K-TEK
A MEMBER OF THE ABB GROUP

Installation & Operation Manual

KSONIK™

KMICRO COMPACT

Compact "Loop Powered" Ultrasonic Level Transmitter

For the latest version of this manual, visit ktekcorp.com or kteksolidslevel.com.

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1.0 Introduction

The KMICRO COMPACT works on the non-contact principle of ultrasonics. A pulse of energy emits from the Transducer at the speed of sound and is detected on its return. The Transmitter can distinguish the difference between the correct echo and other ambient noise. When the signal returns, the KMICRO COMPACT measures the time period, and then knowing the speed of sound, it can accurately calculate the distance from the material to the Transducer. The KMICRO COMPACT will adjust the 4-20mA output accordingly.

The KMICRO COMPACT has two different programming methods:
1. TWO TOUCH BUTTON KEY PAD
This is when the KMICRO COMPACT is used to measure simple level applications.

2. KSCOPE COMPACT
KSCOPE COMPACT is used for more complex measuring applications, e.g. Open Channel and the lineariser function.

KSONIK MICRO COMPACT

Compact "Loop Powered" Ultrasonic Level Transmitter

2.0 Get to know the KMICRO COMPACT with Keypad

The KMICRO COMPACT is designed with a very simple configuration method, the empty and full distances of the vessel are programmed with the use of the two push buttons.

Key description
KMICRO COMPACT is "user friendly" having only 2 keys. The keys are listed below with their appropriate functions.
4mA: The 4mA button is used to set the empty distance.
20mA: The 20mA button is used to set the full distance.

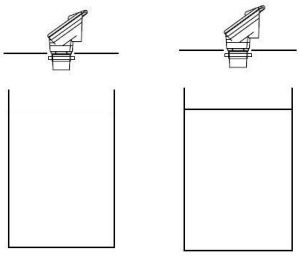
Wiring connections: Simply connect the regulated power supply to the positive and negative terminals. A multi-meter should be placed in series with the positive supply to measure the mA output. Using the default values of the instrument, aim the transducer at a wall about 1m away and check that the multi-meter is reading 17.71mA.
- If the mA is above 17.71mA move the transducer away from the wall
- If the mA is below 17.71mA move the transducer towards the wall.

The closer the transducer is to the wall the higher the mA output should read and vice versa. You may now proceed and check other distances.

2.1 Quick Start for KMICRO COMPACT Using the Keypad

Setting Empty Distance
When the vessel is EMPTY Press and hold the 4mA button until the green LED flashes.

Setting Full Distance
When the vessel is FULL press and hold the 20mA button until the red LED flashes.



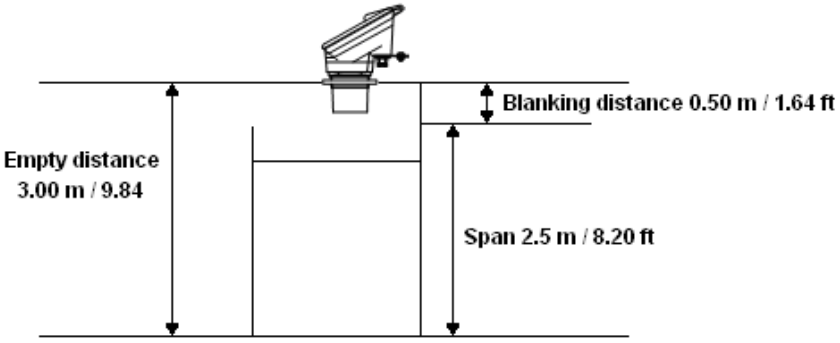
3.0 EXAMPLE - Level Measurement for KMICRO COMPACT

The KMICRO COMPACT is monitoring the level in an open tank and sending back to the control room a 4-20mA signal. The tank is 2.5 m / 8.20 ft high and the transducer is mounted 0.5 m / 1.64 ft above the tank. The actual level is at 2.00 m / 6.56 ft which would make the output 16.8mA.

