CORE & MAIN'S RESPONSE TO REQUEST FOR PROPOSAL FOR THE RUBIDOUX COMMUNITY SERVICES DISTRICT, CALIFORNIA

Advanced Metering Infrastructure Implementation Project Phase 1

SUBMISSION DEADLINE:
Date: May 21st, 2026
Time: 3:00 PM PDT

SUBMITTED TO:
PlanetBids Vendor Portal

PRIMARY CORE & MAIN CONTACT:
Shawn Proudlove
Meter Specialist II
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(310) 569-7685

SECONDARY CORE & MAIN CONTACT:
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Kamstrup Initiative Manager
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CERTIFICATE OF AUTHORITY

Core & Main LP
1830 Craig Park Court
St Louis, MO 63146

CERTIFICATE OF AUTHORITY
Regional Vice Presidents

Name of Company:	Core & Main LP, a Florida limited partnership
Reference:	Customer Sales Contracts, RFPs, Bids, and Related Matters
Date:	March 31, 2025

THE UNDERSIGNED DOES HEREBY CERTIFY that I am the CEO of Core & Main LP, a Florida limited partnership ("Core & Main") and am authorized to sign on behalf of Core & Main. As CEO, I am authorized to make and deliver this certificate. I do hereby designate each of the following Regional Vice Presidents of Core & Main: Ray Seigworth, Ogonna Hymes, Richard Schaefer, Donald Taylor, Christopher Conde, Don Teter, Ryan Johnson and Charles Zappola, as my designees, and authorize each of them to execute and deliver, or cause to be executed and delivered, any and all bids and offers for furnishing materials and/or services, including related non-disclosure agreements, requests for qualifications, requests for proposals, customer sales contracts, supply agreements, distributor agreements, purchase orders and similar agreements, provided that the total bid or contract price is not in excess of $6,000,000 (the "Documents"), and to take or cause to be taken any and all actions in connection therewith as such individual or individuals may consider necessary or desirable, with such necessity or desirability being conclusively evidenced by the actions so taken. Further I hereby ratify and approve all previous actions taken with respect to the execution and delivery of such Documents in the name of and on behalf of Core & Main.

The authorization hereunder is effective as of the date hereof, and shall continue until the earlier of the undersigned's revocation of such authorization in writing, or the last date of the applicable employee's employment with Core & Main.

IN WITNESS WHEREOF, the undersigned has executed this instrument with an effective date of March 31, 2025.

Mark Witkowski, CEO

Confidential

DELEGATION OF AUTHORITY

Docusign Envelope ID: 5C898F5F-641C-47AE-82A4-ACB55FEDC26A

DELEGATION OF AUTHORITY

I, Ogonna Hymes, Vice-President for Core & Main LP, a Florida limited partnership (the "Company"), hereby delegate authority to Shawn Proudlove, Meter Specialist (the "Delegate"), to execute and deliver a bid in response to an Invitation for Bids for Advanced Metering Infrastructure Implementation Project Phase 1 (the "Document") to the Rubidoux Community Services District, and to take or cause to be taken any and all actions in connection therewith as such individual may consider necessary or desirable, with such necessity or desirability being conclusively evidenced by the actions so taken, on behalf of the Company.

This Delegation is limited to the Document as described above.

The Delegation is personal to the Delegate. The Delegate may not further delegate the authorities granted in this Delegation.

IN WITNESS WHEREOF, I have hereunto set my hand on March 20, 2026.

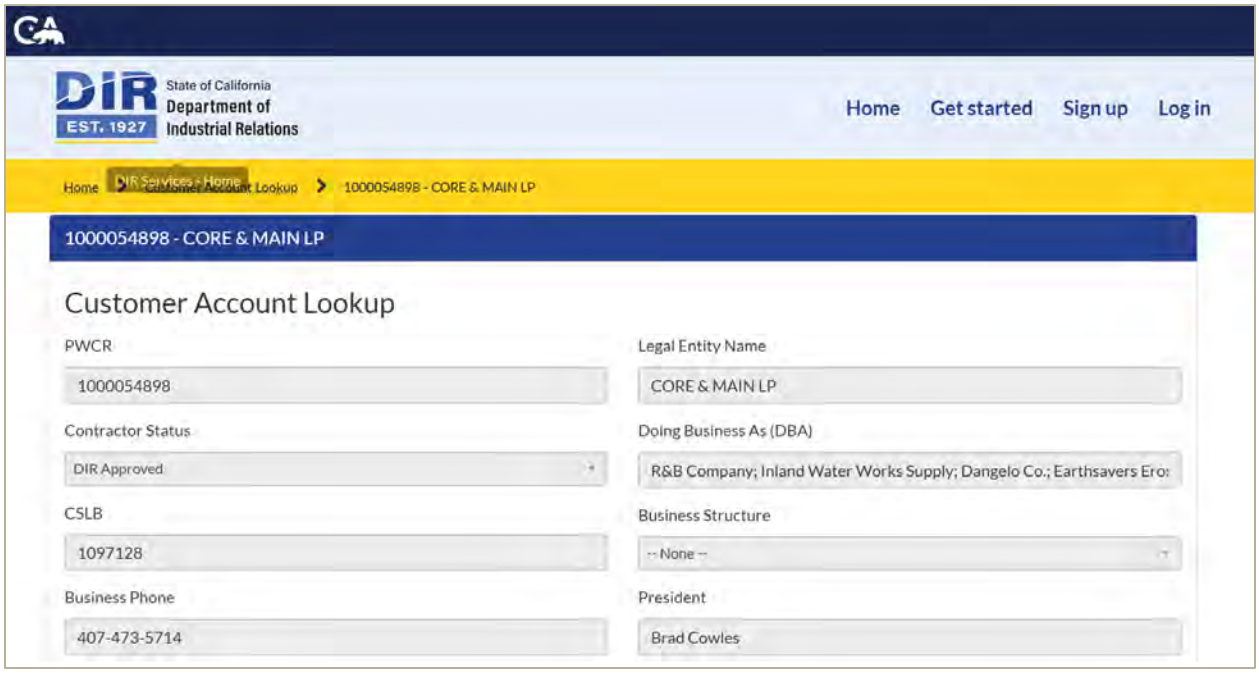
CORE & MAIN LP, a Florida limited partnership

By: DocuSigned by: Ogonna Hymes 84C724571CF2496...

Ogonna Hymes

BID PROPOSAL PACKET – REQUESTED DOCUMENTATION

CORE & MAIN DIR REGISTRATION CONFIRMATION



CORE & MAIN CA CONTRACTOR LICENSE


STATE OF CALIFORNIA
dca
DEPARTMENT OF CONSUMER AFFAIRS

CONTRACTORS
STATE LICENSE BOARD
ACTIVE LICENSE

License Number 1097128
Entity PART
Business Name CORE & MAIN LP

Classification(s) A

Expiration Date 09/30/2026
www.cslb.ca.gov

CSLB

CORE & MAIN FINANCIALS

Core & Main has provided a condensed version of our last 3 years of audited financial statements below. For additional information on our financials, please refer to Core & Main, Inc. - Financials - Annual Reports.

Item 8. Financial Statements and Supplementary Data

Index to Audited Consolidated Financial Statements

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Core & Main, Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Core & Main, Inc. and its subsidiaries (the "Company") as of February 2, 2025 and January 28, 2024, and the related consolidated statements of operations, of comprehensive income, of stockholders' equity and of cash flows for each of the three years in the period ended February 2, 2025, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of February 2, 2025, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of February 2, 2025 and January 28, 2024, and the results of its operations and its cash flows for each of the three years in the period ended February 2, 2025 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of February 2, 2025, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Annual Report on Internal Control over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that (i) relates to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Revenue Recognition – Net Product Sales

As described in Notes 2 and 3 to the consolidated financial statements, the Company's total net sales were $7,441 million, of which $7,412 million relates to product sales for the year ended February 2, 2025. The Company's revenues are earned from contracts with customers. These contracts include written agreements and purchase orders as well as arrangements that are implied by customary business practices or law. The revenue contracts are primarily single performance obligations for the sale of product. Revenue is recognized when title is passed to the customer in an amount that reflects the consideration the Company expects to be entitled to in exchange for the products, which is net of sales tax, customer incentives, returns and discounts. For product sales, the transfer of title generally occurs at the point of destination for products shipped by internal fleet and at the point of shipping for products shipped by third-party carriers. Estimates for expected customer incentives, returns and discounts are based on historical experience, anticipated performance and management's judgement. Generally, the Company's contracts do not contain significant financing as the standard terms are short term in nature.

The principal consideration for our determination that performing procedures relating to revenue recognition of net product sales is a critical audit matter is a high degree of auditor effort in performing procedures related to the Company's revenue recognition of net product sales.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the financial statements. These procedures included testing the effectiveness of controls relating to the revenue recognition process of net product sales, (i) testing the completeness, accuracy, and existence of revenue recognized for a sample of net product sales revenue transactions by obtaining and inspecting source documents, such as invoices, pick tickets, shipping documents, cash receipts from customers, and, where applicable, customer contracts and (ii) testing, for a sample of net product sales revenue transactions on or before February 2, 2025, the cutoff of net product sales revenue transactions.

/s/ PricewaterhouseCoopers LLP
St. Louis, Missouri
March 25, 2025

We have served as the Company's auditor since 2021

CORE & MAIN, INC.
CONSOLIDATED BALANCE SHEETS
Amounts in millions (except share and per share data)

	February 2, 2025	January 28, 2024
ASSETS		
Current assets:		
Cash and cash equivalents	$ 8	$ 1
Receivables, net of allowance for credit losses of $18 and $12	1,066	973
Inventories	908	766
Prepaid expenses and other current assets	43	33
Total current assets	2,025	1,773
Property, plant and equipment, net	168	151
Operating lease right-of-use assets	244	192
Intangible assets, net	935	784
Goodwill	1,898	1,561
Deferred income taxes	558	542
Other assets	42	66
Total assets	$ 5,870	$ 5,069
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Current maturities of long-term debt	$ 24	$ 15
Accounts payable	562	504
Accrued compensation and benefits	123	106
Current operating lease liabilities	67	55
Other current liabilities	90	94
Total current liabilities	866	774
Long-term debt	2,237	1,863
Non-current operating lease liabilities	178	138
Deferred income taxes	87	48
Tax receivable agreement liabilities	706	706
Other liabilities	22	16
Total liabilities	4,096	3,545
Commitments and contingencies		
Class A common stock, par value $0.01 per share, 1,000,000,000 shares authorized, 189,815,899 and 191,663,608 shares issued and outstanding as of February 2, 2025 and January 28, 2024, respectively	2	2
Class B common stock, par value $0.01 per share, 500,000,000 shares authorized, 7,936,061 and 9,630,186 shares issued and outstanding as of February 2, 2025 and January 28, 2024, respectively	—	—
Additional paid-in capital	1,220	1,214
Retained earnings	449	189
Accumulated other comprehensive income	27	46
Total stockholders' equity attributable to Core & Main, Inc.	1,698	1,451
Non-controlling interests	76	73
Total stockholders' equity	1,774	1,524
Total liabilities and stockholders' equity	$ 5,870	$ 5,069

The accompanying notes are an integral part of these consolidated financial statements.

CORE & MAIN, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
Amounts in millions (except share and per share data)

	Fiscal Years Ended		
	February 2, 2025	January 28, 2024	January 29, 2023
Net sales	$ 7,441	$ 6,702	$ 6,651
Cost of sales	5,461	4,884	4,856
Gross profit	1,980	1,818	1,795
Operating expenses:			
Selling, general and administrative	1,078	931	880
Depreciation and amortization	183	147	140
Total operating expenses	1,261	1,078	1,020
Operating income	719	740	775
Interest expense	142	81	66
Income before provision for income taxes	577	659	709
Provision for income taxes	143	128	128
Net income	434	531	581
Less: net income attributable to non-controlling interests	23	160	215
Net income attributable to Core & Main, Inc.	$ 411	$ 371	$ 366
Earnings per share			
Basic	$ 2.14	$ 2.15	$ 2.16
Diluted	$ 2.13	$ 2.15	$ 2.13
Number of shares used in computing EPS			
Basic	191,617,275	172,839,836	169,482,199
Diluted	201,442,750	227,818,077	246,217,004

The accompanying notes are an integral part of these consolidated financial statements.

CORE & MAIN, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
Amounts in millions

	Fiscal Years Ended		
	February 2, 2025	January 28, 2024	January 29, 2023
Net income	$ 434	$ 531	$ 581
Net comprehensive (loss) gain, net of tax benefit (expense) of $6, $(1) and $(9)	(20)	(22)	44
Total comprehensive income	414	509	625
Less: comprehensive income attributable to non-controlling interests	22	156	232
Total comprehensive income attributable to Core & Main, Inc.	$ 392	$ 353	$ 393

The accompanying notes are an integral part of these consolidated financial statements.

CORE & MAIN, INC.
CONSOLIDATED STATEMENTS OF CHANGES IN STOCKHOLDERS' EQUITY
Amounts in millions (except share and per share data)

	Class A Common Stock		Class B Common Stock		Additional Paid In Capital	Accumulated Other Comprehensive Income (Loss)	Retained Earnings	Non-Controlling Interests	Total Stockholders' Equity
	Shares	Amount	Shares	Amount					
Balances at January 30, 2022	**167,522,403**	**$ 2**	**78,398,141**	**$ 1**	**$ 1,214**	**$ 16**	**$ 92**	**$ 506**	**$ 1,831**
Net income	—	—	—	—	—	—	366	215	581
Equity-based compensation	—	—	—	—	8	—	—	3	11
Net comprehensive gain, net of tax	—	—	—	—	—	27	—	17	44
Distributions to non-controlling interest holders	—	—	—	—	(6)	—	—	(48)	(54)
Exchange of Partnership Interests and Class B Shares for Class A Shares	5,132,134	—	(5,133,763)	—	40	2	—	(42)	—
Establishment/adjustment of deferred tax asset associated with Core & Main investment in Core & Main Holdings, LP	—	—	—	—	30	—	—	—	30
Establishment of Tax Receivable Agreement Liabilities	—	—	—	—	(34)	—	—	—	(34)
Activity under equity-based compensation plans, net of tax withholdings	110,644	—	—	—	1	—	—	—	1
Forfeiture of Class A Shares and Partnership Interests	(20)	—	(34,703)	—	—	—	—	—	—
Non-controlling interests' adjustment for purchase of Partnership Interests and vesting of Core & Main Holdings, LP Partnership Interests held by non-controlling interests	—	—	—	—	(12)	—	—	12	—
Balances at January 29, 2023	**172,765,161**	**2**	**73,229,675**	**1**	**1,241**	**45**	**458**	**663**	**2,410**
Net income	—	—	—	—	—	—	371	160	531
Equity-based compensation	—	—	—	—	8	—	—	2	10
Net comprehensive loss, net of tax	—	—	—	—	—	(18)	—	(4)	(22)
Distributions to non-controlling interest holders	—	—	—	—	(5)	—	—	(37)	(42)
Repurchase and Retirement of equity interests	(28,131,551)	—	(16,868,449)	—	(324)	—	(640)	(380)	(1,344)
Exchange of Partnership Interests and Class B Shares for Class A Shares	46,683,021	—	(46,731,040)	(1)	313	19	—	(331)	—
Establishment/adjustment of deferred tax asset associated with Core & Main investment in Core & Main Holdings, LP	—	—	—	—	515	—	—	—	515
Establishment of Tax Receivable Agreement Liabilities	—	—	—	—	(537)	—	—	—	(537)
Activity under equity-based compensation plans, net of tax withholdings	346,977	—	—	—	3	—	—	—	3
Balances at January 28, 2024	**191,663,608**	**2**	**9,630,186**	**—**	**1,214**	**46**	**189**	**73**	**1,524**
Net income	—	—	—	—	—	—	411	23	434
Equity-based compensation	—	—	—	—	14	—	—	—	14
Net comprehensive loss, net of tax	—	—	—	—	—	(19)	—	(1)	(20)
Distributions to non-controlling interest holders	—	—	—	—	(3)	—	—	(5)	(8)
Repurchase and Retirement of equity interests	(3,974,820)	—	—	—	(20)	—	(151)	(5)	(176)
Exchange of Partnership Interests and Class B Shares for Class A Shares	1,684,022	—	(1,694,125)	—	9	—	—	(9)	—
Establishment/adjustment of deferred tax asset associated with Core & Main investment in Core & Main Holdings, LP	—	—	—	—	23	—	—	—	23
Establishment of Tax Receivable Agreement Liabilities	—	—	—	—	(19)	—	—	—	(19)
Activity under equity-based compensation plans, net of tax withholdings	443,089	—	—	—	2	—	—	—	2
Balances at February 2, 2025	**189,815,899**	**$ 2**	**7,936,061**	**$ —**	**$ 1,220**	**$ 27**	**$ 449**	**$ 76**	**$ 1,774**

The accompanying notes are an integral part of these consolidated financial statements.

CORE & MAIN, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
Amounts in millions

	Fiscal Years Ended		
	February 2, 2025	January 28, 2024	January 29, 2023
Cash Flows From Operating Activities:			
Net income	$ 434	$ 531	$ 581
Adjustments to reconcile net cash from operating activities:			
Depreciation and amortization	194	154	148
Equity-based compensation expense	14	10	11
Deferred income tax expense	13	2	(7)
Other	8	5	7
Changes in assets and liabilities:			
(Increase) decrease in receivables	(2)	21	(51)
(Increase) decrease in inventories	(36)	328	(149)
(Increase) decrease in other assets	(13)	2	(4)
Increase (decrease) in accounts payable	14	11	(140)
Increase (decrease) in accrued liabilities	(5)	5	5
Net cash provided by operating activities	621	1,069	401
Cash Flows From Investing Activities:			
Capital expenditures	(35)	(39)	(25)
Acquisitions of businesses, net of cash acquired	(741)	(231)	(128)
Other	(12)	—	1
Net cash used in investing activities	(788)	(270)	(152)
Cash Flows From Financing Activities:			
Repurchase and retirement of equity interests	(176)	(1,344)	—
Distributions to non-controlling interest holders	(11)	(41)	(57)
Payments pursuant to Tax Receivable Agreements	(11)	(5)	—
Borrowings on asset-based revolving credit facility	774	665	244
Repayments on asset-based revolving credit facility	(1,110)	(235)	(244)
Issuance of long-term debt	950	—	—
Repayments of long-term debt	(223)	(15)	(15)
Debt issuance costs	(15)	—	(2)
Other	(4)	—	1
Net cash provided by (used in) financing activities	174	(975)	(73)
Increase (decrease) in cash and cash equivalents	7	(176)	176
Cash and cash equivalents at the beginning of the period	1	177	1
Cash and cash equivalents at the end of the period	$ 8	$ 1	$ 177
Cash paid for interest (excluding effects of interest rate swap)	$ 197	$ 105	$ 74
Cash paid for income taxes	143	116	147

The accompanying notes are an integral part of these consolidated financial statements.

1) BASIS OF PRESENTATION & DESCRIPTION OF BUSINESS

Organization

Core & Main, Inc. ("Core & Main" and collectively with its subsidiaries, the "Company") is a leading specialty distributor dedicated to advancing reliable infrastructure with local service, nationwide. With a focus on water, wastewater, storm drainage and fire protection products, and related services, the Company provides solutions to municipalities, private water companies and professional contractors across municipal, non-residential and residential end markets, nationwide. The Company's specialty products and services are used in the maintenance, repair, replacement, and construction of water and fire protection infrastructure. The Company reaches customers through a nationwide network of over 370 branches across 49 United States ("U.S.") states. The Company's products include pipes, valves, fittings, storm drainage products, fire protection products, meter products and other products. The Company has complemented its core products through additional offerings, including smart meter systems, fusible high-density polyethylene ("fusible HDPE") piping solutions, specifically engineered treatment plant products and geosynthetics and erosion control products. The Company's services and capabilities allow for integration with customers and form part of their sourcing and procurement function. Substantially all of the Company's long-lived assets are located within the U.S.

Core & Main is a holding company that indirectly owns Core & Main LP through its ownership interest in Core & Main Holdings, LP ("Holdings"). Core & Main's primary material assets are its direct and indirect ownership interest in Holdings and deferred tax assets associated with such ownership.

Secondary Offerings and Repurchase Transactions

On June 12, 2024, the Company's board of directors authorized a share repurchase program (the "Repurchase Program"), pursuant to which the Company may purchase up to $500 million of the Company's Class A common stock. Shares repurchased under the Repurchase Program are retired immediately and are accounted for as a decrease to stockholders' equity. During the fiscal year ended February 2, 2025 ("fiscal 2024"), the Company repurchased 3,974,820 shares of Class A common stock for a total of $176 million through open market transactions.

During the fiscal year ended January 28, 2024 ("fiscal 2023") and the fiscal year ended January 29, 2023 ("fiscal 2022"), secondary public offerings of Class A common stock were completed by certain selling stockholders (the "Selling Stockholders") affiliated with Clayton, Dubilier & Rice, LLC ("CD&R"). As part of the secondary public offerings, the Selling Stockholders sold to the public (i) existing shares of our Class A common stock and (ii) shares of Class A common stock received in exchange for an equal number of limited partner interests of Holdings ("Partnership Interests"), together with the retirement of a corresponding number of shares of our Class B common stock. Below is a summary of the secondary public offerings completed during fiscal 2023 and fiscal 2022 (collectively the "Secondary Offerings").

Secondary Offering Date	Existing Shares of Class A Common Stock Sold to the Public	Partnership Interests Exchanged for Class A Common Stock Prior to Sale to the Public	Total Shares of Class A Common Stock Sold	Price Per Share
Fiscal 2023 Secondary Offerings				
January 25, 2024	12,366,683	7,415,404	19,782,087	$40.985
January 10, 2024[1]	12,084,902	7,465,098	19,550,000	$38.120
December 11, 2023[1]	10,783,760	6,466,240	17,250,000	$35.540
November 9, 2023[1]	13,659,431	8,190,569	21,850,000	$30.440
September 19, 2023	11,252,620	6,747,380	18,000,000	$29.015
June 12, 2023	8,752,038	5,247,962	14,000,000	$28.215
April 14, 2023	3,125,728	1,874,272	5,000,000	$22.151
Fiscal 2022 Secondary Offering				
September 19, 2022	6,876,601	4,123,399	11,000,000	$23.750

(1) Includes shares of Class A common stock purchased by the underwriter, pursuant to the exercise in full of the option granted in connection with the secondary public offering.

The Company did not receive any of the proceeds from the Secondary Offerings. The Company paid the costs associated with the sale of shares by the Selling Stockholders in the Secondary Offerings, other than underwriting discounts and commissions.

Concurrently with the completion of the Secondary Offerings completed in fiscal 2023, (i) the Company repurchased from the Selling Stockholders shares of our Class A common stock, and Holdings redeemed from the Company a corresponding number of Partnership Interests, and (ii) Holdings redeemed Partnership Interests from one of the Selling Stockholders, with the Company repurchasing a corresponding number of shares of our Class B common stock from such Selling Stockholder for no additional consideration. Below is a summary of the repurchase transactions completed during fiscal 2023 (the "Repurchase Transactions").

Repurchase Transaction Date	Shares of Class A Common Stock Repurchased	Partnership Interests Redeemed	Total Repurchase Amount	Price Per Share/Partnership Interest	Total Consideration Paid (in millions)
January 25, 2024	3,125,728	1,874,272	5,000,000	$40.985	$205
January 10, 2024	3,125,728	1,874,272	5,000,000	$38.120	$191
December 11, 2023	3,125,728	1,874,272	5,000,000	$35.540	$178
November 9, 2023	3,125,728	1,874,272	5,000,000	$30.440	$152
September 19, 2023	3,125,728	1,874,272	5,000,000	$29.015	$145
June 12, 2023	3,125,728	1,874,272	5,000,000	$28.215	$141
April 14, 2023	9,377,183	5,622,817	15,000,000	$22.151	$332

Following the completion of the Secondary Offerings and the Repurchase Transactions during fiscal 2023, investors affiliated with CD&R no longer own shares of Core & Main.

Basis of Presentation

The accompanying consolidated financial statements present the results of operations, financial position and cash flows of Core & Main and its subsidiaries, which includes the consolidated financial statements of Holdings and its consolidated subsidiary, Core & Main LP, as the legal entity that conducts the operations of the Company. Certain reclassification have been made to previously reported financial information to conform to the Company's current period presentation. All intercompany balances and transactions have been eliminated in consolidation. The Partnership Interests not held by Core & Main are reflected as non-controlling interests in the consolidated financial statements.

Segments

The Company's chief operating decision maker ("CODM") is the Chief Executive Officer. The CODM manages the business as a single operating and reportable segment. The Company operates over 370 branch locations across the U.S. The nature of the products and services, suppliers, customers and distribution methods are similar across branches. The consolidated performance of the Company is utilized to determine incentive compensation for executive officers, annual merit decisions, management of national supplier relationships, allocation of resources and in evaluating acquisitions and the Company's capital structure. Performance is most notably measured by the CODM based on net sales and net income at the consolidated level, as reported in the consolidated statement of operations. Significant expenses within net income include cost of sales and selling, general and administrative expense, which are each separately presented in the consolidated statement of operations. Other segment items within net income include depreciation and amortization expense, interest expense and income tax expense.

Fiscal Year

The Company's fiscal year is a 52- or 53-week period ending on the Sunday nearest to January 31st. Quarters within the fiscal year include 13-week periods, unless a fiscal year includes a 53rd week, in which case the fourth quarter of the fiscal year will be a 14-week period. Fiscal 2024 included 53 weeks and fiscal 2023 and fiscal 2022 included 52 weeks. The next fiscal year ending February 1, 2026 ("fiscal 2025") will include 52 weeks.

2) SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Estimates

Management has made a number of estimates and assumptions relating to the reporting of certain assets and liabilities, the disclosure of contingent assets and liabilities, and reported amounts of revenues and expenses in preparing the elements of these financial statements in conformity with U.S. generally accepted accounting principles ("GAAP"). Actual results could differ from these estimates.

Cash and Cash Equivalents

The Company classified all highly liquid investments with maturities of three months or less when purchased to be cash equivalents. The Company maintains cash deposits according to a banking policy that requires diversification across a variety of highly-rated financial institutions. However, this could result in concentration of cash and cash equivalents across these financial institutions in excess of Federal Deposit Insurance Corporation-insured limits.

Allowance for Credit Losses

Accounts receivable are evaluated for collectability based on numerous factors, including past transaction history with customers, their credit-worthiness, and an assessment of lien and bond rights. An allowance for credit losses is estimated as a percentage of aged receivables. This estimate is periodically adjusted when management becomes aware of a specific customer's inability to meet its financial obligations (e.g., a bankruptcy filing) or as a result of changes in historical collection patterns.

Inventories

Inventories consist primarily of finished goods and are carried at the lower of cost or net realizable value. The cost of substantially all inventories is determined by the weighted average cost method. The carrying value of inventory includes the capitalization of inbound freight costs and is net of supplier rebates and purchase discounts for products not yet sold. The inventory reserve is based on an analysis of historical physical inventory results, a review of excess and obsolete inventories based on inventory aging and anticipated future demand.

Consideration Received from Suppliers

The Company enters into agreements with many of its suppliers providing for inventory purchase rebates ("supplier rebates") upon achievement of specified volume purchasing levels and purchase discounts. The Company accrues the receipt of supplier rebates and purchase discounts as part of its cost of sales for products sold based on progress towards earning the supplier rebates, taking into consideration cumulative purchases of inventory to the measurement date and projected purchases through the end of the year. An estimate of supplier rebates and purchase discounts is included in the carrying value of inventory at each period end for supplier rebates to be received on products not yet sold. Supplier rebates and purchase discounts included in inventory were $54 million and $43 million at February 2, 2025 and January 28, 2024, respectively.

Property and Equipment

Property and equipment are recorded at cost and depreciated using the straight-line method based on the following estimated useful lives of the assets:

Buildings and improvements	5 - 39 years
Transportation equipment	5 - 7 years
Furniture, fixtures and equipment	3 - 10 years
Capitalized software	3 years

Property and equipment assets are assessed for recovery when a triggering event occurs. A potential impairment is first evaluated by comparing the undiscounted cash flows associated with the asset, or the asset group it is part of, to its carrying value. If the carrying value is greater than the undiscounted cash flows, the amount of potential impairment is measured by comparing the fair value of the asset, or the asset group it is part of, with its carrying value. The Company assesses the remaining useful life and the recoverability of property and equipment assets whenever events or circumstances indicate that the carrying value of an asset may not be recoverable. Judgments regarding the existence of a triggering event are based on market and operational performance. Evaluating potential impairment also requires estimates of future operating results and cash flows. There were no impairments of property and equipment assets during fiscal 2024, fiscal 2023 or fiscal 2022.

Acquisitions and Goodwill

Amounts paid for acquisitions are allocated to the tangible assets acquired and liabilities assumed based on their estimated fair values at the date of acquisition. The Company then allocates the purchase price in excess of net tangible assets acquired to identifiable intangible assets. The fair value of identifiable intangible assets is based on detailed valuations. The Company allocates any excess purchase price over the fair value of the net tangible and intangible assets acquired to goodwill.

The Company does not amortize goodwill but does conduct an impairment test of goodwill on an annual basis or whenever events or circumstances indicate that it is "more likely than not" that the fair value of its reporting unit has dropped below its carrying value. The annual goodwill impairment assessment for fiscal 2024, fiscal 2023 and fiscal 2022 consisted of a qualitative assessment to determine whether it is "more likely than not" that the fair value of the reporting unit exceeds its carrying value. The quantitative assessment, when applicable, is comprised of comparing the carrying value of a reporting unit to its estimated fair value. The Company estimates the fair value of the reporting unit based on a detailed valuation, utilizing an income approach based on the present value of future cash flows, a market approach based on multiples of sales and profit metrics of similar public companies and a market approach based on multiples of sales and profit metrics for purchase transactions of similar companies (all of which are considered level three measurement techniques). If the carrying value of the reporting unit exceeds its fair value, the Company will recognize the excess of the carrying value over the fair value as a goodwill impairment loss.

Intangible Assets

Finite-lived intangible assets consist primarily of customer relationships which are amortized over the periods during which the Company expects to generate net sales from these customer relationships. The initial amortization life of finite-lived intangible assets primarily ranged from 10 to 15 years. Finite-lived intangible assets are assessed for impairment when a triggering event occurs. A potential impairment of finite-lived intangible assets is first evaluated by comparing the undiscounted cash flows associated with the asset, or the asset group it is part of, to its carrying value. If the carrying value is greater than the undiscounted cash flows, the amount of potential impairment is measured by comparing the fair value of the asset, or the asset group it is part of, with their carrying value. The Company assesses the remaining useful life and the recoverability of finite-lived intangible assets whenever events or circumstances indicate that the carrying value of an asset may not be recoverable. Judgments regarding the existence of a triggering event are based on market and operational performance. Evaluating potential impairment also requires estimates of future operating results and cash flows.

Internal use software is recognized separately as an intangible asset and is carried at cost less accumulated amortization. Cost may include external and internal costs directly attributable to the development, design and implementation of the computer software. Costs related to training and data conversion are expensed as incurred.

All of the Company's intangible assets are subject to amortization.

Fair Value Measurement

The carrying amounts of cash and cash equivalents, accounts receivable and accounts payable, accrued compensation and benefits and other current liabilities approximate fair value due to the short-term nature of these financial instruments. The Company's long-term financial assets and liabilities are generally recorded at historical costs. The carrying amounts of derivative assets or liabilities (see Note 6) are recorded at fair value.

Revenue Recognition

The Company's revenues are earned from contracts with customers. These contracts include written agreements and purchase orders as well as arrangements that are implied by customary business practices or law. The revenue contracts are primarily single performance obligations for the sale of product or performance of services for customers. Revenue is recognized when title is passed to the customer or services are provided in an amount that reflects the consideration the Company expects to be entitled to in exchange for the products and services, which is net of sales tax, customer incentives, returns and discounts. For product sales, the transfer of title generally occurs at the point of destination for products shipped by internal fleet and at the point of shipping for products shipped by third-party carriers. Revenues related to services are recognized in the period the services are performed and were approximately $29 million, $23 million and $17 million during fiscal 2024, fiscal 2023 and fiscal 2022, respectively. Estimates for expected customer incentives, returns and discounts are based on historical experience, anticipated performance and management's judgment. Generally, the Company's contracts do not contain significant financing as the standard sales terms are short term in nature.

Shipping and Handling Fees and Costs

The Company includes shipping and handling fees billed to customers in net sales. Shipping and handling costs associated with inbound freight are capitalized to inventories and relieved through cost of sales as inventories are sold. Shipping and handling costs associated with outbound freight are included in selling, general and administrative expenses and totaled $46 million, $43 million and $37 million during fiscal 2024, fiscal 2023 and fiscal 2022, respectively.

Income Taxes

Income taxes are accounted for under the asset and liability method. Deferred tax assets and liabilities are recognized for future tax consequences attributable to temporary differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and operating losses and tax credit carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities from a change in tax rates is recognized in income in the period that includes the enactment date.

The Company recognizes deferred tax assets to the extent that it believes that these assets are more likely than not to be realized. In making such a determination, the Company considers all available positive and negative evidence, including future reversals of existing taxable temporary differences, projected future taxable income, tax-planning strategies and results of recent operations. If it is determined that the Company is not able to realize deferred tax assets in the future, a valuation allowance would be established, which would impact the provision for income taxes.

Uncertain tax positions are recorded on the basis of a two-step process in which (1) it is determined if a tax position is more-likely-than-not of being sustained on the technical merits of the position and (2) for those tax positions that meet the more-likely-than-not recognition threshold, the Company recognizes the largest amount of tax benefit that is more than 50% likely to be realized upon ultimate settlement with the related tax authority. The Company records interest and penalties related to uncertain tax positions in the provision for income taxes in the audited Consolidated Statements of Operations.

Concentration of Credit Risk

The majority of the Company's revenues are credit sales which are made primarily to customers whose ability to pay is dependent, in part, upon the economic strength of the construction industry in the areas where they operate and availability of municipal funding. Concentration of credit risk with respect to trade accounts receivable is limited by the large number of customers comprising the Company's customer base. The Company performs ongoing credit evaluations of its customers.

Leases

The Company determines if an arrangement is or contains a lease at inception. Obligations under operating leases are included in the Balance Sheets in both current and non-current operating lease liabilities, while the corresponding rights to use the leased assets are presented as operating lease right-of-use ("ROU") assets. Operating lease ROU assets and operating lease liabilities are recognized based on the present value of the remaining lease payments. As the rate implicit in the lease is not readily determinable, the Company uses its incremental borrowing rate, which is based on information available at the commencement date of the relevant lease, in determining the present value of future payments. The lease term includes an option to extend the lease when it is reasonably certain that the Company will exercise that option. Payment obligations related to real estate taxes, insurance and other lease components are excluded from the measurement of operating lease ROU assets and lease liabilities. The Company's lease agreements generally do not contain any material residual value guarantees or material restrictive covenants. The Company recognizes expense within selling, general and administrative expense associated with the accretion of operating lease liabilities and amortization of ROU assets in an amount calculated to result in straight-line expense over the lease terms.

Tax Receivable Agreements

In connection with the initial public offering and other related transactions, Core & Main entered into a tax receivable agreement with the Former Limited Partners (as defined below) (the "Former Limited Partners Tax Receivable Agreement") and a tax receivable agreement with the Continuing Limited Partners (as defined below) (the "Continuing Limited Partners Tax Receivable Agreement") (collectively, the "Tax Receivable Agreements"). Core & Main has generated, and expects to generate additional, tax attributes associated with future exchanges of Partnership Interests by Continuing Limited Partners, that will reduce amounts that it would otherwise pay in the future to various tax authorities.

The "Former Limited Partners" are defined as CD&R Fund X Advisor Waterworks B, L.P., CD&R Fund X Waterworks B1, L.P., CD&R Fund X-A Waterworks B, L.P. and the other Original Limited Partners (as defined below) that transferred all or a portion of their Partnership Interests (including those held indirectly through CD&R WW Advisor, LLC and CD&R WW Holdings, LLC) for shares of Class A common stock in connection with the initial public offering and other related transactions, and represent entities that transferred all of their Partnership Interests (including Partnership Interests held indirectly through certain "blocker" corporations) for shares of Class A common stock in connection with the consummation of certain reorganization transactions.

The "Original Limited Partners" are defined as CD&R Waterworks Holdings, LLC ("CD&R Waterworks Holdings"), the Former Limited Partners and Core & Main Management Feeder, LLC ("Management Feeder") and represent the direct and indirect owners of Holdings prior to the initial public offering and other related transactions.

The "Continuing Limited Partners" are defined as CD&R Waterworks Holdings and Management Feeder, and represent the Original Limited Partners that continued to own Partnership Interests after the reorganization transactions and that are entitled to exchange their Partnership Interests, together with the retirement of a corresponding number of shares of Class B common stock for shares of Class A common stock.

The Former Limited Partners Tax Receivable Agreement provides for the payment by Core & Main to certain Former Limited Partners, or their permitted transferees, of 85% of the tax benefits, if any, that Core & Main realizes, or in some circumstances is deemed to realize, as a result of (i) certain tax attributes of the Partnership Interests Core & Main holds in respect of such Former Limited Partners' interest in Core & Main, including such attributes which resulted from such Former Limited Partners' prior acquisition of ownership interests in Holdings and Core & Main's allocable share of existing tax basis acquired in connection with the initial public offering attributable to the Former Limited Partners and (ii) certain other tax benefits.

The Continuing Limited Partners Tax Receivable Agreement provides for the payment by Core & Main to the Continuing Limited Partners, or their permitted transferees, of 85% of the benefits, if any, that Core & Main realizes, or in some circumstances is deemed to realize, as a result of (i) increases in tax basis or other similar tax benefits as a result of exchanges of Partnership Interests for cash or shares of Class A common stock pursuant to the Exchange Agreement, dated as of July 22, 2021 (the "Exchange Agreement"), by and among Core & Main, Holdings, CD&R Waterworks Holdings and Management Feeder, (ii) Core & Main's allocable share of existing tax basis acquired in connection with the initial public offering attributable to the Continuing Limited Partners and in connection with exchanges of Partnership Interests for cash or shares of Class A common stock pursuant to the Exchange Agreement and (iii) Core & Main's utilization of certain other tax benefits related to Core & Main's entering into the Continuing Limited Partners Tax Receivable Agreement, including tax benefits attributable to payments under the Continuing Limited Partners Tax Receivable Agreement. Core & Main expects to obtain an increase in its share of the tax basis in the net assets of Holdings as Partnership Interests are exchanged by Continuing Limited Partners. Core & Main intends to treat any exchanges of Partnership Interests as direct purchases of Partnership Interests for U.S. federal income tax purposes. These increases in tax basis may reduce the amounts that it would otherwise pay in the future to various tax authorities.

Except to the extent that any benefits are deemed realized, Core & Main will receive the full benefit in tax savings from relevant taxing authorities and provide payment of 85% of the amount of any tax benefits to the Former Limited Partners or the Continuing Limited Partners, as applicable, or their permitted transferees. Core & Main expects to benefit from the remaining 15% of any cash tax savings, except to the extent of any deemed realizations. For the Tax Receivable Agreements, Core & Main assesses the tax attributes to determine if it is more likely than not that the benefit of any deferred tax assets will be realized. Following that assessment, Core & Main recognizes a liability under the applicable Tax Receivable Agreements, reflecting approximately 85% of the expected future realization of such tax benefits. Amounts payable under the Tax Receivable Agreements are contingent upon, among other things, (i) generation of sufficient future taxable income during the term of the applicable Tax Receivable Agreements and (ii) future changes in tax laws.

Upon an exchange transaction that increases the tax attributes available to Core & Main, an increase to deferred tax assets or reduction to deferred tax liabilities is recorded with a corresponding increase to equity. The recognition of the liability under the Tax Receivable Agreement is recorded with a corresponding reduction to equity. Both of these transactions impact equity as they are transactions with shareholders.

Equity-Based Compensation

The Company recognizes the cost of employee services received in exchange for awards of equity instruments based on the grant date fair value of those awards. That cost is recognized over the requisite service period (generally the vesting period), which is the period during which an employee is required to provide service in exchange for the award.

Basic and Diluted Earnings per Share

The accounting policy for basic and diluted earnings per share is described in Note 12.

Non-controlling Interests

The accounting policy for non-controlling interests is described in Note 11.

Recent Accounting Pronouncements

Segment Reporting - In November 2023, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2023-07, "Segment Reporting (Topic 280): Improvements to Reportable Segment Disclosures" ("ASU 2023-07"). The new guidance expands reportable segment disclosure requirements primarily through enhanced disclosures about significant segment expenses. ASU 2023-07 requires disclosure of (i) significant segment expenses that are regularly provided to the segment's CODM and included within the segment measure of profit or loss, (ii) an amount and description of its composition for other segment items to reconcile to segment profit or loss, and (iii) the title and position of the Company's CODM. The ASU does not change how a public entity identifies its operating segments, aggregates them, or applies the quantitative thresholds to determine its reportable segments. ASU 2023-07 is effective for annual periods beginning after December 15, 2023, and interim periods within fiscal years beginning after December 15, 2024, with early adoption permitted. The adoption of ASU 2023-07, as of February 2, 2025, resulted in additional disclosures, but did not have a material impact on the consolidated financial statements.

Income Tax Disclosures - In December 2023, the FASB issued ASU No. 2023-09, "Income Taxes (Topic 740): Improvements to Income Tax Disclosures" ("ASU 2023-09"). The new guidance requires, on an annual basis, disclosure of specific categories in the rate reconciliation and disclosure of income taxes paid disaggregated by jurisdiction. ASU 2023-09 is effective for annual periods beginning after December 15, 2024. The adoption of ASU 2023-09 is expected to result in additional disclosures, but not have a material impact on the consolidated financial statements.

Disaggregation of Income Statement Expenses - In November 2024, the FASB issued ASU No. 2024-03, "Disaggregation of Income Statement Expenses" ("ASU 2024-03"). The new guidance requires additional disclosure related to the disaggregation of income statement expense categories. ASU 2024-03 is effective for annual periods beginning after December 15, 2026 and interim periods within fiscal years beginning after December 15, 2027, with early adoption permitted. The adoption of ASU 2024-03 is expected to result in additional disclosures and the Company is currently evaluating the effect this standard will have on the consolidated financial statements.

3) REVENUE

Disaggregation of Revenue

The following table represents net sales disaggregated by product category:

	Fiscal Years Ended		
Product Category	**February 2, 2025**	**January 28, 2024**	**January 29, 2023**
Pipes, valves & fittings products	$ 5,006	$ 4,504	$ 4,548
Storm drainage products	1,147	985	949
Fire protection products	596	688	701
Meter products	692	525	453
Total Net Sales	$ 7,441	$ 6,702	$ 6,651

4) ACQUISITIONS

The Company made various acquisitions during fiscal 2024 (the "Fiscal 2024 Acquisitions"), fiscal 2023 (the "Fiscal 2023 Acquisitions") and fiscal 2022 (the "Fiscal 2022 Acquisitions") with an aggregate transaction value of $769 million, $244 million and $124 million, subject to working capital adjustments, respectively. These transactions were funded with cash and borrowings under the Senior Term Loan Credit Facility (as defined in Note 6).

Fiscal 2024 Acquisitions

- On November 7, 2024, the Company acquired certain assets and assumed certain liabilities of ARGCO Northeast LLC ("ARGCO"). ARGCO has one location and is a distributor of fire protection products.
- On October 30, 2024, the Company acquired certain assets and assumed certain liabilities of Eastcom Associates, Inc. ("Eastcom"). Eastcom has one location and is a provider of underground utility protection equipment.
- On September 16, 2024, the Company acquired certain assets and assumed certain liabilities of Green Equipment Company ("Green Equipment"). Green Equipment has one location and is a provider of underground utility protection equipment.
- On September 9, 2024, the Company acquired certain assets and assumed certain liabilities of GroGreen Solutions Georgia, LLC ("GroGreen"). GroGreen has four locations and is a provider of geosynthetics products.
- On August 12, 2024, the Company acquired certain assets and assumed certain liabilities of HM Pipe Products LP and HM Pipe Products Kitchner LP (collectively, "HM Pipe Products"). HM Pipe Products has two locations and is a Canadian distributor of water and wastewater products.
- On May 6, 2024, the Company acquired certain assets and assumed certain liabilities of Geothermal Supply Company Inc. ("GSC"). GSC has one location and is a distributor and fabricator of fusible HDPE pipe and other related products, primarily serving the geothermal, water and sewer industries.
- On April 30, 2024, the Company acquired certain assets and assumed certain liabilities of EGW Utilities Inc. ("EGW"). EGW has one location and is a provider of underground utility infrastructure products and services.
- On April 1, 2024, the Company acquired all of the outstanding shares of NW Geosynthetics Inc. ("ACF West"). ACF West has six locations and is a distributor of geosynthetics products and provider of soil stabilization solutions.
- On March 7, 2024, the Company acquired all of the membership interests of DKC Group Holdings, LLC, and associated entities (collectively, "Dana Kepner"). Dana Kepner has twenty-one locations and is a distributor of water, wastewater and storm drainage products.
- On February 12, 2024, the Company acquired certain assets and assumed certain liabilities of Eastern Supply Inc. and a related entity (collectively, "Eastern Supply"). Eastern Supply has two locations and is a distributor of a broad range of storm drainage products, with custom fabrication capabilities.

Fiscal 2023 Acquisitions

- On January 16, 2024, the Company acquired certain assets and assumed certain liabilities of Lee Supply Company, Inc. ("Lee Supply"). Lee Supply has four locations and is a leading specialty distributor and fabricator of fusible HDPE pipe and other related services, including HDPE fusion equipment rentals and custom fabrication.
- On December 4, 2023, the Company acquired certain assets and assumed certain liabilities of Granite Water Works, Inc. ("Granite Water Works"). Granite Water Works has one location and is a provider of water, wastewater and storm drainage products.
- On November 28, 2023, the Company acquired certain assets and assumed certain liabilities of Enviroscape Erosion Control Materials Ltd. and three affiliated entities (collectively "Enviroscape"). Enviroscape has one location and is a provider of geosynthetics and erosion control products.
- On July 12, 2023, the Company acquired all of the outstanding shares of J.W. D'Angelo Company, Inc. ("D'Angelo"). D'Angelo has three locations and is a full-service provider of fire protection and waterworks products.
- On July 10, 2023, the Company acquired certain assets and assumed certain liabilities of Foster Supply Inc. and R.P. Foster Inc. (collectively, "Foster Supply"). Foster Supply has seven locations and is a full-service provider of precast concrete structures, pipe, drainage materials and related geosynthetics products.
- On April 17, 2023, the Company acquired certain assets and assumed certain liabilities of Midwest Pipe Supply Inc. ("Midwest Pipe"). Midwest Pipe has one location and is a distributor of drainage and waterworks products.

- On April 10, 2023, the Company acquired certain assets and assumed certain liabilities of UPSCO Manufacturing & Distribution Company, UPSCO, Inc. and TMB Holdings, LLC (collectively, "UPSCO"). UPSCO is a provider of utility infrastructure products and services.
- On March 6, 2023, the Company acquired certain assets and assumed certain liabilities of Landscape & Construction Supplies LLC ("LCS"). LCS has two locations and is a provider of geosynthetics products.

Fiscal 2022 Acquisitions

- On December 5, 2022, the Company acquired certain assets and assumed certain liabilities of Lanier Municipal Supply Co. Inc. ("Lanier"). Lanier has four locations and is a full-service distributor of water, wastewater, storm drainage, agricultural and irrigation products.
- On October 10, 2022, the Company acquired certain assets and assumed certain liabilities of Distributors, Inc. ("Distributors"). Distributors has one location and distributes fire protection products.
- On October 3, 2022, the Company acquired certain assets and assumed certain liabilities of the municipal waterworks division of Trumbull Industries, Inc., and acquired certain assets and assumed certain liabilities of an affiliated entity, Trumbull Manufacturing, Inc. (collectively "Trumbull"). Trumbull has three locations and distributes a variety of infrastructure products to the waterworks industry.
- On August 8, 2022, the Company acquired certain assets and assumed certain liabilities of Inland Water Works Supply, Co. ("Inland"). Inland has one location and distributes waterworks products.
- On June 28, 2022, the Company acquired certain assets and assumed certain liabilities of Earthsavers Erosion Control, LLC ("Earthsavers"). Earthsavers has three locations and produces and distributes a variety of geosynthetics products.
- On May 2, 2022, the Company acquired certain assets and assumed certain liabilities of Lock City Supply, Inc. ("Lock City"). Lock City has one location and distributes waterworks products.
- On March 21, 2022, the Company acquired certain assets and assumed certain liabilities of Dodson Engineered Products, Inc. ("Dodson"). Dodson has one location and distributes waterworks products.

The following table represents the preliminary allocation of the transaction price to the fair value of identifiable assets acquired and liabilities assumed in the Fiscal 2024 Acquisitions and final allocation of the transaction price to the fair value of identifiable assets acquired and liabilities assumed in the Fiscal 2023 Acquisitions and Fiscal 2022 Acquisitions:

	Fiscal 2024 Acquisitions[1]	Fiscal 2023 Acquisitions	Fiscal 2022 Acquisitions
Cash	$ 31	$ 5	$ —
Receivables	96	48	22
Inventories	113	52	44
Intangible assets	284	107	43
Goodwill	336	26	21
Property, plant and equipment	16	35	7
Operating lease right-of-use assets	22	8	5
Other assets, current and non-current	2	4	4
Total assets acquired	900	285	146
Accounts payable	44	13	11
Deferred income taxes	41	8	—
Operating lease liabilities, current and non-current	22	8	5
Deferred consideration	14	12	3
Other liabilities, current and non-current	6	7	—
Net assets acquired	$ 773	$ 237	$ 127

(1) Amounts include the preliminary purchase price allocation of Dana Kepner net assets of $262 million to goodwill, $184 million to intangible assets, $90 million to net working capital, $29 million to cash and $8 million to fixed assets. Additionally, includes a deferred income tax liability of $36 million for the Dana Kepner acquisition.

The net outflow of cash in respect of the purchase of businesses is as follows:

	Fiscal 2024 Acquisitions	Fiscal 2023 Acquisitions	Fiscal 2022 Acquisitions
Net assets acquired	$ 773	$ 237	$ 127
Plus: Working capital adjustment	(1)	(1)	1
Less: Cash acquired in acquisition	(31)	(5)	—
Total consideration, net of cash; investing cash outflow	$ 741	$ 231	$ 128

In the above transactions, to the extent applicable, the excess of purchase price over net tangible and intangible assets acquired resulted in goodwill, which represents the assembled workforce and anticipated long-term growth in new markets, customers and products. Goodwill of $260 million, $11 million and $21 million associated with the Fiscal 2024 Acquisitions, Fiscal 2023 Acquisitions, and Fiscal 2022 Acquisitions, respectively, are fully deductible by the Company for U.S. income tax purposes.

Intangible Assets

For the Fiscal 2024 Acquisitions, Fiscal 2023 Acquisitions and Fiscal 2022 Acquisitions discussed above, the intangible assets acquired consist of customer relationships and other intangible assets.

The customer relationship intangible assets represent the value associated with those customer relationships in place at the date of the Fiscal 2024 Acquisitions, Fiscal 2023 Acquisitions and Fiscal 2022 Acquisitions. The Company valued the customer relationships using an excess earnings method using various inputs such as customer attrition rate, revenue growth rate, gross margin percentage and discount rate. Cash flows associated with the existing relationships are expected to diminish over time due to customer turnover. The Company reflected this expected diminishing cash flow through the utilization of an annual customer attrition rate assumption and in its method of amortization.

The other intangible assets primarily consist of trademark intangible assets that represent the value associated with the brand names in place at the date of the applicable closing.

A summary of the intangible assets acquired and assumptions utilized in the valuation, for the acquisitions is as follows:

	Intangible Asset Amount	Weighted Average Amortization Period	Weighted Average Discount Rate	Weighted Average Attrition Rate
Customer Relationships				
Fiscal 2024 Acquisitions[(1)]	$ 279	10 years	13.5 %	12.5 %
Fiscal 2023 Acquisitions	106	10 years	16.0 %	13.2 %
Fiscal 2022 Acquisitions	43	10 years	15.6 %	12.1 %
Other Intangible Assets				
Fiscal 2024 Acquisitions	$ 5	5 years	13.6 %	N/A
Fiscal 2023 Acquisitions	1	2 years	15.5 %	N/A

(1) Customer relationships acquired and assumptions utilized in the valuation for the Dana Kepner acquisition were as follows: $181 million customer relationship intangible asset, 10 years amortization period, 13.0% discount rate and 12.5% attrition rate.

Pro Forma Financial Information

The following pro forma information presents a summary of the results of operations for the periods indicated as if the Dana Kepner acquisition had been completed as of January 30, 2023. The pro forma financial information is based on the historical financial information for the Company and Dana Kepner, along with certain pro forma adjustments. These pro forma adjustments consist primarily of:

- increased amortization and depreciation expense related to the intangible assets and fixed assets acquired, respectively, in the Dana Kepner acquisition;
- increased interest expense to reflect the borrowings under the Senior Term Loan Credit Facility including the interest and amortization of deferred financing costs;
- reclassification of direct acquisition transaction costs, retention bonuses and inventory fair value adjustments from the period incurred to periods these expenses would have been recognized given the assumed transaction date identified above; and
- the related income tax effects of the aforementioned adjustments to the provision for income taxes for Core & Main.

The following pro forma information has been prepared for comparative purposes only and is not necessarily indicative of the results of operations as they would have been had the Dana Kepner acquisition occurred on the assumed date, nor is it necessarily an indication of future operating results. In addition, the pro forma information does not reflect the cost of any integration activities, benefits from any synergies that may be derived from the Dana Kepner acquisition or revenue growth that may be anticipated.

	Fiscal Years Ended	
	February 2, 2025	January 28, 2024
Net sales	$ 7,470	$ 7,034
Net income	435	519

As a result of integration of the Dana Kepner acquisition with existing operations of the Company it is impracticable to identify the discrete financial performance associated with the Dana Kepner acquisition. As such, the Company has not presented the post-acquisition net sales and net income for the Dana Kepner acquisition.

5) GOODWILL AND INTANGIBLE ASSETS

Goodwill

The carrying amount of the Company's goodwill included in its Balance Sheets is as follows:

	February 2, 2025	January 28, 2024
Gross Goodwill	$ 1,898	$ 1,561
Accumulated Impairment	—	—
Net Goodwill	$ 1,898	$ 1,561

The changes in the carrying amount of goodwill are as follows:

	Fiscal Years Ended	
	February 2, 2025	January 28, 2024
Beginning Balance	$ 1,561	$ 1,535
Goodwill acquired during the year	336	25
Goodwill adjusted during the year	1	1
Ending balance	$ 1,898	$ 1,561

Goodwill acquired during fiscal 2024 and fiscal 2023 was related to the Fiscal 2024 Acquisitions and Fiscal 2023 Acquisitions, respectively, as further discussed in Note 4.

During the fiscal 2024, fiscal 2023 and fiscal 2022 annual goodwill impairment assessment, the Company performed a qualitative assessment. The qualitative assessment included evaluating economic, industry, regulatory and company specific factors that could impact the reporting unit fair value. These factors included historical and projected financial metrics (including net sales, operating cash flow and discount rate trends), public equity market trends and evaluation of the markets the Company serves. Based on the assessment it was determined that it is not "more likely than not" that the fair value of its reporting unit is less than the carrying value of its reporting unit in fiscal 2024, fiscal 2023 and fiscal 2022. Therefore, no further assessment was necessary. There was no goodwill impairment during fiscal 2024, fiscal 2023 or fiscal 2022.

The Company's analyses were based in part on the expectation of future market conditions, future net sales and operating cash flow growth and discount rates that would be used by market participants in an arms-length transaction. Should actual performance or expectations of long-term assumptions be lower than presently expected, the Company's goodwill could be impaired.

Intangible Assets

The Company's intangible assets included in its Balance Sheets consist of the following:

	February 2, 2025			January 28, 2024		
	Gross Intangible	Accumulated Amortization	Net Intangible	Gross Intangible	Accumulated Amortization	Net Intangible
Customer relationships	$ 1,775	$ 868	$ 907	$ 1,496	$ 718	$ 778
Internal use software	23	—	23	4	—	4
Other intangible assets	10	5	5	6	4	2
Total	$ 1,808	$ 873	$ 935	$ 1,506	$ 722	$ 784

Amortization expense related to intangible assets was as follows:

	Fiscal Years Ended		
	February 2, 2025	January 28, 2024	January 29, 2023
Amortization expense	$ 151	$ 122	$ 120

There were no intangible asset impairments during fiscal 2024, fiscal 2023 or fiscal 2022.

