

Application Data Sheet



Leak Detection Pipeline Pump Seal

KAYDEN[®]

Pump Mechanical Seal Leak Detection

Application Pump Mechanical Seal Leak Detection

Product Kayden CLASSIC 812 Series Flanged Thermal Dispersion Flow, Level, Interface & Temperature Switch & Transmitter

Description

Flow and liquid level detection in drain line systems.

Problem

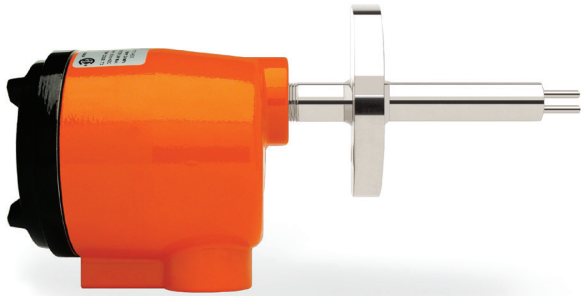
Pumps require a form of mechanical seal, these seals will eventually break down and leak. Determining the point of failure is achieved by routine monitoring of the seal. Seal leak can be tolerated by directing the fluid into a recovery system by use of a drain line that directs the fluid into a storage container.

How is it determined when the leak is occurring and to what degree? The Kayden CLASSIC 800 Series Flow, Level, Interface and Temperature Switch/Transmitter will help you determine whether or not to shut down the pump or send out a maintenance crew to service the mechanical seal.

Solution

A common "Pipeline Leak Detection" setup for **No Flow Condition, Pump Protection:**

- Staff can monitor the storage container and recover the leaked fluid, however, the storage container will quickly be overwhelmed if the seal fails and floods the recovery system.
- Monitor inside the drain to detect if there is a fluid present and if so inform the relevant party.
- Monitor the liquid level in the drain pipe while monitoring the flow rate. It is now possible to choose both an alarm point and a shut-down point using the Kayden CLASSIC 800 Series Switch/Transmitter.



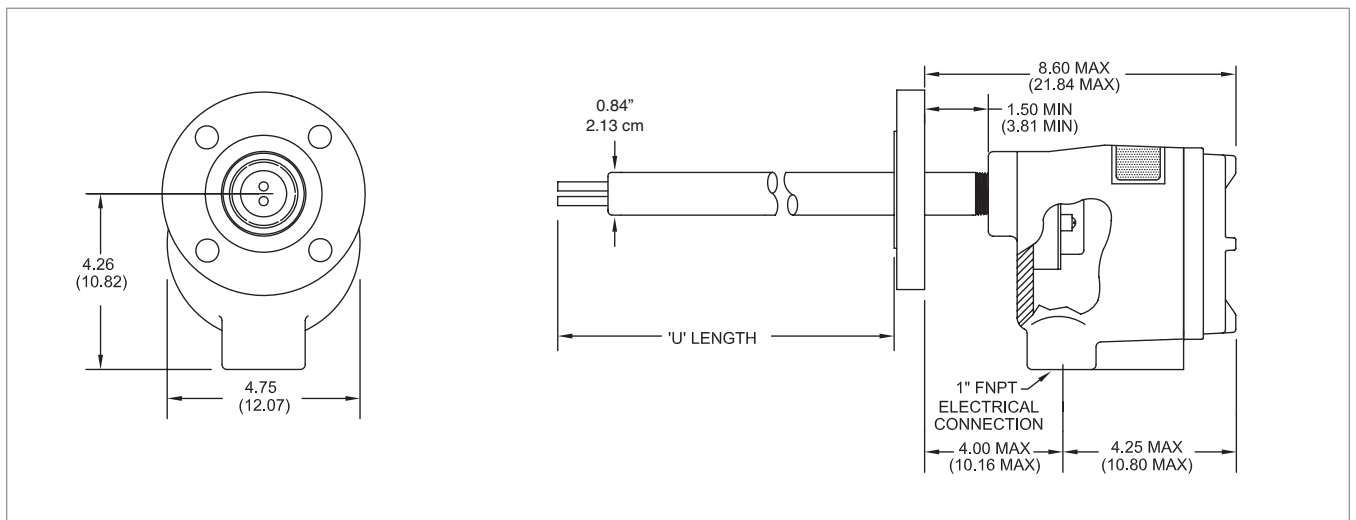
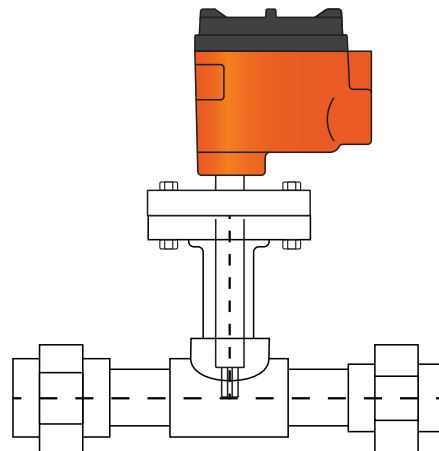
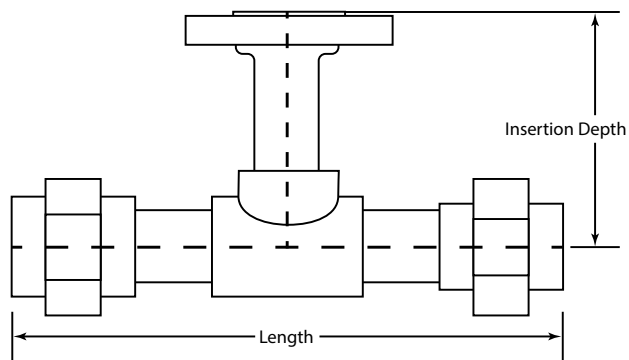
Kayden CLASSIC® 812



