CLAIMS

1. A vacuum system (1) comprising:

a vacuum pump (3);

a heat exchanger (7) for receiving a heat transfer fluid, the heat transfer fluid comprising a gas;

and a control valve (9) for controlling the supply of the heat transfer fluid to the heat exchanger (7),

wherein the heat exchanger (7) is thermally coupled to the vacuum pump (3) and is operable to absorb thermal energy from the vacuum pump (3) and wherein the control valve (9) is operable selectively to bypass the heat exchanger (7).

2. A vacuum system (1) as claimed in claim 1 comprising at least one port (29) for introducing the heat transfer fluid from the heat exchanger (7) into the vacuum pump (3) and/or into an exhaust of the vacuum pump (3).

3. A vacuum system (1) as claimed in claim 2 comprising a gas heater (11) for heating the heat transfer fluid, the gas heater (11) being disposed between the heat exchanger (7) and the port (29).

4. A vacuum system (1) as claimed in claim 1 comprising a valve controller (31) for controlling operation of the control valve (9), the valve controller (31) comprising at least one electronic processor having at least one input for receiving a signal indicating an operating state of the vacuum pump (3).

5. A vacuum system (1) as claimed in claim 4, wherein the valve controller (31) is configured selectively to actuate the control valve (9) to decrease the supply of the heat transfer fluid to the heat exchanger (7) to reduce the absorption of thermal energy from the vacuum pump (3).

6. A vacuum system (1) as claimed in claim 4 or claim 5, wherein the valve controller (31) is configured selectively to actuate the control valve (9) to decrease the supply of the heat transfer fluid to the heat exchanger (7) in dependence on the signal indicating that the vacuum pump (3) is operating in a low load condition.

7. A vacuum system (1) as claimed in any one of claims 4, 5 or 6, wherein the valve controller (31) is configured selectively to actuate the control valve (9) to increase the supply of the heat transfer fluid to the heat exchanger (7) so as to increase the absorption of thermal energy from the vacuum pump (3).

8. A vacuum system (1) as claimed in any one of claims 4 to 7, wherein the valve controller (31) is configured selectively to actuate the control valve (9) to increase the supply of the heat transfer fluid to the heat exchanger (7) in dependence on the signal indicating that the vacuum pump (3) is operating in a high load condition.

9. A vacuum system (1) as claimed in any one of the preceding claims comprising a cooling block (39) thermally coupled to the heat exchanger (7) and operable selectively to absorb thermal energy from the heat exchanger (7); the cooling block (39) being configured to receive a coolant wherein the coolant comprises a liquid.

10. A vacuum system (1) as claimed in claim 9, wherein the cooling block (39) has an inlet and an outlet for conveyance of the coolant.

11. A vacuum system (1) as claimed in claim 9 or claim 10 comprising a cooling block controller (31) for controlling a supply of the coolant to the cooling block (39), the cooling block controller (31) being configured to supply coolant in dependence on a determination that the temperature of the heat exchanger (7) is greater than or equal to a predefined temperature threshold.

12. A vacuum system (1) as claimed in any one of claims 9, 10 or 11, wherein the heat exchanger (7) and the cooling block (39) are operable independently of each other.

13. A method of operating a vacuum system (1), the vacuum system (1) comprising a vacuum pump (3) and a heat exchanger (7) for absorbing thermal energy from the vacuum pump (3), the heat exchanger (7) being configured to receive a heat transfer fluid;

wherein the heat transfer fluid comprises a purge gas and the method comprises selectively supplying the heat transfer fluid from the heat exchanger (7) to the vacuum pump (3) or into an exhaust of the vacuum pump (3); actuating a control valve (9) to control the supply of the heat transfer fluid to the heat exchanger (7); and selectively actuating the control valve (9) to bypass the supply of the heat transfer fluid to the heat exchanger (7).

14. A method as claimed in claim 13 comprising controlling the supply of the heat transfer fluid to the heat exchanger (7) in dependence on one or more operating parameters of the vacuum pump (3).

15. A method as claimed in claim 14 comprising supplying the heat transfer fluid to the heat exchanger (7) in dependence on a determination that the vacuum pump (3) has an operating temperature greater than or equal to a predetermined threshold.

16. A controller (31) for controlling operation of a vacuum system (1), the controller (31) comprising at least one electronic processor (33) and a memory (33), wherein a set of instructions is stored in the memory (33); and, when executed, the instructions cause the controller (31) to implement the method claimed in any one of claims 13 to 15.