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(54) **METHOD FOR EXTRACTING BIOGAS AND CORRESPONDING DEVICE**

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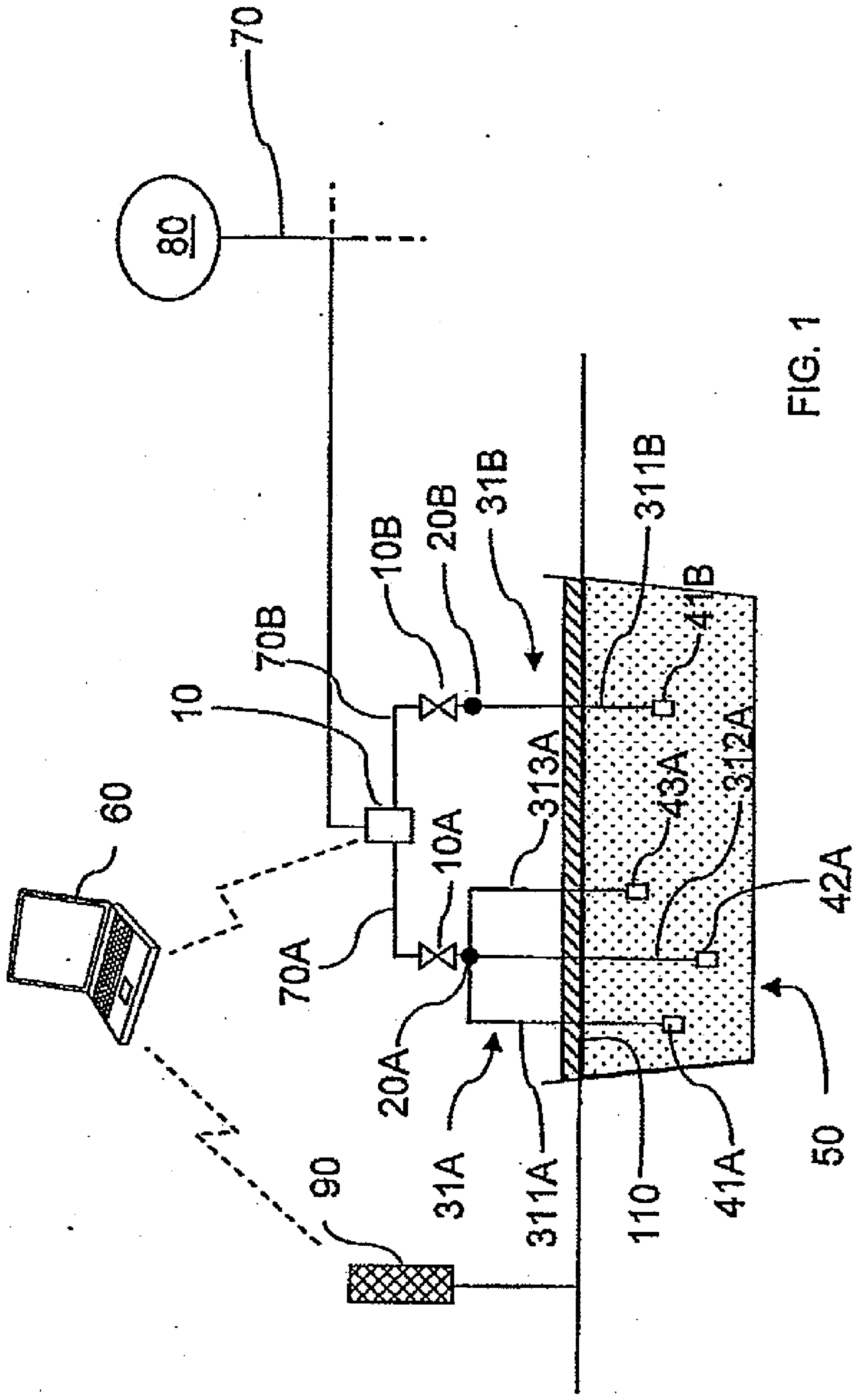
(57) **ABSTRACT**

The invention essentially relates to a method for controlling the extraction of a biogas from a housing (**50**) equipped with at least one extraction assembly (**31**A, **31**B) connected to a manifold (**70**A, **70**B) via a control valve (**10**A, **10**B), said method comprising the following steps: providing a respective predetermined manifold pressure (Pr) for each manifold (**70**A, **70**B), and opening the control valve (**10**A, **10**B) in a given position. The method is essentially characterised in that it further comprises the following steps: measuring the value of a meteorological parameter outside the housing; calculating a global set point (dPci) of the control valve (**0**A, **10**B) position based on the measured meteorological parameter value, and opening the control valve (**10**A, **10**B) in a given position in response to the global set point (dPci).


