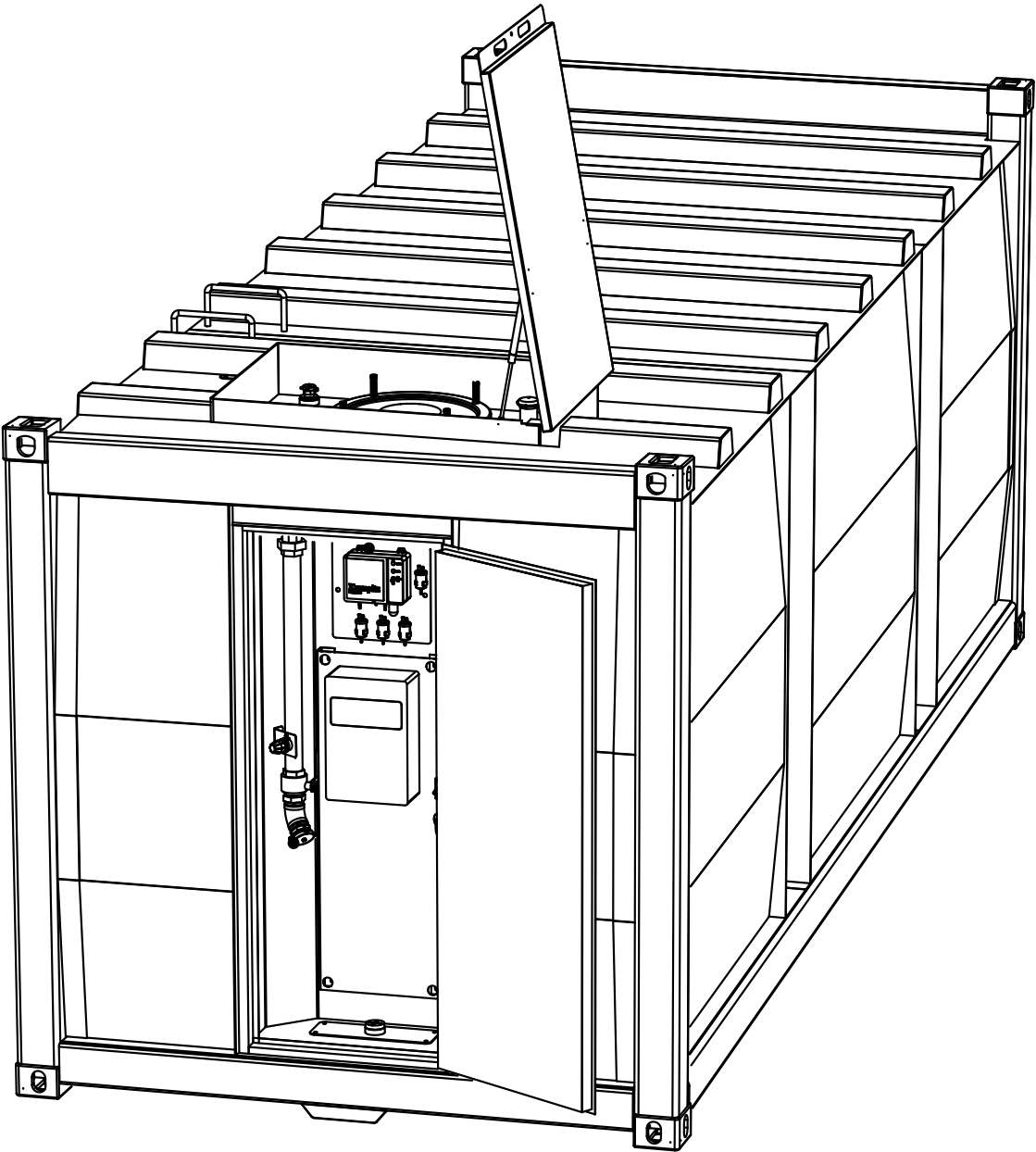


Operating and Assembly Instructions (OAI)
Storage Tank Container KCD-ISO
for non-flammable, flammable and water-polluting liquids

Krampitz®



Type: _____

Tank no.: _____

Year: _____

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Setting the limit value transmitter for the storage tank KCD-ISO

limit value transmitter, adjustment dimensions

CAUTION
When installed at the factory, the limit value transmitters/ probes are set to 95 % of the gross volume. The operator/ installer of the system is obliged to check the conditions at the installation site and adjust the adjustment dimension in accordance with the operating instructions from the manufacturer of the limit value transmitter/probe.

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

a - height between tank roof and limit value transmitter response point
b - roof thickness (see table)
c - sleeve height (20 mm)
d - reduction height (12 mm)

HI - height - interior
X-GWG - adjustment dimension for limit value transmitter
Y - control measure


Setting the overfill protection for the storage tank KCD-ISO

overfill protection, adjustment dimensions

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

a - height between tank roof and overfill protection response point
b - roof thickness (see table)
c - sleeve height (20 mm)
d - reduction height (12 mm)

HI - height - interior
X-ÜSI - setting dimension for overfill protection
Y - control measure

Type series	P-EPBS-GWG-ÜSI (inspection certificate) - 10.2014 - English	 EQUIPMENT
Equipment GWG, ÜSI	Installation and test certificate	

Specialised 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

limit value transmitter

☐ AE-250 - probe and tanker plug
(type GWG 12-K1/1)
type approval: Z-65.17-182

☐ EX-AE-250 - probe and tanker plug
(type 81-D-Ex-400-W)
type approval: Z-65.17-362
EC 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
230 V 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
EC 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
230 V for probe EX-AE-220.3 for installation outside of the
EX zone (type LS 500)
type approval: Z-65.11-228

☐ other: _____
probe type: _____
type approval: _____
evaluation unit / level limiter type: _____
type approval: _____

information about the storage container:

type: _____

volume [m³]: _____

year of construction: _____

manufacturing no.: _____

medium: _____

We hereby certify:

- the installation of the limit value transmitter / the overfill protection according to the installation instructions
- setting dimension „X“ _____ mm
- the installation by a licensed specialist company in accordance with WHG

location / date

signature / confirmation of installation (specialist)

on-site function test:

operator: _____

street: _____

location: _____

Checking the functionality of the connection fitting and the level limiter / overfill protection cable in its fully installed state by using a limit indicator tester or overfill protection tester.

The test was completed successfully.

location / date

signature / stamp of the assembly company

Inspection certificate for installation of leak detection devices and installation of leak protection linings - P-EPBS-LAZ-KÜR-5

Prüfungsbescheinigung

Herr

Friedemann Krampitz

Firma

Krampitz GmbH
24913 Osterwohle

hat sich heute vor dem Prüfungsausschuß der Gütegemeinschaft Tankschutz e. V. einer schriftlichen und mündlichen Prüfung als Sachkundiger auf dem Gebiet der Montage, Wartung und Instandsetzung von Leckanzeigeräten aller Bauarten an Tank- und Rohrleitungsanlagen für wassergefährdende Flüssigkeiten mit Erfolg unterzogen.

Die bestandene Prüfung erfüllt die personelle Anforderung der Gütesicherung „Tankschutz RAL-RG 977“ und der TRbF 503 für

MONTAGE LECKANZEIGERÄTE

und

MONTAGE LECKSCHUTZAUSKLEIDUNGEN

Die Prüfungsbescheinigung berechtigt nicht zur Führung des Gütezeichens „Tankschutz RAL-RG 977“ sowie auch nicht zur Ausführung der entsprechenden Arbeiten, ohne daß dem Fachbetrieb die hierfür erforderlichen Gütezeichen „Tankschutz RAL-RG 977“ für „Tankrevision“ und „Montage Leckanzeigeräte“ verliehen wurden.

Freiburg i.Br., den 18. März 1994

FÜR DIE PRÜFUNGSKOMMISSION

Januar 1994

Der Vorsitzende

Der TÜV-Sachverständige


certificate of a specialist
concerning the installation of a leak detection device

The installation according to the technical description or operating instructions and the functional test of the leak detection device in connection with the leak monitoring room of the tank are hereby confirmed:


<input type="checkbox"/> Vacuum leak detector, electronic Vacuum generator creates a constant negative pressure in the leak monitoring room. type: _____ type approval: _____ manufacturing no.: _____ pump off: _____ mbar pump on: _____ mbar alarm off: _____ mbar alarm on: _____ mbar tank manufacturer: _____ specialist company: _____ operator: _____ site: _____	<input type="checkbox"/> Vacuum leak detector, static without vacuum generator. type: _____ type approval: _____ applied test pressure: _____ pressure drop within 24h: _____ mbar standing time (min. 24h): _____ h test result: _____ tank according to: _____ year of construction: _____ tank capacity: _____ manufacturing no.: _____ installation: _____
--	---

location / date _____ signature / confirmation of assembly (specialst company) _____


- These technical operating and assembly instructions (OAI) describe the “KCD-ISO storage tank for non-flammable, flammamble and water hazardous liquids such as diesel, heating oil or mineral oil”. Contained herein are descriptions and instructions, the understanding of which is necessary for the operator, and which ensure the proper and correct operation, the proper maintenance of the material and compliance with the industrial and work safety regulations.
- Tank unit designation: The KCD-ISO storage tank for non-flammable, flammable and water hazardous liquids such as diesel, heating or mineral oil is designated in the following text as KCD-ISO, respectively, for simplicity.
- The table of contents is an overview of the OAI and names the main sections and subsections with the page numbers.
- Important instructions affecting technical and operational safety are especially emphasised via the following pictograms.
- The OAI are only valid in connection with the documentational drawing of the corresponding tank. The appropriate dimensions and components used follow from the drawing.
- For any equipment and components not contained in these particular instructions, the appropriate special instructions and descriptions then apply.



CAUTION working procedures to be precisely adhered to in order to avoid endangering people




CAUTION working procedures to be precisely adhered to in order to avoid damaging the installation




NOTE technical requirements that the user of the unit must pay particular attention to

KCD-ISO	- double walled storage tank for outdoor use
OAI	- operating and assembly instructions
TRbF	- German abbreviation for guidelines for technical regulations for inflammable liquids
VAwS	- German abbreviation for regulations on installations using water hazardous substances and on the related specialised companies (valid for the respective German state only)
VDE	- German abbreviation for the association of electro industries
VDS	- German abbreviation for the association of property insurers
WHG	- German abbreviation for the law on water supply
AG, IG	- male/external thread (AG), female/internal thread (IG)


1.1 Safety guidelines




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




CAUTION The system carries life-threatening voltages after connecting the electrical components to a power source. Before starting work on the electrical components the supply cable must be disconnected from the power supply.



CAUTION The tank may be only be entered via the opening provided for that purpose. The container must be completely emptied, cleaned and degassed. Anyone entering the tank may only do so while wearing full protective equipment in accordance with health and safety regulations



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



CAUTION Incorrect operation or disregard of the information in the OAI as well as the health and safety regulations will result in damage to the unit, to people and to the environment and will invalidate the warranty.

The KCD-ISO as well as its accessories and equipment must be inspected periodically after the initial commissioning.

1.2 Operating regulations

1.2.1 General regulations and usage

The KCD-ISO may only be used for water hazardous, non-inflammable liquids with a flash point > 55°C, such as diesel, extra light heating oil etc. Resistance has been proven for the media diesel and EL heating oil. In the event of using other liquids (including combustibile or lightly combustibile liquids), additional equipment is required. The tank must be equipped with all the accessory and equipment components in accordance with legal requirements. Any necessary components not contained within the scope of delivery must be assembled before commissioning the tank. The maximum operating temperature of the tank is 50° C. For diesel or EL heating oil with a flash point > 55°C, the return temperature may not exceed 40°C, otherwise fuel cooling or explosion protection measures are necessary. The KCD-ISO is designed for outdoor use and correspondingly equipped, it must be ensured that the load bearing capacity of the ground beneath the installation is verified according to local conditions. An indoor installation is also possible as long the legal requirements are met.

1.2.2 General operating regulations

Initial commissioning

Prior to the initial commissioning, the KCD-ISO and the associated equipment must be checked for any externally visible damage. The leak detectors must be checked for any pressure loss.

Tank equipment

The conditions for the equipment of the tanks and, if applicable, collecting devices are to be taken from the water, occupational health and safety and building regulations. If no water or building regulations exist for the equipment, TRbF 206, section 9 must be observed.

Stored liquids

The tanks can be used for storing liquids.

Useable tank volume

The permissible filling level of the containers must not exceed 95 % of its total capacity unless another filling level has been proven or must be complied with in accordance with TRbF 206. The overfill protection must be set up accordingly.

Operational readiness

While in use, the power supply must not be interrupted. The system must be continuously monitored so that any malfunctioning in the course of operation can be detected as quickly as possible, thus avoiding any further damage. Monitoring and elimination of malfunctions or their sources must be undertaken by suitably qualified, instructed and trained personnel.

Temporary shutdown

For temporary shutdown, the KCD-ISO must be switched off or disconnected from the power supply.

Recommissioning

When the KCD-ISO is put back into action, it must be checked to ensure that it is in proper condition.

The following components must be checked:

- the leak detectors,
- the electrical connection,
- the containers and connection lines for tightness.

1.2.3 Rules of conduct

1. The operator is obliged to maintain the KCD-ISO in proper working order, carry out any necessary repair work without delay and take any required safety measures required by the circumstances.
2. If the operator cannot assess the condition of the system himself and cannot rectify faults, he must seek the advice of an expert or conclude a maintenance contract with an approved specialist company.
3. The system must not be operated if it has defects which could cause a hazard or danger.
4. Measures to eliminate or lessen any dangerous situations are to be immediately undertaken.
5. The prescribed safety devices are to be used.
6. Those safety devices must be operated and maintained in such a way that their function and effectiveness remain unimpaired.
7. In particular, safety installations must not be bypassed or rendered completely or even partially inoperative.
8. Only water-polluting, non-inflammable liquids may be stored in the KCD-ISO for which the tank is approved. The permissible media are indicated on the identification plate.
9. The filling of the KCD-ISO must be carried out in such a way that overfilling does not occur. Before filling, the level inside of the tank must be determined. The amount of additional liquid the KCD-ISO will be able to hold must be determined.
10. The KCD-ISO filling and emptying processes using a tank truck or drum must be constantly monitored by the operator. Only containers approved for such liquids may be used.
11. Spilled substances or liquids must be taken up immediately. Measures must be taken to prevent further spreading. The obligation to report leaks of liquids hazardous to water must be observed.
12. The applicable legal regulations for handling liquids hazardous to water must be observed

Documents

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

- a copy of the general building authority approval no. Z-38.12-312
- a copy of the building authority proof of usability of the limit value transmitter or overfill protection suitable for the use.

