CARREL-ELECTRADE LTD
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NEW ZEALAND MADE

R-LVL LEVEL CONTROLLER

R-LVL level controller for conductive liquids

- **Monitoring of up to 4 different levels**
- **Pump fill, pump empty or combined pump fill & empty**
- **Low level AC voltage probe excitation**
- **Adjustable sensitivity, automatic adjustment option**
- **35mm DIN rail enclosure**
- **Optional alarm output (relay)**
- **2 or 3 10A relay outputs**

The R-LVL level controller has up to four separate level inputs and two or three relay outputs. This enables two pump fill and empty operations to be done with one controller. An optional third relay output can be used to signal alarm conditions in two pump fill and empty operations.
The controller can also do single pump fill or empty operations with optional high and low level alarms.
Level control is achieved by monitoring the apparent resistance between a common probe and a number of other probes positioned at the required control levels. A low level AC voltage on the common probe is used to measure the resistance. The low level AC voltage is safe and prevents corrosion due to electrolysis.
DIP switches on the side of the R-LVL controller are used to set the operating function and sensitivity.
The unit has four different sensitivity settings which enable it to be used in a wide variety of applications, from low resistance (salt water) to high resistance liquids (clean water). An automatic setting adjusts the sensitivity to best suit the detected input resistance range.
Unused inputs are connected to either C(ommon) or Lo(w) to disable them.

The R-LVL level controller has built in logic which can recognise fault conditions on the level sensor inputs. This will cause the unit to turn off the relay control outputs and set the alarm.

Order code: R-LVL-(supply voltage)
Sample order codes: R-LVL-230V - supply 230V ac

Specifications

Inputs	Up to four level inputs sensing a low level ac voltage induced from the common probe	
Excitation		: 4Vac
Sensitivity	DIP switch selectable	: <=10k Ohms, <=50k Ohms, <=150k Ohms or automatic
	Usable resistance range	: 1k Ohms to 470k Ohms
Startup delay		: 5 seconds
Relay output	Single pole change over relay contacts	
		: AC1(non-inductive) 2500VA, 10A 250Vac
		: AC15(inductive) 500VA, 2A 250Vac
		: DC1 30V/10A, 110V/0.3A, 220V/0.12A
		: AgNi contacts for resistive to slightly inductive loads, inrush currents <25A
Supply		: 24Vac, 110Vac, 230Vac. 3VA max.
Isolation	Galvanic isolation between level sensing inputs, relay outputs and the supply	
	Test voltage	: 4kV rms 50Hz for 1 minute
	Impulse	: 5kV 1.2/50µsec waveform
Temperature	Operating	: -10°C to +20°C to +50°C
	Storage	: -20°C to +70°C
Housing	Fire retardant blend PC/ABS in gray DIN rail mounting (EN 60715)	
Terminals	Plug in polarised with rising clamp, nickeled copper alloy clamp and terminal with galvanised steel screw Suitable for up to 2.5mm^2 stranded conductor	
EMC compliance		: AS/NZS 61000.6.3:2012

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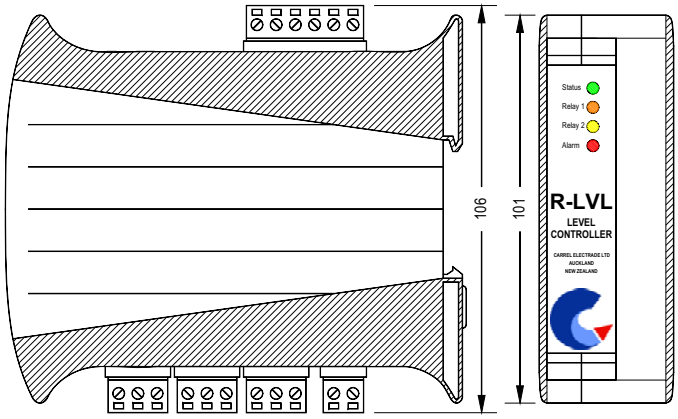
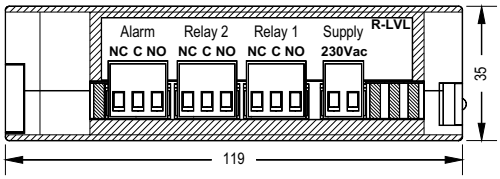
23 March 2021