70
80
60
10
70B
10B
20B
31B
311B
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312A
42A
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20A
31A
311A
110
41A
50
90

FIG. 1

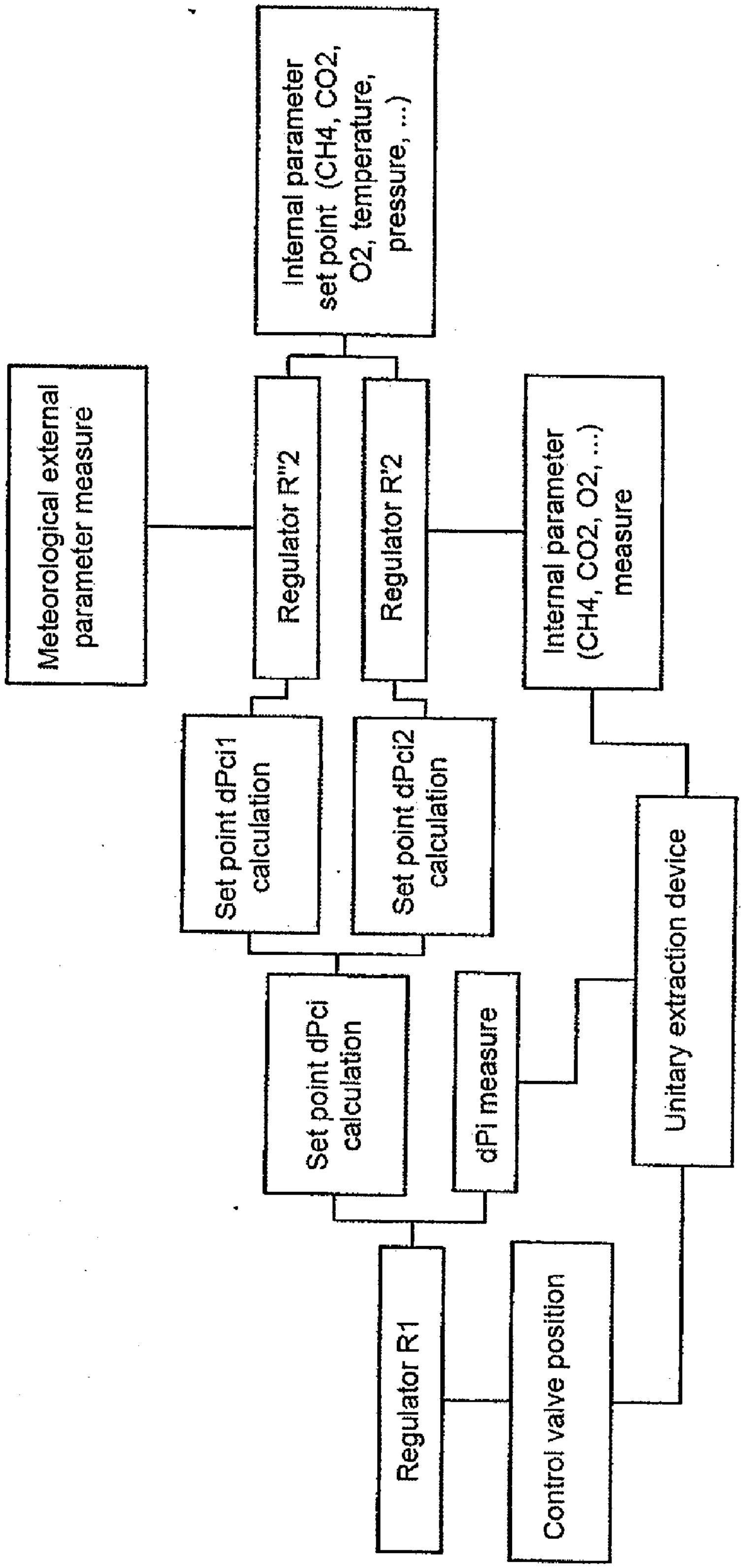
Internal parameter set point (CH4, CO2, O2, temperature, pressure, ...)
Meteorological external parameter measure
Regulator R"2
Regulator R'2
Internal parameter (CH4, CO2, O2, ...) measure
Set point dPci1 calculation
Set point dPci2 calculation
Unitary extraction device
Set point dPci calculation
dPi measure
Regulator R1
Control valve position

FIG.2

METHOD FOR EXTRACTING BIOGAS AND CORRESPONDING DEVICE

[0001] The present invention relates to the field of biogas extraction.

[0002] More specifically, according to a first aspect, the invention relates to a method for controlling the extraction of a biogas from a housing (**50**) equipped with at least one extraction assembly (**31**A, **31**B), each extraction assembly being connected to a respective manifold (**70**A, **70**B) via a respective control valve (**10**A, **10**B) and comprising at least one unitary extraction device (**311**A, **312**A, **313**A, **31**B), the method comprising the steps of:

- **[0003]** providing a respective predetermined manifold pressure (Pr) at each manifold (**70**A, **70**B), and
- **[0004]** opening the control valve (**10**A, **10**B) at a given position.

[0005] The extraction of biogas depends on internal parameters (type of waste, bacteria, air/oxygen amount, age of waste), and parameters external to the housing. The distribution of the production areas inside a housing is heterogeneous.

[0006] It is known by the skilled person the related prior art document U.S. Pat. No. 6,169,962.

[0007] The extraction of biogas is controlled well by well. The proposed system comprises a sensors-based measuring device in each wellhead for measuring the flow, vacuum, temperature and the $O_2/CH_4/CO_2$ content of the extracted gas. The measuring data are sent to a remote computer that, in return, with reference to a model, controls the opening/closing of a pneumatic control valve of each well, the pneumatic control valve allowing for the adjustment of the flow of gas extracted well by well.

