VIP5 Plus Controller

Control system for small and medium size Lubrication Systems

Software Version 3.0

User Operating and Maintenance Manual

Original text translation

CONTENT

Manual compiled in accordance with Directive 06/42 CE

C2161IE – WK 01/24

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ATTENTION: ***Automatic Control device***
This control device is designed to automatically activate solenoid valve, motors, pumps and other control devices based on timer or other inputs.
Failure to follow safety information may lead to serious personal injury.

1. INTRODUCTION

Thank you for purchasing the *Dropsa* ***VIP5 Plus controller – The control device for Lubrication Systems***

The Controller subject of this operating and maintenance manual is an evolution of the Vip5 family of advanced lubrication control system. It maintains all its basic features and has additional functions and features such as the ability to directly switch on/off three-phase pump and other devices.

It is possible to obtain the latest documentation by visiting our website, www.dropsa.com
This manual contains important operating and safety information for users of this product. It is essential that you carefully read this manual and conserve a copy with the product so that other users may consult it at any time.

1.1 DEFINITION OF LUBRICATION AND STANDBY PHASE, LUBRICATION PHASE, AND LUBRICATION CYCLE

In this manual the **LUBRICATION PHASE** and **LUBRICATION CYCLE** refer to the specific instances when the lubrication pump is operating to provide lubrication in a system.
The **LUBRICATION CYCLE** is made up of: ***Cycle Start*** -> ***Control*** of a sensor device -> ***Delay*** time to allow sensor device to stabilize -> ***Wait*** Time before another Cycle Start. This sub-cycle can be repeated as many times as required and the completion of this repetition is considered the **LUBRICATION PHASE.** Fig. 1 illustrates this graphically.

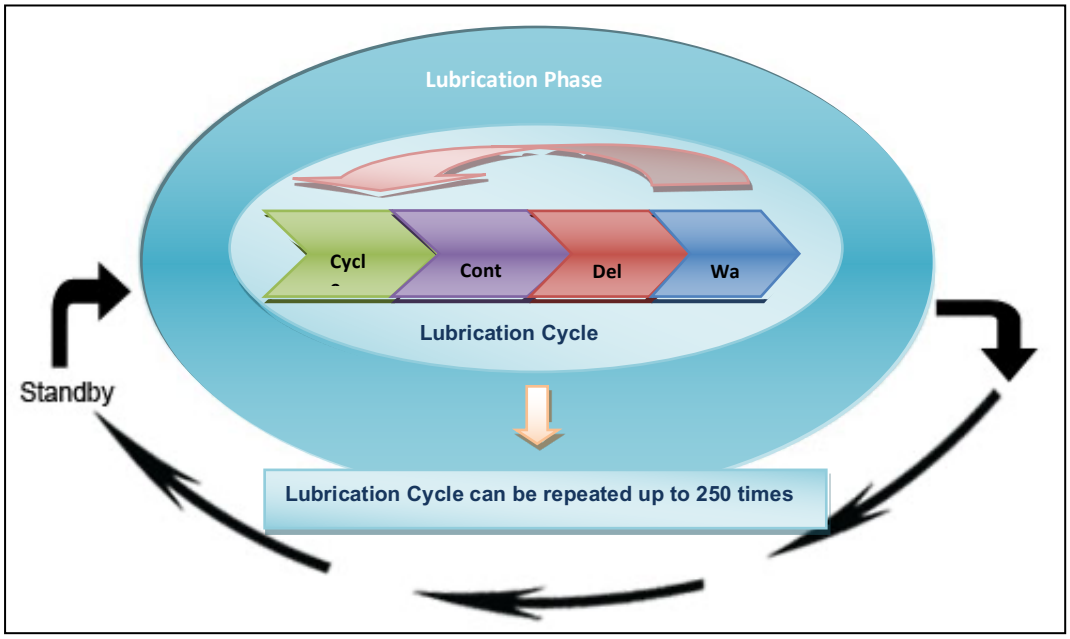


Fig.1 A Lubrication Phase can comprise of many Lubrication Cycles

The **STANDBY PHASE** defines the interval between each **LUBRICATION PHASE**.

2. PRODUCT FEATURES

VIP5 Plus offers many functions, the following brief summary are:

- Integrated LCD Display for diagnostic and ease of use;
- Diagnostic and Lubricant Counters for Operation and Alarm conditions;
- Three separate inputs (to monitor Dual line pressure switches, progressive cycle switch, injector pressure switch and external signals to use as a counter for standby or lubrication phase);
- Signal Inputs can be NPN, PNP or a Clean Contact (or Namur style switching);
- Time or counter based determination of both Lubrication and Standby Phase;
- Counter based Lubrication phase can be used independently while monitoring correct function of a cycle switch, ideal for use in impulse piloted system (e.g. chain and conveyor lubrication);
- Ability to configure pump output for Electrical or pneumatic pump (pump On/Pump Off values can be set individually);
- General Alarm Output Relay can be a constant signal or generate a coded alarm to allow remote PLC to determine nature of alarm;
- Monitoring and indication of the thermal protection trip input;
- Minimum Level Input;
- 4..20mA Input for analogue measurement of Reservoir Level;
- Maximum level monitoring;
- Separate remote output signalling for Minimum Level alarm and General Alarm conditions;
- 4-20 mA continuous input level monitoring;
- Ability to control line invertor valves for dual line systems with pneumatic or electromagnetic actuators;
- Ability to power input and output circuits using different power sources;
- Ability to isolate the voltage of the inverter valve power circuit from the main power framework.

All configuration parameters can be set from the Setup menu via the LCD display using the front panel keys. No complex internal switches need to be set.

3. DESCRIPTION OF OPERATING PROCEDURES

The **VIP5** controller has three operating modes:

1. **CYCLE**
2. **PULSE**
3. **FLOW**

CYCLE and PULSE modes are designed for intermittent or continuous lubrication system that requires the control of a pump and monitoring of feedback signals to determine when lubrication has successfully completed.

FLOW is designed as a monitoring only operating mode that allows the user to monitor a pulse signal and determine the actual flow rate. This is useful for process control and generally used in re-circulating systems.

3.1 CYCLE and PULSE Control System operating Principles.

The VIP5 control system is designed to control intermittent or continuous lubrication system with a variety of control inputs. Intermittent operating principle is based on three distinct phases.

- **PRELUBE Phase -> Pre Lubrication that occurs during power up of a system.**
- **LUBRICATION Phase (Lube –> Wait stages) -> This is when lubricant is provided (as above)**
- **STANDBY Phase -> The system is inactive awaiting for the next LUBRICATION PHASE**

Additionally, the VIP5 Control system can also be used as a simple monitoring device in the “FLOW” operating Mode described later in this manual.

3.1.1 PRELUBE Phase

The user can specify the number of lubrication cycles up to a maximum of 250.

If Prelube is set to zero, the VIP5 controller will not perform any pre-lubrication; in this case if the START parameter setting is "Resume", when the system is turned on it will revert to its pre-power down, or it will start from a lubrication cycle if the setting of the start is "Lube".

When Prelube is set greater than zero, pre-lubrication will start in the following cases:

- When the VIP5 Plus system is powered on;
- After the RESET button is pressed;
- After the VIP5 exists from the SETUP menu.

3.1.2 LUBE (Lubrication) Phase

The Lubrication Phase is a set of Lubrication Cycles that can be repeated up to 250 times.
A Lubrication ***Cycle*** consists of activating the lubrication pump, then ***Control*** monitoring a feedback signal from a sensing device if installed. There is then ***Delay*** period before switching off the pump, and a ***Wait*** period before the lubrication cycle can be repeated. Specifically:

- ***Cycle*** (time) determine how long to wait for the control signal before determining an alarm condition.
- ***Control*** (Type) determines what kind of control signal (Single Line, Dual Line, Injectors). Alternatively a Timer only setting means no monitoring will occur.
- ***Delay*** (time): Is how long to wait for the signal to be confirmed and switch off the pump (in Pressure switch applications).
- ***Wait*** (time): determines how long to wait in a pump off condition before repeating the cycle. This is necessary in injector systems and represents the minimum time required for the injectors to reset. In progressive systems for example this can be set to zero.

