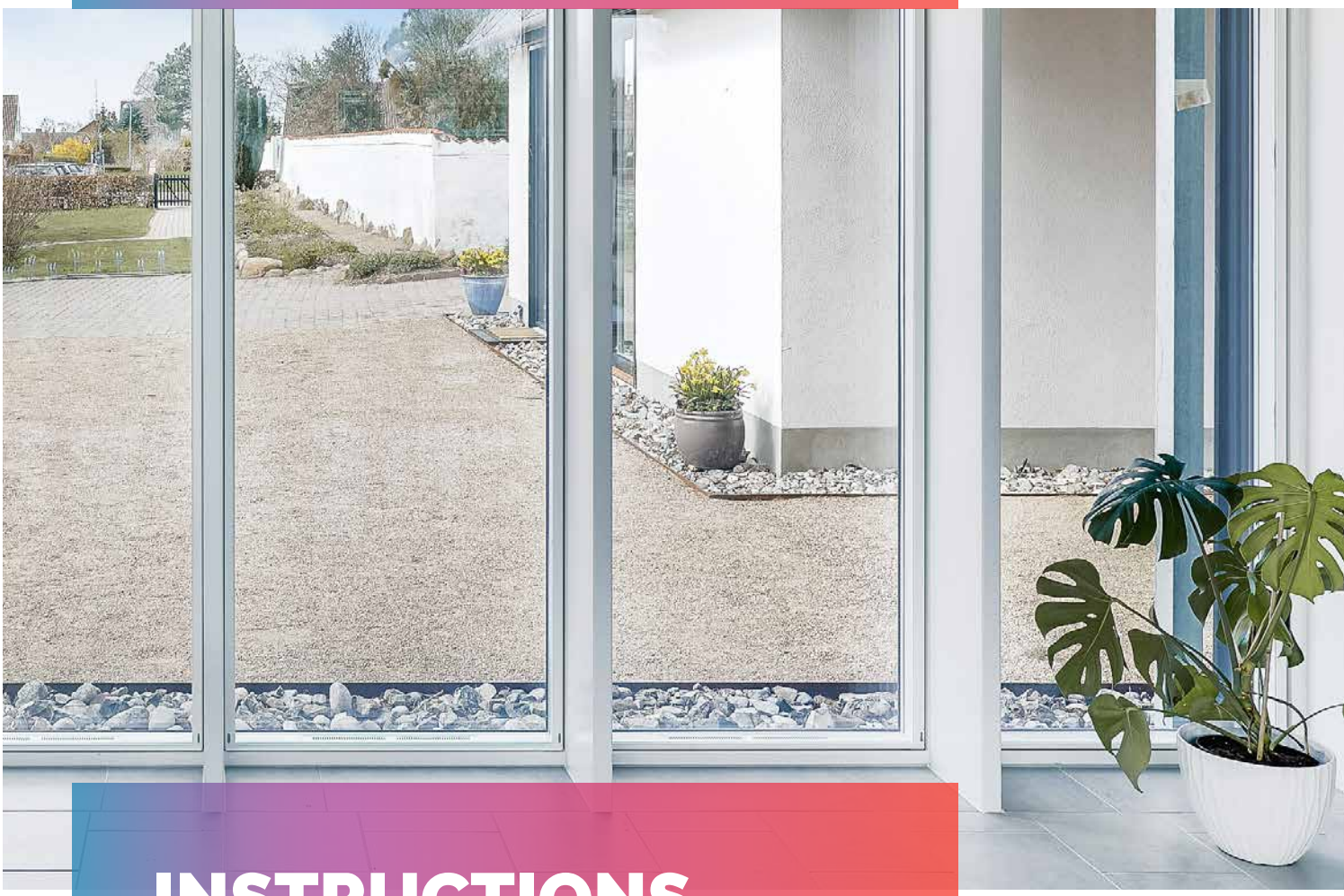
LIVINGBETTER



INSTRUCTIONS FOR ENTERING EQUIVALENT INPUT DATA INTO BE18

CALCULATION TOOL EQUIVALENT VALUES FOR ENTRY INTO BE18

Project-specific values that must be entered into the energy framework calculation are stated in the offer and order confirmation material for LivingBetter ventilation windows and IKM A/S heat pumps.

