Plate heat exchangers DV193 series, type E

Data sheet

v. 2.2

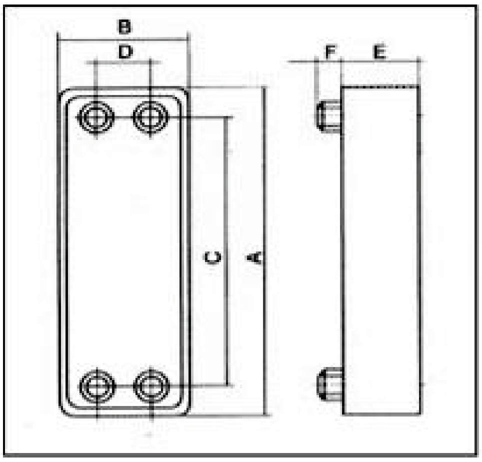


Fig. 1

type		DV 193-20E		DV 193-30E		DV 193-45E		DV 193-60E	
number of plates	-	20		30		45		60	
		no insul.	insul.	no insul.	insul.	no insul.	insul.	no insul.	insul.
code		8026	9548	8028	9549	8029	9550	8030	9551
height (dimension A)	mm	193	223	193	223	193	223	193	223
width (dimension B)	mm	83	113	83	113	83	113	83	113
thickness (dimension E)	mm	55	85	79	109	114	144	149	179
pitch (dimension C)	mm	154	154	154	154	154	154	154	154
pitch (dimension D)	mm	42	42	42	42	42	42	42	42
socket height (dimension F)	mm	35	20	35	20	35	20	35	20
weight	kg	1.6	1.7	2.1	2.2	2.8	2.9	3.6	3.7
heat-exchange surface	m^2	0.28		0.42		0.63		0.84	
liquid vol. - heating/heated	l	0.32/0.32		0.45/0.45		0.62/0.62		0.87/0.87	
max. working pressure	bar	29.4		29.4		29.4		29.4	
max. working temperature	°C	185	150/175*	185	150/175*	185	150/175*	185	150/175*
size of connectin pipes		3/4" M		3/4" M		3/4" M		3/4" M	
heat exchanger material		AISI 316 L		AISI 316 L		AISI 316 L		AISI 316 L	
heat exchanger type		plate type, soldered		plate type, soldered		plate type, soldered		plate type, soldered	

*max. insulation temperature pernament /short term

Table. 1

Product specification

Plate heat exchangers are designed for efficient heat transfer between various fluids. They are made of thin, pressed stainless-steel sheets in AISI 316L quality and soldered with copper. In order to reduce heat loss they are fitted with Aeroflex insulation that resists even 175 °C temperature in short term and can be used with solar systems.

