



Installation & Operation Manual

KM50

Tank Car Gauging Device for Top of Tank Car Mounting



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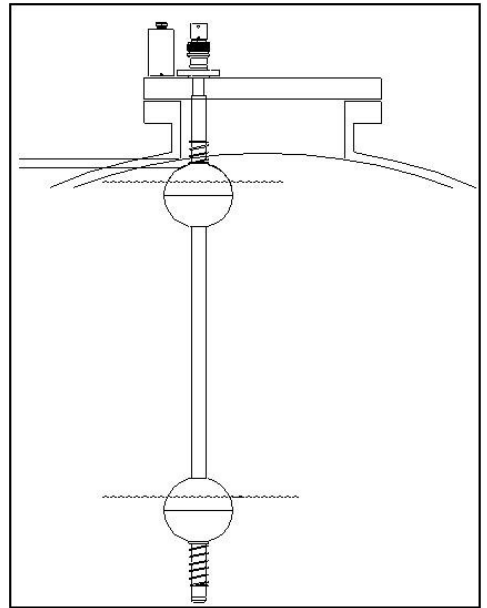
1.0 Operation

The KM50 is a magnetically-coupled, liquid level indicating device that provides an isolated means of determining the fluid level within a storage tank without exposing personnel to potentially harmful contact. It operates of the principle of magnetic coupling between opposing magnets that are separated by the walls of a sealed, non-magnetic tube. One magnet is sealed within a large diameter float that moves up and down the tube as the fluid level changes. A smaller magnet, with poles in the opposite direction, is attached to a calibrated gaging rod that fits inside the tube. When the magnets are brought into proximity with one another they are attracted with sufficient force to cause the gaging rod to remain linked to the float. As the float changes level, so does the gaging rod. Readout is obtained directly from a ruler on the gaging rod. There is no need to dip and clean the rod with each measurement.

2.0 Installation Instructions

Each KM50 consists of a 1-½" OD gauging tube with an upper float stop spring welded in place, a lower spring with a cup washer attached, a KM50 7-½" OD float (standard), a gauging rod bumper, a calibrated gauging rod marked with the service information, a head assembly (may be flanged, welded, or threaded) with an attached cap, an O-ring seal for the cap, and an adjustment collar assembly which consists of the collar, an O-ring, a level indicator disk, and a 8-32 x ¼" long pan head screw. The customer is expected to provide the lower support bracket at the proper level, a gasket for any flange, flange bolting, and any sealant for threaded connections.

The KM50 model number contains a field for the tube connection to the tank car. The gauging tube may be welded to a flange (WF), welded to the head which is welded to the car (WH), welded to a threaded head (WT), or most commonly welded to the man-way flange (WM). When the WM option is indicated, the customer is responsible for the weld at the man-way and the length of tubing above the upper float stop spring will be provided to meet the customer's specifications. Any gap used when inserting the tube for welding will affect the dimension to the float stop spring and should be accounted for if not originally specified at the time of order. The upper float stop spring is set to prevent the float from hitting the sides of the tank or to stop the float when the fluid level reaches the upper most part of the tank ID (if the float is clear to enter the man-way nozzle). Adjustment of the upper spring location by the customer will alter the gauging span and may expose the float to damaging contact with the tank sides.



When the gauging tube is welded to the head assembly, the tube will be inserted through the opening in the tank car. If the opening exceeds 2-¼", the upper spring will be welded at the proper location at the factory. If the opening is between 1-9/16" and 2-¼", the upper spring must be attached at the proper location by the customer. The upper spring will have two cup washers of different ID's. The smaller ID washer is to be towards the top of the tank and welded to gauging tube at the specified distance from the tank opening.

The float is installed with the marked top of the float toward the top of the tank. The float should not be damaged or dented when installed or it will not be able to withstand external pressure. The float has an internal, south-pole up magnet 5/8" from the bottom of the float. The Teflon rings inside the float are held in by pressure, and will not come out unless forced along the axis when inserted on the tube. They can be snapped back into place if dislodged. Due to variations in metal manufacturing, each float would normally have different weights, but each KM50 float is weighted to 1145g with lead shot to provide a standard replacement for the customer. Rattling inside the float does not indicate magnet or float failure. Float failure is characterized by dented sides, internal fluid (increased weight), or loss of magnetism at the magnet location.

