

# Product Guide



**Heating Solutions**

**Fire  slab<sup>®</sup>**



# FIRESLAB - The Brand

Smooth operation in supply engineering thanks to system solutions

For the production of its stainless steel storage tanks FIRESLAB uses only high-quality, corrosion-resistant stainless steel.

FIRESLAB amazes its customers with “Individual Heating Solutions” for solar, hot water and steam generation. The following advantages mark these solutions:

1. Individuality
2. Premium quality
3. Innovation
4. Premium service
5. Efficiency
6. Experience
7. Reliability
8. Sustainability
9. Partnership
10. Internationality

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# Applications



# Model FSHWT: Storage Hot Water Tank



Hygienic



Tested



Reliable



Robust

## PRODUCT HIGHLIGHT

The storage tank is entirely made of high-quality, corrosion resistant stainless steel. This material is resistant to aggressive drinking water. For particularly aggressive water (chloride content greater than 100mg/litre) an optional external current anode helps. It protects the tank by a cathodic corrosion protection against pitting and crevice corrosion.

Torispherical Head Specs. of Tanks

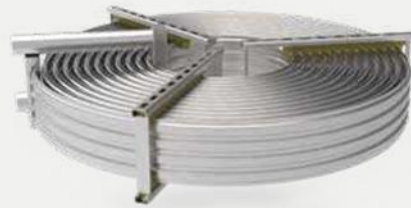
Tanks	D(mm)	S(mm)	R(mm)	r(mm)	h(mm)	Ht(mm)	Weight (2nos)Kg	V(ltr.)
TAS-HWT-750	850	4	850	85	30	194	48	77
TAS-HWT-1000	1000	4	1000	100	40	230	66	129
TAS-HWT-1500	1100	5	1100	110	30	246	100	159
TAS-HWT-2000	1200	5	1200	120	30	265	116	203
TAS-HWT-2500	1300	6	1300	130	40	290	168	267
TAS-HWT-3000	1400	6	1400	140	40	311	192	330

# Heat Exchangers

## Spiral Heat Exchanger

The FIRESLAB's spiral coil has a maximum heat exchange area in the cold water zone or in the desired temperature zone due to its design and horizontal installation.

The high performance spiral heating coil, replaced the previous flat heating coil. By means of a special production process, steel strips are deformed into a profile, welded and then wound in the form of a spiral. This new production process enables the production in stainless steel and mild steel and reduce the weight by 50%.



## Shell & Tube Heat Exchangers

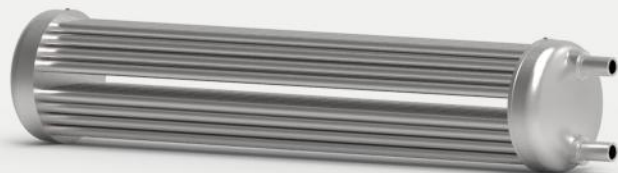


FIRESLAB heat exchangers with their free floating turbulator rods are the most superior heat exchangers available. They incorporate all of the advantages and none of the disadvantages of other types of heat exchangers or heating coils.

Unlike conventional shell and tube heat exchangers, FIRESLAB's high capacity heat exchangers contain free floating turbulator rods. The rods significantly increase the performance and reduce the size of the heat exchanger. The domestic hot water flows through the heat exchanger at high speed in less than 1 second. The cold water is heated up from 12°C to 60°C in one pass.

## Shellless Tube Heat Exchanger

Tube heat exchanger made entirely of corrosion resistant high quality stainless steel 316Ti. Designed for immersion in hot water storage tanks. Smooth surfaces giving lower risk of lime scaling and blockage



### Advantages :

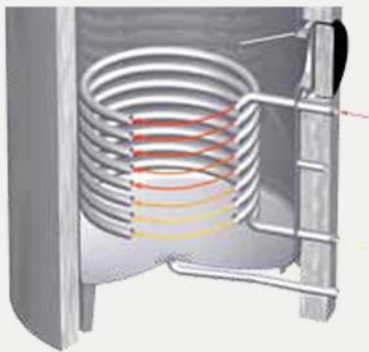
- 1. No need of external heat exchanger (PHE), thus eliminating extra secondary pumps. It saves on operational cost, initial investment and heat loss.**
- 2. Simple design, easy maintainance.**
- 3. Additional control system is not requiried.**
- 4. Requires less footprint.**