Heat exchanger connection

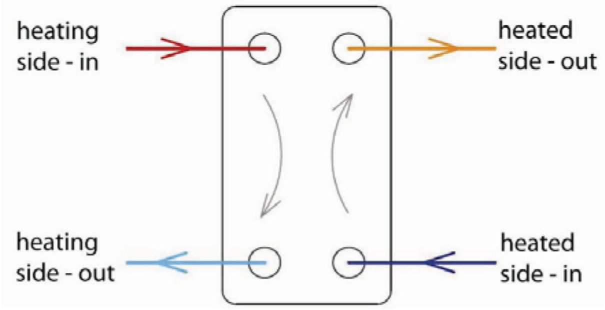


Fig. 2

Connection of the heat exchanger with a pool by-pass

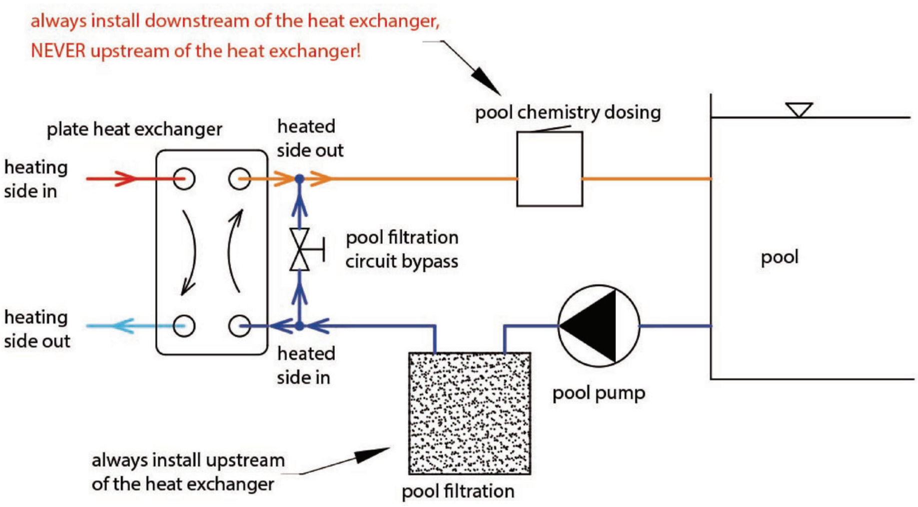


Fig. 3

Pressure drop of the heat exchangers (water / water)

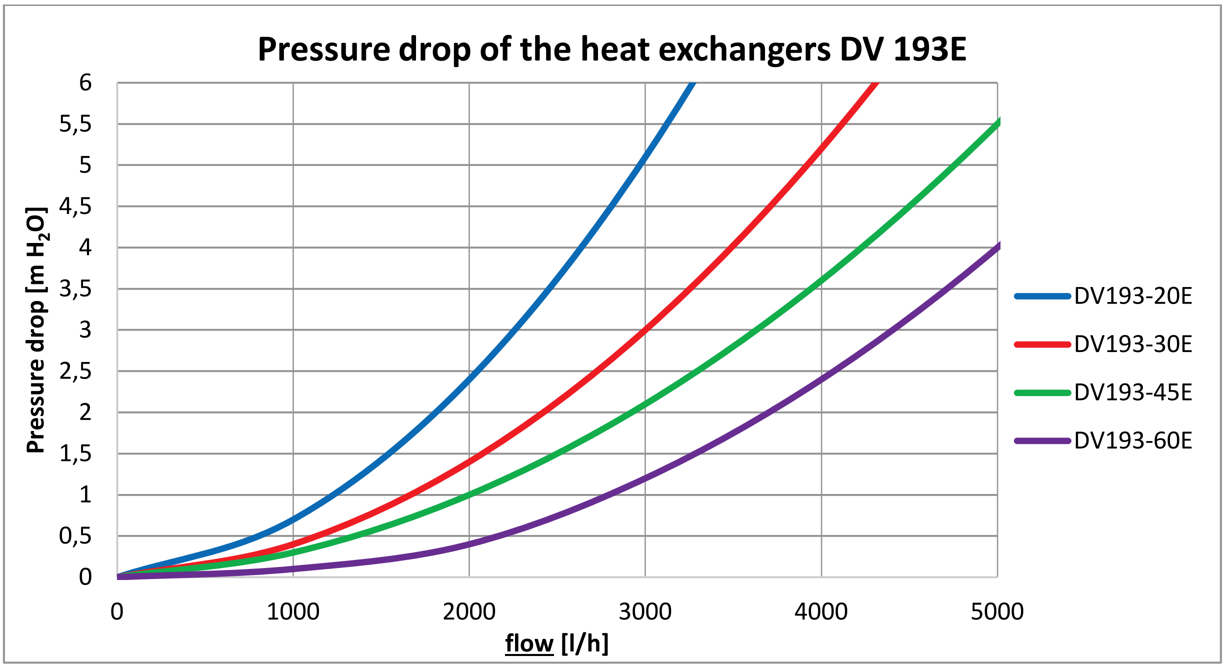


Fig. 4

Recommended max. area of solar collectors

type		DV 193-20E	DV 193-30E	DV 193-45E	DV 193-60E
recommended max. area of collectors at Δt_{mean} = 10 K, solar fluid-water, flow rate in collectors 1 l/min*m^2, flow rate on the heated side 1000 l/hod.	m^2	6	10	16	21