4.0 Factory Default

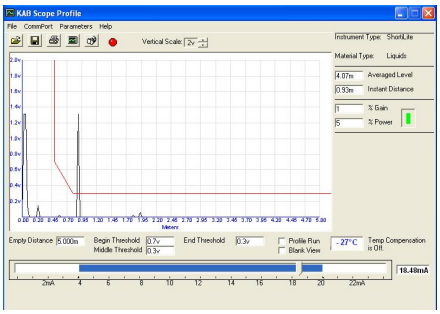
To perform a factory reset, hold both 4mA and 20mA buttons in for 5 seconds. Both LED's will flash alternatively. This will indicate the procedure was successful.
Factory default:

- Empty distance – 4m
- Span – 3.5m
- Blanking – 0.5m
- Measuring mode – Level



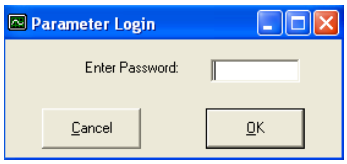
5.0 Changing Parameters with KSCOPE COMPACT

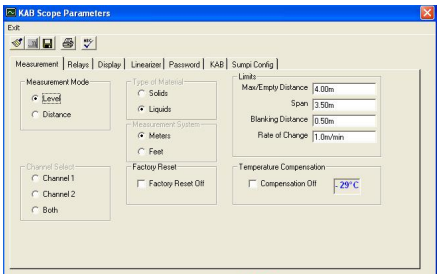
First install KSCOPE COMPACT on PC or laptop. Before any parameters can be changed, KSCOPE COMPACT must be connected and switched on at both the instrument and the PC respectably. To switch on KSCOPE COMPACT press both 4mA and 20mA buttons simultaneously for one second. The following screen will appear:



Step 1

Click on the PARAMETERS tab and press SUMPI PARAMETERS …..F3. Now Enter 5159 into the box and press OK. If the code is not accepted the program will return to the KSCOPE screen. If the code has been accepted the following screen will appear. In this screen it is possible to change the Empty distance, Span, Blanking, Rate of change and do a factory reset.





MAX/EMPTY DISTANCE
This is the distance from the face of the Transducer to the bottom of the vessel.
DEFAULT 4.00m

SPAN
This figure is the measuring range of the instrument i.e. distance from the bottom of the tank to the highest point being measured. Remember the material must not approach within 0.5m of the transducer face.
DEFAULT 3.5m

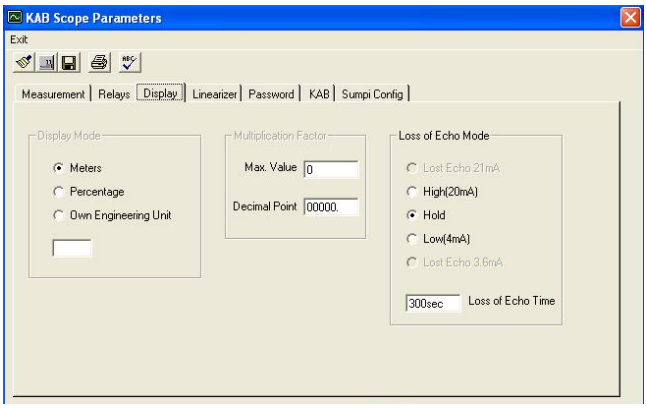
BLANKING
This is the distance measured from the face of the transducer to the highest point being measured and is the area where no measurement can be made.
DEFAULT 0.5m

RATE OF CHANGE
This is used to setup the rate of change of the level output. Increase the number if the level moves faster than 1.00m/min and decrease it if a more stable output is required.
DEFAULT 1.00m/min

FACTORY RESET
This prompt will reset all the values entered back to the factory settings. Please write down the settings before using this function.
DEFAULT NO

Step 2

When you click on the display tab the following screen appears. In this screen it is possible to change the Loss of echo time and fail safe parameter.