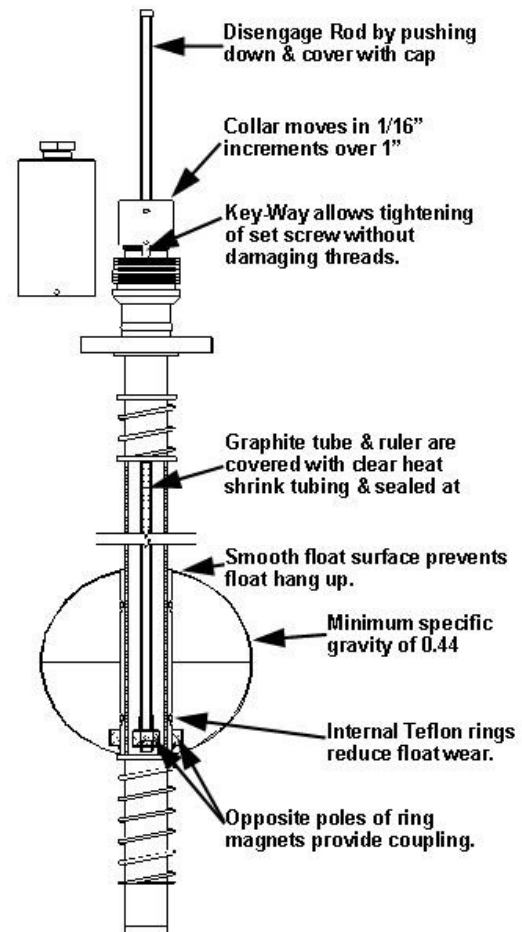
The head assembly will be threaded, welded or bolted in place at the top of the tank. The customer will provide any seal, sealant and appropriate torque to ensure a proper seal for up to 600 PSIG. With the adjustment collar removed from the head, insert a gauging rod bumper into the tube so that it can fall or be pushed to the bottom of the tube. Pour 3 oz of 50/50 mixture of anti-freeze and water into the tube before insertion of rod. The gauging rod is then inserted through the head and into the tube until it reaches the bumper at the tube bottom. The rod is then to be brought back to the point where the magnet couples with the float's magnet. Bring the float to the upper float stop spring without compressing it. The adjustment collar is then screwed onto the head until the level disk is even with the minimum outage reading on the gauging rod. The pan head screw is then to be set against the key-way in the threads so as not to damage the collar threads. It may be secured in place by tack welding the edge of the pan head to the collar. This tack weld should allow for future removal of the screw for readjustment at a later date and should not interfere with the head cap installation. Tacking is not necessary, since the screw cannot back out as long as the head cap is in place.

The lower spring is installed with the cup washer toward the float. The customer provided lower support bracket is then installed to hold the float and spring on the gauging tube. With the float against the upper float stop spring, the distance from the bottom of the float to the top of the lower float stop spring will equal the length of gauging. Length of gauging = maximum outage - minimum outage as given on the gauging range on the rod.

