

Dual Stage Pump with PCB

PNs: 9000-1920, 9000-1921, 9000-1922, 9000-1923

Vacuum Source Specification Sheet

Description

The DST Pump with PCB is a vacuum control system for use with IDEX degassing chambers. The system includes a dual stage (DST) vacuum pump and a controller PCB to maintain vacuum levels. There is a connector for optional external LED indicators or error outputs. The part numbers for various product configurations are located on the last page of this specification sheet. This specification sheet includes details for both the “analytical” and “prep” versions of the pump. The analytical version is designed for standard degassing chambers and fluids. The prep versions are designed to handle high vapor loads from high flow rate chambers or fluids with low vapor pressure that will cause increased solvent pervaporation through the membrane.

PUMP CONTROL SPECIFICATIONS

Power Requirements

15-24 VDC @ 0.75 Amp max.
(< 5 Watts consumption average)

Temperature

50 °C or lower when run in ambient conditions (20-25 °C)

Vacuum Accuracy

Prep 80 mmHg +/- 10mmHg
Analytical 50 mmHg +/- 10mmHg

Closed-Loop Control Setpoint

50 mmHg absolute (analytical) and 80 mmHg (prep)
pump runs at high RPM until near setpoint, then speed is varied to maintain a value of setpoint—load independent.

Errors Detected

- | | |
|--------------------|---|
| 1 – Pumpdown: | Prep — Unable to reach 110 mmHg in 10 minutes.
Analytical — Unable to reach 80 mmHg in 10 minutes. |
| 2 – High Vacuum: | Prep — Vacuum > 110 mmHg for more than 6 min. in the running state (after pumpdown).
Analytical — Vacuum > 80 mmHg for more than 6 min. in the running state (after pumpdown). |
| 3 – Sensor Signal: | Sensor Failure Detected
sensor signal < 25 mmHg. |

LED Indicators or Optional Error Outputs

Electrical Output – 10mA @ 5VDC
Blinking Rate - 1 second on, 1 second off

- | | |
|---------------------------------------|----------------|
| Power on, vacuum above control range: | Red – Blinking |
| Vacuum reaches upper control range: | Green – Solid |
| Error Condition, Shutdown: | Red – Solid |

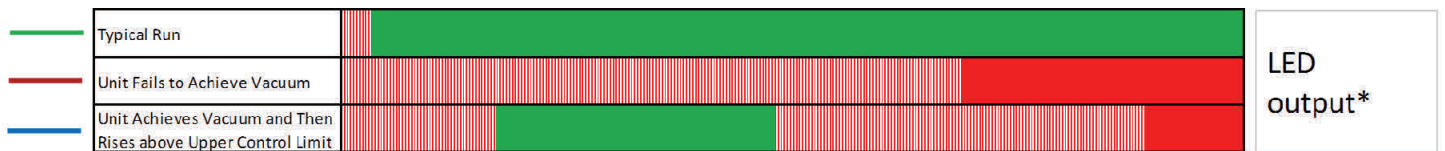
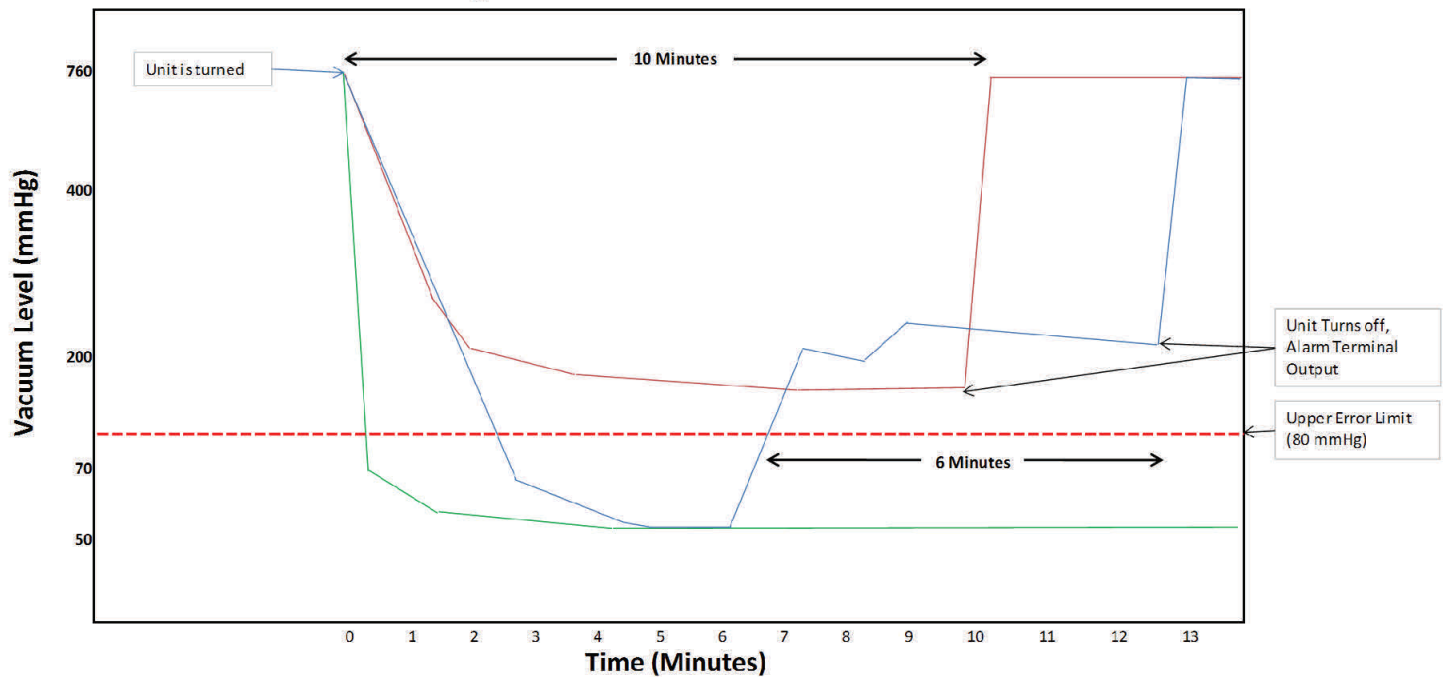
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Analytical (Standard Solvent Load) Variants 50 mmHg Set Point 9000-1920, 9000-1921

