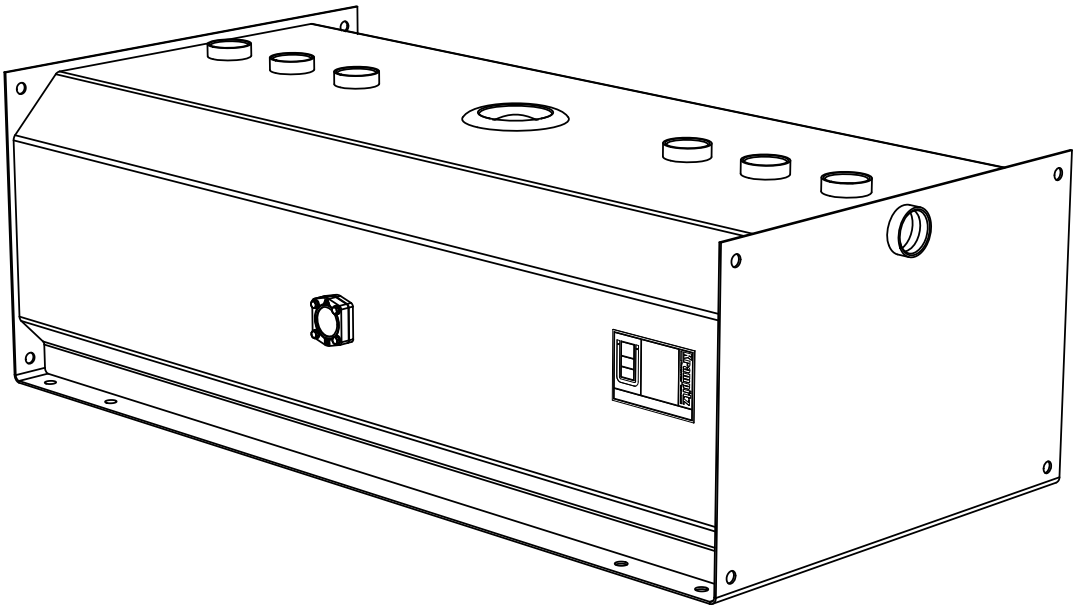
Operation and Installation Instructions TTE for Single Wall Tank System for Diesel Fuel or Mineral Oil (Fresh or Spent Oil)

Krampitz® TANKSYSTEM GMBH



Type TTE: _____

Tank No.: _____

Year of construction: _____

Issue 05/2010

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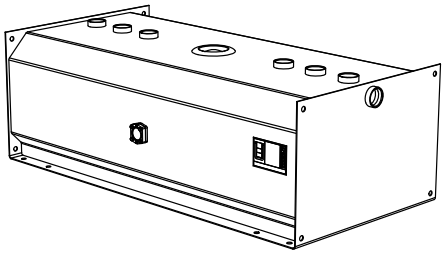
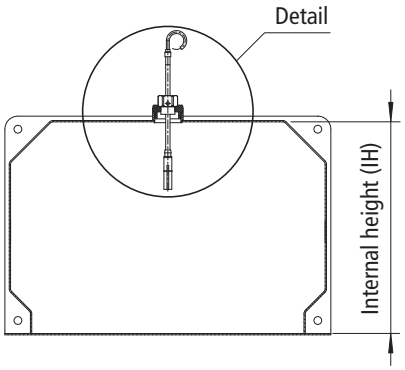
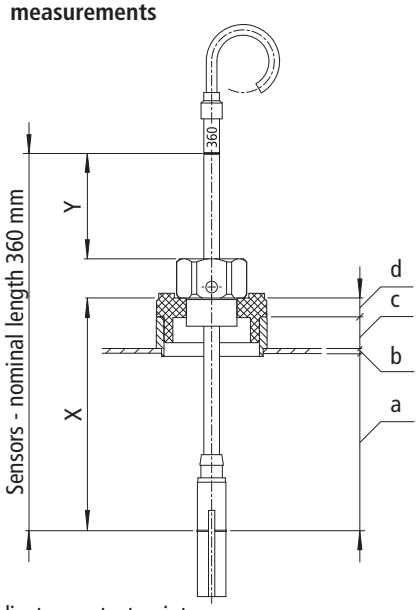
Setting the Limit Indicator for the Day Tank TTE

TTE - day tank





Limit indicator detail, setting measurements



tank type	IH	b	X-GWG	Y
	mm	mm	**mm**	mm
TTE 50	282	3	**49**	286
TTE 100	482	3	**59**	276
TTE 250	482	3	**59**	276
TTE 500	482	3	**59**	276
TTE 750	732	3	**71**	264
TTE 990	732	3	**71**	264
TTE 1500	983	4	**85**	250
TTE 1950	983	4	**85**	250

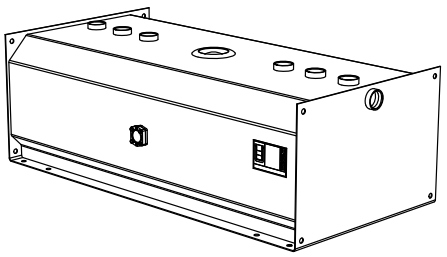
X-GWG = a + b + c + d
Y = 360 - 25 - X-GWG
a = IH - (IH*0,95)

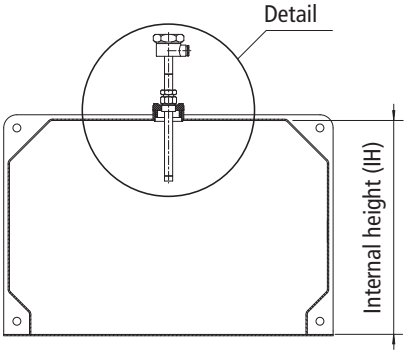
a - height between tank roof and limit indicator contact point
b - roof thickness, (see table)
c - sleeve height (20 mm)
d - reduction height (12 mm)

IH - Internal height
X-GWG - setting measurement for limit indicator
Y - monitoring (control) scale

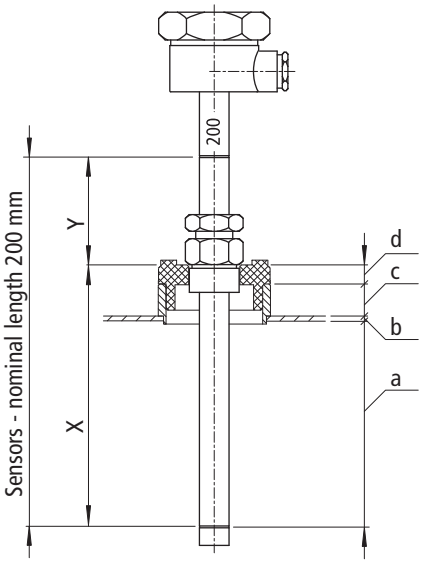
Setting the Overfill Prevention Control for the Day Tank TTE

TTE - day tank





Overfill prevention control detail, setting measurements



tank type	IH	b	X-ÜSI	Y
	mm	mm	**mm**	mm
TTE 50	282	3	**49**	151
TTE 100	482	3	**59**	141
TTE 250	482	3	**59**	141
TTE 500	482	3	**59**	141
TTE 750	732	3	**71**	129
TTE 990	732	3	**71**	129
TTE 1500	983	4	**85**	115
TTE 1950	983	4	**85**	115

X-ÜSI = a + b + c + d
Y = 200 - X-ÜSI
a = IH - (IH*0,95)

a - height between tank roof and overfill prevention control contact point
b - roof thickness, (see table)
c - sleeve height (20 mm)
d - reduction height (12 mm)

IH - Internal height
X-ÜSI - setting measurement for overfill prevention control
Y - monitoring (control) scale

Subject to technical changes!

PRELIMINARY REMARKS

- These technical operating and installation instructions (OII) describe the „TTE Day Tank for Diesel and Mineral Oil". They give descriptions and instructions required by the operator to ensure correct operation, proper material maintenance and compliance with safety and occupational health and safety regulations.
- Tank system designation: The TTE day tank for diesel and mineral oil is hereafter referred to as TTE for reasons of simplicity.
- The table of contents provides an outline of the OII and gives the chapters and sub-sections including page numbers.
- Important instructions regarding technical safety and occupational health and safety are highlighted using the pictograms below.

CAUTION Operating procedures which must be strictly respected to avoid bodily injuries.

ATTENTION Operating procedures which must be strictly respected to avoid damages to or destruction of the system.

NOTE Technical requirements which must be particularly respected by the operator.

LIST OF ABBREVIATIONS

TTE - Single wall day tank
WHG - Water management act
TRbF - Technical rules for combustible liquids
OII - Operation and installation instructions
VDE - Electrical engineering association
VAwS - Ordinance regarding plants for handing potentially water polluting substances and on specialist manufacturers
VDS - Property insurer association

1. SAFETY GUIDELINES AND REGULATIONS

1.1 Safety guidelines

CAUTION Maintenance and repair work on overfill prevention control and leakage warning devices may be carried out by authorised specialists only in accordance with § 19 l WHG.

CAUTION After connecting up the electronic components to the main source, the installation will conduct potentially fatal electric voltages. Before commencing work on the electrical components, the main power cable connection must be disconnected.

CAUTION The tank may be only be entered via the opening provided for that purpose. The container must be completely emptied, cleaned and degassed. The person entering the tank must wear the appropriate protective equipment - in accordance with the requirements of the Law on Work and Health Protection.

WARNING No work such as drilling, welding, burning or grinding may be performed on the body of the tank, as it is enclosed by metal sheeting.

WARNING Operating errors or disregarding the information in the OAI, as well as the health and working safety provisions guidelines will lead to damage to the installation and the environment, harm to people, as well as to the expiry of the warranty claims.

WARNING Due to its single-walled design the TTE must be installed for the storage of water polluting media in an approved collecting pan.

The TTE and its accessory and equipment parts must be maintained on a regular basis after they were taken into operation for the first time.

1.2 Operating Regulations

1.2.1 General operating regulations

Initial commissioning
Prior to the initial commissioning, the TTE plus any needed equipment must be checked for any visible damage.

Operational readiness
The installation must be continuously monitored, in order that any malfunctioning in the course of operation can be determined as early as possible, thus avoiding any further damage. Monitoring and correcting of malfunctions or faults must be undertaken by suitably qualified and trained personnel.

Temporary taking out of service
For a temporary taking out of service, the power supply to the TTE must be disconnected.

Restarting the installation
To restart the installation, the TTE must be checked to be working properly.
The following components must be checked:
- the electrical connections,
- the container and supply pipes for leak tightness.

