect is detected. If the defect detected is obviously caused by transport, it has to be reported additionally to the carrier – if a consignment note was issued or receipt has to be confirmed by a signature, the damage should be recorded on this document.
- 4) In the case of a justified defect of the object purchased, we are entitled to subsequent performance by either rectifying the defect or supplying a new item free of any defects. This does not affect the right to refuse subsequent performance under the statutory provisions. If we chose to rectify the defect, we are obliged to bear any costs required, in particular transport, travelling, labour and material costs provided these have not increased because the object purchased has been relocated to a place (outside Germany) other than the place of performance (within Germany). In this case it has to be agreed in advance with the customer how costs can be minimized, or what other options exist. The general assumption of transport, travelling, labour and material costs associated with the settlement of customer's complaints at a place of performance outside Germany is excluded.
- 5) We are entitled to subsequent performance subject to the condition that the customer pays the purchase price due. The customer is however entitled to retain provisionally a portion of the purchase price appropriate in relation to the defect.
- 6) If subsequent performance is not successful, the customer is entitled to cancel the contract or demand reduction of the purchase price.
- 7) Customer's claims for damages or compensation for futile expenses are exclusively subject to the provisions of Section 7 of these terms of sale, even in the case of defects.
- 8) By derogation from Section 438 para. 1 No. 3 BGB the general period of limitation for quality defects and defects of title (warranty period) is one year from the date of delivery. If acceptance inspection is agreed, the period of limitation commences on the date of the acceptance inspection. Claims for defects are excluded after expiry of the warranty period. This does not affect any statutory special provisions for limitation (in particular Section 438 para. 1 Nos. 1 and 2, para. 3, Sections 444, 479 BGB). Claims for damages according to Section 7 are exclusively subject to the statutory provisions for limitation.

§ 8 Other Liability

- 1) Unless otherwise agreed in the contract, we are liable as follows:

Unless otherwise specified below, our liability for damages is based on the statutory provisions. In the event of breach of duty for whatever cause in law, our liability for default covers damage/loss caused intentionally and by gross negligence.

Subject to extenuating liability criteria according to the statutory provisions (e.g. *diligentia quam in suis*) we are liable in the event of ordinary negligence in the following cases only:

- a) damage/loss caused by injury to life, body or health, and
 - b) damage/loss caused by breach of substantial contractual obligations (obligations the fulfilment of which is deemed to be necessary for the due and careful completion of the contract and on whose fulfilment the contractual party regularly counts and may regularly count); in this case liability is however limited to compensation for the foreseeable and typical damage/loss.
- 2) The above restrictions of liability also apply to breaches of duty by or for the benefit of persons for whose faults we are liable in accordance with law. Claims under the product liability law are subject exclusively to the statutory provisions.

6. APPENDIX

6.1 Bearing chart - TTE-XL-2500

Filling level	Volume	Filling level	Filling level	Volume	Filling level	Filling level	Volume	Filling level	Filling level	Volume	Filling level
mm	l	%	mm	l	%	mm	l	%	mm	l	%
10	22	0,8	410	948	33,2	810	1.924	65,7			
20	45	1,6	420	972	34,0	820	1.948	66,5			
30	67	2,4	430	996	34,9	830	1.972	67,3			
40	89	3,2	440	1.021	35,7	840	1.997	68,1			
50	112	4,1	450	1.045	36,5	850	2.021	68,9			
60	134	4,9	460	1.069	37,3	860	2.046	69,7			
70	157	5,7	470	1.093	38,1	870	2.070	70,5			
80	179	6,5	480	1.118	38,9	880	2.095	71,3			
90	202	7,3	490	1.142	39,7	890	2.119	72,1			
100	225	8,1	500	1.166	40,5	900	2.143	73,0			
110	247	8,9	510	1.191	41,3	910	2.168	73,8			
120	270	9,7	520	1.215	42,2	920	2.192	74,6			
130	293	10,5	530	1.240	43,0	930	2.217	75,4			
140	316	11,3	540	1.264	43,8	940	2.241	76,2			
150	338	12,2	550	1.289	44,6	950	2.266	77,0			
160	361	13,0	560	1.313	45,4	960	2.290	77,8			
170	384	13,8	570	1.337	46,2	970	2.314	78,6			
180	407	14,6	580	1.362	47,0	980	2.339	79,4			
190	430	15,4	590	1.386	47,8	990	2.363	80,2			
200	453	16,2	600	1.411	48,6	1000	2.388	81,1			
210	477	17,0	610	1.435	49,4	1010	2.412	81,9			
220	500	17,8	620	1.460	50,3	1020	2.437	82,7			
230	523	18,6	630	1.484	51,1	1030	2.461	83,5			
240	546	19,5	640	1.508	51,9	1040	2.485	84,3			
250	569	20,3	650	1.533	52,7	1050	2.510	85,1			
260	593	21,1	660	1.557	53,5	1060	2.534	85,9			
270	616	21,9	670	1.582	54,3	1070	2.559	86,7			
280	640	22,7	680	1.606	55,1	1080	2.583	87,5			
290	663	23,5	690	1.631	55,9	1090	2.608	88,4			
300	687	24,3	700	1.655	56,7	1100	2.632	89,2			
310	710	25,1	710	1.679	57,6	1110	2.656	90,0			
320	734	25,9	720	1.704	58,4	1120	2.681	90,8			
330	757	26,7	730	1.728	59,2	1130	2.705	91,6			
340	781	27,6	740	1.753	60,0	1140	2.730	92,4			
350	805	28,4	750	1.777	60,8	1150	2.754	93,2			
360	829	29,2	760	1.801	61,6	1160	2.779	94,0			
370	853	30,0	770	1.826	62,4	1170	2.803	94,8			
380	876	30,8	780	1.850	63,2	1172	2.808	95,0			
390	900	31,6	790	1.875	64,0						
400	924	32,4	800	1.899	64,8						