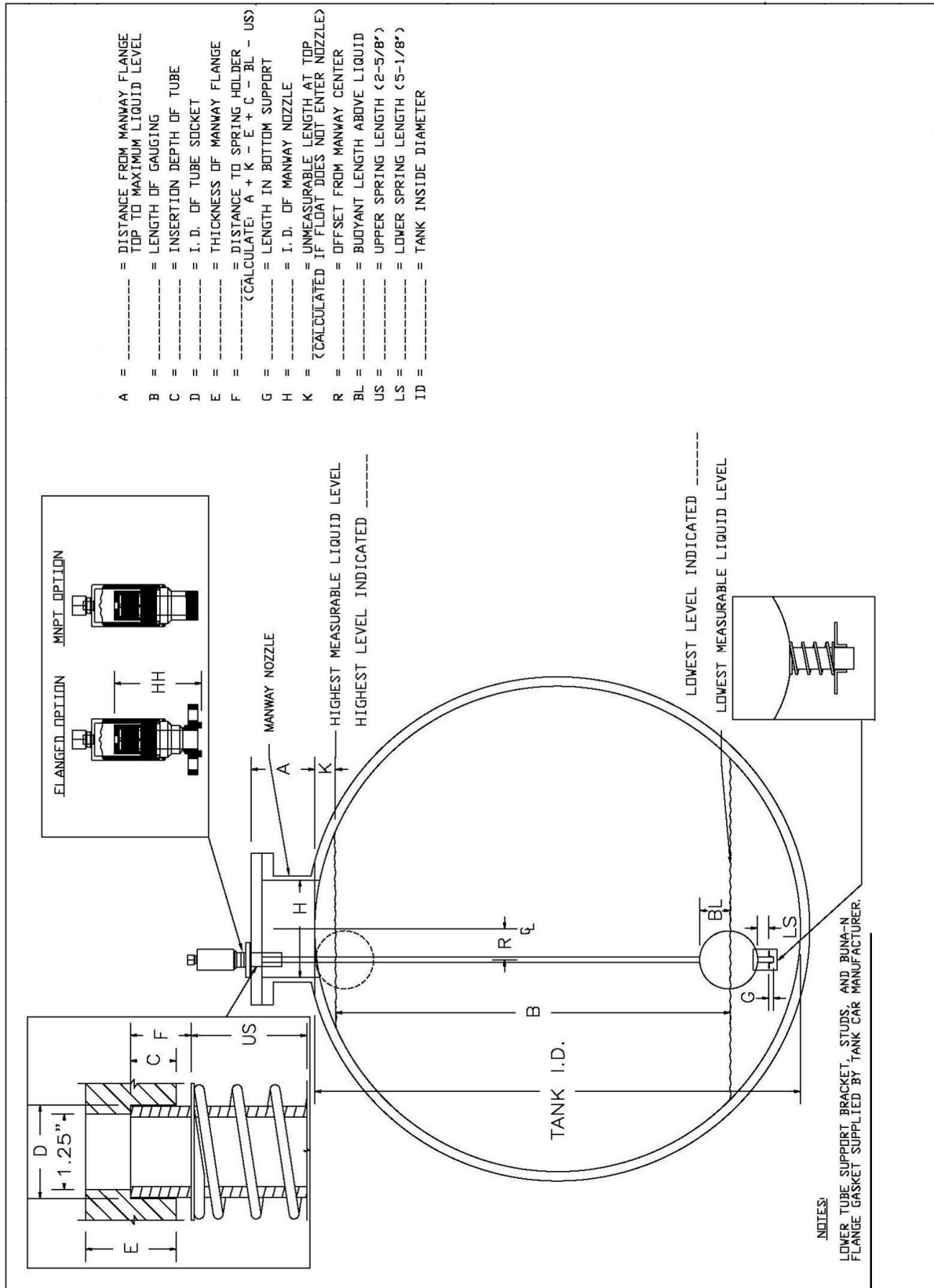
The adjustment collar O-ring holds the level indicating disk in the collar. It must be installed into the collar groove before installing the disk. The O-ring must be centered in the opening and the level disk must be centered in the O-ring to be snapped into place. With the level disk flat across the O-ring, apply uniform pressure on the surface to expand the O-ring equally in all directions until the disk snaps into place. If one side of the disk is inserted prematurely, the remaining O-ring will not allow the disk into the opening and you must re-align the components before attempting to re-insert.

The head cap is designed to be installed over the disengaged gauging rod. To disengage the rod, simply push the rod downward until the magnetic coupling is broken. The gauging rod will rest at the bottom of the gauging tube with sufficient clearance of the level indicating disk to allow for grasping the knob. The rod should have no more than 1-1/2" above the disk when decoupled; more exposed rod indicates an obstruction in the tube or too many bumpers installed. Install the head cap with adequate lubricant to prevent thread damage when tightening. The seal at the cap is accomplished by two methods. Tapered pipe threads provide one seal and the O-ring provides the other seal. The O-ring seal is designed to withstand up to 600 PSIG on its own provided it is fully engaged past the vent holes. The tapered threads are a secondary seal and thread life can be extended if the cap is not excessively torqued.

To use the gauging device, open the head cap and pull the gauging rod upward until the magnets are engaged. Verify the coupling with light up and down pressure on the rod. Release the rod and allow it to follow the float with the change in fluid level. Be sure to verify the gauging range as it may or may not indicate to the full level of the tank due to upper limit of float travel. If the level indicated does not change despite a known change in fluid level, the level is either outside of the range of the gauging device, or the float and/or gauging rod are stuck in place. Periodic application of a light up and down force on the gauging rod should provide a feel for the float bobbing up and down in the liquid. If this does not occur, the float may be damaged and should be inspected once the tank is off-loaded.