1.2.2 Conduct regulations

1. The operator is obliged to maintain the TTE in proper working order, carry out any necessary repair work without delay and take any required safety measures according to the circumstances.
2. In the event of the operator being unable to determine the condition of the installation or effect the repairs, he must either seek advice from a qualified expert or conclude a maintenance contract with an approved qualified company.
3. The installation must not be used while in a defective condition, 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 installations are to be used.
6. The safety installations must be operated and maintained in such a way, that their function and effectiveness remain unimpaired.
7. Safety installations must especially not be by-passed or completely or even partially rendered inoperative.
8. Only approved water hazardous, non-inflammable liquids may be stored in the TTE. The approved liquids are indicated on the identification plate.
9. Filling the TTE must be carried out in such a way, that overfilling is avoided. Before filling, the level of the liquid in the tank interior must be checked. The amount of liquid required to fill the TTE must be determined.
10. The TTE filling and emptying processes using a tanker or drum must be constantly controlled by the operator.

1.2.3 Training the operating personnel

Operating personnel must familiarise themselves with both the use of the TTE and the contents of the operating instructions. They must be formally instructed in relation to the dangers of spills or leaks associated with storing and filling water hazardous liquids, as well as measures to avert such - before the initial operation, and subsequently in appropriate intervals, but at least once a year.

1.2.4 Repair and maintenance

During maintenance works, the TTE must neither be filled nor emptied.
Before repair work on the electrical system, make sure the entire system is dead (zero potential).

1.2.5 Technical safety inspections

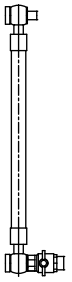
Name of inspecting authority	Inspected by	Date	Inspection certificate
Visual inspection for tightness of connections to tank	User	Weekly	Continuous documentation
Visual inspection for cleanliness of the vent cap	For specialist use in accordance with WHG / User	Weekly	Continuous documentation
Visual inspection for cleanliness of the collecting pan*	User	Weekly	Continuous documentation
Functional testing of limit indicator*	For specialist use in accordance with WHG	Yearly	Certification
Functional testing of oil warning sensor*	For specialist use in accordance with WHG	Yearly	Certification
Functional testing of overfill protection control*	For specialist use in accordance with WHG	Yearly	Certification
Functional testing of liquid level gauge*	Elektro-Betrieb oder eingewiesenes Personal	Yearly	Certification

* Special equipment (if appropriate)

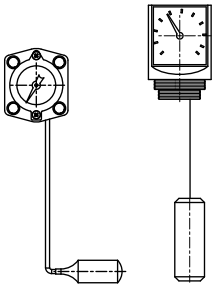
1.2.6 Handling diesel, heating and mineral oil

When handling diesel, heating and mineral oil, the generally applicable safety regulations as well as the particular operating instructions of the individual owner / user are to be followed.

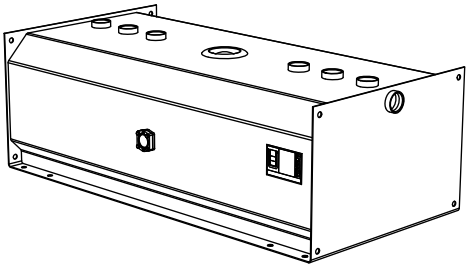
2.1 Graphical Representation of the TTE Tank Fittings



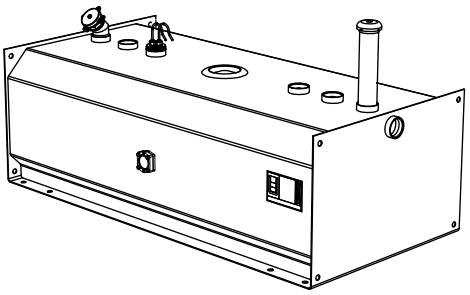
Viewing tube
AM-012



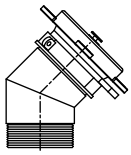
Float level indicator
AM-004.1, AM-001



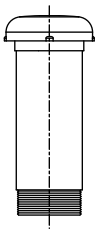
TTE without tank fittings



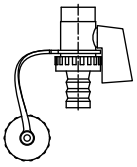
TTE with tank fittings



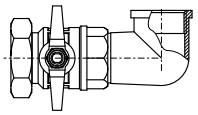
Filler neck
AM-912



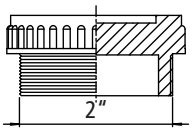
Vent cap with
Pipe socket
AM-911



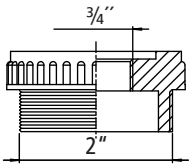
Residual drain
AM-950



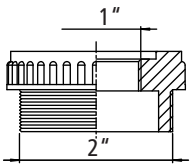
Flow ball valve
AM-951



Blind plug 2″
AM-099-81



Adapter 2″ x ¾″
AM-960-21P



Adapter 2″ x 1″
AM-960-22P

2.2 Intended Use of the TTE

The TTE serves as day fuel tank to supply Gen-Set with fuel or lube oil. The TTE is also identified as holding tank or reservoir. This tank can not only be set up inside buildings but also in facility-containers. The installation surface must be smooth and sustainable, on which a catch sump must be set up.

If there is no catch sump area provided by customer, a catch sump must be used. The tank should only be installed in areas which are not exposed to additional hazards or requirements. If the tank is used under special conditions, all applicable requirements should be observed.
The cubic-design of TTE ensures the optimal utilization of space. The tank is set up close by the equipment which it supplies so that the small external pump or the pump integrated in the tank unit can pump the liquid. It requires no pump, if the supply line is not moved in height or sharp turns. The daily storage tank will be installed above the injection pump of the unit to be supplied (accordance with VDE 107/108). The fuel then can flow unhindered through its own static pressure to the injection pump (flow pipe), which will facilitate the immediate startup of the equipment unit concerned without any problems.
The TTE is manufactured according to the general inspectorate approval No. Z-38.11-86.

CAUTION Move the TTE only when it is empty and clean.

2.3 Specifications of the TTE

2.3.1 Weights and Dimensions of the TTE

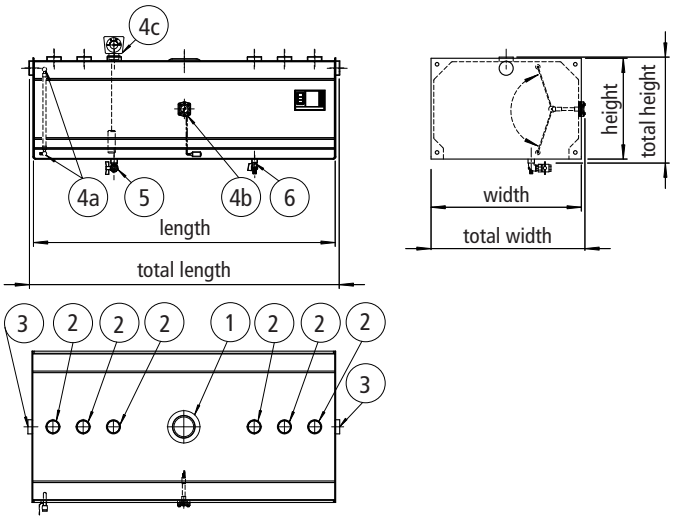
The TTE is available in six different standard sizes. Custom-design dimensions in length, width and height can be realized without any problem. Boundaries are only set for approval and transportability.

The volume capacities of the different tank types are listed in the table below. The digit in the designation is an indicator and designated the tank type.

tank type	volume 100%	volume 95%	length	total length	width	total width	height	total height	weight
art.-Nr.	liter	liter	mm	mm	mm	mm	mm	mm	kg
TTE 250	265	250	1.250	1.296	500	550	500	533	68
TTE 500	500	470	1.500	1.546	750	800	500	533	115
TTE 750	770	730	1.500	1.546	750	800	750	783	153
TTE 990	1.020	980	2.000	2.046	750	800	750	783	192
TTE 1500	1.870	1.790	2.000	2.048	1.000	1.050	1.000	1.043	318
TTE 1950	2.370	2.260	2.000	2.048	1.250	1.300	1.000	1.043	410

2.3.2 Connections of the TTE

The following connections are provided on the TTE:
1. Roof side: Six connecting sleeves 2´´ for optional installation of level sensor, overfill guard, machine return pipe, filling by pump, filling from tank truck, and ventilation. Located at the center is an NBR rupture disk which protects the tank from overpressure. If the rupture disk is removed, the opening can be used as hand hole or for inspection.
2. Bottom side: Two connection sockets with the following functions: the left is a ¾"sleeve for connecting the machine forward line, a nozzle approximately 10 mm above the tank floor (protection from debris and dirt) and a right sleeve ½"for complete emptying of the tank.
3. Front side: A 2" overflow sleeve for connection of an overflow pipe back to the storage tank is located on the right and left, centrally relative to the top edge 2". If no overflow pipe is installed, the connecting sleeve should be closed by a dummy plug. The overfill tube is a reasonably priced alternative to the overfill guard, for which the storage tank should not be more than five meters away from the day tank and not placed lower than the outline of the day tank.



NOTE The general inspectorate approval No. Z-38.11-86 limits the maximum filling volume to 95 percent of the tank height.