NOTE
Due to the general approval by the building authorities Z-38.11-127, the maximum filling volume is 95 % of the tank height inside.

The values given in the above chart are to be regarded as guide values. The actual tank capacity may deviate from the table value due to manufacturing tolerances and the material properties of the materials used.

6.2 Bearing chart - TTE-XL-3000

Filling level	Volume	Filling level	Filling level	Volume	Filling level	Filling level	Volume	Filling level	Filling level	Volume	Filling level
mm	l	%	mm	l	%	mm	l	%	mm	l	%
10	27	0,8	410	1.146	33,2	810	2.318	65,7			
20	54	1,6	420	1.175	34,0	820	2.348	66,5			
30	81	2,4	430	1.204	34,9	830	2.377	67,3			
40	108	3,2	440	1.233	35,7	840	2.406	68,1			
50	136	4,1	450	1.262	36,5	850	2.436	68,9			
60	163	4,9	460	1.291	37,3	860	2.465	69,7			
70	190	5,7	470	1.320	38,1	870	2.494	70,5			
80	217	6,5	480	1.350	38,9	880	2.524	71,3			
90	245	7,3	490	1.379	39,7	890	2.553	72,1			
100	272	8,1	500	1.408	40,5	900	2.582	73,0			
110	300	8,9	510	1.438	41,3	910	2.612	73,8			
120	327	9,7	520	1.467	42,2	920	2.641	74,6			
130	355	10,5	530	1.496	43,0	930	2.670	75,4			
140	382	11,3	540	1.526	43,8	940	2.700	76,2			
150	410	12,2	550	1.555	44,6	950	2.729	77,0			
160	438	13,0	560	1.584	45,4	960	2.759	77,8			
170	466	13,8	570	1.614	46,2	970	2.788	78,6			
180	493	14,6	580	1.643	47,0	980	2.817	79,4			
190	521	15,4	590	1.672	47,8	990	2.847	80,2			
200	549	16,2	600	1.702	48,6	1000	2.876	81,1			
210	577	17,0	610	1.731	49,4	1010	2.905	81,9			
220	605	17,8	620	1.761	50,3	1020	2.935	82,7			
230	633	18,6	630	1.790	51,1	1030	2.964	83,5			
240	661	19,5	640	1.819	51,9	1040	2.993	84,3			
250	689	20,3	650	1.849	52,7	1050	3.023	85,1			
260	718	21,1	660	1.878	53,5	1060	3.052	85,9			
270	746	21,9	670	1.907	54,3	1070	3.081	86,7			
280	774	22,7	680	1.937	55,1	1080	3.111	87,5			
290	802	23,5	690	1.966	55,9	1090	3.140	88,4			
300	831	24,3	700	1.995	56,7	1100	3.169	89,2			
310	859	25,1	710	2.025	57,6	1110	3.199	90,0			
320	888	25,9	720	2.054	58,4	1120	3.228	90,8			
330	916	26,7	730	2.083	59,2	1130	3.258	91,6			
340	945	27,6	740	2.113	60,0	1140	3.287	92,4			
350	973	28,4	750	2.142	60,8	1150	3.316	93,2			
360	1.002	29,2	760	2.171	61,6	1160	3.346	94,0			
370	1.031	30,0	770	2.201	62,4	1170	3.375	94,8			
380	1.059	30,8	780	2.230	63,2	1172	3.381	95,0			
390	1.088	31,6	790	2.260	64,0						
400	1.117	32,4	800	2.289	64,8						



NOTE
Due to the general approval by the building authorities Z-38.11-127, the maximum filling volume is 95 % of the tank height inside.

The values given in the above chart are to be regarded as guide values. The actual tank capacity may deviate from the table value due to manufacturing tolerances and the material properties of the materials used.