Table. 2

Output curves

Output curves for the heat exchangers are calculated on the base of measurements under various temperature and flow conditions. An output curve represents the relation between the heat exchanger output and its secondary side flow rate at a given mean temperature difference between the primary and secondary sides (temperature drop) and a flow rate on its primary side. The output curves are valid for water on both the sides of a heat exchanger

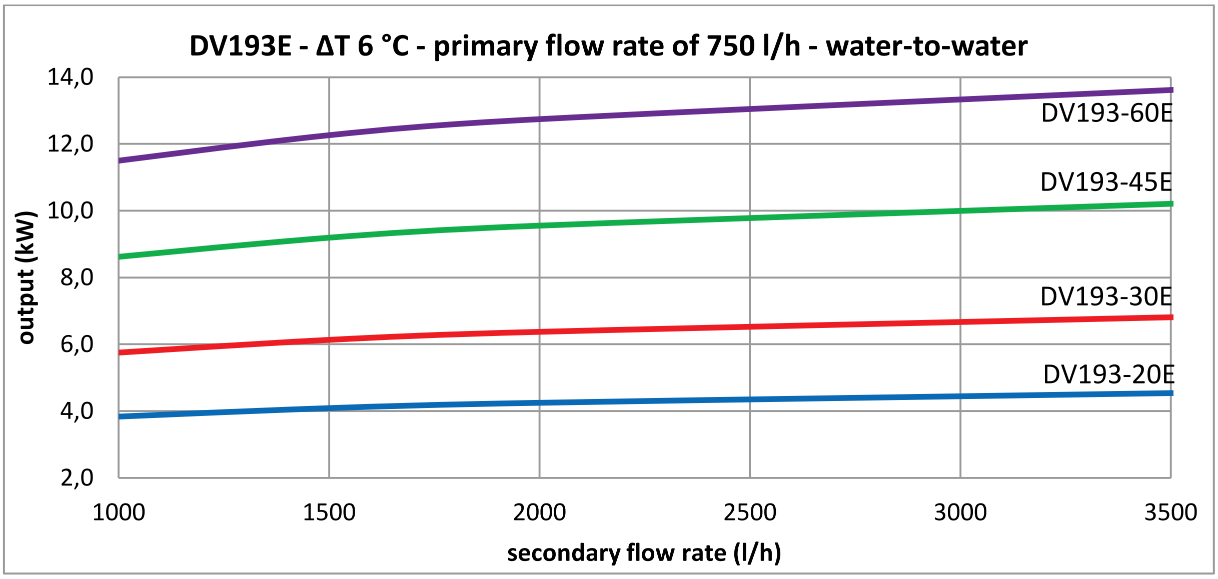
mean temperature drop of the heat exchanger	current applications
6 K	applications requiring as low as possible temperature difference between the primary and secondary sides of a heat exchanger – solar systems, heat pumps, condensing boilers etc.
10 K	applications requiring a current temperature difference between the primary and secondary sides of a heat exchanger – traditional electric- and gas-fired sources, pool heating etc.
20 K	applications with high-temperature sources whose efficiency is not temperature-dependent – solid-fuel boilers, sanitary water heating, pool heating etc.