3.1.3 STANDBY Phase

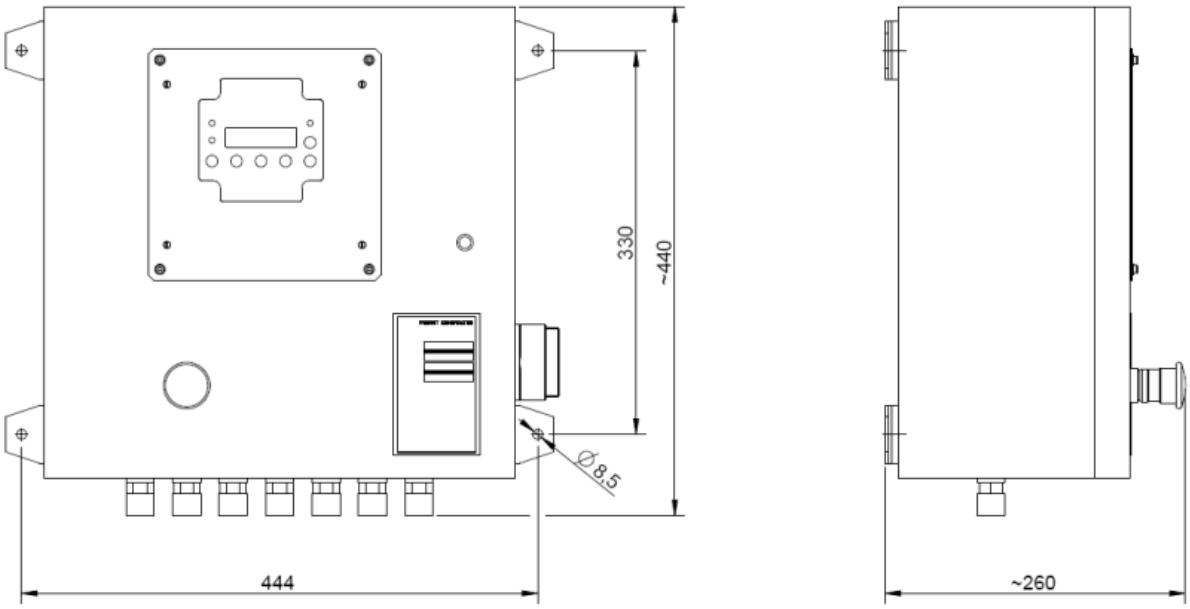
During the ***Standby*** the VIP5 switches off the pump and waits for the start of another ***Lubrication Phase***. The duration of the ***Standby*** phase can be determined by a countdown timer or a by an external pulse signal that can be used as a counter. The VIP5 also allows a combination of both timer and external pulse signals to determine either the next Lubrication phase or to signal an alarm if external pulse signals are not received within a pre-set time.

3.2 FLOW MODE OPERATING PRINCIPLES

The VIP5 can also be used as a simple Flow monitoring system. When ***Flow*** mode is selected the unit operates as a flow display and monitors an external signal to calculate the flow based on external impulses. The User can additionally set a minimum and maximum Flow limit. If the flow is out of these limits, the remote alarm contact and the alarm LED on the front panel are both activated.

4. FIXING AND INSTALLATION DETAILS

Following shows the maximum dimensions and mounting positions of the panel.



4.1 UN-PACKING

Once the installation point has been identified, you can unpack the VIP5 Plus from its shipping box. Check that the unit has not been subject to any damage during transport. Dispose of the packaging in an appropriate manner, following local waste regulations.

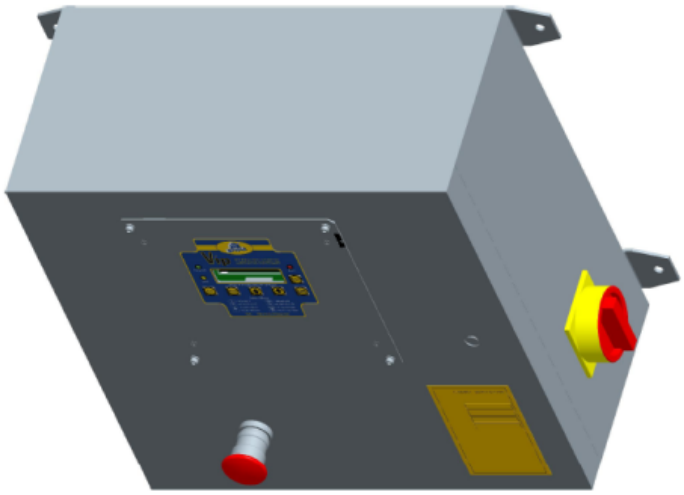


Fig. 2 ***VIP5 Plus***

4.2 INSTALLATION

The VIP5 Plus must be secured physically to a mounting location and cabled to all the required components of the lubrication system.

The following are general recommendation:

- Install the unit in an easy to access location so that users can avoid unnatural postures and have good visibility of the display.
- Leave 100mm or 4 inches around the unit of space to facilitate cabling and maintenance.
- Do not install the unit in dangerous or excessively aggressive environments with high levels of vibration or in the vicinity of flammable substances.
- Always use the four fixing points as indicated in the diagram.
- For installation, use the holes shown in the previous paragraph.

5. INPUTS/OUTPUTS

5.1 ELECTRICAL CONNECTIONS

Inside the control panel there are two connecting terminal boards named X1 and X2 (see following image).
X1 Terminal Board must be connected to supply voltage of control panel and three phase output control of the pump.

Location		Function
Block	**Num**	
X1	1.1	SUPPLY PANEL
	1.2	
	1.3	
	1.4	PUMP CONTROL
	1.5	
	1.6	

X2 terminal board is for the connection of input/output devices as a following table.

Block		Signal level		Function	Note
Block	**Num**				
X2	2.5	C	SPST, 3 A 250Vac resistive load	low alarm level	
	2.6	NC			
	2.7	NO			
	2.8	C	SPST, 3 A 250Vac resistive load	general alarm	Stable or encoded (see parameter ALARM)
	2.9	NC			
	2.10	NO			

X2	2.1	V inv	SPST-NO 30 A 250Vac, 20 A 28Vdc	inverter command line 1	direct load
	2.2	NO			dial, contact NO
	2.3	V inv	SPST-NO 30 A 250Vac, 20 A 28Vdc	inverter command line 2	direct load
	2.4	NO			dial, contact NO

As indicated on the electrical diagram of equipment (Part #1327290), it is suggested to use 2.5 mm2 section cable. The maximum thermal protection mounted on equipment can be 4 A.

NOTE: During the connection of field devices use the internal ducts to maintain tidy cabling.

All connections must be made by qualified staff in compliance relevant regulations. Only performing wiring operation when power is completely removed from the unit.

Be careful that:

- The wires are not shorted;
- Have adequate insulation;
- Intact until their entry into the terminal and properly locked.

ATTENTION: *The Framework is connected to power supply 400V~. For other voltages indicated in paragraph 11. par. 11 you must reconnect the primary transformer ring to the desired value.*
Failure to do this may result in damage to the unit.

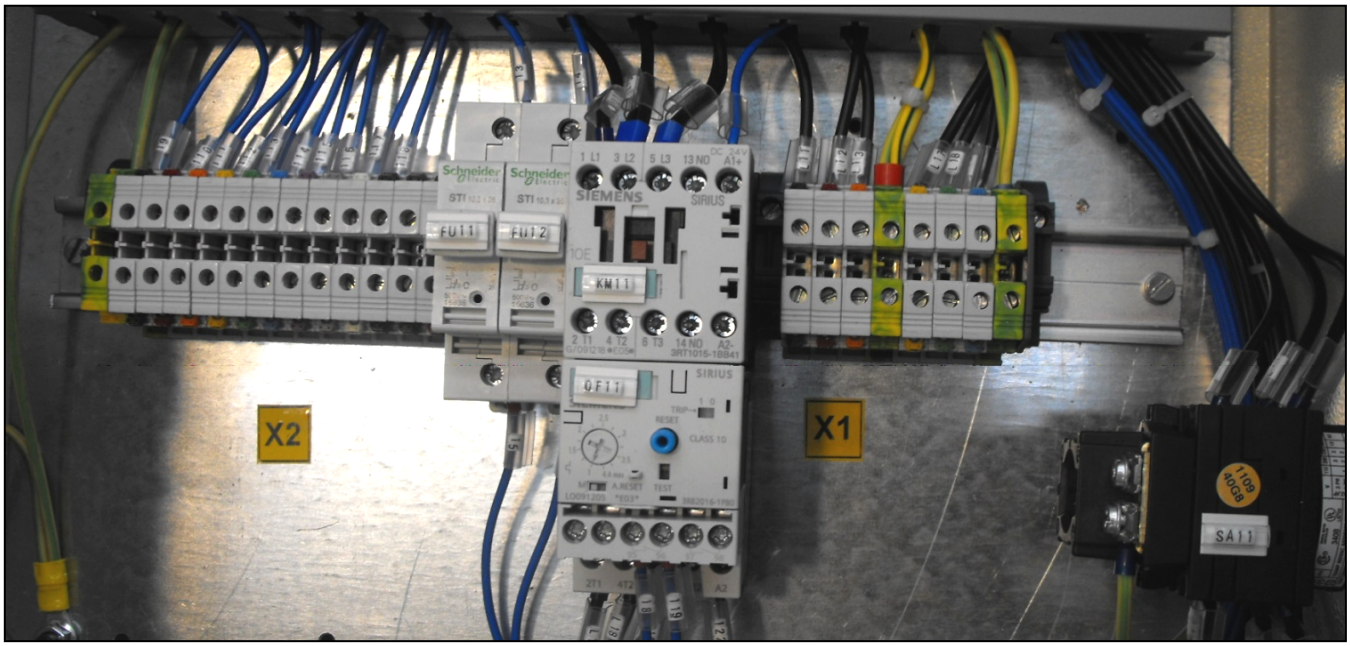


Fig. 3 - The layout and the numbering of the image are indicative

These connections are routed from the main terminal boards on the **1639187** board according tables below. For correct wiring you should note the following:

1. All input and output signals refer to a nominal voltage of 24Vdc.
2. The outputs on terminal board CN8 refer to voltage indicated as Vio on terminal 1 and 2 of CN11.
3. The framework is provided with (Vio) power supply input coinciding with (Vint) internal power supply via bridges on the terminals: CN.3 with CN11.1, CN2.4 with CN11.2.
   The inputs are provided galvanic isolated.
4. Outputs equipped with galvanic insulator; If you want to enter with active signals whose 24V alimentation is taken outside the framework is necessary to remove the connections on CN11.1 and CN11.2. In this case is also necessary carry this power to CN11.1 and CN11.2. in according to polarity.
5. The connections for dual line commands on CN4 are configured for 24Vdc changeover valve. If it the changeover solenoid use different power supply, remove connections on terminal CN4.3 and CN4.4 and connect the appropriate voltage.
6. Connections on terminal CN10 are SPDT type clean contacts.

For further details also check the completed electrical diagram enclosure with your specific equipment.

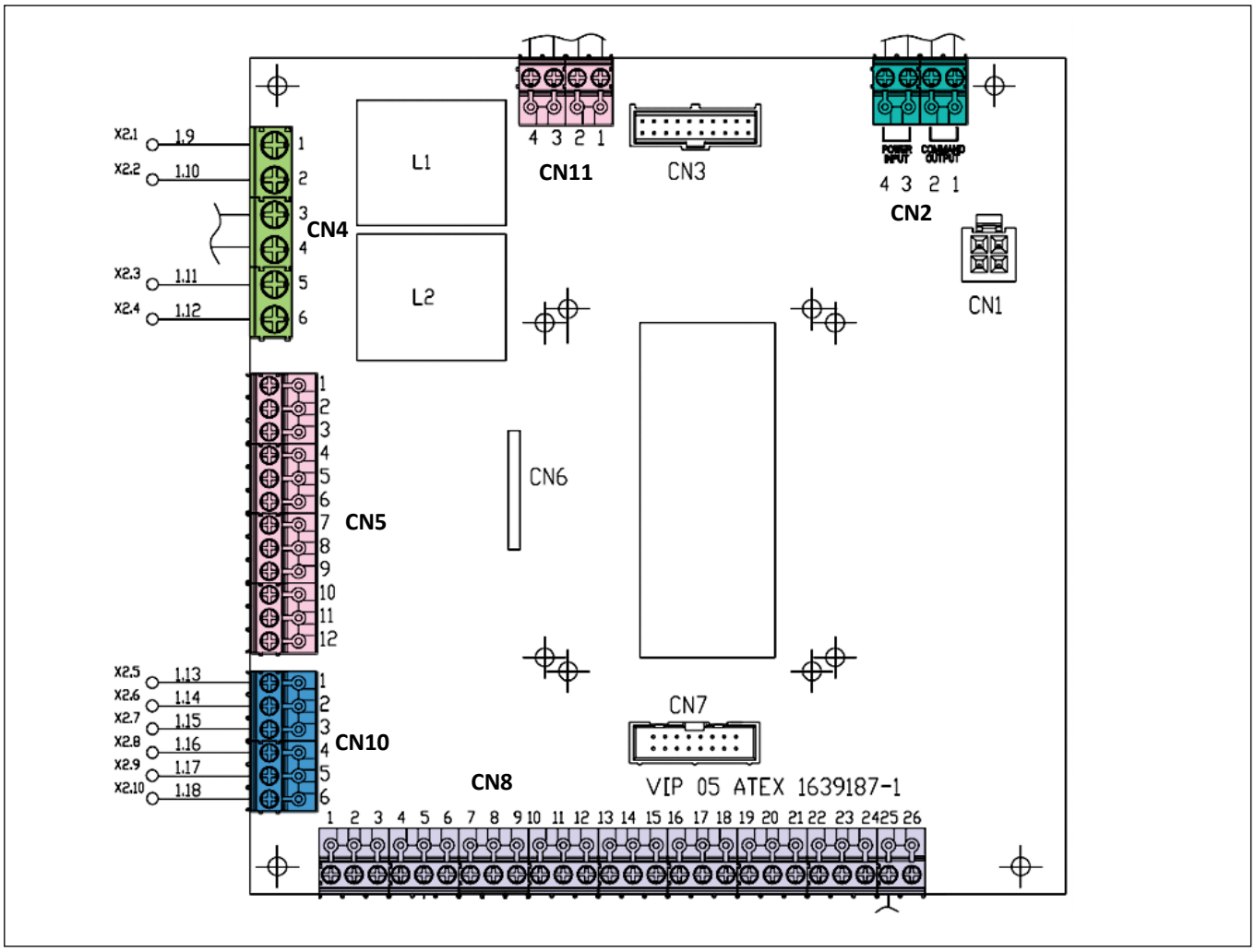


Fig. 4

NOTE: To connect micro-switches or clean contacts inputs, equipped by creating a terminals for the positive power supply (+) and the relative input P (IN +), you must make a link between (+) and (IN+) after that connect the 2 wires of micro-switch at (-) or (IN-)

Location		Signal level		Function	Note
Block	**Num**				
CN8	1	0:10V	0:10 V input	Analog input 0:10V to future expansion	Not isolated, not buffered , load 20 Kohm
	2	0 V	0:10 V reference		
	3	4:20mA	4:20 mA input	Analog input 4:20mA to input level probe	Not isolated, not buffered, load 220R
	4	0 V	4:20 mA reference		
	5	+	24 Vdc input (Vio+)	Max level	
	6	IN +	input P		
	7	IN -	input N		
	8	-	0 Vdc input (Vio-)		
	9	+	24 Vdc input (Vio+)	PULSE	Devices for counting
	10	IN +	input P		
	11	IN -	input N		
	12	-	0 Vdc input (Vio-)		
	13	+	24 Vdc input (Vio+)	P1	First sensor input for system monitoring. (Pressure injector, control loop for progressive, suspend for timer…..)
	14	IN +	input P		
	15	IN -	input N		
	16	-	0 Vdc input (Vio-)		
	17	+	24 Vdc input (Vio+)	P2	Second sensor input for system monitoring. (pressure 2 pressure switch dual line, Boost for cycle SEP, ...)
	18	IN +	input P		
	19	IN -	input N		
	20	-	0 Vdc input (Vio-)		
	21	+	24 Vdc input (Vio+)	Min level	
	22	IN +	input P		
	23	IN -	input N		
	24	-	0 Vdc input (Vio-)		
	25	IN -	input N	Thermal protection	Input for motor thermal protection alarm
	26	+	24 Vdc input (Vio+)		

Location		Signal level		Function	Note
Block	**Num**				
CN11	1	IN +	24 Vdc input (Vio+)	External power input	Protection fuse on the transformer secondary
	2	IN -	0 Vdc input (Vio-)		
	3	Vrel +	24 Vdc internal logic	Power logic and relay control	Protection fuse on the transformer secondary
	4	Vrel -	0 Vdc internal logic		

Location		Signal level		Function	Note
Block	**Num**				
CN10	1	C	SPST, 3 A 250Vac resistive load	Low alarm level	
	2	NC			
	3	NO			
	4	C	SPST, 3 A 250Vac resistive load	General alarm	**Stable or encoded (see parameter ALARM)**
	5	NC			
	6	NO			

Location		Signal level		Function	Note
Block	Num				
CN4	1	V inv	SPST-NO 30 A 250Vac, 20 A 28Vdc	Inverter command line 1	Direct load
	2	NO			Dial, contact NO
	3	V inv	Direct load	Power inverter line	Bring the voltage at these terminals for the type of inverter used
	4	C	line of contact C		
	5	V inv	SPST-NO 30 A 250Vac, 20 A 28Vdc	Inverter command line 2	Direct load
	6	NO			Dial, contact NO

Location		Signal level		Function	Note
Block	Num				
CN2	1	24V		Pump control	Connecting to the power contactor
	2	0 V			
	3	Vint +	Positive power	Power tab 1639187	24Vdc input power supply to control board
	4	Vint -	Negative power		