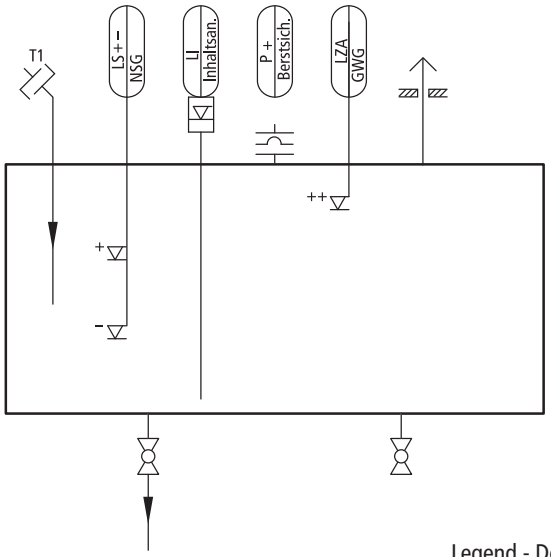
item.	connection
1	rupture disk
2	connecting sleeve
3	overflow
4a	level indicator viewing tube with ball valve (TTE 50)
4b	mechanical level indicator (from TTE 100 to TTE 990)
4c	mechanical level indicator (from TTE 1500)
5	flow ball valve
6	residual drain

2.3.3 Filling and Discharge Rates of the TTE from Tank Trucks

TTE-Type	**filling rate**	**withdrawal rate**
to TTE 990	150 liters/min - only with dispensing nozzle	600 liters/min
from TTE 1500	600 liters/min - with tank truck hose set	600 liters/min

Tanks are filled at the tank truck connection. Tanks up to 1,000 liters volume can also be filled by dispensing nozzle which stops the liquid flow according to the dead man's principle

2.3.4 Plant Layout Scheme



TTE - day tank, single-wall

Standard tank with tank fittings containers with standard equipment and optional accessories in working order

Legend - Designations acc. to DIN 19227

P + Berstsich. — rupture disk overpressure guard

LI Inhaltsan. — local level indicator Mechanical level indicator

LS + – NSG — float switch

LZA GWG — overfill guard Limit monitor with design approval

Legend - Symbols according to DIN 2481

connection for filling from tank truck

rupture disk (overpressure)

ball valve

foot valve

filter / mud trap

level meter

ventilation to atmosphere

indicates direction of liquid flow

level meter, Switching contacts for top and bottom limits

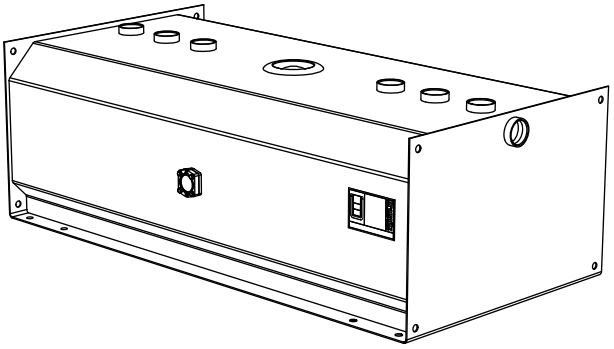
single-wall tank

collecting pan

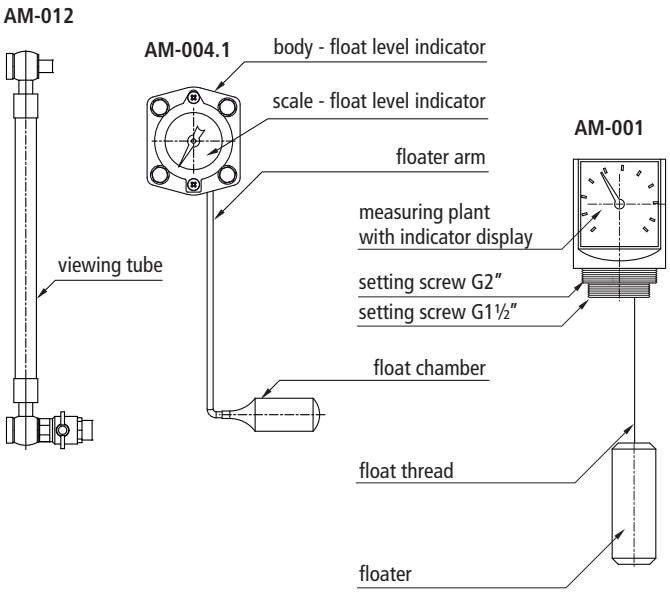
2.4. Units of the TTE - Standard Equipment

2.4.1 The Tank Vessel

The typical feature of the tank vessel is the single wall cube design. This design ensures maximum utilization of the available space. The standard tank vessel of the TTE is made of steel (S235 JRG2).
To protect it from corrosion, the tank vessel is provided with a 2-component coat of paint on the outside (RAL 7032). The inside wall is blank and oiled.



2.4.2 The Mechanical Level Indicator (AM-001, AM-004.1) and Viewing Tube (AM-012)



Each tank must be provided in accordance with flammable liquids (TRbF) with a device for determining the liquid level. The mechanical level indicator with an adjustable float is mounted on the tank manufacturer. The float is adjusted according to the display area.

2.4.3 Bearing Charts

2.4.3.1 Bearing Charts for TTE 50, TTE 100, TTE 250 and TTE 500

Bearing charts - TTE 50

Level mm	Content Liter	Level %	Level mm	Content Liter	Level %	Level mm	Content Liter	Level %
10	2	3,5%	110	22	38,9%	210	46	74,2%
20	4	7,1%	120	25	42,4%	220	48	77,7%
30	6	10,6%	130	27	45,9%	230	50	81,3%
40	8	14,1%	140	29	49,5%	240	52	84,8%
50	9	17,7%	150	32	53,0%	250	54	88,3%
60	11	21,2%	160	34	56,5%	260	55	91,9%
70	13	24,7%	170	36	60,1%	270	57	95,4%
80	15	28,3%	180	39	63,6%	280	58	98,9%
90	18	31,8%	190	41	67,1%			
100	20	35,3%	200	44	70,7%			

Bearing charts - TTE 100

Level mm	Content Liter	Level %	Level mm	Content Liter	Level %	Level mm	Content Liter	Level %
10	2	2,1%	170	36	35,2%	330	74	68,3%
20	4	4,1%	180	39	37,3%	340	77	70,4%
30	6	6,2%	190	41	39,3%	350	79	72,5%
40	8	8,3%	200	44	41,4%	360	81	74,5%
50	9	10,4%	210	46	43,5%	370	84	76,6%
60	11	12,4%	220	48	45,5%	380	86	78,7%
70	13	14,5%	230	51	47,6%	390	88	80,7%
80	15	16,6%	240	53	49,7%	400	91	82,8%
90	18	18,6%	250	55	51,8%	410	93	84,9%
100	20	20,7%	260	58	53,8%	420	95	87,0%
110	22	22,8%	270	60	55,9%	430	97	89,0%
120	25	24,8%	280	62	58,0%	440	99	91,1%
130	27	26,9%	290	65	60,0%	450	101	93,2%
140	29	29,0%	300	67	62,1%	460	103	95,2%
150	32	31,1%	310	70	64,2%	470	104	97,3%
160	34	33,1%	320	72	66,3%	480	106	99,4%

Bearing charts - TTE 250

Level mm	Content Liter	Level %	Level mm	Content Liter	Level %	Level mm	Content Liter	Level %
10	5	2,1%	170	91	35,2%	330	186	68,3%
20	9	4,1%	180	97	37,3%	340	192	70,4%
30	14	6,2%	190	103	39,3%	350	197	72,5%
40	19	8,3%	200	109	41,4%	360	203	74,5%
50	24	10,4%	210	115	43,5%	370	209	76,6%
60	28	12,4%	220	121	45,5%	380	215	78,7%
70	33	14,5%	230	127	47,6%	390	221	80,7%
80	39	16,6%	240	133	49,7%	400	227	82,8%
90	44	18,6%	250	138	51,8%	410	232	84,9%
100	50	20,7%	260	144	53,8%	420	238	87,0%
110	56	22,8%	270	150	55,9%	430	243	89,0%
120	62	24,8%	280	156	58,0%	440	248	91,1%
130	68	26,9%	290	162	60,0%	450	252	93,2%
140	74	29,0%	300	168	62,1%	460	256	95,2%
150	79	31,1%	310	174	64,2%	470	261	97,3%
160	85	33,1%	320	180	66,3%	480	264	99,4%

Bearing charts - TTE 500

Level mm	Content Liter	Level %	Level mm	Content Liter	Level %	Level mm	Content Liter	Level %
10	9	2,1%	170	173	35,2%	330	347	68,3%
20	19	4,1%	180	184	37,3%	340	357	70,4%
30	28	6,2%	190	195	39,3%	350	368	72,5%
40	38	8,3%	200	206	41,4%	360	379	74,5%
50	47	10,4%	210	217	43,5%	370	390	76,6%
60	56	12,4%	220	227	45,5%	380	401	78,7%
70	66	14,5%	230	238	47,6%	390	411	80,7%
80	76	16,6%	240	249	49,7%	400	422	82,8%
90	87	18,6%	250	260	51,8%	410	433	84,9%
100	97	20,7%	260	271	53,8%	420	443	87,0%
110	108	22,8%	270	282	55,9%	430	453	89,0%
120	119	24,8%	280	292	58,0%	440	462	91,1%
130	130	26,9%	290	303	60,0%	450	471	93,2%
140	141	29,0%	300	314	62,1%	460	480	95,2%
150	152	31,1%	310	325	64,2%	470	489	97,3%
160	162	33,1%	320	336	66,3%	480	497	99,4%

2.4.3.2 Bearing Charts for TTE 750, TTE 950, TTE 1500 and TTE 1950

Bearing charts - TTE 750

Level mm	Content Liter	Level %	Level mm	Content Liter	Level %	Level mm	Content Liter	Level %
10	9	1,4%	260	271	35,5%	510	541	69,6%
20	19	2,7%	270	282	36,8%	520	552	70,9%
30	28	4,1%	280	292	38,2%	530	563	72,3%
40	38	5,5%	290	303	39,6%	540	574	73,7%
50	47	6,8%	300	314	40,9%	550	585	75,0%
60	56	8,2%	310	325	42,3%	560	596	76,4%
70	66	9,6%	320	336	43,7%	570	606	77,8%
80	76	10,9%	330	347	45,0%	580	617	79,1%
90	87	12,3%	340	357	46,4%	590	628	80,5%
100	97	13,6%	350	368	47,7%	600	639	81,9%
110	108	15,0%	360	379	49,1%	610	650	83,2%
120	119	16,4%	370	390	50,5%	620	661	84,6%
130	130	17,7%	380	401	51,8%	630	671	85,9%
140	141	19,1%	390	411	53,2%	640	682	87,3%
150	152	20,5%	400	422	54,6%	650	693	88,7%
160	162	21,8%	410	433	55,9%	660	703	90,0%
170	173	23,2%	420	444	57,3%	670	714	91,4%
180	184	24,6%	430	455	58,7%	680	723	92,8%
190	195	25,9%	440	466	60,0%	690	733	94,1%
200	206	27,3%	450	476	61,4%	700	742	95,5%
210	217	28,6%	460	487	62,8%	710	751	96,9%
220	227	30,0%	470	498	64,1%	720	760	98,2%
230	238	31,4%	480	509	65,5%	730	768	99,6%
240	249	32,7%	490	520	66,8%			
250	260	34,1%	500	531	68,2%			

