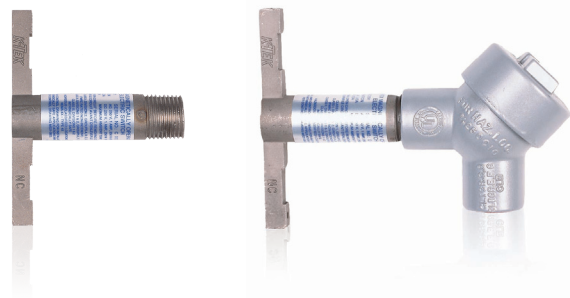


MS30/EX Magnetic Level Gauge Switch

Magnetically actuated 1 amp
SPDT electric switch
K-TEK Products



Introduction

The operation and instruction manual provides the following information:

- Mounting and installation - see page 3
- Maintenance instructions - see page 5
- Electrical installation drawing - see page 6
- Installation and parts drawing - see page 7

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1.0 Description

The MS30 is a magnetically actuated single pole, double throw switch. When the MS30 is mounted on a KM26 Magnetic Level Gauge, LS Series Cage Level switch or an External Chamber that contains a magnetic float, it can sense high or low levels within a vessel. The unique magnetic coupling action eliminates the need for things as seals, diaphragms, spring or torque tubes because there is no physical contact with the process. Magnetic coupling also eliminates the necessity of process connections and insures total isolation from the process.

2.0 Application

The MS30 will provide either a normally open or normally closed dry contact which may be used to activate external devices such as alarms or solenoids. Its main application is to sense the passing of a magnetic float in a KM26, or similar chamber, attached to a vessel containing a fluid. These trip points can be used for alarms for to activate a pump motor starter relay.

3.0 Operation

The MS30 consists of a form C reed switch and a bias magnet. The reed switch uses precious metal contacts in an inert gas atmosphere sealed by glass to metal bond. The bias magnet allows the switch to maintain its last state (latch) after the activating magnetic field is removed. A magnetic float traveling relative to the MS30 causes the reed switch to change state. After the float has passed, the reed switch will maintain its state until the float reverses direction and passes the switch in the opposite direction. The action of the switch is break before make. The hermetically sealed contacts serve to insure a high degree of hazardous area safety, weather resistance and general reliability of the product.

4.0 Mounting & Installation

The MS30 is mounted using two stainless steel clamps that pass through the mounting slots attached to the switch housing. The switch can be easily positioned by loosening the clamp and sliding the switch to the correct position on the chamber. Other switches can be added at any time, without the concern for additional process piping or valves. Note that two switches can be mounted so that they can trip at the same point or at two points separated by less than the length of a switch.

CAUTION: MAKE SURE CIRCUIT IS DE-ENERGIZED WHILE INSTALLING THE SWITCH.

The following procedure outlines the steps necessary to install the switch:

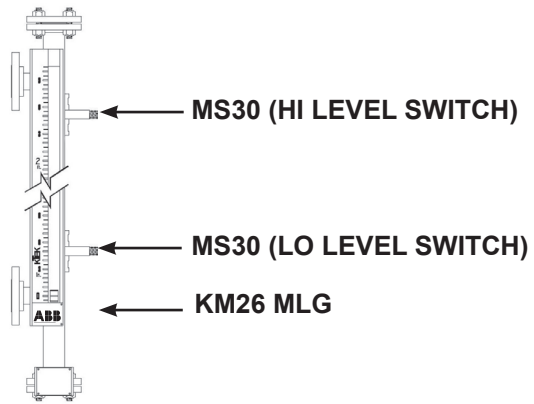
1. Mount the switch to the chamber where you want the switch to trip. The switch should be mounted 90° from the indicator assembly to insure optimum magnetic coupling.
2. Hook the field wires to the pigtail from the MS30 according to the application. See the wiring diagram on the drawing of Installations and Parts on page 7.
3. The float must be cycled past the switch in both directions to insure that the switch will operate properly when put into service.