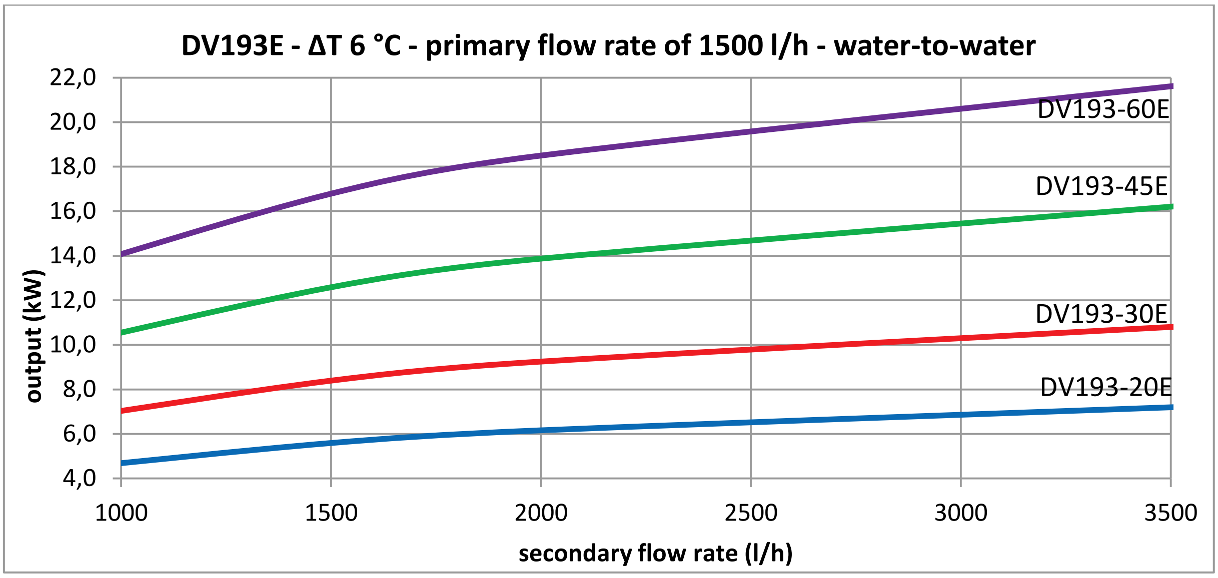
Table 3

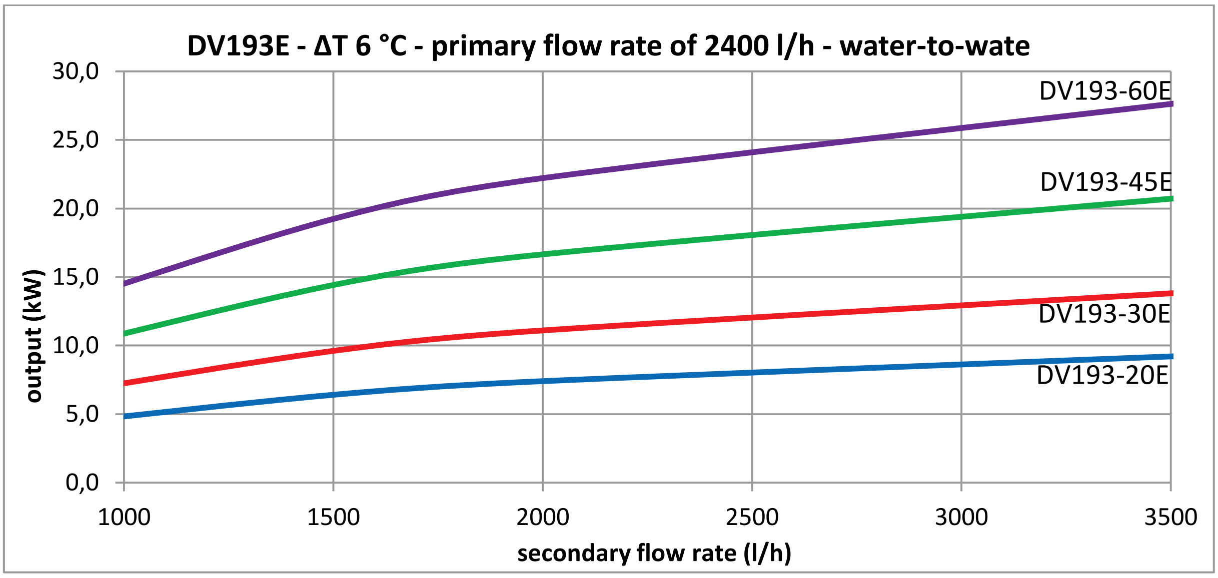
How to select the right size of a plate heat exchanger::