Bearing charts - TTE 990

Level mm	Content Liter	Level %	Level mm	Content Liter	Level %	Level mm	Content Liter	Level %
10	13	1,4%	260	361	35,5%	510	722	69,6%
20	25	2,7%	270	375	36,8%	520	736	70,9%
30	38	4,1%	280	390	38,2%	530	751	72,3%
40	50	5,5%	290	404	39,6%	540	765	73,7%
50	63	6,8%	300	419	40,9%	550	780	75,0%
60	75	8,2%	310	433	42,3%	560	794	76,4%
70	88	9,6%	320	448	43,7%	570	809	77,8%
80	102	10,9%	330	462	45,0%	580	823	79,1%
90	116	12,3%	340	476	46,4%	590	837	80,5%
100	130	13,6%	350	491	47,7%	600	852	81,9%
110	144	15,0%	360	505	49,1%	610	866	83,2%
120	159	16,4%	370	520	50,5%	620	881	84,6%
130	173	17,7%	380	534	51,8%	630	895	85,9%
140	188	19,1%	390	549	53,2%	640	910	87,3%
150	202	20,5%	400	563	54,6%	650	924	88,7%
160	217	21,8%	410	578	55,9%	660	938	90,0%
170	231	23,2%	420	592	57,3%	670	951	91,4%
180	245	24,6%	430	606	58,7%	680	964	92,8%
190	260	25,9%	440	621	60,0%	690	977	94,1%
200	274	27,3%	450	635	61,4%	700	989	95,5%
210	289	28,6%	460	650	62,8%	710	1.001	96,9%
220	303	30,0%	470	664	64,1%	720	1.013	98,2%
230	318	31,4%	480	679	65,5%	730	1.024	99,6%
240	332	32,7%	490	693	66,8%			
250	347	34,1%	500	708	68,2%			

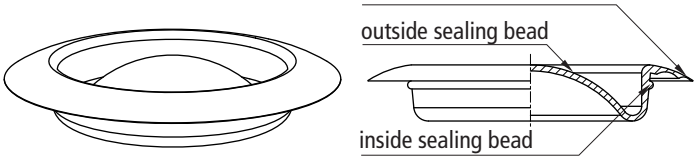
Bearing charts - TTE 1500

Level mm	Content Liter	Level %	Level mm	Content Liter	Level %	Level mm	Content Liter	Level %
10	18	1,0%	340	646	34,6%	670	1.288	68,2%
20	35	2,0%	350	666	35,6%	680	1.307	69,2%
30	53	3,1%	360	685	36,6%	690	1.327	70,2%
40	70	4,1%	370	705	37,6%	700	1.346	71,2%
50	88	5,1%	380	724	38,7%	710	1.366	72,2%
60	105	6,1%	390	744	39,7%	720	1.385	73,2%
70	123	7,1%	400	763	40,7%	730	1.405	74,3%
80	142	8,1%	410	783	41,7%	740	1.424	75,3%
90	161	9,2%	420	802	42,7%	750	1.444	76,3%
100	180	10,2%	430	821	43,7%	760	1.463	77,3%
110	199	11,2%	440	841	44,8%	770	1.482	78,3%
120	219	12,2%	450	860	45,8%	780	1.502	79,3%
130	238	13,2%	460	880	46,8%	790	1.521	80,4%
140	258	14,2%	470	899	47,8%	800	1.541	81,4%
150	277	15,3%	480	919	48,8%	810	1.560	82,4%
160	297	16,3%	490	938	49,8%	820	1.580	83,4%
170	316	17,3%	500	958	50,9%	830	1.599	84,4%
180	335	18,3%	510	977	51,9%	840	1.618	85,5%
190	355	19,3%	520	996	52,9%	850	1.638	86,5%
200	374	20,3%	530	1.016	53,9%	860	1.657	87,5%
210	394	21,4%	540	1.035	54,9%	870	1.677	88,5%
220	413	22,4%	550	1.055	56,0%	880	1.696	89,5%
230	433	23,4%	560	1.074	57,0%	890	1.716	90,5%
240	452	24,4%	570	1.094	58,0%	900	1.735	91,6%
250	472	25,4%	580	1.113	59,0%	910	1.754	92,6%
260	491	26,5%	590	1.132	60,0%	920	1.772	93,6%
270	510	27,5%	600	1.152	61,0%	930	1.790	94,6%
280	530	28,5%	610	1.171	62,1%	940	1.808	95,6%
290	549	29,5%	620	1.191	63,1%	950	1.825	96,6%
300	569	30,5%	630	1.210	64,1%	960	1.842	97,7%
310	588	31,5%	640	1.230	65,1%	970	1.859	98,7%
320	608	32,6%	650	1.249	66,1%	980	1.875	99,7%
330	627	33,6%	660	1.269	67,1%			

Bearing charts - TTE 1950

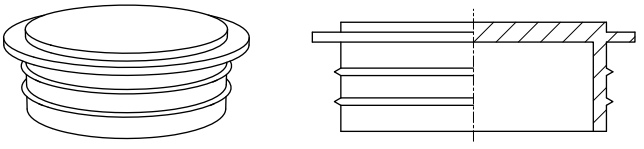
Level mm	Content Liter	Level %	Level mm	Content Liter	Level %	Level mm	Content Liter	Level %
10	23	1,0%	340	816	34,6%	670	1.623	68,2%
20	45	2,0%	350	841	35,6%	680	1.647	69,2%
30	68	3,1%	360	865	36,6%	690	1.672	70,2%
40	90	4,1%	370	890	37,6%	700	1.696	71,2%
50	113	5,1%	380	914	38,7%	710	1.721	72,2%
60	135	6,1%	390	939	39,7%	720	1.745	73,2%
70	158	7,1%	400	963	40,7%	730	1.770	74,3%
80	182	8,1%	410	988	41,7%	740	1.794	75,3%
90	206	9,2%	420	1.012	42,7%	750	1.819	76,3%
100	230	10,2%	430	1.036	43,7%	760	1.843	77,3%
110	254	11,2%	440	1.061	44,8%	770	1.867	78,3%
120	279	12,2%	450	1.085	45,8%	780	1.892	79,3%
130	303	13,2%	460	1.110	46,8%	790	1.916	80,4%
140	328	14,2%	470	1.134	47,8%	800	1.941	81,4%
150	352	15,3%	480	1.159	48,8%	810	1.965	82,4%
160	377	16,3%	490	1.183	49,8%	820	1.990	83,4%
170	401	17,3%	500	1.208	50,9%	830	2.014	84,4%
180	425	18,3%	510	1.232	51,9%	840	2.038	85,5%
190	450	19,3%	520	1.256	52,9%	850	2.063	86,5%
200	474	20,3%	530	1.281	53,9%	860	2.087	87,5%
210	499	21,4%	540	1.305	54,9%	870	2.112	88,5%
220	523	22,4%	550	1.330	56,0%	880	2.136	89,5%
230	548	23,4%	560	1.354	57,0%	890	2.161	90,5%
240	572	24,4%	570	1.379	58,0%	900	2.185	91,6%
250	597	25,4%	580	1.403	59,0%	910	2.209	92,6%
260	621	26,5%	590	1.427	60,0%	920	2.232	93,6%
270	645	27,5%	600	1.452	61,0%	930	2.255	94,6%
280	670	28,5%	610	1.476	62,1%	940	2.278	95,6%
290	694	29,5%	620	1.501	63,1%	950	2.300	96,6%
300	719	30,5%	630	1.525	64,1%	960	2.322	97,7%
310	743	31,5%	640	1.550	65,1%	970	2.344	98,7%
320	768	32,6%	650	1.574	66,1%	980	2.365	99,7%
330	792	33,6%	660	1.599	67,1%			

2.4.4 The Rupture Disk (installed) (AM-595)



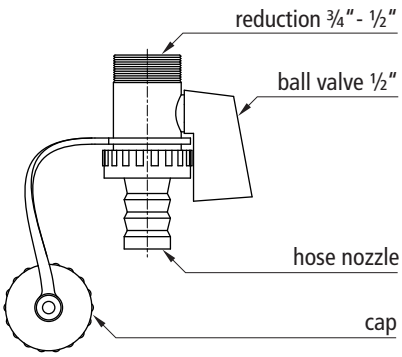
The pressure relief device is installed in the centre of the manhole on the tank roof. In the event of a sudden excess pressure, it opens to avoid that the tank bursts. The opening for the pressure relief device serves at the same time as a hand hole and inspection opening. The burst disk is made of oil-resistant material (NBR).

2.4.5 The Transport Plug (installed) (AM-948)



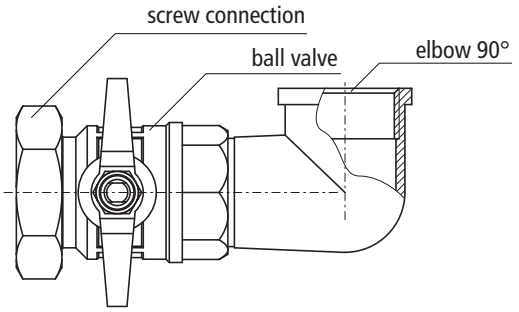
The plastic transport plugs are inserted in all sleeves of the tank vessel. They provide protection from corrosion during transport. All transport plugs should be removed before the fittings are installed or the TTE or fittings of the TTE are put into operation. Sleeves not used should be closed by dummy plug (see item 2.5.2).

2.4.6 Residual Drain (AM-950)



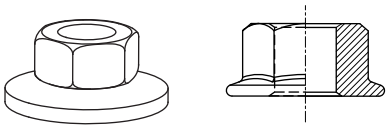
The emptying ½" located in the bottom of the tank, must be attached to the ball valve for drain with cap. This is to be installed on site. For this purpose the enclosed Krampitz Sealfix should be used. Check that the cap is securely screwed to the end of the assembly.

2.4.7 Flow Ball Valve (AM-951)



The enclosed, also in the bottom of the tank mounted machine supply ¾" is be equipped by the manufacturer with a ball valve and a elbow 90° that is rotated by 360 ° over a pipe fitting. In accordance with local conditions a easy installation is possible. Use Krampitz SEALFIX for the installation.

2.4.8 The Krampitz Special Nut with Captive Washer



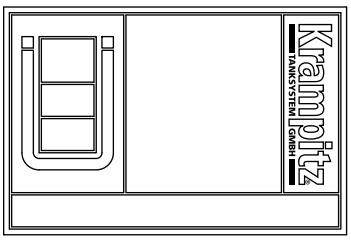
For quick and safe installation, the Krampitz Tanksystems come with special bolts. Unlike conventional fasteners is in the Krampitz special bolt washer connected with the captive nut. So quickly and a permanent connection can be established.

2.4.9 Corrosion Protection for Indoor Installation

Every TTE day tank is provided with standard corrosion protection of 2-component textured paint. The standard finish of Krampitz Tanksystem GmbH for this series is RAL 7032 (pebble grey). Other RAL finishes are possible on request and against extra price.
The inside of the tank is not treated and provided with a thin coat of oil as corrosion protection.