# Advantages of Spiral Heat Exchanger

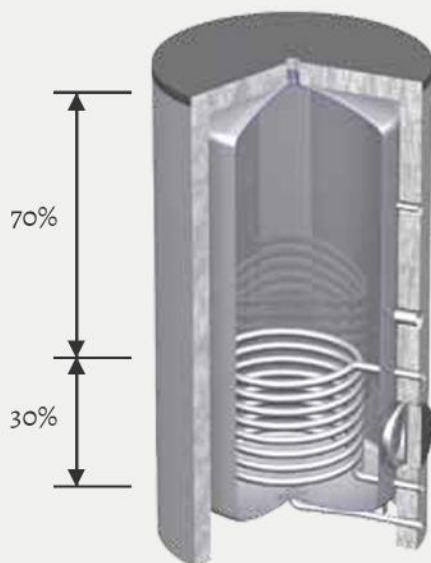
## Heating coils

Conventional heat exchangers are always in mixing temperature zones from 10°C to 60°C and thus have a reduced heat transfer rate. During the heating phase heating coils produce circulations in the storage tank and need more primary energy.

The available standby volume is usually only about 70% of the capacity of the storage tank.



- Up to 30% reduced effective volume & risk of legionella
- Reduced power consumption and poor heat layering
- Limited heat exchanger surfaces and reduced installation options
- Increased primary energy consumption

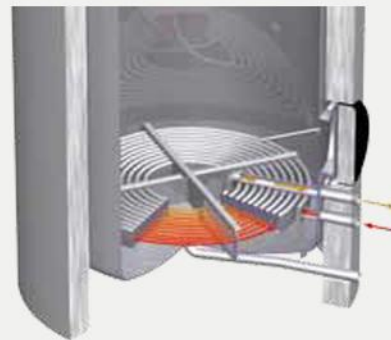


- 70% Standby volume
- 30% Mixing water area and "dead" volume

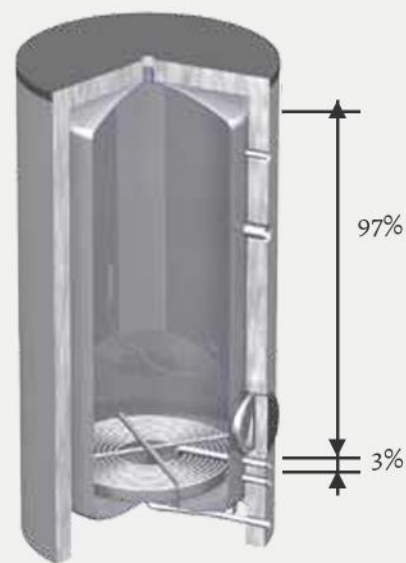
## Spiral Heat Exchanger

The patented spiral heat exchanger is mounted horizontally at the bottom of the storage tank. It is 100% in the cold water zone, respectively only in one temperature zone.

The installation directly above the tank bottom and the low height (13cm) allow an almost complete heating of the storage tank.



- The special construction of the register ensures:
- High standby volume (97% of the tank capacity)
  - Hygienic water
  - High efficiency due to efficient heat transfer
  - Optimized heat layering
  - Primary energy savings



