



Installation and Operating Instructions

Please retain for future usage

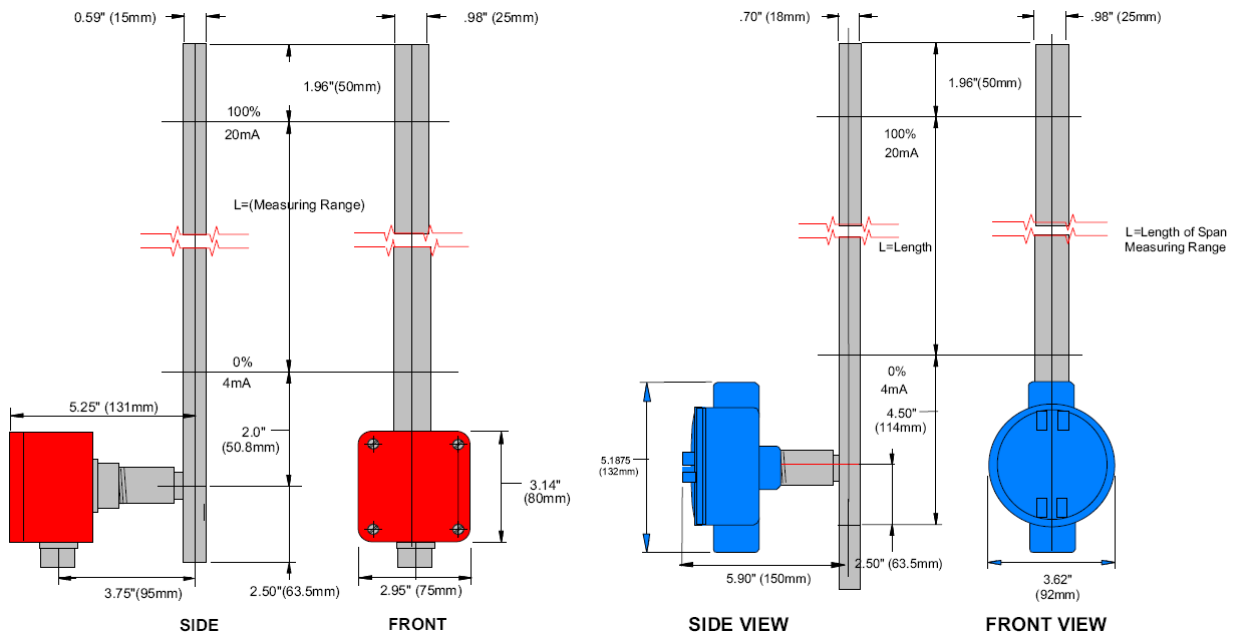
Level Transmitters for Magnetic Level Gauges

INTRODUCTION

KSR Kuebler level transmitters are primarily used for continuous measurement of liquid levels. They operate by using the field of a magnet inside the float to actuate reed switches inside the device rod. A measuring network (reed switches and precision resistors) built into the transmitter rod provides an internal potentiometer-style signal proportional to the position of the float. The resolution of the transmitter is dependent on the number of switches per unit length and is customer specified along with device length at the time of order. The output of the device is two-wire 4 to 20 ma and can be configured to increase or decrease with float level.

For your convenience please enter: Model # _____

Serial # _____



KSR Kuebler level transmitters have approvals up to Explosion Proof Class 1, Division 1, Group B depending on the ordered configuration. They can be used for Intrinsically Safe applications up to Group A with the addition of an agency approved safety barrier. All materials which come into contact with the liquid must be corrosion resistant and are customer specified. The liquid to be monitored must not be heavily contaminated and must not have a tendency to crystallize or solidify.

INSTALLATION NOTES!

