COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC HYDEN-LESLIE COUNTY WATER DISTRICT'S UNACCOUNTED-FOR WATER LOSS REDUCTION PLAN, SURCHARGE AND MONITORING	**)** **)** **)** **)**	**CASE NO. 2020-00340**

VERIFIED MOTION FOR AUTHORIZATION TO EXPEND SURCHARGE PROCEEDS

Pursuant to KRS 278.160(2) and 807 KAR 5:001, Section 4, Hyden-Leslie County Water District ("Hyden-Leslie District" or "the District") moves for authorization to expend the proceeds of its Water Loss Control Program Surcharge ("Surcharge") to purchase a portable ultrasonic flow meter and to purchase as many water meters as the remaining Surcharge proceeds will permit to replace the District's aging and inaccurate water meters. Due to anticipated increases in the vendor's price for metering equipment, the District requests the Public Service Commission ("Commission") issue a decision on this Motion no later than **January 31, 2025.**

In support of its Motion, Hyden-Leslie District states:

Background

1. The District is a water district organized pursuant to KRS Chapter 74 that provides water service to the city of Hyden, Kentucky and the unincorporated areas of Leslie County, Kentucky.

2. As shown in Table 1, between 2010 and 2018 the District experienced high levels of unaccounted-for water. For each year of that period, it was unable to account for 30 percent or more of its total produced water. During this period, the District recorded sales of slightly more than two gallons of water for every three gallons of water produced.

TABLE 1[1]	
Year	**Unaccounted-For Water Loss (%)**
2010	32.9117
2011	30.8019
2012	35.8484
2013	35.7552
2014	38.5027
2015	34.5985
2016	34.9022
2017	35.7395
2018	32.8656
Average	34.6584

3. As a result of the District's high level of unaccounted-for water, the Commission in March 2019 included the District in its investigation of Kentucky jurisdictional water utilities that had excessive water loss.[2] After an extensive review of the District's operations and financial condition, the Commission in its Order of November 22, 2019 in Case No. 2019-00041 criticized the District's water loss control efforts and directed the District to take corrective actions.[3]

4. In May 2020, the District in Case No. 2020-00141[4] applied for an adjustment of its rates for water service. In its Order of November 6, 2020, the Commission authorized the District to increase its rates approximately 72.3 percent. On its own motion, the Commission further directed the District to assess each District customer a monthly surcharge of $1.53 for 48 months. It restricted the District's use of the surcharge proceeds to water loss reduction efforts and required prior Commission approval before any expenditure of surcharge proceeds. The Commission also

[1] This table is a compilation of the unaccounted-for water loss reported annually in Hyden-Leslie District's annual reports filed with the Commission for the years 2010 through 2018.

[2] *Electronic Investigation Into Excessive Water Loss By Kentucky's Jurisdictional Water Utilities*, Case No. 2019-00041 (Ky. PSC Mar. 12, 2019).

[3] *Id.*, Order of Nov. 22, 2019 at 6-10, App. E at 1-2, and App. L at App. E.

[4] *Electronic Application of Hyden-Leslie County Water District for An Alternative Rate Adjustment*, Case No. 2020-00141 (Ky. PSC Nov. 6, 2020).

directed the District to submit "a qualified infrastructure improvement plan" that included a "comprehensive unaccounted-for water loss reduction plan."[5]

5. On November 24, 2020, the District filed tariff sheets to implement the surcharge, which the Commission permitted to take effect without revision, containing the following controls:

a. The surcharge was to be billed as a separate line item and identified as "Water Loss Reduction Surcharge" ("Surcharge");

b. All Surcharge proceeds must be maintained in a separate, interest-bearing account;

c. Expenditure of Surcharge proceeds required prior Commission approval; and,

d. The District must submit to the Commission periodic water loss reports and monthly activity reports that included a statement of monthly surcharge billings and collections; a monthly surcharge bank statement; a list of payments from the account, their payees, and their purpose; and invoices supporting each payment.[6]

6. The Surcharge tariff further provided that the District's failure to comply with any control constituted grounds for the Surcharge's termination and the refund of all unspent Surcharge proceeds.[7]

7. On March 20, 2021, the District submitted its Infrastructure Improvement Plan, which included its plan for controlling water loss. In this plan, the District identified the following as necessary for effective water loss control: (1) the establishment of a zone metering system; (2) the replacement of the District's mechanical meters with ultrasonic meters that are part of a radio

[5] *Id.*, Order of Nov. 6, 2020 at 24.
[6] Tariff of Hyden-Leslie County Water District, PSC KY No. 5, Original Sheet 1.2 (effective Nov. 17, 2019).
[7] *Id.*

read or advanced meter infrastructure ("AMI") system; (3) the replacement of the District's existing pumps with variable frequency drive pumps; and (4) the replacement of distribution mains that have experienced significant number of breaks or leaks. A copy of this plan is attached to this Motion as **Exhibit A**.

8. Pursuant to the Commission's Order of November 6, 2020 in Case No. 2020-00141, the District issued bills assessing the Surcharge from December 2020 until November 2024. On November 7, 2024, the District advised the Commission that it would not request an extension of the Surcharge and would cease billing the Surcharge beginning with bills issued in the month of December 2024.[8] As of January 1, 2025, collected surcharge proceeds totaled $265,996.39.

9. The District has timely complied with all reporting requirements of the Order of November 6, 2020.

10. Recognizing that the Surcharge proceeds are insufficient to fund the improvements identified in its Infrastructure Improvement Plan, the District has taken reasonable steps to fund and implement that plan. It sought and obtained commitments to fund the following projects:

a. **Leslie Waterline Replacement Phase I** (WX1131013). This project involves the replacement of 27,000 linear feet of water main that has experienced recurring failures; the replacement of two booster pump stations; the rehabilitation of five booster pump stations with variable frequency drive pumps; and the purchase and installation of thirteen zone master meters. Total estimated project cost is $3,891,690. Project funding consists of a Kentucky Infrastructure State Revolving Fund Loan[9] of $2,001,013; Cleaner Water Program Grants[10] of

[8] Letter from Gerald E. Wuetcher, legal counsel for Hyden-Leslie County Water District, to Linda C. Bridwell, Executive Director, Kentucky Public Service Commission (Nov. 7, 2024).
[9] KIA Loan F23-001. The loan agreement has not yet been executed.
[10] Grants No. 21CWW231 and No. 22CWW180.

$181,372 and $319,305; and a Federal Government appropriation of $1,390,000.[11] This project is currently in the design phase.

b. **Phase III Water System Improvements** (WX21131011). This project includes the installation of variable frequency drives high service pumps at the District's water treatment plant; replacement of pump stations at Muncy Creek, Hurts Creek (also known as Hurricane Creek), Essie, Owls Nest, and Wolfe Creek; and rehabilitation of the 200,000-gallon Essie Tank. Total estimated project cost is $3,491,200. Funding for this project is provided through an Abandoned Mine Lands grant of $1,750,000; an Appalachian Regional Commission grant of $723,000; a Community Development Block Grant of $1,000,000, a Kentucky State Budget Appropriation (HB 303) of $2,500, and a Local Government Economic Development Grant of $15,700. This project is currently in the design phase.

c. **Cutshin Water Line Replacement Phase 1** (WX21131019). This project is the first phase of a multi-phase project and includes the replacement of approximately 9,700 linear feet of existing six-inch water main along Kentucky Highway 699, which has experienced recurring failures. The estimate project cost is $2,500,000, which an Abandoned Mine Lands grant will fund. This project is currently in the design phase.

11. The District anticipates beginning construction on the projects listed in the preceding paragraph in 2025.

12. As of January 9, 2025, the Surcharge account has a balance of $266,260.90. Collected surcharge proceeds total $265,996.39. Interest on the collected Surcharge proceeds totals $264.51. As of this date, no Surcharge proceeds have been spent.

[11] FY 2022 Consolidated Appropriations Act (P.L. 117-103). *See also* U.S. Environmental Protection Agency, *Community Grants Program: Final Implementation Guidance* (Oct. 2022), available at https://www.epa.gov/system/files/documents/2023-05/FY22-Community-Grants-Program-Guidance.pdf (last visited Jan. 6, 2025).

Portable Flowmeter

13. The District proposes to use approximately $7,154.00 of Surcharge funds to purchase a portable ultrasonic flow meter. This meter can be temporarily installed in any area within the District's distribution system to determine water flow rate. When an area has a higher-than-normal flow rate, the District can then install the meter in various locations throughout that area to narrow the suspected leak's location until the exact location is determined. The manufacturer's description of the proposed equipment is attached to this Motion as **Exhibit B**. A price quote for the equipment is attached as **Exhibit C**. The proposed purchase will enhance the District's ability to locate leaks within its distribution system. The District does not currently own a portable flow meter.

14. As the proposed purchase does not involve the construction of any facilities or the install or any equipment, does not represent a sufficient capital outlay to materially affect the District's financial condition, and will not result in increased charges to the District's customers, no certificate of public convenience and necessity for the purchase is required.

Purchase of Replacement Water Meters

15. The District proposes to use the Surcharge funds that remain after the proposed portable flowmeter, approximately $259,100, to acquire approximately 764 meters and related meter accessories and services.

16. The District currently has approximately 3,600 mechanical meters in service. Approximately 2,600 meters have not been tested for accuracy within the last ten years. In its report of its 2024 inspection of the District's facilities, Commission Staff reported that the District was in violation of 807 KAR 5:066, Section 16(1), which provides that a one inch or smaller meter must be tested for accuracy at least every ten years. See **Exhibit D** to this Motion.

17. In its Infrastructure Improvement Plan, the District expressed its concern that a sizable portion of its unaccounted-for water loss was from apparent losses, not real losses of water.[12] It noted that most District meters are mechanical meters that have been in service ten or more years and that this meter type becomes less accurate with time, is less sensitive to low water flows, and generally fails to accurately measure water usage at low flows. Accordingly, to reduce apparent water losses the District intended to replace its existing residential and commercial meters with ultrasonic meters, which are more sensitive to low flow usage and more accurately measure water usage.[13] The District's plan was consistent with the Commission's stated position that that inaccurate meters are a significant contributor to unaccounted-for water loss and water meter replacements tend to improve water loss detection and prevention.[14]

18. The District has developed two projects, Meter Replacement Phase 1 (WX21131015) and Meter Replacement Phase 2 (WX21131014) which involve the purchase and installation of 3,650 ultrasonic meters. The estimated total cost of these projects is $3,745,000. Funding has not yet been obtained for these projects.[15]

19. The most effective use of the remaining Surcharge proceeds is the immediate purchase of approximately 764 Kamstrup flowIQ® 2200 meters. A detailed description of these meters as provided by the meter manufacturer is attached as **Exhibit E** of this Motion. These meters have the following characteristics:

a. The meters are static ultrasound meters. They use transmit time methodology and ultrasonic sound to measure the flow of the water. Two ultrasonic transducers,

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[12] Exhibit A at 7.
[13] *Id.*
[14] Case No. 2019-00141, Order of Nov. 22, 2019 at 7.
[15] The proposed projects involve not only the purchase of ultrasonic meters but the establishment of an Advanced Meter Infrastructure ("AMI") system. As a result, the projects' estimated average cost per meter, which includes the AMI infrastructure, is $1,026. This amount is significantly greater than the cost of purchasing only meters.

which function as both transmitters and receivers, send sound signals against and with the flow of water. The ultrasonic signal traveling with the flow will reach the opposite transducer first. The time difference between the two signals is converted into a flow and the flow sensor sends out pulses corresponding to the amount of the flow. In contrast to mechanical meters that use rotating turbines, ultrasound meters have no moving parts and are thus unaffected by wear and tear. They can measure flow even with low pressure, which is difficult for mechanical flow sensors.

b. The meters have a low start flow down to 0.05 gallons per minute which ensures the measurement of water at low flows and allows for greater measurement accuracy. The meters are also capable of detecting signs of water leaks and pipe bursts.

c. The meters' housing and measurement part is made of the synthetic material polyphenylene sulfide, which is free from lead and other heavy metals. The meters are fully compliant with NSF/ANSI 61, which establishes the minimum requirements for the control of potential adverse human health effects from products that contact drinking water.

d. The meters measure water and ambient temperatures and thus will enable the District to monitor the temperature of the water reaching the end user and warn of freezing temperatures that may damage meter equipment and piping.

e. Each meter is equipped with a wireless radio transmitter and high-power antenna that can transmit a data package every 16 seconds. This data package includes target meter readings, daily maximum flow, monthly maximum flow, and water and ambient temperature. The meters can collect and store up to 460 days of information. All transmitted information is encrypted. It can be configured to allow data collection by mobile radio read device or through a fixed radio network.

f. Each meter is warranted for a period of twenty years and is equipped with a lithium battery that is also warranted for twenty years.

g. Each meter has built-in acoustic sensors that permit the detection of leaks that occur after the meter inside the customer's structure but before the meter in adjacent service connections and distribution mains. A description of the meters' leak detection capabilities is attached as **Exhibit F** to this Motion.

20. The District selected the Kamstrup flowIQ® 2200 meter after a three-year review of available mechanical and ultrasonic meters. Its general manager gathered the available literature on various mechanical and ultrasonic meters in use, including Badger, Diehl, Neptune and Zenner International; interviewed meter equipment vendors and distributors; conferred with neighboring utilities that had recently engaged in large scale water meter replacement, such as McCreary County Water District, Estill County Water District No. 1, and Oneida, Tennessee Water Works; and witnessed in-person demonstrations of various meters. The District selected the Kamstrup flowIQ® 2200 meter because of its accuracy when measuring low water flows, its relative ease to convert from a radio-read system to an AMI system, and its built and its relative ease and to convert from a radio-read system to an AMI system, and its built-in acoustic sensors, which would significantly expend the District's leak detection ability. Once the District has obtained funding for its Meter Replacement Phase 1 and Phase II projects, it will replace its remaining meters with Kamstrup flowIQ® 2200 meters.

21. The estimated cost of each meter is $320.27. To purchase 764 meters will require $244,686. An additional $14,548 will be required for accessories, computer software and set up

fees. A price quote from Kamstrup's authorized distributor is attached as **Exhibit G** to this Motion.[16]

22. District employees will remove the District's existing meters or install the purchased meters. No Surcharge funds will be used for that work.

23. The proposed purchase will provide immediate labor savings. Currently, Hyden-Leslie District manually reads its water meters. Six employees each devote 40 hours per month to meter reading. The proposed meter replacement will reduce required meter reading time by 537.6 manhours annually and permit District employees to devote the manhour savings to leak detection efforts.[17]

24. The proposed purchase will significantly reduce the number of untested meters in use, represents a major step towards the District's goal of the total replacement of its meter inventory, and is consistent with the District's Infrastructure Improvement Plan. Given the limited funds in the Surcharge account and the District's existing funded improvement projects, the proposed expenditure is the most effective use of Surcharge funds and should have an immediate impact on unaccounted-for water loss.

25. As the proposed purchase and installation of the replacement meters does not involve sufficient capital outlay to materially affect the District's financial condition and will not

[16] The proposed number of meters is an approximation. The District estimates that, after purchasing the portable flow meter, the remaining Surcharge proceeds will permit the purchase of 764 meters and related accessories and services. The precise number of meters will depend upon prices at the issuance of the purchase order. The District will also incur a monthly fee of $230 for the use of Kamstrup meter software. These fees will be paid with general revenue funds.

[17] Currently, it takes 240 manhours to read the District's 3,600 meters monthly, or approximately .067 hours to read one meter or 51.2 hours to read 764 meters monthly. With the proposed meters, the average time to read a meter will be .0089 hours or 6.8 hours to read 764 meters monthly. The annual savings in manhours will be 537.6 hours (44.4 hours x 12 months). As the District will continue to employ the same number of employees, the new meters will not result in labor cost savings but will allow the District employees to devote more time to leak detection and repair efforts and potentially reduce the level of unaccounted-for water.

result in increased charges to its customers, no certificate of public convenience and necessity is required.

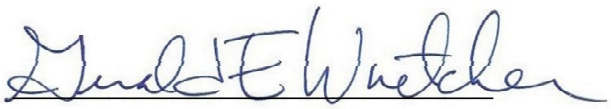
26. Kamstrup's authorized distributor has informed the District that the price for the meters will increase by three percent on or about **January 31, 2025**. Accordingly, the District requests that the Commission expedite its review of this Motion and issue its decision within the next 21 days to permit the District to purchase the meters prior to the expected price increase.

Requested Relief

WHEREFORE, Hyden-Leslie District requests authorization to use the funds in the Surcharge Account to purchase a portable ultrasonic flow meter and metering equipment described in this Motion, and for entry of an Order on this Motion no later than **January 31, 2025** to permit the District to make the proposed purchases before expected price increases.