The estimated aggregate amortization expense on intangible assets owned by the Company as of February 2, 2025 was expected to be as follows:

Fiscal 2025	$ 148
Fiscal 2026	138
Fiscal 2027	129
Fiscal 2028	120
Fiscal 2029	106

6) DEBT

Debt consisted of the following:

	February 2, 2025		January 28, 2024	
	Principal	Unamortized Discount and Debt Issuance Costs	Principal	Unamortized Discount and Debt Issuance Costs
Current maturities of long-term debt:				
Senior Term Loan due July 2028	$ 15	$ —	$ 15	$ —
Senior Term Loan due February 2031	9	—	—	—
	24	—	15	—
Long-term debt:				
Senior ABL Credit Facility due February 2029	93	—	430	—
Senior Term Loan due July 2028	1,233	12	1,448	15
Senior Term Loan due February 2031	933	10	—	—
	2,259	22	1,878	15
Total	$ 2,283	$ 22	$ 1,893	$ 15

The debt obligations as of February 2, 2025 include the following debt agreements:

Senior Term Loan Credit Facility

On July 27, 2021, Core & Main LP entered into a Senior Term Loan Credit Facility (as defined herein) under which it can incur tranches of indebtedness. On May 21, 2024, Core & Main LP amended the terms of the $1,500 million senior term loan (as amended, the "2028 Senior Term Loan"), in order to reduce the effective applicable margin from 2.60% to 2.00%. The 2028 Senior Term Loan requires quarterly principal payments on the last business day of each fiscal quarter in an amount equal to approximately 0.25% of the original principal amount. The remaining balance is payable upon final maturity of the 2028 Senior Term Loan on July 27, 2028. The 2028 Senior Term Loan bears interest at a rate equal to (i) term secured overnight financing rate ("Term SOFR") plus, in each case, an effective applicable margin of 2.00% or (ii) the base rate, which will be the highest of (x) the corporate base rate established by the administrative agent as its prime rate in effect at its principal office in New York City from time to time, (y) the overnight federal funds rate plus 0.50% per annum and (z) one-month Term SOFR (adjusted for maximum reserves) plus 1.00% per annum, plus, in each case, an applicable margin of 1.50%. The 2028 Senior Term Loan is subject to a Term SOFR "floor" of 0.00%. The weighted average interest rate, excluding the effect of the interest rate swap, of Core & Main LP's outstanding borrowings under the 2028 Senior Term Loan as of February 2, 2025 was 6.31%. See further discussion of the interest rate swap below. Based on quotes from financial institutions (i.e., level 2 of the fair value hierarchy), the fair value of the 2028 Senior Term Loan was $1,254 million as of February 2, 2025.

On February 9, 2024, Core & Main LP entered into an additional $750 million senior term loan (the "2031 Senior Term Loan" and, together with the 2028 Senior Term Loan, the "Senior Term Loan Credit Facility"). On December 17, 2024, Core & Main LP amended the terms of the 2031 Senior Term Loan, in order to reduce the effective applicable margin from 2.25% to 2.00% and increase the principal balance by $200 million to $944 million with the proceeds used to repay outstanding borrowings under the 2028 Senior Term Loan. The 2031 Senior Term Loan requires quarterly principal payments, payable on the last business day of each fiscal quarter, in an amount equal to approximately 0.25% of the amended principal amount of the 2031 Senior Term Loan. The remaining balance is payable upon final maturity of the 2031 Senior Term Loan on February 9, 2031. The 2031 Senior Term Loan bears interest at a rate equal to (i) Term SOFR plus, in each case, an applicable margin of 2.00% or (ii) an alternate base rate plus an applicable margin of 1.00%. The 2031 Senior Term Loan is subject to a Term SOFR "floor" of 0.00%. The weighted average interest rate, excluding the effect of the interest rate swap, of Core & Main LP's outstanding borrowings under the 2031 Senior Term Loan as of February 2, 2025 was 6.31%. See further discussion of the interest rate swap below. Based on quotes from financial institutions (i.e., level 2 of the fair value hierarchy), the fair value of the 2031 Senior Term Loan was $946 million as of February 2, 2025.

Asset-Based Credit Facility

On February 9, 2024, Core & Main LP amended the terms of the credit agreement governing its senior asset-based revolving credit facility (as amended, the "Senior ABL Credit Facility") in order to, among other things, extend the maturity from July 27, 2026 to February 9, 2029 and amend the credit agreement governing the Senior ABL Credit Facility to the extent necessary or appropriate to reflect the extension of the amended maturity. The Senior ABL Credit Facility has a borrowing capacity of up to $1,250 million, subject to borrowing base availability. Borrowings under the Senior ABL Credit Facility bear interest at either a Term SOFR rate plus an applicable margin ranging from 1.25% to 1.75%, or an alternate base rate plus an applicable margin ranging from 0.25% to 0.75%, depending on the borrowing capacity under the Senior ABL Credit Facility. Additionally, Core & Main LP pays a fee of 0.25% on unfunded commitments under the Senior ABL Credit Facility. As of February 2, 2025 and January 28, 2024 there were $93 million and $430 million amounts outstanding, respectively, under the Senior ABL Credit Facility with a weighted average interest rate of 7.75% as of February 2, 2025.

The aforementioned debt agreements include customary affirmative and negative covenants, which include, among other things, restrictions on Core & Main LP's ability to make distributions, pay dividends, create liens, incur additional indebtedness, make investments, dispose of assets and merge or consolidate with any other person. The Senior Term Loan Credit Facility may require accelerated repayment based upon cash flows generated in excess of operating and investing requirements when the Consolidated Secured Leverage Ratio (as defined in the agreement governing the Senior Term Loan Credit Facility) is greater than or equal to 3.25. In addition, the Senior ABL Credit Facility requires Core & Main LP to comply with a consolidated fixed charge coverage ratio of greater than or equal to 1.00 when availability under the Senior ABL Credit Facility is less than 10.0% of the lesser of (i) the then applicable borrowing base or (ii) the then aggregate effective commitments. The Company was in compliance with all debt covenants as of February 2, 2025.

Substantially all of Core & Main LP's assets are pledged as collateral for the Senior Term Loan Credit Facility and the Senior ABL Credit Facility.

The aggregate amount of debt payments for the next five fiscal years are as follows:

Fiscal 2025	$ 24
Fiscal 2026	24
Fiscal 2027	24
Fiscal 2028	1,212
Fiscal 2029	102

Interest Rate Swaps

Core & Main LP entered into an instrument in which it makes payments to a third party based upon a fixed interest rate of 0.693% and receives payments based upon the one-month Term SOFR rate. The interest rate swap has a notional amount of $800 million as of February 2, 2025. The notional amount decreases to $700 million on July 27, 2025 through the instrument maturity on July 27, 2026. This instrument is intended to reduce the Company's exposure to variable interest rates under the Senior Term Loan Credit Facility. As of February 2, 2025, this instrument resulted in an effective fixed rate of 2.693%, based upon the 0.693% fixed rate plus an effective applicable margin of 2.00%.

On February 12, 2024, Core & Main LP entered into an additional instrument pursuant to which it will make payments to a third party based upon a fixed interest rate of 3.913% and receive payments based upon the one-month Term SOFR rate. The interest rate swap has a starting notional amount of $750 million that increases to $1,500 million on July 27, 2026 through the instrument maturity on July 27, 2028. The instrument is intended to reduce the Company's exposure to variable interest rates under the Senior Term Loan Credit Facility. As of February 2, 2025, this instrument resulted in an effective fixed rate of 5.913%, based upon the 3.913% fixed rate plus an effective applicable margin of 2.00%.

The fair value of these cash flow interest rate swaps was a $40 million and $67 million asset as of February 2, 2025 and January 28, 2024, respectively, which is included within other assets in the Balance Sheet.

Accumulated Other Comprehensive Income	Fiscal Years Ended		
	February 2, 2025	January 28, 2024	January 29, 2023
Beginning of period balance	$ 48	$ 70	$ 26
Measurement adjustment gain for interest rate swap	23	21	66
Reclassification of (income) expense to interest expense	(47)	(42)	(13)
Tax benefit (expense) on interest rate swap adjustments			
Measurement adjustment gain for interest rate swap	(6)	(4)	(11)
Reclassification of (income) expense to interest expense	12	8	2
Tax impact of exchange of Partnership Interests	—	(5)	—
End of period balance	$ 30	$ 48	$ 70

The cash flows related to settlement of the interest rate swaps are classified in the consolidated statements of cash flows based on the nature of the underlying hedged items. Fair value is based upon the present value of future cash flows under the terms of the contract and observable market inputs (level 2). Significant inputs used in determining fair value include forward-looking one-month Term SOFR rates and the discount rate applied to projected cash flows.

As of February 2, 2025, the Company estimates $28 million of the cash flow interest rate swap gains will be reclassified from accumulated other comprehensive income into earnings over the next 12 months.

7) INCOME TAXES

Core & Main is the general partner of Holdings, which is treated as a partnership for U.S. federal and most applicable state and local income tax purposes. As a partnership, Holdings is generally not subject to U.S. federal and certain state and local income taxes. Any taxable income or loss generated by Holdings is passed through to and included in the taxable income or loss of its partners, including Core & Main. Core & Main is subject to U.S. federal income taxes, in addition to state and local income taxes, with respect to its allocable share of any taxable income of Holdings.

The provision for income taxes consisted of the following:

	Fiscal Years Ended		
	February 2, 2025	January 28, 2024	January 29, 2023
Current:			
Federal	$ 101	$ 98	$ 110
State	29	28	25
	130	126	135
Deferred:			
Federal	11	2	(5)
State	2	—	(2)
	13	2	(7)
Total	$ 143	$ 128	$ 128

The reconciliations of the provision for income taxes at the federal corporate statutory rate of 21% to the tax provision for fiscal 2024, fiscal 2023 and fiscal 2022 are as follows:

	Fiscal Years Ended		
	February 2, 2025	January 28, 2024	January 29, 2023
Income taxes at federal statutory rate	21.0 %	21.0 %	21.0 %
State income taxes	4.5	3.5	3.2
Partnership income not subject to U.S. tax	(0.8)	(5.0)	(6.3)
Corporate subsidiary tax	—	(0.3)	0.1
Permanent differences	0.3	0.4	0.3
Other	(0.2)	(0.2)	(0.2)
Total provision	24.8 %	19.4 %	18.1 %

The variations between the Company's estimated effective tax rate and the U.S. and state statutory rates are primarily due to the portion of the Company's earnings attributable to non-controlling interests partially offset by certain permanent book-tax differences.

The tax effects of temporary differences that give rise to the deferred tax assets and liabilities were as follows:

	February 2, 2025	January 28, 2024
Deferred Tax Assets:		
Basis difference in partnership investments of Core & Main, Inc.	$ 503	$ 489
Imputed interest on Tax Receivable Agreements	49	48
Intangibles	4	5
Other	2	—
Deferred Tax Liabilities:		
Basis difference in partnership investments of Core & Main Buyer, Inc.	(87)	(48)

The Company's operations have resulted in income, and as such, the Company maintains no valuation allowance against its deferred tax assets.

Core & Main, Inc. Partnership Investment

As part of the reorganization transactions performed at the time of the initial public offering, the Company assumed a deferred tax liability associated with the difference between its financial reporting investment and tax basis in Holdings. The assumed deferred tax liability was adjusted to reflect the initial public offering and subsequent book-tax differences. Subsequent exchanges of Partnership Interests by certain stockholders affiliated with CD&R and Management Feeder that continued to own Partnership Interests beyond the time of the initial public offering created additional tax basis that may reduce taxable income in the future. This resulted in the recognition of deferred tax assets that have been partially offset by incremental recognition of the deferred tax liability assumed at the initial public offering. As of February 2, 2025 and January 28, 2024, the Company had a $503 million and $489 million, respectively, in deferred tax asset associated with the difference between Core & Main's financial reporting basis and the tax basis of Core & Main's investment in Holdings.

Buyer Deferred Tax Liability

The Company completed the acquisitions of all the outstanding shares of certain acquired companies through Core & Main Buyer, Inc. ("Buyer"), a wholly-owned subsidiary of the Company. Buyer subsequently contributed these acquired companies to Core & Main LP. As part of the opening balance sheets, Buyer recorded deferred tax liabilities of $41 million during fiscal 2024 related to the difference between Buyer's financial reporting basis and tax basis of Buyer's investment in Core & Main LP. The taxable income that is allocated to Buyer, for its contribution of these acquired companies to Core & Main LP, is subject to corporate federal and state income tax in substantially all fifty states. As of February 2, 2025 and January 28, 2024, this deferred tax liability was $87 million and $48 million, respectively.

Tax Receivable Agreements and Reorganization Transactions

The Company is party to the Former Limited Partners Tax Receivable Agreement and the Continuing Limited Partners Tax Receivable Agreement. The Company has generated tax attributes, and expects to generate additional tax attributes with future exchanges of Partnership Interests, that will reduce amounts that it would otherwise pay in the future to various tax authorities. The Tax Receivable Agreements provide payments to the parties subject to the Tax Receivable Agreements, or their permitted transferees, of 85% of the tax benefits realized by the Company, or in some circumstances are deemed to be realized.

The Company recorded payables to related parties pursuant to the Tax Receivable Agreements of $725 million and $717 million as of February 2, 2025 and January 28, 2024, respectively. Payments under the Tax Receivable Agreements within the next 12 months are expected to be $19 million, which is included within other current liabilities in the Balance Sheet.

The actual amount and timing of any potential additional payments under the Tax Receivable Agreements will vary depending upon a number of factors, including the timing of exchanges by the holders of Partnership Interests, the amount of gain recognized by such holders of Partnership Interests, the amount and timing of the taxable income the Company generates in the future and the federal tax rates then applicable. Assuming (i) that Management Feeder exchanged all of their remaining Partnership Interests at $56.44 per share of our Class A common stock (the closing stock price on January 31, 2025), (ii) no material changes in relevant tax law, (iii) a constant corporate tax rate of 25.1%, which represents a pro forma tax rate that includes a provision for U.S. federal income taxes and assumes the highest statutory rate apportioned to each state and local jurisdiction and (iv) that the Company earns sufficient taxable income in each year to realize on a current basis all tax benefits that are subject to the Continuing Limited Partners Tax Receivable Agreement, the Company would recognize a deferred tax asset (subject to offset with existing deferred tax liabilities) of approximately $131 million and a liability of approximately $111 million, payable over the life of the Continuing Limited Partners Tax Receivable Agreement. The full exchange will also decrease Core & Main's aforementioned deferred tax asset associated with its investment in Holdings by $5 million, as Core & Main recognizes the deferred tax consequences associated with the non-controlling Partnership Interests being exchanged. These amounts are estimates only and are subject to change.

Uncertain tax positions

Total gross unrecognized tax benefits as of February 2, 2025 and January 28, 2024, as well as activity within each of the years, were not material.

8) LEASES

The Company occupies certain facilities and operates certain equipment and vehicles under operating leases that expire at various dates through the year 2038.

The table below presents lease costs associated with facility, equipment and vehicle operating leases:

		Fiscal Years Ended		
Lease Cost	**Classification**	**February 2, 2025**	**January 28, 2024**	**January 29, 2023**
Operating Lease Cost	Selling, general, and administrative expense	$ 98	$ 80	$ 69

Future aggregate rental payments under non-cancelable operating leases as of February 2, 2025 are as follows:

	February 2, 2025
Fiscal 2025	$ 78
Fiscal 2026	66
Fiscal 2027	52
Fiscal 2028	34
Fiscal 2029	19
Thereafter	26
Total minimum lease payments	275
Less: present value discount	(30)
Present value of lease liabilities	$ 245

To calculate the present value of the operating lease liabilities, the Company determined its incremental borrowing rate by considering market and company specific factors, including interest rates for borrowings secured by collateral and adjusted for the remaining term of the leased facility, machinery, or vehicle categories. The table below presents the weighted average remaining lease term (years) and the weighted average discount rate of the Company's operating leases:

Operating Lease Term and Discount Rate	**February 2, 2025**	**January 28, 2024**
Weighted average remaining lease term (years)	3.9	4.0
Weighted average discount rate	5.8 %	5.3 %

The table below presents cash and non-cash impacts associated with leases:

	Fiscal Years Ended		
	February 2, 2025	January 28, 2024	January 29, 2023
Operating cash flow payments for operating lease liabilities	$ 64	$ 54	$ 50
Operating cash flow payments for non-lease components	34	26	19
Right-of-use assets obtained in exchange for new operating lease liabilities	$ 93	$ 65	$ 68

The non-cash impact related to ROU assets obtained in exchange for new operating lease liabilities in the table above excludes the impact from acquisitions ROU assets acquired as part of the acquisitions are presented in Note 4.

9) COMMITMENTS AND CONTINGENCIES

Purchase Obligations

As of February 2, 2025, the Company had agreements in place with various suppliers to purchase goods and services, primarily inventory, in the aggregate amount of $1,225 million. These purchase obligations are generally cancellable, but the Company does not currently intend to cancel. Payment is dependent on lead times from our suppliers, and could be extended due to supply chain disruptions. Payments are generally expected to be made during fiscal 2025 for these obligations.

Encumbered Assets

As of February 2, 2025, substantially all of the Company's assets were pledged as collateral for the Company's credit facilities.

Legal Matters

The Company is involved in various legal proceedings arising in the normal course of its business. The Company establishes reserves for litigation and similar matters when those matters present loss contingencies that it determines to be both probable and reasonably estimable. As of February 2, 2025 and January 28, 2024, these established reserves for litigation were not material. In the opinion of management, based on current knowledge, all probable and reasonably estimable matters are believed to be adequately reserved for or covered by insurance and are not expected to have a material adverse effect on the Company's financial condition, results of operations or cash flows. For all other matters, management believes the possibility of losses from such matters is not probable, the potential loss from such matters is not reasonably estimable, or such matters are of such kind or involve such amounts that would not have a material adverse effect on the financial position, results of operations or cash flows of the Company if resolved unfavorably.

Self-Insurance

The Company has high deductible insurance programs for most losses related to general liability, product liability, automobile liability and workers' compensation, and is self-insured for medical claims, while maintaining per employee stop loss coverage, and certain legal claims. The expected ultimate cost for claims incurred as of the balance sheet date is not discounted and is recognized as a liability in the accompanying Balance Sheets. The Company's self-insurance losses for claims filed and claims incurred but not reported are accrued based upon estimates of the aggregate liability for uninsured claims using loss development factors and actuarial assumptions followed in the insurance industry and historical loss development experience. At February 2, 2025 and January 28, 2024, the Company's self-insurance liabilities totaled $29 million and $28 million, respectively.

Continuing Limited Partners Tax Receivable Agreement

Core & Main is party to the Continuing Limited Partners Tax Receivable Agreement, which will result in the recognition of deferred tax benefits and liabilities upon the exchange of Partnership Interests, together with the retirement of a corresponding number of shares of the Company's Class B common stock, by Management Feeder for shares of Class A common stock of Core & Main or cash pursuant to the Exchange Agreement. See further discussion in Note 2 and Note 7.

10) SUPPLEMENTAL FINANCIAL STATEMENT INFORMATION

Receivables

Receivables consisted of the following:

	February 2, 2025	January 28, 2024
Trade receivables, net of allowance for credit losses	$ 986	$ 888
Supplier rebate receivables	80	85
Receivables, net of allowance for credit losses	$ 1,066	$ 973

Property, Plant and Equipment

Property, plant and equipment consisted of the following:

	February 2, 2025	January 28, 2024
Land	$ 38	$ 38
Buildings and improvements	85	80
Transportation equipment	55	41
Furniture, fixtures and equipment	122	98
Capitalized software	26	23
Construction in progress	10	5
Property, plant and equipment	336	285
Less accumulated depreciation and amortization	(168)	(134)
Property, plant and equipment, net	$ 168	$ 151

Depreciation expense is classified within cost of sales and depreciation and amortization within the Statement of Operations. Depreciation expense related to property, plant and equipment, including capitalized software, was as follows:

	Fiscal Years Ended		
	February 2, 2025	January 28, 2024	January 29, 2023
Depreciation expense	$ 35	$ 27	$ 23

Accrued Compensation and Benefits

Accrued compensation and benefits consisted of the following:

	February 2, 2025	January 28, 2024
Accrued bonuses and commissions	$ 91	$ 82
Other compensation and benefits	32	24
Accrued compensation and benefits	$ 123	$ 106

11) NON-CONTROLLING INTERESTS

Core & Main is the general partner of Holdings and operates and controls all of the business and affairs of Holdings and, through Holdings and its subsidiaries, conducts the Company's business. Core & Main consolidates the consolidated financial statements of Holdings and attributes a portion of net income and equity of Holdings to non-controlling interests related to the vested Partnership Interests not held by the Company. Income or loss is attributed to the non-controlling interests based on the weighted average percentage of Partnership Interests held by Management Feeder, excluding unvested Partnership Interests held, relative to all Partnership Interests of Holdings during the period. Holdings equity is attributed to non-controlling interests based on the Partnership Interests not held by the Company, excluding unvested Partnership Interests, relative to all Partnership Interests as of the balance sheet date multiplied by the equity of Holdings prior to distributions, less distributions made to non-controlling interest holders. The non-controlling interests' ownership percentage may fluctuate over time as Partnership Interests are exchanged, together with the retirement of a corresponding number of shares of Class B common stock, for shares of Class A common stock and Partnership Interests held by Management Feeder vest. The following table summarizes the ownership of Partnership Interests of Holdings (excluding unvested Partnership Interests held by Management Feeder):

	Partnership Interests			Ownership Percentage		
	Core & Main	Continuing Limited Partners	Total	Core & Main	Continuing Limited Partners	Total
Balances at January 29, 2023	172,765,161	72,471,473	245,236,634	70.4 %	29.6 %	100.0 %
Retirement of Partnership Interests	(28,131,551)	(16,868,449)	(45,000,000)	1.8 %	(1.8)%	—
Issuance of Partnership Interests	346,977	—	346,977	0.1 %	(0.1)%	—
Exchange of Partnership Interests	46,683,021	(46,731,040)	(48,019)	23.2 %	(23.2)%	—
Vesting of Partnership Interests	—	371,292	371,292	(0.1)%	0.1 %	—
Balances at January 28, 2024	191,663,608	9,243,276	200,906,884	95.4 %	4.6 %	100.0 %
Retirement of Partnership Interests	(3,974,820)	—	(3,974,820)	(0.1)%	0.1 %	—
Issuance of Partnership Interests	443,089	—	443,089	— %	— %	—
Exchange of Partnership Interests	1,684,022	(1,694,125)	(10,103)	0.9 %	(0.9)%	—
Vesting of Partnership Interests	—	164,614	164,614	(0.1)%	0.1 %	—
Balances at February 2, 2025	189,815,899	7,713,765	197,529,664	96.1 %	3.9 %	100.0 %

12) BASIC AND DILUTED EARNINGS PER SHARE

The following table presents the calculation of basic and diluted earnings per share for fiscal 2024, fiscal 2023 and fiscal 2022.

Basic earnings per share is computed by dividing net income attributable to Core & Main by the weighted average number of shares of Class A common stock outstanding during the same period. Shares of Class A common stock issued during the period were weighted for the portion of the period in which the shares of Class A common stock were outstanding. The Company did not apply the two-class method because shares of Class B common stock do not participate in earnings of Core & Main. As a result, the shares of Class B common stock are not considered participating securities and are not included in the weighted average shares outstanding for purposes of basic earnings per share. Net income allocated to holders of non-controlling interests was excluded from net income available to the Class A common stock. There were no preferred dividends and no shares of preferred stock outstanding for the period.

The diluted net earnings per share calculation includes the basic weighted average number of shares of Class A common stock outstanding plus the dilutive impact of potential outstanding shares of Class A common stock that would be issued upon exchange of Partnership Interests, together with the retirement of a corresponding number of shares of Class B common stock, under the if-converted method, if dilutive. The treasury stock method is applied to outstanding awards, including unvested Partnership Interests and outstanding stock appreciation rights, restricted stock units and stock options.

	Fiscal Years Ended		
Basic earnings per share:	**February 2, 2025**	**January 28, 2024**	**January 29, 2023**
Net income	$ 434	$ 531	$ 581
Net income attributable to non-controlling interests	23	160	215
Net income available to Class A common stock	411	371	366
Weighted average shares outstanding	191,617,275	172,839,836	169,482,199
Net income per share	$ 2.14	$ 2.15	$ 2.16
Diluted earnings per share:			
Net income available to common shareholders - basic	$ 411	$ 371	$ 366
Increase to net income attributable to dilutive instruments	18	118	159
Net income available to common shareholders - diluted	429	489	525
Weighted average shares outstanding - basic	191,617,275	172,839,836	169,482,199
Incremental shares of common stock attributable to dilutive instruments	9,825,475	54,978,241	76,734,805
Weighted average shares outstanding - diluted	201,442,750	227,818,077	246,217,004
Net income per share - diluted	$ 2.13	$ 2.15	$ 2.13

13) EQUITY-BASED COMPENSATION

Equity-Based Compensation Plan

Prior to the initial public offering, the board of Holdings approved the Core & Main Holdings, LP Equity Incentive Plan. Employees and independent directors of the Company previously received profits units and unit appreciation rights in Holdings indirectly through Management Feeder. These awards were issued from Management Feeder, which in turn received grants from Holdings in the amounts and terms that were identical to those that were issued to employees and independent directors.

Treatment of Core & Main Holdings, LP Equity Incentive Plan

In connection with the reorganization transactions performed as part of the initial public offering, Holdings was recapitalized and its common units and profits units were converted to a single class of Partnership Interests. Partnership Interests in the recapitalized Holdings, which correspond to prior profits units of Holdings, which were held by Management Feeder (which relate to profits units in Management Feeder held by the Company's employees and directors), remain subject to the same time-based vesting requirements that existed prior to the reorganization transactions. As part of the recapitalization of Holdings, the quantity of Partnership Interests issued in the recapitalization contemplated the settlement of the historical benchmark prices and the public offering price of Class A common stock in the initial public offering.

In addition, in connection with the reorganization transactions, unit appreciation rights of Holdings were converted to stock appreciation rights denominated in shares of Class A common stock with adjustments to the number of awards and benchmark prices.

Partnership Interests

A summary of the Partnership Interests is presented below (shares in thousands):

	Number of Shares	Weighted Average Benchmark Price
Outstanding as of January 28, 2024	8,669	$ —
Exchanged	(1,546)	—
Outstanding as of February 2, 2025	7,123	$ —

	Number of Shares	Weighted Average Benchmark Price
Unvested as of January 28, 2024	387	$ —
Vested	(165)	—
Unvested as of February 2, 2025	222	$ —

The estimated fair value of the profits units when granted was amortized to expense over the vesting period. The fair value for these profits units was estimated by management, after considering a third-party valuation specialist's assessment, at the date of grant based on the expected life of the profits units, using a Black-Scholes pricing model.

Stock Appreciation Rights

A summary of the stock appreciation rights is presented below (shares in thousands):

	Number of Shares	Weighted Average Exercise Price	Aggregate Intrinsic Value
Outstanding as of January 28, 2024	332	$ 5.28	
Exchanged	(160)	4.46	
Outstanding as of February 2, 2025	172	$ 6.03	$ 9
Exercisable as of February 2, 2025	109	$ 4.59	$ 6

The estimated fair value of the stock appreciation rights when granted was amortized to expense over the vesting or required service period. The fair value for these stock appreciation rights was estimated by management, after considering a third-party valuation specialist's assessment, at the date of grant based on the expected life of the unit appreciation rights, using a Black-Scholes pricing model.

Omnibus Incentive Plan

In July 2021, in connection with the initial public offering, Core & Main's sole stockholder approved and Core & Main's board of directors adopted the 2021 Omnibus Equity Incentive Plan (the "Omnibus Incentive Plan"). Under the Omnibus Incentive Plan, 12.6 million shares of Class A common stock, plus 634 thousand shares of Class A common stock in respect of stock appreciation rights that were converted from unit appreciation rights of Holdings outstanding prior to the initial public offering, are reserved for the awards granted and available for future issuances.

Restricted Stock Units

A summary of the restricted stock units granted under the Omnibus Incentive Plan is presented below (shares in thousands):

	Number of Shares	Weighted Average Grant Date Fair Value
Outstanding and Unvested as of January 28, 2024	359	$ 23.10
Granted	123	50.28
Distributed	(162)	23.83
Forfeited	(3)	32.92
Outstanding and Unvested as of February 2, 2025	317	$ 33.23

The restricted stock units generally vest over a three-year period. The estimated fair value of the restricted stock units when granted was amortized over the vesting period. The grant date fair value of RSUs was determined based on the price of the Company's Class A common stock on the grant date.

Stock Options

A summary of the stock options granted under the Omnibus Incentive Plan is presented below (shares in thousands):

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Outstanding as of January 28, 2024	1,720	$ 21.54		
Granted	512	50.32		
Exercised	(135)	21.36		
Forfeitures	(4)	36.11		
Outstanding as of February 2, 2025	2,093	$ 28.56	8.0	$ 58
Exercisable as of February 2, 2025	698	$ 21.32	7.5	$ 25

The stock options generally vest over a three-year period and expire after ten years. The estimated grant-date fair value of stock options when granted was amortized to expense over the vesting period. The fair value for these stock options was estimated by management, after considering a third-party valuation specialist's assessment, at the date of grant based on the expected life of the stock options, using a Black-Scholes pricing model with the following weighted-average assumptions:

	February 2, 2025	January 28, 2024	January 29, 2023
Risk-free interest rate	4.04%	3.87%	1.85%
Dividend yield	1.0%	2.0%	—%
Expected volatility factor	36.5%	40.0%	40.0%
Expected life in years	6.0	6.0	6.0
Weighted-average fair value	$ 19.15	$ 8.06	$ 8.55

The risk free interest rate was determined based on an analysis of U.S. Treasury zero-coupon market yields as of the date of the stock options grant for issues having expiration lives similar to the expected life of the stock options. The expected volatility was based on an analysis of the historical volatility of a peer group over the expected life of the stock options. The expected term in years for each stock option was calculated using a simplified method based on the average of each option's vesting term of three years and contractual term of ten years.

Employee Stock Purchase Plan

In July 2021, Core & Main's sole stockholder approved and Core & Main's board of directors adopted the Employee Stock Purchase Plan (the "ESPP"). Under the ESPP, 2.5 million shares of Class A common stock are reserved and available for future purchase. For fiscal 2024, 92 thousand shares of Class A common shares were purchased under the ESPP at a weighted-average price of $47.41 per share, resulting in cash proceeds of approximately $4 million. For fiscal 2023, 108 thousand shares of Class A common shares were purchased under the ESPP at a weighted-average price of $33.28 per share, resulting in cash proceeds of approximately $3 million.

Compensation Expense

The Company evaluated the conversions of the profits units and unit appreciation rights as part of the reorganization transactions and concluded that each represented an accounting modification of the original awards. As such, the Company is required to recognize the incremental fair value immediately after each modification compared with immediately before as additional compensation expense. Incremental compensation expense for awards that were vested as of the reorganization transactions were recognized immediately and expense for unvested awards will be recognized over the remaining service period. The Company recognized compensation expense of $14 million, $10 million and $11 million during fiscal 2024, fiscal 2023 and fiscal 2022, respectively. As of February 2, 2025, the unrecognized share based compensation was $15 million which is expected to be recognized over a weighted average period of 0.9 years.

Employee Benefit Plans

The Company offers a comprehensive Health & Welfare Benefits Program (the "Program") which allows employees who satisfy certain eligibility requirements to choose among different levels and types of coverage. The Program provides employees healthcare coverage in which the employer and employee share costs. In addition, the Program offers employees the opportunity to participate in various voluntary coverages, including flexible spending accounts and health savings accounts. The Company maintains a 401(k) defined contribution plan that is qualified under Sections 401(a) and 501(a) of the Internal Revenue Code. Employees of the Company who satisfy the plan's eligibility requirements may elect to contribute a portion of their compensation to the plan on a pre-tax basis. The Company may match a percentage of the employees' contributions to the plan based on eligible compensation deferred. Matching contributions are generally made shortly after the end of each pay period. The Company recorded expenses of $14 million, $12 million and $11 million related to matching contributions during fiscal 2024, fiscal 2023 and fiscal 2022, respectively.

14) RELATED PARTIES

Tax Receivable Agreements

Core & Main is party to the Former Limited Partners Tax Receivable Agreement and the Continuing Limited Partners Tax Receivable Agreement, see further discussion in Note 2 and Note 7.

Exchange Agreement

Core & Main entered into the Exchange Agreement as further described in Note 2. Pursuant to the Exchange Agreement, certain stockholders affiliated with CD&R and Management Feeder that continued to own Partnership Interests beyond the time of the initial public offering (or their permitted transferees) will have the right, subject to the terms of the Exchange Agreement, to exchange their Partnership Interests, together with the retirement of a corresponding number of shares of Class B common stock, for shares of Class A common stock generally on a one-for-one basis or for cash in limited circumstances as specified in the Exchange Agreement. Holders of Partnership Interests will not have the right to exchange Partnership Interests if Core & Main determines that such exchange would be prohibited by law or regulation or would violate other agreements with Core & Main or its subsidiaries to which the holder of Partnership Interests may be subject. Core & Main may also refuse to honor any request to effect an exchange if it determines such exchange would pose a material risk that Holdings would be treated as a "publicly traded partnership" for U.S. federal income tax purposes. Notwithstanding the foregoing, Management Feeder is generally permitted to exchange Partnership Interests, subject to the terms of the Exchange Agreement.

The Exchange Agreement also provides that, in connection with any such exchange, to the extent that Holdings has, since the initial public offering, made distributions that are proportionately lesser or greater than the distributions made to Core & Main, on a pro rata basis, the number of shares of Class A common stock to be issued or cash to be paid to Management Feeder will be adjusted to take into account the amount of such discrepancy that is allocable to the Partnership Interests, and Class B common stock, subject to such exchange. As of February 2, 2025, the Company had a shareholder receivable of $15 million recorded within additional paid in capital related to distributions in excess of shareholders' pro rata share. Core & Main expects to cause Holdings to make distributions to its partners in such a manner as generally to limit increases to the number of shares of Class A common stock to be issued or cash to be paid to Management Feeder in connection with the adjustment described in the preceding sentence.

15) SUBSEQUENT EVENTS

Management has evaluated events or transactions that may have occurred that would merit recognition or disclosure in the condensed consolidated financial statements. No subsequent events were identified.

DBE GOOD FAITH EFFORTS VERIFICATION

Solicitation Lists/Publications

GFE Outreach Advertisement

GFE Outreach:

GFE Ad URL: https://live.gfeoutreach.com/adDetails?adsRef=1383

Order ID1383
Post Date: 2026-03-26 11:13 AM

Core & Main

Seeking qualified DBE's for the following project:

Advanced Metering Infrastructure Implementation Project Phase I

Project Information

Sub-bids Due: 2026-04-30 11:00 AM
Project Bid date: 2026-04-30 11:00 AM
Agency Name: United States Department of the Interior Bureau of Reclamation
Agency Project Number: n/a
Address: 3590 Rubidoux Blvd, Riverside, CA 92509, USA

Contact Information
Company Name: Core & Main
Name: Shawn Proudlove
Email: shawn.proudlove@coreandmain.com
Phone Number: (210) 560-7880
Website: coreandmain.com

DBE Types

SBA Section 8(a), WOSB, DBE, MBE, WBE, SBE

Scope of Work

Water meter & infrastructure installation

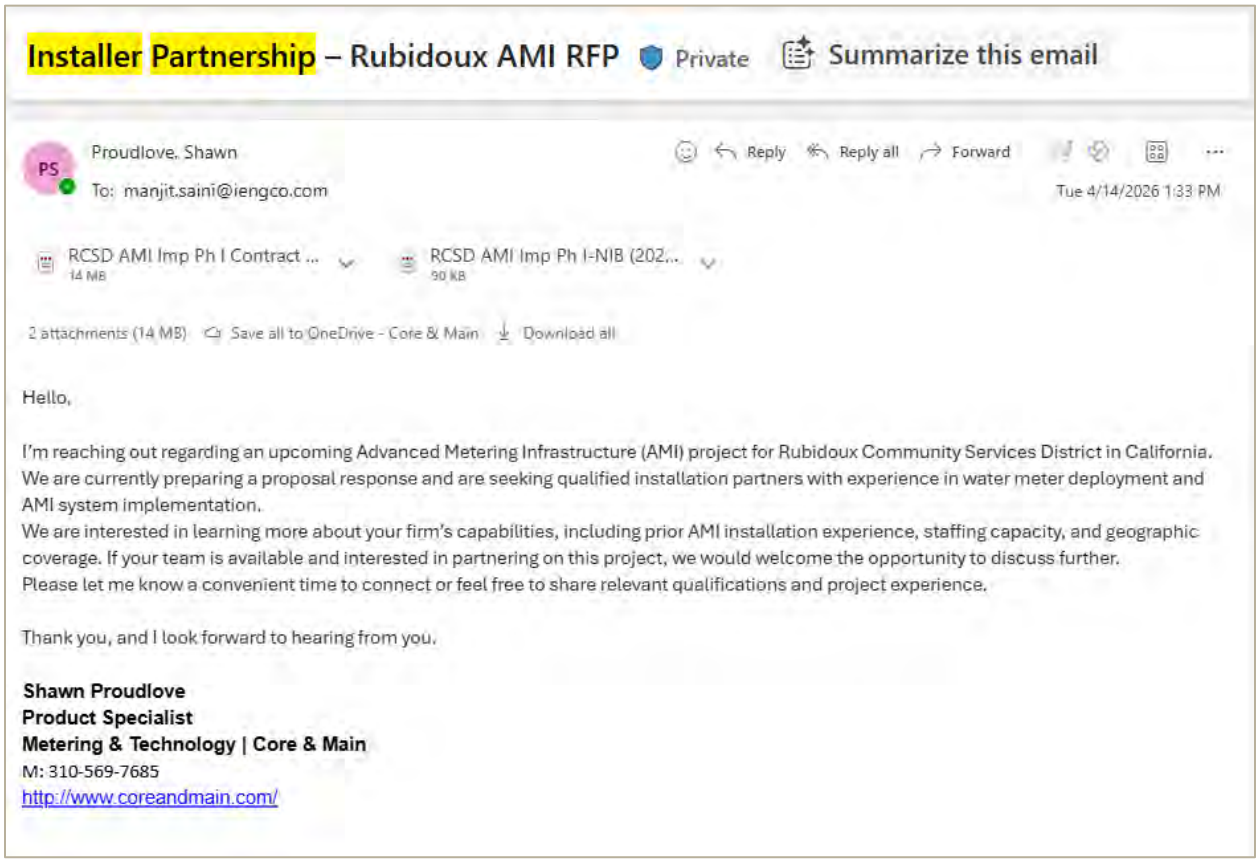
Plans and Spec

Website / URL: https://vendors.planetbids.com/portal/65580/bo/bo-detail/138762#bidDocs

GFE Ad URL: https://live.gfeoutreach.com/adDetails?adsRef=1383

Mail Logs

Inder Design Build (ENGCO) – SBE



Installer Partnership – Rubidoux AMI RFP Private Summarize this email

Proudlove, Shawn

To: manjit.saini@iengco.com

Reply Reply all Forward

Tue 4/14/2026 1:33 PM

RCSD AMI Imp Ph I Contract ... 14 MB

RCSD AMI Imp Ph I-NIB (202... 90 KB

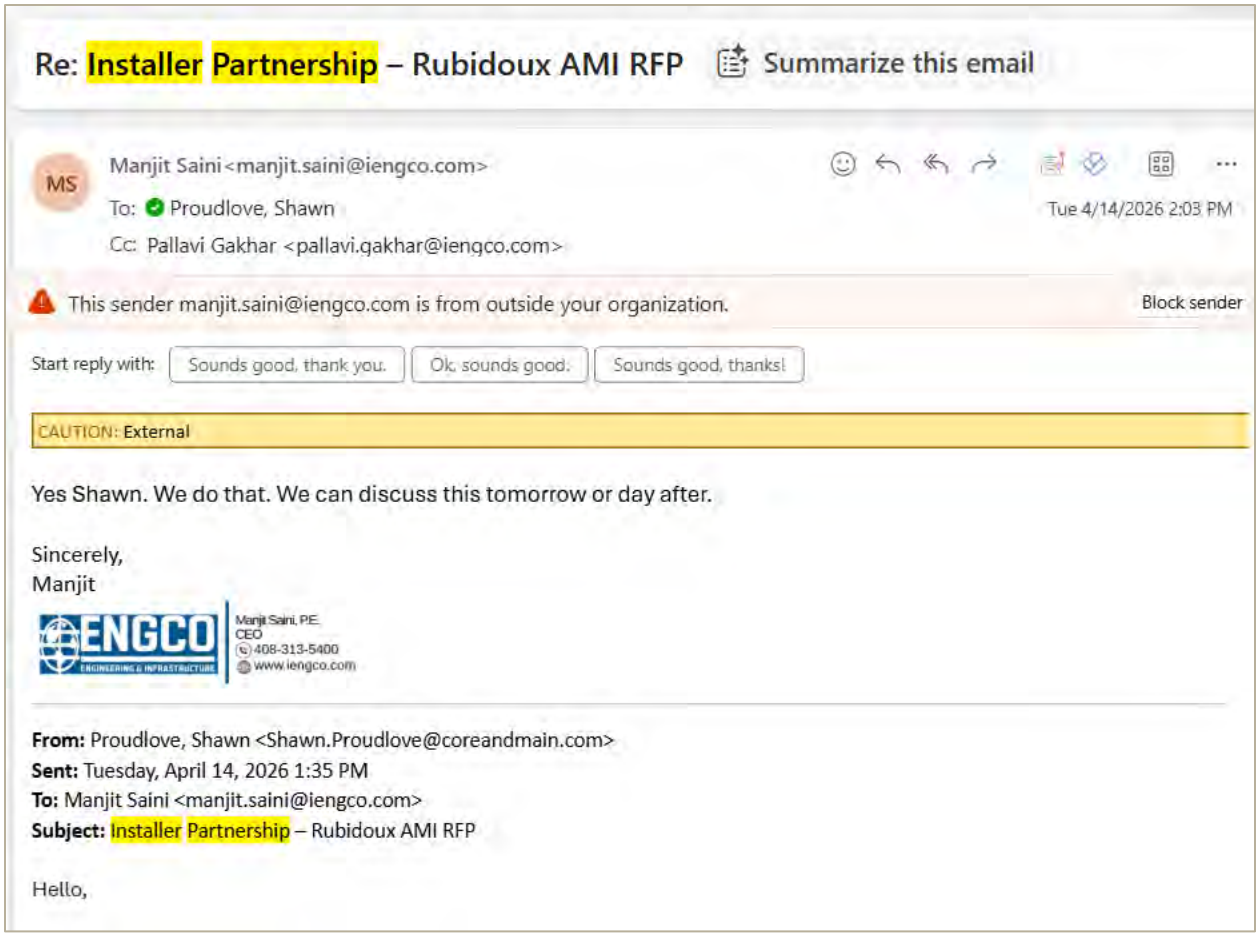
2 attachments (14 MB) Save all to OneDrive - Core & Main Download all

Hello,

I'm reaching out regarding an upcoming Advanced Metering Infrastructure (AMI) project for Rubidoux Community Services District in California. We are currently preparing a proposal response and are seeking qualified installation partners with experience in water meter deployment and AMI system implementation.
We are interested in learning more about your firm's capabilities, including prior AMI installation experience, staffing capacity, and geographic coverage. If your team is available and interested in partnering on this project, we would welcome the opportunity to discuss further.
Please let me know a convenient time to connect or feel free to share relevant qualifications and project experience.

Thank you, and I look forward to hearing from you.

Shawn Proudlove
Product Specialist
Metering & Technology | Core & Main
M: 310-569-7685
http://www.coreandmain.com/



Re: Installer Partnership – Rubidoux AMI RFP Summarize this email

MS

Manjit Saini <manjit.saini@iengco.com>

To: Proudlove, Shawn

Cc: Pallavi Gakhar <pallavi.gakhar@iengco.com>

Tue 4/14/2026 2:03 PM

This sender manjit.saini@iengco.com is from outside your organization. Block sender

Start reply with: Sounds good, thank you. | Ok, sounds good. | Sounds good, thanks!

CAUTION: External

Yes Shawn. We do that. We can discuss this tomorrow or day after.

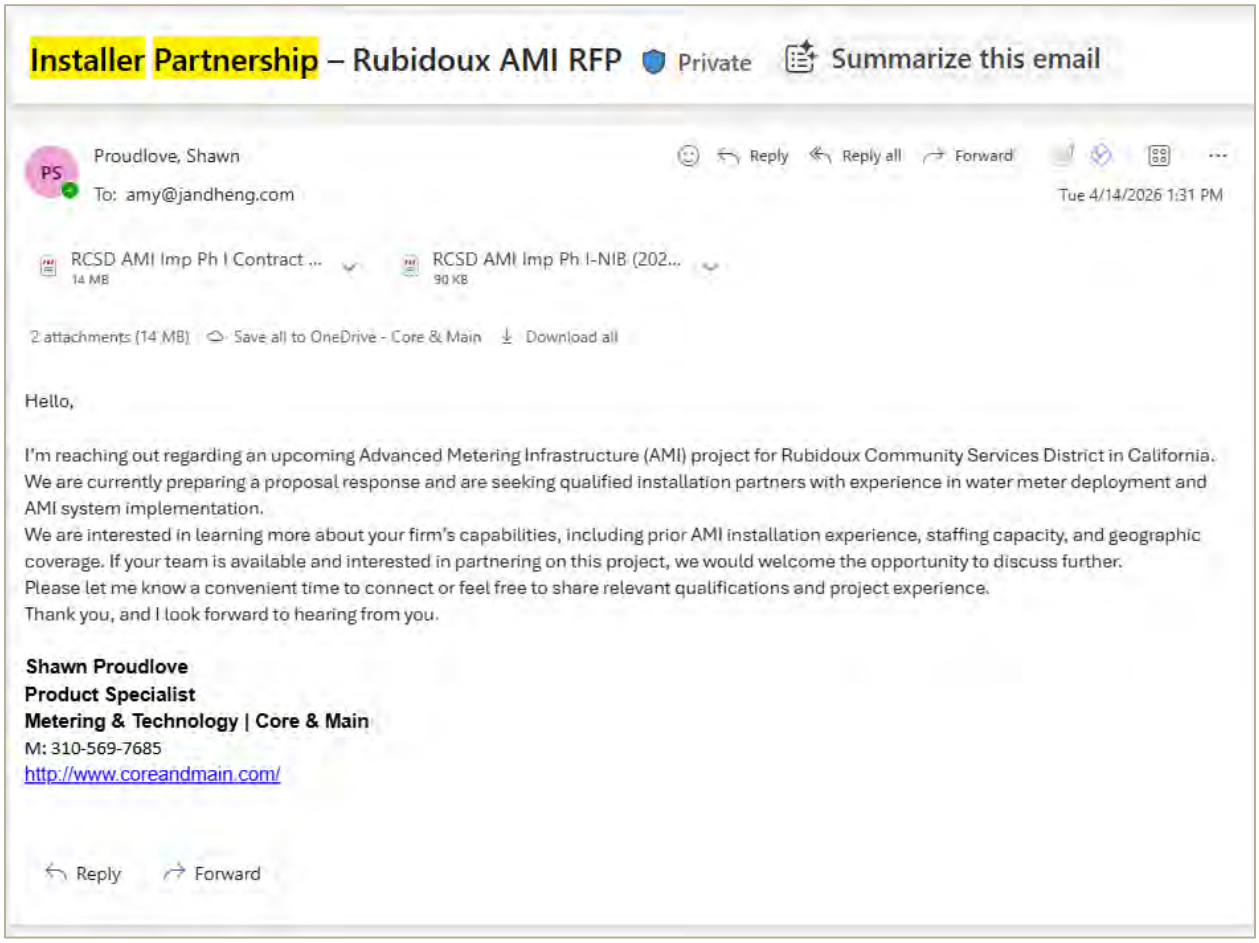
Sincerely,
Manjit

ENGCO ENGINEERING & INFRASTRUCTURE
Manjit Saini, P.E.
CEO
408-313-5400
www.iengco.com

From: Proudlove, Shawn <Shawn.Proudlove@coreandmain.com>
Sent: Tuesday, April 14, 2026 1:35 PM
To: Manjit Saini <manjit.saini@iengco.com>
Subject: Installer Partnership – Rubidoux AMI RFP

Hello,

J&H Engineering



Installer Partnership – Rubidoux AMI RFP Private Summarize this email

Proudlove, Shawn
To: amy@jandheng.com

Reply Reply all Forward

Tue 4/14/2026 1:31 PM

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RCSD AMI Imp Ph I-NIB (202... 90 KB

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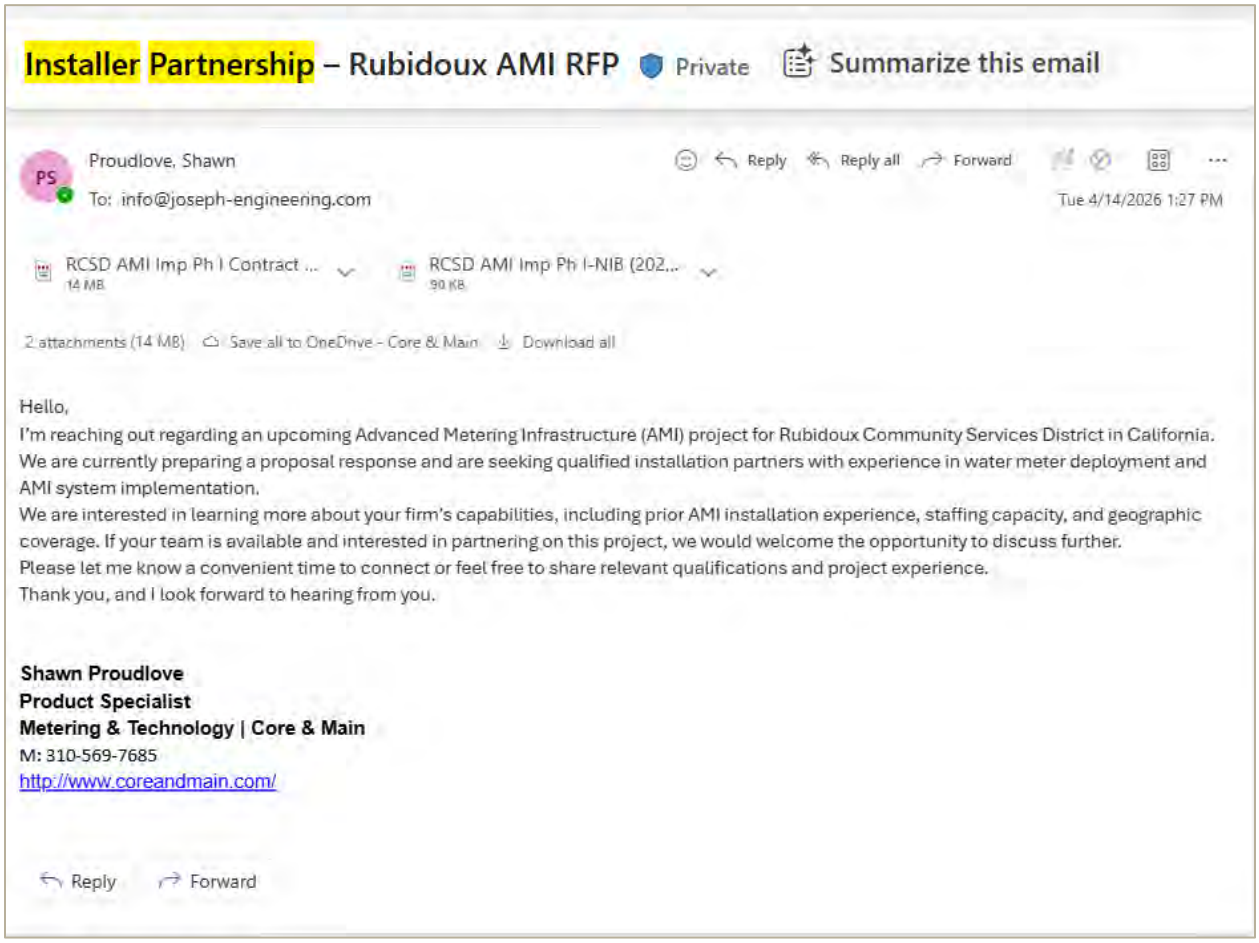
Thank you, and I look forward to hearing from you.

Shawn Proudlove
Product Specialist
Metering & Technology | Core & Main
M: 310-569-7685
http://www.coreandmain.com/

Reply Forward

Joseph Engineering – SBE



Installer Partnership – Rubidoux AMI RFP Private Summarize this email

PS Proudlove, Shawn

To: info@joseph-engineering.com

Reply Reply all Forward

Tue 4/14/2026 1:27 PM

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RCSD AMI Imp Ph I-NIB (202... 90 KB

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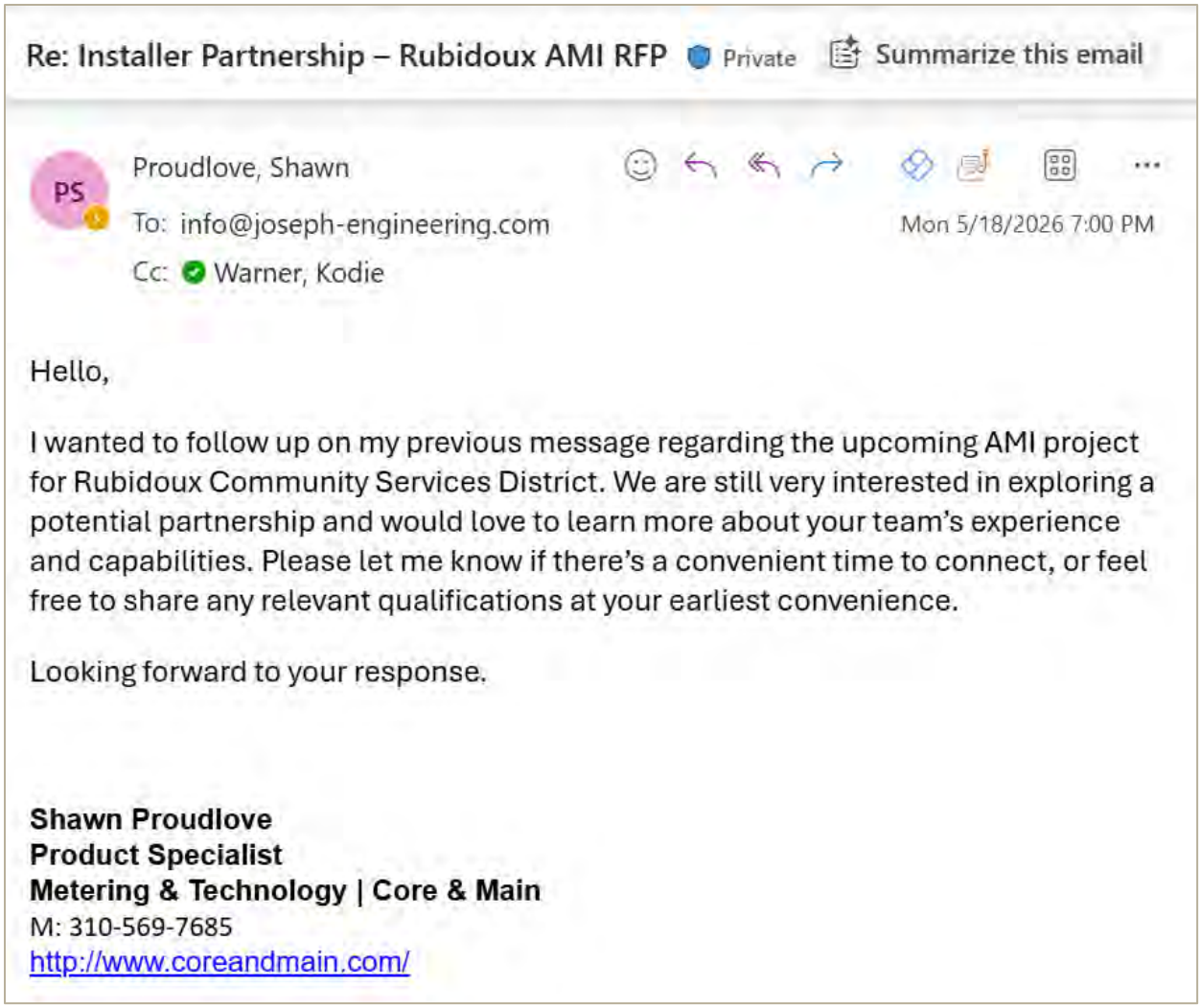
Shawn Proudlove
Product Specialist
Metering & Technology | Core & Main
M: 310-569-7685
http://www.coreandmain.com/

Reply Forward



Re: Installer Partnership – Rubidoux AMI RFP Private Summarize this email

PS

Proudlove, Shawn

To: info@joseph-engineering.com

Cc: Warner, Kodie

Mon 5/18/2026 7:00 PM

Hello,

I wanted to follow up on my previous message regarding the upcoming AMI project for Rubidoux Community Services District. We are still very interested in exploring a potential partnership and would love to learn more about your team's experience and capabilities. Please let me know if there's a convenient time to connect, or feel free to share any relevant qualifications at your earliest convenience.

Looking forward to your response.

