





Main Features. (Version 4310.00 Onwards)

- □ An industry proven dedicated pump control system designed to operate as a constant pressure, variable flow control system.
- □ Complete control package.
 - Connect power via suitably rated circuit breaker, wire in the pumps and attach the pressure tube.
- □ Supplied equipment.
 - SNAPPER+ controller
 - Eaton, Vacon, ABB or Danfoss Variable Frequency Drive (Other brands available)
 - IP21, IP54 or IP65 Enclosure Versions
 - Fan forced ventilation on enclosed (switchboard) version.
- Set-Pr Actual-Pr 300 300 Smappert RUN MODE RUN MODE
- 25Bar pressure transducer 4-20mA with 3x over pressure capability.
- Constant Level or Constant Flow also available
- □ Capable of operating up 1 or 2 pumps.
 - Main Pump only- VFD
 - Jockey + Main Pump Jockey Pump options are:- DOL, Soft Start OR Separate VFD
 - Main + Lag Pump Lag Pump options are:- DOL OR Soft Start
- □ Real English Menus with a 2 Line 16 characters LCD Display.
- Pump enabled and run indicators.
- Easy navigation menu system with password access control.
- □ For clarity Menus disappear when an option or function is not selected or required.
- Whilst tuning the actual pressure is displayed along side the value of the adjustment to facilitate rapid evaluation of any change.
- Simple push button actions to enable/disable or manually operate each pump.
- □ Inbuilt settable time clock.
- Remote Control capability via digital input or telemetry.
- SCADA Compatible Modbus/RS485 for remote data acquisition, download or control.
- □ Capable of up to 7 externally activated set pressures for changing duties.
- □ Capable of 7 time activated set pressures.
- User selectable timed activated outputs that can be associated to a time activated pressure settings.
- Data protection or user entry via access code.
- □ Eight programmable inputs for user selectable functions with adjustable delay.
- Two programmable voltage free outputs for BMS interfacing or user selectable output functions.
- Temporary mute of the buzzer on key press actions for silent operation.
- Friction Loss Compensation.
 - Linear, exponential or none.
- Continuous display of the pressure and setpoint.
- User selectable decimal placement for pressure and flow readings. Allows the user to have setting such as PSI with greater resolution. EG 20.3 PSI
- □ Simple scaling and zeroing for all types of sensors or transducers.
- Optional backup pressure transducer with auto change over on detection of a faulty transducer.
- Data logs for local or remote viewing.
 - Total system flow. (Calculated or Actual)
 - o Current average flow rate (Calculated or Actual)
 - Average pressure since last start.
 - Highest pressure recorded
 - o Resettable Hours runs and pump starts for each pump
 - Status of all inputs or outputs.
 - o Local temperature of controller.
 - Communications status.

- Fault logging.
- User adjustable Low Pressure Setting with adjustable delay which performs a Low Pressure Shutdown.
- □ User adjustable Cut In (Restart) Pressure setting.
- User adjustable High Pressure setting with adjustable delay which performs a High Pressure Shutdown.
- □ High pressure shutdown displays the pressure that exceeded the limit until the system is reset.
- Continuously displays the current flow rate.
 - If a flow meter is attached it will be actual flow.
 - If there is no flow meter it will be based on calculated flow.
- Individual pump fault protection option with adjustable delay.
- □ Individual pump protection option with auto-resetting and adjustable delay.
- User adjustable next pump In (ON) delay timer
- User adjustable next pump Out (OFF) delay timer
- □ System Restart Delay Timer.
- System No Flow Input with adjustable timer.
 - Two possible uses for system No Flow Input
 - System loss of prime.
 - Detection of possible standby or sleep condition.
- Configuration Backup and Restore.
 - A complete backup of settings and system configuration including sensor scaling can be implemented at any time and then restored if unconfirmed or doubtful changes have been made.
- Eight individual set points activated by time or external signal.
 - \circ $\;$ Each of the extra setpoints can be activated by the activation of an input.
 - Each of the extra setpoints can be activated by a start and stop time from the internal clock.
 - Each one of the timed Set Points can also have one of the Programmable Outputs operating at the same time. Typically used to operate valves for different systems.
- Specialised Control algorithms that are ultra responsive to minimise overpressure occurrences for critical applications.
- Depiption Pipe Fill Mode- Elimination of water hammer at start-up.
 - Operator adjustable settings to determine at what point pipe fill should be initiated during a restart.
 - Operator adjustable time for pipe filling which automatically stages all pumps to coincide with the overall time.
 - Automatic resumption of pressure control if pipe was only partially empty.
 - Settings to prevent cavitation during the initial stages of pipe fill or when using turbines or bore pumps it facilitates the movement of water past the motor or bearings.
 - Jump duration- This sets how long it takes for the first pump to get to the jump speed before commencing the actual pipe fill sequence.
 - Jump Final Speed- This specifies the final speed of the first pump after the jump duration time.
- □ Flow Meter Support.
 - o Digital output meters
 - Analogue output meters.
 - A digital output pulsed flow meter or Analogue output meter can be connected to log/monitor flow and also used to determine any no flow condition for normal standby mode or faults such as loss of prime.
- Deptional Knob style Set Point adjustment available for ease of use.
- Programmable Start and Stop times for system operation.

