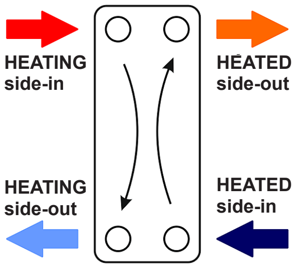
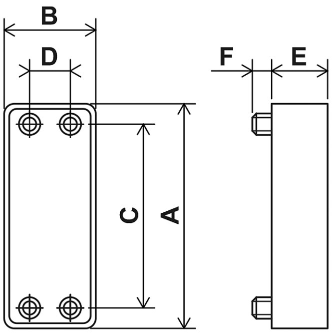
DATA SHEET

Plate heat exchanger DV193, insulated

Inlet / outlet marking



Dimensions



Main Features

Application	Designed for efficient heat transfer between fluids, suitable for use with solar thermal systems.
Description	Consisting of thin pressed stainless-steel plates, copper soldered, it comes in thermal insulation.
Working fluid	Hot water (TV), water, antifreeze fluid for heating and solar thermal systems and heat pumps.

Code

9548	DV193-20E
9549	DV193-30E
9550	DV193-45E
9551	DV193-60E

Technical Data

Type	DV193-20E	DV193-30E	DV193-45E	DV193-60E
Number of plate	20	30	45	60
Heat-exchange surface	0.28 m²	0.42 m²	0.63 m²	0.84 m²
Liquid volume (heating)	0.32 l	0.45 l	0.62 l	0.87 l
Liquid volume (heated)	0.32 l	0.45 l	0.62 l	0.87 l
Max. working pressure	29.4 bar			
Max. working temp.	185 / 150 / 175 °C*			

** Without insulation / with insulation permanent / with insulation short term.*

Materials

Heat exchanger	AISI 316 L
Insulation	EPDM

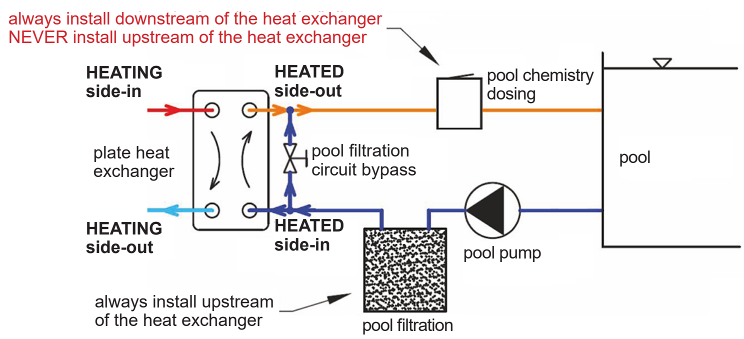
Dimensions with insulation and weight

	DV193-20E	DV193-30E	DV193-45E	DV193-60E
Size of connection pipes	G 3/4" M	G 3/4" M	G 3/4" M	G 3/4" M
Height (dim. A)	223 mm	223 mm	223 mm	223 mm
Width (dim. B)	113 mm	113 mm	113 mm	113 mm
Thickness (dim. E)	85 mm	109 mm	144 mm	179 mm
Pitch (dim. C)	154 mm	154 mm	154 mm	154 mm
Pitch (dim. D)	42 mm	42 mm	42 mm	42 mm
Socket height (dim. F)	20 mm	20 mm	20 mm	20 mm
Weight incl. insulation	1.7 kg	2.2 kg	2.9 kg	3.7 kg

Recommended max. area of collectors

	DV193-20E	DV193-30E	DV193-45E	DV193-60E
Under these conditions: mean Δt = 10 K, flow rate in collectors 1 l/min·m², solar fluid–water, flow rate on the heated side 1000 l/h	6 m²	10 m²	16 m²	21 m²