a) **Substitution** – when a heat exchanger shall be substituted by another one, e.g. their surface areas are compared, or their height (this makes a difference only when fluid shall be heated by a high ΔT – e.g. DHW heated from 10 °C to 55 °C), and their pressure drops.
b) **Required output and mean temperature drop** - prior to the heat exchanger selection, at least two its parameters out of three shall be known – output, flow rates on the primary and secondary sides and temperature drops on the primary and secondary sides. From the 2 parameters known the third is calculated using the equations at the end of this document. After that, the mean temperature drop between the primary and secondary sides is established using the equations at the end of this document (if the required temperature drop is not given by the system design, the mean temperature drop depends on the application type, see Table 3). Then use the calculated or given flow rate and select its closest lower flow rate on the primary side shown in the diagrams – 750, 1500 or 2400 l/h. Then seek the diagram that corresponds to the selected mean temperature drop and primary flow rate. In this diagram select the closest higher curve of the heat exchanger output. The size of the heat exchanger can be read at the right end of the curve. The pressure drop of the selected heat exchanger is shown in Fig. 4.

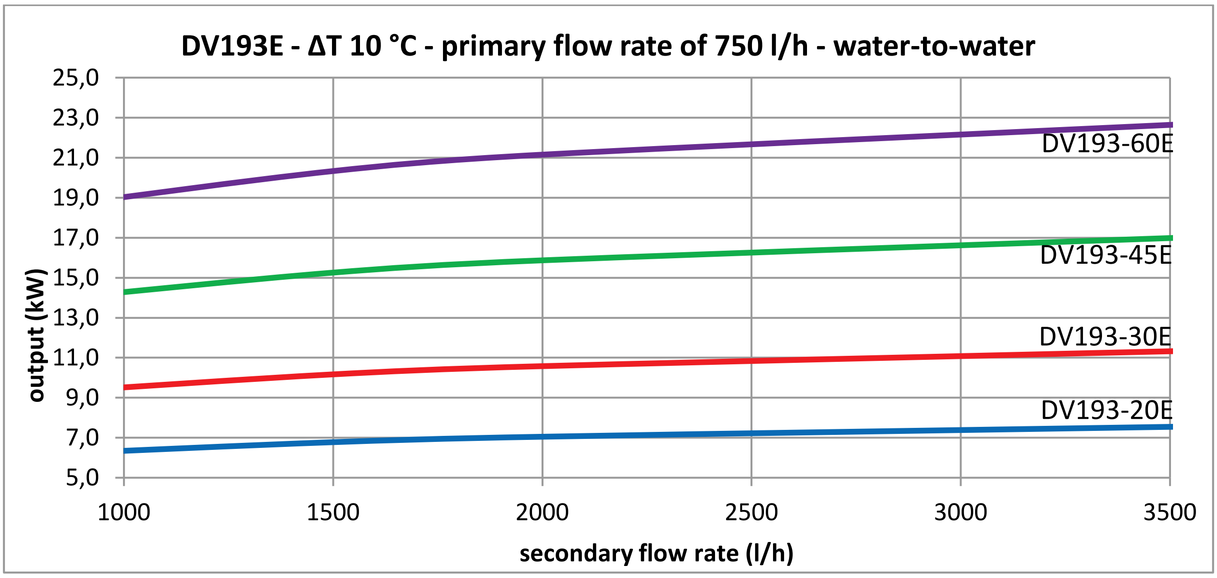
Charts for medium temperature drop of 6 K