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 - The entry of a Shutoff head allows the minimum pump speed to be automatically calculated from the current set point and is essential for multiset point control when the set points vary dramatically.
 - Fixed minimum pump speed is sometimes desirable to enforce a greater overlap between pumps or preset the change over point between pumps.
 - Accurate zero displacement or minimum frequency is also required to determine when the system should be placed on standby or sleep mode.
- Relative or fixed pressure settings.
 - Low pressure shut down. This setting can be a fixed or relative a value.
 - Relative mode. The Low pressure will be a percentage of the current set point. As the set point changes the Low Pressure will then change.
 - Fixed mode. Low pressure will remain constant regardless of the current set point.
 - o Cut In Pressure, High pressure limit and High pressure shutdown. (Relative settings)
 - These settings are all set as a percentage of the current set point. The actual value calculated by from the % of set point is also shown to make it easy to use.
- Optional independent Jockey pump.
 - A full set of independent settings available for Jockey pump operation.
- Soft Pause Input.
 - Used to ramp the system down slowly. Typically used in conjunction with an irrigation controller to turn off the system at the end of a cycle. Pause is displayed when Pause is activated.
 - Two options available.
 - Pause all pumps including the Jockey pump.
 - Pause the main pumps and allow the Jockey pump to run.
- Low Level Input option.
 - Used with floats or similar. Displays "Paused Low-Level".
- Optional Access Code Features
 - Selectable Access code functions.
 - Three different Levels-
 - Menu adjustments only.
 - Pumps only.
 - All.
- □ Industry standard sensor interface
 - 4-20mA
- □ Telemetry
 - The SNAPPER+ is capable of communicating with an external telemetry system based on digital Inputs and/or Outputs from other devices.
 - A serial communications port is provided for direct connection to SCADA or BMS system for access to the SNAPPER+ operating parameters. This is via RS485 MODBUS RTU protocol. A full list of registers addresses can be provided.
- Digital Outputs
 - The SNAPPER+ has 2 programmable outputs that can be selected for a variety of functions. They are rated to 5 amps 240VAC with change over contacts.
- Digital Inputs
 - All inputs can be configured to operate as contact closure = ON or Contact Open = ON (Inverted).
 - The SNAPPER+ has 8 programmable voltage free inputs that can be selected for a variety of functions.

Outline of available menus.