ANALYTICAL VACUUM PUMP TECHNICAL DATA

Air Flow (no vacuum): 650 SCCM @ 400 RPM; 100 SCCM @ 60 RPM
 Typical Vacuum Performance: 50 mmHg @ (60±20) RPM (3 SCCM air flow, closed loop)
 Pump-down Time: <1 minute (with 4 MINI degassing channels, 50 cc total internal volume)
 Pump Head Continuous Purge Air Flow Rate: ~12 SCCM
 Vacuum Flow Path Materials: 303 Stainless Steel, Polypropylene, PTFE, EPDM Rubber
 Expected Lifetime: >5 years (continuous run @ 60 RPM)

Degasser Run Characteristics



*Red and green blinking @ 0.100 sec rate.

Prep (High Solvent Load) Variants

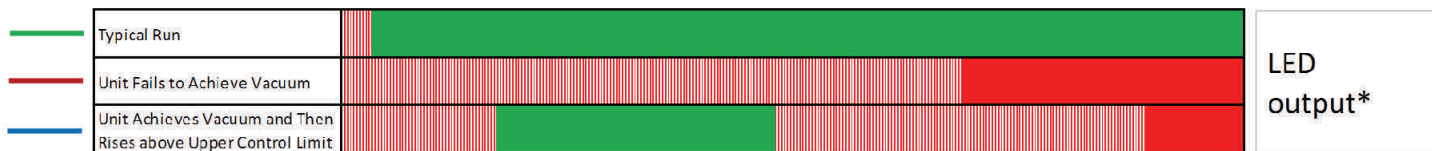
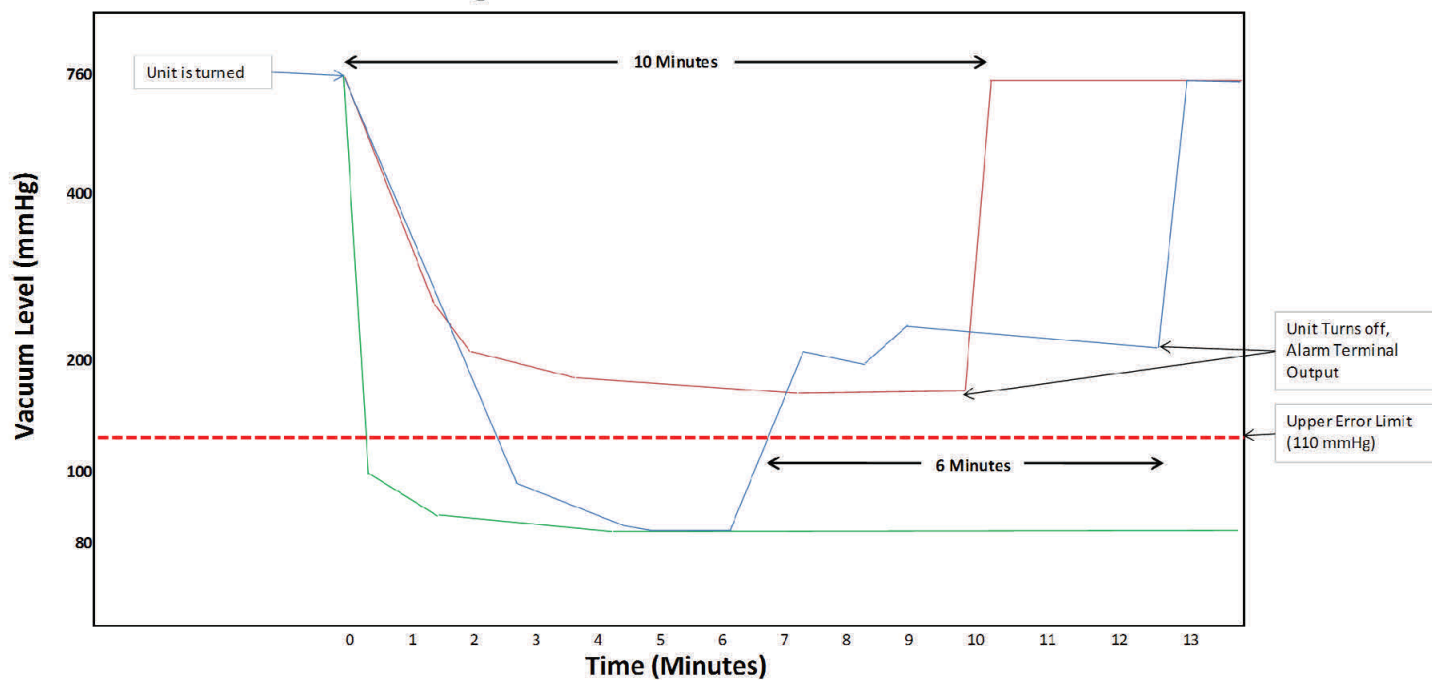
80mmHg Set Point

