

HEAT EXCHANGER type TV

09/2022

1. APPLICATION

The heat exchanger is designed for gas heating before reduction to lower pressure in gas pressure regulating stations according to EN 12186 and EN 12279. The working fluid can be natural gas, hydrogen and their mixture. The gas, flowing through the tube bundle, is heated by hot circulatory fluid (water or water with non-freezing liquid) flowing within inter-tubular space.

The heat exchanger meets the technical requirements for gas preheating. The heat exchanger meets technical requirements for gas preheating equipment acc. to EN 12186 and EN 12279. The heat exchanger is the pressure equipment meaning of Directive 2014/68/EU of the European Parliament and the Council. The heat exchanger is certified by a notified body. The design calculation is according to EN 13445.

2. DESCRIPTION

The heat exchanger consists of sectional tubular body and tube sheet. The bottom part, consists of a two chambers, is equipped with flange branches for gas inlet and outlet. The tubular body's upper part consists of a flange branches for circulatory water inlet and outlet and for connection of safety valve or venting. The tube sheet and the U-tube bundle are assembled between the upper and bottom parts of the tubular body. The installed feet are on the exchanger body for mounting on a frame, or struts are for anchoring onto the floor.



3. TECHNICAL PARAMETERS

Basic technical parameters – HEAT EXCHANGER TV .. PN 40

TV		06	12	18	30	46	60	75	100	150	200	400	
Nominal heat output	kW	6	12	18	30	46	60	75	100	150	200	400	
Max. allowable pressure	bar	40											
Working temperature	° C	Gas part: -20 to +50 °C						Water part: -20 to +100 °C					
Heat transfer surface	m ²	0,37	0,62	1,13	1,70	2,29	2,94	4,12	4,12	6,22	7,08	13,07	
Working gas pressure	bar	25											
Gas flow *	m ³ (n)/h	1 300	2 100	3 400	7 000	10 000	13 000	17 000	20 000	30 000	40 000	60 000	
Gas temperature inlet / outlet of the exchanger	° C	4 / 20	4 / 21	4 / 20	4 / 17	4 / 17	4 / 17	4 / 19	4 / 19	4 / 19	4 / 19	4 / 21	
Gas temp. after regulation	° C	~ 6,5	~ 7,5	~ 6,5	~ 3,5	~ 3,5	~ 3,5	~ 5,5	~ 5,5	~ 5,5	~ 5,5	~ 7,5	
Min. water flow	m ³ /h	1,44	1,44	1,44	1,44	2,88	2,88	4,32	5,76	8,64	12,96	20,88	
Water temp. inlet/outlet	° C	80 / 74	80 / 69	80 / 64	80 / 53	80 / 60	80 / 54	80 / 55	80 / 58	80 / 57	80 / 59	80 / 58	
Working gas pressure	bar	40											
Gas flow *	m ³ (n)/h	650	1 300	2 000	3 000	5 000	6 000	8 000	10 000	15 000	20 000	40 000	
Gas temperature inlet / outlet of exchanger	° C	4 / 26	4 / 27	4 / 25	4 / 26	4 / 24	4 / 26	4 / 27	4 / 26	4 / 27	4 / 27	4 / 26	
Gas temp. after regulation	° C	~ 5	~ 6	~ 4	~ 5	~ 3	~ 5	~ 6	~ 5	~ 6	~ 6	~ 5	
Min. water flow	m ³ /h	1,44	1,44	1,44	1,44	2,88	2,88	4,32	5,76	8,64	12,96	20,88	
Water temp. inlet/outlet	° C	80 / 75	80 / 71	80 / 67	80 / 59	80 / 64	80 / 59	80 / 61	80 / 63	80 / 62	80 / 64	80 / 60	

* gas flow values given in the table apply to a reduction from working pressure to outlet pressure of 1 bar