Location		Signal level		Function	Note
Block	Num				
CN5	1	IN	Input button	ENTER button	Active button closure to GND
	2	GND	common keys		
	3	IN	Input button	UP - INCREMENT button	Active button closure to GND
	4	GND	common keys		
	5	IN	Input button	DOWN - DECREMENT button	Active button closure to GND
	6	GND	common keys		
	7	IN	Input button	MODE button	Active button closure to GND
	8	GND	common keys		
	9	IN	Input button	ESCAPE button	Active button closure to GND
	10	GND	common keys		
	11	IN	Input button	RESET button	Active button closure to GND
	12	GND	common keys		

5.2 ACTIVATING THE BATTERY FOR REAL TIME CLOCK FUNCTIONS

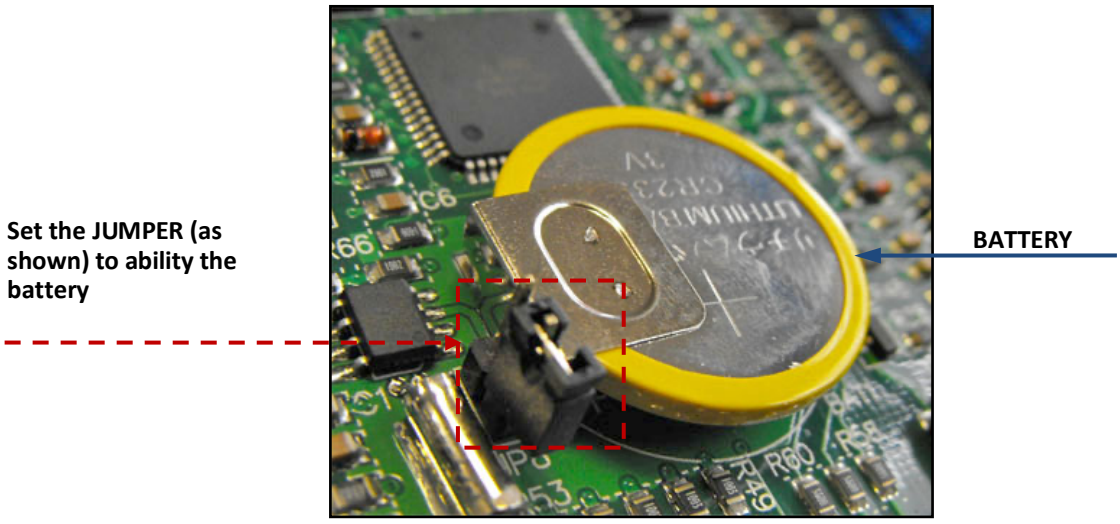


Fig. 5

By inserting the Jumper into the bridging pins, the battery function is activated and this allows the **VIP5** to operate with the Date/time and status save function when the power is removed.

Note: Every time the battery jumper is removed and reinserted causes the DATE/TIME function to be set to zero. Therefore it is recommended that after inserting the battery jumper, the date and time is set.

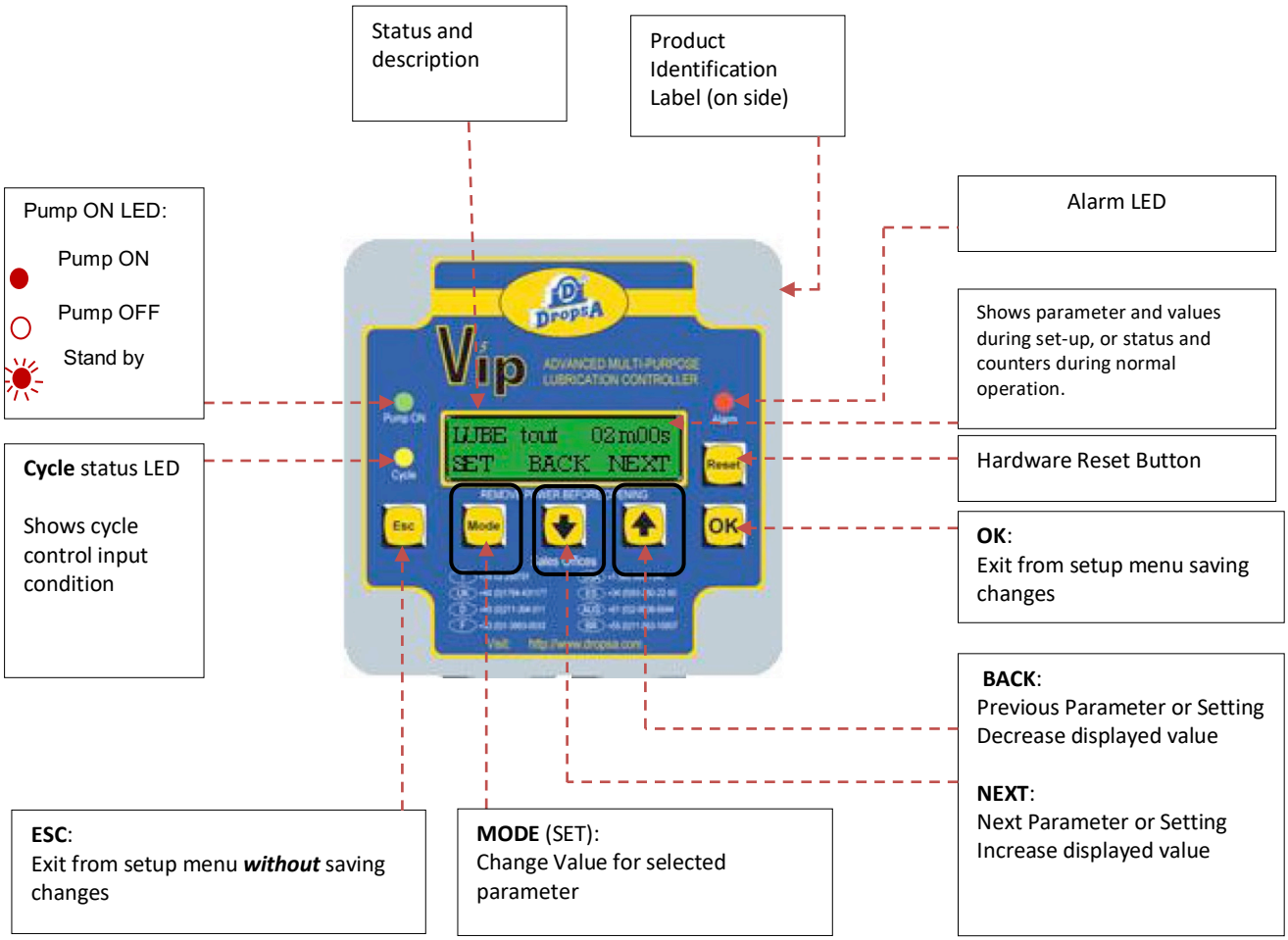
5.3 PRECAUTIONS TO BE USED WHEN CARRING OUT WIRING

There is no specific safety risks associated with this device. Use general precautions that you would use when operating an electrical device. All wiring should be carried out by a qualified electrician.

- Before wiring the panel ensure correct voltage as indicated on the product label.
- Only perform wiring operations once you are sure power is off and cannot be accidentally switched on.
- A circuit breaker that is easy accessible must be used in the wiring of the pump. Ensure the break contact has a contact distance of at least 3 mm
- The power connections and pump must have armoured insulation until entrance into the terminals. The cable must be positioned to have no damage to the insulation sleeve.
- Up to the terminal connections. The cable must be routed to avoid damage to the outer isolation sheaf.
- It is advisable to use a fuse or a differential isolation to protect the device. The device should have a recommended value of 0,03 Ampere with 1 millisecond maximum activation time. Isolation capability ≥ 10kV and nominal In=6A.

6. OPERATOR INTERFACE FRONT PANEL

6.1 LAYOUT AND STATUS TABLE OF VIP5 FRONT PANEL



VIP5 Condition	PUMP ON LED	CYCLE INPUT LED	ALARM LED
Alarm	OFF	ON	ON
Standby Phase	OFF	ON	OFF
Lubrication Phase/Cycle	ON	ON	OFF
Setup	OFF	OFF	ON

7. OPERATING MODE

VIP5 Plus has three different operating modes which are determined during the setup stage described previously.
These are: **CYCLE, PULSE** and **FLOW.**

7.1 CYCLE Mode

In *Cycle* mode a cycle sensor determines the completion of the LUBRICATION PHASE. If using timer setting, the Lubrication Cycle will complete when the timer expire. The Standby phase is determined by a timer or by an external input counter.

