



City of Ketchum

September 6, 2022

Mayor Bradshaw and City Councilors
City of Ketchum
Ketchum, Idaho

Mayor Bradshaw and City Councilors:

Recommendation to Approve Right-of-Way Encroachment Agreement 22786 for the placement of driveway pavers with snowmelt in the public right-of-way at 150 Spur Lane.

Recommendation and Summary

Staff recommends the Ketchum City Council approve the attached Right-of-Way Encroachment Agreement 22786 and adopt the following motion:

“I move to authorize the Mayor to sign Right-of-Way Encroachment Agreement 22786 with Timothy Mott.”

The reasons for the recommendation are as follows:

- The improvements will not impact the use or operation of Spur Lane.
- The improvements will not impact drainage or snow removal within the public right-of-way.
- The project complies with all standards for Right-of-Way Encroachment Permit issuance specified in Ketchum Municipal Code §12.12.060.

Introduction and History

The property owner submitted a Right-of-Way Encroachment Permit application for driveway pavers and snowmelt pavers within the City’s right-of-way along Spur Lane. The driveway will access a new home located at 150 Spur Lane within the City’s Limited Residential (LR) Zoning District.

A public right-of-way is defined as improved or unimproved public property dedicated or deeded to the City for the purpose of providing vehicular, pedestrian, and public use. In Ketchum, the public rights-of-way consist of roadways, curbs, gutters, sidewalks, signage, and drainage facilities. The public rights-of-way are also used for public parking, wintertime snow storage, and conveyance of utilities, such as water, sewer, electricity, telephone, and cable.

Analysis

Pursuant to Ketchum Municipal Code §12.12.040.C, a Right-of-Way Encroachment Permit is required for any permanent encroachment of the public right-of-way where a permanent fixture to the ground or a building will occur. The associated Right-of-Way Encroachment Agreement is intended to help protect the City in the event the proposed encroachments were to ever pose an issue requiring repair, relocation, or removal of the encroachment. The standards for issuance of a Right-of-Way

Encroachment Permit are specified in Ketchum Municipal Code §12.12.060. The encroachments proposed for the 150 Spur Lane (Mott) Residence project comply with all standards.

Sustainability

The ROW Encroachment Permit does not limit the ability of the city to reach the goals of the Ketchum Sustainability Action Plan – 2020.

Financial Impact

There is no financial requirement from the city for this action.

Attachments

ROW Encroachment Agreement 22786

WHEN RECORDED, PLEASE RETURN TO:

**OFFICE OF THE CITY CLERK
CITY OF KETCHUM
POST OFFICE BOX 2315
KETCHUM, IDAHO 83340**

RIGHT-OF-WAY ENCROACHMENT AGREEMENT 22786

THIS AGREEMENT, made and entered into this ____ day of ____, 2022, by and between the CITY OF KETCHUM, IDAHO, a municipal corporation ("Ketchum"), whose address is Post Office Box 2315, Ketchum, Idaho 83340 and TIMOTHY MOTT, ("Owner"), whose address is Post Office Box 1702, Ketchum, Idaho 83340.

RECITALS

WHEREAS, Owner is the owner of real property described as 150 Spur Lane ("Subject Property"), located within the City of Ketchum, State of Idaho, and;

WHEREAS, Owner wishes to permit the placement of a paver driveway with snowmelt within the right-of-way on Spur Lane. These improvements are shown in Exhibit A attached hereto and incorporated herein (collectively referred to as the "Improvements") and;

WHEREAS, Ketchum finds that said Improvements will not impede the use of said public right-of-way at this time subject to the terms and provisions of this Agreement;

WHEREAS, the Owner will restore the street, alley, sidewalk, curb, and gutter and any landscaping back to the original condition acceptable to the Streets and Facilities Director;

NOW, THEREFORE, in contemplation of the above stated facts and objectives, it is hereby agreed as follows:

TERMS AND CONDITIONS

1. Ketchum shall permit Owner to construct, install, maintain, and repair the Improvements identified in Exhibit A within within the public rights-of-way on Spur Lane until notified by Ketchum to remove the Improvements at which time Owner shall remove Improvements at Owner's expense.
2. Owner shall be responsible for the maintenance of said Improvements and shall repair said improvements within 48 hours upon notice from Ketchum that repairs are needed.
3. Snowmelt systems installed in the public right-of-way shall be installed and operate at all times during the winter according to the following:
 - The system shall meet the requirements of the International Energy Conservation Code (2018 IECC, 403.12.2)
 - The system shall have an electronic main control board to operate the system that is programmable and optimizes the way the system functions.

- Installation of in-ground control sensors linked to the main control board that detect snow and ice on the surface, monitor the sidewalk or driveway temperature, and automatically activates the system to be turned on or off based on the snow condition and air temperature.

4. Owner shall be responsible for restoring the alley, sidewalk, curb, and gutter and landscaping that is altered due to the construction and installation of the Improvements, to the satisfaction of the Director of Streets and Facilities.

5. In consideration of Ketchum allowing Owner to maintain the Improvements in the public right-of-way, Owner agrees to indemnify and hold harmless Ketchum from and against any and all claims of liability for any injury or damage to any person or property arising from the Improvements constructed, installed and maintained in the public right-of-way. Owner shall further indemnify and hold Ketchum harmless from and against any and all claims arising from any breach or default in the performance of any obligation on Owner's part to be performed under this Agreement, or arising from any negligence of Owner or Owner's agents, contractors or employees and from and against all costs, attorney's fees, expenses and liabilities incurred in the defense of any such action or proceeding brought thereon. In the event any action or proceeding is brought against Ketchum by reason of such claim, Owner, upon notice from Ketchum, shall defend Ketchum at Owner's expense by counsel satisfactory to Ketchum. Owner, as a material part of the consideration to Ketchum, hereby assumes all risk of damages to property or injury to persons in, upon or about the Improvements constructed, installed and maintained in the public right-of-way arising from the construction, installation and maintenance of said Improvements and Owner hereby waives all claims in respect thereof against Ketchum.

6. Ketchum shall not be liable for injury to Owner's business or loss of income therefrom or for damage which may be sustained by the person, goods, wares, merchandise or property of Owner, its tenants, employees, invitees, customers, agents or contractors or any other person in or about the Subject Property caused by or resulting from the Improvements constructed, installed, removed or maintained in the public right-of-way.

7. Owner understands and agrees that by maintaining the Improvements in the public right-of-way pursuant to this Agreement, Owner obtains no claim or interest in said public right-of-way which is adverse to that of Ketchum and that Owner obtains no exclusive right to said public right-of-way nor any other right to use the public right-of-way not specifically described herein.

8. In the event either party hereto retains an attorney to enforce any of the rights, duties and obligations arising out of this Agreement, the prevailing party shall be entitled to recover from the non-prevailing party reasonable attorney's fees at the trial and appellate levels and, whether or not litigation is actually instituted.