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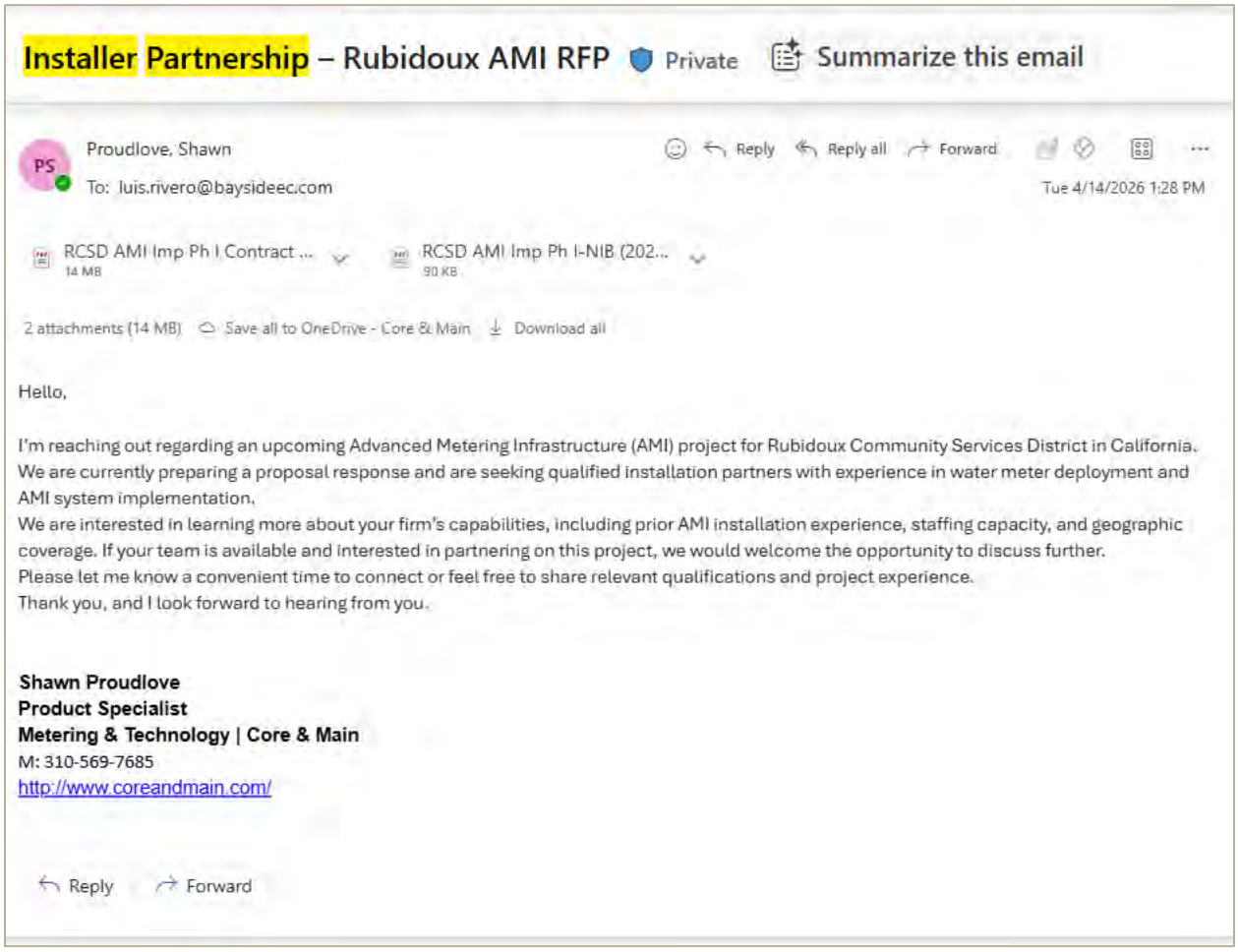
Bayside Engineering Construction



Installer Partnership – Rubidoux AMI RFP Private Summarize this email

PS Proudlove, Shawn

To: luis.rivero@baysideec.com

Reply Reply all Forward

Tue 4/14/2026 1:28 PM

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RCSD AMI Imp Ph I-NIB (202... 90 KB

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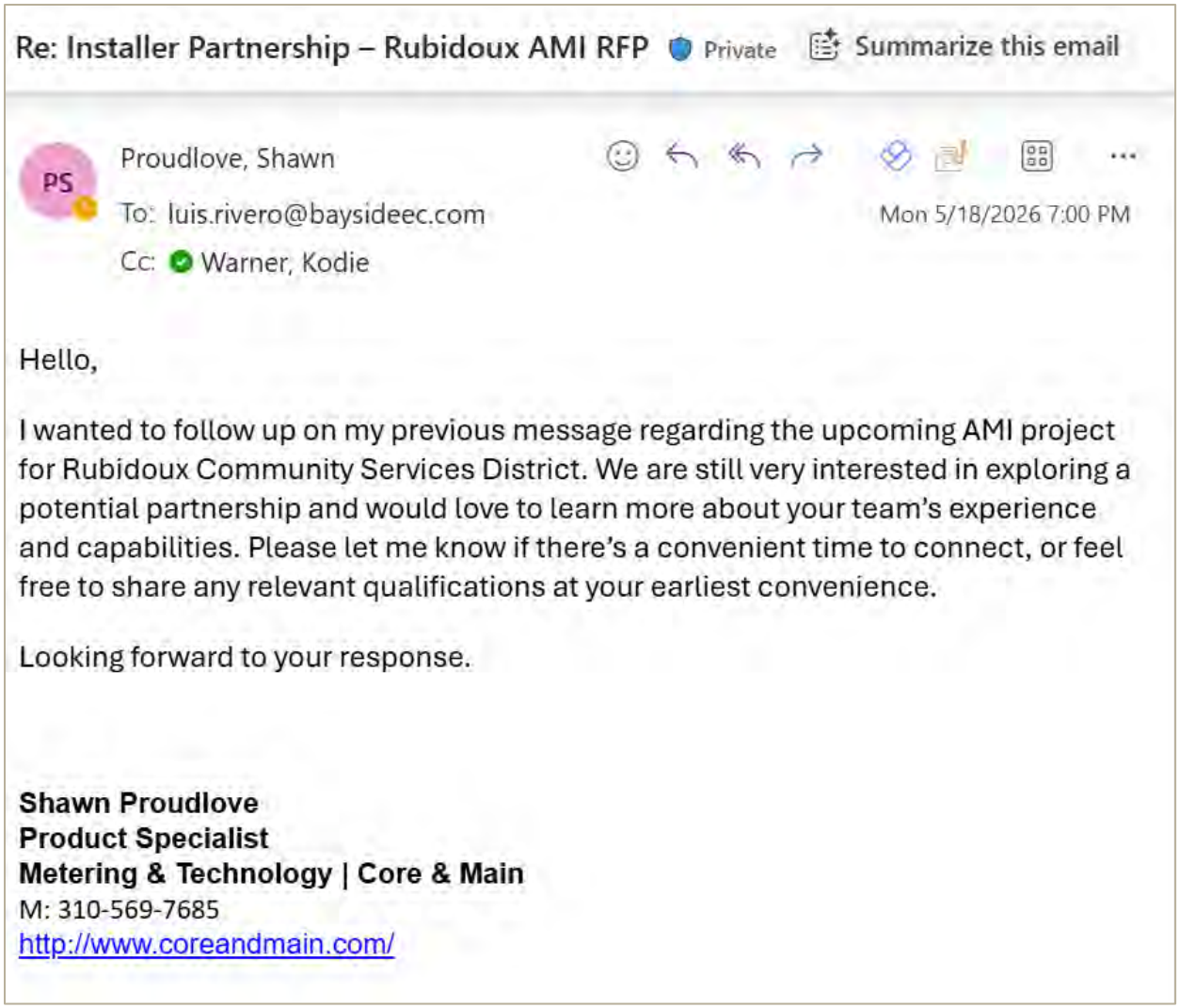

Re: Installer Partnership – Rubidoux AMI RFP Private Summarize this email

PS

Proudlove, Shawn

To: luis.rivero@baysideec.com

Cc: Warner, Kodie

Mon 5/18/2026 7:00 PM

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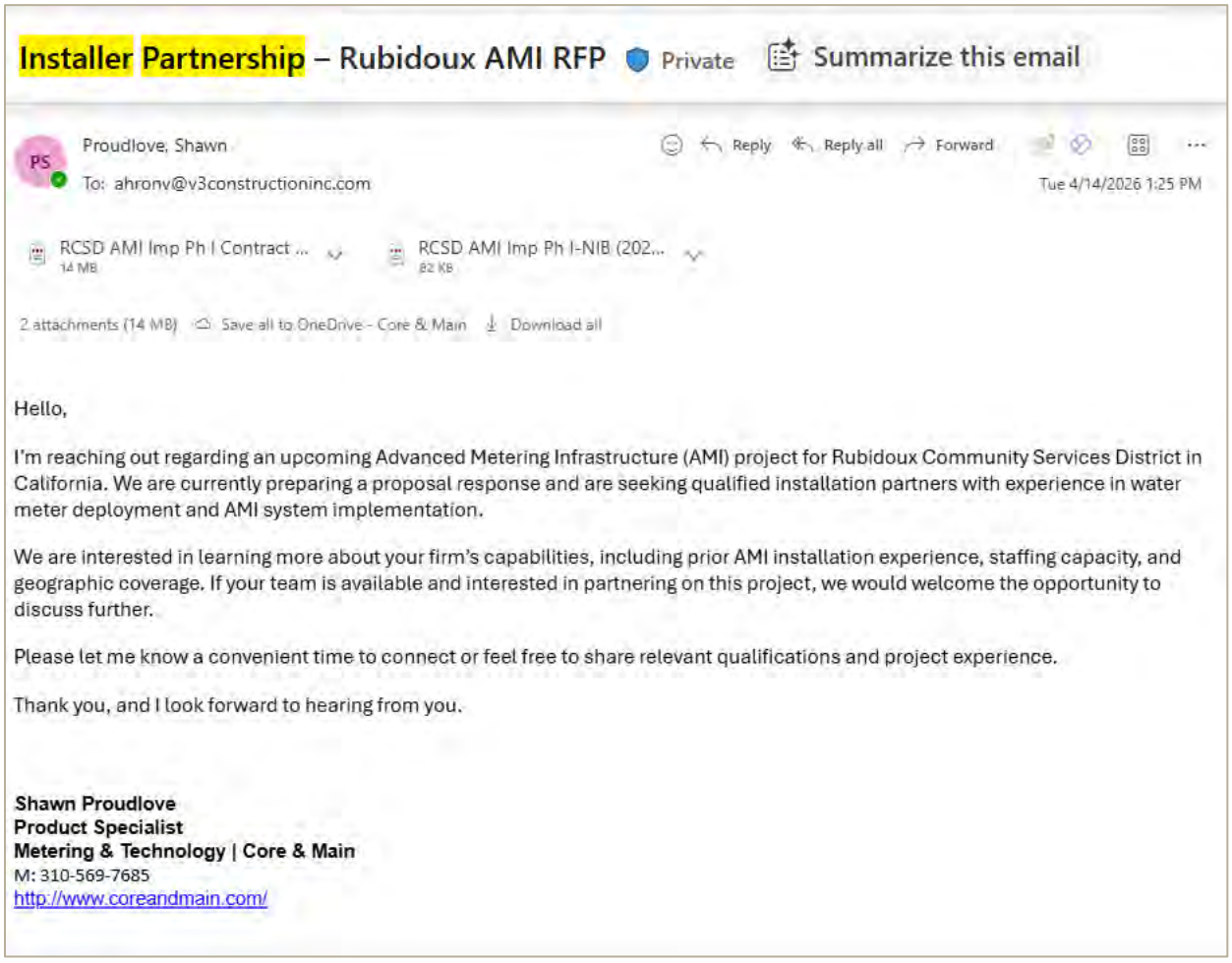
http://www.coreandmain.com/

V3 Construction Inc.



Installer Partnership – Rubidoux AMI RFP Private Summarize this email

Proudlove, Shawn
To: ahronv@v3constructioninc.com
Reply Reply all Forward
Tue 4/14/2026 1:25 PM

RCSD AMI Imp Ph I Contract ... 14 MB
RCSD AMI Imp Ph I-NIB (202... 82 KB

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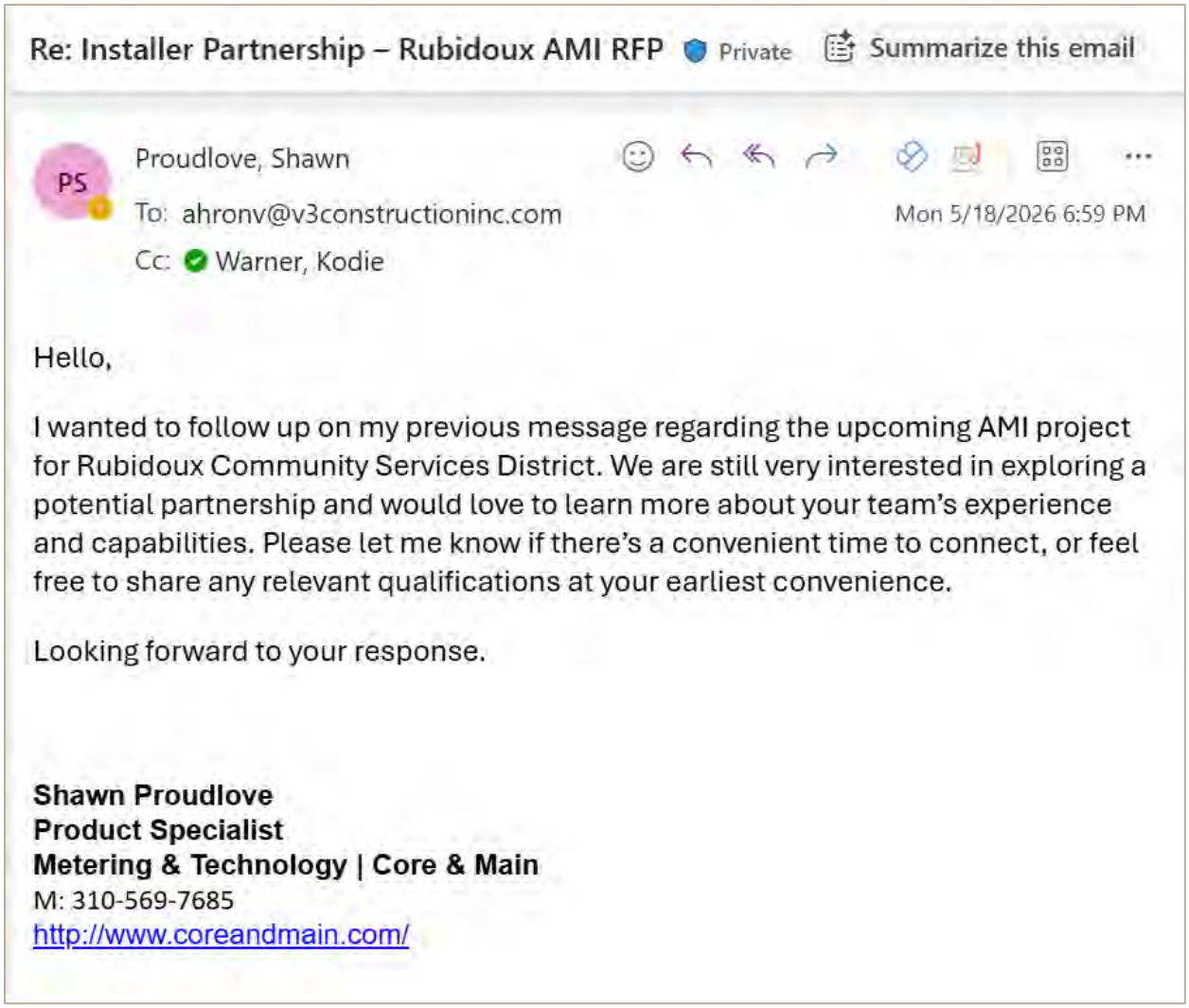

Re: Installer Partnership – Rubidoux AMI RFP Private Summarize this email

PS

Proudlove, Shawn

To: ahronv@v3constructioninc.com

Cc: Warner, Kodie

Mon 5/18/2026 6:59 PM

Hello,

I wanted to follow up on my previous message regarding the upcoming AMI project for Rubidoux Community Services District. We are still very interested in exploring a potential partnership and would love to learn more about your team's experience and capabilities. Please let me know if there's a convenient time to connect, or feel free to share any relevant qualifications at your earliest convenience.

Looking forward to your response.

Shawn Proudlove
Product Specialist
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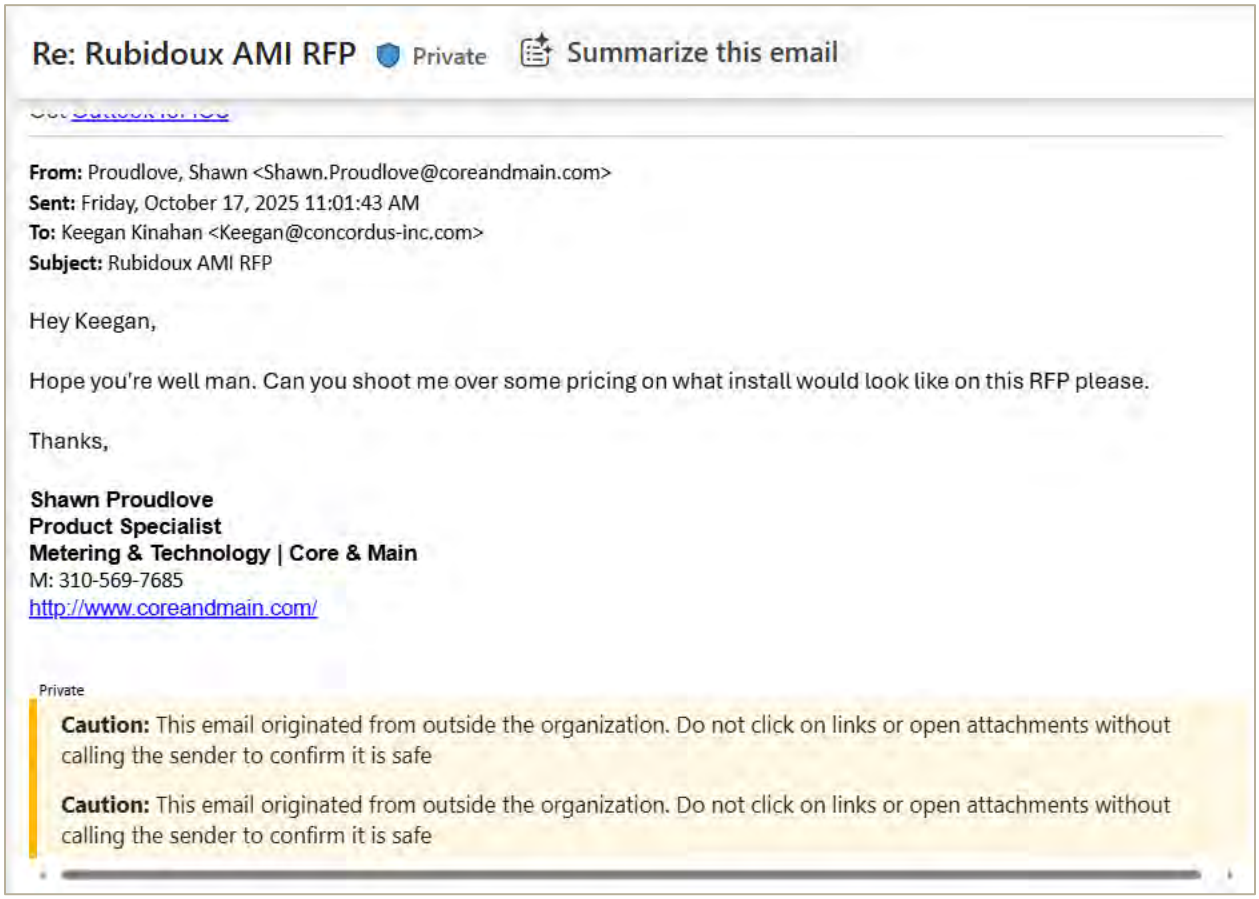
M: 310-569-7685
http://www.coreandmain.com/

Concord – WBE



Re: Rubidoux AMI RFP Private Summarize this email

From: Proudlove, Shawn <Shawn.Proudlove@coreandmain.com>
Sent: Friday, October 17, 2025 11:01:43 AM
To: Keegan Kinahan <Keegan@concordus-inc.com>
Subject: Rubidoux AMI RFP

Hey Keegan,

Hope you're well man. Can you shoot me over some pricing on what install would look like on this RFP please.

Thanks,

Shawn Proudlove
Product Specialist
Metering & Technology | Core & Main
M: 310-569-7685
http://www.coreandmain.com/

Private

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FLEET CERTIFICATION DOCUMENTATION

CALIFORNIA AIR RESOURCES BOARD

CLEAN TRUCK CHECK

Vehicle Compliance Certification

Issue Date: 3/4/2026

Start Date: 4/30/2026

Expiration Date: 10/30/2026

Certification ID: VCC1003620147

Vehicle Information

Vehicle Identification Number (VIN): 3AKJHLDV6SSWB0046
Vehicle License Plate: 3648783
Vehicle Make: FREIGHTLINER
Vehicle Model Year: 2025
Vehicle Model: CASCADIA 126

Business Information

Company/Entity Name: Core & Main
Entity ID: E163251
Primary Address: 1830 Craig Park Ct, Saint Louis, MO 63146-4122, USA

CARB reserves the right to invalidate this certificate if the vehicle is found violating the Clean Truck Check requirements prior to the certificate expiration date.

Future certificates may be denied if the vehicle has any outstanding CARB Enforcement actions.

Non-compliant vehicles could also have their registration denied by the Department of Motor Vehicles.

This compliance certificate does not exempt the vehicle from emissions-related inspection or audit.

For more information on Clean Truck Check, visit https://ww2.arb.ca.gov/cleantruckcheck.

To verify this certification: https://cleantruckcheck.arb.ca.gov.

CARB's Clean Truck Check team can be reached at hdim@arb.ca.gov.

Page 1

CALIFORNIA AIR RESOURCES BOARD

CLEAN TRUCK CHECK

Vehicle Compliance Certification

Issue Date: 12/10/2025

Start Date: 12/10/2025

Expiration Date: 5/31/2026

Certification ID: VCC1003620166

Vehicle Information

Vehicle Identification Number (VIN): 3ALACXFC7NDNA8986
Vehicle License Plate: 33402F3
Vehicle Make: FRTL
Vehicle Model Year: 2022
Vehicle Model: M2 106 MEDIUM DUTY

Business Information

Company/Entity Name: Core & Main
Entity ID: E163251
Primary Address: 1830 Craig Park Ct, Saint Louis, MO 63146-4122, USA

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To verify this certification: https://cleantruckcheck.arb.ca.gov.

CARB's Clean Truck Check team can be reached at hdim@arb.ca.gov.

CALIFORNIA AIR RESOURCES BOARD

CLEAN TRUCK CHECK

Vehicle Compliance Certification

Issue Date: 12/22/2025

Start Date: 12/22/2025

Expiration Date: 5/31/2026

Certification ID: VCC1003620151

Vehicle Information

Vehicle Identification Number (VIN): 3AKJHLDV8SSWB0047
Vehicle License Plate: 3648784
Vehicle Make: FREIGHTLINER
Vehicle Model Year: 2025
Vehicle Model: CASCADIA 126

Business Information

Company/Entity Name: Core & Main
Entity ID: E163251
Primary Address: 1830 Craig Park Ct, Saint Louis, MO 63146-4122, USA

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To verify this certification: https://cleantruckcheck.arb.ca.gov.

CARB's Clean Truck Check team can be reached at hdim@arb.ca.gov.

BABA PRODUCT WAIVER

Approved: December 20, 2024
Expires: December 19, 2027

DEPARTMENT OF THE INTERIOR
Bureau of Reclamation
and
The U.S. Environmental Protection Agency

General Applicability Non-Availability Waiver
Build America, Buy America Product Waiver: AMI Water Meters

1. Summary

Agency: Department of the Interior (DOI/Department)'s Bureau of Reclamation (USBR) and the U.S. Environmental Protection Agency (EPA)

Final Waiver: The Department is joining the EPA to issue a partial general applicability/nonavailability waiver of the requirements of section 70914 of the Build America, Buy America Act included in the Infrastructure Investment and Jobs Act (Pub. L. No. 117-58) for Advanced Metering Infrastructure (AMI) water meters used in infrastructure projects funded through USBR and the EPA, while requiring certain components of the water meters to be manufactured in the United States according to the phased implementation schedule below. This waiver is in effect for three (3) years from the date of approval. DOI and the EPA are implementing a phased approach during the waiver period, whereby, for two years from the date of approval, purchases of AMI meters and all components (the entire "manufactured product") are waived. Two (2) years from the date of approval, AMI meter housings shall be domestically manufactured or produced and excluded from the waiver scope; all other components continue to be waived through the end of the three-year period. This waiver only applies to products purchased after the effective date of this waiver and may not be used for products purchased after the expiration date of the waiver. At the conclusion of the full three-year waiver period, DOI and the EPA expect AMI water meters to be manufactured in the United States and their total cost of components to be greater than 55 percent domestically manufactured or produced.

Waiver type: Nonavailability of domestic products

Waiver level: General Applicability, Product level waiver

Waiver justification summary: There are no AMI water meters manufactured in the United States meeting BABA's 55 percent total cost of components domestic content requirement.

Length of the waiver: This waiver is in effect for three (3) years from the date of approval. DOI and the EPA are implementing a phased approach during the waiver period, whereby, for two years from the date of approval, purchases of AMI meters and all components (the entire "manufactured product") are waived. Two (2) years from the date of approval, AMI meter housings shall be domestically manufactured or produced components and will be excluded from the waiver scope. This waiver only applies to products purchased after the effective date of this waiver and may not be used for products purchased after the expiration date of the waiver.

Summary of items covered in the waiver:

- AMI water meters.

1

NAICS: 334514
PSC: 6632

2. Background

The Buy America Preference set forth in section 70914 of the Build America, Buy America Act included in the Infrastructure Investment and Jobs Act (Pub. L. No. 117-58), requires all iron, steel, manufactured products, and construction materials used for infrastructure projects under Federal financial assistance awards be produced in the United States.

Under section 70914(b), a Federal agency may waive the application of the Buy America Preference, in any case in which it finds that: applying the domestic content procurement preference would be inconsistent with the public interest; types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality; or the inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent. All waivers must have a written explanation for the proposed determination; provide a period of not less than 15 calendar days for public comment on the waiver; and submit the waiver to the Office of Management and Budget Made in America Office for review to determine if the waiver is consistent with policy.

3. Description of Covered Items

Manufactured products: AMI water meters collect water usage information. When used as a fixed network across a community, AMI water meters automatically collect and store consumption data, aiding in water conservation and water use efficiency, improved water management, and energy savings. Information provided helps identify high water usage that could indicate leaks, providing time sensitive leak detection alerts. AMI water meter networks reduce water demand by enhancing conservation, reduce energy use/operating costs, and reduce carbon emissions using remote/automated meter reads.

AMI water meters are composed of meter housings, end points/transmitters, printed circuit boards, meter electronics, batteries, base stations, repeaters and associated equipment. Based on market research completed within the last two years, some manufacturers source the materials for the meter housings domestically. A few manufacturers indicated that their meter housings are 100 percent manufactured or produced within the United States. However, the industry universally sources the end points/transmitters, printed circuit boards, meter electronics, and batteries internationally. As these components are the most expensive parts of the water meter, the meter system as a whole does not meet BABA's 55 percent of total cost of components domestic content requirement.

Based on the market research described below, there are currently no AMI water meters manufactured domestically that meet BABA requirements.

4. Waiver Justification

Based on cumulative and collaborative market research efforts, DOI and the EPA are issuing a three-year waiver split into two phases. In the first phase, a waiver shall be provided for two years from the date of approval to cover AMI meters and all their components. Two (2) years

from the date of approval, AMI meter housings shall be a domestically manufactured or produced component, but other AMI water meter components will continue to be waived. At the conclusion of the three-year waiver period, DOI and the EPA anticipate that AMI water meters (i.e., bundled with their component parts) will be available as a manufactured product with 55 percent or more of the components domestically manufactured or produced.

This waiver's purpose is to incentivize production of BABA compliant AMI water meters. Based on stakeholder feedback, DOI and the EPA have identified that significant challenges prevent AMI water meters from being BABA compliant. However, with appropriate market signals, AMI water meters could be BABA compliant by the expiration of the waiver. DOI and the EPA are seeking this waiver specifically to send the appropriate market signals to the AMI water meter manufacturing community. DOI and the EPA's expectation is that AMI water meters be BABA compliant. This waiver identifies a realistic phased pathway for domestic manufacture of these products, first by targeting the domestic manufacture of meter housings, with the second phase for the remaining components of an AMI water meter that are not currently available to be manufactured or produced within the United States. As an incentive, while this waiver is active, manufacturers may still receive the benefit of Federal funding by providing products to be used under Federal awards, with the phased approach rewarding those manufacturers that take advantage of the waiver period to transition to domestic content.

Anticipated impact if no waiver were issued: DOI's USBR provides annual funding for the competitive Water and Energy Efficiency Grant (WEEG) program, which regularly funds AMI water meter projects. As no BABA compliant AMI water meter is available, there is no alternative but for these projects to be covered by a product or project waiver. In FY23 alone, USBR's WEEG program competitively selected water meter grants totaling $43 million Federal and $90 million non-Federal funding. This $134 million investment is expected to result in an annual water savings of over 20,000 acre-feet. Based on historical data, the EPA anticipates that at least 10 percent of all EPA funded water infrastructure projects will purchase and install AMI water meters. The majority of these will occur through the State Revolving Fund, the Water Infrastructure Finance and Innovation Act program, and other funding programs. As no BABA compliant AMI water meter is available, there is no alternative but for these projects to be covered by a product or project waiver.

In the absence of this waiver, DOI, the EPA, and the Federal grant-making community will miss an opportunity to clearly articulate expectations for creating a domestically manufactured or produced market to the AMI water meter manufacturing community. This could have the impact of slowing the long-term domestic sourcing transition, and curtailing Federal participation in AMI water meter projects, which would weaken support for communities throughout the West that are struggling to conserve their declining water supply.

Market Research to Justify Product Non-Availability Waiver: From 2022 through 2024, DOI, the EPA, and grant recipients conducted market research to assess the availability of domestically manufactured AMI water meters. As a result of this cumulative market research, there is no known manufacturer of AMI water meters, that meet BABA's domestic production requirements.

All manufacturers responsive to market research inquiries stated that they are in the process of evaluating the idea of moving manufacturing to the U.S., but have no immediate plans or timeframes identified. As there are upwards of fifty (50) components to an AMI water meter system, evaluating the domestic sourcing of the manufactured product as a whole through the component cost break down is a significant effort. Should key high-cost components of an AMI water meter be manufactured within the U.S. in the future, this could lead to a domestically produced manufactured product meeting the 55 percent BABA requirement.

DOI and the EPA considered whether an AMI water meter waiver could target certain components, such as the internal electronics and end points, rather than the AMI water meter as a whole. Transmitters, printed circuit boards, meter electronics, batteries, and end points used within AMI water meters were identified as the components most difficult to source domestically. Market research feedback has indicated that one component of the AMI meter -- the meter housings -- are manufactured domestically by several manufacturers. However, BABA-compliant water meter housings are not available immediately in sufficient quantities to meet demand, nor are they universally compatible. This waiver, through the phased approach, reflects market research and public comments confirming that water meter housing components can be manufactured domestically within two years. DOI and the EPA also considered whether this waiver could be targeted to AMI water meters below a size threshold but found no evidence to support targeting specific size thresholds.

To gain additional industry feedback on materials used in water infrastructure products, such as AMI water meters, the EPA published a Request for Information (RFI) *Request for Information Regarding Products and Categories of Products Used in Water Infrastructure Programs* in the Federal Register on November 20, 2023, which closed on December 20, 2023, EPA-HQ-OW-2023-0396-0001). The RFI requested feedback detailing domestic materials sourcing, market readiness, other product supply considerations, and whether water infrastructure products are manufactured in the U.S. The EPA and DOI examined the 12 comments that provided feedback on the domestic availability of water meters.

In general, commentors to the RFI noted that manufacturers need time to assess, design, develop, and test new lines of domestically produced products consistent with BABA requirements. Component changes on manufactured goods require re-evaluation periods to reduce major issues in manufacturing. This includes establishing new domestic production facilities, new BABA compliant lines of domestic products, and staffing for the new facilities. Commenters also reported significant concerns with stocking burdens, customer communication issues, and production capacity issues. Commenters noted that there are significant issues related to the domestic sourcing of electronics. Commenters note that there is no support to offset the foreign procurement of the electronics. One commentor shared that they were unlikely to meet the BABA domestic component sourcing requirements within five years, as the effort requires a significant time and funding investment.

Given that it is not possible for all future funded AMI water meter projects to source the meter housings from the few domestic sources, (for the above described compatibility and market lead times concerns), DOI and the EPA are issuing a time-limited three-year phased waiver, in which all components of the water meter product are waived in phase one. This initial, two-year phase

of the waiver covers all components of the AMI smart meter to provide an opportunity for manufacturers to assess the sourcing of their meter housings and transition to a domestic supply for that component. The second phase of this waiver, which begins two (2) years from the date of approval, extends waiver coverage to components of the AMI water meter except the meter housing, for the third of three years, whereby AMI water meter housings will be required to be domestically manufactured at that time.

DOI and the EPA consider this waiver to provide a significant market signal and time for manufacturers to analyze current issues and develop strategies to create domestically manufactured or produced products that are consistent with BABA requirements. This will also give time to assess, design, develop, and test new lines of the domestic products. Responses to the EPA's RFI were generally consistent with the feedback DOI had previously received.

DOI and the EPA consider this waiver's incentive-based approach to be appropriate and fair for both manufacturers that have manufactured or produced some of their AMI water meter components domestically and those that have not prioritized a domestic supply of components prior to the enactment of the Infrastructure Investment and Jobs Act, sometimes referred to the Bipartisan Infrastructure Law. Manufacturers not sourcing their components domestically will have sufficient and reasonable time to reassess, plan, and implement changes. Manufacturers currently sourcing some of their products domestically will have sufficient and reasonable time to source the high-cost components of AMI water meters domestically. While the industry as a whole manages this transition, DOI and the EPA may continue to fund projects to conserve and efficiently use water resources through the use of AMI water meters. An analysis will be required immediately prior to the conclusion of the waiver period to identify how the AMI water meter industry has shifted in response to changing market conditions.

Expectation for the agency, award recipients, and industry at the conclusion of the waiver:
DOI and the EPA expect to continue to engage in conversations with grant recipients and other Federal agencies to encourage the AMI water meter manufacturing industry to meet the 55 percent of total cost domestic content requirement for BABA compliance.

DOI and the EPA will review this waiver annually to assess whether it remains necessary. DOI and the EPA may, based on the results of that review, terminate, or narrow the scope or duration of this waiver, or take such other action deemed as appropriate.

5. Assessment of Cost Advantage of a Foreign-Sourced Product

Under OMB Memorandum M–24-02, Federal agencies are expected to assess "whether a significant portion of any cost advantage of a foreign-sourced product is the result of the use of dumped steel, iron, or manufactured products or the use of injuriously subsidized steel, iron, or manufactured products" as appropriate before granting a public interest waiver. DOI and the EPA's analysis has concluded that this assessment is not applicable to this waiver as this waiver is not based on the cost of foreign-sourced products.

6. Summary of Public Comments

The waiver received sixteen (16) public comments over the thirty (30) day publication period from August 30, 2024 through September 28, 2024. Five (5) municipal water authorities, four (4) manufacturing entities, three (3) state revolving fund programs, two (2) water infrastructure associations, one (1) national manufacturing association, and one (1) consulting engineer submitted comments. None of the comments opposed the waiver, in general. Most comments included detailed information for consideration, all of which were substantive. While commenters expressed support for the waiver generally, many raised concerns with aspects of the waiver including the phasing and overall duration, component specificity, nomenclature, and scope.

Many commenters requested the waiver duration be extended beyond the three years proposed, noting that additional time appears necessary to scale up and build production for the potential demand cited in the proposal. DOI and the EPA considered the comments regarding waiver duration and determined that the points raised did not warrant extension beyond the proposed three-year duration. Market research for this waiver identified several domestic manufacturing entities that have made recent investments in domestic manufacturing, and comments to the waiver confirm that increasing domestic supply will be available nearing the end of the waiver period. Extension of the waiver beyond three years may disincentivize potential investment and expansion of the developing domestic sources. Before the conclusion of the waiver, DOI and the EPA will re-evaluate the conditions of supply chains for water meters. Should domestic availability continue to be a concern and the identified domestic manufacturing base is unable to ramp up production to meet expected demand, the expiring waiver will be re-considered.

Comments also asked for clarification on the timing of the waiver phases, noting that the language in the proposal caused some confusion about the sequence of the phases whereby some commenters interpreted the total waiver time period as five years, which was not the intent of the proposal. This final waiver includes adjusted language to clarify the phases of the waiver, as follows: The first phase, which is two (2) years in duration, covers AMI meters and all their components. Two (2) years from the date of approval, AMI meter housings shall be a domestically manufactured or produced component, but all other components continue to be waived for the final year of the waiver. The total duration of the waiver is three (3) years.

Several comments expressed concerns with terminology used in the waiver, including references to water meter "bodies" and "resins," in addition to requesting clarification regarding the components of a water meter manufactured product. The consensus of comments recommended changing "bodies" to "housings" to clarify and avoid confusion, a change which is reflected in the final waiver. Additionally, comments recommended striking "resins" from inclusion in the components list describing typical water meter products, noting that the resins are typically input materials that are used to produce components (such as meter housings), and therefore are not directly incorporated into the final manufactured product. The term "resins" has been removed from the final waiver. The final waiver does not, however, include any other changes in reference to the components of a water meter product. DOI and the EPA examined the comments and while the consensus of comments requests delineation of all known, specific components of a water meter product, or to refer to the products as "systems," the final waiver is unchanged from the proposal in this aspect. Several comments noted that the technologies can differ

significantly across brands and models, and that products are evolving rapidly. In order to avoid confusion and mischaracterization of product types, the final waiver retains the example list of water meter product components (such as meter housings, end points/transmitters, printed circuit boards, meter electronics, batteries, base stations, repeaters, and associated equipment), noting that components can differ depending on the water meter system in use or the needs of specific projects. DOI and the EPA view this list of components as a reasonable instructive example of what comprises a water meter manufactured product.

The waiver requested comments regarding the substitutability and compatibility of meter housings and meters from different manufacturers. Six (6) commenters responded that AMI water meters from different manufacturers are not compatible without loss of "AMI" features. One (1) commenter shared that intermingling components would likely void product warranties. DOI and EPA, therefore, consider it important to provide sufficient time and appropriate phasing of this waiver to encourage a market-wide domestic sourcing transition.

The waiver requested comments regarding a potential domestic assembly requirement, to which two (2) commenters responded substantively. One (1) commenter requested expanding the timeframe of the waiver significantly in order to include a domestic assembly requirement after four (4) years. Another commenter responded noting that they could presently domestically assemble a portion of the projected national supply for AMI water meters and could expand that domestic assembly capability to a larger portion (though far less than half of the total) of the demand with further investment, but the timing for the expansion was not provided. While DOI and the EPA appreciate the manufacturing entities' encouraging efforts toward domestic assembly, and strongly recommend recipients to utilize domestically assembled water meters when available, comments did not indicate market readiness for domestic assembly across the industry. The comments did not address or remove concerns that including a domestic assembly requirement within the three-year waiver period would alleviate existing supply chain issues. In light of many comments received emphasizing compatibility issues for municipal projects, the evidence for domestic assembly sourcing to supply the wide range and full projected needs of recipient projects does not warrant inclusion of an assembly requirement during the waiver period.

The waiver applies coverage at the point of purchase. Several comments requested that the final waiver include a change or further clarification to the applicability point for the acquisition of water meters. DOI and the EPA consider the purchase date stipulation to be a clear signal point of waiver applicability for manufacturers and a workable definition for recipients and oversight authorities. Other commenter suggested reference points could create confusion between manufacturers and recipients, ultimately undermining the waiver intent and potentially inviting noncompliance through misapplication of the waiver. The EPA has demonstrated success from past national waivers with the use of purchase date as the waiver applicability point, providing clarity for manufacturers, financial assistance recipients (including sub-recipients), and compliance oversight authorities.

Several comments requested expansion of the waiver to include other types of flow meters beyond AMI water meters. DOI and the EPA are not expanding the waiver to include additional meter types at this time. Although the comments shared supply chain concerns for additional

meter types, the information available does not provide sufficient detail to support expansion of the waiver. DOI and the EPA will continue to evaluate supply chains for these products and may examine future waiver actions based on additional market research or project-specific waiver requests.

Multiple commenters requested the waiver apply to projects with AMI water meter projects already underway, noting that supply chain issues identified in the waiver apply to current activity equally as to future purchases. DOI and the EPA acknowledge that active water meter projects that have already received federal financial assistance for AMI smart water meters are not within the scope of this waiver, noting that extension of this waiver for these situations would "retroactively" apply the waiver, a policy prohibited through M-24-02. If a project has concerns or uncertainty about the status of their project relative to this waiver, DOI and the EPA recommend that projects contact the appropriate funding authority to discuss the specifics of ongoing projects.

For more information on the Buy America Preference, please reference www.doi.gov/grants/buyamerica or MadeinAmerica.gov and www.epa.gov/cwsrf/build-america-buy-america-baba.

The EPA hereby issues this general applicability/nonavailability waiver of the requirements of section 70914 of the Build America, Buy America Act included in the Infrastructure Investment and Jobs Act (Pub. L. No. 117-58) for AMI water meters used in infrastructure projects.

Michael S. Regan, Administrator
U.S. Environmental Protection Agency

PROPAGATION STUDY

***START OF CONFIDENTIAL INFORMATION**

kamstrup

Propagation Study

Rubidoux, CA

Consultant/Radio Planner	DEGN
Date	March 16th, 2026
Version	01.00
Approver	MAHS

Facts – from the questionnaire

No. of Meters: 4,982
No. of Collectors: 2
Meter location: 100% pit; mix of lids
Requested Performance: Hourly
Extra info:

Conditions

The following situations are not included in the measured performance:

- Failure of third-party communications (e.g. GSM network or IP infrastructure)
- Defective meters or collectors
- Poor meter box/pit maintenance
- Meters or collectors that have been affected by external factors (e.g. vandalism, physical harm or enclosure)
- Installations that are not performed or not possible to perform in accordance with the installation instructions and training of the vendor.
- The sites should be established within 150 feet of the specified locations. Alternative locations need approval by Kamstrup.
- Antenna must be placed at minimum the specified height (above ground) and free from surrounding roofs and structures.

Page 1

kamstrup

Service Area

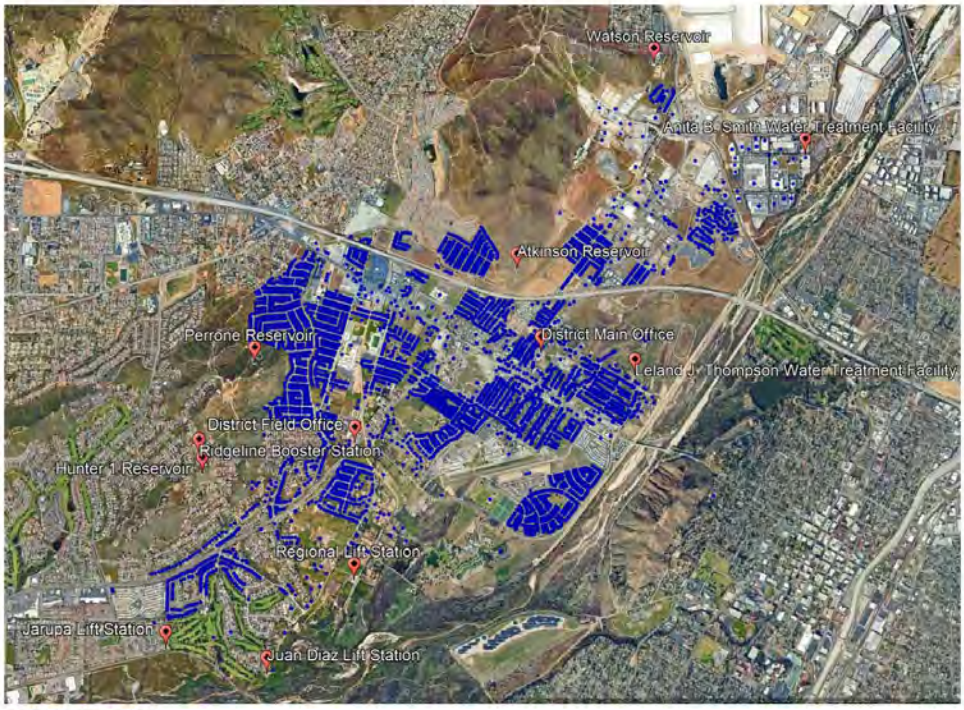

Figure 1: Service Area

Page 2

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Site placement & Radio cover

Assets Used

Asset Name	Structure Type	Address/Coordinates	Min. antenna height
Atkinson Reservoir	Existing Tank	34.006760°, -117.407747°	37'
Hunter 1 Reservoir	Existing Tank	33.988446°, -117.441249°	40'

Table 1 Assets Used

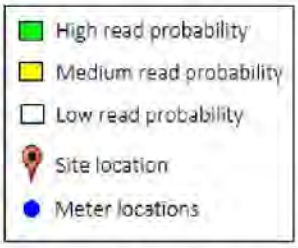
Assets Not Used

Asset Name	Structure Type	Address/Coordinates	Min. antenna height
Anita B. Smith Water Treatment Facility	New Pole	34.01762576, -117.3755908	40'
District Field Office	New Pole	33.99131465, -117.42481573	40'
District Main Office	New Pole	33.99910399, -117.40446093	40'
Jarupa Lift Station	New Pole	33.97342969, -117.44373926	40'
Juan Diaz Lift Station	New Pole	33.97094011, -117.43321416	40'
Leland J. Thompson Water Treatment Facility	New Pole	33.99743981, -117.39397966	40'
Perrone Reservoir	Existing Tank	33.99797305, -117.43387809	40'
Regional Lift Station	New Pole	33.97917548, -117.42414074	40'
Ridgeline Booster Station	New Pole	33.99019007, -117.44091647	40'
Watson Reservoir	Existing Tank	34.02594309, -117.39188534	37'

Table 2 Assets Not Used

Study results

When analyzing the scenarios presented in this section, refer to the legend below:



High Read Probability: Highlighted Green on the Map – very likely to receive daily reads from meter

Medium Read Probability: Highlighted Yellow on the map – likely to receive reads every other day to every seven days

Low read Probability: No highlighting shown on map – likely to not have radio signal coverage from collector

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Coverage - Dry pit with polymer lids

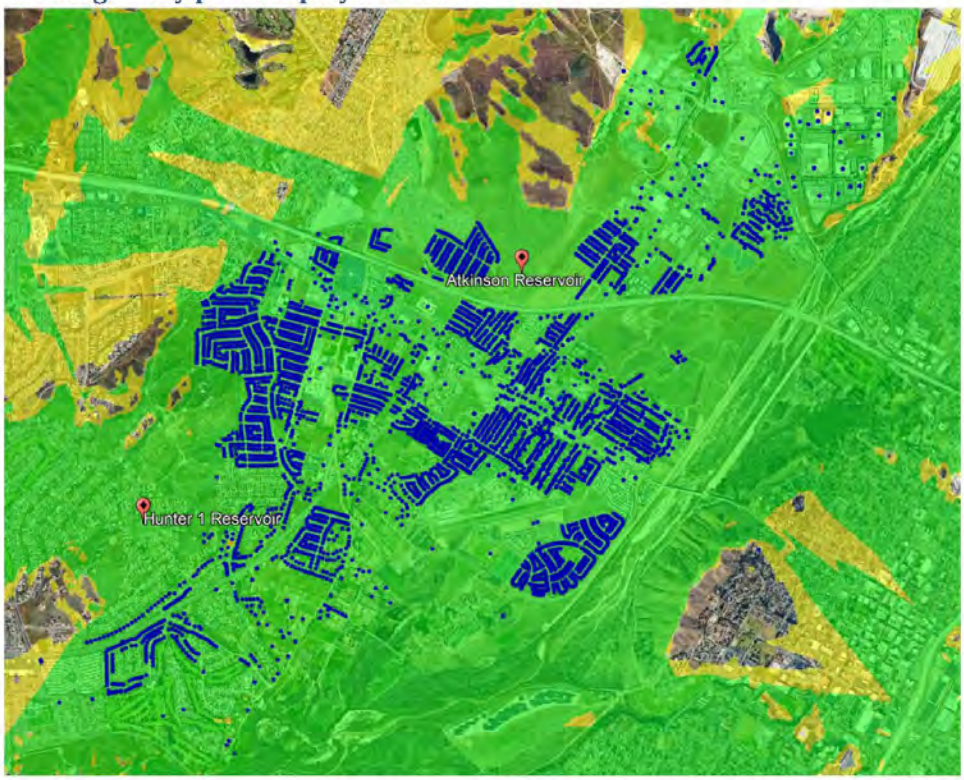

Figure 2: Dry pit with polymer lids

Coverage - Dry pit with concrete lids

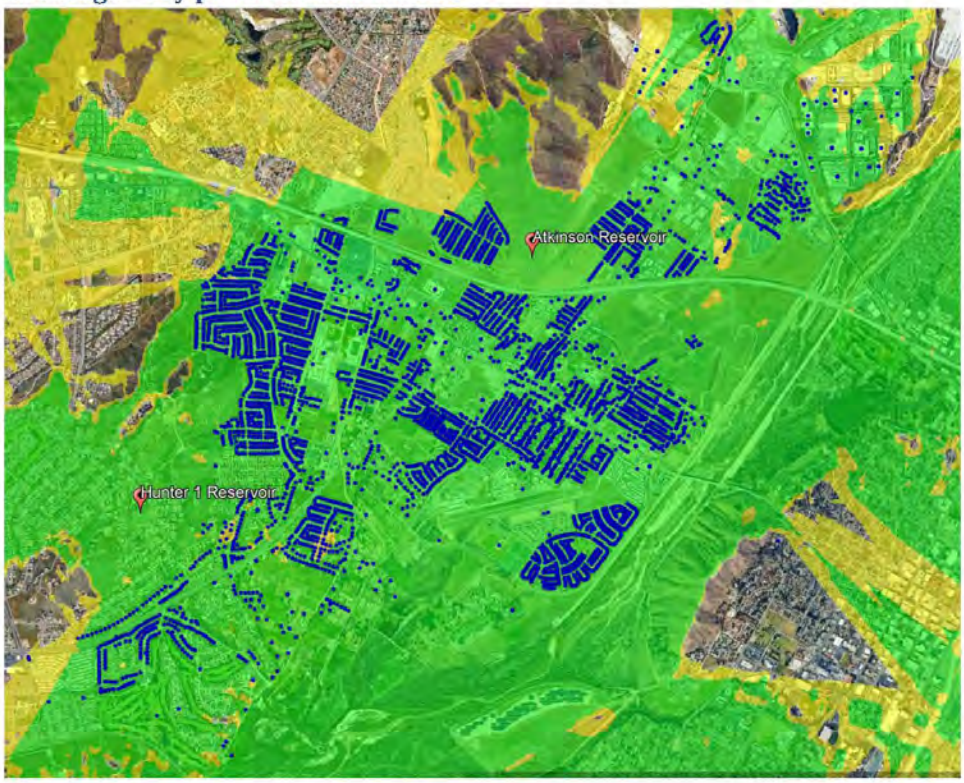

Figure 3: Dry pit with concrete lids

kamstrup

Coverage – Flooded pits or cast-iron lids

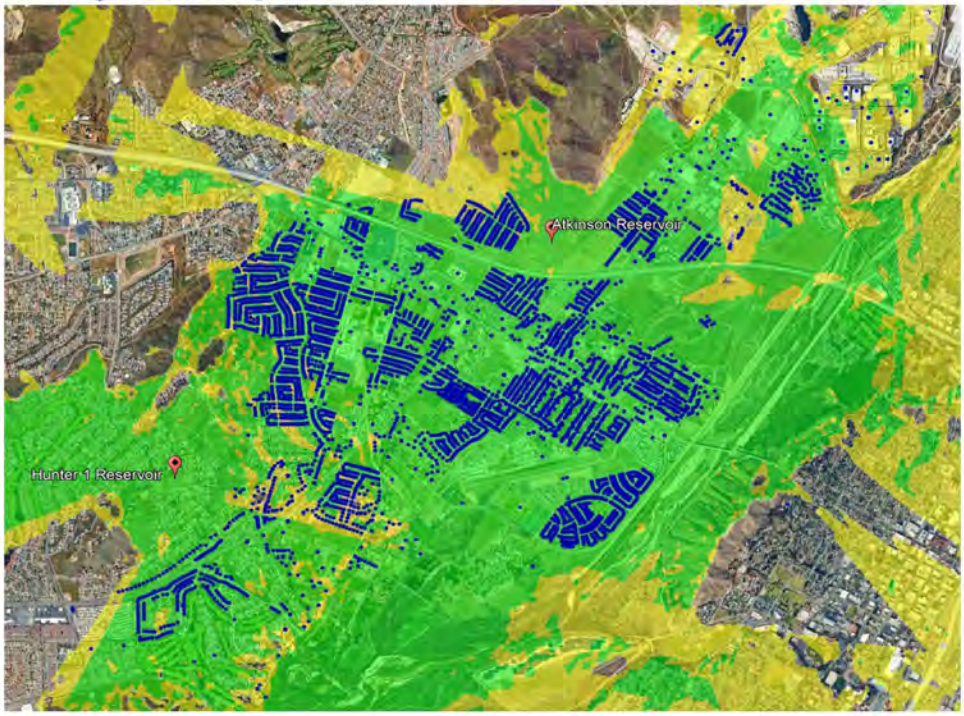

Figure 4: Flooded pits or cast-iron lids

Results of the propagation study

Budget with 2 collectors and 2-3% external antennas for full coverage and a maximum of 99% hourly reads for a mix of lids, or 1% external antennas for all polymer lids.

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***END OF CONFIDENTIAL INFORMATION**

EXCEPTIONS OF CORE & MAIN LP

The replacement pages supersede and replace the corresponding original pages in their entirety.

Shawn Proudlove
Shawn Proudlove (Jun 25, 2026 13:16:09 PDT)

Jun 25, 2026

Docusign Envelope ID: A6B0D5D2-6408-8A4F-8087-3B141AACEB23

Exceptions of Core & Main LP

Submitted to the Rubidoux Community Services District, CA
Invitation for Bids: Advanced Metering Infrastructure Implementation Project Ph 1

Core & Main LP ("Core & Main") hereby qualifies its bid and takes exception to the provisions of any Invitation for Bids as follows. The bid of Core & Main and acceptance by Core & Main of any subsequent agreement is made expressly conditioned upon assent of the Rubidoux Community Services District (the "Owner") to the following additional or different terms, which shall supersede and control over the terms of any invitation for bids, any contract documents and specifications, and any prior addenda thereto:

1. **INSURANCE.** A certificate of insurance (COI) is attached to demonstrate the level of coverage carried by Core & Main. Core & Main will not be required to provide copies of its policies or carry owner's/contractor's protective liability coverage. However, Core & Main will provide an updated COI showing the Owner as additional insured on liability policies. Notice of cancellation or reduction of coverage will be per policy terms. Property (install floater) insurance will not cover materials post install, but this shall in no way diminish, impair or in any other way affect warranty rights and obligations.

2. **INDEMNITY.** Core & Main shall not be required to defend or indemnify Owner or any other persons or parties except to the extent claims are alleged or determined to have been caused by the negligence, willful misconduct, or breach of contract of Core & Main or anyone for whose acts it is contractually or otherwise legally responsible.

3. **RISK OF LOSS.** Risk of loss of or damage to all equipment and materials shall pass from Core & Main to the Owner (or Owner's individual customer) at the time they are installed and confirmed as operating properly. However, the foregoing shall in no way diminish, impair or in any other way affect warranty rights and obligations.

Dated this 30th day of April, 2026; revised June 25, 2026.

CORE & MAIN LP

Signed by:
Shawn Proudlove
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Page **1 of 1**

CORE & MAIN WARRANTY

RUBIDOUX COMMUNITY SERVICES DISTRICT WARRANTY

The warranties on meters, equipment and services included within the scope of Core & Main LP's proposal and any resulting agreement, shall be as follows:

1. Project Materials and Equipment.

(a) General. Materials and equipment included in the project scope purchased from Core & Main are warranted by the manufacturers to be free from defects for the period specified in the manufacturers' warranties, upon the terms and subject to any limitations stated therein. A copy of the present warranty of each manufacturer that will supply materials and equipment as part of the project is attached hereto as Exhibit A. The duration of any such manufacturer's warranty shall be as set forth in such warranty ("Manufacturer's Warranty Period"). CORE & MAIN DOES NOT PROVIDE ANY WARRANTY FOR PROJECT MATERIALS AND EQUIPMENT BEYOND THE MANUFACTURER'S WARRANTY.

(b) Core & Main's Responsibility. Upon any breach of the manufacturer's warranty on materials or equipment noticed to Core & Main during the applicable Manufacturer's Warranty Period, Core & Main's sole responsibility shall be to cooperate with the District in arranging for the manufacturer to repair or replace any defective material or equipment.