Dated: January 10, 2025

Respectfully submitted,

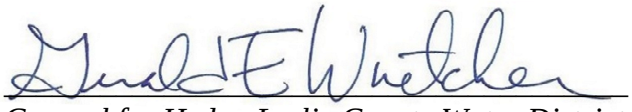


Gerald E. Wuetcher
Stoll Keenon Ogden PLLC
300 West Vine Street, Suite 2100
Lexington, Kentucky 40507-1801
Telephone: (859) 231-3017
Fax: (859) 259-3517
gerald.wuetcher@skofirm.com

Counsel for Hyden-Leslie County Water District

CERTIFICATE OF SERVICE

In accordance with 807 KAR 5:001, Section 8, and the Public Service Commission's Order of July 22, 2021 in Case No. 2020-00085, I certify that this document was transmitted to the Public Service Commission on January 10, 2025 and that there is currently no party that the Public Service Commission has excused from participation by electronic means in this proceeding.



Counsel for Hyden-Leslie County Water District

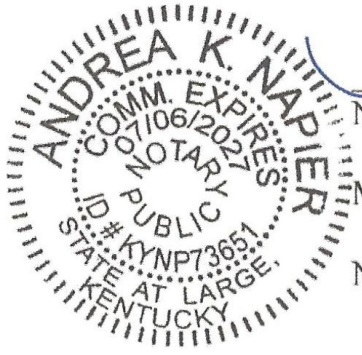
VERIFICATION

COMMONWEALTH OF KENTUCKY)
) **SS:**
COUNTY OF LESLIE)

The undersigned, L.J. Turner, being duly sworn, deposes and states that he is the General Manager of Hyden-Leslie County Water District and that he has personal knowledge of the matters set forth in this Motion, and that the statements contained in this Motion are true and correct to the best of his information, knowledge, and belief.

L.J. Turner
General Manager
Hyden-Leslie County Water District

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 9th day of January 2025.



Andrea Napier (SEAL)
Notary Public

My Commission Expires: 7-6-2027

Notary ID: 73651

EXHIBITS

EXHIBIT A

HYDEN-LESLIE COUNTY WATER DISTRICT
INFRASTRUCTURE IMPROVEMENT PLAN

PURPOSE

On November 6, 2020, the Public Service Commission of Kentucky ("Commission") issued an Order in Case No. 2020-00340 directing Hyden-Leslie County Water District ("Hyden-Leslie District") to prepare an infrastructure plan that included an unaccounted-for water loss reduction plan. This document is submitted to response to that directive.

BACKGROUND

Hyden-Leslie District was established on February 15, 1964 by order of the Leslie County Court. Its territory encompasses all of Leslie County, Kentucky, including the city of Hyden, Kentucky. It is the only municipal water system in Leslie County. As of December 31, 2019, it supplied water to 3,683 customers (3,412 residential customers and 271 commercial customers). Hyden-Leslie District operates a 1.5 million gallon per day ("MGD") water treatment plant, which is sufficient to meet its water supply requirements.

Hyden-Leslie District has experienced significant water loss in the last decade. As shown in Attachment 1 to this report, its annual water loss for the period from 2011 to 2018, ranged from 32 percent to 36 percent of total water produced. Simply put, during that period Hyden-Leslie District lost one of every three gallons of water produced. In 2018, it instituted and strictly adhered to new water loss surveillance and control techniques. These techniques resulted in an annual water loss to 22 percent of total water produced in 2020. While this level represents a one-third reduction in water loss, it still is much higher that the industry standard of 15 percent.

WATER INFRASTRUCTURE INVENTORY

A discussion of Hyden-Leslie District's capital assets is set forth below. The inventory identifies all existing assets, their current condition and performance, the need or urgency to replace the asset, and the cost of replacement.

An asset's current condition is based upon the following scale:

1 New or Excellent - None or minor defects
2 Good - Defects that have not begun to deteriorate
3 Fair - Moderate defects that will continue to deteriorate
4 Poor - Severe defects that will collapse/break in near future
5 Inoperable - Defects need immediate attention

An asset's evaluated current performance is based on the following scale:

1 Exceeds/Meets all performance targets
2 Minor performance deficiencies
3 Considerable performance deficiencies
4 Major performance deficiencies
5 Fails to meet performance targets

The priority that the District has assigned to an asset's replacement is:

0 Not a priority
1 Desirable, but not necessary
2 Improved system operations & maintenance (O&M) efficiency
3 Internal safety concern or public nuisance
4 Potential public health, safety, or environmental concern
5 Existing threat to public health, safety, or environment

Booster Pump Stations. Hyden-Leslie District's water distribution system currently has 30 booster pump stations. Each station is equipped with two pumps. Thirteen of these pump stations are graded as being in poor condition. Hyden-Leslie District has designated two of the stations as posing a potential health or safety concerns. To replace all of the pump stations listed in poor condition is estimated to cost $1,075,000. As shown in Table 1 on the following page, pump stations highlighted in yellow or orange are either in poor condition, a potential public health or safety threat, or have internal safety concerns.

Most of the pump stations lack variable frequency drive ("VFD") systems. As a result, use of these pumps result in sudden pressure spikes when the pump initiates operation that can adversely affect water mains. Repeated pressure spikes over time can weaken water mains and increase the frequency of leaks and breaks. This problem is amplified by the mountainous terrain over which Hyden-Leslie District's system operates and which can result in drastic pressure ranges. One means of ameliorating this problem is the use VFD systems which allow pumping to start and stop at a gradual pace as opposed to the sudden start/stop. Replacing existing pumps with VFD systems would lessen the stress on existing distribution water mains and lengthen the actual service lives of the District's water distribution mains. VFD pumps are also more energy efficient.

Hyden-Leslie District currently has plans to replace seven of the pumping stations as part of its proposed Phase IIIB Water System Improvements Project (WX21131002). These pump stations are highlighted in yellow in Table 1. Their replacement represents a capital expenditure of approximately $700,000. In addition, the District has recently purchased the components needed to rehabilitate the Rockhouse Pump Station and will perform the work using its employees.

Distribution Lines. Hyden-Leslie currently has 1,637,556 linear feet of water mains and lines. It estimates the total cost of replacing these lines is approximately $30.1 million. These lines range in age from 10 to 60 years. Approximately 30,614 linear feet of these water mains, or about two percent of these mains are asbestos concrete mains install in the 1960s. The remaining mains are polyvinylchloride mains.

Table 1 – Booster Pump Stations

Asset Name	Pump Count	Condition Code	Performance Code	Priority Code	Replacement Cost
BIG BRANCH #1	2	4	2	3	$ 75,000.00
BIG BRANCH #2	2	4	2	3	$ 75,000.00
BOWENS CREEK	2	1	1	0	$ 75,000.00
BOWLING BR	2	2	1	0	$ 75,000.00
ESSIE	2	4	2	3	$ 125,000.00
FLACKEY BRANCH	2	3	2	1	$ 75,000.00
GLADY BRANCH	2	2	3	2	$ 75,000.00
HIGH SERVICE (OUTPUT PUMP)	2	1	1	0	$ 25,000.00
HONEYSUCKLE	2	4	2	3	$ 75,000.00
HOSPITAL HILL	2	1	1	0	$ 75,000.00
HURTS CREEK (HURRICANE)	2	4	4	3	$ 125,000.00
HYDEN SPUR	2	1	1	0	$ 125,000.00
LOWER BAD CREEK	2	2	2	0	$ 75,000.00
MUNCY CREEK	2	4	4	4	$ 125,000.00
OWLS NEST	2	4	2	3	$ 75,000.00
POLLS CREEK #1	2	4	3	3	$ 75,000.00
POLLS CREEK #2	2	4	3	3	$ 75,000.00
ROCKHOUSE	2	4	3	3	$ 100,000.00
WILDER BRANCH	2	4	4	4	$ 75,000.00
WOLFE CREEK	2	3	3	3	$ 100,000.00
WOOTON MOUNTAIN	2	4	3	3	$ 75,000.00
Saylor BPS	2	1	1	0	$ 75,000.00
Camp Creek BPS	2	1	1	0	$ 100,000.00
Greasy BPS	2	2	1	0	$ 75,000.00
Hell For Certain	2	1	1	0	$ 75,000.00
Persimmon Fork BPS	2	1	1	0	$ 75,000.00
Bellwood Pump	2	1	1	0	$ 75,000.00
Stone Coal BPS	2	1	1	0	$ 75,000.00
Bowling Branch	2	1	1	0	$ 75,000.00
Grassy BPS	2	1	1	0	$ 75,000.00

Hyden-Leslie District's water mains are relatively new. As shown in Table 2, approximately 42.3 percent of its mains and lines have been in service for 20 years or less. Approximately 90.6 percent of its mains and lines have been in service for 30 years or less.

Table 2 – Age of Distribution Mains

Decade	Mains (Linear Feet)
1960	30,718
1980	122,014
1990	792,294
2000	488,481
2010	204,049

The bulk of Hyden-Leslie District's water mains are three-inch and four-inch mains. As shown in Table 3, approximately 79.7 percent of its water distribution mains are those sizes. Less than 18.1 percent of its mains are larger than four inches. Less than 1.2 percent are eight inches or larger in diameter.

Table 3 – Distribution Main Size

Diameter	Mains (Linear Feet)
Less than 2″	36,477
3″	476,054
4″	828,996
6″	277,159
8″	11,172
10″	2,460
12″	5,238

Hyden-Leslie District has assessed the condition and performance of the its distributions and found that 30,614 linear feet of distribution main is in poor condition with severe defects and suffering from major performance deficiencies. This group consists of its asbestos cement mains, which were constructed in the 1960s. The estimated cost to replace this main is $682,117. In addition, it has determined that 458,574 feet of distribution main, while in fair condition, have considerable performance deficiencies. The estimated cost of replacing these mains is $8,588,040. Table 4, which appears on the following page, shows the complete assessment of Hyden-Leslie's distribution lines and mains. The mains highlighted in yellow are the mains that are in poor condition and have major performance deficiencies or have considerable performance deficiencies.

Table 4 – Distribution Mains

Size (Inches)	Material	Decade Constructed	Length (LF)	Condition Code	Performance Code	Priority Code	Replacement Cost
Up to 2	PVC	1980	22,889	3	3	3	$ 325,127.84
3	PVC	1980	40,910	3	3	3	$ 581,107.95
3	PVC	1990	48,764	3	3	3	$ 692,670.45
3	PVC	2000	44,309	3	3	3	$ 629,389.20
3	PVC	2010	16,313	3	3	3	$ 231,718.75
4	AC	1960	1,283	4	4	3	$ 24,299.24
4	PVC	1980	16,989	3	3	3	$ 321,761.36
4	PVC	1990	63,320	3	3	3	$ 1,199,242.42
4	PVC	2000	43,240	3	3	3	$ 818,939.39
4	PVC	2010	9,157	3	3	3	$ 173,428.03
6	PVC	1980	24,461	3	3	3	$ 579,095.64
6	PVC	1990	41,286	3	3	3	$ 977,414.77
6	PVC	2000	79,509	3	3	3	$ 1,882,315.34
6	PVC	2010	7,427	3	3	3	$ 175,828.60
Up to 2	AC	1960	194	4	4	3	$ 2,755.68
Up to 2	PVC	1990	13,394	2	2	2	$ 190,255.68
3	AC	1960	3,775	4	4	3	$ 53,622.16
3	PVC	1980	10,795	2	2	3	$ 153,338.07
3	PVC	1990	68,410	2	2	2	$ 971,732.95
3	PVC	2000	38,934	2	2	2	$ 553,039.77
3	PVC	2010	7,759	2	2	2	$ 110,213.07
4	AC	1960	10,958	4	4	3	$ 207,537.88
4	PVC	1990	157,970	2	2	2	$ 2,991,856.06
4	PVC	2000	10,281	2	2	1	$ 194,715.91
4	PVC	2010	51,362	2	2	2	$ 972,765.15
6	AC	1960	3,232	4	4	3	$ 76,515.15
6	PVC	1960	104	2	2	2	$ 2,462.12
6	PVC	1980	5,970	2	2	2	$ 141,335.23
6	PVC	1990	40,529	2	2	2	$ 959,493.37
6	PVC	2000	77	2	2	2	$ 1,822.92
6	PVC	2010	286	2	2	2	$ 6,770.83
8	AC	1960	11,172	4	4	3	$ 317,386.36
10	PVC	2010	2,460	2	2	2	$ 69,886.36
12	PVC	2010	5,238	2	2	2	$ 158,727.27
3	PVC	1990	29,157	2	2	2	$ 414,161.93
3	PVC	2000	132,415	2	2	2	$ 1,880,894.89
4	PVC	1990	266,496	2	2	2	$ 5,047,272.73
4	PVC	2000	87,249	2	2	2	$ 1,652,443.18
6	PVC	1990	21,232	2	2	2	$ 502,651.52
6	PVC	2000	35,535	2	2	2	$ 841,264.20
3	PVC	1990	15,102	2	2	2	$ 214,517.05
3	PVC	2000	4,856	2	2	2	$ 68,977.27
3	PVC	2010	14,555	2	2	2	$ 206,747.16
4	PVC	1990	9,123	2	2	2	$ 172,784.09
4	PVC	2000	12,076	2	2	2	$ 228,712.12
4	PVC	2010	89,492	2	2	2	$ 1,694,924.24
6	PVC	1990	17,511	2	2	2	$ 414,559.66

Storage Tanks. Hyden-Leslie District's distribution system has 14 storage tanks with a total storage capacity of 2.3 million gallons. The largest of these tanks is the Dollar Store Tank, which was constructed in 2012 and has a storage capacity of one million gallons. Of the remaining storage tanks, none have a storage capacity exceeding 209,000 gallons. Table 5 shows the complete assessment of Hyden-Leslie's District's storage tanks. It identifies the Dollar Store Tank and the Hyden Spur Tank as having moderate defects and considerable performance deficiencies. Hyden-Leslie District has applied to KIA and Rural Development for funding to perform repairs to these water storage tanks as part of its Phase IIIA Water System Improvements Project (WX21131011). Its application remains under consideration.

Table 5 – Water Storage Facilities

Asset Name	Capacity (gallons)	Date Constructed	Condition Code	Performance Code	Priority Code	Replacement Cost
BIG BRANCH NO. 1	100,000	6/1/1996	2	1	0	$ 250,000.00
BIG BRANCH NO. 2	100,000	6/1/1996	2	1	0	$ 250,000.00
DOLLAR STORE TANK	1,000,000	1/1/2012	3	3	0	$ 450,000.00
ESSIE ST RT 406	100,000	6/1/1991	3	2	2	$ 250,000.00
HOSPITAL HILL PRESSURE TANK	1,740		1	1	0	$ 100,000.00
HURTS CREEK	209,000	6/1/2002	2	2	1	$ 350,000.00
HYDEN SPUR	209,000	6/1/1993	3	3	0	$ 350,000.00
MUNCY CREEK	209,000	6/1/1994	2	2	1	$ 350,000.00
OWLS NEST PRESSURE TANKS	1,740		3	2	2	$ 10,000.00
ROCKHOUSE	150,000	2/1/2012	1	1	0	$ 30,000.00
WOLFE CREEK TANK	50,000	1/1/2003	2	1	0	$ 200,000.00
LEECO TANK	50,000	1/1/2012	2	1	0	$ 200,000.00
HELL FOR CERTAIN TANK	60,000	1/1/2012	2	1	0	$ 200,000.00
GRASSY TANK	60,000	1/1/2012	2	1	0	$ 200,000.00

WATER LOSS CONTROL PLAN

In the short term, an effective water loss control plan must emphasis the rapid detection and repair of water main breaks and leaks. Unless the location of the water main break or leak is located, additional manpower and other resources are of limited value. Accordingly, Hyden-Leslie District will first focus on the development of a zone metering system, dividing the District's distribution system into twelve zones whose water consumption can be monitored for unusual high consumption, which is indicative of a water main break. A master meter will be installed for each zone. The meters would be read daily. Monthly totals will be compared to readings from customer meters in the zone to monitor losses in the zone. These meters will eventually be connected to the District's SCADA system to allow for the centralized monitoring and the dispatch of field crews from the District's central office. If additional funding becomes available, the District would begin dividing existing zones into subzones to further increase the District's ability to locate leaks. Hyden-Leslie District estimates that the initial cost of establishing a zone metering system will be approximately $120,000. This estimate is based upon an assumed cost of $10,000 to purchase and install each zone meter.