9. This Agreement shall be governed by, construed, and enforced in accordance with the laws and decisions of the State of Idaho. Venue shall be in the District Court of the fifth Judicial District of the State of Idaho.

10. This Agreement sets forth the entire understanding of the parties hereto and shall not be changed or terminated orally. It is understood and agreed by the parties hereto that there are no verbal promises or implied promises, agreements, stipulations or other

representations of any kind or character pertaining to the Improvements maintained in the public right-of-way other than as set forth in this Agreement.

11. No presumption shall exist in favor of or against any party to this Agreement as the result of the drafting and preparation of this document.

12. This Agreement shall be recorded with the Blaine County Recorder by Ketchum.

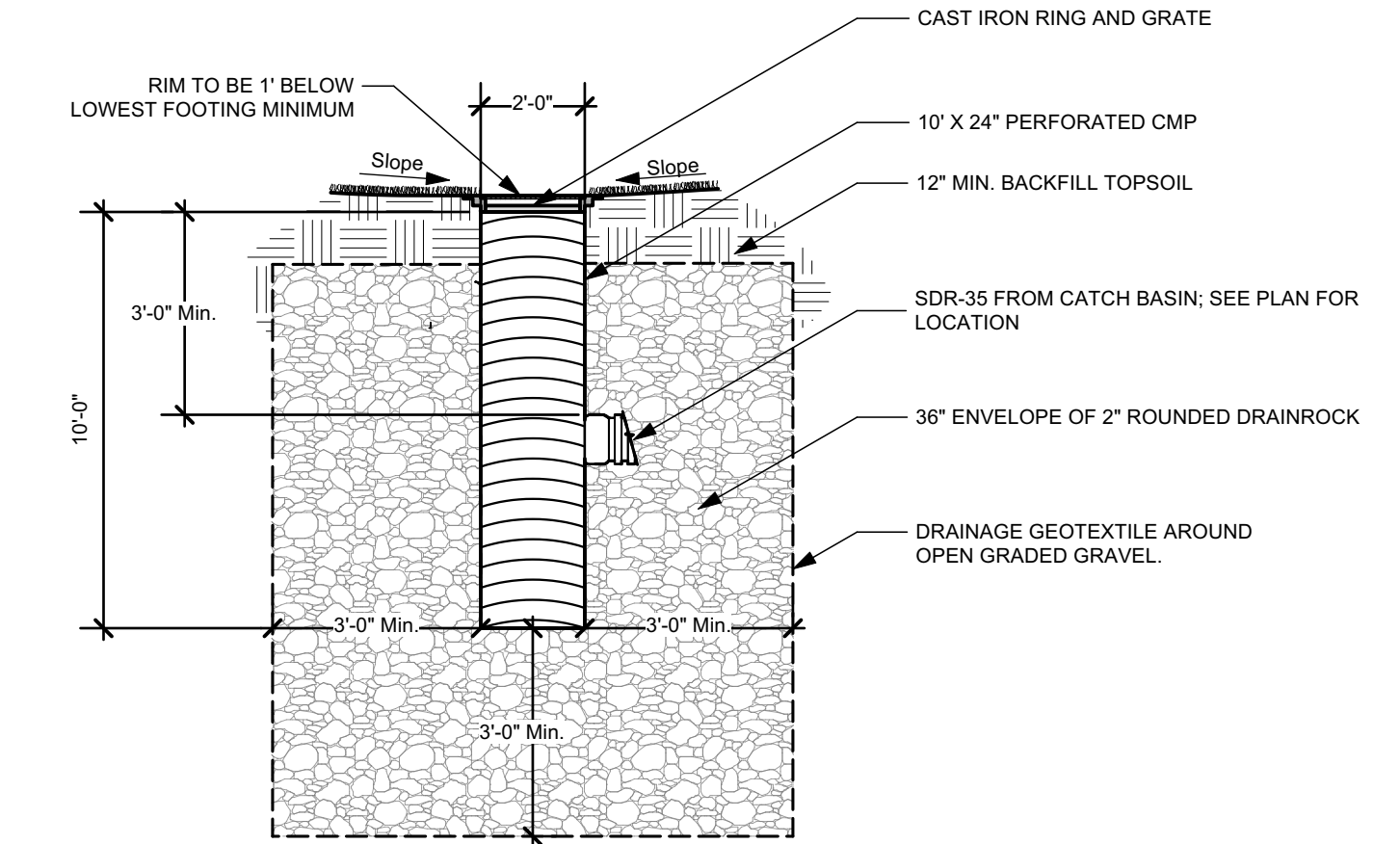
13. The parties fully understand all of the provisions of this Agreement, and believe them to be fair, just, adequate, and reasonable, and accordingly accept the provisions of this Agreement freely and voluntarily.

EXHIBIT A

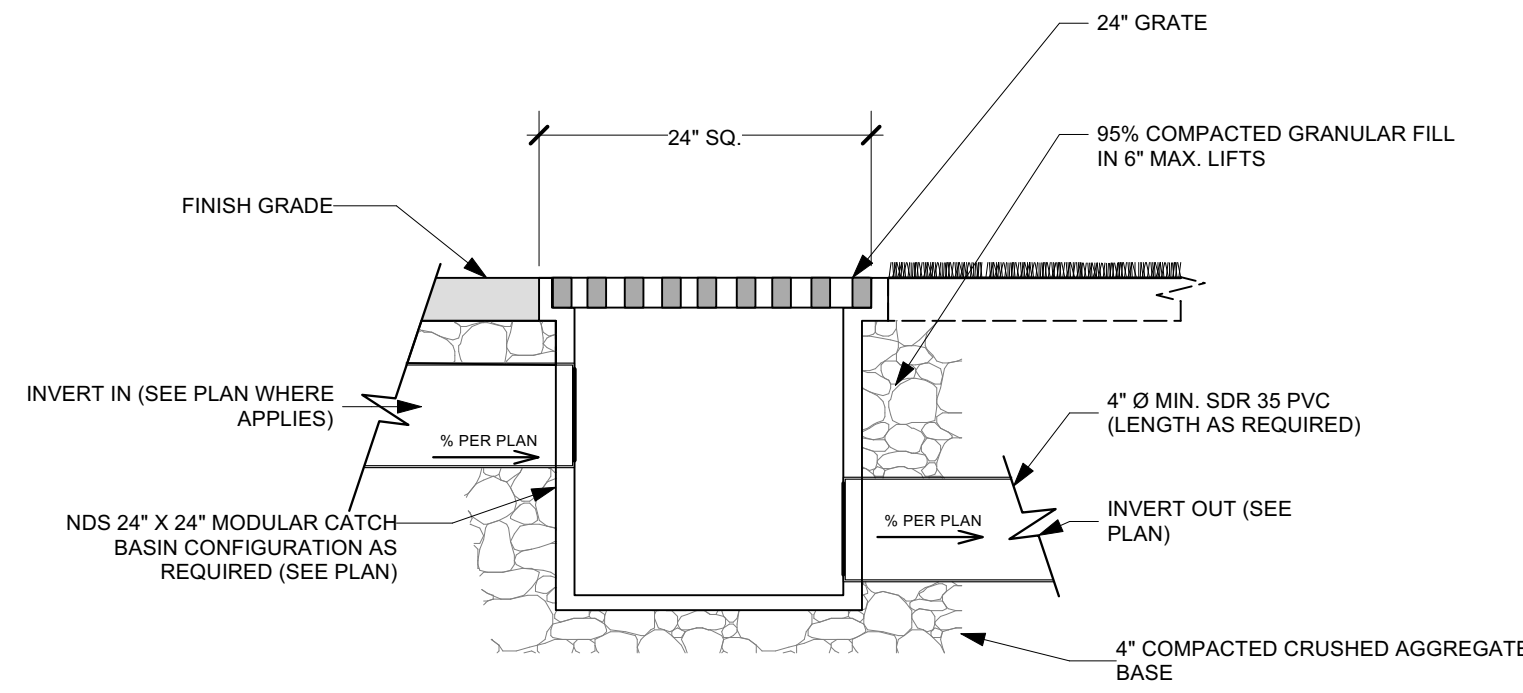


GRADING + DRAINAGE LEGEND	
SYMBOL	DESCRIPTION
	24" Catch Basin
	24" Drywell (Cast Iron)
	4" Solid SDR-35 Drain Pipe
	4" Perforated Drain Pipe
	% Pitch
	Drainage Direction
	Flush Grade Condition
	Footing
	FFE Finished Floor Elevation
	+10.50 Spot Elevation
	FG Finished Grade
	FS Finished Surface
	TS Top of Step
	BS Bottom of Step
	TW Top of Wall
	BW Bottom of Wall
	LP Low Point
	HP High Point

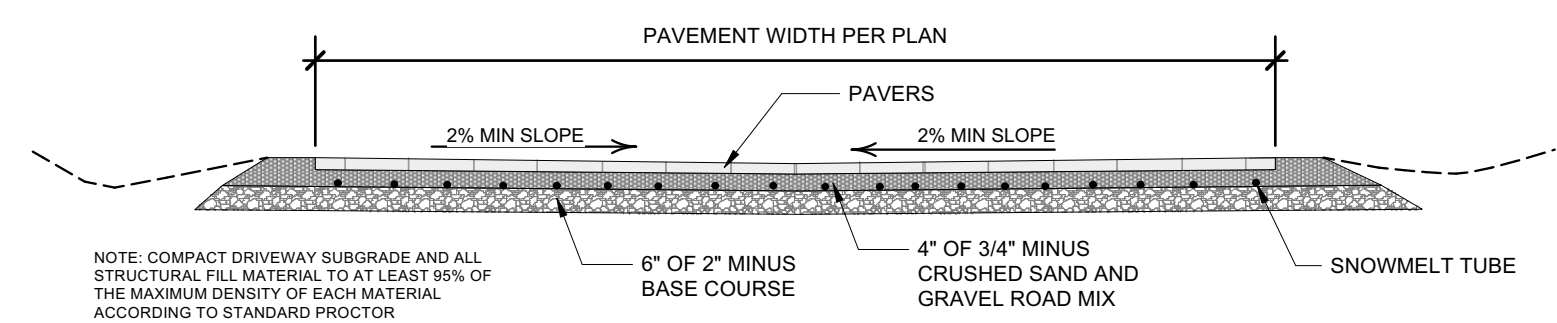
SHEET LEGEND	
SYMBOL	DESCRIPTION
	Property Line
	Building Envelope
	Setbacks / Easements
	Existing Contours
	Proposed Contours
	Existing Utility
	Proposed Driveway
	Retaining Wall



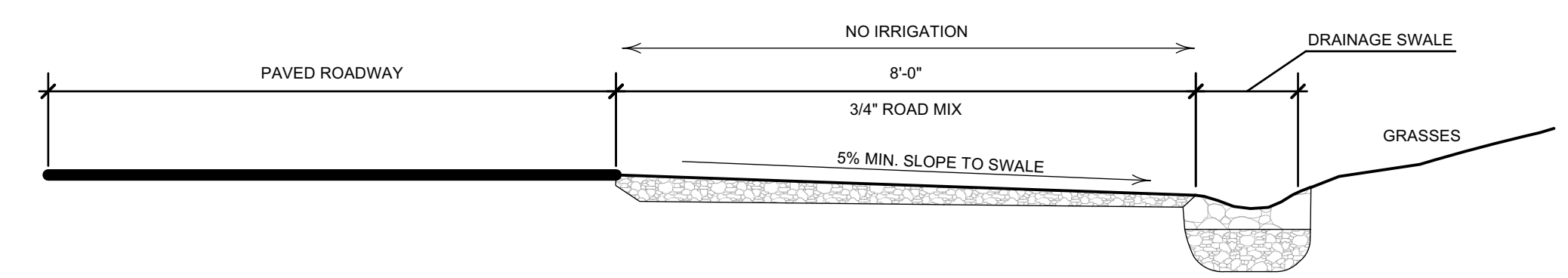
1 DRYWELL DETAIL
N.T.S.



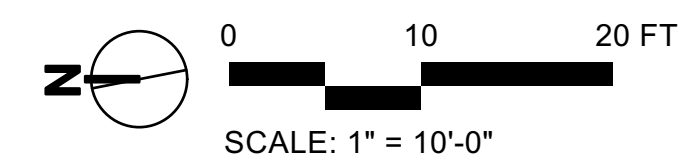
2 CATCH BASIN DETAIL
N.T.S.



3 PAVER DRIVEWAY DETAIL
N.T.S.



4 R.O.W. DETAIL
N.T.S.



LANDSCAPE PLAN
150 SPUR LANE
LOT 20, SADDLE VIEW SUB #2, KETCHUM, ID

FILENAME: 150 SPUR LANE PERMIT SET.vwg
PROJECT MANAGER: SET.vwg
DRAWN BY: TP
ISSUE DATE: 8/17/2022
PLOT DATE: 8/17/22 8:44:13

PLANTING PLAN

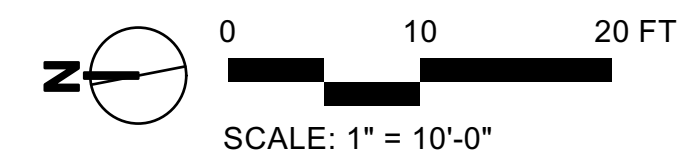
SHEET NO.

L5.0

SHEET LEGEND	
SYMBOL	DESCRIPTION
---	Property Line
BE	Building Envelope
---	Setbacks / Easements
-SILT-	Silt Fence (during construction)
(5999)	Existing Contours
(6000)	Existing Contours
99	Proposed Contours
TP	Existing Utility
W	Existing Utility
GAS	Existing Utility
SWR	Existing Utility
PWR	Existing Utility
⊙	Existing Vegetation
⊙	Surface Material - Gravel
▨	Hardscape - Paved Drive
▨	Hardscape - Stone Pavers
▨	Hardscape - Concrete Steps
▨	Concrete Wall
⊙	Landscape Boulder
▨	Landscape - Native
▨	Landscape - Lawn
▨	Landscape - Perennials
⊙	Landscape - Shrubs
⊙	Landscape - Trees
⊕	Drywell

PLANT SCHEDULE				
TREES				
ABBRV	QTY.	SIZE	BOTANICAL NAME	COMMON NAME
AL-1	3	8" B&B	<i>Abies lasiocarpa</i>	Subalpine Fir
BP	3	9" B&B	<i>Pinus aristata</i>	Bristlecone Pine
PAP	1	10" B&B	<i>Picea abies 'Pendula'</i>	Weeping Norway Spruce
PC	2	10" B&B	<i>Pinus contorta var. contorta</i>	Lodgepole Pine
PT	17	2"-3" CAL.	<i>Populus tremuloides</i>	Quaking Aspen
PT	3	3" CAL.	<i>Populus tremuloides</i>	Quaking Aspen
SA	2	12"-14"	<i>Sorbus americana</i>	American Mountain Ash
SHRUBS				
ABBRV	QTY.	SIZE	BOTANICAL NAME	COMMON NAME
CS	15	5 Gal.	<i>Cornus sericea</i>	Red Twig Dogwood
SAV	7	4"-0" B&B	<i>Salix alba var. vitellina</i>	Golden Willow
PERENNIALS				
		600 SQ. FT.	PERENNIALS	
		8,900 SQ. FT.	NATIVE GRASS VEGETATION	

IRRIGATION NOTE:
ALL TREES TO HAVE DRIP IRRIGATION AND ALL OTHER PLANTINGS TO BE IRRIGATED



150 Spur Lane
Ketchum ID, 83340
Mott Residence

This brief narrative explains how the snowmelt system at 150 Spur Lane located in the public right-of-way complies with both City requirements and IECC Code.

The system is comprised of multiple elements.

1. Insulated substrate to improve efficiency within system.
2. Approved tubing designed for snowmelt applications.
 - a. See attached document from Rehau **(pg 2-3)**
3. Snowmelt sensor spec and location
 - a. See attached document from Tekmar **(pg 4-5)**
4. Snowmelt Controller
 - a. See attached document from Tekmar **(pg 6-7)**
5. Boiler
 - a. See attached document from Lochnivar **(pg 8-9)**

All portions of this system have been installed according to manufactures requirements and inspected by state of Idaho officials.

This system within the right -of-way will be maintained and operated at all times during the winter.

Please also see attached pictures of tubing installed **(pg 10)**.

Thank you

Matt Spence
Lee Gilman Builders.

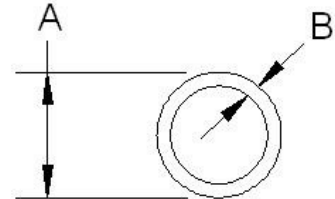
PRODUCT SUBMITTAL 102

RAUPEX O₂ barrier pipe



Product: RAUPEX® O₂ barrier pipe

Date: 11 February 2021 (supersedes 31 July 2019)



Article No.	Nominal Size in	Average OD A in (mm)	Minimum Wall Thickness B In (mm)	Weight lb/ft (kg/m)	Capacity gal/ft (l/m)
136008	3/8	0.500 (12.70)	0.070 (1.78)	0.05 (0.07)	0.0050 (0.0624)
136031	1/2	0.625 (15.88)	0.070 (1.78)	0.06 (0.08)	0.0098 (0.1222)
136880	5/8	0.750 (19.05)	0.083 (2.12)	0.08 (0.11)	0.0134 (0.1671)
136051	3/4	0.875 (22.22)	0.097 (2.47)	0.10 (0.15)	0.0189 (0.2356)
136011	1	1.125 (28.58)	0.125 (3.18)	0.17 (0.26)	0.0316 (0.3939)
136283	1 1/4	1.375 (34.92)	0.153 (3.88)	0.25 (0.37)	0.0467 (0.5827)
136293	1 1/2	1.625 (41.28)	0.181 (4.59)	0.35 (0.52)	0.0650 (0.8118)
136303	2	2.125 (53.98)	0.236 (6.00)	0.60 (0.90)	0.1114 (1.3906)

For updates to this publication, visit na.rehau.com/resourcecenter

The information contained herein is believed to be reliable, but no representations, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications or the results to be obtained therefrom. Before using, the user will determine suitability of the information for user's intended use and shall assume all risk and liability in connection therewith.

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PRODUCT SUBMITTAL 102

RAUPEX O₂ barrier pipe



TECHNICAL DESCRIPTION

Specification	English	SI	Standard	Specification	English	SI	Standard
Minimum Density	58 lb/ft ³	926 kg/m ³	ASTM F876	Tensile Strength	4194-4355 psi @ 68°F	26-30 N/mm ² @ 20°C	--
Min. Degree of Crosslinking	70%	70%	ASTM F876		2610-2900 psi @ 176°F per ASTM D638	18-20 N/mm ² @ 80°C per ASTM D638	
Max. Thermal Conductivity	2.84 Btu in./(ft ² °F hr)	0.41 W/(m ² K)	DIN 16892	Roughness	e=0.00028 in	e=0.007 mm	--
Coefficient of Linear Expansion	9.33X10 ⁻⁴ in/ft°F @ 68°F	0.14 mm/(m°C) @ 20°C	Mean @ 20-70°C per DIN 16892	Temperature Working Range	-40 to 200°F	-40 to 93°C	--
	1.33x10 ⁻³ in/ft°F @ 212°F	0.2 mm/(m°C) @ 100°C					
IZOD Impact Res.	No Break	No Break	--	O ₂ Permeability	--	<=0.32 mg/m ² /day @ 40°C	DIN 4726
Modulus of Elasticity	87,000-130,500 psi @ 68°F	600-900 N/mm ² @ 20°C	Minimum @ 20°C per DIN 16892	Max. Short-term Exposure	150 psig @ 210°F (48 hr)	1035 kPa @ 99°C (48 hr)	ASTM F876
	43,500-58,000 psi @ 176°F	300-400 N/mm ² @ 80°C		UV Resistance	See TB218		ASTM F2657

FUNCTIONAL DESCRIPTION

RAUPEX O₂ barrier pipe is manufactured using REHAU's high-pressure peroxide method for crosslinked polyethylene (PEXa). RAUPEX pipe meets or exceeds the requirements of ASTM F876, F877, NSF 61, CSA B137.5 and PPI TR-3. RAUPEX O₂ barrier pipe is SDR9, red in color and for use with the EVERLOC+® compression-sleeve system certified to ASTM F877, the REHAU F1960 cold expansion fitting system certified to ASTM F1960, and RAUPEX compression nut fittings. See REHAU *Technical Bulletin TB261* for other compatible PEX fitting systems. RAUPEX O₂ barrier pipe has a co-extruded oxygen diffusion barrier that exceeds the strict requirements of DIN 4726. RAUPEX pipe is manufactured by REHAU using a quality management system which has been certified to the latest version of ISO 9001.

LONG TERM STRENGTH

The maximum temperature and pressure ratings of the RAUPEX pipe are in accordance to ASTM F876, CSA B137.5 and PPI TR-3. The designer shall determine the actual conditions and apply the appropriate and additional design factors as required for any particular project. The temperature and pressure ratings apply to the application of RAUPEX pipe for conveying heating and cooling water at the 2.0 safety factor on allowable working pressure according to ASTM and CSA. According to the REHAU *PEXa Limited Warranty*, the RAUPEX pipe warranty period of 25 years is for operating conditions at or below 180°F (82.2°C) in permitted applications when the handling, use, installation and maintenance continually complies with all REHAU technical guidelines.

RAUPEX SDR9

maximum pressures and temperatures	design factors
160 psi @ 73.4°F (1055 kPa @ 23°C)	0.50 (per ASTM F876, CSA B137.5)
100 psi @ 180°F (690 kPa @ 82.2°C)	0.50 (per ASTM F876, CSA B137.5)
80 psi @ 200°F (550 kPa @ 93.3°C)*	0.50 (per ASTM F876, CSA B137.5)

* REHAU defines Elevated Temperature Applications as those with operating conditions greater than 180°F (82.2°C).

When REHAU PEXa pipes are planned to be operated in Elevated Temperature Applications, contact REHAU Engineering to verify your project conditions comply with the REHAU *PEXa Limited Warranty* in accordance to REHAU *Technical Bulletin TB230 Elevated Temperature Applications*.

For updates to this publication, visit na.rehau.com/resourcecenter

The information contained herein is believed to be reliable, but no representations, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications or the results to be obtained therefrom. Before using, the user will determine suitability of the information for user's intended use and shall assume all risk and liability in connection therewith.

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tekmar® Submittal

Snow / Ice Sensor 090



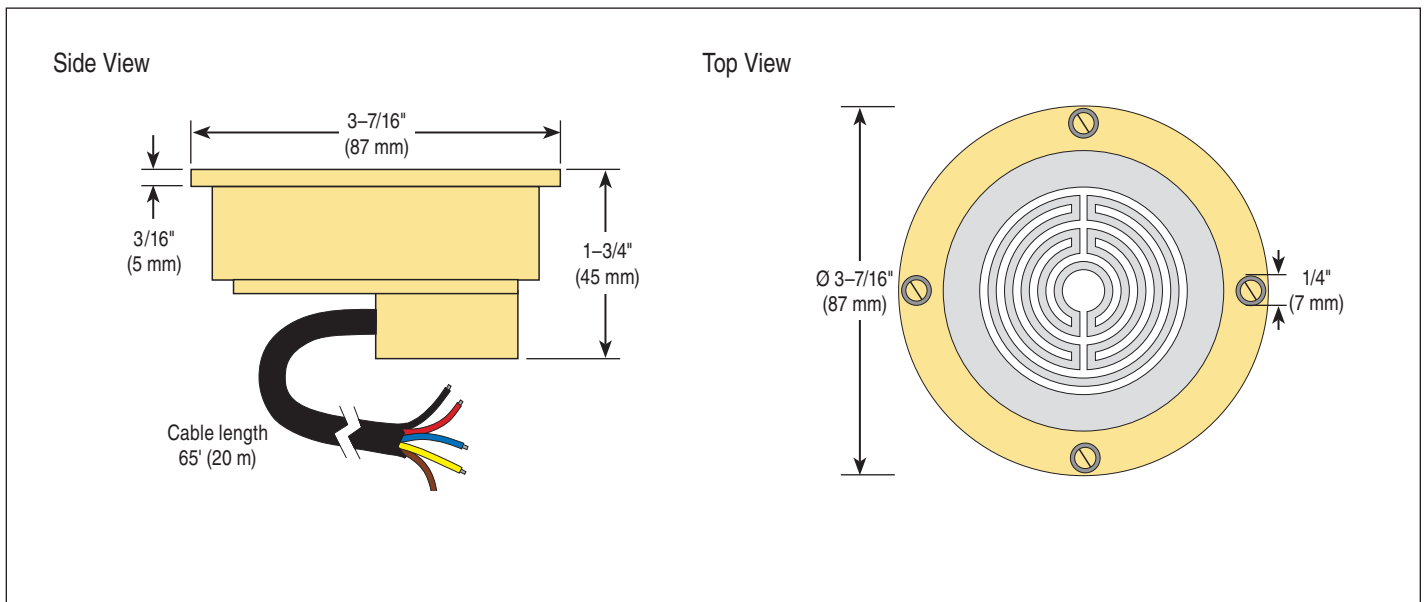
090_C

02/16

Snow Melting Replaces: 10/13

Job _____ Designer _____ Contact _____

The Snow/Ice Sensor 090 is an in ground sensor used with tekmar snow melting controls to automatically detect snow or ice on a driveway or walkway. The 090 has 65 ft (20 m) of wire. This product can be used in applications ranging from residential driveways to commercial building fronts such as emergency access entries. This sensor allows tekmar snow melting controls to automatically operate the snow/ice melt system only when snow or ice is present, while also providing temperature feedback to the control.



Specifications

Snow / Ice Sensor 090 In-slab, 65 ft. (20 m) Wire	
Literature	090_D, 090_C
Packaged weight	4.4 lb (2000 g)
Dimensions	1-3/4" H x 3-7/16" OD (45 mm H x 87 mm OD)
Sensor material	Silicon brass
Cable Material	65 ft. (20 m) 5 conductor stranded wire with polyethylene jacket
Approvals	CSA C US with tekmar Snow Melting Controls
Operating range	-30 to 170°F (-34 to 77°C)
Load rating	15,000 lb (66,723 N) distributed load, non-impact, installed in concrete according to the manual
Included	4 #4-40, 7/16" machined, stainless steel screws 4 #6-32, 3/8" flathead, slotted, stainless steel screws
Warranty	Limited 3 Year (See 090_D for full warranty)

Energy Saving Features

- Automatic snow/ice detection so melting systems only operate when needed

Additional Features

- Slab temperature sensing
- Long wire included so in field splicing is not necessary
- Designed for long life in driveway and walkway installations
- 65 ft (20 m) of cable

SPECIAL REQUIREMENTS

The Snow / Ice Sensor 090 must be operated by a tekmar Snow Melting Control 654, 661, 662, 664, 665, 667 or 680. Operation of the sensor by 3rd party control systems may result in electrolysis failures not covered by the tekmar Limited Warranty.



