Prosense Sampling System

Prosense produces sampling solutions integrated with detectors to be used when sampling is required for measurement. These solutions have been developed to ensure continuous measurement by sampling from environments where there are high temperature and/or pressure, which cannot be measured directly by the diffusion method, or where there are elements such as dust and humidity that prevent measurement.

The diagram shows basic components and airflow of sampling system:

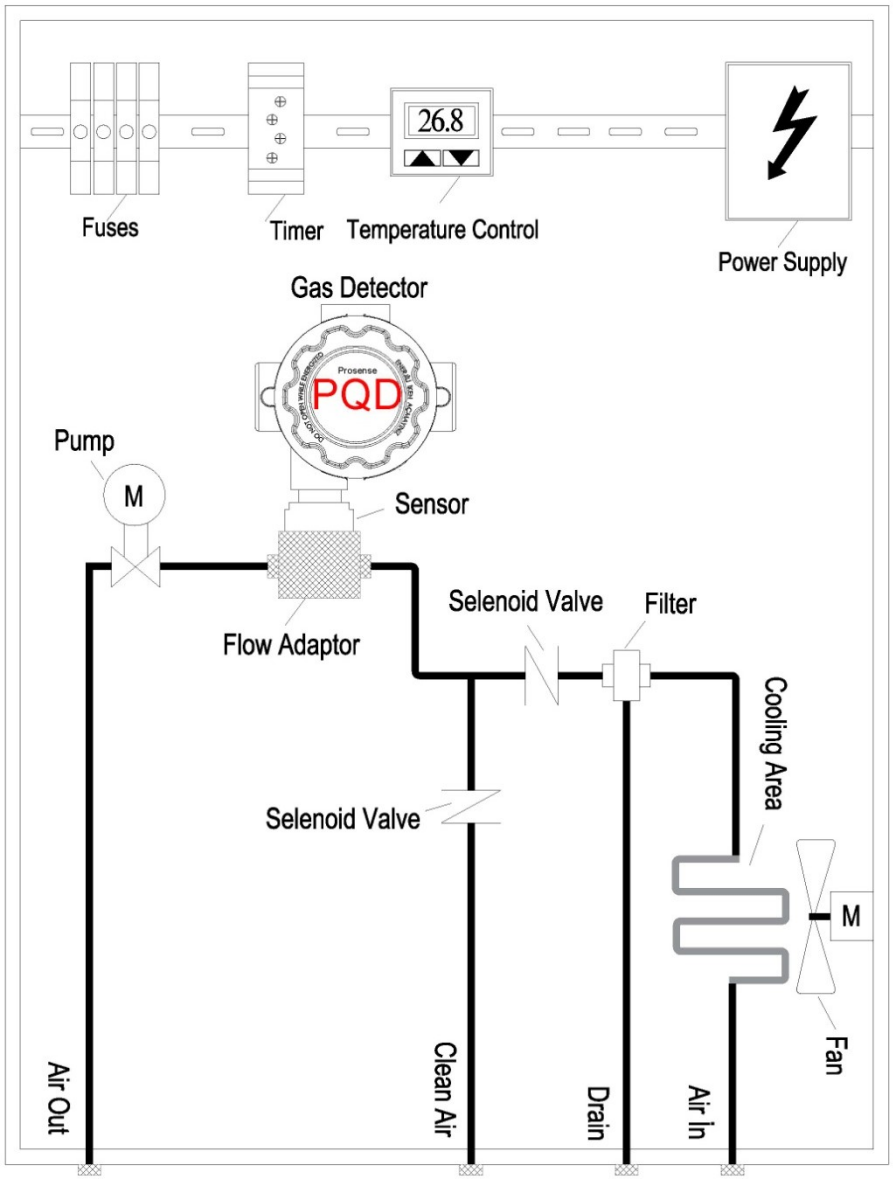

Diagram-1: System components

The sampling system is an integrated structure with a pump, a cooler, a filter that draws air from the environment prepare for measurement. In this system, the pump is behind the detector and continuously vacuum the air from the environment to be sampled. The air is first cooled by passing through the cooler assembly. The cooling process is based on the principle of cooling the air by means of a fan while passing it through an aluminum or stainless steel pipe. There is a temperature

gauge on the spiral pipe. The temperature control unit starts the air cooling process by operating the fan when the temperature in the cooling pipe exceeds the preset limit value. When the temperature drops below the determined limit value, the fan is stopped by the control unit. In this way, it is ensured that the temperature of the incoming air is kept within the specified limits.