The District suspects that a portion of its water losses is composed of apparent losses, not real losses of water. Stated another way, the District is actually delivering water to its end users, but this delivery is not being accurately recorded or measured. Most of the District meters are mechanical meters that have been in service ten years or longer. It is generally recognized that this type of meter become less accurate with time in service. Moreover, this meter type has been found to be less sensitive to low flows and generally fails to properly measure usage due to low flows. The District intends to replace its existing residential and commercial meters with ultrasonic meters. These meters are more sensitive to low flow usage, will more accurately measure water usage, and reduce apparent water losses.

In addition to the more accurate measure of water usage, the new meters should produce significant labor savings. Currently, Hyden-Leslie District manually reads its water meters. Six employees each devote 40 hours per month to meter reading activities. The replacement meters will be radio read meters enabling two employees to read the District's meters in a total of 32 hours (2 employees x 2 days @ 8 hours per day). Approximately 2,496 manhours will be released from meter reading activities to focus instead upon water loss control activities.

Hyden-Leslie estimates that cost for total meter replacement is approximately $666,000 based upon an assumed price of $180 per meter and the purchase of 3,700 meters.

Additionally, the District proposes to replace its existing pumps with pumps that have VFD systems and flow meters. VFD systems allow pumping to start and stop at a gradual pace as opposed to the sudden start/stop with older pumping equipment. Sudden start/stop cycles cause substantial pressure spikes which can cause reoccurring failures in a water distribution system fragile system such as ours. The replacement pumps will avoid these sudden start/stops, lessen the stress on existing distribution water mains, and extend the useful service life of those mains. These pumps are more efficient in their energy usages and, therefore, should reduce the District's overall energy costs. The use of flow meters on these pumps will assist the District in identifying usage that exceeds normal operating levels as well as tracking daily and monthly flow totals. The total replacement cost for these pumps is $2,475,000.

The District must replace several of its existing water distribution mains that are nearing the end of their useful service life. Frequent breaks in these older and more fragile water mains represent a major source of water loss. The estimated cost to replacement the oldest water mains, which are asbestos concrete lines, is $683,000.

The Commission has authorized Hyden-Leslie District to assess and collect from each of its customers a monthly surcharge of $1.53 for a period of four years or until $263,124 is collected. Surcharge proceeds will allow Hyden-Leslie District to establish zone metering program and to begin a gradual replacement of customer meters. Full implementation of the meter replacement program will require Hyden-Leslie to access additional funding sources, such as Rural Development or Kentucky Infrastructure Authority ("KIA"), or the extension of the surcharge beyond the original four years. Hyden-Leslie District is exploring borrowing the funds for full meter replacement and using a surcharge to fund the debt service on such loan.

Hyden-Leslie District has not yet determined the appropriate method to fund the remaining portions of its water loss control plan. Funding for the replacement of some pumping stations is

included in the District's proposed Phase IIIB Water System Improvements Project (WX21131002), which would include funding from a Community Development Block Grant, KIA loan, and a Rural Development loan. These pumping stations are highlighted in yellow in Table 1. Funding for some water main replacements are also funded in this package. Efforts to obtain additional funding will be required.

CONCLUSION

Hyden-Leslie District faces a number of challenges in its efforts to control its water loss. Additional funds will be required to reduce water loss to acceptable standards. The proceeds from the recently authorized surcharge will assist in those efforts and will lay the foundation for a more aggressive program. These efforts must be coupled with additional investment in the District's infrastructure to replace aging and outdated facilities. The investment in these facilities will likely not only assist in the reduction of water loss but will enable the District to operate more efficiently and ultimately reduce the cost of water, or at least the need for large rate adjustments, such as the adjustment the District recently experienced.

2013	44%	35%	44%	31%	35%	29%	33%	36%	34%	38%	36%
2014	41%	33%	43%	31%	35%	27%	34%	40%	40%	48%	44%
2015	38%	42%	25%	31%	33%	28%	34%	36%	36%	39%	32%
2016	41%	27%	37%	37%	35%	24%	33%	38%	39%	33%	33%
2017	37%	38%	42%	33%	24%	35%	29%	30%	38%	35%	37%
2018	33%	41%	43%	30%	29%	23%	25%	39%	25%	36%	31%
2019	35%	23%	39%	19%	22%	20%	16%	22%	19%	20%	30%
2020	27%	22%	19%	24%	18%	17%	23%	17%	19%	30%	20%
2021	26%	21%									

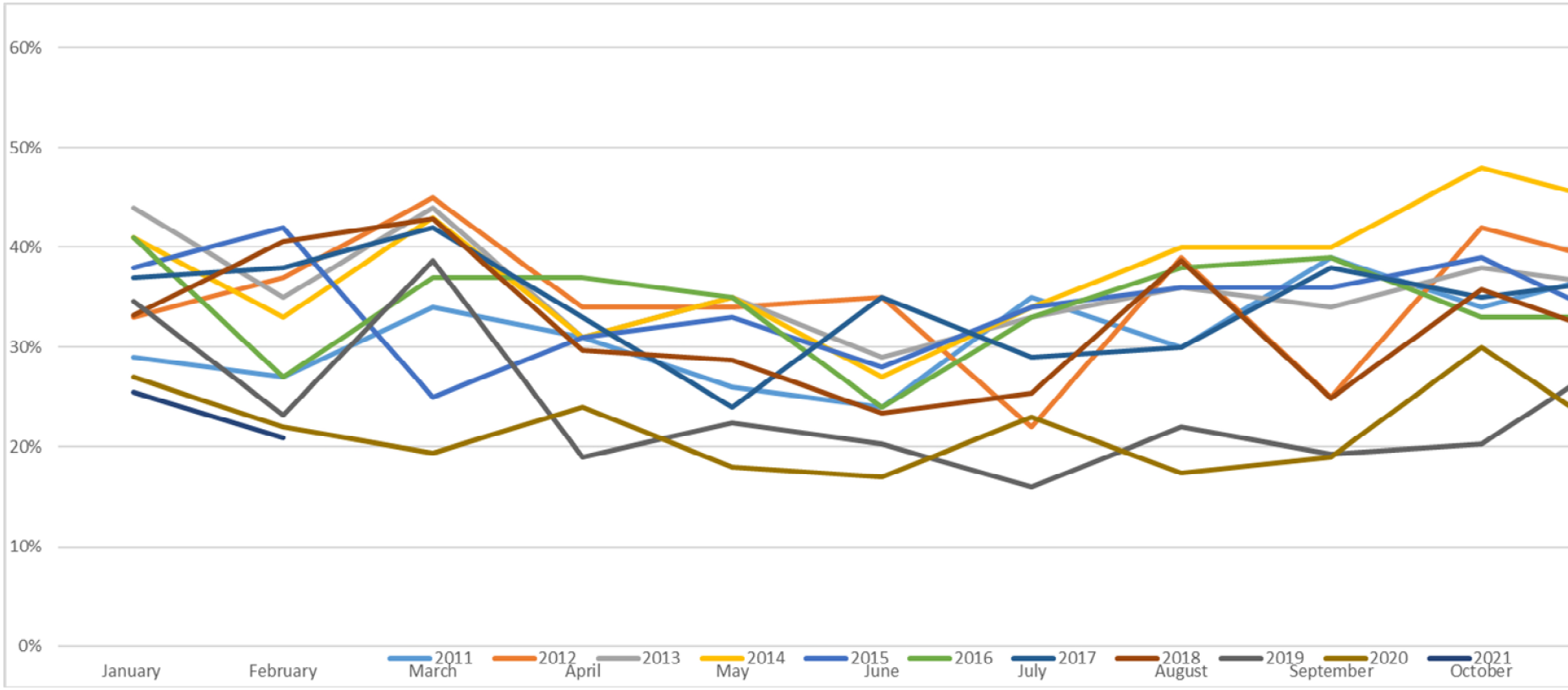


EXHIBIT B

Dynasonics®
Ultrasonic Flow Meters

Hybrid Ultrasonic Flow Meter

DXN Portable Ultrasonic Flow and Energy Meter

DESCRIPTION

The DXN Portable Ultrasonic Flow and Energy Meter is a true hybrid instrument, capable of measuring liquid flow with multiple technologies, including: Doppler, transit time and liquid thermal (heat energy) flow. Easy to install by clamping onto the outside of the pipe, the DXN measures flow using non-invasive ultrasonic sensors. Compatible with a pipe wall thickness gauge, inside pipe diameter can be verified to ensure accurate ultrasonic measurements when piping details are unknown or unavailable.

The DXN has a number of advanced features including a touchscreen interface, full-color graphing, wizard-based start-up configuration, USB connectivity, and Modbus TCP/IP connectivity. These features make it easy for technicians to obtain accurate readings while capturing flow surges and high-speed batch operations. The DXN captures and displays multiple user-defined and application parameters at once and can record the data with an easy-to-use data logging function. The ability to monitor and record several parameters at once allows technicians to verify and troubleshoot permanent flow installations with ease.

Full kit includes meter, transducers, RTDs, cables, thickness gauge, power cord, and carrying case

OPERATION

Transit time flow meters measure the time difference between the travel time of an ultrasound wave going with the fluid flow and then against the fluid flow. This time difference is used to calculate the velocity of the fluid traveling in a closed-pipe system. The transducers used in transit time measurements operate alternately as transmitters and receivers. Transit time measurements are bi-directional and are most effective for fluids that have low concentrations of suspended solids.

Doppler flow meters operate by transmitting an ultrasonic wave from a transducer through the pipe wall and into the moving liquid. The sound wave is "reflected" by suspended particles or bubbles moving with the liquid and ultimately gathered by the receiving transducer. A frequency shift (Doppler effect) will occur that is directly proportional to the speed of the moving particles or bubbles. This shift in frequency is interpreted by the digital signal processor (DSP) and converted to a fluid velocity measurement.

Using its built-in hybrid technology, the DXN will automatically choose which type of flow measurement to read based on signal quality during operation. Regardless of the method used to determine velocity, multiplying the pipe's cross-sectional area by the fluid velocity produces a volumetric flow rate. The measurement also presumes that the pipe is completely full during the measurement cycle.

When used in conjunction with flow measurement, temperature measurements can yield energy usage readings in the form of heat flow. To find the net heat loss or gain, energy usage is calculated by multiplying the flow rate of the heat transfer fluid by the change of heat content in the fluid after it has done some kind of work

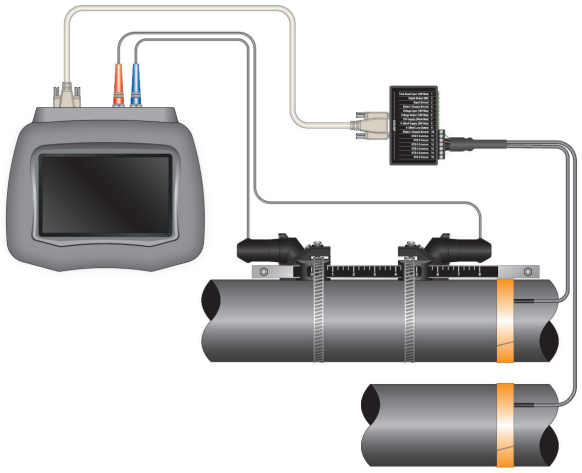
An ultrasonic meter equipped with heat flow capabilities measures the rate and quantity of heat delivered or removed from devices such as heat exchangers. The instrument measures the volumetric flow rate of the heat exchanger liquid, the temperature at the inlet pipe and the temperature at the outlet pipe.

$$\textit{Rate of Heat Delivery} = Q * (T_{In} - T_{Out}) * C * \rho$$

Where…

- Q = Volumetric flow rate
- T_{In} = Temperature at the Inlet
- T_{Out} = Temperature at the Outlet
- C = Heat Capacity
- ρ = Density of fluid

By applying a scaling factor, this heat flow measurement can be expressed in the units of your choosing (Btu, Watts, Joules, Kilowatts and so on).



Badger Meter®

HYB-DS-00086-EN-09 (July 2021)

Product Data Sheet

SPECIFICATIONS

System

Measurement Type	**Flow:** Ultrasonic transit time and Doppler (reflection of acoustic signals); hybrid operation; liquid thermal energy			
	Pipe wall thickness: Ultrasonic transit time of acoustic signals			
Liquid Types	Liquid dominant fluids, acoustically conductive			
Velocity Range	**Transit Time:**	**Medium and large pipes:** Bi-directional up to 40 ft/s (12 m/s), depending on pipe and fluid	**Doppler:** Uni-directional to 40 FPS (12 MPS)	
		Small pipes (DTTSU): Bi-directional up to 20 ft/s (6 m/s), depending on pipe and fluid		
Flow Rate Accuracy	**Transit Time:**	**1 in. (25 mm) and larger:** ±1% of reading ±0.03 ft/s (0.01 m/s)	**Doppler:** 2% of full scale	
		3/4 in. (20 mm) and smaller: ±1% of full scale		
Flow Sensitivity	0.001 FPS (0.0003 MPS)			
Repeatability	±0.2% of reading			
Temperature Accuracy	**Absolute:** 0.5° F (1° C)	**Difference:** 0.2° F (0.5° C)	**Resolution:** 0.02° F (0.01° C)	
Logging	Greater than 300 sites stored in 1 GB; download to USB flash drive			
Update Time	0.1…10 seconds update/filter rate. Transit time, up to 50 Hz high speed mode			
Battery	Internal 11.1V lithium ion battery, 75 W-hr. Provides 6…9 hr of continuous operation with battery and indefinitely on external power. Complete charge at 32…104° F (0…40° C), 4 hours when powered off.			
Power Requirements	**Transmitter:** 10…30V DC via 3-pin connector, 40 W, minimum; 3.6 A re-settable fuse **Supplies:** Wall adapter: 100…240V AC 50/60 Hz 50 W 10…18 V; Cigarette lighter adapter: 5 A fused			
Power Cords	North American plug (2 flat & 1 round prong; NEMA 5/15P); Chinese plug (3 flat prongs; GB2099); Euro plug (2 round prongs; CEE7/7); U.K./Singapore plug (3 rectangular prongs; BS1363A) Japanese plug (2 flat & 1 round, JIS8303, w/ 3-2 prong adapter) Australian plug (3 flat prongs, AS3112)			
Display	800 × 480 WVGA color outdoor readable display; gloved-operation resistive touch screen 6 in. × 3.6 in. (152.4 mm × 41.44 mm)			
Ambient Conditions	**Battery powered:** –4…110° F (–20…45° C)	**Externally powered:** –20…140° F (–30…60° C)		
Storage Temperature	Do not exceed 175° F (80° C)			
Enclosure	Water/dust resistant			
User Menu	**Multi-language:** English, Spanish, German, French, Portuguese, Japanese, Russian, Italian, Dutch, Norwegian, Swedish, Korean, simplified Chinese, Polish			
Compliance	**Safety:** UL61010-1, CSA C22.2 No. 61010-1, EN61010-1 **Directives:** 2006/95/EC low Voltage, 2004/108/EC EMC			

Transducers

Pipe Sizes	1/2 in. and larger; US standard pipe tables are built into user Interface			
Housing Material	**DTTSU:** CPVC, Ultem®, and anodized aluminum track system; nickel-plated brass connector with Teflon® insulation	**DTTR:** PBT glass filled, Ultem, Nylon cord grip, PVC cable jacket	**DTTL/DT94:** CPVC, Ultem®; nickel-plated brass connector with Teflon® insulation	**DTTH:** PTFE, Vespel, Nickel-plated brass cord grip PFA cable jacket
Pipe Surface Temperature	**DTTSU/DTTL:** –40…194° F (–40…90° C)	**DTTR:** –40…250° F (–40…121° C)	**DT94:** –40…194° F (–40…90° C)	**DTTH:** –40…350° F (–40…176° C)
Transducer Frequency	**DTTSU:** 2 MHz	**DTTR/DTTH:** 1 MHz	**DTTL:** 500 kHz	**DT94:** 625 kHz
Cable Length	Transit time: 20 ft (6 m) paired coaxial cable, BNC to BNC, Doppler: 20 ft (6 m) paired coaxial cable, BNC to 4-pin			
Pipe Thickness	Dual mode transducer with 6 ft (1.8 m) of cable (BNC ends), ± 0.03 in. (0.76 mm), stainless steel, carbon steel, pipe, polypropylene, PVC pipes			
RTDs	2 × platinum TCR 0.00385, 1000 Ohm, 3-wire PVC jacketed cable standard with quick connector			

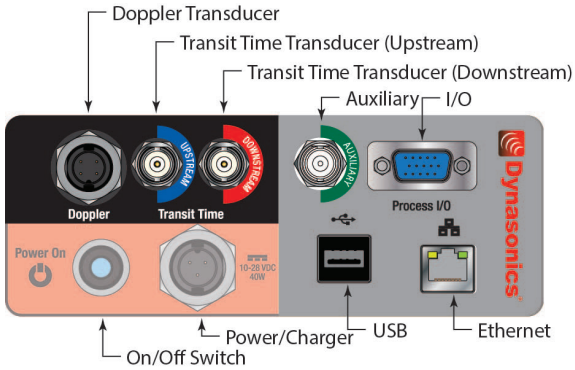
Process Monitoring Inputs/Outputs

Connector	15-pin high-density DSUB	
Breakout Box	0.2 in. quick disconnect screw terminal; 15-pin to adapter box; 6 ft (1.8 m) of cable (DSUB to DSUB connectors)	
RTD Input	Energy/Temperature (2) tab type PT1000 RTDs. Can handle various temperature ranges from –58…392° F (–50…200° C), based on RTD type	
Current Output	4…20 mA active/passive 1% accuracy	
Voltage Input	0…5V or 0…10V, 1% accuracy, Software scaling and control, 80 k Ohms input impedance, Data log capable	
Voltage Output	0…5V or 0…10V output voltage, 1% accuracy, Software scaling and control, 100 Ohms output impedance	
Sensor Supply	14V @ 50 mA max for powering current or voltage sensors	
Digital Output	Open collector, external pull-up; Rate or total pulse user selectable	
	Rate pulse: 0…1000 Hz	**Total pulse:** 33 ms duration
Digital Input	Totalizer reset, external pull-up, software enabled	

MOUNTING SYSTEM

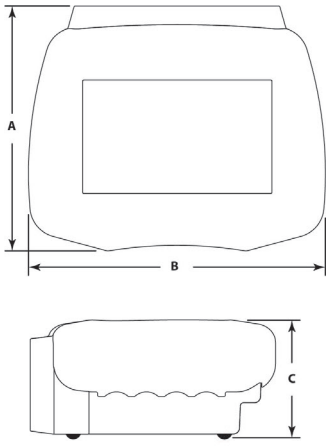
For DTTR transducers, the rail mounting kit aids in installation and positioning of the transducers. Transducers slide on the rails, which have measurement markings that are used for proper spacing of transducers.