[0008] Nevertheless, such a system does not allow taking into account the network disruptions, nor the extraction disruptions resulting from atmospheric disturbances.

[0009] It is also known by the skilled person the related prior art document EP 1291093. The extraction method of biogas proposed by this patent is based on a measure of relative pressure between atmospheric pressure and gas pressure in the waste.

[0010] The gas extraction is based on a set point depending on meteorological forecasts, such that the set point is lowered beforehand when the meteorological forecasts predict a drop in atmospheric pressure.

[0011] Nevertheless, such a solution does not allow for an optimal capture as this depends on the meteorological forecast, itself having a more or less high level of uncertainty in value, time and space.

[0012] The object of the present invention is to remedy to these drawbacks by proposing a solution for optimally capturing the biogas, that is, the captured flow is equal to the flow produced by the waste.

[0013] With this objective in mind, the device according to the invention, which still further conforms to the above-mentioned preamble, is substantially characterized in that it further comprises, the steps of:

- **[0014]** measuring the value of a meteorological parameter outside the housing,
- **[0015]** calculating a global set point (dPci) of differential pressure based on the measured meteorological parameter value,
- **[0016]** measuring the relative pressure (dPi) at least at one extraction assembly,
- **[0017]** comparing the measured relative pressure to the set point value (dPci), and
- **[0018]** changing the control valve (**10**A, **10**B) position based on the comparison result.

[0019] In an embodiment, the method further comprises the steps of:

- **[0020]** providing a first local set point (dPci**1**) by comparing the value of measured meteorological parameter (s) to a reference model,
- **[0021]** the step of calculating the global set point (dPci) being a function of said first local set point (dPci**1**).

[0022] Thanks to this feature, it is possible to anticipate the effects linked to the climatic conditions on the amount of biogas to be captured.

[0023] Preferably, the external measured meteorological parameter is comprised within the set including the atmospheric pressure, the external temperature and the rainfall rate.

[0024] In an embodiment, the method further comprises the steps of:

- **[0025]** measuring the value of a physico-chemical internal regulation parameter comprised in the set ($O_2/CH_4/CO_2$ content, temperature, pressure) at least at one extraction assembly,
- **[0026]** comparing the measured value with a reference value, and
- **[0027]** providing a second local set point (dPci**2**) based on the comparison result,
- **[0028]** the step of calculating the global set point (dPci) being a function of said second local set point (dPci**2**).

[0029] Preferably, the reference model is built through a preliminary learning step, wherein the evolution of the pressure internal to the mound of waste is measured according to the value of the measured external and/or internal parameter (s).

[0030] Thanks to the invention, it is possible to anticipate the variations linked to the operating conditions on a biogas extraction network.

[0031] The relative pressure obtained at the extraction system depends on the relative pressure value imposed at the manifold by the biogas suction systems. In any case, the pressures (dPi, Pr, Pi) are differential pressure values with respect to atmospheric pressure.

[0032] For this reason, the notions of relative pressure and differential pressure will be used indistinctly.

[0033] According to another aspect, the invention also relates to a device for controlling the extraction of biogas, able to implement the method according to the invention.

[0034] The device comprising:

- **[0035]** a housing (**50**) equipped with at least one extraction assembly (**31**A, **31**B), each extraction assembly being connected to a respective manifold (**70**A, **70**B) via a respective control valve (**10**A, **10**B) and comprising at least one unitary extraction device (**311**A, **312**A, **313**A, **31**B),
- **[0036]** means for providing a manifold pressure (Pr) to the respective manifold(s) (**70**A, **70**B), and
- **[0037]** means for opening the control valve (**10**A, **10**B) in a given position.

[0038] The device is substantially characterized in that it further comprises,

[0039] means for measuring the value of a meteorological parameter outside the housing,

[0040] means for calculating a global set point (dPci) of differential pressure based on the measured meteorological parameter value,

[0041] means for measuring the differential pressure (dPi) at least at one extraction assembly,

[0042] means for comparing the measured relative pressure with the set point value (dPci), and

[0043] means for changing a position of the control valve (**10**A, **10**B) according to the comparison result.

[0044] In an embodiment, the device further comprises:

[0045] means for providing a first local set point (dPci**1**) by comparing the value of the measured meteorological parameter(s) with a reference model, the step of calculating the global set point (dPci) being a function of said first local set point (dPci**1**).

[0046] Preferably, the device according to the invention further comprises learning means, configured to measure the evolution of the internal pressure (Pi) based on the value of the external measured meteorological parameter(s), the reference model being built from learning means.

[0047] In an embodiment, the device further comprises:

[0048] means for measuring the value of an internal physicochemical parameter comprised in the set (O_2/CH_4/CO_2 content) at least at one extraction assembly,

[0049] means for comparing the measured value with a reference value, and

[0050] means for providing a second local set point (dPci**2**) according to the comparison result, the global set point (dPci) being a function of said second local set point (dPci**2**).

[0051] Thanks to the invention, the external (meteorological) disturbances may be taken into account. Yet, these external disturbances play a major part in the diffused emissions, a few more percentages of biogas may be extracted compared to the prior art.