Connection of the heat exchanger with a pool by-pass



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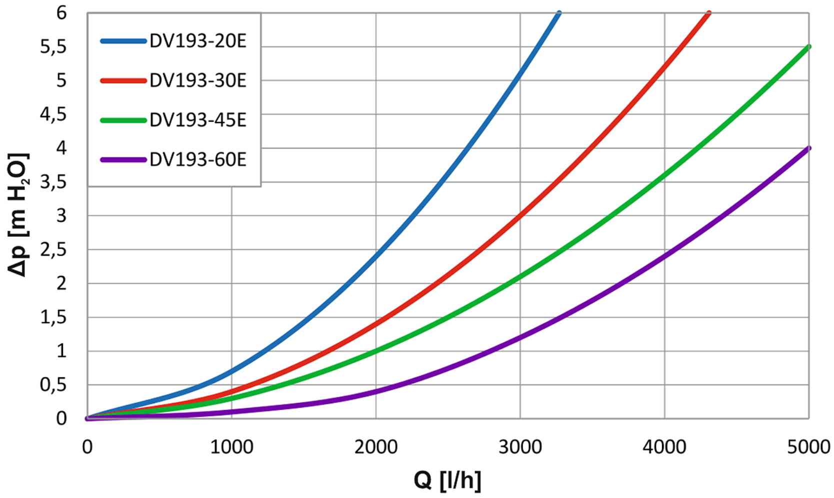
Pressure drop of the heat exchangers



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

How to select the right size of a plate heat exchanger

a) Substitution
When a H. E. shall be substituted by another one. 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 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). 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.

Calculations

Total output of a heat exchanger P:

$$P = \dot{m}_1 \cdot c_1 \cdot \Delta T_1 = \dot{m}_2 \cdot c_2 \cdot \Delta T_2 \; [W]$$

Mean temperature drop of a heat exchanger $\Delta T_{stř}$:

$$\Delta T_{stř} = \frac{\Delta T_1 - \Delta T_2}{ln \frac{\Delta T_1}{\Delta T_2}} \; [W]$$

WHERE:

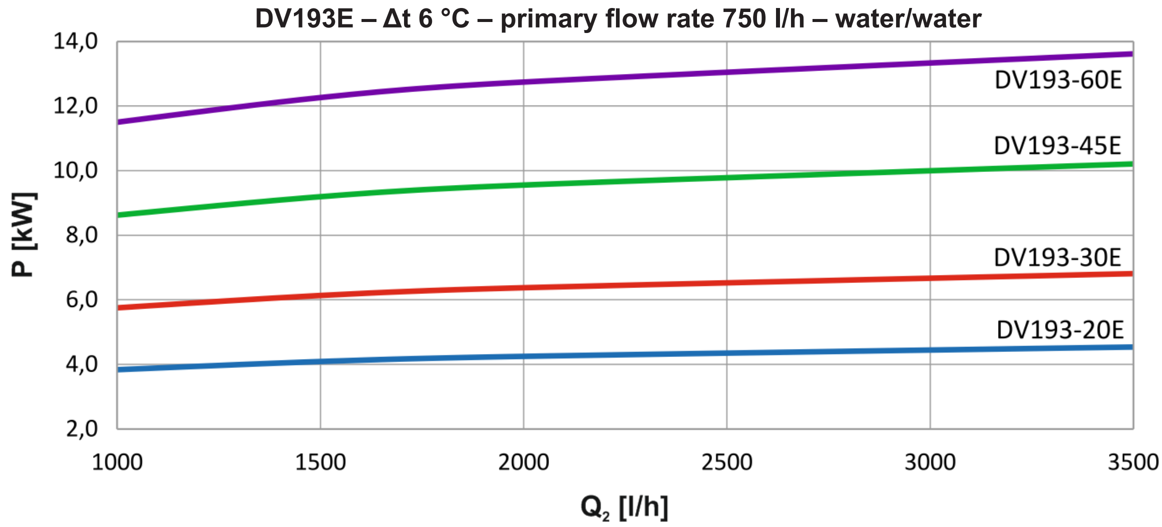
$m_{1,2}$ [kg/s] … *mass fluid flow rate on the primary (1) and secondary (2) sides*