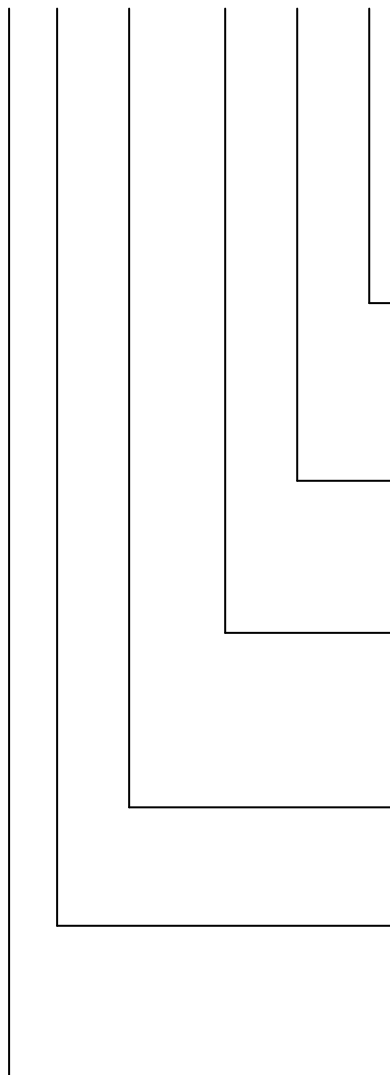
Basic technical parameters – HEAT EXCHANGER TV.. PN 63, 100

TV		06	12	18	30	46	60	75	100	200	30	46	
Nominal heat output	kW	6	12	18	30	46	60	75	100	200	30	46	
Max. allowable pressure	bar	63										100	
Working temperature	° C	Gas part: -20 to +50 °C						Water part: -20 to +100 °C					
Heat transfer surface	m ²	0,41	0,63	1,42	2,90	2,90	3,20	3,92	3,92	4,52	2,84	2,84	
Working gas pressure	bar	45										80	
Gas flow *	m ³ (n)/h	500	1 000	2 000	3 000	4 000	5 000	7 000	10 000	15 000	1 200	2500	
Gas temperature inlet / outlet of the exchanger	° C	4 / 33	4 / 33	4 / 29	4 / 31	4 / 32	4 / 33	4 / 33	4 / 29	4 / 30	4 / 44	4/40	
Gas temp. after regulation	° C	~ 9	~ 9	~ 5	~ 7	~ 8	~ 9	~ 9	~ 5	~ 6	~ 8	~ 6	
Min. water flow	m ³ /h	1,44	1,44	1,44	1,44	2,88	3,96	4,32	5,76	12,6	1,44	3,6	
Water temp. inlet/outlet	° C	80 / 75	80 / 71	80 / 64	80 / 54	80 / 62	80 / 63	80 / 59	80 / 60	80 / 65	80 / 62	80/66	
Working gas pressure	bar	63										100	
Gas flow *	m ³ (n)/h	400	800	1 100	2 000	3 000	4 000	5 000	7 000	12 000	800	1250	
Gas temperature inlet / outlet of exchanger	° C	4 / 33	4 / 33	4 / 38	4 / 35	4 / 34	4 / 35	4 / 37	4 / 34	4 / 34	4 / 50	4/45	
Gas temp. after regulation	° C	~ 2	~ 2	~ 7	~ 4	~ 3	~ 4	~ 6	~ 3	~ 3	~ 11	~ 4	
Min. water flow	m ³ /h	1,44	1,44	1,44	1,44	2,88	3,96	4,32	5,76	12,6	1,44	1,98	
Water temp. inlet/outlet	° C	80 / 76	80 / 72	80 / 67	80 / 58	80 / 64	80 / 64	80 / 61	80 / 62	80 / 66	80 / 65	80/64	

* gas flow values given in the table apply to a reduction from working pressure to outlet pressure of 1 bar

The type number is determined as follows::

TV 18 - 40 - 50 - 06 - 25 - 25 - K - S



Special version:
it is given only in cases of different version than standard

Flange orientation – water part:
K – upright to gas flow direction
R – parallel to gas flow direction