- **KSR Kuebler level transmitters must be installed within 30 degrees of vertical to function correctly. They must not be installed within 3 feet of strong electromagnetic fields.**

- **When installing a level transmitter in a vessel connection smaller than the diameter of the float requiring removal of the float(s), mark the top of the float(s) and the position of the retaining collar(s). Be sure to replace the float(s) in the same orientation. Reposition and securely tighten the retaining collar(s).**
- **All wiring and hardware must be in accordance with applicable standards and regulations. Avoid running 4 to 20 ma cabling next to AC power wiring, always use shielded cable. When installing in a location requiring Intrinsic Safety, an agency approved barrier must be used (see Installation Drawings).**
- **Install a pour-seal fitting within 18 inches of the housing to prevent water from entering the housing and for compliance with the National Electrical Code.**

INSTALLATION (Transmitters with Integral Electronics)

Install KSR level transmitters according to their type (flange, thread, or bracket) using the correct gasket or compound for sealing. Make sure the gasket is installed correctly and tighten all fasteners to the correct torque. Replace the float(s) and retaining collar(s) in the correct orientation if previously removed. Note it may be easier to calibrate the unit before installation if possible.

Transmitters with integral electronics (puck and/or display) must be connected in a series loop with the readout or data acquisition device and the power supply. Shielded cable must be used for noise immunity and for Intrinsically Safe applications an agency approved safety barrier must be installed. A ground wire must be provided and connected to the ground block inside the housing.

To connect a transmitter with a built-in digital display, unscrew and remove the housing cover and carefully remove the plastic label from around the display by grasping each side and pulling upwards. Remove the digital display by carefully pulling up on two diagonal sides of the display. The indicator is held in place by two banana plugs which plug into the baseboard where the 4 to 20 ma puck is mounted. Field wiring connections are made to a two point, compression type, terminal block located on the baseboard (see Fig. 2 for Explosion Proof or drawing 095-3201-001 Pg. 1 for Intrinsically Safe applications). Attach a ground wire directly to the ground screw inside the housing.

To connect a transmitter without a built-in display, unscrew and remove the housing cover. Field wiring connections are made directly to the puck (see Fig 3 for Explosion Proof, drawing 095-3201-001 Pg. 2 for single puck Intrinsically Safe applications, or drawing 095-3201-001 Pg. 4 for dual puck Intrinsically Safe applications). Attach a ground wire directly to the ground screw inside the housing.

The transmitter comes pre-wired from the factory, however to reverse the reading of the gauge relative to the float position it is necessary to reverse the “max” and “min” connections on the puck (see Figure 1).