tekmar Control Systems Ltd., A Watts Water Technologies Company. Head Office: 5100 Silver Star Road, Vernon, B.C. Canada V1B 3K4, 250-545-7749, Fax. 250-984-0815 Web Site: tekmarControls.com

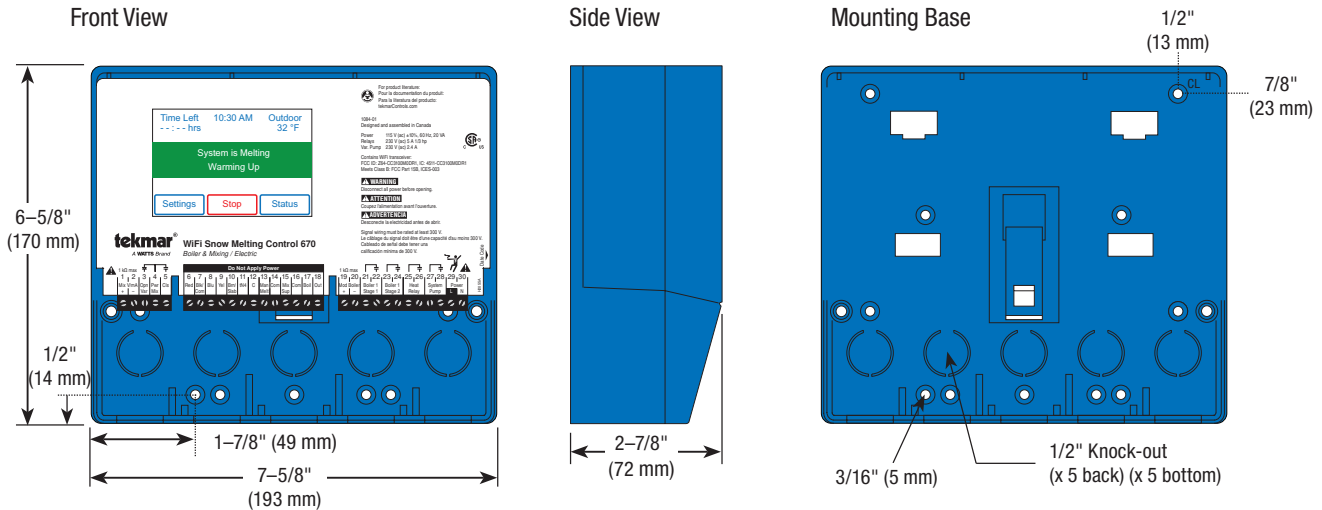


Submittal

Job _____ Designer _____ Contact _____

WiFi Snow Melting Control 670

The WiFi Snow Melting Control 670 operates hydronic and electric heating equipment designed to melt snow and/or ice from roads and walkway surfaces. The control works with the tekmar Snow/Ice Sensor 090 or Snow Sensor 095 to automatically detect snow or ice and operates a single boiler, steam valve, or electric cable to supply heat to the slab. Boiler return protection is provided to non-condensing boilers using a mixing valve or variable speed injection mixing pump. When connected to the Internet, the Watts® Home mobile app allows the 670 to be controlled remotely.



Features

- Mobile app for iOS and Android
- Automatic software updates
- Automatic snow/ice detection
- Supports both inslab & retrofit aerial sensors
- Supports multiple zones with priority
- Idling
- Auto Storm
- Warm Weather Shut Down
- Cold Weather Cut Off
- EconoMelt
- Slab Protection
- Tandem Snow/Ice Detection
- Equipment exercising

Specifications

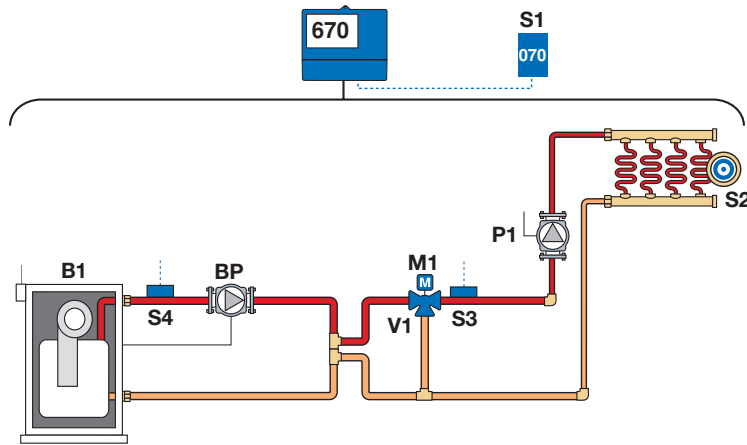
WiFi Snow Melting Control 670 Boiler & Mixing / Electric	
Literature	670_A, 670_C, 670_D, 670_J, 670_U
Control	Microprocessor control. This is not a safety (limit) control
Packaged weight	4.3 lb. (1960 g)
Dimensions	6-5/8" H x 7-9/16" W x 2-13/16" D (170 x 193 x 72 mm)
Display	3.5" color touchscreen
Enclosure	Blue PVC plastic, NEMA type 1
Approvals	CSA C US, meets Class B: ICES & FCC Part 15
Ambient conditions	-4 to 122°F (-20 to 50°C), < RH 90% non-condensing, outdoor use permitted when installed inside a NEMA 3 enclosure
Power supply	115 V (ac) ±10%, 60 Hz, 20 VA
Relays	230 V (ac), 5 A, 1/3 hp
Boiler modulation output	0-10 V (dc) 500 Ω min impedance / 4-20 mA 1 kΩ max impedance
Injection mixing output	230 V (ac), 2.4 A, 1/6 hp, fuse T2.5 A 250V
Floating mixing output	230 V (ac), 5 A
Analog mixing output	0-10 V (dc) 500 Ω min impedance / 4-20 mA 1 kΩ max impedance
Manual melt call	Short or 0 - 32 V(ac)
Communications	WiFi 802.11n, 2.4 GHz, WPA2 encryption
Mobile app	Apple iOS 12 or higher, Android 8 or higher
Sensor	NTC thermistor, 10 kΩ @ 77°F (25°C ±0.2°C) β=3892
-Included	Outdoor Sensor 070 and 2 of Universal Sensor 082
-Optional	tekmar type # 072, 073, 082, 087, 090, 094, 095
Warranty	Limited 3 Year (See 670_D for full warranty)

tekmar product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact tekmar Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on tekmar products previously or subsequently sold.