Flange branch on head – water part d₃: 25 – DN 25
50 – DN 50
65 – DN 65

Inlet and outlet flange - hot water part d₂: 25 - DN 25
32 - DN 32
40 - DN 40
50 - DN 50
65 - DN 65
80 - DN 80
100 - DN 100

Nominal pressure - water part:
06 – for max. allowable pressure 6 bar
40 – for max. allowable pressure 40 bar
63 – for max. allowable pressure 63 bar
100 - for max. allowable pressure 100 bar

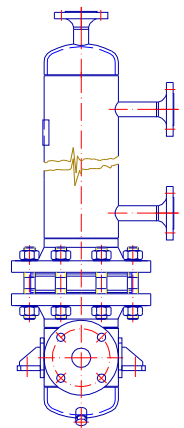
Inlet and outlet flange - gas part d₁: 25 - DN 25
50 - DN 50
80 - DN 80
100 - DN 100
125 - DN 125
150 - DN 150
200 - DN 200

Nominal pressure - gas part:
40 – for max. allowable pressure 40 bar
63 – for max. allowable pressure 63 bar
100 – for max. allowable pressure 100 bar

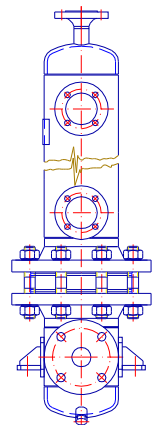
Nominal heat output:
06 - 6 kW 60 - 60 kW 400 – 400 kW
12 - 12 kW 75 - 75 kW
18 - 18 kW 100 - 100 kW
30 - 30 kW 150 - 150 kW
46 - 46 kW 200 - 200 kW