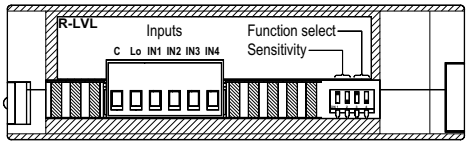
R-LVL LEVEL CONTROLLER

Housing Dimensions

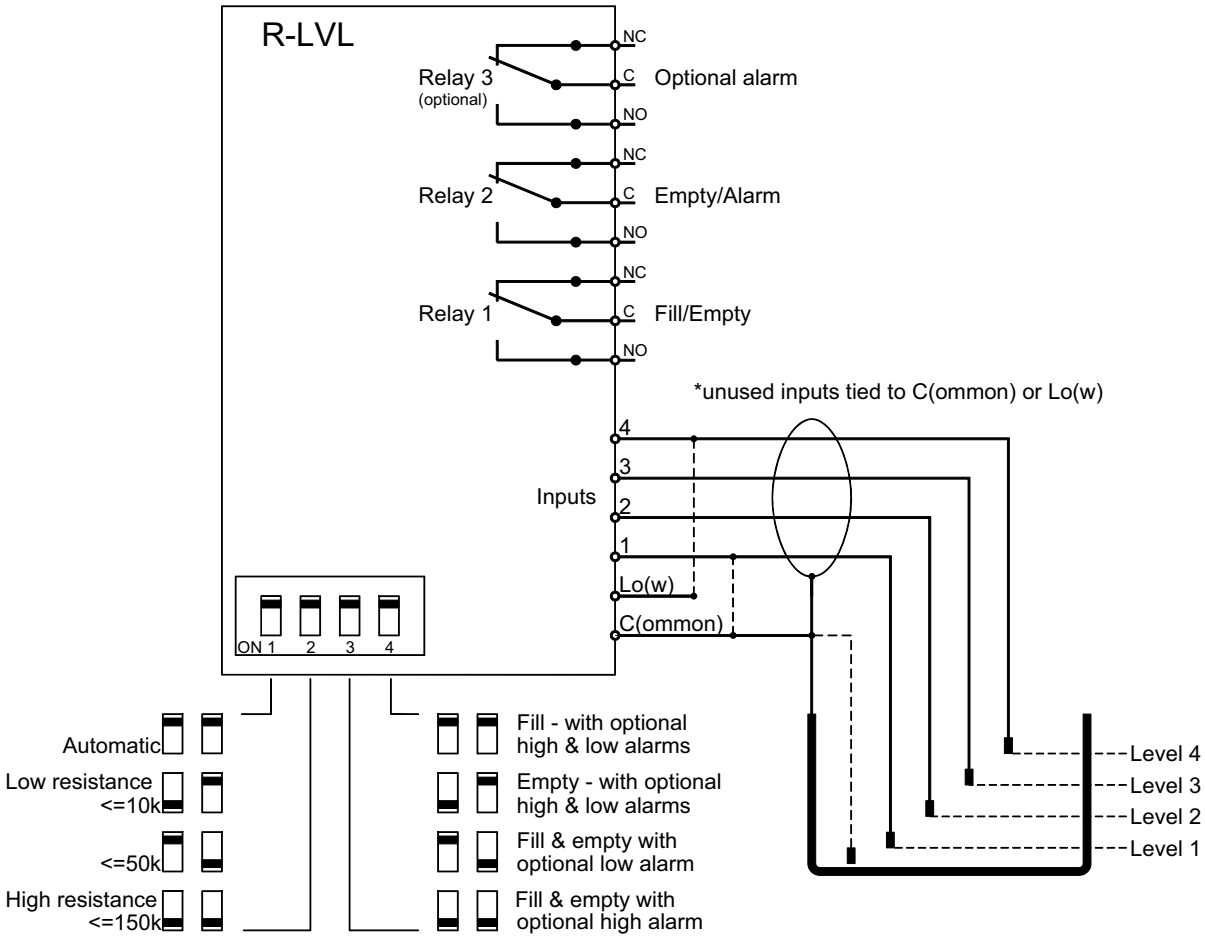


Status LED flash sequence
- Level < IN1
- IN1 < Level < IN2
- IN2 < Level < IN3
- IN3 < Level < IN4
- Level > IN4
- Error