[0052] Likewise, thanks to the invention, the internal disturbances may be compensated for.

[0053] Thus, the invention makes it possible to dampen the biogas production variations due to the external parameters, as well as the internal parameters owing to the handling of a plurality of networked housings.

[0054] Thanks to the invention, a determined quality of biogas may be extracted, that is, a biogas having a determined methane content in a given range. Keeping a constant predetermined quality makes it possible to ensure an optimal valorization of the extracted biogas, particularly owing to the fact that the valorization systems do not accept important variations of methane content.

[0055] In fact, the invention allows to reduce the biogas quality variations linked to atmospheric events. In fact, when only the methane percentage of a well is measured and controlled, the depression disturbances resultant is only evaluated a few hours later.

[0056] Thanks to the invention, the depression may be adjusted at each well so that it may be adapted over time based on the quality of the methane and atmospheric variations, that is, the depression variation applied through the (dPci) model make it possible to manage the imbalance associated with the change in atmospheric pressure, the quality variations of the biogas are lessened.

[0057] Other characteristics and advantages of the present invention will become more apparent upon reading the following description given by way of non limitative example and carried out with reference to the accompanying figures wherein:

[0058] FIG. **1** is a representation of an embodiment of the device according to the invention, and

[0059] FIG. **2** is a synoptic representation of an embodiment of the method according to the invention.

[0060] With reference to FIG. **1**, the device according to the invention comprises a housing **50** equipped with a first assembly **31**A of first unitary extraction devices, in the present case, wells **311**A, **312**A, **313**A, connected to a manifold **70**A via a control valve **10**A. Furthermore, the device may comprise at least one second assembly **31**B of second unitary extraction devices, in the present case, a second well **311**B connected to a manifold **70**B via a control valve **10**B.

[0061] Each assembly may thus comprise a plurality of unitary extraction devices and the device may comprise a plurality of network-fashion mounted assemblies as explained further down.

[0062] Each unitary extraction device, hereinafter called well, comprises a suction head **41**A, **42**A, **43**A, **41**B for collecting the biogas within the housing **50**, and each assembly comprises a wellhead, **20**A and **20**B, respectively.

[0063] The control valve **10**A, **10**B is mounted between the wellheads **20**A, **20**B respectively and the respective primary manifolds **70**A, **70**B.

[0064] Manifolds **70**A, **70**B are connected to a main manifold **70** by an appropriate piping network, so that in other embodiments, manifolds **70**A, **70**B and **70** may be the same.

[0065] The device comprises means, not shown, such as a constant or variable displacement pump for providing a manifold pressure Pr, in the present case, a negative pressure, that is, a depression dPci, to manifold(s) **70**A, **70**B. The device also comprises means **60**, **10** to selectively open automatically the control valve **10**A, **10**B respectively in a given position. Preferably, these means comprise operating means **60**, in the present case, a computer or an automaton. The operating means may directly operate the control valve **10**A, **10**B. They comprise, or are coupled to, adjusting means **10**. Preferably, the regulating means comprise a first and second regulator, they are configured to calculate and transmit pressure set points inducing a position change of the control valve **10**A, **10**B based on the various parameters, as described further down.

[0066] The communication between the operating means **60** and the control valve **10**A, **10**B may be carried out by any known, wired or wireless, means, thus, the operating means **60** may be remotely disposed.

[0067] The device according to the invention also comprises meteorological means **90** to measure the value of at least one meteorological parameter outside the housing, in the present case, a pressure sensor for atmospheric pressure, a thermometer for the temperature, and a rain gauge for the rainfall rate are arranged on surface, preferably next to the housing **50**. These meteorological means **90** are in communication with the operating means **60**.

[0068] The operating means **60** advantageously comprise prediction means, in the present case, a reference model in the form of a software, for predicting the evolution of the internal pressure Pi at each extraction assembly according to the value of the measured meteorological parameter(s).

[0069] To this end, the value of the measured meteorological parameter(s) is compared to the reference model, so as to provide a first local pressure set point dPci**1**, called local pressure set point, by a regulator R"**1** of a first regulation loop.

[0070] The first regulation loop is called slow regulation loop in that it takes into account the changes due to the external conditions, diurnal/nocturnal, season and other atmospheric effects.

[0071] The first set point dPci**1** makes it possible to obtain a constant quality of the biogas extracted based on the gas quality set point (that is, substantially the methane content comprised in the biogas), set by the operator. The methane content represents an internal parameter set point example; in another embodiment it may concern the depression dPi, the gas temperature, the O_2 or CO_2 content, etc.

[0072] Preferably, the reference model is built through a preliminary learning step.

[0073] The learning consists, for example, in measuring the evolution of the internal pressure Pi based on the measured meteorological parameter(s). This evolution may be registered as a reference model in the operating means **60**. The model may be established beforehand, and possibly be continuously updated, when operating the housing.

[0074] At a given moment, the measurement of a given meteorological parameter is compared to its nearest value in the model. The corresponding internal pressure is then evaluated, by the preliminary learning step.

[0075] Thanks to the reference model built through a learning step, it is possible to carry out a step of predicting the evolution of the internal pressure Pi based on the measured meteorological parameter(s), and provide an appropriate local set point dPci.