2. Services Work.

(a) General. Core & Main warrants that all services provided by Core & Main or its subcontractors shall be performed in a workmanlike manner and in compliance with any specifications set forth in the agreement between the parties, with such warranty to expire one year from the date when such services were provided (the "Services Warranty Period").

(b) Exclusive Remedy. Upon any breach of Core & Main's warranty as to services during the Services Warranty Period, Core & Main's sole responsibility shall be to perform any corrective work necessary to bring Core & Main's services into compliance with such requirements.

3. DISCLAIMER OF FURTHER WARRANTIES. EXCEPT FOR THE FOREGOING EXPRESS WARRANTIES, CORE & MAIN DISCLAIMS ALL WARRANTIES INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT, WHETHER ARISING OUT OF WARRANTY, INDEMNITY, TORT, CONTRACT OR OTHERWISE, SHALL CORE & MAIN BE LIABLE FOR ANY INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES OF ANY KIND.

MEMORANDUM OF INSURANCE

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 07/30/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Willis Towers Watson Northeast, Inc. c/o 26 Century Blvd P.O. Box 305191 Nashville, TN 372305191 USA	CONTACT NAME: Willis Towers Watson Certificate Center PHONE (A/C, No, Ext): 1-877-945-7378 FAX (A/C, No): 1-888-467-2378 E-MAIL ADDRESS: certificates@willis.com
INSURED Core & Main LP 1830 Craig Park Court Saint Louis, MO 63146	INSURER(S) AFFORDING COVERAGE — NAIC # INSURER A : Greenwich Insurance Company — 22322 INSURER B : XL Insurance America Inc — 24554 INSURER C : INSURER D : INSURER E : INSURER F :

COVERAGES **CERTIFICATE NUMBER:** W39898704 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS		
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR X SIR: Each Occurence$1,000,000 GEN'L AGGREGATE LIMIT APPLIES PER: X POLICY X PRO-JECT LOC OTHER:			RGE3002852	08/01/2025	08/01/2026	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ $ $ $ $ $	2,000,000 2,000,000 15,000 2,000,000 4,000,000 4,000,000
A	AUTOMOBILE LIABILITY X ANY AUTO OWNED AUTOS ONLY HIRED AUTOS ONLY SCHEDULED AUTOS NON-OWNED AUTOS ONLY			RAD9439188	08/01/2025	08/01/2026	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ $ $ $	5,000,000
B	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED RETENTION $			US00155968LI25A	08/01/2025	08/01/2026	EACH OCCURRENCE AGGREGATE SIR	$ $ $	10,000,000 10,000,000 10,000
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N No (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A		RWD3002853	08/01/2025	08/01/2026	X PER STATUTE OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ $ $	1,000,000 1,000,000 1,000,000
B	Workers Compensation and Employers Liability Per Statute - AK, DE, WI			RWR3002854	08/01/2025	08/01/2026	E.L. EACH ACCIDENT E.L. DISEASE - EA EMP E.L. DISEASE-POL LMT	$1,000,000 $1,000,000 $1,000,000	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Per Project Aggregate applies where required by contract.

CERTIFICATE HOLDER

Evidence of Insurance

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Patricia A Fray

ACORD 25 (2016/03) The ACORD name and logo are registered marks of ACORD

SR ID: 28166016 BATCH: 4063895

Core & Main Cost Proposal

Notwithstanding the cost in the bids as described, the following costs are determinative and controlling and signed.

Shawn Proudlove
Shawn Proudlove (Jun 25, 2026 13:16:09 PDT)

Jun 25, 2026

Submission

Bidder Details

Vendor Name	Core & Main LP
Address	3155 Indian Ave Perris, California 92571 United States
Respondee	Shawn Proudlove
Respondee Title	Meter Specialist
Phone	310-569-7685
Email	shawn.proudlove@coreandmain.com
Vendor Type	CASoS
License #	1097128
CADIR	

Submission Detail

Submission Format	Electronic
Submitted	05/21/2026 2:48 PM (PDT)
Delivery Method	
Responsive	
Submission Status	Submitted
Confirmation #	488433

Respondee Comment

Buyer Comment

Attachments

File Title	File Name	File Type
20260227033344558 RCSD AMI Imp Ph I-Bid Proposal Packet (2026-02-26).pdf	20260227033344558 RCSD AMI Imp Ph I-Bid Proposal Packet (2026-02-26).pdf	RCSD AMI Imp Ph I-Bid Proposal Packet
CNM Response to Rubidoux CA FINAL COMPRESSED.pdf	CNM Response to Rubidoux CA FINAL COMPRESSED.pdf	General Attachment
		General Attachment
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		General Attachment
		General Attachment

Line Items

Discount Terms No Discount

Item #	Item Code	Type	Item Description	UOM	QTY	Unit Price	Line Total	Response	Comment

Bid Schedule I - Bronze Option							$0			
[redacted]										
Bid Schedule II - Composite Stainless Steel Option							$2,616,135.23			
32	201		Furnish contract bonds, project insurance, project permits, and project management.	L.S.	1	$25,000.00	$25,000.00	Yes	
33	202		Mobilization of equipment, materials, and labor.	L.S.	1	$24,266.00	$24,266.00	Yes	
34	203		Furnish trench protection in accordance with Cal/OSHA Standards for all trenches greater than 5' deep.	L.S.	1	$0.00	$0.00	Yes	In pricing
35	204		Furnish, install, and maintain traffic control, including approved traffic control plans, all signs, delineators, arrowboards, flagmen, and all related work, all in accordance with the Contract Documents.	L.S.	1	$0.00	$0.00	Yes	In pricing
36	205		Furnish and install 3/4" diameter PPS composite flow meters, appurtenant piping and fittings; install District-furnished adapters (1" x 3/4"); and all related work.	EA	3725	$383.62	$1,428,984.50	Yes	
37	206		Furnish and install 3/4" diameter stainless steel flow meters, appurtenant piping and fittings; install District-furnished adapters (1" x 3/4"); and all related work.	EA	1000	$395.84	$395,840.00	Yes	
38	207		Furnish and install meter box lids with quick read port for 3/4" diameter flow meters (for meters with antenna in lid).	EA	1000	$0.00	$0.00	Yes	N/A
39	208		Furnish and install plug for quick read port for 3/4" diameter meter box (for meters without antenna in lid).	EA	3725	$10.67	$39,745.75	Yes	
40	209		Furnish and install 1" diameter stainless steel flow meters, appurtenant piping and fittings, and all related work.	EA	106	$464.80	$49,268.80	Yes	
41	210		Furnish and install meter box lids with quick read port for 1" diameter flow meters (for meters with antenna in lid).	EA	20	$0.00	$0.00	Yes	N/A
42	211		Furnish and install plug for quick read port for 1" diameter meter box (for meters without antenna in lid).	EA	86	$116.80	$10,044.80	Yes	
43	212		Furnish and install 1-1/2" diameter stainless steel flow meters and appurtenant piping and fittings; install District-furnished adapters (2" x 1-1/2"); and all related work.	EA	58	$1,284.77	$74,516.66	Yes	
44	213		Furnish and install meter box lids with quick read port for 1-1/2" diameter flow meters (for meters with antenna in lid)..	EA	10	$0.00	$0.00	Yes	N/A
45	214		Furnish and install plug for quick read port for 1-1/2" diameter flow meters (for meters without antenna in lid).	EA	48	$116.80	$5,606.40	Yes	
46	215		Furnish and install 2" diameter stainless steel flow meters, appurtenant piping and fittings, and all related work.	EA	83	$1,621.72	$134,602.76	Yes	
47	216		Furnish and install meter box lids with quick read port for 2" diameter flow meters (for meters with antenna in lid).	EA	16	$0.00	$0.00	Yes	N/A
48	217		Furnish and install plug for quick read port for 2" diameter flow meters (for meters without antenna in lid).	EA	67	$116.80	$7,825.60	Yes	

Item #	Item Code	Type	Item Description	UOM	QTY	Unit Price	Line Total	Response	Comment
49	218		Furnish and install 3" diameter stainless steel flow meters, appurtenant piping and fittings, and all related work.	EA	2	$2,480.96	$4,961.92	Yes	
50	219		Furnish and install 4" diameter stainless steel flow meters, appurtenance piping and fittings, and all related work.	EA	5	$3,035.63	$15,178.15	Yes	
51	220		Furnish and install 6" diameter stainless steel flow meters, appurtenance piping and fittings, and all related work.	EA	3	$5,685.72	$17,057.16	Yes	
52	221		Furnish and install fixed data collection systems, including all components, software, permanent power distribution facilities, software, and all related work.	EA	1	$59,054.60	$59,054.60	Yes	
53	222		Repair of existing residential water services as a result of installation.	EA	250	$0.00	$0.00	Yes	Included in pricing
54	223		Remove and dispose of debris (clean out) existing residential meter boxes up to 6" deep.	EA	250	$33.34	$8,335.00	Yes	
55	224		Remove and dispose of debris (clean out) existing residential meter boxes from 6" to 12" deep.	EA	250	$33.34	$8,335.00	Yes	
56	225		Furnish drive-by data collection systems, software, and all related work.	EA	1	$0.00	$0.00	Yes	N/A
57	226		Furnish walk-by data collection systems, software, and all related work.	EA	1	$0.00	$0.00	Yes	N/A
58	227		Furnish one-year software service contract and all related work.	EA	1	$76,537.13	$76,537.13	Yes	This includes first time initiation fee and optional leak detector (refer to ps bid)
59	228		Furnish one-year customer portal interface access and all related work.	EA	1	$30,975.00	$30,975.00	Yes	This includes first time initiation fee (refer to ps bid)
60	229		Furnish training of District personnel and all related work.	EA	1	$0.00	$0.00	Yes	included
61	230		Provide system testing and all related work.	L.S.	1	$0.00	$0.00	Yes	included
62	231		Furnish operation and maintenance manuals.	L.S.	1	$0.00	$0.00	Yes	included
63	232		Allowance for unforeseen conditions.	L.S.	1	$200,000	$200,000	Yes	

Line Item Subtotals

Section Title	Line Total
Bid Schedule I - Bronze Option	N/A
Bid Schedule II - Composite Stainless Steel Option	$2,616,135.23
Grand Total	$2,616,135.23

Shawn Prowllove
06/25/26

SECTION 17330 – RESIDENTIAL FLOW METERS TECHNICAL SPECIFICATIONS

PART 1 – GENERAL

1.01 General Requirements

Contractor shall furnish and install residential flow meter systems, meter box lids, and all appurtenant materials, equipment, and work suitable for the services listed, complete and operable in accordance with requirements of the Contract Documents and in conformance with the manufacturer's recommendations. Upon completion of installation, the work shall be tested to demonstrate compliance with these specifications. All materials and equipment supplied under this Section shall be new, of good quality, and in good condition.

Core & Main complies with this requirement.

1.02 AMI/AMR Systems Supplier

All equipment specified herein, in Section 17331 – Commercial and Industrial Flow Meters Technical Specifications, and in Section 17335 – AMI/AMR Data Collection Systems Technical Specifications, shall be supplied by a single manufacturer (AMI/AMR Systems Supplier) to assure compatibility and unit responsibility for operation and performance.

Core & Main and Kamstrup comply with this requirement.

1.03 Related Sections

A. Section 17331 – Commercial and Industrial Flow Meters Technical Specifications

B. Section 17335 – AMI/AMR Data Collection Systems Technical Specifications

Core & Main acknowledges these specification sections.

1.04 Specific Project Requirements

A. Contractor shall replace the following quantity and sizes of existing residential flow meters:

Meter Size	Quantity
3/4"	4,725
1"	106
1-1/2"	58
2"	83[1]

[1] 78 potable water and 5 reclaimed water

Core & Main complies with this requirement.

B. Contractor shall replace damaged meter box lids. Meter box lids shall be compatible with meter appurtenances.

Core & Main complies with this requirement.

1.05 Submittals

All submittals shall be in accordance with Section 01300, Contractor Submittals and Requests Technical Specifications.

Core & Main complies with this requirement.

A. Shop Drawings

Contractor shall submit shop drawings in accordance with the Contractor Submittals Technical Specifications, including, but not be limited to, the following:

1. Details and specifications of all components of all meters including detailed installation instructions.

2. Wiring and connection schematics.

3. Manufacturer's application performance guarantee for each meter location, and recommendations for installation at each location.

4. Factory accuracy test reports for each meter furnished per ANSI/AWWA C715.

5. Manufacturer's guarantee for acoustic leak detection compatibility with flow meter.

Core & Main complies with this requirement.

B. Operation and Maintenance

Manual Contractor shall submit a detailed operation and maintenance manual for the complete flow metering system(s) with acoustic leak detection specified herein.

Core & Main complies with this requirement.

C. Billing Integration

Contractor shall submit a description of proposed software and guarantee of compatibility from the Manufacturer with Owner's existing billing software.

Please refer to the Solution Overview section of our response for a description of the AMI software and Customer Portal.

Kamstrup's READy AMI Headend will support integration to any Utility Enterprise System required by the utility. Integrating between the utility's enterprise systems and the Kamstrup READy Manager Head-end System (HES) can be accomplished in a number of ways. The most common integration is simple file transfer. This interface can be formatted using any fixed width or CSV format and the transfer can be automated through a SFTP or FTPS server if the utility needs a continuous flow of data between the software platforms. API integrations are also available to continuously sync data if required. Because of the flexibility in its integration formats, Kamstrup has not run into any significant integration issues in any previous deployment.

PART 2 - PRODUCTS

2.01 General

A. Residential flow meter system shall consist of a flow meter with integral factory-programmed electronic register/interface device. Water services with flow meter systems 2" and smaller shall consist of integral acoustic leak detection capabilities or compatible external devices on each water service.

The Kamstrup integrated flowIQ® 2200 meters serve as residential flow meter systems with a factory-programmed electronic register device. These meters integrate Acoustic Leak Detection (ALD) technology to continuously monitor water services up to 2", effectively detecting leaks on service connections and distribution mains. No additional external devices or infrastructure are required.

B. Flow meter systems shall be contained within existing meter boxes.

The proposed metrology complies with this requirement.

C. Acoustic leak detection shall be either integral to the flow meter or an external compatible device. For external leak detection devices, data shall be transmitted automatically.

Kamstrup's flowIQ® 2200 meters have integral acoustic leak detection capabilities, eliminating the need for external devices. Acoustic data is continuously monitored and transmitted automatically through secure RF messaging. This ensures streamlined leak detection without additional infrastructure or devices.

D. Flow meter shall be solid-state with no moving parts

The proposed metrology complies with this requirement. The proposed Kamstrup metrology utilizes **ultrasonic technology,** ensuring no moving parts. This eliminates mechanical wear, enhancing long-term performance and accuracy over the product's lifetime while removing maintenance costs typically associated with moving component meters.

E. All sensors and electronics shall be designed so that they are fully protected against internal and external penetration of fluid.

The Kamstrup metrology complies with this requirement. The **flowIQ® 2200** meter is hermetically sealed and built to an IP68 rating, which ensures complete protection of all sensors and electronics against internal and external fluid penetration. The IP68 rating confirms that the meter is fully submersible and designed to prevent water ingress under prolonged submersion and harsh environmental conditions.

F. The meter shall be to NSF/ANSI 61 certified.

Kamstrup meters comply with the NSF/ANSI 61 certification requirements. Both residential and commercial meter options are constructed with certified materials and conform to ANSI/NSF Standard 61, ensuring they meet Safe Drinking Water Act standards.

G. The meter shall fully comply with AWWA C715-18 guidelines.

The Kamstrup flowIQ® 2200 complies with all the AWWA C715-18 guideline for Ultrasonic Water Meters.

H. All radio communications shall comply with relevant FCC rules, including Part 15. Meters shall have been tested by FCC to ensure that they meet requirements regarding EMC emissions and FCC ID shall be laser printed or permanently engraved on each meter.

The proposed Kamstrup metrology complies with this requirement.

I. All flow meters shall be provided with new gaskets.

Core & Main acknowledges this requirement.

J. Flow meter system shall be manufactured to order with a manufacturing date no earlier than three (3) months prior to order date.

Kamstrup Complies with this requirement.

K. Flow meter system shall be manufactured by Kamstrup, Neptune, or approved equal.

The proposed Kamstrup metrology complies with this requirement.

2.02 Flow Meter

A. Meter Body

1. The meter body shall be NSF/ANSI 61 certified lead-free materials and shall be either cast bronze, 316L stainless steel, or fiberglass reinforced polyphenylene sulfide (PPS) composite material. PPS composite material shall not be used when there is significant misalignment of the service line. Service line connections shall be protected from galvanic corrosion. Other material bodies or flow tubes are not acceptable.

Kamstrup meters comply with NSF/ANSI 61 certification and are constructed from lead-free materials. Meter bodies are available in composite fiberglass-reinforced PPS, 316L stainless steel.

2. Meter size, model, direction of flow, and NSF 61 certification shall be indicated on the meter body.

The proposed Kamstrup metrology complies with this requirement.

3. All fastening hardware shall be constructed of Type 316 non-magnetic corrosion resistant stainless steel to prevent corrosion.

Core & Main and DB Utility comply with this requirement.

4. Meters 5/8" through 1" in size shall be provided with National Pipe Straight Mechanical (NPSM) threaded end connections and meters larger than 1" shall be provided with 2-bolt oval flanged end connections. Contractor shall coordinate connection type and size based on actual meters furnished.

Core & Main and DB Utility acknowledge this requirement.

5. Meter shall be suitable for a operating pressures up to 175 psi (minimum).

Kamstrup meters meet the specified requirement. The residential and light commercial ultrasonic meters are rated for operating pressures up to a maximum of 250 PSI, while commercial-sized meters (1.5”–12”) can withstand pressures ranging from 275 PSI to 300 PSI depending on flange type.

B. Meter Register/Interface Device

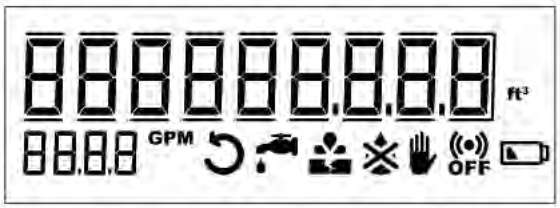
1. The meter register/interface device shall consist of a meter register and meter interface unit (MIU), housed within the same enclosure.

Kamstrup metrology complies with this requirement. The flowIQ® water meters have integrated registers and RF communication capabilities contained within the same enclosure, simplifying installation and minimizing components. The meter's all-in-one design eliminates the need for separate meter interface units (MIU) or external connections, ensuring a more robust and tamper-resistant solution.

2. The device shall be provided with a 9-digit LCD display, unit of measure, billable digits, all active alarm codes (leak, burst, dry, reverse, tamper, low battery) radio off, and visual flow rate indicator.

All registers feature 9 digit LCD display. Unit of measurement options include: gallons, liters, and cubic feet.

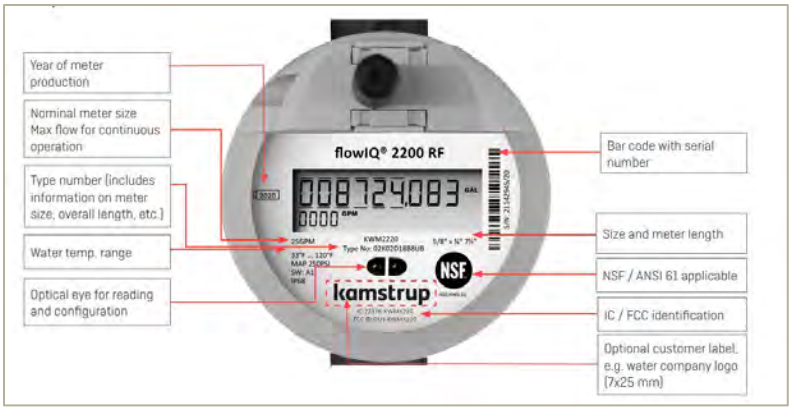
What is shown on the meter LCD is what is transmitted over the AMI network. As a visual aid for end customers, the LCD can be configured to have hash marks above and below the billing digits so that customers can easily compare their bill to the read on the meter.



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.

3. Meter serial number, meter size, FCC identification, NSF compliance, production year, and maximum operating pressure shall be displayed in a permanent location on the register.

The proposed Kamstrup metrology complies with this requirement.



4. The device shall be hermetically sealed or fully potted with no exposed wires connecting the MIU and register.

Kamstrup meters are hermetically sealed under vacuum in a humidity controlled environment during manufacturing. All meters exceed IP-68 ratings for 0-100% humidity and are designed and tested in environmental chambers simulated for both temperature and humidity extremes.

5. The device shall transmit seamlessly in both advanced metering infrastructure (AMI) and automated meter reading (AMR) mode without any additional programming.

In a dual mode operation involving both AMI and AMR, the system can seamlessly switch between modes as needed. When operating in AMI mode, the system uses scheduled transmissions, typically every three hours, to send data from the meters to the collectors. If the AMI network experiences communication issues, the system can revert to AMR mode, allowing for drive-by readings to be collected in the field using a mobile receiver. This ensures continuous data collection and billing accuracy despite potential network interruptions.

Reprogramming or changing the conditions for transmission is managed through the Kamstrup READy Head End System, which allows for remote configuration and updates. The system's flexibility supports both network-based and field-based operations, ensuring that utilities can maintain accurate data collection under varying conditions.

6. The device shall be capable of operating at external ambient temperatures of 35°F to 130°F (1.5°C to 55°C) and operating humidity factor of 0 to 100% condensing.

The flowIQ complies with this requirement. Please refer to the Product Data Sheet for more information.

7. The radio circuit board and battery shall be protected by a hard-potting material or hermetically sealed.

Kamstrup complies with this requirement. The **flowIQ® meters** feature integrated registers and radios that are **hermetically sealed** within the enclosure. This design ensures safeguarding against environmental impacts like moisture, temperature fluctuations, and submersion, conforming to **IP68 standards** for prolonged reliability.

8. The device shall either have an integral antenna mounted to the meter or be designed for a remote antenna capable of being installed through an industry standard 1-3/4" hole in a meter box lid for maximum transmission range.

No wires are required between the meter, encoder, and radio. The majority of meters in the system will be able to transmit under the lid, whether metal or composite, without issue. In the event that communication is not consistent, the easiest course of action is to swap a

metal lid for a composite. The next is to raise the signal out of the pit using and external antenna. An external antenna is available as a wall mount option in lengths of 6.6ft or 65.6ft and in a pit mount option in lengths of 2ft, 6.6ft, and 24.6 ft for use in situations like meter vaults and inside sets. The pit mount option goes through the industry standard 1' –¼" hole. Because of it's backfill capabilities, even an inconsistent connection can often show no data gaps in the HES.

9. Remote antennas shall be capable of mounting to various thicknesses of meter box lids from 1/2" to 2-1/2" and various distances from meters.

The Kamstrup solution complies with this requirement.

10. Remote antennas shall be rigid in design to withstand traffic loads and shall not pose a tripping hazard to pedestrian traffic.

Kamstrup Complies with this requirement.

11. The MIU device shall be protected against static discharge without loss of data per IEC 801-2, Issue 2.

Kamstrup complies with this requirement.

12. Power shall be supplied to the MIU by a lithium battery with capacitor.

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

13. The number of radio-based meter reads performed must not affect the battery life.

The Kamstrup AMI solution guarantees that the number of radio-based meter reads performed does not adversely affect the battery life due to **automatic power optimization** built into the system. The radios dynamically adjust their transmission power based on communication signal strength, conserving battery life under optimal conditions.

14. The battery life shall not be affected by outside erroneous wake-up tones (e.g., other water, gas, or electric utilities reading and therefore sending out a wakeup tone).

Kamstrup's AMI system operates on a secure FCC-licensed 450 MHz frequency, which prevents interference from external signals, including wake-up tones from other utilities (e.g., water, gas, or electric). AES encryption and proprietary data transmission protocols further safeguard against erroneous triggers or unauthorized interactions. The transmitter does not respond to non-designated signals, ensuring that battery life is not affected by outside erroneous wake-up tones.

15. The battery shall be hermetically sealed or a fully potted component of the MIU with no external wires.

Kamstrup hermetically seals the electronics of the meter with a low pressure helium and gasket. This takes advantage of the higher pressure of the surrounding environment to increase the effectiveness of the seal and actually leads to an even tighter seal with the added pressure of full immersion.

16. The device shall be rated IP68 suitable for continuous submergence in water.

Kamstrup meters are designed for rigorous environmental conditions, meeting IP68 standards for water resistance, and are suitable for continuous submergence in water. The meters are hermetically sealed under vacuum in a controlled manufacturing environment to protect against humidity and water ingress, ensuring long-term durability and performance under full immersion.

Please refer to the Product Data Sheet for more information.

C. Performance

1. All meters shall be capable of the following flow ranges at the listed accuracies.

Meter Size	Extended Low Flow @ 100% Accuracy (U.S. gpm ± 5%)	Normal Operating Range @ 100% Accuracy (U.S. gpm ± 1.5%)	Safe Maximum Operating Capacity (U.S. gpm)	
			Normal Operation	Fire Service
5/8"	0.05	0.10 to 20	20	N/A
3/4"	0.05	0.10 to 30	30	30
1"	0.25	0.40 to 50	50	50
1-1/2"	0.30	0.80 to 100	100	100
2"	0.50	1.5 to 160	160	160

Comply. Please refer to the Product Data Sheets for more information.

2. Meters shall not require a strainer for accurate operation.

Kamstrup meters comply with this requirement. Ultrasonic technology ensures accurate operation without the need for a strainer. This design eliminates dependence on additional components for debris management while maintaining high accuracy.

3. All meters shall have the ability to log a total of historic volumes by flow rate range to conduct a consumption profile for the installation.

All Kamstrup flowIQ meters retain 100 days worth of hourly data and 460 days of daily data that can be locally pulled and logged. This ensures meter data is preserved even when meter communication is disrupted.

D. Distribution Acoustic Leak Detection

1. Meters up to 2" shall have the capability to monitor and record acoustic noise to enable distribution side leak detection.

Kamstrup's AMI solution provides comprehensive leak detection capabilities using both **acoustic leak detection (ALD)** technology and **advanced flow analytics**, enabling utilities to identify leaks on both the **customer side** and across the **distribution network**.

Distribution side leak detection is achieved through the integrated acoustic leak detection (ALD) sensor in every flowIQ 2200. This device works by sampling the noise 26x per day and sending the lowest recorded value into the analytics platform, and with meters being installed within the water column, this makes pipe material agnostic and leaks are detectible across all pipe material and can be heard greater distances. **Advanced data analytics** are automatically applied to detect abnormal acoustic patterns indicative of leaks. The system also generates **prioritized alerts** based on historical trends, deviation from baselines, and proximity of suspected leaks, enabling efficient field investigation and repair.

Customer side leak detection is achieved through the flowIQ meter's **Leak alarm**, which will flag 24 hours of continuous flow. This alarm threshold is a % of maximum flow for the meter size and is configurable through the HES.

2. Meters with integral (built-in) leak detection capabilities shall consist of acoustic leak detection sensor and electronics hermetically sealed with no external wires integral in the meter body.

The Kamstrup flowIQ® 2200 meters offer acoustic leak detection capabilities integrated directly into the meter body. These sensors and electronics are hermetically sealed, eliminating the need for external wires or additional infrastructure. This integration allows utilities to continuously monitor for leaks on service lines and mains without requiring separate devices.

3. Meters without built-in leak detection shall be supplied with an external acoustic leak detection device.

Kamstrup's flowIQ® 2200 water meters include integrated Acoustic Leak Detection (ALD) technology within the ultrasonic meter design, eliminating the need for external acoustic leak detection devices. This built-in system provides continuous, proactive monitoring of leaks in both customer-side connections and distribution mains. As such, for operational uses where external acoustic leak detection would otherwise be needed, the flowIQ® 2200 meters provide an all-inclusive solution without requiring separate hardware or additional infrastructure.

4. The device shall be rated IP68 suitable for continuous submergence in water.

All Kamstrup products are rigorously tested beyond IP68 applications needed for harsh pit environments (0-100% humidity and varying temperatures).

5. External acoustic leak detection devices shall be supplied with certificate of affidavit from manufacturer for compatibility with meter.

Not applicable. Kamstrup's ALD solution is an intrinsic component of their meters and does not require additional external hardware, ensuring full compatibility without separate certifications or affidavits from the manufacturer.

6. External acoustic leak detection devices shall be hermetically sealed or potted with no electrical wires and shall be contained in the meter box.

Not applicable. Kamstrup's flowIQ® 2200 water meters include integrated Acoustic Leak Detection (ALD) technology within the ultrasonic meter design, eliminating the need for external acoustic leak detection devices.

The ALD solution requires no additional sensors, as it utilizes the same acoustic transducers used for water flow measurement, ensuring no impact on meter battery life and no additional maintenance requirements. Loudness measurements are taken every 55 minutes, and the lowest volume sound is sent once per day. The software tracks noise values and compares them to nearby meters to localize leaks and alert the utility.

7. External acoustic leak detection devices shall not have any protruding components from the meter box and shall not interfere with the operation of the meter.

Not applicable. Kamstrup's flowIQ® 2200 water meters include integrated Acoustic Leak Detection (ALD) technology within the ultrasonic meter design, eliminating the need for external acoustic leak detection devices.

8. External acoustic leak detection devices shall be supplied with a lithium-ion battery with a minimum battery life equal to the meter.

Not applicable. Kamstrup's flowIQ® 2200 water meters include integrated Acoustic Leak Detection (ALD) technology within the ultrasonic meter design, eliminating the need for external acoustic leak detection devices.

9. The acoustic leak data shall be captured and communicated regardless of reading method (AMR or AMI) and shall be transmitted without interruption or interference of meter data.

Kamstrup's integrated acoustic leak detection solution ensures that acoustic leak data is captured and transmitted without interruption or interference, regardless of the reading method used—both AMR and AMI modes.

Advanced Metering Infrastructure

The system uses integrated acoustic leak detection (ALD) sensors in every flowIQ 2200 meter, which sample noise 26 times per day and transmits the lowest recorded value to the analytics platform for evaluation. Advanced data analytics are applied automatically to detect abnormal acoustic patterns indicative of leaks, and the system generates prioritized alerts based on historical trends, deviation from baselines, and proximity of suspected leaks. This enables utilities to monitor for leaks and respond efficiently to potential issues.

Automated Meter Reading (AMR)

All Kamstrup flowIQ meters 2" and below listen every 55 minutes and store the lowest level of sound that is heard. This ensures the meter has the highest chance of reporting actual leak noise, rather than unrelated noises such as pumps. The meter internally stores 460 days of daily acoustic noise data. When a meter is read using drive-by, it reports the acoustic noise value for the previous day, along with 7, 14, and 21 days before that. In other words, the utility gets the previous three weeks of data on the same day of the week as when the meter is read. So, if the utility were to read everyday of the week once per month, all acoustic leak data for the month would be available in the Leak Detector software.

2.03 Data Transport

A. All Data communicated over a radio network, AMR or AMI, shall always be encrypted.

The Kamstrup READy AMI system operates on a secure FCC-licensed 450-470 MHz frequency, providing protection against interference and ensuring reliable data transmission. It employs AES encryption, with 128-bit encryption from the meter to the collector and 256-bit encryption from the collector to the READy Head End System (HES), to maintain data security. RF transmissions occur every three hours, delivering the current read along with the previous two hourly reads to the collector. If a transmission is missed, the system can reconcile reading gaps for up to 24 hours by including the current hour read and the previous five hours of data in the next transmission.

B. The MIU shall provide 8-digit reading resolution from encoded registers using either Neptune ProRead™/E-CODER protocol or Sensus UI-1203 protocol in mobile as well as AMI network data collection applications, simultaneously, without need for programming.

Kamstrup Encoded Output supports the Neptune ProRead™/E-CODER protocol and Sensus UI-1203 protocol in both mobile and AMI network data collection applications simultaneously without requiring additional programming. This compatibility ensures seamless integration with these systems, facilitating efficient and accurate utility data collection across various applications.

C. The MIU shall read the encoded register at hourly intervals to provide accurate leak and reverse flow detection using 8-digit resolution reads.

Kamstrup's flowIQ meters, paired with integrated AMI technology, read the encoded register at hourly intervals with a resolution of up to 8 digits. This ensures high accuracy in detecting leaks and reverse flow. The meters transmit this data in three-hour intervals to the head-end system, and

adjustments can be made over the air using the READy Manager platform. Any changes to reading intervals may affect the warranty for battery life depending on frequency.

D. The MIU shall transmit the meter reading continuously at a predetermined transmission interval.

The Kamstrup AMI system operates with a mode of three-hour RF transmission intervals from the meters to the collectors. During each transmission, the current hour's read along with the previous two hours of data are sent to ensure overlap and successful collection. If a transmission is missed, the next scheduled transmission will attempt to reconcile the missed read by including the most recent hour and up to the previous five hours. This reconciliation behavior continues for up to 24 hours.

E. The MIU shall transmit AMI network messages every three (3) hours – standard. No programming shall be necessary to activate transmission of AMI network messages.

Comply. Please refer to the answer above.

F. Each AMI network message shall include capability to backfill missed reading data for redundancy and to improve read success rates.

The proposed Kamstrup metrology and network complies with this requirement. Please refer to our response for 2.03 D.

G. No programming shall be necessary to activate or revert to transmission of AMR messages.

Comply. In a dual mode operation involving both AMI and AMR, the system can seamlessly switch between modes as needed. When operating in AMI mode, the system uses scheduled transmissions, typically every three hours, to send data from the meters to the collectors. If the AMI network experiences communication issues, the system can revert to AMR mode, allowing for drive-by readings to be collected in the field using a mobile receiver. This ensures continuous data collection and billing accuracy despite potential network interruptions.

H. In the event of a cut wire, the MIU shall not send the last good read as this can lead to missbilling. The MIU shall transmit a trouble code in lieu of the meter reading.

The Kamstrup solution complies with this requirement.

I. Tamper – If wiring has been disconnected, a "non-reading" shall be provided indicating wire tamper; a reading that gives the last available reading is an incorrect reading.

The Kamstrup solution complies with this requirement.

J. Each device shall have unique preprogrammed identification numbers (ID) of nine (9) characters. ID numbers shall be permanent and shall not be altered. Each device shall be

labeled with the ID number in numeric and barcode form. The label shall also display FCC approval information, manufacturer's designation, and date of manufacture.

Kamstrup flowIQ meters comply with this requirement. Each device is manufactured with a unique nine-character identification number that is permanent and cannot be altered. The ID number is displayed in both numeric and barcode format. Additionally, each label includes FCC approval information, the manufacturer's designation, and the date of manufacture. Please refer to 2.02 #3 for a graphic of the Meter Face and items included.

K. The MIU shall transmit the encoder meter reading and a unique MIU ID number. The MIU shall interface to encoder registers using Neptune E-CODER or Sensus UI-1203 communication protocol via a 3-conductor wire without need for special configuration to the MIU.

Not applicable, as Core & Main and Kamstrup are proposing an **integrated proprietary MIU solution** where compatibility with external encoder protocols, such as Neptune E-CODER or Sensus UI-1203, is inherently unnecessary due to the fully integrated design.

L. The MIU shall transmit time-synchronized, top-of-the-hour readings as part of its scheduled, periodic AMI network transmission.

Kamstrup AMI Endpoints, READy MTUs and Integrated flowIQ RF meters, transmit hourly readings every 3 hours at the top of the hour to the Network (8x per day). With every transmission to the Network time synchronization occurs and accuracy drift is kept within a +/-10 second tolerance.

M. The MIU shall periodically transmit a packet that includes the register information such as register ID, register type, and other status information no less than weekly.

Kamstrup's integrated AMI system ensures periodic transmission of key register information, including register ID, register type, and status details:

1. Transmission Frequency: AMI endpoints transmit readings, alarms, and register information every 3 hours as standard practice. This data includes hourly usage values, sequential hourly reads for reconciliation, and critical identification and operational statuses.

2. Additional Fallback: In case of communication gaps, AMR fallback transmissions occur every 32 seconds, ensuring billing continuity.

3. Status Information: With each transmission, the AMI endpoint delivers updates on battery health, tamper alarms, and environmental data, meeting the requirement for regular and comprehensive reporting.

N. The MIU shall automatically attempt to join an AMI network on a periodic basis and once provisioned and authorized, shall begin transmission of AMI network messages for

consumption by host software as part of simultaneous operation of walk-by, mobile, or AMI network without any site visits or reprogramming of MIU.

The Kamstrup transmitter is preprogrammed before installation according to specifications desired by the utility. The programming includes embedding the FCC licensed network and security encryption keys within the device. The meters activate automatically and begin registering flow and connecting to the AMI network upon water flow. No field programming is required during installation, and any necessary programming adjustments or updates can be done remotely via Over The Air (OTA) updates using the system's software tools.

2.04 FCC Licensing and Certification

A. If applicable, AMR communications shall operate within Federal Communications Commission (FCC) Part 15.247 regulations for devices operating in the 902 MHz to 928 MHz unlicensed band. The output power of the devices shall be governed by their conformance to these relevant FCC standards.

Comply. Kamstrup AMR communications comply with Federal Communications Commission (FCC) Part 15.247 regulations for devices operating within the 902 MHz to 928 MHz unlicensed band. Kamstrup's AMR system transmits over the unlicensed 900 MHz band as part of its drive-by fallback functionality, ensuring compatibility with these FCC standards.

B. If operating on the 902 MHz to 928 MHz unlicensed band, the MIU shall transmit using a frequency hopping, spread spectrum technique comprised of alternating pseudo-random frequencies and/or transmit using the LoRaWAN™ protocol using spread spectrum modulation.

The Kamstrup AMI network uses an FCC-licensed 450-470 MHz frequency that is unique to the Utility and is protected from outside interference by the FCC. Reads collected in AMR, or drive-by mode, operate on the 902 MHz to 928 MHz on an unlicenced band which uses frequency hopping. LoRaWAN not currently supported.

C. AMI communications that utilize an FCC assigned frequency within the licensed 450 MHz to 470 MHz frequency range are preferred. For those that do not utilize an FCC assigned frequency, the system must operate in the 902 MHz to 928 MHz unlicensed band.

The Kamstrup AMI system primarily operates on an FCC-licensed frequency between 450 MHz and 470 MHz, ensuring secure and reliable communication protected from interference by regulatory measures. The system adheres to FCC requirements and includes AES-128 encryption from meter to collector and AES-256 encryption from collector to the Head End System (HES), delivering robust security and integrity during data transmission

D. The system must be expandable at any time without getting authorization from the FCC.

The Kamstrup AMI system is designed to be fully scalable, allowing for expansion at any time without requiring authorization from the FCC. The network operates on an FCC-licensed 450-470 MHz frequency and supports straightforward addition of collectors or endpoints while maintaining compatibility across the infrastructure.

2.05 Meter Software Requirements

A. The software shall be a cloud-based solution. It shall include online help describing all menus and feature sets with step-by-step tutorials.

The Kamstrup Head End System (HES), READy Manager, is a Software as-a-Service (SaaS) offering that is cloud hosted on secure Microsoft Azure US database servers. The City can download READy Manager for free onto any Windows based PC.

READy Manager is where all meter readings and alarm info codes are stored and easily managed. The software is optimized for simple navigation, group/route management, customer consumption evaluation, Radio Frequency (RF) performance monitoring, alarm info code assessment and customer billing transfers to/from the City's CIS.

READy HES includes a searchable, up-to-date help section with step-by-step guides showing how to perform any functions within the software.

B. Data Hosting

All data shall be hosted on multiple US based servers.

The Kamstrup Meter Data Management System (MDMS) is hosted on secure Microsoft Azure cloud servers located in the United States, ensuring SOC2 compliance. This setup provides robust security and data protection measures, including AES encryption and regular audits to maintain security standards.

C. Data Storage

Historical reading data shall be hosted for up to thirteen months for hourly data and five years for daily data.

READy Manager HES stores hourly usage values for 13 months, daily values for 5 years, and monthly values for 10 years. This data storage capacity is first-in first-out. However, for additional data hosting, the utility can opt to store data in a data lake or cloud data warehouse from a 3rd party provider.

D. Billing Systems Integration

The software interface to and from Owner's billing software shall be flexible supporting with single record fixed width or delimited (CSV) file formats that can be customized to easily integrate to the billing system.

Kamstrup's READy AMI Headend will support integration to any Utility Enterprise System required by the utility. Integrating between the utility's enterprise systems and the Kamstrup READy Manager Head-end System (HES) can be accomplished in a number of ways. The most common integration is simple file transfer. This interface can be formatted using any fixed width or CSV format and the transfer can be automated through a SFTP or FTPS server if the utility needs a continuous flow of data between the software platforms. API integrations are also available to continuously sync data if required. Because of the flexibility in its integration formats, Kamstrup has not run into any significant integration issues in any previous deployment.

E. File Scheduler

User defined custom data imports and exports shall have the ability to be scheduled as automatic jobs to an FTPS/SFTP server or email.

The HES supports automatic integration via an SFTP server, allowing data synchronization at any desired frequency of hourly or greater intervals. Additionally, an API solution is available for near real-time data transfer to external systems.

F. Features

1. The software shall have search capabilities to search all or specific fields such as address, meter serial number, account number, customer name, etc.

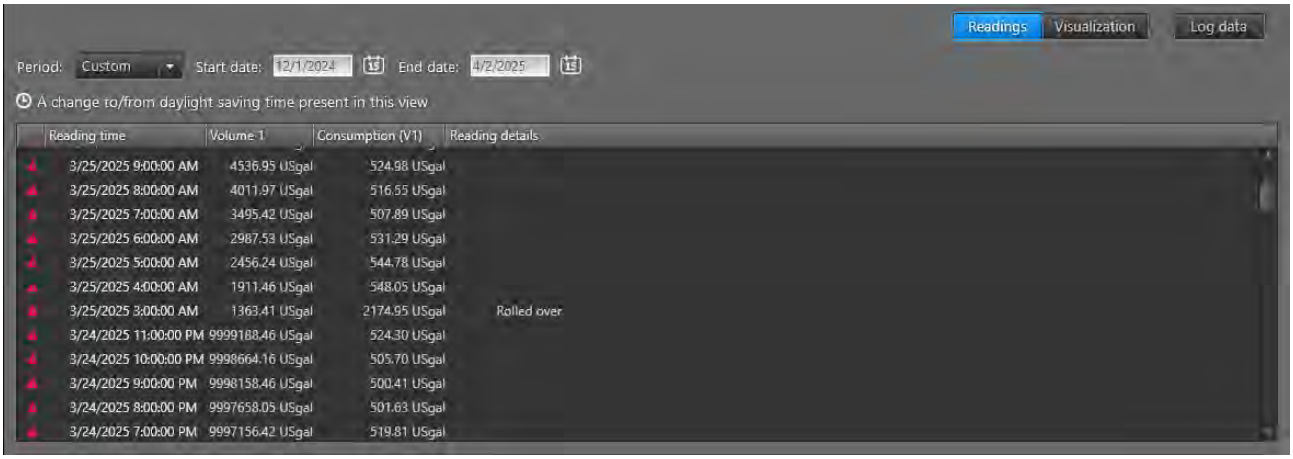
READy Manager utilizes a dynamic search bar that can search by any data field provided by the CIS system including all of those listed above as well as any custom field data the District provides.

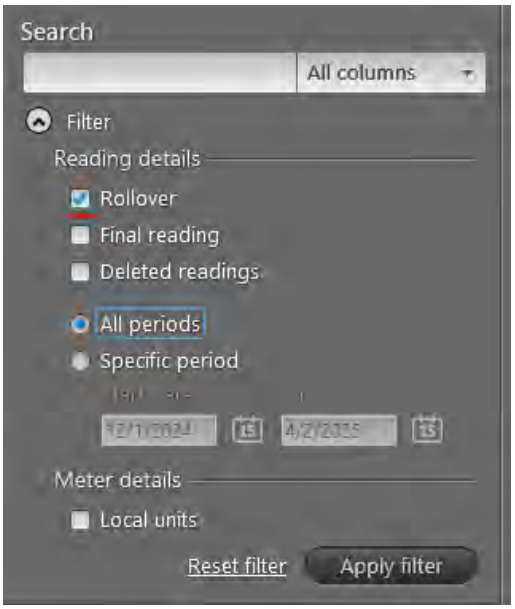
Once a CSR has located the consumer's account, they can assist the consumer in understanding their consumption by showing the consumer their hourly usage over the month as a graph or in a list view. This data can be useful to identify whether the consumer might have a leak or offer a reminder of times when the consumer might have been using more water than they realized (Ex: Filling a pool, watering their yard, or washing a car). The data can be exported from READy and emailed or printed so that the consumer can have a copy as well.

2. The software shall be able to filter on meter rollovers and final readings.

All readings for Kamstrup meters are collected via radio communication, either via AMR or AMI. This ensures complete data integrity as there is no point in the reading process that the readings can be manipulated. Meter rollovers are handled as normal hourly reading intervals

in the HES and are labeled as 'Rolled Over' for the reading details. Note that the Rollover event is a searchable field in the HES search menu.





3. The software shall provide hourly readings, bar graph chart visualization of average flow per hour to easily identify trends, and anomalies and hourly, daily, monthly, yearly consumption over a user defined date range.

Yes, the READy software can meet all of the specifications mentioned and over a custom date range defined by the user.

4. The software shall be able to send notifications for meter alarms via email or text message when they are detected or on a scheduled basis.

Comply. Notifications included in the software package, where you can be automatically notified of important meter events that appear in your supply network as soon as they are detected or on a regular basis. The notifications are sent via email or SMS.

5. The software shall allow the creation of meter groups automatically through imports or manually

Comply.

The District has the ability to create, edit, or delete any groups desired within the HES. Creating custom groups is easy by selecting multiple meters and selecting 'Add to New Group' or by right clicking and selecting those meters to be added to a new group. At this time a custom group name can be created specifically for that District personnel to utilize and add/remove meters from the group as needed. Groups are used within READy to everything from reporting to meter reading. Groups can be automatically setup from routes created in the CIS.

6. The software shall allow a user to perform meter exchanges, so that historical data may be referenced under the account with associated meter data history.

Asset data is maintained the Meter Exchange page or READy HES and includes all meter swap information including, Model number, install date, old meter final read, old meter s/n, new meter start read, new meter s/n etc.

7. The software shall have consumption reporting capabilities by group and custom date range.

The READy Manager reporting functionality is robust and customizable to fit the Water District's needs. Any data field can be exported as its own report either as an excel file for data evaluation or to a text file for standard reporting structure. Reports are built for the customer during the initial rollout and testing phase of the project. Training is provided to the City personnel to empower them with the ability to create ad-hoc reports to fit a wide variety of reporting needs.

READy also contains several pre-defined reports for utility use. For individual meters, these include Hourly, Daily, Monthly, and Yearly consumption reports with graphs. Using meter grouping functionality, utilities can generate consumption reports to find abnormally high or low usage over a day, month, year, or custom defined amount of time. The Data Comparison report can compare the usage of up to four individual meters over a definable amount of time. Finally, the Water Loss Analysis report can compare a master meter or upstream meter's usage to the combined usage of all the downstream meters combined into a virtual meter. This is the perfect way for a utility to precisely measure their real system losses and get an extremely accurate idea of the non-revenue water that is being created by leaks in their system.

8. The software shall allow import and display of custom fields which also may be exported back to the CIS.

Kamstrup complies with this requirement.

9. The software shall allow the reading to be displayed and exported as read from the meter in US gal or ft3, (Us Gallons and cubic feet).

Comply.

G. Fallback Mobile Drive-By Reading

1. The AMI software shall include the ability to read meters via AMR mobile drive by and AMI without installing additional PC software or add on module components.

The District will always have the option to collect contingency mobile readings for an AMI meter as each device continues to transmit this fallback capability read over the life of the product. This fallback capability is typically used for disaster recovery reads but can be used for a monthly billing cycle read if desired. These readings are collected using the READy App paired with the READy Converter and can be done remotely from the curb without physically needing to visit the meter.

A fallback read will provide a single volumetric read for the date and time the meter is read in the field. If additional data history is desired, the meter can be logged instead which would provide the most recent 100 days of hourly usage and also the most recent 460 days of daily usage data.

Once the network connectivity is restored the collector will backfill hourly interval reading data for up to the previous 30 days.

2. The mobile collection system data may be synchronized to the head end servers via Wi-Fi or cellular network without the loss of captured data.

The Kamstrup mobile collection system ensures seamless data synchronization with the Head End System (HES) via Wi-Fi or cellular networks, with robust safeguards to prevent data loss during the process. The system uses buffer storage in network collectors, which can retain up to 30 days of hourly readings for up to 25,000 endpoints in case of backhaul communication interruptions. Once communication is restored, the data is transmitted to the HES without any loss.

Additionally, individual meter endpoints store data locally for up to 100 days of hourly interval reads, which can be retrieved remotely via the READy mobile app or manually if necessary. For immediate synchronization, both mobile reads and regular transmissions update to the HES when cellular or Wi-Fi connections become available, maintaining data integrity throughout.

3. In addition, if readings were missed by the fixed network system, the mobile collection system shall allow a data log of the meter's internal read data to be sent back to the head end system.

A fallback read will provide a single volumetric read for the date and time the meter is read in the field. If additional data history is desired, the meter can be logged instead which would provide the most recent 100 days of hourly usage and also the most recent 460 days of daily usage data.

Once the network connectivity is restored the collector will backfill hourly interval reading data for up to the previous 30 days.

H. Mapping Visualization

The software shall have the ability to import GIS coordinates or be able to geocode by address, city and zip code. The meter may be viewed graphically in the host software and in the mobile application when in the field.

Kamstrup's READy Manager software supports the import of GIS coordinates and geocoding by address, city, and zip code. Meters can be viewed graphically within the system via the map-based interface, allowing visualization of both meter and collector locations using integrated terrain, street, and satellite views from Google Maps. This mapping functionality is also available in the READy mobile app for field use, enabling technicians to access meter locations and associated data efficiently.

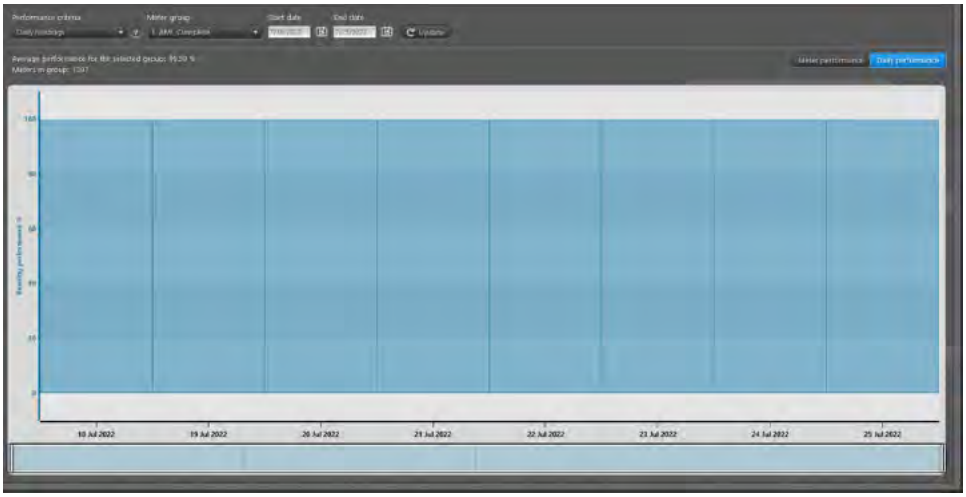
I. Performance Reporting

The software shall provide performance analytics to recognize data collection success of all meters or meter groups on user defined parameters such as daily or hourly reads as a percentage or number to monitor the health of the system.

Kamstrup's READy Manager software provides tools for monitoring meter performance on user-defined parameters such as daily or hourly reads. Performance analytics can be accessed via two primary tabs:

Monitoring of the consumption limit can be active for a specified period of time, or be set up without an end date.

Performance Report – Meter Performance



Performance Report – Daily Performance

To ensure proper operation of the AMI system and accurate billing of the consumers, a reading performance report is available to assess the read rate percentage for meters in your network. READy Manager enables you to see the reading performance either as an average per meter in the Meter performance tab, or as an average per day in the Daily performance tab.

J. Data Security and Integrity

1. Hosted data shall be stored in a SOC 2 or ISO 27001 certified environment including firewalls, antimalware systems and encryption for data protection.

Kamstrup holds to the most stringent security certifications including ISO 27001:2022.

Kamstrup solution and service delivery dept. (GOE) is using CIS18, ISO/IEC 27017 and ISO/IEC 27018 frameworks to measure the effectiveness of internal processes. The 27017 and 27018 standards have been implemented following ISO 27001:2022 as of September 2023.

READy SaaS data is hosted on Microsoft Azure cloud based software meeting SOC2 Type 2 Compliance. SOC2 Type 2 attestation is performed under:

2. Meter encryption keys are assigned to the utility to prevent unauthorized access to meter reading data. Data sent to the host software shall use TLS 1.2 protocol with AES 256-bit encryption.

The AMI system is protected at all component levels utilizing standard communication protocols such as TLS 1.2 AES 256 encryption from collector to the head end and CCM AES 128 encryption from meter to collector. All data transfers between mobile devices are encrypted and use a secure TLS connection. Mobile devices use a unique token by scanning a QR code and can be revoked if the device is lost or stolen.

3. The import of meter data shall prevent human data entry errors, prevent duplication of meter serial numbers, and distinguish between meters with integrated or separate endpoints.

The READy Manager system prevents human data entry errors, eliminates duplication of meter serial numbers, and differentiates between meters with integrated or separate endpoints through its efficient data import features.

- **Error Prevention:** Meter data is preprogrammed to avoid manual entry mistakes, ensuring system accuracy. The system checks for inconsistencies or missing fields during data import processes.
- **Duplicate Serial Number Prevention:** Every meter and endpoint is assigned a unique identifier, which is verified during the import process to prevent duplication.
- **Identification of Meters:** The system supports differentiation between meters with integrated endpoints or separate configurations by utilizing distinct attributes and metadata for each type during setup and operation.

These features ensure reliable integration of meter data into the system and eliminate potential inaccuracies.

4. The system shall enable the utility to assign and customize user access and permissions based on each user's role within the organization.

READy Manager supports customizable user access and permissions based on organizational roles. Key details include:

- **Role-Based Permissions**: READy Manager offers three main permission levels: User, Superuser, and Administrator. These default role settings can be further customized to tailor access based on user responsibilities

2.06 Acoustic Leak Detection Software Requirements

A. The software shall support the collection of acoustic noise data from integrated acoustic smart meters or external acoustic noise detection devices and automatically prioritize them based on customer defined levels.

Kamstrup's advanced AMI solution supports the collection of acoustic noise data from its integrated flowIQ® 2200 meters with Acoustic Leak Detection (ALD) technology. The system automatically prioritizes noise readings within the Leak Detector software based on utility-defined acoustic thresholds. Meters are categorized into high, medium, and low noise levels, effectively streamlining detection and management of potential leaks in customer service lines and distribution mains.

B. The software shall be accessible via desktop computer or mobile device. The software shall graph acoustic noise trends over time and allow the user to select the desired date range to facilitate the finding of distribution leaks.

Kamstrup's Leak Detector software is accessible via desktop and mobile devices. It enables utilities to graph acoustic noise trends over time, providing historical data visualization for precise analysis. Users can select and customize the desired date range to track noise development and identify potential issues, facilitating the proactive detection and management of distribution leaks.

C. The software shall visually display meters or external acoustic noise detection devices by noise level geographically in map view and allow customization of which meters or devices are displayed or hidden.

Kamstrup's Leak Detector software includes GIS-based mapping capabilities to visually display noise levels from meters or external acoustic noise devices geographically. Users can customize the display to show or hide specific meters based on defined acoustic thresholds, enabling targeted analysis of noise data for efficient leak detection and prioritization.

D. The software shall support acoustic event tracking, leak type categorization, commenting, and final resolution reporting after field leak investigations.

Kamstrup complies with this requirement.

E. The software shall provide manual or auto-generated reports indicating possible leak events.

Leak Detector allows for data gathering of the number of leaks found/fixed and the estimated cost of leaks assisting the reporting water loss. This data can not only be used to validate water loss for internal and external reporting, but other Utilities have also used this data as evidence to validate the need and provide assistance in requesting grant money to replace pipe assets.

READY Manager has very robust and customizable export options. The District has full autonomy to create and edit formats to extract any data from the READy HES instance. These exports can be formatted in CSV or text file formats.

F. The software shall provide a list view of meters or sensors with a corresponding overlay of both leak data and relevant meter data including customer side constant consumption alarms, high consumption alarms, and latest reading date.

The Kamstrup solution complies with this requirement.

G. The software shall have the ability to incorporate meter flow conditions to determine if the leak may be before or after the meter.

The Kamstrup solution complies with this requirement.

H. The software shall provide the option to integrate a distribution pipe layer network to aid in visualization of meter and external device locations in relation to distribution main lines and utility service lines.