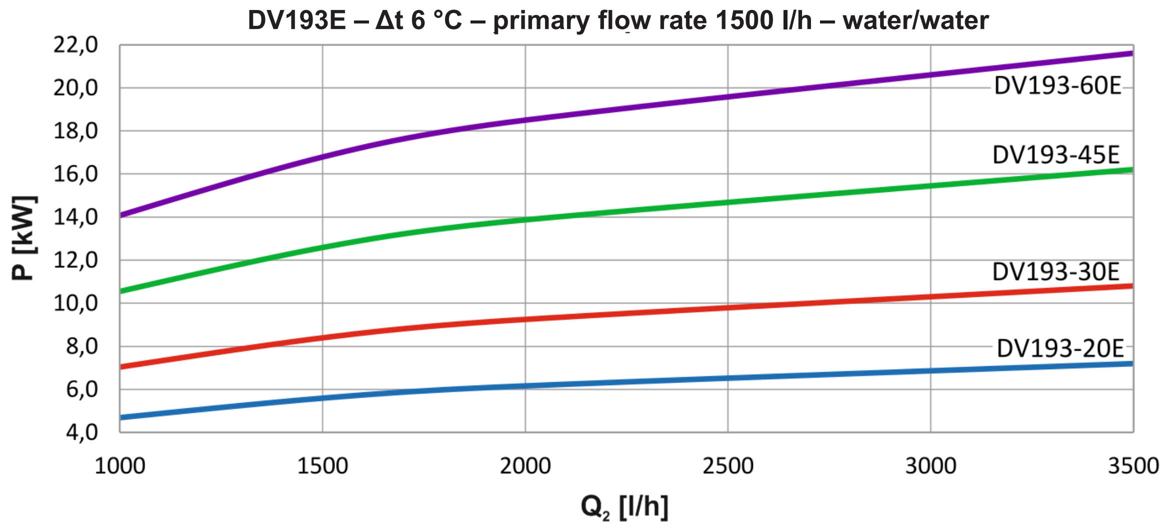
$\Delta T_{1,2}$ [K] … *temp. doff. between the incoming and outgoing temp. of the primary (1) and secondary (2) side of a H.E.*

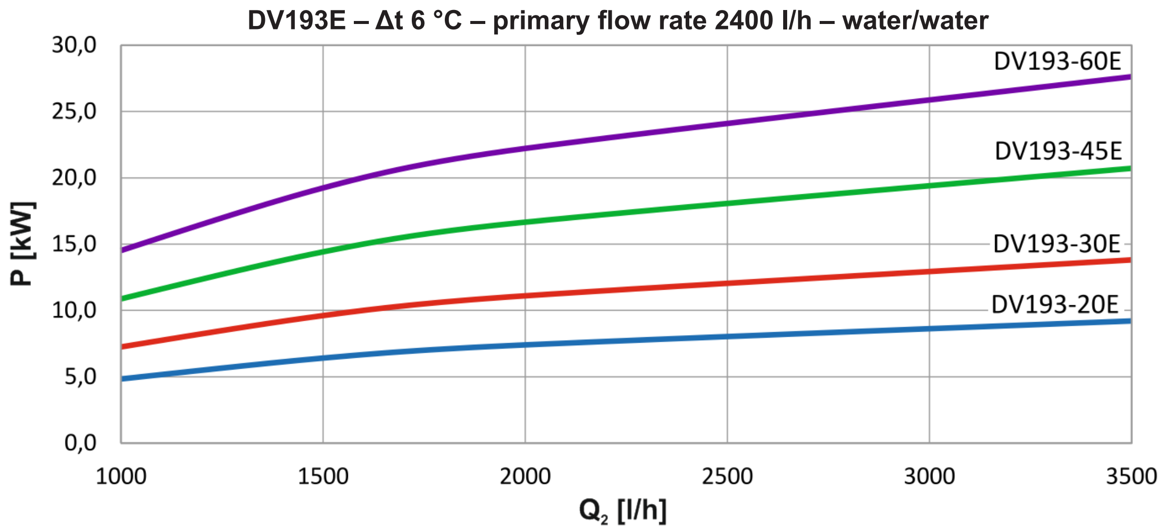
$c_{1,2}$ [J/kg·K] … *specific heat capacity*

Plate heat exchanger DV193, insulated

Charts for medium temperature drop of 6 K







LEGEND:

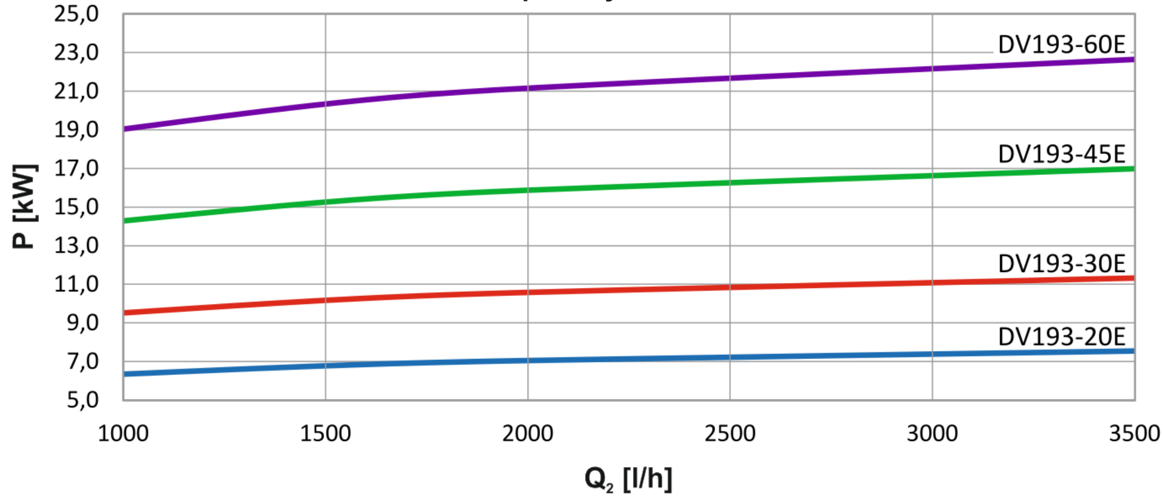
ΔT … mean temperature drop, P … output, Q_1 … mass fluid flow rate on the primary side, Q_2 … mass fluid flow rate on the secondary side