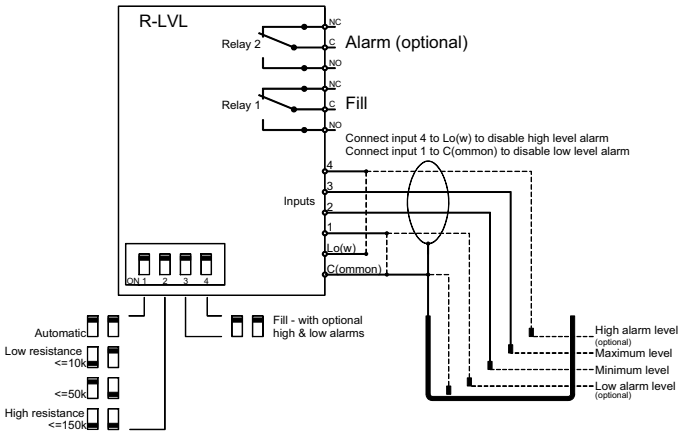




Connection Diagram

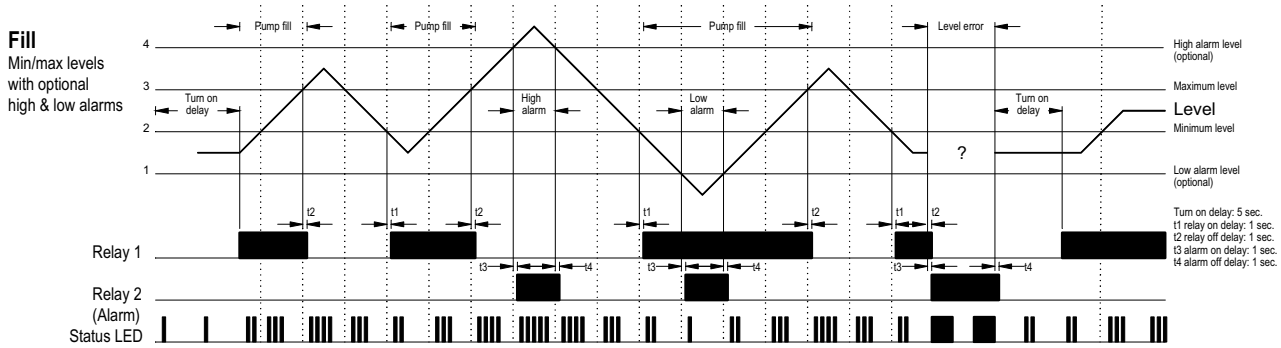


Fill with optional high & low alarms
With minimum and maximum levels

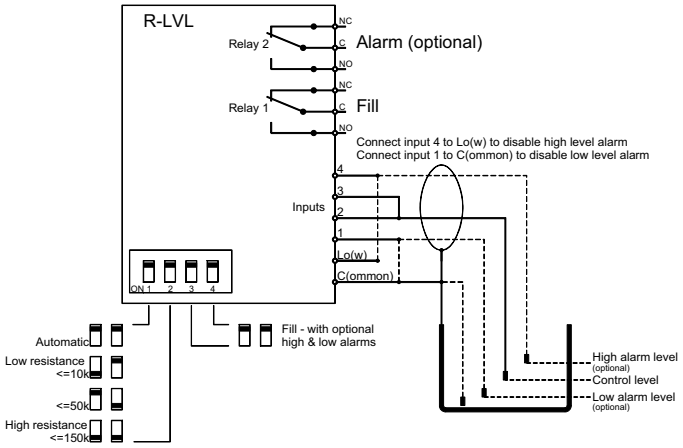


Single pump fill with minimum & maximum level operation. Optional high and low level alarms.
After the turn on delay **Relay 1** will turn on if the fluid level is below the minimum level. **Relay 1** will turn off when the fluid level reaches the maximum level.
Relay 2 (Alarm) will turn on if **Input 1** or **Input 4** is wired to be active and the level is below the low alarm level or above the high alarm level. **Relay 2 (Alarm)** will turn off when the alarm condition clears.
Relay 2 (Alarm) will also turn on if the controller sees an **Error** condition on the inputs, i.e. if **Input 3** maximum level is sensed but **Input 2** minimum level or **Input 1** low alarm level is not sensed.
After the error condition clears, **Relay 2** will turn off after a turn on delay.

Note. Input 1 must be connected to **C** if not used and **Input 4** must be connected to **Lo** if not used.

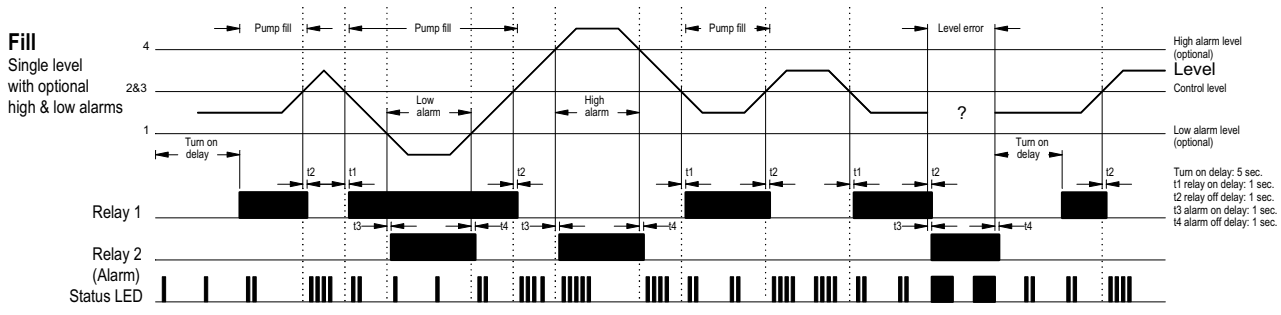


Fill with optional high & low alarms
With single level control

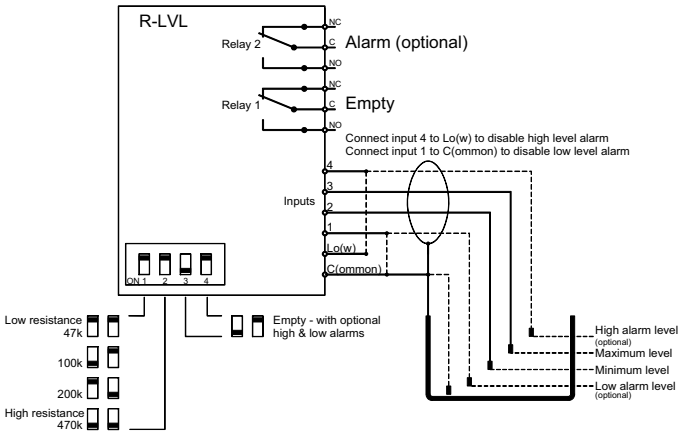


Single pump fill with single control level operation. Optional high and low level alarms.
After the turn on delay **Relay 1** will turn on if the fluid level is below the control level. **Relay 1** will turn off when the fluid level reaches the control level.
Relay 2 (Alarm) will turn on if **Input 1** or **Input 4** is wired to be active and the level is below the low alarm level or above the high alarm level. **Relay 2 (Alarm)** will turn off when the alarm condition clears.
Relay 2 (Alarm) will also operate if the controller sees an **Error** condition on the inputs, i.e. if **Inputs 2 & 3** control level is sensed but **Input 1** low alarm level is not sensed.
After the **Error** condition clears, **Relay 2 (Alarm)** will turn off after a turn on delay.

