Electrical Installation Requirements

Care should be taken to separate the power and signal cables to prevent electrical interference and possible damage due to inadvertent connection.

An on board isolated 15Vac supply is present on the `C' terminal. This provides voltage for alarm inputs. Inputs are energised via volt free contacts connecting `C' to the appropriate `IP' terminal. ON NO ACCOUNT MUST AN EXTERNAL SUPPLY BE USED FOR INPUTS.

Terminal 1should be connected to the supply voltage neutral.

In order for inbuilt suppressors to function the outputs MUST be wired according to the wiring diagram.

CE Conformance

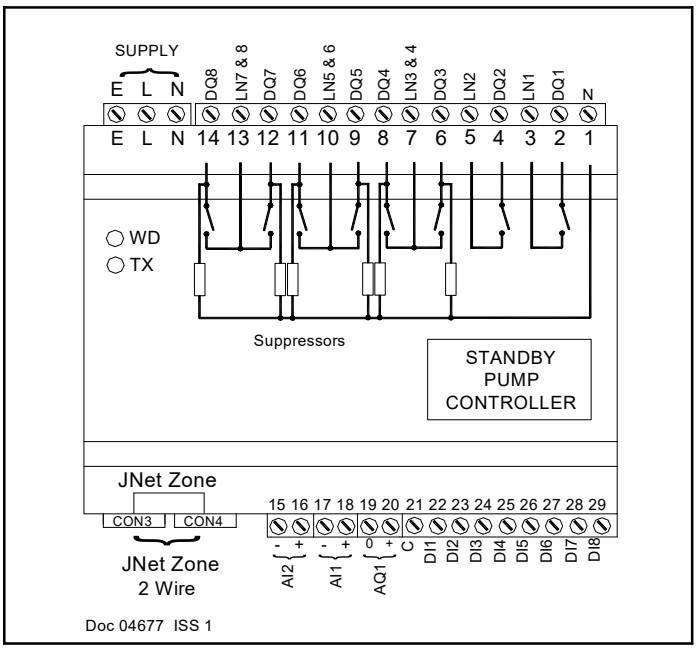
This unit conforms with the relevant EU standards when installed according to the JTL Installation Requirements for this product.

DIGITAL INPUTS		
DI1	Volt Free	Auto/Manual
DI2	Volt Free	Run Pumps
DI3	Volt Free	Pump 1 Healthy
DI4	Volt Free	Pump 2 Healthy
DI5	Volt Free	Flow Present
DI6	Volt Free	Pump 1 Force Run
DI7	Volt Free	Pump 2 Force Run
DI8	Volt Free	Not used

DIGITAL OUTPUTS		
DQ1	Unsuppressed	Pump 1 Healthy
DQ2	Unsuppressed	Pump 2 Healthy
DQ3	Suppressed	Run Pump 1
DQ4	Suppressed	Run Pump 2
DQ5	Suppressed	Flow Present
DQ6	Suppressed	Not used
DQ7	Suppressed	Not used
DQ8	Suppressed	Not used

ANALOGUE INPUTS		
AI1	TP501	Water Flow Temperature
AI2	TP501	Not used

ANALOGUE OUTPUT		
AQ1	0-10V	Not used



Description

The JTL Standby Pump Controller type PU310 is designed to be mounted in a control cabinet on DIN rail and control the operation of two circulation pumps. Changeover on flow fail, pump fault, or duty cycle time is managed automatically. In addition a fluid temperature sensor can be configured to stop pumps running when a threshold is exceeded.

Use of Maintenance Unit

The controller can be checked and the operation adjusted using a JTL portable maintenance unit which plugs into the interface. Each item of information has an item number. The more important items are listed in the tables overleaf. Examples:

To read item 41 press: ITEM 4 1 ENTER

To set item 31 to 2 press: ITEM 3 1 ENTER SET 2 ENTER

To correct errors press: CANCEL

To select next or previous items press: + and −

JTL Network Communications

RJ connections are available to use with Jnet cables for connection to the JTL network.

Functionality & Configuration

To take advantage of remote configuration and alarm monitoring the PU310 controller should be assigned a network address and connected to the JTL network. However the PU310 controller may be operated as a stand-alone unit.

Basic Operation

In normal operating mode two circulation pumps are controlled automatically and are cycled over an adjustable period (Item 30). The default period is 24 hours. The duty of Pump 1 is set in % (Item 31) with the remaining duty implicitly assigned to Pump 2. The default value of 66% ensures both pumps run in the duty cycle period, with Pump 1 running for twice as long as Pump 2.

If Pump 1 duty is set to 100% Pump 1 will run all the time and Pump 2 will only run if a fault occurs with Pump 1. Conversely if Pump 1 duty is set to 0% Pump 2 will run all the time and Pump 1 will only run if a fault occurs with Pump 2.

An adjustable restart inhibit time (Item 35) prevents short cycling of Pumps in fault conditions.
Total hours for each Pump are logged in 10s of hours (Item 47/57).

Pumps will continue to run, changing over at the end of each pump cycle, unless a flow fail is detected, a pump healthy input goes away, or a stop condition occurs. See "control inputs" section for more information.

Control Inputs
"Auto" input must be present to allow automatic pump control and monitoring. If this input goes away, all output relays are de-energised and automatic control stops immediately.

"Run pumps" is a pump demand input and is used to start or maintain automatic pump control. When the input is removed, the controller behaves according to the overrun mode setting (Item 36);

No overrun
The running pump is stopped immediately and the controller enters standby mode.