These instructions show where to enter the data and ensure that the building's energy framework is calculated correctly. Naturally, the data varies from that entered in connection with standard products and solutions, as these do not have the same impact on energy consumption and the indoor climate.

ENERGY VALUES FOR THE VENTILATION WINDOW

LivingBetter receives scale drawings (floor plans and façades) from the customer. Based on the drawings, we draw up proposals to indicate the volume of supply air that is required to meet BR18 requirements.

This figure is then used to calculate more precise equivalent U-values that can be entered in the BE18 program. The equivalent U- and g-values are stated in a table at the back of LivingBetter's offer.

This calculation method has been devised in cooperation with Aalborg University (AAU) in compliance with the Danish Building Research Institute's instructions 213 Energy demand in buildings.

THE VENTILATION WINDOW

The ventilation window is defined as a double window structure with a double-glazed unit on the inside and a single-glazed unit on the outside (the opposite is also possible) fitted in conjunction with LivingBetter's patented thermostatic valve system and with air channels, made to LivingBetter's specifications and fully tested by an independent research institute.

The window's function presupposes that there is negative pressure in the building, achieved either by natural or mechanical air extraction. For the ventilation window to contribute to the energy framework calculation, a mechanical means of extraction (e.g. an exhaust air heat pump) is required that recovers energy from the exhaust air.

Fraunhofer Gesellschaft (research institute) and Aalborg University (AAU) have conducted exhaustive tests on ventilation windows fitted with the LivingBetter thermostatic valve system. The test results make it possible to calculate and substantiate air volume and energy recovery so that the solution meets energy labelling requirements.

THE EXTRACT AIR HEAT PUMP

When installed in combination with ventilation windows, IKM's extract air heat pump operates constantly and maintains negative pressure in the building at all times. The heat pump recovers energy from exhaust air. This energy is used to produce domestic hot water and central heating.

IKM A/S exhaust air heat pumps are approved in accordance with EN14825. The BE data is stated in accordance with EN14511 Air condition systems, table 9, exhaust air. Domestic hot water meets the requirements of EN16147 profile (L).

Please note: An extract air heat pump is not listed on the so-called positive list. The only heat pumps on this list are heat pumps that have an outdoor unit. Even so, IKM extract air heat pumps are approved for use in new residential units.

TOOL FOR CALCULATING EQUIVALENT VALUES FOR ENTRY INTO BE18

U-value equivalent

Enter U-value in the "Data/Statisk værdi" (Data/static value) folder. The program calculates a U-value equivalent for the ventilation window's reduced ventilation heat loss.

The static U-value is stated in LivingBetter's offer/order confirmation

Enter U-value equivalent into BE18

Calculating the equivalent U- and g-values for ventilation windows with CWT valve technology (Input data from LivingBetter offer/order confirmation is typed in blue)						Output data (enter in Energy calculation)				
The residential unit's gross area 155 m²		Differential pressure in the building (Pa) 13.7 --- Recommended 12 - 16 Pa	The ventilation window's % share of total element width	The ventilation window's static values (enter figures from offer) With no air circulation through the window (0.0 l/s) (0.0 m³/t)		The ventilation window's equivalent values for mechanical ventilation (supply air volume per vent) 3.9 l/s 14.0 m³/t		The ventilation window's glazing factor (f_f) + equivalent E_w-values		Screening factor Enter shading coefficient as screening factor
Mandatory basic air exchange rate (cf. BR18) for ventilation (0.3 l/s/m²) 1.08 m³/t/m²: 46.5 l/s/m2 / 167.4 m³/t										
Offer/order position ID	Dimensions Width	Height	No. of CWT vents in the window element	(%)	U_w-value [W/k m²]	g_g-value	U_w-value [W/k m²]	g_g-value	f_f	E_w	NB: Set X in "Kun sommer" (summer only)
West – bedroom	70	127	2	100	0.85	0.63	0.37	0.69	0.78	71.6	0.92
West – living room	150	212	2	50	0.80	0.63	0.53	0.66	0.89	66.1	0.96
East – living room	90	212	2	75	0.81	0.63	0.41	0.67	0.84	74.3	0.94
East – room	107	127	2	100	0.85	0.63	0.37	0.69	0.69	58.5	0.92
East – room	107	127	2	100	0.85	0.63	0.37	0.69	0.69	58.5	0.92
East – office	107	127	2	100	0.85	0.63	0.37	0.69	0.69	58.5	0.92
Total no. of CWT vents			12								

g-value equivalent

Enter g-value in the "Data/Statisk værdi" (Data/static value) folder. The program calculates a g-value equivalent for the ventilation window's reduced ventilation heat loss.