[0076] According to this prediction of the evolution of the internal pressure Pi, the operating means **60** then transmit a position change set point of the control valve **10**A, **10**B.

[0077] Thus, the detection of an external meteorological variation make it possible to anticipate, to predict the variation of biogas production, hence the internal pressure P**1** within a set of wells.

[0078] The prediction is linked to the ideal gas law PV=nRT. If the pressure variation is known (measured pressure and temperature), then the volume variation of the biogas produced in the housing is known (calculated). Furthermore, an empirical delay factor, identified in situ, as well as environment porosity coefficients, etc. make it possible to determine the pressure variation on either side of the control valve.

[0079] By way of illustration, if the atmospheric pressure is constant and the control valve is open, and the membrane **110** semi-permeable, air is suctioned into the housing and the methane is diluted, which is not desirable.

[0080] Thanks to the invention, although the atmospheric pressure varies, the methane content extracted from the biogas is constant.

[0081] Advantageously, the device according to the invention further comprises, means for measuring the value of a physicochemical parameter inside the housing comprised within the assembly ($O_2/CH_4/CO_2$ content, quality of biogas, pressure, etc.) at least at one well, in the present case, appropriate sensors.

[0082] The measurements of at least one of the parameters comprised in the assembly are preferably carried out sequentially and periodically from one extraction head to another.

[0083] The measured content is compared to a reference value, for example through the operating means **60**, that transmit a second pressure set point dPci**2**, called local set point, allowing for the position change of the control valve **10**A, **10**B based on the comparison result, the global set point dPci being a function of said second local set point dPci**2**. The second set point dPci**2** is provided by a regulator R'**1** of the first regulation loop.

[0084] Advantageously, the adjusting means **10** comprise a feedback loop, relating the comparison value and the opening/closing value of the control valve, so as to obtain a gradual precise opening/closing (position), and not an all-or-nothing type opening/closing.

[0085] In this embodiment, the global pressure set point dPci, is a function of both local pressure set points dPci**1**, and dPci**2**, particularly, the global set point dPci is the sum of local set points dPci**1**+dPci**2**.

[0086] The first adjusting level thus preferably comprises two regulators. Thus, the prediction done at regulator R"**1** is corrected by the measure carried out at regulator R'**1**. This correction allows at the same time to limit the introduction of air into the housing, thus, the introduction of oxygen, in case of an increase in atmospheric pressure, and to limit possible methane leaks in case of a decrease in atmospheric pressure, thus the set point of control valve position is calculated so as to be always optimal.

[0087] Apart from the mentioned atmospheric disturbances, the device according to the invention may also be subjected to internal disturbances.

[0088] In operation, a biogas extraction site is a system comprising a plurality of devices such as described and connected between each other to a main manifold **70** via a piping network. The main manifold is connected to a biogas treatment means **80** (valorization, flaring, etc.)

[0089] If for various reasons one of the network pipings is closed, the (constant) depression exerted at the main manifold is split on the other pipings. The depression, hence the capture flow increases, with the aforementioned risk of introducing air into the housing.

[0090] Thanks to the invention, this risk is eliminated by keeping a fixed flow at each valve, or more exactly, a maximum biogas flow by maintaining a constant gas quality.

[0091] The coupling of the control valve position to the differential pressure measurement defines a second regulation loop, implemented by a second regulator R**2** of the adjusting means **10**.

[0092] This second regulation loop makes it possible to optimally configure the device for instantaneous methane production. It is called fast in that it allows for an adaptation to rapid changes in biogas production.

[0093] To this regard, the device according to the invention comprises means for measuring the differential pressure dPi at least at one extraction assembly.

[0094] The measured relative pressure dPi is compared to a set point value dPci and a change in position of the control valve is carried out, based on the comparison result, by regulator R**1**.

[0095] That is, based on set point dPci, regulator R**1** sends a signal for controlling the opening/closing of the control valve, defining a depression value to be applied at this valve.

[0096] Thus, regulator R**1**, has as entry parameter at least the differential pressure, and possibly the local temperature, on either side of the considered valve, these variables being measured. Regulator R**1** has as set point a determined differential pressure value dPci. If the measured differential pressure dPi is different from the set point value, the valve position is changed by adjusting means **10**, to obtain the set point differential pressure.

[0097] The operating means **60** are advantageously used as means for comparing the relative measured pressure with a reference value, and as means for providing, via the adjusting means **10**, a first position change set point of the control valve based on the comparison result.

[0098] Preferably, the set point dPci is fixed as predetermined for each of the extraction heads. Furthermore, this set point is advantageously determined based on the first regulation loop.

[0099] The use of the differential pressure as control variable make it possible to eliminate the disturbances relating to the depression variations of the biogas extraction network, such as: operation incident, isolation of a network sub-part, regime change of the extractors.

[0100] With reference to the measured external meteorological parameters:

[0101] In an embodiment, the external parameter is the external temperature, as the temperature has an influence on biological reactions, hence, on biogas production (drop in activity with a drop in temperature, for example during winter time). Nevertheless, the influence of the temperature remains lower than the influence of both following parameters (rainfall rate and pressure).

[0102] In an embodiment, the external parameter is the rainfall rate.