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

Operation

Before commissioning the container, the operator has to post a sign specifying the stored liquid as well as its density and concentration in a suitable position. Labelling according to other areas of law remains unchanged. The containers may only be filled via fixed line connections. This does not apply to individual containers with a filling volume ≤ 1000 l for storing heating oil EL according to DIN 51603-1¹³ or diesel fuel according to DN EN 590¹⁴, which are filled from road tankers, demountable tanks or tank containers in a full hose system with an automatically closing nozzle with filling rates of no more than 200 l/min in free outlet. Before filling it is mandatory to check whether the medium that is to be stored inside the container corresponds to the permissible medium and to determin how much liquid the container can still hold and whether the overfill protection / limit value transmitter are in proper working condition. The filling process must be fully monitored from start to finish. After completion of the filling process, compliance with the permissible filling level according to section **Useable tank volume** must be checked. In case of an installation with a collecting device, removal may only take place at the top or bottom. The side discharge nozzle may only be used when the unit is installed without a collecting device, provided that this is observed or specified.

1.2.4 Instruction of the operating personnel

The operators have to familiarize themselves with the commissioning, the operation of the KCD-ISO and the contents of the operating and assembly instructions. The operating personnel has to be instructed on record about the dangers of storing and filling liquids hazardous to water as well as preven-tative measures prior to the initial operation and thereafter in regular, appropriate intervals, but at least once a year.

1.2.5 Upkeep and maintenance

Regardless of safety inspections, the operator (owner) should regularly (weekly) conduct the following check-ups on their own to ensure the safe ope-ration of the system:

- external check for leak tightness of all pipes and connections
- check of the tank interior and the stored medium for cleanliness
- check of the tank interior for water and rust

If water or rust appear, the tank must be cleaned and the interior corrosion protection restored, e. g. by oiling the surface. During maintenance work no refilling or draining processes may be carried out. Prior to carrying out any repairs to the electrical system, the entire system has to be disconnected from the power supply.

CAUTION Unauthorised modifications or repairs not agreed with the manufacturer will lead to the expiration of the approval and thus to the exclusion of usability.

CAUTION No works such as welding, grinding or drilling may be performed on the tank.

1.2.6 Safety inspections

Duty of disclosure
Tanks and systems for non-flammable liquids that are hazardous to water must be disclosed to the competent authority. Exceptions are regulated by the VAWs of the respective federal state.

Inspections
Necessity and extent of the safety inspections are determined during the inspection ahead of commissioning and may deviate from the contents of the table below. Separate regulations apply for installation in water protection areas.

Guidelines for safety inspections

Subject of inspection	Performed by	Date	Proof of inspection
inspection ahead of commissioning	qualified VAWs expert	prior to commissioning	certificate
visual inspection of the tank	operator	weekly	continuous documentation
visual inspection of the tank's connections for tightness	operator	weekly	continuous documentation
inspection of the tank interior - starting at a volume of 10000 litres	qualified VAWs expert	appr. every 5 years de- pending on classification	certificate
inspection of the safety components	qualified VAWs expert	appr. every 5 years de- pending on classification	certificate
functional inspection of the leak detector	specialist company according to WHG*	once per year***	certificate
functional inspection of the limit value transmitter	specialist company according to WHG	once per year***	certificate
functional inspection of the overfill protection**	specialist company according to WHG	once per year***	certificate
functional inspection of the level sensor**	electrical company or instructed perso- nnel	once per year***	certificate

* after instruction by the manufacturer ** if applicable - special equipment *** follow the manufacturer's instructions

Damage
If damage and/or leaks are detected, the system must be taken out of operation. Damaged tanks are to be drained if necessary. Measures to remedy damage must be agreed upon in consultation with the expert in water law.

1.2.7 Handling heating oil, diesel and mineral oil.

When handling heating oil, diesel, mineral oil and other hazardous substances, the universally applicable safety regulations as well as the specific operating instructions of the respective owner/operator have to be followed.

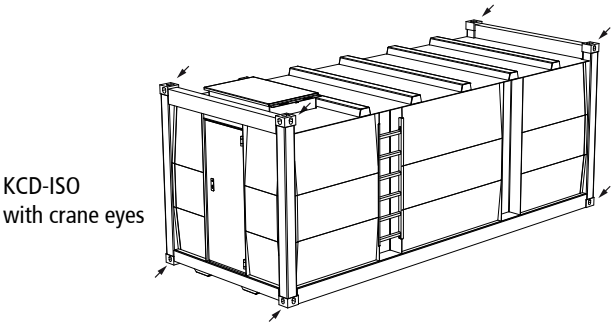
According to VAWs and the Ordinance on Industrial Safety and Health (BetrSichV), operating instructions with monitoring, maintenance and alarm plans must always be drawn up and complied with. Exceptions are regulated in the VAWs of the respective federal state, e. g.:
- operating instructions are not required for installations of hazard level A according to VAWs and heating oil consumption installations
- for heating oil consumption installations
- use of leaflets „Operating and behavioural regulations for handling substances hazardous to water“ (in German)
(according to the announcement of the Ministry of the Environment) permanently in a clearly visible place near the installation

2. COMMISSIONING

2.1 Transportation of the KCD-ISO

Transportation may only be carried out using suitable means of transport, the applicable legal requirements have to be observed and fulfilled. During transport the tank is to be protected from moisture, dirt and damage. Storing the tank is permitted both indoor and outdoor.

CAUTION During transport the applicable legal requirements have to be observed and damage has to be prevented. In the case of paint damage, the corrosion protection must be properly restored.



2.2 Loading

The KCD-ISO can be moved by forklift or crane without problem. The KCD-ISO is always equipped with crane eyes.

CAUTION Lifting and loading of the tank may only be carried out when it is completely empty. Any connected lines and pipes have to be removed so that safe movement is ensured. The connected power supply must be disconncted and any connections must be removed.

- Lifting/loading by crane:
- only approved and suitable slings may be used
 - the max. stop angle is 30° to the vertical
 - if the stop angle cannot be realised with the existing hanger, a suitable lifting beam must be used
 - if the tank has forklift pockets, they may be used for loading instead of the crane eyes

Moving and lifting must be carried out using the four crane eyes located in the roof area. All crane eyes must be loaded evenly. An inclined pull of more than 30° to the vertical is not permitted. After damage to the packaging or the tank, the damage must be documented and the manufacturer informed. Damage to the packaging must be repaired professionally; repair of the tank or equipment parts is prohibited without the manufacturer's consent.

2.3 Installation of the KCD-ISO
The KCD-ISO comes equipped with feet (height min. 100 mm). These reliably prevent condensation from forming on the outer tank bottom and also ensure good visibility. **Tanks with a height above 2.000 mm must, in addition to being fixed at the four corner points of the long sides, also be fixed at the four corner points of the short sides.**
The KCD-ISO may only be installed on level and stable ground, e. g. concrete (minimum quality C20/25 or equivalent). Static proofs must be provided on-site for this purpose. In order to maintain warranty claims, the storage tanks have to be permanently and reliably protected against moisture, dirt and other harmful influences for the time until commissioning. To prevent condensation inside of the tank, the exterior conditions such as air temperature, changes of temperature (cooling, dew point), humidity or return temperature have to be taken into account during planning and must be observed during installation. Condensation water inside of the tank leads to corrosion and has to be permanently prevented. This results in the following requirements for storage of the KCD-ISO:

- temperature +5 °C to +30 °C; max. humidity 75 %
- no aggressive atmosphere
- no pollution from construction activity
- no flying sparks or other interference from metal and welding work
- protected from unauthorised use and damage

2.3.1 Installation of the KCD-ISO inside a machine room

In principle, storage tanks with a maximum storage volume of 5,000 litres may be operated in a machine room. A separate tank storage room is required for all tanks with a higher storage volume.

2.3.2 Installation of the KCD-ISO outside a machine room

Up to 100,000 litres may be stored inside of a KCD-ISO outside a machine room.

2.3.3 Outdoor installation of the KCD-ISO

A level and suitably stable surface is necessary for the installation of the KCD-ISO outside of buildings. Depending on the local conditions, the tank has to be secured against impact loads and against slippage. Proof of this must be provided by the customer. Refer to chapters 2.6 / 2.7 for suggestions. The tank must be sufficiently equipped for outdoor installation.

i **NOTE** A weather-resistant coating is mandatory if the KCD-ISO is to be installed outdoor.

2.4 Initial commissioning

The following things must be checked head of the first filling of the KCD-ISO:

- 1. proper fastening/installation of the tank
- 2. tightness and strength of the pipe connections and the dome cover
- 3. proper connection of sensors such as
 - a. level sensor, b. overfill protection, c. vacuum leak detector, d. limit switch
- 4. firm attachment of the blind plugs

2.5 Operating sequence

- check the position of the ball valves, the ones on the machine feed must be closed
- switch on the voltage to put the sensors into operation.

! **CAUTION** The existing overfill protection will signal an alarm in the first few seconds, as the PTC thermistor of the level sensor must first be heated up.

- refuelling by tanker truck:

- 1. As the fill level rises, the switching of the level switch points can be checked (if present, these are: MIN-MIN, MIN, MAX, MAX-MAX).
- 2. If the limit switch is wetted, refuelling is automatically stopped. Filling via a filling line using a tank truck is mandatory from a volume size of more than 1,000 litres. Below this volume, the day tank may also be filled with a nozzle of the tank truck that switches off automatically according to the dead man’s principle.

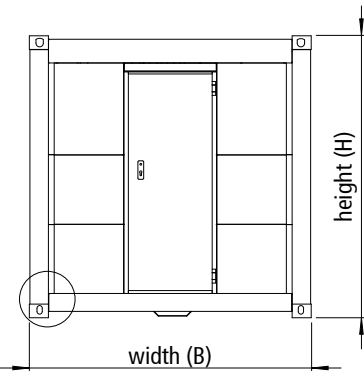
- refuelling with the system’s own pump:

- 1. As the fill level rises, the switching of the level switch points can be checked (if present, these are: MIN-MIN, MIN, MAX, MAX-MAX).
- 2. If the installed overfill protection is wetted, the pump must be switched off automatically.
 - check pipe connections for tightness
 - if necessary, open the ball valves on the machine supply line
 - the KCD-ISO is now ready for use

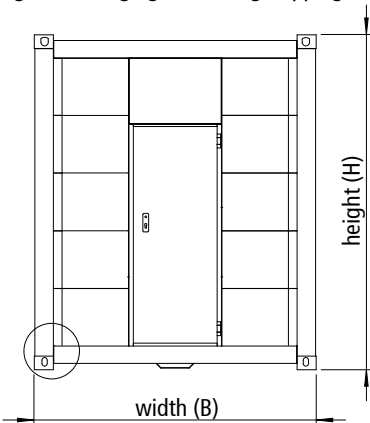
2.6 Anchoring for outdoor installation (suggestions without verification)

The tank must be provided with an anchorage for outdoor installation. The execution and the verification of the anchoring must be carried out on site by the user and is only part of the delivery if agreed upon separately.

For width > height, securing against slipping is required, securing against lifting / tipping is not required.



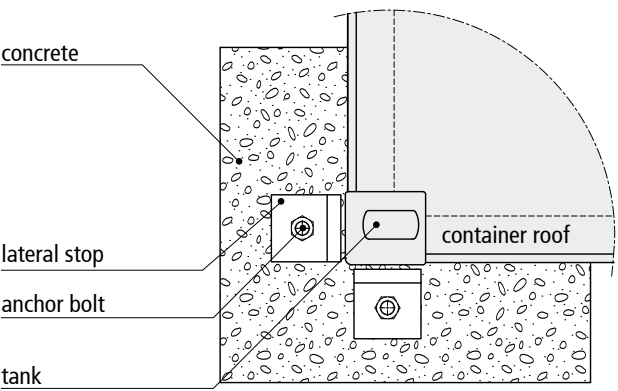
For width < height, securing against lifting / tipping is required!



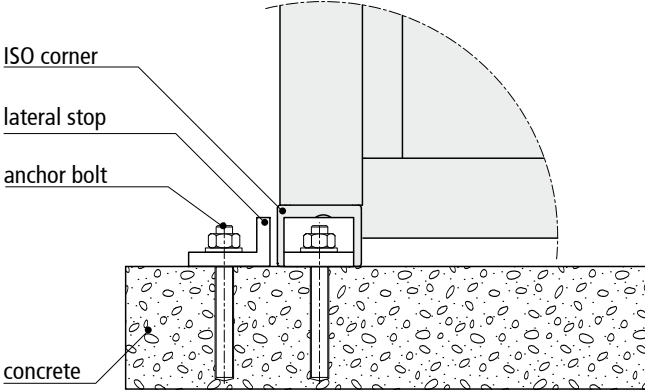
The loads for the dimensioning of the fastening/anchoring are to be determined and verified by the customer, taking into account the local conditions and the installation area.