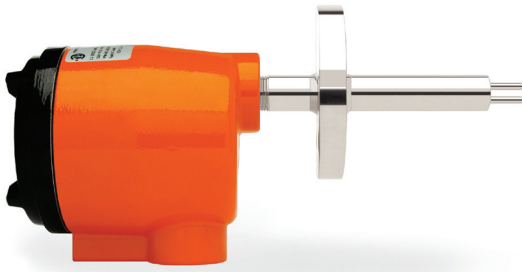
CLASSIC® 812 with Customer Specified T



Customer Specified T



CLASSIC® 812 Flanged



Flow, Level, Interface & Temperature Switch & Transmitter

- Flanged Process Connections - 316/316L Stainless Steel Sensor standard
- Exotic Alloys, Custom 'U' Lengths and Remote Mounted Electronics Available
- Digital Microprocessor Technology - Settings configurable by user for Flow, Level, Interface & Temperature Sensing
- No Jumpers - All Configurable Options are stored in Non-Volatile Memory
- CSA/ANSI UL Flameproof Class I, Div. 1, Groups B, C & D
- 316/316L Stainless Steel & Exotic Alloy versions designed to ASME Section VIII Div. 1 2007 Latest Addenda and/ or to be inserted in system complying with ASME/ANSI B31.3-2006 +2007 Addenda. Canadian Registration Number (CRN): 0F09437.2

Display Panel & Intelligent User Interface

The KAYDEN CLASSIC 800 Series Electronics Module is designed for quick and easy setup.

Display Panel Indicators:

- Relay 1 & 2
- Set Point 1 & 2
- Fault Alarm
- Run Mode
- Start-up Bypass Timer (for pump control)
- LED Bar Graph for Flow Rate, Level or Interface Indication

- Universal Power 12-24 VDC & 115-230 VAC standard
- Two SPDT Relays - independently adjustable
- 4-20 mA Analog Output
- "Smart Heater" function for power economy and increased heater life
- Start-up Bypass Timer (for pump control)