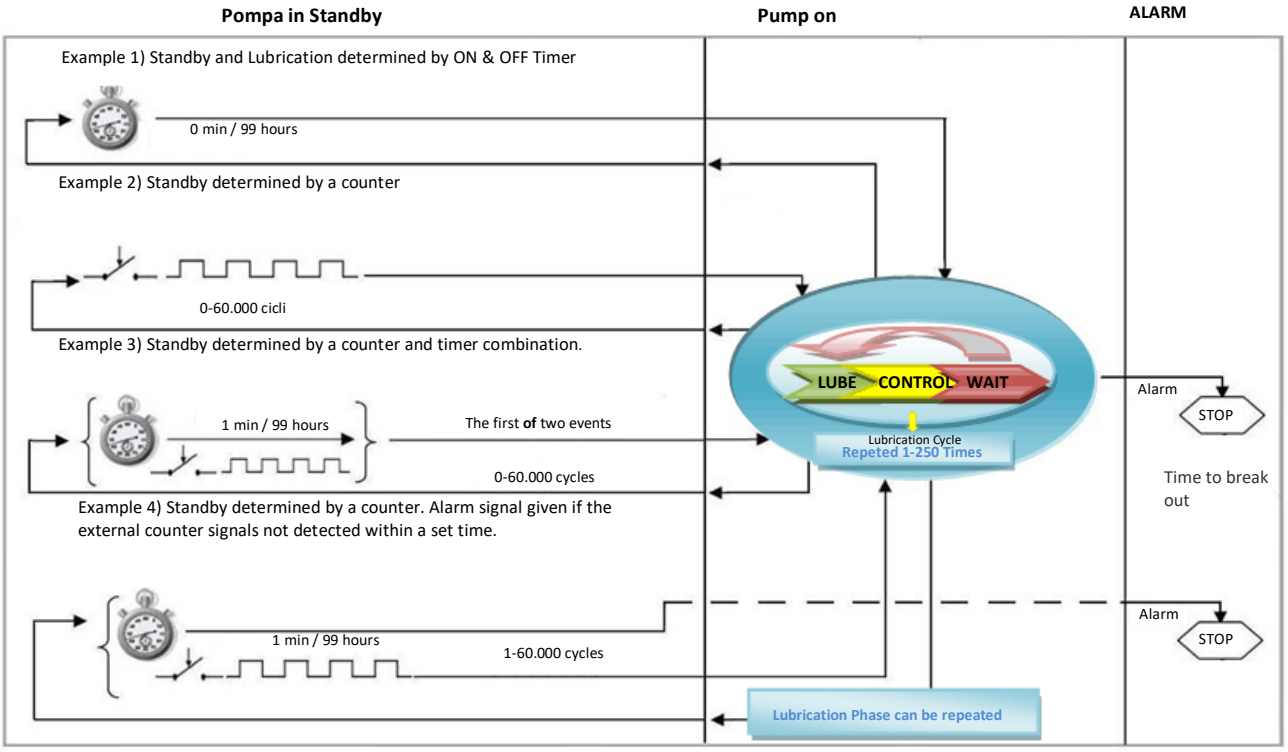


Fig. 6

7.2 PULSE Mode

In ***Pulse*** mode, the duration of the ***Standby Phase*** and the ***Lubrication Phase*** are both determined by an external counter. The correct operation of the ***Lubrication Cycle*** can be monitored using a cycle sensor.

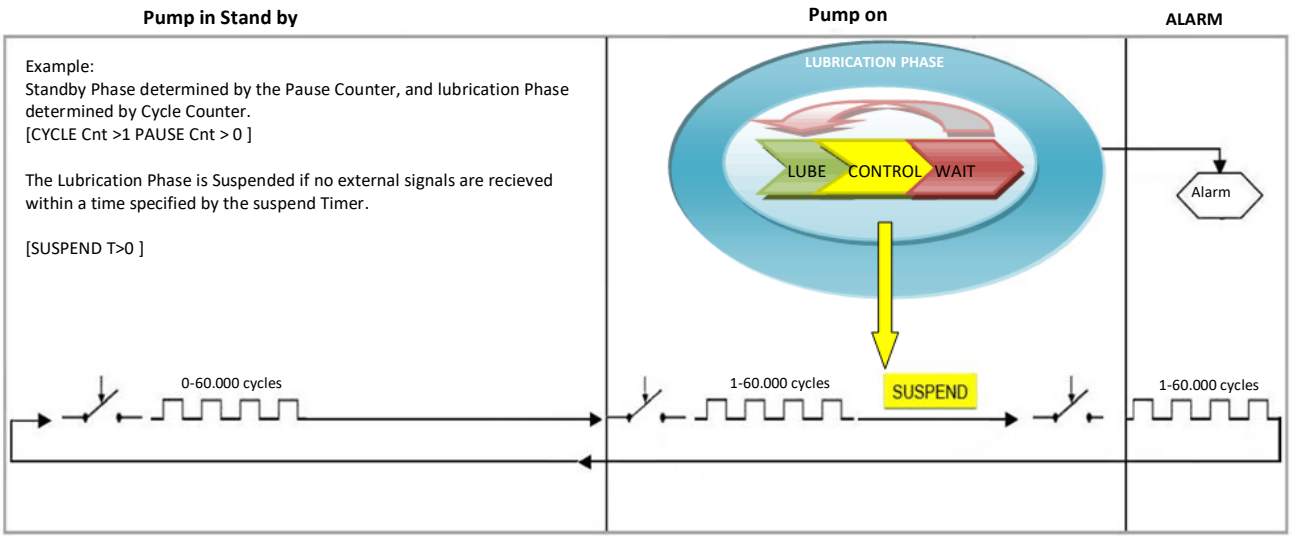


Fig. 7

7.3 FLOW Mode

Using this mode allows the **VIP5 Plus** to be used as a simple flow monitoring and display device.

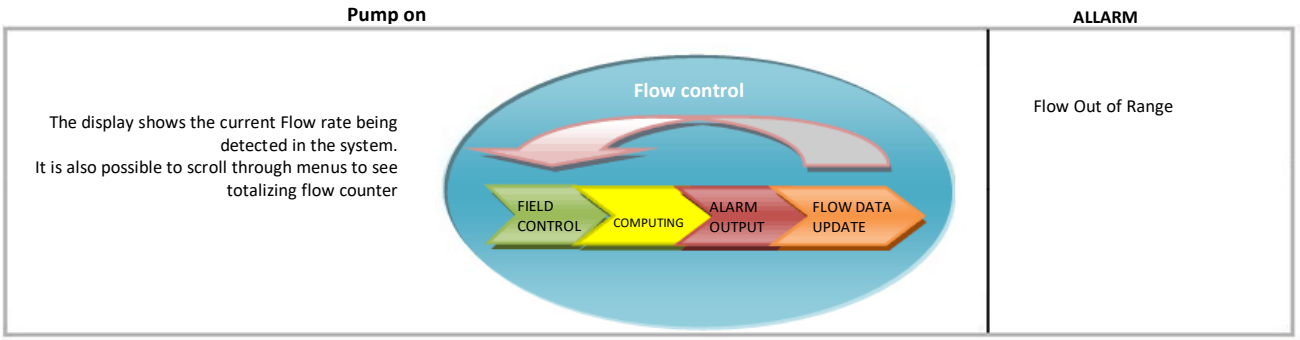
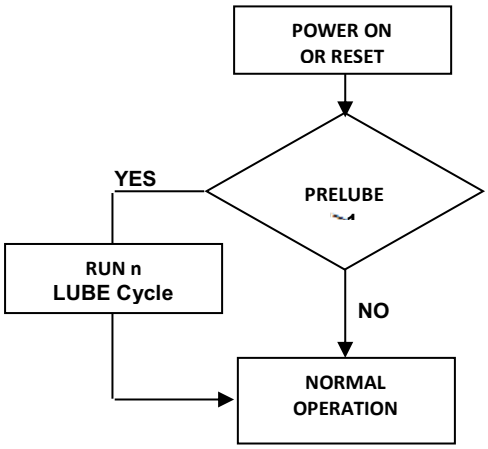


Fig. 8

7.4 PRELUBE

The Prelube cycle is a pre-lubrication cycle that is triggered when the system is powered on or reset. If the pre-lube cycle value is set to 1 or greater the VIP5 will perform the set number of ***Lubrication Phases***.

Note that if Each ***Lubrication Phase*** comprises two or more ***Lubrication Cycles,*** then the total cycles performed will be equal to the ***Lubrication Cycles*** multiplied by the ***Prelube*** Cycles.



8. CYCLE MONITORING

8.1 MONITORING OPTIONS.

There are four possible Cycle Monitoring Options, explained below.

1) DL – DUAL LINE

Dual Line cycles generally use two pressure switches connected to **P1** and **P2**.

The **VIP5 Plus** starts the pump and must see that **P1** switch is closed within the timeout time. After this, the Lubrication lines are inverted by use of a directional valve.

The **P2** switch must also then be made within the timeout timer setting.

A user configurable **DELAY** timer can be set to filter pressure spikes as in the **PS** operating mode.