Position lock against slipping B > H (can also be designed with lock against tipping/lifting)
Anti-slip stop in each corner!

topdown view tank corner

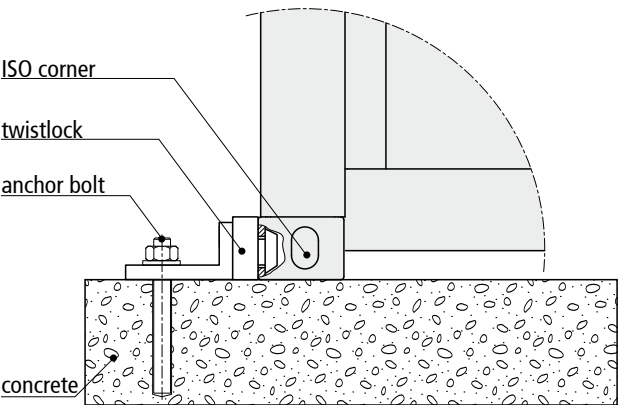


view tank corner

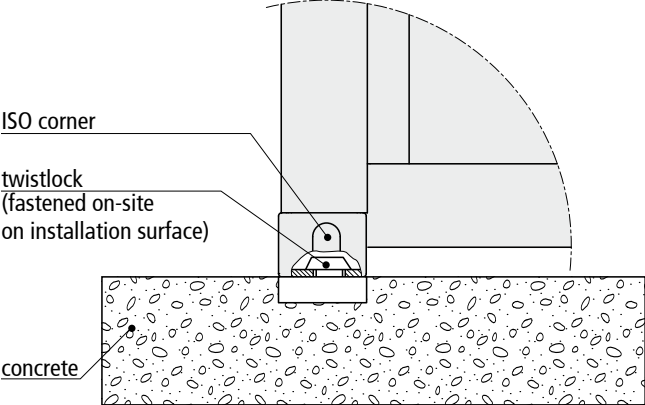


Securing against tipping (lifting) (Other fastenings are possible and must be verified according to local conditions)

Fastening with twistlock and angle



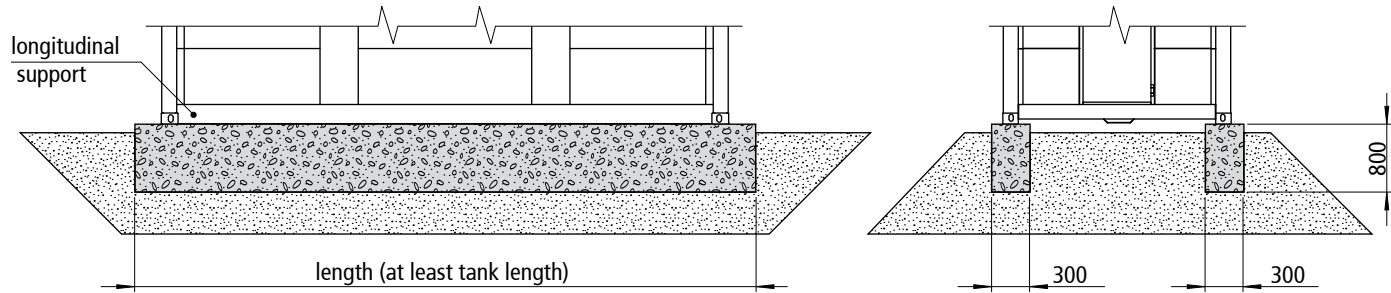
Fastening with twistlock inside the foundation



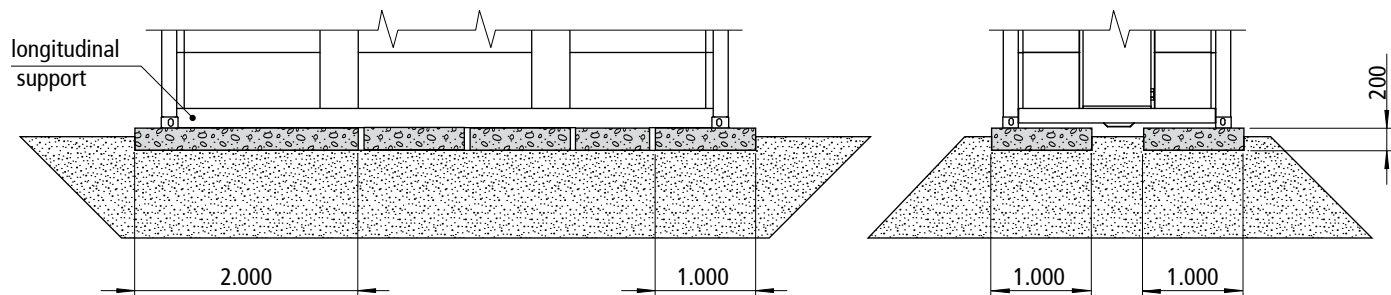
2.7 Installation surface

All foundations must be frost-free! Concrete quality is at least C20/25. Foundations can also be compacted surfaces. Verification of the foundations on site! As a rule, the supports are to be provided under the longitudinal beams. The load is applied as a line or area load from the load carriers to the supports.

version A - strip foundation below the longitudinal beams



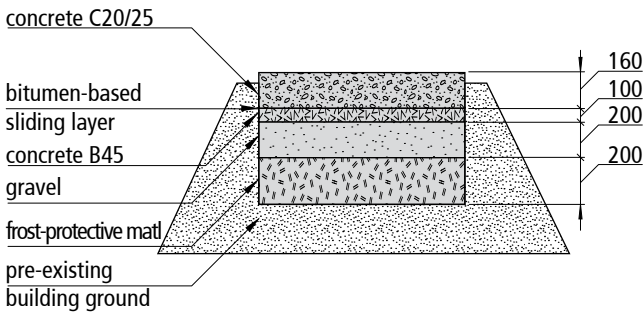
version B - prefabricated foundation slabs - FDE reinforced concrete (under the longitudinal beams)



building with FDE reinforced concrete - slabs

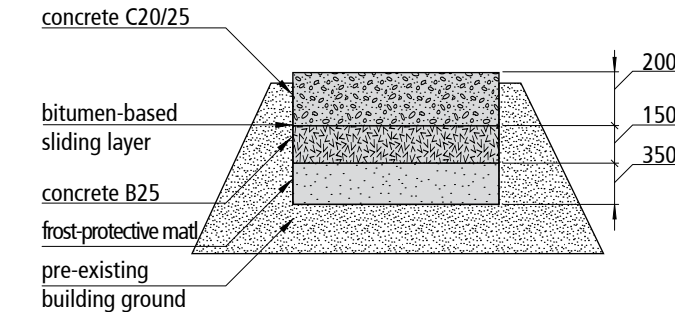
standard structure of base courses and joint formation for slab thickness 160 mm and standard vehicle SLW 30

detail: base course structure under FDE carriageway slabs

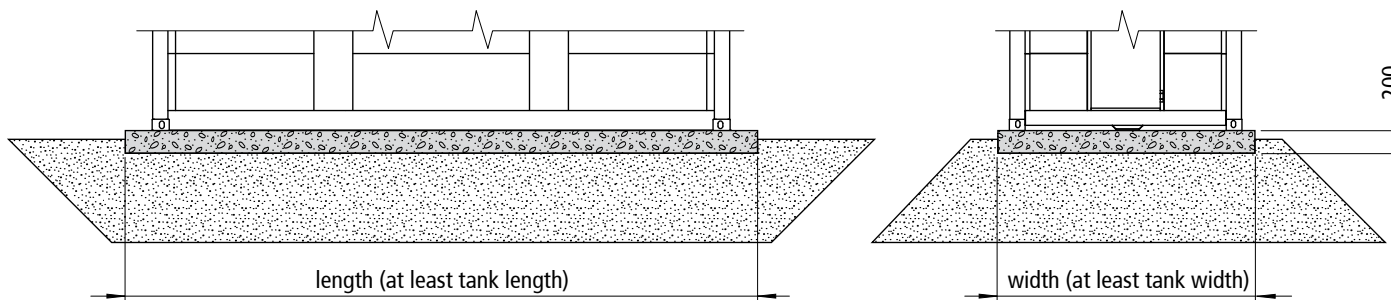


standard structure of base courses and joint formation for slab thickness 200 mm and standard vehicle SLW 60

detail: base course structure under FDE carriageway slabs



version C - foundation plate (brine slab)



3. DESCRIPTION

3.1 Intended use of the KCD-ISO

The KCD-ISO is used to store non-flammable, water-polluting liquids such as heating oil, diesel fuel or mineral oil (fresh and used oil). The KCD-ISO can also be described as a storage tank. Its double-walled construction ensures the highest standards of safety. The cubic design ensures optimal utilisation of the available space. The KCD-ISO is suitable for both indoor and outdoor installation. In accordance with its general building approval, the tank is resistant to the effects of fire for a duration of 30 minutes. The installation surface must be level and load-bearing. Installation is exclusive to areas without any additional hazards or requirements. For use under special conditions (e.g. water protection area, EX zone, flammable liquids), the applicable valid regulations must be observed. The KCD-ISO is normally manufactured in accordance with the general building authority approval Z-38.12.312.



CAUTION

Transportation of the KCD-ISO is only permissible in empty and cleaned condition.

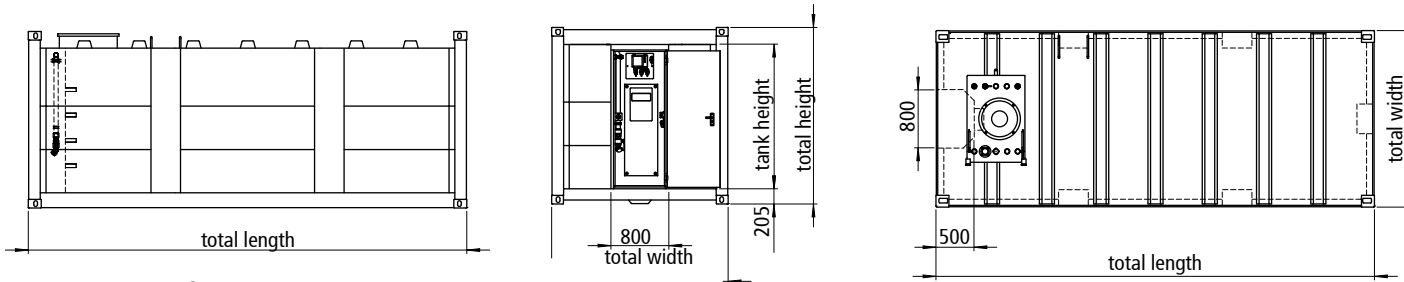


NOTE

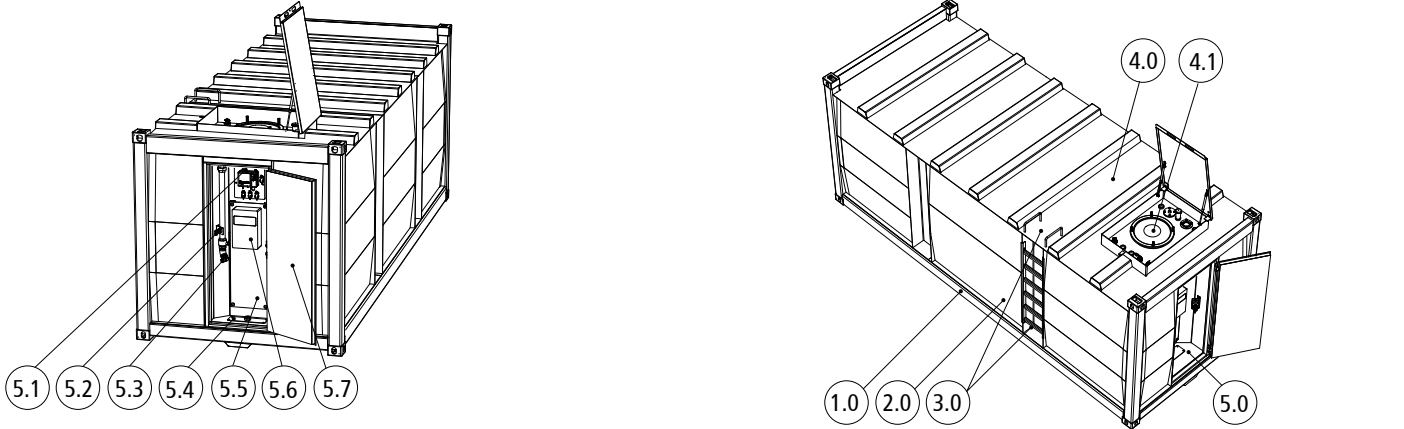
Because of the general building authority approval Z-38.12.312 the maximum filling volume is limited to 95 % of the tank height.

3.2 KCD-ISO technical data

3.2.1 Views of the KCD-ISO



3.2.2 Illustration of the KCD-ISO



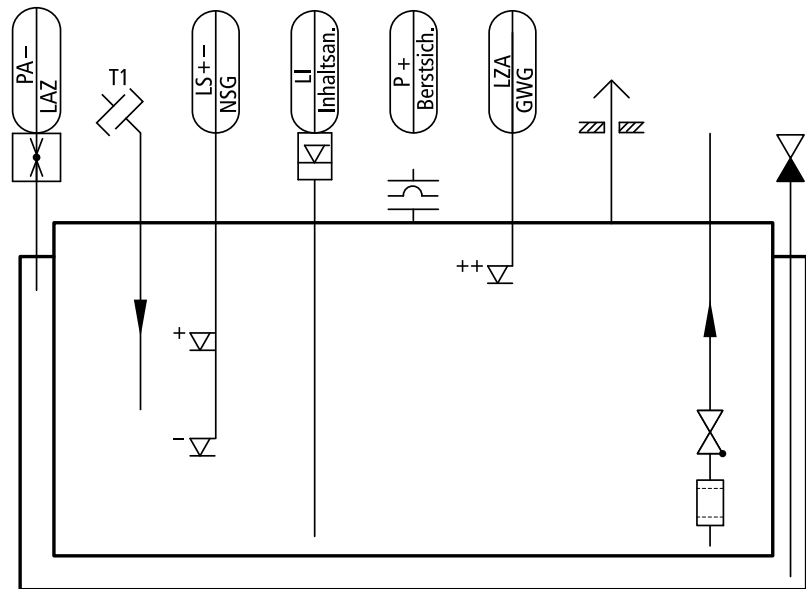
3.2.3 KCD-ISO standard equipment

- 1.0 supporting structure consisting of stable, well-ventilated floor assembly with continuous longitudinal beams
- 2.0 robust, cubic, double-walled body made of steel S 235 JR
- 3.0 access ladder (access rungs mounted in one of the outer stiffening niches) incl. 2x handholds on the tank roof (ladder and handholds are omitted with thermal insulation)
- 4.0 tank roof is a self-supporting, single-walled construction (fully welded)
- 4.1 hood element mounted on tank roof, consisting of:
 - hood with gas pressure spring and handle bar
 - dome access DN 600 - type A
 - connection interfaces (socket 2")
 - venting socket 2" with vent cover
 - mechanical content indicator (dipstick)
 - suction line flanged 1" with foot valve and strainer
 - limit value transmitter (probe) with type approval
 - 2x level sensors AE-100-E (min and min/min)
 - cable conduit to the function niche on the front side
- 5.0 functional niche at the front incl. locking door, dimensions: width: 800 mm, depth: 500 mm, height: tank height, consisting of:
 - 5.1 vacuum leak detector with type approval
 - 5.2 limit value transmitter (plug) with type approval
 - 5.3 filling system for tank truck DN50 with tank truck coupling VK 50, non-return valve and ball valve
 - 5.4 cable gland in the floor
 - 5.5 mounting plate
 - 5.6 electrical connection for leak detector and distribution box (incl. control and wiring of existing electr. components), incl. lamp and switch
 - 5.7 door B 750

3.2.4 KCD-ISO dimensions and weight

tank type	volume 100 %	volume 95 %	total length	total width	total height	tank height	weight (empty)
item no.	litres	litres	mm	mm	mm	mm	kg (appr.)
KCD-ISO-10	11.500	11.000	2.991	2.438	2.438	2.000	3.200
KCD-ISO-20	25.000	24.000	6.058	2.438	2.438	2.000	5.600
KCD-ISO-HC-20	30.000	29.000	6.058	2.438	2.896	2.500	6.200
KCD-ISO-40	52.500	50.000	12.192	2.438	2.438	2.000	9.400
KCD-ISO-HC-40	63.500	60.000	12.192	2.438	2.896	2.500	11.600