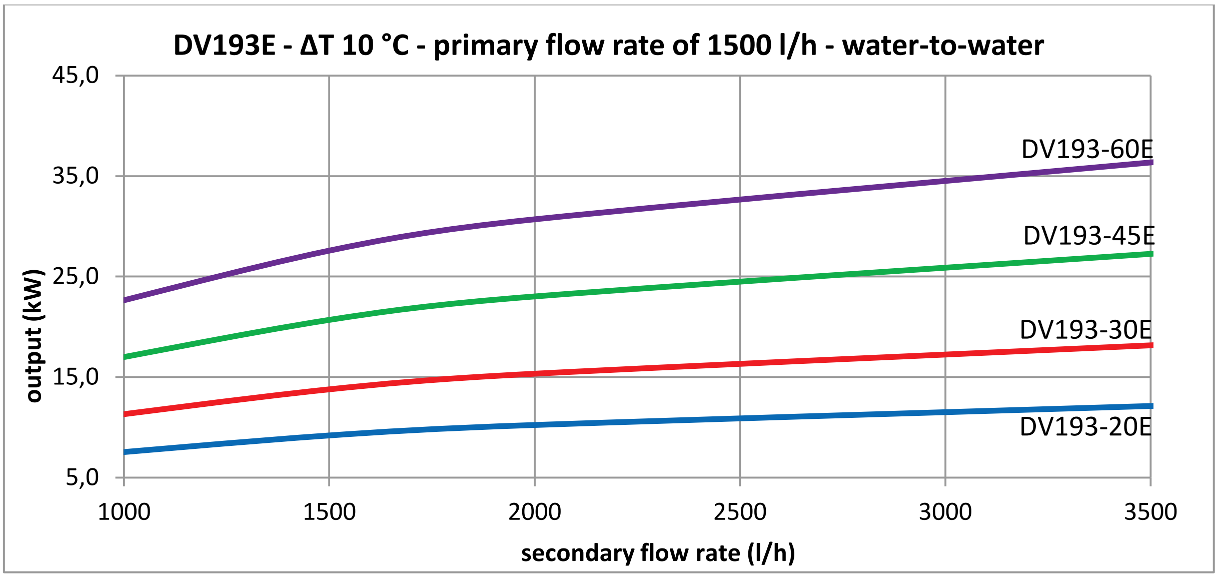


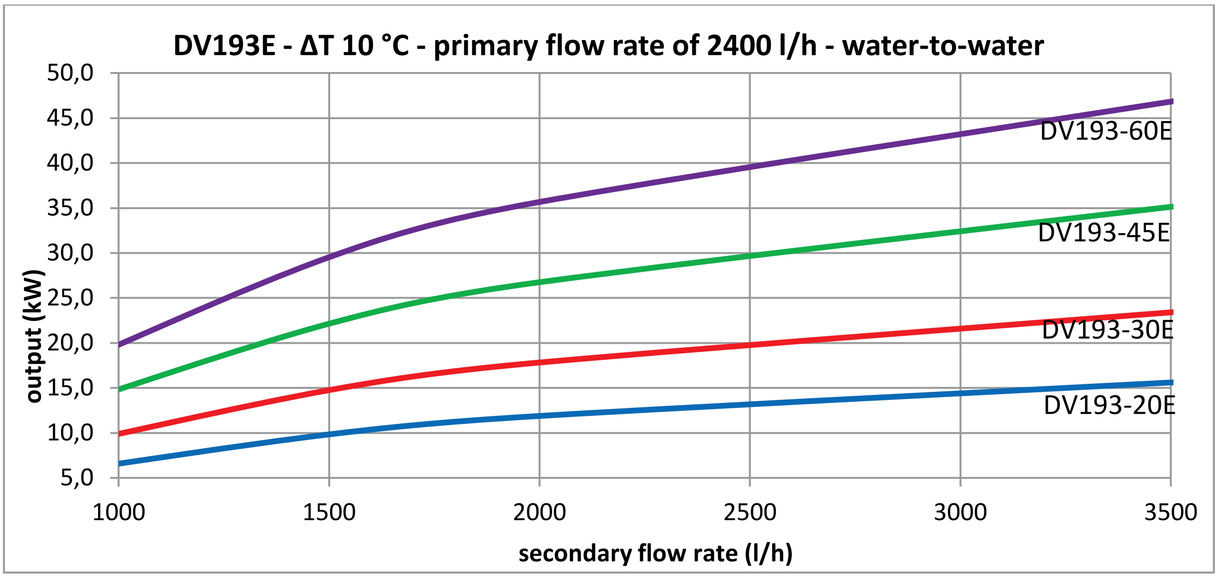