6.3 Bearing chart - TTE-XL-4000

Filling level	Volume	Filling level	Filling level	Volume	Filling level	Filling level	Volume	Filling level	Filling level	Volume	Filling level
mm	l	%	mm	l	%	mm	l	%	mm	l	%
10	27	0,7	410	1.127	27,6	810	2.292	54,6	1210	3.466	81,6
20	53	1,3	420	1.155	28,3	820	2.322	55,3	1220	3.496	82,3
30	80	2,0	430	1.184	29,0	830	2.351	56,0	1230	3.525	82,9
40	106	2,7	440	1.212	29,7	840	2.380	56,6	1240	3.554	83,6
50	133	3,4	450	1.241	30,3	850	2.410	57,3	1250	3.584	84,3
60	160	4,0	460	1.270	31,0	860	2.439	58,0	1260	3.613	85,0
70	187	4,7	470	1.298	31,7	870	2.468	58,7	1270	3.643	85,6
80	214	5,4	480	1.327	32,4	880	2.498	59,3	1280	3.672	86,3
90	241	6,1	490	1.356	33,0	890	2.527	60,0	1290	3.701	87,0
100	268	6,7	500	1.385	33,7	900	2.556	60,7	1300	3.731	87,7
110	295	7,4	510	1.414	34,4	910	2.586	61,4	1310	3.760	88,3
120	322	8,1	520	1.443	35,1	920	2.615	62,0	1320	3.789	89,0
130	349	8,8	530	1.472	35,7	930	2.645	62,7	1330	3.819	89,7
140	376	9,4	540	1.501	36,4	940	2.674	63,4	1340	3.848	90,3
150	403	10,1	550	1.530	37,1	950	2.703	64,1	1350	3.877	91,0
160	430	10,8	560	1.559	37,8	960	2.733	64,7	1360	3.907	91,7
170	458	11,5	570	1.588	38,4	970	2.762	65,4	1370	3.936	92,4
180	485	12,1	580	1.617	39,1	980	2.791	66,1	1380	3.965	93,0
190	512	12,8	590	1.647	39,8	990	2.821	66,7	1390	3.995	93,7
200	540	13,5	600	1.676	40,5	1000	2.850	67,4	1400	4.024	94,4
210	567	14,2	610	1.705	41,1	1010	2.879	68,1	1409	4.051	95,0
220	595	14,8	620	1.735	41,8	1020	2.909	68,8			
230	622	15,5	630	1.764	42,5	1030	2.938	69,4			
240	650	16,2	640	1.793	43,2	1040	2.967	70,1			
250	678	16,9	650	1.823	43,8	1050	2.997	70,8			
260	705	17,5	660	1.852	44,5	1060	3.026	71,5			
270	733	18,2	670	1.881	45,2	1070	3.055	72,1			
280	761	18,9	680	1.911	45,8	1080	3.085	72,8			
290	789	19,6	690	1.940	46,5	1090	3.114	73,5			
300	817	20,2	700	1.969	47,2	1100	3.144	74,2			
310	845	20,9	710	1.999	47,9	1110	3.173	74,8			
320	873	21,6	720	2.028	48,5	1120	3.202	75,5			
330	901	22,2	730	2.057	49,2	1130	3.232	76,2			
340	929	22,9	740	2.087	49,9	1140	3.261	76,9			
350	957	23,6	750	2.116	50,6	1150	3.290	77,5			
360	985	24,3	760	2.146	51,2	1160	3.320	78,2			
370	1.013	24,9	770	2.175	51,9	1170	3.349	78,9			
380	1.042	25,6	780	2.204	52,6	1180	3.378	79,6			
390	1.070	26,3	790	2.234	53,3	1190	3.408	80,2			
400	1.098	27,0	800	2.263	53,9	1200	3.437	80,9			



NOTE
Due to the general approval by the building authorities Z-38.11-127, the maximum filling volume is 95 % of the tank height inside.

The values given in the above chart are to be regarded as guide values. The actual tank capacity may deviate from the table value due to manufacturing tolerances and the material properties of the materials used.