[0103] There exists on the surface of a housing an area-called water table fluctuation area. These areas have a thickness of around a few meters, typically of 4-5 m. With their geological location, these areas are alternatively aerobic and anaerobic depending on rainfall rate, and as a result, unusable for the methanogenesis as there are not maintained in a strict anaerobic condition.

[0104] Often, these upper layers of the housing are clayey (loam or other). In case of rain, the clay functions as an impermeable layer, and the capture flow may hence be increased.

[0105] In case of rainy storms for example, we may consequently have a rapid increase (in a few hours) in biogas quality.

[0106] Thanks to the invention, the thickness of the fluctuation zone is highly reduced, or even nearly null, with the mastery of biogas extraction.

[0107] The invention advantageously anticipates the impact of rainfall rate on biogas extraction, as rainfall leads to the obstruction of the clayey cover. This promotes a decrease of air input and allows for an increase in the depression to provide in the mound of waste to capture more biogas. Furthermore, a period of drought leads to the creation of cracks in the cover and creates emissive areas. The invention makes it possible to limit the air input in the mound of waste, by also adjusting over the oxygen levels in the biogas.

[0108] In an embodiment, the external parameter is the atmospheric pressure.

[0109] When atmospheric pressure increases, the biogas volume produced in the housing **50** decreases and the risk of capturing air increases (PV= a constant).

[0110] Contrarily, with a decrease of the atmospheric pressure, the biogas volume, in housing **50**, increases and the risk of biogas leakage into atmosphere rises.

[0111] Furthermore, if the pressure Pi for the capturing is too high, the risk of dilution increases (introduction of atmospheric air into the housing), and if pressure Pi is too low, there is a risk of increasing the pressure within the mound of waste, hence of losing biogas in the atmosphere and inhibiting the biogas production reactions.

[0112] The invention allows to optimally capture biogas, so as to prevent the introduction of air as much as an emanation of methane.

[0113] By way of example, the surface of a housing may be around an hectare. For a volume of a housing of about a million m3, a variation of atmospheric pressure of 2 mBar/h generates a variation in volume of biogas of around 200 m3/h, after a certain lag phase (transmission time/device inertia time).

[0114] With reference to oxygen, it inhibits the methanogenesis.

[0115] In an embodiment, it is possible to provide measuring means in the extraction heads and a set point relative to the oxygen content at the first adjusting level, so that the extracted oxygen does not exceed a certain amount, hence to maintain a certain biogas quality.

[0116] Likewise, in another embodiment, it is possible to provide measuring means in the mound of waste, resulting in a possible air input within the housing. The measured value may thus be used in the second regulation loop.

[0117] With reference to cover **110** (FIG. **1**), it is leakproof, or semi-permeable, depending on the local needs and regulations. Advantageously, a leakproof cover makes it possible to use a more important depression, and hence to extract more biogas.

[0118] Preferably, the depression Pr of the manifold is equal to or higher than the internal depression Pi of the mound of waste, making it possible to ensure that the methane is not released into atmosphere.

[0119] The invention may be particularly implemented according to two operating modes.

[0120] In a first operating mode, the aim is to valorize biogas, that is, to obtain a constant methane content in the extracted gas and obtain a maximal stream (concentration× flow).

[0121] Advantageously, the extraction of biogas largely limits the diffusion of methane in the surrounding grounds.

[0122] In a second operating mode, for end-of-life sites and comprising the housing(s) according to the invention, the methane extraction stream may be maximized (content*flow), particularly, for safety reasons, and greenhouse gases, while guaranteeing a minimal methane content necessary for the functioning of a flare.

[0123] Thanks to the invention, the set of controlling systems (regulation loops) that anticipates internal and external disturbances makes it possible to maintain a constant quality of biogas over time.

[0124] Thanks to the invention, the stream of methane extracted from the biogas may be maintained to a predetermined value.

1. A method for controlling the extraction of a biogas from a housing equipped with at least one extraction assembly, each extraction assembly being connected to a respective manifold via a respective control valve and comprising at least one unitary extraction device, the method comprising the steps of:

providing a respective predetermined manifold pressure (Pr) for each manifold, and

opening the control valve at a given position,

characterized in that it further comprises the steps of:

measuring the value of a meteorological parameter outside the housing,

calculating a global set point (dPci) of differential pressure based on the measured meteorological parameter value,

measuring a relative pressure (dPi) at least at one extraction assembly,

comparing the measured relative pressure (dPi) with the global set point (dPci), and

changing a position of the control valve based on the comparison result.

2. The method according to claim **1**,

further comprising a step of:

providing a first local set point (dPci**1**) by comparing the value of the measured meteorological parameter with a reference model,

the step of calculating the global set point (dPci) being a function of said first local set point (dPci**1**).

3. The method according to claim **2**, wherein the measured external meteorological parameter value comprises at least one of atmospheric pressure, external temperature and rainfall rate.

4. The method according to claim **1**, further comprising the steps of:

measuring a value of an internal adjusting parameter comprising $O_2/CH_4/CO_2$ content, pressure, and temperature at least at one extraction assembly,

comparing the measured value to a reference value, and

providing a second local set point (dPci**2**) based on the comparison result,

the step of calculating the global set point (dPci) being a function of said second local set point (dPci**2**).