Acoustic noise value from the meter is transmitted through the AMR or AMI Network and viewed in Leak Detector web-based software where information is easily digested in dashboard format for Meters of Interest, Meters in Warning, and availability to view all in map or list view. Integration of pipe overlay from GIS is also available. Leak data patterns can be easily managed and compared to neighboring meters ensuring quicker localization of potential leaks before even visiting the field. Reports are also available and can be automated to be sent to City personnel responsible for managing Non-Revenue Water initiatives or weekly leak investigations. Leak Detector also allows for data gathering of the number of leaks found/fixed and the estimated cost of leaks assisting the reporting or water loss for the city. This data can not only be used to validate water loss for internal and external reporting, but other Utilities have also used this data as evidence to validate the need and aid in requesting grant money to replace critical pipe assets. Ability to integrate with third party sensors on software roadmap.

I. The software shall be able to export data in CSV and PDF formats.

READY Manager has very robust and customizable export options. The District has full autonomy to create and edit formats to extract any data from the READy HES / MDM instance. These exports can be formatted in CSV or text file formats.

PART 3 - EXECUTION

3.01 Factory Testing

Each meter shall be factory-tested for accuracy in accordance with AWWA C715 to demonstrate compliance with these specifications.

Kamstrup water meters, including the flowIQ® 2200, comply with AWWA C715 standards for accuracy. Each meter undergoes 100% factory testing for compliance, and electronic or paper test results are provided for verification upon shipment. This ensures accuracy and performance align with specifications before installation.

3.02 Installation

A. Installation of residential flow meter systems shall be in strict accordance with the manufacturer's written instructions.

Core & Main and its installation partner, DB Utility, comply with this requirement.

B. The meter may be installed at any angle and position with no minimum straight pipe and meet applicable AWWA accuracy standards.

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.

The Kamstrup flowIQ® 2200 is easy to install in all operating environments, horizontally as well as vertically, independent of piping and installation conditions

C. When the meter is installed, the use of a mobile application shall confirm that the meters signal is being received by one or more AMI data collector and verify the signal strength to determine whether the installation is good before leaving the installation site.

Yes, the mobile application allows users to verify the signal strength and readability of the desired meter.

3.03 Warranty

A. Materials and Workmanship

The manufacturer warrants that the products shall be free from defects in materials and workmanship during the warranty period defined as follows:

1. Smaller than 1-1/2" – the Warranty Period shall be a full twenty (20) years from the date of delivery to buyer.

Yes, the warranty period will be a 10/10. 10 year full replacement in the first ten years and the following ten years the warranty will be prorated.

2. 1-1/2" and larger – the Warranty Period shall be a full ten (10) years from date of delivery to buyer.

Yes, the warranty period will be a 5/5. 5 year full replacement in the first five years and the following five years the warranty will be prorated.

B. Accuracy

Manufacturer shall warrant that the meters will perform to the accuracy as defined in AWWA C715-18 and AWWA M6 manual. In event that the meters do not comply with

the warranties, the manufacturer shall repair or replace any defective meter at no cost or shall refund the purchase price of such defective meters during the warranty period defined as follows:

1. Smaller than 1-1/2" – the Warranty Period shall be a full twenty (20) years from the date of delivery to buyer.

The accuracy warranty is for the life of the meter. 20 years.

2. 1-1/2" and larger – the Warranty Period shall be a full ten (10) years from date of delivery to buyer.

The accuracy warranty is for the life of the meter. 10 years.

C. Battery Life

Based on operation of the meters at an ambient operating temperature not higher than stated in the technical documentation, the manufacturer shall warrant the system battery during the warranty period defined as follows:

1. ***Smaller than 1-1/2" – the Warranty Period shall be twenty (20) years (10 full/ 10 prorated) from the date of delivery to buyer. Manufacturer shall replace any meters that contain defective batteries at a cost to buyer equal to the price set out in the price list valid at the time of return of the meter, minus the discount according to the following schedule:***

Year	Discount	Year	Discount
11	75%	16	40%
12	75%	17	30%
13	50%	18	20%
14	50%	19	10%
15	50%	20	10%

Comply.

2. 1-1/2" and larger – the Warranty Period shall be a full ten (10) years from date of delivery to buyer.

Correct, however on meters 6'' and above we offer a field replaceable battery that doesn't intercept the metrology of the meter.

D. Warranty shall be provided in the District's name.

Kamstrup complies with this requirement.

3.04 Training

AMI/AMR System Supplier shall provide training to District personnel, including operation, maintenance, and troubleshooting. Training shall include a minimum of one (1) hour classroom training and a minimum of two (2) hours field training for the residential flow meters.

Core & Main and Kamstrup comply with this requirement. We have provided a sample training plan under the *AMI Support and Customer Training* section of our response.

3.05 Field Testing AMI/AMR System

Supplier shall demonstrate to the Owner that the equipment operates as designed and specified with internal or external acoustic leak detection device.

The Kamstrup flowIQ® 2200 meters incorporate integrated Acoustic Leak Detection (ALD) technology, enabling consistent monitoring of both customer-side and utility distribution leaks directly through the water. Data collected via these internal sensors is transmitted daily to the Leak Detector platform. Demonstration can be provided to verify that the metering equipment functions as specified, showcasing its ability to analyze water network conditions efficiently without external devices or additional infrastructure while maintaining performance compliance standards.

SECTION 17331 – COMMERCIAL AND INDUSTRIAL FLOW METERS TECHNICAL SPECIFICATIONS

PART 1 – GENERAL

1.01 General Requirements

Contractor shall furnish and install commercial and industrial flow meter systems and all appurtenant materials, equipment, and work suitable for the services listed, complete and operable in accordance with requirements of the Contract Documents and in conformance with the manufacturer's recommendations. Upon completion of installation, the work shall be tested to demonstrate compliance with these specifications.

Core & Main complies with this requirement.

1.02 AMI/AMR Systems Supplier

All equipment specified herein, in Section 17330 – Residential Flow Meters Technical Specifications, and in Section 17335 – AMI/AMR Data Collection Systems Technical Specifications shall be supplied by a single manufacturer (AMI/AMR Systems Supplier) to assure compatibility and unit responsibility for operation and performance.

Core & Main complies with this requirement.

1.03 Related Sections

A. Section 17330 – Residential Flow Meters Technical Specifications

B. Section 17335 – AMI/AMR Data Collection Systems Technical Specifications

Core & Main acknowledges these Technical Specification sections.

1.04 Specific Project Requirements

Contractor shall replace the following quantity and sizes of existing commercial and industrial flow meters:

Meter Size	Quantity
3"	2
4"	5
6"	3

Core & Main complies with this requirement.

1.04 Submittals

All submittals shall be in accordance with Section 01300, Contractor Submittals and Requests Technical Specifications.

A. Shop Drawings

Contractor shall submit shop drawings in accordance with the Contractor Submittals Technical Specification and shall include, but not be limited to, the following:

1. Details and specifications of all components of all meters including detailed installation instructions.

2. Wiring and connection schematics.

3. Manufacturer's application performance guarantee for each meter location, and recommendations for installation at each location.

4. Factory accuracy test reports for each meter furnished.

Core & Main complies with this requirement. Kamstrup complies with this requirement, these reports can be provided upon request.

B. Operation and Maintenance Manual

Contractor shall submit a detailed operation and maintenance manual for the flow metering system(s) specified herein.

Comply

PART 2 - PRODUCTS

2.01 General

A. Commercial and industrial flow meter systems shall consist of a flow meter with integral factory-programmed electronic register/interface device.

Kamstrup's flow meters, including the **flowIQ® 2200**, **3200**, and **4200**, incorporate fully integrated electronic registers and transmitters, eliminating external wiring or adapters. These meters are factory-programmed and ready for immediate integration into AMI systems.

B. Flow meter shall be solid-state with no moving parts and utilize two (2) ultrasonic transducers to measure flow rate.

Comply

C. Flow meter size, capacity, and length shall be as specified in AWWA C715.

Comply.

D. All flow meters shall be provided with new gaskets.

Core & Main acknowledges this requirement.

E. Flow meter system shall be manufactured to order with a manufacturing date no earlier than three (3) months prior to order date.

Kamstrup Complies with this requirement.

F. Flow meter system shall be Kamstrup (flowIQ), Neptune, or approved equal or approved equal.

For Rubidoux Community Services District, Core & Main is proposing the approved Kamstrup metrology and network.

2.02 Flow Meter

A. Meter Body

1. The meter body shall be NSF/ANSI 61 certified lead-free materials and shall be either cast bronze, or 316L stainless steel. Insulating or isolation fittings shall be provided at connections to dissimilar metals.

Comply. The flowIQ 3200 and 4200 meter has been approved according to Drinking Water Standards and is certified to NSF/ANSI 61 and the meter body is stainless steel.

2. Meter size, model, direction of flow, and NSF 61 certification shall be indicated on the meter body.

Comply

3. All fastening hardware shall be constructed of Type 316 non-magnetic corrosion-resistant stainless steel to prevent corrosion.

Kamstrup Complies with this requirement.

4. Meters 3" through 12" in size shall be provided with Class 150 flat-faced flanges conforming to ASME B16.24. Contractor shall coordinate connection type and size based on actual meters furnished.

Kamstrup Complies with this requirement.

5. Meter shall be suitable for a maximum operating pressure of 175 psi (minimum).

Kamstrup meters are pressure-tested to ensure performance and durability. Residential meters are rated for a maximum operating pressure of 250 psi, while commercial meters range between 275 psi and 300 psi, exceeding the minimum requirement of 175 psi.

B. Meter Register/Interface Device

1. The meter register/interface device shall consist of a meter register and meter interface unit (MIU), housed within the same enclosure. The meter register/MIU enclosure shall contain all the elements necessary for accurate measurement and registration of water flow rate.

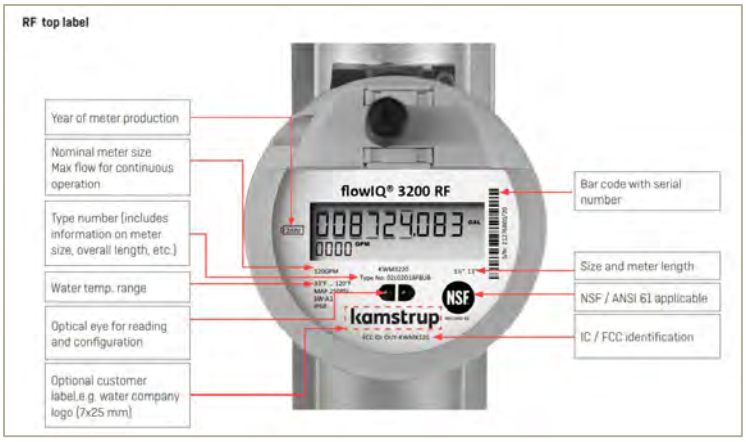
Comply. Kamstrup complies with this requirement. The flowIQ® water meters have integrated registers and RF communication capabilities contained within the same enclosure, simplifying installation and minimizing components. The meter's all-in-one design eliminates the need for separate meter interface units (MIU) or external connections, ensuring a more robust and tamper-resistant solution.

2. The device shall be provided with a 9-digit LCD display.

Comply. Kamstrup meters are equipped with a 9-digit LCD display.

3. The meter serial number shall be displayed in a permanent location on the register.

Comply.



4. The device shall be hermetically sealed or fully potted with no exposed wires connecting the MIU and register.

The integrated meter is hermetically closed and vacuum-sealed to prevent humidity from reaching the electronics and avoid condensation between the glass and display.

5. The device shall transmit seamlessly in both advanced metering infrastructure (AMI) and automated meter reading (AMR) mode without any additional programming.

Comply.

6. The device shall be capable of operating at external ambient temperatures of 35°F to 130°F (1.5°C to 55°C) and operating humidity factor of 0 to 100% condensing.

Comply.

7. The radio circuit board and battery shall be protected by hard-potting material or hermetically sealed.

The integrated meter is hermetically closed and vacuum-sealed to prevent humidity from reaching the electronics and avoid condensation between the glass and display.

8. The device shall either have an integral antenna mounted to the meter or be designed for a remote antenna capable of being installed through an industry standard 1-3/4" diameter hole in a meter box lid for maximum transmission range.

Comply

No wires are required between the meter, encoder, and radio. The majority of meters in the system will be able to transmit under the lid, whether metal or composite, without issue. In the event that communication is not consistent, the easiest course of action is to swap a metal lid for a composite. The next is to raise the signal out of the pit using and external antenna. An external antenna is available as a wall mount option in lengths of 6.6ft or 65.6ft

and in a pit mount option in lengths of 2ft, 6.6ft, and 24.6 ft for use in situations like meter vaults and inside sets. The pit mount option goes through the industry standard 1' –¼" hole. Because of it's backfill capabilities, even an inconsistent connection can often show no data gaps in the HES.

9. If using an external antenna, it shall be capable of mounting to various thicknesses of meter box lids from 1/2" to 2-1/2" and various distances from meters.

Comply

10. Remote antennas shall be rigid in design to withstand traffic and shall have a dual-seal connection to the MIU housing.

Kamstrup Complies with this requirement.

11. The MIU device shall be protected against static discharge without loss of data per IEC 801-2, Issue 2.

Kamstrup Complies with this requirement.

12. Power shall be supplied to the MIU by a lithium battery with capacitor.

The MIU is powered by a **long-life lithium battery** designed for extended operational life. The device incorporates **internal power management components** to support reliable operation during transmission events and varying load conditions.

13. The number of radio-based meter reads performed must not affect the battery life.

Comply. Please refer to our response within the Residential Meter Specifications.

14. The battery life shall not be affected by outside erroneous wake-up tones (e.g., other water, gas, or electric utilities reading and therefore sending out a wake-up tone).

Comply.

15. The battery shall be hermetically sealed or a fully potted component of the MIU with no external wires.

Comply. Please refer to our response within the Residential Meter Specifications.

16. The device shall be rated IP68 suitable for continuous submergence in water.

Comply. The meter is IP68 (submersible) type tested and suitable for installation in meter pits.

C. Performance

1. All meters shall be capable of the following flow ranges at the listed accuracies.

Meter Size	Extended Low Flow @ 100% Accuracy (U.S. gpm ± 10%)	Normal Operating Range @ 100% Accuracy (U.S. gpm ± 1.5%)	Safe Maximum Operating Capacity (U.S. gpm)	
			Normal Operation	Fire Service
3"	0.50	7.5 to 350	350	420
4"	0.75	5.0 to 700	700	700
6"	1.4	5.0 to 1400	1400	1400
8"	4.0	6.0 to 40280000	2800	2800
10"	6.0	7.0 to 4500	4500	4500
12"	8.0	8.0 to 5500	5500	5500

Comply

2. Meters shall not require a strainer for accurate operation.

Comply.

2.03 Data Transport

A. The MIU shall provide 8-digit reading resolution from encoded registers using either Neptune ProRead™/E-CODER protocol or Sensus UI-1203 protocol in mobile as well as AMI network data collection applications, simultaneously, without need for programming.

Kamstrup **Encoded Output** supports the Neptune ProRead™/E-CODER protocol and Sensus UI-1203 protocol in both mobile and AMI network data collection applications simultaneously without requiring additional programming. This compatibility ensures seamless integration with these systems, facilitating efficient and accurate utility data collection across various applications.

B. The MIU shall read the encoded register at hourly intervals to provide accurate leak and reverse flow detection using 8-digit resolution reads.

Comply

C. The MIU shall transmit the meter reading continuously at a predetermined transmission interval.

Comply. Please refer to our response within the Residential Meter Specifications.

D. The MIU shall transmit AMI network messages every three (3) hours – standard. No programming shall be necessary to activate transmission of AMI network messages.

Comply. Please refer to our response within the Residential Meter Specifications.

E. Each AMI network message shall be capable of including 24-meter readings for redundancy to improve read success rates.

Comply. If a transmission is missed, the system uses Reading Gap Reconciliation to reconcile reading gaps for up to 24 hours by including the current hour read and the previous five hours of data in the next transmission.

F. The MIU shall transmit AMR Fallback messages every 32 seconds – standard. No programming shall be necessary to activate or revert to transmission of AMR Fallback messages.

Comply. Kamstrup meters comply with the AMR fallback feature, transmitting messages every 32 seconds. The feature does not require programming for activation or reversion to AMR fallback mode.

G. Each device shall have unique preprogrammed identification numbers (ID) of nine (9) characters. ID numbers shall be permanent and shall not be altered. Each device shall be labeled with the ID number in numeric and barcode form. The label shall also display FCC approval information, manufacturer's designation, and date of manufacture.

Comply. Please refer to our response within the Residential Meter Technical Specifications.

H. The MIU shall transmit the encoder meter reading and a unique MIU ID number. The MIU shall interface to encoder registers using Neptune E-CODER or Sensus UI-1203 communication protocol via a 3-conductor wire without need for special configuration to the MIU.

Not applicable, as Core & Main and Kamstrup are proposing an **integrated proprietary MIU solution** where compatibility with external encoder protocols, such as Neptune E-CODER or Sensus UI-1203, is inherently unnecessary due to the fully integrated design.

I. The MIU shall transmit time-synchronized, top-of-the-hour readings as part of its scheduled, periodic AMI network transmission.

Comply.

J. The MIU shall periodically transmit a packet that includes the register information such as register ID, register type, and other status information no less than weekly.

Comply. Please refer to our response within the Residential Meter Technical Specifications.

K. The MIU shall automatically attempt to join an AMI network on a periodic basis and, once provisioned and authorized, shall begin transmission of AMI network messages for consumption by host software as part of simultaneous operation of walk-by, mobile, or AMI network without any site visits or reprogramming of MIU.

Comply. The Kamstrup transmitter is preprogrammed before installation according to specifications desired by the utility. The programming includes embedding the FCC licensed network and security encryption keys within the device. The meters activate automatically and begin registering flow and connecting to the AMI network upon water flow. No field programming is required during installation, and any necessary programming adjustments or updates can be done remotely via Over The Air (OTA) updates using the system's software tools.

L. The MIU shall provide empty pipe detection that is visibly displayed on the meter's LCD register.

Comply.

M. The MIU shall provide and display low battery detection on the meter LCD and shall communicate low battery detection to the AMI network.

Comply.

2.04 FCC Licensing and Certification

A. The MIU shall operate within Federal Communications Commission (FCC) Part 15.247 regulations for devices operating in the 902 MHz to 928 MHz unlicensed band. The output power of the devices shall be governed by their conformance to these relevant FCC standards.

Comply.

B. AMI communications that utilize an FCC assigned frequency within the licensed 450 MHz to 470 MHz frequency range are preferred. For those that do not utilize an FCC assigned frequency, the system must operate in the 902 MHz to 928 MHz unlicensed band.

The Kamstrup READy AMI system operates on a secure FCC-licensed 450-470 MHz frequency, providing protection against interference and ensuring reliable data transmission.

C. The system must be expandable at any time without authorization from the FCC.

The Kamstrup AMI system is designed to be fully scalable, allowing for expansion at any time without requiring authorization from the FCC. The network operates on an FCC-licensed 450-470 MHz frequency and supports straightforward addition of collectors or endpoints while maintaining compatibility across the infrastructure.

D. No wake-up tone shall be necessary.

Comply

PART 3 - EXECUTION

3.01 Factory Testing

Every meter shall be factory-tested for accuracy in accordance with AWWA C715 to demonstrate compliance with these specifications.

Kamstrup complies with this requirement.

3.02 Installation

Installation of commercial and industrial flow meter systems shall be in strict accordance with the manufacturer's written instructions.

Comply.

3.03 Warranty

Manufacturer shall guarantee electrical equipment against defects in material and workmanship for a period of ten (10) years from date of manufacture. Warranty shall include battery life for a period of ten (10) years. Warranty shall be for full replacement of the meter. Warranty shall be provided in the District's name.

Comply. Please refer to the Warranty Statement attached.

3.04 Training

AMI/AMR System Supplier shall provide training to District personnel, including operation, maintenance, and troubleshooting. Training shall include a minimum of one (1) hour classroom training and two (2) hours field training for the commercial and industrial flow meters.

Core & Main and Kamstrup comply with this requirement. A training plan has been provided below.

SECTION 17335 – AMI/AMR DATA COLLECTION SYSTEMS TECHNICAL SPECIFICATIONS

PART 1 – GENERAL

1.01 General Requirements

Contractor shall furnish and install AMI Data Collection System including and all appurtenant materials, equipment, and work suitable for the services listed, complete and operable in accordance with requirements of the Contract Documents and in conformance with the manufacturer's recommendations. Upon completion of installation, the work shall be tested to demonstrate compliance with these specifications. All materials and equipment supplied under this Section shall be new, of good quality, and in good condition.

Core & Main and Kamstrup comply with this requirement.

A. The system network design shall achieve a minimum of +98.5% daily reading performance over a 3-day billing read window.

Comply. Please refer to the Propagation Study attached above.

B. The system network design shall achieve 100% coverage of meter population.

Comply

1.02 AMI/AMR Systems Supplier

All equipment specified herein, in Section 17330 – Residential Flow Meters Technical Specifications, and in Section 17331 – Commercial and Industrial Flow Meters Technical Specifications shall be supplied by a single manufacturer (AMI/AMR Systems Supplier) to assure compatibility and unit responsibility for operation and performance.

Core & Main complies with this requirement.

1.03 Related Sections

A. Section 17330 – Residential Flow Meters Technical Specifications

B. Section 17331 – Commercial and Industrial Flow Meters Technical Specifications

Core & Main acknowledges these Technical Specification sections.

1.04 Specific Project Requirements

A. Fixed Data Collection Systems

1. Contractor shall furnish and install fixed data collection systems at existing District facilities as required to collect data from residential, commercial, and industrial flow meters throughout the District's service area. The District's service area boundary is shown on Figure 1 included in these Contract Documents.

Core & Main complies with this requirement.

2. AMI System Supplier shall visit existing District facilities and determine the exact quantity and location of fixed data collection systems required for a complete and operable system. Existing District facilities available for installing fixed data collection systems are shown on Figures 1 through 5 included in these Contract Documents.

Core & Main and Kamstrup comply with this requirement; a site survey was conducted during the solicitation process.

3. Contractor shall furnish and install permanent 120VAC power distribution facilities for each proposed fixed data collection system. Contractor shall connect proposed power distribution facilities to existing 120VAC power supply facilities at each site.

Comply.

B. Drive-By Data Collection Systems

Contractor shall furnish one (1) drive-by data collection system.

Core & Main and Kamstrup comply with this requirement.

C. Walk-By Data Collection Systems

Contractor shall furnish one (1) walk-by data collection system.

Core & Main and Kamstrup comply with this requirement.

D. Software Service

Contractor shall furnish a one (1) year software service contract as specified herein.

Core & Main and Kamstrup comply with this requirement.

E. Customer Portal Interface Access

Contractor shall furnish a one (1) year customer portal interface access contract.

Core & Main and H2O Analytics comply with this requirement. Please refer to the Solution Overview section of our response for an overview on the Customer Portal solution.

1.05 Submittals

All submittals shall be in accordance with Section 01300, Contractor Submittals and Requests Technical Specifications.

Core & Main complies with this requirement.

A. Shop Drawings

Contractor shall submit shop drawings in accordance with the Contractor Submittals Technical Specification and shall include, but not be limited to, the following:

1. Manufacturer's product data sheets for all equipment, materials, and components specified herein.

2. Details and specifications of all data collection system components.

3. Fabrication and assembly drawings for fixed data collection system components.

4. Detailed installation instructions for all components furnished.

5. Wiring and connection schematics.

6. Manufacturer's application performance guarantee for each fixed data collection system location.

7. Calculations and details signed and stamped by a civil or structural engineer registered in the State of California for the free-standing antenna tower base and reinforced concrete foundation prepared in accordance with the California Building Code (latest).

8. Fabrication drawings and details for electrical enclosure mounting frames and stanchions.

Core & Main complies with this requirement.

B. Post Warranty Support Plan

Contractor shall submit a Post-Warranty Support Plan identifying software update frequency, software support contact structure, field service and troubleshooting response times, and spare parts availability.

1. Software Update Frequency:

Kamstrup's READy Head End System (HES) receives approximately two updates/upgrades annually. Updates are automatically pushed to users' instances when logging into the system.

2. Software Support Contact Structure:

Core & Main provides support alongside Kamstrup’s resources. Utilities get access to a MyKamstrup account, allowing easy access to manuals, troubleshooting guides, videos, customer support, and issue reporting.

3. Field Service and Troubleshooting Response Times:

Personnel trained by the manufacturer are available for support, with troubleshooting response capability in accordance with Service Level Agreement (SLA) requirements, including severity levels and guaranteed response times.

4. Spare Parts Availability:

Spare parts and system scalability are ensured through Kamstrup’s modular system design, with documentation supporting future scalability and additional collectors to expand coverage seamlessly.

Kamstrup software and system maintenance align with ISO standards and rigorous quality assurance protocols for testing updates, securing against vulnerabilities, and ensuring compliance with cybersecurity frameworks.

C. Operation and Maintenance Manual

Contractor shall submit detailed operation and maintenance manuals for the data collection systems specified herein.

Core & Main complies with this requirement. Upon award, Core & Main and Kamstrup will provide O&M documentation for the AMI system.

PART 2 - PRODUCTS

2.01 General

A. Data collection systems shall provide a means of communication between the data collection devices and flow meters.

The Kamstrup AMI solution provides a robust means of communication between data collection devices (collectors) and flow meters using an FCC-licensed 450 MHz frequency, ensuring reliable and secure long-range communications.

Key components include:

1. Integrated Radio Communication: Kamstrup meters, such as flowIQ® 2200, flowIQ® 3200, and flowIQ® 4200, have built-in radios that eliminate the need for separate wired communication devices. This simplifies installation and reduces maintenance requirements. Each meter transmits hourly consumption data and alarm information (e.g., leaks, tampering) to the nearest collector.

2. Collectors: Kamstrup READy Collectors are central to the system's fixed network infrastructure, designed to receive meter data and transmit it to the Head-End System (READy Manager). These collectors can store up to 30 days of hourly readings for up to 25,000 meters, ensuring data continuity even during backhaul interruptions.

3. Two-Way Communication: The system supports true two-way communication. Meters can send hourly data and alerts to the collector, while utilities can remotely perform updates, reprogram, and schedule readings through the Head-End System.

4. Automated Data Transmission: Meters operate on a routine RF transmission schedule of every three hours to ensure consistent data delivery (including current and previous reads). Missed transmissions are reconciled in subsequent schedules, with capabilities to restore up to 100 days of hourly data via AMR fallback if necessary.

5. READy Manager Integration: The collected data is transmitted securely to the cloud-based READy Manager platform for storage, monitoring, and analysis. It supports data encryption, ensuring the integrity of communication between collectors and the meters/head-end system.

This communication framework ensures comprehensive data collection and management, scalability, and secure transmission, making it suitable for efficient utility operations and billing purposes.

B. Data collection systems shall provide a means for communication with the District's software system.

The proposed Kamstrup AMI solution complies with this requirement. Please refer to the answer above.

1. The AMI network shall allow for collector redundancy.

Kamstrup complies with this requirement.

2. An AMI network capable of self-healing by automatically monitoring reading performance and adjusting power output of meter transmissions is preferred.

The Kamstrup AMI solution incorporates self-healing capabilities to optimize the functionality and reliability of the network. Key features addressing automatic monitoring and adjustment of power output include:

1. Automatic Power Optimization: Meters dynamically adjust output transmission power based on the signal strength received from the connected collector. This ensures efficient communication and minimizes energy consumption, providing the highest chance of reliable data transmission without manual intervention.

2. Automatic Path Optimization: Meter radios actively scan and store paths to multiple collectors upon activation or if communication with the current collector is lost. This feature enables the meter to immediately attempt a connection with the next collector based on signal strength before rescanning the network, ensuring uninterrupted data collection.

3. Reading Gap Reconciliation: If a scheduled transmission is missed, the system includes the most recent meter reading along with the previous five hours of data in the next transmission. This approach continues up to 24 hours, ensuring high data integrity despite network disruption.

4. Fallback AMR Operation: Meters maintain a continuous backup capability for AMR drive-by readings, ensuring billing reads can still be obtained reliably even during unexpected network interruptions.

5. Network Collector Data Retention: Collectors store up to 30 days of hourly data for up to 25,000 meters, enabling backhaul communications to be restored without data loss or affecting system accuracy. Once communication is re-established, stored data is automatically updated to the Head End System (HES).

This combination of features enables a resilient and adaptive network infrastructure ensuring uninterrupted performance and reliable operations over the long lifecycle of the system.

3. The AMI network software shall include the ability to read meters via AMR mobile drive by and AMI without reprogramming of the meter or MIU.

Comply.

4. The AMI network shall provide two-way communication in order to perform firmware updates on devices as needed.

The proposed Kamstrup AMI solution complies with this requirement. The Kamstrup AMI system provides true two-way communication between the Head End System (HES) and the transmitter. The system supports Over The Air (OTA) updates, allowing commands and configuration changes to be sent from the HES to individual meters or groups of meters. This includes scheduling updates, reprogramming read intervals, and pushing firmware updates. The communication is secured with AES 128 and AES 256 encryption, ensuring data integrity and security in both directions. Additionally, on-demand readings can be initiated remotely, allowing the utility to collect data or perform diagnostics as needed without physical meter access.

2.02 Fixed Data Collection Systems

A. General

Each fixed data collection system shall consist of a data collection device, antenna, antenna support system, communication cable, radio lightning arrestor, uninterruptible power supply (UPS), and electrical enclosure support frames and stanchions.

Kamstrup complies with this requirement.

B. AMI Network Collectors

1. AMI network collectors shall be housed in rugged NEMA 4, (IP66) enclosure class with built-in lightning protection.

The proposed Kamstrup READy Collector complies with this requirement.

2 AMI network collector shall operate from -4° F to 130° F and 10% to 100% condensing humidity.

The Kamstrup READy Collector exceeds these requirements with an operating temperature range of -22° F to 149 ° F. Please refer to the Product Data Sheet for more information.

3. AMI network collectors shall automatically perform required updates such as firmware without user intervention.

Comply. Code or firmware upgrades for the collectors are automatically performed over-the-air (OTA) from the Head End System (HES).

4. AMI network data backhaul communication options shall include either cellular modem or ethernet network.

The proposed Kamstrup READy Collector complies with this requirement.

5. AMI network collectors shall have onboard storage and support up to 30 days of hourly data for up to 20,000 meters.

Comply. Collectors store up to 30 days of hourly reads for up to 25,000 endpoints in case of backhaul communication interruption.

6. AMI network collectors shall require minimal maintenance. Contractor shall provide any manufacturer-required maintenance instructions.

The recommended maintenance intervals for collectors are as follows:

- **Year 3:** Visually check the collector installation. Replace any chaffed wires or pieces showing signs of wear.
- **Year 8:** Visually check the collector installation. Replace any chaffed wires or pieces showing signs of wear. Replace units degrading in performance, expecting a 20% replacement of infrastructure.
- **Year 13:** Visually check the collector installation. Replace any chaffed wires or pieces showing signs of wear.
- **Year 18:** Visually check the collector installation. Replace any chaffed wires or pieces showing signs of wear. Replace units degrading in performance, expecting a 50% replacement of infrastructure.

The useful life expectancy of collectors is estimated at 20 years.

Code or firmware upgrades for the collectors are automatically performed over-the-air (OTA) from the Head End System (HES). This process does not require manual intervention, ensuring collectors remain updated with the latest software enhancements and security measures.

7. Collector shall offer an optional solar power input, to ensure functionality in locations where mains power is unavailable.

Comply.

C. Antenna

1. Antenna shall be suitable for 100 mph wind.

Kamstrup complies with this requirement.

2. DC grounded electrostatic discharge (ESD) protection.

Kamstrup complies with this requirement.

3. Antenna shall be provided with a corrosion resistant metal mounting mast as necessary for required mounting height.

Kamstrup complies with this requirement.

4. Antenna shall be furnished with all necessary mounting clips, adapters, supports, hardware, and appurtenance. Said components shall be corrosion resistant metal.

Comply.

D. Antenna Support System

1. Reservoir Handrail At reservoir sites, antenna shall be mounted to handrail on reservoir roofs with strut channel when handrail is present. Strut channel shall be hot dip galvanized steel, 1-5/8" by 1-5/8" by 12 gauge thick (minimum) with hot-dip galvanized hardware and fittings. Cut edges of strut shall be ground smooth and coated with Cold Galvanizing Compound or equivalent repair method.

Comply

2. Free-Standing Tower

a. A 40-foot tall (minimum) free-standing, aluminum tower with hinged base shall be provided for mounting the fixed data collection system antenna and cables when the antenna cannot be located on the roof of a reservoir.

Comply

b. 10-foot high anti-climb panels shall be provided on all sides of the tower near the bottom of the tower and secured with stainless steel hardware.

Comply

c. Tower base shall be embedded in a cast-in-place reinforced concrete foundation designed by a civil or structural engineer registered in the State of California. Foundation shall be 5-foot square by 8-foot high structural concrete with #6 reinforcing bars each way at 12" on center spacing, minimum. Concrete shall be Class 650 CW 4000 concrete conforming to SSPWC Section 201 1.3.3 and reinforcing bars shall be Grade 60 conforming to SSPWC Section 2001-2.2.1. Exposed subgrade shall be scarified 12" and recompacted to 95% (minimum relative compaction) prior to placing concrete.

Not applicable as the propagation study requires use of the existing water tank sites.

d. Tower shall be located where it can pivot and lay down flat on the ground.

Not applicable. The Propagation Study utilizes the utility's existing water tank sites.

e. Lighting Rod and Grounding

1) A lightning rod, Novalynx Model 190-121 or equal, shall be attached to the tower with two (2) stainless steel pole mount brackets and U-bolts.

Comply

2) A #2/0 bare copper ground conductor shall be attached to the lighting rod and clamped to the tower with stainless steel clamps at 24" spacing. At the base of the tower, the ground conductor shall be installed in conduit and run to outside the limits of the tower foundation and connected to a bare copper ground rod. Open end of exposed conduit above grade shall be sealed with duct seal to prevent entry of water and debris.

Comply

3) A #4 AWG bare copper ground conductor shall be attached to the tower base above grade and run to the ground rod per Item b above (installation in conduit not necessary).

Comply

E. Radio Lightning Arrestor

1. A radio lightning arrestor shall be provided between the antenna and data collection device.

Kamstrup complies with this requirement.

2. A #3/0 bare copper conductor shall be installed in conduit from the radio lightning arrestor to a ground rod.

Kamstrup complies with this requirement.

F. Communication Cable

1. Communication cable shall be watertight, flexible, low-loss communications coaxial cable rated for outdoor use and suitable for an operating temperature range of -4°F to +140°F.

Kamstrup complies with this requirement.

2. Minimum velocity of propagation shall be 85%.

Kamstrup complies with this requirement.

3. Maximum impedance shall be 50 ohms.

Kamstrup complies with this requirement.

4. Maximum DC resistance of inner conductor shall be 1.39 ohms per 1000 feet and 1.65 ohms per 1000 feet for outer conductor.

Kamstrup complies with this requirement.

5. Communication cable shall be able to withstand 2500 volts DC.

Kamstrup complies with this requirement.

6. When the antenna is located on top of a reservoir, communication cable shall be installed in conduit mounted to reservoir shell. When antenna is located on top of a free-standing tower, communication cable shall be attached to tower with stainless steel clamps.

Kamstrup complies with this requirement.

7. Communication cable shall be provided with all necessary fittings and connectors.

Comply.

G. Uninterruptible Power Supply (UPS)

1. UPS shall supply 120VAC, 60 Hz, 1-phase power to the fixed data collection system.

Yes, UPS output will be 120 vac, 60 hz, single-phase (note: maximum UPS output current is 1A).

2. Input power shall be 120VAC, 60 Hz, 1-phase.

Yes, input power for the UPS is 120 vac, 60 hz, single phase (note: maximum input current is 8.3A)

3. UPS shall be capable of operating the fixed data collection system for a period of 18 hours in the event of a power failure.

Partial compliance as UPS will provide about 15 hours of battery-backed 120 vac, 1A (120 watts) power to the data collection system in event of AC input power failure

4. UPS shall be suitable for an operating temperature range of -40°F to 130°F at 0% to 95% non-condensing relative humidity.

Yes.

5. Battery(ies) shall be sealed lead acid-type.

Yes.

6. UPS shall be provided with a NEMA 3R forced-air ventilated enclosure suitable for wall or stanchion mounting.

Comply. Please refer to the Product Data Sheet for the UPS.

7. UPS shall have alarms for low battery and no battery.

Partial compliance as UPS will provide "AC input failure" and "Low battery" alarms. However, it does not provide "No Battery" alarm.

8. UPS shall have a five (5)-year warranty.

UPS includes 5 year warranty.Please refer to the Warranty Statement attached.

H. Support Frames and Stanchions for Electrical Enclosures

1. Electrical enclosures shall be mounted on support frames or stanchions. Support frames and stanchions shall be constructed of hot dip galvanized steel strut channel systems or custom fabricated structural shapes.

Comply.

2. Strut channels shall be hot dipped galvanized steel, 1-5/8" by 1-5/8" by 12 gauge thick (minimum) with hot-dip galvanized hardware and fittings. Cut edges of strut shall be ground smooth and coated with Cold Galvanizing Compound or equivalent repair method.

Comply.

3. Support frames and stanchions shall be anchored to reinforced concrete pads with Type 316 stainless steel anchor bolts.

Comply.

4. Support frames, stanchions, reinforced concrete pads, and anchorage shall be designed by a civil or structural engineer registered in the State of California.

Comply.

2.02 AMR Fallback Equipment

A. AMR fallback equipment shall be handheld and battery powered.

Comply. The **READy Converter** is a portable, battery-powered handheld device used for fallback AMR readings. It communicates wirelessly with meters using a Bluetooth connection and a 900 MHz radio frequency, ensuring field operators can efficiently collect readings without physically accessing the meters.

B. The mobile drive by application shall support Android or iOS devices (smart phones or tablets). Data may be synchronized from the mobile app and host software at any time via Wi-Fi or cellular network without the loss of captured data.

The Kamstrup AMI solution supports mobile drive-by applications with seamless integration for Android devices using the READy App.

Key capabilities include:

1. Platform Compatibility: The READy App is specifically designed for Android devices and allows use on smartphones or tablets.

2. Data Synchronization: The app supports near real-time synchronization with the READy Head-End System (HES) through Wi-Fi or cellular network connectivity. This ensures data captured during mobile drive-by readings is promptly updated to the central database without any loss of captured data.

3. Continuous Data Integrity: All captured data is securely stored in the mobile app until synchronization is completed, preventing loss during transmission or transfer interruptions.

4. Flexible Deployment: Field personnel can view current assignments, retrieve meter logs, verify installation, and perform diagnostics while ensuring all updates are successfully reflected in the HES.

The READy App's features allow utilities to streamline mobile operations effectively while maintaining data security and integrity during synchronization.

2.03 Data Transport

1. All data communicated over a radio network, AMR or AMI, shall always be encrypted.

The Kamstrup AMI solution ensures encrypted communication for all data transmitted over its radio network, complying with stringent security standards. The details are as follows:

Encryption Protocols:

- Meter to Collector Communication: Utilizes AES 128-bit encryption to protect data during transmission.
- Collector to Head-End System (HES): Employs AES 256-bit encryption for enhanced security.

Through these measures, the Kamstrup solution guarantees the integrity and confidentiality of all data transmitted via its AMR and AMI networks.

2. The MIU shall provide 8-digit reading resolution from encoded registers using either Neptune ProRead™/E-CODER protocol or Sensus UI-1203 protocol in mobile as well as AMI network data collection applications, simultaneously, without need for programming.

Comply

3. The MIU shall read the encoded register at hourly intervals to provide accurate leak and reverse flow detection using 8-digit resolution reads.

Comply.

4. The MIU shall transmit the meter reading continuously at a predetermined transmission interval.

Comply.

5. No programming shall be necessary to activate transmission of AMI network messages.

Comply.

6. Each AMI network message shall include capability to backfill missed reading data for redundancy and to improve read success rates.

The Kamstrup AMI system operates with a mode of three-hour RF transmission intervals from the meters to the collectors. During each transmission, the current hour's read along with the previous two hours of data are sent to ensure overlap and successful collection. If a transmission is missed, the next scheduled transmission will attempt to reconcile the missed read by including the most recent hour and up to the previous five hours. This reconciliation behavior continues for up to 24 hours.

Collectors store up to 30 days of hourly reads for up to 25,000 endpoints in case of backhaul communication interruption. Once communication is restored, data is transmitted to the READy Headend System (HES) using either cellular or ethernet backhaul. The HES stores hourly data for 13 months, daily data for 5 years, and monthly data for 10 years, with first-in-first-out data management. The system is designed to provide reliable data retention and transmission, ensuring comprehensive coverage and data integrity.

7. No programming shall be necessary to activate or revert to transmission of AMR messages.

Comply.

8. In the event of a cut wire, the MIU shall not send the last good read as this can lead to missbilling. The MIU shall transmit a trouble code in lieu of the meter reading.

Comply

9. Tamper – If wiring has been disconnected, a "non-reading" shall be provided indicating wire tamper; a reading that gives the last available reading is an incorrect reading.

Comply

10. Each device shall have unique preprogrammed identification numbers (ID) of nine (9) characters. ID numbers shall be permanent and shall not be altered. Each device shall be labeled with the ID number in numeric and barcode form. The label shall also display FCC approval information, manufacturer's designation, and date of manufacture.

Comply.

11. The MIU shall transmit the encoder meter reading and a unique MIU ID number. The MIU shall interface to encoder registers using Neptune E-CODER or Sensus UI-1203 communication protocol via a 3-conductor wire without need for special configuration to the MIU.

Not applicable, as Core & Main and Kamstrup are proposing an **integrated proprietary MIU solution** where compatibility with external encoder protocols, such as Neptune E-CODER or Sensus UI-1203, is inherently unnecessary due to the fully integrated design.

12. The MIU shall transmit time-synchronized, top-of-the-hour readings as part of its scheduled, periodic AMI network transmission.

Comply.

13. The MIU shall periodically transmit a packet that includes register information such as register ID, register type, and other status information no less than weekly.

Comply.

14. The MIU shall automatically attempt to join an AMI network on a periodic basis and, once provisioned and authorized, shall begin transmission of AMI network messages for consumption by host software as part of simultaneous operation of walk-by, mobile, or AMI network without any site visits or reprogramming of MIU.

Comply.

2.04 AMI/AMR Software Application

A. The software application shall provide all controls needed in the network for the essential functions of the metering data output received through communication with the data

collection systems. The software application shall present this data within an intuitive user interface that is easy to interpret and understand. It shall integrate seamlessly with other third-party applications the District utilizes, such as customer information systems (CIS) software, billing software applications, and work order management systems.

Comply. The Kamstrup Head End System (HES), READy Manager, is a Software as-a-Service (SaaS) offering that is cloud hosted on secure Microsoft Azure US database servers. The City can download READy Manager for free onto any Windows based PC.

READy Manager is where all meter readings and alarm info codes are stored and easily managed. The software is optimized for simple navigation, group/route management, customer consumption evaluation, Radio Frequency (RF) performance monitoring, alarm info code assessment and customer billing transfers to/from the City's CIS.

Integration between READy Manager, the City's CIS, and the H20 Analytics customer engagement platform will most likely occur through automatic file transfer using a secure SFTP server. READy Manager is incredibly flexible when it comes to file structure and data requirements and Kamstrup has not run into a CIS system it was unable to integrate with.

B. Basic Functionality for AMR and AMI

1. The AMI/AMR software application shall have the capability of interfacing with the District's CIS/billing software through a file layout that meets the specifications provided by the systems vendor.

Comply. Integrations between READy Manager and other municipal software can be completed using the same REST (REpresentational State Transfer) API as the CIS integration or via a standard file transfer in any CSV or fixed width format required by the municipal software.

File transfer can also be automated to send or receive files to/from a SFTP server to eliminate the manual process of synchronizing files with other software platforms.

2. The software application shall have a method of importing and exporting files for billing processes.

Comply.

3. A method shall be available for a user to specify the routes to be exported and for transferring files from the software application to the billing system.

Comply. Kamstrup's systems comply with the requirement for users to specify routes for data export and facilitate file transfers to billing systems.

4. The software application shall be accessible through an internet web browser for accessibility anywhere.

Comply.

5. The software application shall operate within a Microsoft Windows platform and be hosted by the system's vendor.

Comply.

6. A geographical view of metering assets shall be available within the user interface.

Comply

7. The software application shall allow AMI and AMR metering processes to run in parallel within a single user interface.

Comply. **READy Manager** integrates AMR mobile reading and AMI fixed network reading seamlessly into one platform.

8. Graphical presentation of consumption data shall be viewable within the user interface.

Comply.

9. The software application shall have a method to display individual account consumption based on meter size, meter type, and unit of measure.

Comply.

10. Multiple levels of user security access shall be available within the software application.

Comply. The Kamstrup READy Manager system provides different user permission levels to control access and interaction with the Meter Data Management System (MDMS). Here are the key permission levels and recommended roles for different positions:

User Permission Levels:

- User: Basic access suitable for field technicians to perform essential tasks without altering system settings.
- Superuser: Enhanced access for customer service representatives, allowing them to handle customer interactions, generate reports, and address common issues.
- Administrator: Full access for leadership and systems/network management personnel, enabling them to configure system settings, manage user accounts, and perform comprehensive data analysis.

Recommended Permission Levels:

- Field Technician: Assigned 'User' level to perform tasks such as data retrieval and basic diagnostics, ensuring they cannot modify critical system configurations.
- Customer Service Representative: Assigned 'Superuser' level to access customer accounts, analyze consumption data, and manage customer inquiries effectively.
- Leadership: Assigned 'Administrator' level to oversee system operations, generate strategic reports, and make high-level decisions based on system data.
- Systems/Network Management: Also assigned 'Administrator' level to manage system configurations, ensure data security, and maintain overall network health.

These permission levels ensure that each role has the appropriate access needed to perform their duties without compromising system integrity or security.

11. A method to search for records matching flow meter ID, account, name, or address shall be available within the software application.

Comply.

12. The software application shall support meter readings (4-8 digits) and flow meter ID numbers up to 10 digits.

Comply

13. All metering output data, such as leaks and reverse flow indications, shall be viewable within the software application. Granular reporting shall be available and define all accounts that have triggered the event.

Comply

14. The software application shall display the top ten (10) consumers with the highest consumption within the user interface. A method to view additional high usage consumers should be available.

Comply. The software includes **Consumption Reports**, which provide ranking data for individual customers or groups based on consumption levels.

Beyond the top ten consumers, additional high-usage consumers can be identified using filtering and sorting functionalities.

15. Reading performance reports and usage analysis capabilities shall be available within the software application.

Comply.

The District can access data on network and transmitter health and performance using the Kamstrup READy Head End System (HES). This system provides comprehensive monitoring capabilities, including:

- Received Signal Strength Indicator (RSSI): Allows evaluation of the communication quality between endpoints and collectors.
- Signal to Noise Ratios: Provides insights into the clarity of the signal versus background noise.
- Packet Success Rates: Measures the efficiency and reliability of data transmission across the network.
- Channel Utilization: Assesses how effectively network channels are being used.
- Backhaul Performance: Evaluates the stability and speed of data transmission from collectors to the head-end system.

These metrics help the City ensure optimal network performance and quickly identify and address any issues.

16. All available reports shall be exportable to Microsoft Excel or PDF formats.

Comply.

17. The software application shall present to the user the number of successful, unsuccessful, and invalid readings.

Comply

C. AMI Network Software Functionality

1. The software application shall have the capability to store all meter data information obtained from the data collection systems.

Comply.

2. The software application shall provide system critical alarms, such as reverse flow and potential continuous consumption, in a statistical view within the software application and provide notification to District personnel.

Comply.

The District will have access to various active alerts through the Kamstrup READy Head End System, which can be configured to meet specific needs. These alerts include:

- Consumption Alerts: These can be set up for a meter if a specified consumption limit is exceeded. Alerts appear within READy as orange exclamation points for easy

identification and navigation. Monitoring can be configured for specific periods or set indefinitely.

- Alarm Info Code Alerts: Provides an overview of all meter alarms registered during the last meter reading. Filters can be applied to show only high-priority or active info codes. Alerts can be exported to Excel for further analysis.
- Notifications: Automatic alerts for important meter events can be sent via email or SMS. These notifications are customizable to allow regular updates or immediate alerts as events are detected.

The HES includes a 'notification' feature that allows the Utility to configure text or email messages alerting on potential high-usage anomalies or other alarm info codes. These messages can be customized to send to specific District personnel and can be limited to specific alarm codes if desired.

These messages can be scheduled for a specific time and day of the week or can be set up to send 'At detection'. At detection codes will send a message to the District personnel after every info code received from the network.

3. The software application shall have a method to clone a specific AMI data collection device for replacement device when required.

Comply

4. The software application shall have the capability to monitor flow meters that have transmitted for the first time to identify reading success.

Comply

5. Monthly, daily, and hourly consumption shall be viewable within the user interface in a tabular and graphical data presentation.

Comply.

6. Daily and hourly readings shall be viewable within the user interface in a tabular format.

Comply.

D. AMR System Software Functionality

1. The cloud platform shall provide the capabilities of collecting metering data from the Mobile AMR collection devices and present the data in a user-friendly view for consumption by District users.

Comply.

2. The District application shall have a method to view, load, and make route assignments for meter readers.

Comply.

3. A method of loading routes to drive-by data collection devices, walk-by data collection devices, mobile phones, and tablet devices shall be viewable within the software application.

Comply.

4. The software application shall provide a method of data transfer to the drive-by data collection device and accept data from the device.

Comply.

5. The software application shall manage the routes that are loaded into the data collection device.

Comply.

6. The software application shall have a method to communicate wirelessly to handheld, cellular phones, or tablet devices.

Comply.

7. The software application shall have a method to split routes by collection method or into equal parts for managing meter reading load activities.

Comply.

E. Mobile Software Application Device Compatibility

1. The mobile software application shall contain a method of completing meter reading tasks via an Android or Apple iOS mobile phone or tablet device.

READy manager is designed for use with PC and **Android** systems and is dependent on data from Kamstrup's flowIQ meter product line.

2. The mobile software application shall contain a method to provide data log capabilities via a mobile phone or tablet device.

Comply. All meters continuously store the most recent 100 days of hourly data and 460 days of daily data. This data can be remotely logged via the READy App paired with the READy Converter.

3. When using a drive-by or walk-by device for meter reading, the software platform shall provide a method of real-time synchronization for loading and unloading routes on the device.

Comply. In AMR (Automated Meter Reading) mode, meter readings are collected by a vehicle equipped with a receiver and antenna that drives through a service area. This vehicle gathers data from meters as it passes, using radio signals transmitted from the meters. The drive-by method allows for efficient data collection without the need for manual reading at each meter location. The frequency of data collection depends on the schedule set by the utility and the range of the transmission capabilities of the meters.

In AMR mode, the interval at which reads are received depends on the frequency of the drive-by data collection. The meters continuously broadcast their readings at set intervals, but the actual collection of these reads occurs when the vehicle equipped with a receiver drives by the meters. The specific interval for receiving reads is determined by how often the utility schedules the drive-by sessions.

4. The mobile software application shall log flow meter data and shall include graphical and tabular views that include any meter output such as leaks and reverse flow indications.

Comply.

F. Cybersecurity

Meter data, customer records, configurations, and system information shall remain the exclusive property of the District. The AMI/AMR software shall maintain the following minimum security standards:

1. National Institute of Standards and Technology (NIST) Cybersecurity Framework alignment

Comply. All data is securely hosted and replicated **within U.S. borders**, and the system is fully compliant with **NIST, FedRAMP, and ISO/IEC 27001** standards.

2. U.S.-based encrypted data storage

The proposed READy Manager HES is hosted on **Microsoft Azure**, which is designed to meet the high security, compliance, and performance standards required by public sector utilities. Kamstrup leverages Microsoft's geographically redundant architecture to ensure **high availability**, **disaster recovery**, and **data residency within the United States**.

Due to security protocols and nondisclosure policies governed by Microsoft's cloud service architecture, the specific geographic data center locations are not shared. However, all data

is securely hosted and replicated **within U.S. borders**, and the system is fully compliant with **NIST, FedRAMP, and ISO/IEC 27001** standards.

3. End-to-end encryption (at rest and in transit)

The Kamstrup AMI system is protected at all component levels utilizing standard communication protocols such as TLS 1.2 AES 256 encryption from collector to the head end and CCM AES 128 encryption from meter to collector. All data transfers between mobile devices are encrypted and use a secure TLS connection. Mobile devices use a unique token by scanning a QR code, which can be revoked if the device is lost or stolen. Data is stored in an ISO27001 certified environment and follows backup and recovery procedures according to this certification. All data is backed up daily and necessary procedures are implemented to prevent data loss. The Azure Cloud Platform provides built-in monitoring and correction of potential database errors, and Kamstrup adds a service setup for additional monitoring and detection of abnormalities.

4. Role-based access control and user audit logging

The system supports internal and external users, where the Administrators can invite internal and external users into the system. External users are handled on a separate management layer to further ensure control and security.

The Application Programming Interface (API) is secured with an OAuth 2.0 protocol where a tenant ID with a client ID and secret is needed to create a token to access data. Audit logging and traceability is enabled for all API transactions as well as controls to restrict access.

Users are granted functional access based on roles with the District's administrative users having control over user directories. Optionally, Single-Sign-On (SSO) can be implemented for internal users with SAML-compliant user authentication/authorization systems. API access is secured by the use of Service Accounts.

G. Software Service

1. Contractor shall furnish the services of a vendor to provide Software-as-Service (SaaS) support services that is responsible for ownership of the AMI/AMR software and all associated hardware to operate the software. The District shall only be responsible for the computers or laptops needed to access the AMI/AMR software applications via a web browser. The District shall maintain ownership of all data received by the AMI network and AMR system and shall be provided online access to all data during an active subscription. In the event the subscription terminates, the SaaS vendor shall provide the data to the District in an agreed upon media format.

The proposed system architecture centers on the Kamstrup READy Manager Headend System (HES), which is delivered as a **SaaS solution hosted on secure US-based**

Microsoft Azure cloud servers. All meter data is securely stored and managed in the Azure environment, supporting both production and backup operations. On-premises infrastructure such as network servers, switches, or hubs is not required for the AMI headend, as all core functionalities—including monitoring, maintenance, upgrades, and data storage—are managed in the cloud. The architecture includes FlowIQ water meters with integrated RF radios, AMI collectors, and supporting field tools. The system supports both ethernet and cellular backhaul for collectors, ensuring reliable transmission of meter data to the cloud-hosted HES. The SaaS model ensures that all HES components, including system software and databases, operate in a virtualized cloud environment, eliminating the need for physical servers or network appliances at the utility site. All upgrades and maintenance are handled by Kamstrup, and data is backed up nightly with a 14-day retention schedule, stored in a physically separate location from the operating server.

2. The software service vendor shall provide the following services to the District during the subscription:

The proposed system architecture centers on the Kamstrup READy Manager Headend System (HES), which is delivered as a **SaaS solution hosted on secure US-based Microsoft Azure cloud servers**. All meter data is securely stored and managed in the Azure environment, supporting both production and backup operations. On-premises infrastructure such as network servers, switches, or hubs is not required for the AMI headend, as all core functionalities—including monitoring, maintenance, upgrades, and data storage—are managed in the cloud. The architecture includes FlowIQ water meters with integrated RF radios, AMI collectors, and supporting field tools. The system supports both ethernet and cellular backhaul for collectors, ensuring reliable transmission of meter data to the cloud-hosted HES. The SaaS model ensures that all HES components, including system software and databases, operate in a virtualized cloud environment, eliminating the need for physical servers or network appliances at the utility site. All upgrades and maintenance are handled by Kamstrup, and data is backed up nightly with a 14-day retention schedule, stored in a physically separate location from the operating server.

a. The SaaS vendor shall have a minimum of two years of experience providing hosting services for municipal water providers.

Comply. READy Manager has been available in the U.S. market for over **eight years**,

b. The SaaS subscription shall cover all software patches, operating system updates, security and network monitoring, and platform preventive maintenance.

Comply. The SaaS model ensures that all HES components, including system software and databases, operate in a virtualized cloud environment, eliminating the

need for physical servers or network appliances at the utility site. All upgrades and maintenance are handled by Kamstrup.

c. The SaaS vendor shall provide the District with a service level agreement that meets 99% application availability during business hours of operation, excluding corporate holidays.

The Supplier will use commercially reasonable efforts to provide a target monthly uptime of at least ninety-eight percent (98%) for the hosted AMI Software, measured as a thirty (30) calendar day average. Availability excludes approved Service Windows, scheduled or emergency maintenance, Force Majeure events, and outages caused by external or third-party systems outside the Supplier's reasonable control.

d. The SaaS vendor shall provide a disaster recovery plan for any failures at the managed services center to ensure continuity of the District's data and continued access.

Kamstrup's READy software employs Microsoft Azure's cloud platform to deploy replication, failover, and recovery processes across multiple and geographically diverse data Microsoft data centers to keep our HES running during planned and unplanned outages. Backup data is stored in a separate physical location from the operating server providing data redundancy in the event of a server failure and ensuring quick and easy access to historical data.

e. The SaaS vendor shall have a data backup strategy and process.