- 97% Standby volume
- 3% Mixing water area and "dead" volume

# Comparison

## Plate Heat Exchanger (PHE) VS Spiral Heat Exchanger (SHE)

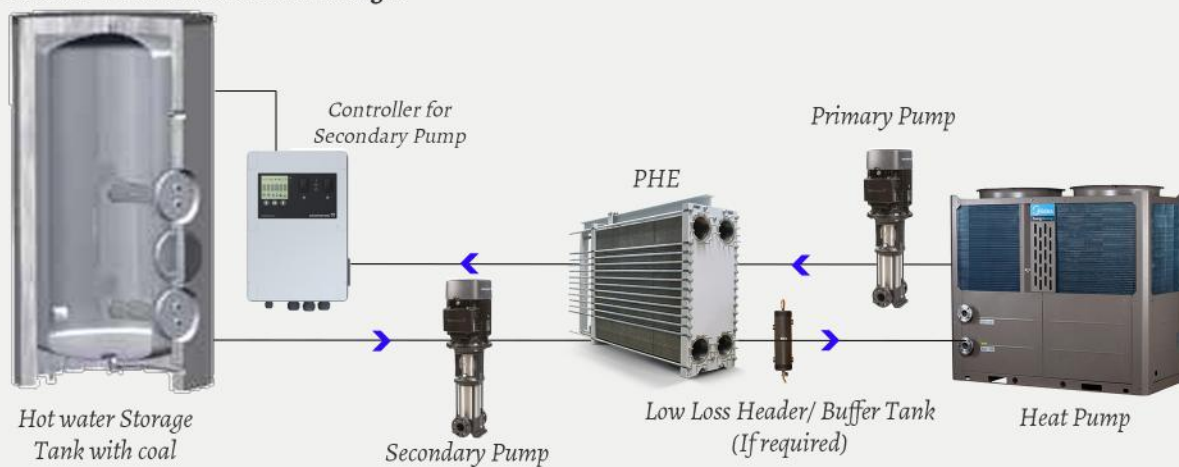
### Plate Heat Exchanger

1. Additional equipments/components required for secondary circulation loop like Secondary Circulation pump along with controller panel and extra pipping and valves required.
2. Extra Power Consumption for secondary circulation pump.
3. Heat loss via PHE which is generally not insulated and secondary circulation loop pipings, valves and fittings.

### Spiral Heat Exchanger

1. No secondary circulation loop is required.
2. Only one circulation pump power consumption.
3. No external HE and secondary circulation loop.

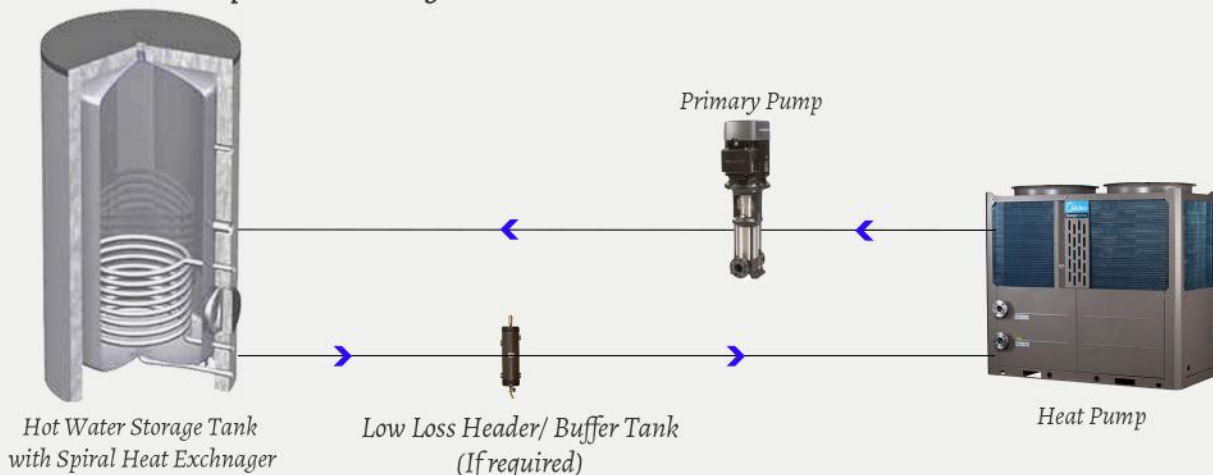
### Scheme - I with Plate Heat Exchanger



4. PHE requires maintance like replacemnt of gaskets and has limited life of appeox. 10 years.
5. Extra investment on secondary pump, control panel & secondary loop pipping, valves and fitting.
6. Larger footprints due to external PHE & Secondary Loop.

4. SHE requires zero maintance and life is more than 25 years.
5. Approx. 20-40% less captial cost
6. Less footprints due to no external HE & Secondary loop requiremnt and there is only primary pipings outside.

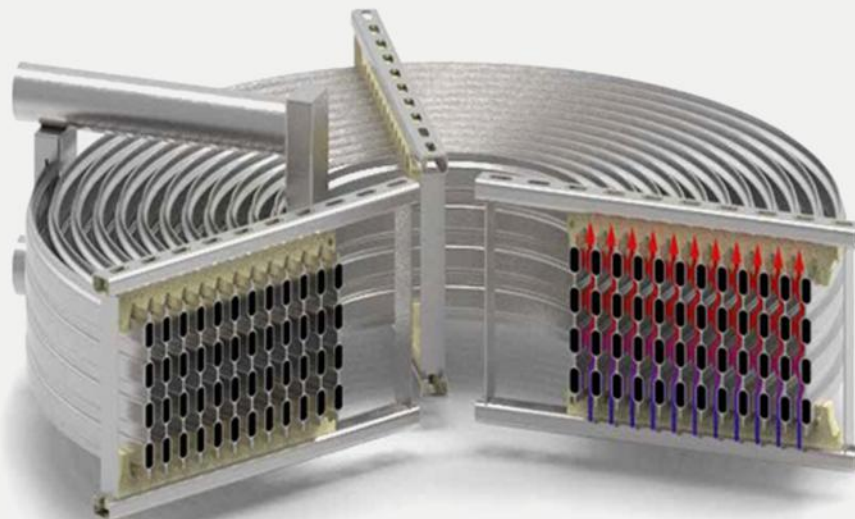
### Scheme - II with Spiral Heat Exchanger





