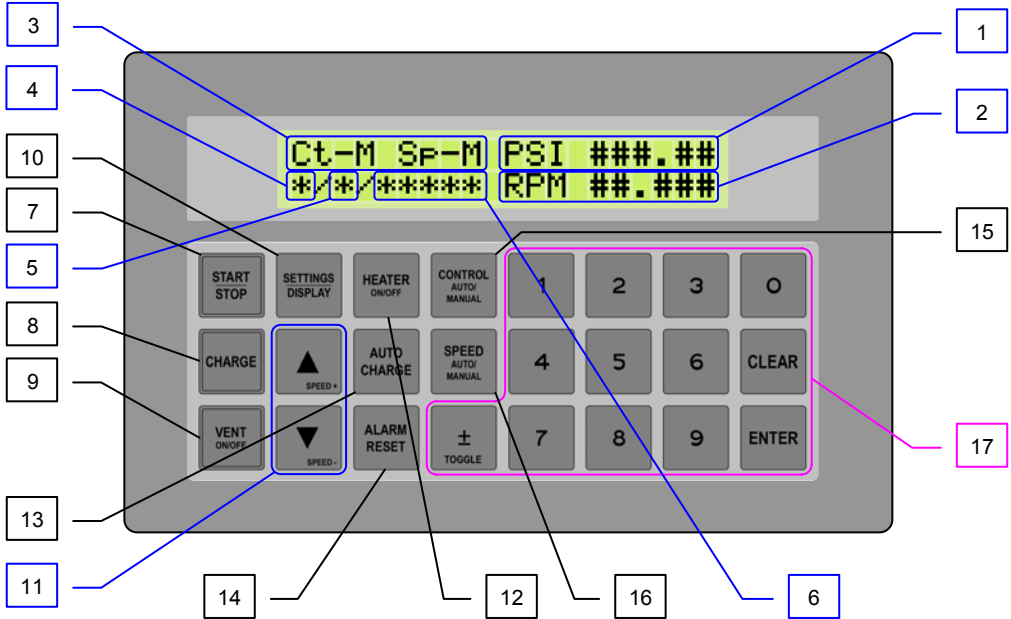


BP60C OPERATOR INTERFACE TERMINAL DIAGRAM



1. Pressure Display
2. Speed Display
3. Auto/Manual Status Display: Ct = Control Input, Sp = Speed Input, M = Manual, A = Auto
4. Heater Status Display: H = Heater On, * = Heater Off
5. Vent Status Display: V = Venting, * = Isolated
6. Main Status Display: On=Motor On, AC=Auto Charge, LOW=Powder Low, STL=Motor Stall
7. Start/Stop Key - Toggles Motor On/Off in Manual Control Input mode
8. Charge Key - Momentary switch to charge canister pressure, or cancel Auto Charge Function
9. Vent Key - Toggles Vent Valve On/Off in Manual Control Input mode
10. Settings/Display Key – Toggles Between Status Display and Settings Screen
11. Up/Down Keys – In the Status Display Screen it will increment manual RPM value by the amount stored in the INC VALUE setting, if held for more than 2 seconds it will ramp manual RPM value by 0.1 RPM/sec, if held for more than 4 seconds it will ramp manual RPM value by 1.0 RPM/sec.
In the Settings Screen Use the Up/Down Keys to Navigate to the Setting Values
12. Heater Key – Toggles Heater On/Off
13. Auto Charge Key – When the motor is off in Manual Control Mode this key will engage the Auto Charge Function, or cancel it if it is already running
14. Alarm Reset Key – Resets Powder Low and Stall Alarms
15. Control Auto/Manual Key – Toggles Auto/Manual Mode for machine control. In Manual Mode Motor, Charge, and Vent functions Are controlled by the Panel, In Auto Mode they are controlled by J1 pins A, D, and E. See note J1 for details
16. Speed Auto/Manual Key – Toggles Auto/Manual Mode for RPM Value. In Manual Mode the stored SPEED setting is used, in Auto Mode the J2 analog pin 1 is used.
17. Value Edit Keys – In the Settings Screen values can be changed by first pressing the Clear Key. Once the new value has been written it can be stored by pressing the Enter Key. The ±/Toggle Key can be used to negate numeric values, or toggle the boolean values ZERO REF HOURS?, and DISABLE LOW ALARM