6.4 Bearing chart - TTE-XL-5000

Filling level	Volume	Filling level	Filling level	Volume	Filling level	Filling level	Volume	Filling level	Filling level	Volume	Filling level
mm	l	%	mm	l	%	mm	l	%	mm	l	%
10	41	0,8	410	1.740	33,2	810	3.508	65,7			
20	83	1,6	420	1.784	34,0	820	3.552	66,5			
30	124	2,4	430	1.828	34,9	830	3.596	67,3			
40	165	3,2	440	1.871	35,7	840	3.640	68,1			
50	207	4,1	450	1.915	36,5	850	3.685	68,9			
60	248	4,9	460	1.959	37,3	860	3.729	69,7			
70	290	5,7	470	2.003	38,1	870	3.773	70,5			
80	331	6,5	480	2.047	38,9	880	3.817	71,3			
90	373	7,3	490	2.092	39,7	890	3.862	72,1			
100	415	8,1	500	2.136	40,5	900	3.906	73,0			
110	457	8,9	510	2.180	41,3	910	3.950	73,8			
120	499	9,7	520	2.224	42,2	920	3.995	74,6			
130	541	10,5	530	2.269	43,0	930	4.039	75,4			
140	583	11,3	540	2.313	43,8	940	4.083	76,2			
150	625	12,2	550	2.357	44,6	950	4.127	77,0			
160	667	13,0	560	2.401	45,4	960	4.172	77,8			
170	709	13,8	570	2.446	46,2	970	4.216	78,6			
180	751	14,6	580	2.490	47,0	980	4.260	79,4			
190	794	15,4	590	2.534	47,8	990	4.304	80,2			
200	836	16,2	600	2.578	48,6	1000	4.349	81,1			
210	878	17,0	610	2.623	49,4	1010	4.393	81,9			
220	921	17,8	620	2.667	50,3	1020	4.437	82,7			
230	963	18,6	630	2.711	51,1	1030	4.481	83,5			
240	1.006	19,5	640	2.755	51,9	1040	4.526	84,3			
250	1.049	20,3	650	2.800	52,7	1050	4.570	85,1			
260	1.091	21,1	660	2.844	53,5	1060	4.614	85,9			
270	1.134	21,9	670	2.888	54,3	1070	4.658	86,7			
280	1.177	22,7	680	2.932	55,1	1080	4.703	87,5			
290	1.220	23,5	690	2.977	55,9	1090	4.747	88,4			
300	1.263	24,3	700	3.021	56,7	1100	4.791	89,2			
310	1.306	25,1	710	3.065	57,6	1110	4.835	90,0			
320	1.349	25,9	720	3.109	58,4	1120	4.880	90,8			
330	1.392	26,7	730	3.154	59,2	1130	4.924	91,6			
340	1.436	27,6	740	3.198	60,0	1140	4.968	92,4			
350	1.479	28,4	750	3.242	60,8	1150	5.012	93,2			
360	1.522	29,2	760	3.286	61,6	1160	5.057	94,0			
370	1.566	30,0	770	3.331	62,4	1170	5.101	94,8			
380	1.609	30,8	780	3.375	63,2	1172	5.110	95,0			
390	1.653	31,6	790	3.419	64,0						
400	1.696	32,4	800	3.463	64,8						



NOTE
Due to the general approval by the building authorities Z-38.11-127, the maximum filling volume is 95 % of the tank height inside.

The values given in the above chart are to be regarded as guide values. The actual tank capacity may deviate from the table value due to manufacturing tolerances and the material properties of the materials used.

6.5 Bearing chart - TTE-XL-6000

Filling level	Volume	Filling level	Filling level	Volume	Filling level	Filling level	Volume	Filling level	Filling level	Volume	Filling level
mm	l	%	mm	l	%	mm	l	%	mm	l	%
10	41	0,7	410	1.715	27,6	810	3.474	54,6	1210	5.244	81,6
20	81	1,3	420	1.758	28,3	820	3.518	55,3	1220	5.289	82,3
30	122	2,0	430	1.801	29,0	830	3.563	56,0	1230	5.333	82,9
40	163	2,7	440	1.845	29,7	840	3.607	56,6	1240	5.377	83,6
50	204	3,4	450	1.888	30,3	850	3.651	57,3	1250	5.421	84,3
60	245	4,0	460	1.931	31,0	860	3.695	58,0	1260	5.466	85,0
70	286	4,7	470	1.975	31,7	870	3.740	58,7	1270	5.510	85,6
80	327	5,4	480	2.018	32,4	880	3.784	59,3	1280	5.554	86,3
90	368	6,1	490	2.062	33,0	890	3.828	60,0	1290	5.598	87,0
100	409	6,7	500	2.105	33,7	900	3.872	60,7	1300	5.643	87,7
110	450	7,4	510	2.149	34,4	910	3.917	61,4	1310	5.687	88,3
120	491	8,1	520	2.193	35,1	920	3.961	62,0	1320	5.731	89,0
130	533	8,8	530	2.237	35,7	930	4.005	62,7	1330	5.775	89,7
140	574	9,4	540	2.280	36,4	940	4.049	63,4	1340	5.820	90,3
150	616	10,1	550	2.324	37,1	950	4.094	64,1	1350	5.864	91,0
160	657	10,8	560	2.368	37,8	960	4.138	64,7	1360	5.908	91,7
170	699	11,5	570	2.412	38,4	970	4.182	65,4	1370	5.952	92,4
180	740	12,1	580	2.456	39,1	980	4.226	66,1	1380	5.997	93,0
190	782	12,8	590	2.501	39,8	990	4.271	66,7	1390	6.041	93,7
200	824	13,5	600	2.545	40,5	1000	4.315	67,4	1400	6.085	94,4
210	866	14,2	610	2.589	41,1	1010	4.359	68,1	1409	6.125	95,0
220	908	14,8	620	2.633	41,8	1020	4.403	68,8			
230	950	15,5	630	2.678	42,5	1030	4.448	69,4			
240	992	16,2	640	2.722	43,2	1040	4.492	70,1			
250	1.034	16,9	650	2.766	43,8	1050	4.536	70,8			
260	1.076	17,5	660	2.810	44,5	1060	4.580	71,5			
270	1.118	18,2	670	2.855	45,2	1070	4.625	72,1			
280	1.160	18,9	680	2.899	45,8	1080	4.669	72,8			
290	1.203	19,6	690	2.943	46,5	1090	4.713	73,5			
300	1.245	20,2	700	2.987	47,2	1100	4.758	74,2			
310	1.287	20,9	710	3.032	47,9	1110	4.802	74,8			
320	1.330	21,6	720	3.076	48,5	1120	4.846	75,5			
330	1.372	22,2	730	3.120	49,2	1130	4.890	76,2			
340	1.415	22,9	740	3.164	49,9	1140	4.935	76,9			
350	1.458	23,6	750	3.209	50,6	1150	4.979	77,5			
360	1.500	24,3	760	3.253	51,2	1160	5.023	78,2			
370	1.543	24,9	770	3.297	51,9	1170	5.067	78,9			
380	1.586	25,6	780	3.341	52,6	1180	5.112	79,6			
390	1.629	26,3	790	3.386	53,3	1190	5.156	80,2			
400	1.672	27,0	800	3.430	53,9	1200	5.200	80,9			