# Spiral Heat Exchanger

Storage tank type	One heating surface coil in m2		Two heating surface coil in m2		Three heating surface coil in m2		Four heating surface coil in m2	
	55/50 °C - 10/45 °C Capacity in kW	55/50 °C - 10/45 °C Capacity in kW	55/50 °C - 10/45 °C Capacity in kW	55/50 °C - 10/45 °C Capacity in kW	55/50 °C - 10/45 °C Capacity in kW	55/50 °C - 10/45 °C Capacity in kW	55/50 °C - 10/45 °C Capacity in kW	
FSSF-400	2.5	44	5.1	88	7.6	131	10.1	175
FSSF-630	3	53	6.1	105	9.1	158	12.2	211
FSSF-800	4.2	73	8.4	145	12.6	218	16.8	291
FSSF-1000	5.5	95	11	190	16.5	286	22	381
FSSF-1250	7	121	14	242	21	364	28	485
FSSF-1500	9.4	163	18.8	325	28.2	488	37.6	651
FSSF-2000	11.2	194	22.4	388	33.6	582	44.8	776
FSSF-3000	13.2	229	26.4	457	39.6	686	52.8	914
FSSF-4000	15.3	265	30.6	530	45.9	795	61.2	1060



# Advantages of Shell & Tube Heat Exchanger

## Patented free floating turbulator rods

The free floating turbulator rods are hard wearing and designed for extremely long life. They fulfill many important functions:

### Efficient heat transfer

The free floating turbulator rods in the centre of the heat exchanger tubes force thin films of water to flow along the walls of the tubes. The high water surface exposure per volume makes efficient heat transfer possible. Thanks to the fast flow rate, Fireslab high capacity heat exchangers perform at around 3,500 to 5,000 W/m<sup>2</sup>K, which enables even low temperature output from the boiler perfectly satisfactory for efficient operation.

### Turbulent flow

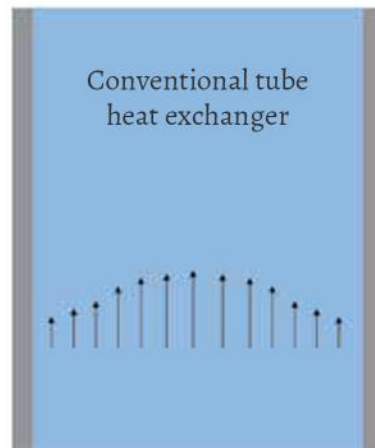
The free floating turbulator rods constantly oscillate from side to side. This lateral movement causes turbulent water flow in the tubes, which is beneficial for efficient heat transfer. (Poor mixing caused by laminar water flow would greatly reduce heat transfer efficiency).

### High flow speed

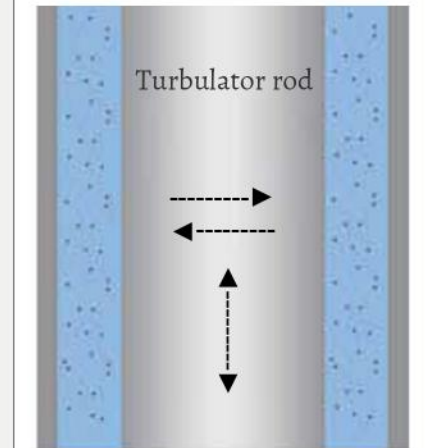
Thanks to the free floating turbulator rods, domestic water passes through the heat exchanger at a speed of approximately 1.6 m/s. This high speed and turbulent flow helps prevent fouling. (Lime scale deposits would act as a heat insulator, greatly reducing the heat transfer capacity of the heat exchanger)