VARIABLE DEFINITION TABLE

| | |
|--------------------------|--|
| SPEED | The stored RPM value for Manual Speed Mode. Range = 0.0 - 10.0 |
| PRES RAW | Raw value from the Transducer. Used as a reference for calibration |
| PRES OFF | Raw offset value for pressure calibration. See note * for details |
| PRES POS M | Numerator value for positive pressure calibration. See note * for details |
| PRES POS D | Denominator value for positive pressure calibration. See note * for details |
| PRES NEG M | Numerator value for negative pressure calibration. See note * for details |
| PRES NEG D | Denominator value for negative pressure calibration. See note * for details |
| SPEED RAW | Raw value from the analog input pin. Used as a reference for calibration |
| SPEED OFF | Raw offset value for speed input calibration. See note # for details |
| SPEED MLT | Numerator value for speed input calibration. See note # for details |
| SPEED DIV | Denominator value for speed input calibration. See note # for details |
| REF OFF | Raw offset value for analog speed reference output. See note ** for details |
| REF MLT | Numerator value for analog speed reference output. See note ** for details |
| REF DIV | Denominator value for analog speed reference output. See note ** for details |
| AC SET PT | Auto Charge target pressure. See note ## for details |
| AC TIMEOUT | Auto Charge pump-down time-out. See note ## for details |
| AC RUN PT | Auto Charge pump-down time-out start pressure. See note ## for details |
| MN TIMEOUT | Manual Control Mode Run timeout in seconds. Enter 0 to disable feature. |
| INC VALUE | The increment value in RPM for a single press of the Up/Down Keys |
| RUN HOURS | Total machine run hours reference |
| REF HOURS | Machine run hours since last zero. Used as a reference for maintenance |
| ZERO REF HOURS? | When this setting is toggled it zeros out the Ref Hours Value |
| RUNTIME | The time in seconds of the last run, and time in seconds of the current run |
| DISABLE LOW ALARM | Enables or disables the audible powder low alarm |

* The PLC uses the following equations to calibrate the raw pressure value

If the raw pressure is greater than or equal to PRES OFF then

$$\text{PRESSURE} = ((\text{PRES RAW}) - (\text{PRES OFF})) \times (\text{PRES POS M}) / (\text{PRES POS D})$$

If the raw pressure is lower than PRES OFF then

$$\text{PRESSURE} = ((\text{PRES RAW}) - (\text{PRES OFF})) \times (\text{PRES NEG M}) / (\text{PRES NEG D})$$

The PLC uses the following equation to calibrate the raw analog input value

$$\text{RPM} = ((\text{SPEED RAW}) - (\text{SPEED OFF})) \times (\text{SPEED MLT}) / (\text{SPEED DIV})$$

** The PLC uses the following equation to calibrate the Speed Reference Output.

OUTPUT values of (0 – 32000) ≈ (0 – 10) volts

$$\text{OUTPUT} = ((\text{RPM} \times 1000) - (\text{REF OFF})) \times (\text{REF MLT}) / (\text{REF DIV})$$

The Auto Charge function begins its cycle by venting the canister and waiting for the pressure to drop below the value specified by AC RUN PT. The function will then continue to vent for the time period specified by AC TIMEOUT. The AC TIMEOUT value represents the length of time in 1/10th second intervals. After the Auto Charge function has timed out it will begin charging the canister until the pressure raises above the value specified by AC SET PT. To disable the wait period, set AC RUN PT to 327.67. To disable the timeout period set AC TIMEOUT to 0. The Auto Charge function can be canceled at any point by pressing the Auto Charge, Charge, or Vent Keys

IO CONNECTION DIAGRAM

