

Tank Heaters

Armstrong



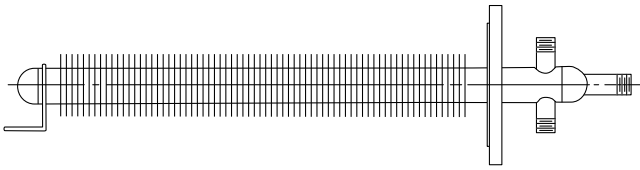
Armstrong[®]

Intelligent System Solutions[™]

STEAM • AIR • HOT WATER



Features/Benefits of Armstrong Tank Heaters



Flange Mounted Bayonet Type FBC and FBS

Application Flexibility

Four types of tank heaters are offered in several materials and sizes to suit your specific requirements.

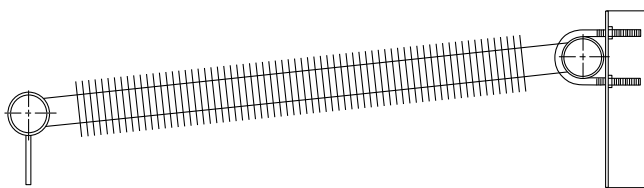
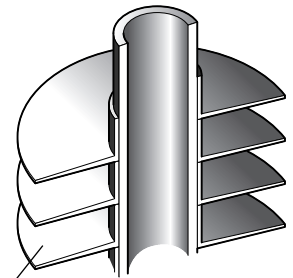
Space Savings

Flange mounted heaters are installed on various standard manhole sizes. You save internal space because only the heating element itself is inside. Steam and condensate connections are outside of the tank.

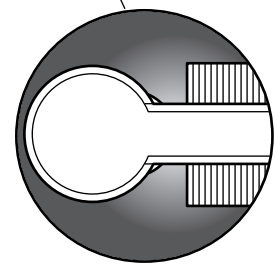
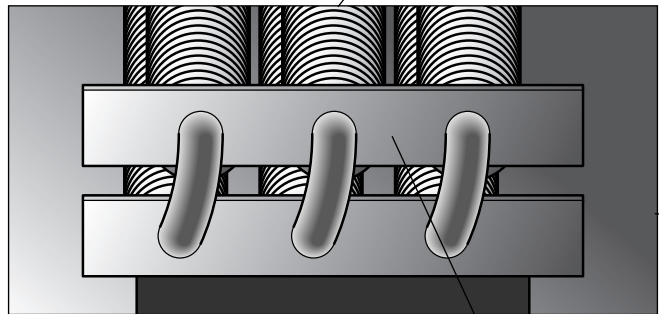
Heat Transfer Efficiency

Stiff, helically wound L fin design for an efficient and long-lasting heat transfer surface.

Vertical fin surface provides uniform heating of liquid with a minimum of coking due to hot spots.



Base Mounted Direct Type BD

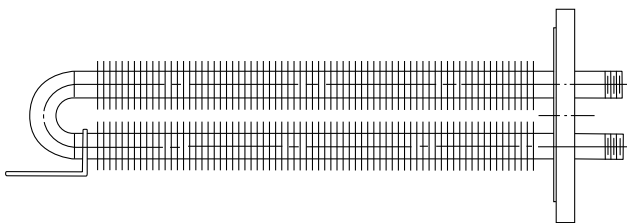


Durability Over Long Life

Pipes and headers are of heavy construction (minimum Sch. 40 pipe for steel). Greater thickness means a stronger, more corrosion-resistant design that lasts longer.

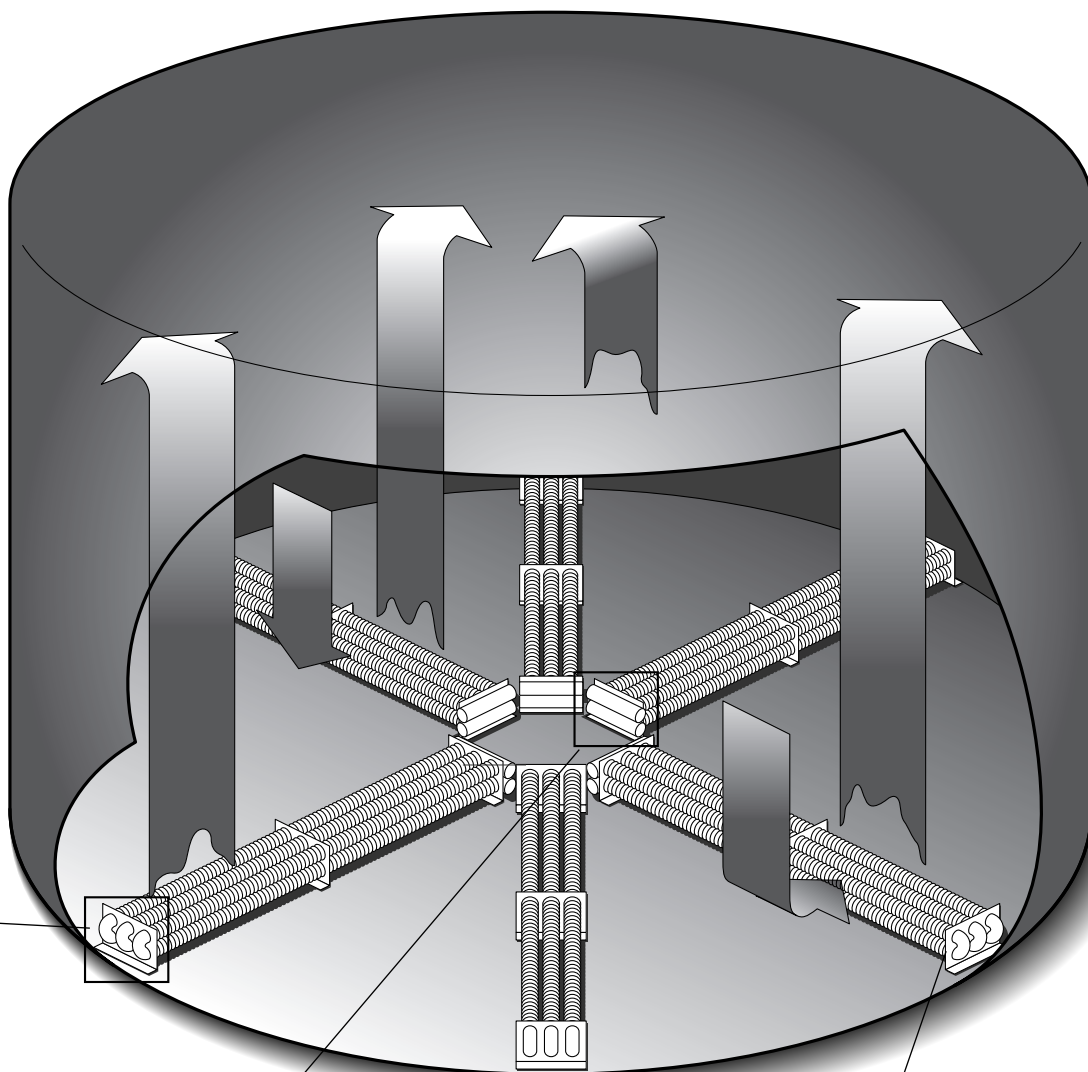
Corrosion Resistance

Pipes, headers and connections are welded together for a tough, single material joint. Eliminating dissimilar materials precludes galvanic corrosion, thereby lengthening service life.



Flange Mounted Hairpin Type FHC and FHS

Base Mounted
Hairpin Types
BHC and BHS
Shown

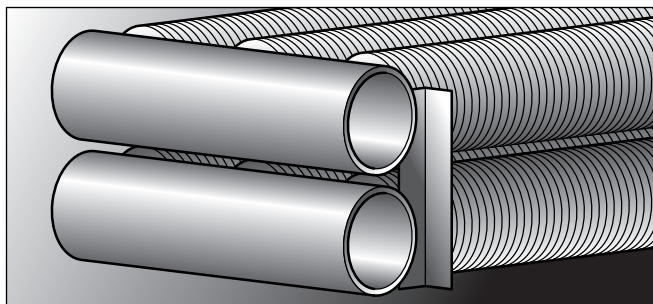


Unit & Tank Heaters

Fast, Direct Connection

Heaters are ready for connection to the steam and condensate systems as supplied. Numerous types of connections are available.

Base mounted heaters come with supports to allow for a proper distance between the tank bottom and the heating surface. This also helps to minimize the need for internal welding. Longer units are provided with mid-support members to further minimize inside welding and ensure rigid footing.



Minimum Installation Welding

Armstrong base-mounted tank heaters are installed and removed easily through manholes, eliminating the need for time-consuming welding inside the tank.



Tougher on the Job

Armstrong tank heaters are built to withstand the rigorous demands encountered in industrial installations. The heavy-duty features of our units were developed in response to a need for tank heaters that could provide efficient heat transfer without sacrificing structural integrity. These features include heavy-wall pipes and headers, thick L footed fins and all welded construction. In addition, the mono-metallic construction of our units precludes galvanic corrosion, and the finned surface is rigid enough to withstand high-pressure cleaning.

Experience gained over 80 years backs every Armstrong tank heater. As a steam system specialist, your Armstrong Representative can provide assistance with everything from the boiler to the condensate return system.

Quality products from Armstrong, plus the practical knowledge to integrate them into your total steam system, ensure an efficient and trouble-free installation.

Efficient Heat Transfer

Finned pipe tank heaters are easier than bare pipe units to install, remove and repair. They are also more compact and provide superior efficiency in product heating. Finned pipe tank heaters provide up to 10 times as much heat transfer as an equivalent length of bare pipe, resulting in lower film or "skin" temperatures. This reduces coking of the product on the heat transfer surface and discoloration of heat-sensitive products. This buildup of deposits on the heater requires that more frequent cleanings be carried out to maintain maximum efficiency and original heat transfer design conditions.

This helically wound finned pipe is best suited for horizontal units, with the fins being in the vertical plane. This increases the natural convection currents, which increases heat transfer and continuously wipes the coil surface to maintain cleanliness.

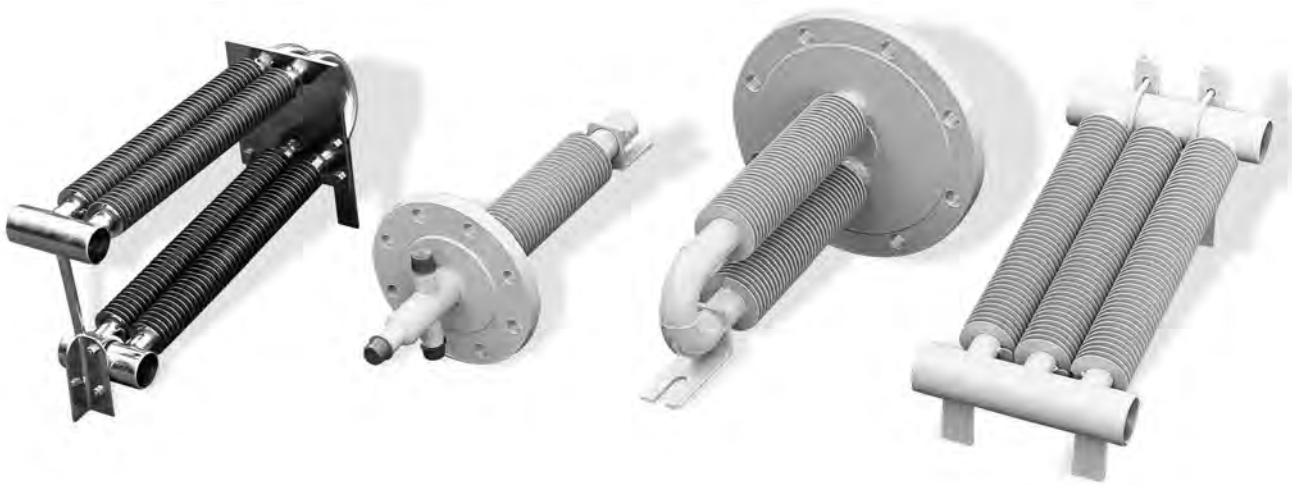
Options to Match Your Applications

Armstrong tank heaters are available in four standard configurations:

- Flange Mounted Hairpin—Types FHC and FHS
- Flange Mounted Bayonet—Types FBC and FBS
- Base Mounted Hairpin—Types BHC and BHS
- Base Mounted Direct—Type BD

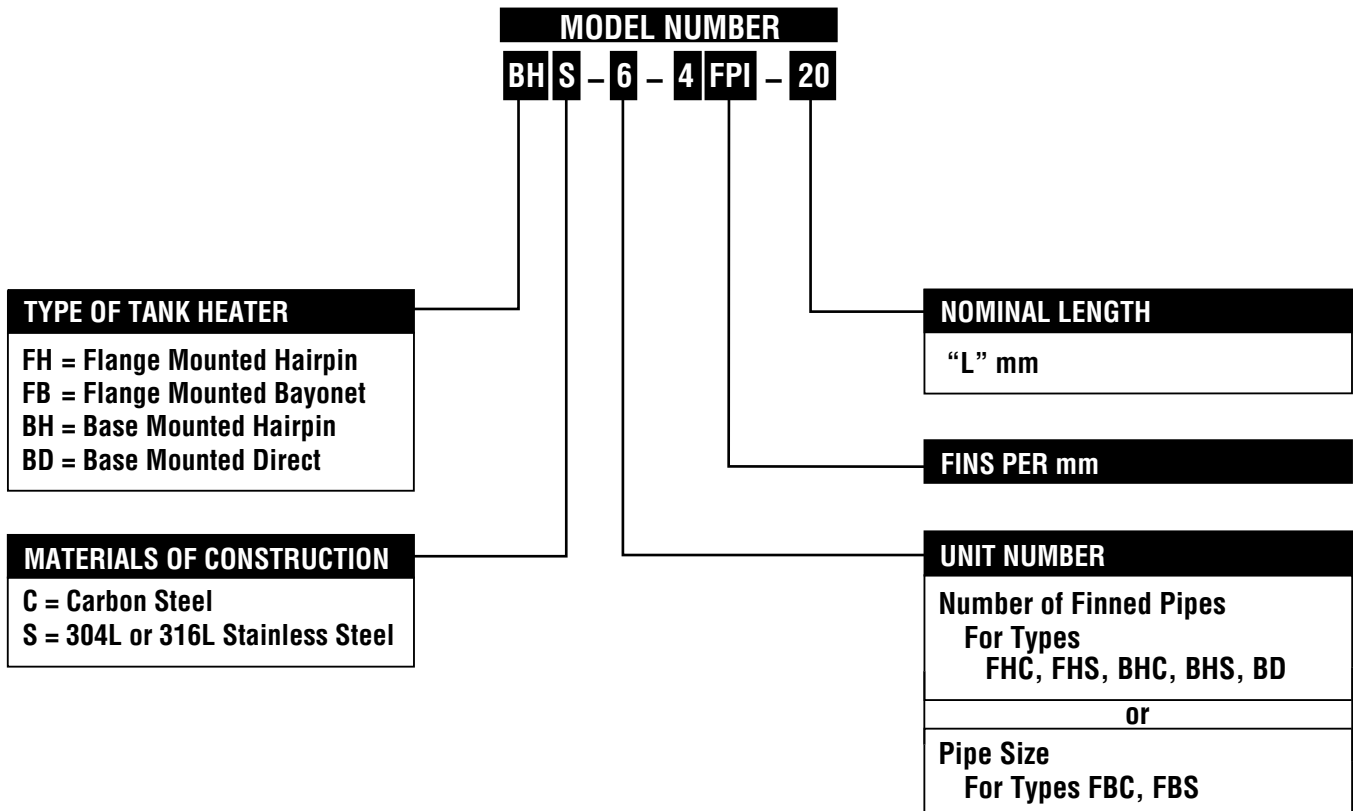
These four configurations offer a range of choices to suit most area coverage and thermal performance requirements. Each type includes a number of length, width and fin pitch options. All units are available in seamless carbon steel pipe construction. The hairpin and bayonet types are available in stainless steel. Liquid heated units and custom designs are also available.

Critical to the heating and maintenance of temperatures for a broad variety of products, Armstrong tank heaters are widely used in breweries, chemical and food processing plants, oil refineries, paper mills, tank storage farms, and in shipping and other industries.



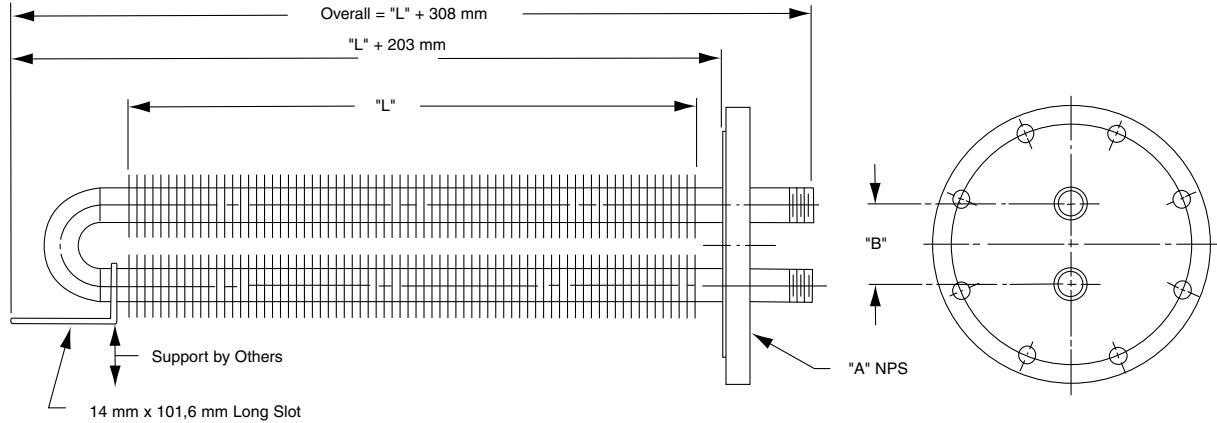
From left to right, Base Mounted Hairpin, Flange Mounted Bayonet, Flange Mounted Hairpin and Base Mounted Direct.

Model Number Selection





Flange Mounted Hairpin Type FHC and FHS



Standard Sizes

Table C-366-1. FHC Carbon Steel Units

Type	A Flange size (mm)	B (mm)	Nominal Length L (mm)	Surface area (m ²)			Weight (kg)		
				3 fpi	4 fpi	5 fpi	3 fpi	4 fpi	5 fpi
FHC-2	203	95	610	1,08	1,38	1,68	32,23	33,60	34,96
			915	1,62	2,07	2,53	36,77	39,04	40,86
			1 220	2,16	2,77	3,37	41,31	44,04	46,76
			1 525	2,69	3,46	4,22	46,31	49,49	52,66
			1 830	3,23	4,14	5,05	50,85	54,48	58,57
			2 135	3,77	4,84	5,90	55,39	59,93	64,47
			2 440	4,31	5,53	6,74	59,93	65,38	70,37
			2 745	4,86	6,22	7,58	64,47	70,37	76,27
			3 050	5,40	6,91	8,43	69,46	75,82	82,17
			FHC-4	254	134	610	2,03	2,59	3,16
915	3,10	3,98				4,85	65,38	69,46	73,09
1 220	4,18	5,36				6,53	74,91	79,90	84,90
1 525	5,26	6,74				8,22	83,99	90,80	96,70
1 830	6,34	8,12				9,90	93,52	101,24	108,51
2 135	7,41	9,50				11,58	102,60	11,68	120,31
2 440	8,49	10,89				13,28	11,68	122,13	132,11
2 745	9,58	12,27				14,96	121,22	132,57	143,92
3 050	10,66	13,65				16,65	130,30	143,46	155,72

Table C-366-2. FHS Stainless Steel Units

Type	A Flange size (mm)	B (mm)	Nominal Length L (mm)	Surface area (m ²)			Weight (kg)		
				3 fpi	4 fpi	5 fpi	3 fpi	4 fpi	5 fpi
FHS-2	203	95	610	0,82	1,03	1,24	27,24	27,69	28,15
			915	1,22	1,54	1,87	29,51	60,42	31,33
			1 220	1,63	2,06	2,50	32,23	33,14	34,05
			1 525	2,03	2,57	3,12	34,50	35,87	37,23
			1 830	2,44	3,09	3,74	37,23	38,59	39,95
			2 135	2,84	3,60	4,37	39,50	41,31	43,13
			2 440	3,25	4,12	4,99	41,77	44,04	45,85
			2 745	3,66	4,64	5,61	44,49	46,76	49,03
			3 050	4,07	5,16	6,24	46,76	49,49	51,76
			FHS-4	254	134	610	1,63	2,06	2,50
915	2,44	3,09				3,74	50,39	51,76	53,57
1 220	3,25	4,12				4,99	55,39	57,20	59,47
1 525	4,07	5,16				6,24	59,93	62,65	65,38
1 830	4,88	6,19				7,49	64,92	68,10	71,28
2 135	5,69	7,22				8,73	69,92	73,55	77,18
2 440	6,50	8,25				9,99	74,91	79,00	83,08
2 745	7,32	9,28				11,23	79,90	84,44	88,98
3 050	8,14	10,31				12,48	84,44	89,89	94,89

Materials of Construction

Pipes: 31,75 mm NPS Sch. 80 Seamless Steel (42 mm OD x 4,85 Wall)
Fins: 0,91 mm Thick Helically Wound Steel "L" Foot
Return Bends: A-234 Long Radius Forged Steel Sch. 80
Mounting Flange: A-105 Forged Steel, 68 kg Raised Face
Mechanical Design: 31 bar, 343 C°, Hydro Test 47,5 bar

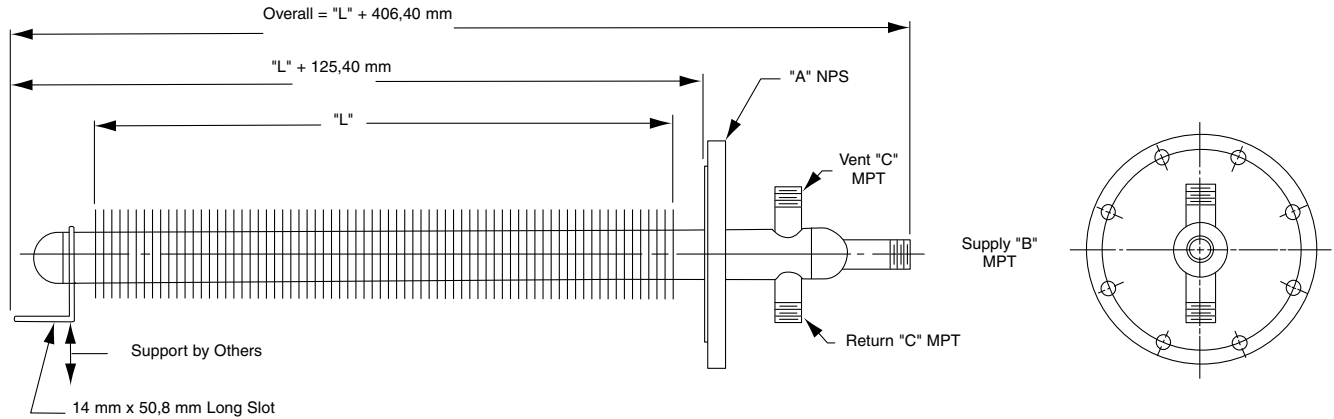
Materials of Construction

Pipes: 31,75 mm NPS Sch. 10, 304L SS (42 mm OD x 4,85 mm Wall)
Fins: 0,50 mm Thick Helically Wound 304 SS "L" Foot
Return Bends: A-403 Long Radius 304L SS Sch. 10
Mounting Flange: A-182 304L SS, 68 kg Raised Face
Mechanical Design: 31 bar, 343 C°, Hydro Test 47,5 bar

NOTE: Type 316L SS Construction is available.

All dimensions and weights are approximate. Use certified print for exact dimensions. Design and materials are subject to change without notice.

Flange Mounted Bayonet Type FBC and FBS



Standard Sizes

Type	A Flange size (mm)	B (mm)	C (mm)	Nominal Length L (mm)	Surface area (m ²)			Weight (kg)		
					3 fpi	4 fpi	5 fpi	3 fpi	4 fpi	5 fpi
FBC-125	102	95	95	610	0,54	0,69	0,85	14,98	15,44	15,89
				915	0,81	1,04	1,26	17,71	18,61	19,07
				1 220	1,08	1,38	1,68	20,43	21,34	22,70
				1 525	1,35	1,73	2,11	23,15	24,52	25,88
				1 830	1,62	2,07	2,53	25,88	27,24	29,60
				2 135	1,89	2,42	2,95	28,60	30,42	32,69
				2 440	2,16	2,77	3,37	31,33	33,60	35,87
				2 745	2,42	3,11	3,79	34,05	36,32	39,04
				3 050	2,69	3,46	4,22	36,77	39,50	42,22
				FBC-200	152	25	25	610	0,73	0,94
915	1,10	1,40	1,71					26,79	28,15	29,51
1 220	1,46	1,88	2,29					30,42	32,23	34,05
1 525	1,83	2,34	2,85					34,50	36,77	39,04
1 830	2,19	2,81	3,43					38,59	41,31	43,58
2 135	2,56	3,28	3,99					42,68	45,85	48,58
2 440	2,93	3,74	4,57					46,31	49,94	53,57
2 745	3,29	4,22	5,14					50,39	54,48	58,11
3 050	3,66	4,68	5,71					54,48	59,02	63,11
FBC-250	152	32	25					610	0,85	1,10
				915	1,28	1,64	2,00	32,69	34,05	35,87
				1 220	1,71	2,18	2,67	38,14	40,41	42,68
				1 525	2,14	2,73	3,33	44,04	46,31	49,03
				1 830	2,56	3,28	3,99	49,49	52,21	55,84
				2 135	2,99	3,83	4,66	54,93	58,57	62,20
				2 440	3,42	4,38	5,33	60,38	64,47	68,55
				2 745	3,85	4,92	5,99	65,83	70,37	75,36
				3 050	4,09	5,47	6,66	71,73	76,27	81,72

Materials of Construction

FBC-125 Pipes:

31,75 mm NPS Sch. 40 Seamless Steel (42 mm OD x 3,55 mm Wall)

FBC-200 Pipes:

50,80 mm NPS Sch. 40 Seamless Steel (60,32 mm OD x 3,91 mm Wall)

FBC-250 Pipes:

63,50 mm NPS Sch. 40 Seamless Steel (73 mm OD x 5,15 mm Wall)

Fins: 0,91 mm Thick Helically Wound Steel "L" Foot

Inner Distributing Pipe: Sch. 80A-53F Steel

End Caps: A-234 Forged Steel Sch. 40

Mounting Flange: A-105 Forged Steel, 68 kg Raised Face

Mechanical Design: 31 bar, 343 C°, Hydro Test 47,5 bar

NOTE: Sch. 80 Construction is available.

Type	A Flange size (mm)	B (mm)	C (mm)	Nominal Length L (mm)	Surface area (m ²)			Weight (kg)		
					3 fpi	4 fpi	5 fpi	3 fpi	4 fpi	5 fpi
FBS-125	102	95	95	610	0,41	0,51	0,62	12,26	12,71	13,17
				915	0,61	0,77	0,94	14,07	14,53	14,98
				1 220	0,82	1,03	1,24	15,44	16,34	16,80
				1 525	1,01	1,29	1,56	17,25	17,71	18,61
				1 830	1,22	1,54	1,87	18,61	19,52	20,43
				2 135	1,42	1,80	2,18	20,43	21,34	22,70
				2 440	1,63	2,06	2,50	21,79	23,15	24,52
				2 745	1,83	2,32	2,81	23,61	24,97	26,33
				3 050	2,03	2,57	3,12	24,97	26,33	28,15
				FBS-200	152	25	25	610	0,56	0,70
915	0,83	1,05	1,26					20,88	21,79	22,25
1 220	1,11	1,39	1,69					23,15	24,06	24,97
1 525	1,38	1,75	2,11					25,88	26,79	27,69
1 830	1,66	2,10	2,54					28,15	29,06	30,42
2 135	1,93	2,44	2,95					30,42	31,78	33,14
2 440	2,21	2,80	3,38					32,69	34,50	35,87
2 745	2,49	3,14	3,80					34,96	36,77	38,59
3 050	2,77	3,49	4,23					37,68	39,50	41,31
FBS-250	152	32	25					610	0,64	0,81
				915	0,97	1,21	1,46	24,06	24,52	25,42
				1 220	1,28	1,62	1,95	26,79	27,69	28,60
				1 525	1,61	2,02	2,43	29,96	31,33	32,23
				1 830	1,92	2,42	2,93	33,14	34,50	35,41
				2 135	2,25	2,82	3,41	36,32	37,68	39,04
				2 440	2,56	3,23	3,90	39,04	40,86	42,68
				2 745	2,89	3,63	4,38	42,22	44,04	45,85
				3 050	3,21	4,04	4,88	45,40	47,67	49,49

Materials of Construction

FBS-125 Pipes:

31,75 mm NPS Sch. Sch. 10, 304L SS (42 mm OD x 2,76 mm Wall)

FBS-200 Pipes:

50,80 mm NPS Sch. Sch. 10, 304L SS (60,32 mm OD x 2,76 mm Wall)

FBS-250 Pipes:

63,50 mm NPS Sch. 10, 304L SS (73 mm OD x 3 mm Wall)

Fins: 0,50 mm Thick Helically Wound 304L SS "L" Foot

Inner Distributing Pipe: Sch. 10, 304L SS

End Caps: A-403, 304L SS, Sch. 10

Mounting Flange: A-182, 304L SS 68 kg Raised Face

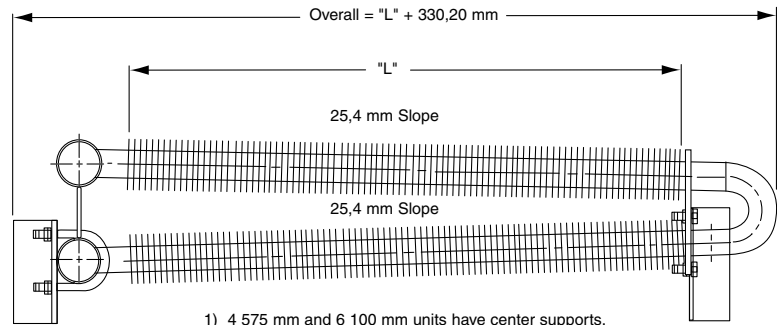
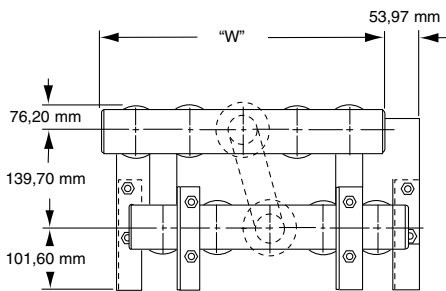
Mechanical Design: 31 bar, 343 C°, Hydro Test 47,5 bar

NOTE: Type 316L SS Construction is available.

All dimensions and weights are approximate. Use certified print for exact dimensions. Design and materials are subject to change without notice.



Base Mounted Hairpin Type BHC and BHS



- 1) 4 575 mm and 6 100 mm units have center supports.
- 2) Header ends are beveled for on-site butt welding

Standard Sizes

Table C-368-1. BHC Carbon Steel Units

Type	Minimum Manhole Size (mm)	W (mm)	Nominal Length L (mm)	Surface area (m ²)			Weight (kg)		
				3 fpi	4 fpi	5 fpi	3 fpi	4 fpi	5 fpi
BHC-4	406	181	1525	5,48	7,06	8,64	49,03	58,57	62,65
			3050	10,96	14,12	17,28	89,89	103,51	117,13
			4575	16,54	21,18	25,83	133,02	153,45	173,88
			6100	22,02	28,24	34,47	174,34	201,58	228,36
BHC-6	457	260	1525	8,27	10,59	12,91	71,73	81,72	92,16
			3050	16,54	21,18	25,83	133,48	153,91	173,88
			4575	24,71	31,77	38,83	197,49	227,91	258,33
			6100	32,98	42,36	51,75	258,78	299,64	340,05
BHC-8	559	340	1525	10,96	14,12	17,28	94,43	108,05	121,97
			3050	22,02	28,24	34,47	176,61	203,85	230,63
			4575	32,98	42,36	51,75	261,50	302,36	342,77
			6100	43,94	56,48	68,93	343,68	398,16	451,73
BHC-10	610	419	1525	13,75	17,65	21,55	117,13	133,93	150,73
			3050	27,50	35,30	43,11	219,74	253,79	287,38
			4575	41,25	52,95	64,66	352,52	376,82	427,21
			6100	55,00	70,60	86,21	428,12	496,22	563,41

Table C-368-2. BHS Stainless Steel Units

Type	Minimum Manhole Size (mm)	W (mm)	Nominal Length L (mm)	Surface area (m ²)			Weight (kg)		
				3 fpi	4 fpi	5 fpi	3 fpi	4 fpi	5 fpi
BHS-4	406	181	1525	4,09	5,11	6,22	31,78	34,50	36,77
			3050	8,18	10,31	12,45	56,30	61,29	66,74
			4575	12,17	15,42	18,67	82,63	90,35	98,52
			6100	16,26	20,62	24,99	107,14	116,22	128,03
BHS-6	457	260	1525	6,13	7,71	9,38	45,85	49,94	54,03
			3050	12,17	15,42	18,67	82,63	90,35	98,52
			4575	18,30	23,23	28,06	121,67	133,48	145,28
			6100	24,43	30,94	37,44	158,45	174,34	189,77
BHS-8	559	340	1525	8,18	10,31	12,45	60,38	65,38	70,82
			3050	16,26	20,62	24,99	108,96	119,86	130,30
			4575	24,43	30,94	37,44	160,72	176,61	192,50
			6100	32,52	41,25	49,98	209,75	230,63	251,97
BHS-10	610	419	1525	10,13	12,91	15,61	74,46	81,27	87,62
			3050	20,35	25,73	31,21	135,75	148,91	162,08
			4575	30,47	38,65	46,82	199,76	219,74	239,26
			6100	40,69	51,56	62,43	261,05	287,38	313,71

Materials of Construction

Pipes: 31,75 mm NPS Sch. 40 Seamless Steel (42 mm OD x 3,55 mm Wall)

Fins: 0,91 mm Thick Helically Wound Steel "L" Foot

Headers:

50,80 mm NPS Sch. 40 Seamless Steel (60,32 mm OD x 3,91 mm Wall)

Return Bends: A-234 Long Radius Forged Steel Sch. 40

Mechanical Design: 31 bar, 343 C°, Hydro Test 47,5 bar

NOTE: Sch. 80 Construction is available.

Materials of Construction

Pipes: 31,75 mm NPS Sch. 10, 304L SS (42 mm OD x 2,76 mm Wall)

Fins: 0,50 mm Thick Helically Wound 304L SS "L" Foot

Headers:

50,80 mm NPS Sch. 40, 304L SS (60,32 mm OD x 3,91 mm Wall)

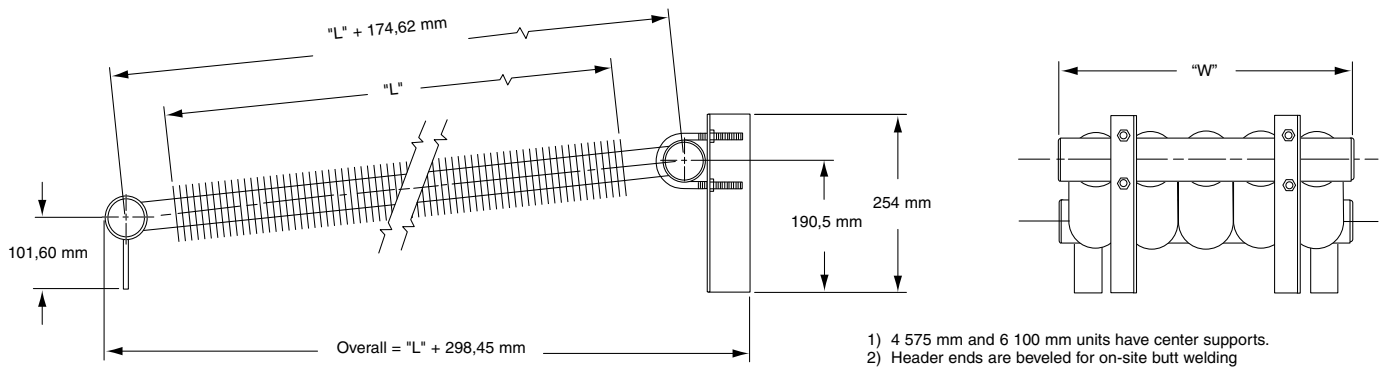
Return Bends: A-403 Long Radius 304L SS Sch. 10

Mechanical Design: 31 bar, 343 C°, Hydro Test 47,5 bar

NOTE: Type 316L SS Construction is available.

All dimensions and weights are approximate. Use certified print for exact dimensions. Design and materials are subject to change without notice.

Base Mounted Direct Type BD



Standard Sizes

Table C-369-1. BD Carbon Steel Units									
Type	Minimum Manhole Size (mm)	W (mm)	Nominal Length L (mm)	Surface area (m ²)			Weight (kg)		
				3 fpi	4 fpi	5 fpi	3 fpi	4 fpi	5 fpi
BD-2	356	181	1525	2,79	3,53	4,37	27,24	30,87	34,05
			3050	5,48	7,06	8,64	47,22	54,93	61,29
			4575	8,27	10,59	13,01	70,82	81,27	91,25
			6100	10,96	14,12	17,28	91,25	104,87	118,49
BD-3	406	260	1525	4,18	5,30	6,50	39,04	44,04	49,49
			3050	8,27	10,59	12,91	69,92	80,36	90,35
			4575	12,45	15,89	19,42	103,06	118,49	133,48
			6100	16,54	21,18	25,83	133,93	154,36	174,34
BD-4	508	340	1525	5,48	7,06	8,64	50,85	57,66	64,47
			3050	8,27	10,59	12,91	92,16	105,78	118,95
			4575	12,45	15,89	19,42	135,29	155,72	176,15
			6100	16,54	21,18	25,83	176,61	203,85	230,63
BD-5	559	419	1525	6,87	8,83	10,78	62,65	71,28	79,45
			3050	13,75	17,65	21,55	113,95	130,75	147,55
			4575	20,62	26,48	32,33	167,53	192,95	218,37
			6100	27,50	35,30	43,11	218,83	252,88	286,47

Materials of Construction

Pipes: 31,75 mm NPS Sch. 40 Seamless Steel (42 mm OD x 3,55 mm Wall)

Fins: 0,91 mm Thick Helically Wound Steel "L" Foot

Headers:

50,80 mm NPS Sch. 40 Seamless Steel (60,32 mm OD x 3,91 mm Wall)

Mechanical Design: 31 bar, 343 C°, Hydro Test 47,5 bar

NOTE: Sch. 80 Construction is available.

These units are available only in Carbon Steel

All dimensions and weights are approximate. Use certified print for exact dimensions. Design and materials are subject to change without notice.



Tank Heater Selection Work Sheet

Tank Information

Tank Reference Number
 Tank Type
 Tank Material
 Dimensions mm
 Insulated? If yes, how thick? mm
 Open Top?
 Tank Level (% full) or Fluid Volume
 Design Ambient Air Temperature °C
 Design Wind Velocity (if outside and not insulated) m/S

Steam Information

Steam Pressure bar
 Saturated? If not, what temperature? °C

Fluid Information

Type of Fluid
 Properties (not required for water)
 1. Specific Gravity at °C
 or Density kg/m³ at °C
 2. Specific Heat KJ/Kg x °C at °C
 3. Viscosity (at least one value required, preferably two)
 units
 at °C
 at °C

Heating Requirements

A. Through Load m³/h at °C not applicable
 B. Heat-Up Load from °C to °C in hours not applicable
 C. Maintenance Load to Hold °C
 D. Total Heat Load (if known) KJ/h

Tank Heater Requirements

1. Materials of Construction
 A. Carbon Steel
 B. Type 304L Stainless Steel
 C. Type 316L Stainless Steel
 2. Type of Unit
 A. Flange Mounted (preference? Hairpin Bayonet)
 B. Base Mounted (preference? Hairpin Direct)
 If flange mounted, is std. flange size OK? If not, specify size

Other Information

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Unit & Tank Heaters

Notes



A series of horizontal dotted lines for writing notes.

Unit & Tank Heaters