DXN CONNECTION PANEL



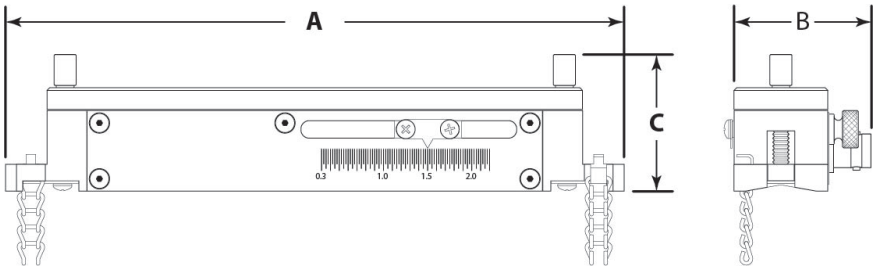
DIMENSIONS

DXN Transmitter

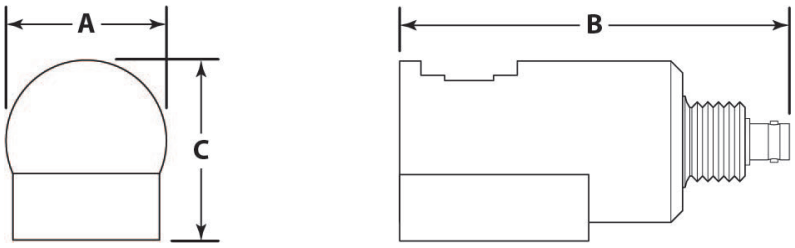


A	B	C
7.8 in. (198 mm)	9.4 in. (240 mm)	3.8 in. (96 mm)

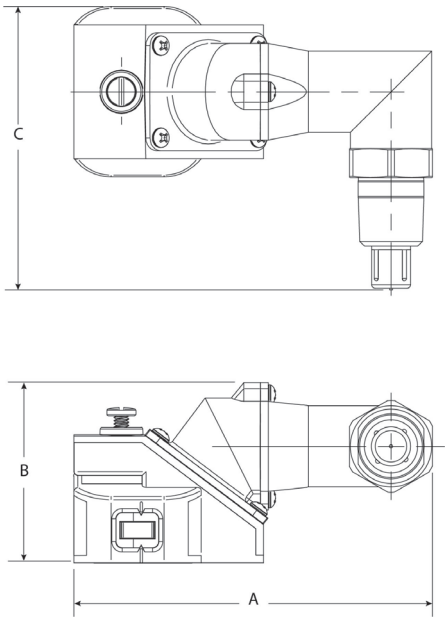
Transducers



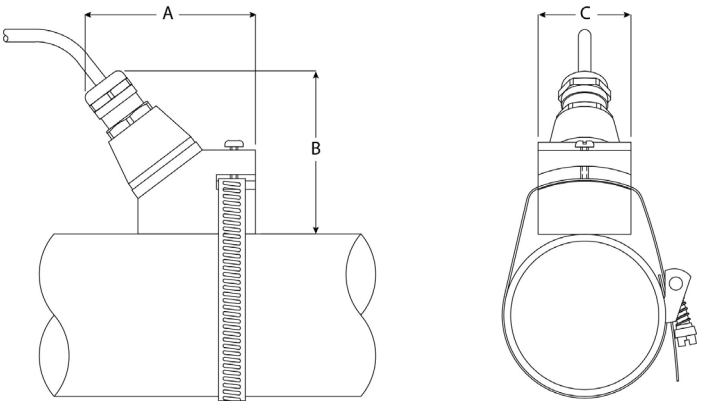
DTTSU Transit Time Transducer



DT94 Doppler Transducer



DTTR Transit Time Transducer



DTTL/DTTH Transit Time Transducer

	A	B	C	D	Minimum Pipe O.D.	Maximum Pipe O.D.
DTTSU	7 in. (178 mm)	1.6 in. (42 mm)	1.5 in. (39 mm)	—	0.5 in. (12 mm)	2.4 in. (60 mm)
DT94	1.7 in. (43 mm)	4.1 in. (105 mm)	1.9 in. (48 mm)	—	1 in. (25 mm)	60 in. (1524 mm)
DTTR	4.6 in. (117mm)	2.3 in. (58 mm)	3.6 in. (91 mm)	—	2 in. (50 mm)	98 in. (2500 mm)
DTTL	2.5 in. (63 mm)	4.2 in. (107 mm)	2.5 in. (63 mm)	3.9 in. (99 mm)	16 in. (400 mm)	120 in. (3050 mm)
DTTH	3.1 in. (79 mm)	2.9 in. (75 mm)	1.7 in. (43 mm)	3 in. (76 mm)	2 in. (50 mm)	98 in. (2500 mm)

PART NUMBER CONSTRUCTION

DXN Portable Transit Time/Doppler Flow Meter

DXN	P	-			S	-	N	N

MODEL

Portable Ultrasonic Flow Meter	P

POWER CORD (see image below for details) [1]

North American	A
Chinese	C
European	E
Japanese	J
United Kingdom	U
Australian	Z

SENSOR AND HARDWARE KIT

Basic	B
High Temperature	C
Transit Time	T
Hybrid	H
Hybrid All	U
Energy	E
Full	F

CARRYING CASE

DXN Shoulder Strap and Outter Carrying Case	S

APPROVALS

CE; General Safety, U.S., Canada and Europe	N

OPTIONS

None	N

[1] Includes Universal AC Power Converter; 95 … 264V AC 50/60 Hz - C14 Connection

SENSOR AND HARDWARE KIT OPTIONS

Basic	Small pipe and standard pipe transit time transducers and 20 ft cables (1) Couplant, grease; 5.3 oz; Dow 111 (1) Couplant, Ultrasound gel; 0.25 liter bottle (4) Stainless steel straps (1/2 in. wide, 12-5/16 in. max dia., worm drive clamp)
Transit Time Standard Temperature	Basic kit and large pipe transducers
High Temperature	Basic kit and high temperature pipe transducers
Hybrid	Basic kit, Doppler transducers and 20 ft cables for Doppler tranducers
Hybrid All Sizes	Basic kit, large pipe transducers, Doppler transducers and 20 ft cables for Doppler transducers
Energy	Basic kit and non-invasive RTDs (1) Silicone Heat Sink Compound; 5 oz. syringe (1) RTD Installation tape, 36 feet
Full	Basic kit plus all, transit time, Doppler, RTDs and pipe wall thickness gauge (1) Silicone Heat Sink Compound; 5 oz. syringe RTD Installation tape, 36 feet (2) Stainless steel straps (1/2 in. wide, 21-1/4 in. max dia., worm drive clamp)

PARTS AND ACCESSORIES

Power Cords and Cables

Part Number	Description
D005-2109-013	North American Plug (2 flat & 1 round prong; NEMA 5/15P)
D005-2109-015	UK Plug (3 rectangular prongs; BS1363A)
D005-2109-016	European Plug (2 round prongs; CEE7/7)
D005-2109-017	Japan Plug (2 flat & 1 round, JIS8303, w/ 3-2 prong adapter)
D005-2109-014	China Plug (3 flat prongs; GB2099)
D005-2109-018	Australian Power Plug (3 Flat Prongs; AS3112)
D005-2129-020	Transit Time Cables, 20 ft (6 m)
D005-2129-050	Transit Time Cables, 50 ft (15 m)
D005-2129-100	Transit Time Cables, 100 ft (30 m)
D005-2130-020	Doppler Cables, 20 ft (6 m)
D005-2130-050	Doppler Cables, 50 ft (15 m)
D005-2130-100	Doppler Cables, 100 ft (30 m)

Transducers (Heads with Case)

Part Number	Description	Minimum Pipe O.D.	Maximum Pipe O.D.
D010-2200-002-C	DTTSU Universal Small Pipe	0.5 in. (12 mm)	2.4 in. (60 mm)
D071-0107-302-C	DTTR Standard Pipe	2 in. (50 mm)	98 in. (2500 mm)
D071-0110-200-C	DTTL Large Pipe	16 in. (400 mm)	120 in. (3050 mm)
D071-0112-001-C	DT94 Doppler Transducer	1 in. (25 mm)	60 in. (1524 mm)
DTTH-020-D000-N-C	DTTH High Temperature, Standard Pipe Kit	2 in. (50 mm)	98 in. (2500 mm)

Spare Parts

Part Number	Description
D002-2007-004	0…392° F (0…200° C) RTD Silicone stretch tape
D002-2007-001	36 in. (914 mm) SS Hose clamp / transducer strap
D002-2007-005	72 in. (1829 mm) SS Hose clamp / transducer strap
D002-2011-014	AcquaSonic 100
D002-2011-001	Acoustic couplant, grease (Dow 111), 150° F (65° C) 5.3 oz (150.2 gram) tube
D002-2011-011	Acoustic couplant, paste high temperature, 5 oz (142 gram) tube, 392° F (200° C)
D010-2102-310	DTTR rail
D040-0115-003-T	Wall thickness gauge, 6 ft (1.83 m)
D010-3000-128	Industrial RTD Kit[1], 1000 Ohm, 392° F (200° C); 20 ft (6 m) cable
D010-3000-130	Industrial RTD Kit[1], 1000 Ohm, 392° F (200° C); 50 ft (15 m) cable
D010-3000-132	Industrial RTD Kit[1], 1000 Ohm, 392° F (200° C); 100 ft (30 m) cable

[1] RTD Kits include 2 RTDs, heat sink compound and installation tape.

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EXHIBIT C

PROCESS CONTROLS CORPORATION
2231-B Ampere Drive
Louisville, KY 40299
Phone: 502/266-6640 Fax 502/266-6658
E-mail dans@processcontrolscorp.com

Date: 01/07/2025
Quote # 250110-ds

Attn: **LJ Turner, Manager**
Hyden Leslie Water District

Qty.	Description	Part Number	Price($) Each	Total Price
1	**Badger Meter Dynasonics DXN "Basic" portable flow meter** Model: DXN Portable Ultrasonic Flow Meter Power Cord 1: A - North American Carrying Case: S - DXN Shoulder Strap and Outer Carrying Case Approvals: N - CE; General Safety, U.S., Canada and Europe Options: N - None This is the "Basic Kit" which includes: -20 ft color coded cable set -(4) Stainless mounting straps, and Acoustic couplant. -Small tranducer set (DTTSU) for 1/2 to 2 Inch pipes. -Standard Pipe set (DTTR) for pipes larger than 2.5 inches.	**DXNP-ABS-NN**	$ 7,154.00	$ 7,154.00
	Total			**$ 7,154.00**

Availability: 2-3 weeks
Term: Net 30 Days
FOB: Shipping point, freight not allowed
Please make your purchase order out to: Process Controls Corp. P.O. Box 30390 Indianapolis, IN 46230

Best Regards,

Dan Shaffner
Process Controls Corp.-KY
502/544-3232

EXHIBIT D

Commonwealth of Kentucky
Public Service Commission
211 Sower Blvd.
P.O. Box 615
Frankfort, Kentucky 40602-0615
Telephone: (502) 564-3940
psc.ky.gov

December 5, 2024

Hyden-Leslie County Water District
LJ Turner
356 Wendover Road
Hyden, KY 41749

Re: Periodic Water Inspection
Hyden-Leslie County Water District
Leslie County, Kentucky

Dear Hyden-Leslie County Water District:

The Kentucky Public Service Commission (Commission) has exclusive jurisdiction over regulation of utility rates and services in the Commonwealth of Kentucky pursuant to KRS 278.040. KRS 278.250 grants the Commission authority to investigate the condition of a utility subject to its jurisdiction. The Division of Inspections regulates the safety and requirements of jurisdictional water utilities pursuant to 807 KAR Chapter 005.

Commission Staff performed a periodic water inspection of Hyden-Leslie County Water District's system on November 14, 2024, reviewing Hyden-Leslie County Water District's operations and management practices pursuant to Commission regulations. Commission Staff prepared an Inspection Report dated December 2, 2024. Please find enclosed a copy of the Inspection Report. The Inspection Report cited Hyden-Leslie County Water District for two violations of water utility regulations:

1. 807 KAR 5:066 Section 6(3) – Unaccounted-for water loss. For ratemaking purposes, a utility's unaccounted-for water loss shall not exceed fifteen (15) percent of total water produced and purchased, excluding water used by a utility in its own operations. Water Loss was reported on the 2023 Annual Report at 18.77 percent.

2. 807 KAR 5:066 Section 16(1) – Periodic Tests. Each utility shall test periodically all water meters so that no meter will remain in service without test for a period longer than specified in the below table. Inspection revealed that approximately 2,500 meters are out of compliance.

Size of Meter Inches	Interval Between Tests Years
5/8	10
5/8 x 3/4	10
3/4	10
1	10
1 1/4	4
1 1/2	4
2	4
3	2
4 and larger	1

For the deficiencies listed above, Hyden-Leslie County Water District will need to provide Commission Staff with a detailed explanation regarding each deficiency. Hyden-Leslie County Water District will need to address each deficiency in the letter and state why the deficiency occurred, what is being done to correct the deficiency, and what action is being taken to prevent the deficiency from occurring in the future.

Hyden-Leslie County Water District's response will be used by Commission Staff in determining whether a penalty will be assessed and, if so, the amount of the penalty to be assessed against Hyden-Leslie County Water District. Hyden-Leslie County Water District will have the ability to contest any proposed penalty at a hearing in front of the Commission where the Commission will make a final determination, if Hyden-Leslie County Water District so desires.

Hyden-Leslie County Water District's response regarding the deficiencies should be submitted within thirty (30) days of the date of this letter via email to PSCED@ky.gov.

If Hyden-Leslie County Water District does not respond within thirty (30) days of the date of this letter, the Commission will institute an administrative proceeding against Hyden-Leslie County Water District. The Administrative Proceeding will include a formal hearing in front of the Commission during which Hyden-Leslie County Water District will have an opportunity to show cause as to why Hyden-Leslie County Water District should not be subject to penalties under KRS 278.990 for the violations cited herein.

If you have any questions regarding this matter, please contact Erin Donges, Division of Inspections, at erin.donges@ky.gov or 502-330-5970.