9000-1922, 9000-1923

PREP VACUUM PUMP TECHNICAL DATA

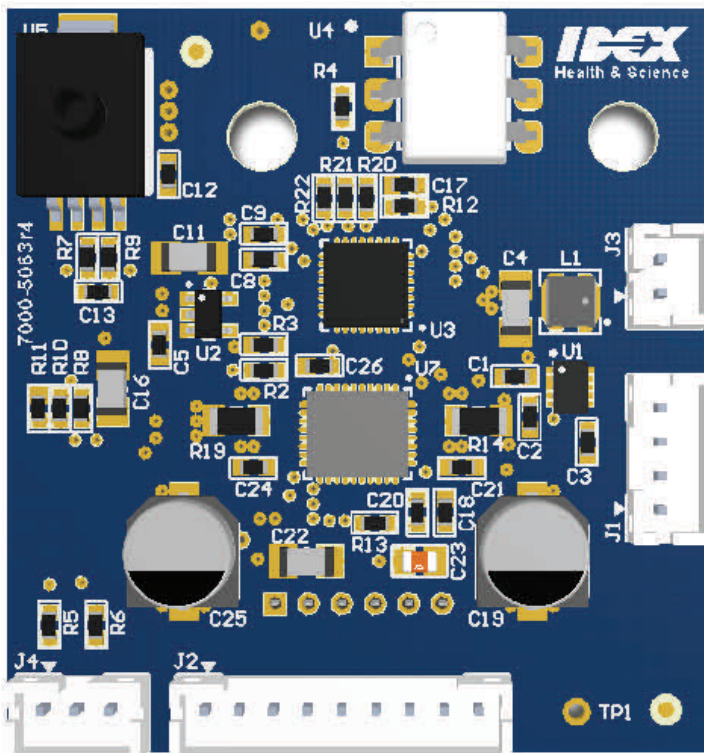
Air Flow (no vacuum): 650 SCCM @ 400 RPM; 100 SCCM @ 60 RPM
 Typical Vacuum Performance: 80 mmHg @ (80±20) RPM (3 SCCM air flow, closed loop)
 Pump-down Time: <1 minute (with 4 MINI degassing channels, 50 cc total internal volume)
 Pump Head Continuous Purge Air Flow Rate: ~30 SCCM
 Vacuum Flow Path Materials: 303 Stainless Steel, Polypropylene, PTFE, EPDM Rubber
 Expected Lifetime: >5 years (continuous run @ 60 RPM)

Degasser Run Characteristics



*Red and green blinking @ 0.100 sec rate.

