Be15 model: be 15 kindegarden Date 8.01.2017 19.27

| Ny Dyginstitution i Kragelund | |
|---|---|
| BBR-no | |
| Owner | |
| Address | |

| The building | |
|---|---|
| Building type | Other |
| Rotation | 356.0 deg |
| Area of heated floor | 624.0 m² |
| Area heated basement | 0.0 m² |
| Area existing / other usage | 0.0 m² |
| Heated gross area incl. basement | 624.0 m² |
| Heat capacity | 120.0 Wh/K m² |
| Normal usage time | 45 hours/week |
| Usage time, start at - end at, time | 7 - 16 |

| Calculation rules | |
|---|---|
| Calculation rules | BR: Actual conditions |
| Suplement to energy frame | 0.0 kWh/m² år |

| Heat supply and cooling | |
|---|---|
| Basic heat supply | District heating |
| Electric panels | No |
| Wood stoves, gas radiators etc. | No |
| Solar heating plant | No |
| Heat pumps | No |
| Solar cells | Yes |
| Wind mills | No |
| Mechanical cooling | No |

| Room temperatures, set points | |
|---|---|
| Heating | 20.0 °C |
| Wanted | 23.0 °C |
| Natural ventilation | 24.0 °C |
| Mechanical cooling | 25.0 °C |

| Room temperatures, set points | |
|---|---|
| Heating store | 15.0 °C |

| Dimensioning temperatures | |
|---|---|
| Room temp. | 20.0 °C |
| Outdoor temp. | -12.0 °C |
| Room temp. store | 15.0 °C |

| External walls, roofs and floors | | | | | |
|---|---|---|---|---|---|
| Building component | Area (m²) | U (W/m²K) | b | Dim.Inside (C) | Dim.Outside (C) |
| External wall | 226.2 | 0.15 | 1.000 | 20 | -12 |
| External wall next to unheated rooms | 74.0 | 0.15 | 0.700 | 20 | -12 |
| Flat roof | 652.0 | 0.10 | 1.000 | 20 | -12 |
| Traingle roof | 78.0 | 0.10 | 1.000 | 20 | -12 |
| Skylight roof | 63.6 | 0.10 | 1.000 | 20 | -12 |
| Ground floor slab with floor heating | 552.2 | 0.10 | 1.000 | 30 | 10 |
| Ground fæppr slab at the entrance | 8.5 | 0.10 | 0.700 | 30 | 10 |
| Ground floor slab in unheated rooms | 69.8 | 0.10 | 0.700 | 30 | 10 |
| Ialt | 1724.3 | - | - | - | - |

| Foundations etc. | | | | | |
|---|---|---|---|---|---|
| Building component | l (m) | Loss (W/mK) | b | Dim.Inside (C) | Dim.Outside (C) |
| External wall foundation | 213.3 | 0.13 | 1.000 | 20 | -12 |
| Joints at windows and doors | 120.0 | 0.03 | 1.000 | | -12 |
| | 0.0 | 0.00 | 0.000 | | |
| | 0.0 | 0.00 | 0.000 | | |
| | 0.0 | 0.00 | 0.000 | | |
| Ialt | 333.3 | - | - | - | - |

| Windows and outer doors | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Building component | Number | Orient | Inclination | Area (m²) | U (W/m²K) | b | Ff (-) | g (-) | Shading | Fc (-) | Dim.Inside (C) | Dim.Outside (C) | Ext |
| Window on north site 700*700 | 5 | N | 90.0 | 2.3 | 0.70 | 1.000 | 0.70 | 0.47 | Window 700*700 n | 0.77 | 20 | -12 | 0 |
| Window on north site 1000*1000 | 3 | N | 90.0 | 4.0 | 0.70 | 1.000 | 0.70 | 0.47 | Window 1000*1000 s | 0.77 | 20 | -12 | 0 |