Sincerely,

Brandon S. Bruner
Director, Division of Inspections

Enclosure

EXHIBIT E

kamstrup

Data sheet

flowIQ® 2200

» **RF**
» **Encoded**
» **Cellular**

- Multiple radio options available
- Ultrasonic measurement
- Sustainable measurement accuracy
- Temperature measurement
- IP68 Vacuum sealed construction
- Lead free and certified to NSF/ANSI 61
- Flow measurement in display
- Acoustic leak detection in service and distribution lines

Contents

Technical data	4
Material	5
Meter sizes	5
Meter face details	6
Core features	8
Meter modes	8
Display and info codes	9
Data registers	10
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Pressure loss	12
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Dimensions	18
Accessories	19

Electronic ultrasonic cold-water meter for measurement of cold-water consumption in households, multi-unit buildings and industry

Sustainable accuracy
Ultrasonic flow measurement guarantees sustainable accuracy and longevity. Ultrasonic flow measurement is based on the transit time method, and all measurements, references, readings, calculations and data communication are controlled by an advanced, specially designed electronic circuit. Thus, the meter includes no moving parts, which makes flowIQ® 2200 less sensitive to wear and tear and impurities in the water.

Construction
The meter is hermetically closed and vacuum-sealed to prevent humidity from reaching the electronics and avoid condensation between the glass and display. The meter is IP68 (submersible) type tested and suitable for installation in meter pits.

Installation
flowIQ® 2200 is easy to install in all operating environments, horizontally as well as vertically, independent of piping and installation conditions. Consumption data can be read visually from the display, using an optical eye, and remotely read by various integrated communication protocols.

Specific features
flowIQ® 2200 measures the water and environment temperatures and it includes acoustic leak detection, securing that water loss is discovered quickly.

The unique combination of all the flowIQ® 2200 features reduce current operating costs to measure water usage and minimizes unexpected expenses in connection with possible leakage.

Environmentally friendly
The meter has been approved according to Drinking Water Standards and is certified to NSF/ANSI 61. The meter housing and measuring part are made of the high-performance thermoplastic material polyphenylene sulfide (PPS) with 40% fiberglass, which is free from lead and other heavy metals. The environmental report, Carbon Footprint, documents the meter's high reusability and low environmental impact, including recycling of materials.

Hygiene
To protect the health of the consumers Kamstrup has a hygienic manufacturing process of the water meters.

Kamstrup also has a highly automated manufacturing process and only uses materials approved for drinking water. Furthermore, the products get disinfected before dispatch. The hygiene is being controlled by external accredited laboratories and by frequent audits.

General description
flowIQ® 2200 is a hermetically sealed water meter intended for measurement of cold and *reclaimed water consumption in residentials and multi-unit buildings.

flowIQ® 2200 employs the ultrasonic measurement principle, based on Kamstrup's experience since 1991, with the initial development and production of static ultrasonic meters.

flowIQ® 2200 is available in an Encoded Output version with 2 x A-cell battery supply and a RF and Cellular version with 1 x D-cell battery supply.

One of flowIQ® 2200's many advantages is the fact that it has no wearing parts, which ensures a high and stable accuracy throughout its lifetime. flowIQ® 2200 complies with all the AWWA C715-18 guideline for Ultrasonic Water Meters.

flowIQ® 2200 measures the water consumption electronically, as a volume, using a pair of ultrasonic signals. Through two ultrasonic transducers, an ultrasonic signal is sent with and against the flow direction. A transducer serves both as a 'speaker' when transmitting and as a 'microphone' when a signal is received. The ultrasonic signal traveling with the flow will be the first to reach the opposite transducer, while the signal running against the flow will be received a little later.

The time difference between the two signals can be converted into flow velocity, and thereby also into a volume. The measuring principle is a proven, long-term stable and accurate measuring principle.

In addition to volume reading, an indication of current flow and several other information codes are displayed. All registers are saved daily in the meter data logger (EEPROM) and are kept for 460 days. Furthermore, monthly data for the latest 36 months (3 years), hourly data for the latest 100 days (about 3 and a half months) and 50 info code events are saved.

flowIQ® 2200 is powered by an internal lithium battery which can provide up to 20 years operating life.

flowIQ® 2200 is available with a choice of integrated data communication options:

- 912.5, 915 or 918.5 MHz - RF
- 450-470 MHz - RF
- Cellular
- Encoded Output

The meter is fitted with an optical eye which makes it possible to read saved consumption data and info codes, stored in the meter's data logger. Using an optical reading head, it is also possible to change the meter configuration, e.g. data packages.

flowIQ® 2200 can and must only be opened by Kamstrup A/S. If the meter has been opened and the sealing has been broken, the meter is no longer valid for billing purposes and the warranty is void.

** For information concerning reclaimed water we refer to document no.: FILE100003532*

Technical data

Electrical data

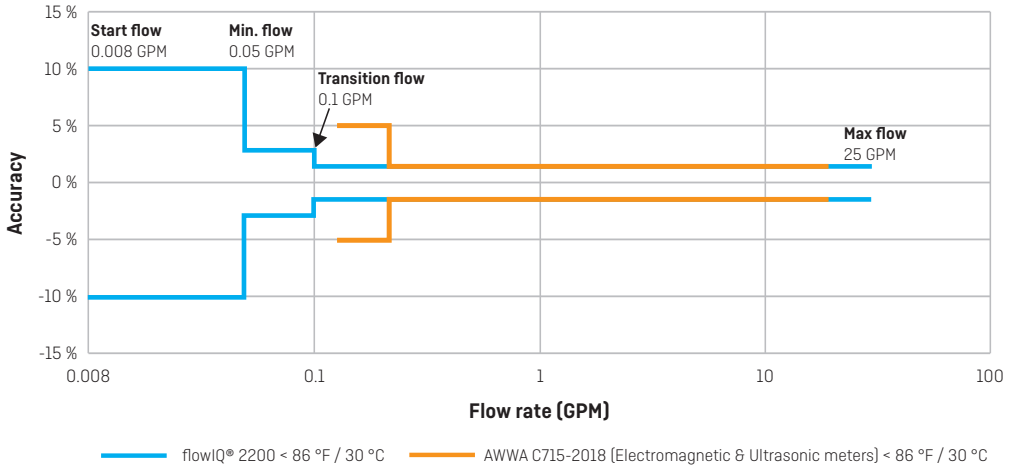
Battery (flowIQ® 2200 RF and Cellular)	1 x D-Cell battery, 3.6V, 19Ah. The battery warranty does not apply at meter temperatures above t_{BAT} > 95 °F / 35° C
Battery (flowIQ® 2200 E0)	2 x A-Cell battery, 3.6V, 3.6Ah. The battery warranty does not apply at meter temperatures above t_{BAT} > 95 °F / 35° C

Mechanical data

Protection class	IP68-rated (waterproof/submersible)
Mechanical environment	Class M1 (Measuring Instruments Directive classification)
Ambient/meter temperature	
- flowIQ® 2200, composite	35... 130 °F / 1.5... 55 °C
- flowIQ® 2200, metal	35... 130 °F / 1.5... 55 °C
Water temperature	
- flowIQ® 2200, composite	33... 120 °F / 0.5... 50 °C
- flowIQ® 2200, metal	33... 120 °F / 0.5... 50 °C
Storage temp. empty sensor	-10... 140 °F / -20... 60 °C
Maximum operating pressure	250 PSI (17 bar)

Accuracy

Accuracy limits for ⅝" meters



Note: At flows between 'Start flow' and 'Maximum flow' measurement occurs – however the accuracy is only guaranteed in the range from minimum flow to maximum flow

Approved meter data

Certified to NSF/ANSI 61
Complies to part 15 of the FCC rules, ISED, IFT and with AWWA C715-18

Material

Wetted parts (composite model)

Meter housing and flow part	Polyphenylene sulfide (PPS) with fiberglass (40 %) reinforcement, PSU, extenders made from PA12
Reflectors	Stainless steel 316

Wetted parts (2-part body)

Flow part, threaded	Stainless Steel 316L
O-ring/gasket	EPDM
Measuring tube	PPS with fiberglass
Reflectors	Stainless steel

External meter parts

Top ring (sealing)	Polycarbonate (gray)

Meter sizes

flowIQ® 2200 is available in the sizes shown in table below:

XX = Communication module Y = Battery suply ZZ = Country code

Type number	Meter size Inches	Start flow[1] (S) [GPM]/ [L/h]	Min. flow[1] [GPM]/ [L/h]	Transition flow [GPM]/ [L/h]	Max flow [GPM]/ [m³/h]	Sat. flow rate [GPM]/ [m³/h]	Pressure loss SMOC [PSI]/ [bar]	Connection on meter NPSM thread	Lay length [Inches]/ [mm]	Strainer	Temp. measurement of water
02-K-XX-Y-1-8A-8ZZ	⅝" x ½"	0.008/ 2	0.05/ 11.4	0.1/ 22.7	25/ 5.68	35/ 7.95	6.2/ 0.43	¾"	7½"/ 190	Yes	Yes
02-K-XX-Y-1-8B-8ZZ	⅝" x ¾"	0.008/ 2	0.05/ 11.4	0.1/ 22.7	25/ 5.68	35/ 7.95	7.7/ 0.53	1"	7½"/ 190	Yes	Yes
02-K-XX-Y-1-8R-8ZZ	⅝" x ¾"	0.008/ 2	0.05/ 11.4	0.1/ 22.7	25/ 5.68	35/ 7.95	7.7/ 0.53	1"	5.1"/ 130	Yes	Yes
02-K-XX-Y-1-8C-8ZZ	¾"	0.011/ 2.5	0.05/ 11.4	0.1/ 22.7	32/ 7.27	45/ 10.22	9.0/ 0.62	1"	7½" or 9"/ 229	Yes	Yes
02-L-XX-Y-1-8B-8ZZ	⅝" x ¾"	0.013/ 3	0.10/ 22.8	0.15/ 34.1	25/ 5.68	35/ 7.95	3.8/ 0.26	1"	7½"/ 190	No	Yes
02-L-XX-Y-1-8N-8ZZ	¾"	0.013/ 3	0.10/ 22.8	0.15/ 34.1	35/ 7.95	49/ 11.13	3.9/ 0.27	1"	7½"/ 190	No	Yes
02-L-XX-Y-1-8L-8ZZ	¾"	0.013/ 3	0.10/ 22.8	0.15/ 34.1	35/ 7.95	49/ 11.13	3.9/ 0.27	1"	9"/ 229	No	Yes
02-L-XX-Y-1-8D-8ZZ	1"	0.022/ 5	0.25/ 56.8	0.4/ 90.8	55/ 12.49	77/ 17.49	3.1/ 0.21	1¼"	10¾"/ 273	No	Yes

Note! 02-K-02-D-1-8C-8UB can be ordered with a 1½" extension and washer (installed by the customer) to fit 7½" or 9" lay lengths

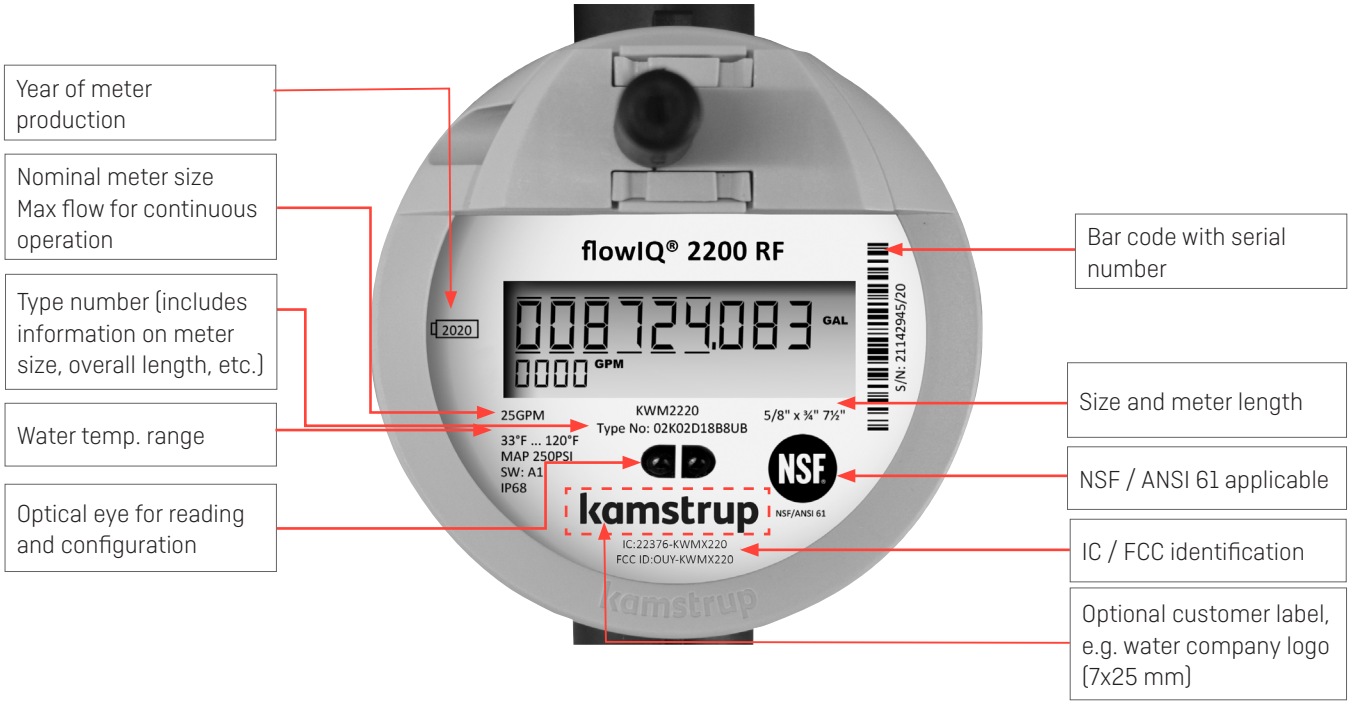
Note! Flow specifications only apply at temperatures below 86 °F / 30 °C

[1] At flows between 'Start flow' and 'Maximum flow' measurement occurs – however the accuracy is only guaranteed in the range from minimum flow to maximum flow

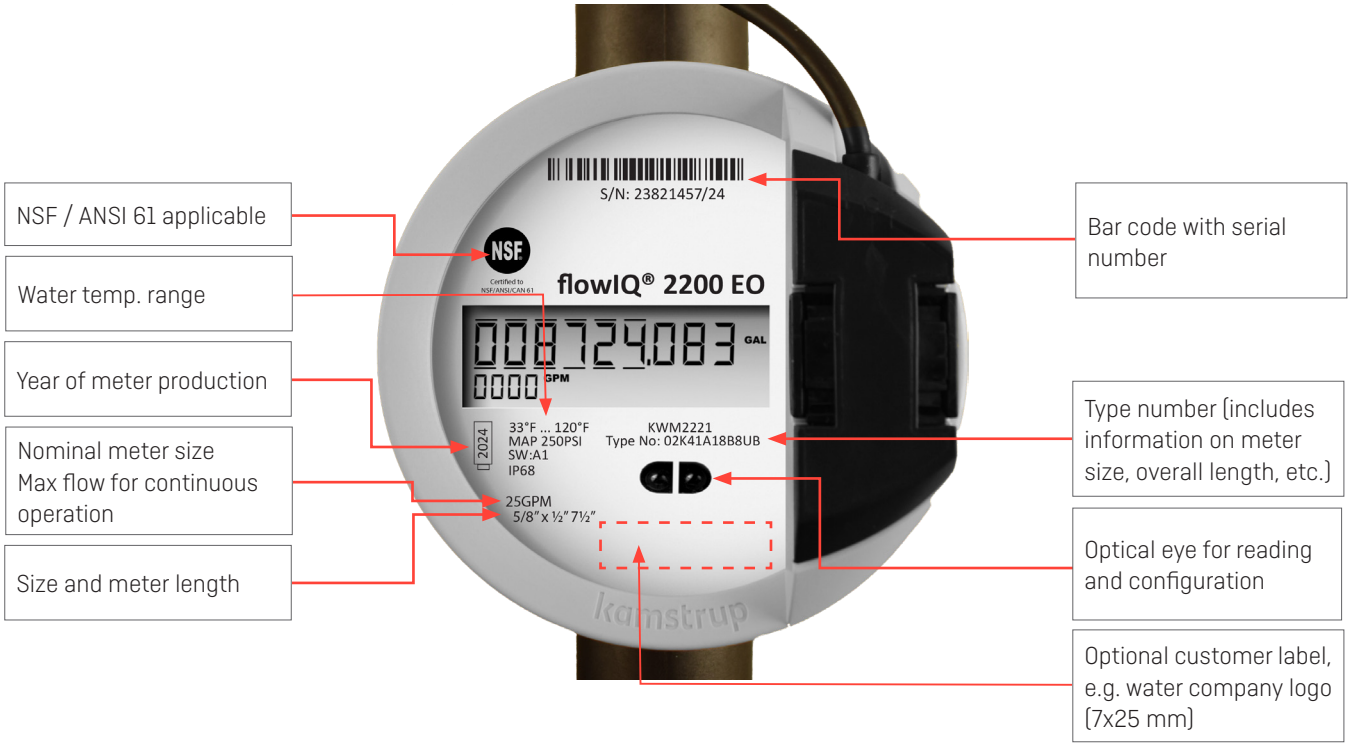
Meter face details

Meter information in permanent laser engraved text

RF top label

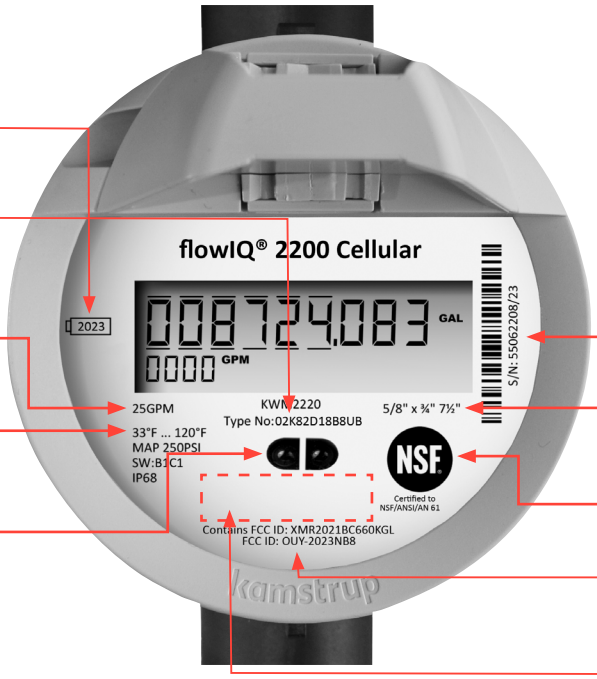


Encoded top label



Meter face details

Cellular top label



Year of meter production

Type number (includes information on meter size, over all length, etc.)