The static g-value is stated in LivingBetter's offer/order confirmation

Enter g-value equivalent into BE18

Calculating the equivalent U- and g-values for ventilation windows with CWT valve technology (Input data from LivingBetter offer/order confirmation is typed in blue)						Output data (enter in Energy calculation)				
The residential unit's gross area 155 m²		Differential pressure in the building (Pa) 13.7 --- Recommended 12 - 16 Pa	The ventilation window's % share of total element width	The ventilation window's static values (enter figures from offer) With no air circulation through the window (0.0 l/s) (0.0 m³/t)		The ventilation window's equivalent values for mechanical ventilation (supply air volume per vent) 3.9 l/s 14.0 m³/t		The ventilation window's glazing factor (f_f) + equivalent E_w-values		Screening factor Enter shading coefficient as screening factor
Mandatory basic air exchange rate (cf. BR18) for ventilation (0.3 l/s/m²) 1.08 m³/t/m²: 46.5 l/s/m2 / 167.4 m³/t										
Offer/order position ID	Dimensions Width	Height	No. of CWT vents in the window element	(%)	U_w-value [W/k m²]	g_g-value	U_w-value [W/k m²]	g_g-value	f_f	E_w	NB: Set X in "Kun sommer" (summer only)
West – bedroom	70	127	2	100	0.85	0.63	0.37	0.69	0.78	71.6	0.92
West – living room	150	212	2	50	0.80	0.63	0.53	0.66	0.89	66.1	0.96
East – living room	90	212	2	75	0.81	0.63	0.41	0.67	0.84	74.3	0.94
East – room	107	127	2	100	0.85	0.63	0.37	0.69	0.69	58.5	0.92
East – room	107	127	2	100	0.85	0.63	0.37	0.69	0.69	58.5	0.92
East – office	107	127	2	100	0.85	0.63	0.37	0.69	0.69	58.5	0.92
Total no. of CWT vents			12								

Screening factor

Enter shading coefficient as screening factor in “Skygger” (Shade), table 1.
NB: Set X or ÷ before the figures entered under “Kun sommer” (summer only).

Enter screening factor in BE18

Calculating the equivalent U- and g-values for ventilation windows with CWT valve tech-nology (Input data from LivingBetter offer/order confirmation is typed in blue)						Output data (enter in Energy calculation)				
The residential unit's gross area 155 m²		Differential pressure in the building (Pa) 13.7 --- Recommended 12 - 16 Pa	The ventilation window's % share of total element width	The ventilation window's static values (enter figures from offer) With no air circulation through the window (0.0 l/s) (0.0 m³/t)		The ventilation window's equivalent values for mechanical ventilation (supply air volume per vent) 3.9 l/s 14.0 m³/t		The ventilation window's glazing factor (f_f) + equivalent E_w-values		Screening factor Enter shading coef-ficient as screening factor
Mandatory basic air exchange rate (cf. BR18) for ventilation (0.3 l/s/m²) 1.08 m³/t/m²: 46.5 l/s/m2 / 167.4 m³/t										
Offer/order position ID	Dimensions Width Height	No. of CWT vents in the window element	(%)	U_w-value [W/k m²]	g_g-value	U_w-value [W/k m²]	g_g-value	f_f	E_w	NB: Set X in “Kun sommer” (summer only)
West – bedroom	70 127	2	100	0.85	0.63	0.37	0.69	0.78	71.6	0.92
West – living room	150 212	2	50	0.80	0.63	0.53	0.66	0.89	66.1	0.96
East – living room	90 212	2	75	0.81	0.63	0.41	0.67	0.84	74.3	0.94
East – room	107 127	2	100	0.85	0.63	0.37	0.69	0.69	58.5	0.92
East – room	107 127	2	100	0.85	0.63	0.37	0.69	0.69	58.5	0.92
East – office	107 127	2	100	0.85	0.63	0.37	0.69	0.69	58.5	0.92
Total no. of CWT vents		12								

Dynamic U-values_width-corrected:

If the area of the ventilation window is less than 100%, enter the static U- and g-values for that part of the window that is a standard element. These values are stated in LivingBetter's quote/order confirmation.

