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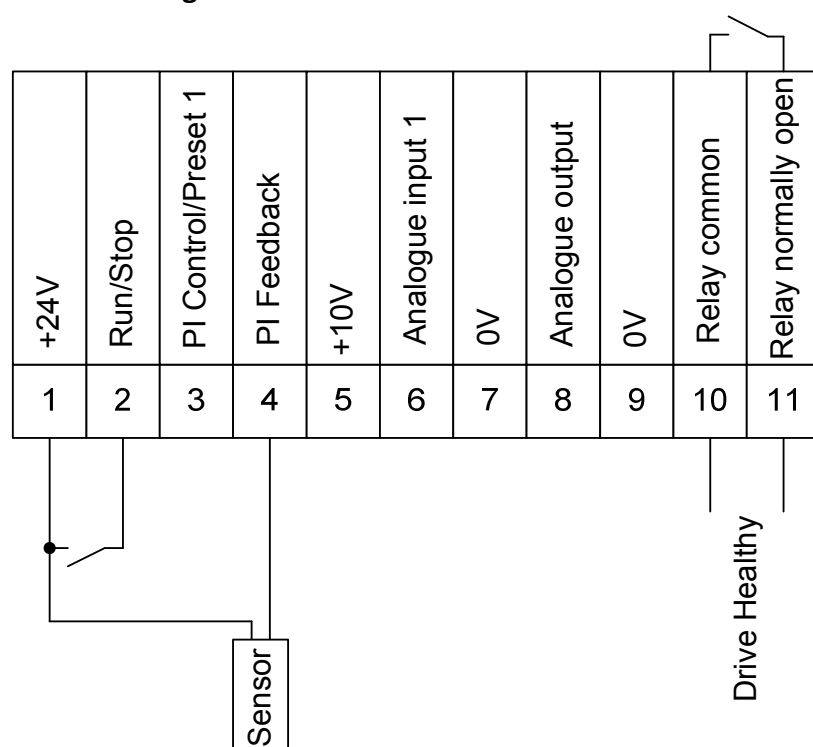
Document number	MCW-E2-017
Revision	0.0
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Product	Optidrive E2

Title	Invertek E2 Example PI Set-up with a Vacuum Sensor
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Summary	This document gives an example PI set up of an Optidrive E2 when used with a Vacuum sensor
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NOTE: This document should be used in conjunction with the Optidrive E2 User Guide and Invertek Drives E2 Application Note AN-ODE-2-032

Control wiring



(NOTE: Sensor connection depends on type of sensor. Please refer to sensor installation guide)

Terminal 1: +24V 100mA User Supply
Terminal 2: Open – Stop / Closed – Run
Terminal 3: Open – PI Control / Closed – Preset speed 1 (P-20)
Terminal 4: PI Feedback (Source type selected by P-47)
Terminal 5: +10V 20mA User Supply
Terminal 6: Analogue input 1 (Can be used as an adjustable PI set point when P-44 = 1)
Terminal 7: 0V
Terminal 8: Analogue output
Terminal 9: 0V
Terminal 10: Drive healthy relay common
Terminal 11: Drive healthy relay normally open

Inverter Set Up

P-01 - Maximum frequency: Default 50Hz. Set as required
P-02 - Minimum frequency: Default 0Hz. Set as required
(**NOTE:** The minimum and maximum speeds should be set according to the manufacturers specification for the vacuum pump)
P-03 - Acceleration ramp time: Default 5s. Set as required
P-04 - Deceleration ramp time: Default 5s. Set as required
P-07 - Motor rated voltage: Set to the motor nameplate voltage
P-08 - Motor rated current: Set to the motor nameplate current
P-09 - Motor rated frequency: Set to the motor nameplate frequency
P-12 - Primary command source: Set to 5 for PI operation. Configures the drive to work with the sensor to keep a constant vacuum/pressure
P-14 - Extended menu access: Set to 101 to access all parameters
P-41 - PI controller proportional Gain: Default 1.0. Set as appropriate for application. Larger values make the drive responds quickly to a small change in pressure. Too high a value can cause instability
P-42 - PI controller integral gain: Default 1.0. Set as appropriate for application. Larger values provide a more damped response
P-43 - User PI operating mode: Set to 1 - Inverse operation. The drive speeds the pump up when the vacuum pressure decreases.
P-44 - PI Reference (setpoint) source select: Default 0 - Digital preset setpoint, P-45 is used as the setpoint
P-45 - PI Digital setpoint. Set as appropriate for application. Sets the preset digital reference for the PI controller. The set-point represents the process level the system is required to maintain
P-46 - User PI feedback select. Default 0. This means that the drive looks for the sensors feedback on Terminal 4
P-47 - Analogue input 2 signal format. Default 0-10V. Set as appropriate for the type of sensor used

PI Digital Setpoint

For a simple system with a fixed setpoint, the value for **P-45** can be calculated from the transducer range.

Example: If a system is required to hold a constant pressure of 1.5 Bar and uses a transducer for feedback with measurement range 0 to 10 Bar, the value of P-45 can be calculated as

$$\frac{1.5 \text{ Bar} \times 100\%}{10 \text{ Bar}} = 15\%$$