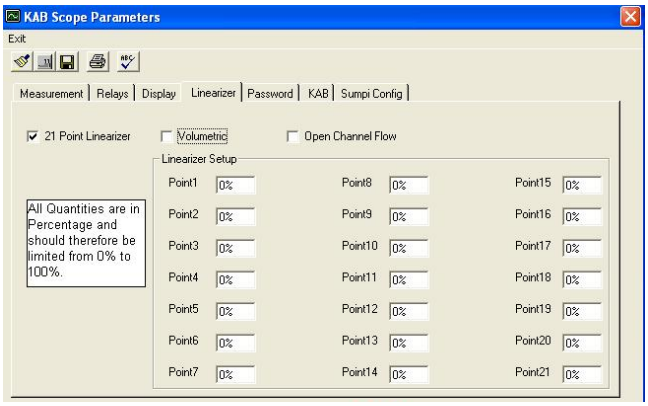


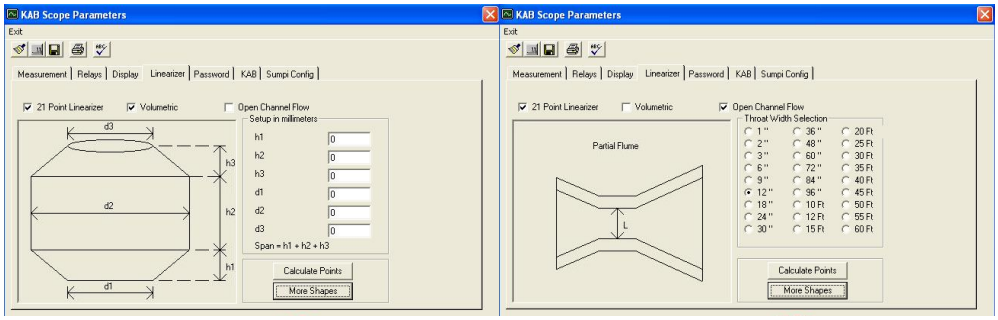
LOSS OF ECHO MODE
If loss of echo condition is reached then the 4-20 mA output will follow the configured settings 4mA (LOW), 20mA (HIGH) or hold the last recognized echo.
DEFAULT HOLD

LOSS OF ECHO TIME
This sets up the time period from the time the KMICRO COMPACT does not receive a good echo to the time it goes into the loss of echo routine.
DEFAULT 300sec

Step 3

Click on the linearizer tab to go to the linearizer screen. To activate, mark the Linearizer box. The values can be inserted manually or with the use of the predefined Volumetric or Open channel flow calculators. When using the calculators press the More Shapes button to cycle through the shapes.





21 POINT LINEARIZER
This prompt will allow you input a curve to linearize the vessel. The span is divided by 21 and you can input the new height for each point as well as the corresponding percentage fill at that point.
DEFAULT NO

VOLUMETRIC
This is a predefined shape calculator which can be used to calculate the values of the 21 point linearizer.
DEFAULT NO

OPEN CHANNEL FLOW
This is a predefined open channel flow calculator to calculate the values of the 21 point linearizer when the KMICRO COMPACT is used as open channel flow meter.
DEFAULT NO

Step 4

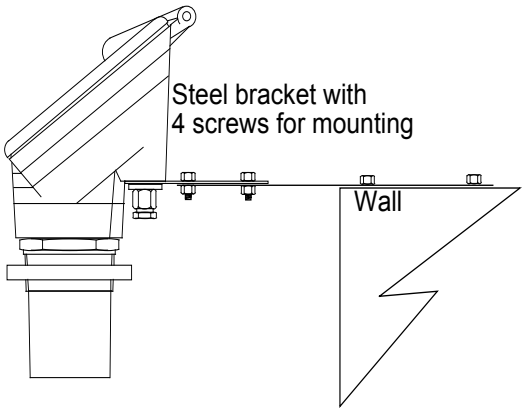
When all the values are entered press the save button to configure the KMICRO COMPACT.