3.3 System diagram



KCD-ISO - double-walled storage tank
containers with standard and special equipment in operational condition

legend - symbols per DIN 2481

tanker connection filling

rupture disc (overpressure)

foot valve

filter / dirt trap

level gauge

ventilation to the outside

conveying direction indicator

leak detector

leak detector suction piece

level measurement,
switching contacts for upper
and lower limit values

container double-walled

legend - designations per DIN 19227

vacuum leak detector
with type approval (LAZ-04/1)

overpressure protection
rupture disc

local level indicator
mechanical content indicator

float switch

overfill protection limit value
transmitter with type approval

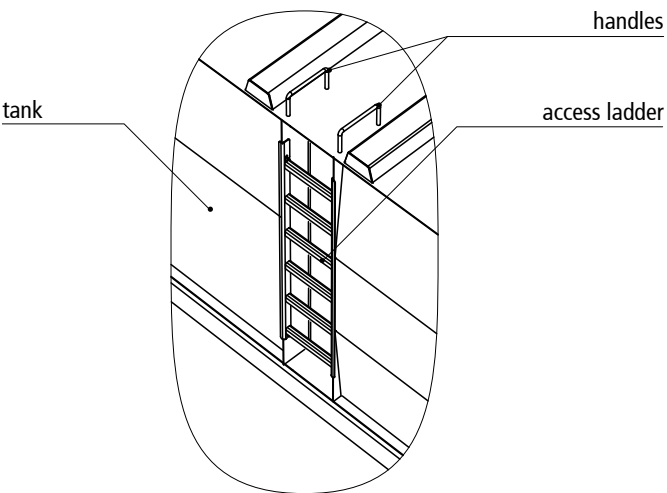
3.4 Overview: possible switching points and control commands

level indicator	design- nation	filling level in percent	level transmitter type	control command
++	max-max	95	limit value transmitter/ overflow protection for export application: mini detector	overflow alarm: pump off
+	max	70	mini detector	working contact: pump off
-	min	40	mini detector	working contact: pump on / signal for reordering fuel
--	min-min	10	mini detector	deficiency alarm: machine off

3.5 Components of the KCD-ISO standard and special equipment

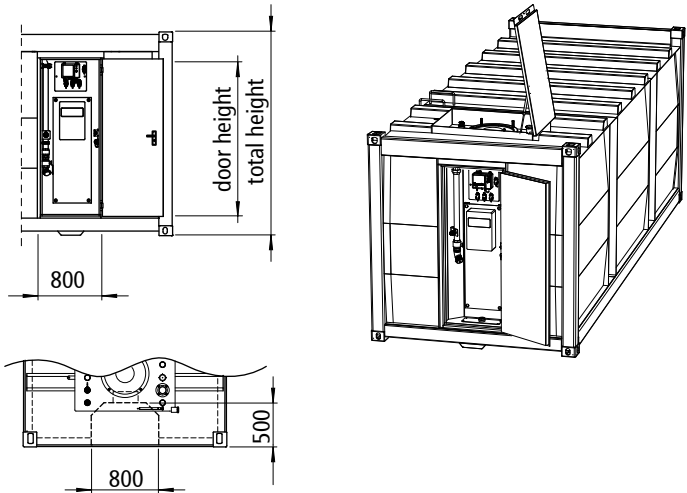
3.5.1 Access ladder

Ladder rungs are fitted in a stiffening niche of the KTD-F as standard. Handholds are welded into the roof area of the ladder to enable safe access to the tank roof. Ladder and handholds are omitted in case of thermal insulation. There are steps on the inside wall of the KTD-F to facilitate inspection.



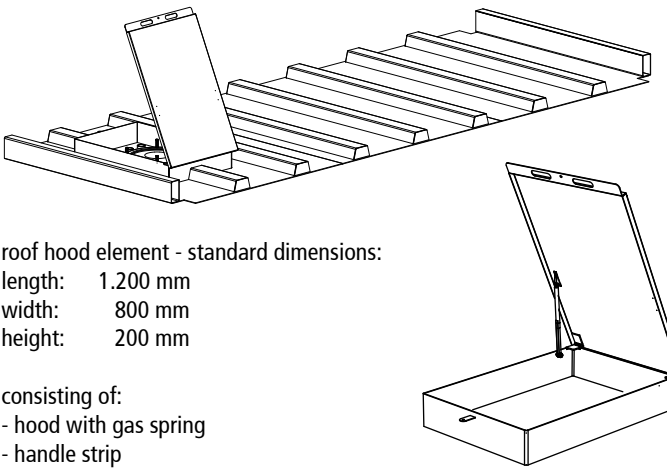
3.5.2 Functional niche on the front side

The tank body of the KCD-ISO can contain several functional niches which serve to accommodate technological components. As standard, one functional niche is included at the front. Dimensions: width: 800 mm, depth: 500 mm, height: tank height, incl. multi-purpose door 1875x750 mm.



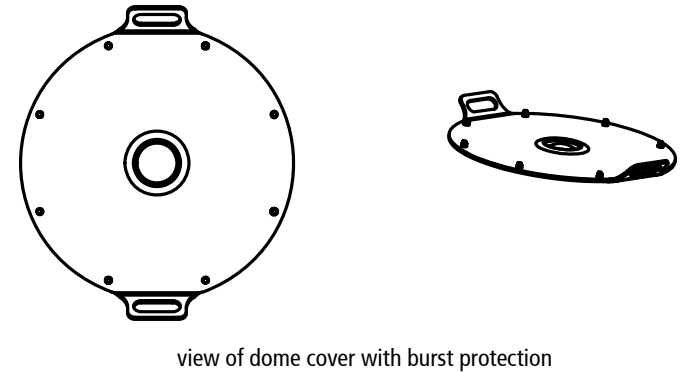
3.5.3 Tank roof and roof hood element

The roof of the KTD-F is a self-supporting single-wall construction (fully welded). The hood element with all technologically necessary roof openings is located on top of the roof. The hood element is responsible for protecting all technological openings in the roof area against unauthorised access. While open the lid is held in place by a gas spring and it can be locked with a padlock (padlock not included).



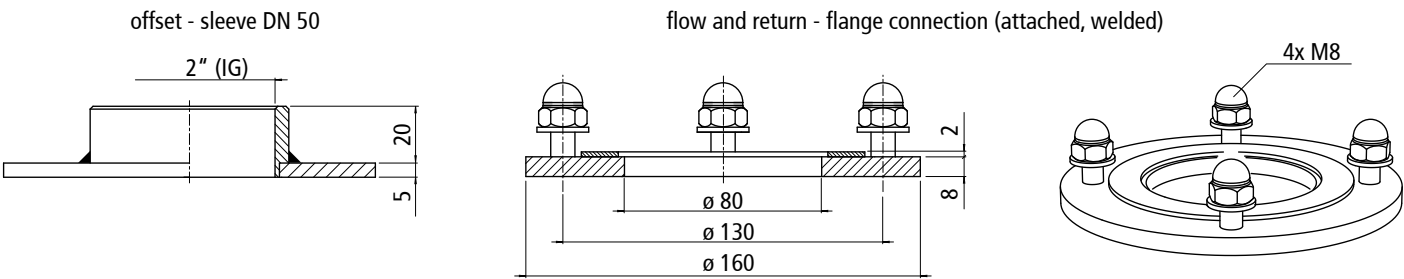
3.5.3 Dome access DN 600

The DN 600 dome access is located on the roof of the KTD-F. The opening serves as a manhole for the purposes of interior inspection and cleaning of the container. The burst protection prevents damage to the tank in case of ventilation failure or if the volumetric flow is too high. The burst protection consists of an oil and ageing resistant special rubber and may only be used indoors.



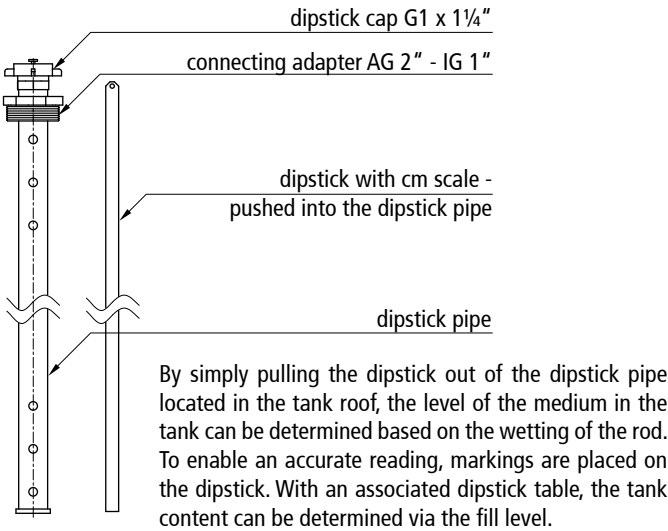
3.5.5 Connection interfaces sleeves and flange

The connection interfaces on the tank are G 2" sleeves fitted as standard or welded-on flanges in special dimensions.

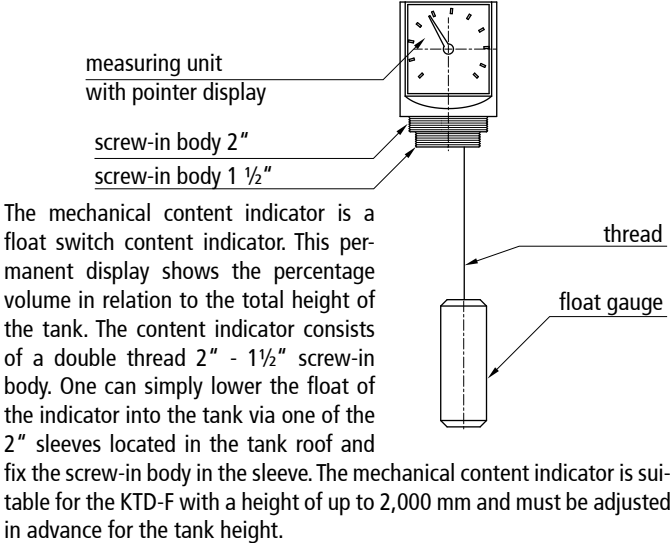


3.5.6 Mechanical content indicators - dipstick (AM-005.xx) and float switch content indicator (AM-001)

dipstick (AM-005.xx)

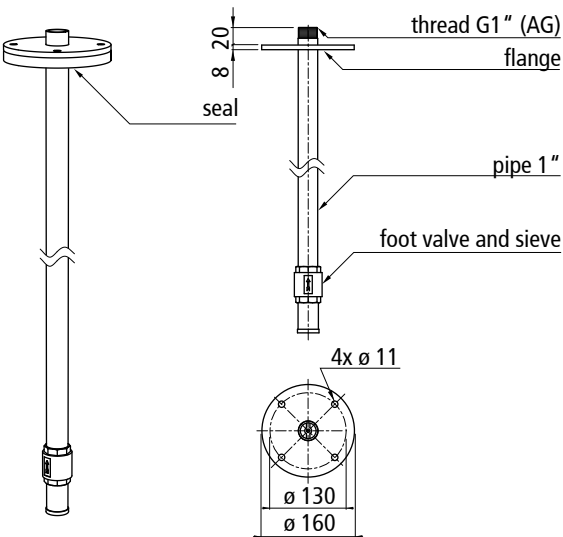


float switch content indicator (AM-001)



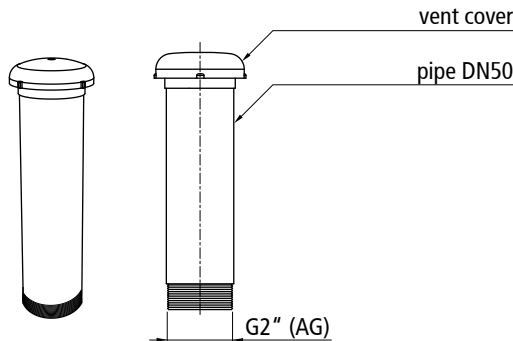
3.5.7 Suction pipe - machine feed (AM-920)

The suction pipe is mounted on the roof by means of a flange. Once the suction pipe with foot valve has been installed, the machine flow is connected to it.



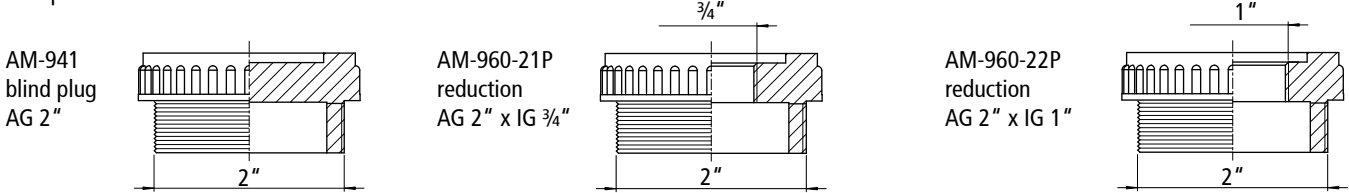
3.5.8 Vent pipe with vent cover (AM-911)

The 2" vent pipe is installed in a 2" 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. In the case of tanks installed below ground level (for example in the cellar), the vent pipe must be laid to at least 500 mm above the connection for filling by road tanker vehicles and at least 500 mm above ground level. The vent pipe must not end in closed rooms and must be laid outside on site.



3.5.9 Adapter set

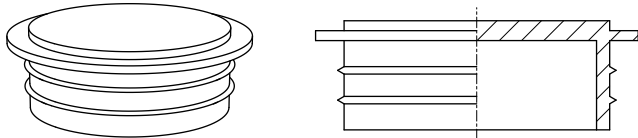
The adapter set ensures that fittings can be accommodated. The adapters cannot be used for connecting pipelines. The adapter set consists of:



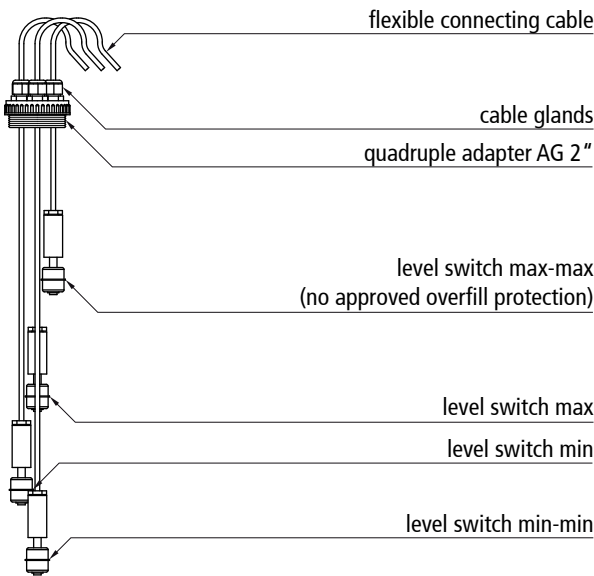
Die Blindstopfen 2" und Reduzierung sind aus PE-HD gefertigt. Die Abdichtung des Stopfens erfolgt über einen Dichtring. Der Stopfen wird durch einfaches Einschrauben in die entsprechende 2"-Muffe auf dem Tankdach und handfestes Anziehen fest dichtend verschlossen. Der Stopfen ist zur optimalen Handhabung am äußeren Rand gerändelt.