Note. Input 1 must be connected to **C** if not used and **Input 4** must be connected to **Lo** if not used.

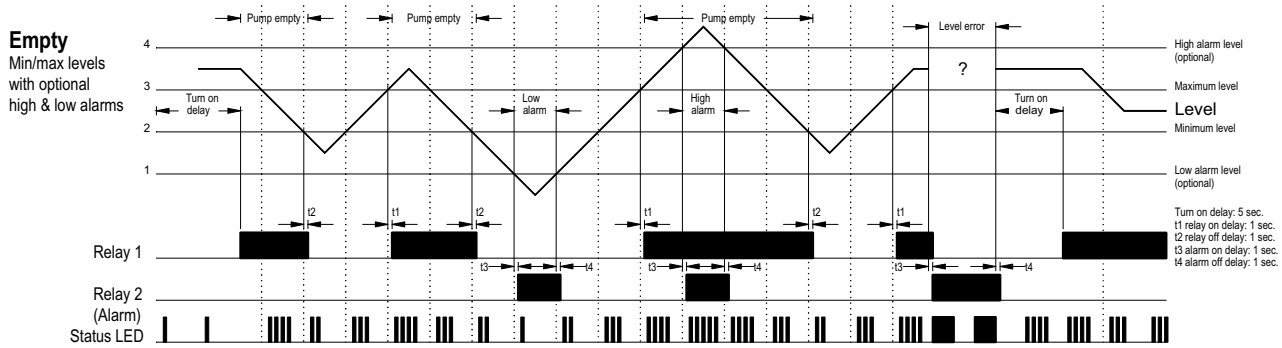


Empty with optional high & low alarms
With minimum and maximum levels

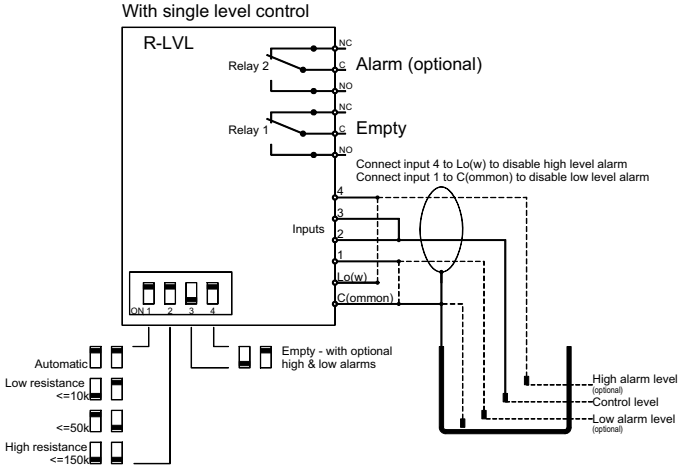


Single pump empty with minimum & maximum level operation. Optional high and low level alarms.
After the turn on delay **Relay 1** will turn on if the fluid level is above maximum. **Relay 1** will turn off when the fluid level falls to the minimum level.
Relay 2 will operate if **Input 1** or **Input 4** is wired to be active and the fluid level is below the low alarm level or above the high alarm level. **Relay 2** will turn off when the alarm condition clears.
Relay 2 will also operate if the controller sees an **Error** condition on the inputs, i.e. if **Input 3** maximum level is sensed but **Input 2** minimum level or **Input 1** low alarm level is not sensed.
After the error condition clears, **Relay 2** will turn off after a turn on delay.

Note. Input 1 must be connected to **C** if not used and **Input 4** must be connected to **Lo** if not used.