PCB Connector and Pin Map



Connector J1: Power Input

Header: JST B4B-PH-K-S(LF)(SN)
 Mating Terminal: SPH-002T-P0.5S
 Mating Housing: JST PHR-4

Connector J4: Bi-Color LED

Header: JST B3B-PH-K-S(LF)(SN)
 Mating Terminal: SPH-002T-P0.5S
 Mating Housing: JST PHR-3

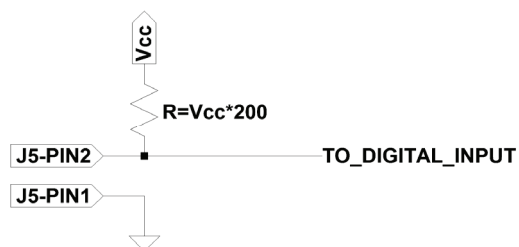
Connector J3: Opto-isolated Error Output

Header: JST B2B-PH-K-S(LF)(SN)
 Mating Terminal: SPH-002T-P0.5S
 Mating Housing: JST PHR-2

Connector	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
J1	+24VDC	+24VDC	GND	GND					
J2	I2C_SDA	I2C_SCL	U1_TX	U1_RX	U0_RX	U0_TX	GND	ISPn	RESETn
J3	Emitter	Collector							
J4	Red LED Anode	GND	Green LED Anode						

The recommended wiring for these connectors is stranded 24 AWG, UL 1007.

J2 provides I2C and UART communication interfaces. Both IDEX and Modbus command protocols are available.

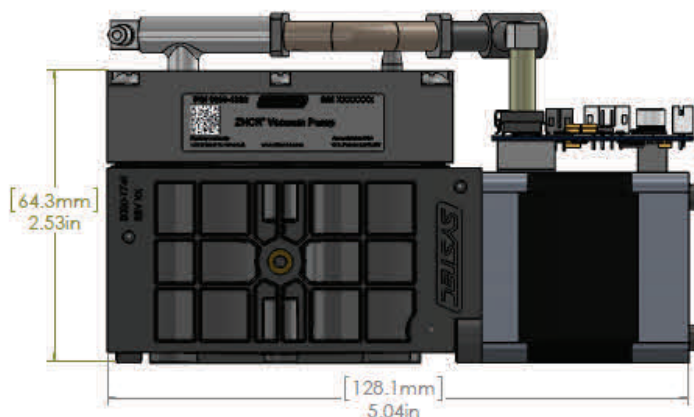
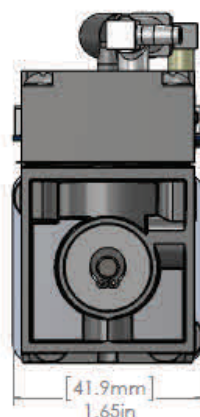
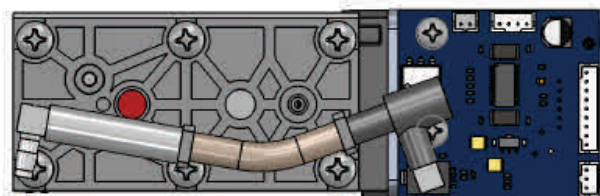
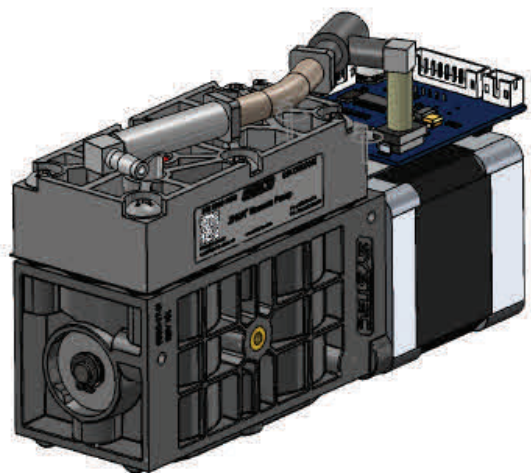


J3 exposes the opto-isolated, bi-polar transistor outputs of the onboard Fairchild Semiconductor H11G2SR2M integrated circuit. The collector and emitter of the opto-coupled transistor are exposed. The recommended circuit for interfacing to digital CMOS or TTL systems is shown in Figure 2.

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Dimensional Drawings

Dimensions are in inches and millimeters [mm]



Vacuum Degassing Control System

Part Number	Description	Mounting	Scale
9000-1920	Vacuum Control System (Pump, PCB and Air Bleed)	Bottom	Analytical
9000-1921	Vacuum Control System (Pump, PCB and Air Bleed)	Side	Analytical
9000-1922	Vacuum Control System (Pump, PCB and Air Bleed)	Bottom	Prep
9000-1923	Vacuum Control System (Pump, PCB and Air Bleed)	Side	Prep