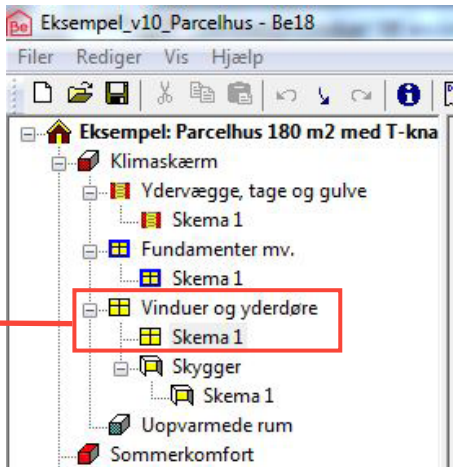
Calculating the equivalent U- and g-values for ventilation windows with CWT valve tech-nology (Input data from LivingBetter offer/order confirmation is typed in blue)						Output data (enter in Energy calculation)				
The residential unit's gross area 155 m²		Differential pressure in the building (Pa) 13.7 --- Recommended 12 - 16 Pa	The ventilation window's % share of total element width	The ventilation window's static values (enter figures from offer) With no air circulation through the window (0.0 l/s) (0.0 m³/t)		The ventilation window's equivalent values for mechanical ventilation (supply air volume per vent) 3.9 l/s 14.0 m³/t		The ventilation window's glazing factor (f_f) + equivalent E_w-values		Screening factor Enter shading coef-ficient as screening factor
Mandatory basic air exchange rate (cf. BR18) for ventilation (0.3 l/s/m²) 1.08 m³/t/m²: 46.5 l/s/m2 / 167.4 m³/t										
Offer/order position ID	Dimensions Width Height	No. of CWT vents in the window element	(%)	U_w-value [W/k m²]	g_g-value	U_w-value [W/k m²]	g_g-value	f_f	E_w	NB: Set X in “Kun sommer” (summer only)
West – bedroom	70 127	2	100	0.85	0.63	0.37	0.69	0.78	71.6	0.92
West – living room	150 212	2	50	0.80	0.63	0.53	0.66	0.89	66.1	0.96
East – living room	90 212	2	75	0.81	0.63	0.41	0.67	0.84	74.3	0.94
East – room	107 127	2	100	0.85	0.63	0.37	0.69	0.69	58.5	0.92
East – room	107 127	2	100	0.85	0.63	0.37	0.69	0.69	58.5	0.92
East – office	107 127	2	100	0.85	0.63	0.37	0.69	0.69	58.5	0.92
Total no. of CWT vents		12								

The static values for windows and doors **without** ventilation are stated in LivingBetter's offer/order confirmation (see individual positions).

ENTER EQUIVALENT INPUT DATA

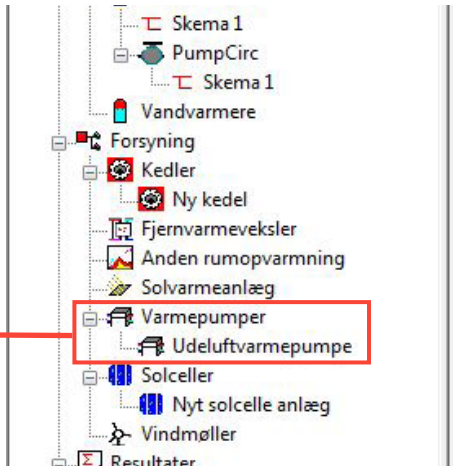
The BE18 program:
Input data equivalent
U- and g-values

VENTILATIONSVINDUET



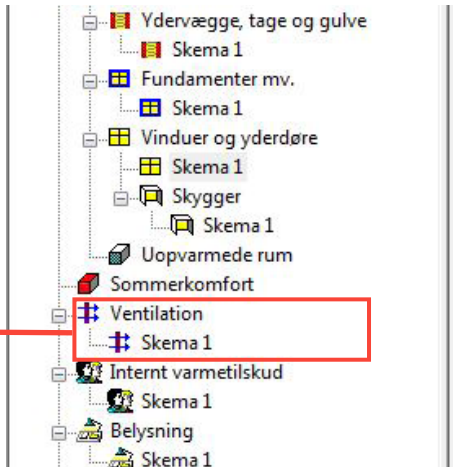
The BE18 program:
Input data values
heat pump