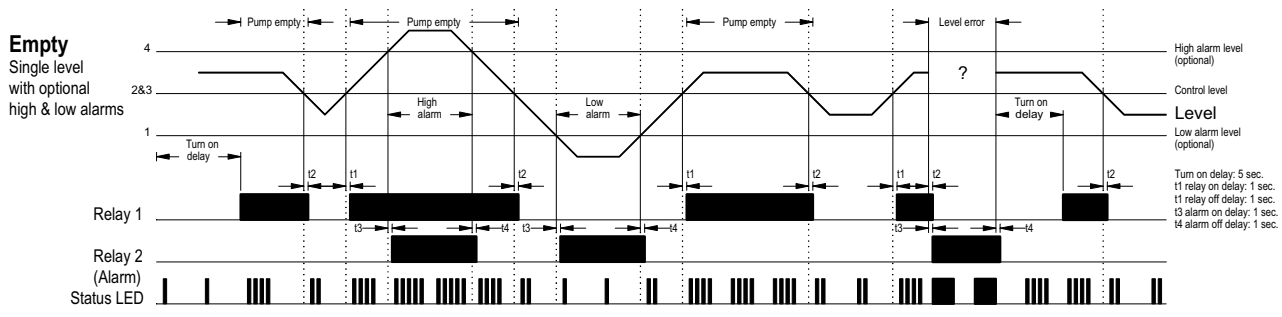


Empty with optional high & low alarms
With single level control

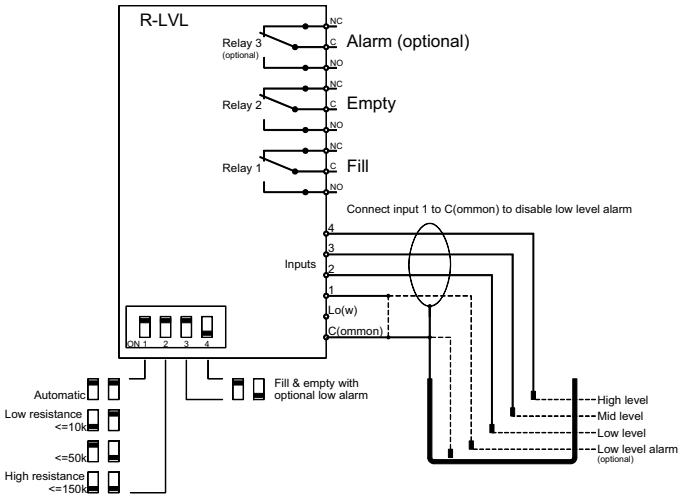


Single pump empty with single control level operation. Optional high and low level alarms.
After the turn on delay **Relay 1** will turn on if the fluid level is above the control level. **Relay 1** will turn off when the fluid falls below the control level.
Relay 2 (Alarm) will turn on if **Input 1** or **Input 4** is wired to be active and the level is below the low alarm level or above the high alarm level. **Relay 2 (Alarm)** will turn off when the alarm condition clears.
Relay 2 (Alarm) will also operate if the controller sees an **Error** condition on the inputs, i.e. if **Inputs 2 & 3** control level is sensed but **Input 1** low alarm level is not sensed.
After the error condition clears, **Relay 2 (Alarm)** will turn off after a turn on delay.

Note. Input 1 must be connected to **C** if not used and **Input 4** must be connected to **Lo** if not used.