DATA SHEET

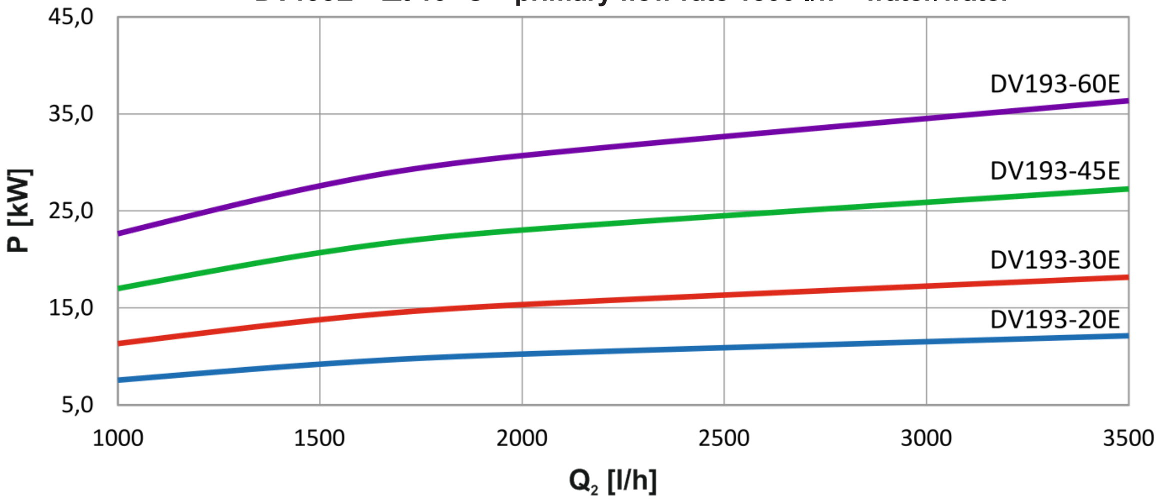
Plate heat exchanger DV193, insulated

Charts for medium temperature drop of 10 K

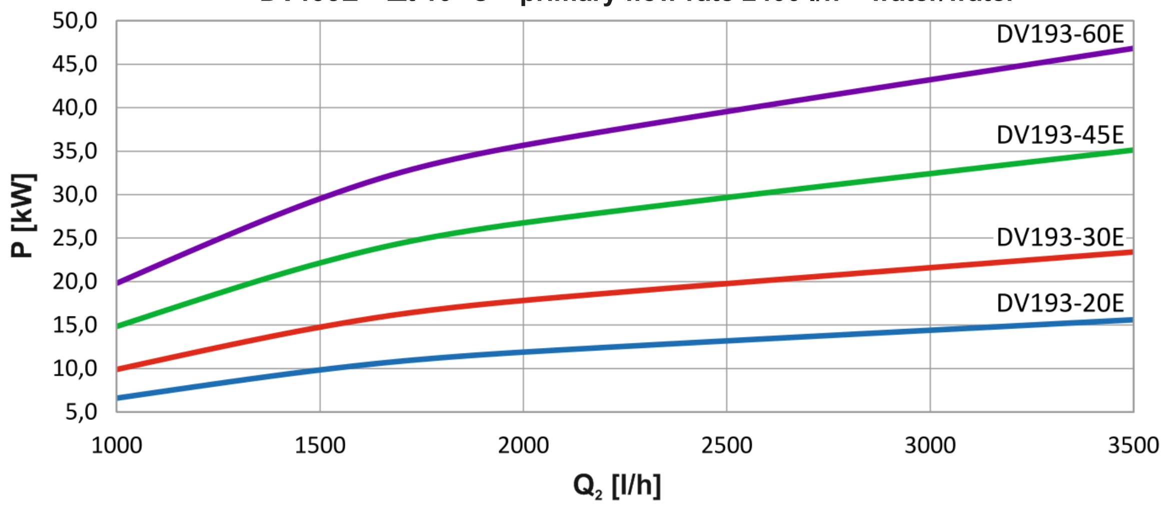
DV193E – Δt 10 °C – primary flow rate 750 l/h – water/water