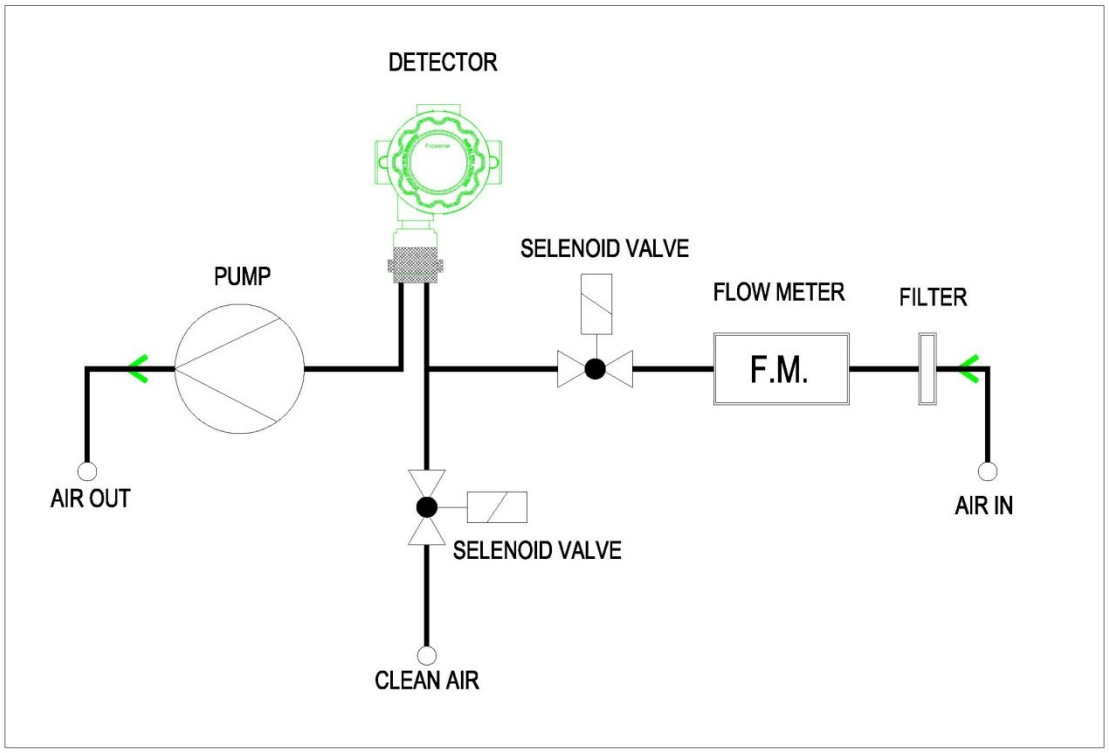

Diagram-2 :Air flow and components

Then sampled air is filtered and purified from the possible dust, oil and water components. It is necessary to open the drain of the filter from time to time and take the accumulated waste out. Otherwise, the accumulated wastes prevent the filter from working properly and the measurement cannot be done correctly.

The filtered air reaches the detector and the measurement is performed by passing it through the sensor with the air flow adapter mounted on the sensor head. The air drawn from the outlet of the flow adapter is vented to the outside. There are two solenoid valves at the inlet of the air flow adapter. These valves are controlled via timer. One of the vans allows fresh air to be drawn from outside. At this time, the sampled airway is closed by the other valve. After sampling with clean air, the clean air valve is closed and the sampling valve is opened to measure the sampled air. The system is set to draw sampling air for 30 minutes and fresh air for 1 minute. These times can be changed as desired via the timer. The purpose of this setup is to control the possibility of the detector making mistakes while continuously measuring. Because if there are sticky components in the sampled environment, it may cause deviations in the measurements over time. By using clean air, this situation can be controlled and the sensor is cleaned as well. It can also be used during detector calibration by controlling the fresh air intake by solenoid valves. Thus, detector calibration can be done without making any changes on the sampling system.

The sampling system electrical connection must made through the main power terminalinside the panel. All components of sampling system are cabled within the switchboard. The system works with 220VAC electricity. When energized, it all starts working. There is a fuse on the electrical connection terminal. Main power inlet terminal components are given in the table:

Label	Cable Color	Connection
L (F1-fused)	Brown	Phase
GND	Yellow/Green	Ground
N	Blue	Notr

Tablo-1: Electric input

Since the detector is produced in an integrated manner in the sampling system, the signals to be received from the detector are made through the terminal where the detector connections are met. The connections carried by the terminals used here are given in the table:

Label	Cable Color	Terminal	Usage
+	Brown	Red	Detector power input V+
-	White	Blue	Detector power input V-
S	Green	Gray	4-20mA Analogue current out
A	Green	Gray	RS485 Serial MODBUS A
B	Yellow	Blue	RS485 Serial MODBUS B
Hata (Fault)	Brown	Gray	Fault Relay output (NC)
Hata (Fault)	White	Gray	Fault Relay output (COM)
A1	Yellow	Red	Alarm-1 Relay output (NO/NC)
A1	Brown	Red	Alarm-1 Relay output (COM)
A2	Green	Red	Alarm-2 Relay output (NO/NC)
A2	White	Red	Alarm-2 Relay output (COM)