Nominal meter size
Max flow for continuous operation

Water temp. range

Optical eye for reading and configuration

Bar code with serial number

Size and meter length

NSF / ANSI 61 applicable

IC / FCC identification

Optional customer label, e.g. water company logo (7x25 mm)

Core features

Water meters placed throughout the network make it possible to gather information that can be of vital importance for an effective water supply, asset management and improved customer service.

Acoustic leakage detection
flowIQ® 2200 water meter introduces integrated acoustic leak detection that allows you to monitor your service connections for possible leaks. Like a fine-meshed network of noise-loggers, all your meters monitor the noise in the distribution lines and service connections to detect possible leaks – 24/7.

Temperature monitoring
flowIQ® 2200 measures water and ambient temperatures respectively. Information on temperatures above or below the configured temperature in the meter will warn the utility of potential frost damage or quality issues. These measurements can be used to monitor the installation and will indicate the water's quality.

Current flow display
Besides the consumed volume, flowIQ® 2200 also shows the current flow in the display. The flow display has been designed with user experience in mind, where it can be advantageous, for example during installation, to be able to see the current consumption. In this context, it is important to stress that the metrological approval of the water meter is related to the volume reading only. Due to the meter's update time, the flow display, in case of rapidly increasing/decreasing flow, may turn out to be slower than the real flow and not a one-to-one correlation between the flow display and the volume growth. In general, one would expect the flow display to stabilize after about half a minute of constant flow and thereafter to be consistent with volume growth.

Consumption above max flow

The meter logs information on consumption above max flow. This information can be used to indicate if the meter size for a given installation is correct.

Consumption histogram
The meter tracks consumptions in different flow intervals for further analysis of the consumption patterns for the specific installation.

Meter modes

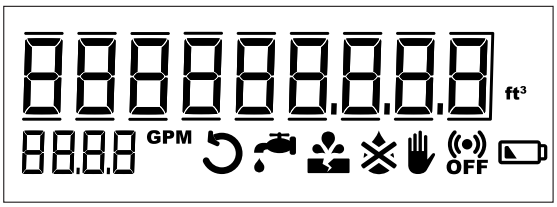
flowIQ® 2200 can operate in two modes, Normal and Verification mode.

Verification mode is only used by authorized laboratories during verification.

flowIQ® 2200 RF and flowIQ® 2200 Cellular	Normal mode	Verification mode
Flow measurement and flow display update	1 s	0.125 s
Volume integration and volume display update	8 s	1 s

flowIQ® 2200 EO	Normal mode	Verification mode
Flow measurement and flow display update	2 s	0.125 s
Volume integration and volume display update	16 s	1 s

Display and info codes



The large display with totalized volume, flow rate and intuitive info codes on flowIQ® 2200 makes it easy for end users to understand their own consumption data.

flowIQ® 2200 includes a large number of intelligent info codes and alarms. An info code indicates a special condition in the meter. If the info code is available in the display, the related symbol is on when it has been activated. If the 'condition' is not active, the sign is OFF. The info codes provide you with the exact knowledge you need to target your efforts within operations optimization, customer information, water loss and tampering. The info codes in the display have the following meaning and function:

Info code	Meaning
	The water in the meter has not been stagnant for one continuous hour during the last 24 hours. This can be a sign of a leaky faucet or toilet cistern or indicate a leakage after the meter.
	The water consumption has been consistently high for half an hour, which indicates a pipe burst.
	Attempt of fraud. The meter is no longer valid for billing.
	The meter is dry. In this case nothing will be measured.
	The water flows through the meter in the wrong direction.
OFF	RADIO OFF flashes. The meter is still in transport mode with the built-in radio transmitter turned off. The transmitter turns on automatically when water runs through the meter for the first time.*
OFF	RADIO OFF lights permanently. The radio is switched off permanently. Can be activated via METERTOOL.*
	The symbol appears when the expected capacity left is 6 months or less.

	Switch off automatically when the condition that activated them no longer exists.
	Disappears when the water has been stagnant for one hour.
	Disappears when the consumption falls to normal level.
	Disappears when the water no longer flows in the wrong direction.
	Disappears when the meter is filled with water.

**RADIO OFF is not available for Encoded Output meters*

Data registers

The water meter has a permanent memory, in which the values of various data loggers are saved. The loggers can be read via the meter's optical eye and from communications protocols

The following registers are logged:

Description	Yearly logger	Monthly logger	Daily logger	Hourly logger
Logger depth	20 years	36 months	460 days	2400 hours
Operating hours	✓	✓	✓	✓
Info codes incl. hour counter	✓	✓	✓	✓
Volume	✓	✓	✓	✓
Volume reverse	✓	✓	✓	✓
Volume net	✓	✓	✓	✓
Acoustic Noise Value Day			✓	
Flow max incl. date	✓	✓		
Flow min incl. date	✓	✓		
Flow max day incl. Timestamp			✓	
Flow min day incl. Timestamp			✓	
Water temp. max	✓	✓	✓	
Water temp. min.	✓	✓	✓	
Water temp. avg.	✓	✓	✓	
Ambient temp. max	✓	✓	✓	
Ambient temp. min.	✓	✓	✓	
Ambient temp. avg.	✓	✓	✓	

Every time the information code changes, date and info codes are logged. Thus, it is possible to data read the latest 50 changes of the information code as well as the date the change was made.

Integrated communication

The meter supports a variety of different communication options depending on meter type. All radio supported meters can be used with Kamstrup's external antenna. Transmission properties and data packages are defined in the configuration number YY-ZZZ. These can be changed with METERTOOL, MeterToolX or READy App through the optical IR interface or with a READy converter.*

**Depending on communication protocol*

RF

Kamstrup RF is based on Wireless M-Bus which is a mature and proven technology for remote reading of smart meters. Wireless M-Bus provides a robust, simple and secure reading of meters and requires a low initial investment, but is flexible enough to be expanded whenever desired. Wireless M-Bus is based on an European standard (EN 13757-4) applicable to devices for reading consumption of water, electricity or energy. The data encryption consists of a 128-bit AES counter mode encryption. Both AMR 912.5, 915 and 918.5 MHz and AMI 450-470 MHz are available.

For additional information about the Kamstrup RF communication module, please refer to the module data sheet, document no.: FILE100003480.

Cellular

NB-IoT (Narrowband Internet of Things) is one of the most popular LPWA (Low-Power, Wide-Area) technologies offered by most mobile network operators worldwide via the established 4G and 5G network infrastructures, meaning that no network ownership is required. Unlike 2G and 3G, which are designed for mobile broadband communication at the expense of high-power consumption, NB-IoT offers affordable data communication for power constrained IoT devices. Most 4G and 5G networks support NB-IoT technology.

For additional information about the Kamstrup Cellular communication module, please refer to the Cellular module data sheet, document no.: FILE100003864.

Encoded Output

The Sensus Encoded Output and TouchRead are implemented based on Sensus specification UI-1203 and UI1204. Encoded Output is compatible with several 3rd party RF network systems. Kamstrup Encoded Output supports Sensus Encoded Output systems and Sensus TouchRead systems. In addition, Neptune ProRead, Neptune E-coder systems and others are supported.

For additional information about the Kamstrup Encoded Output communication module, please refer to the Encoded Output module data sheet, document no.: FILE100003729.

State of the art meter reading system (READy)

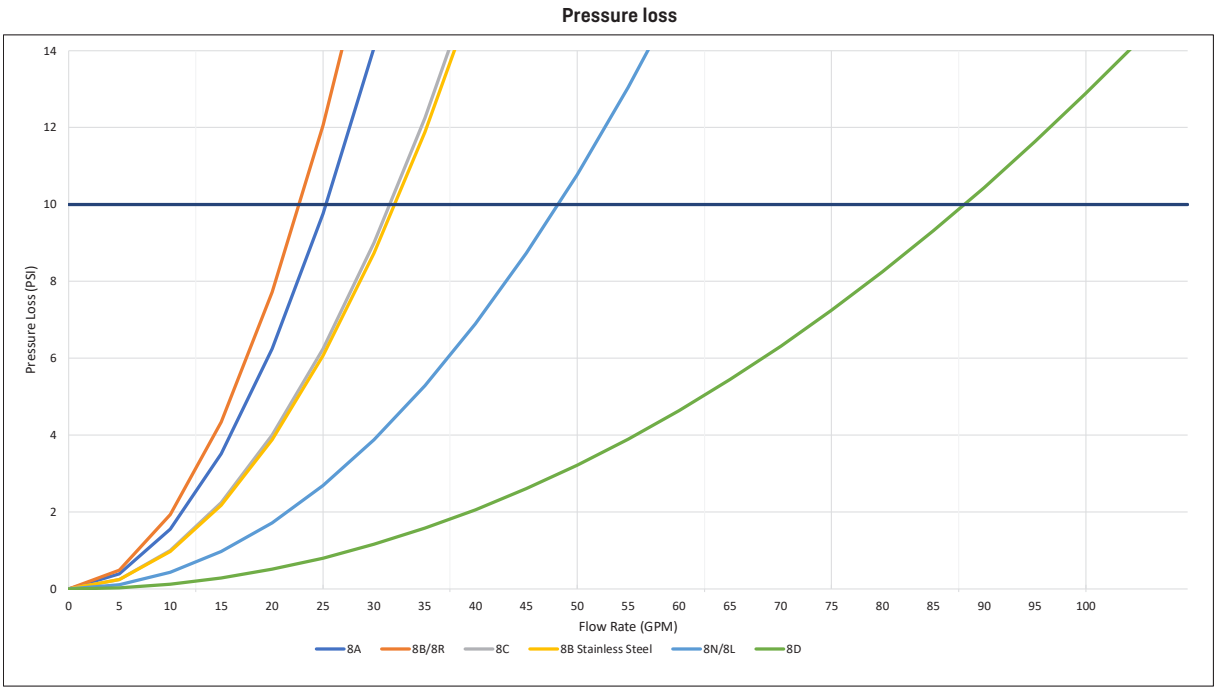
Standardized and open communication

902-928 MHz band RF is an open standard, following EN13757-4:2010, which means that while the flowIQ® 2200 can be configured with or without encryption of the transmitted signal, encryption is required in the United States.

Encryption protects personal data against unauthorized monitoring. Furthermore, the encryption file provides easy access to import meter data for reading programs.

Pressure loss

According to AWWA C715-18 Type I guideline the maximum pressure loss must not exceed 10 PSI (0.69 bar) at SMOC.
The following graph shows pressure loss with respect to flow rate:



See Technical description for Water Meters North America: Document no.: FILE100001331, for more information about pressure loss.

Ordering details

Start your order by stating the type number of the selected model of flowIQ® 2200.

The type number includes information on meter type, meter version, size, lay length, service connection and time zone.

Subsequently the meter configuration, which determines customer-specific requirements such as number of digits in display etc., is selected. The configuration is completed during programming of the final meter.

Accessories are enclosed separately to be mounted by the installer.

Meter type - flowIQ® 2200

Type	□□	□	□□	□	□	□□	□	□□
Meter generation								
Second generation	02							
Mechanical design								
Composite, PPS		K						
Stainless steel		L						
Communication								
RF			02					
Encoded Output			41					
Cellular			82					
Power supply								
D-cell				D				
2 x A-cell				A				
Dynamic range								
AWWA C715-18					1			
Meter size								
⅝" x ½" (25GPM); ¾" NPSM; 7½"						8A		
⅝" x ¾" (25GPM); 1" NPSM; 7½"						8B		
⅝" x ¾" (25 GPM); 1" NPSM; 5.1"						8R		
¾" (32GPM); 1" NPSM; 7½" or 9"; includes 1½" extension						8C		
¾" (35GPM); 1" NPSM; 7½"						8N		
¾" (35GPM); 1" NPSM; 9"						8L		
1" (55GPM); 1¼" NPSM; 10¾"						8D		
Meter type								
Cold water							8	
Reclaimed water							9	
Country code								
North America, FCC and NSF approved								UB
Canada, ISED and NSF approved								CA
Mexico, IFT and NSF approved								MX

The features included in the type number cannot be changed once the meter has been produced.

Configuration - flowIQ® 2200

Config	DDD □□□	JJ □□	LLL □□□	MMMM □□□□	N □	P □	S □	U □	RR □□	CCC □□□	V □	T □	YY □□	ZZZ □□□
Display views														
Standard	810													
GMT offset (time zone)														
USA Eastern (GMT-5)		28												
USA Central (GMT-6)		24												
USA Mountain (GMT-7)		20												
USA Pacific (GMT-8)		16												
Target date (handled as order data)														
Max values averaged over time (1..120 min.)														
2 minutes			002											
Customer label														
Alphanumeric (2060-MMMM)				0000										
Leakage message limit														
OFF					9									
Flow continuously > 0.25% of max flow					2									
Flow continuously > 0.5% of max flow					3									
Flow continuously > 1.0% of max flow					4									
Flow continuously > 2.0% of max flow					5									
Pipe burst limit														
OFF						0								
Flow > 5% of max flow for 30 minutes						1								
Flow > 10% of max flow for 30 minutes						2								
Flow > 20% of max flow for 30 minutes						3								
Ambient Temperature low limit														
OFF							0							
Ambient temperature < 2 °C/ 36 °F							2							
Ambient temperature < 3 °C / 37 °F							3							
Ambient temperature < 6 °C / 43 °F							6							
Ambient Temperature high limit														
OFF								0						
Ambient temperature > 35 °C / 95 °F								3						
Ambient temperature > 45 °C / 113 °F								6						
Data logger profile														
Standard RF									04					
Standard Encoded Output									15					
Standard Cellular									16					

To be continued on next page...

Configuration - flowIQ® 2200

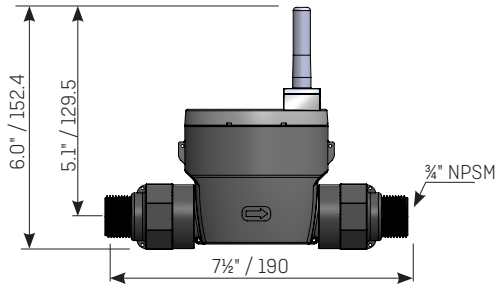
Config	DDD □□□	JJ □□	LLL □□□	MMMM □□□□	N □	P □	S □	U □	RR □□	CCC □□□	V □	T □	YY □□	ZZZ □□□
...continued from previous page														
Display resolution (alphanumeric)														
0000000.00 USgal - 0.01 GPM - Billing in 1,000s (recommended for residential meters)										220				
000000000 ft³ - 0000 GPM - Billing in 1,000s (recommended for district meters)										154				
For additional options please refer to FILE100002712														
Temperature units of measure														
Fahrenheit											1			
Celsius											0			
Encryption level														
Encryption with separately forwarded key												3		
Communication														
For communication protocols please refer to the section "Integrated Communication"														

	DDD	JJ	LLL	MMMM	N	P	S	U	RR	CCC	V	T	YY	ZZZ
Unless otherwise stated in the order, Kamstrup supplies the following:	810	□□	002	0000	4	3	3	3	04	220	1	3	YY	ZZZ

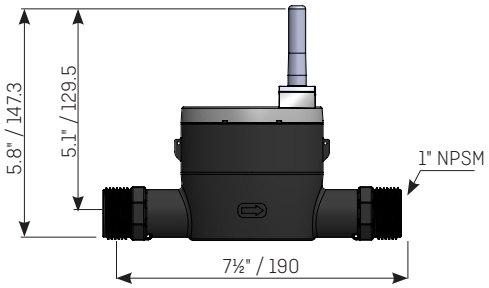
Note: JJ (time zone) and target date are not predefined and has to be chosen in the ordering system.

Dimensional sketches – flowIQ® 2200

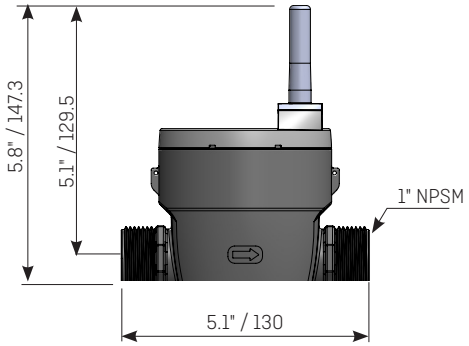
Type: 8A – Size: 25 GPM ⅝" x ½" x 7½"



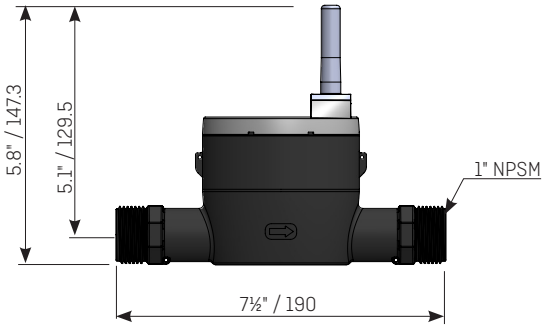
Type: 8B – Size: 25 GPM ⅝" x ¾" x 7½"



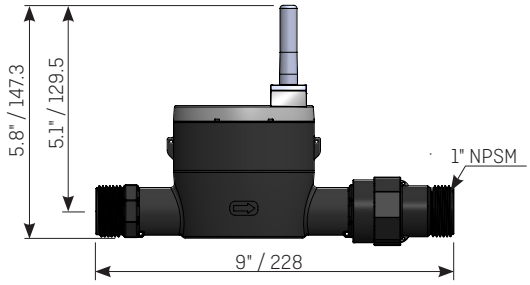
Type: 8R – Size: 25 GPM ⅝" x ¾" x 5.1"



Type: 8C – Size: 32 GPM ¾" x ¾" x 7½"



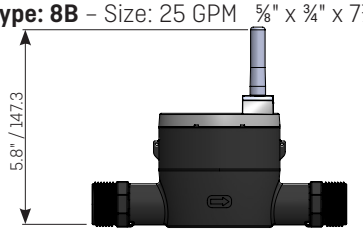
Type: 8C+ – Size: 32 GPM ¾" x ¾" x 9"

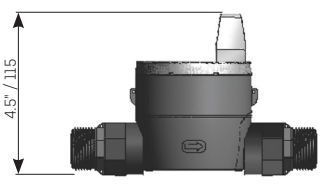


Encoded Output has the exact same dimensions as RF and Cellular – apart from the meter cup height.

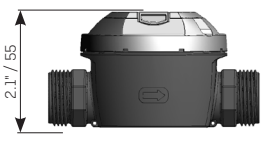
Examples:

Type: 8B – Size: 25 GPM ⅝" x ¾" x 7½"



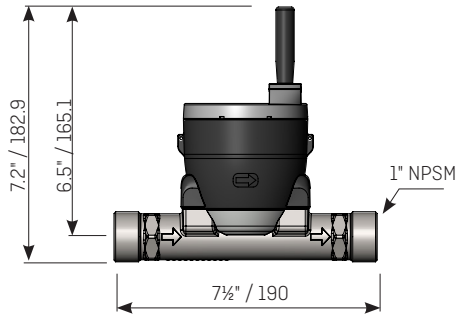


Type: 8R – Size: 25 GPM ⅝" x ¾" x 5.1"

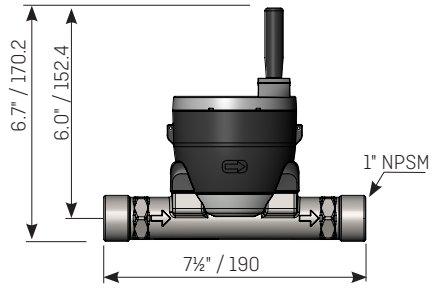


Dimensional sketches – flowIQ® 2200

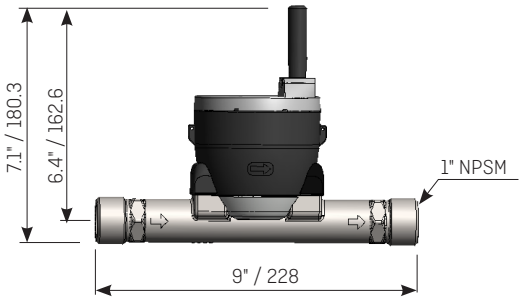
Type: 8B – Size: 25 GPM ⅝" x ¾" x 7½"



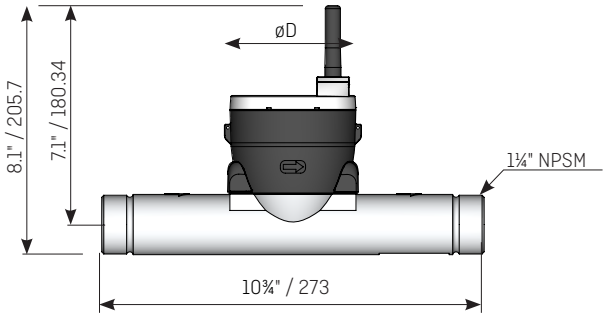
Type: 8N – Size: 35 GPM ¾" x 1" x 7½"



Type: 8L – Size: 35 GPM ¾" x 1" x 9"



Type: 8D – Size: 55 GPM 1" x 1¼ " x 10¾"



NOTE! Same threads for in- and outlet. / Dimensions: Inches/mm

Dimensions

flowIQ® 2200 RF and Cellular

Mechanical design	Meter type	Meter size GPM	NPSM thread	L	H	øD	Weight approx. [Lbs / Kg]
				[Inches / mm]			
Composite	8A	25	¾"	7½" / 190	RF 6.0" / 152.4 Cellular 4.5" / 115	3.6" / 91.4	1.08 / 0.49
Composite	8B	25	1"	7½" / 190	RF 5.8" / 147.3 Cellular 4.5" / 115	3.6" / 91.4	1.01 / 0.46
Composite	8R	25	1"	5.1" / 130	RF 5.8" / 147.3 Cellular 4.5" / 115	3.6" / 91.4	1.01 / 0.46
Composite	8C	32	1"	7½" / 190	RF 5.8" / 147.3 Cellular 4.5" / 115	3.6" / 91.4	1.01 / 0.46
Composite	8C+	32	1"	9" / 228	RF 5.8" / 147.3 Cellular 4.5" / 115	3.6" / 91.4	1.10 / 0.50
Stainless steel	8B	25	1"	7½" / 190	RF 7.2" / 182.9 Cellular 4.5" / 115	3.6" / 91.4	1.01 / 0.46
Stainless steel	8N	35	1"	7½" / 190	RF 6.7" / 170.2 Cellular 4.5" / 115	3.6" / 91.4	2.2 / 1.0
Stainless steel	8L	35	1"	9" / 228	RF 7.1" / 180.3 Cellular 4.5" / 115	3.6" / 91.4	2.5 / 1.13
Stainless steel	8D	55	1¼"	10¾" / 273	RF 8.1" / 205.7 Cellular 4.5" / 115	3.6" / 91.4	4.1 / 1.86

flowIQ® 2200 EO

Mechanical design	Meter type	Meter size GPM	NPSM thread	L	H	øD	Weight approx. [Lbs / Kg]
				[Inches / mm]			
Composite	8A	25	¾"	7½" / 190	2.1" / 55	3.6" / 91.4	0.90 / 0.41
Composite	8B	25	1"	7½" / 190	2.1" / 55	3.6" / 91.4	0.86 / 0.39
Composite	8R	25	1"	5.1" / 130	2.1" / 55	3.6" / 91.4	0.86 / 0.39
Composite	8C	32	1"	7½" / 190	2.1" / 55	3.6" / 91.4	1.01 / 0.46
Composite	8C+	32	1"	9" / 228	2.1" / 55	3.6" / 91.4	0.93 / 0.42
Stainless steel	8B	25	1"	7½" / 190	3.9" / 101	3.6" / 91.4	1.87 / 0.85
Stainless steel	8N	35	1"	7½" / 190	3.9" / 101	3.6" / 91.4	1.87 / 0.85
Stainless steel	8L	35	1"	9" / 228	3.9" / 101	3.6" / 91.4	2.09 / 0.95
Stainless steel	8D	55	1¼"	10¾" / 273	4.2" / 109	3.6" / 91.4	2.82 / 1.28

Accessories

See accessories for water meters, document no.: FILE100000644.
Accessories are ordered separately in CPQ (Kamstrup ordering system) and will be delivered as single parts in the packaging.

Kamstrup A/S • FILE100000648_J_EN-US_10.2024

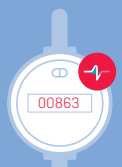
Kamstrup Water Metering, LLC
2855 Forsyth Commerce Way, Building 200
Cumming, GA 30040, USA
T: +1 (404) 835-6716
info-us@kamstrup.com
kamstrup.com

EXHIBIT F

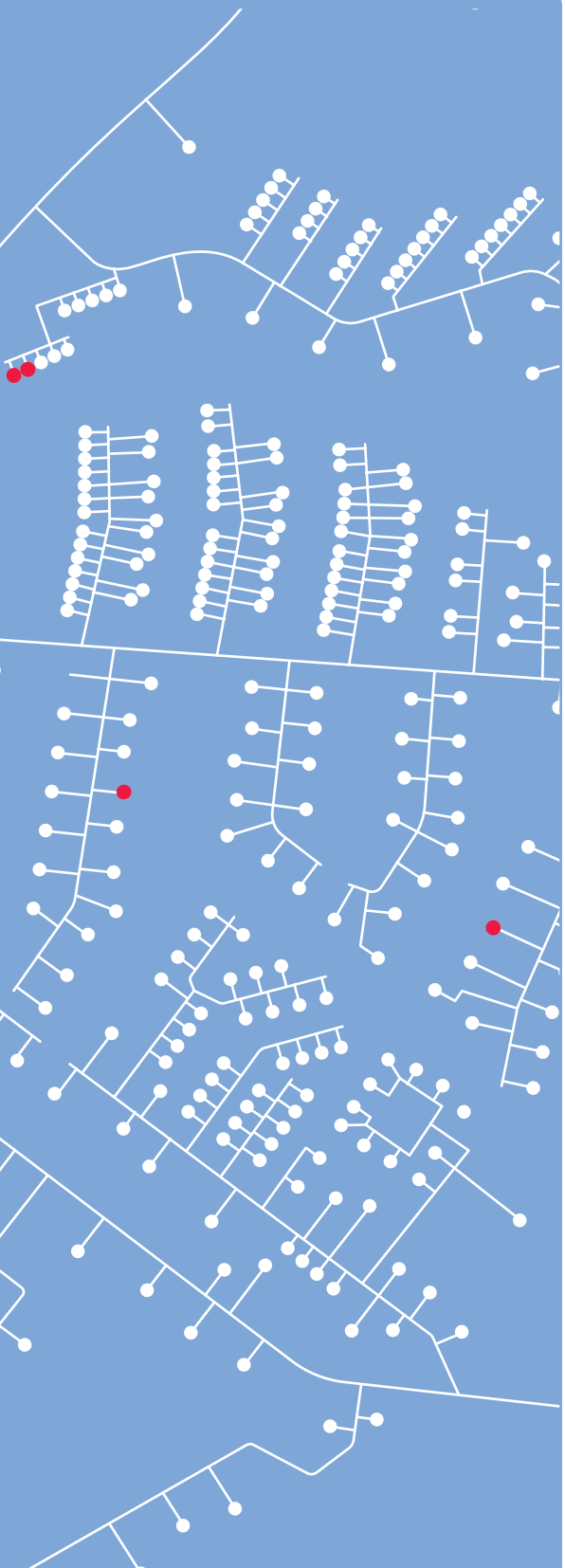
kamstrup

Acoustic Leak Detection

With the flowIQ® 2200, Leak Detector Software and Kamstrup Services



Preserving water resources is everyone's responsibility, but as a water professional, minimizing water loss and Non-Revenue Water is literally your business.



A proactive approach to fighting water loss

Today ...

Leak detection is often a time-consuming inefficient and expensive task as service connections are often on private property. With limited knowledge about what goes on in your distribution network and the state of your service connections, locating leaks can be like finding a needle in a haystack.

And when you cannot identify where the leaks in your distribution network are coming from, how do you optimize and prioritize your daily work? How do you assess the need for maintenance and future investments?

Just imagine ...

Instead, what if you had real-time data and insight that enabled you the ability to identify and verify potential leaks before they developed into bursts? Or, if you could efficiently prioritize your time and target your resources where you knew they would deliver the most value?

With Kamstrup's next generation solution for acoustic leak detection, which detects leaks upstream of the meter, you'll have full transparency of your distribution network, which ultimately allows you to have the tools you need for an efficient and proactive approach to leak detection and fighting water loss.

Less Non-Revenue Water

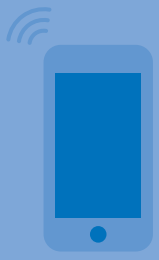
Faster and more efficient leak detection enables you to reduce your level of Non-Revenue Water. By lowering operational costs as you distribute less water, you are more likely to meet legislative and environmental goals and requirements. And, with detailed knowledge on leaks and the overall condition of your network, you can better prioritize - perhaps even postpone - investments in maintenance, renovation or additional capacity.

Acoustic Leak Detection

The solution

flowIQ® 2200

flowIQ® 2200 raises the bar for what you can expect from a residential water meter. You get uncompromising accuracy, state-of-the-art built-in acoustic leak detection, full support for remote reading and a host of other intelligent features in one superior meter that is protected from water ingress and has up to 20 years battery-lifetime.



Remote reading

The flowIQ® 2200 offers full support for both drive-by and network remote reading. This ensures efficient, stable and secure meter reading and significantly reduces the time, costs and administration involved in your data collection.

Leak Detector

The accompanying analytics module, Leak Detector, assists you in locate leaks in service connections and distribution mains based on acoustic noise levels registered by flowIQ® 2200 meter. Leak Detector generates a visual map and provides you with insightful data about your distribution network, allowing you to narrow down areas and focus your efforts.

Service & Support

Implementation is done in close cooperation with Kamstrup to ensure that you get off to the best possible start, and you can choose between different options for how much support and training you need. This ranges from standard set-up and onboarding, to service packages where we monitor your network and provide you with a list of possible leaks for further investigation.

$12
per MP

On average the water lost in service connection has a value of $12 per meter point every year*

**European statistics.*

22%
leaks on service line*

29%
leaks on service mains*

**Results from Kamstrup conducted in 2020*

Raising the bar for residential water meters based on proven ultrasonic technology

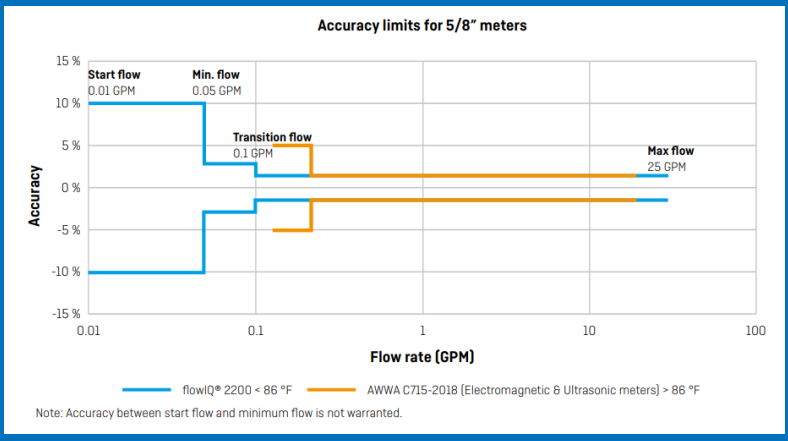
The flowIQ® 2200 smart water meter is the first of its kind with integrated acoustic leak detection. The meter monitors noise patterns that indicate possible leaks in the adjacent pipes and allows you to identify high-risk installations and find leaks in both service connections and distribution mains.