3.5.10 Transport plugs (installed) (AM-948)

The plastic transport plugs are driven into all sockets of the tank. They protect against corrosion during transport. Before installing the fittings, commissioning the KTD-F or its fittings, all transport plugs must be removed. Unoccupied sleeves must be sealed with blanking plugs.



3.5.11 Electric level transmitter (mini detector) with flexible float switch cable (AE-100-xx)

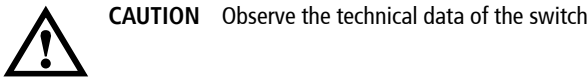


Flexible level transmitters have a plastic cable with a stainless steel switching head in which a short sliding tube is incorporated. Level sensors detect the level of a liquid in a tank. A distinction is made here between

- a.) a switching system with level switches and
- b.) an electronic measuring system with sensors

With level switches, the signals can be used directly for automatic control, regulation or signalling. In an electronic measuring system, the signal from the transducer is converted into corresponding switching signals and level indicators in the associated evaluation units. In the level sensor of an electronic overfill protection system, the signal from the sensor is converted into a corresponding switching signal in the evaluation units.

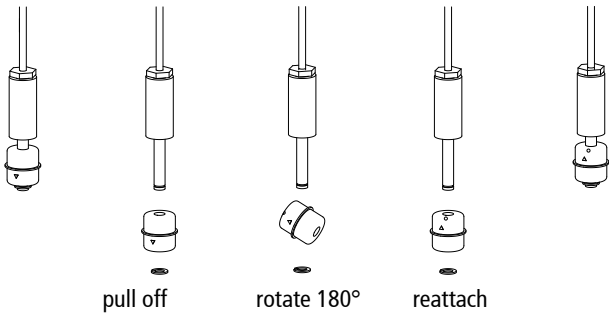
technical data of the AE-100-xx		
switching voltage	max. 200 V DC / max. 120 V AC	
switching power	max. 10 W	
contact resistance	max. 0,5 mOhm	
switching current	max. 0,5 A	
cable proportions	2 x 0,5 mm² x 5.000 mm	
material	float switch, weight, shaft	stainless steel
	cable	PVC (oil resistant)



CAUTION Observe the technical data of the switch

The electric level limit switch (mini detector) is used to control and signal precisely defined levels in the tank. When using a quadruple cable gland, up to four level switches can be installed in one tank. The level limit switch 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). For the alarm switching point „overfill“ (max-max), only approved overfill protection devices may be used.

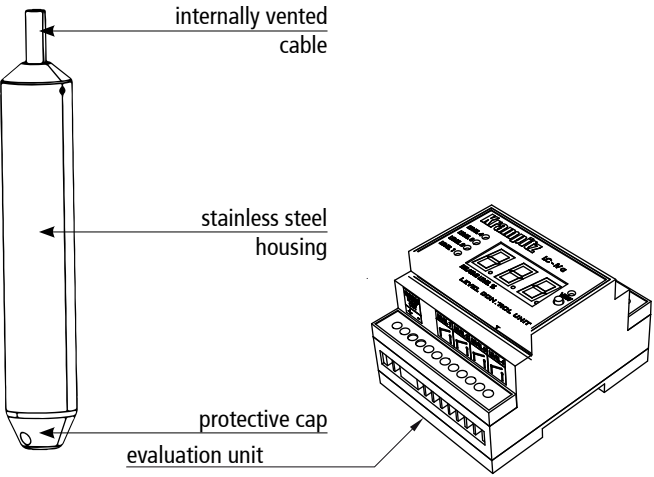
The level switch can also be used for simple leakage detection. By means of the cable glands mounted in the quadruple adapter, the level switch can be set to the desired level and fastened accordingly. By turning the float 180° on the switch shaft, the level switch can be easily converted from a „normally closed“ to a „normally open“ contact. (see figure)



Changing the switching direction of the AE-100 from n. c. to n. o.

The level switch 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 can be installed directly on the control of the system.

3.5.12 Electric content indicator for heating oil and diesel (AE-332)



Evaluation unit AE-115-A

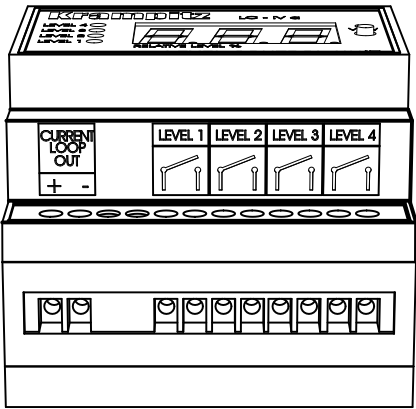
The evaluation unit is a processor-controlled tank level indicator with limit value detection. This unit is easy to use and also well-suited for other measuring tasks. A 4-20 mA sensor, for example for pressure, temperature or flow measurement, is required. The evaluation unit has been designed for mounting on DIN rails. This ensures easy integration into existing control systems.

Description/technical data

- operational voltage 24 V DC; current 150 mA; analogue output signal 4 ... 20 mA (galvanically separated)
- setting the switching points for the limit value adjustment in the entire measuring range
- four potential-free make contacts with a contact load capacity of 230 V / 2 A
- range of application: heating oil and diesel only

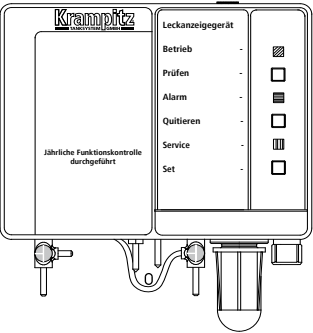
The KTD-F can be outfitted with an electric content indicator to allow for comfortable tracking of its filling level. This electronic content indicator is a complete measuring system for tracking the filling level in tanks filled with heating oil and diesel. The device detects the hydrostatic pressure and converts it into an analogue output signal. The output signal changes proportionally to the fill level of the container. The device works according to the relative pressure principle. A capillary tube is used to equalise the pressure. It is led through the connection line.

The electronic content indicator is tested and supplied pre-calibrated to match the tank.



3.5.13 Electronic vacuum leak detector, 230 V (AE-350)

The leak detector's impact-resistant plastic casing houses its display and control elements, a vacuum pump, a pressure switch, a printed circuit board with the electromagnetic components for processing the output signal, a filter and three hose connections for the pneumatic connection to the interstitial space of the tank. When the operating voltage (230 V, 50 Hz) is present and the vacuum is built up, the green operating lamp lights up. The leak detector generates a constant negative pressure (approx. -400 mbar) in the interstitial space of the tank and gives an alarm when the negative pressure drops. (= pressure increase) (below approx. -340 mbar). The alarm is indicated visually (red alarm light) and acoustically and can be picked up via a potential-free relay contact (1 changeover switch). The acoustic alarm can be switched off via the „alarm tone“ toggle switch after the seal has been released. If the mains voltage fails, no alarm is triggered. When the mains voltage returns, the unit is immediately ready for operation. Any leakage that has occurred in the meantime is indicated. Work on the leakage monitor must be carried out by authorised specialists.



- operating lamp green
- alarm lamp red
- service lamp yellow

The inspection of the LAZ has to be carried out as a visual inspection, after

- each transport
- each relocation
- each initial commissioning
- each recommissioning
- each temporary shutdown

The LAZ inspection must take place annually and be documented!

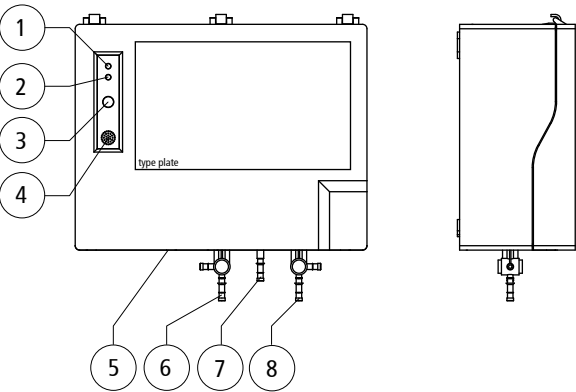
Technical data	
measurements (L x B x H) in mm	202 x 230 x 70
weight in kg	1,1
mode of action and additional mode of action	type 1.B
nominal voltage	AC 100-240 V ± 10 %
nominal power	< 10 VA
noise emissions	min. 70 dB(A), A-weighted sound level of the acoustic alarm at a distance of one metre
output relay	1 toggle switch
Switching capacity output relay	max. 250 V, 2 A, resistive load
relay fuse	T 2 A
operating pressure inside interstitial space	appr. -400 mbar
switching point „alarm on“ in mbar	-325 to -355
switching point „alarm off“ in mbar	-380 (reference point, results from the switching hysteresis)
switching point „pump on“ in mbar	-380 (reference point, results from the switching hysteresis)
switching point „pump off“ in mbar	-410 to -450
connecting hose	PVC hose 6 x 2 mm
permissible surrounding temperature in °C	-5 to +50
permissible storage temperature in °C	-10 to +60
electrical safety protection class	IP 30
interference emission	according to CISPR 22
interference immunity	according to EN 61000



CAUTION

The leak detector operates with mains voltage 230 V, 50 Hz. This voltage can cause extremely serious burn injuries if not handled properly. A person who comes into contact with mains voltage may die. Before opening the leak detector or before maintenance and cleaning work, disconnect the mains voltage (switch off the fuse).

3.5.14 Electronic vacuum leak detector, 24 V (AE-354)



- 1 green operating lamp
- 2 red alarm lamp
- 3 acknowledgement button - alarm sound - OFF
- 4 horn
- 5 seal fastening
- 6 suction line connection
- 7 exhaust pipe connection
- 8 measuring line connection

Vacuum leak detector for monitoring double-walled containers. A negative pressure is generated and maintained in the interstitial space of the double-walled container by the leak detector. In case of a leak, air or vapours are sucked into the interstitial space and cause a pressure increase. Minor leaks are compensated by switching on the pump. Relevant leaks cannot be compensated due to the limited pump delivery capacity. The negative pressure will continue to drop. When the alarm negative pressure is reached, the optical and acoustic alarm is triggered.

In the event of a liquid leak, stored goods or groundwater are sucked into the interstitial space. The negative pressure is reduced and the pump is switched on to generate the operating negative pressure again. Over time, stored material or groundwater is sucked into the suction line of the leak detector. The liquid barrier closes and separates the pump from the interstitial space. The pump cannot now generate any further negative pressure. The remaining negative pressure in the interstitial space or in the measuring line is reduced by further liquid being sucked in. When the alarm negative pressure is reached, the optical and acoustic alarm is triggered. The negative pressure still present in the event of an alarm is so high that no stored goods can escape into the environment.

An inspection of the LAZ must be carried out and documented annually. Work on the leakage monitoring system must be carried out by authorised specialists.

Technical data	
measurements (L x B x H) in mm	265 x 110 x 220
required space (L x B x H) in mm	265 x 330 x 350
appr. weight	2 kg
voltage	24 V DC
electric power	50 W
output relay	1 toggle switch
switching capacity output relay	max. 230 V, 3 A, resistive load
switching point „alarm on“	-330 mbar
switching point „alarm off“	-445 mbar
switching point „pump on“	-345 mbar
switching point „pump off“	-450 mbar
hose connection Ø	5 mm
connecting hose	PVC hose 4 x 2 mm
permissible surrounding temperature	-5 to +50 °C

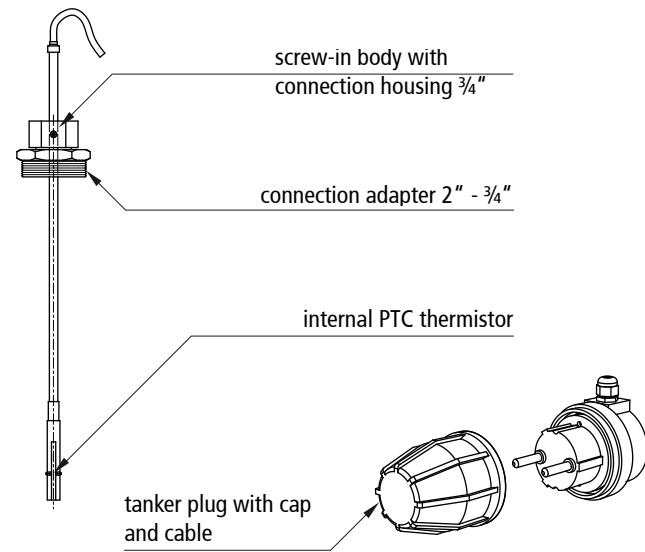
3.5.16 Limit value transmitter

3.5.16.1 Limit value transmitter type K12/1 PTC thermistor for diesel fuel and heating oil only (AE-250)

The PTC thermistor based level transmitter of the approved overfill prevention system is installed in a 2" socket in the tank roof via a connection adapter 2" x 3/4".

The level transmitter is a device which, in interaction with the filling safety device (evaluation units) on the road tanker, prevents overfilling of fixed tanks.

Stationary tanks for the storage of diesel fuel or heating oil, which are filled from a road tanker, must be equipped with a limit value transmitter.

