CLAIMS:

1. A control system for sourcing a system load, comprising:

a variable speed device, comprising a pump, and having an operable element in order to source the system load;

one or more controllers configured to determine control curve information for variable operation of the operable element of the variable speed device, the control curve information being dependent on at least a first parameter and a second parameter, the first parameter and the second parameter being correlated, wherein the first parameter comprises a pressure parameter and the second parameter comprises a flow parameter, the control curve information including:

a) a first setpoint of rated total value of the system load for the first parameter and rated total value of the system load for the second parameter, and

b) a second setpoint of a minimum partial percentage of the rated total value of the first parameter at an over-percentage of the rated total value of the second parameter;

the one or more controllers being configured to:

receive one or more inputs in relation to at least one of the parameters, and

operate the variable speed device based on the received one or more inputs according to the control curve information.

2. The control system as claimed in claim 1, wherein the control curve information further comprises:

c) a path which maintains the rated total value of the first parameter for all values of the second parameter up to the first setpoint.

3. The control system as claimed in claim 1, wherein the control curve information further comprises:

d) a path between the first setpoint and the second setpoint.

4. The control system as claimed in claim 1, wherein the control curve information further comprises:

e) a path from the second setpoint which limits values of the first parameter for values of the second parameter greater than the second setpoint.

5. The control system as claimed in claim 2, wherein the control curve information further comprises:

f) a further setpoint of over-percentage of the rated total value of the first parameter for shutoff or zero value of the second parameter, and

g) a path from the further setpoint to the path which maintains the rated total value of the first parameter.

6. The control system as claimed in claim 1, wherein the pump comprises an impeller and the operable element comprises a variably controllable motor.

7. The control system as claimed in claim 6, further comprising a variable speed drive for controlling the variably controllable motor, wherein the operating of the variable speed device includes control of the variable speed drive.

8. The control system as claimed in claim 6, wherein the pump comprises a fire pump, a fire pump unit, or a domestic water booster.

9. The control system as claimed in claim 6, wherein a suction side of the pump comprises a variable pressure supply source.

10. The control system as claimed in claim 1, wherein for the second setpoint the minimum partial percentage and the over-percentage are set by a process requirement.

11. The control system as claimed in claim 1, wherein for the second setpoint the minimum partial percentage is on or about 65% of the rated total value of pressure of the system load and the over-percentage is on or about 150% of the rated total value of flow

of the system load.

12. The control system as claimed in claim 1, further comprising a pressure sensor that is integrated with the variable speed device and for determining the pressure parameter, and further comprising a flow sensor that is integrated with the variable speed device and for determining the flow parameter, wherein the control curve information is for controlling the variable speed device to operate at the pressure parameter for a determined flow parameter.

13. The control system as claimed in claim 1, wherein the system load comprises one or more fire protection valves.

14. The control system as claimed in claim 1, wherein the system load comprises one or more loads which are sourced in an open circuit by the variable speed device.

15. The control system as claimed in claim 1, wherein said operating of the variable speed device includes transferring direct power from a generator to the operable element.

16. The control system as claimed in claim 1, further comprising a pressure sensor for determining the first parameter, wherein the pressure sensor, the variable speed device, the operable element, and the one or more controllers are factory integrated as a singular product.

17. The control system as claimed in claim 1, wherein one or more of pressure regulating valves, direct online (DOL) bypass starters, drain risers, or remote pressure sensors are not required.

18. A fire pump for sourcing a system load having one or more fire protection valves, comprising:

a pump having a variably controllable motor resulting in output parameters including pressure and flow for the system load;

one or more controllers configured to determine control curve information for variable operation of the variably controllable motor, the control curve information

including:

a) a first setpoint of rated total value of the system load for the pressure and the flow, and

b) a second setpoint of a minimum partial percentage of the rated total value of the pressure at an over-percentage of the rated total value of the flow;

the one or more controllers being configured to:

receive one or more inputs in relation to at least one of the pressure and the flow, and

operate the controllable motor based on the received one or more inputs according to the control curve information.

19. The fire pump as claimed in claim 18, wherein the control curve information further comprises:

c) a path which maintains the rated total value of the pressure for all values of the flow up to the first setpoint.

20. The fire pump as claimed in claim 18, wherein the control curve information further comprises:

d) a path between the first setpoint and the second setpoint.

21. The fire pump as claimed in claim 18, wherein the control curve information further comprises:

e) a path from the second setpoint which limits values of the pressure for values of the flow greater than the second setpoint.

22. The fire pump as claimed in claim 19, wherein the control curve information further comprises:

f) a further setpoint of over-percentage of the rated total value of the pressure for

shutoff of the flow, and

g) a path from the further setpoint to the path which maintains the rated total value of the pressure.

23. The fire pump as claimed in claim 18, wherein a suction side of the pump comprises a variable pressure supply source.

24. The fire pump as claimed in claim 22, wherein for the second setpoint the minimum partial percentage and the over-percentage are set by a process requirement.

25. The fire pump as claimed in claim 22, wherein for the second setpoint the minimum partial percentage is on or about 65% of the rated total value of pressure of the system load and the over-percentage is on or about 150% of the rated total value of flow of the system load.

26. The fire pump as claimed in claim 18, further comprising a pressure sensor that is integrated with the pump and for determining the pressure, and further comprising a flow sensor that is integrated with the pump and for determining the flow, wherein the control curve information is for controlling the variably controllable motor to operate at a controlled pressure for a determined flow.