| Windows and outer doors | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Window on north site 1500*1500 | 1 | N | 90.0 | 2.1 | 0.70 | 1.000 | 0.70 | 0.47 | Window 1500*1500 s | 0.77 | 20 | -12 | 0 |
| Window on north site with door 1200*2145 | 3 | N | 90.0 | 13.5 | 0.70 | 1.000 | 0.70 | 0.47 | Window with door | 0.77 | 20 | -12 | 0 |
| Door on north site | 1 | N | 90.0 | 1.7 | 0.70 | 1.000 | 0.70 | 0.47 | Window with door | 0.77 | 20 | -12 | 0 |
| Window on east site 700*700 | 1 | E | 90.0 | 0.5 | 0.70 | 1.000 | 0.70 | 0.47 | Window 700*700 s | 0.77 | 20 | -12 | 0 |
| Window on east stie 1000*1000 | 2 | E | 90.0 | 2.0 | 0.70 | 1.000 | 0.70 | 0.47 | Window 1000*1000 s | 0.77 | 20 | -12 | 0 |
| Window on east stie with door | 1 | E | 90.0 | 4.5 | 0.70 | 1.000 | 0.70 | 0.47 | Window with door | 0.77 | 20 | -12 | 0 |
| Door on east stite 912*2145 | 1 | E | 90.0 | 1.9 | 0.70 | 1.000 | 0.70 | 0.47 | Window with door | 0.77 | 20 | -12 | 0 |
| | 1 | E | 90.0 | 0.0 | 0.70 | 1.000 | 0.70 | 0.47 | Glass facade | 0.70 | 20 | -12 | 0 |
| Window on south site 700*700 | 2 | S | 90.0 | 1.0 | 0.70 | 1.000 | 0.70 | 0.47 | Window 700*700 s | 0.77 | 20 | -12 | 0 |
| Window on south site 1000*1000 | 3 | S | 90.0 | 3.0 | 0.70 | 1.000 | 0.70 | 0.47 | Window 1000*1000 s | 0.77 | 20 | -12 | 0 |
| Window with door 1200*2145 | 1 | S | 90.0 | 1.7 | 0.70 | 1.000 | 0.70 | 0.47 | Window 1500*1500 s | 0.77 | 20 | -12 | 0 |
| | 0 | | 0.0 | 0.0 | 0.00 | 0.000 | 0.00 | 0.47 | Window with door | 0.00 | | | 0 |
| Glass facade on south site | 1 | S | 90.0 | 55.0 | 0.70 | 1.000 | 0.70 | 0.47 | Glass facade | 0.77 | 20 | -12 | 0 |
| Window on vest site 700*700 | 1 | V | 90.0 | 0.5 | 0.70 | 1.000 | 0.70 | 0.25 | Window 700*700 s | 0.77 | 20 | -12 | 0 |
| Window on vest site 1000*1000 | 1 | V | 90.0 | 1.0 | 0.70 | 1.000 | 0.70 | 0.47 | Window 1000*1000 s | 0.77 | 20 | -12 | 0 |
| Window on vest site 1500*1500 | 2 | V | 90.0 | 4.5 | 0.70 | 1.000 | 0.70 | 0.47 | Window 1000*1000 s | 0.77 | 20 | -12 | 0 |

| Windows and outer doors | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Skylight | 4 | S | 45.0 | 38.0 | 0.70 | 1.000 | 0.70 | 0.25 | Glass facade | 0.77 | 20 | -12 | 0 |
| | 1 | V | 90.0 | 0.0 | 0.00 | 1.000 | 0.70 | 0.47 | Glass facade | 0.77 | 20 | -12 | 0 |
| Ialt | 35 | - | - | 309.1 | - | - | - | - | - | - | - | - | |

| Shading | | | | | |
|---|---|---|---|---|---|
| Description | Horizon (°) | Eaves (°) | Left (°) | Right (°) | Window opening (%) |
| Glass facade | 0 | 55 | 0 | 0 | 10 |
| Window 700*700 s | 0 | 55 | 0 | 0 | 10 |
| Window 1000*1000 s | 15 | 55 | 0 | 0 | 10 |
| Window 1500*1500 s | 15 | 55 | 0 | 0 | 10 |
| Window with door | 15 | 55 | 0 | 0 | 10 |
| Window 700*700 n | 15 | 55 | 0 | 0 | 10 |

| Summer comfort | |
|---|---|
| Floor area | 0.0 m² |
| Ventilation, winther | 0.0 l/s m² |
| Ventilation, summer, 9-16 | 0.0 l/s m² |
| Ventilation, summer, 17-24 | 0.0 l/s m² |
| Ventilation, summer, 0-8 | 0.6 l/s m² |

| Ventilation | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Zone | Area (m²) | Fo, - | qm (l/s m²), Winter | n vgv (-) | ti (°C) | El-HC | qn (l/s m²), Winter | qi,n (l/s m²), Winter | SEL (kJ/m³) | qm,s (l/s m²), Summer | qn,s (l/s m²), Summer | qm,n (l/s m²), Night | qn,n (l/s m²), Night |
| Mechanical ventilation 1 | 38.0 | 0.70 | 1.77 | 0.90 | 18.0 | No | 0.13 | 0.09 | 1.8 | 1.77 | 0.13 | 0.00 | 0.09 |
| Mechanical ventilation 2 | 11.0 | 0.70 | 1.89 | 0.90 | 18.0 | No | 0.13 | 0.09 | 1.8 | 1.89 | 0.13 | 0.00 | 0.09 |
| Mechancal ventilation 3 | 11.0 | 0.70 | 1.89 | 0.90 | 18.0 | No | 0.13 | 0.09 | 1.8 | 1.89 | 0.13 | 0.00 | 0.09 |
| Mechanical ventilation 4 | 22.0 | 0.70 | 1.75 | 0.90 | 18.0 | No | 0.13 | 0.09 | 1.8 | 1.75 | 0.13 | 0.00 | 0.09 |
| Mechanical ventilation 5 | 52.0 | 0.70 | 1.71 | 0.90 | 18.0 | No | 0.13 | 0.09 | 1.8 | 1.71 | 0.13 | 0.00 | 0.09 |
| Mechanical ventilation 6 | 0.0 | 0.00 | 0.00 | 0.90 | 0.0 | No | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mechanical ventilation 7 | 40.0 | 0.70 | 1.70 | 0.90 | 18.0 | No | 0.13 | 0.09 | 1.8 | 1.70 | 0.13 | 0.00 | 0.09 |