6.0 INSTALLATION

The KMICRO COMPACT housing is protected to IP65. The Transmitter is dust and waterproof when closed so it can be mounted outside. The KMICRO COMPACT should be mounted using the bracket supplied. The transducer is IP68 and can be immersed up to the thread.

Do not install the KMICRO COMPACT in areas of high vibration as this may cause failure.

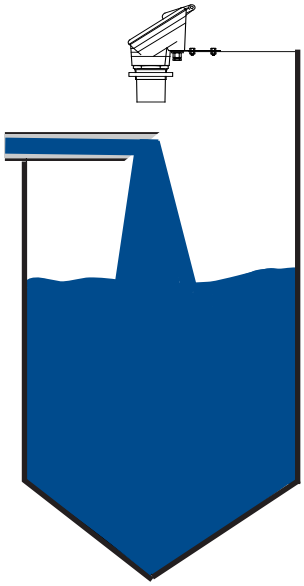
Do not install the KMICRO COMPACT in the close vicinity of electrical cable, SCR's or variable speed drives.



The installation of KMICRO COMPACT is the most important section of this manual and has been divided up into 7 sub sections.

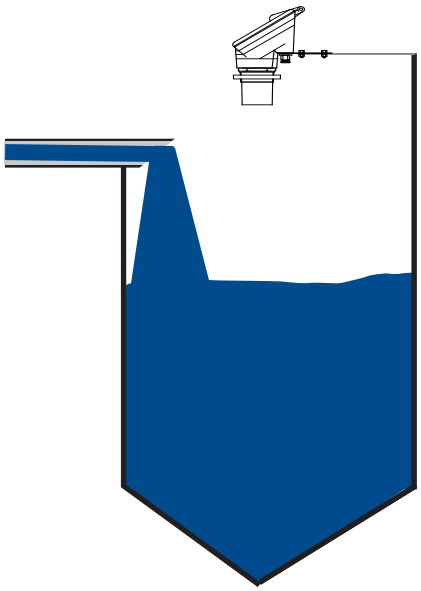
1. The KMICRO COMPACT must be fitted at least 0.50 m / 1.64 ft above the highest point of level.
2. Always use the plastic nut. The KMICRO COMPACT must be fitted to a rigid support. Use mild steel or a suitable plastic. Do not use stainless steel as this can cause ringing, use the bracket provided.
3. The KMICRO COMPACT must be perpendicular to the liquid it is measuring with a clear line of sight and must not be above beams or filling points.

INCORRECT



THIS IS INCORRECT AS THE FILLING POINT IS OBSCURING THE KMICRO's LINE OF SIGHT

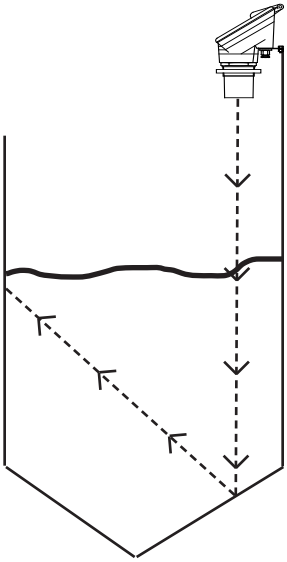
CORRECT



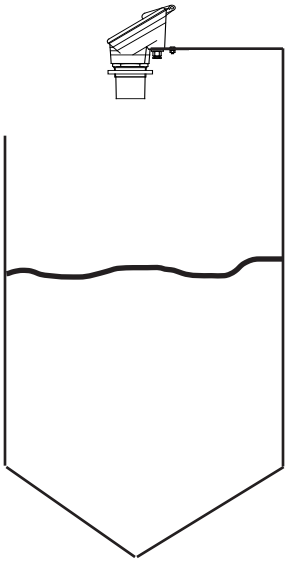
THIS IS CORRECT AS THE FILLING POINT IS NOT OBSCURING THE KMICRO's LINE OF SIGHT

4. If the KMICRO COMPACT is in a coned vessel, it must be positioned over the cone. This ensures that the Transducer receives the true echo and not one from the sides of the cone.

