

# ELGE TECHNOLOGIES

13 Central Drive, Glen Head, NY 11545  
Tel: 516-945-9392

## GENERAL SUBMITTAL

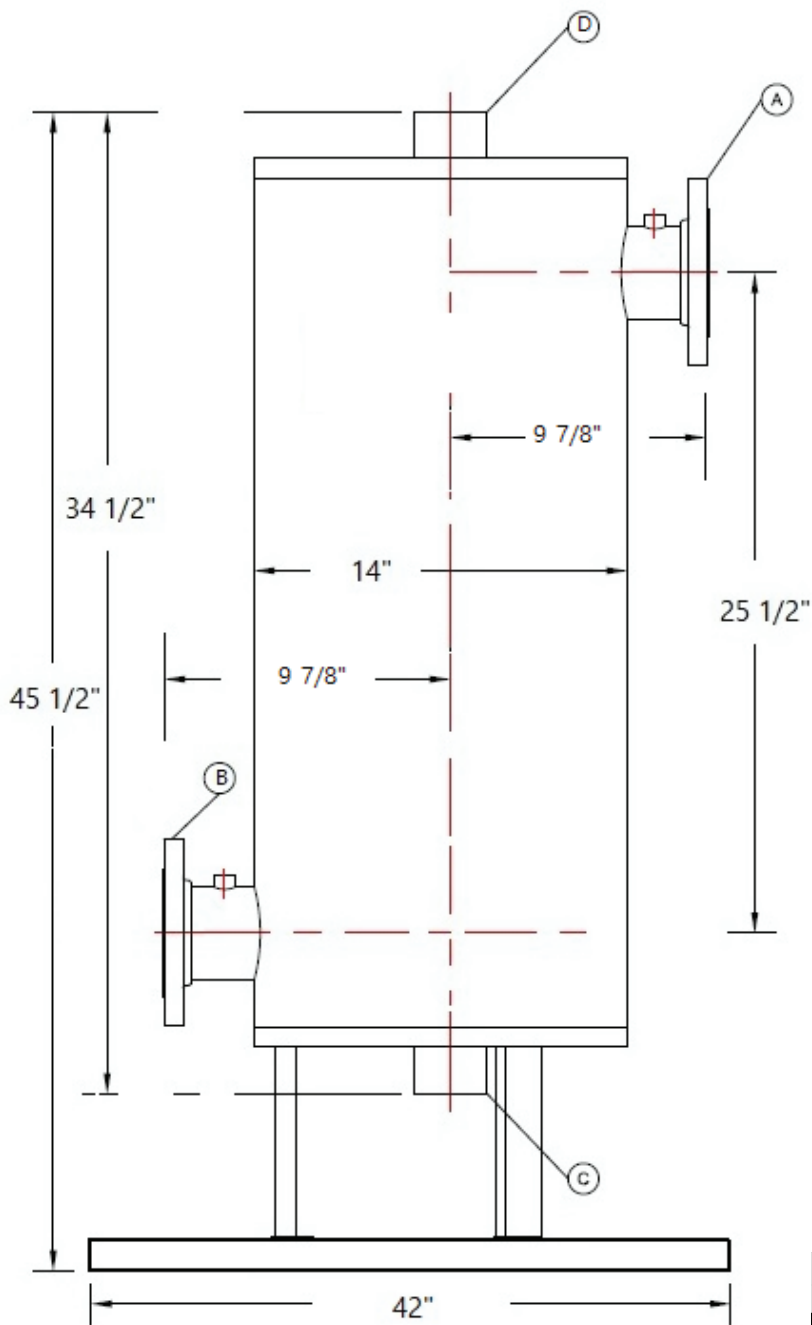
### PROJECT

MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
PROJECT NO. 28621.02  
MIT Thermal Renewal - East Campus

Tag	DESCRIPTION	Model	Qty
HW-HX-006	ELGE HIGH EFFICIENCY HEAT EXCHANGER	A-71	1
HW-HX-007	ELGE HIGH EFFICIENCY HEAT EXCHANGER	A-71	1
HW-HX-008	ELGE HIGH EFFICIENCY HEAT EXCHANGER	A-61	1
HW-HX-009	ELGE HIGH EFFICIENCY HEAT EXCHANGER	A-61	1
HW-HX-010	ELGE HIGH EFFICIENCY HEAT EXCHANGER	A-61	1
HW-HX-012	ELGE HIGH EFFICIENCY HEAT EXCHANGER	A-71	1
HW-HX-013	ELGE HIGH EFFICIENCY HEAT EXCHANGER	A-71	1
HW-HX-014	ELGE HIGH EFFICIENCY HEAT EXCHANGER	A-51	1
HW-HX-015	ELGE HIGH EFFICIENCY HEAT EXCHANGER	A-51	1
HW-HX-019	ELGE HIGH EFFICIENCY HEAT EXCHANGER	A-71	1
HW-HX-020	ELGE HIGH EFFICIENCY HEAT EXCHANGER	A-71	1