NOTE
Due to the general approval by the building authorities Z-38.11-127, the maximum filling volume is 95 % of the tank height inside.

The values given in the above chart are to be regarded as guide values. The actual tank capacity may deviate from the table value due to manufacturing tolerances and the material properties of the materials used.

6.6 Bearing chart - TTE-XL-7000

Filling level	Volume	Filling level	Filling level	Volume	Filling level	Filling level	Volume	Filling level	Filling level	Volume	Filling level
mm	l	%	mm	l	%	mm	l	%	mm	l	%
10	48	0,7	410	2.009	27,6	810	4.065	54,6	1210	6.133	81,6
20	95	1,3	420	2.060	28,3	820	4.117	55,3	1220	6.185	82,3
30	143	2,0	430	2.110	29,0	830	4.168	56,0	1230	6.237	82,9
40	191	2,7	440	2.161	29,7	840	4.220	56,6	1240	6.288	83,6
50	239	3,4	450	2.211	30,3	850	4.272	57,3	1250	6.340	84,3
60	287	4,0	460	2.262	31,0	860	4.324	58,0	1260	6.392	85,0
70	335	4,7	470	2.313	31,7	870	4.375	58,7	1270	6.443	85,6
80	383	5,4	480	2.364	32,4	880	4.427	59,3	1280	6.495	86,3
90	431	6,1	490	2.415	33,0	890	4.479	60,0	1290	6.547	87,0
100	480	6,7	500	2.466	33,7	900	4.530	60,7	1300	6.599	87,7
110	528	7,4	510	2.517	34,4	910	4.582	61,4	1310	6.650	88,3
120	576	8,1	520	2.568	35,1	920	4.634	62,0	1320	6.702	89,0
130	625	8,8	530	2.619	35,7	930	4.686	62,7	1330	6.754	89,7
140	673	9,4	540	2.670	36,4	940	4.737	63,4	1340	6.805	90,3
150	722	10,1	550	2.722	37,1	950	4.789	64,1	1350	6.857	91,0
160	771	10,8	560	2.773	37,8	960	4.841	64,7	1360	6.909	91,7
170	819	11,5	570	2.825	38,4	970	4.892	65,4	1370	6.960	92,4
180	868	12,1	580	2.876	39,1	980	4.944	66,1	1380	7.012	93,0
190	917	12,8	590	2.928	39,8	990	4.996	66,7	1390	7.064	93,7
200	966	13,5	600	2.979	40,5	1000	5.047	67,4	1400	7.116	94,4
210	1.015	14,2	610	3.031	41,1	1010	5.099	68,1	1409	7.162	95,0
220	1.064	14,8	620	3.083	41,8	1020	5.151	68,8			
230	1.113	15,5	630	3.134	42,5	1030	5.203	69,4			
240	1.162	16,2	640	3.186	43,2	1040	5.254	70,1			
250	1.212	16,9	650	3.238	43,8	1050	5.306	70,8			
260	1.261	17,5	660	3.290	44,5	1060	5.358	71,5			
270	1.310	18,2	670	3.341	45,2	1070	5.409	72,1			
280	1.360	18,9	680	3.393	45,8	1080	5.461	72,8			
290	1.409	19,6	690	3.445	46,5	1090	5.513	73,5			
300	1.459	20,2	700	3.496	47,2	1100	5.564	74,2			
310	1.509	20,9	710	3.548	47,9	1110	5.616	74,8			
320	1.558	21,6	720	3.600	48,5	1120	5.668	75,5			
330	1.608	22,2	730	3.651	49,2	1130	5.720	76,2			
340	1.658	22,9	740	3.703	49,9	1140	5.771	76,9			
350	1.708	23,6	750	3.755	50,6	1150	5.823	77,5			
360	1.758	24,3	760	3.807	51,2	1160	5.875	78,2			
370	1.808	24,9	770	3.858	51,9	1170	5.926	78,9			
380	1.858	25,6	780	3.910	52,6	1180	5.978	79,6			
390	1.909	26,3	790	3.962	53,3	1190	6.030	80,2			
400	1.959	27,0	800	4.013	53,9	1200	6.082	80,9			