Tablo-2: Detector Connections

Fuses can be used to stop any component from the system. Fuses and controlled components are given in the table:

Fuse	Cable color	Terminal color	Controling	Range
F1	Brown	Brown	Main power input	220VAC
F2	Red	Brown	Detector	12VDC
F3	Red	Gray	Selenoid Valves	12VDC
F4	Brown	Gray	Pump	220VAC
F5	Brown	Gray	Timer	220VAC
F6	Brown	Gray	Termostat and Fan	220VAC
F7	Brown	Gray	PSU	220VAC

Tablo-3 Fuses

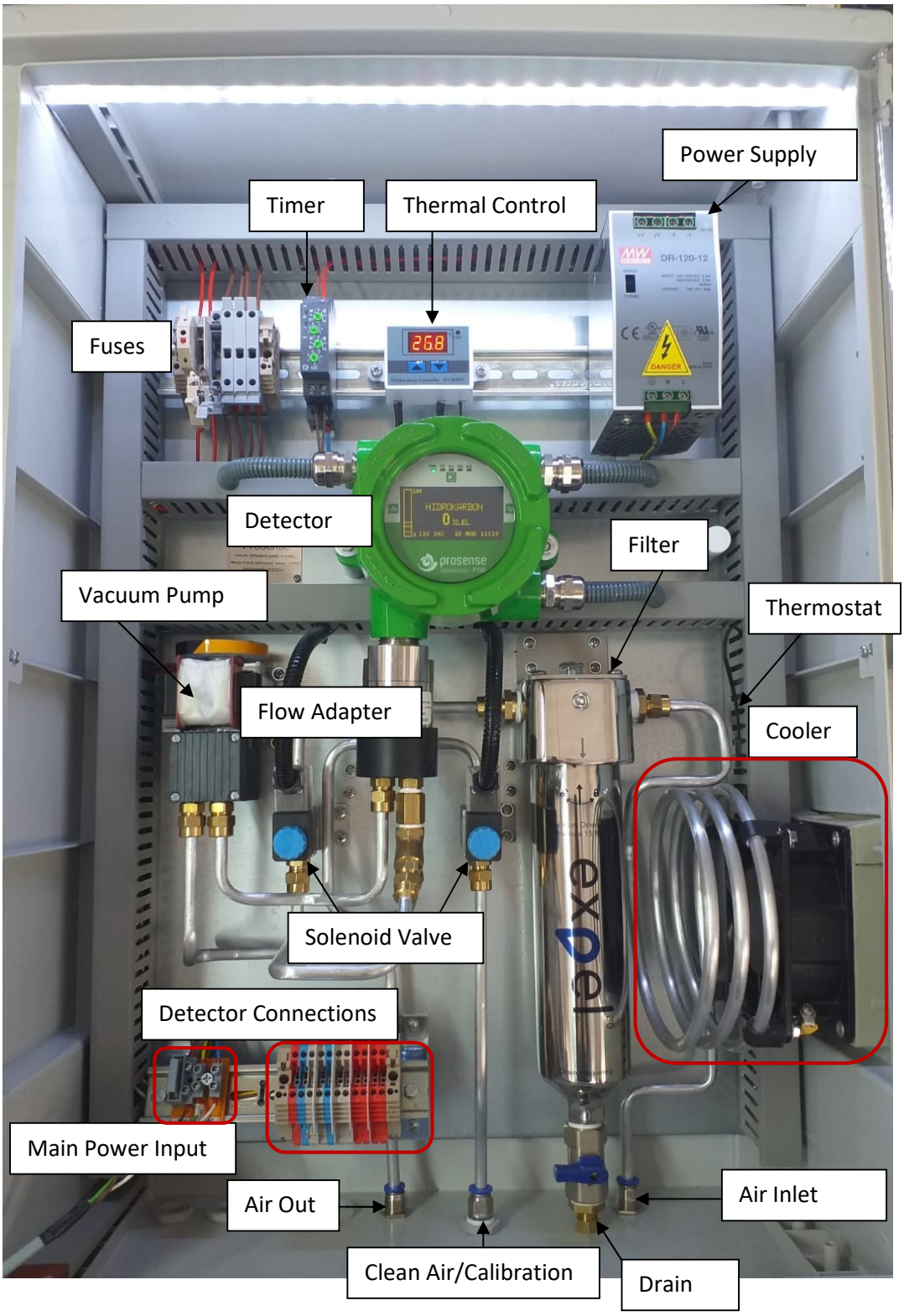

Diagram-3: An operating sampling system