### Self cleaning action

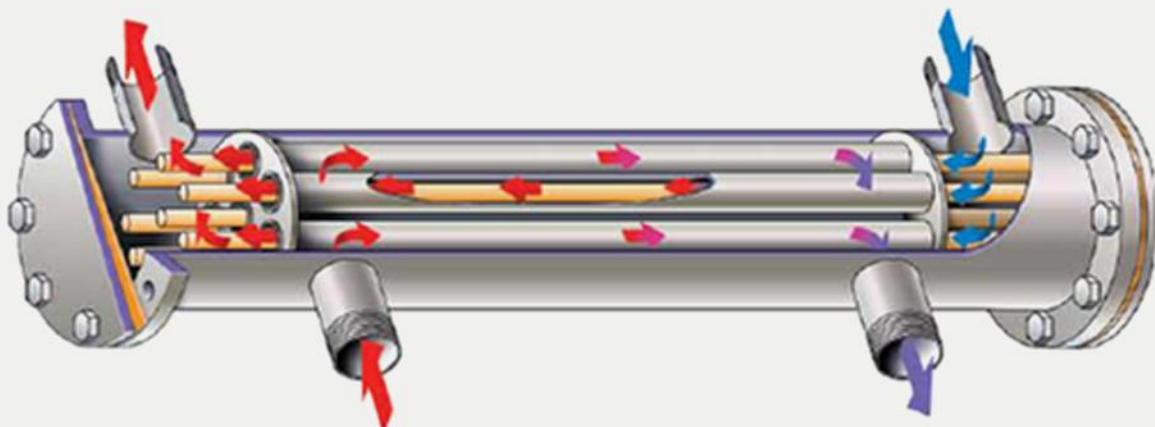
The constantly oscillating rods inhibit the formation of fouling on the walls of the tubes, thus further ensuring that maximum efficiency is maintained.



Cross section of conventional heat exchanger tube showing laminar flow of domestic hot water. Poor heat transfer to water flowing in centre of tube.



Cross section of heat exchanger tube with oscillating turbulator rod. High speed turbulent flow of the thin film of domestic hot water enables higher rate of heat transfer.



# Insulation System

## Advantages

- Optimal thermal insulator because the fibre fleece insulation perfectly fits the shape of the storage tank
- Robust PP outer sheathing, which can be printed individually
- Patented aluminum closure strips without unwished opening
- Can be used for any sizes and heights of storage tanks
- Patented covering rosettes
- Sleeve caps for insulation of unused connections
- Loss-optimized insulation cutouts at the connecting points
- Environmentally friendly manufacturing process (without chemical additives)
- 100% recyclable
- Flame retardant according to DIN 4102-1 class B2 and on request in B1
- Food-safe, robust and extremely impact-resistant outer sheathing
- Excellent aging stability & shape stability
- Resistance to various acids and alkalis
- Easy and quick installation (even in winter at low ambient temperatures)
- Lightness
- Flexibility through in-house production



*The patented aluminum closure strip allows simple and quick opening and closing of the outer sheathing by one single person*

## Unique Fiber Fleece Insulation

The newly developed fibre fleece insulation has up to 30 percent less heat losses compared to conventional foam insulations. Fibre-fleece has been used for several years in the clothing industry and in the automotive industry. The material fits perfectly to the shape of the storage tank due to its special characteristics. Thus so called chimney effects are reduced. Without the use of chemical additives the insulating material is made of PET bottles and is therefore 100 percent recyclable. The insulation is flame retardant according to DIN 4102-1 class B2 and is available on request also for B1.



## Material Analysis of Fiber Fleece Insulation and Sheathing

### Fire Fleece

Data fleece	Thermally bonded without chem. binder	
Fibre composite	100% PET	
Property	Method	Averages
Weight	Insulation 80 mm	1200 g/m <sup>2</sup>
	strength 100 mm	1500 g/m <sup>2</sup>
	120 mm	1800 g/m <sup>2</sup>
Thickness (0.02 kPa)	WSP 120.6	80 mm 100 mm 120 mm
Density	DIN EN ISO 1183	12 kg/m <sup>3</sup> *13 kg/m <sup>3</sup>
Thermal conductivity (10°) 15 kg/m <sup>3</sup>	DIN EN 12667	0.040 W/(mK)
Fire class	DIN 4102-1	B2