All READy HES data is cloud hosted securely on Microsoft Azure located in US database centers. All data is subject to an extensive backup strategy where all data is backed up on a nightly basis on a 14-day retention schedule. Backups are stored on appropriate media and under conditions so that the environmental effect on the media is controlled and the backup is stored in a physically different location than the operating server. A separate backup is stored on a monthly basis in a fireproof box at Kamstrup and as an additional precaution in another physical location away from where the server is located. Recovery of data from backups is tested minimum four times each year. This is documented in accordance with Kamstrup's ISO 27001 certification.

f. The SaaS vendor shall provide a method of communicating or alerting the District in the event of system failure or downtime.

Comply.

g. The SaaS vendor shall have security and monitoring services in place that ensures the privacy and security of the District's data.

Kamstrup ensures the privacy and security of the District's data through robust security and monitoring services. Kamstrup's solution is hosted on Microsoft Azure, maintaining SOC2 Type 2 compliance.

h. The SaaS vendor shall ensure that the data and all redundant data is housed in the country in which the District resides.

All READy HES data is cloud hosted securely on Microsoft Azure located in US database centers. All data is subject to an extensive backup strategy where all data is backed up on a nightly basis on a 14-day retention schedule. Backups are stored on appropriate media and under conditions so that the environmental effect on the media is controlled and the backup is stored in a physically different location than the operating server.

i. All data in transit to the cloud shall be encrypted.

The Kamstrup AMI system is protected at all component levels utilizing standard communication protocols such as TLS 1.2 AES 256 encryption from collector to the head end and CCM AES 128 encryption from meter to collector. All data transfers between mobile devices are encrypted and use a secure TLS connection.

2.05 FCC Licensing and Certification

A. If applicable, AMR communications shall operate within Federal Communications Commission (FCC) Part 15.247 regulations for devices operating in the 902 MHz to 928 MHz unlicensed band. The output power of the devices shall be governed by their conformance to these relevant FCC standards.

The proposed Kamstrup AMR solution complies with this requirement.

B. If operating on the 902 MHz to 928 MHz unlicensed band, the MIU shall transmit using a frequency hopping, spread spectrum technique comprised of alternating pseudo-random frequencies and/or transmit using the LoRaWAN™ protocol using spread spectrum modulation.

The Kamstrup AMI network uses an FCC-licensed 450-470 MHz frequency that is unique to the Utility and is protected from outside interference by the FCC. Reads collected in AMR, or drive-by mode, operate on the 902 MHz to 928 MHz on an unlicenced band which uses frequency hopping. LoRaWAN not currently supported.

C. AMI communications that utilize an FCC assigned frequency within the licensed 450 MHz to 470 MHz frequency range are preferred. For AMI communications that do not utilize an FCC assigned frequency, the system must operate in the 902 MHz to 928 MHz unlicensed band.

Kamstrup operates on an FCC-licensed 450–470 MHz frequency. The licensed frequency provides protection against interference, ensuring reliable and secure communication.

D. The system must be expandable at any time without authorization from the FCC.

The Kamstrup AMI system is designed to be fully scalable, allowing for expansion at any time without requiring authorization from the FCC. The network operates on an FCC-licensed 450-470 MHz frequency and supports straightforward addition of collectors or endpoints while maintaining compatibility across the infrastructure.

PART 3 - EXECUTION

3.01 Installation

A. Installation of AMI network collectors shall be in strict accordance with the manufacturer's written instructions.

Core & Main and DB Utility comply with this requirement.

B. The AMI network collectors shall be installed at the locations and heights as determined by an AMI network propagation study.

Core & Main and DB Utility comply with this requirement.

C. AMI network collectors shall be confirmed to be online and operating before installation is completed.

Core & Main and Kamstrup comply with this requirement.

3.02 Field Testing

AMI/AMR System Supplier shall demonstrate to the Owner that the equipment operates as designed and specified.

Core & Main and Kamstrup comply with this requirement.

3.03 Training

AMI/AMR System Supplier shall provide training to District personnel, including operation, maintenance, and troubleshooting. Training shall include classroom and field training as specified in the following table:

Item	Training Type	Duration (Minimum)
AMI Network Software Application	Classroom	2 Hours
AMR Systems Software Application	Classroom	2 Hours
Customer Billing Interface	Classroom	2 Hours
Customer Portal Interface Access	Classroom	2 Hours
Fixed Data Collection Systems	Classroom	2 Hours
	Field	2 Hours

Item	Training Type	Duration (Minimum)
Drive-By Data Collection System	Classroom	1 Hour
	Field	2 Hours
Walk-By Data Collection System	Classroom	1 Hours
	Field	2 Hours

Comply.

3.03 Warranty

A. Materials And Workmanship

The manufacturer warrants that the products shall be free from defects in materials and workmanship during the warranty period defined as follows:

AMI collector devices: two calendar years from the date of delivery to utility.

AMI collector devices are covered by a warranty for two years starting from the date of delivery to the utility. Please refer to the Warranty Statement attached.

Company Background & Experience

CORE & MAIN – PRIME CONTRACTOR

Core & Main LP was established in 2004 and built on the foundation of 80+ legacy companies, including HD Supply Waterworks, Hughes Supply, and National Waterworks. Our products are integral to building, repairing, and maintaining water and wastewater systems. They serve as part of the basic municipal infrastructure required to support population and economic growth, including residential and commercial construction. C&M holds a **leading market position** in the United States for water, sewer, storm drain, and fire protection products.

Headquartered in St. Louis Missouri, we have over 5,500 employees across 49 states and over 370 locations that strive daily to provide local knowledge, experience, and service nationwide.

OUR VISION

To foster a world where communities thrive because our people and products provide safe, sustainable infrastructure for generations to come.

OUR MISSION

We are industry leaders, supplying local expertise, service, and products nationwide to build innovative water, wastewater, energy and fire protection solutions for our customers and the communities we serve.

We invest in the development and well-being of our people, who are the key to our future. Together, we act with honesty and integrity because we believe strong relationships make for strong communities.

OUR CORE PRINCIPLES

- Our team members are family
- Honesty & integrity guide us
- Everyone is in sales
- We value industry, technical & local expertise
- We are action-oriented & accountable
- We are growth-focused

BUSINESS STRUCTURE

Core & Main LP (“Core & Main,” the “Company,” “we,” “our” or “us”) is a Florida limited partnership.

CONTACT INFORMATION

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- **Website:** https://coreandmain.com/
- **President:** Brad Cowles
- **CEO:** Mark Witkowski

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- **Email:** Perris@coreandmain.com
- **Local Manager:** Andrew Bohannah
- **Metering Initiative Manager:** Brent Olson

SIZE & SUPPORT

Core & Main is Publicly Traded; Core & Main became a publicly traded company on the NYSE in July of 2021 with a current market cap of over $7 Billion USD.

Local Support, Nationwide

Operating approximately **370 branches nationwide**, we combine local expertise with a national supply chain to provide contractors and municipalities with innovative solutions for new construction and aging infrastructure. Core & Main's **5,700 associates** are committed to helping their communities thrive with safe and sustainable infrastructure. We have over 1,600 sales representatives offering sales and support on the branch level and nearly 200 technical product specialists at the national and regional levels who have expertise in specific product and service offerings and who support our other sales representatives with product training and technical support.

We support our network of branches with the following company-wide resources: strategic accounts, product specialists, category management, sourcing, supply chain, finance, tax, accounting, pricing analytics, payroll, marketing communications, human resources, legal, safety and information technology.

CORE & MAIN AMI EXPERTISE

Core & Main offers Metering & Technology as one of its core growth initiatives. Our company has been selling and supporting automated meter functions for several decades, starting with its infancy in touch-read, its evolution into radio read, and now AMI.

With brick-and-mortar locations across the United States, Core & Main provides our customers with premium waterworks supplies and services. Our primary servicing branch for the Rubidoux Community Services District is in Perris and we have 30+ additional brick-and-mortar locations across the state of California. We have full-time local AMI service and support technicians and project managers on staff that will be dedicated to the deployment of this project.

We are the authorized distributor of Kamstrup Metering Products in the State of California. **Core & Main has successfully completed over 2,000 metering projects nationwide.**

OUR PARTNERS

KAMSTRUP METERING – METER MANUFACTURER

Kamstrup is a world leading manufacturer of system solutions for smart metering. Through our leadership, expertise, and passion for partnership, we always think forward of a brighter energy future, one that advances the performance of every customer, whilst creating value for the communities that they serve.

Experience and Qualifications

Kamstrup has over 70 years in the metering market and over 30 years of experience developing and delivering over 11 million ultrasonic water meters globally with a recorded failure rate of less than 0.50%. Kamstrup will be the metering technology and AMI network hardware provider of the future. Kamstrup employs over 1,700 people worldwide, 25% of which are PhDs and engineers, overseeing the quality and functionality of our product offerings. Kamstrup has invested in U.S. operations since 2013 from its production facility in Roswell, Georgia, and strives to become the leading supplier of water measurement solutions throughout North America.

DB UTILITY – METER/ INFRASTRUCTURE INSTALLATION

About Us - The Leaders in Meters.

DB Utility is a utility contractor that specializes in AMI projects. From the smallest meter to the tallest collector, DB installs everything needed for your turnkey AMI project. We pride ourselves in precise installation, flawless data, and thorough communication. We've developed a reputation for being a trustworthy partner throughout the construction process, from start to finish.

Our team of experts follows strict safety protocols and best practices to ensure that every project is delivered on time, on budget, and to the highest standards of quality.

Our Services:

- **AMR/AMI:** We've installed meters from all of the largest and smallest manufacturers. No job is too big or small - in meter size OR quantity of installs.
- **Collector Installation:** Our skilled team has experience installing collectors for your new (or current) AMI meters. Let us know what is needed, and we can tackle it together.
- **Data Reporting:** Our internal software collects as much data is needed for your billing software or other requirements.

H2O ANALYTICS – CUSTOMER PORTAL VENDOR

H20 is a customer portal vendor who will give your customers the tools to monitor their own water usage in near-real-time and to receive automated notifications when abnormalities occur. Our proposed customer portal will help them understand how their water usage compares to similar customers and how to conserve this precious shared resource.

Experience and Qualifications

H20 Analytics has served over 749 water utilities, including Milcrofton, TN, Sharyland Water Supply Corporation and Lower Valley Water District, and specializes in providing customers and utilities with a piece of mind regarding their water usage. H20 Analytics was founded in 2011 and has been in business for over 12 years.

Solution Overview

KAMSTRUP'S ACOUSTIC LEAK DETECTION SOLUTION

Kamstrup's patented Acoustic Leak Detection (ALD) Solution is a comprehensive, fully integrated system designed to provide utilities with continuous, real-time monitoring of their water distribution network. Leak detection has traditionally been a complex, time-consuming, and expensive process, but the ALD Solution streamlines and optimizes these efforts by leveraging advanced acoustic technology, automated data collection, and intelligent software analytics to proactively identify and address leaks before they escalate into costly issues.

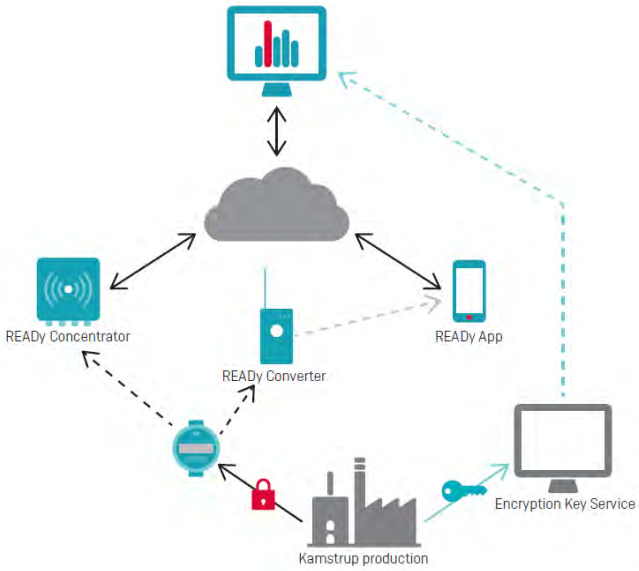


Figure: *AMI Architecture Diagram*

At the core of the ALD Solution is Kamstrup's flowIQ® 2200 water meter, the industry's only meter with built-in acoustic leak detection technology. This meter continuously monitors acoustic noise levels directly through the water, **detecting potential leaks on both service connections and distribution mains without the need for external sensors, wiring, or additional infrastructure**. Unlike traditional leak detection methods that rely on temporary lift-and-shift strategies or third-party surveying solutions, the ALD Solution provides permanent 24/7/365 monitoring for up to 20 years (one warranty for all components), ensuring the lowest total cost of ownership and the highest return on investment for leak detection technology.

Supporting the ALD Solution is **Kamstrup's Leak Detector software**, a powerful web-based analytics platform that provides utilities with an **intuitive visualization of noise data** collected from the water meters. Using an advanced algorithm, the software identifies meters with the highest risk of leakage, allowing utilities to target their investigations efficiently rather than searching blindly. The system records **26 offset noise values daily**, automatically filtering out interference from pumps, lift stations, and valves to ensure precise and actionable data.

By integrating automated leak detection, data analytics, and remote monitoring, the ALD Solution significantly enhances the efficiency of Non-Revenue Water (NRW) management. Utilities can reduce operational costs, minimize water loss, and improve service reliability with faster, more efficient leak detection. With its seamless integration, real-time insights, and ability to prioritize maintenance efforts where they will have the greatest impact, the ALD Solution represents the future of intelligent water management.

KAMSTRUP'S AMI NETWORK

An FCC-licensed 450MHz frequency powers the Kamstrup AMI network, providing reliable long-range communications. No separate wired meter communication devices are required since all radio components are integrated within the water meter register, eliminating the concern with long-term maintenance of another device.

WATER METERS

FLOWIQ 2200 (5/8"- 1")

flowIQ® 2200 is a residential water meter based on proven ultrasonic technology. It features a host of intelligent features in one superior meter protected from water ingress, and with up to 20 years battery life. flowIQ® 2200 maintains the same high accuracy throughout its lifetime and measures even the smallest consumption due to its very low error margin, industry-leading accuracy, and optimized low start flow.

Figure: *flowIQ® 2200*

With its ***built-in acoustic leak detection***, flowIQ® 2200 works to detect possible leaks in the service connections and distribution mains. The meter monitors noise patterns giving you a better picture of the condition of your network and enabling you to identify high-risk installations.

Founded on our more than 30 years of experience, flowIQ® 2200 provides modern water utilities with the data needed to bill consumers fairly, optimize operations, and lower their water loss. Utilities get a solid foundation for prioritizing both daily efforts and long-term investments through advanced data analytics focused on non-revenue water and leak detection on both sides of the meter.

Key Benefits:

- Best-in-class low-flow range for superior leak detection
- Embedded acoustic leak detection actively listens for distribution side leaks
- Can be installed in both horizontal and vertical applications
- No moving parts eliminates added cost of meter maintenance
- Available in composite and stainless steel (1" stainless steel only)
- Integrated Radio Frequency (RF) and Cellular communications with Encoded Output (EO) option

FLOWIQ® 3200 (1.5”- 4”)

The flowIQ® 3200 features groundbreaking ultrasonic technology that offers unmatched precision and reliability in water flow measurements. This meter provides more than data; it offers a wide measuring range that captures everything from an off-hours toilet flush to peak-hour water consumption. This sensitivity ensures billing accuracy and delivers essential insights to help transform your billing efficiency, safeguard vital resources, and elevate customer satisfaction. Its adaptability allows for usage with potable water, reclaimed water, and fire services.

Figure: *flowIQ® 3200*

The flowIQ® 3200 comes with robust advanced meter alarms. These alarms include continuous flow, excessive usage, tamper, dry pipe, reverse flow, and low battery. They provide valuable information to optimize operations and troubleshoot issues in the field from the utility office.

And of course, like all Kamstrup meters, the flowIQ® 3200 utilizes ultrasonic technology to provide accurate and reliable water flow measurements. It is able to meter both high and low flow ranges, and its lack of moving parts ensures the meter’s accuracy will not degrade over time for maximized ROI.

Key Benefits:

- Suitable for usage in multi-unit apartments and commercial premises for district metering applications
- Water/Ambient temperature monitoring and configurable alarms for high and low thresholds
- Continuous flow, excessive usage, tamper, dry pipe, reverse flow, and low battery alarms
- Can be installed in both horizontal and vertical applications
- No upstream/downstream requirements
- No moving parts eliminates added cost of meter maintenance
- Potable water, reclaimed water, fire service approved
- Integrated Radio Frequency (RF) and Cellular communications with Encoded Output (EO) option

FLOWIQ® 4200 (6”- 10”)

Designed for commercial and industrial applications, the flowIQ® 4200 smart meter transcends expectations, offering an extended range and superior durability. However, its most distinguishing feature is its engineering excellence—explicitly geared for large-scale applications. It’s more than just a meter. It’s an insightful window into the intricacies of your water system, laying the groundwork for reduced waste, increased revenue, and greater peace of mind. The flowIQ 4200 utilizes ultrasonic technology to provide precise and reliable water flow measurements. It has a wide measuring range with outstanding low-flow measurement capabilities, ensuring trustworthy billing and detection of potential leaks or abnormalities in the water distribution network.

Figure: *flowIQ® 4200*

Furthermore, the flowIQ 4200 seamlessly integrates AMR/AMI data communications directly into the meter to enable “plug-and-play" remote reading, data analysis and near real-time monitoring while eliminating the potential points of failure of an external radio device. With a field replaceable battery lasting up to 20 years, utilities are able to extend the meters life without taking it out of service.

Key Benefits:

- Can be installed in both horizontal and vertical applications
- No upstream/downstream requirements
- No moving parts eliminates added cost of meter maintenance
- Swivel flange for easy installation
- Field replaceable battery to extend the life of the meter
- Approved for potable water and fire service
- Integrated Radio Frequency (RF) and Cellular communications with Encoded Output (EO) option

READY COLLECTOR

The Kamstrup READy Collector is a central easy to use two-way network component in your AMI network. The data is collected from the meters, stored until the planned transmission and displayed in the READy Manager - the Meter Data Management software. The data can be collected in a number of differing time frames up to hourly readings, and if an event occurs, this data will be transmitted immediately, independent of your data scheme.

Figure: *Ready Collector*

The Kamstrup READy Collector is a rugged design that is to be used in the harshest of conditions, such as the top of towers or elevated storage tanks, where service can be difficult. Temperature extremes and lightning protection have been thoughtfully included in the engineering of the collector unit. Another important feature of the system is that no coax is necessary between the Collector unit and bottom unit, just standard off-the-shelf wiring components. The bottom unit has been built with industrialized components incorporating multiple surge protection systems, and power supply for use in the most challenging conditions.

SOFTWARE

READY MANAGER AND READY APP

Kamstrup's READy manager is an intuitive and powerful cloud-native platform designed to enable utilities to collect, access and visualize data from anywhere. READy manager can be accessed via desktop or using the READy mobile app for reading, installation, logging and verification.

READy manager empowers utilities to transform data into actionable intelligence through a variety of automation and visualization tools, such as automatic import and export tasks, automated performance reporting,

Figure: *Ready Manager*

water loss analysis and usage graphs and charts. READy manager can be used remotely or with the READy mobile app for AMR reading, installation, logging and verification.

READy manager is designed for use with PC and Android systems and is dependent on data from Kamstrup's flowIQ meter product line. The system supports CIS utility billing integration or configuration with third party apps. Standard license supports two user seats with additional users priced per seat.

Key Benefits:

- Intuitive PC software and mobile app for reading ultrasonic water meters
- Easy to use icon-based navigation
- Supports both mobile AMR reading and AMI fixed network reading
- Mobile app with built-in installation tool

LEAK DETECTOR

Leak Detector is a cloud-based platform with integrated GIS mapping, designed to receive and display leak locations within a network of meters equipped with Acoustic Leak Detection (ALD) technology. With just a browser and an internet connection, utilities can identify potential leaks from anywhere. Acting as a 24/7 monitoring tool, Leak Detector continuously collects ultrasonic data to detect leaks across a distribution network. Its GIS integration provides precise visual representation of leak locations, while alarm handling allows users to personalize notifications. Additionally, integrated work order management enables direct dispatch of alerts to field crews for prompt action.

Figure: *Leak Detector*

The platform features a map-based interface that displays noise levels detected by each meter using a color-coded system with user-defined acoustic thresholds. Meters are categorized into high, medium, and low noise levels, simplifying the identification and prioritization of potential leaks. The map view also supports pipe network visualization, offering added context for more effective leak management. Using an advanced algorithm, Leak Detector automatically identifies high-risk meters and marks them as ‘meters of interest’, allowing utilities to focus their efforts where they are needed most.

Custom filtering options give users control over which meters are displayed, making it easy to pinpoint installations with increased noise levels. Historical trend graphs visualize noise development over time, helping utilities track changes and detect potential issues early. Automated reports provide an overview of all meters with elevated noise levels, while the Dashboard keeps users updated on critical findings, ensuring proactive and efficient leak management.

Key Benefits:

- Find possible leaks in your service connections and distribution mains
- Reduce your amount of non-revenue water

- Utilize Leak Detector’s dashboard and built-in algorithms to prioritize your resources better
- Get a map-based overview of your distribution network to conduct more in-depth analysis of your network

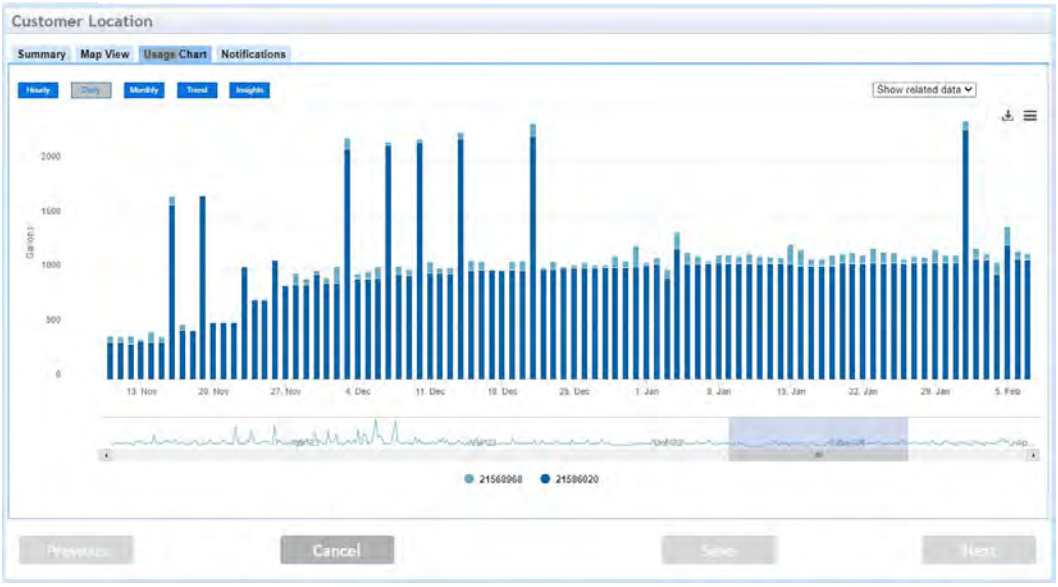
H2O ANALYTICS – CUSTOMER PORTAL

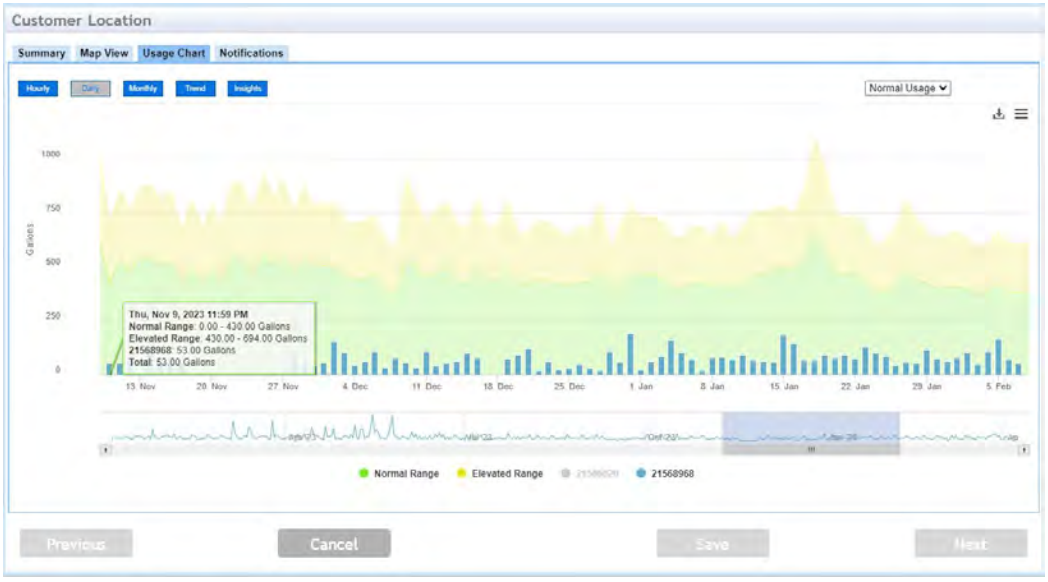
The H2O Customer Portal is an innovative and user-centric solution designed to transform utility-customer interactions by leveraging advanced data analytics and cloud technology. This portal provides utility customers with seamless access to their water usage data through both web-based interfaces and dedicated mobile applications for iOS and Android devices. With a focus on enhancing customer engagement and service efficiency, the portal offers real-time and historical water consumption insights, allowing customers to monitor their usage patterns across daily, monthly, and hourly intervals. Innovative features include configurable notification preferences enabling automated alerts for leaks, abnormal usage, and conservation tips, which aid customers in maintaining efficient water usage.

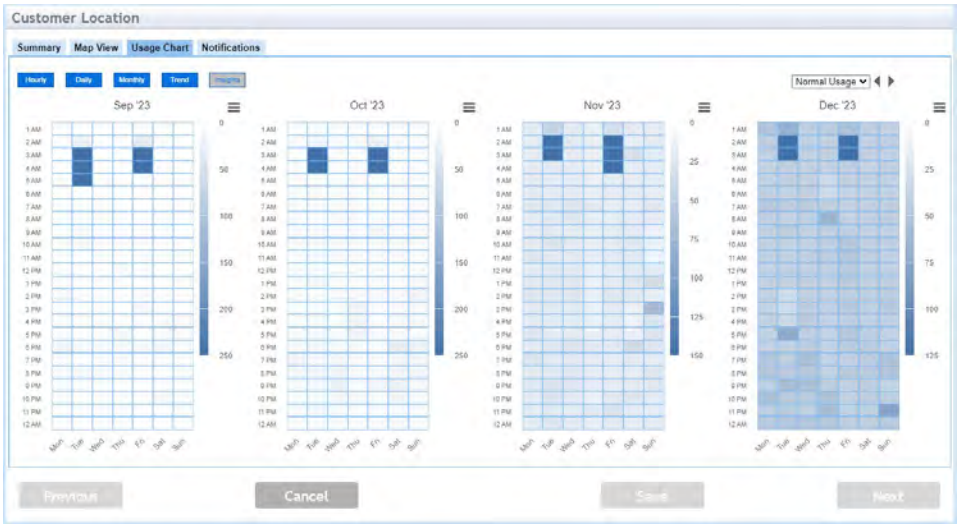
The H2O Customer Portal integrates seamlessly with existing utility systems, requiring no additional server setup while ensuring the highest levels of security with adherence to proven software standards and data center audits. It empowers utility customers with single sign-on capabilities, robust security measures like strong passwords, and self-service account management features. Its design emphasizes usability across all major browsers, ensuring accessibility on both desktop computers and mobile devices. Furthermore, the portal supports bilingual interfaces and templates, reinforcing inclusivity in user communication.

Utility personnel are equipped with tools for overseeing customer data, managing notifications, and accessing detailed usage analytics that assist in proactive service management and conservation efforts. The platform also facilitates comprehensive system integration, leveraging existing billing and metering systems to deliver automated alerts without placing an additional burden on utility staff. This cloud-based solution offers scalability and flexibility, allowing utilities to manage customer service efficiently amid growing demands and an evolving digital landscape. Overall, the H2O Customer Portal stands as a robust, secure, and adaptable solution for modern utilities seeking to enhance customer engagement and foster sustainable water usage.

The H2O Customer Portal provides a variety of ways to view account-level consumption on a daily basis, including several charts and the ability to download/view the raw meter readings using Microsoft Excel or compatible spreadsheet software. Several of these charts allow account-level usage-date to be compared with other accounts, statistical measures of 'normal' usage and weather data as shown in the screenshots below.







Project Methodology

PROJECT MANAGEMENT APPROACH

Meter replacement projects with AMR / AMI technology are complex, each with unique elements. Core & Main understands and manages these intricacies and is an industry leader in meter system deployments. Core & Main's Project Management Team is knowledgeable and experienced, with PMP®-certified project managers, Mechanical and Computer Engineers, meter support specialists, software managers, business analysts, and metering subject matter experts.

The CORE+ Team utilizes a structured methodology with proven processes and procedures in planning, safety, quality, deployment, and communication to successfully implement AMR/AMI systems. This foundation enables Core & Main's experienced and dedicated team to deliver projects on time, within budget, and with industry-leading customer satisfaction.

1. PROJECT INITIATION PHASE

The CORE+ Project Management approach begins with a focus on program initiation - to define how we will consistently collaborate with the various stakeholders to support best-for-program decision-making and mitigate the risks associated with "silo-behaviors" between projects, functions, stakeholders, and governance entities. Broader thinking, planning, and execution address the complexity of multiple, overlapping, and potentially conflicting solutions. This approach to program management is holistic, flexible, and focuses equal rigor on realizing outcomes and delivering the assets that enable them.

- Notice to Proceed
- Sales to PM Handoff
- Subcontractor Alignment
- Deliver Project Charter
- Identify Stakeholders

2. PROJECT PLANNING PHASE

Core & Main employ proven methods to ensure proper project planning, which is a critical success factor. Our assigned Project Manager will collaborate diligently with suppliers, representatives of systems requiring integration, other vendors/subcontractors, and the Utility to develop a realistically

aggressive schedule to set reasonable expectations from the start and then manage it accordingly. Necessary activities completed in collaboration with the Utility during the planning phase include:

- Conduct Kick-Off Meeting Planning Workshops
  - Scope Mgmt
  - Communications
  - Risk Mgmt
  - Change Mgmt
  - Procurement Mgmt
  - Data Mgmt
  - Schedule Mgmt
  - Network Infrastructure
  - Meter Planning
  - Inventory Mgmt
  - Field Installation
  - QA / QC
  - Training
  - Public Outreach
- Solution Design
  - Identify Technical / Integration Requirements

3. PROJECT EXECUTION PHASE

Core & Main understands the need for testing, validation, and approval. Core & Main will never begin a full deployment until stakeholders have accepted the testing results. During an Initial Deployment Phase, a subset of water meters will be installed in the Initial Deployment Area, and adherence to standard installation procedures will be monitored. The flow and validation of data from the field Work Order Management System to the Meter Exchange interface to the CIS/Utility Billing system to accurately changeout the meter, as well as device activation in the field to the Headend system to the CIS/Utility Billing system to create a customer bill. Testing results will be reviewed, and a formal customer acceptance will be requested to proceed to full deployment. Once the town has approved to proceed to full deployment, the Core & Main team will execute the plan to install the remaining meters within the contracted timeframe, focusing daily on safety and quality. Meter inventory will be controlled and tracked as meters throughout the remaining service territory are installed. Project communications will keep project stakeholders apprised of the deployment status and any issues that may arise.

Delivering large-scale public works infrastructure projects requires the involvement of numerous technical disciplines, staff from multiple departments, and someone to effectively coordinate the efforts of the individuals to support the project moving forward to completion. Transparency is the main objective of the Core & Main metering project communication methodology, with the Utility having an awareness of the project status and metrics when needed, along with any issues the project team is actively working to resolve. The Core & Main Project Manager will be involved in all aspects of the project to provide continuity among the project team and a go-to person for the town

and other stakeholders to get accurate, up-to-date information on the project status. This flexible management coordination structure leverages meetings, one-on-one communication, and email updates to provide the necessary information to each project stakeholder without burdening them with unnecessary meeting time and attendance. The Project Manager will coordinate all Purchase Orders and keep the Utility apprised of lead times and delivery status. The Project Manager will work closely with the onsite Construction Manager to ensure all processes and procedures related to safety, quality, inventory, and installation are followed and the planned meter installations are progressing on schedule.

- AMI System Deployment
  - Install sample meters
- Billing Software Integration
  - CIS Analysis
  - Software Integration
  - Development
  - Integration Testing
- Mass Meter Deployment
  - Mobilization: Mass Meter & Endpoint Installation
  - Data Reconciliation
  - QA Meter Installs
  - Inventory Control

4. PROJECT MONITORING & CONTROL PHASE

Quality assurance is an integral part to every Core & Main AMI meter deployment project. The two main areas of quality focus are fieldwork and data. Throughout the meter deployment project, staff will monitor meter installation quality in the field and adjust processes to meet unique project circumstances. Core & Main Project Managers and Installation Supervisors conduct the field audits. Data collection accuracy during the installation process is a critical success factor. We employ a data validation team to ensure that the equipment's serial numbers, final read, and other data logged in the field match the information captured by the photos. Discrepancies are field-verified and corrected to ensure accurate meter exchange data is transmitted to the town's systems.

Core & Main is committed to providing employees with a safe working environment and complying with all federal, state, and local safety regulations. Workplace safety is not a burden on a project but rather a required daily focus integrated into our training and deployment processes and procedures.

- System Acceptance Testing
- Scope Validation & Control

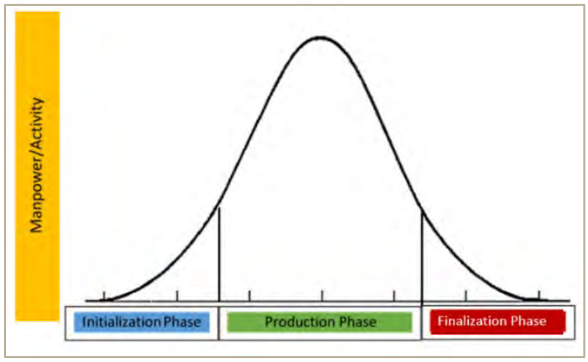
5. PROJECT CLOSE OUT PHASE

The Project Closeout Phase of the project signifies the completion of the installation and construction within the project, marking the transition from the construction phase to the operational

phase of the AMI system. This phase ensures that all project requirements have been fulfilled, any lingering issues are addressed, and the system is ready to operate as intended.

- Mass Meter Installation Complete
- Training
- Utility Sign-Off

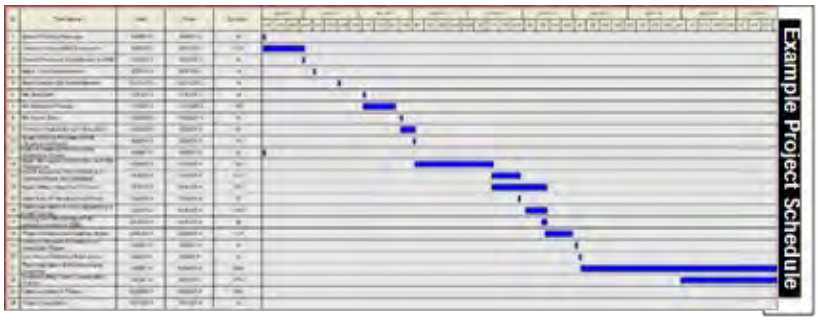
INSTALLATION & MAINTENANCE APPROACH



Knowledge, experience, and industry best practices have been acquired by the Core & Main team after more than 2,500 successful metering projects. A dedicated project management team responsible for all project elements will give your Utility confidence that your project will be well-planned and well-executed and ensure minimal disruptions to your operations and your customers.

The production schedule is developed by our on-staff project manager, with input from the Utility and a clear understanding of the project scope and the Utility's current read and billing schedule. We believe developing and testing all processes and procedures during a slow ramp-up period is essential. The ramp-up time allows for the refinement and optimization of project processes early in the production cycle. During the Initialization phase, meter installations will start slow. The town will receive Work Order Management System training. Standard operating procedures and other project processes will be refined and optimized to help ensure minimal disruptions to the town and its customers. The network is validated to ensure it performs as expected and meter data is available in the head-end system. The meter exchange interface with the Utility Billing System will be exercised to ensure meter exchange data processes correctly in the production environment. During the Production Phase, the installation team will be staffed with trained and qualified installers to support the planned monthly production rates. Final acceptance testing and project close-out will be completed during the Finalization Phase.

The project manager develops a production schedule and then conducts periodic meetings to gather information and update the team on the progress. The production schedule is updated, and should the project be determined to be behind schedule, work procedures/resource allocations are adjusted as required.



AMI Support and Customer Training

CORE & MAIN'S CUSTOMER SUPPORT

Customer Support

Core & Main provides multilayered, dedicated support tailored to metering and Advanced Metering Infrastructure (AMI). At the local level, we offer regional product availability complemented by a team of sales and metering specialists committed to catering to your daily needs. **Swift and efficient local support is paramount to addressing any challenges that may arise during project execution.**

Building on this local foundation, Core & Main also deploys in-state product specialists to support AMI for Rubidoux Community Services District. This level of specialized support ensures a clear understanding of your unique needs and an ability to provide prompt, targeted assistance.

Beyond our local and regional AMI support, Core & Main hosts a National Services Group, a team committed to AMI project support and execution. This group's focus spans project management, system integration, and other essential functions. Their mission is to ensure smooth, efficient project realization from conception through to completion.

National Supply and Support

Core & Main is the largest Waterworks Distributor in the United States. As such, our National Smart Utility team assists in the development, deployment and supply of all Metering and Technology Projects throughout the United States. Below we have outlined our multi-faceted support approach.

Figure: National Core & Main Holistic Support Graphic

National support is also imperative to the support of large systems lifecycles. Our National Smart Utility team has been implementing projects over the last 15 years from Water AMR all the way to integration with Smart City platforms.

Core & Main will strive to provide a satisfying and positive experience. However, if at any time, throughout any portion of the project, the customer is not completely satisfied, the escalation process should proceed as follows:

- **Level 1:** Project Manager
- **Level 2:** AMR/AMI Product Specialist
- **Level 3:** Regional Initiative Manager
- **Level 4:** National Director of Metering & Technology

AMI Software Support

Core & Main provides multilayered, dedicated support tailored to metering and Advanced Metering Infrastructure (AMI). At the local level, we offer regional product availability complemented by a team of sales and metering specialists committed to catering to your daily needs. **Core & Main's local manufacturer-trained representatives are available to assist the Rubidoux Community Services District with software needs on-site during normal business hours 8am-5pm CST, and by phone.**

Kamstrup uses Service Now Incident Management, which is where customer support tickets are inputted with detailed information, issues worked to resolved, and approved by customer before cases are closed. Our aim is to resolve issues while minimizing impact to business operations and maintaining quality. This ensures a standard operating procedure for handling incidents and ensuring business continuity. Service Now is monitored and maintained 24/7 to ensure compliance with incident handling.

There are two levels of severity within the Kamstrup support organization:

- Cases: Any inquiry sent to the Kamstrup support team will initially start as a case. These can be hardware or software questions or requests for additional support.

- Incidents: If a case has been assessed and either a hardware or software component is deemed broken then it is escalated to an incident. These incidents can then be escalated from local US based support to additional support levels in Denmark if necessary.

All communications provided within both cases and incidents will be documented within the service platform and can be tracked by the Authority for progress.

CUSTOMER TRAINING

We've provided a brief training overview below that includes the initial training of the Kamstrup solution. Additional and ongoing trainings will be provided on an as-needed basis free of charge to the City.

Core & Main (Metering Technology, Meter Installation, READy)	
Description	**Duration**

Metering Technology Training – Field Team
 	
• Train the Trainer – Field AMI Training
  o Meter 101 – Integral Parts of Kamstrup Meter
  o Proper Installation Technique
  o WOMS Software Training
  ▪ Navigation
  ▪ Required Documentation
  ▪ Data Sync
  o READy Field Manager Training
  ▪ Mobile Data Collection Entry
  ▪ Data Logging / Troubleshooting
  ▪ Route Assignments
  o Return to Manufacturer (RMA) Prep Procedures
	5-7 + hours

READy Head End Software – Administrative, Customer Service, IT
 	
• Billing Integration File Training
  o Installation File Training
• READy Software Training
  o Navigation
  o Analytics
  o Navigating Customer Complaints
  o Exporting Reports
  o Day in the Life
  o Route Assignments
  o User-Role Based Training
  ▪ Utility Administrator
  ▪ Utility User
  ▪ Utility Read Only
  ▪ Utility Meter Reader
	2-4 Days

Product Data Sheets

- Acoustic Leak Detection (ALD)
  - The Value of ALD
  - ALD Overview
- Meters
  - Water Resistance
  - FlowIQ 2200
  - FlowIQ 3200
  - FlowIQ 4200
- READy Collector
- READy MTU
- READy HeadEnd System Software
- Aquana Remote Shutoff Valve

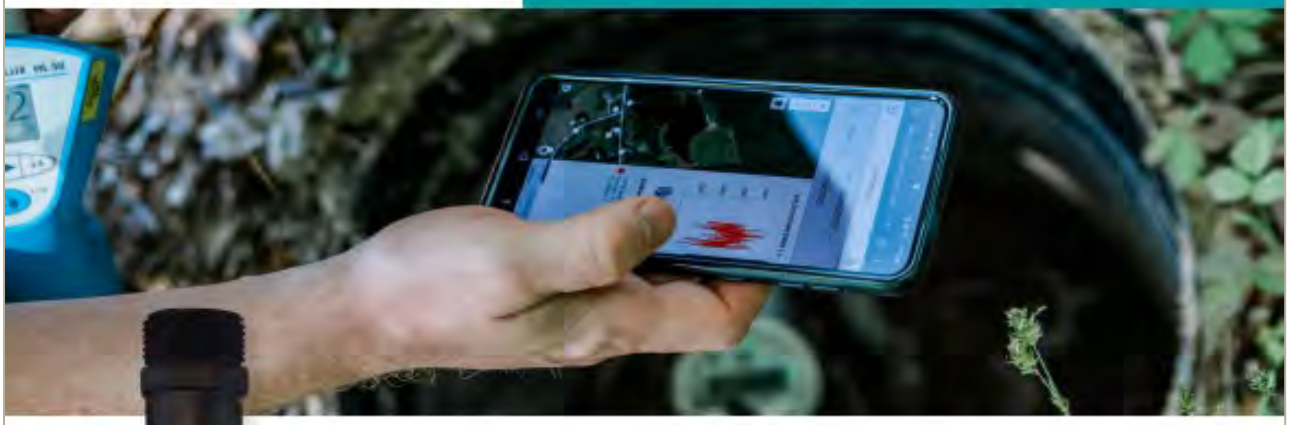
ACOUSTIC LEAK DETECTION

The Value of ALD

kamstrup

The Difference is Built-In

The flowIQ® 2200 is the only meter on the market that listen for leaks



The Value of Embedded Acoustic Leak Detection (ALD)

The value proposition of built-in acoustic leakage detection is simple. With the flowIQ® 2200 meter, every meter (up to 1") can continuously listen and proactively detect possible leaks, daily – for 20 years. This technology has been proven to detect leaks, not only after the meter on the customer side, but also before the meter in the District's adjacent service connections and distribution mains.

This capability allows utilities to have constant visibility into their water distribution network every day, for 20 years, and to reduce real water loss and better track and report Non-Revenue Water per state regulations. Utilities gain the ability to dispatch leak detection crews to known problem areas, greatly reducing awareness and locating time. In addition, if leaks are found in difficult environments, locating the leak before a burst occurs will ensure proper planning for equipment, interruptions, etc. before coming much worse.

The Kamstrup ALD Advantage

20YR ACTIVE LISTENING
Every residential meter is actively listening for 20 years to utility-side pipe assets and proactively alerting to new leaks.

MACHINE LEARNING
Leak Detector's machine learning algorithm has an 85%+ success rate at providing Meters of Interest that are detecting leaks.

AUTOMATED REPORTS
Weekly reports can be automated to dispatch leak detection crews.

PROACTIVE MONITORING
Leaks can be tracked for better planning and reducing further costs compared to reacting to bursts and/or surfaced leaks.

NRW RECOVERY DATA
Repaired leaks are captured within Leak Detector to provide total NRW savings based on pipe size, material, leak size, and cost of water. This data aids in annual AWWA Water Loss Audits and CA State regulations / reporting.

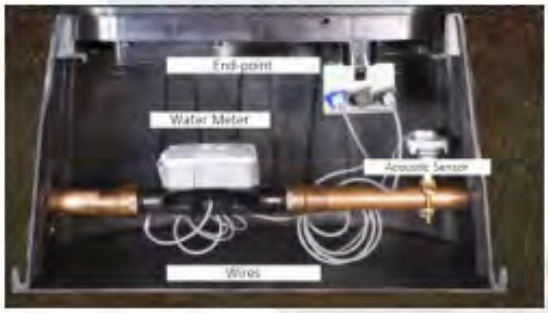
kamstrup.com

What do utilities have to say about Kamstrup?

To hear from other utilities that are using Kamstrup AMI and Acoustic Leak Detection (ALD) follow the links below:

- kamstrup.com/en-us/insights/**oneida**
- kamstrup.com/en-us/insights/**lincolnton**
- kamstrup.com/en-us/insights/**ebci**
- kamstrup.com/en-us/insights/**town-of-urbanna**
- kamstrup.com/en-us/insights/**madison**
- kamstrup.com/en-us/insights/**milcrofton**
- kamstrup.com/en-us/insights/**iredell**
- kamstrup.com/en-us/insights/**greer**
- kamstrup.com/en-us/insights/**ira-township**

More Functionality with Reduced Complexity



ADD ON LEAK SENSOR, REQUIRES:

Meter Cost + Radio Cost + Leak Sensor Cost

Meter Installation + Radio Installation + Leak Sensor Installation

Not Full Deployment Coverage

3 Hardware Components To Manage / Troubleshoot (Wires)

3 Different Warranties

2 Different Vendors, Multiple Distributors

The Difference is Built-In

INTEGRATED ACOUSTIC SENSOR, INCLUDES:

Meter Price

Meter Installation

Full Distribution Coverage

1 Hardware Component To Manage/Troubleshoot

1 Warranty

1 Vendor/Distributor

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ALD in Action

Utility Service Line – Multiple Correlations

- High noise detected on several meters
- Service line leak had been running a minimum of 5 months

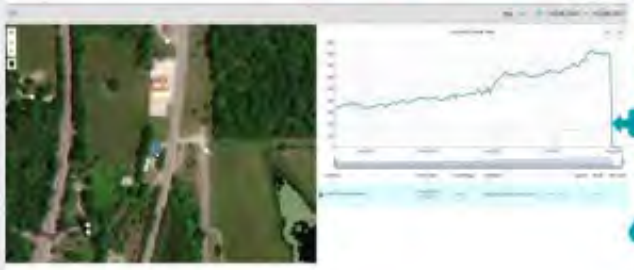
Leak estimated at 2 GPM and had been running for at least 5 months

Utility Service Line made from ductile iron

Distance to leak was approximately 30 feet to 150 ft

Poly Service Line – Isolated Leak

- High noise detected on single meter
- Service line leak had been running a minimum of 4.5 months
- The revenue lost estimated around $21,000 in 12 months



Leak estimated at 4 GPM and had been running for at least 4 months

Utility Service Line made of PVC

Distance to leak was approximately 50 ft

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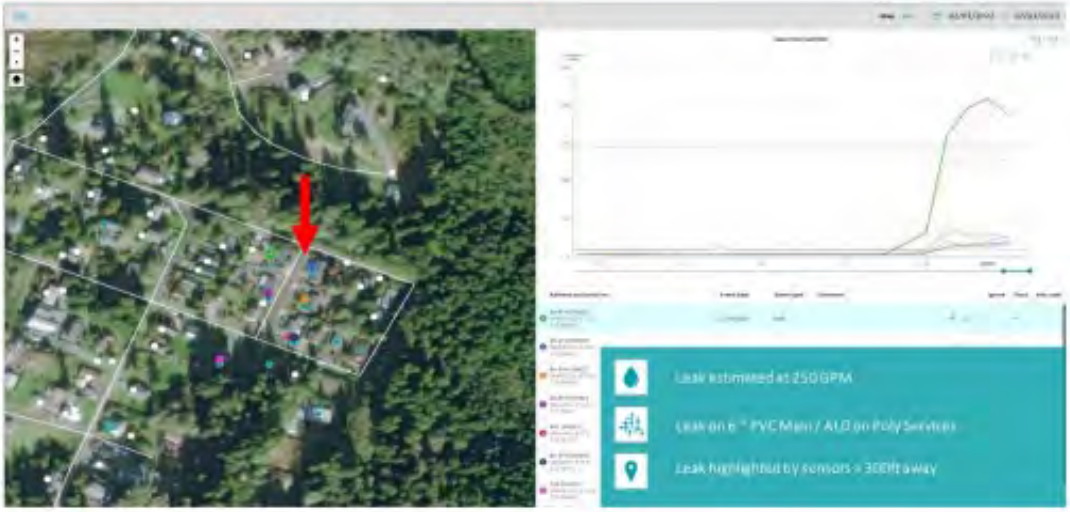
ALD in Action

6" Main Line - PVC



14" Main Line - A/C

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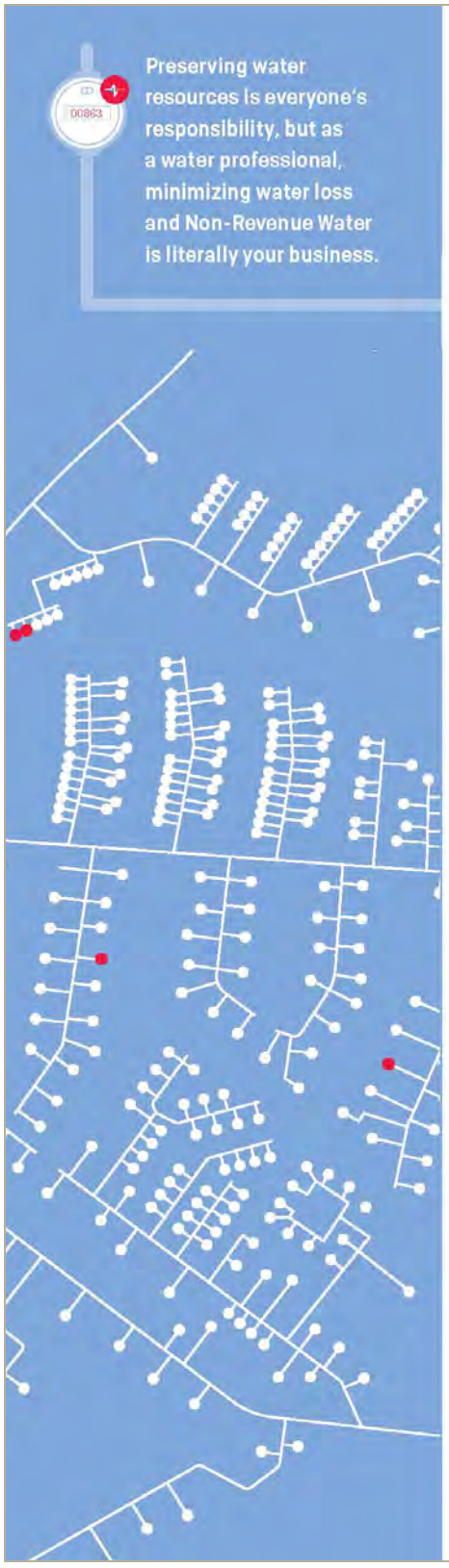
ALD Overview

kamstrup

Acoustic Leak Detection

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



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

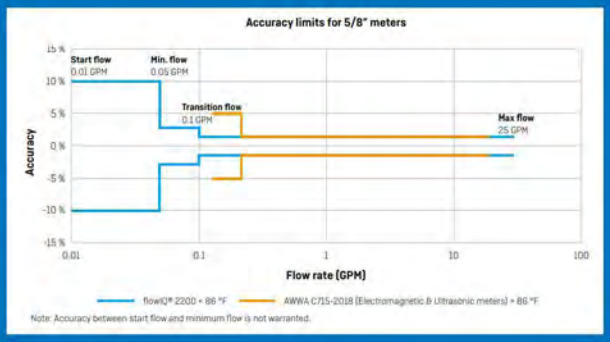
The flowIQ® 2200 smart water meter is the first of its kind with integrated acoustic leak detection. The meter monitors noise patterns that indicate possible leaks in the adjacent pipes and allows you to identify high-risk installations and find leaks in both service connections and distribution mains.

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

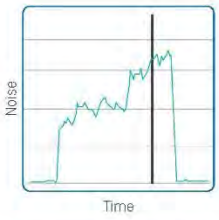
Accuracy and reliability that customers know today, but with add-on functionality of acoustic leak detection.

- 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

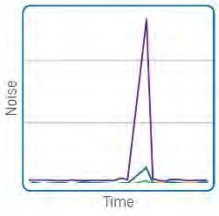
1 Leak turning into a burst on a service connection

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.



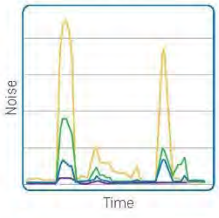
2 Burst inside consumer's home

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.



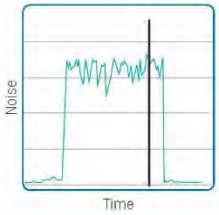
3 Simulated leak on service connections

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.



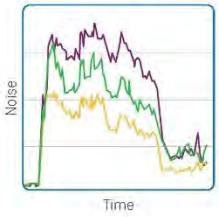
4 Leak on service connection

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

Water Resistance

Technical Whitepaper

kamstrup

Water resistance

Kamstrup water meters have an excellent water resistance and can withstand being submerged into water for more than 20 years. This by far surpass the requirements for the IP68 rating. Data from in-house tests and real customer installations show the exceptionally low water ingress of the Kamstrup water meters.

Introduction

At Kamstrup we design and manufacture meters of high quality, durability, and longevity. One of the keys to the long lifetimes of the meters is prevention of water ingression to the electronics components.

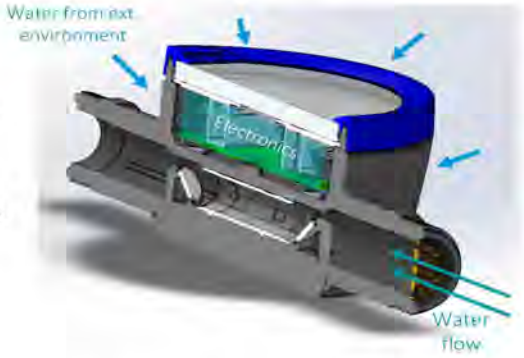
Water ingression will become an issue for all electronic meters when installed in a wet environment for extended time. Several factors are relevant when looking at meter resilience with regards to water ingress. Water will penetrate the meter to the electronic components through assembly leakages as well as the meter material. To ensure a low enough water permeability to not limit the lifetime of the meter, requires great care in the design and manufacturing of the meter.

Kamstrup water meters are certified with the highest possible water resistance rating, the IP68. The IP68 requires water resistance for complete immersion in water for more than 30 min. Kamstrup water meters go far beyond that and can withstand continuous submersion in water more than 20 years, as the data below will show. This is possible because of the design of the Kamstrup meter featuring the virtually impenetrable PPS composite material, a hermetic seal and desiccant in the electronic housing.

Our understanding of the water ingress in our meters is based on extensive in-house tests of both raw materials and complete meters as well as investigation of meters returned from end-user installations.

Patented design

Kamstrup water meters have a patented monolithic construction. With the meter housing moulded in one piece and no membranes or feedthroughs, the electronics is completely separated from the flow stream. With this design water ingression is only possible through diffusion through the materials or from the sealings towards the external environment.



In-house testing

One of the in-house tests continuously performed is on assembled meters. The meters are tested by placing a desiccant bag in the electronics compartment, where the exact mass of the desiccant bag is known. The meters are then exposed to hot water for a longer period with the higher temperature accelerating potential water ingress. Afterwards the desiccant bag mass is measured to determine the water ingress. The test ensures proactive validation of the potential water ingress in our different meter models.

Classification: Confidential 1/3

Kamstrup flowIQ 2200

kamstrup

Data sheet

flowIQ® 2200

» RF
» Encoded

- 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

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 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.

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

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
- 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.

Technical data

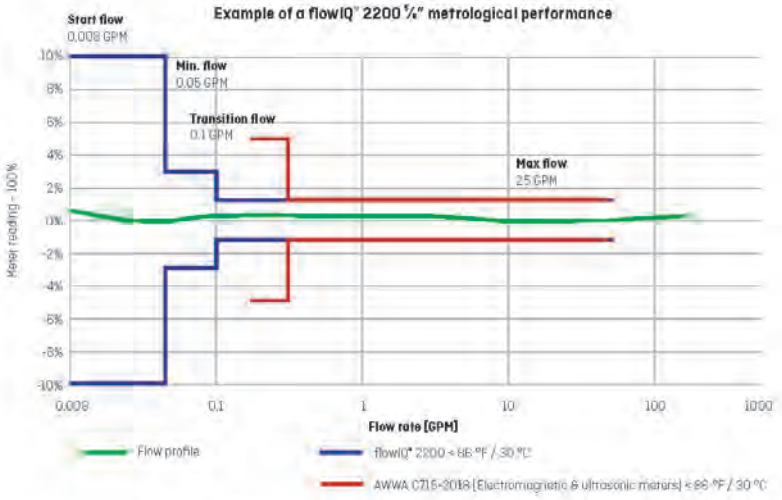
Electrical data

Battery (flowIQ® 2200 RF)	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



The above flow profile is an example of a flowIQ® 2200 5/8" metrological performance and does not represent a generic profile for all Kamstrup water meters. Each meter will have an unique flow profile however all within both Kamstrup and AWWA C715-2019 limitations.