DV193E – Δt 10 °C – primary flow rate 1500 l/h – water/water



DV193E – Δt 10 °C – primary flow rate 2400 l/h – water/water

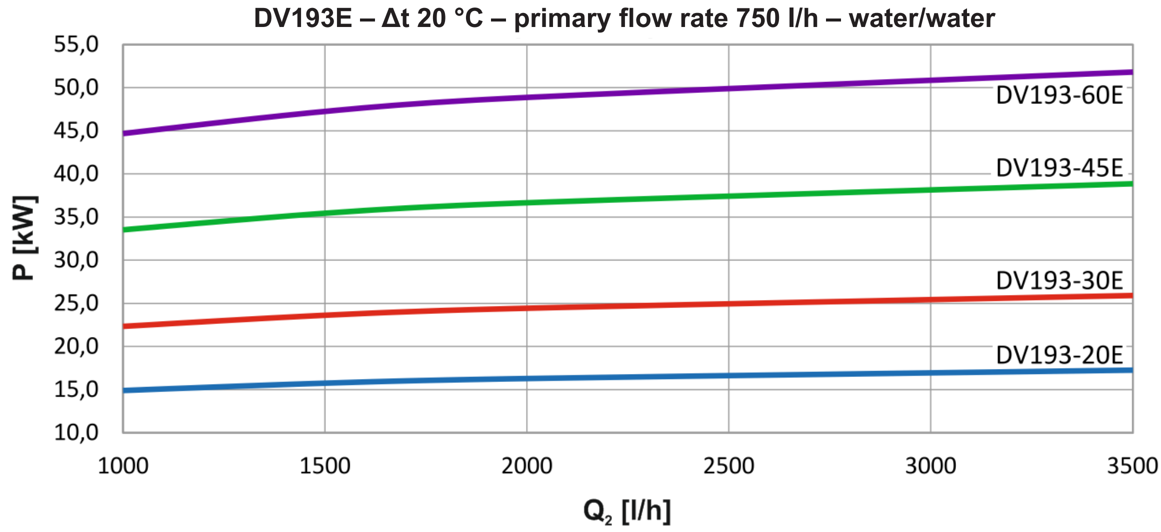


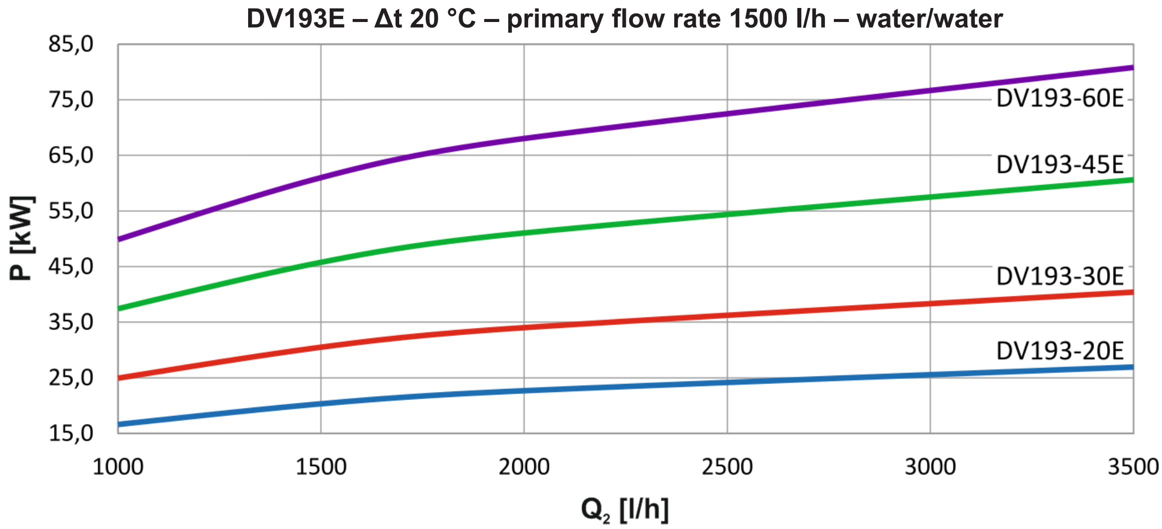
LEGEND:

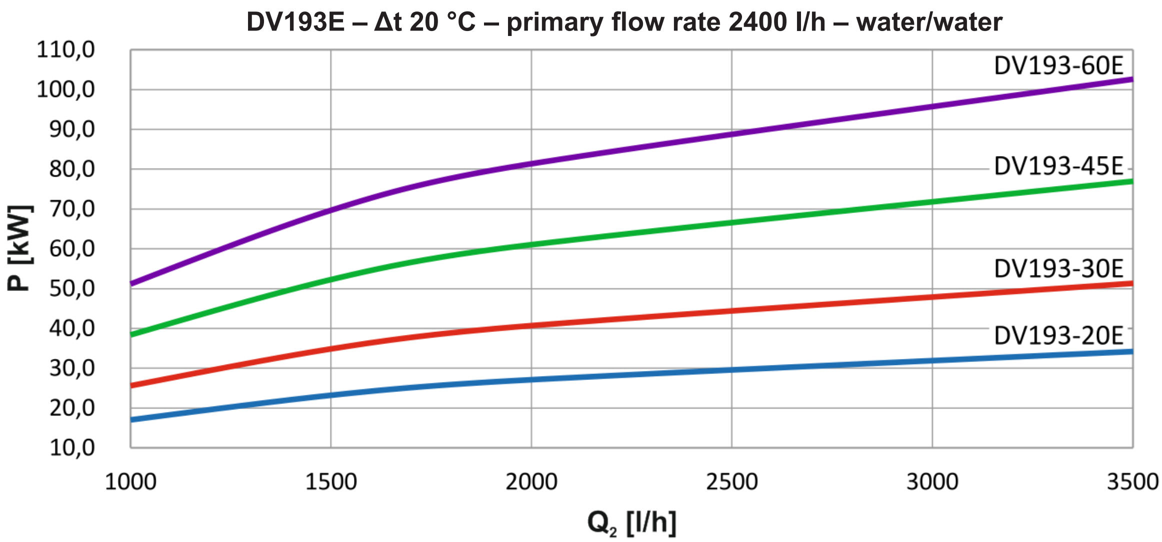
ΔT … mean temperature drop, P … output, Q_1 … mass fluid flow rate on the primary side, Q_2 … mass fluid flow rate on the secondary side

Plate heat exchanger DV193, insulated

Charts for medium temperature drop of 20 K







LEGEND:

ΔT … mean temperature drop, P … output, Q_1 … mass fluid flow rate on the primary side, Q_2 … mass fluid flow rate on the secondary side