tekmar[®]
A WATTS Brand

Sample Application Drawing

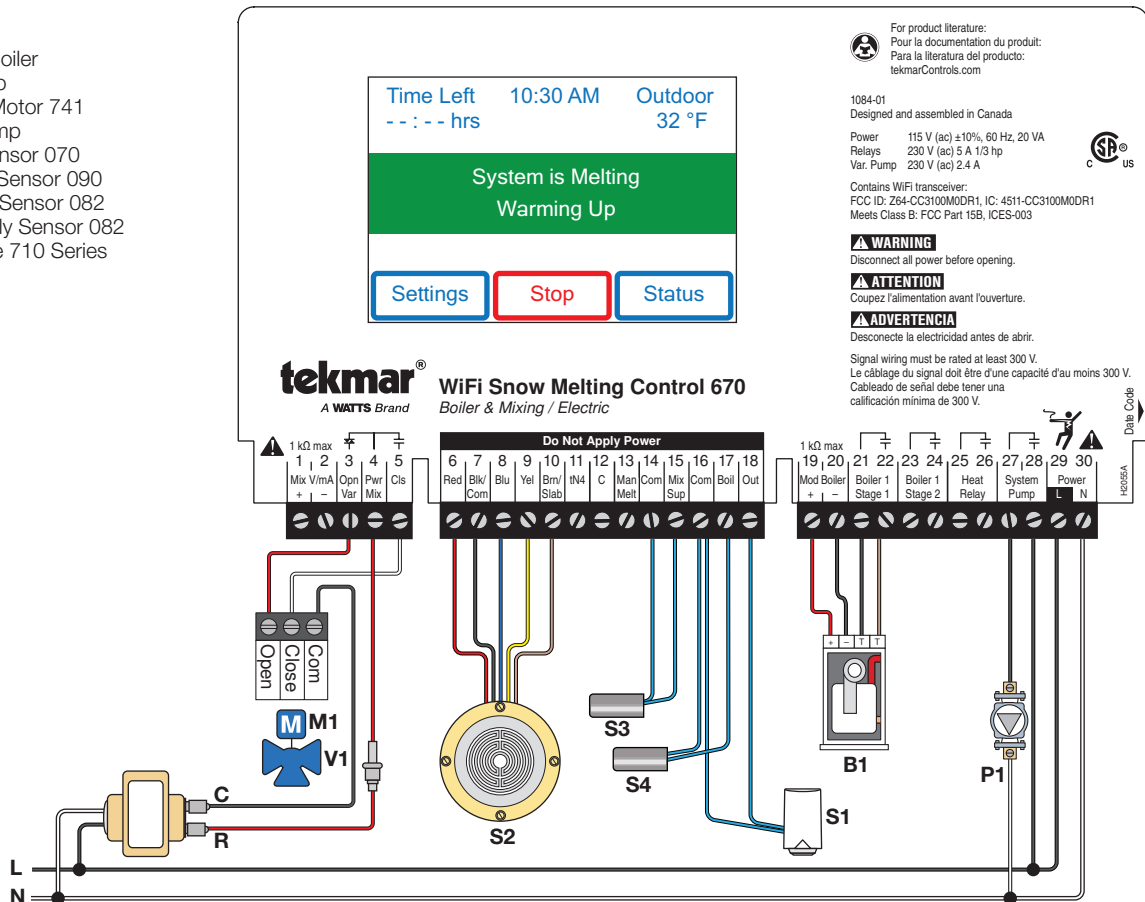
Sample Mechanical diagram



Sample Electrical diagram

Legend

- B1 = Mod-Con Boiler
- BP = Boiler Pump
- M1 = Actuating Motor 741
- P1 = System Pump
- S1 = Outdoor Sensor 070
- S2 = Snow / Ice Sensor 090
- S3 = Mix Supply Sensor 082
- S4 = Boiler Supply Sensor 082
- V1 = Mixing Valve 710 Series





Lochinvar®

FTXL FIRE TUBE CONDENSING BOILER

Submittal Sheet

FTX-Sub-03

FTXL FIRE TUBE COMMERCIAL BOILERS

Job Name: _____ Model No. _____

Location: _____ Type Gas: _____

Engineer: _____ Equipment Tag(s): _____

Agent/Wholesaler: _____

Contractor: _____

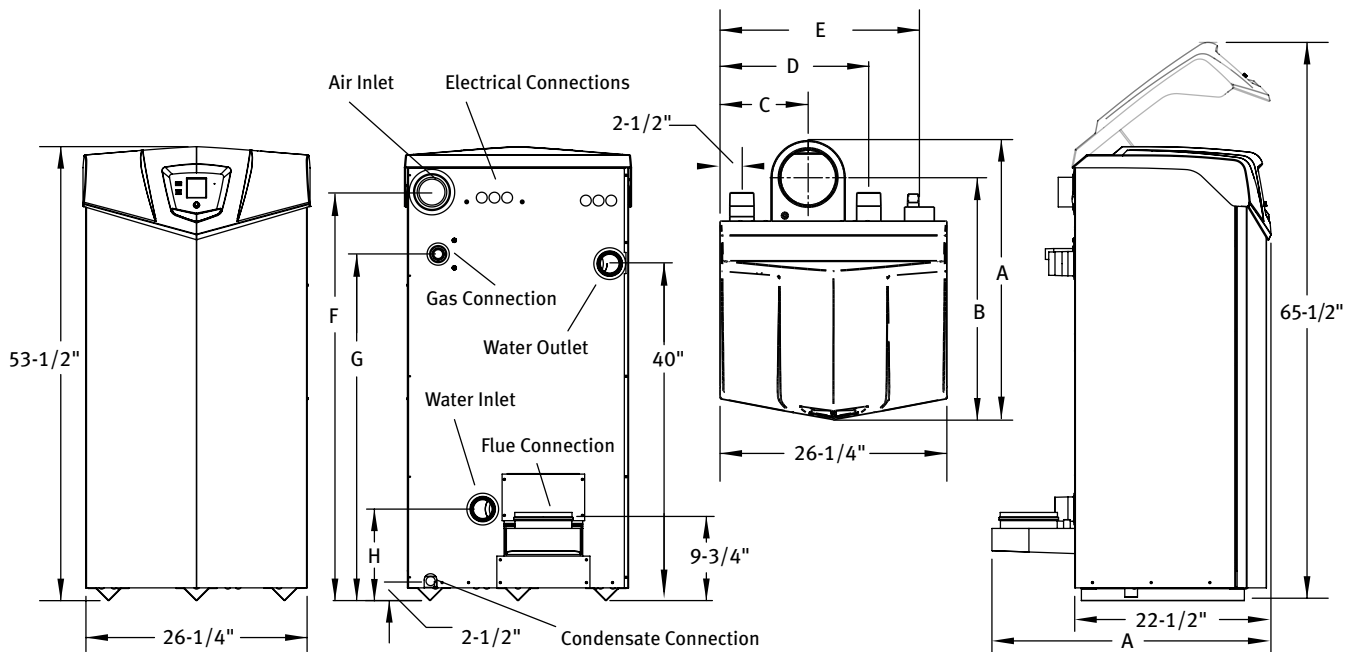
NOTES:

FOR EASE IN ORDERING
BY MODEL NUMBER

FTX	850	N	M13
FTXL Boiler	850,000 Btu/hr Input	Natural Gas	Firing Control

This model is:

- FTXL Fire Tube boiler
- 850,000 Btu/hr
- Natural gas
- M13 Firing Controls



FTXL Boiler										Dimensions and Specifications												
Model No.	Min MBH	Max MBH	Thermal Eff.	Gross Output MBH	NET AHRI Rating MBH	Turn down	Flow (GPM) Min	Flow (GPM) Max	HEX Water Volume	A	B	C	D	E	F	G	H	Water Conn.	Vent Size	Air Intake	Gas Conn.	Ship Wt. (lbs.)
FTX400(N,L)	40.0	399.9	98.0%	392	341	10:1	10	105	13	30-1/2"	27-1/2"	10-1/4"	17"	23-1/4"	46-1/4"	39-1/2"	10-3/4"	2"	4"	4"	1"	435
FTX500(N,L)	50.0	500.0	97.7%	489	425	10:1	15	105	12	30-1/2"	27-1/2"	10-1/4"	17"	23-1/4"	46-1/4"	39-1/2"	10-3/4"	2"	4"	4"	1"	460
FTX600(N,L)	85.0	600.0	97.5%	585	509	7:1	15	105	12	30-1/2"	27-1/2"	10-1/4"	17"	23-1/4"	46-1/4"	39-1/2"	10-3/4"	2"	4"	4"	1"	470
FTX725(N,L)	103.5	725.0	97.2%	705	613	7:1	20	150	17	33"	28-1/2"	10-1/2"	17-1/2"	23-1/2"	48-1/2"	41-1/4"	11"	2-1/2"	6"	4"	1"	510
FTX850(N,L)	121.5	850.0	97.0%	825	717	7:1	25	150	16	33"	28-1/2"	10-1/2"	17-1/2"	23-1/2"	48-1/2"	41-1/4"	11"	2-1/2"	6"	4"	1"	535

*Information subject to change without notice. Dimensions are in inches. Select "N" or "L" for Natural or LP gas. *The Net AHRI Water Ratings shown are based on a piping and pickup allowance of 1.15. *Lochinvar should be consulted before selecting a boiler for installations having unusual piping and pickup requirements, such as intermittent system operation, extensive piping systems, etc. *The ratings have been determined under the provisions governing forced draft burners.

FTXL™

FIRE TUBE BOILER



- CON-X-US® REMOTE CONNECT CAPABLE
- CASCADING SEQUENCER
- LOCH-N-LINK™ USB DRIVE SETUP
- 5 INPUTS FROM 399,999 TO 850,000 BTU/HR
- UP TO 10:1 TURNDOWN RATIO
- COMMON VENT AND PVC DIRECT-VENTING
- FLOW RATES FROM 10 TO 150 GPM
- SMALL 6.2 SQ. FT. FOOTPRINT
- 4 PUMP CONTROL
- WIRELESS OUTDOOR SENSOR CAPABLE

Smart System Features

- › **Smart System Digital Operating Control**
Multi-Color Graphic LCD Display w/Navigation Dial
- › **Loch-N-Link™ USB Thumb Drive Port for Easy Programming**
- › **Cascading Sequencer with Built-in Redundancy**
Selectable Cascade Type:
Lead Lag/Efficiency Optimization
Multiple Size Boilers
Front-End Loading
- › **3 Reset Temperatures Inputs w/Independent Outdoor Reset Curves for Each**
Outdoor Sensor
- › **Four-Pump Control**
System Pump with Parameter for Continuous Operation
Boiler Pump with Variable-Speed Control
Domestic Hot Water Boiler Pump
Domestic Hot Water Recirculation Pump Control with Sensor
- › **Building Management System Integration**
0-10 VDC Input to Control Modulation or Setpoint
0-10 VDC Input from Variable-Speed System Pump
0-10 VDC Modulation Rate Output Signal
0-10 VDC Enable/Disable Signal
- › **Programmable System Efficiency Optimizers**
Space Heating Night Setback
DHW Night Setback
Anti-Cycling
Ramp Delay
Boost Time and Temperature
- › **High-Voltage Terminal Strip**
120 VAC/60 Hertz/1 Phase
Pump Contacts for 3 Pumps
- › **Low-Voltage Terminal Strip**
Building Recirculation Pump Start/Stop
Building Recirculation Return Temp Sensor
Contacts
Proving Switch Contacts
Flow Switch Contacts
Alarm Contacts

- Runtime Contacts
- 3 Space Heat Thermostat Contacts
- Tank Thermostat Contacts
- System Sensor Contacts
- Tank Sensor Contacts
- Cascade Contacts
- 0-10 VDC BMS Contacts
- 0-10 VDC Boiler Rate Output Contacts
- 0-10 VDC Boiler Pump Speed Contacts
- 0-10 VDC System Pump Speed Contacts
- ModBus Contacts
- › **Time Clock**
- › **Data Logging**
Ignition Attempts
Last 10 Lockouts
Space Heat Run Hours
Domestic Hot Water Run Hours

Standard Features

- › **97%-98% Thermal Efficiency**
- › **Modulating Burner with up to 10:1 Turndown**
Direct Spark Ignition
Low NOx Operation
Sealed Combustion
Low Gas Pressure Operation
- › **Stainless Steel Fire-Tube Heat Exchanger**
ASME-Certified, "H" Stamped
160 psi Working Pressure
50 psi Relief Valve
Combustion Analyzer Test Port
Fully Welded Design
- › **Vertical and Horizontal Direct Vent**
Direct Vent up to 100 feet
PVC, CPVC, Polypropylene or AL29-4C
Factory Supplied Sidewall Vent Termination
- › **Smart System Control**
- › **Other Features**
On/Off Switch
Adjustable High Limit with Manual Reset
Automatic Reset High Limit

- Manual Reset Low Water Cutoff
- Flue Temperature Sensor
- Low Air Pressure Switch
- Temperature and Pressure Gauge
- Condensate Trap
- Zero Service Clearances
- 10-Year Limited Warranty
- Low Water Cutoff
- Custom Maintenance Reminder with Contact Info
- Password Security
- Customizable Freeze Protection Parameters

Optional Equipment

- Alarm Bell
- BACnet MSTP Communications Kit
- BMS Gateway to BACnet or LonMark
- Common Vent Kit
- Concentric Vent Kit (FTX400-FTX600)
- Condensate Neutralization Kit
- Constant-Speed Boiler Circulator
- CON-X-US Remote Connectivity
- Flow Switch
- High and Low Gas Pressure Switches w/Manual Reset (FTX500-FTX850)
- ModBus Communication
- Motorized Isolation Valve
- Multi-Temperature Loop Control
- SMART SYSTEM PC Software
- Variable-Speed Boiler Circulator
- Wireless Outdoor Temperature Sensor
- 30 psi ASME Relief Valve
- 75 psi ASME Relief Valve
- 100 psi ASME Relief Valve
- 125 psi ASME Relief Valve
- 150 psi ASME Relief Valve
- › **Firing Controls**
- M9 - Standard Construction
- M13 - CSD-1/FM/GE Gap (FTX500-FTX850)



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