| Ventilation | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mechanical ventilation 8 | 31.0 | 0.70 | 1.64 | 0.90 | 18.0 | No | 0.13 | 0.09 | 1.8 | 1.64 | 0.13 | 0.00 | 0.09 |
| Mechanical ventilation 9 | 60.0 | 0.70 | 2.55 | 0.90 | 18.0 | No | 0.13 | 0.09 | 1.8 | 2.50 | 0.13 | 0.00 | 0.09 |
| Mechanical ventilation 10 | 17.0 | 0.70 | 1.70 | 0.90 | 18.0 | No | 0.13 | 0.09 | 1.8 | 1.70 | 0.13 | 0.00 | 0.09 |
| Mechanical ventilation 11 | 40.0 | 0.70 | 1.82 | 0.90 | 18.0 | No | 0.13 | 0.09 | 1.8 | 1.82 | 0.13 | 0.00 | 0.09 |
| Mechanical ventilation 12 | 18.0 | 0.70 | 1.62 | 0.90 | 18.0 | No | 0.13 | 0.09 | 1.8 | 1.62 | 0.13 | 0.00 | 0.09 |
| Mechanical ventilation 14 | 44.0 | 0.70 | 1.82 | 0.90 | 18.0 | No | 0.13 | 0.09 | 1.8 | 1.82 | 0.13 | 0.00 | 0.09 |
| Mechanical ventilation 15 | 64.0 | 0.70 | 1.72 | 0.90 | 18.0 | No | 0.13 | 0.09 | 1.8 | 1.72 | 0.13 | 0.00 | 0.09 |
| Mechanical ventilation 16 | 26.0 | 0.70 | 1.69 | 0.90 | 18.0 | No | 0.13 | 0.09 | 1.8 | 1.69 | 0.13 | 0.00 | 0.09 |

| Internal heat supply | | | | |
|---|---|---|---|---|
| Zone | Area (m²) | Persons (W/m²) | App. (W/m²) | App,night (W/m²) |
| Whole building | 624 | 1.5 | 3.5 | 0.0 |
| | 0 | 0.0 | 0.0 | 0.0 |
| | 0 | 0.0 | 0.0 | 0.0 |
| | 0 | 0.0 | 0.0 | 0.0 |
| | 0 | 0.0 | 0.0 | 0.0 |

| Lighting | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Zone | Area (m²) | General (W/m²) | General (W/m²) | Lighting (lux) | DF (%) | Control (U, M, A, K) | Fo (-) | Work (W/m²) | Other (W/m²) | Stand-by (W/m²) | Night (W/m²) |
| Building | 624.0 | 1.0 | 2.0 | 200 | 3.00 | M | 0.90 | 1.0 | 0.0 | 0.0 | 0.0 |
| Kontorer mv. langs bagvæg | 0.0 | 0.0 | 0.0 | 0 | 0.00 | K | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 |
| Reception og venteområde, langs facade | 0.0 | 0.0 | 0.0 | 0 | 0.00 | K | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gangareal | 0.0 | 0.0 | 0.0 | 0 | 0.00 | U | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 |
| Toiletter | 0.0 | 0.0 | 0.0 | 0 | 0.00 | A | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 |

| Other el. consumption | |
|---|---|
| Outdoor lighting | 0.0 W |
| Spec. apparatus, during service | 0.0 W |
| Spec. apparatus, always | 0.0 W |

| Basement car parkings etc. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Zone | Area (m²) | General (W/m²) | General (W/m²) | Lighting (lux) | DF (%) | Control (U, M, A, K) | Fo (-) | Work (W/m²) | Other (W/m²) | Stand-by (W/m²) | Night (W/m²) |

| Mechanical cooling | |
|---|---|
| Description | Mekanisk køling |
| Share of floor area | 0 |
| El-demand | 0.50 kWh-el/kWh-cool |
| Heat-demand | 0.00 kWh-heat/kWh-cool |
| Load factor | 0 |
| Heat capacity phase shift (cooling) | 0 Wh/m² |
| Increase factor | 1.50 |
| Documentation | |

| Heat distribution plant | | | | | |
|---|---|---|---|---|---|
| **Composition and temperature** | | | | | |
| Supply pipe temperature | 60.0 °C | | | | |
| Return pipe temperature | 45.0 °C | | | | |
| Type of plant | 2-string | | | Anlægstype | |
| **Pumps** | | | | | |
| Pump type | Description | Number | | Pnom | Fp |
| