Operating instruction manual OI/PS35-EN Rev. D

PS35
Magnetic Level Gauge Switch

Magnetically actuated pneumatic switch
K-TEK Products

Introduction

This operation and instruction manual provides the following information:

Power and productivity for a better world™

Table of Contents

1.0 Description

The ABB PS35 is a point level (on - off) pneumatic switch device used in conjunction with the KM26 Magnetic Level Gauge. LS Series Cage Level switch or an External Chamber containing a magnetic ABB float. The unique magnetic coupling action eliminates the need for such things as seals, diaphragms, springs or torque tubes. Since process connections to the switch are eliminated, the user is insured complete isolation from the process. Valves are not required to block off the switch from the process for maintenance or operational testing. Preventive maintenance functions are greatly reduced since the switch never contacts the process fluid.

2.0 Application

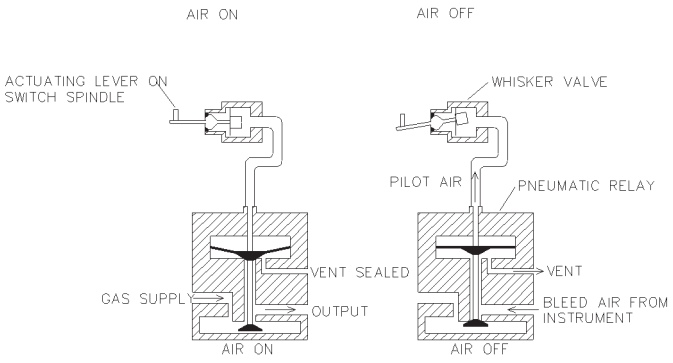
The PS35 is designed to provide a pneumatic control signal dependent on the liquid level within a vessel. The device is configurable such that actuation can occur on rising and falling level. When a magnetic float passes in the first direction, the PS35 will route the input supply gas through to its output port. When the float passes in the opposite direction, the supply gas is shut off (disconnected) from the output port and the output port typically vented to the atmosphere. The PS35 thus provides the user with a pneumatic signal that can be used to activate alarms and/or open and close control valves. An example application would be the pneumatic operation of safety shutdown systems on oil and gas production equipment.

3.0 Operation

The PS35 switch mechanism consists of the following integral components:

1. Actuating lever-spindle-magnet assembly
2. Whisker valve assembly
3. Pneumatic relay

When the whisker valve is in the unactuated position (see Figure 1), a backpressure is created that causes the pneumatic relay diaphragm to move. This allows supply gas at the relay input port to pass through to the output port and thus to the final control element. As the magnetic float travels past the switch, the actuating level tips the whisker level, venting the backpressure on the relay. This allows the relay diaphragm to vent to atmosphere and move to the opposite position. The supply pressure is then blocked from the output port, and the output port is vented to atmosphere. The PS35 is easily reconfigured in the field with regard to the action of the air-on/air-off relative to the float.



Air On: Whisker Valve Seals Pilot Air Flow
Air Off: Whicker Valve Allows Pilot Air To Flow

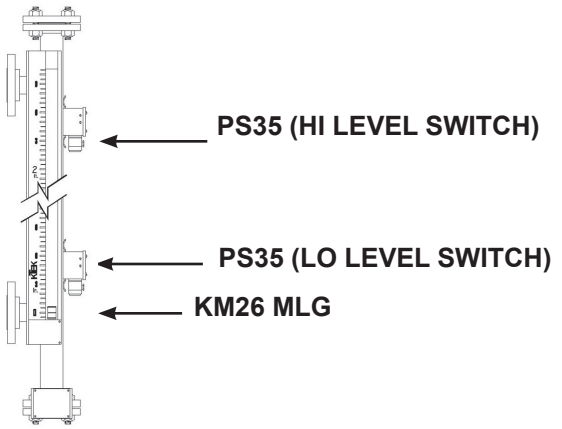
Figure 1

4.0 Mounting & Installation

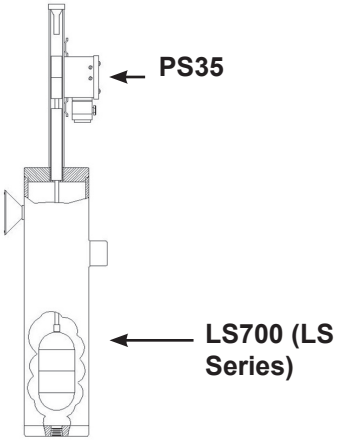
The simplicity of mounting the PS35 switch housing is such that the only necessary tool is a small screwdriver. The switch is attached to the KM26 via two small stainless steel variable clamps. These clamps allow the switch to be positioned anywhere over the entire length of the float chamber, thereby providing an infinitely variable trip point setting. Loosening the clamps will allow the PS35 to be easily moved to provide a new trip point. Other switches can be added at any time without the concern for additional process piping or valves. The optional LR35 (Latching Relay) housing can also be attached to the KM26 MLG chamber and two small stainless steel variable clamps.

Note: Two switches can be mounted so they can trip at the same point or at two different points separated by less than the length of a switch

Example Configurations:



PS35 Mounted on KM26 Magnetic Level Gauge



PS35 Mounted on LS Series Mechanical Level Switch

5.0 Maintenance

The PS35 does not require any routine maintenance in normal day to day operation if a clean, dry air supply is provided.

6.0 Troubleshooting

The PS35 switch is a very reliable device if a clean, dry air or gas supply is provided. If you suspect the switch is not working, check the following:

1. Supply pressure is between 15 and 100 psi (1 and 7 bars).
2. Check the operation of the pneumatic relay by removing the cover and pinching the tube connecting form the pneumatic relay to the whisker valve assembly. The relay should connect the supply port to the output port when the tube is pinched.
3. Verify that the magnet is correctly oriented. See "proper magnet-spindle orientation" detail in section 7.0 on page 5.
4. Move the float back and forth past the switch and see if the switch will change positions. It should make an audible click as it snaps from one position to the other. If the switch does not change position there are there possible problems.
    a. The spindle ahs some restrictions that are binding it. Check by manually moving the spindle and look for the following two things:
        1.) Tubing interfering with magnet or spindle
        2.) Foreign material in pivot point.
    b. The switch is positioned too far away from the float. See section 4.0 Mounting and Installation on page 3. Remove the switch from the chamber and pass a float by it. The switch should work if the checks in step "A" work. Position the switch as close to the indicatory as possible.
    c. If the buoyancy of the float is too small to overcome the magnetic pull of the switch. The probable cause for this condition is that the specific gravity of the fluid has fallen at least 5% below the specified specific gravity. To check for this condition, the chamber will have to be slowly filled with the process liquid. When the float as shown by the external indicator reaches the vicinity of the switch it will stop moving even though more fluid is continually added. The best way to correct this problem is to replace the float with a float that matches the specific gravity of the fluid.
5. Remove the output port fitting and either move the float back and forth past the switch or move the spindle manually and observe if the air is turned on and off at the output port. If not, check the whisker valve to see if it is plugged or if the tubing from the whisker valve to the pneumatic is crimped. To get to the whisker valve remove the two screws that hold the core of the switch to the side of the enclosure.

7.0 LR35 Latching Relay

LR35 Latching Relay is used in conjunction with PS35 switches for differential gap control (See Figure 2). The part number is VPP-3301-316.

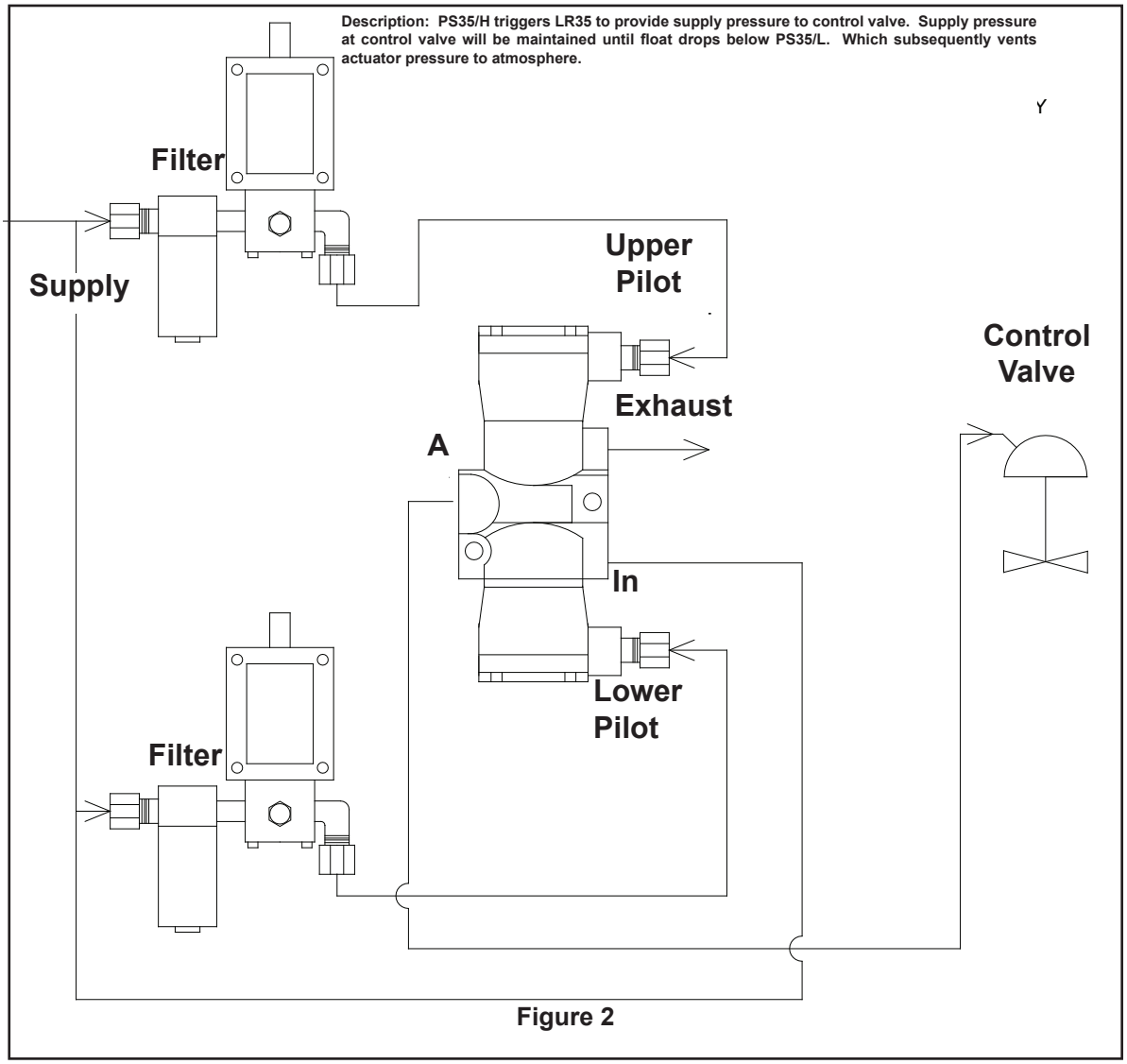


Figure 2

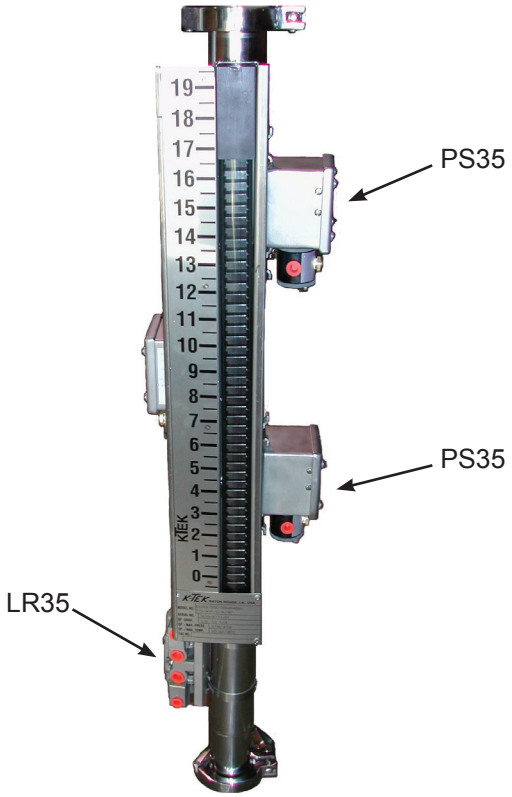
7.1 Description of Operation

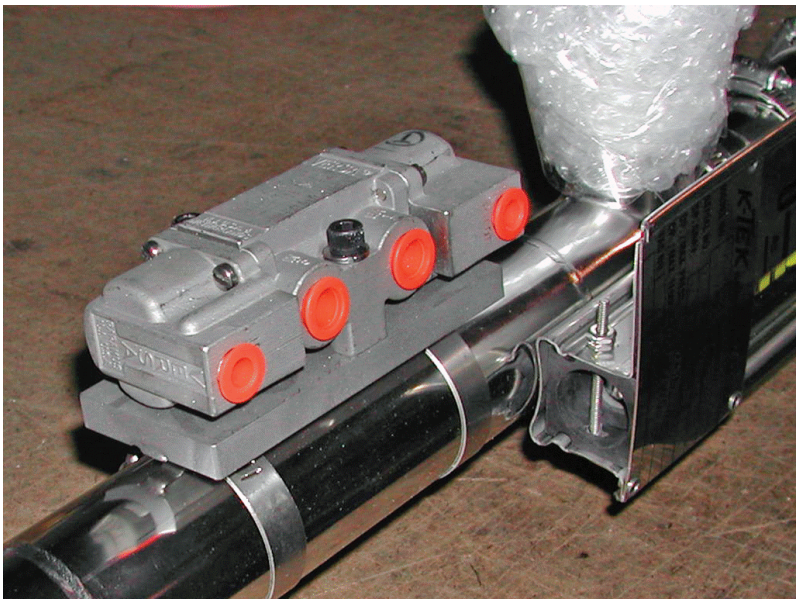
1. Applying pressure to the upper pilot connects the main air pressure at the “In” port to port “A” (approximately 10 psig is required to activate).
2. Main air pressure is maintained at port “A” even when the pressure at the upper pilot is removed.
3. Applying pressure to the lower pilot connects port “A” to the exhaust port.

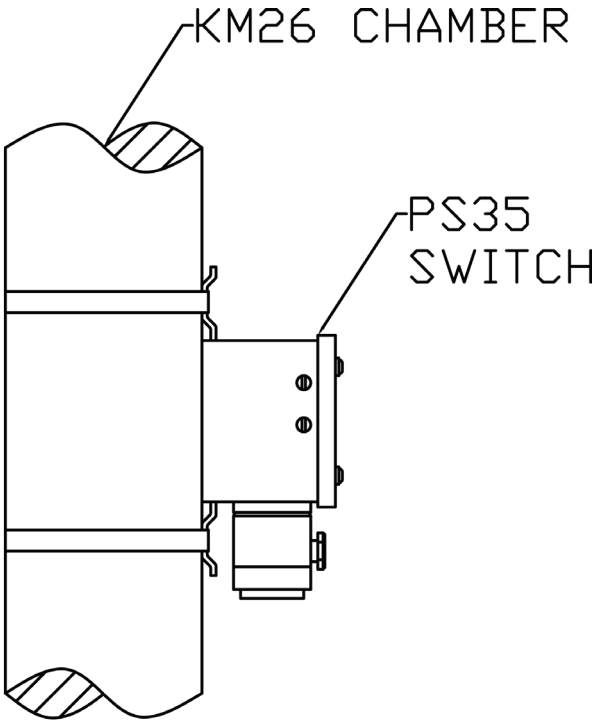
NOTE:

1. The LR35 is designed to be sued with 2 PS35 switches to control fill/drain valves or pumps to control level when an adjustable differential is desired.
2. Pilot ports are 1/8” FNPT.
3. “A”, “In” and “Exhaust Ports” are 1/4” FNPT.
4. Materials of construction are 316L SS.

7.2 Mounting / Installation

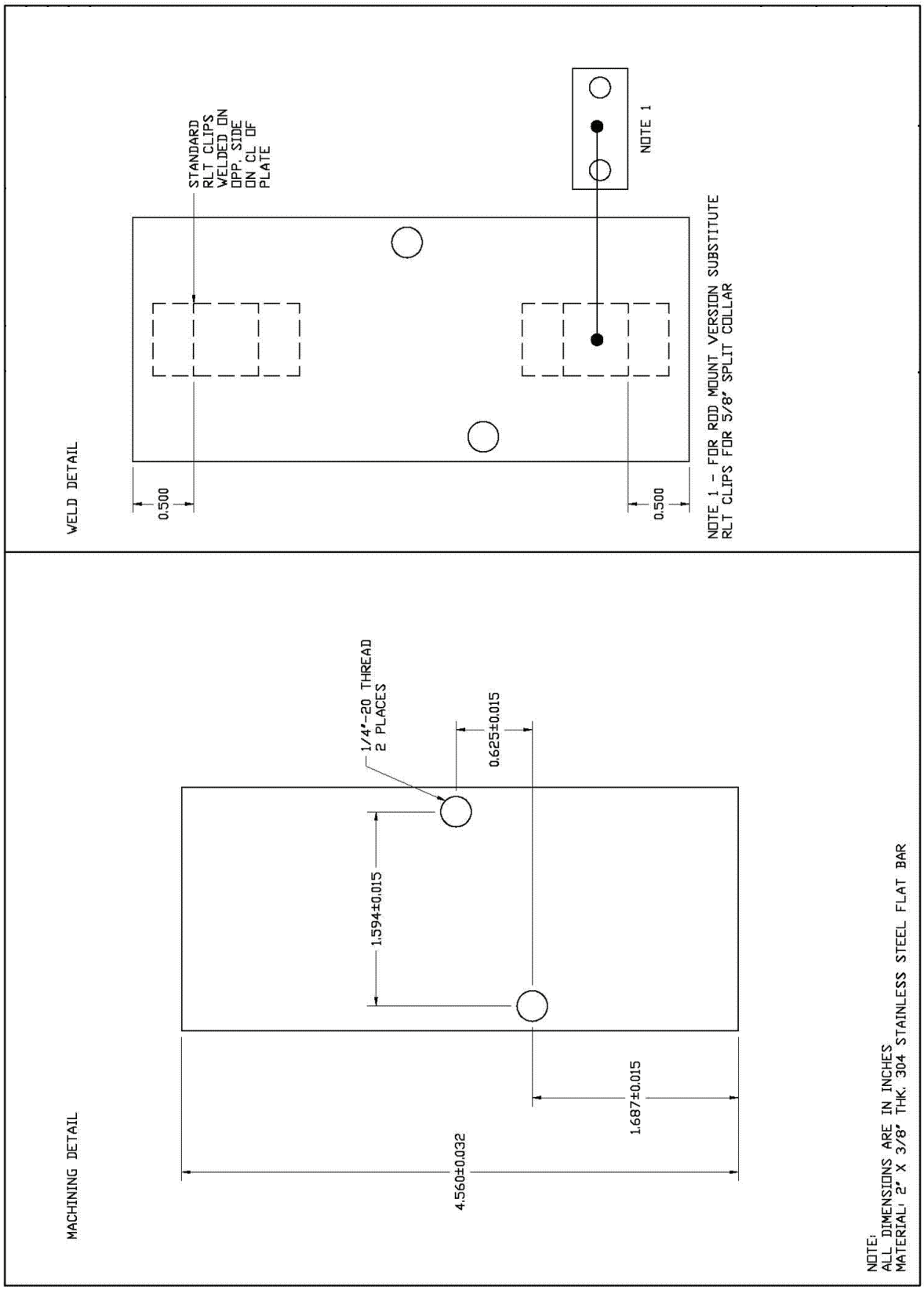






PS35 MOUNTING

7.3 LR35 Versa Valve Mounting Plate



8.0 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.

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.

9.0 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

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

Account #:

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.
18321 Swamp Road
Prairieville, LA 70769 USA
Phone: +1 225 673 6100
Service: +1 225 677 5836
Fax: +1 225 673 2525
Service e-mail: service@us.abb.com

www.abb.com/level

OI/PS35-EN Rev. D 06.2012

Power and productivity
for a better world™