IKM IndeKlimaMiljø



The BE18 program:
Input data values
ventilation

IKM IndeKlimaMiljø

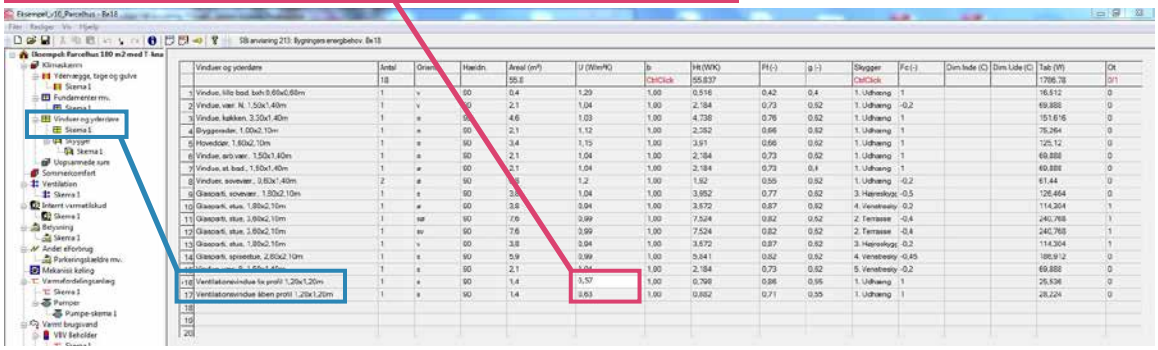


THE BE18 PROGRAM:

Enter the windows' energy parameters in the "Vinduer og yderdøre" (Windows and outside doors) folder.

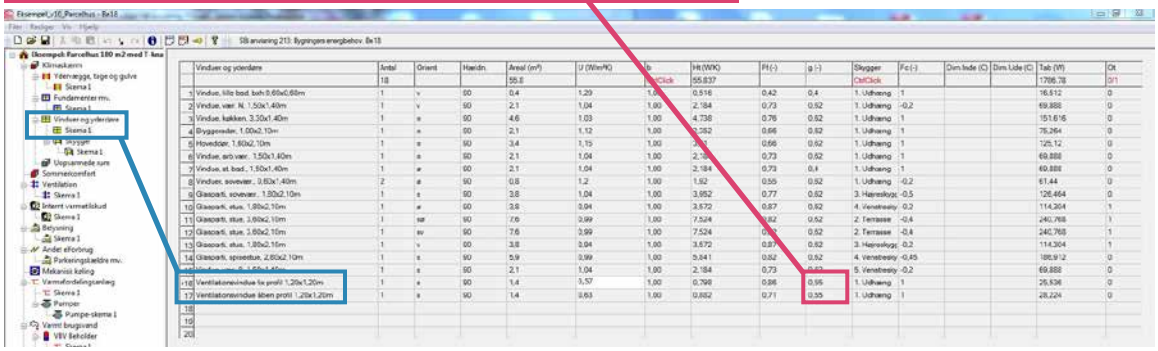
Calculate **U-value** equivalent as instructed in SBI 213 and enter in column U (W/m2-K)