2.4.10 The Nameplate

Every TTE day tank is provided with a nameplate according to general inspectorate certificate No. Z-38.11-86. Placed on the right side of the nameplate is the logo of the manufacturer Krampitz Tanksystem GmbH. All relevant data of the tank (manufacturer's number, year of production, test pressure, tank capacity, material, etc.) is placed in the center of the nameplate. The label confirming compliance with the EC directives for vessels is attached on the left of the nameplate. The name of the manufacturer, the number of the general inspectorate approval and the organization by which the manufacturer is inspected are also put there. The nameplate is attached on the long side of the tank. The tester's code according to DIN 6600 is added to the nameplate after the successful test of the tank.



2.4.11 Krampitz Sealfix M

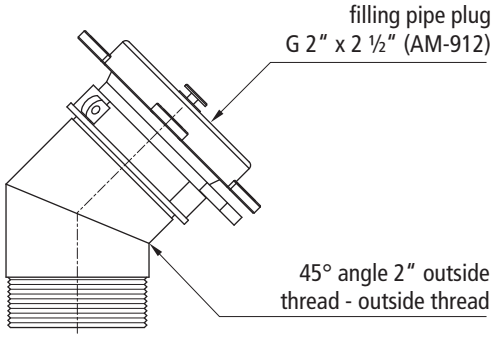
Krampitz Sealfix M is a thread sealant for oil-proof threaded connections. Sealfix M is applied to the cleaned thread area. The threaded connection is closed. After 15 to 30 minutes, Sealfix M has cured to a finger-tight degree.

NOTE The cleaned thread area must be totally free from grease and oil.

Example:
10 ml bottle

2.5 Connection kit

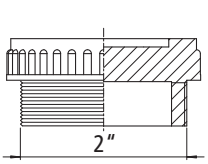
2.5.1 The Filler Neck with Filling pipe plug (AM-912)



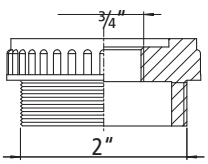
Every TTE must be equipped with a filling connection. (see too TRbF 20). The 2´´ x 2 ½´´ tank lorry connection is installed using a 2´´/45° angle in a 2´´ sleeve on the tank roof. In the event that the connection is displaced from the system on-site, the connection can also be installed outside on a wall.

2.5.2 The Adapter Set

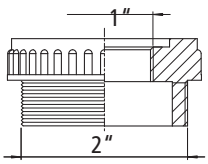
The adaptor set ensures the connection of socket fittings. The adaptors are not suitable for connecting pipes.
The adaptor set consists of:



AM-099-81
4x blind plug
outside thread 2"



AM-960-22P
2x reduction outside thread 2" x inside thread ¾"



AM-960-21P
2x reduction outside thread 2" x inside thread 1"

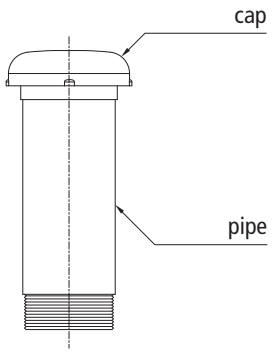
The 2´´ sealing plug and reduction are made of High Density Polyethylene (PE-HD). A sealing ring is used to seal the plug. Simply screw the plug tightly into the appropriate 2´´sleeve on the tank roof by hand. The knurled outside edge of the plug makes it very easy to grasp and turn.

2.5.3 The System Return

The system return can be easily installed using one of the 2˝ sleeves on the roof via a 2˝ x ¾˝ connection adapter.

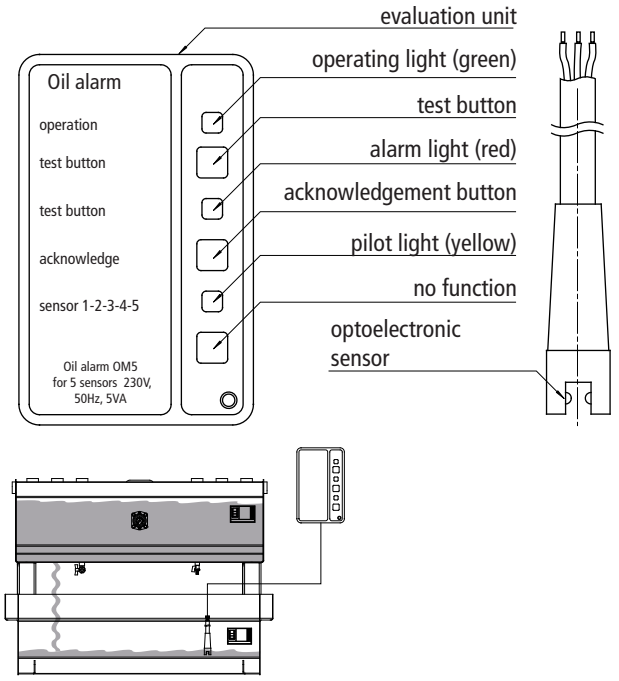
2.5.4 The Vent Connection with Cap (AM-911)

The 2˝ vent pipe is installed on the tank roof using a 2˝ connecting sleeve. If the tank is filled through the tank lorry connection by a road tank vehicle, the vent pipe must be as high above the tank roof as the filling connection used by road vehicles.
For tanks placed below the ground level (for example in the cellar), the vent connection must be installed at least 500 mm above the connection for the filling by road tank vehicles and at least 500 mm above the ground level. The vent connection must not end in closed rooms.
Exception: individual surface tanks for diesel and heating oil smaller than 1,000 litres.



2.6 TTE Components - Special Equipment

2.6.1 The Oil Warning Sensor (AE-303) with Detector and Evaluation Unit



2.6.1.1 Function of Oil Alarm Unit

The oil alarm unit is an approved leakage detection warning system. Up to 5 sensors may be attached to one evaluation unit. The unit is used to quickly register any leakages of water or hazardous liquids (in accordance with VawS). If a sensor is immersed in liquid, the signal component registers the changed signal from the sensor, produces an optical and acoustic alarm and, in addition, activates the relay for the output signal.

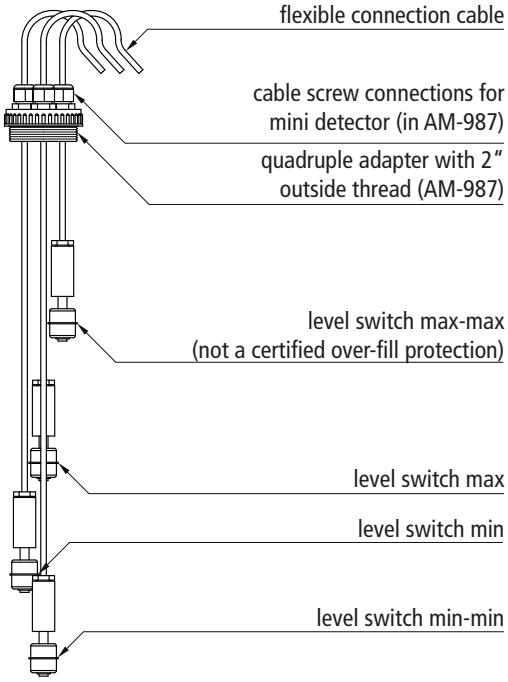
The oil alarm unit's sensor registers the different behaviour of air and liquids. It is installed at the lowest point of the monitoring room. The integrated signal component constantly monitors the sensor's electrical output signals. The green light is on when it is in operation. If the sensor is in air, its signal component registers normal operating conditions: the green operating light is on, the red alarm light is off, and the relay is closed. If the sensor is immersed in oil, a leak (alarm) is registered: the red operation light comes on, the acoustic alarm is sounded and the relay is opened. In the event of alarm, the acoustic alarm signal may be switched off by pressing the "acknowledgement" button. Pressing this button a second time will reactivate it.
By the use of several sensors on one evaluation unit, the affected sensors may be closed by means of the number of the yellow monitoring light's flashing pulses. The successive flashing sequence comprises a period of approx. three seconds.
In the case of a power failure, the alarm will not be triggered. When power is restored the device is immediately operable. Any leakage occurring in the meantime will be registered.
The green operating light will come on as soon as power is supplied to the oil alarm unit. The test button enables a functional monitoring by simulating the alarm event.

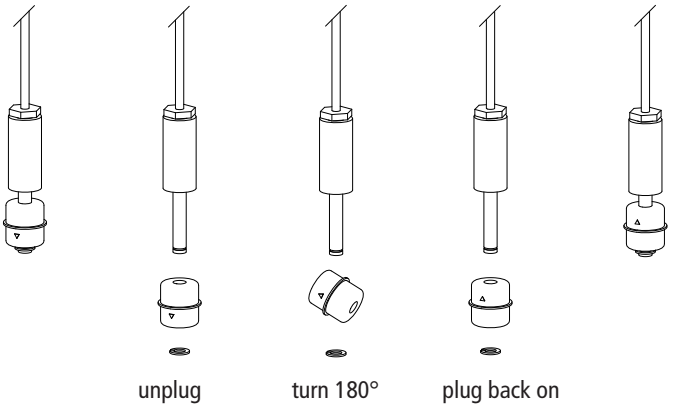
2.6.1.2 Oil Alarm Unit Assembly

The oil alarm unit consists of a signal component and up to five sensors. The signal component and sensors are connected to each other by a three-wire cable up to 10 metres in length.
The unit's sensor consists of an infra-red transmitter and infra-red receiver, set at a fixed distance from each other. Together, they make up a photoelectric barrier. If there is air between the transmitter and receiver, most of the transmitted signals will reach the receiver - the optocoupler principle.
Contained in a shock-resistant plastic housing, the signal component consists of the display and operating elements as well as all the electronic components for evaluating the sensor's signals and converting them into a digital output signal. The output signal is then available as a potential-free relay contact (change-over).

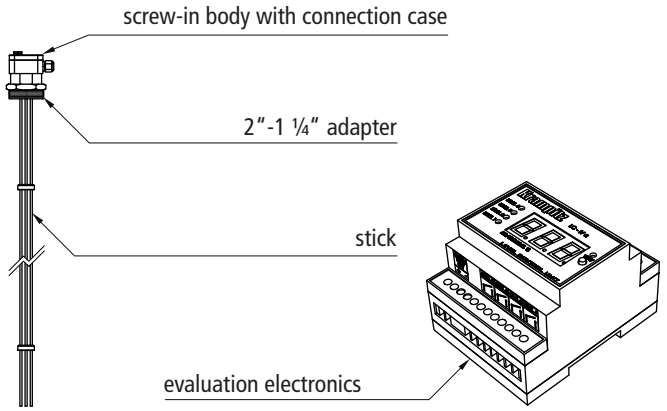
2.6.2 The Level Sensor

2.6.2.1 The Filling Level Switch (Mini Detector) (AE-100-E)





2.6.2.2 The Electronic Level Indicator (AE-115-VI)



For a comfortable detection of the filling level, the TTE can be equipped with an electronic level indicator.
The electronic level indicator Level Control V is a complete measuring system for detecting filling levels of containers. The system allows to adjust the tank height and to set up to four limiting values. The relay contacts are galvanically isolated from the system. The evaluation unit of the system shows the filling level in percent.
The electronic level indicator is certified and calibrated before delivery.