**ADVANTAGE**  
*Need or manpower to do insulation at site is not required.*

# Heating Elements

## Heating Elements - Thread Type



- Incoloy 825 (UNS NO 8825/W.Nr. 2.4858)  
Nickel-iron-chromium molybdenum, copper and titanium alloy is designed to provide exceptional resistance to many corrosive environments.
- Low watt density down to 4.57 W/cm<sup>2</sup> significantly reduces fouling and increases service life
- Thermostat: TR/STB
- 1 year warranty

Selection Table

Type	Power rating	Head Ø	Length	Power Supply	Tube Ø	Surface Load	Switches	Cable Cross Section	Cable Length	TR / STB	Full Load Current
	kW	Inch		V							
EHK-I-2000	2	1.½"	250	230/400	8.5	7.81	1	4x1.5 <sup>2</sup>	1.5	x	3
EHK-I-3000	3	1.½"	250	230/400	8.5	4.57	1	4x1.5 <sup>2</sup>	1.5	x	4.5
EHK-I-6000	6	1.½"	250	230/400	8.5	9.13	1	4x1.5 <sup>2</sup>	1.5	x	9
EHK-I-9000	9	1.½"	250	230/400	8.5	8.51	1	4x1.5 <sup>2</sup>	1.5	x	13.5
EHK-I-12000	12	1.½"	250	230/400	8.5	9.36	1	4x2.5 <sup>2</sup>	2	x	17.5
EHK-I-15000	15	2.½"	250	400	8.5	5.1	1	4x6 <sup>2</sup>	2	x	27
EHK-I-18000	18	2.½"	250	400	8.5	5.1	1	4x6 <sup>2</sup>	2	x	27
EHK-I-25000	25	2.½"	250	400	8.5	6.8	1	4x10 <sup>2</sup>	2	x	36

Tube material: 2 4858, Incoloy 825

Head material: 1½": stainless steel 316Ti; 2½" brass

EHK 2-12 kW: TR = Thermostat (30-75°C),  
STB = Safety temperature limiter (98°C), IP55

EHK 15-30 kW: no thermostat installation available

## Heating Elements - Flange Type



- Material flange plate: stainless steel 316Ti
- With welded heating rods
- Material heating surface:  
Stainless steel 1.4539-X1NiCrMoCu25-20-5
- 1 year warranty

Selection Table (6.0 to 1,000 kW, working pressure: 10 bar, design pressure 12 bar)

Type	Length of Electric Heating Flanges				
	Dimension	500 mm	1,000 mm	1,500 mm	2,000 mm
	DN	kW / Amps	kW / Amps	kW / Amps	kW / Amps
DN 65	65	6 / 9	13.5 / 20	21 / 30	36 / 52
DN 100	100	12 / 17	27 / 39	42 / 61	72 / 104
DN 125	125	18 / 26	40 / 58	63 / 91	108 / 156
DN 150	150	24 / 35	54 / 78	84 / 121	144 / 208
DN 200	200	48 / 69	108 / 15	168 / 243	288 / 416
DN 250	250	72 / 104	162 / 234	252 / 364	432 / 624

# Heating Elements - Ceramic Heating



- Removable without draining the tank
- Longer life expectancy
- 1 year warranty

Selection Table

Type	Power Rating	Head Ø	Length	Connection	Tube Ø	Surface Load	Full Load Current
	kW	Inch	mm	Volt, AC	mm	W/cm <sup>2</sup>	Amps.
EHK-K-2000	2	47	370	230/400	50	5.03	2.9
EHK-K-3000	3	47	480	230/400	50	5.39	4.3
EHK-K-4000	4	47	900	400	50	4.41	5.8
EHK-K-5000	5	47	1200	400	50	4.01	7.2
EHK-K-6000	6	47	1200	400	50	4.12	8.7
EHK-K-7000	7	47	2000	400	50	4.14	10.1
EHK-K-8000	8	47	2000	400	50	3.99	11.6
EHK-K-9000	9	47	2000	400	50	3.88	13
EHK-K-10000	10	47	2000	400	50	4.04	14.5

# Accessories

- Thermowell
- Dial Type Thermometer (Back & Bottom Connection)
- Pressure Gauge (Back & Bottom Connection)
- TP Valve
- Safety Valve
- Air Release Valve
- Drain Valve
- Tank Brass/ SS Fittings
- Expansion Tank
- Pressure Relief Valve
- Low Loss Header



## Contact Us



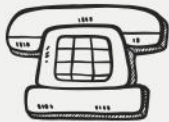
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