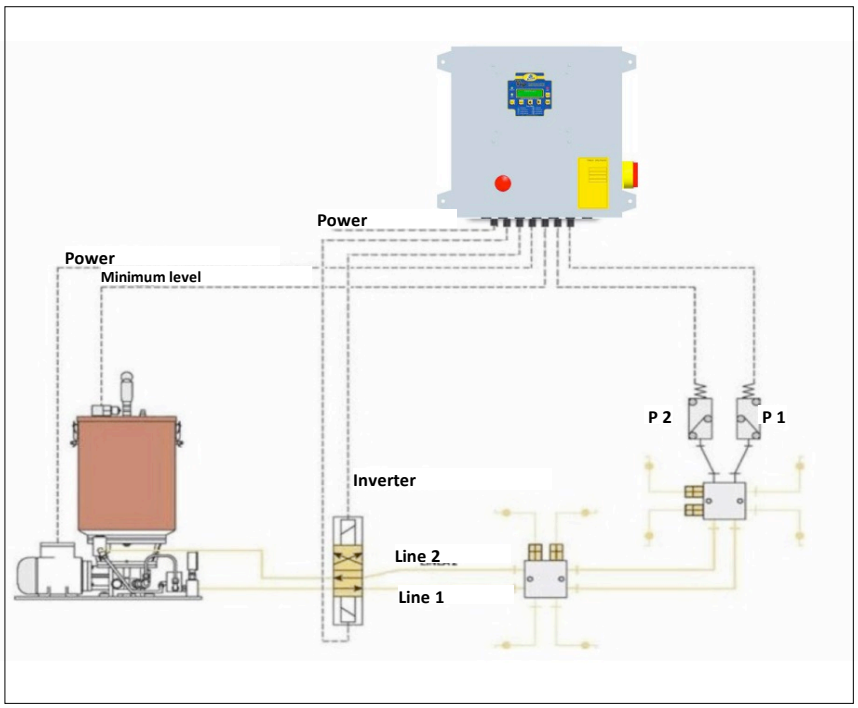


Fig. 9

2) TIMER – TIME ONLY

The Lubrication cycle is simply operated according to a preset Timer value.

Therefore, **no input is monitored** to confirm the correct completion of the lubrication cycle.

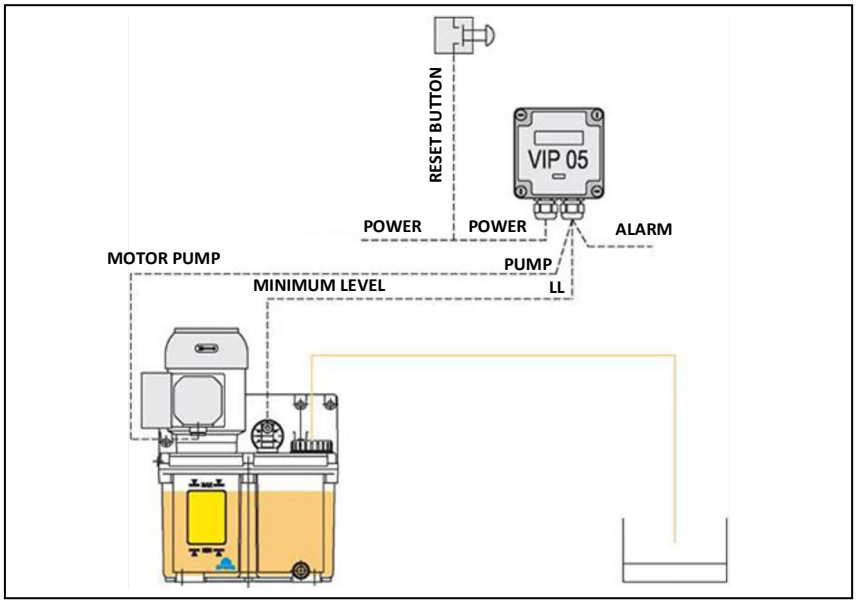


Fig. 10

3) PS – PRESSURE SWITCH

Pressure switch monitoring is typically used in injector system.

The **VIP5 Plus** will monitor input **P1** to verify that it is an **OPEN** contact at the start of the cycle.

The pump is activated and the pressure switch must **CLOSE** within a timeout period otherwise a cycle alarm is generated.

Once the **P1** contact is closed, a **DELAY** timer checks that the switch is not broken for a set time before switching off the pump. This ensures that pressure spikes at the start of a lubrication cycles on long lines are filtered out.

A **WAIT** timer can be set to allow the injectors to reset when using multi cycle configuration.

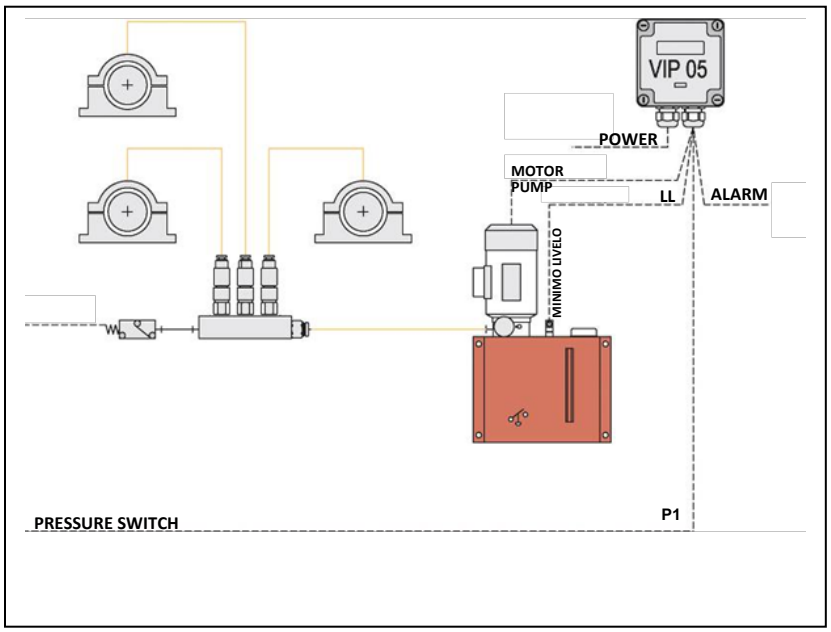


Fig. 11

3) SEP – SERIES PROGRESSIVE

Series progressive Operating mode is used for Cycle switch monitoring typically on progressive systems.

The Pump is switched on and P1 input is monitored and must change state twice within the timeout period otherwise a timeout alarm will be generated.

Once P1 changes state twice, the pump is switched off and VIP5 goes to standby or the Lubrication Cycle is repeated for the desired number of times.

There is no WAIT time in this mode as progressive systems do not need venting time.