NOTE
Due to the general approval by the building authorities Z-38.11-127, the maximum filling volume is 95 % of the tank height inside.

The values given in the above chart are to be regarded as guide values. The actual tank capacity may deviate from the table value due to manufacturing tolerances and the material properties of the materials used.

6.7 Bearing chart - TTE-XL-8000

Filling level	Volume	Filling level	Filling level	Volume	Filling level	Filling level	Volume	Filling level	Filling level	Volume	Filling level
mm	l	%	mm	l	%	mm	l	%	mm	l	%
10	55	0,7	410	2.303	27,6	810	4.656	54,6	1210	7.022	81,6
20	109	1,3	420	2.361	28,3	820	4.715	55,3	1220	7.081	82,3
30	164	2,0	430	2.419	29,0	830	4.774	56,0	1230	7.140	82,9
40	219	2,7	440	2.477	29,7	840	4.833	56,6	1240	7.200	83,6
50	274	3,4	450	2.535	30,3	850	4.893	57,3	1250	7.259	84,3
60	329	4,0	460	2.593	31,0	860	4.952	58,0	1260	7.318	85,0
70	384	4,7	470	2.651	31,7	870	5.011	58,7	1270	7.377	85,6
80	440	5,4	480	2.709	32,4	880	5.070	59,3	1280	7.436	86,3
90	495	6,1	490	2.768	33,0	890	5.129	60,0	1290	7.495	87,0
100	550	6,7	500	2.826	33,7	900	5.188	60,7	1300	7.555	87,7
110	606	7,4	510	2.884	34,4	910	5.248	61,4	1310	7.614	88,3
120	661	8,1	520	2.943	35,1	920	5.307	62,0	1320	7.673	89,0
130	717	8,8	530	3.002	35,7	930	5.366	62,7	1330	7.732	89,7
140	772	9,4	540	3.060	36,4	940	5.425	63,4	1340	7.791	90,3
150	828	10,1	550	3.119	37,1	950	5.484	64,1	1350	7.850	91,0
160	884	10,8	560	3.178	37,8	960	5.543	64,7	1360	7.909	91,7
170	940	11,5	570	3.237	38,4	970	5.602	65,4	1370	7.969	92,4
180	996	12,1	580	3.296	39,1	980	5.662	66,1	1380	8.028	93,0
190	1.052	12,8	590	3.355	39,8	990	5.721	66,7	1390	8.087	93,7
200	1.108	13,5	600	3.414	40,5	1000	5.780	67,4	1400	8.146	94,4
210	1.164	14,2	610	3.473	41,1	1010	5.839	68,1	1409	8.199	95,0
220	1.220	14,8	620	3.532	41,8	1020	5.898	68,8			
230	1.277	15,5	630	3.591	42,5	1030	5.957	69,4			
240	1.333	16,2	640	3.650	43,2	1040	6.017	70,1			
250	1.390	16,9	650	3.710	43,8	1050	6.076	70,8			
260	1.446	17,5	660	3.769	44,5	1060	6.135	71,5			
270	1.503	18,2	670	3.828	45,2	1070	6.194	72,1			
280	1.559	18,9	680	3.887	45,8	1080	6.253	72,8			
290	1.616	19,6	690	3.946	46,5	1090	6.312	73,5			
300	1.673	20,2	700	4.005	47,2	1100	6.371	74,2			
310	1.730	20,9	710	4.064	47,9	1110	6.431	74,8			
320	1.787	21,6	720	4.124	48,5	1120	6.490	75,5			
330	1.844	22,2	730	4.183	49,2	1130	6.549	76,2			
340	1.901	22,9	740	4.242	49,9	1140	6.608	76,9			
350	1.958	23,6	750	4.301	50,6	1150	6.667	77,5			
360	2.016	24,3	760	4.360	51,2	1160	6.726	78,2			
370	2.073	24,9	770	4.419	51,9	1170	6.786	78,9			
380	2.131	25,6	780	4.479	52,6	1180	6.845	79,6			
390	2.188	26,3	790	4.538	53,3	1190	6.904	80,2			
400	2.246	27,0	800	4.597	53,9	1200	6.963	80,9			



NOTE
Due to the general approval by the building authorities Z-38.11-127, the maximum filling volume is 95 % of the tank height inside.