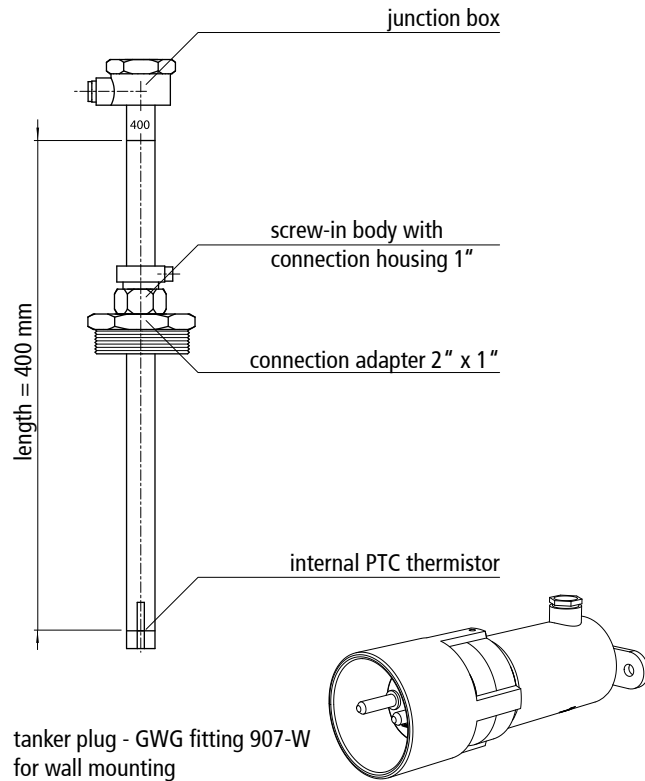


3.5.16.2 Limit value transmitter type 81-D-EX-400-W for flammable liquids (e. g. gasoline) (EX-AE-250)

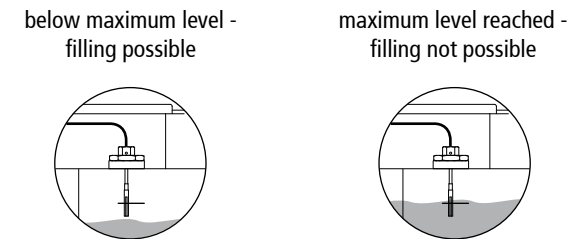
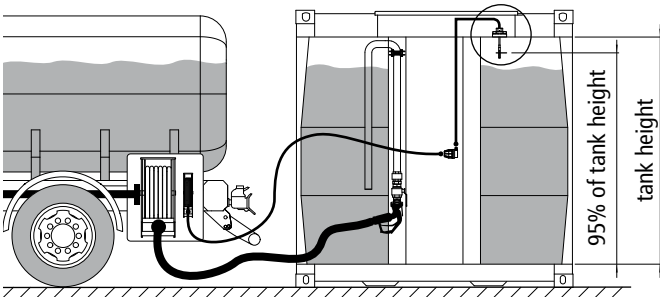
The level sensor based on PTC thermistors of the approved overfill protection is installed in a 2" socket in the tank roof via a connection adapter 2" x 1".

The level sensor is a device that prevents overfilling of stationary tanks in cooperation with the filling safety device (evaluation units) on the road tanker.

Fixed tanks for the storage of flammable liquids, which are filled from a road tanker, must be equipped with a limit value transmitter.



3.5.16.3 Limit value transmitter, connection to tank truck



The permissible filling level of the containers must not exceed 95%. The PTC resistor changes its resistance abruptly when immersed in liquid. This impulse is transmitted via a switching amplifier mounted on the tank truck, which switches the actuator (shut-off device) on the tank truck.

3.5.17 Overfill protection

Every tank for the storage of diesel fuel or heating oil which is filled via a tanker connection (with the exception of above-ground tanks with a volume not exceeding 1,000 litres which are filled manually with a nozzle without a fixed line) shall 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 switch 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 water-endangering liquids and flammable substances such as mineral oil which are filled automatically shall be equipped with an approved overfill protection device. The overfill protection must not be used as an operational switching point for the control of the refilling device.



NOTE

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

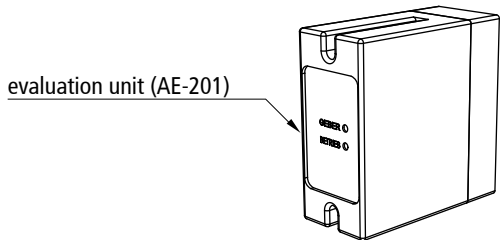
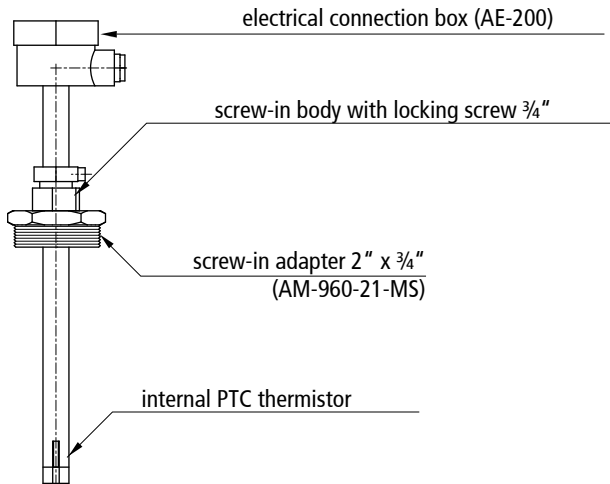


NOTE

Tanks may only be filled to the extent of the permissible degree of filling. The permissible degree of filling depends on the medium (cubic expansion coefficient; see also TRbF 20, § 9.3).

3.5.17.1 Overfill protection (AE-200) with electronic evaluation system (AE-201)

The level sensor on PTC thermistor basis of the approved overfill protection is installed via a connection adapter 2" x 3/4", in a 2" sleeve in the tank roof (see item connection adapter). An approved overfill protection must generally be installed if the tank is filled by an electric pump and fixed pipes (see also installation instructions for overfill protection). The overfill protection must be adapted to the max. permissible filling height of the tank.



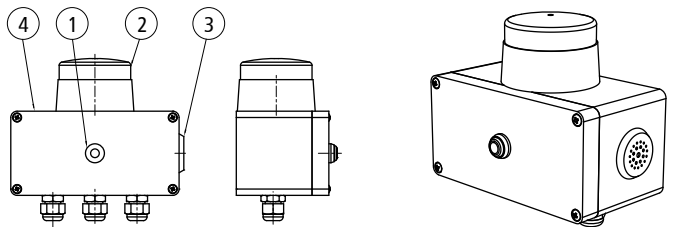
3.5.17.2 Overfill acknowledgement box (B-AE-110)

voltage: 230 V (Std.)

description: 24 V (optional)

The B-AE-110 is used to signal or alarm the overfill protection to the tanker driver during filling. The tanker driver switches off the tanker pump manually. The horn is switched off by means of an acknowledgement button when the overfill protection is activated. The flashing light goes out if the overfill protection is not activated.

application area: optical and acoustic alarm box as signal for overfill protection



1. acknowledgement button
3. horn - noise level 95 db
4. housing - protection 54 IP

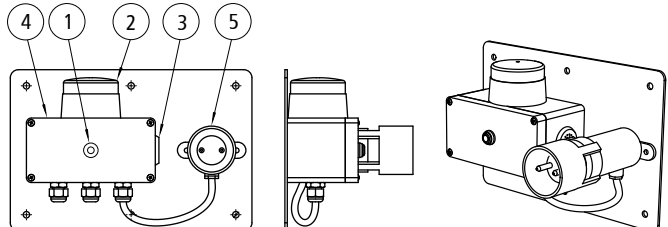
2. flashing light - power 1 joule
- /- supply voltage 24 V DC

3.5.17.3 Overfill acknowledgement box with tanker plug (B-AE-907-W)

description:

The B-AE-907-W is used to automatically switch off the pump of the tank truck or to signal the tank truck driver when filling the tank. By means of the acknowledgement button, the horn is switched off when the overfill protection is activated. The flashing light goes out when the overfill protection is not activated.

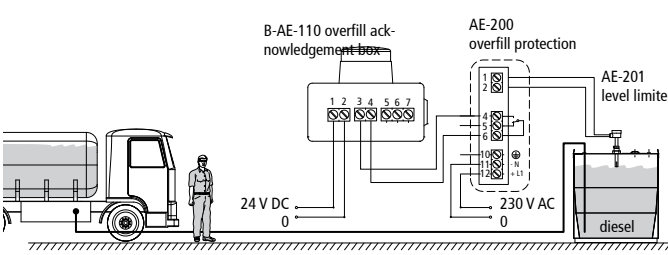
application area: optical and acoustic alarm box as signal for overfill protection with tanker plug



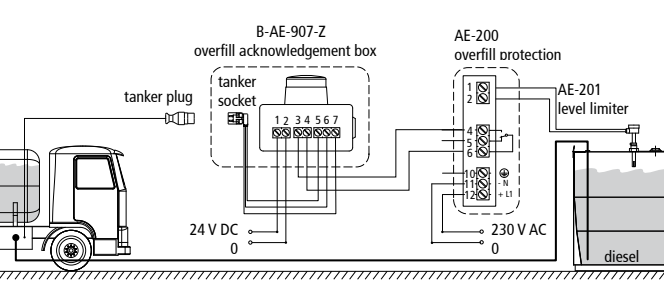
1. acknowledgement button
3. horn - noise level 95 db
5. tank truck plug - 907-Z

2. flashing light - power 1 joule
4. housing - protection 54 IP
- /- supply voltage 24 V DC

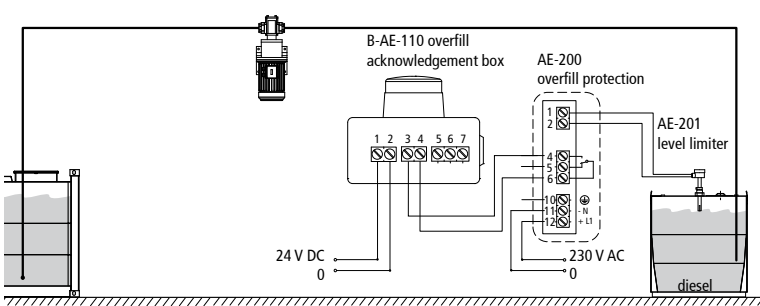
Application example / terminal diagram: for tankers without tank plug, for diesel



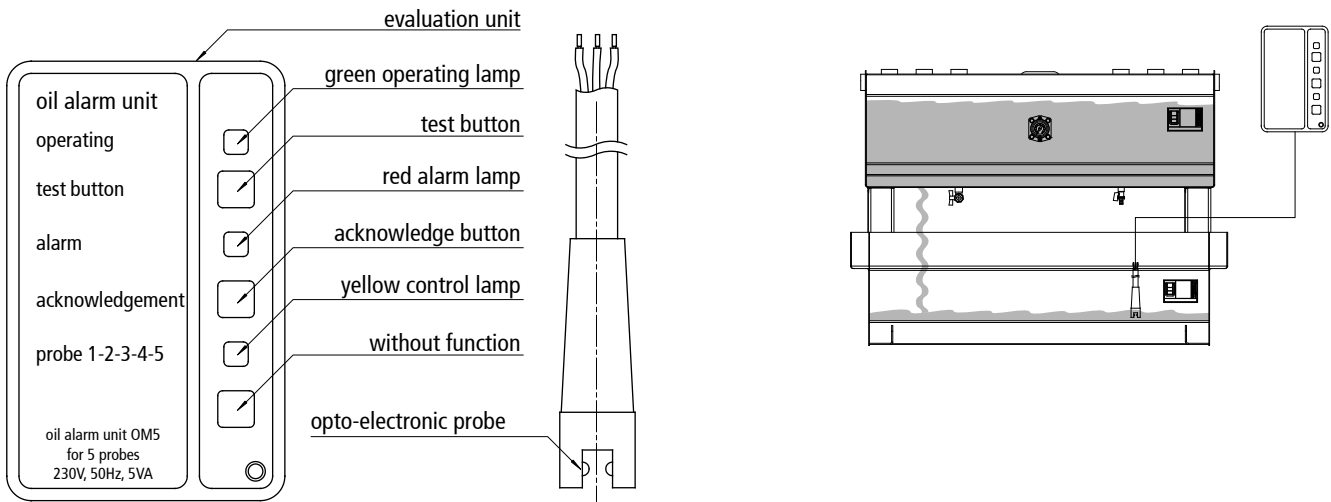
Application example / terminal diagram: for diesel



Application example / terminal diagram: for diesel



3.5.18 Oil alarm unit (AE-303) with signalling and evaluation unit



3.5.18.1 Oil alarm unit functionality

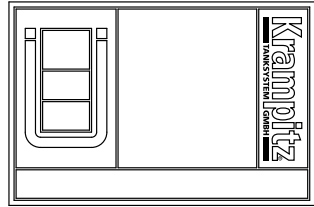
The oil alarm unit is an approved leakage warning device. It is mounted in the collection space of the day tank. Up to 5 probes can be connected to an evaluation unit. The unit is used for quick detection of leaking water, hazardous substances according to VAWS. If a probe is immersed in liquid, the 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 unit 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 part signals a leak (alarm): The red ready-to-operate lamp and the acoustic alarm go on, the relay picks up. 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 key again. When using several probes on one evaluation unit, the number of flashes of the yellow control lamp can be used to close the probes concerned. The duration of the successive flashes is about three seconds. If the mains voltage fails, no alarm is triggered. When the mains voltage returns, the unit is immediately ready for operation. A leakage that has occurred in the meantime is indicated. The green operating lamp lights up as soon as the oil detector is supplied with mains voltage. The test button enables a function check by simulating the alarm event.

3.5.18.2 Oil alarm unit structure

The oil alarm unit consists of a signal section and up to five probes. The signal part and the probes are connected to each other by a three-core signal line of up to 10 metres in length. The probe of the alarm unit 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 the receiver, most of the infrared radiation generated by the transmitter reaches the receiver. The principle of the opto-isolator is used. The signal section contains the display and operating elements as well as all electronic components for evaluating and converting the probe signal into a digital output signal in an impact-resistant plastic housing. The output signal is available as a potential-free relay contact (changeover contact).

3.5.19 Manufacturer's plate, type plate

On every KTD-F storage tank there is a manufacturer's plate in accordance with the general building inspection approval or test mark Z-38.12-312. On the right-hand side of the manufacturer's plate is the logo of the manufacturer, Krampitz Tanksystem GmbH. 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 is the mark of conformity as proof of conformity with the requirements of the building authority approval. The name of the manufacturer, the number of the general technical approval and the organisation that monitors the manufacturer are also listed here. The manufacturer's plate is attached to the front of the storage tank as standard. Once the test has been passed, the manufacturer's plate is given the mark of the factory inspector in accordance with DIN 6600 (bottom right).

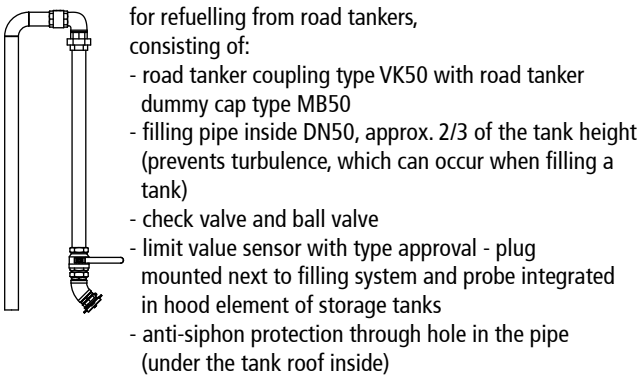


3.5.20 Machine return flow

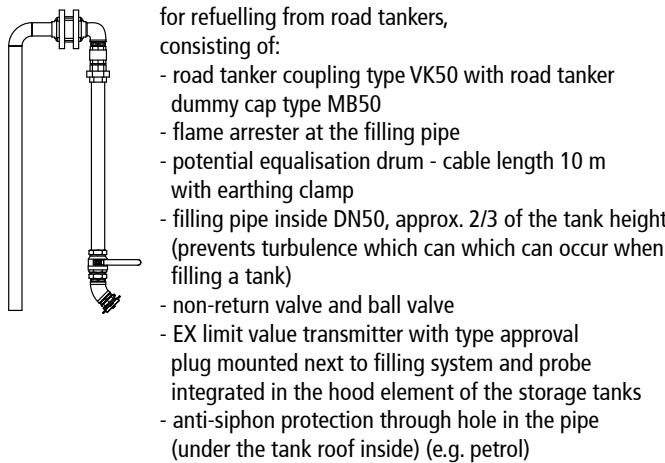
If required, the machine return flow can be installed in one of the 2" sleeves located in the roof via a 2" x 3/4" connection adapter.