NOTE:

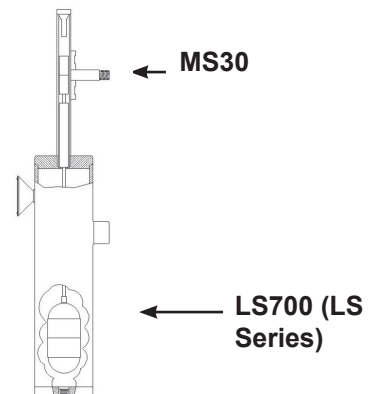
- A. All field wiring that is connected to the MS30 switch must comply with the National Electric Code guidelines.
- B. Do not use the switch on chambers with operating temperatures above 300°F / 149°C without using insulation between the switch and the chamber to keep the temperature of the switch from exceeding 300°F/ 149°C. Consult factory.
- C. KM26 chambers that are furnished with factory installed insulation blankets, the switch may be mounted via special rod mount brackets to a factory installed switch mount rod that is external to the insulation.
- D. Any conduit or fittings hooked to either a MS30 or MS30EX magnetically activated switch should be aluminum or some other non-magnetic material. This is necessary to avoid interference with the operation of the KM26 Magnetic Liquid Level Indicator or other magnetically activated switches.

4.0 Mounting & Installation (cont'd)

Example Configurations:



MS30 Mounted on KM26 Magnetic Level Gauge



MS30 Mounted on LS Series Mechanical Level Switch

5.0 Maintenance

The MS30 does not require any routine maintenance in normal day to day operation.

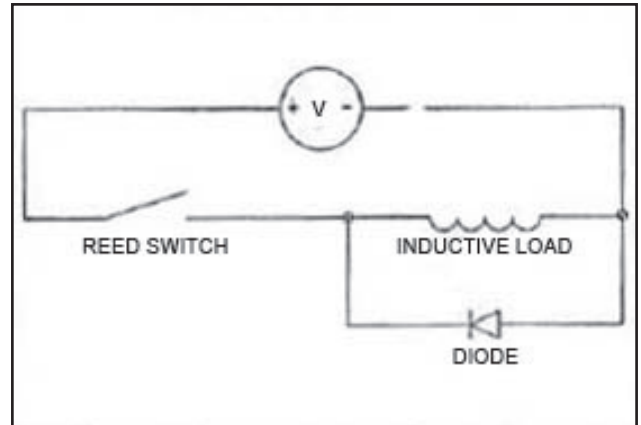
CAUTION: If there is a need to take the switch out of service or disconnect it for any reason, then make sure the circuit is de-energized or that the area is known to be non-hazardous.

6.0 Appendix

ABB's switch products (MS30, MS30EX, MS50) are based on magnetically operated reed switches. Since reed switches have the inherent characteristic of very closely spaced switch contacts, it is extremely important to protect these contacts from high voltage transients caused by inductive loads. When an inductive load is de-energized, the collapsing magnetic field induces a high voltage of opposite polarity into itself and thus the switch. Two basic methods exist to clamp this voltage and thus protect the switch contacts.

6.1 D.C. Applications

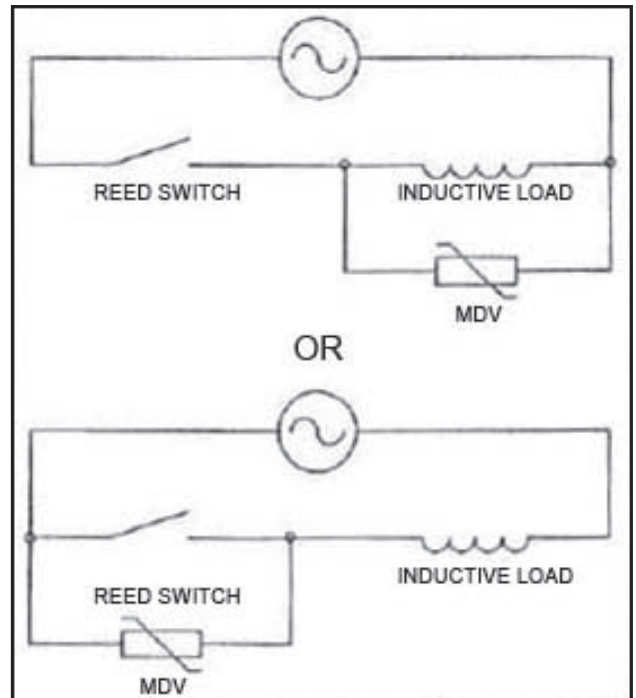
For D.C. applications, a diode is placed in parallel with the inductive load (note the polarity of the diode and power supply). A 1N4001 general purpose diode is normally sufficient to clamp the induced voltage of the inductive load to a safe level.



D.C. Contact Protection

6.2 A.C. Applications

For A.C. applications, a Metal Oxide Varistor (MOV transient surge suppressor) is placed either in parallel with the switch or the inductive load. The MOV changes from a high impedance to a very low impedance when the voltage across the MOV exceeds its rated voltage (the MOV rating must correspond with the power supply voltage). For 120 VAC control systems a typical MOV would be the GE (General electric Co.) part number V130LA10A. In either case shown, the result is the limiting of the switch voltage to approximately 130 volts.



A.C. Contact Protection

7.0 Electrical Installation

NOTES RELATED TO FM APPROVAL

(C.J. 019A7AE)

- 1) THESE SWITCHES CONFORM TO FMRC APPROVAL STANDARD NO. 3610 (APPROVAL STANDARD), INTRINSICALLY SAFE APPARATUS FOR USE IN CLASS I, II, III, DIVISION 1 HAZARDOUS (CLASSIFIED) LOCATIONS. ENTITY PARAMETERS: $V_{(max)}=100V$, $I_{(max)}=750mA$, $C(0)=0\mu F$, $L(0)=0mH$.
- 2) SINGLE OR MULTIPLE CHANNEL PROTECTIVE BARRIER PARAMETERS MUST MEET THE FOLLOWING REQUIREMENTS: $V_{(oc)} \geq I_{sc} R_{(t)}$ OR $V_{(t)} \leq 100V$, $I_{(sc)} \text{ OR } I_{(t)} \leq 750mA$, $C(0) > 0\mu F$, $L(0) > 0mH$.
- 3) INSTALLATION SHALL CONFORM TO THE MANUFACTURERS INSTRUCTIONS SUPPLIED WITH THE PROTECTIVE BARRIER AS WELL AS THE NATIONAL ELECTRICAL CODE AND ANSI/ISA-RP12.6-1987 (INSTALLATION OF INTRINSICALLY SAFE INSTRUMENT SYSTEMS IN HAZARDOUS (CLASSIFIED) LOCATIONS).
- 4) MAXIMUM NONHAZARDOUS AREA VOLTAGE SHOULD NOT EXCEED 250 V(rms).
- 5) THESE SWITCHES ARE CONSIDERED A SIMPLE APPARATUS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NECA) AND ANSI/ISA - RP12.6-1987. NO SPECIFIC APPROVAL FOR SUCH DEVICES IS REQUIRED TO PERMIT USAGE WITH SAFETY BARRIERS.
- 6) SWITCH CONNECTION SHOWN FOR FAIL-SAFE OPERATION (CONTACTS OPEN ON ALARM). IF HIGH LEVEL ALARM IS REQUIRED INSTEAD OF LOW LEVEL, CONNECT AS PER NOTE BELOW SWITCH CONTACTS.
- 7) PROTECTIVE ZENER BARRIER IS NOT REQUIRED FOR DIVISION 2 APPLICATIONS WHEN INSTALLED PER THE NATIONAL ELECTRICAL CODE.
- 8) CLASS II, DIV 1 & 2, AND CLASS III, DIV 1 & 2 APPLICATIONS MUST BE INSTALLED WITH APPROVED (LISTED) SEAL FITTING.