Basic type designation

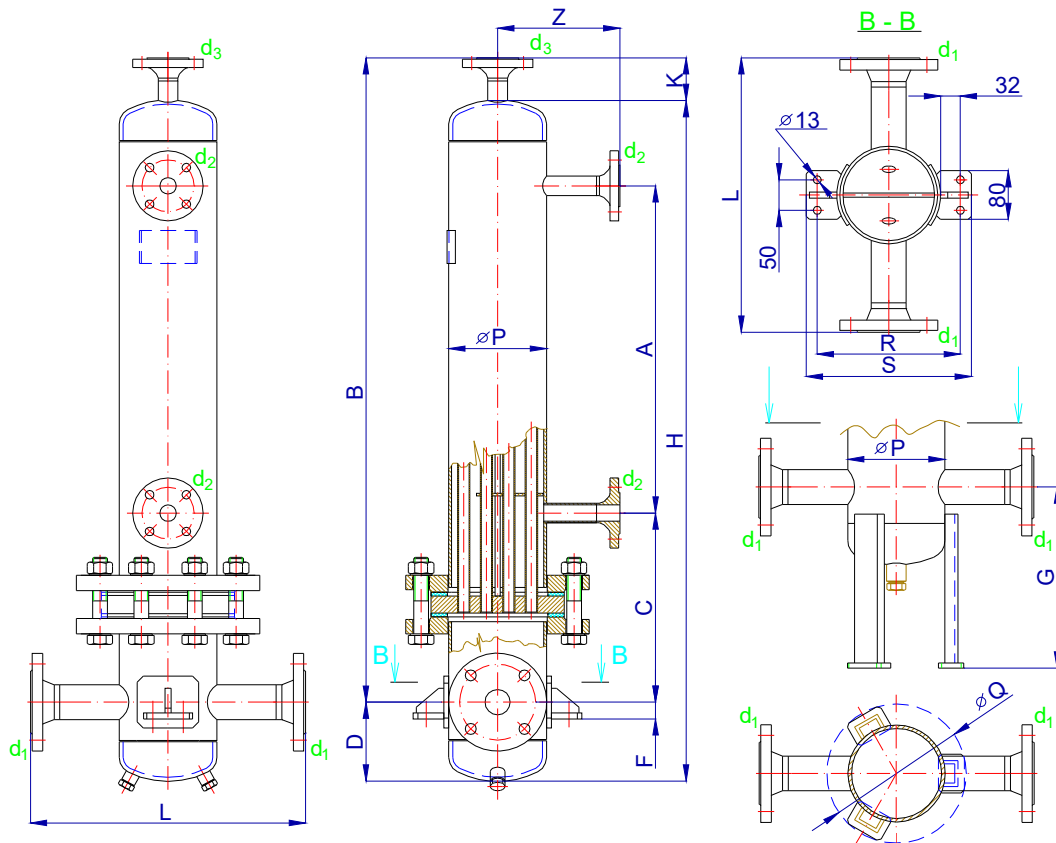
VERSION K



VERSION R



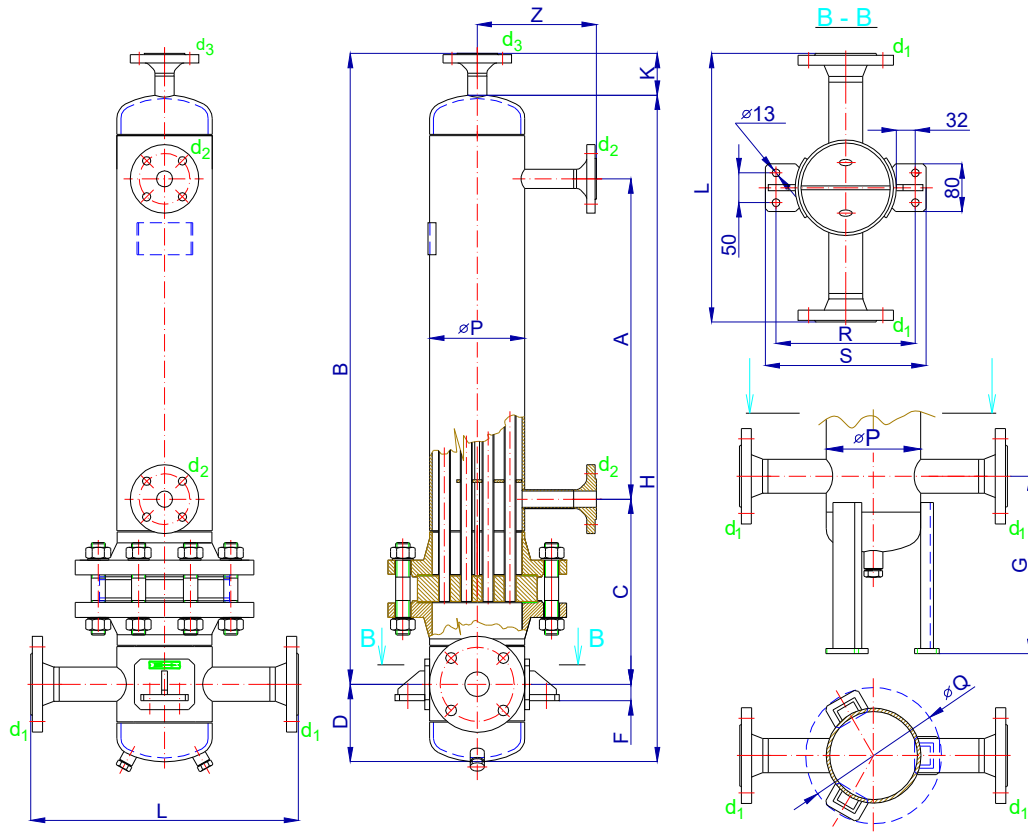
INSTALLATION DIMENSIONS FOR PN 40



FLANGES d_1, d_2, d_3 acc. to EN 1092-1, type 11/B1
 FLANGES d_1, d_2, d_3 different on demand