INCORRECT

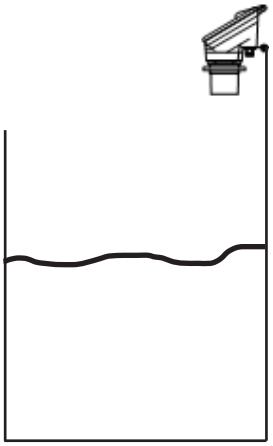


CORRECT

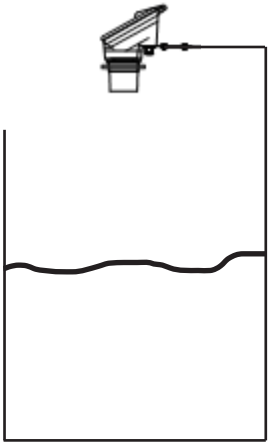


5. The KMICRO COMPACT should not be mounted next to the wall. This ensures that the Transducer receives the true echo and not one from the wall.

INCORRECT

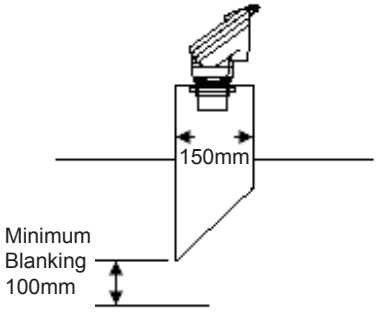


CORRECT



6. When a standpipe is being used it must be as wide as possible; i.e. the pipe diameter must be at least 150mm, preferably made of plastic. The base MUST have a 45° chamfer to reduce the echo size from the bottom of the standpipe. No welding should be present on the inside of the pipe as this causes false echoes. The blanking must be at least 100mm beyond the end of the stand pipe.

7. If any large electrical equipment is installed in the vicinity, then earthed steel conduit must be used.



7.0 FAULT FINDING

There are three categories of possible faults:
- The malfunction of the instrument
- Loss of echo and
- Wrong reading.

The biggest problem is to identify the malfunction. If the instrument is not working satisfactorily then remove the transmitter to the workshop. Connect the power and aim the KMICRO COMPACT to a wall about 1.00m away, making sure that it is perpendicular to the wall. Now reset the instrument by the factory reset prompt. KMICRO COMPACT should now read 17.71mA. If it does not read the above then there is a malfunction with the instrument and it should be returned for repair. If the above works and it still does not work in the field then there are many possible problems. Please check below for possibilities.

Loss of Echo

Check that the KMICRO COMPACT is not being used on a solid or agitated surface, as agitated surfaces and solids do not reflect as much signal as flat surfaces. Aim the Transducer straight down. Check if the Transducer face is not dirty.

Wrong reading, always reading close to the Transducer.
Do not reduce the blanking distance below 0.50 m / 1.64 ft unless consultation has been made with K-TEK. Electrical noise can cause this error. Remove noise.

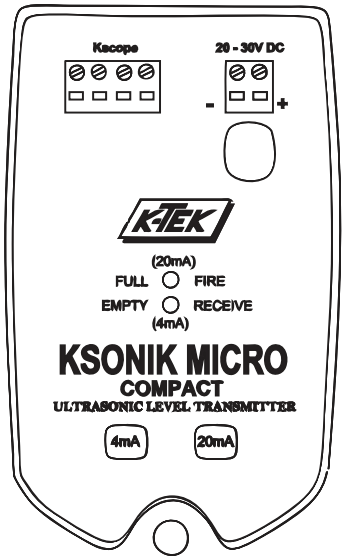
Wrong reading, anywhere in tank.
Check to see if there is a reflection from the wall. Please note that a piece of wire across a tank can be a big enough obstruction for an echo to be accepted. Are the parameters correct? Reset to factory default and check that KMICRO COMPACT reads correctly. If the factory settings are OK then your parameters need changing. Re-check them with a tape measure.