Containing no moving parts, the meter maintains the same high-level of pinpoint accuracy throughout the meter's lifetime. With full support for remote reading, the flowIQ® 2200 offers a number of configurable data packages, both well-known and new intelligent alarms as well as a number of target volumes, volumes, maximum and minimum flows and temperature values.

In addition, the flowIQ® 2200 comes with a new display that shows flow rate and updates every twenty seconds.

Ability to improve customer service

Acting like a fine-meshed network of noise-loggers, the meters listen to the distribution lines and service connections to detect possible leaks. Through early detection of leaks, the flowIQ® 2200 enables you to provide more proactive customer service due to the real-time data that can warn about possible leaks before scale bursts which ultimately can limit the amount of consequential property damage.



flowIQ® 2200 – Technical features

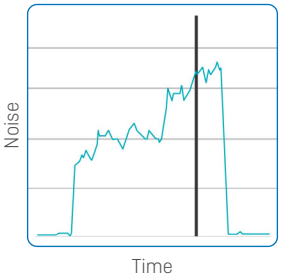
Accuracy and reliability that customers know today, but with add-on functionality of acoustic leak detection.

- Acoustic leak detection
- Flow rate shown in display
- Histogram
- Hourly log
- Remote reading
  - 3 Channel
  - AMR (912.5, 915, 918.5 MHz)
  - AMI (450-470 MHz)
- Intelligent alarms
  - Leak
  - Burst
  - Tamper
  - Dry
  - Reverse Flow
  - Low Battery
  - High ambient temperature
  - Low ambient temperature
  - Overflow
- Flow measurement/display update
  - 1 sec/20 sec (>0.05 GPM)
- Water ingress protection
  - IP68
- Sizes
  - ⅝" x ¾" x 7½" (1" thread, PPS) 25 GPM
  - ⅝" x ¾" x 5.1" (1" thread, PPS) 25 GPM
  - ⅝" x ½" x 7½" (¾" thread, PPS) 25 GPM
  - ¾" x 7½" (1" thread, PPS) 32 GPM
  - ¾" x 9" (1" thread, PPS) 32 GPM (incl. PPS extender)
  - ⅝" x ¾" x 7½" (1" thread, stainless steel) 25 GPM
  - ¾" x 7½" (1" thread, stainless steel) 35 GPM
  - ¾" x 9" (1" thread, stainless steel) 35 PGM
  - 1" x 10¾" (1¼" thread, stainless steel) 55 PGM
- Battery lifetime
  - 20 years
- AWWA C715-18 Compliance

5 examples of leaks found by the flowIQ® 2200

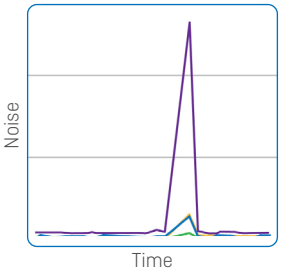
1 Leak turning into a burst on a service connection

When something escalates in the distribution network, it is important to act in time. The example shows a case where a leak was detected the moment the meter was installed, but after a short while this leak quickly rose to be in potential risk of bursting. The leak was discovered before it actually ended up with a burst, saving both money and valuable water.



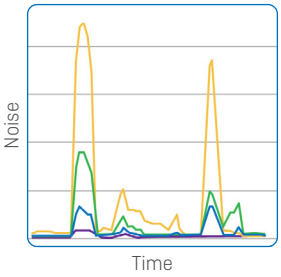
2 Burst inside consumer's home

A sudden spike of high acoustic values indicates that something has deviated - likely either due to extremely high consumption or a burst. The example shows a burst inside a consumer's home, which was also detected by the neighboring meters. This kind of correlation is particularly interesting as it will be able to detect acoustic changes far out in the distribution network.



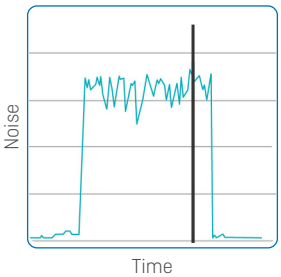
3 Simulated leak on service connections

This example shows a simulated leak on a service connection close to the main pipe. This leak was approximately 2.2 GPM to 3.3 GPM, and therefore a relatively large leak that would have had a costly effect. In the figure there is a clear representation of the spikes in the acoustic noise created by the leak as it was "turned on" which could be detected by several meters.



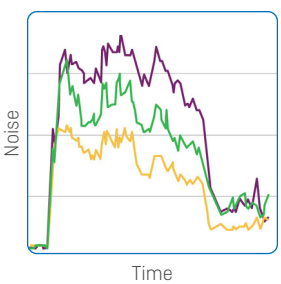
4 Leak on service connection

Leaks on service connections can be a black-box for many utilities, and they often require a lot of time and effort to find. This example shows multiple leaks discovered on service connections and a rapid increase in acoustic values. This spike happened just after the flowIQ® 2200 was installed, and a leak was detected instantly.



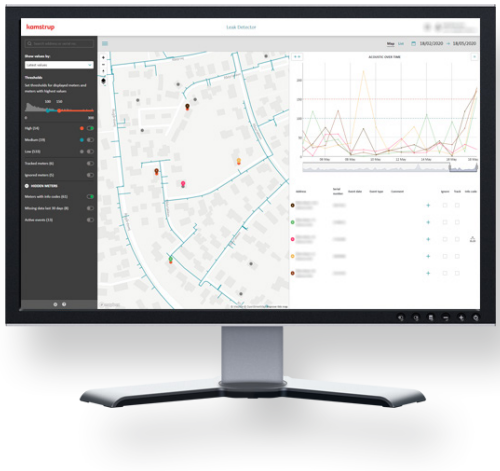
5 Leaking fire hydrant

The flowIQ® 2200 can also register leaking fire hydrants. In the figure, one of the leaky fire hydrants was registered by several meters in close proximity, which can be seen in the similar pattern in the acoustic values. The leak was repaired and the noise fell to a normal level again.



Leak Detector

Easily identify leaks on service connections and distribution mains based on acoustic data noise in a cloud-based platform aimed at analyzing data



Leaks can be caused by a variety of reasons and often difficult to detect. With acoustic noise data from your water meters, leaks can now be detected in an entirely new way. Leak Detector, the analytics module in conjunction with the flowIQ® 2200, enables you to locate leaks based on acoustic noise levels registered by the meter, which means time can be spent fixing leaks instead of searching blindly for them.

Leak Detector provides a map-based overview of your supply area and shows your meters with intuitive color coding representing the noise level registered by each, with graphs visualizing the development over time. The module enables you to easily identify high-risk installations where elevated noise levels indicate possible leaks or bursts.

With faster and more efficient leak detection, you can reduce the cost per identified leak and also reduce Non-Revenue Water. Detailed knowledge about high-risk installations with possible leaks and the overall condition of your network will also enable you to prioritize your daily efforts to when and where they will have the biggest impact.

Identifying high-risk installations
The map in Leak Detector shows your meters with intuitive color coding representing the acoustic noise level in the surrounding pipes registered by each meter.

Filters and customizable thresholds let you control what meters are shown on the map. You can filter out meters with low noise levels, so you can focus on the meters where the risk of a leak is highest. You can also correlate the noise data from one meter with that of others to look for nearby meters with similar noise patterns, which could indicate a possible leak on a distribution main.

Noise data visualized
As you select one or more meters, graphs visualize the registered acoustic noise over time, allowing you to follow the development.

This enables you to take action as soon as the noise reaches a critical level. It also helps you to distinguish meters with a noise level caused by a leak from meters in which the noise is caused by something else, such as a circulation pump.

Increased transparency
Leak Detector provides the ability to increase overall transparency in your supply area.

A reduction in water loss will lower your operational costs. It also will limit your overall costs, and help you to meet environmental and legislative goals and requirements.

Set-up for success

Implementation of a smart meter solution with acoustic leakage detection including flowIQ® 2200 water meters and the Leak Detector analytics module is done in close cooperation with Kamstrup to ensure that you get off to the best possible start. You can choose between different options for how much support and training you need.

A range of services and training offerings are available to support you in fighting Non-Revenue Water. By working in close cooperation with Kamstrup you can choose between different options for services, support and training to scale and customize your needs for not only today, but also the future.

Up & Running Service
With Up & Running Service, you get off to a better – and faster – start utilizing the Leak Detector module by having Kamstrup provide set-up and dedicated guidance on module overview.

Who is this for?
Up & Running Leak Detector is for those who want turnkey help creating the right foundation for maximizing the Leak Detector module.

What's in it for you?
- Minimal time investment and hassle
- Proper foundation for efficient use
- Faster time to use

Leak Monitoring Service
With Leak Monitoring Service, Kamstrup monitors your service connections through the Leak Detector module and then notifies you of potential leaks to give you the information you need to efficiently verify and locate them.

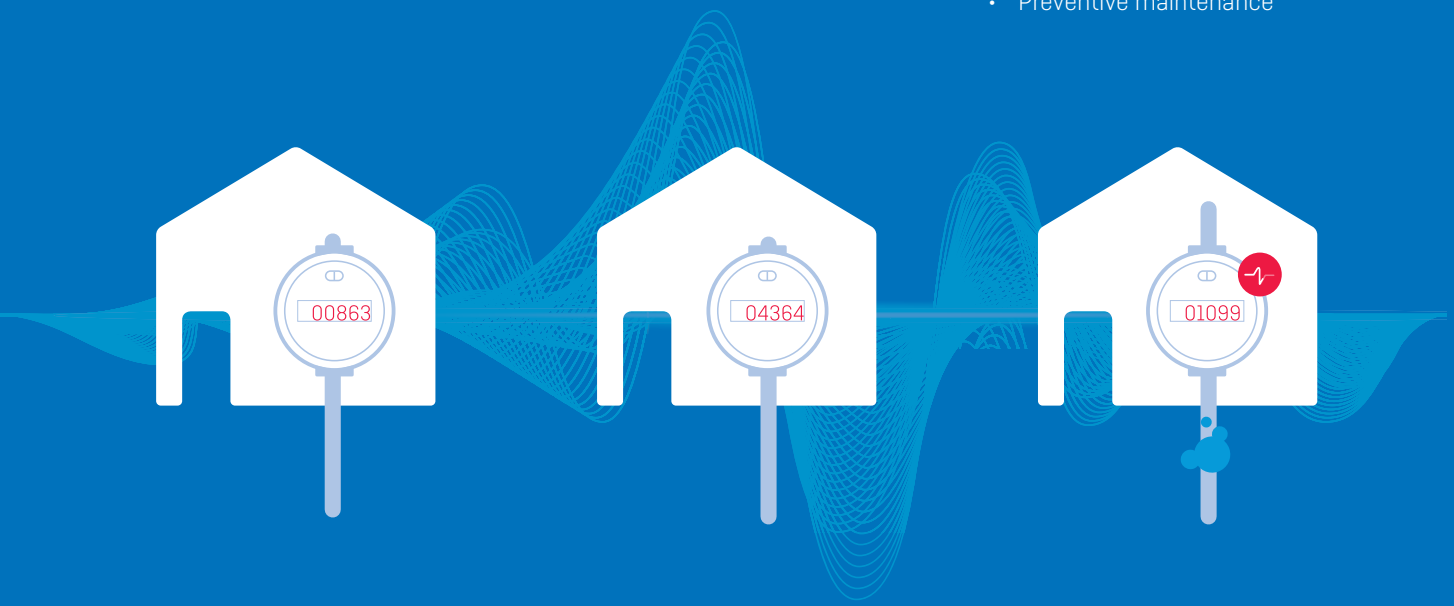
Who is this for?
Leak Monitoring Service is for those who want to improve detection of leaks in service connections by having someone else monitor them.

What's in it for you?
- Efficient use of field time
- High hit rate for beating leaks
- Improved customer service and satisfaction

Pipeline Integration Service
Pipeline Integration for Water Intelligence provides an improved overview of your assets, the ability to pinpoint incidents and a better understanding of potential improvements to pipeline design. With Pipeline Integration Service, your pipeline layout will be integrated into your water intelligence module.

Who is this for?
Pipeline Integration Service is for utilities that want better transparency of their distribution network through the various Water Intelligence modules but want to outsource the integration.

What's in it for you?
- Increased transparency
- Preventive maintenance



Kamstrup Water Metering, LLC
2855 Forsyth Commerce Way Suite 200
Cumming, GA 30005, USA
T: +1 (404) 835-6716
info-us@kamstrup.com
kamstrup.com

EXHIBIT G

Bid Proposal for HYDEN-LESLIE KAMSTRUP JUNE 2024

CUSTOMER

HYDEN-LESLIE CO WATER DIST
325 WENDOVER RD
HYDEN, KY 41749
Contact: L.J. Turner
(T) 606-672-2971
(F) 606-672-7510
hlwater@tds.net

Job
HYDEN-LESLIE KAMSTRUP JUNE 2024
LEXINGTON, KY
Bid Date: 12/31/2023
Bid #: 3596415

CONTACT

Sales Representative
MARK CERRIE
(M) 859-321-8331
(T) 859-321-8331
mark.cerrie@coreandmain.com

Core & Main
2141 Christian Rd
Lexington, KY 40509
(T) 8592533464

NOTES

*Core & Main will hold pricing until Dec 31st 2024

*Pricing is 1-479 & 480 plus Meters only

*Meters are packaged from the factory at 120 Meters per pallet

HYDEN-LESLIE CO WATER DIST
Job Location: LEXINGTON, KY
Bid Date: 12/31/2023
Core & Main 3596415

Core & Main
2141 Christian Rd
Lexington, KY 40509
Phone: 8592533464
Fax: 8592530848

Seq#	Qty	Part Number	Description	Units	Price	Ext Price
20	1	NS	2200 ALD FLOWIQ 5/8X3/4 USG	EA	290.00	290.00
30	1	NS	US PIT ANTENNA	EA	44.29	44.29
40	1	NS	CVR ADAPT & SEALF/AMI	EA	3.09	3.09
					SUBTOTAL	**337.38**
60	480	4307G02K02D18B8UB	5/8X3/4 FLOWIQ 2200 USG ALD 7-1/2"LL COMPOSITE BODY	EA	272.89	130,987.20
			02-K-02-D-1-8B-8UB			
70	480	446697914	KAMSTRUP 6697914 US PIT ANT 5" 6.6' CABLE, AMI CONNECTION	EA	44.29	21,259.20
80	480	446556565	KAMSTRUP 65-56-565 CVR, ADPT & SEAL F/ AMI	EA	3.09	1,483.20
					SUBTOTAL	**153,729.60**
					Sub Total	**154,066.98**
					Tax	0.00
					Total	**154,066.98**

Branch Terms:
This quote represents our interpretation of the plans & specifications and is offered as an aid to bidding only.
Customers should verify all materials & quantities prior to bidding or ordering.
Unless otherwise noted, PVC pipe prices are based on availability at the time of shipping.
HDPE prices are good for 10 days from quote date and price per foot might be revised if quantity changes.
Pricing is subject to change if the scope of the quote is altered, at the discretion of the branch.
Special order material or other non-stock items may be non-refundable or subject to a cancellation/restock charge.
Special order non-stock items must be shipped to customer within 30 days of receipt by Core & Main.

UNLESS OTHERWISE SPECIFIED HEREIN, PRICES QUOTED ARE VALID IF ACCEPTED BY CUSTOMER AND PRODUCTS ARE RELEASED BY CUSTOMER FOR MANUFACTURE WITHIN THIRTY (30) CALENDAR DAYS FROM THE DATE OF THIS QUOTATION. CORE & MAIN LP RESERVES THE RIGHT TO INCREASE PRICES TO ADDRESS FACTORS, INCLUDING BUT NOT LIMITED TO, GOVERNMENT REGULATIONS, TARIFFS, TRANSPORTATION, FUEL AND RAW MATERIAL COSTS. DELIVERY WILL COMMENCE BASED UPON MANUFACTURER LEAD TIMES. ANY MATERIAL DELIVERIES DELAYED BEYOND MANUFACTURER LEAD TIMES MAY BE SUBJECT TO PRICE INCREASES AND/OR APPLICABLE STORAGE FEES. THIS BID PROPOSAL IS CONTINGENT UPON BUYER'S ACCEPTANCE OF SELLER'S TERMS AND CONDITIONS OF SALE, AS MODIFIED FROM TIME TO TIME, WHICH CAN BE FOUND AT: https://coreandmain.com/TandC/