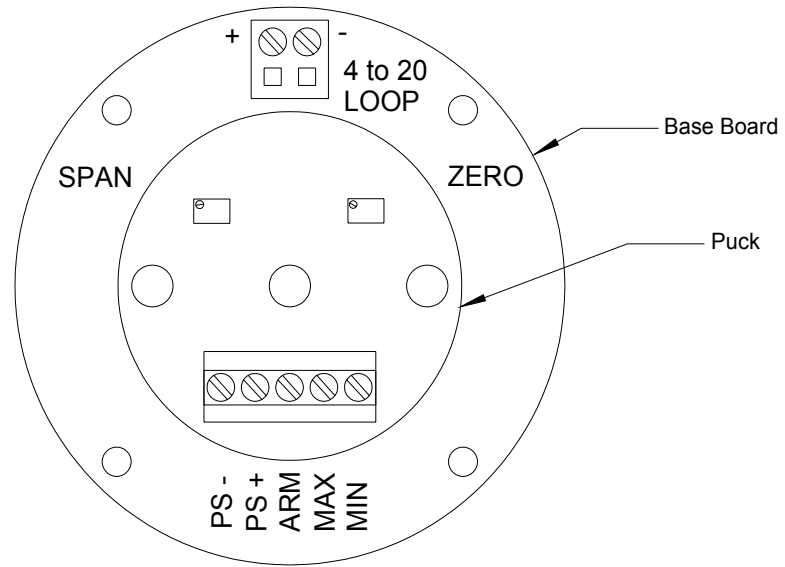


Figure 1
Component Identification

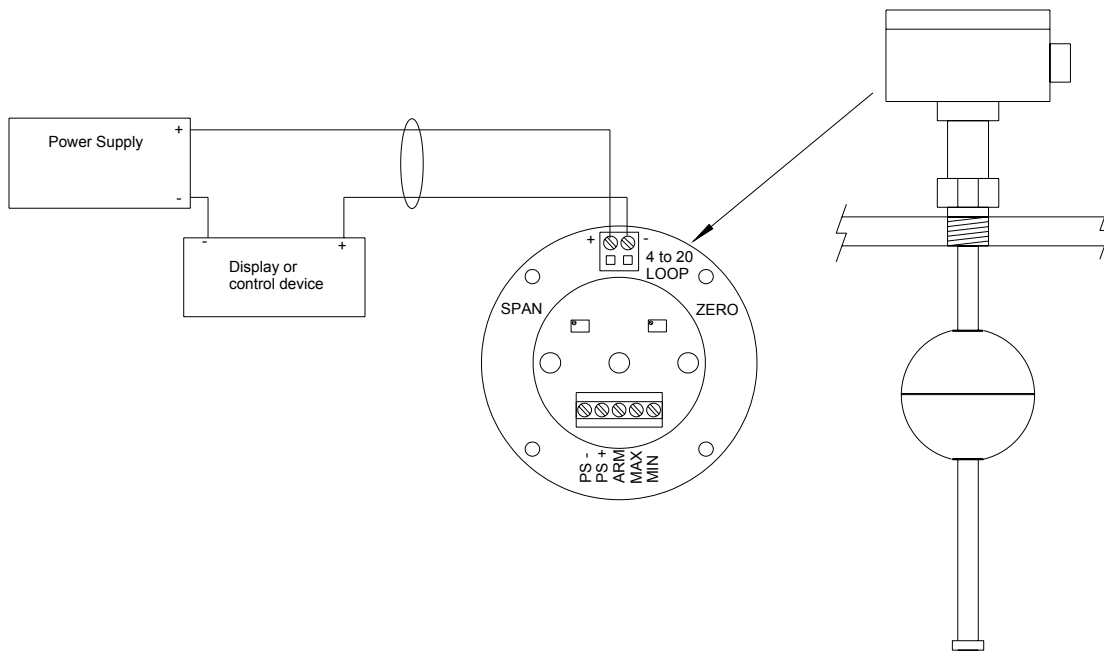


Figure 2
Explosionproof Wiring for Transmitters with Integral Display

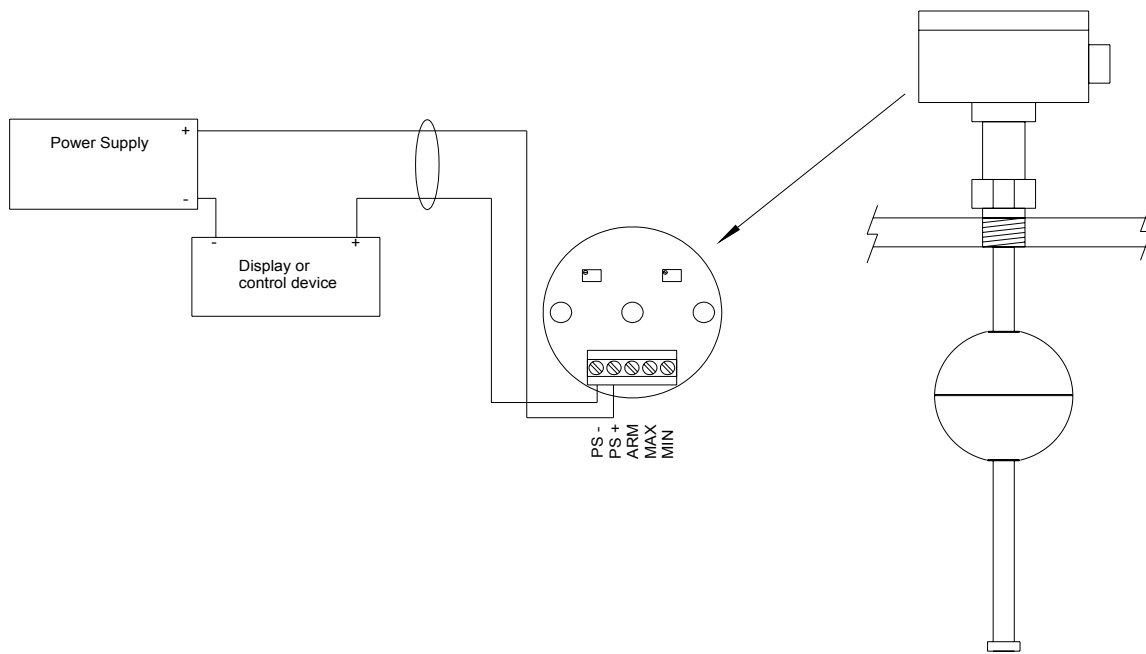
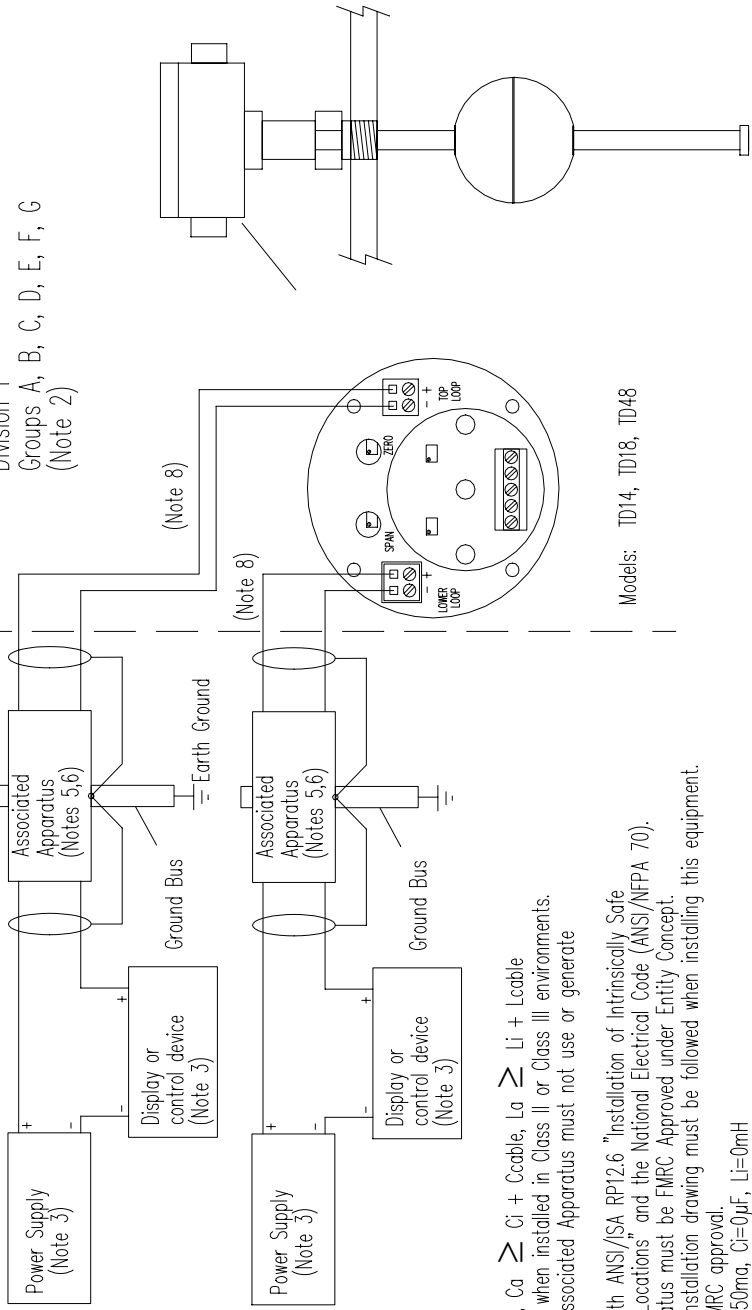


Figure 3
Explosionproof Wiring for Transmitters without Integral Display

Non-Hazardous Location

Hazardous Location

Class I,II,III
Division 1
Groups A, B, C, D, E, F, G
(Note 2)



Models: TD14, TD18, TD48

- Notes:
- V_{oc} or $V_t \leq V_{max}$, I_{sc} or $I_t \leq I_{max}$, $C_a \geq C_i$ + Coable, $L_a \geq L_i$ + Lcable
 - Dust-tight conduit seal must be used when installed in Class II or Class III environments.
 - Control equipment connected to the Associated Apparatus must not use or generate more than 250 Vrms or Vdc.
 - Installation should be in accordance with ANSI/ISA RP12.6 "Installation of Intrinsic Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code (ANSI/NFPA 70).
 - The configuration of Associated Apparatus must be FMRC Approved under Entity Concept.
 - Associated Apparatus manufacturer's installation drawing must be followed when installing this equipment.
 - No revision to drawing without prior FMRC approval.
 - Entity Parameters: $V_{max}=32V$, $I_{max}=150mA$, $C_i=0\mu F$, $L_i=0mH$