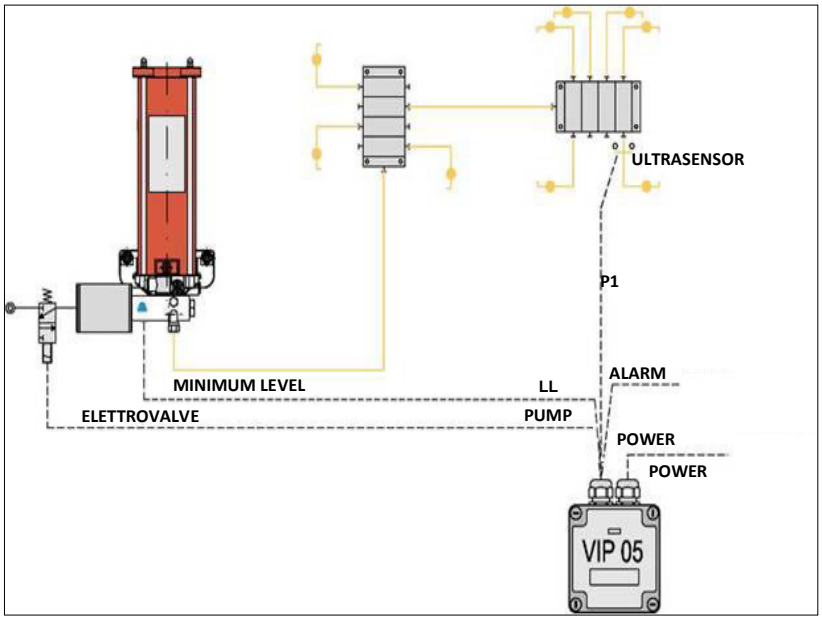


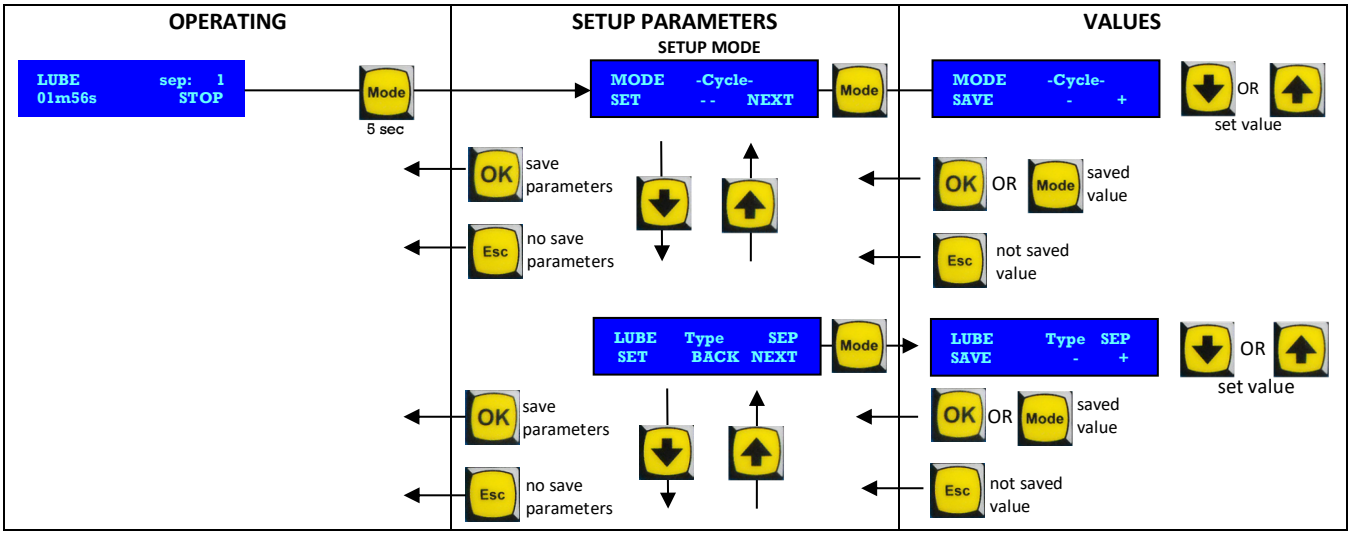
Fig. 12

9. SETUP PROGRAMMING

The following section explains how to navigate the **VIP5 Plus** setup menus and contains detailed explanation of each parameter and possible values.

9.1 Navigating around the setup menu.

The navigation map below shows how to navigate around the setup menu.



To enter the SETUP menu from the OPERATING Mode, hold the Mode (Mode) button for 5 seconds.

The ▲ ▼ (Up and Down) keys allow scrolling through the parameters.

By pressing the Mode button again, the indicated parameter value can be modified by using the Up and Down keys.

To exit, use the OK (OK) key, or Esc (Esc) if you with to exit without saving.

9.2 PARAMETERS AND VALUES

The following table shows the parameters and possible values of VIP5 Plus. The first two parameters (MODE and TYPE) determine what parameters are available in the menu and they are the first that must be set.

PARAMETER NAME	DEFAULT VALUE	DESCRIPTION	VALUES/ RANGE	APPLICABILITY							
									PULSE	CYCLE	FLOW
MODE	**CYCLE**	**SELECT THE OPERATIMG MODE:**									
		Flow monitoring mode	**FLOW**								
		Lubrication Cycle completed when the cycle sensor confirms correct lubrication	**CYCLE**								
		Both Standby and Lubrication Phase determined by external signal.	**PULSE**								
TYPE	**SEP**	**SELECTS THE CYCLE MONITORING:**							X	X	
		Timer only	**TIMER**								
		Pressure switch	**PS**								
		Progressive Cycle switch	**SEP**								
		Dual Line cycle with control signals	**DUAL**								
		Timed Dual Line cycle	**DUAL TIMED**								
				DUAL TIMED	DUAL	SEP	PS	TIMER/NO CONTROL			
INVERTER	PNEUM	Type of connected inverter for Dual systems	PNEUM-ELETT		X				X	X	
INVER.Ton	3s	Time for inversion	0,1s - 25,0s	X	X				X	X	
INVE.Wait	.null.	Waiting time for inversion command and pump	1s - 1h	X	X				X	X	
CYCLE TOUT	2 min	Timeout counter determines how long to wait for cycle completion before a timeout alarm is generated	1s - 1h		X	X	X		X	X	X
LUBE TIME	2 min	In timer Mode, how long the pump will run	0s – 99h					X		X	
CYCLE CNT	1	The Duration of the Lubrication cycle (in PULSE Mode)	1 - 60000	X	X	X	X	X	X		
DELAY TIM	5s	When the pressure switch is made, how long to keep the pump running to ensure that the signal is genuine and not a pressure spike	0s – 2min	X	X		X		X	X	
		With FLOW mode time that alarm condition must exist before being reported									X
SUSPEND T	1s	In Pulse Mode, will suspend the Lubrication Phase if a signal is not received	Null – 2min	X	X	X	X	X	X		
PAUSE CNT	1	Counter for standby phase (PULSE input). See: PAUSE MULTIP.	Null -250 (cycle mode) Null-60000 (pulse mode)	X	X	X	X	X	X	X	
SUSPEND	Never	With cycle mode suspend remote signal on pulse input can be connected. The lubrication cycle is completed before any suspension	Never, In Pause In Cycle, Always	X	X	X	X	X		X	
PAUSE BY	Timer	Determines Standby Phase Timing		X	X	X	X	X		X	
		Time based Standby	Time								
		A set number of external PULSE signals	Counter								
		Whichever of above 2 events occurs first	Time & Counter								
		By PULSE signals. However, if PAUSE TIM. is reached, an alarm will be given	Tout & Count								
PAUSE TIM.	6m 00s	Standby Timer setting. Null means the standby phase will be skipped	Null – 99h 00m	X	X	X	X	X		X	
PUMP	Continuous	Pump output can be constant signal, pulsed signal or synchronized with control signal (see next 3 parameters)	Continuous, Pulsed	X	X	X	X	X	X	X	
			syncronyzed						X		
PUMP TON	5,0	Sets the ON value of the pump pulse	0,1-25,0s	X	X	X	X	X	X	X	
PUMP TOFF	5,0	Sets the OFF value of the pump pulse	0,1-25,0s	X	X	X	X	X	X	X	
PAUSE MULTIP.	1	Multiply pause settings by 10 or 100 to achive more higt values. See: PAUSE CNT	1; 10; 100	X	X	X	X	X	X		
LUBE CYCLES	1	Number of Lubrication Cycles to complete a Lubrication Phase	1 - 250	X	X	X	X	X		X	
BOOST CYCLES	1	In a SEP mode, If P2 input is closed the LUBE CYCLES values is increased by this value contained in this setting	1 - 250			X				X	

PRELUBE	0	Number of Prelube Cycles	0 - 250	X	X	X	X	X		X	
WAIT TIME	10s	Time between two Lubrication Cycles within the Lubrication Phase	Null - 2 min	X	X	X	X	X		X	
START IN	Resume	Determines state at power on:		X	X	X	X	X	X	X	
		Start in Lubrication Phase	Lube								
		Resume from power down state	Resume								
FLOW VALUE	1,0	Informational value of how much lubricant is dispensed per Lubrication Cycle	0,0 - 1000	X	X	X	X	X	X	X	X
UNITS	Counts	Information Unit for the flow value parameter used for display purposes only	Counts, CubicC., Liters, Pints, Gallons, Kilos, Grams	X	X	X	X	X	X	X	X
FLOW MIN	10,0	Minimum Flow Setting Totally excludes flow alarm if null	0,0 - 6000								X
FLOW MAX	100,0	Maximum Flow Setting	0,0 – 6000								X
ALARM	Standard	How REMOTE ALARM is managed		X	X	X	X	X	X	X	X
		Relay is powered off during alarm	Standard								
		Relay is powered On during alarm	Inverted								
		Coded alarm is signalling	Coded								
STOP	On All	Determines what Alarm conditions should stop the VIP5 Lubrication cycles VIP5 Pro		X	X	X	X	X	X	X	
		Never stop the lubrication cycle	On None								
		All alarm conditions	On All								
		All but min Level stops the Vip5 pro	All But Min Level								
		Only minimum level alarm stops the VIP5	All But Max Level								
		All but Maximum Level	Minlev Only								
MIN. LEV. INPUT	NC	Configuration for the input signal of minimum level	NC, NO, 4 - 20mA	X	X	X	X	X	X	X	
LO LEVEL MA	19,8	Setting a low level if you use 4-20mA input	4,0 - 20,0	X	X	X	X	X	X	X	
HI LEVEL MA	4,2	Setting a high level if you use 4-20mA input	4,0 - 20,0	X	X	X	X	X	X	X	
MININPUT DELAY	0,5s	When resetting a low level alarm, grace period before monitoring level inputs	0s-5s	X	X	X	X	X	X	X	
HI LEVEL IN	NO	Setting for max level signal	NC, NO	X	X	X	X	X	X	X	
THERMAL INPUT	NO	Setting for thermal protection signal	NC, NO	X	X	X	X	X	X	X	
FILL Tout	.null.	Max time for refilling activation after minimum level is switched off	Null – 10 h	X	X	X	X	X	X	X	
AIR Delay	0,5s	Drop-out delay after switching off the pump control	0,1 - 25,0s	X	X	X	X	X	X	X	
DATETIME	Disable	Enable or Disable the Real Time clock functions. Note: be sure battery is connected	Enable, Disable	X	X	X	X	X	X	X	X
DAY	1	Date Time: Day setting	1 – 31	X	X	X	X	X	X	X	X
MONTH	1	Date Time: Month setting	1 - 12	X	X	X	X	X	X	X	X
YEAR	2000	Date Time: Year setting	2000 - 2099	X	X	X	X	X	X	X	X
HOUR	0	Date Time: Hour setting	0 - 23	X	X	X	X	X	X	X	X
MINUTE	00	Date Time: Minute setting	0 - 59	X	X	X	X	X	X	X	X
SET DEFAULT VAL.		RESET TO FACTORY DEFAULT SETTINGS	Yes - No	X	X	X	X	X	X	X	X