PN 40	A	B	C	D	F	G	H	K	L	ϕP	ϕQ	R	S	Z	d_1	d_2	d_3	Volume-water [l]	Weight [kg]
TV 06	245	809	315	156	20	-	865	100	450	168	-	240	276	200	25	25	25	9	70÷78
															32	32	32		
TV 12	525	1089	315	156	20	-	1145	100	450	168	-	240	276	200	25	25	25	13	80÷89
															32	32	32		
															40	40	40		
TV 18	405	1055	375	185	20	-	1140	100	500	219	-	294	330	230	50	25	25	19	140÷150
															32	32	32		
															40	40	40		
TV 30	705	1355	375	185	20	-	1440	100	500	219	-	294	330	230	50	25	25	26	165÷170
															32	32	32		
															40	40	40		
TV 46	476	1265	450	230	-	600 (522)	1375	120	600	273	380	-	-	280	50	25	25	34	245÷250
															32	32	32		
															40	40	40		
TV 60	715	1495	450	230	-	600	1605	120	600	273	380	-	-	280	50	25	25	43	280÷285
															32	32	32		
															40	40	40		
TV 75	590	1460	510	275	-	600	1615	120	650	324	430	-	-	300	50	25	25	56	375÷380
															32	32	32		
															40	40	40		
TV 100	590	1460	510	275	-	600	1615	120	650	324	430	-	-	300	50	25	25	56	375÷380
															32	32	32		
															40	40	40		
TV 150	710	1615	530	275	-	600	1770	120	650	324	430	-	-	325	50	25	25	63	415÷420
															32	32	32		
															40	40	40		
TV 200	530	1680	700	403	-	600	1961	122	900	406	500	-	-	400	50	25	25	93	730÷765
															32	32	32		
															40	40	40		
TV 400	640	1850	715	454	-	800	2184	120	900	508	620	-	-	450	50	25	25	158	1140÷1175
															32	32	32		
															40	40	40		

INSTALLATION DIMENSIONS FOR PN 63, PN100



FLANGES d₁, d₂, d₃ acc. to EN 1092-1, type 11/B1
 FLANGES d₁, d₂, d₃ different on demand

PN 63	A	B	C	D	F	G	H	K	L	φ P	φ Q	R	S	Z	d ₁	d ₂	d ₃	Volume-water [l]	Weight [kg]
TV 06	450	1071	363	156	20	-	1127	100	450	168	-	240	276	200	25	25	25	12	117
																32	25		
																40	50		
																50	50		
																50	50		
TV 12	800	1404	363	156	20	-	1460	100	450	168	-	240	276	200	25	25	25	17	132
																32	50		
																40	50		
																50	50		
TV 18	655	1355	415	185	20	-	1440	100	500	219	-	294	330	230	25	25	24,5	210	
															32	50			
															40	50			
TV 30	695	1545	510	230	-	600	1655	120	600	273	380	-	-	280	50	50	39	345	
															50	65			
															50	65			
TV 46	695	1545	510	230	-	600	1655	120	600	273	380	-	-	280	50	50	39	345	
															40	50			
															50	65			
															65	65			
TV 60	795	1645	510	230	-	600	1755	120	600	273	380	-	-	280	50	50	45	355	
															40	50			
															50	65			
															65	65			
															80	65			
TV 75	1035	1885	510	230	-	600	1995	120	600	273	380	-	-	280	50	50	55	390	
															65	65			
															80	65			
TV 100	1035	1885	510	230	-	600	1995	120	600	273	380	-	-	280	50	50	55	395	
															50	65			
															80	65			
TV 200	1235	2082	510	230	-	600	2192	120	600	273	380	-	-	280	50	50	60	420	
															50	65			
															80	65			
															100	65			
TV 30 PN 100	795	1772	620	243	-	600	1890	125	600	273	375	-	-	280	25	25	43	520	
															32	25			
TV 46 PN 100	795	1772	620	243	-	600	1890	125	600	273	375	-	-	280	25	25	43	520	
															32	25			
															40	25			
															50	25			

Detailed data about the heat exchanger TV are given in document TPN, can be sent on your request.