Level sensors detect the filling level of a fluid in the tank. Two systems can be distinguished:
a.) a switching system with level switches and
b.) an electronic measuring system with sensors.
Level switches allow for using signals for automatic control, adjustment or signalling. An electronic measuring system converts the signal from the sensor into the respective switch signal and filling level using the pertaining evaluation electronics. If a level sensor of an electronic over-fill protection is used, the evaluation electronics convert the sensor signal into the respective switch signal.

technical data		
switching voltage	max. 200 V DC / max. 120 V AC	
switching capacity	max. 10 W	
contact resistance	max. 0.5 mOhm	
switching current	max. 0.5 A	
cable size	2 x 0.5 mm² x 4,000 mm	
material	floater, weight, shaft	stainless steel
	cable	PVC

ATTENTION Observe the technical data of the switch.

The electronic level switch (mini detector) serves as control and indication of accurately defined filling levels of the tank. When using a 4-cable screw connection, up to four level switches can be installed in a tank. A certified level switch is not required because it is only used as an operating contact within tank systems, for example for the pump controls „Pump On" (minimum contact) or „Pump Off" (maximum contact). For the alarm switch point „Overfilled" (max-max) only certified over-fill protections must be used.
The level switch can also be used to detect leaks.
The cable screw connections of the quadruple adapter allow for adjusting the desired level of the level switch and fastening it on this level. By turning the floater by 180° on the switch shaft, the level switch can be easily converted from a normally-closed contact into a normally-open contact.

The level switch is made of stainless steel and is equipped with a flexible, oil-proof cable. The permissible temperature range for the cable is between -5°C and +50°C. The 5-meter-long connection cable is directly connected to the system control.

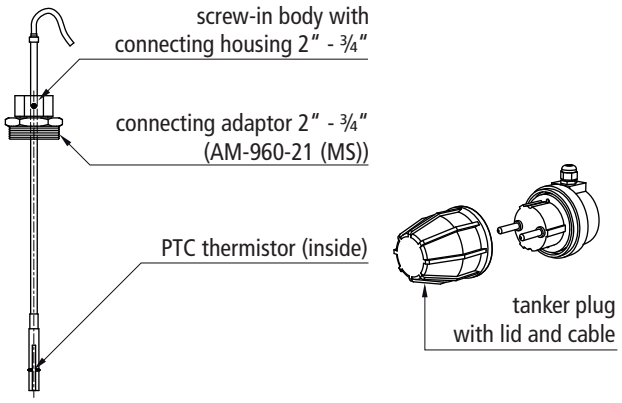
2.6.3 The Overfill Protection

Every tank for the storage of diesel fuel or heating oil, which is filled via a tank lorry connection, must be equipped with an overfill protection which interrupts the filling process or triggers an alarm sound before reaching the permissible filling level.
This does not apply to surface tanks with a capacity below 1,000 litres which are manually filled via nozzle without stationary connection.
Tanks with a capacity of more than 1,000 litres for the storage of diesel fuel or heating oil which are filled by road tank vehicles or through demountable tanks must be equipped with a limiting value transmitter, which serves as an overfill protection. (see TRbF 20, para 9.3)
Tanks for the storage of other liquids hazardous to water and flammable substances, such as mineral oil, which are filled automatically, must be equipped with a certified overfill protection.
The over-fill protection must not be used as an operational switch point for controlling the refill device.

NOTE The used overfill protection must be certified for the respective storage tank.

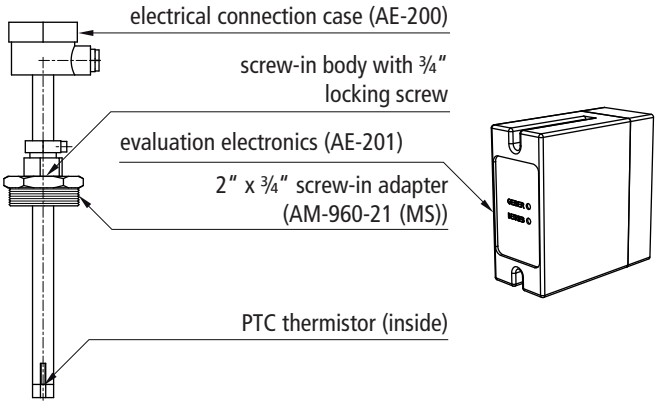
NOTE Tanks must not be filled exceeding the permissible filling level. The permissible filling level depends on the tank type (cubic expansion coefficient, see TRbF 20, para 9.3) and is 95% of the tank height in case of the TTE.

2.6.3.1 The Limiting-Value Transmitter with PTC Thermistor - Only for Diesel Fuel and Heating Oil (AE-250)



In combination with the overfill protection (evaluation electronics) on road tank vehicles, the limiting-value transmitter is a device preventing the overfilling of stationary tanks. Stationary tanks for the storage of diesel fuel or heating oil which are filled by road tank vehicles must be equipped with a limiting-value transmitter.
Exception: tanks with a capacity less than 1,000 litres (see also installation instructions for limiting-value transmitter).

2.6.3.2 The Overfill Protection (AE-200) with Evaluation Electronics (AE-201)



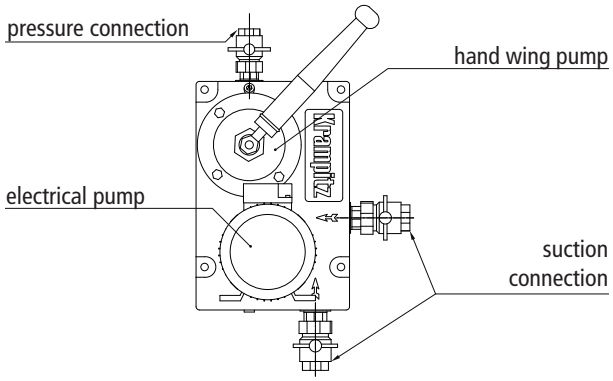
The PTC thermistor-based level sensor of the certified overfill protection is installed via a 2˝ x ¾ ˝ connection adapter and a 2˝ connecting sleeve in the tank roof (see section about connection adapter).
A certified over-fill protection must always be installed if the tank is filled through an electric pump and stationary connections (also see installation instructions for overfill protection). The overfill protection must be adjusted to the maximum allowed filling height of the tank.

2.6.3.3 Overview: Switch Points and Control Commands

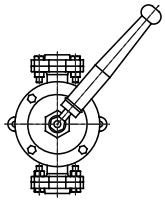
filling level symbol	designation	filling level in percent	level sensor type	control command
++	max-max	95	limiting-value transmitter / overfill protection in case of export application: mini detector	overfill alarm - pump off
+	max	70	mini detector	operating contact: pump off
−	min	40	mini detector	operating contact: pump on and signal indicating the repeat order of fuel
− −	min-min	10	mini detector	low-level alarm - system off

2.6.4 The Pump Combination

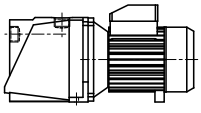
The pump combination uses the TTE day tank to supply remote daily tanks. The pump combination contains an electrical pump and a hand wing pump in one case. In the event of a failure or defect of the electrical pump, the hand pump ensures that the system can be operated without interruption. It also serves the ventilation of the suction pipe (for further details see the operating instructions for the pump combination).



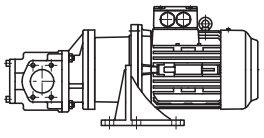
Further Pumps from the Product Range of Krampitz Tanksystem GmbH



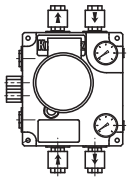
hand wing pump
from 20 litres/min
to 100 litres/min
Example: 20 litres/min



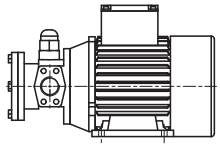
electrical centrifugal pump
from 45 litres/min
to 1,000 litres/min
Example: 80 litres/min



gear pump
from 6 litres/min
to 200 litres/min
Example: 200 litres/min

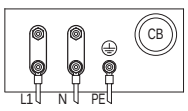


block pump unit
from 6 litres/min
to 26 litres/min
Example: 26 litres/min

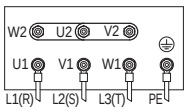


gerotor pump
from 6 litres/min
to 26 litres/min
Example: 26 litres/min

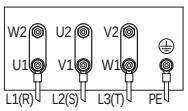
Connection Schemes for electropumps



Connection scheme 230 V/AC
Alternating current (single-phase)
CB operating capacitor
(internally connected to motor,
no internal bridge is required!)

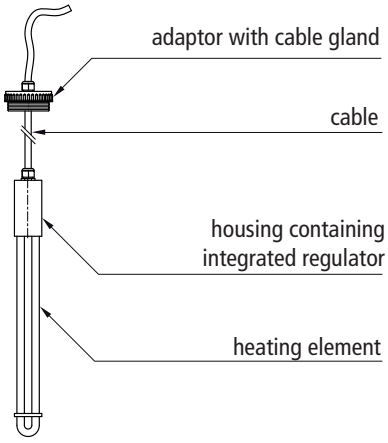


Connection scheme
380-420 V
Rotary current (three-phase) Star connection



Connection scheme
220-240 V
Rotary current (three-phase) Delta connection

2.6.5 Tank Heater (AE-800)



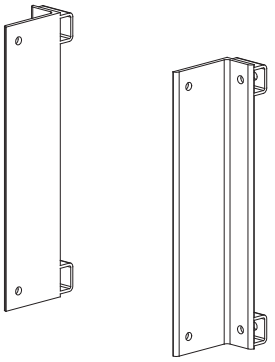
Tank heater (AE-800) up to 1,500 W / up to 8,000 litres

The use of a tank heating with integrated temperature control between 8°C to 12°C and temperature limiter prevents reliably the paraffin precipitation of the light heating oil and diesel when temperatures sink.
Thus, the pump and nozzle viscosity of the oil and diesel in the suction area is retained.

NOTE Not allowed/approved for media of hazard classes F and F+.

power	pank volume	voltage
220 W	to 2,000 Liters	230 V, 50 Hz

2.6.6 The Wall Brackets (WK)



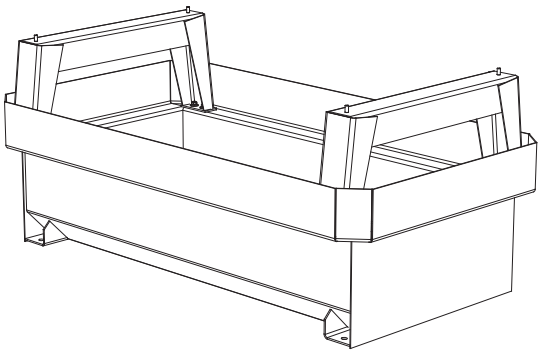
The wall brackets will be installed at the two boreholes in the front wall area. The tank with the wall brackets will then be positioned on the wall to which it is to be fixed and installed with the relevant dowels. In the case of combination with the collecting pan is recommended, to fasten the collecting pan with day tank standing on the ground and then bring the whole group by means of lifting truck or pallet truck in the appropriate final position.

NOTE Due to the static requirements concerning the wall of the building, the use of wall brackets will only make sense for tanks up to the TTE 990 series.

tank type	TTE 250	TTE 500	TTE 750	TTE 990
wall brackets type	WK 2		WK 3	
weight/pair	12 kg		18 kg	

2.6.7 Collecting Pan (TW)

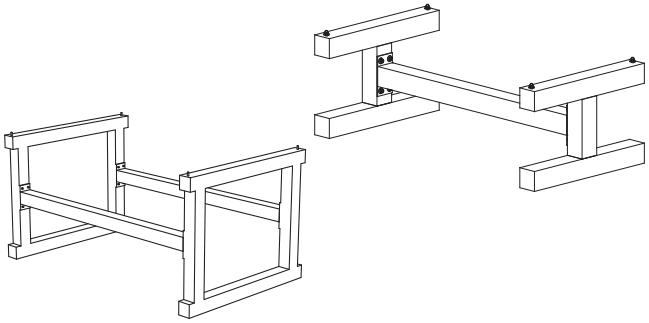
The collecting pan retains substances that may leak from the tank or leaky connecting nozzles and endanger the water. If there is no collecting room for the daily storage tank at the customer's place, a single-walled cubic collecting pan made of steel must be installed. It can be delivered in all TTE standard sizes. The collecting pan is also built according to the national type approval Z-38.11-86. Two supporting consoles for the daily storage tank, equipped with one M10x30 welding bolt each at the corners, are integrated into the collecting pan. The daily storage tank will be attached to the collecting pan with these bolts and four M10 nuts including non-detachable washers. When using the wall bracket at the daily storage tank, the collecting pan is suspended directly underneath the daily storage tank. When using the feet or the vertical column, the collecting pan sits on the feet or on the column, with the daily storage tank resting on the collecting pan.



tank type	length	total length	width	total width	height	total height	weight
art. no.	mm	mm	mm	mm	mm	mm	kg
TW 50	510	670	500	660	300	500	45
TW 100	510	670	500	660	500	700	55
TW 250	1.260	1.420	500	660	500	700	85
TW 500	1.510	1.670	750	910	500	700	115
TW 750	1.510	1.670	750	910	750	950	145
TW 990	2.010	2.170	750	910	750	950	175
TW 1500	2.010	2.170	1.000	1.160	1.000	1.200	320
TW 1950	2.010	2.170	1.250	1.410	1.000	1.200	450

2.6.8 The Supporting Column (ST)

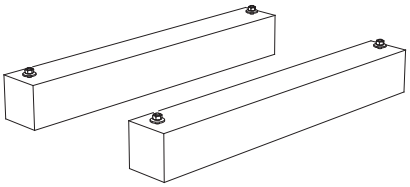
The vertical column is made up of two columns in double T-shape that are manufactured from square tube dimensioned 100 x 100 x 3 mm. These columns will be bolted with four nuts each to a cross-member at two head plates. The collecting pan or the daily storage tank will then be lifted onto this vertical column, placed on the relevant welding bolts and fixed with four M10 nuts and non-detachable washers. The openings of the square tubes will then be sealed with the lids that are included in the delivery.



tank type	TTE 250	TTE 500	TTE 750	TTE 990	TTE 1500	TTE 1950
height vertical column	vertical column type and weight					
500 mm	ST 2/5	ST 3/5	ST 3/5	ST 4/5	ST 5/5	ST 6/5
1000 mm	ST 2/10	ST 3/10	ST 3/10	ST 4/10	ST 5/10	ST 6/10
1500 mm	ST 2/15	ST 3/15	ST 3/15	ST 4/15	ST 5/15	ST 6/15

2.6.9 The Feet (F)

The feet consist of a pair of square steel tubes dimensioned 100 x 100 x 3 mm. They are equipped with M10 welding bolts and M10 nuts with non-detachable washers. The daily storage tank or the collecting pan can be put up on the ground in the most optimal way with their help.



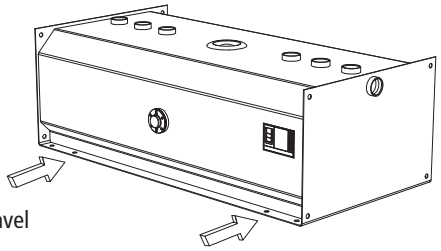
tank type	TTE 250	TTE 500	TTE 750	TTE 990	TTE 1500	TTE 1950
foot type	FS 1	FS 2			FS 3	FS 4
weight/pair	9 kg	14 kg			16 kg	18 kg

3. START-UP

3.1 Transport of the TTE

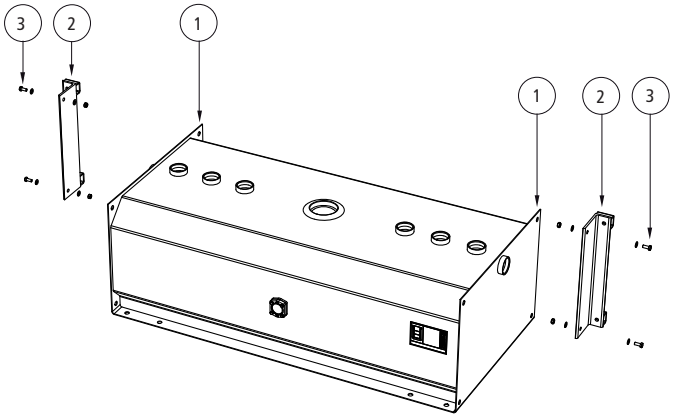
The TTE can be easily transported by fork lift or hand lift.

CAUTION During transport, the relevant, currently valid safety regulations must be observed and damages must be avoided. In the event that the colour coat is damaged, corrosion protection must be properly restored.



Under the direction of travel

3.2 Wall Mounting of the TTE



The permit system for mounting the tank wall at a building site must be obtained. The static strength of the wall (at least B15) must be proven before installation. The day tank can be mounted by using two anchor wall brackets with four corresponding types of fasteners. The wall bracket (2) will be at the rear holes of the front walls (1) mounted with the tank bolts M 10 (3).

After the day tank means including wall bracket with hoist on the wall is positioned. Now it's possible to drill holes in the wall, then can be the wall anchor (corresponding to manual) fixed. Now, the day tank with the wall brackets on the wall or be attached to the wall anchor.

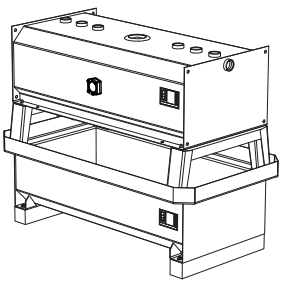
In the case of combination with the collecting pan is recommended, to fasten the collecting pan with day tank standing on the ground and then bring the whole group by means of lifting truck or rope pull in the appropriate final position. Mounting on the wall as previously described.

3.3 Setting up the TTE on Feet / Supporting

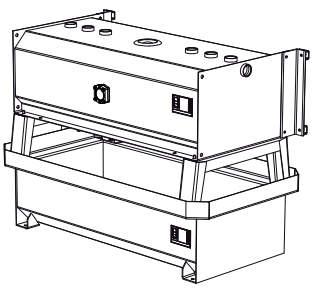
The TTE must only be placed on even and load-bearing floor space (minimum quality B 15 or equal). A stress analysis must be performed and presented. Generally, storage tanks up to a maximum storage volume of 5,000 litres can be operated in a machine room. The day tank can be positioned exactly over the injection pump of a motor with the stand column. For this will be the foots of the stand column connected wit the head plate of the sub-carrier (bolts M 10). In the case of combination with the collecting pan this is lifted onto the support column and screwed together (bolts M 10). After that, the day tank is lifted onto the tray supports the collecting pan and screwed together (bolts M 10). Now the whole construction will be positioned at the intended location and anchored.

CAUTION Rollover risk in cases of excessive movement by moving the construction.

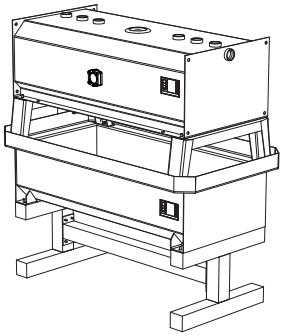
CAUTION The lifting of the tanks is to follow safety rules for appropriate and valid. There is danger of injury and damage to components.



TTE-500 daily storage tank, single wall with feet and TW-500 collecting pan, single wall



TTE-500 daily storage tank, single wall with wall brackets and TW-500 collecting pan, single wall



TTE-500 daily storage tank, single wall with vertical column and TW-500 collecting pan, single wall

3.4 First start-up

Before filling the TTE for the first time, check that::

1. the tank is properly fastened and placed
2. the pipe connections are leak-tight and properly connected (Cap of the residual drain)
3. the sensors are properly connected, such as the
    a. level sensor
    b. over-fill protection
    c. oil warning probe (oil detector)
    d. limiting-value transmitter
4. the blind plugs are tightly connected

3.5 Operation sequence

- Check the position of the ball valves. The ball valves at the system flow connection and residual drain must be closed. The residual drain is plugged or screwed tight by the residual cap.
- Apply voltage. The voltage puts the sensors into operation.
- Check during refueling system with its own pump position of the pump valves.

CAUTION The over-fill protection triggers an alarm during the first seconds because the PTC thermistor of the level sensor must heat up first.