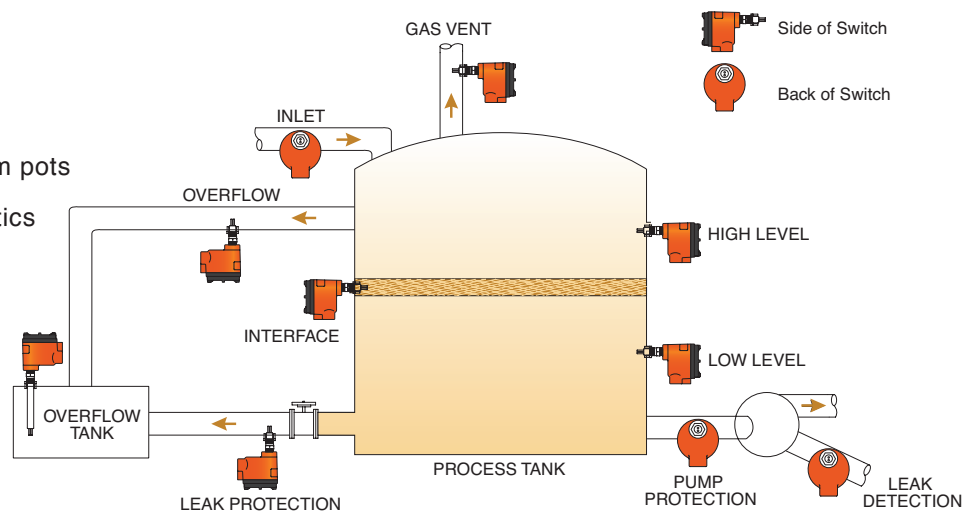
Configuration Mode Features

- Adjustable Sensitivity
- Zero & Span Adjustment
- Modbus Addressable

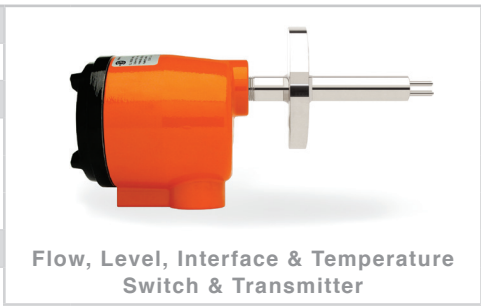
Electronics Modules Feature

- Easy setup; no jumpers or trim pots
- Continuous Self-test Diagnostics with Fault Indicator
- Temperature Compensation

Applications



812	CODE	Sensor Type																
	R	-55°C to +200°C (-58°F to +392°F) Continuous Service																
	CODE	Sensor Material																
	A	316/316L Stainless Steel																
	X	Titanium Gr. 2																
	T	Hastelloy C-276																
	CODE	Process Connection - Flange Type																
	A	Raised Face																
	B	RTJ - Ring Type Joint																
	CODE	ANSI	CODE	ANSI	CODE	ANSI	CODE	ANSI	CODE	ANSI	CODE	ANSI	CODE	ANSI	CODE	ANSI		
		1"		1-1/2"		2"		3"		4"		5"		6"		8"		10"
	121	150	131	150	141	150	151	150	161	150	171	150	181	150	191	-	201	-
	122	300	132	300	142	300	152	300	162	300	172	300	182	-	192	-	202	-
	123	600	133	600	143	600	153	600	163	600	173	-	183	-	193	-	203	-
	124	900	134	900	144	900	154	900	164	900	174	-	184	-	194	-	204	-
	CODE	Flange Material																
	A	316/316L Stainless Steel																
	X	Titanium Gr. 2																
	T	Hastelloy C-276																
	CODE	Insertion 'U' Lengths 2.5" - 120" 6.4 cm - 305 cm in 1/2" 1.0 cm increments.																
	IXXXX	Custom 'U' Lengths: Use 4 digits preceded by an 'I' (i.e. 3.5" 'U' = I0035) ('M' = cm)																
	CODE	Input Power																
	C	12-24 VDC and 115-230 VAC, 50 to 60 Hz																
	CODE	Electronics																
		Microprocessor Controlled with User Interface.																
		Two SPDT fully sealed relay contacts. Modbus via RS-485. 4-20 mA current loop.																
	CODE	Local Enclosure																
	1	Flameproof - Aluminum																
	CODE	Cover - For Local Enclosure																
	B	Blind Cover - Flameproof																
	G	Glass Lens Cover - Flameproof																
	CODE	Remote Electronics Enclosure & Cover																
	0A	Not Required																
	1G	Glass Lens Cover - Flameproof																
	CODE	Agency Approvals																
	1	cCSA _{us} (UL Standards)																
	3	cCSA _{us} (UL Standards) & CRN																
	CODE	Language																
	E	English																
812	R	A	A	131	A	I0035	C		1	G	0A	1	E					



Flow, Level, Interface & Temperature Switch & Transmitter

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Model Number Legend
DOC#: ML-812-006

ML-812-006-[004]

CLASSIC® 812 Specifications

Applications

- Flow, Level, Interface & Temperature

Process Connections

- Flanged

Insertion ‘U’ Lengths

- **Custom Lengths:**
Available in 1/2” or 1 cm increments
Min. 1.2” - Max. 120” (3.0 - 305 cm)

Wetted Materials

- 316/316L Stainless Steel standard
- Titanium Gr. 2, Hastelloy® C-276

Enclosure Material

- Copper-free Aluminum
(does not exceed 0.4% copper)
- Powder Coated Polyester TGIC
(polyestertriglycidyl isocyanurate)
- NEMA 4X / Type 4 / IP55
- 1” FNPT Conduit Connection
- Buna O-ring on Cover

Temperature Range – Continuous Service

- **Sensors:**
-55°C to +200°C (-58°F to +392°F)
- **Electronics:**
-55°C to +65°C (-67°F to +149°F)

Note: For temperatures above +65°C (+149°F) electronics must be remotely mounted.