3.5.21 Tanker - filling system

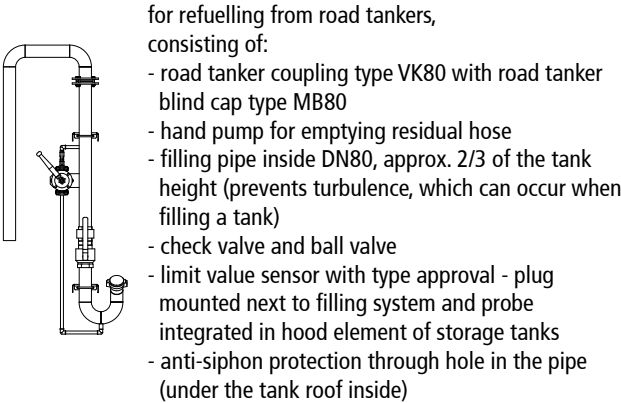
Filling system DN50 without transfer pump for non-flammable liquids (e.g. diesel)



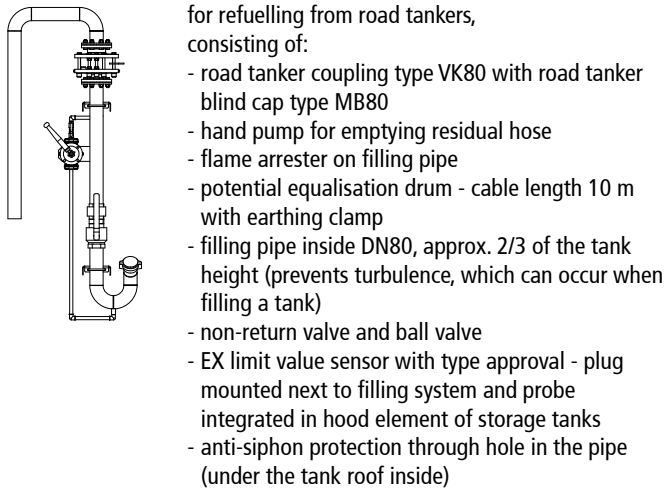
Filling system DN50 without transfer pump for flammable liquids (e.g. petrol)



Filling system DN80 without transfer pump with hose residue emptying for non-flammable liquids (e.g. diesel)



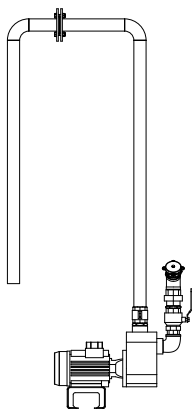
Filling system DN80 without transfer pump with hose residue emptying for flammable liquids (e.g. petrol)



Filling system DN50 with transfer pump for non-flammable liquids (e.g. diesel)

for refuelling from road tankers, consisting of:

- road tanker coupling type VK50 with road tanker blind cap type MB50
- transfer pump, delivery rate approx. 600 l/min
- filling pipe inside DN50, approx. 2/3 of the tank height (prevents turbulence that can occur when filling a tank)
- non-return valve and ball valve
- overfill protection with type approval



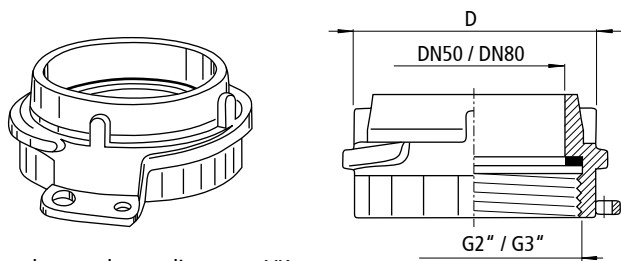
measuring transducer integrated in system control and level sensor (probe) integrated in the hood element of the storage tank

- operating element with: pump start/stop button, (switch button - empty filling hose) option
- anti-siphon protection through hole in the pipe (under the tank roof inside)

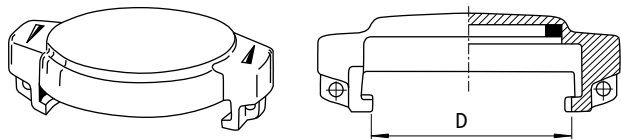
3.5.20 Tanker coupling variants

3.5.20.1 Fuelling pipe couplings mounted on the tank, male part

Fuel pipe connector according to DIN EN 14420-6 (DIN 28 450)

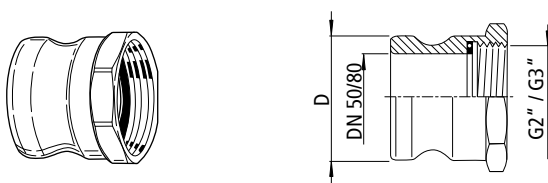


tanker - male couplings type VK with female pipe thread and inserted thread seal (GD)

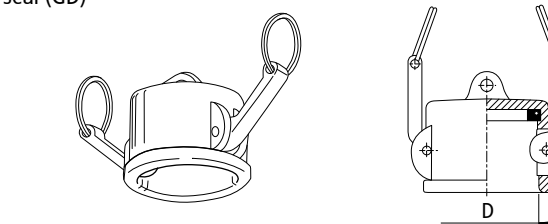


tanker - blanking caps type MB for VK male couplings with coupling seal (KD)

Lever arm coupling according to DIN EN 14420-7 (DIN 2828) Camlock Couplings



male coupling type AVKI with female pipe thread and internal thread seal (GD)

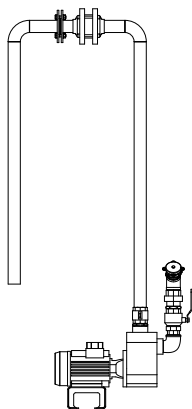


blanking cap type AMB for AVK - male couplings, with inserted coupling seal (KD)

Filling system DN50 with transfer pump for flammable liquids (e.g. gasoline)

for refuelling from road tankers, consisting of:

- road tanker coupling type VK50 with road tanker blind cap type MB50
- transfer pump - motor according to ATEX, delivery rate approx. 600 l/min
- flame arrester at the filling pipe
- potential equalisation drum - cable length 10 m with earthing clamp
- filling pipe inside DN50, approx. 2/3 of the tank height (prevents turbulence that can occur when filling a tank)
- non-return valve and ball valve
- EX overfill protection with type approval

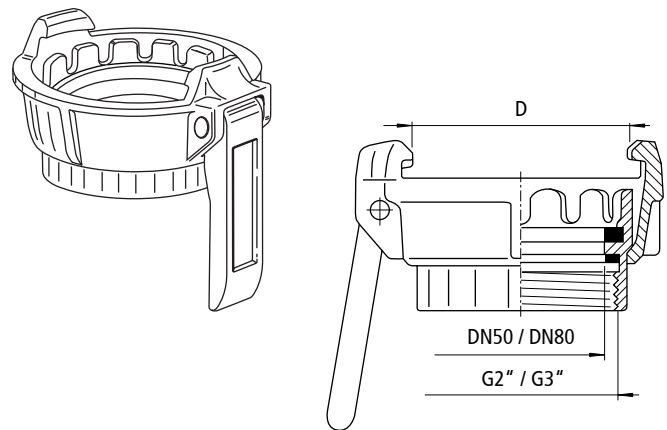


measuring transducer integrated in the system control and level sensor (probe) integrated in the hood element of the storage tanks.

- operating element with: pump start/stop button, (switch button - empty filling hose) option
- anti-siphon protection by drilling in the pipe (under the tank roof inside)

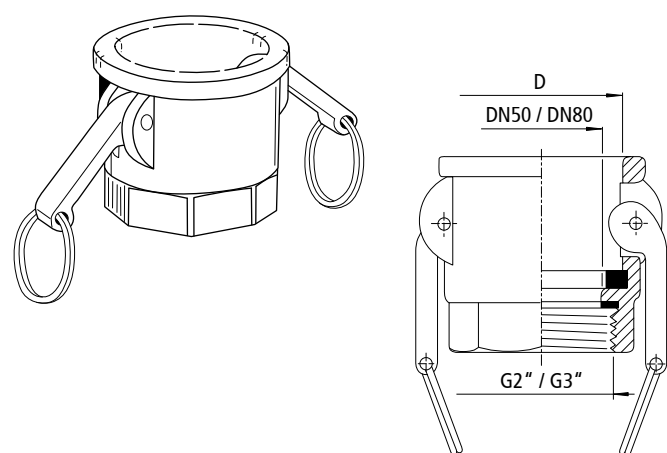
3.5.20.2 Tanker couplings fitted to the tanker, nut part

Tanker coupling according to DIN EN 14420-6 (DIN 28 450)



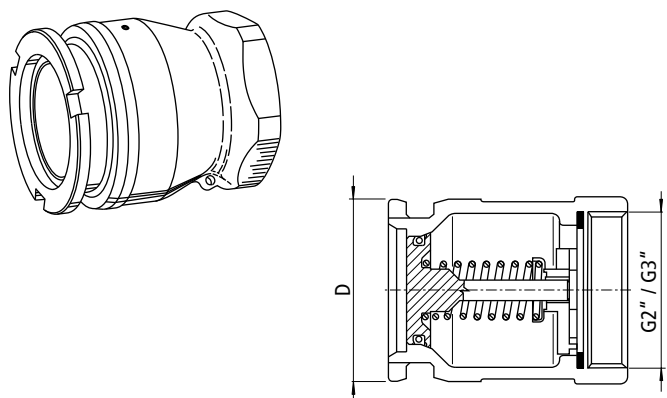
tanker - nut couplings type MK with internal pipe thread and thread seal (GD) and coupling seal (KD)

Lever arm coupling according to DIN EN 14420-7 (DIN 2828) Camlock Couplings

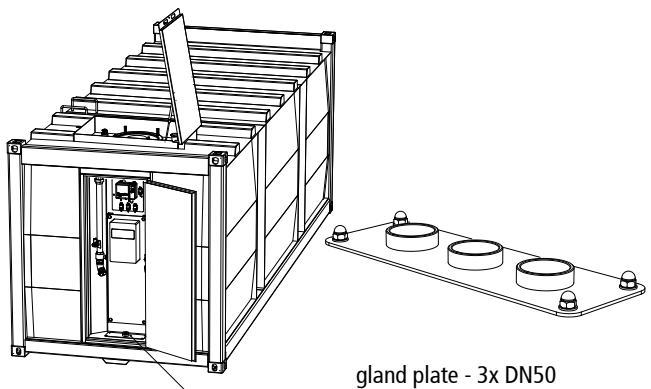


female couplings type AMKI, with female pipe thread and thread seal (GD), with coupling seal (KD)

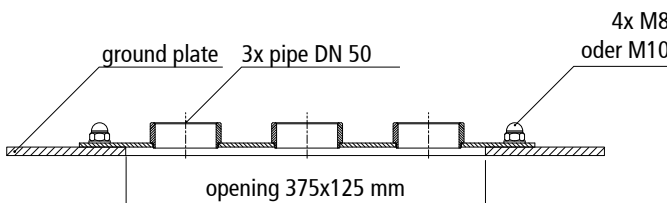
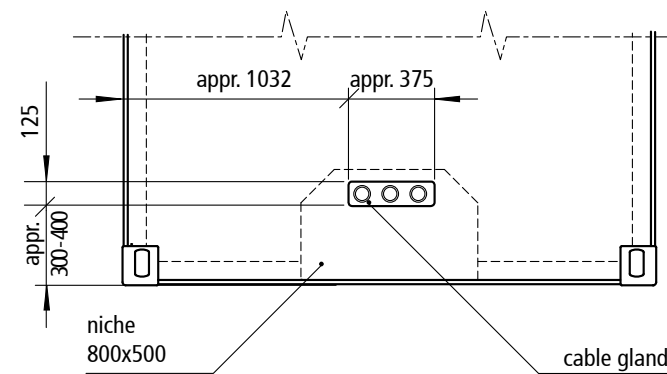
DDC - Dry disconnect couplings male part (fixed part), according to NATO STANAG 3756. Standard version with female pipe thread. Self-closing fitting for liquid media. Compatible with dry couplings from MannTek, Emco, Avery Hardoll, Todo.



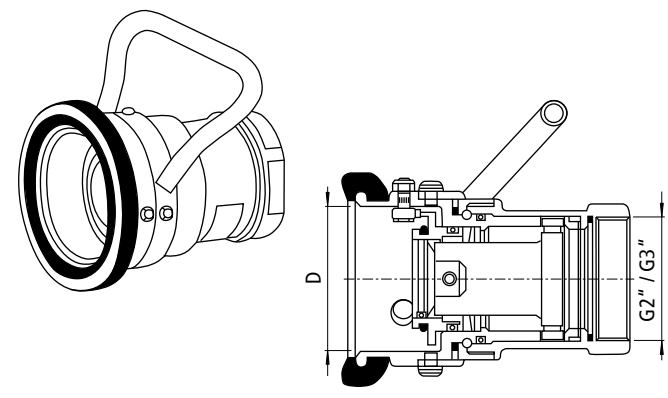
3.5.21 Cable gland in the floor



The storage tank container requires a permanently installed connection to the mains power supply for operation.