Stated in the table at the back of the LivingBetter's offer/order confirmation



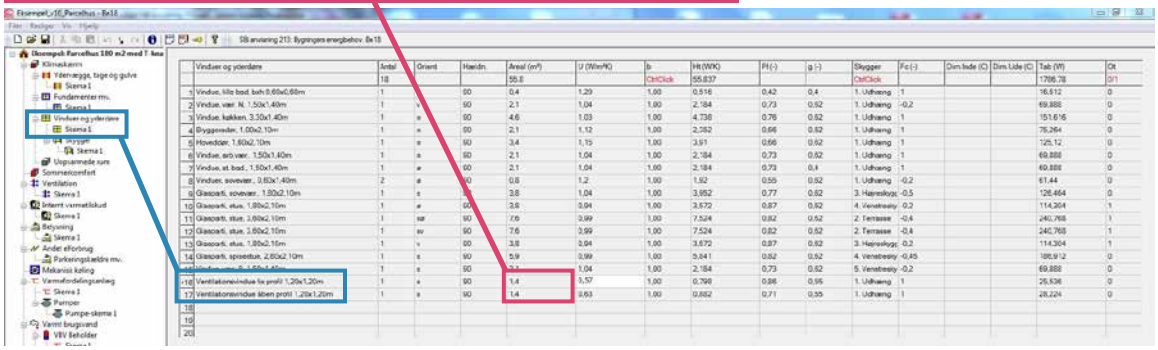
Calculate **g-value** equivalent as instructed in SBI 213 and enter in column g

Stated in the table at the back of the LivingBetter's offer/order confirmation



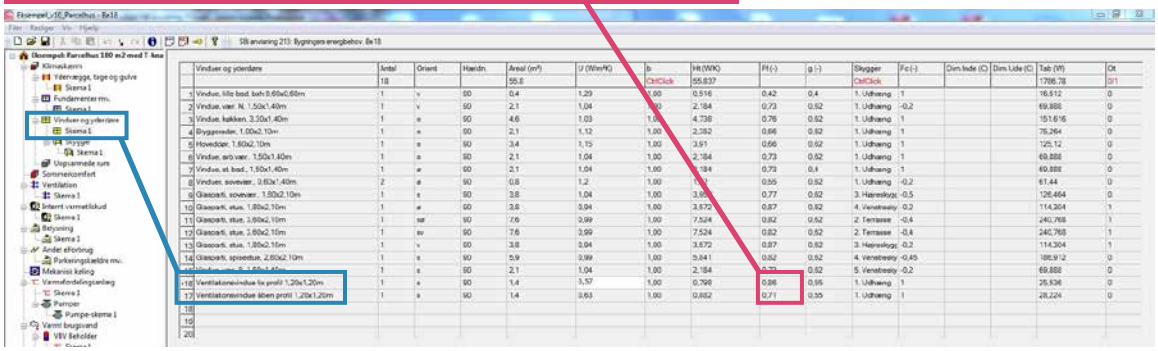
Area (m2) is the gross window area (stated in the offer)

Stated in the table at the back of the LivingBetter's offer/order confirmation



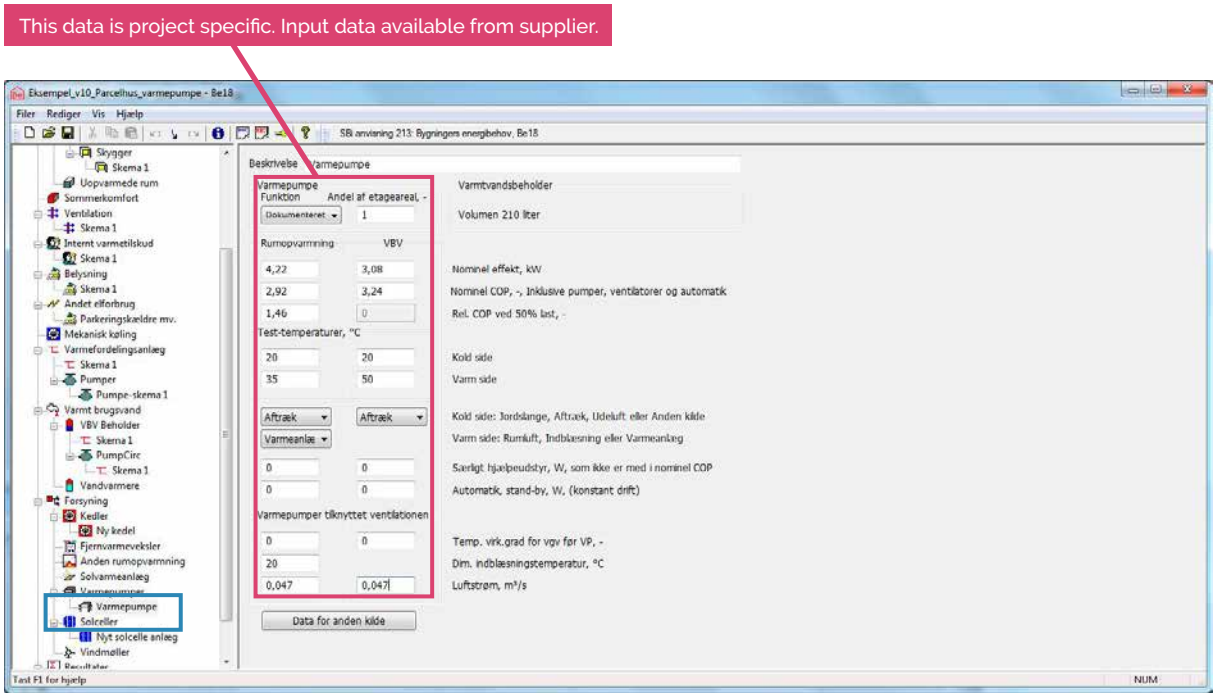
Ff (-) is the window's glazing factor (%). Calculated as area of glass/gross area