REV	Description
A	Release to Production

Changes	Date	Dr. by	Chk. By	Scale	Format
REV A	3/4/99	AB		NONE	A
				Material	

Drawing Number
095-3201-001 Page 4
Installed per Drawing
Transformer, Dual
Intrinsically Safe

K

S

INSTALLATION

(Transmitters with remote electronics)

Install KSR level transmitters according to their type (flange, thread, or bracket) using the correct gasket or compound for sealing. Make sure the gasket is installed correctly and tighten all fasteners to the correct torque. Replace the float(s) and retaining collar(s) in the correct orientation if previously removed.

Transmitters with remote electronics must be connected using three-conductor shielded cable (see Fig. 4 for Explosion Proof, drawing 095-3201-001 Pg. 3 for single puck Intrinsically Safe applications, or drawing 095-3201-001 Pg. 5 for dual puck Intrinsically Safe applications).

The symbols screened on the board show the connections to the terminal blocks. By reversing the “max” and “min” connections at the puck, the gauge readout can be reversed relative to the float position (see Fig. 1).

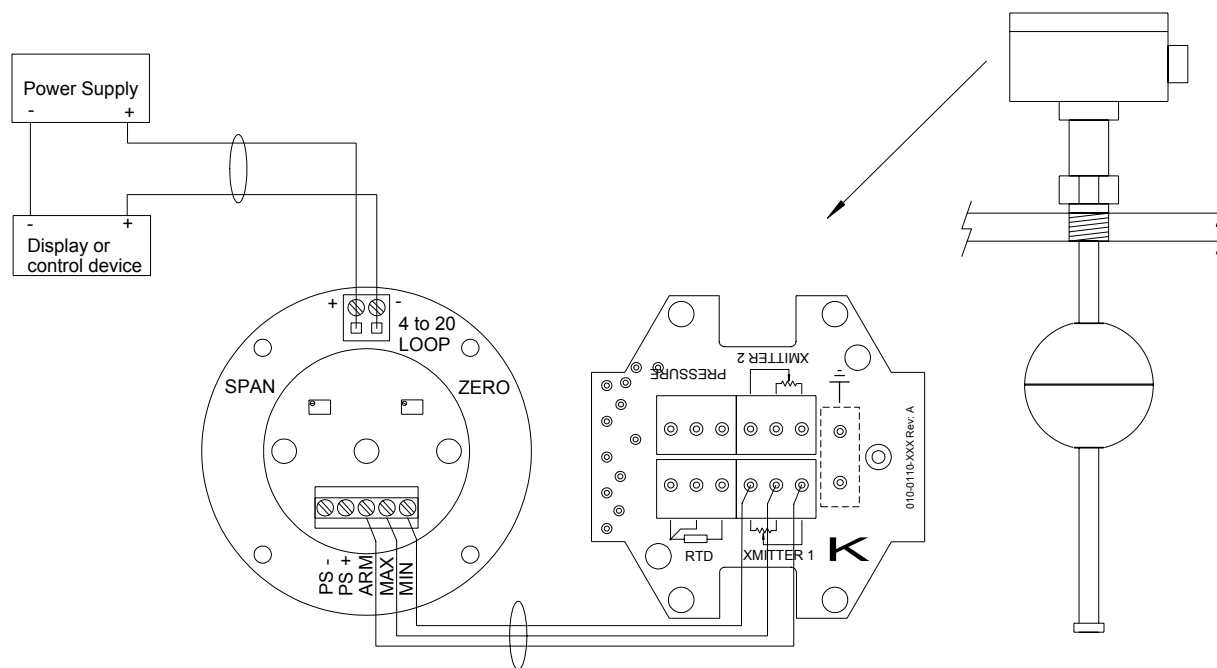


Figure 4
Explosion Proof Wiring for Transmitters With Remote Electronics

QUALIFICATION

WARNING! Make sure any tests performed in qualification do not unintentionally start any processes resulting in loss of control.