Time
The pumps continue to cycle as in normal operation until the overrun time (item 37) has elapsed. The controller then enters standby mode.

Temperature and Time
The pumps continue to cycle as in normal operation unless the threshold temperature (item 38) has been reached or exceeded. Normal operation then continues and pump running terminates as Time mode. The overrun timer is reset if the temperature drops below the threshold at any point during the time period. Note that if the temperature sensor is disabled (item 60) or becomes faulty the controller assumes the threshold has not been reached and continues tu run pumps indefinitely.

Each Pump has an associated "Pump Healthy" input which must be present for the pump to run. A running pump stops immediately if its input goes away. If this input is not used it must be wired present.

The "Flow Present" input is used to cause pump changeover in the event of a flow failure. It is ignored for an adjustable period (Item 67) following the starting of either Pump to allow flow to become established. If the input is disabled (Item 65) no pump changeover will occur as the result of a flow failure, and flow fail alarms will be not be set.

The "Manual Run Pump" inputs force the controller to run one of the pumps until the input is removed. Pump changeover will not occur regardless of any duty settings or flow failure. The controller will not, however, override the pump restart inhibit timer, and the corresponding pump healthy input must be present. If both manual run inputs are present Pump 1 takes precedence.

The temperature sensor input is used in conjunction with the Time and Temperature overrun mode, see "Run Pumps" earlier. The sensor may be disabled (Item 60). The sensed temperature is visible on the JTL Maintenance Unit (Item 61), and via the JTL network.

Control Outputs
All output relays are de-energised unless "Auto" input is present.

"Pump Healthy" output relays are energised if the associated pump is enabled (Item 40/50), has Pump Healthy input present, and no latched flow fail condition.

"Run Pump" output relays are energised when the controller wants to run the associated pump.

"Flow Present" output relay is energised when the controller has determined that flow is present. The flow state is also visible on the JTL Maintenance Unit (Item 66), and on the JTL network. The output is subject to a symmetrical state change delay (Item 67) to avoid spurious flow fail conditions at pump changeover. The relay is de-energised if flow sensing is disabled (Item 65)

Maintenance Features
In addition to controller configuration, the maintenance unit enables the user to look at various items for diagnostic purposes.

Logical inputs (the inputs the internal logic sees) are displayed on item 71 in binary coded form. These input values can be forced to read differently by setting a non-zero value on item 78. The physical inputs however, are always displayed on item 100.

Logical outputs (outputs commanded by the internal logic) are displayed in binary coded form on item 72. Physical outputs are displayed on item 73. Physical outputs can be forced, overriding internal logic commands by entering a non zero value in item 79.

The binary coding works as follows:

1	=	ip1 / op1
2	=	ip2 / op2
4	=	ip3 / op3
8	=	ip4 / op4
16	=	ip5 / op5
32	=	ip6 / op6
64	=	ip7 / op7
128	=	ip8

If more than 1 input or output is active then the code is added arithmetically.
Eg., input 1 & 3 active = 1 + 4 = 5.

Forced functions remain forced whilst the maintenance unit is plugged in. They are cancelled automatically 30 minutes after the maintenance unit is unplugged.

ADJUSTABLE PARAMETERS

Item	Function	Range	Units
1	Jnet network address	0.1 - 899.7	
30	Pump cycle duty period	1 - 48	hours
31	Pump 1 duty	0 - 100	%
32	Alarm delay	0 - 240	seconds
35	Pump restart inhibit time	0 - 120	seconds
36	Overrun mode (0 = no overrun, 1 = overrun on time, 2= overrun on temperature time)	0 - 2	
37	Overrun time period	0 - 240	minutes
38	Overrun temperature threshold	-45.0 - 150.0	deg C
40	Enable Pump 1 (0 = dis, 1 = En)	0 - 1	
50	Enable Pump 2 (0 = dis, 1 = En)	0 - 1	
46	Include Flow fail in pump 2 healthy output (0 = No, 1 = Yes)	0 - 1	
56	Include Flow fail in pump 2 healthy output (0 = No, 1 = Yes)	0 - 1	
60	Enable temp sensor	0 - 1	
65	Enable flow sense input (0 = dis, 1 = En)	0 - 1	
67	Flow state change delay	0 - 60	seconds

OTHER USEFUL ITEMS

Item	Function	Units
70	Operating mode	
41	Pump 1 calculated cycle time	minutes
51	Pump 2 calculated cycle time	minutes
44	Pump 1 remaining cycle time	minutes
54	Pump 2 remaining cycle time	minutes
45	Pump 1 restart inhibit timer	seconds
55	Pump 2 restart inhibit timer	seconds
47	Pump 1 total runs hours	hours x 10
57	Pump 2 total run hours	hours x 10
61	Fluid temperature	deg C
62	Temperature error	deg C
66	Flow state	
68	Flow state timer	seconds
100	Input status	
71	Input status to control logic (as above unless forced)	
78	Force inputs	
72	Output status from control logic	
73	Output relay status (as above unless forced)	
79	Force outputs	

Full operating manuals and item number information can be obtained from your supplier or JTL Systems.

Relay Output Rating
2A resistive

Supply Requirements
230 V ac 48-52 Hz
Supply 3 VA maximum

CE This unit conforms with the relevant EU standards when fitted in accordance with its installation instructions.

Applicable Documentation

Item Numbers	Doc No. 04674
Firmware Variations	Doc No. 04675
Connection diagram	Doc No. 04638

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