**ELGE**<sup>®</sup>  
*Shell and Coil Heat Exchanger*

[www.elge-technologies.com](http://www.elge-technologies.com)



<b>APPROVED</b>	
Company:	_____
Approved by:	_____
	Name
	_____
	Signature
Date:	_____

**DESIGN DATA**

LOCATION	PRESSURE, PSIG		TEMPERATURE, F°	
	DESIGN	TEST	DESIGN	TEST
SHELL	325	PER CODE	400	70

NOZZLE				
	SIZE	SERVICE	SCH	DESCRIPTION
A	3"	SHELL CONNECTION WATER INLET	40	#150 RF SO FLANGE
B	3"	SHELL CONNECTION WATER OUTLET	40	#150 RF SO FLANGE
C	2"	COIL CONNECTION WATER INLET	40	SA-106 Steel pipe .125 tk
D	2"	COIL CONNECTION WATER OUTLET	40	SA-106 Steel pipe .125 tk

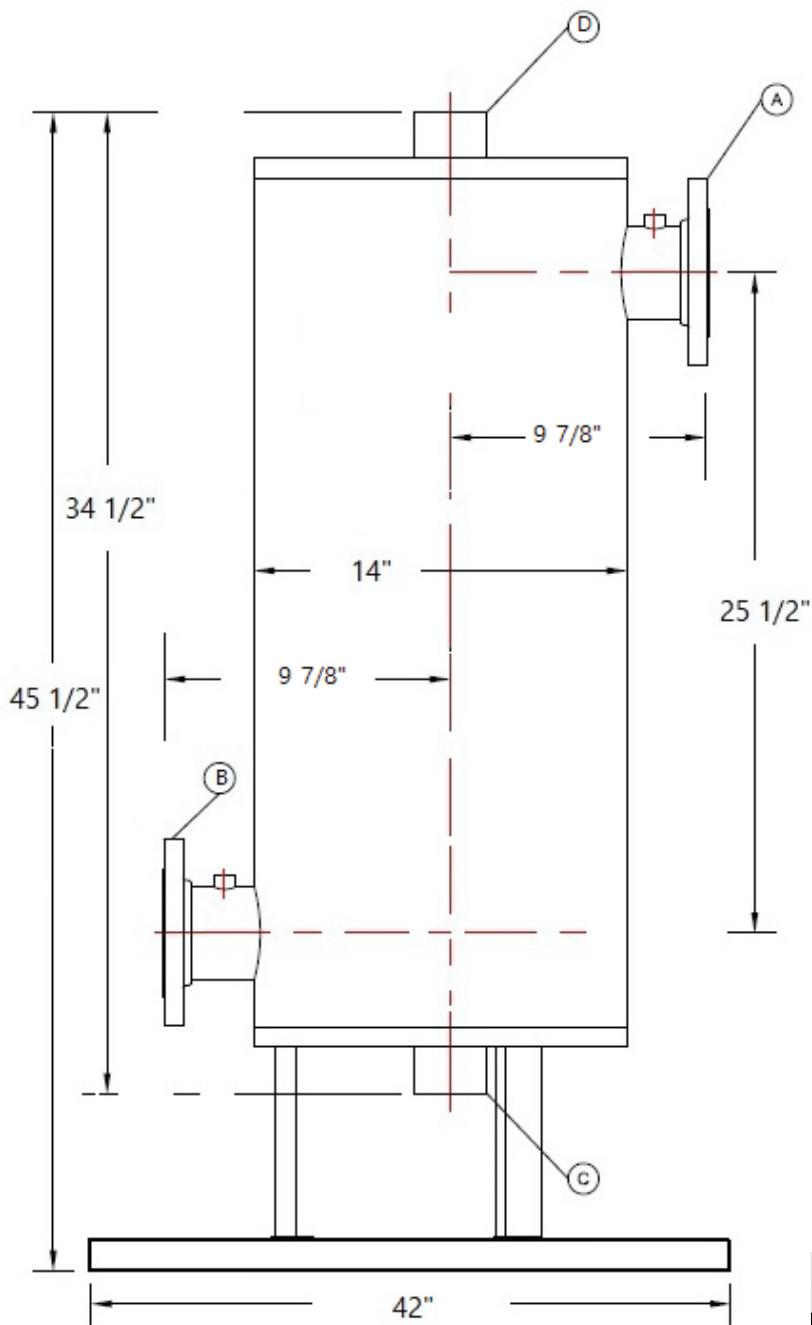
**NOTES:**

1. FABRICATED AND STAMPED IN ACCORDANCE WITH ASME CODE, SECTION VIII, LAST EDITION
2. Packaged Heat Exchanger Base is 42" long x 18" wide