- Filling by tank trucks:

1. When the filling level rises, the switching of the level switch points can be checked (if applicable, these are: MIN-MIN, MIN, MAX, MAX-MAX).
2. As soon as the limiting-value transmitter is wet, the filling is automatically interrupted. The filling via filling connection with a tank lorry is mandatory for storage tanks with a capacity of more than 1,000 litres. Smaller daily tanks can be filled with the petrol pump nozzle with a dead man's switch which automatically shuts off fuel delivery

- Fillings by system pump:

1. When the filling level rises, the switching of the level switch points can be checked (if applicable, these are: MIN-MIN, MIN, MAX, MAX-MAX).
2. As soon as the installed over-fill protection is wet, the pump must be automatically switched off

- Check pipe connections for leak-tightness
- Filling level per level indicator to check again
- If necessary, open the ball valves at the system flow connection
- The TTE is now ready to use

4. TTE-COMPLETE PACKAGES
Depending on the application possibility

The space conditions at the day tank and of its integration into the workflow require individual solutions that are tailored to meet specific requirements.
To save this plan work, installation time and money, the Krampitz Tanksystem GmbH offers different TTE module with special equipment.
The six designs are complete packages: These include donors, plugs, gaskets, fittings, pumps, etc. (except sump, wall consoles, support column, feet, anchors for wall mounting). The TTE has only built up, and completes the necessary, be connected on site to be compiled connecting lines.

Notes to the selection of complete packages:
- Applies only to the media, diesel and heating oil (light) -

A: A tank in the engine compartment with a volume of 1,000 liters may be filled manually directly from the tank car with a fuel nozzle during a refueling. Maximum flow rate 200 liters / minute (TRbF 20, para 9.3)

B: A level limiter for overfill protection is installed when the tank is filled directly from a tanker truck. (TRbF 20, para 9.3)

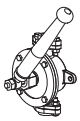
C: To prevent overfilling during filling of the TTE (on a filling line or a separate pump system from a barrel or tank) an approved overfill protection is to be installed (TRbF 20, para 9.3).

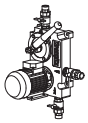
D: In the case of the installation of an overflow pipe is to be noted that the storage tank, which sucks from the filling pump, located under the TTE is not more than 6 feet away (TRbF 20, para 9.4). The overflow line must also be attributed to this tank.

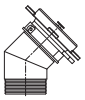
E: The installation of a solid tank truck filling line is not required if:
1st a slope of the filling of at least 1 percent of the tank is not technically feasible. (TRbF 20, para 9.3)
2nd the technical complexity for installing one filling line is too high. Alternative: Refuelling at short distances from barrel or refueling directly from tankers via filling hose. (TRbF 50, para 5.4)

F: If not otherwise required the venting of the TTE with a tank capacity up to 1000 liters can end in the engine room. (TRbF 20, para 9.1)

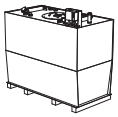
fuel delivery	additional storage tank	filling equipment	filling safety sensors	TTE equipment complete package	name of complete package
from barrels of 200-liters					**TTE module „Emden“** Installation location of the TTE is not accessible from the tank truck, filling line unprofitable firm, day tank is less than 500 liters
					TTE module „Elmshorn“ Installation location of the TTE is not accessible from the tank truck, solid filling line is unprofitable and technically not realizable


hand wing pump (PH-30-001)

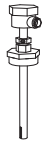

pump combination (Z-PK-2000/2001)


filler neck (AM-912)

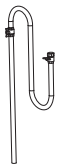

solid filling line


additional storage tank


limiting-value transmitter (AE-250)

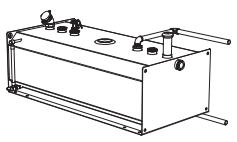
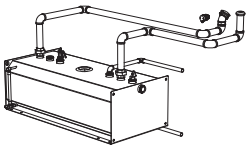
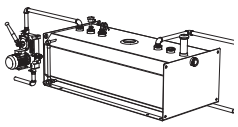

overfill protection (AE-200)

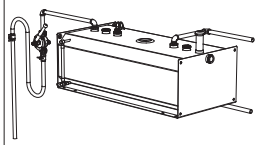
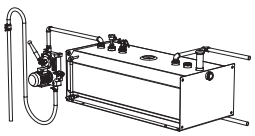
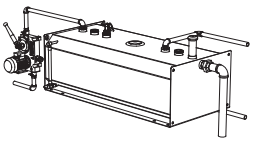

overflow


dip tube (AM-1200) with hose and ball valve

fuel delivery	additional storage tank	filling equipment	filling safety sensors	TTE equipment complete package	name of complete package
by tank truck	equipment of the storage tanks not considered here				**TTE module „Erfurt“** TTE located over the level of storage tanks, less than 6 meters away from the storage tank
					TTE module „Erlangen“ TTE located the level below of storage tanks, more than 6 meters away from the storage tank
					TTE module „Essen“ TTE is not directly accessible from the tank truck
					TTE module „Eisenach“ TTE not more than 10 meters away from the parking space of the tank truck

Comparison of variants of the equipment package

equipment / scope of delivery		TTE module „Eisenach“	TTE module „Essen“	TTE module „Erlangen“
				
variant of the equipment package	flow ball valve ¾" with elbow 90° (AM-951) *1 O	-	1	1
	residual drain 1/2" with KFE ball valve (AM-950) *1 O	-	1	1
	safety fitting (AM-595) *1	1	1	1
	volume display (AM-004.1) *1	1	1	1
	blind plug (AM-099-81) **2 O	4	4	4
	vent connection with cap (AM-911) **2 O	1	1	1
	reduction 2˝ - 1˝ / 2˝ - ¾˝ (AM-960-21P, AM-960-22P) **2	2/2	2/2	2/2
	Krampitz Sealfix M (10ml) *2	1	1	1
	filler neck with filling pipe plug (AM-912) **2 O	-	1	1
	filling level switch (mini detector) (AE-100-E) **2	3	2	3
	cable screw connections for mini detector (AM-987) **2	1	1	1
	overfill protection (AE-200) with evaluation electronics (AE-201) **2	1	-	-
	limiting-value transmitter (AE-250) **2	-	1	-
	hand wing pump (PH-30-001) **2	-	-	-
	dip tube (AM-1200) with hose and ball valve **2	-	-	-
	pump combination (Z-PK-2000/2001) **2	1	-	-

equipment / scope of delivery		TTE module „Elmshorn“	TTE module „Emden“	TTE module „Erfurt“
				
variant of the equipment package	flow ball valve ¾" with elbow 90° (AM-951) *1 O	1	1	1
	residual drain 1/2" with KFE ball valve (AM-950) *1 O	1	1	1
	safety fitting (AM-595) *1	1	1	1
	volume display (AM-004.1) *1	1	1	1
	blind plug (AM-099-81) **2 O	4	4	4
	vent connection with cap (AM-911) **2 O	1	1	1
	reduction 2˝ - 1˝ / 2˝ - ¾˝ (AM-960-21P, AM-960-22P) **2	2/2	2/2	2/2
	Krampitz Sealfix M (10ml) *2	1	1	1
	filler neck with filling pipe plug (AM-912) **2 O	-	-	-
	filling level switch (mini detector) (AE-100-E) **2	2	3	3
	cable screw connections for mini detector (AM-987) **2	1	1	1
	overfill protection (AE-200) with evaluation electronics (AE-201) **2	-	1	-
	limiting-value transmitter (AE-250) **2	-	-	-
	hand wing pump (PH-30-001) **2	1	-	-
	dip tube (AM-1200) with hose and ball valve **2	1	1	-
	pump combination (Z-PK-2000/2001) **2	-	1	1

* standard ** Complete Equipment Package [1] permanently mounted

[2] enclosed O Assembly an extra charge

5. DOCUMENTS

The TTE single wall daily storage tanks are delivered with the documents below:

- inspection sheet in German language (two copies)
- drawing (one copy)
- building authority permit Z-38.11-86 (one copy)
- operating instructions for the individual module components, such as level sensor, over-fill protection, pump combination

These documents are sent to the customer by mail. Only the delivery note is delivered together with the tank to avoid loos of the important documents at the construction site

The permit book contains an inspection table for the respective tank. This inspection table holds the tank dimensions, the tank type, the date of the first inspection as well as further inspection dates. The person conducting the further inspections can sign in the book to acknowledge the inspections.

6. WARRANTY

§1 Scope of warranty

(1) The warranty covers system defects throughout the warranty period which occur during proper operation and use of the system and circuitry and which don't result from external causes of any kind, mechanical damages or non-compliance of regulations regarding the use of the system or circuitry.
(2) In addition, the warranty doesn't cover damages resulting from improper maintenance and repair work.

§2 Warranty Period

The warranty period begins when the system is taken into operation on-site. Any warranty claims made within the warranty period are reviewed. This only applies to the tank system. The warranty period is 24 months.
For fittings and devices (mechanical, electromechanical, electrical and electronic), supplied by external manufacturers, the warranty period is 6 months.

§3 Handling

(1) In the event that defects occur during the warranty period, warranty claims must be made immediately, at the latest within two weeks, in writing.
(2) Only Krampitz Tanksystem GmbH is authorised to accept warranty claims.

§ 4 Warranty Exclusion

Warranty claims cannot be considered:

a. if the damage to – or destruction of – the installation, circuitry, or parts of such, has been caused by an act of nature or by the consequences of operation of the installation in a manner not intended, in particular by external mechanical or chemical factors;
b. if damage has occurred as a result of improper handling, particularly non-compliance with the operating instructions provided.
c. if the circuitry, or parts of such, have not been repaired or serviced by legitimate representatives, employees or agents of Krampitz Tanksystem GmbH.
d. if the circuitry, or parts of such, exhibit mechanical damage of any kind.

§5 Supplementary regulations

(1) In the event of a warranty claim, the foregoing provisions regulate the legal relationship with respect to us in a final and conclusive manner. Any further claims, in particular those concerning damage or loss, of whatever nature, arising from the installation, circuitry, parts of the circuitry or by operation of such, are excluded.
(2) The burden of proof for the proper installation and operation of the facility, circuitry or parts of such, in accordance with the operating instructions provided, rests with the purchaser.
(3) Place of performance, applicable law, venue of jurisdiction

Place of performance for the delivery is the destination, for payment the place of the customer. Supplementary to the purchasing conditions, German law is applicable. The applicability of the UN law on sale of goods, however, is excluded.

The sole venue of jurisdiction for all disputes arising directly or indirectly from the contractual relationship – provided that the contractor is a registered trader – is Lüneburg.

If the contractor is not a registered trader, then Lüneburg is the venue of jurisdiction for claims for summary proceedings for collection procedure (Mahnverfahren). Should any of the individual provisions of the contract be – or become – void, the validity of the remaining parts of these conditions shall not be affected.

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