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	¾" 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	¾" 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	¾" 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	¾" 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	3.8/ 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	3.8/ 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

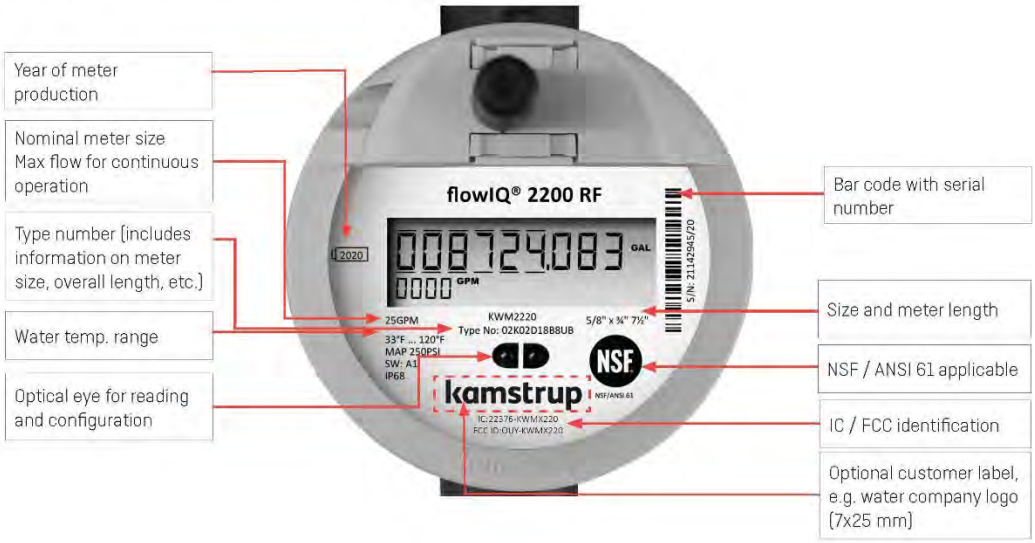
Note! Flow specifications only apply at temperatures below 86 °F / 30 °C

[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

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	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 E0	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	✓	✓	✓	✓
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.

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

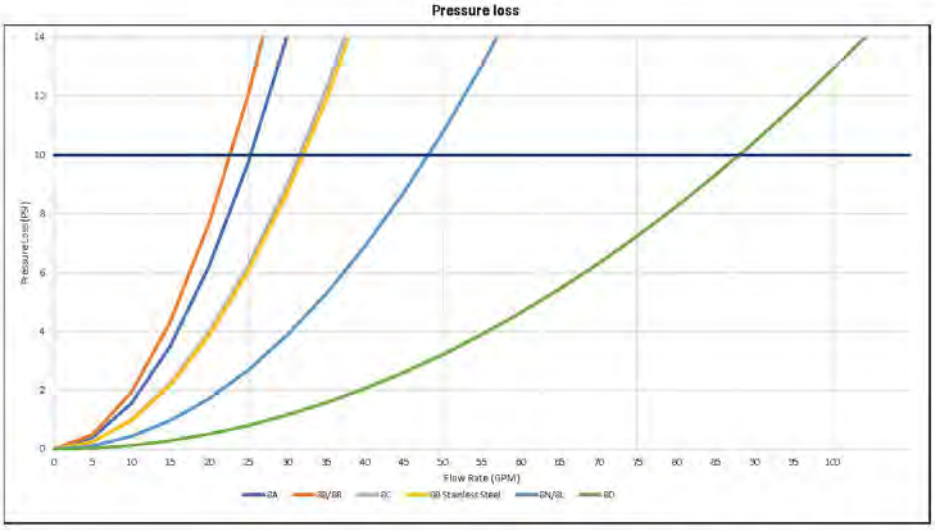
902-928 MHz band RF is an open standard, following EN13757-4:2010, which means that while the flowIQ® 2200 can be configured with or without encryption of the transmitted signal, encryption is required in the United States.

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					
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[1]							9	
Country code								
North America, FCC and NSF approved								UB
Canada, ISED and NSF approved								CA
Mexico, IFT and NSF approved								MX

[1] *Only available for RF communication*

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 (2060-) Alphanumeric														
Customer label blank (default)				5000										
Kamstrup serial number				0010										
Incremented number - 8 digits				8004										
Customer specific labels				MMMM										
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					

To be continued on next page...

Configuration - flowIQ® 2200

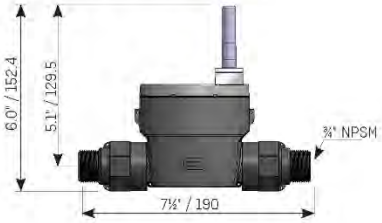
Config	DDD □□□	JJ □□	LLL □□□	MMMM □□□□	N □	P □	S □	U □	RR □□	CCC □□□	V □	T □	YY □□	ZZZ □□□
...continued from previous page														
Display resolution (alphanumeric)														
0000000.00 USgal - 0.01 GPM - Billing in 1,000s (recommended for residential meters)										220				
000000000 ft³ - 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		
No encryption (applicable for Encoded meters)												0		
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	5000	4	3	3	3	04	220	1	3	YY	ZZZ

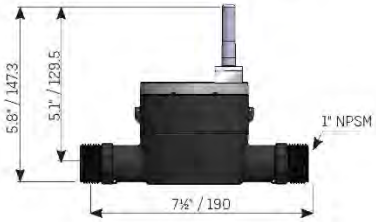
Note: JJ (time zone) and target date are not predefined and has to be chosen in the ordering system.

Dimensional sketches – flowIQ® 2200

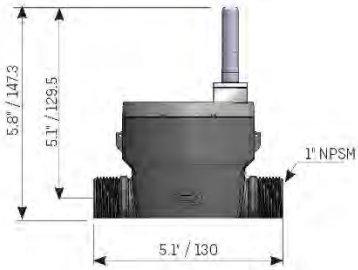
Type: 8A – Size: 25 GPM ⅝" x ½" x 7½"



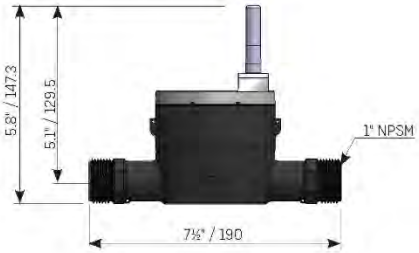
Type: 8B – Size: 25 GPM ⅝" x ¾" x 7½"



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



Type: 8C – Size: 32 GPM ¾" x ¾" x 7½"

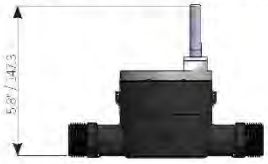


Type: 8C+ – Size: 32 GPM ¾" x ¾" x 9"

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

Examples:

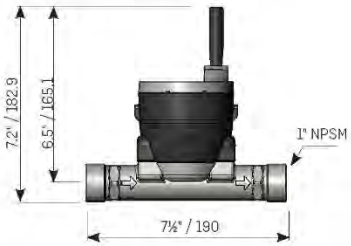
Type: 8B – Size: 25 GPM ⅝" x ¾" x 7½"



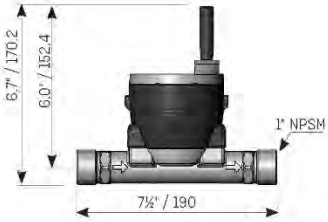
Type: 8R – Size: 25 GPM ⅝" x ¾" x 5.1"

Dimensional sketches – flowIQ® 2200

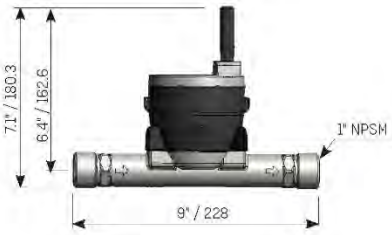
Type: 8B – Size: 25 GPM ⅝" x ¾" x 7½"



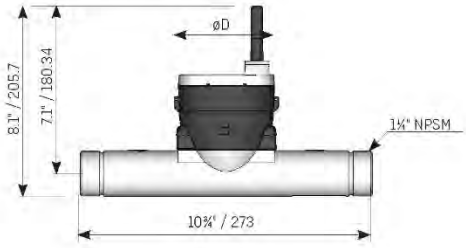
Type: 8N – Size: 35 GPM ¾" x 1" x 7½"



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

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

flowIQ® 2200 E0

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 on Kamstrup.com, document no.: FILE100000644.
Accessories are ordered separately in CPQ (Kamstrup ordering system) and will be delivered as single parts in the packaging.

Kamstrup flowIq 3200

kamstrup

Data sheet

flowIQ® 3200

» RF
» Encoded

- Ultrasonic measurement
- Sustainable measurement accuracy
- Flow measurement in display
- Multiple radio options available
- IP68 Vacuum sealed construction
- Lead free and certified to NSF/ANSI 61
- Fire Service approved

Contents

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® 3200 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® 3200 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® 3200 measures the water and environment temperatures and it includes leak detection, securing that water loss is discovered quickly.

The unique combination of all the flowIQ® 3200 features reduces 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 gets disinfected before dispatch. The hygiene is being controlled by external accredited laboratories and by frequent audits.

General description
flowIQ® 3200 is a hermetically sealed water meter intended for measurement of cold and *reclaimed water consumption in residentials and multi-unit buildings and commercial applications.

flowIQ® 3200 employs the ultrasonic measurement principle, based on Kamstrup's experience since 1991, with the initial development and production of static ultrasonic meters.

flowIQ® 3200 is available in an Encoded Output version with 2 x A-cell battery supply and a RF version with 1 x D-cell battery supply.

One of flowIQ® 3200's many advantages is the fact that it has no wearing parts, which ensures a high and stable accuracy throughout its lifetime. flowIQ® 3200 complies with all the AWWA C715-18 and CN1044 fire service guideline for Ultrasonic Water Meters.

In the flowIQ® 3200 series a composite housing is mounted on a stainless steel meter body. Thus, the electronics are fully protected against internal or external penetration of water.

flowIQ® 3200 is suitable for measurement in multi-unit apartments and light commercial premises. The meter is suitable for mounting in pump stations or wellheads, as it will also function in fully submerged conditions.

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

flowIQ® 3200 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 a number of 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, hourly data for the latest 100 days and 50 info code events are saved.

flowIQ® 3200 is powered by an internal lithium battery which can provide up to 20 years operating life.

flowIQ® 3200 is available with a choice of integrated data communication options:

- 912.5, 915 or 918.5 MHz – RF
- 450-470 MHz - RF
- 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® 3200 can and must only be opened by Kamstrup A/S. If the meter has been opened and the sealing has thus been broken, the meter is no longer valid for billing purposes and the warranty is void.

Technical data

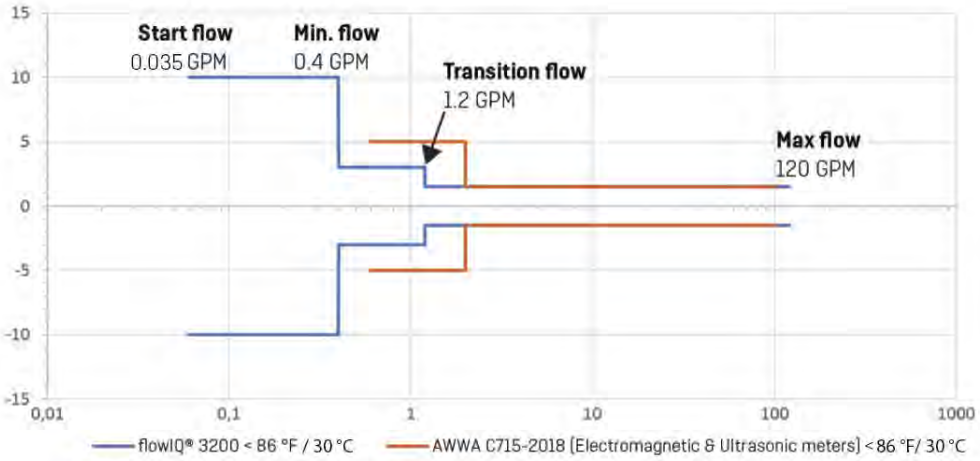
Electrical data

Battery (flowIQ® 3200 RF)	D-cell battery, 3.6V, 19Ah. The battery warranty does not apply at meter temperatures above t_{BAT} > 95 °F / 35 °C
Battery (flowIQ® 3200 E0)	2 x A-Cell battery, 3.6V, 3.6Ah. The battery warranty does not apply at meter temperatures above tBAT > 95 °F / 35 °C

Mechanical data

Protection class	IP68-rated (waterproof/submersible)
Mechanical environment	Class M1 (Measuring Instruments Directive classification)
Maximum operating pressure	Oval flange mounted, 300 PSI / (20.7 bar)
	Round flange mounted, 275 PSI (19 bar)
Ambient/meter temperature	35...130 °F / 0.5...55 °C
Water temperature	33...120 °F / 0.5...50 °C
Storage temp. empty sensor	-10...140 °F / -20...60 °C

Accuracy



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 and CN1044.

Material

Wetted parts

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

External meter parts

Meter housing	Polyphenylene sulfide (PPS) – 40% fiberglass
Cover	Glass
Spring ring	Stainless steel
Top ring (sealing)	Polycarbonate (gray)

Meter sizes

flowIQ® 3200 is available in the sizes shown in table below:

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

Type number	Meter size Inches	Start flow (S) [GPM]/ [L/h]	Min. flow [GPM]/ [L/h]	Transition flow[1] [GPM]/ [m³/h]	Max flow [GPM]/ [m³/h]	Sat. flow rate [GPM]/ [m³/h]	Pressure loss SMOC [PSI]/ [bar]	Connection on meter	Lay length [inches]/ [mm]	Strainer	Temp. measurement of water
02-L-XX-Y-1-8F-8ZZ	1½"	0.035/ 8	0.4/ 90.8	1.2/ 0.27	120/ 27.25	168/ 38.16	5.5/ 0.38	1½"[2]	13"/ 330	No	Yes
02-L-XX-Y-1-8H-8ZZ	2"	0.088/ 20	0.5/ 113.6	1.5/ 0.34	160/ 36.34	224/ 50.88	1.8/ 0.12	2"	17"/ 432	No	Yes
02-L-XX-Y-1-8M-8ZZ	2"	0.088/ 20	0.5/ 113.6	1.5/ 0.34	160/ 36.34	224/ 50.88	1.8/ 0.12	2"	15¼"/ 387	No	Yes
02-L-XX-Y-1-8K-8ZZ	3"	0.22/ 50	1.1/ 249.8	7.5/ 1.70	350/ 79.49	490/ 111.29	3.5/ 0.24	3"	12"/ 305	No	Yes
02-L-XX-Y-1-8P-8ZZ	4"	0.35/ 80	1.7/ 386.1	5/ 1.14	700/ 158.99	980/ 222.58	4/ 0.27	4"	14"/ 356	No	Yes

[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.

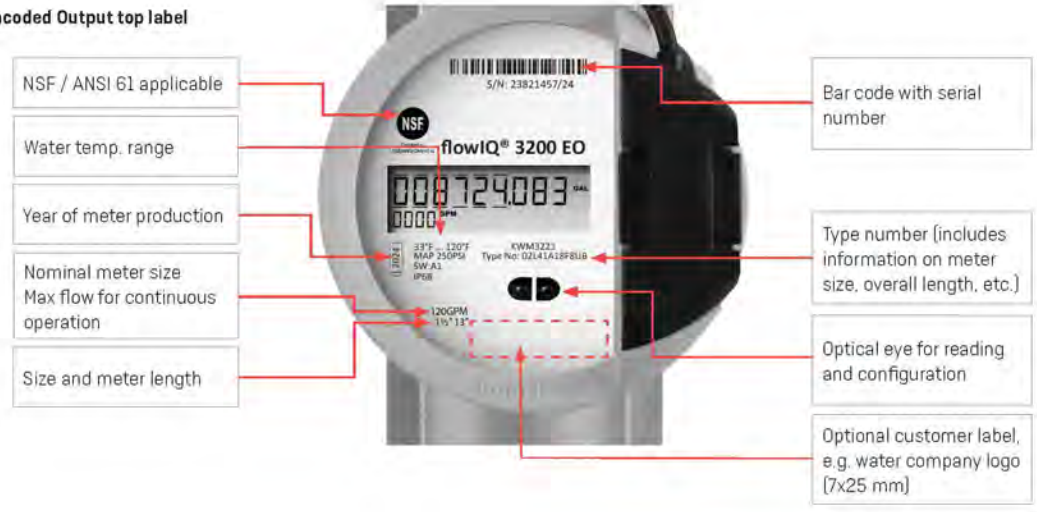
[2] Only >1½" meters are recognized by the CN1044 approval standard for fire service meters.

Meter face details

Meter information in permanent laser engraved text. Note: Only FM fire service meters will be stamped with the FM approval mark.

RF top label

Encoded Output top label



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.

Temperature monitoring
flowIQ® 3200 measures ambient temperatures.

Information on temperatures above or below the configured temperature in the meter will warn the utility on potential frost damages or quality issues.

These measurements can be used to monitor the installation and will indicate the water's quality.

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.

Acoustic Leakage Detection
For 1½" and 2", the flowIQ® 3200 water meter introduces integrated acoustic leak detection, enabling continuous monitoring of both distribution mains and service lines without the need for additional hardware or external reading infrastructure. This built in functionality expands Kamstrup's proactive leak detection solution, offering near system wide coverage that enhances operational efficiency, reduces non-revenue water, and supports long-term asset management strategies.

Current flow display
Besides the consumed volume, flowIQ® 3200 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 only related to the volume reading. 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.

Meter modes

flowIQ® 3200 can operate in two modes, Normal and Verification mode.

Verification mode is only used by authorized laboratories during verification.

flowIQ® 3200 RF	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® 3200 E0	**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® 3200 makes it easy for end users to understand their own consumption data.

flowIQ® 3200 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
	Water in the meter has not been stagnant for one continuous hour during the latest 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 on the first time water runs though the meter.*
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	✓	✓	✓	✓
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 RF module data sheet, document no.: FILE100003480.

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)

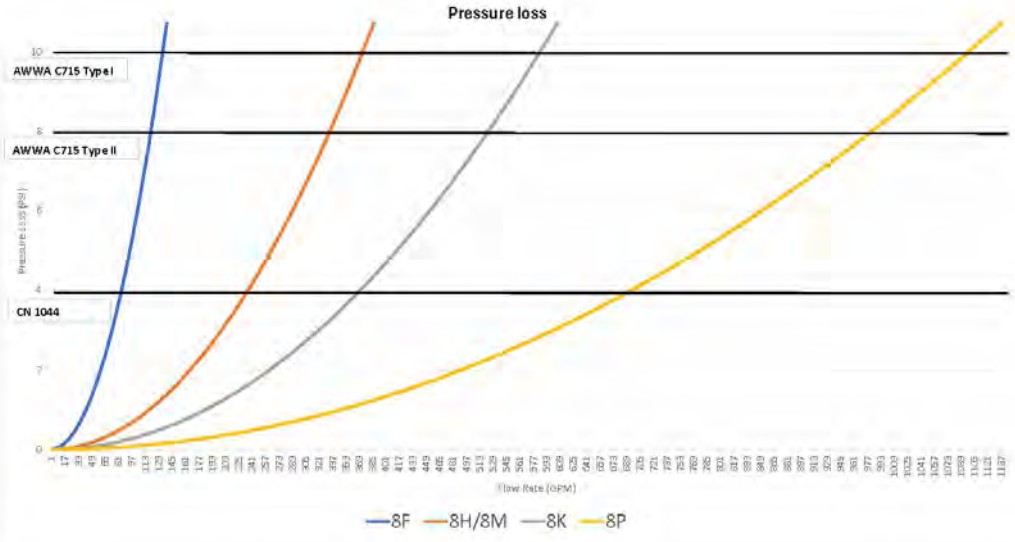
Standardized and open communication

902-928 MHz band RF is an open standard, following EN13757-4:2010, which means that while the flowIQ® 3200 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 the maximum pressure loss must not exceed 10 PSI (0.69 bar) for ½"-2" meters and 8 PSI (0.55 bar) for 3"-4" at SMOC.
According to CN1044 the maximum pressure loss must not exceed 4 PSI (0.27 bar) at SMOC for FM fire service meters.
The following graph shows pressure loss with respect to flow rate:



See document no.: FILE100000199 for more information about pressure loss.

Ordering details

Start your order by stating the type number of the selected model of flowIQ® 3200. 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.

Meter type - flowIQ® 3200

Type	□□	□	□	□	□	□□	□	□□
Meter generation								
Second generation	02							
Mechanical design								
Stainless steel		L						
Communication								
RF			02					
Encoded Output			41					
Power supply								
D-cell				D				
2 x A-cell				A				
Dynamic range								
AWWA C715-18 and CN1044					1			
Meter size								
1½" (120GPM); 1½" Flange; 13"						8F		
2" (160 GPM); 2" Flange; 17"						8H		
2" (160 GPM); 2" Flange; 15¼"						8M		
3" (350 GPM); 3" Flange; 12"						8K		
4" (700 GPM); 4" Flange; 14"						8P		
Meter type								
Cold water							8	
Reclaimed water[1]							9	
Country code								
North America, FCC and NSF approved								UB
Canada, ISED and NSF approved								CA
FM fire service approved								FM
Mexico, IFT and NSF approved								MX

[1] *Only available for RF communication*

Fiber gaskets can be ordered with flowIQ® metal meters.

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

Configuration - flowIQ® 3200

Config	DDD □□□	JJ □□	LLL □□□	MMMM □□□□	N □	P □	S □	U □	RR □□	CCC □□□	V □	T □	YY □□	ZZZ □□□
Display views [1]														
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 (2060-) Alphanumeric														
Customer label blank (default)				5000										
Kamstrup serial number				0010										
Incremented number - 8 digits				8004										
Customer specific labels				MMMM										
Leakage message limit														
OFF					9									
Flow continuously > 0.1% of max flow (not recommended)					1									
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 (default)									04					
Standard Encoded Output									15					

To be continued on next page...

Configuration - flowIQ® 3200

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)										223				
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		
No encryption (applicable for Encoded meters)												0		
Communication														
For communication protocols please refer to the specific module data sheets														

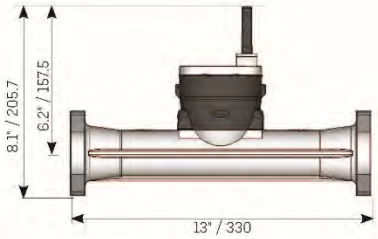
	DDD	JJ	LLL	MMMM	N	P	S	U	RR	CCC	V	T	YY	ZZZ
Unless otherwise stated in the order, Kamstrup supplies the following:	810	□□	002	5000	4	3	3	3	04	154	1	3	yy	ZZZ

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

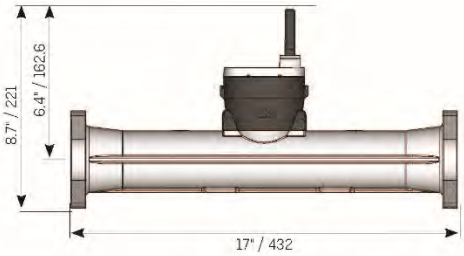
Dimensional sketches – flowIQ® 3200

NOTE! Same flanges for in- and outlet.

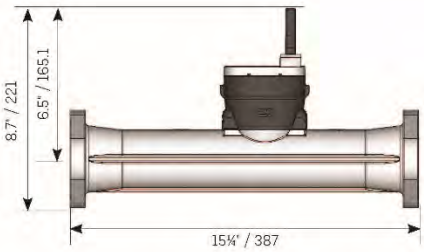
Type: 8F – Size: 120 GPM 1½" x 1½" x 13"



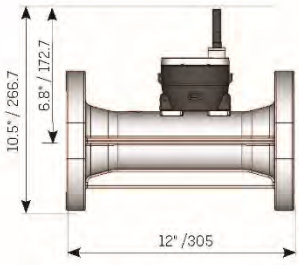
Type: 8H – Size: 160 GPM 2" x 2" x 17"



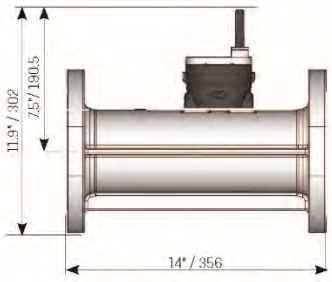
Type: 8M – Size: 160 GPM 2" x 2" x 15¼"



Type: 8K – Size: 350 GPM 3" x 3" x 12" **T**



Type: 8P – Size: 700 GPM 4" x 4" x 14"

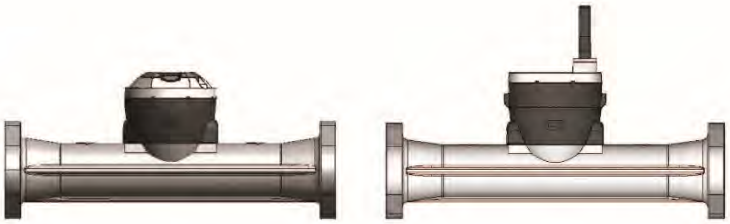


Dimensional sketches – flowIQ® 3200

Encoded Output and RF have the exact same dimensions apart from the meter cup height.

Example:
Type: 8F – Size: 120 GPM 1½" x 1½" x 13"

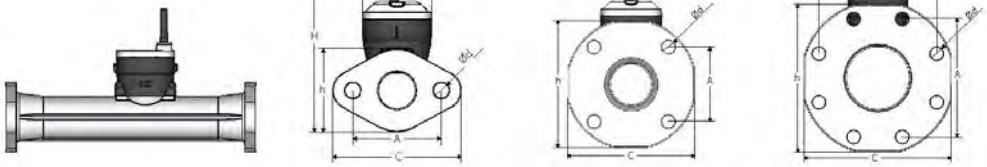
Size: 120 GPM 1½" x 1½" x 13"



Dimensions

flowIQ® 3200 RF

Meter type	Meter size GPM	Connection	L	H	h	A	C	d	Weight approx. [Lbs / Kg]
			[Inch / mm]						
8F	120	1½" flange	13"/ 330	8.07"/205	3.6"/ 91.4	4.0"/ 101.6	5.7"/ 144.8	0.79"/ 20.07	13/ 5.9
8H	160	2" flange	17"/ 432	8.66"/220	4.13"/ 104.9	4.49"/ 114	6.54"/ 166.1	0.79"/ 20.07	19/ 8.6
8M	160	2" flange	15¼"/ 387	8.66"/220	4.13"/ 104.9	4.49"/ 114	6.54"/ 166.1	0.79"/ 20.07	17/ 7.7
8K	350	3" flange	12"/ 305	10.47"/265.9	7.24"/ 183.9	4.24"/ 107.7	7.24"/ 183.9	0.75"/ 19.05	31/ 14.1
8P	700	4" flange	14"/ 356	11.85"/301	8.66"/ 220	6.93"/ 176	8.66"/ 220	0.75"/ 19.05	43/ 19.5



flowIQ® 3200 E0

Meter type	Meter size GPM	Connection	L	H	h	A	C	d	Weight approx. [Lbs / Kg]
			[Inch / mm]						
8F	120	1½" flange	13"/ 330	5.39"/ 137	3.6"/ 91.4	4.0"/ 101.6	5.7"/ 144.8	0.79"/ 20.07	9.3/ 4.2
8H	160	2" flange	17"/ 432	5.98"/ 152	4.13"/ 104.9	4.49"/ 114	6.54"/ 166.1	0.79"/ 20.07	14.2/ 6.5
8M	160	2" flange	15¼"/ 387	5.98"/ 152	4.13"/ 104.9	4.49"/ 114	6.54"/ 166.1	0.79"/ 20.07	16.2/ 7.4
8K	350	3" flange	12"/ 305	7.7"/ 198	7.24"/ 183.9	4.24"/ 107.7	7.24"/ 183.9	0.75"/ 19.05	34.1/ 15.5
8P	700	4" flange	14"/ 356	9.17"/ 233	8.66"/ 220	6.93"/ 176	8.66"/ 220	0.75"/ 19.05	44.5/ 20.2

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 • FILE100001401_N_EN-US_06.2025

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Kamstrup flowIQ 4200

kamstrup

Data sheet

flowIQ® 4200

- Ultrasonic measurement
- Sustainable measurement accuracy
- Flow measurement in display
- Dual band radio
  - AMR (Walk-by/drive-by)
  - AMI (Fixed network)
- IP68 Vacuum sealed construction
- Lead free and certified to NSF/ANSI 61
- Replaceable battery
- Coated split flanges in cast iron

Contents

Electronic ultrasonic cold water meter for measurement of cold water consumption in multi-unit buildings, commercial applications 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® 4200 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) and is suitable for installation in meter pits.

Installation
flowIQ® 4200 is easy to install horizontally as well as vertically, independent of piping and installation conditons.
Consumption data can be read visually from the display, using an optical IR interface head, or remotely read, either by 912.5, 915 or 918.5 MHz (AMR) and 450-470 MHz (AMI) band RF signal, built into the meter.

Specific features
flowIQ® 4200 measures the environment temperatures.

The battery package is replaceable.

flowIQ® 4200 is utilizing split flanges allowing for flexible installation options.

Environmentally friendly
The meter has been approved according to Drinking Water Standards in multiple countries, and it is certified to NSF/ANSI 61. The meter housing is made of stainless steel 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 has a highly automated manufacturing process, and only uses materials which are approved for drinking water. The hygiene is being controlled by external accredited laboratories and by frequent audits.

General description
flowIQ® 4200 is a hermetically sealed water meter intended for measurement of cold water consumption in multi-unit buildings, commercial applications and industry.

flowIQ® 4200 employ the ultrasonic measurement principle, based on Kamstrup's experience since 1991, with the initial development and production of static ultrasonic meters.

One of flowIQ® 4200's many advantages is the fact that it has no wearing parts, which ensures a high and stable accuracy throughout its lifetime. flowIQ® 4200 complies with all the AWWA C715-18 guideline for Ultrasonic Water Meters.

In the flowIQ® 4200 series a composite housing is mounted on a stainless steel meter body with coated split flanges in cast iron. The electronics are fully protected against internal and external penetration of water.

The meter is suitable for mounting in pump stations or wellheads, as it will also function in fully submerged conditions.

flowIQ® 4200 measures the water consumption electronically, as a volume, using two pairs of ultrasonic signals. Through four 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 delayed. 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 a number of 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, hourly data for the latest 100 days and 50 info code events are saved.

flowIQ® 4200 is powered by a double D-cell internal lithium battery which can provide up to 20 years operating life depending on usage and configuration.

flowIQ® 4200 is available with a choice of two integrated data communication options and can be operated in either frequency configuration:

- 912.5, 915 or 918.5 MHz – Wireless Radio version (RF) for Wireless M-Bus – US localization of European standard for remote reading of meters EN 13757-4
- 450-470 MHz is used in AMI (Fixed network)

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

flowIQ® 4200 can and must only be opened by Kamstrup A/S or by Kamstrup instructed personnel in regards to battery replacement.

Technical data

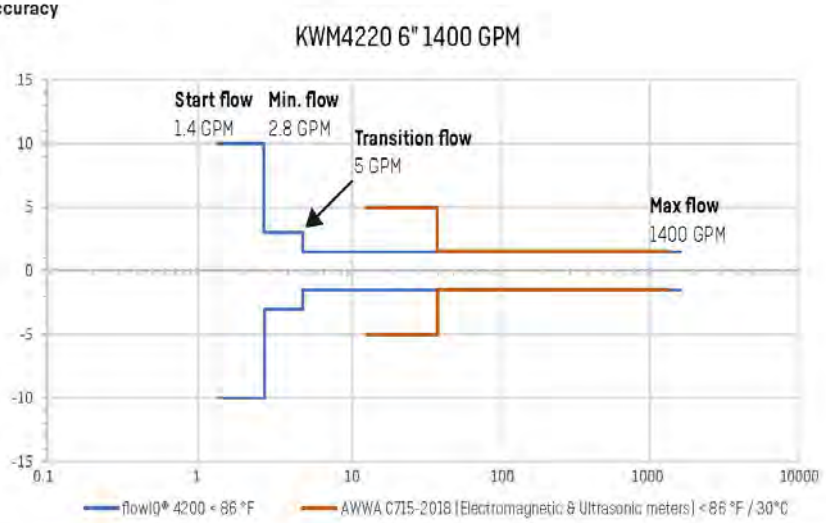
Electrical data

Battery	2xD-cell batteries, 3.6V. 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 1 (Measuring Instruments Directive classification)
Maximum operating pressure	Round flange mounted, 275 PSI
Ambient/meter temperature	35... 130 °F / 0.5... 55 °C
Water temperature	35... 120 °F / 0.5... 50 °C
Storage temp. empty sensor	-10... 140 °F / -20... 60 °C
Upstream/Downstream Pipe Lenght Req.	U0/D0

Accuracy



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 and with AWWA C715-19

Material

Wetted parts

Flow part, flanged	Stainless Steel 316L
O-ring/gasket	EPDM
Transducer pocket	PPS with fiberglass

Non-wetted parts

Split flanges	Cast iron, EN-GJS-500-7C-black-FBE coating

External meter parts

Meter housing	Polyphenylene sulfide (PPS) – 40 % fiberglass
Cover	Glass
Top ring (sealing)	Polycarbonate (gray)

Meter sizes

flowIQ® 4200 is available in these sizes:

Type number RF version	Meter size Inches	Start flow (S) [GPM]/ [L/h]	Min. flow [GPM]/ [L/h]	Transition flow[1] [GPM]/ [m³/h]	Max flow [GPM]/ [m³/h]	Sat. flow rate [GPM]/ [m³/h]	Pressure loss SMOC[3] [PSI]/ [bar]	Connection on meter	Lay length [Inches]/ [mm]	Split flanges weight [lbs]/ [Kg]	Total weight [lbs]/ [Kg]
02-E-02-G-1-FR-8US[2]	6"	1.4/ 318	2.8/ 635	5/ 1.136	1600/ 317.97	1960/ 445.16	4.2/ 0.954	6"	18"/ 457	31/ 14.1	60/ 27.2
02-E-02-G-1-GA-8US[2]	8"	1.7/ 386	4/ 908	7/ 1.590	2800/ 635.95	3920/ 890.33	3.9/ 0.886	8"	20"/ 508	42/ 19.1	86/ 39.0
02-E-02-G-1-GJ-8US	10"	2/ 454	5/ 1136	8/ 1.817	4500/ 1022.06	6300/ 1430.89	4.2/ 0.954	10"	17.7"/ 450	64/ 29.0	134/ 60.8
02-E-02-G-1-GS-8US	12"	2.3/ 522	6/ 1363	10/ 2.271	5500/ 1249.19	7700/ 1748.86	2.8/ 0.636	12"	19.7"/ 500	84/ 38.1	185/ 83.9

[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.
[2] Spool piece is available for this meter size.
[3] SMOC = Safety Maximum Operating Capacity (pressure).

Meter face details

Meter information in permanent laser engraved text.

Sensor information

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.

Temperature monitoring
flowIQ® 4200 measures ambient temperatures.

Information on temperatures above or below the configured temperature in the meter will warn the utility on potentiel frost damages or quality issues.

The measurements can be used to monitor the installation and to give an indication of the quality of the water.

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.

No consumption
If no consumption has been measured for a long period of time the meter will inform the utility, as this indicates a potential problem with the installation.

Replaceable battery

flowIQ® 4200 has two built-in D-cell lithium batteries that supply the meter. When replacing the battery, Kamstrup's Battery replacement kit no: 66-99-821 must be utilized with the relevant replacement guide.

The battery replacement kit can ONLY be ordered through Kamstrup's product service. Otherwise the warranty is void. Kamstrup's product service will also help you with the training tutorial.

Display and info codes

The large display of flowIQ® 4200 shows the totalized volume, flow rate and info.

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.

Info code	Condition
	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 on the first time water runs though the meter.
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.

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 IR interface.

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	✓	✓	✓	✓
Flow max year incl. Date	✓			
Flow min year incl. Date	✓			
Flow max month incl. Date		✓		
Flow min month incl. Date		✓		
Flow max day incl. Timestamp			✓	
Flow min day incl. Timestamp			✓	
Ambient temp. Max. Year	✓			
Ambient temp. Min. Year	✓			
Ambient temp. Avg. Year	✓			
Ambient temp. Max. Month		✓		
Ambient temp. Min. Month		✓		
Ambient temp. Avg. Month		✓		
Ambient temp. Max. Day			✓	
Ambient temp. Min. Day			✓	
Ambient temp. Avg. Day			✓	

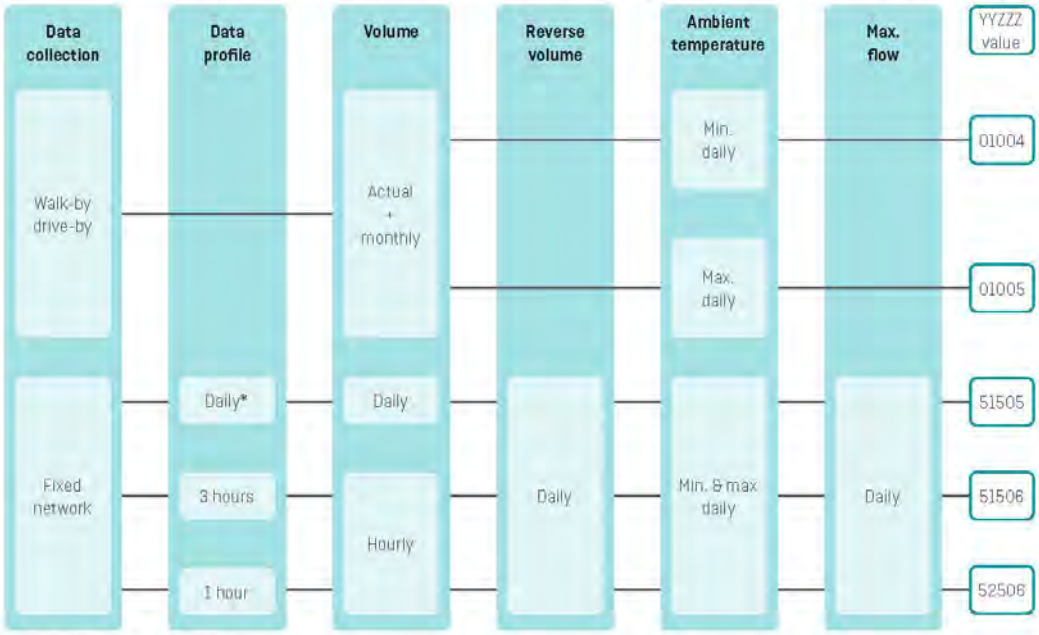
Every time the information code changes, date and info codes are logged. Thus, it is possible to data read the latest 50 changes of the information code as well as the date the change was made. Reading is only possible via the optical IR interface.

Radio package options

Optional RF output

Some of the data sent via a high-power antenna and integrated 912.5, 915 or 918.5 MHz band RF is optional. It is possible to select one of the data packages with content illustrated in the figure below.

The choices are determined by means of the selected YYZZZ-value when ordering a water meter – shown to the right in the figures.



*The package is transmitted every 3 hours.

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® 4200 can be configured with or without encryption of the transmitted signal, encryption is required in the United States.

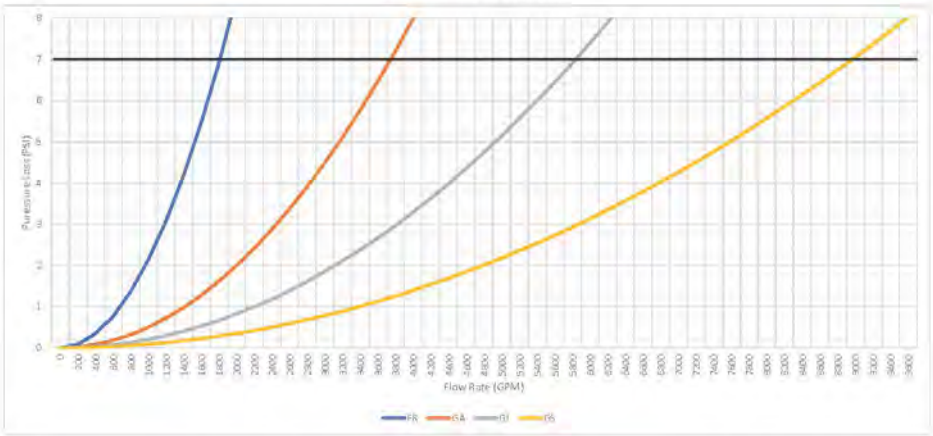
Encryption protects personal data against unauthorized monitoring. Furthermore, the encryption file provides easy access to import meter data for reading programs.

Pressure loss

According to AWWA C715-18 guideline Type II (except C708 or others if stated in the order confirmation) the maximum pressure loss must not exceed 7 PSI (0.48 bar) at SMOC for water meters.

The following graph shows pressure loss with respect to flow rate:

Pressure loss flowIQ® 4200



See Technical description for Water Meters North America: FILE100001331_EN-US for more information about pressure loss.

Ordering details

An order is initiated by stating the type number of the selected model of flowIQ® 4200. 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® 4200

Type	□□	□	□□	□	□	□□	□	□□
Meter generation								
Second generation	02							
Mechanical design								
Stainless steel with iron split flanges		E						
Communication								
AMI, dual-band capable, (2-way)			02					
Power supply								
Double D-cell				G				
Dynamic range								
AWWA C715-18					1			
Meter size								
6" x 18" (incl. spool piece) (1600GPM)						FR		
8" x 20" (incl. spool piece) (2800 GPM)						GA		
10" x 17.7" (4500 GPM)						GJ		
12" x 19.7" (5500 GPM)						GS		
Meter type								
Cold water							8	
Country code								
North America, FCC and NSF approved								UB
Canada, ISED and NSF approved								CA

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

Configuration - flowIQ® 4200

Config	DDD □□□	JJ □□	LLL □□□	MMMM □□□□	N □	P □	S □	U □	RR □□	CCC □□□	V □	T □	YY □□	ZZZ □□□
Display views [1]														
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														
Customer label blank				5000										
Leakage message limit														
OFF					0									
Pipe burst limit														
OFF						0								
Ambient Temperature low limit														
OFF							0							
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 / 122 °F								6						
Data logger profile														
Standard (default)									04					

To be continued on next page...

Configuration - flowIQ® 4200

Config	DDD □□□	JJ □□	LLL □□□	MMMM □□□□	N □	P □	S □	U □	RR □□	CCC □□□	V □	T □	YY □□	ZZZ □□□
...continued from previous page														
Display resolution (alphanumeric)														
000000000 ft³ - 0000 GPM – Billing in Billing in 1,000s										154				
(recommended for district meters)														
For additional options please refer to FILE100002712														
Temperature units of measure														
Fahrenheit											1			
Celsius											0			
Encryption level														
Encryption with separately forwarded key												3		
System														
AMR													01	
AMI													51	
AMI, no battery warranty [2]													52	
Data packages - AMR														
Actual: Vol., Monthly: Vol., Daily: Min. ambient temp.														(01)-004
Actual: Vol., Monthly: Vol., Daily: Max ambient temp.														(01)-005
Data packages - AMI														
Default, Daily - Vol., reverse vol., Min. ambient temp., Max flow, Max Ambient temp.														(51)-505
Default, 3 hour - Vol., reverse vol., Min. ambient temp., Max flow, Max Ambient temp.														(51)-506
Default, 1 hour - Vol., reverse vol., Min. ambient temp., Max flow, Max Ambient temp.														(52)-506

[1] Volume and software version are always a part of display views
[2] Only for data package 506

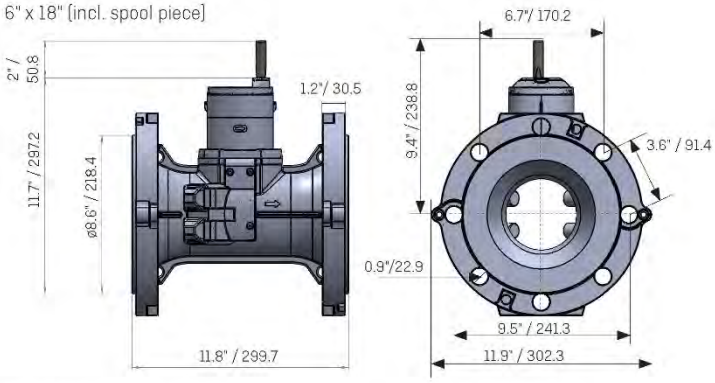
	DDD	JJ	LLL	MMMM	N	P	S	U	RR	CCC	V	T	YY	ZZZ
Unless otherwise stated in the order, Kamstrup supplies the following:	810	□□	002	5000	0	0	3	3	04	100	1	3	01	004

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

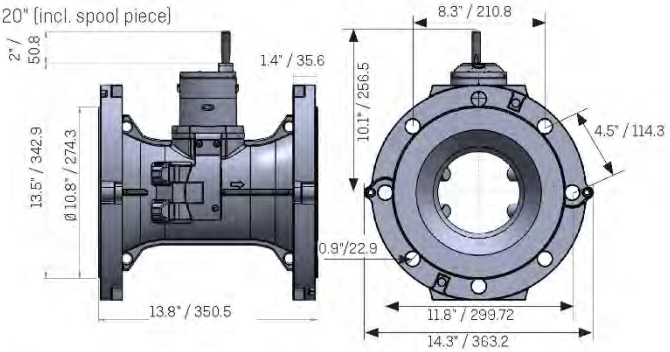
Dimensional sketches

NOTE! Same flanges for in- and outlet.

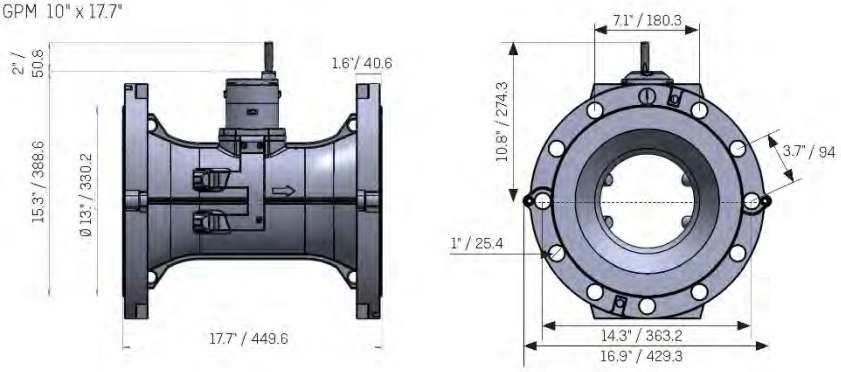
Type: FR
Size: 1600 GPM 6" x 18" (incl. spool piece)



Type: GA
Size: 2800 GPM 8" x 20" (incl. spool piece)

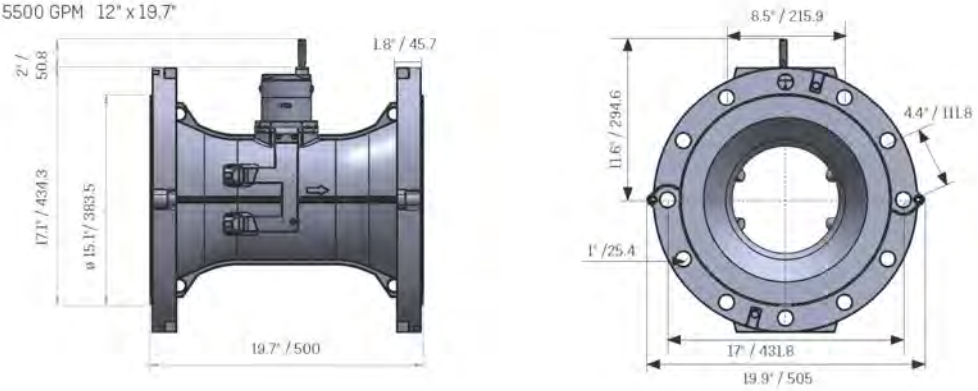


Type: GJ
Size: 4500 GPM 10" x 17.7"



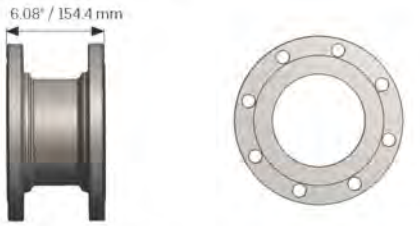
Dimensional sketches

Type: GS
Size: 5500 GPM 12" x 19.7"

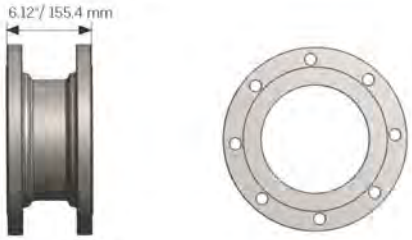


*Dimensions: Inches / mm

Spool piece for 6" (FR)



Spool piece for 8" (GA)



Accessories

See Accessories for Water Meters on Kamstrup.com.
(Accessories are ordered separately in CPQ (Kamstrup ordering system) and will be delivered as single parts in the packaging.)

KAMSTRUP READY COLLECTOR

kamstrup

Data sheet

Kamstrup READy Collector

- Data collector for smart meter reading
- Rugged design
- 2-way intelligent network
- High level of security, individual encryption keys
- Optional Cellular connection
- Intelligent power management
- Instant event notification
- Plug-and-play installation

Contents

A READy Suite component

The Kamstrup READy Collector is a central easy to use two way network component in your AMI network. The data is collected from the meters, stored until the planned transmission and displayed in READy Manager the Meter Data Management software. The data can be collected in a number of differing time frames up to hourly readings, and If an event occurs, this data will be transmitted immediately, independent of your data scheme.

The Kamstrup READy Collector is a rugged design that is to be uses in the harshest of conditions, such at the top of towers or elevated storage tanks, where service can be difficult. Temperature extremes and lightning protection has been thoughtfully included in the engineering of the collector unit. Other important features of the system is that no coax is necessary between the Collector unit and bottom unit, just standard off the shelf wiring components. The bottom unit has been built with industrialized components incorporating multiple surge protection systems, and power supply for use in the most challenging conditions.

Features

- Easiest to learn and understand system available
- No IT experience necessary
- Built in redundancy
- Fault tolerant system
- Two-way communication
- High-level security all the way
- Intelligent power management
- Instant event notification

Technical data

The Kamstrup READy Collector can be ordered as prepared for one and up to four READy Collector top units.
The system consists of a READy Collector Base unit supplying power and network for the READy Collector Top unit.
Both a READy Collector Top and a READy Collector Base are required.

Kamstrup READy Collector Top

Dimensions (without connections)	10.2 x 6.3 x 3.6 inches 260 x 160 x 91 mm
Weight	6.23 lb 2.85 kg
Operating temperature	-22 to 149 °F (-30 to 65 °C)
Storage temperature	-40 to 185 °F (-40 to 85 °C)
Enclosure rating	NEMA 4, IP66
Power input	24 VDC
Frequency	450 - 470 MHz FCC license required
Capacity	Up to 25.000 Kamstrup Water meters
Supported meters	flowIQ® 2250 and 3250

Kamstrup READy Collector Base

Dimensions (without connections)	15.5 x 12.3 x 7.1 inches 394 x 313 x 181 mm
Weight	Dependant on configuration
Operating temperature	-22 to 149 °F (-30 to 65 °C)
Storage temperature	-40 to 185 °F (-40 to 85 °C)
Enclosure rating	NEMA 4, (IP66)
Power input	110-265 VAC 50/60 Hz
Power output	24 VDC/10 A

AMI-antenna

Length	58 inches
Frequency	440 - 470 MHz
Gain	3 dB

Antenna cables

6.5 feet (2 m)
16.4 feet (5 m)

Technical data

Power cable to READy Collector Top
Length between READy Collector Top and Base:
6.5 feet (2 m)
50 feet (15 m)
80 feet (24.5 m)
150 feet (45.7 m)
200 feet (61 m)
240 feet (73 m)
Note: Must match length with the Ethernet cable.

Ethernet cable to READy Collector Top
Length between READy Collector Top and Base:
6.5 feet (2 m)
50 feet (15 m)
80 feet (24.5 m)
150 feet (45.7 m)
200 feet (61 m)
240 feet (73 m)
Note: Must match length with the Power cable.

Sierra Wireless modem
For the READy Collector Base

GSM antenna
Used for the Sierra Wireless modem
Comes with a 16'4" cable

Approvals and Markings

FCC part 90 and part 15B.
FCC ID: READYAMI
The READy Collector Base is build using UL listed products.

OUTDOOR AC – UPS

Revision 1
Engineering: Tom G., Lon B.

Product Specifications

April 30, 2021
Approved by: Ujjwal S.

Outdoor AC-UPS-120-5460

AC Input	
Nominal Voltage	120 V, 60 Hz
Operating Voltage Range	100 – 136 V
Frequency	47 – 63 Hz
Current @ 100 V & Max Charging	8.3 A
Fuse Rating	10 A
Surge Voltage Withstand Rating (Remnant Voltages)	ANSI/IEEE: 6 kV, 1.2 x 50 us / 3kA, 8 x 20 us combination waveform (Remnant voltages are L-N: 450V & L-G: 300V)
Terminals	3 position terminal block (for LI, NI, and Earth Ground wires)
AC Output	
Maximum Power	120 W / VA
Voltage	120 V +/- 3%, 60 Hz
Maximum Current	1 A
Power Efficiency in Utility AC Mode	76% typical (with fully charged batteries) (under 50~100% load condition)
Power Efficiency in Battery Mode	84% typical (under 50~100% load condition)
Power On/Off Switch	On / off rocker style switch
Transfer Time	Zero (double-conversion online UPS design)
Terminals	3 position terminal block (for LO, NO, and Earth Ground)
Battery & Battery Charger	
Battery Type	Wide-temperature rated sealed gel-cell batteries (8G31)
Battery Bank Capacity	24 V, 97.6 Ah (@ C/20), Two 8G31 batteries are connected in series configuration Each 8G31 battery is rated at 12 V, 97.6 Ah (@ C/20)
Fuse Rating	30 A
Battery Charger Type	Temperature-compensated 24 V, 15 A battery charger
Battery Runtime (Recharge Time)	Approximately 13.5 hours for 120 watt load (@ 25°C) (8.5 hours to recharge batteries to 90% full charge level)
LED Indicators	
GREEN	AC Input OK
YELLOW	Solid: Battery charged Slow Blinking: Charging Fast Blinking: Discharging
RED	Blown fuse
Alarms	
BATTERY OK (BATTERY LOW)	Pin 1: NO, Pin 2: COM, Pin 3: NC (reversed on LOW BATT)
AC INPUT OK (AC FAIL)	Pin 4: NO, Pin 5: COM, Pin 6: NC (reversed on AC FAIL)
Terminals	6 position terminal block
Mechanical	
Enclosure (Pad (PAD 2) or Pole mount option ordered separate)	Wall-mounted light gray powder coat aluminum cabinet with swing-out front door. NEMA 3R / IP 44 rated
Dimensions	24" H x 24" W x 17.125" D (28" high with PAD 2 option)
System Weight	Approx. 200 lbs. (including batteries)
Environmental	
Installation Environment	Sun shade over north facing enclosure required to avoid solar heating. (not included) Enclosure must be located at least 2 km from ocean.
Operating Temperature - Ambient	-10° to 50°C (-4° to 122°F) (-40° to 50°C (-40° to 122°F) with optional BH5 thermostat-controlled battery heaters)
Operating Humidity	10 to 90% (non-condensing)
Protection Against Moisture and Dust	Circuit boards are conformal coated
Warranty	
Two-year limited warranty on parts and labor; One-year manufacturer's warranty on batteries. • Batteries must be recharged once every 6 weeks if unit is placed in long-term storage. • Unit must be stored in cool and dry conditions if placed in long-term storage of over 6 weeks. • Per battery mfg., full battery runtime is not available until after 15 charge-discharge cycles.	

Note: For continuous product improvement, specifications are subject to change without notice.

