Model 515

Application LK01

Leak Monitor

for Volumetric Frequency Flowmeters

Features

- **Monitors critical applications as Leakage Vs Time**
- **Alarms on unacceptable degree of leakage**
- **Tailored for volumetric frequency flowmeters**
- **Leak Preset value is accessed via the front panel**
- **Remote RUN, STOP & RESET inputs available**
- **Outputs and relays used to indicate leak monitor status**
- **Allows for non-linear correction of flow input**
- **Storage of 1000 transactions with time and date stamp**
- **Selection of Detail or Basic main menu to suit operator and application**
- **Available protocols on communication ports including Printers, Modbus RTU & TCP/IP**

Overview

The 515-LK01 Leak Monitor is designed to be part of an accurate and reliable monitoring and alarm system for critical processes where not more than acceptable volume is allowed to pass in a given time. A primary example of this is in the cooling processes in power generation plants where it is critical to monitor the loss/usage of coolant (water) in a system. This can be important to monitor for cooling performance or environmental concerns.

This application operates as a "Leak Monitor" with a programmable preset value and a programmable internal timer to activate an alarm when the preset value is reached before the timer expires. It is designed to operate with an external NO/NC relay to act as a fail safe relay with the ability to raise an alarm on a power fail or whenever the unit is not monitoring the rate of leakage.

The instrument is compatible with a wide range of volumetric frequency flowmeter outputs, including millivolt signals, reed switches, Namur proximity switches and pulse trains.
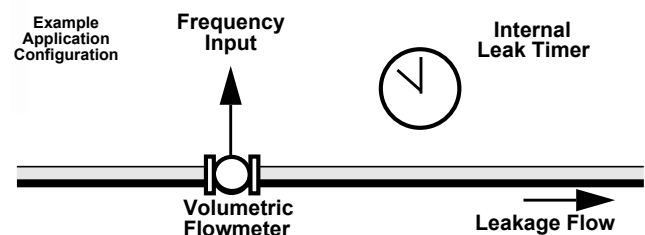
Calculations

The total and flowrate are derived from accurately measured frequency and the number of received pulses.

volume = pulses / k-factor

volume flow = frequency / k-factor

Leak Timer is maintained accurately by a precise internal clock and is displayed and recorded in minutes and seconds.

Example Application Configuration — Frequency Input — Internal Leak Timer — Volumetric Flowmeter — Leakage Flow

A c c u r a c y • Q u a l i t y • P e r f o r m a n c e

Displayed Information

The front panel display shows the current values of the input variables and the results of the calculations. A list of the variables for this application and their type (total or rate) is shown at the end of this document.

The instrument can be supplied with a real-time clock for storage of up to 1000 transactions with time and date stamps.

Communications

There are two communication ports available as follows:

- COM-1 RS-232 port
- COM-2 RS-485 port (optional) or Ethernet (optional)

The ports are available for remote data reading, printouts and for initial application loading of the instrument.

Isolated Outputs

The opto-isolated outputs are dedicated logic outputs, where OUT1 provides an Exception Active signal and OUT2 provides a Monitor Mode Active signal. One output is standard, a second output is available as an option.

Relay Outputs

The relay output 1 is dedicated as the Primary Status Relay (monitor mode) and relay output 2 is able to be used as assignable alarm. The advanced option provides another two relays that can be used as fully programmable alarms for any rate type variable.

Software Configuration

The instrument can be programmed to suit the particular application needs and the flexible I/O can be assigned as required. Program settings can be changed either via the front panel (depending on assigned access levels) or via the 500 Series Program Manager (500-PM software).

The instrument stores all set-up parameters, totals and logged data in non-volatile memory with at least 30 years retention.
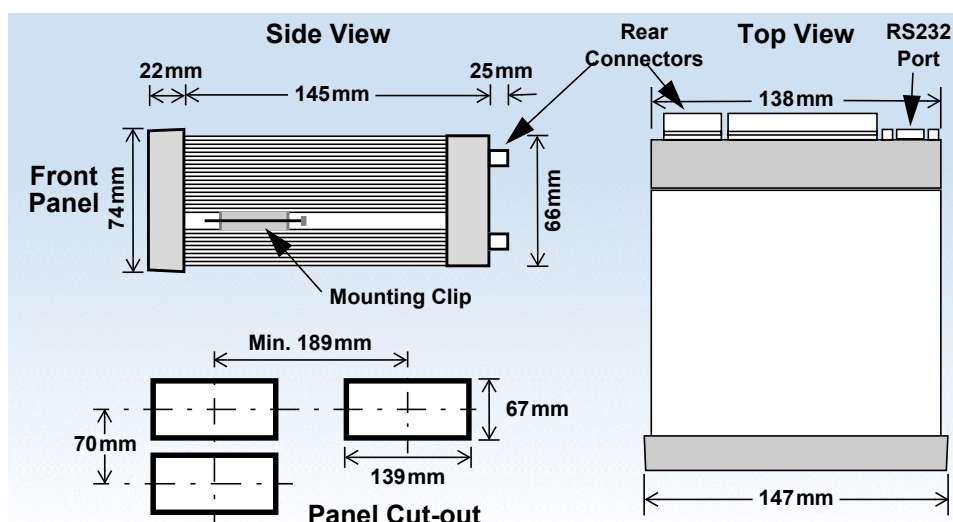
Terminal Designations

	Terminal Label		Designation	Comment
1	FINP	1+	Frequency Input 1+	Volumetric Flow Input
3	SG	-	Signal ground	
15	Vo	+	8-24 volts DC output	Overload protected
16	G	-	DC Ground	
17	Vi	+	DC power input	DC power in 12-28V
18	SH	E	Shield terminal	
19	RS485	+	RS485 (+)	Optional RS485 port may be replaced by Ethernet port.
20	COM-2	-	RS485 (-)	
21	port	G	RS485 ground	
22		1+	Switch 1	Remote Run
23		2+	Switch 2	Remote Stop
24	LOGIC INPUTS	3+	Switch 3	Remote Reset
25		4+	Switch 4	CAL Switch – In field access protection
26		C-	Signal ground	
27	OUT1	+	Output ch 1 (+)	Exception Active
28		-	Output ch 1 (-)	
29	OUT2	+	Output ch 2 (+)	Monitor Mode Active
30		-	Output ch 2 (-)	
31		RC	Relay Common 1-2	*Term 31 - Common 1-4 on legacy option card*
32		R1	Relay 1	Primary Status Relay (Monitor Mode)
33	RELAYS	R2	Relay 2	
34		R3	Relay 3	
35		R4	Relay 4	
36		RC	Relay common 3-4	*Term 36 only available on new style option card*
E	AC MAINS	E	Mains ground	AC power in 100-240VAC
N		N	Mains neutral	
A		A	Mains active	
RS232 COM-1 port			9-pin serial port	

Dimension Drawings

Part Number

515.XXXXXX-LK01
see **Product Codes** to select required features

Default Application software:
515-LK01-000000

Side View

22mm 145mm 25mm

Front Panel 74mm 66mm

Mounting Clip

Rear Connectors Top View RS232 Port

138mm

147mm

Min. 189mm

70mm 67mm 139mm

Panel Cut-out

Specifications

Operating Environment

Temperature	+5°C to +40°C (standard - no coating) -20°C to +60°C (with conformal coating) -30°C to +60°C (ExD housing with heater)
Humidity	0 to 95% non condensing (conformal coating) 5% to 85% non condensing (no coating)
Power Supply	100-240 V AC (+/-10%) 50-60 Hz (+/-10%) or 12-28 V DC
Consumption	10W (max) Overvoltage category II
Protection	Sealed to IP65 (Nema 4X) when panel mounted
Dimensions (panel option)	147mm (5.8") width 74mm (2.9") height 170mm (6.6") depth (behind the panel)

Display

Type	Backlit LCD with 7-digit numeric display and 11-character alphanumeric display
Digits	15.5mm (0.6") high
Characters	6mm (0.24") high
LCD Backup	Last data visible for 15min after power down
Update Rate	0.3 second

Non-volatile Memory

Retention	> 30 years
Data Stored	Setup, Totals and Logs

Approvals

Electrical & Interference	UKCA, CE, CSA compliance
Enclosure	Ex d Enclosure - ATEX & IECEx available for hazardous area (CSA Pending). Field Mount Enclosure - UKCA, CE, CSA safe area weather proof enclosure. Other - RoHS compliant

Real Time Clock (Optional)

Battery Type	3 volts Lithium button cell - For Issue 7 option card, type CR2450N manufactured by Renata only - For conformal coated 'C' version, type BR2032 manufactured by Panasonic only - For non-conformal coated versions, type BR2032 and CR2032 manufactured by Panasonic or Sony
Battery Life	5 years (typical)