NOTES RELATED TO CSA CERTIFICATION

(FILE LR 79626-1)

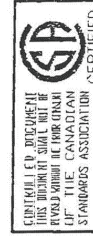
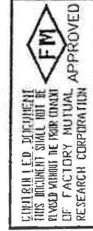
- A) THESE SWITCHES CONFORM TO CSA STANDARD NO. 157. ENTITY PARAMETERS: $V_{(max)}=100V$, $I_{(max)}=750mA$, $C(0)=0\mu F$, $L(0)=0mH$.
- B) INSTALLATION SHALL CONFORM TO THE MANUFACTURERS INSTRUCTIONS SUPPLIED WITH THE PROTECTIVE BARRIER, AS WELL AS THE CANADIAN ELECTRICAL CODE.
- C) MAXIMUM NON-HAZARDOUS AREA VOLTAGE SHALL NOT EXCEED 250 V(rms).
- D) SWITCH CONNECTION IS SHOWN FOR FAIL SAFE OPERATION (CONTACTS OPEN ON ALARM). IF HIGH LEVEL ALARM IS REQUIRED INSTEAD OF LOW LEVEL, CONNECT AS PER NOTE BELOW SWITCH CONTACTS.
- E) SAFETY BARRIERS MUST BE CSA CERTIFIED.
- F) MAXIMUM AMBIENT TEMPERATURE FOR I.S. INSTALLATIONS = 50C (122F).
- G) ADDITIONAL NOMENCLATURE:
Exia - INTRINSICALLY SAFE / SECURITE INTRINSEQUE

DOCUMENT CONTENTS:

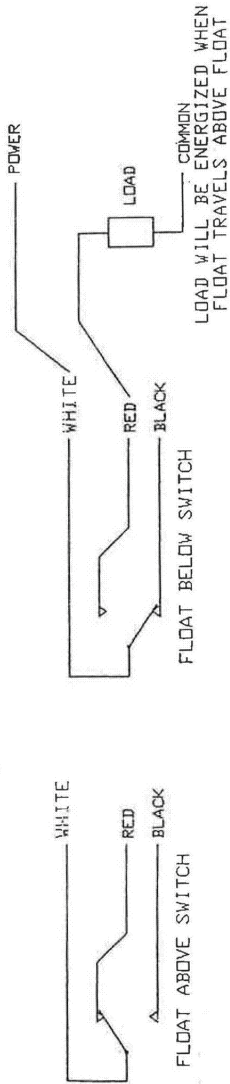
PAGE 1	-	NOTES
PAGE 2	-	GENERIC BARRIER
PAGE 3	-	MTL 707
PAGE 4	-	MTL 2210B
PAGE 5	-	P&F Z129/EX
PAGE 6	-	P&F WE77/EX1
PAGE 7	-	MTL 3011
PAGE 8	-	MTL 2211
PAGE 9	-	P&F WE77/EX2
PAGE 10	-	R-STAHL 9001/01-280-100-10
PAGE 11	-	R-STAHL 9251/01-40
PAGE 12	-	R-STAHL 9251/02-40

PAGES 1 & 2 OF THIS DOCUMENT ARE SUPPLIED WITH EACH SWITCH USERS MANUAL. REQUEST INSTALLATION INFORMATION BY PAGE NUMBER LISTED AT LEFT.

ALSO SEE THE FOLLOWING INSTALLATION DOCUMENTS FOR ADDITIONAL INFORMATION:
MS21-0001 -1- MS-21 AND MS-21/EX INSTALLATION
MS30-0001 -1- MS-30 AND MS-30/EX INSTALLATION