5. The method according to claim **2**, wherein the reference model is built through a preliminary learning step, wherein an evolution of a pressure inside a mound of waste of the housing is measured based on the value of a measured external and internal parameter.

6. A device for controlling the extraction of a biogas, capable of implementing the method according to claim **1**

the device comprising:

a housing equipped with at least one extraction assembly, each extraction assembly being connected to a respective manifold via a respective control valve and comprising at least one unitary extraction device,

means for providing a manifold pressure (Pr) to the respective manifold, and

means for opening the control valve at a given position

characterized in that it further comprises,

means for measuring a value of a meteorological parameter outside the housing,

means for calculating a global set point (dPci) of differential pressure based on the measured meteorological parameter value,

means for measuring the differential pressure (dPi) at least at one extraction assembly,

means for comparing the measured relative pressure with the global set point (dPci), and

means for changing a position of the control valve according to the comparison result.

7. The device according to claim **6**, further comprising:

means for providing a first local set point (dPci**1**) by comparing the value of the measured meteorological parameter with a reference model, the step of calculating the global set point (dPci) being a function of said first local set point (dPci**1**).

8. The device according to claim **7**, further comprising learning means, configured to measure an evolution of an internal pressure (Pi) based on the value of the measured external meteorological parameter, the reference model being built from the learning means.

9. The device according to claim **6**, further comprising:

means for measuring a value of an internal physicochemical parameter comprising $O_2/CH_4/CO_2$ content at least at one extraction assembly,

means for comparing the measured value with a reference value, and

means for providing a second local set point (dPci**2**) based on the comparison result, the global set point (dPci) being a function of said second local set point (dPci**2**).

10. The method according to claim **2**, further comprising the steps of:

measuring a value of an internal adjusting parameter comprising $O_2/CH_4/CO_2$ content, pressure, and temperature at least at one extraction assembly,

comparing the measured value to a reference value, and

providing a second local set point (dPci**2**) based on the comparison result,

the step of calculating the global set point (dPci) being a function of said second local set point (dPci**2**).

11. The method according to claim **3**, further comprising the steps of:

measuring a value of an internal adjusting parameter comprising $O_2/CH_4/CO_2$ content, pressure, and temperature at least at one extraction assembly,

comparing the measured value to a reference value, and

providing a second local set point (dPci**2**) based on the comparison result,

the step of calculating the global set point (dPci) being a function of said second local set point (dPci**2**).

12. The method according to claim **3**, wherein the reference model is built through a preliminary learning step, wherein an evolution of a pressure inside a mound of waste of the housing is measured based on the value of a measured external and internal parameter.

13. The method according to claim **3**, wherein the reference model is built through a preliminary learning step, wherein an evolution of a pressure inside a mound of waste of the housing is measured based on the value of a measured external or internal parameter.

14. The method according to claim **4**, wherein the reference model is built through a preliminary learning step, wherein an evolution of a pressure inside a mound of waste of the housing is measured based on the value of a measured external and internal parameter.

15. The method according to claim **4**, wherein the reference model is built through a preliminary learning step, wherein an evolution of a pressure inside a mound of waste of the housing is measured based on the value of a measured external or internal parameter.

16. The method according to claim **10**, wherein the reference model is built through a preliminary learning step, wherein an evolution of a pressure inside a mound of waste of the housing is measured based on the value of a measured external and internal parameter.

17. The method according to claim 10, wherein the reference model is built through a preliminary learning step, wherein an evolution of a pressure inside a mound of waste of the housing is measured based on the value of a measured external or internal parameter.

18. The method according to claim 11, wherein the reference model is built through a preliminary learning step, wherein an evolution of a pressure inside a mound of waste of the housing is measured based on the value of a measured external and internal parameter.

19. The method according to claim 11, wherein the reference model is built through a preliminary learning step, wherein an evolution of a pressure inside a mound of waste of the housing is measured based on the value of a measured external or internal parameter.

20. A device for controlling the extraction of a biogas, capable of implementing the method according to claim 2,

the device comprising:

a housing equipped with at least one extraction assembly, each extraction assembly being connected to a respective manifold via a respective control valve and comprising at least one unitary extraction device,

means for providing a manifold pressure (Pr) to the respective manifolds, and

means for opening the control valve at a given position

characterized in that it further comprises,

means for measuring a value of a meteorological parameter outside the housing,

means for calculating a global set point (dPci) of differential pressure based on the measured meteorological parameter value,

means for measuring the differential pressure (dPi) at least at one extraction assembly,

means for comparing the measured relative pressure with the global set point (dPci), and

means for changing a position of the control valve according to the comparison result.

21. The device according to claim 20, further comprising:

means for providing a first local set point (dPci1) by comparing the value of the measured meteorological parameter with a reference model, the step of calculating the global set point (dPci) being a function of said first local set point (dPci1).

22. The device according to claim 21, further comprising learning means, configured to measure an evolution of an internal pressure (Pi) based on the value of the measured external meteorological parameter, the reference model being built from the learning means.