Frequency Input (General)

Range	0 to 10kHz for Pulse input type 0 to 5 kHz for Coil & NPS input types
Overvoltage	30V maximum
Update Time	0.3 sec
Cutoff frequency	Programmable
Configuration	Pulse, coil or NPS input
Non-linearity	Up to 10 correction points

Pulse

Signal Type	CMOS, TTL, open collector, reed switch
Threshold	Signals switch below 1.3 & above 2 volts

Coil

Signal Type	Turbine and sine wave
Sensitivity	15mV minimum amplitude (typical)

NPS

Signal Type	NPS sensor to Namur standard

Logic Inputs

Signal Type	CMOS, TTL, open collector, reed switch
Overvoltage	30V maximum

Relay Output

No. of Outputs	2 relays plus 2 optional relays
Voltage	250 volts AC, 30 volts DC maximum (solid state relays use AC only)
Current	3A maximum - mechanical relays 1.5A maximum - solid state relays

Communication Ports

Ports	COM-1 RS-232 port COM-2 RS-485 or Ethernet port (optional)
Baud Rate	2400 to 19200 baud
Parity	Odd, even or none
Stop Bits	1 or 2
Data Bits	8
Protocols	ASCII, Modbus RTU, Modbus TCP/IP (Ethernet Port), Printer

Transducer Supply

Voltage	8 to 24 volts DC, programmable
Current	70mA @ 24V, 120mA @ 12V maximum
Protection	Power limited output

Isolated Output

No. of Outputs	2 outputs
Configuration	Digital output

Digital Output

Signal Type	Open collector
Switching	200mA, 30 volts DC maximum
Saturation	0.8 volts maximum

Important: Specifications are subject to change without notice.

Ordering Information

Product Codes

Model	Supplementary Code							Dĸescription
515	**.**					-	**LK01**	
Enclosure	1							Panel mount enclosure
	2/7							Field mount enclosure (NEMA 4X / IP66) (7 specifies heater included)
	3/5							Explosion proof Ex d (IECEx/ATEX), metric glands (5 specifies heater included)
	4/6							Explosion proof Ex d (CSA), NPT glands (6 specifies heater included)
Output Options		0						4 logic inputs, 1 isolated output, 2 relays (only relay type 1 is available), RS232 (DB9) communication port
		1						4 logic inputs, 2 isolated outputs, 4 relays, real-time clock data logging, RS232 (DB9) and RS485 communication ports
		2						4 logic inputs, 2 isolated outputs, 4 relays, real-time clock data logging, RS232 (DB9) & Ethernet communication ports
Relay Type			1					Electromechanical relays only
			2					2 electromechanical relays (1-2) and 2 solid state relays (3-4)
			3					Solid state relays only
Power Supply				U				Inputs for 12-28VDC and 100-240 VAC, 50-60Hz *(Previous Models: A = 110/120 VAC, E = 220/240 VAC)*
				D				Input for 12-28VDC power only
Display Panel Option					S			Standard option (now with backlight & LCD backup) *(original Full option: F, with Infra-Red comms, no longer available)*
PCB Protection						C		**Conformal coating** - required for maximum environmental operating range. Recommended to avoid damage from moisture and corrosion.
						N		**None** - suitable for IEC standard 654-1 Climatic Conditions up to Class B2 (Heated and/or cooled enclosed locations)
Application Pack Number							LK01	Defines the application software to be loaded into the instrument

Example full product part number is 515.111USC-LK01 (this is the number used for placing orders).

Main Menu Variables

Main Menu Variables	Default Units	Preferred Units	Variable Type
Leak Volume	L		Total
Flowrate	L/min		Rate
Leak Timer	- - -		- - -
Leak Preset	- - -		- - -
Leak Timer Preset	- - -		- - -

500 Series in BZC Ex d enclosure

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Contrec Ltd	**Contrec - USA, LLC**	**Contrec Systems Pty Ltd**
Riverside, Canal Road	916 Belcher Drive	5 Norfolk Avenue
Sowerby Bridge, West Yorkshire	Pelham, Alabama	Ringwood, Victoria 3134
HX6 2AY United Kingdom	AL 35124 United States	Melbourne Australia
Tel: +44 1422 829944	Tel: +1 (205) 685 3000	Tel: +61 413 505 114
Email: sales@contrec.co.uk	Email: contrec@contrec-usa.com	Email: info@contrec.com.au

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