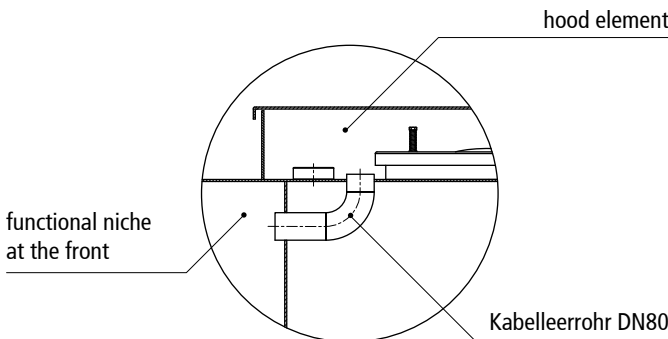
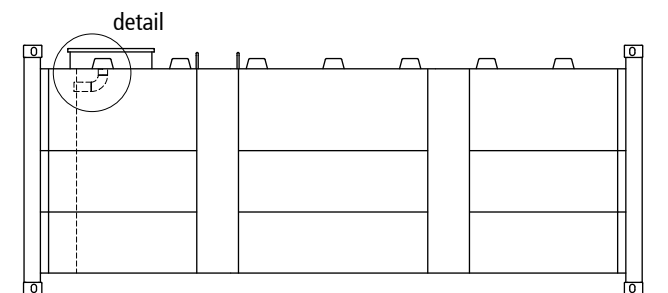


DDC - dry coupling, nut part (hose part), according to NATO STANAG 3756 with integrated swivel joint. Standard version with female pipe thread. Self-closing fitting for liquid media. Compatible with dry couplings from MannTek, Emco, Avery Hardoll, Todo.

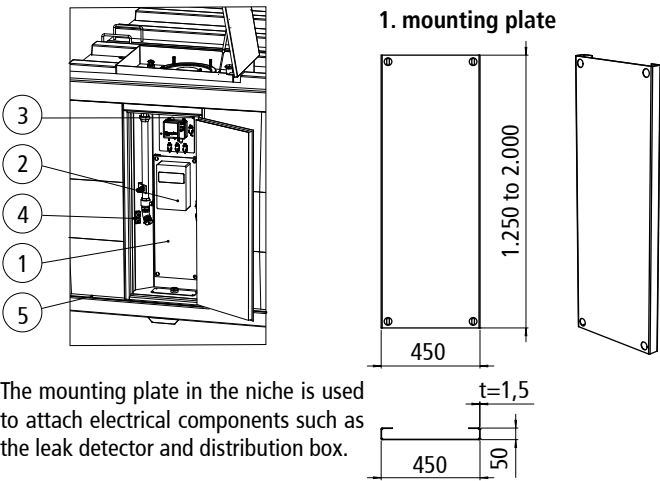


3.5.22 Cable conduit from hood element to the functional niche at the front

The cable conduit is intended to create electrical connection lines between the electrical components in the hood element and in the electrical niche.



3.5.23 Mounting plate, electrical connection and distribution box
(incl. control and wiring of existing electr. components), incl. lamp and switch



All electrical components are connected in the distribution box. The external power supply and the data cables can be connected here by qualified personnel.

3.5.22 Corrosion protection for outdoor installation

- inside: raw, oiled
- outside: coating with 2-component coating paint in RAL 7032 (pebble grey), other colours are available on request

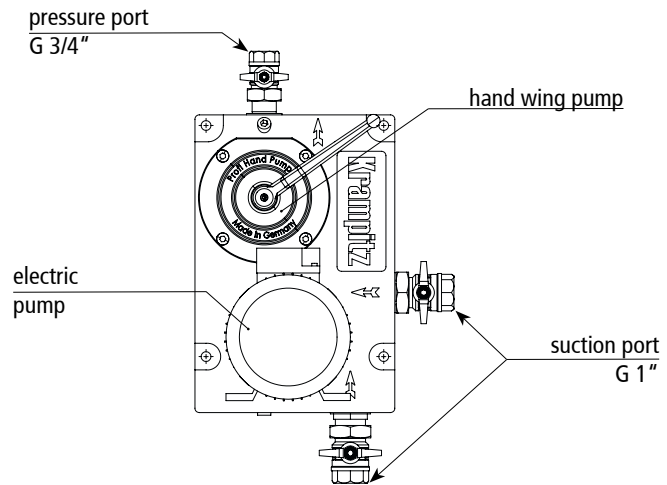
Corrosivity category corrosion load	Corrosivity	Protection period (classes)*	Target coating thickness (µm)	Typical environments	
				interior	exterior
C1					
insignificant	very low, less aggressive, interior only	short-term, medium-term, long-term	70 70 70	insulated buildings, relative humidity ≤ 60 % e. g. office buildings	—
C2					
low	low, moderately aggressive, interior and exterior	short-term, medium-term, long-term	80 120 160	uninsulated buildings where condensation may occur e. g. depots	atmospheres with low levels of pollution, dry climate e. g. rural areas
C3					
moderate	moderate, less aggressive, interior and exterior	short-term, medium-term, long-term	120 160 200	rooms with high relative humidity and some air pollution e. g. breweries	urban or industrial atmosphere, moderate SO2 pollution, temperate coastal climate
C4					
strong	high, moderately aggressive, interior and exterior	short-term, medium-term, long-term	160 200 240 - 280	e. g. swimming pools, chemical plants	industrial areas, coastal areas with moderate salinity
C5-I					
very strong (industrial)	very high, aggressive, interior and exterior	short-term, medium-term, long-term	200 240 - 280 320	buildings or areas with almost permanent condensation and high pollution	industrial areas, high humidity, aggressive atmosphere
C5-M					
very strong (sea)	very high, maritime, interior and exterior	short-term, medium-term, long-term	200 240 - 280 320	buildings or areas with almost permanent condensation and high pollution	coastal and offshore areas with high salinity

* classes of protection periods: short-term - 2 to 5 years, medium-term - 5 to 15 years, long-term - more than 15 years

3.5.27 Pumps

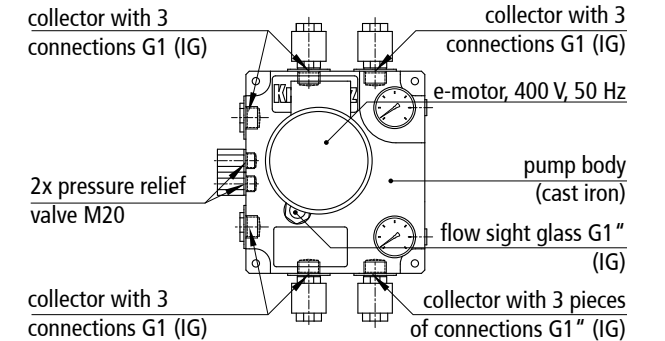
Z-PK

The Z-PK is used to supply decentralised day tanks from a KTD-F storage tank. The pump combination combines an electric pump and a hand wing 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 serves to vent the suction line (for further information, see the operating instructions for the pump combination).
Intended primarily for use with diesel/heating oil.

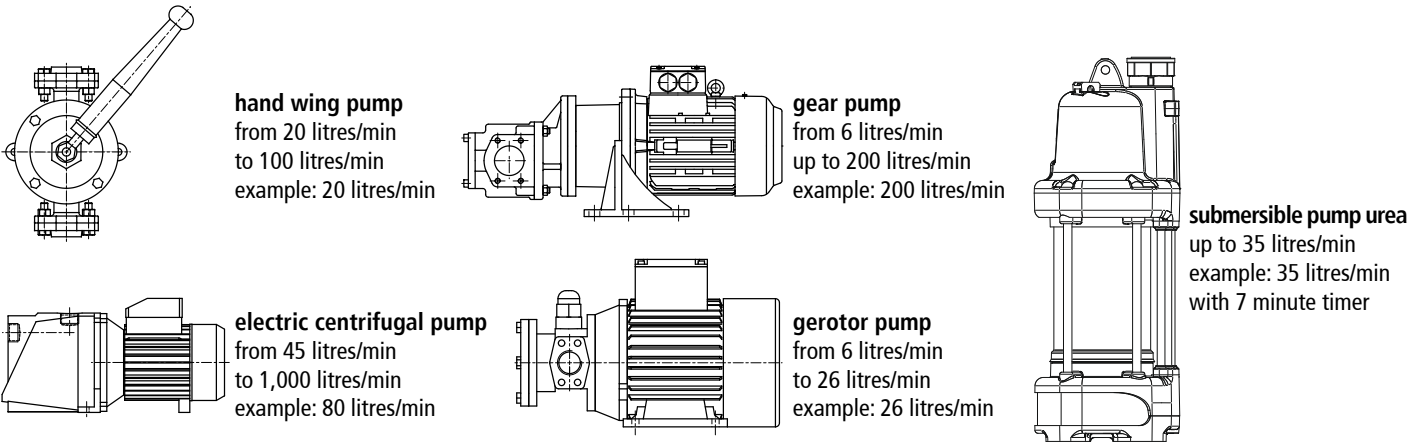


Z-PG

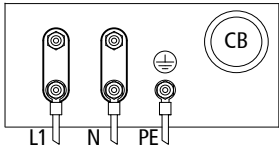
The Z-PG close-coupled pump unit was specially developed for the requirements of oil changes or the oil supply of industrial combustion engines. The aim in developing this pump was a compact design in which as many functions and fittings as possible are integrated in the pump housing. The housing of the close-coupled pump is made of grey cast iron and is machined with high precision. This guarantees a long service life and precise replacement. In order to achieve a simple mode of operation, the unit is designed in such a way that the two respective required delivery paths of the pump are achieved by simply switching the direction of rotation of the electric motor. Intended primarily for use with lubricating oil and waste oil.



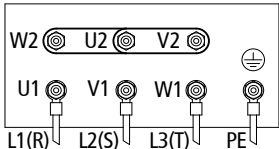
Further pumps from the Krampitz Tanksystem GmbH product range
(for further data see special data sheet)



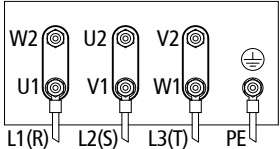
Connection diagram for electric pumps



connection diagram 220-240 V/AC
single-phase AC
CB - operating capacitor
(connected internally to the motor,
no internal bridges necessary!)



connection diagram 380-420 V
three-phase current
star connection



connection diagram 380-420 V
three-phase current
triangular connection

3.5.28 Tank heater (AE-800) (optional)

The use of a tank heater with integrated temperature control between 8°C to 12°C and temperature limiter reliably prevents paraffin precipitation of the light fuel oil and diesel at falling temperatures. This maintains the pump and nozzle viscosity of the oil and diesel in the intake area. For data and installation instructions, please refer to the relevant data sheet.

i

NOTE

Not permitted/approved for media of the with flash point < 55 °C.

power	tank volume	voltage
220 W	up to 2,000 ltr	230 V, 50 Hz
1,500 W	up to 8,000 ltr	230 V, 50 Hz
3 kW	up to 15,000 ltr	400 V, 50 Hz
6 kW	up to 25,000 ltr	400 V, 50 Hz

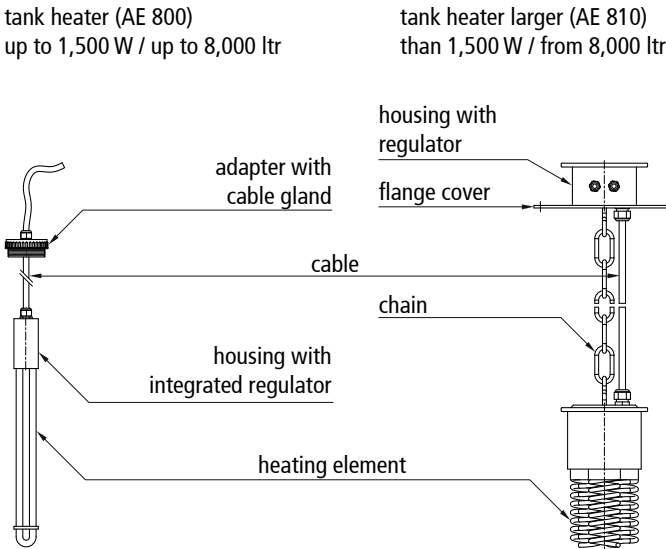
3.5.29 Krampitz Sealfix M (optional)

Krampitz Sealfix M is a thread sealant for oil-resistant threaded connections. Sealfix M is applied to the cleaned thread section. The threaded connection is closed. Sealfix M is cured after 15 to 30 minutes.

i

NOTE

The cleaned thread section must be completely devoid of grease and oil.



example: 10 ml bottle



4. DOCUMENTATION

Documentation consisting of the following components is supplied with the KTD-F storage tanks:

- test report in German language
- drawing
- approval booklet of the general building authority approval Z-38.12-312
- operating instructions for the individual module components such as tank, level sensor, overfill protection, pump combination, etc.
- sounding table

The documentation is sent to the customer by email. Only the delivery note is enclosed with the tank or tank module on delivery, so that no important documents can get lost on 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

§1 Scope of warranty

1. The warranty covers defects in the system occurring during the warranty period, which occur during the proper operation and use of the system and circuit and which are not due to external influences of any kind, mechanical damage or use of the system or circuit contrary to its intended purpose.
2. Furthermore, no guarantee is given for damage caused by improper maintenance and repair work.

§2 Warranty period

1. If faults appear on the system within the warranty period, warranty claims must be made in writing immediately, at the latest, however, within a period of two weeks.
2. Only Krampitz Tanksystem GmbH is authorised to accept warranty claims.

§3 Processing

1. The guarantee begins at the time of commissioning on site. All warranty claims which arise within the warranty period are taken into account. This only applies to the tank system. The warranty period is 24 months.
2. For fittings and devices (mechanical, electromechanical, electrical or electronic) supplied by external manufacturers, a six-month warranty period is granted.

§4 Exclusion of the guarantee

Warranty claims cannot be considered

- a. if the system, the circuit or parts of the circuit have been damaged by the influence of force majeure or by influences which have not been caused by the intended use of the system, in particular mechanical influences from the outside or of a chemical nature
- b. in the event of damage caused by improper handling, in particular non-observance of the operating instructions supplied with the equipment
- c. if the circuit or parts of the circuit have not been repaired or maintained by legitimate representatives, employees or vicarious agents of Krampitz Tanksystem GmbH
- d. if the circuit or parts of the circuit show mechanical damage of any kind.

§5 Supplementary provisions

1. The above provisions conclusively regulate the legal relationship with us in the event of a guarantee claim. Further claims, in particular for damage and loss of any kind whatsoever caused by the equipment, the circuit, parts of the circuit or by their use, are excluded.
2. The burden of proof for the proper use and operation of the system, the circuit or parts of the circuit in accordance with the operating instructions supplied shall be borne by the purchaser.
3. Place of performance, law and jurisdiction
The place of performance for the delivery is the place of destination, for payment the registered office of the customer. German law shall apply in addition to these Terms and Conditions of Purchase. However, the applicability of the UN Convention on Contracts for the International Sale of Goods is excluded.
The sole place of jurisdiction for all disputes arising directly or indirectly from this contractual relationship - insofar as the contractor is a registered trader - is Lüneburg. If the contractor is not a registered trader, Lüneburg shall be the place of jurisdiction for claims by way of dunning proceedings. Should individual provisions of the contract be or become invalid, this shall not affect the validity of all other provisions.

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