Stated in the table at the back of the LivingBetter's offer/order confirmation

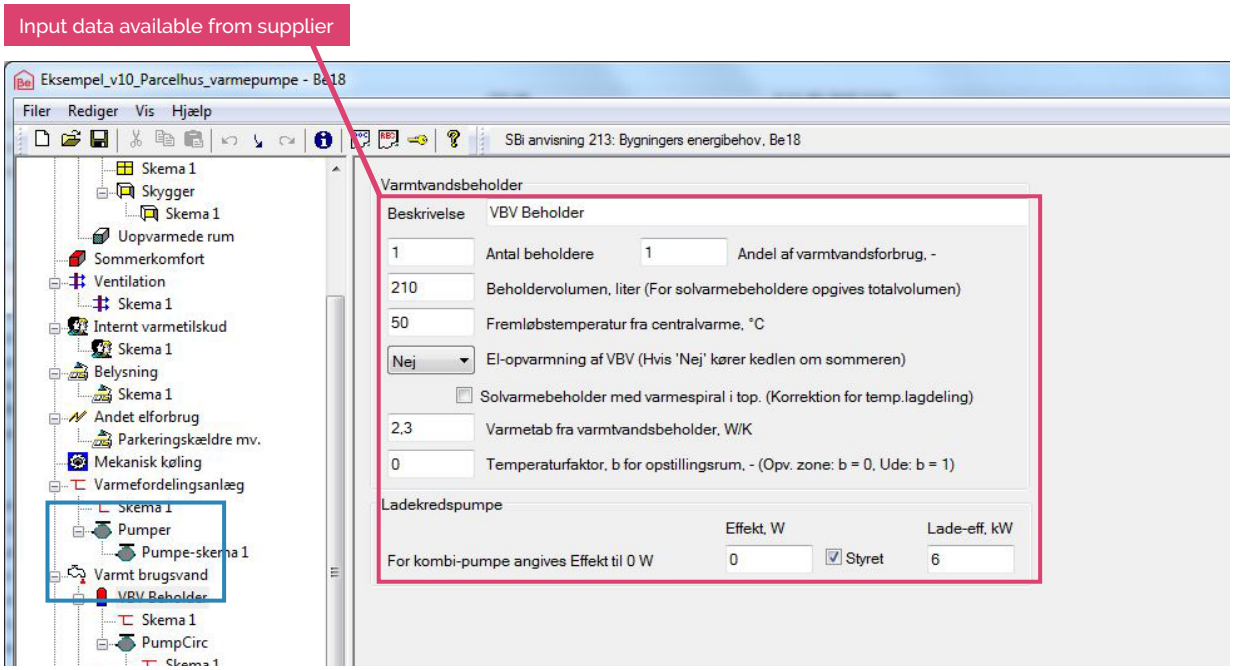


THE BE18 PROGRAM:

Heat pumps:
Enter the heat pump's energy parameters in the table in the "Varmepumper" (Heat pumps) folder.



Domestic hot water:
Enter the heat pump's hot water tank data and (if relevant) circulation pumps and distribution data in the VBV Beholder (Domestic hot water tank) and PumpCirc tables respectively, in the "Varmt brugsvand" (Domestic hot water) folder.



THE BE18 PROGRAM:

Ventilation:
Enter project-specific calculated values in the table in the “Ventilation” folder.