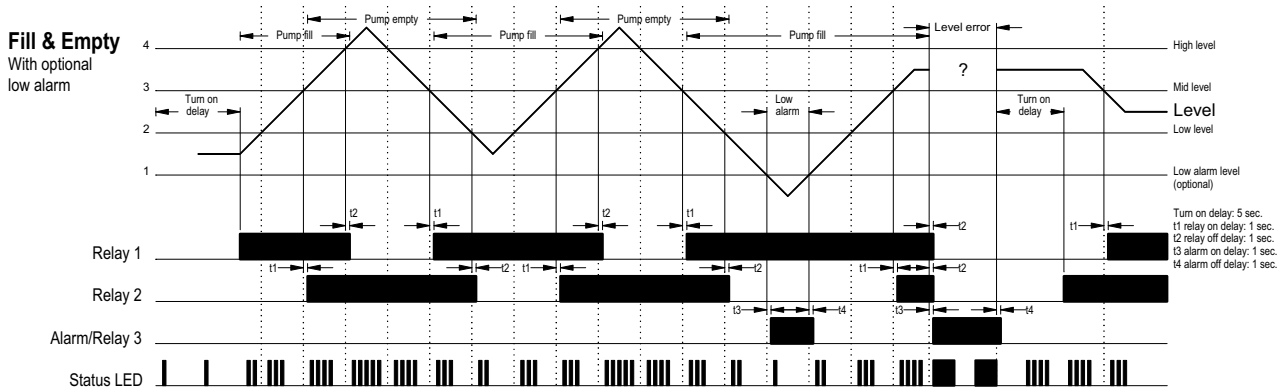


Fill & empty with optional low alarm

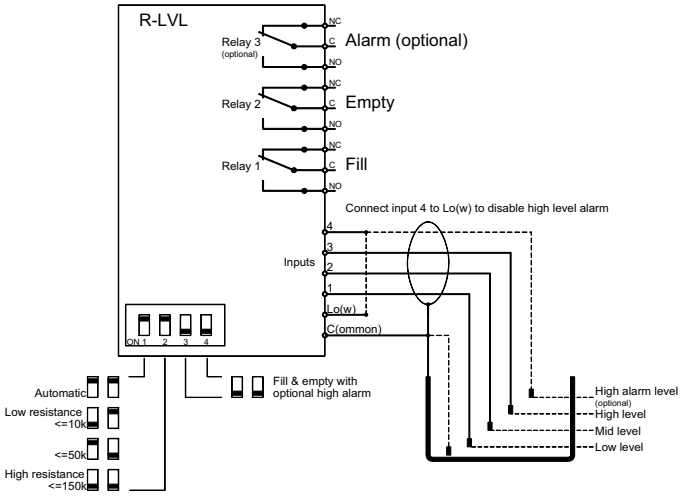


Two pump fill and empty operation with optional low alarm level.
After the turn on delay **Relay 1** will turn on if the fluid level is below the mid level. **Relay 1** will turn off when the fluid level reaches the high level. **Relay 1** will turn on when the fluid levels falls below the mid level.
After the turn on delay **Relay 2** will turn on if the fluid level is above the mid level. **Relay 2** will turn off when the fluid level falls below the low level. **Relay 2** will turn on when the fluid level rises above the mid level.
An **Alarm** condition will occur if **Input 1** is wired to be active and the fluid level is below the low alarm level. The **Alarm** will turn off when the alarm condition clears. If **Relay 3** is fitted it will turn on during alarm conditions.
If the controller sees an error condition on the inputs, i.e. if **Input 3** mid level is sensed but **Input 2** low level or **Input 1** low alarm level is not sensed, the controller will signal an **Error** condition and turn off the level control outputs. If **Relay 3** is fitted it will turn on.
After the **Error** condition clears, normal operation will resume after a turn on delay. If **Relay 3** is fitted it will turn off.

Note. Input 1 must be connected to **C** if not used.

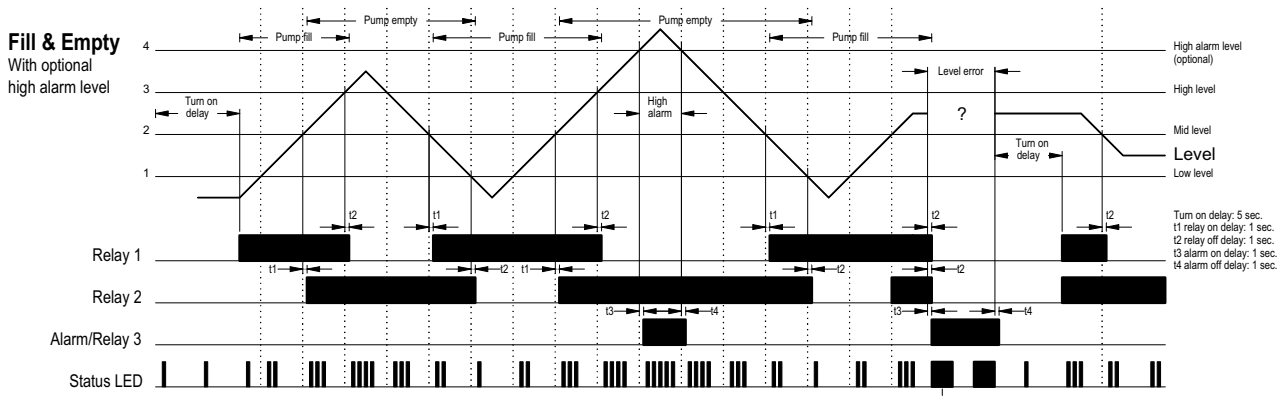


Fill & empty with optional high alarm

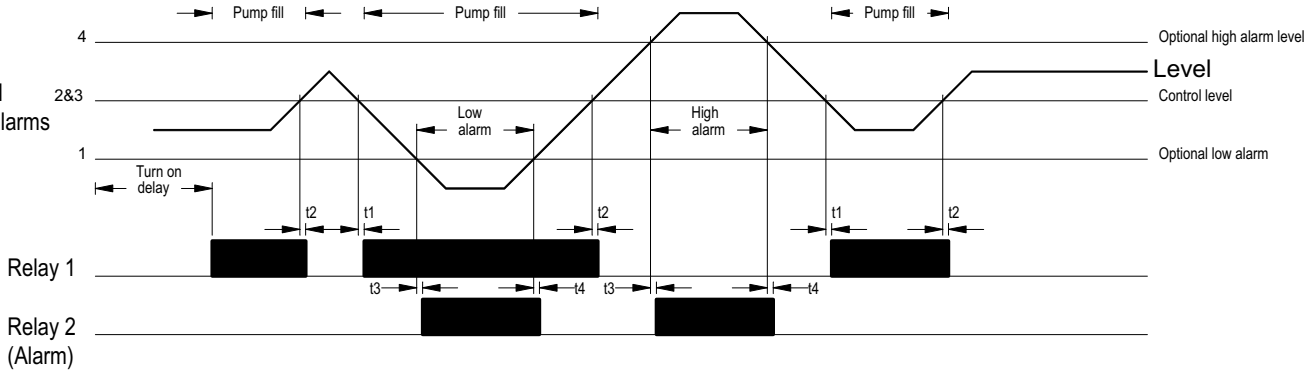


Two pump fill and empty operation with optional high alarm level.
After the turn on delay **Relay 1** will turn on if the fluid level is below the mid level. **Relay 1** will turn off when the fluid level reaches the high level. **Relay 1** will turn on when the fluid levels falls below the mid level.
After the turn on delay **Relay 2** will turn on if the fluid level is above the mid level. **Relay 2** will turn off when the fluid level falls below the low level. **Relay 2** will turn on when the fluid level rises above the mid level.
An **Alarm** condition will occur if **Input 4** is wired to be active and the fluid level is above the high alarm level. The **Alarm** will turn off when the alarm condition clears. If **Relay 3** is fitted it will turn on during alarm conditions.
If the controller sees an **Error** condition on the inputs, i.e. if **Input 3** high level is sensed but **Input 2** mid level or **Input 1** low level is not sensed, the controller will signal an **Error** condition and turn off the level control outputs. If **Relay 3** is fitted it will turn on.
After the error condition clears, normal operation will resume after a turn on delay. If **Relay 3** is fitted it will turn off.