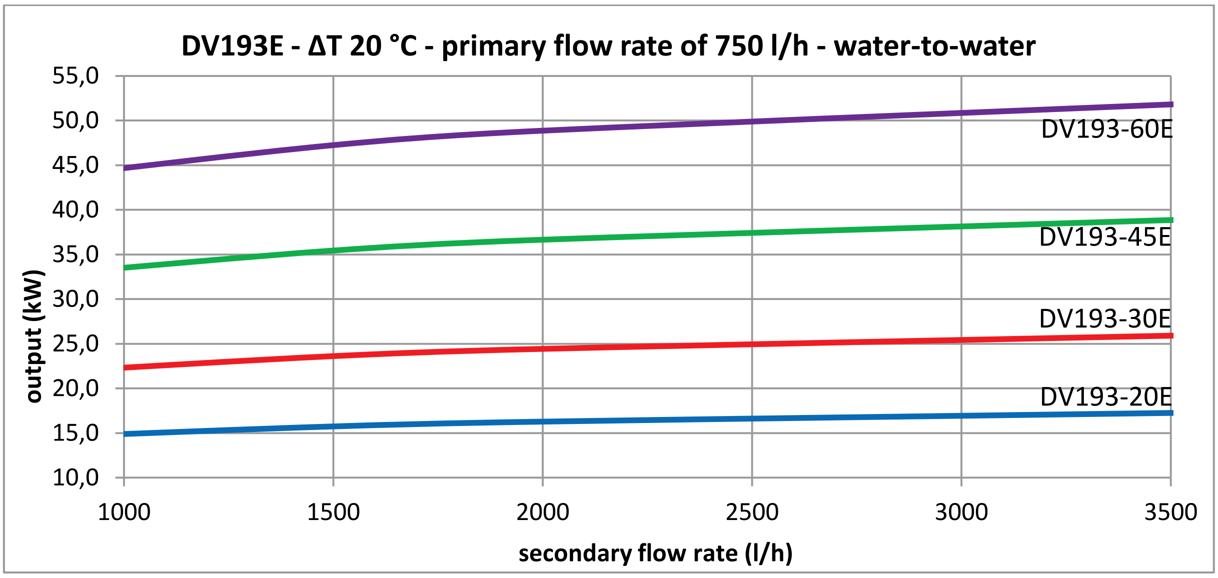
Charts for medium temperature drop of 10 K