TSI Power Corporation
1103 West Pierce Avenue
Antigo, WI 54409, USA

Tel: 715-623-0636
URL: www.tsipower.com
e-mail: sales@tsipower.com

Photos (of similar model)

TSI Power Corporation
1103 West Pierce Avenue
Antigo, WI 54409, USA

Tel: 715-623-0636
URL: www.tsipower.com
e-mail: sales@tsipower.com

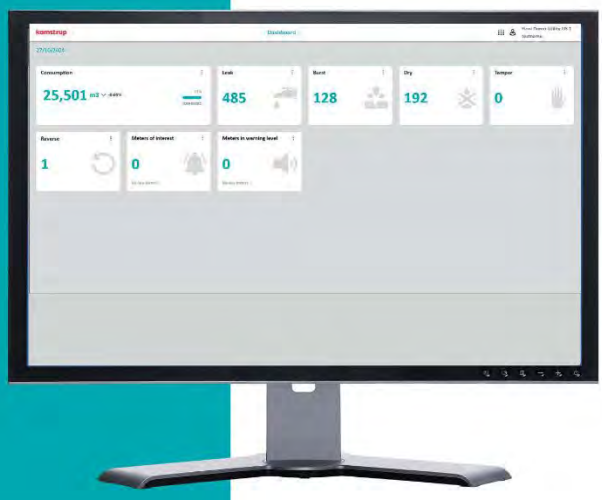
kamstrup

Data sheet

READy Manager and App

Intuitive, scalable, cloud- and app-based single platform solution for reading and managing data from intelligent water meters

- Powerful and flexible data integration and API support
- App with built-in meter installation tool
- Effective alarm management
- Near real-time notifications



READy Manager: Easy to use and with a multitude of functionalities

READy Manager is Kamstrup's software solution for managing meter and radio data, network collectors, and intelligent alarm management and notifications as well as data reporting and integrations. The solution is highly intuitive and job execution centric, allowing the user to easily view and manage system occurrences from a top-down perspective, e.g., the at a glance dashboard displays alarm summaries making it possible to dive into actions from there. READy Manager is hosted regionally in a Microsoft Azure cloud setup with up-to-date rigorous security protection to keep your data safe.

Highlighted features:

Data Management

- Single software platform for AMR, AMI and NB-IoT data reading and alarm support
- High data security utilizing Kamstrup encryption keys for advance security with AES-128 bit encryption
- Alarm management for thresholds and normal vs. high priority alarms
- Data import and export functionality for customer integrations and data analysis
- Management of mobile route creation and AMR reads/ alarms
- Network Collector management and notifications
- Alarm notifications via email or SMS

Data Integration

- Flexible user-defined import and export integrations with customizable CSV, fixed width, or API formats for billing or data analysis
- Automatic import and export functionality (scheduling)
- Possibility of receiving readings by email (predefined intervals)
- Advanced filtering
- API integration using REST and Webhook (SHA-256) via JSON (e.g. for consumption to do billing)

Data Visualization

- At a Glance Dashboard for a fast operational overview
- An optimized customer service module that facilitates the good consumer dialog
- Meter/Collector location on a map
- Automatic GIS coordinates based on addresses
- Alarms overview with flexible filtering options
- Display of logged data from meters
- Grouping of meters
- User defined custom columns and groups
- Analysis of users by high/low or no consumption

READy Manager: Hardware and software requirements

PC core components

Type	Minimum	Recommended
Processor	Intel Core I3 compatible processor (2.4 GHz)	Intel Core i5 compatible processor (Intel Core i5-6300U, 2.4 GHz or faster)
RAM	8 GB	16 GB

System and connectivity requirements

Microsoft Windows 10 (64 bit) compatible device (e.g., PC). The device must be fully updated via Windows Update.

Internet access and open outgoing TCP/443 is required.

Data retention

Reading data collected via network and drive-by is thinned according to the following rules:

- During the first 13 months, all readings are stored
- After 13 months, readings are compressed to 1 per day
- After 5 years, all readings are deleted

Security

Kamstrup is ISAE3000 and ISO27001:2022 certified, and works in alignment to relevant aspects of CIS18 and the IEC62443 set of standards.

READy App – mobile reading and installation tool

READy App is a mobile application that – together with a Bluetooth®-connected converter – changes your smartphone into an efficient installation, reading, data logging, and field tool. READy App is extremely intuitive and enables meter reading and data synchronization with the READy HES data management software easy.

The application supports meter installation, AMR meter reading (incl. AMI fallback reading), and exchange of meters. Additionally, it can be used together with a Bluetooth®- connected optical read-out head to read the data logger in the meter.

In reading mode, a map shows the geographical position of not yet read meters, making meter reading with READy App very simple and efficient. Visual and audible notifications guide the user on the progress of meter reading.

READy App features

- Easy and intuitive user interface
- Map and list view of meters and routes
- Graphical display of logged data from meters
- Display of alarms
- In-field synchronization of data with READy Manager
- Verification of the signal strength from meters
- Configuration of network components.

READy App recommended hardware

Supported smart phones	Supported tablets
Samsung Galaxy S23	Samsung Galaxy Tab S9
Samsung A Series A54	
HUAWEI P60	

Must be Android OS version 11.0 or newer to comply with security updates.

Hardware

Memory	Minimum 8 GB
Connection	Wi-Fi, Bluetooth 5.0
Display size and resolution	Minimum 4.3" and 1024 x 768

In addition, some features require the following:

Memory	Minimum 12 MB
Connection	Wi-Fi, Bluetooth 2.1
Display size and resolution	Minimum 4.3" and 1024 x 768

- Mobile data access (SIM card) for using map view
- Integrated camera in smartphone (for easy pairing of PC software and smartphone app).

Software

Andriod OS	Minimum version 11 (Security updated)!

IP access to PC software via Wi-Fi Google Play access (Google account).

Kamstrup A/S • FILE100002189_D_US_10.2024

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T: +1 (404) 835-6716
info-us@kamstrup.com
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LEAK DETECTOR

kamstrup

Data Sheet

Water Intelligence US

- Cloud based platform for analyzing data
- Intuitive dashboards and detailed overview of the distribution network
- Advanced algorithm processing based on meter data
- Utilizing new technologies to help utilities reduce their non-revenue water

Contents

Water Intelligence

Non-revenue water is a well-known global problem that results in large volumes of water being lost. It is a challenge faced by many water utilities, and it is often caused by increased urbanization and ageing distribution networks, which lead to a higher demand and increased prices.

There are different approaches to find the root cause of the water loss problem and different approaches of how it can be reduced. However, the complexity is often underestimated because of the different types of water loss, each of which needs to be dealt with differently.

With our Water Intelligence platform, you will be provided with a solution that scales to meet the demands of your utility.

With a simple and intuitive web interface, Water Intelligence is tailored and designed to bring power and simplicity to the process of fighting non-revenue water.

Modules for Water Intelligence

District Analyzer

Get a complete overview of your distribution network split into districts. For each district, you will receive detailed information on inlet flow, consumption, night flow and water loss, which lets you monitor developments closely, target your efforts and act as soon as the water loss increases in a district.

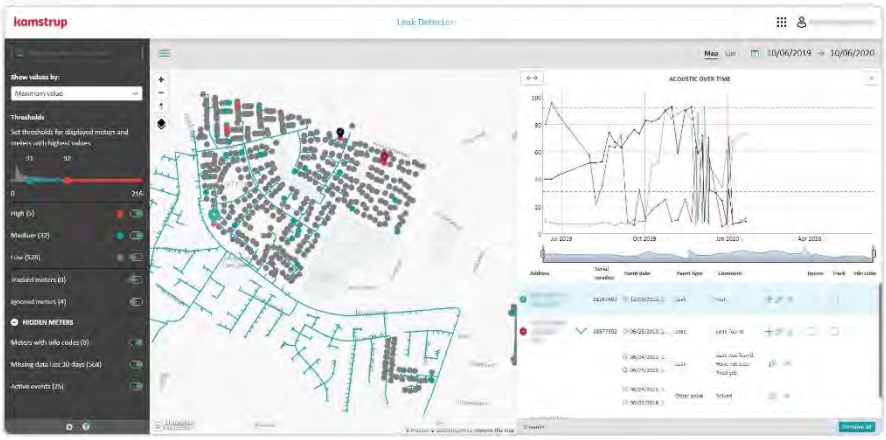
Features that are included in District Analyzer consists of:

- Map view with color coded districts
- List view with meta data for districts
- Graphical representation of consumed water, supplied water and water loss
- KPI reporting based on water loss during last day, week and month
- Intuitive drawing tool for districts/sections
- Integration of pipe layer network to know where meters are in connection to the pipes
- Addition of compensated water such as pipe flushing
- Alarm system to indicate if a water balance is moving in a wrong direction.
- Advanced algorithms to monitor water balances

Modules for Water Intelligence

Leak Detector

It can be difficult to find leaks in the system, especially those on the service pipes. With the advanced technology of Leak Detector, you get a complete overview of potential leakages in your distribution network, without searching for them yourself. With this application, you will receive 24/7 monitoring of your distribution network, which lets you target your efforts where they will be most effective.



Features that are included in Leak Detector consists of:

- Map view with color coded installations
- List view with meta data for all meters
- Track meters to always have a list of important installations that needs to be tracked every day, week or month
- Add events and comments to installations with findings from the field, to easier make a decisions based on past findings
- Graphical representation of data to quickly determine if an installation is requiring immediate action
- Integration of pipe layer network to know where meters are in connection to the pipes
- Advanced filtering giving you the possibility to quickly find high-risk installations
- Build a work-order list with installations that have active events
- Correlate alarms with active alarms to determine if a leak is before or after the meter

Hardware requirements

Windows
To use the Water Intelligence website on Windows, you need the following:

- Windows 7, Windows 8, Windows 8.1, Windows 10 or later
- An Intel Pentium 4 processor or later that is SSE2-capable
- 2 GB of RAM

Linux
To use the Water Intelligence website on Linux, you need the following:

- 64-bit Ubuntu 14.04+, Debian 8+, openSUSE 13.3+ or Fedora Linux 24+
- An Intel Pentium 4 processor or later that is SSE2-capable
- 2 GB of RAM

Data requirements

District Analyzer
To make a coherent analysis of the network, it is a requirement that we can receive data from the district meter(s) in your network:

- The district meter(s) must be remotely read from an API or an FTP server
- The district meter(s) must be remotely read on a daily or hourly basis
- It must be possible to define inbound and outbound district meter(s) for each district
- The consumption meter(s) must be present in READy Manager at all times
- The consumption meter(s) must be read either through AMR or AMI

Leak Detector
To utilize the full potential of the Leak Detector module, we advise you to have the solution with daily values.

- The consumption meter(s) must be present in READy Manager at all times
- The consumption meter(s) must be read either through AMR or AMI

System requirements

Kamstrup recommends that you use the Water Intelligence website using a modern web or mobile browser to get the optimal experience. This section covers the system requirements for viewing and using the Water Intelligence website.

Browser requirements
The Water Intelligence website supports many popular web and mobile browsers. By using one of the following browsers, we can guarantee an optimal experience:

- Microsoft Internet Explorer 8 or newer (it is recommended to use the latest Microsoft Edge browser)
- Google Chrome, latest version

Recommended settings for mobile devices
With the rapid development of mobile devices, it is utterly important for us that you can have the same experience on your mobile device as you have on your desktop computer. This is why we have also optimized the Water Intelligence website to be compatible with the following mobile devices:

Android
- Devices: All android phones and tablets
- Android 5.0+

Windows
- Devices: All tablets and smartphones
- Windows 8.1+

For Android, the Water Intelligence website does not fully support the earlier versions of the WebKit browsers that were previously used in 2013 by Google. Instead, consider using the Chrome Mobile browser if you experience any problems.

Other requirements

JavaScript
Water Intelligence uses JavaScript for many functions and features. For the full experience, it is required to enable JavaScript in your browser. Consult your browser's Help section for information on how to change this setting.

Cookies
Some features and functions of the Water Intelligence website, e.g. region selection for the map, user sign-in and statistical analysis, require browser cookies to be enabled. Consult your browser's Help section for information on how to change this setting. For more information about Kamstrup's use of cookies, see [illegible] information.

Internet connection
To use the Water Intelligence website, it is required to have an internet connection. As with any other web-based application, it is a must that we can get in contact with the data that we need in order to make the analysis reports as coherent as possible. 1 Mbps is recommended for using the Water Intelligence website.

Data hosting

All data that rests within the Water Intelligence suite is hosted on the Microsoft Azure platform on a cloud hosted environment in the United States of America to ensure optimal performance on load times.

We have also created the data center in US to ensure that data stays within US, thus complying with data regulations and laws.

H2O ANALYTICS CUSTOMER PORTAL

H_2O Analytics

Customer Portal

Engage your Customers with self-service usage information and proactive notifications

Go beyond monthly statements and engage your customers with interactive technologies that will allow them to visualize and understand their water usage through intuitive charts and proactive alerts and notifications. Improve customer service and encourage changes in customer behavior to drive conservation. Consumption data is imported automatically from your metering system(s), and alerts and notifications are automatically sent to your customers via email, text messaging and automated phone calls (based on their preferences). Give your customers a unique conservation tool while easing the workload on your customer service department.

SOLUTION OVERVIEW

- Browser-based Portal and Mobile Apps allow your Customers direct access to their meter data
- Customers control notification messages for leaks and high use conditions
- Notifications are delivered via email, text message and computerized voice calls
- Delegated administration for full utility control of user account information
- Integrated with your existing billing and metering systems for quick and easy implementation

H_2O Analytics is a cloud-based solution that is easy to integrate into virtually any IT environment

GIVE CUSTOMERS DIRECT ACCESS TO THEIR USAGE INFORMATION

Customers can review hourly, daily and monthly usage information along with temperature and precipitation data from your service area, online through any web browser, from a tablet computer or on their iPhone or Android phone. Customers can also receive automated leak and high use notifications according to their preferences.

INTEGRATED WITH YOUR BILLING, GIS AND METERING SYSTEMS

Customers sign up for the portal by registering with "off bill" information accessed through an interface with your billing software. Customer location data is accessed by integration with your Geographic Information System (GIS) if available, and monthly and hourly data (if available) is access through integration with your metering system.

PART OF A FAMILY OF CLOUD-BASED *ANALYTIC SERVICES*

- **Customer Notifications** – automated communication drives satisfaction, boosts cash flows and encourages conservation
- **Loss Reduction** – integrate SCADA, customer meter and GIS data to automate zone-level water loss analyses
- **Conservation Campaigns** – send personalized conservation emails; driven by analytics and business rules that you can tailor
- **Customer Portal** – engage your Customers with self-service usage information and proactive notifications

Help your Customers make informed usage decisions to conserve water.

FOR MORE INFORMATION

Please contact H_2O Analytics at:

https:// h2oanalytics.com

(512) 788-3000

info@h2oanalytics.com

EASY TO USE ACROSS A RANGE OF DEVICES

Your customers can enjoy self-service access to their meter data from a variety of platforms. Our browser-based portal application is accessible from the https://getMyMeter.info domain, or through embedding the Customer Portal functionality directly into your existing utility web site. Apple iOS and Android smart-phone apps are available from the respective app stores. Customers can access their information and manage their notifications across multiple devices.

REACH ALL YOUR CUSTOMERS VIA MULTIPLE CHANNELS

You decide whether you want notifications to be "opt in" or "opt out." Under the "opt in" model, customers only receive notifications after they have registered for an account in the Customer Portal. Under the "opt out" model, customers receive notifications using the contact information contained in your billing system until they decide not to receive notifications.

Notifications can be sent to your Customers via email, SMS text messaging and computerized "text to voice" telephone calls. Reach a larger percentage of your customers by supporting all three notification protocols.

FULLY MANAGED AND SECURE

From integration with your internal systems to 24x7x365 monitoring of the servers running your portal, we offer a fully managed solution. We understand that protection of your customer information is crucial; our platform undergoes several independent third party audits on a regular basis to provide this assurance. This means that an independent auditor has examined the controls present in our data centers, infrastructure and operations. Annual audits ensure compliance with the following standards: SSAE16 / ISAE 3402 Type II, ISO 27001, ISO 27017, Cloud Security and ISO 27018, Cloud Privacy.

H_2O Analytics

H2O ANALYTICS CUSTOMER NOTIFICATION SOFTWARE

H_2O Analytics

Customer Notification Software

Improve customer satisfaction, reduce inbound calls and accelerate cash flows

Past-due bills, imminent cut-offs, boil notices, conservation messages, service outage notifications – these are just a few of the messages that you need to deliver to your customers every day. But many utilities are stuck using outdated methods for delivering these messages; mailing letters, newspaper notices, and door-hangers. Many of these are never seen in time or are ignored, which means additional work for your staff, reduced revenue for your utility, and frustration for your customers. Our notification software gives you state-of-the-art messaging capabilities with high levels of automation and integration with your existing software systems.

SOLUTION OVERVIEW

- Communicate via email, phone and SMS messaging
- Integrated with your existing Customer database
- Many messages automated from business events in existing utility software
- Automated leak alerts triggered by leak detection algorithm
- Boil notices and other mass notifications won't tie up your phone lines
- Location-based targeting of messages for service outages

H_2O Analytics is a cloud-based solution that is easy to integrate into virtually any IT environment

LOCATION-AWARE MOBILE MESSAGING

Utility customers today expect and increasingly demand that you communicate with them using the latest technologies. Our cloud-based

voice-over-ip system can send thousands of calls in just minutes without using any of your phone lines. Phone, email and SMS/text messages are template based and automated based on business events detected in your existing systems and by our analytic models. Messages can also be geographically targeted by selecting customers from a Google Map. Stay in touch and communicate proactively with virtually no work required; dramatically boost the efficiency of your back-office staff.

EVENT-BASED NOTIFICATIONS

Integration with your existing billing, metering and SCADA systems allows for fully-automated notifications triggered by business events. Past-due notices, cut-off warnings, leak alerts and conservation campaigns all flow to your customers with virtually no work required by your staff.

PART OF A FAMILY OF CLOUD-BASED *ANALYTIC SERVICES*

- **Customer Notifications** – automated communication drives satisfaction, boosts cash flows and encourages conservation
- **Loss Reduction** – integrate SCADA, customer meter and GIS data to automate zone-level water loss analyses
- **Conservation Campaigns** – send personalized conservation emails; driven by analytics and business rules that you can tailor
- **Leak Detection** – monitor meter data flows to detect probable leaks and automate alerts

Proactive communication drives increased Customer satisfaction and speeds cash flows

FOR MORE INFORMATION

Please contact H_2O Analytics at:

http://www.h2oanalytics.com

(512) 553-5185

info@h2oanalytics.com

INTEGRATED WITH YOUR EXISTING SYSTEMS

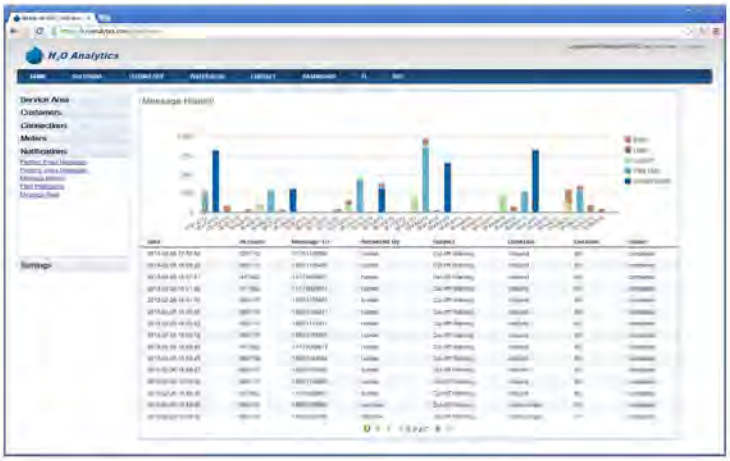
Unlike many other notification solutions, H_2O Analytics is tightly integrated with your existing utility systems. This bi-directional capability means your existing GIS, billing and customer-information systems are the 'source' for customer contact information; no duplicate registrations required. All customer contacts are notated in your existing customer-information or billing system; your customer service reps will always have complete information at their fingertips.

MULTI-CHANNEL MESSAGING

Send customer notifications via telephone (voice-over-ip), email and simple-message-service (cell-phone text messages). Send thousands of calls per hour without tying up any of your phone lines. Customize from dozens of pre-built templates to tailor your message and apply your existing logo and marketing 'look and feel.' Regular communication with your customers has never been easier.

A CLOUD-BASED SOLUTION

No phone lines, telecomm or dedicated computer hardware required. This is a cloud-based solution that is a snap to install and use. If your staff can use Google they can easily learn to use H_2O Analytics.

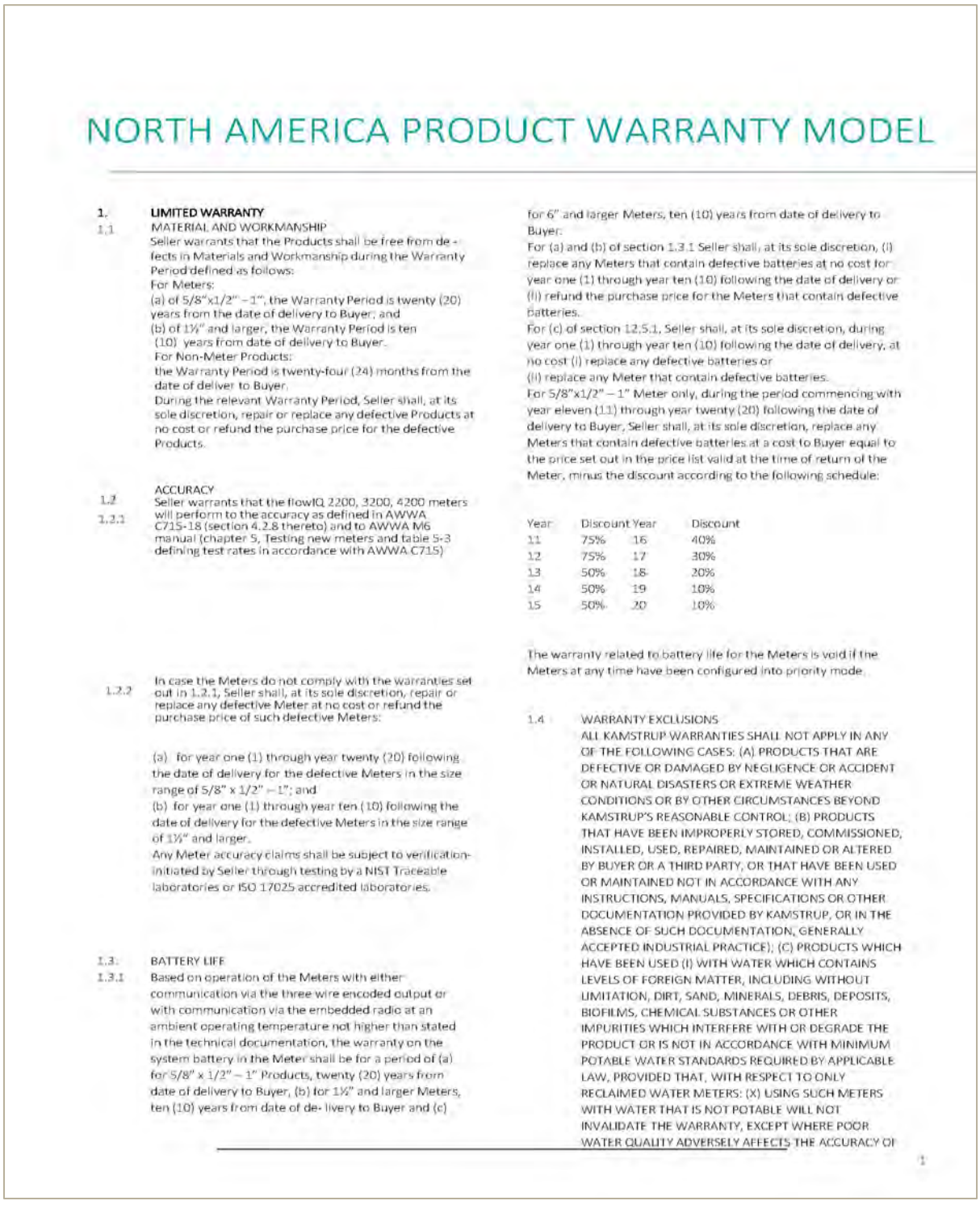


The Message History screen shows the status of all messages sent

H_2O Analytics

Product Warranty Statements

KAMSTRUP WARRANTY STATEMENT



NORTH AMERICA PRODUCT WARRANTY MODEL

1. **LIMITED WARRANTY**

1.1 MATERIAL AND WORKMANSHIP

Seller warrants that the Products shall be free from de - fects in Materials and Workmanship during the Warranty Period defined as follows:

For Meters:

(a) of 5/8"x1/2" – 1", the Warranty Period is twenty (20) years from the date of delivery to Buyer; and

(b) of 1½" and larger, the Warranty Period is ten (10) years from date of delivery to Buyer.

For Non-Meter Products:

the Warranty Period is twenty-four (24) months from the date of deliver to Buyer.

During the relevant Warranty Period, Seller shall, at its sole discretion, repair or replace any defective Products at no cost or refund the purchase price for the defective Products.

1.2 ACCURACY

1.2.1 Seller warrants that the flowIQ 2200, 3200, 4200 meters will perform to the accuracy as defined in AWWA C715-18 (section 4.2.8 thereto) and to AWWA M6 manual (chapter 5, Testing new meters and table 5-3 defining test rates in accordance with AWWA C715)

1.2.2 In case the Meters do not comply with the warranties set out in 1.2.1, Seller shall, at its sole discretion, repair or replace any defective Meter at no cost or refund the purchase price of such defective Meters:

(a) for year one (1) through year twenty (20) following the date of delivery for the defective Meters in the size range of 5/8" x 1/2" – 1"; and

(b) for year one (1) through year ten (10) following the date of delivery for the defective Meters in the size range of 1½" and larger.

Any Meter accuracy claims shall be subject to verification- initiated by Seller through testing by a NIST Traceable laboratories or ISO 17025 accredited laboratories.

1.3 BATTERY LIFE

1.3.1 Based on operation of the Meters with either communication via the three wire encoded output or with communication via the embedded radio at an ambient operating temperature not higher than stated in the technical documentation, the warranty on the system battery in the Meter shall be for a period of (a) for 5/8" x 1/2" – 1" Products, twenty (20) years from date of delivery to Buyer, (b) for 1½" and larger Meters, ten (10) years from date of de- livery to Buyer and (c) for 6" and larger Meters, ten (10) years from date of delivery to Buyer.

For (a) and (b) of section 1.3.1 Seller shall, at its sole discretion, (i) replace any Meters that contain defective batteries at no cost for year one (1) through year ten (10) following the date of delivery or (ii) refund the purchase price for the Meters that contain defective batteries.

For (c) of section 12.5.1, Seller shall, at its sole discretion, during year one (1) through year ten (10) following the date of delivery, at no cost (i) replace any defective batteries or (ii) replace any Meter that contain defective batteries.

For 5/8"x1/2" – 1" Meter only, during the period commencing with year eleven (11) through year twenty (20) following the date of delivery to Buyer, Seller shall, at its sole discretion, replace any Meters that contain defective batteries at a cost to Buyer equal to the price set out in the price list valid at the time of return of the Meter, minus the discount according to the following schedule:

Year	Discount	Year	Discount
11	75%	16	40%
12	75%	17	30%
13	50%	18	20%
14	50%	19	10%
15	50%	20	10%

The warranty related to battery life for the Meters is void if the Meters at any time have been configured into priority mode.

1.4 WARRANTY EXCLUSIONS

ALL KAMSTRUP WARRANTIES SHALL NOT APPLY IN ANY OF THE FOLLOWING CASES: (A) PRODUCTS THAT ARE DEFECTIVE OR DAMAGED BY NEGLIGENCE OR ACCIDENT OR NATURAL DISASTERS OR EXTREME WEATHER CONDITIONS OR BY OTHER CIRCUMSTANCES BEYOND KAMSTRUP'S REASONABLE CONTROL; (B) PRODUCTS THAT HAVE BEEN IMPROPERLY STORED, COMMISSIONED, INSTALLED, USED, REPAIRED, MAINTAINED OR ALTERED BY BUYER OR A THIRD PARTY, OR THAT HAVE BEEN USED OR MAINTAINED NOT IN ACCORDANCE WITH ANY INSTRUCTIONS, MANUALS, SPECIFICATIONS OR OTHER DOCUMENTATION PROVIDED BY KAMSTRUP, OR IN THE ABSENCE OF SUCH DOCUMENTATION, GENERALLY ACCEPTED INDUSTRIAL PRACTICE); (C) PRODUCTS WHICH HAVE BEEN USED (I) WITH WATER WHICH CONTAINS LEVELS OF FOREIGN MATTER, INCLUDING WITHOUT LIMITATION, DIRT, SAND, MINERALS, DEBRIS, DEPOSITS, BIOFILMS, CHEMICAL SUBSTANCES OR OTHER IMPURITIES WHICH INTERFERE WITH OR DEGRADE THE PRODUCT OR IS NOT IN ACCORDANCE WITH MINIMUM POTABLE WATER STANDARDS REQUIRED BY APPLICABLE LAW, PROVIDED THAT, WITH RESPECT TO ONLY RECLAIMED WATER METERS: (X) USING SUCH METERS WITH WATER THAT IS NOT POTABLE WILL NOT INVALIDATE THE WARRANTY, EXCEPT WHERE POOR WATER QUALITY ADVERSELY AFFECTS THE ACCURACY OF

THE METER TO AN UNUSUAL DEGREE, IN WHICH CASE THE WARRANTY IS INVALID - OR USED IN ENVIRONMENTS WITH EXPOSURE TO ELECTROMAGNETIC PHENOMENA OR OTHER ABNORMAL ELECTRICAL INTERFERENCE, INCLUDING WITHOUT LIMITATION UNNATURAL MAGNETIC FIELDS, RADIATION OR ELECTROMAGNETIC PULSES, OR EXCESSIVE ELECTRICAL CURRENT, EXCEPT TO THE EXTENT PERMITTED IN THE PRODUCT SPECIFICATIONS;

PRODUCTS WHERE ANY SERIAL NUMBER OR SECURITY SEAL HAS BEEN INTERFERED WITH; (E) NORMAL WEAR AND TEAR; (F) PRODUCTS THAT ARE EXPERIMENTAL, DEVELOPMENTAL, PROTOTYPE, OR PILOT; OR
(G) PRODUCTS WHICH HAVE BEEN USED AFTER DISCOVERY OF THE DEFECT.

1.5. PRODUCT RETURN

1.5.1. IF, WITHIN THE APPLICABLE WARRANTY PERIOD, (I) BUYER DISCOVERS ANY DEFECTS IN MATERIALS OR WORKMAN- SHIP, AND (II) NOTIFIES SELLER IN WRITING OF SUCH DEFECTS, AND (III) RETURNS THE DEFECTIVE PRODUCTS TO SELLER, SELLER SHALL, AT SELLER'S SOLE DISCRETION, RE- PAIR OR REPLACE THE DEFECTIVE PRODUCTS, OR REFUND THE PURCHASE PRICE FOR THE DEFECTIVE PRODUCTS. NO WARRANTY CLAIMS WILL BE PROCESSED IF RECEIVED AF- TER THE WARRANTY PERIOD. REJECTED PRODUCTS MAY BE RETURNED ONLY WITH SELLER'S PRIOR EXPRESS WRITTEN CONSENT AND AT BUYER'S COST AND RISK. IF PRODUCTS ARE RETURNED WITHOUT SELLER'S PRIOR CONSENT, SELLER MAY REFUSE TO ACCEPT THE RETURNED PRODUCTS AND MAY RETURN THEM TO SELLER AT BUYER'S COST AND EXPENSE.

1.6. SET-OFF

1.6.1. IN NO CASE WHATSOEVER, INCLUDING JUSTIFIED WAR- RANTY CLAIMS, IS THE BUYER ENTITLED TO RETAIN ANY MONIES OWED TO SELLER, EXCEPT UPON THE WRITTEN CONSENT OF SELLER. FURTHER, THE WARRANTIES PRO- VIDED FOR HEREIN SHALL NOT APPLY IN THE EVENT BUYER HAS FAILED TO REMIT PAYMENT IN FULL FOR SUCH PRODUCTS.

1.7. WARRANTY DISCLAIMER

1.7.1. WARRANTY DISCLAIMER. THE FORFGOING LIMITED WAR-RANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WAR-RANTIES OF MERCHANTABILITY, FITNESS FOR ANY PAR-TICULAR PURPOSE, OR NON-INFRINGEMENT, ALL OF WHICH ARE HEREBY EXPRESSLY DISCLAIMED.

TSI POWER (UPS) WARRANTY STATEMENT

TSI POWER

Warranty Policy for customers in US and Canada

TSi Power warrants its products to be free from defects in materials and workmanship for two (2) years* from the date of purchase from TSi Power or its authorized representatives. TSi Power will repair (or at its option, replace) any defective component(s) during this warranty period. To make a request or claim for service under this limited warranty, the original purchaser must return the product, in the original shipping container or equivalent, to TSi Power, accompanied by a written receipt showing the date of purchase and both the name and serial number of the product. * Excluding batteries. Battery manufacturer's warranty applies to batteries.

Warranty does not cover transportation costs. Damage by misuse, accident or unauthorized tampering of the product is not covered by the warranty. NO OTHER WARRANTIES ARE EXPRESSED OR IMPLIED. TSI POWER IS NOT LIABLE FOR CONSEQUENTIAL DAMAGES. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

LIMITATION OF LIABILITY: IN NO EVENT SHALL TSI POWER OR ITS AFFILIATES BE LIABLE FOR ANY DAMAGES WHATSOEVER (INCLUDING WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR OTHER PECUNIARY LOSS) ARISING OUT OF THE USE OR INABILITY TO USE THIS PRODUCT, EVEN IF TSI POWER OR ITS AGENT HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. SOME JURISDICTIONS DO NOT ALLOW THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. SO THE ABOVE EXCLUSIONS MAY NOT APPLY TO YOU.

TSI Power Corporation
1103 W Pierce Avenue
Antigo, WI. 54409-3103
USA & Canada: 800-874-3160 (toll-free)
Fax: +1-715-623-2426
International: +1-715-623-0636
Email: sales@tsipower.com
www.tsipower.com

To make a warranty claim, please contact TSi Power at: sales@tsipower.com

Advanced Capabilities/Core+ Overview

***START OF CONFIDENTIAL INFORMATION**

Utilities face growing challenges such as staffing shortages, aging infrastructure, rising costs, evolving regulations, and increasing customer expectations all while managing limited resources. To help utilities overcome these obstacles, Core & Main's Smart Utility Team created **CORE+**, an innovative program designed to streamline operations, enhance efficiency, and prepare for the future.

WHAT IS CORE+?

CORE+ is Core & Main's comprehensive smart utility solutions program that brings together hardware, software, services, and advanced monitoring into one integrated offering. It's a flexible, scalable platform that can be tailored to each utility's unique needs. From integrated metering systems and data analytics to software and managed services, CORE+ empowers utilities to modernize operations, improve efficiency, and strengthen service reliability.

Unlike one-size-fits-all solutions, CORE+ is fully customizable. Utilities can select à la carte features to expand AMI Smart Utility Solutions, ensuring they have the right tools and expertise to meet today's demands while preparing for tomorrow's opportunities.

CORE+ focuses on four key segments:

- **Smart Metering Systems** – AMR and AMI Solutions
- **Projects & Field Services** – Turnkey implementation, project management, and staff augmentation
- **Advanced Monitoring Solutions (AMS)** –Monitoring for pressure, flow, water quality, sewer overflows, and leak detection
- **Software Solutions** – Billing/CIS, Meter Data Management (MDM), asset management, GIS, analytics dashboards, and customer portals

CORE+ Services

Our CORE+ Team is knowledgeable and experienced, with PMP®- certified project managers, Mechanical and Computer Engineers, AMI Specialists, Software Manager, Business Analysts, and metering subject matter experts. Utilizing a structured methodology with proven processes and procedures in planning, safety, quality, deployment, and communication to successfully implement AMI Systems, this foundation enables Core & Main's experienced and dedicated team to deliver projects on time, within budget, and with industry-leading customer satisfaction.

CORE+ Brochure

Below, we've included a sample of our CORE+ Brochure. A full copy of our brochure and detailed subpages on each quadrant of our CORE+ offerings is available upon request.

NETWORK-AS-A SERVICE

The CORE+ Managed Services Program will enable the Rubidoux Community Services District to experience the industry's highest level of Network as a Service (NaaS) across its service territory. As part of this CORE+ program, local, experienced, and dedicated service technicians monitor and maintain all elements of the Advanced Metering Infrastructure, including the Kamstrup AMI system, the meters, and endpoints, to provide 100% network availability and billable reads monthly.

With CORE+ NaaS, Rubidoux Community Services District can rest assured that the new metering network infrastructure will remain at peak operational performance, even during outages and disaster recovery.

The Core & Main CORE+ NaaS service will enable the Rubidoux Community Services District staff to focus on the business of water and not on infrastructure operations and maintenance.

Key benefits to a CORE+ NaaS Services:

- Core & Main will provide dedicated, qualified, local service technicians
- Core & Main will proactively monitor the health and performance of the AMI infrastructure
- Core & Main will perform all AMI infrastructure manufacturer-recommended maintenance
- Core & Main will perform all required software/firmware updates for network components
- Core & Main will troubleshoot and resolve all network infrastructure issues
- Core & Main will provide a software dashboard with field work order and repair information
- Core & Main will administer all aspects of the equipment warranty and RMA process
- Core & Main will provide monthly reports for all warranty-related transactions
- Core & Main will troubleshoot and resolve all endpoint issues (Tier 2 Required)
- Core & Main will guarantee 100% billable reads, monthly, across the service territory (Tier 2 Required)
- Core & Main will maintain an inventory of AMI network components, meters, and endpoints (Tier 2 Required)

Service Components	Tier 1	Tier 2
Purchase and Own Network Infrastructure Equipment (AMI Network Host)	Rubidoux Community Services District	Rubidoux Community Services District
Pay Monthly Cellular Network Backhaul Fees	CNM	CNM
Provide City-owned Assets to House Network Infrastructure Equipment	Rubidoux Community Services District	Rubidoux Community Services District

Provide Leased Assets for Network Infrastructure Equipment (to supplement City-owned, if necessary)	CNM	CNM
Install Network Infrastructure	CNM	CNM
CORE+ On-site Field Technicians	Rubidoux Community Services District	1
Monitor Network Infrastructure Alarms & Performance	CNM	CNM
Troubleshoot and Resolve Network Infrastructure Issues	CNM	CNM
Monitor Endpoint Alarms & Performance	CNM	CNM
Troubleshoot and Resolve Endpoint Issues	Rubidoux Community Services District	CNM
Maintain Endpoint Equipment Inventory for RMA	Rubidoux Community Services District	CNM
Equipment Warranty Administration (RMA)	CNM	CNM
Guaranteed 100% Billable Reads	Rubidoux Community Services District	CNM

Core & Main is pleased to offer the Rubidoux Community Services District the two top CORE+ NaaS service tiers from which to choose. Both tiers include a robust set of AMI network support services for the City's Field Area Network (FAN). It leverages our purpose-built wireless communication network and head-end system, with ongoing AMI network monitoring and maintenance by our local technical support team.

With the **NaaS Tier 1** service, Rubidoux Community Services District provides field resources for troubleshooting and resolving meter Endpoint field issues.

Alternatively, the **NaaS Tier 2** service is the turnkey, all-inclusive, premier AMI Network-as-a-Service and provides dedicated, qualified, local Core & Main field technicians to maintain all meter Endpoints across the service territory, and a no-cost inventory of Endpoints for quickly resolving Endpoint issues and equipment failures under warranty.

At-A-Glance Comparison

CORE+ NaaS Tier 1

NaaS Tier 1 includes a comprehensive set of base NaaS services including the installation of all AMI network components to enable a fully operational Advanced Metering Infrastructure network; dedicated, qualified, local service technicians proactively monitoring the AMI network to maximize availability and peak performance; periodic network security testing and audits by security experts; completion of required maintenance and resolution of network issues; and monitoring of Endpoint alarms and performance. Generation of work orders to troubleshoot and resolve Endpoint issues; a real-time view of CORE+ field work performed through the work order management software dashboard; complete administration of the equipment warranty program (RMA); a mobile base station, capable of being deployed upon short notice, to support disaster recovery/emergency operations; and the assurance that billable reads for all meters across the service territory are available to the utility billing staff when needed without estimation or City staff field visits.

With NaaS Tier 1, Rubidoux Community Services District will be responsible for all field Endpoint troubleshooting and issue resolution and maintaining an inventory of replacement Endpoints.

NaaS Tier 1 Service Components	Rubidoux Community Services District	Core & Main
Purchase and Own Network Infrastructure Equipment (AMI Network Host)	X	
Pay Monthly Cellular Network Backhaul Fees		X
Provide Utility-owned Assets for Network Infrastructure Equipment	X	
Install Network Infrastructure		X
Monitor Network Infrastructure Alarms & Performance		X
Troubleshoot and Resolve Network Infrastructure Issues		X
Monitor Endpoint Alarms & Performance		X
Troubleshoot and Resolve Endpoint Issues	X	

Maintain Endpoint Equipment Inventory for Replacements	X	
Equipment Warranty Administration (RMA)		X

CORE+ NaaS Tier 2

With the turnkey, all-inclusive, premier NaaS Tier 2 service, the Rubidoux Community Services District will not only reap the value and benefits from Tier 1 but additionally will not be responsible for or assign resources for maintaining Endpoints across the service territory. Core & Main will assign dedicated, qualified, and local service technicians to perform all Endpoint troubleshooting and issue resolution and will maintain an inventory of replacement Endpoints.

NaaS Tier 2 Service Components	Rubidoux Community Services District	Core & Main
Purchase and Own Network Infrastructure Equipment (AMI Network Host)	X	
Pay Monthly Cellular Network Backhaul Fees		X
Provide Utility-owned Assets for Network Infrastructure Equipment	X	
Install Network Infrastructure		X
CORE+ On-site Field Technicians, Based on # Services (1 Tech)		X
Monitor Network Infrastructure Alarms & Performance		X
Troubleshoot and Resolve Network Infrastructure Issues		X
Monitor Endpoint Alarms & Performance		X
Troubleshoot and Resolve Endpoint Issues		X
Maintain Endpoint Equipment Inventory for Replacements		X
Equipment Warranty Administration (RMA)		X
Guaranteed 100% Billable Reads		X

CORE+ ADVANCED MONITORING SOLUTIONS

Core & Main has developed the industry's first complete solution to help utilities tackle infrastructure challenges through advanced technology and data-driven insights. With this vision, we designed our

Advanced Monitoring Solutions, engineered to optimize system performance, reduce operational costs, and ensure regulatory compliance. This solution provides utilities with tools to monitor, analyze, and optimize infrastructure, ensuring proactive maintenance, real-time event detection, and long-term sustainability.

By adopting CORE+ AMS Packages, utilities gain unmatched visibility and control over their infrastructure, allowing them to minimize operational risks, enhance compliance, and improve overall system resilience. These solutions leverage real-time data insights, predictive analytics, and automated alerts, enabling utilities to:

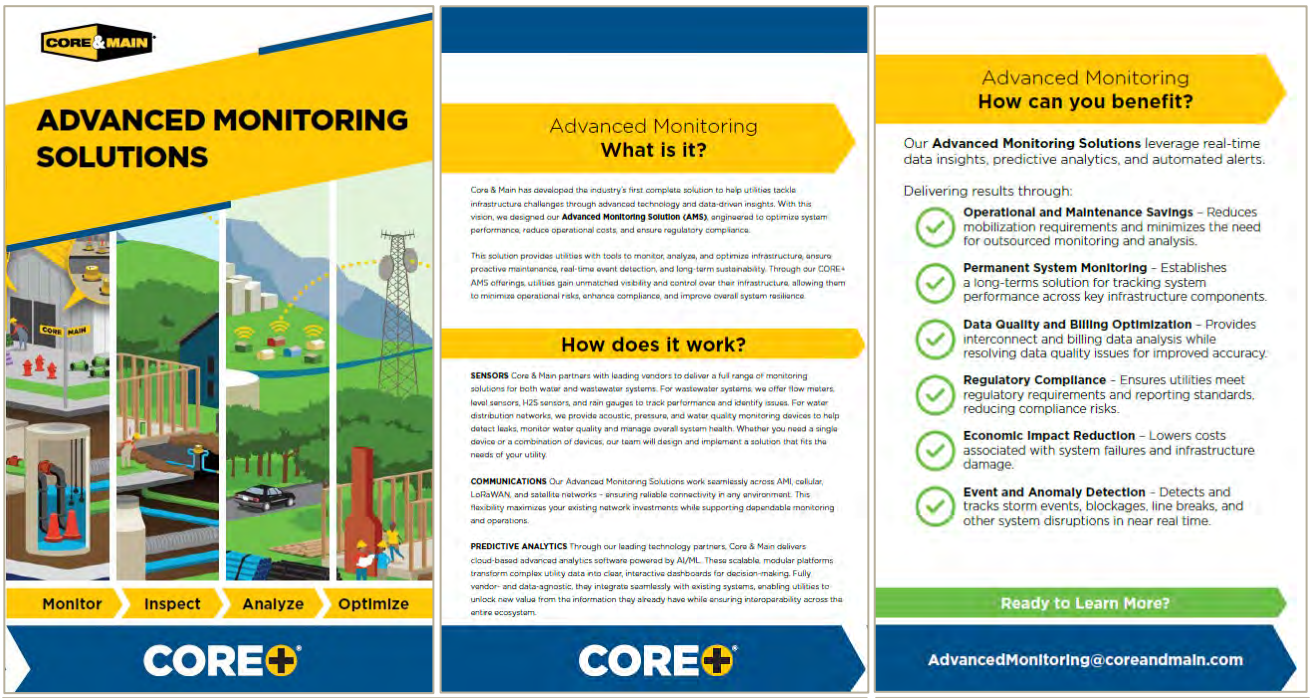
Key Benefits:

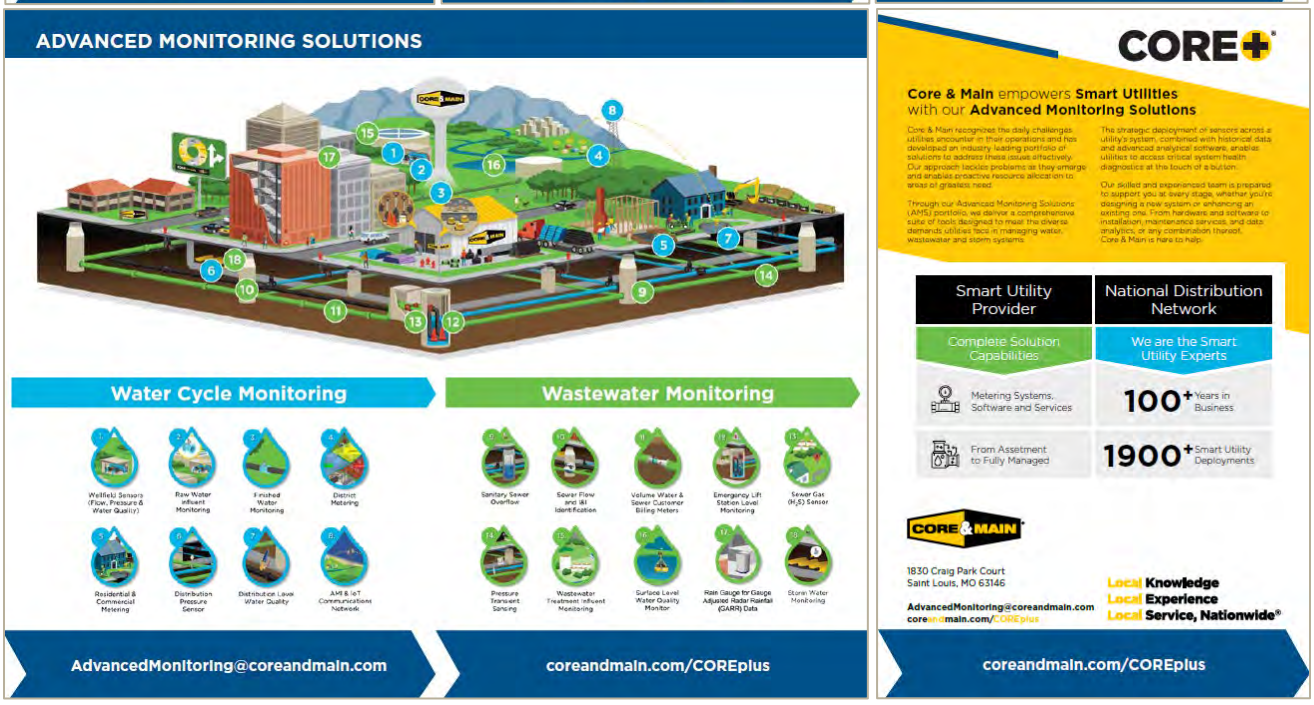
- Operational and Maintenance Savings – Reduces mobilization requirements and minimizes the need for outsourced monitoring and analysis.
- Permanent System Monitoring – Establishes a long-term solution for tracking system performance across key infrastructure components.
- Data Quality and Billing Optimization – Provides interconnect and billing data analysis while resolving data quality issues for improved accuracy.
- Regulatory Compliance – Ensures utilities meet regulatory requirements and reporting standards, reducing compliance risks.
- Economic Impact Reduction – Lowers costs associated with system failures and infrastructure damage.
- Event and Anomaly Detection – Detects and tracks storm events, blockages, line breaks, and other system disruptions in near real time.

With CORE+ AMS Packages, utilities can proactively address system vulnerabilities, optimize maintenance schedules, and reduce emergency interventions. By integrating real-time monitoring, predictive analytics, and automated alerts, utilities benefit from improved resource allocation, increased operational efficiency, and enhanced sustainability. This comprehensive approach ensures safer, more reliable infrastructure management, protecting both assets and the communities served.

Advanced Monitoring Solutions (AMS) Brochure

Below, we've included a sample of our AMS Brochure. A full copy of our brochure is available upon request.





CORE+ AMS Packages

SSO/CSO Level Monitoring

The SSO/CSO Level Monitoring solution provides utilities with a comprehensive, data-driven solution to prevent sewer system overflows and optimize maintenance operations. This solution integrates flow meters, manhole level sensors, and advanced network communications to deliver real-time visibility into wastewater system performance. By detecting blockages and overflow risks before they occur, this solution enables proactive response, reducing emergency interventions and mitigating environmental impact.

Leveraging machine learning-driven analytics, the solution provides trend advisories that help utilities optimize labor deployment and streamline maintenance planning. With near real-time actionable data, operators can make informed decisions to enhance system efficiency and reliability. Additionally, the

By implementing our SSO/CSO Level Monitoring solution, utilities can take a proactive approach to wastewater management, improving system reliability, regulatory compliance, and operational cost savings while enhancing infrastructure resilience.

Flow Monitoring and I&I Analysis

The Flow Monitoring and I&I Analysis solution provides utilities with a comprehensive, data-driven approach to identifying and mitigating inflow and infiltration (I&I) issues. This solution enables near real-time detection of rain derived I&I sources, helping utilities proactively manage sewer system performance. By analyzing wet and dry weather patterns and precisely quantifying inflow and infiltration levels, utilities can make informed decisions to reduce excess flow and optimize system capacity.

With flow and velocity interval measurements, the solution prioritizes basin and lift station maintenance, reducing unnecessary mobilizations and improving operational efficiency. Additionally, integrated machine learning analytics provide actionable insights through dashboards, graphing, and reporting, enhancing data-driven decision-making. The solution features advanced sensor technology, including Doppler radar and electromagnetic sensing, to capture accurate flow data in normal and surcharge conditions.

By implementing the Flow Monitoring and I&I Analysis solution, utilities gain greater visibility and control over sewer system performance, leading to improved reliability, reduced maintenance costs, and enhanced regulatory compliance.

Environmental Water Quality Monitoring

The Environmental Water Quality Monitoring solution offers a practical and proactive approach to ensuring safe and reliable water quality, enhancing public health and environmental protection. Designed to help utilities identify and address critical conditions that can lead to fish kills, algae blooms, and other environmental hazards, this solution provides continuous and accurate data for informed decision-making.

Leveraging battery-powered devices and advanced analytics software, the system enables real-time monitoring and assessment of key water quality parameters. These include pressure, level, conductivity, turbidity, total chlorine, free chlorine, temperature, pH, chlorophyll, dissolved oxygen, and hydrogen sulfide. By integrating cutting-edge sensor technology, utilities can detect and respond to water quality issues before they escalate, ensuring regulatory compliance and improving service reliability.

By implementing the Environmental Water Quality Monitoring solution, utilities can take a data-driven approach to safeguarding water systems, optimizing operational efficiency, and proactively mitigating environmental risks.

Water Distribution Monitoring Solution

The Water Distribution Monitoring solution provides utilities with a real-time, proactive approach to managing system pressure, chlorine and other parameters, detecting anomalies and preventing costly failures. This solution ensures seamless installation, continuous monitoring, real-time alerts, and detailed system insights**,** helping utilities reduce downtime, prevent failures, and improve operational efficiency**.**

Halogen MP5-A Multiparameter Sensor

The Halogen MP5-A is a cutting-edge, flow-independent water quality sensor designed to deliver real-time monitoring of multiple parameters without the need for reagents or membranes. Engineered for versatility and reliability, it supports direct installation in pipes, tanks, or side streams, making it ideal for utilities seeking accurate, low-maintenance chlorine residual measurement and system diagnostics.

Key Features:

- Multiparameter Monitoring – Measures free chlorine, pH, conductivity, temperature, and oxidation-reduction potential (ORP) in a single device.
- Flow-Independent Design – Operates accurately in varying or zero-flow conditions, with direct pipe installation capability.

- Self-Cleaning Technology – Includes captive cleaning beads and a long-life pump for continuous electrode maintenance and extended unattended operation.
- No Reagents or Membranes – Reduces operational complexity and eliminates waste streams, saving up to 70,000 gallons of water annually.
- Cloud Connectivity – Offers remote access and monitoring via cellular communication for enhanced data visibility.
- Flexible Installation Options – Supports immersion, wet tap, and side stream configurations with NSF61-certified cable lengths.
- EPA Method 334.0 Compliant – Approved for chlorine residual reporting, ensuring regulatory alignment.
- Durable & Certified – NSF61/372 certified, CE-compliant, and designed for long-term performance in harsh environments.

The Halogen MP5-A empowers utilities with precise, real-time water quality data, helping reduce water loss, streamline compliance, and improve operational efficiency across the distribution network.

Elynx Cry Out Alarm Unit

The Cry Out Alarm Unit is a critical alert system that instantly notifies operators of pressure drops, equipment failures, or other anomalies in the distribution system. Designed for high reliability and low maintenance, this unit ensures rapid detection and response to critical events.

Key Features:

- Reliable Communication – Operates over satellite or cellular networks**,** ensuring dependable connectivity in both urban and remote locations.
- Multi-Sensor Compatibility – Supports 4-20mA devices and four digital inputs, allowing integration with various pressure, flow, and level sensors.
- Instant Alarming Device – Alerts operators when preset pressure thresholds are exceeded, ensuring quick corrective action.
- Long Battery Life – Features a 3 to 5-year battery, reducing maintenance needs and ensuring continuous operation.
- Flexible Deployment **–** Compact, rugged design allows for installation in remote or high-risk areas, making it ideal for critical infrastructure monitoring.

Elynx Continuous Pressure Monitoring Kit

The Continuous Pressure Monitoring Kit provides real-time, high-resolution pressure monitoring at key locations in the distribution system. Its solar-powered, fully autonomous design ensures uninterrupted operation, while multi-carrier SIM connectivity guarantees reliable data transmission.

Key Features:

- Fully Standalone, Solar-Powered Operation – Eliminates the need for external power sources, providing uninterrupted monitoring.

- Battery Backup – Ensures continuous performance in low-light or extreme weather conditions**.** Multi-Carrier SIM Connectivity – Guarantees seamless communication, minimizing data loss and improving network redundancy.
- High-Pressure Monitoring Capability – Supports pressures up to 300 psi, making it suitable for high-pressure applications.
- Frequent Data Collection – Captures 15-minute interval readings**,** offering timely and actionable insights for improved system control.

This kit allows utilities to identify pressure fluctuations, optimize water flow, and reduce system strain**,** leading to longer infrastructure lifespan and lower operational costs**.**

Elynx Multi-Sensor Kit

The Multi-Sensor Kit is designed for utilities that require a comprehensive monitoring approach**,** allowing them to track multiple parameters simultaneously across their distribution system.

Key Features:

- Fully Standalone, Solar-Powered Unit – Provides autonomous monitoring without reliance on grid power.
- Battery Backup – Ensures uninterrupted performance, even in low-power environments**.**
- Multi-Carrier SIM-Enabled Communication – Delivers seamless, redundant connectivity to prevent data gaps.
- High-Frequency Data Collection – Captures 15-minute data readings for precise system insights.
- Multi-Input Capability – Supports five sensor inputs, enabling the integration of multiple pressure, flow, and environmental sensors.

Orbis Smart Cap

The Orbis Smart Cap is an innovative real-time acoustic leak detection device designed to enhance water distribution system monitoring. By integrating with existing hydrants, it enables utilities to detect leaks early, monitor system conditions, and respond to events efficiently.

Key Features:

- Universal Fit – Designed to fit any manufacturer's hydrant, allowing for easy integration.
- Quick Installation – Can be installed in minutes on both dry and wet hydrants.
- Optimized for Ductile Iron Pipe Systems – Ideal for utilities with ductile iron distribution networks.
- Comprehensive Event Detection – Identifies leaks, flow events, temperature changes, pipe condition changes, and tampering incidents.
- Reliable Performance – Comes with a 3-year warranty on both the sensor and battery, with field-replaceable components for long-term use.

The Orbis Smart Cap provides utilities with instant insight into their distribution network, reducing water loss, improving operational efficiency, and enhancing system security.

***END OF CONFIDENTIAL INFORMATION**