- □ System set pressure & Actual current pressure
- Current system flow rate & speed of the pump currently under VFD control.
 - Fault History menu.
 - Readouts for the last five (5) faults with time and date stamp.
 - Pump Data Log.
 - Total system flow..
 - Average flow rate.
 - Average pressure.
 - Highest pressure reading.
 - Hour Run counters for each pump.
 - Pump Start counters for each pump.
 - Total starts in the last hour.
 - Status of all inputs and outputs.
 - Controller temperature.
 - Communications status monitor.
 - Settings.
 - Low pressure shutdown.
 - Cut In (Restart) pressure.
 - System Set Point.
 - High Pressure Limit.
 - High Pressure Shutdown.
 - Pump flow rate or Flow meter.
 - Friction Loss Compensation.
 - Seven (7) optional pressure setpoints.
 - Pressure trips for activating digital outputs.
 - Flow trips for activating digital outputs.
 - o Tuning.
 - Pump minimum frequency or maximum shut off head.
 - Response rate and tuning parameters.
 - Pump rotation options.
 - Selection of High Pressure restarts.
 - Standby or sleep settings.
 - o Timing.
 - Low pressure shutdown delay.
 - Cut In (Restart) delay.
 - High Pressure Shutdown delay.
 - Next pump ON delay.
 - Pump OFF delay.
 - Main Pump Restart delay.
 - Standby or sleep settings.
 - Jockey Pump fallback delay.
 - Individual and System NO Flow input delay.
 - Delays for general inputs.
 - Pressure trip and flow trip delay for activating digital outputs.
 - System Start & Stop time of day.
 - Configuration.
 - Operating mode. (Pressure or Level or Flow)
 - Number of pumps on the system.
 - Pump minimum frequency option.
 - Pressure display resolution decimal points.
 - Flow display resolution decimal points.
 - Pressure transducer zero and scaling.
 - Flow Meter zero and scaling.
 - Backup pressure transducer zero and scaling.
 - Modes for determining sleep or standby.
 - Jockey Pump fallback enable/disable.
 - Time and date.
 - Activation of friction loss compensation.
 - User Access Code.

- Serial communications settings.
- Type of flow reading.
- Pump manual run options.
- Pump Definition.
 - Configuration for each pump.
 - Jockey.
 - Duty
- o Jockey Pump.
 - Type of jockey pump.
 - DOL. .
 - Cut In pressure.
 - Cut Out
 - Flow rate.
 - Response rate and tuning parameters.
 - Run ON time after a main pumps start.
 - Restart delay..
- Outputs (2) Both individually programmable to one of the options below.
 - Operation in conjunction with Timed Set Points 1-8
 - Shutdown Fault.
 - Low Pressure Fault.
 - High Pressure Fault.
 - Any Alarm.
 - Pump 1-2 Run.
 - Pump 1-2 Fault.
 - System Paused.
 - Any Pump Shutdown.
 - Any Pump Running.
 - No Flow Shutdown.
 - All Pumps Running.
 - VFD Fault.
 - Pressure Trip 1.
 - Pressure Trip 2.
 - Alternate Trip.
 - Flow trip.
 - Jockey Pump Run.
 - All pumps running.
 - Aux Output 1-3.
- Inputs (8) All individually programmable to one of the options below.
 - (All inputs can have Non-Inverted or Inverted logic)
 - Soft Pause.
 - Soft Pause JP Run.
 - Emergency Stop.
 - Pump 1-2 Protect(Pause)
 - Pump 1-2 Stop.
 - Pump 1-2 Manual Run.
 - Fire Mode.
 - Cycle pumps.
 - Reset.
 - No Flow.
 - Aux Input 1-3.
 - Pump 1-6 Fault(Stop)
 - Flow Meter Pulse Input.
 - Low Level Pause.

- Analogue Inputs.
 - Input 1 & 2
 - Mode selection
 - Control Pressure
 - Flow
 - Set Point Input (Potentiometer)
 - o Disabled
 - Input 2 Only
 - Mode selection
 - Backup Pressure
 - (Plus same options as Input 1)
- Pipe Fill Mode.
 - ON or OFF.
 - Initial speed ramp time.
 - Final ramp speed.
 - Pipe fill time
 - Pipe fill activation settings
- Time of day setpoints.
 - Start and Stop times for Setpoints 2 8
- Restore Options.
 - Create a backup copy of configuration and settings.
 - Restore form the most recent backup copy of the configuration and settings.

Controller Specifications.

• Size.

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- 10.5CM Wide x 9CM High x 6CM Deep
- Weight.
 - 250 Grams
- Standard supply voltage.
 - 24VDC +/- 10%
- Optional supply voltage.
 - o 18VAC
 - Power consumption.
 - 3W Typical

All options are available with every controller. Some options will require extra hardware or connection/s to perform the desired task.