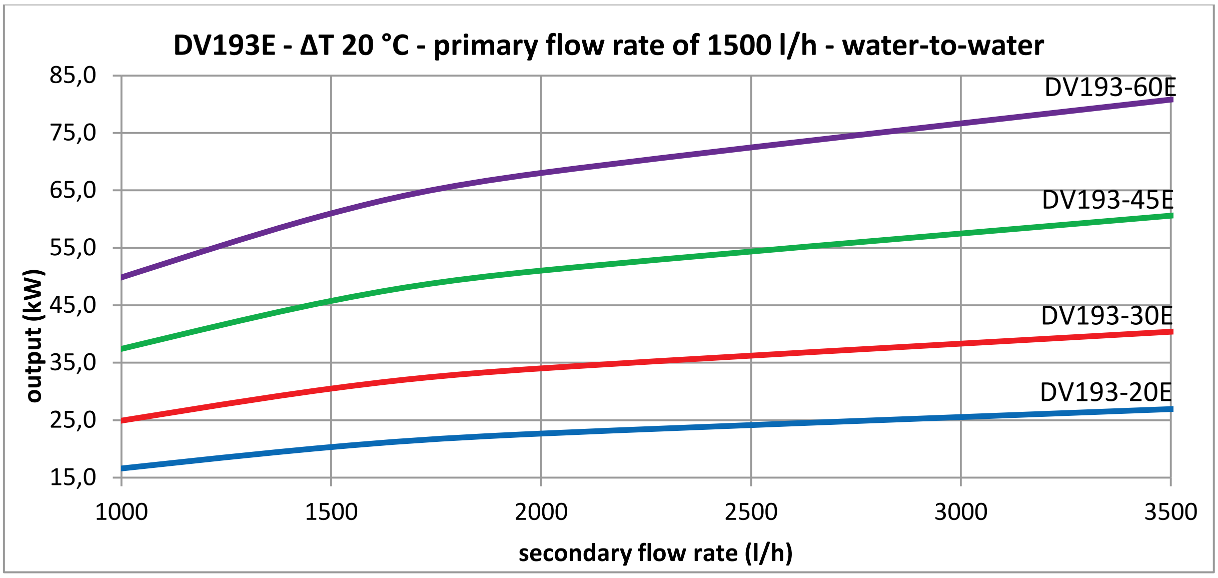


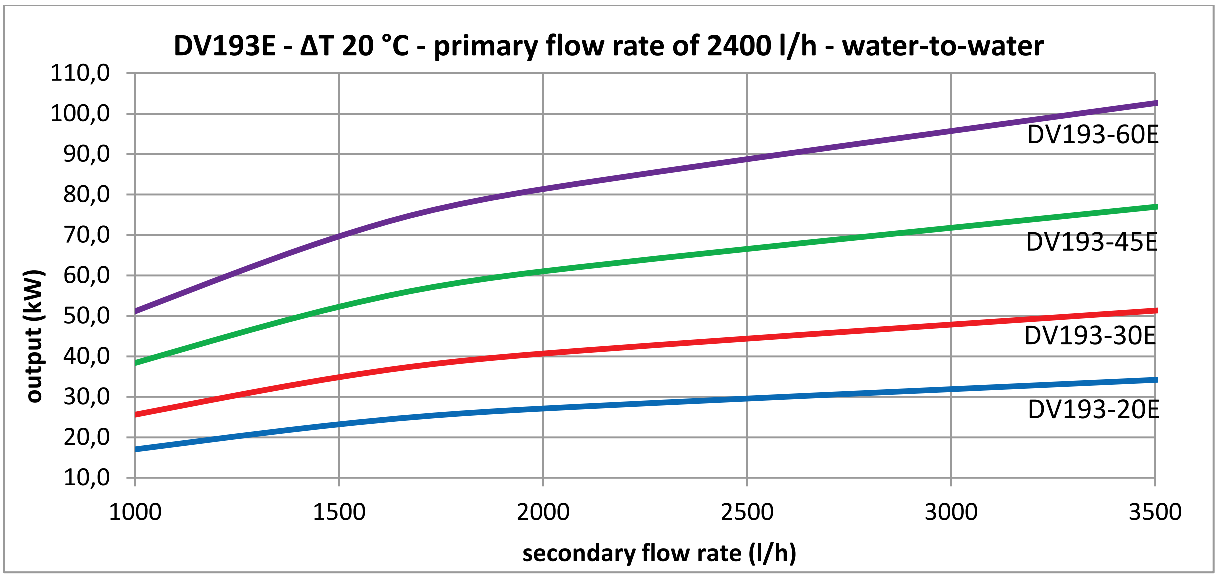




Charts for medium temperature drop of 20 K







Symbols and calculations

Total output of a heat exchanger $Q = m'_I \times c_I \times \Delta t_I = m'_{II} \times c_{II} \times \Delta t_{II}$ [W]

Mean temperature drop of a heat exchanger $\Delta t_{mean} = \frac{\Delta t_I - \Delta t_{II}}{ln\frac{\Delta t_I}{\Delta t_{II}}}$ [K]

where

Q	- heat transferred	[W]
$m'_{I,II}$	- mass fluid flow rate on the primary (I) and secondary (II) sides	[kg/s]
$c_{I,II}$	- specific heat capacity	[J/kg.K]
$\Delta t_{I,II}$	- temperature difference between the incoming and outgoing temperatures of the primary (I) and secondary (II) side of a heat exchanger	[K]
Δt_{mean}	- mean temperature drop (temperature difference) between the primary and secondary sides of a heat exchanger	[K]