3.0 KM50 Dimensions



4.0 Warranty Statement

5 YEAR WARRANTY FOR:

KM26 Magnetic Liquid Level Gauges; MagWave Dual Chamber System; LS Series Mechanical Level Switches (LS500, LS550, LS600, LS700, LS800 & LS900) (does NOT include switching mechanisms, ie. MS30, MS40, MS41, PS35 & PS45); EC External Chambers, STW Stilling Wells and ST95 Seal Pots.

3 YEAR WARRANTY FOR:

KCAP300 & KCAP400 capacitance switches. BETA Pressure and Temperature Switches have a limited factory guarantee, excluding wetted parts & consumables.

2 YEAR WARRANTY FOR:

AT100, AT100S and AT200 series transmitters; RS80 and RS85 liquid vibrating fork switches; RLT100 and RLT200 reed switch level transmitters; TX, TS, TQ, IX and IM thermal dispersion switches; IR10 and PP10 External Relays; MT2000, MT5000, MT5100 and MT5200 radar level transmitters; RI100 Repeat Indicators; KP paddle switches; A02, A75 & A77 RF capacitance level switches and A38 RF capacitance level transmitters; Buoyancy Level Switches (MS50, MS10, MS8D & MS8F); Magnetic Level Switches (MS30, MS40, MS41, PS35 & PS45).

1 YEAR WARRANTY FOR:

KM50 gauging device; AT500 and AT600 series transmitters; LaserMeter and SureShot series laser transmitters; LPM200 digital indicator; DPM100 digital indicators; APM100 analog indicators; KVIEW series digital indicators and controllers; GRANUPOINT and SLUDGEPOINT vibrating fork switches, SOLITRAK Electro-Mechanical Continuous Measuring Devices, KSONIK ultrasonic level switches, transmitters & transducers, ChuteMaster Microwave Transmitter / Receiver and TiltMaster Switches.

SPECIAL WARRANTY CONSIDERATIONS:

K-TEK does not honor OEM warranties for items not manufactured by K-TEK (i.e. Palm Pilots). These claims should be handled directly with the OEM.

K-TEK will repair or replace, at K-TEK's election, defective items which are returned to K-TEK by the original purchaser within the period specified above from the **shipment date** of the item and which is found, upon examination by K-TEK, to its satisfaction, to contain defects in materials or workmanship which arose only under normal use and service and which were not the result of either alterations, misuse, abuse, improper or inadequate adjustments, applications or servicing of the product. K-TEK's warranty does not cover the repair or replacement of units that fail from the effects of excessive vibration unless the units are originally designed for vibration application. In addition, **K-TEK's warranty does not include on-site repair or services**. Field service rates can be supplied on request.

If a product is believed to be defective, the original purchaser shall notify K-TEK and request a Returned Material Authorization before returning the material to K-TEK, with transportation **prepaid** by the purchaser. (To expedite all returns/repairs from outside of the United States, consult K-TEK's customer service team (service@ktekcorp.com) to determine an optimal solution for shipping method and turnaround time.) The product, with repaired or replaced parts, shall be returned to the purchaser at any point in the world with transportation prepaid by K-TEK for best-way transportation only. K-TEK is not responsible for expedited shipping charges. If the product is shipped to K-TEK freight collect, then it will be returned to the customer freight collect.

If inspection by K-TEK does not disclose any defects in material or workmanship, K-TEK's normal charges for repair and shipment shall apply (minimum 250.00 USD).

The materials of construction for all K-TEK products are clearly specified and it is the responsibility of the purchaser to determine the compatibility of the materials for the application.

THE FOREGOING WARRANTY IS K-TEK'S SOLE WARRANTY AND ALL OTHER WARRANTIES EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR PURPOSE, ARE EXCLUDED AND NEGATED TO THE MAXIMUM EXTENT PERMITTED BY LAW. NO PERSON OR REPRESENTATIVE IS AUTHORIZED TO EXTEND ANY OTHER WARRANTY OR CREATE FOR K-TEK ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF K-TEK'S PRODUCTS. THE REMEDIES SET FORTH IN THIS WARRANTY ARE EXCLUSIVE OF ALL OTHER REMEDIES AGAINST K-TEK. K-TEK SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, OR SPECIAL DAMAGES OF ANY KIND. K-TEK'S SOLE OBLIGATION SHALL BE TO REPAIR OR REPLACE PARTS (FOUND TO BE DEFECTIVE IN MATERIALS OR WORKMANSHIP) WHICH ARE RETURNED BY THE PURCHASER TO K-TEK.

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