The values given in the above chart are to be regarded as guide values. The actual tank capacity may deviate from the table value due to manufacturing tolerances and the material properties of the materials used.

6.8 Bearing chart - TTE-XL-9000

Filling level	Volume	Filling level	Filling level	Volume	Filling level	Filling level	Volume	Filling level	Filling level	Volume	Filling level
mm	l	%	mm	l	%	mm	l	%	mm	l	%
10	62	0,7	410	2.598	27,6	810	5.247	54,6	1210	7.911	81,6
20	124	1,3	420	2.663	28,3	820	5.314	55,3	1220	7.978	82,3
30	185	2,0	430	2.728	29,0	830	5.380	56,0	1230	8.044	82,9
40	247	2,7	440	2.793	29,7	840	5.447	56,6	1240	8.111	83,6
50	309	3,4	450	2.858	30,3	850	5.513	57,3	1250	8.177	84,3
60	372	4,0	460	2.924	31,0	860	5.580	58,0	1260	8.244	85,0
70	434	4,7	470	2.989	31,7	870	5.647	58,7	1270	8.311	85,6
80	496	5,4	480	3.055	32,4	880	5.713	59,3	1280	8.377	86,3
90	558	6,1	490	3.121	33,0	890	5.780	60,0	1290	8.444	87,0
100	621	6,7	500	3.186	33,7	900	5.846	60,7	1300	8.510	87,7
110	683	7,4	510	3.252	34,4	910	5.913	61,4	1310	8.577	88,3
120	746	8,1	520	3.318	35,1	920	5.980	62,0	1320	8.644	89,0
130	809	8,8	530	3.384	35,7	930	6.046	62,7	1330	8.710	89,7
140	872	9,4	540	3.450	36,4	940	6.113	63,4	1340	8.777	90,3
150	934	10,1	550	3.516	37,1	950	6.179	64,1	1350	8.844	91,0
160	997	10,8	560	3.582	37,8	960	6.246	64,7	1360	8.910	91,7
170	1.060	11,5	570	3.649	38,4	970	6.313	65,4	1370	8.977	92,4
180	1.123	12,1	580	3.715	39,1	980	6.379	66,1	1380	9.043	93,0
190	1.187	12,8	590	3.782	39,8	990	6.446	66,7	1390	9.110	93,7
200	1.250	13,5	600	3.848	40,5	1000	6.512	67,4	1400	9.177	94,4
210	1.313	14,2	610	3.915	41,1	1010	6.579	68,1	1409	9.236	95,0
220	1.377	14,8	620	3.981	41,8	1020	6.646	68,8			
230	1.440	15,5	630	4.048	42,5	1030	6.712	69,4			
240	1.504	16,2	640	4.115	43,2	1040	6.779	70,1			
250	1.568	16,9	650	4.181	43,8	1050	6.845	70,8			
260	1.631	17,5	660	4.248	44,5	1060	6.912	71,5			
270	1.695	18,2	670	4.314	45,2	1070	6.979	72,1			
280	1.759	18,9	680	4.381	45,8	1080	7.045	72,8			
290	1.823	19,6	690	4.448	46,5	1090	7.112	73,5			
300	1.887	20,2	700	4.514	47,2	1100	7.178	74,2			
310	1.951	20,9	710	4.581	47,9	1110	7.245	74,8			
320	2.016	21,6	720	4.648	48,5	1120	7.312	75,5			
330	2.080	22,2	730	4.714	49,2	1130	7.378	76,2			
340	2.144	22,9	740	4.781	49,9	1140	7.445	76,9			
350	2.209	23,6	750	4.847	50,6	1150	7.511	77,5			
360	2.273	24,3	760	4.914	51,2	1160	7.578	78,2			
370	2.338	24,9	770	4.981	51,9	1170	7.645	78,9			
380	2.403	25,6	780	5.047	52,6	1180	7.711	79,6			
390	2.468	26,3	790	5.114	53,3	1190	7.778	80,2			
400	2.533	27,0	800	5.180	53,9	1200	7.844	80,9			



NOTE
Due to the general approval by the building authorities Z-38.11-127, the maximum filling volume is 95 % of the tank height inside.

The values given in the above chart are to be regarded as guide values. The actual tank capacity may deviate from the table value due to manufacturing tolerances and the material properties of the materials used.