23. The device according to claim 21, further comprising:

means for measuring a value of an internal physicochemical parameter comprising $O_2/CH_4/CO_2$ content at least at one extraction assembly,

means for comparing the measured value with a reference value, and

means for providing a second local set point (dPci2) based on the comparison result, the global set point (dPci) being a function of said second local set point (dPci2).

24. A device for controlling the extraction of a biogas, capable of implementing the method according to claim 3,

the device comprising:

a housing equipped with at least one extraction assembly, each extraction assembly being connected to a respective manifold via a respective control valve and comprising at least one unitary extraction device,

means for providing a manifold pressure (Pr) to the respective manifolds, and

means for opening the control valve at a given position

characterized in that it further comprises,

means for measuring a value of a meteorological parameter outside the housing,

means for calculating a global set point (dPci) of differential pressure based on the measured meteorological parameter value,

means for measuring the differential pressure (dPi) at least at one extraction assembly,

means for comparing the measured relative pressure with the global set point (dPci), and

means for changing a position of the control valve according to the comparison result.

25. The device according to claim 24, further comprising:

means for providing a first local set point (dPci1) by comparing the value of the measured meteorological parameter with a reference model, the step of calculating the global set point (dPci) being a function of said first local set point (dPci1).

26. The device according to claim 25, further comprising learning means, configured to measure an evolution of an internal pressure (Pi) based on the value of the measured external meteorological parameter, the reference model being built from the learning means.

27. The device according to claim 26, further comprising:

means for measuring a value of an internal physicochemical parameter comprising $O_2/CH_4/CO_2$ content at least at one extraction assembly,

means for comparing the measured value with a reference value, and

means for providing a second local set point (dPci2) based on the comparison result, the global set point (dPci) being a function of said second local set point (dPci2).

28. A device for controlling the extraction of a biogas, capable of implementing the method according to claim 4,

the device comprising:

a housing equipped with at least one extraction assembly, each extraction assembly being connected to a respective manifold via a respective control valve and comprising at least one unitary extraction device,

means for providing a manifold pressure (Pr) to the respective manifolds, and

means for opening the control valve at a given position

characterized in that it further comprises,

means for measuring a value of a meteorological parameter outside the housing,

means for calculating a global set point (dPci) of differential pressure based on the measured meteorological parameter value,

means for measuring the differential pressure (dPi) at least at one extraction assembly,

means for comparing the measured relative pressure with the global set point (dPci), and

means for changing a position of the control valve according to the comparison result.

29. The device according to claim 28, further comprising:

means for providing a first local set point (dPci1) by comparing the value of the measured meteorological parameter with a reference model, the step of calculating the global set point (dPci) being a function of said first local set point (dPci**1**).

30. The device according to claim **29**, further comprising learning means, configured to measure an evolution of an internal pressure (Pi) based on the value of the measured external meteorological parameter, the reference model being built from the learning means.

31. The device according to claim **28**, further comprising:
means for measuring a value of an internal physicochemical parameter comprising $O_2/CH_4/CO_2$ content at least at one extraction assembly,
means for comparing the measured value with a reference value, and
means for providing a second local set point (dPci**2**) based on the comparison result, the global set point (dPci) being a function of said second local set point (dPci**2**).

32. A device for controlling the extraction of a biogas, capable of implementing the method according to claim **5**,
the device comprising:
a housing equipped with at least one extraction assembly, each extraction assembly being connected to a respective manifold via a respective control valve and comprising at least one unitary extraction device,
means for providing a manifold pressure (Pr) to the respective manifolds, and
means for opening the control valve at a given position
characterized in that it further comprises,
means for measuring a value of a meteorological parameter outside the housing,
means for calculating a global set point (dPci) of differential pressure based on the measured meteorological parameter value,
means for measuring the differential pressure (dPi) at least at one extraction assembly,
means for comparing the measured relative pressure with the global set point (dPci), and
means for changing a position of the control valve according to the comparison result.

33. The device according to claim **32**, further comprising:
means for providing a first local set point (dPci**1**) by comparing the value of the measured meteorological parameter with a reference model, the step of calculating the global set point (dPci) being a function of said first local set point (dPci**1**).

34. The device according to claim **33**, further comprising learning means, configured to measure an evolution of an internal pressure (Pi) based on the value of the measured external meteorological parameter, the reference model being built from the learning means.

35. The device according to claim **32**, further comprising:
means for measuring a value of an internal physicochemical parameter comprising $O_2/CH_4/CO_2$ content at least at one extraction assembly,
means for comparing the measured value with a reference value, and
means for providing a second local set point (dPci**2**) based on the comparison result, the global set point (dPci) being a function of said second local set point (dPci**2**).

36. The device according to claim **7**, further comprising:
means for measuring a value of an internal physicochemical parameter comprising $O_2/CH_4/CO_2$ content at least at one extraction assembly,
means for comparing the measured value with a reference value, and
means for providing a second local set point (dPci**2**) based on the comparison result, the global set point (dPci) being a function of said second local set point (dPci**2**).

37. The device according to claim **8**, further comprising:
means for measuring a value of an internal physicochemical parameter comprising $O_2/CH_4/CO_2$ content at least at one extraction assembly,
means for comparing the measured value with a reference value, and
means for providing a second local set point (dPci**2**) based on the comparison result, the global set point (dPci) being a function of said second local set point (dPci**2**).

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