8.0 TERMINAL CONNECTIONS

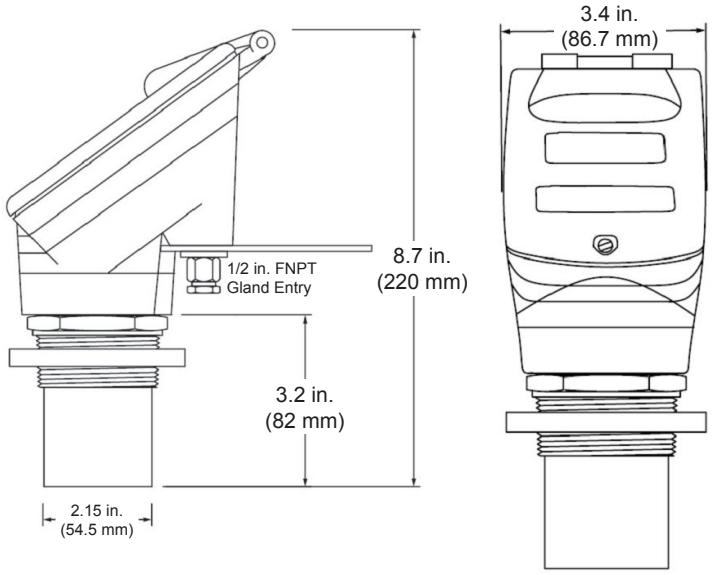
CONNECTIONS

Power Supply and Output
- Negative 4-20 mA and power
+ Positive 4-20 mA and power

KSCOPE COMPACT
Slot for KSCOPE COMPACT cable



9.0 DIMENSIONS



10.0 Customer Support

K-TEK Solids Level (USA, Canada, International)
6100 West by Northwest #140
Houston, TX 77040 USA
Tel: +(1) 713.462.7665
Toll Free 800.245.7056
Fax: +(1) 713.462.7684
Email: service@kteksolidslevel.com
Website: kteksolidslevel.com

K-TEK Corp. (USA, Canada, International)
18321 Swamp Road
Prairieville, LA 70769 USA
Tel: +(1) 225.673.6100
Fax: +(1) 225.673.2525
Email: service@ktekcorp.com
Website: ktekcorp.com

10.1 K-TEK RMA Form

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K-TEK
18321 Swamp Road
Prairieville, LA 70769
Phone: +1 (225) 673-6100
Fax: +1 (225) 673-2525
Email: service@ktekcorp.com
Toll Free: (800) 735-5835

***** IMPORTANT CUSTOMER NOTICE: PLEASE READ PRIOR TO RETURNING PRODUCTS TO K-TEK*****

Be sure to include the Return Authorization (RA) number on the shipping label or package to the attention: Customer Service. A copy of this document should also be included with the packing list. K-TEK wants to maintain a safe work environment for its employees. In the event, the returned product or material has been in contact with a potentially hazardous chemical, per federal regulations, the customer must provide evidence of decontamination and the related chemical composition and characteristics. In order to expedite your return, please include the applicable Material Safety Data Sheets (MSDS) and decontamination tags by affixing these documents in close proximity to the shipment label for identification purposes. (January 18, 2006)

Return Authorization Form	
Customer:	Date:
Contact Name:	Product:
Contact Email:	Serial No:
Contact Phone:	Job No:
Contact Fax:	Service Rep:

Completed by Customer

Reason:

Problem Found: None

Action Requested: None

Is expedited return shipping requested? Yes

If yes, please provide a purchase order or your shipper's account number (ex FedEx or UPS).
K-TEK pays return transport via standard ground shipments only.