**MATERIAL**

SHELL	SA 53 GR E/B
HEAD	SA 234 WPB
FLANGES	SA 105

DRAWN BY DP				
QUALITY CONTROL P.L.	<b>ELGE MODEL A-51 SINGLE PACKAGED UNIT</b> <b>GENERAL</b>			
THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF ELGE TECHNOLOGIES. THIS DOCUMENT MAY NOT BE REPRODUCED, TRANSFERRED OR USED, OR ITS CONTENTS DISCLOSED, WITHOUT THE WRITTEN PERMISSION OF THE OWNER.	SIZE A	SERIAL NO.	DWG NO. A-51 MIT	REV 0
CUSTOMER: MASSACHUSETTS INSTITUTE OF TECHNOLOGY	SCALE 1:8	SHEET #1		



## APPROVED

Company: \_\_\_\_\_  
 Approved by: \_\_\_\_\_  
Name

\_\_\_\_\_  
Signature

Date: \_\_\_\_\_

### DESIGN DATA

LOCATION	PRESSURE, PSIG		TEMPERATURE, F°	
	DESIGN	TEST	DESIGN	TEST
SHELL	325	PER CODE	400	70


NOZZLE				
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### NOTES:

- FABRICATED AND STAMPED IN ACCORDANCE WITH ASME CODE, SECTION VIII, LAST EDITION
- Packaged Heat Exchanger Base is 42" long x 18" wide

### MATERIAL

SHELL	SA 53 GR E/B
HEAD	SA 234 WPB
FLANGES	SA 105

DRAWN BY DP					
QUALITY CONTROL P.L.	ELGE MODEL A-61 SINGLE PACKAGED UNIT				
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	CUSTOMER: MASSACHUSETTS INSTITUTE OF TECHNOLOGY	SIZE A	SERIAL NO.	DWG NO. A-61 MIT	REV 0
	SCALE 1:8		SHEET #1		