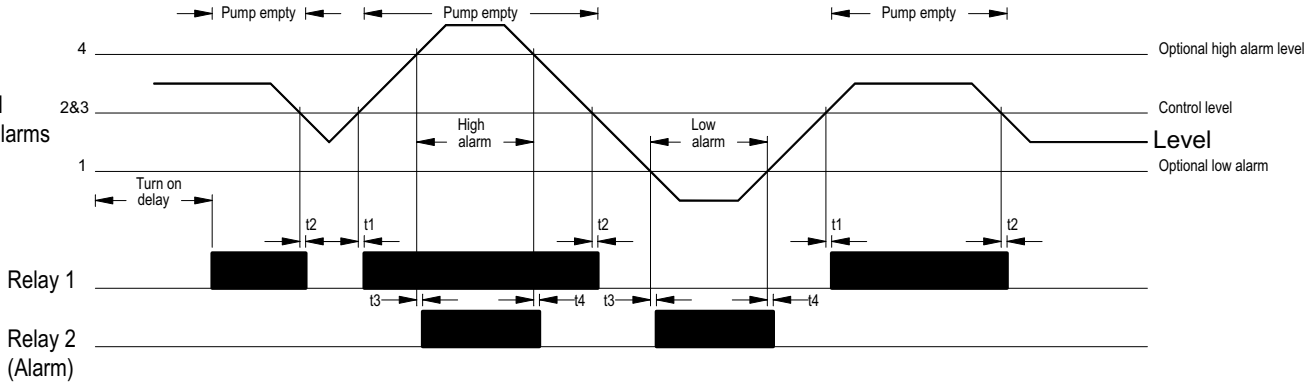
Note. **Input 4** must be connected to **Lo** if not used.



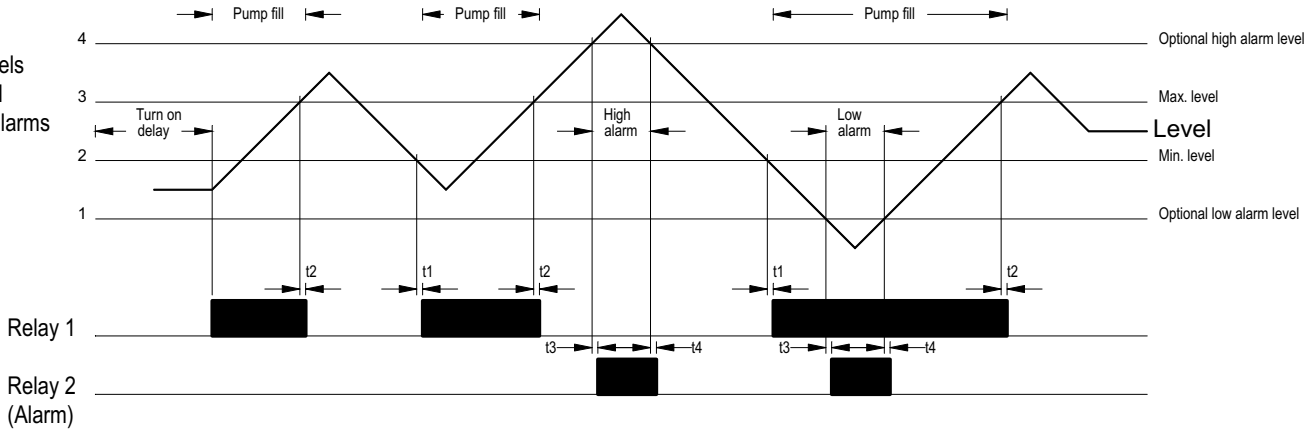
Fill
Single level
with optional
high & low alarms