Account #:

If purchase order is issued, a copy of purchase order must be included with return authorization documentation.

Is K-TEK authorized to repair items determined to be non-warranty? Yes

If yes, a copy of purchase order must be included with return authorization documentation.

Customer PO#:		Date:	

Has product been in contact with any potentially hazardous chemical? Yes

If yes, documentation product and forward MSDS to K-TEK. "ATTN: Customer Service"

Return Repaired Product to Address	
Shipping Address:	Billing Address:
	Ship Via:

10.2 K-TEK Solids Level RMA Form

K-TEK A MEMBER OF THE ABB GROUP

K-TEK Solids Level
6100 West by Northwest #140
Houston, TX 77040 USA
Phone: (1) 713.462.7665
Fax: (1) 713.462.7684
Email: service@kteksolidslevel.com

***** IMPORTANT CUSTOMER NOTICE: PLEASE READ PRIOR TO RETURNING PRODUCTS TO K-TEK*****

Be sure to include the Return Authorization (RA) number on the shipping label or package to the attention: Customer Service. A copy of this document should also be included with the packing list. K-TEK Solids Level wants to maintain a safe work environment for its employees. In the event, the returned product or material has been in contact with a potentially hazardous chemical, per federal regulations, the customer must provide evidence of decantamination and the related chemical composition and characteristics. In order to expedite your return, please include the applicable Material Safety Data Sheets (MSDS) and decontamination tags by affixing these documents in close proximity to the shipment label for identification purposes.

Return Authorization Form	
Customer:	Contact Name:
Contact Phone:	Contact Email:
Contact Fax:	
Date:	Service Rep:

Completed by Customer		
Product	**Serial Number**	**Job Number**

Reason:

Is expedited return shipping requested? ☐ Yes
If yes, please provide a purchase order or your shipper's account number (ex FedEx or UPS).
K-TEK Solids Level pays return transport via standard ground shipments only.
If purchase order is issued, a copy of purchase order must be included with return authorization documentation.

Account #:

Is K-TEK Solids Level authorized to repair items determined to be non-warranty? ☐ Yes
If yes, a copy of purchase order must be included with return authorization documentation.

Customer PO#:		Date:	

Has product been in contact with any potentially hazardous chemical? ☐ Yes
If yes, documentation product and forward MSDS to K-TEK Solids Level. "ATTN: Customer Service"

Return Repaired Product to Address	
Shipping Address:	Billing Address:
	Ship Via:

11.0 Declaration of Conformity

The KMICRO COMPACT complies with conformity in accordance with the following tests.

Electromagnetic Compatibility

Susceptibility:	EN50082-1	EN801-2,3,4,	
	EN50082-2	ENV50140	ENV50204
		EN61000-4-2	ENV50141
		EN61000-4-4	
Emission:	EN50081-2	EN55011	
	EN50081-1	EN55022	EN60555-2,3
Safety:	BSEN61010-1		

CE Conformity Declaration

The KMICRO COMPACT is in accordance with EN50081-2 1993 and EN50082-2 1995.
Johannesburg, South Africa, 28 December 2005.

Eric Fauveau

Eric Fauveau
K-TEK Corp.

12.0 Warranty

5 YEAR WARRANTY FOR:
KM26 Magnetic Liquid Level Gauges; MagWave Dual Chamber System; LS Series Mechanical Level Switches (LS500, LS550, LS600, LS700, LS800 & LS900); 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; SF50 and SF60 vibrating fork switches, KB 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 include onsite 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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For the latest version of this manual, visit ktekcorp.com or kteksolidslevel.com.

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Fax: +(1) 713.462.7684
Email: service@kteksolidslevel.com
Website: kteksolidslevel.com