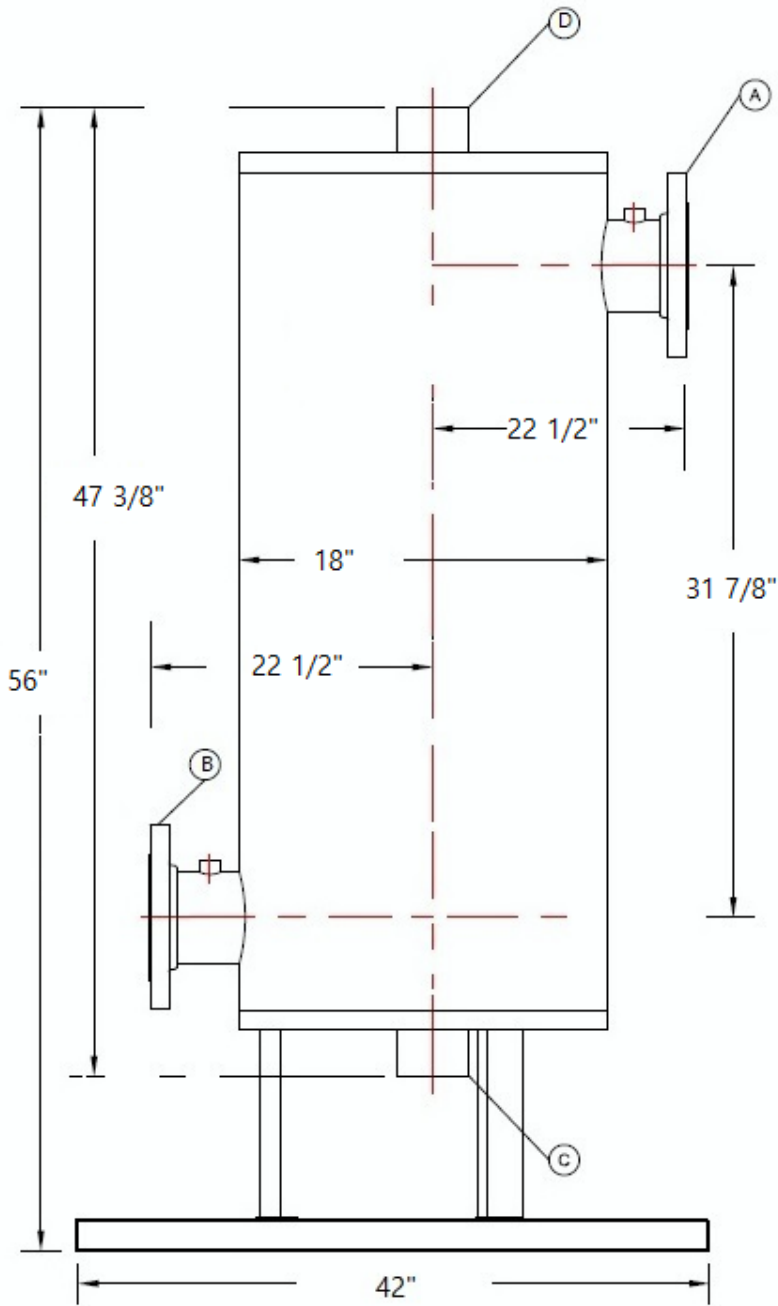
# APPROVED

Company: \_\_\_\_\_  
 Approved by: \_\_\_\_\_  
Name  
 \_\_\_\_\_  
Signature  
 \_\_\_\_\_  
 Date: \_\_\_\_\_

NOZZLE				
	SIZE	SERVICE	SCH	DESCRIPTION
A	4"	SHELL CONNECTION WATER INLET	40	#150 RF SO
B	4"	SHELL CONNECTION WATER OUTLET	40	SA-106 Steel pipe mpt
C	2.5"	COIL CONNECTION WATER INLET	40	SA-106 Steel pipe .125 tk
D	2.5"	COIL CONNECTION WATER OUTLET	40	SA-106 Steel pipe .125 tk

### DESIGN DATA

LOCATION	PRESSURE, PSIG		TEMPERATURE, F°	
	DESIGN	TEST	DESIGN	TEST
SHELL	325	PER CODE	400	70



### NOTES:

- FABRICATED AND STAMPED IN ACCORDANCE WITH ASME CODE, SECTION VIII, LAST EDITION
- Packaged Heat Exchanger Base is 42" long x 22" wide

### MATERIAL

SHELL	SA 53 GR E/B
HEAD	SA 234 WPB
FLANGES	SA 105

DRAWN BY DP					
QUALITY CONTROL P.L.	ELGE MODEL AR-71 SINGLE PACKAGED UNIT GENERAL				
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		SCALE 1:8		SHEET #1	

# ELGE Shell & Coil Heat Exchangers

## Type AR

### DISTRICT HEATING SYSTEMS

At ELGE we have constructed a series of heat exchangers with optimum designs to suit operating conditions inherent to subscriber stations in District Heating Systems and Central Heating Systems.

#### DESCRIPTION

ELGE Model AR Shell & Coil Heat Exchangers are designed for high temperature hot water district heating systems. These units are designed according to the counterflow principle for best thermal properties, at either full load or part load.

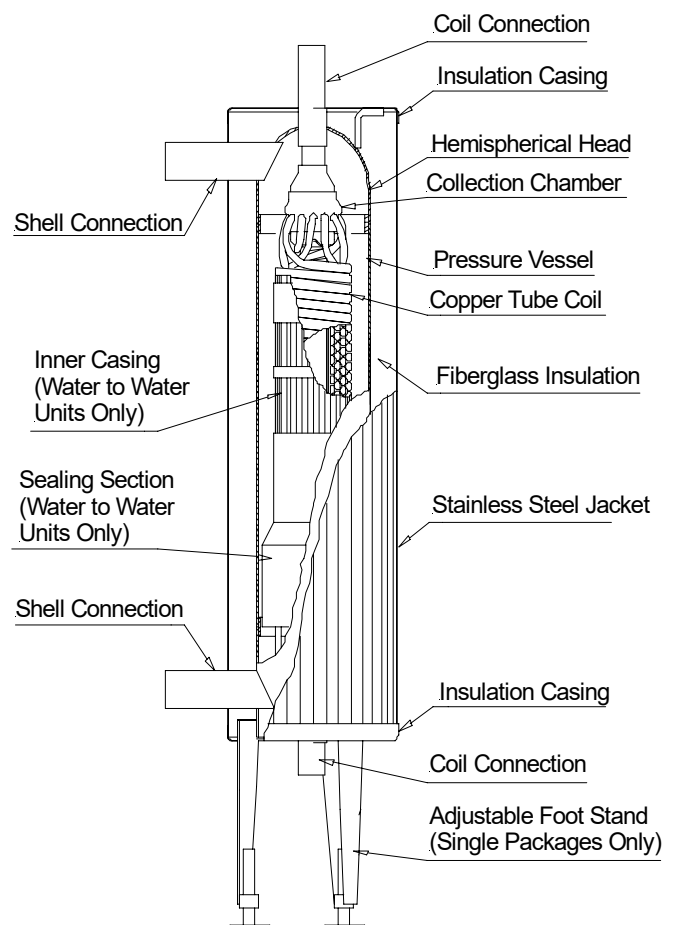
The heating surface in ELGE Shell and Coil Heat Exchangers is unique. The copper tubes are coiled in layers with a spacer element in between. The tubes are given an oval cross section when coiled. The collection chamber, where the copper tubes open out, comprises a specially designed collection chamber for optimum flow. The connecting ends of the copper tubes, which are connected to the collection chamber, are round - this is to provide low inlet and outlet velocities.