9.4 SPECIAL FUNCTIONS:

1) **LCD CONTRAST ADJUSTMENT:** by Pressing ESC or OK during power on or immediately after a reset, you access the menu for adjusting the contrast of LCD; hold down OK the contrast decreases, with ESC increases;
2) **FLOW TOTALIZER DATA VISUALIZATION: w**ith the VIP5 in standby mode, pressing the OK key will allow you to scroll through the current average flow rate, or the total volume dispense in the last DAY, HOUR or TOTAL since last reset;
3) **RESETTING THE FLOW TOTALIZER: d**uring the visualization of the above parameters the flow can be reset by holding the DOWN key;
4) **TIME AND DATE:** during standby, it is possible to view time and date by using the ESC key only if DATETIME parameter is set on “enable”;
5) **EVENT LOG VIEWER:** by holding the Up or Down key for five seconds it is possible to scroll through the Event Log. (Available in version FW 2.xx onwards)

10. PROBLEMS AND SOLUTIONS

***ATTENTION:** The VIP5 Plus should only be repaired by qualified Dropsa technicians.*

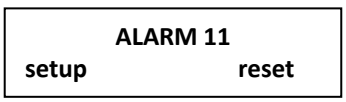
10.1 ALARM CODE TABLE

The following is a list of possible alarms generated by the VIP5 with information for troubleshooting purposes.

ALARM CODE	DESCRIPTION	NOTES/CHECKS/SOLUTIONS
ALARM 01	LOW LEVEL	The Low level sensor has triggered. Replenish the oil reservoir.
ALARM 02	CYCLE TIMEOUT	The cycle switch has not been detected in the specified time. Make sure that you have set the timer to a value that allows the cycle to complete.
ALARM 03	BOOST WARNING	The P2 input has been activated and the Boost Function has increased the number of Lubrication Cycles in the Lubrication Phase.
ALARM 04	THERMAL PROT.	The Thermal relay trip signal has been detected. Verify and repair.
ALARM 05	PS ALREDY ON	In PS Cycle mode, the pressure switch was already active before the pump was switched on. Check to ensure the venting system is operating correctly.
ALARM 06	PS AFTER WAIT	In PS Cycle mode, the Pressure switch cannot achieve pressure for the duration of the DELAY time parameter. Check parameters are correct and the pump is operating correctly and can maintain pressure.
ALARM 07	NOT IN PRESS.	No Pressure switch detected within the timeout time. Verify pump and pressure switch are operating correctly and there are no leaks.
ALARM 08	PAUSE TIMEOUT	In TOUT & Count Mode, no external signal has been received for the Timeout period setting. Verify external switch is operating.
ALARM 09	HI LEVEL	MAX level is present in tank.
ALARM 10	BAD SET 420MA	Programming error on the 4-20 mA input, modify parameters to have a range MIN-MAX >4mA
ALARM 11	BAD IN 420MA	Incorrect wiring on the 4-20 mA, signal underage or overage
ALARM 12	LO FLOW	In Flow mode, the current flow is below the minimum set level
ALARM 13	HI FLOW	In Flow mode, the current flow is above the maximum set level
ALARM 14	LO FLOWT	In Flow mode, the current flow is below the minimum set level because no flow input signal has been received for the timeout time. This generally indicates a broken sensor or that the system being monitored is switched off.
ALARM 15	UNCODED FAIL	An unknown Internal error has occurred. Try resetting the unit. If the error re-occurs, the unit must be returned to Dropsa for inspection.
ALARM 16	EXTERNAL PRESSURE	Overpressure alarm and safety signal in air-oil systems.

10.2 RESTART/RESET

When an alarm occurs it is displayed on the LCD display with the alarm number and a brief description of the alarm.
For Example:



By pressing the button located under the “Setup” label, the user can go and modify the parameter values if it is some incorrect parameter that is causing the alarm.

By pressing the button located under “Reset” (or the hard reset button) the VIP5 will restart its programming with the last saved parameters.

10.3 REMOTE CODED ALARM FUNCTION

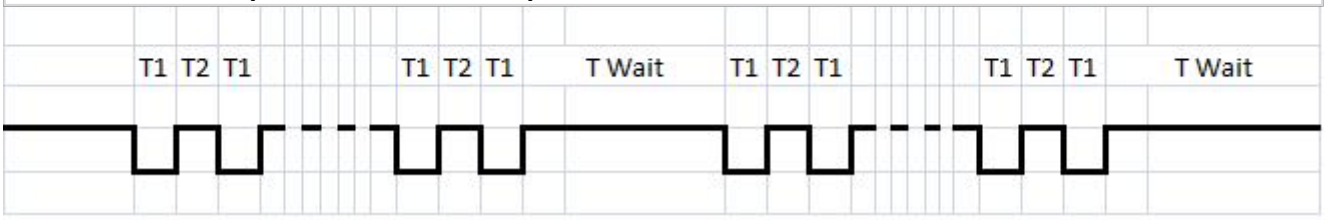
The VIP5 controller has the ability to use a remote pulsed coded alarm contact.
Every time the VIP5 control enters an alarm condition, the remote alarm relay contact is activated.
Most alarm contacts are simply a NC or NO contact that gives a remote system indication that the local controller is in a fault condition.

Additionally, the VIP5 can trigger the alarm according to the alarm code being generated and allow a remote PLC (or even a remote LAMP signal) to read the number of the alarm being generated.

This is done by pulsing the alarm relay in 500ms bursts with a 2000ms gap between each signal burst.

The timing chart below shows how to interface the logic with your PLC.

Alarm code= number of (T1+T2)
T1= 500ms = alarm contact activation time
T2= 500ms = alarm contact deactivation time
TWait= 2000ms= pause time before repetition of same alarm code



11. TECHNICAL SPECIFICATIONS

Supply voltage (see note par.5.1)	110V~ - 230V~ - 400V~ - 460V~
Power Consumption	2 W (In Stop) - 10 W (In Start)
Temperature Operating Range	- 5 °C ÷ + 70 °C
Permissible Temperature storage range	- 20°C ÷ + 80 °C)
Operating Relative Humidity	90% max
Frequency	50/60 Hz

Note: **To ensure that seal of the casing is guaranteed alone use appropriate cable glands that provide adequate protection. If the cable glands are not sufficient in number for your configuration, use a multi-connector solution and a cabling harness that will ensure adequate sealing and avoid torsion and voltage on the cable.**

12. MAINTENANCE PROCEDURES

VIP05 has been designed not to require any regular maintenance. We recommend to occasionally cleaning the unit with a damp cloth, not using solvents

The battery life is approximately 10 years. In the event that the battery needs to be replaced you should note that there are two possible battery types.

a) A Soldered type battery that must be removed and re-soldered.
This type of battery can be obtained from Panasonic PART NUMBER BT-CR2032-H, easily purchased all over the world.
b) The replaceable type battery can be simply removed and replaced.
This type of battery can be obtained from Panasonic PART NUMBER CR2032, easily purchased all over the world.

13. DISPOSAL PROCEDURES

The unit does not contain any harmful substances and should be disposed of following local regulations, including any recycling information indicated on the components themselves.

14. ORDING INFORMATION

VIP5 Plus

CODE	MODEL	DESCRIPTION
VIP05 "PLUS" **1639210** (Standard) (Power supply 400V ~ - Inverter 24V DC)	A	VIP05 "PLUS" (Power supply 110V ~ - Inverter 24V DC)
	B	VIP05 "PLUS" (Power supply 230V ~ - Inverter 24V DC)
	C	VIP05 "PLUS" (Power supply 460V ~ - Inverter 24V DC)
	D	VIP05 "PLUS" (Power supply 110V ~ - Inverter 110V~)
	E	VIP05 "PLUS" (Power supply 230V ~ - Inverter 230V ~)

15. MOVING AND SHIPPING

Use suitable padded packaging when shipping the VIP5 controller and ensure that no damage has been sustained before reinstallation.

16. OPERATING PRECAUTIONS

ATTENTION: **It is necessary to carefully read about the instructions and the risks involved in the use of lubrication machines.**
The operator should make sure he fully understands the operating and safety procedures of the VIP5 controller and any connected machinery or devices.