WARNING! Never open cover in hazardous areas while circuits are energized. Follow all safety work procedures and lock out circuits before servicing or inspection.

To calibrate units with built-in display, two clip leads are required to connect the indicator to the puck baseboard. Connect the clip leads in the same polarity as the indicator plugs into the baseboard making sure no shorts circuits are created; note the indicator will only plug into the baseboard one way. Units with no built-in display do not require jumpers. Power up the device using a suitable calibration source, insuring no processes will be affected during calibration. Move the float to the desired 0% position and adjust the zero adjustment potentiometer on the puck until the display reads 0% or the calibrator indicates 4 ma. Move the float to the desired 100% position and adjust the span potentiometer on the puck until the display reads 100% or the calibrator indicates 20 ma. Move the float back and forth several times to check both settings.

The indicator unit is factory calibrated to read 0% to 100% for 4 to 20 ma respectively and can be calibrated with a suitable supply by adjusting the “zero” and “span” pots of the upper board of the display unit. The pot on the lower display board should not be adjusted.

Install the indicator unit and replace the plastic label around the display. Screw the cover back on the display and tighten.

Replace and tighten the housing cover and energize the power supply for the connected control unit(s). Fill the tank in order to observe that the readout changes smoothly. The level transmitter can also be tested manually by moving the float by hand and observing the result. The 0% and 100% points should be re-checked to ensure they are set correctly.

MAINTENANCE

KSR Kuebler level transmitters operate free from maintenance and wear when used properly. A periodic visual inspection and re-qualification test should be performed at a regular interval.

QUESTIONS

For customer support please call 1-888-KSR-LEVL (577-5385) between the hours of 8:00 a.m. and 5:00 p.m. Eastern time. Please have your model number and serial number (found on the device label) handy.

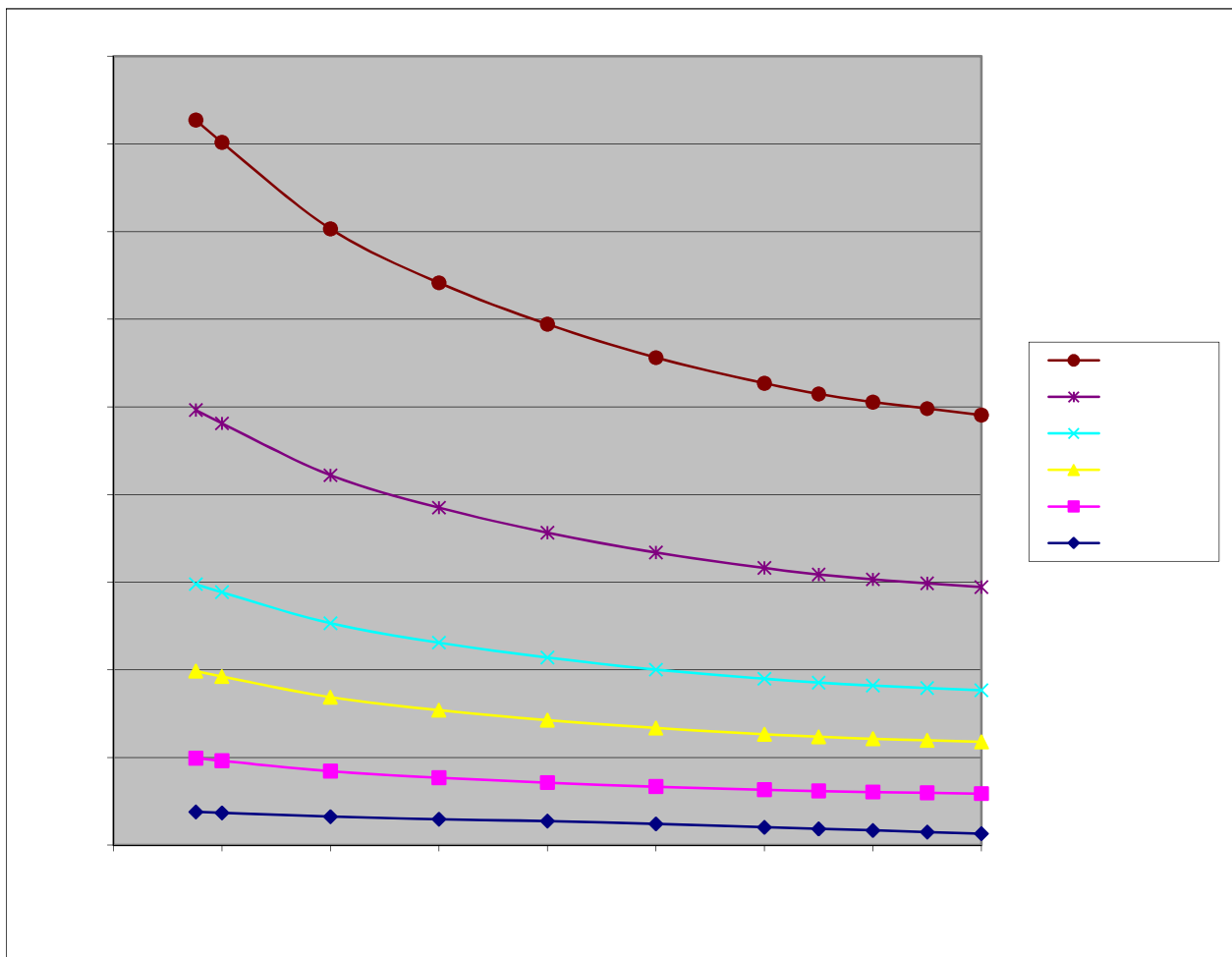
Pressure-Temperature Ratings ANSI-Flanges

