

CLAIMS:

1. A sensor unit support structure for supporting a sensor unit in a manhole, the support structure comprising:

an elongate beam adjustable along its length to span a width of the manhole and support the sensor unit within the manhole;

first and second mounting brackets associated with respective first and second ends of the beam, each mounting bracket being configured to fasten the beam to an inner surface of the manhole, and

first and second temporary brackets associated with respective first and second mounting brackets;

wherein the first and second mounting brackets are configured to be removably coupled to the respective first and second temporary brackets, each temporary bracket being configured to engage a rim of the manhole to allow the first and second mounting brackets to be positioned in the manhole and temporarily supported in position until the mounting brackets are fastened to the inner surface of the manhole.

2. The sensor unit support structure according to claim 1, further comprising a hanger to couple the sensor unit to the beam, the hanger comprising a first coupling portion at a first end of the hanger configured to couple the hanger to the beam, and a second coupling portion at a second end of the hanger configured to couple the hanger to the sensor unit.

3. A sensor unit support structure for supporting a sensor unit in a manhole, the support structure comprising:

an elongate beam adjustable along its length to span a width of the manhole and support the sensor unit within the manhole;

first and second mounting brackets associated with respective first and second ends of the beam, each mounting bracket being configured to fasten the beam to an inner surface of the manhole; and

a hanger to couple the sensor unit to the beam, the hanger comprising a first

coupling portion at a first end of the hanger configured to couple the hanger to the beam, and a second coupling portion at a second end of the hanger configured to couple the hanger to the sensor unit.

4. The sensor unit support structure according to claim 3, wherein the first and second mounting brackets are configured to be removably coupled to respective first and second temporary brackets, each temporary bracket being configured to engage a rim of the manhole to allow the first and second mounting brackets to be positioned in the manhole and temporarily supported in position until the mounting brackets are fastened to the inner surface of the manhole.
5. The sensor unit support structure according to claim 4, further comprising the first and second temporary brackets removably coupled to the first and second mounting brackets respectively.
6. The sensor unit support structure according to any one of claims 1 to 5, wherein the elongate beam is removably coupleable to the mounting brackets.
7. The sensor unit support structure according to any one of claims 1 to 6, wherein each of the mounting brackets comprises a mounting pin configured to be received in an aperture defined in the beam near the associated end of the beam.
8. The sensor unit support structure according to any one of claims 1 to 7, wherein each mounting bracket comprises a fixing plate defining one or more apertures configured to receive mechanical fasteners to fasten the mounting bracket to the inner surface of the manhole.
9. The sensor unit support structure according to claim 2 or 3 or any one of claims 4 to 8 when directly or indirectly dependent on claim 2 or 3, wherein the first coupling portion comprises an adjustable clamp configured to allow the hanger to be slidable along the beam, and configured to selectively clamp the beam to fix the hanger at a selected position relative to the beam.

10. The sensor unit support structure according to claim 9, wherein the clamp comprises a hook, a clamping member, and a tightening mechanism configured to clamp the beam between the clamping member and the hook.
11. The sensor unit support structure according to claim 10, wherein the clamping member comprises an elongate bar configured to clamp against the beam in substantially parallel alignment with the beam.
12. The sensor unit support structure according to claim 2 or 3 or any one of claims 4 to 11 when directly or indirectly dependent on claim 2 or 3, wherein the second coupling portion comprises an adjustable swivel joint configured to allow the sensor unit to be rotated with respect to the hanger, and configured to be selectively tightened to fix the sensor unit at a selected angle relative to the hanger.
13. A sensor unit for detecting a selected characteristic in a manhole, the sensor unit comprising:
- one or more sensors;
 - a controller communicatively coupled to the sensor;
 - first and second casing portions configured to sealingly engage each other and cooperate to form a substantially water tight casing to accommodate the one or more sensors, the controller and a battery for supplying power to the sensor and the controller; and
 - a battery clip at least partially disposed in one of the first and second casing portions, the battery clip configured to removably couple the battery to the casing,
- wherein the first casing portion is removable from the second casing portion to allow access to an inside of the casing for periodic removal and replacement of the battery.
14. The sensor unit according to claim 13, further comprising the battery.

15. The sensor unit according to claim 13 or claim 14, further comprising a transceiver communicatively coupled to the controller to transmit data collected by the sensor unit.

16. The sensor unit according to any one of claims 13 to 15, further comprising one or more removable gaskets configured to engage and form a seal between the first and second casing portions.

17. The sensor unit according to any one of claims 13 to 16, wherein the one or more sensors comprises an ultra-sonic sensor.

18. The sensor unit according to any one of claims 13 to 16, wherein the first and second casing portions are configured to threadedly engage one another to form the casing.

19. The sensor unit according to any one of claims 13 to 18, further comprising at least one additional sensor.

20. The sensor unit according to claim 19, wherein the at least one additional sensor comprises a gas detector configured to detect a concentration of a selected gas in the manhole.

21. The sensor unit according to any one of claims 13 to 20, wherein the controller comprises a processor and memory comprising a control module, which when executed by the processor is configured to determine fluid levels based on readings from the one or more sensors.

22. The sensor unit according to claim 21, wherein the sensor unit is configured to operate in one of a plurality of modes, each mode associated with operations to be performed by the controller according to instructions of the control module.

23. The sensor unit according to claim 21 or claim 22, wherein the control module, when executed by the processor, is configured to determine a fluid level and/or flow rate of fluid in a chase of a manhole associated with the sensor unit.
24. A sewer monitoring system comprising a sensor unit support structure according to any one of claims 1 to 12 and a sensor unit according to any one of claims 13 to 23.