- **Storage:**
Product should be stored in a clean and dry environment between -30°C and +60°C (-34.5°F and 140° F)

Operating Pressure - Sensor

Flanged Style

- Maximum Working Pressure:
per flange rating

Switch Point Range

- **Water-based Liquids:**
0.01 to 3.0 ft./sec. (0.003 to 0.9 meters/sec.)
- **Hydrocarbon-based Liquids:**
0.01 to 5.0 ft./sec. (0.003 to 1.5 meters/sec.)
- **Gases:**
0.25 to 254 sfps (0.076 to 77 smps)
Standard conditions: 21°C (70°F) at 14.7 psi (1 atm)



Display Panel

Display Panel Indicators:

- Relay 1** On steady when Relay 1 is energized
- Relay 2** On steady when Relay 2 is energized
- Fault** Indicates a self-test error or fault condition
- Set Point 1** On steady when viewing Set Point 1
- Set Point 2** On steady when viewing Set Point 2
- Run Mode** Flashing when switch is operating
- Bypass** Flashing when the Start-up Bypass Timer is active

Thermal Signal Displays Thermal Signal

The Thermal Signal increases as:

- Flow** The flow rate increases
- Level** The sensor is submerged
- Interface** The sensor is submerged by the second liquid of greater thermal conductivity

CLASSIC® 812 Specifications

Accuracy

- **Flow Service:**
±1% set point velocity
over operating range of ±28°C (±50°F)
- **Level Service:**
±0.25 inches (±0.64 cm)

Response Time

- Approximately 0.5 to 30 seconds

Remote Electronics Option

- Maximum recommended cable length - 200 feet (60 m)
- Cable type - 24 AWG minimum - twisted pairs

Heater Power

- Field adjustable to optimize performance

Input Power

- Universal Power standard
12-24 VDC and 115-230 VAC, 50-60 Hz
- Consumption Maximum 6.0 Watts

Outputs

- 4-20 mA current loop
- Two (2) SPDT sealed relay contacts
rated @ 5 amps resistive 230 VAC or 30 VDC
Max.; individually adjustable

Start-Up Bypass Timer

- Adjustable for 0 to 100 seconds

Communications

- Modbus via RS-485

RCMS (Remote Control & Monitoring Software) Functions and Features

- Display Panel Lock-Out
- Set Points configuration¹
- Relay Actuation Delay Timer
 - Independently configurable for both On and Off, increasing or decreasing
 - Adjustable from 0 - 5,000 seconds
- Start-up Bypass Timer¹
 - Adjustable from 0 - 100 seconds
- Relay Mode Configuration¹

- Energized above or below set point
- Relay Temperature Mode Configuration
- Heater Power setting¹
- Zero and Span settings¹
- Analog (4-20 mA) output configuration¹
- View and Print Graphing (Trend) function
- Configuring settings; write to device, save to file and print
- Fault Event Log

Note:¹ Also configurable from Display Panel

Diagnostics

- Primary watchdog circuit monitors microprocessor parameter anomalies
- Secondary watchdog circuit monitors microprocessor health
- Heater monitored for out-of-range conditions
- Fault Mode de-energizes relay(s) and halts power to the heater

Agency Approvals

- **CSA - ANSI/UL**
Class I, Div. 1, Groups B, C and D;
Ex d IIB + H₂; AEx d IIB+H₂
(Class I, Zone 1, Group IIB + H₂,)
T3; Enclosure Type 4 / IP55
- **Single Seal Approval**
Per ANSI/ISA 12.27.01-2003
- **CRN - Canadian Registration Number**
 - 1" & 1-1/2": 0F13787.2C
 - 2" to 10": 0F13773.2C



Weights and Dimensions

- 812 Flanged: 1-1/2" 300#, 7" U length - 16 lbs (7.25 kg) (for example)
- Carton Size - 15" x 8" x 8" (38 cm x 20 cm x 20 cm) (for example)

Warranty

- One (1) Year from shipment date from factory (see Terms & Conditions on kayden.com for details)

Ordering Information

Order Online

kayden.com Use our website to order your Kayden products. Please know that your local Authorized Distributor is supported whether you place orders online, via telephone, or email.

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Hours Monday – Friday 8:00 a.m. – 5:00 p.m. MST

Mailing Address 3364–114th Avenue S.E., Calgary, Alberta, Canada T2Z 3V6

Contact a Local Distributor

Distributors

Visit kayden.com to find a local Distributor near you. Distributors provide local inventory, technical support & service.



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