Installation and test certificate

Specialist company according to WHG and TRbF 503

external monitoring TÜV - Nord Systems GmbH & Co KG

Installation and test certificate for a type-approved safety device against overfilling

Level limiter

AE-250 probe and tank truck plug
(Type GWG 12-K1/1)
Type approval: Z-65.17-182

EX-AE-250 probe and tank truck plug
(Type 81-D-Ex-400-W)
Type approval: Z-65.17-362
EG type-examination certificate TÜV 03 ATEX 2034
Ex II 1G EEx ia IIB T3
Ex II 1/2G EEx ia IIB T3

Other: _____

Type: _____

Type approval: _____

Overfill protection

AE-200 probe
(Type 76 A)
Type approval: Z-65.11-185

AE-201 Evaluation unit / level limiter
230V for probe AE-200
(Type NB220 H)
Type approval: Z-65.11-185

EX-AE-220.3 probe for Ex-Zone 0
(Type LS 300 EU)
Type approval: Z-65.11-228
EG type-examination certificate TÜV 00 ATEX 1656X
Ex II 1G EEx ia IIC T4
Ex II 1/2G EEx ia IIC T4

EX-AE-221 Evaluation unit / level limiter 230V for
probe EX-AE-220.3 for mounting outside the Ex zone
(Type LS 500)
Type approval: Z-65.11-228

Other: _____

Probe type: _____

Type approval: _____

Evaluation unit / level limiter: _____

Type approval: _____

Storage container data:

Type: _____

Volume [m³]: _____

Construction year: _____

Manufacturer No.: _____

Medium: _____

Herewith confirmed:

- the installation of the level limiter / the overfill protection according to the installation instructions
- the setting dimension „X“ _____ mm
- installation by approved specialist company according to WHG

Place/ Date

Signature /confirmation of installation (specialist company)

On-site function test:

Operator: _____

Street: _____

City: _____

Checking the function of the connection fitting, as well as the level limiter/overfill protection cable in the fully installed Condition by means of a limit value sensor tester or an overfill protection tester.

The test was successfully performed.

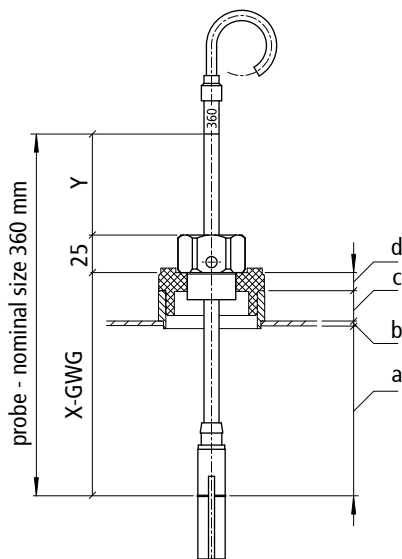
Place / Date

Signature / Stamp of the assembly company

Setting dimension „95 %“ for a type-approved safety device against overfilling for
Krampitz day tank system

Detail level limiter, adjustment dimensions

AE-250 - probe and tank truck plug (Typ GWG 12-K1/1)
Type approval: Z-65.17-182



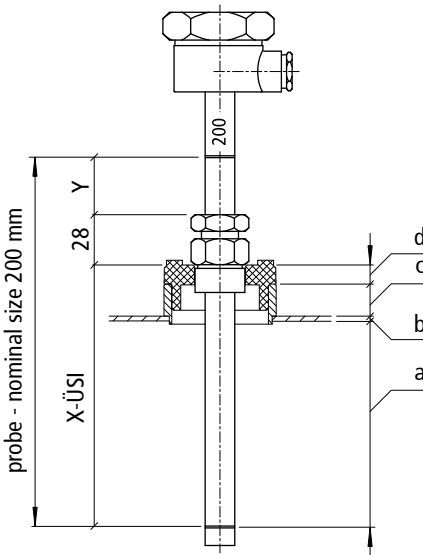
$$X-GWG = a + b + c + d$$
$$Y = 360 - 25 - X-GWG$$
$$a = HI - (HI \cdot 0,95)$$

- a - Height between tank roof and GWG contact point
- b - Roof thickness (see chart)
- c - Socket height (20 mm)
- d - Height of the gland (12 mm)

HI - Tank height inside
X-GWG - adjustment dimensions level limiter
Y - Control measurement

Detail overfill protection, adjustment dimensions

AE-200 - probe (Typ 76 A)
Type approval: Z-65.11-185



$$X-ÜSI = a + b + c + d$$
$$Y = 200 - 28 - X-ÜSI$$
$$a = HI - (HI \cdot 0,95)$$

- a - Height between tank roof and overfill contact point
- b - Roof thickness (see chart)
- c - Socket height (20 mm)
- d - Height of the gland (12 mm)

HI - Tank height inside
X-ÜSI - adjustment dimensions overfill protection
Y - Control measurement

For other types of limit switches or overfill prevention devices as well as other geometrical data (sheet thickness), the setting and control dimensions must be calculated separately according to the manufacturer's specifications.

**Maschinentank GmbH
Container System GmbH
Tanksystem GmbH**

Hauptsitz Dahlenburg
Dannenberger Str. 15
21368 Dahlenburg, Germany

Niederlassung Salzwedel / Auftragsbearbeitung
Siedlung des Friedens 40
29410 Salzwedel, Germany

Tel.: +49(0)3901/3088-100
Fax: +49(0)3901/3088-131

info@krampitz.de
www.krampitz.de

Krampitz®