27. The fire pump as claimed in claim 18, wherein the system load comprises one or more loads which are sourced in an open circuit by the pump.

28. The fire pump as claimed in claim 18, wherein said operating of the variably controllable motor includes transferring direct power from a generator to the variably controllable motor.

29. The fire pump as claimed in claim 18, further comprising a pressure sensor for determining the pressure, wherein the pressure sensor, the pump, and the one or more controllers are factory integrated as a singular product.

30. The fire pump as claimed in claim 18, wherein one or more of pressure regulating valves, direct online (DOL) bypass starters, drain risers, or remote pressure sensors are

not required.

31. The fire pump as claimed in claim 18, wherein the fire pump is a fire pump unit or a domestic water booster.

32. A method for controlling a variable speed device, comprising a pump, and having an operable element in order to source a system load, the method comprising:

determining control curve information for variable operation of the operable element of the variable speed device, the control curve information being dependent on at least a first parameter and a second parameter, the first parameter and the second parameter being correlated, wherein the first parameter comprises a pressure parameter and the second parameter comprises a flow parameter, the control curve information including:

a) a first setpoint of rated total value of the system load for the first parameter and rated total value of the system load for the second parameter, and

b) a second setpoint of a minimum partial percentage of the rated total value of the first parameter at an over-percentage of the rated total value of the second parameter;

receiving one or more inputs in relation to at least one of the parameters; and

operating the variable speed device based on the received one or more inputs according to the control curve information.

33. The method as claimed in claim 32, wherein the control curve information further includes:

c) a path which maintains the rated total value of the first parameter for all values of the second parameter up to the first setpoint.

34. The method as claimed in claim 32, wherein the control curve information further includes:

d) a path between the first setpoint and the second setpoint.

35. The method as claimed in claim 32, wherein the control curve information further includes:

e) a path from the second setpoint which limits values of the first parameter for values of the second parameter greater than the second setpoint.

36. The method as claimed in claim 33, wherein the control curve information further comprises:

f) a further setpoint of over-percentage of the rated total value of the first parameter for shutoff or zero value of the second parameter, and

g) a path from the further setpoint to the path which maintains the rated total value of the first parameter.

37. The method as claimed in claim 32, wherein the pump comprises an impeller and the operable element includes a variably controllable motor.

38. The method as claimed in claim 37, wherein a variable speed drive is for controlling the variably controllable motor, wherein the operating of the variable speed device includes control of the variable speed drive.

39. The method as claimed in claim 37, wherein the pump includes a fire pump.

40. The method as claimed in claim 37, wherein a suction side of the pump includes a variable pressure supply source.

41. The method as claimed in claim 32, wherein for the second setpoint the minimum partial percentage and the over-percentage are set by a safety standard, code, or regulating body.

42. The method as claimed in claim 32, wherein for the second setpoint the minimum partial percentage is 65% of the rated total value of pressure of the system load and the over-percentage is 150% of the rated total value of flow of the system load.

43. The method as claimed in claim 32, wherein a pressure sensor is integrated with the variable speed device and is for determining the pressure parameter, and wherein a flow sensor is integrated with the variable speed device and is for determining the flow parameter, wherein the control curve information is for controlling the variable speed device to operate at the pressure parameter for a determined flow parameter.

44. The method as claimed in claim 32, wherein the system load includes one or more fire protection valves.

45. The method as claimed in claim 32, wherein the system load includes one or more loads which are sourced in an open circuit by the variable speed device.

46. The method as claimed in claim 32, wherein said operating of the variable speed device includes transferring direct power from a generator to the operable element.

47. The method as claimed in claim 32, wherein a pressure sensor is for determining the first parameter, wherein the pressure sensor, the variable speed device, the operable element, and the one or more controllers are factory integrated as a singular product.

48. The method as claimed in claim 32, wherein power demand of the variable speed device will be limited to a maximum of said first setpoint and said second setpoint, wherein selection of a non-overloading drive of the operable element will only have to accommodate power demand of said first setpoint and said second setpoint.

49. The method as claimed in claim 32, wherein the method is performed by one or more controllers.

50. A method for selecting a variable speed device, comprising a pump, from a plurality of variable speed devices, the variable speed device having a variably controllable motor in order to source a system load, wherein control curve information of the variable speed device is dependent on at least a first parameter and a second parameter, the first parameter and the second parameter being correlated, wherein the first parameter comprises a pressure parameter and the second parameter comprises a flow parameter, the method comprising:

determining a first setpoint of rated total value of the system load for the first parameter and rated total value of the system load for the second parameter;

determining a second setpoint of a minimum partial percentage of the rated total value of the first parameter at an over-percentage of the rated total value of the second parameter; and

selecting the variable speed device which has the variable controllable motor having a power capacity which minimally satisfies power required to achieve the first setpoint and the second setpoint.

51. The method as claimed in claim 50, wherein power demand of the variable speed device will be limited to a maximum of said first setpoint and said second setpoint, wherein the selecting of a non-overloading drive will only have to accommodate power demand of said first setpoint and said second setpoint.

52. The method as claimed in claim 50, wherein the method is performed by one or more controllers.

53. A non-transitory computer readable medium comprising instructions which, when executed by one or more controllers, cause the one or more controllers to control a variable speed device, comprising a pump, and having an operable element in order to source a system load, the instructions comprising:

instructions for performing the method as claimed in any one of claims 32 to 52.