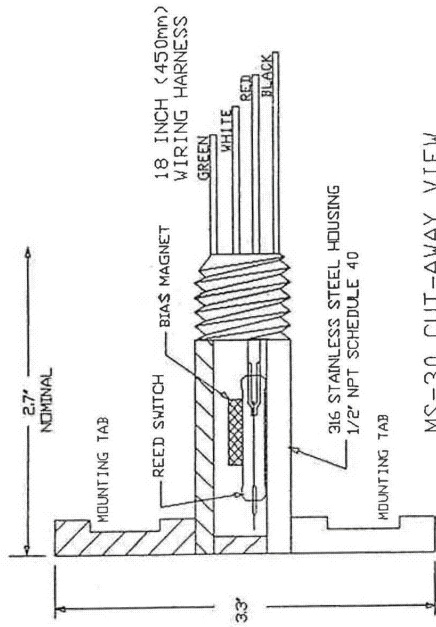
8.0 Installation and Parts



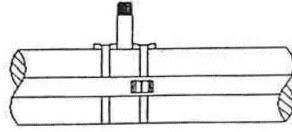
WIRING DIAGRAM AND TYPICAL APPLICATION

THE MS-30 AND MS-30/EX
CONTAIN NO USER SERVICEABLE
COMPONENTS

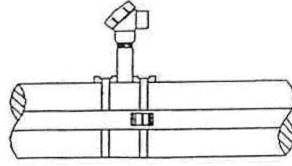
GREEN WIRE IS PROVIDED
FOR GROUNDING



MS-30 CUT-AWAY VIEW



MS-30 MOUNTING



MS-30EX MOUNTING



- INSTALLATION NOTES AND WARNINGS:
- 1) CLASS 1, DIVISION 2 WARNING (MS-30):
WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS 1, DIVISION 2.
AVERTISSEMENT: RISQUE D'EXPLOSION - LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATERIEL INACCEPTABLE POUR LES EMPLOIS DE CLASSE 1, DIVISION 2.
WARNING: EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.
AVERTISSEMENT: RISQUE D'EXPLOSION - AVANT DE DECONNECTER L'EQUIPEMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNÉ NON DANGEREUX.
 - 2) CLASS 1, DIVISION 1 WARNING (MS-30/EX):
CAUTION: OPEN CIRCUIT BEFORE OPENING COVER.
ATTENTION: OUVRIRE LE CIRCUIT AVANT D'ENLEVER LE COUVERCLE.
 - 3) DEVICE IS APPROVED (CERTIFIED) AS INTRINSICALLY SAFE (SECURITE INTRINSIQUE) WHEN INSTALLED PER CONTROL DRAWING MS21-0923

Ex i o

4) SEE USER MANUAL MS30-0200-1 FOR ADDITIONAL INFORMATION.

9.0 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); 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:

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

ABB will repair or replace, at ABB's election, defective items which are returned to ABB by the original purchaser within the period specified above from the shipment date of the item and which is found, upon examination by ABB, 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. ABB'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 ABB and request a Returned Material Authorization before returning the material to ABB, with transportation prepaid by the purchaser. (To expedite all returns/repairs from outside of the United States, consult ABB'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 ABB for best-way transportation only. ABB is not responsible for expedited shipping charges. If the product is shipped to ABB freight collect, then it will be returned to the customer freight collect.

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

The materials of construction for all ABB 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 ABB'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 ABB ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF ABB'S PRODUCTS. THE REMEDIES SET FORTH IN THIS WARRANTY ARE EXCLUSIVE OF ALL OTHER REMEDIES AGAINST ABB. ABB SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, OR SPECIAL DAMAGES OF ANY KIND. ABB'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 ABB.

10.0 RMA Form



ABB US
 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 ABB*****

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. ABB 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: None

Requested:

Is expedited return shipping requested? Yes
If yes, please provide a purchase order or your shipper's account number (ex. FedEx or UPS). ABB pays return transport via standard ground shipments only.

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

Is ABB authorized to repair items determined to be non-warranty? Yes Account #: _____
If yes, a copy of purchase order must be included with return documentation.

Customer PO: _____ Date: _____

Has product been in contact with any potentially hazardous chemical? Yes
If yes, documentation product and forward MSDS to ABB, "ATTN: Customer Service"

Return Repaired Product to Address

Shipping Address:	Billing Address:
	Ship Via: _____

Contact us

ABB Inc.

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