acc. to ASME/ANSI B16.5 - 2003

Material group 2.2 (SS 316, SS 316 H, SS 316 Ti)

Working Pressures by Classes, in bar

Temperature in °C	150	300	600	900	1500	2500
-29 to 38	19,0	49,6	99,3	148,9	248,2	413,7
50	18,4	48,1	96,2	144,3	240,6	400,9
100	16,2	42,2	84,4	126,6	211,0	351,6
150	14,8	38,5	77,0	115,5	192,5	320,8
200	13,7	35,7	71,3	107,0	178,3	297,2
250	12,1	33,4	66,8	100,1	166,9	278,1
300	10,2	31,6	63,2	94,9	158,1	263,5
325	9,3	30,9	61,8	92,7	154,4	257,4
350	8,4	30,3	60,7	91,0	151,6	252,7
375	7,4	29,9	59,8	89,6	149,4	249,0
400	6,5	29,4	58,9	88,3	147,2	245,3



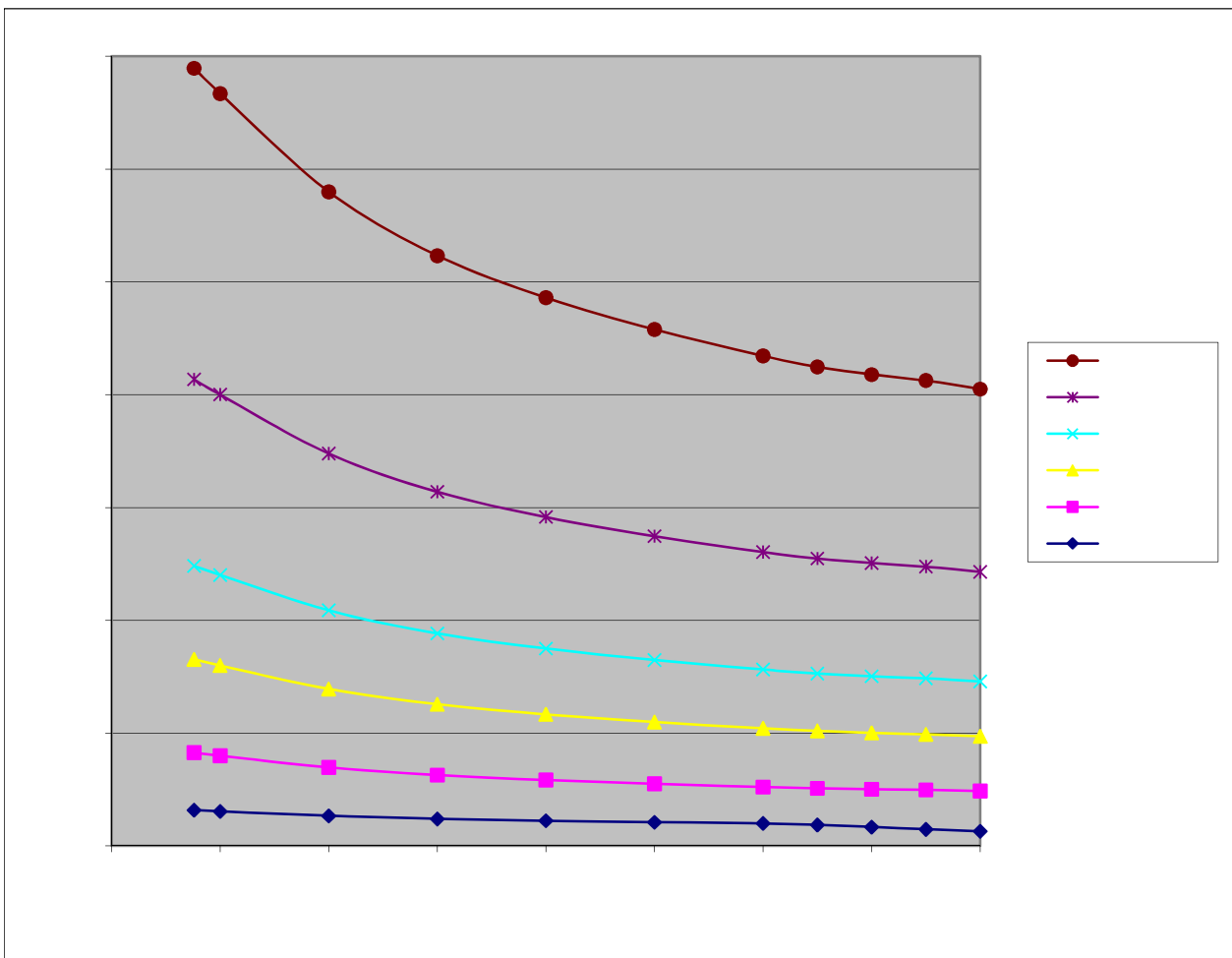
Pressure-Temperature Ratings ANSI-Flanges

acc. to ASME/ANSI B16.5 - 2003

Material group 2.3 (SS 316 L)

Working Pressures by Classes, in bar

Temperature in °C	150	300	600	900	1500	2500
-29 to 38	15,9	41,4	82,7	124,1	206,8	344,7
50	15,3	40,0	80,0	120,1	200,1	333,5
100	13,3	34,8	69,6	104,4	173,9	289,9
150	12,0	31,4	62,8	94,2	157,0	261,6
200	11,2	29,2	58,3	87,5	145,8	243,0
250	10,5	27,5	54,9	82,4	137,3	228,9
300	10,0	26,1	52,1	78,2	130,3	217,2
325	9,3	25,5	51,0	76,4	127,4	212,3
350	8,4	25,1	50,1	75,2	125,4	208,9
375	7,4	24,8	49,5	74,3	123,8	206,3
400	6,5	24,3	48,6	72,9	121,5	202,5



KSR Kuebler Limited Product Warranty

When used in accordance with the applicable documentation, all KSR Kuebler level controls are warranted free of defects in workmanship or materials to the original end-user as follows from the date of original factory shipment:

Five (5) full years for Level Switches & Magnetic Level Indicators
Two (2) full years for Level Transmitters

When returned prepaid within the warranty period and upon factory inspection of the unit and verification of a defect, KSR Kuebler will repair or replace, at its discretion, the defective unit at no cost (other than transportation). KSR Kuebler shall not be liable for direct or consequential equipment damage due to corrosion nor any incompatibility of the materials of construction of the equipment with the process and/or equipment of the user. KSR Kuebler shall not be liable for any type of damage, or loss, direct or consequential, due to misapplication, mis-specification, misuse, damage due to mechanical or electrical overloading, improper mounting, or failure of the device. KSR Kuebler shall not be liable for any direct or consequential damage, expense, or labor claims stemming from the use or installation of KSR Kuebler equipment. Any unauthorized modification, repair or rework of KSR Kuebler equipment renders this warranty null and void.

THE WARRANTIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER STATUTORY, EXPRESS OR IMPLIED (INCLUDING ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ALL WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE).



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