ELGE Shell & Coil Heat Exchangers are very compact since the smooth copper tubes are spun around a small core. The small outside dimensions and the low total weight facilitate the handling of the heat exchangers.

ELGE Shell & Coil Heat Exchangers have fiberglass or optionally mineral wool insulation. The insulating material is covered with stainless steel jacket, a surface which is insensitive to impact and knocks. To provide extra strong protection against damage during transportation and installation, the insulation walls are made of thick sheet steel and are anchored to the pressure vessel. The insulation can be easily removed to provide access for inspection of the pressure vessel.

ELGE Shell & Coil Heat Exchangers are easy to install and connect. The adjustable floor stand facilitate setting up and long pipe ends facilitate connection.

ELGE Shell & Coil heat Exchangers type AR are manufactured according to the ASME Code. Quality Assurance Standard and has an optional ASME U-Stamp. ELGE Shell & Coil Heat Exchangers are available in a wide range of sizes. This range increases the potential for finding the optimum solution where oversizing is reduced to the minimum in terms of capacity and space requirements.



# ELGE Shell & Coil Heat Exchangers

## Type AR

### Technical Description

#### SCOPE OF APPLICATION

Type AR Units are selected for range of applications including hydronic radiators, ventilation, geothermal heating, domestic hot water and drying systems.

#### HEAT TRANSFER MEDIA

The heat exchangers are designed for water-water, and glycol compound applications.

#### COIL

The coil is manufactured from fully-drawn, smooth, spiral wound copper tubes with an oval cross section. The tubes are separated by spacer elements, which form channels where the flow area is smooth and uniform. The copper tubes are joined to a molded collection chamber, which provides low flow resistance.

#### SHELL

The shell is made from pressure vessel carbon steel per ASME standard. MTR's

#### INSULATION/JACKETING

The insulation comprises R13 fiberglass insulation, covered with a stainless steel jacket. Carbon Steel painted jackets optional.

#### FOOT STAND

Feet can be adjusted for standing installation. Skid mounting is optional.

#### PRESSURE AND TEMPERATURES

MAWP: 250 psi at 300 °F / 17 bar at 150 °C  
MAWT: 375 °F at 150 psi / 190 °C at 10 bar

ASME STAMPED: 400 psi @ 600 °F (Optional)

#### CONNECTIONS

Type AR :

##### Shell connections:

Steel Flanged ASTM #150  
Steel Flanged ASTM #300 optional

##### Coil connections:

Steel Flanged ASTM #150  
Steel Flanged ASTM #300 optional  
Copper for brazing

#### NAME PLATE

According to the ASME Code.

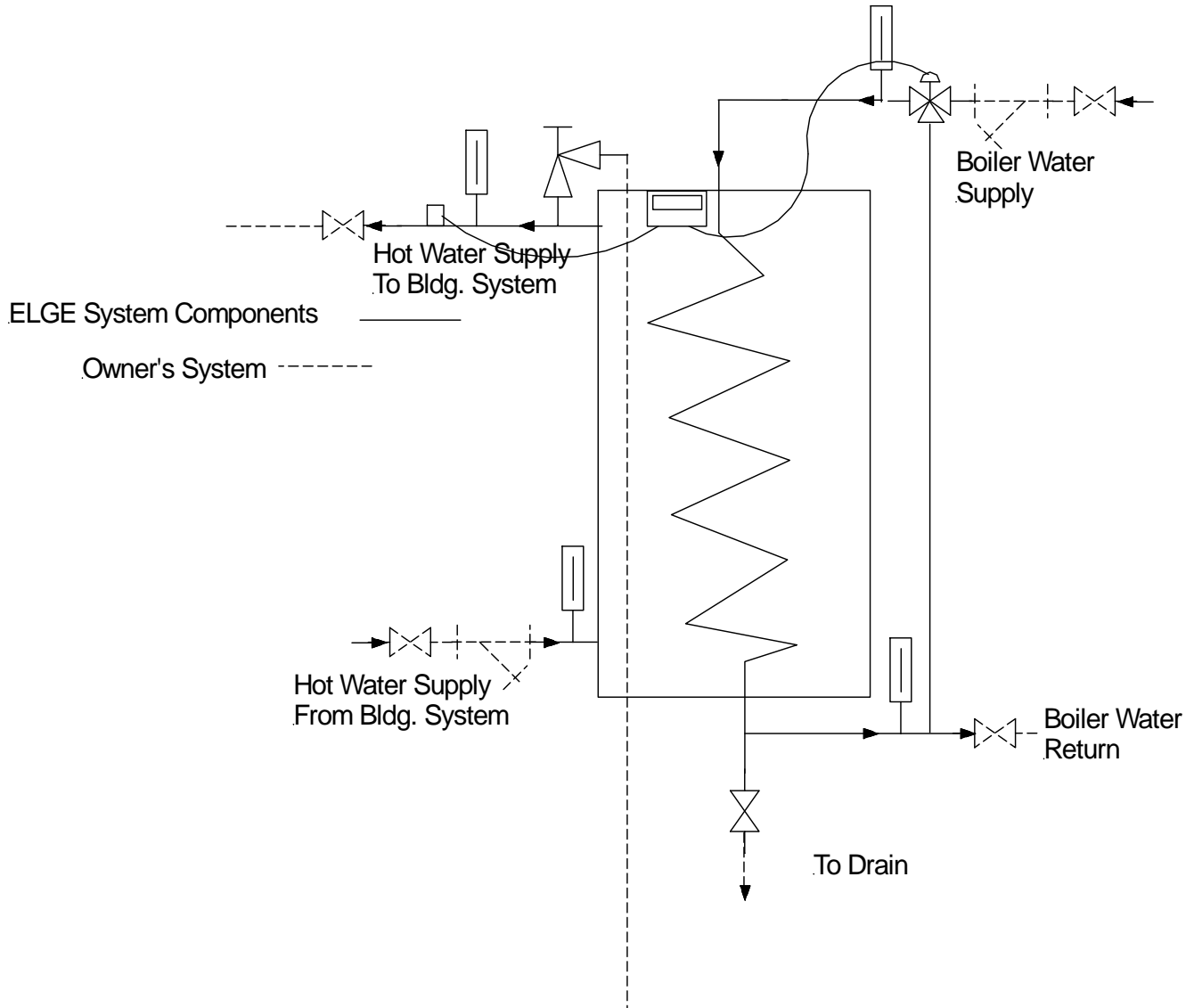
#### QUALITY ASSURANCE

Assurance Standard and has an optional ASME U-Stamp.  
All sizes are CRN- registered.



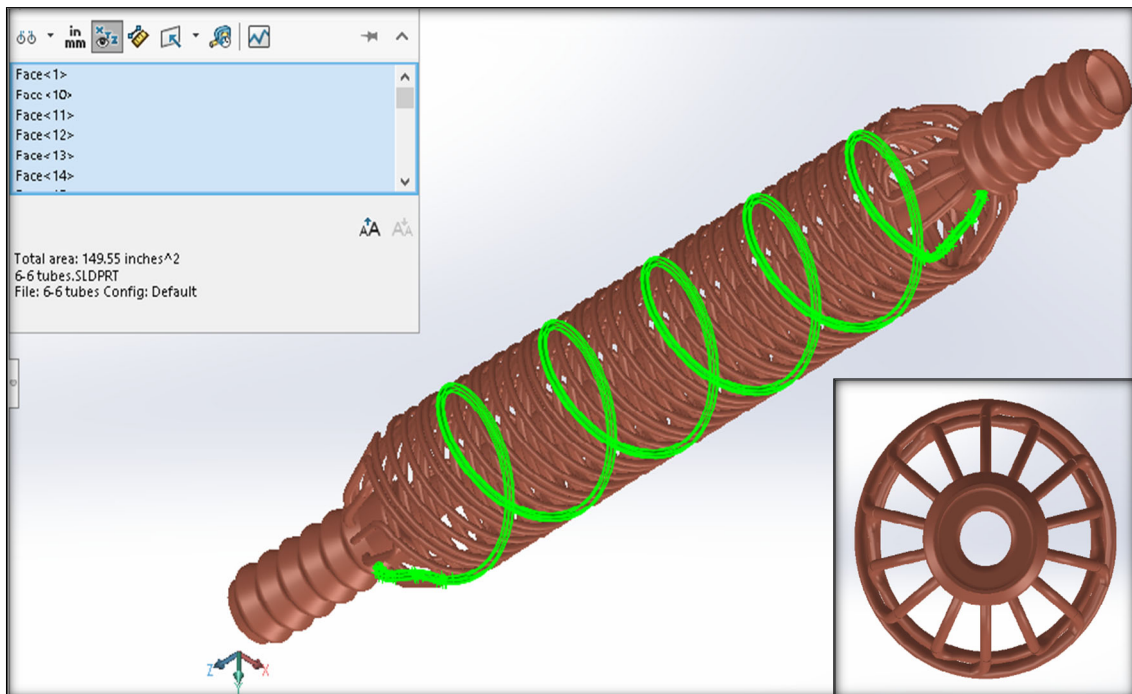
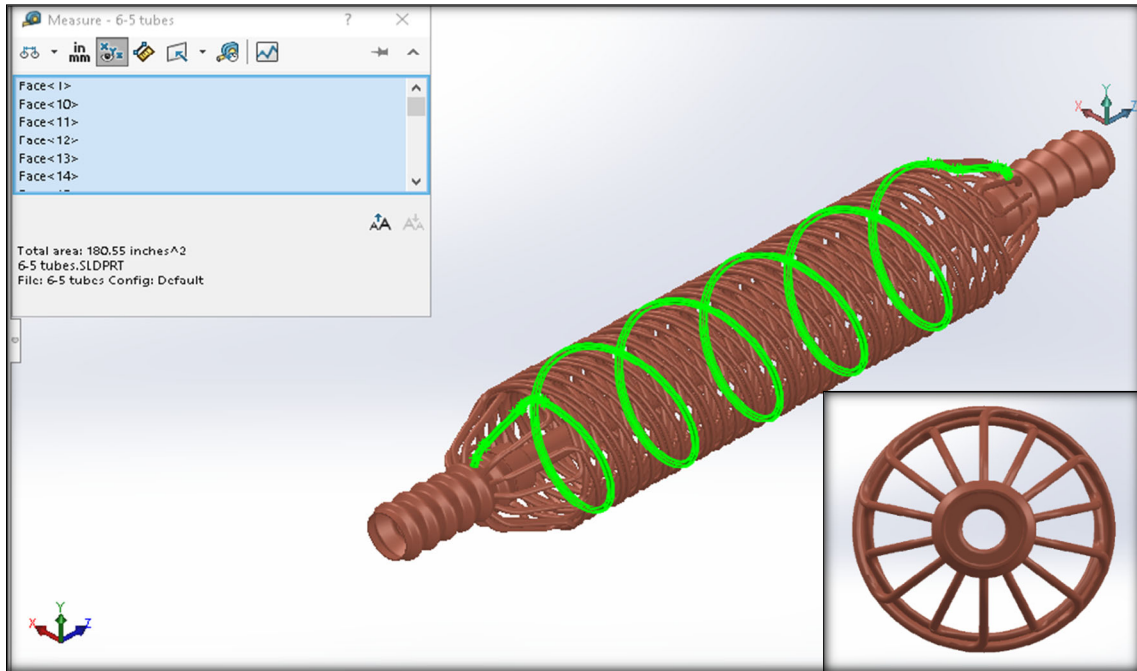
# Typical Installation Schematics

*ELGE® SPU, Water to Water for Heating Applications*



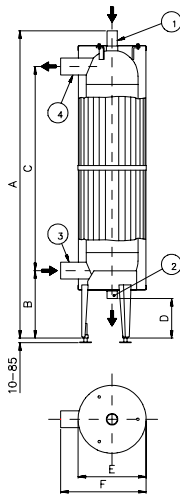
# ELGE®

High Efficiency Shell & Coil  
HEAT EXCHANGERS

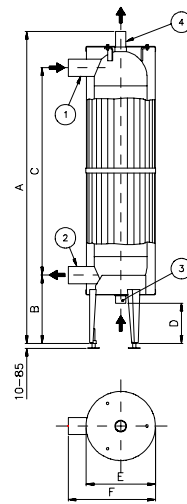


# ELGE Shell & Coil Heat Exchangers

## Type AR, Water to Water dimensions



**Heating**



**Domestic Hot Water**

Type	A	B	C	D	E	F	Weight lb	Connections Heating				Connections DHW				Volume US Gal.	
								Heating		DHW		Shell		Coil			
								1 inch	2 inch	3 inch	4 inch	1 inch	2 inch	3 inch	4 inch	Shell	Coil
AR-11/AR-21	43.5	11.0	26.7	7.7	10.0	17.7	77/88	1 1/4	2	2	1 1/4	2.6/2.4	0.8/0.8				
AR-12/AR-22	47.7	11.0	31.0	7.7	10.0	17.7	88/99	1 1/4	2	2	1 1/4	2.9/2.6	0.8/1.0				
AR-13/AR-23	53.0	11.0	36.1	7.7	10.0	17.7	99/110	1 1/4	2	2	1 1/4	3.4/2.9	0.8/1.0				
AR-14/AR-24	57.7	11.0	40.9	7.7	10.0	17.7	110/121	1 1/4	2	2	1 1/4	3.7/3.2	1.0/1.3				
AR-15/AR-25	62.4	11.0	45.6	7.7	10.0	17.7	121/132	1 1/4	2	2	1 1/4	4.0/3.4	1.3/1.6				
AR-16/AR-26	73.8	11.0	57.0	7.7	10.0	17.7	132/165	1 1/4	2	2	1 1/4	5.0/4.2	1.6/2.1				
AR-31/AR-41	45.5	11.3	27.8	7.5	11.6	19.2	110/121	1 1/2	2 1/2	2 1/2	1 1/2	4.7/4.0	1.0/1.6				
AR-32/AR-42	49.8	11.3	32.1	7.5	11.6	19.2	121/143	1 1/2	2 1/2	2 1/2	1 1/2	5.3/4.2	1.3/1.8				
AR-33/AR-43	54.9	11.3	37.2	7.5	11.6	19.2	132/165	1 1/2	2 1/2	2 1/2	1 1/2	5.8/4.8	1.6/2.1				
AR-34/AR-44	59.7	11.3	42.0	7.5	11.6	19.2	132/187	1 1/2	2 1/2	2 1/2	1 1/2	6.3/5.1	2.1/2.6				
AR-35/AR-45	64.4	11.3	46.7	7.5	11.6	19.2	165/198	1 1/2	2 1/2	2 1/2	1 1/2	6.9/5.3	1.8/2.9				
AR-36/AR-46	75.8	11.3	58.1	7.5	11.6	19.2	209/265	1 1/2	2 1/2	2 1/2	1 1/2	8.2/6.3	2.6/3.7				
AR-51/AR-61	49.6	14.0	28.2	9.2	14.1	21.8	176/198	2	3	3	2	8.7/7.7	2.4/2.9				
AR-52/AR-62	53.9	14.0	32.5	9.2	14.1	21.8	209/243	2	3	3	2	9.2/8.2	2.6/3.4				
AR-53/AR-63	59.0	14.0	37.6	9.2	14.1	21.8	243/287	2	3	3	2	10.3/8.7	3.2/4.2				
AR-54/AR-64	63.8	14.0	42.4	9.2	14.1	21.8	276/330	2	3	3	2	11.1/9.2	3.7/4.7				
AR-55/AR-65	68.5	14.0	47.1	9.2	14.1	21.8	291/364	2	3	3	2	11.9/9.8	4.2/5.5				
AR-56/AR-66	79.9	14.0	58.5	9.2	14.1	21.8	375/463	2	3	3	2	14.0/11.1	5.5/7.1				
AR-71/AR-81	54.4	14.4	31.8	8.7	16.9	25.5	309/331	2 1/2	4	4	2 1/2	15.6/14.5	3.7/4.7				
AR-72/AR-82	58.8	14.4	36.1	8.7	16.9	25.5	353/386	2 1/2	4	4	2 1/2	16.6/15.1	4.2/5.3				
AR-73/AR-83	63.9	14.4	41.2	8.7	16.9	25.5	419/463	2 1/2	4	4	2 1/2	18.2/16.1	5.3/6.6				
AR-74/AR-84	68.6	14.4	46.0	8.7	16.9	25.5	463/529	2 1/2	4	4	2 1/2	19.3/16.9	6.3/7.7				
AR-75/AR-85	73.3	14.4	50.7	8.7	16.9	25.5	518/584	2 1/2	4	4	2 1/2	20.6/18.0	7.1/8.7				
AR-76/AR-86	84.8	14.4	62.1	8.7	16.9	25.5	639/739	2 1/2	4	4	2 1/2	23.8/20.1	9.2/11.6				