Empty
Single level
with optional
high & low alarms

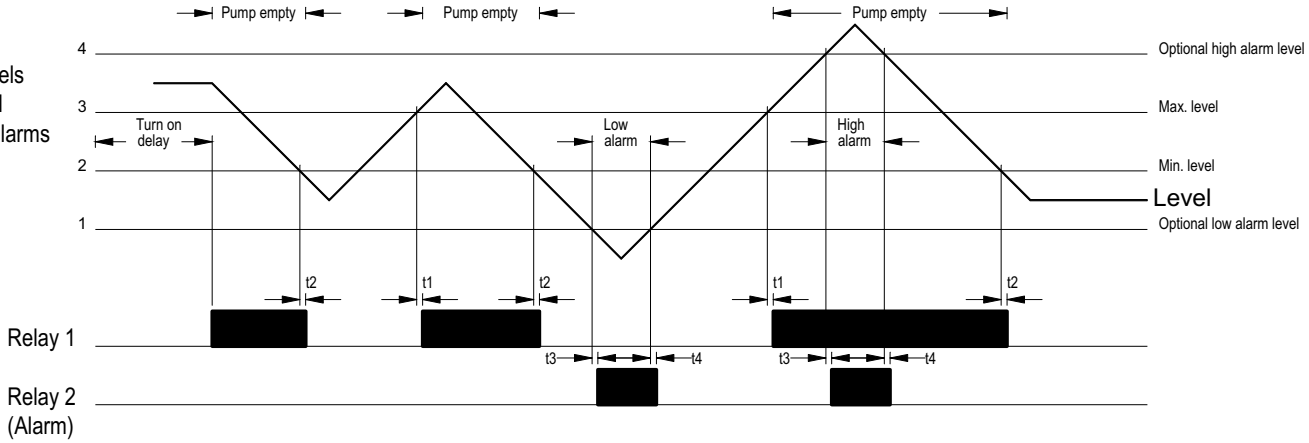


Fill
Min/max levels
with optional
high & low alarms



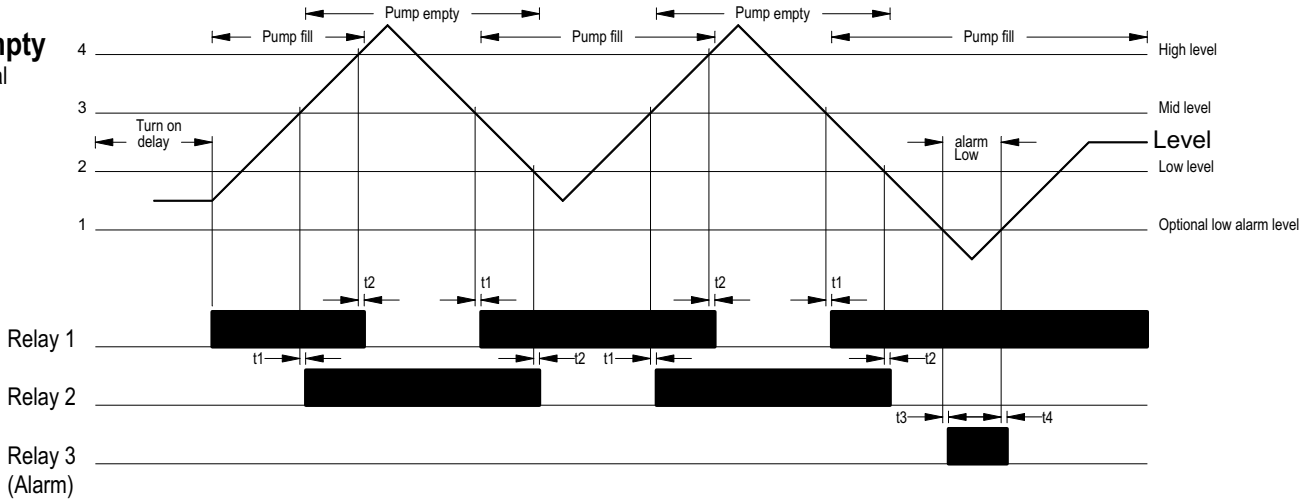
Empty

Min/max levels with optional high & low alarms



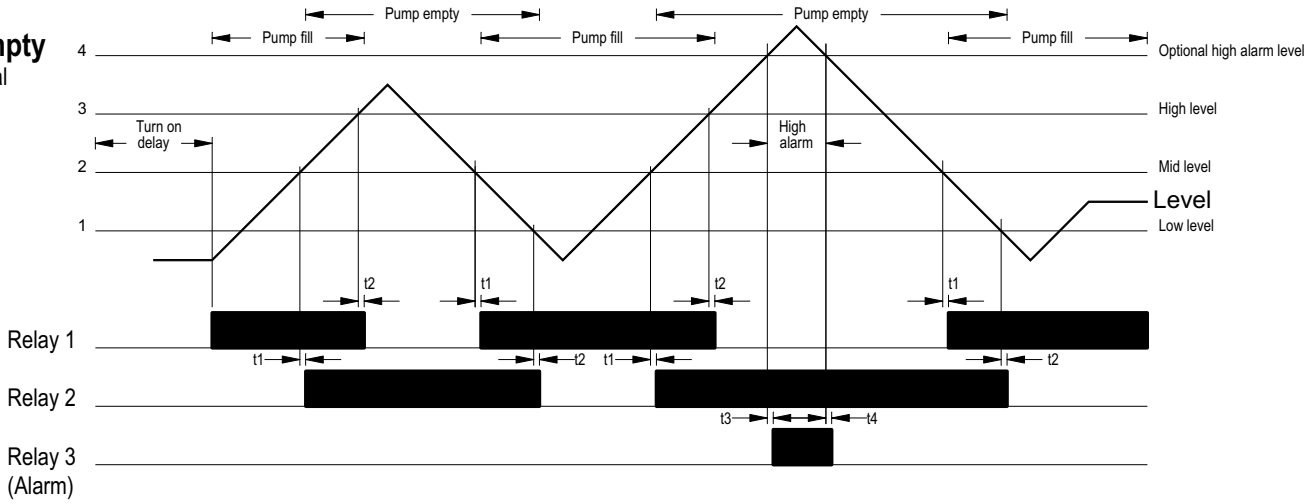
Fill & Empty

With optional low alarm



Fill & Empty

With optional high alarm



t1 relay on delay, t2 relay off delay

t3 alarm on delay, t4 alarm off delay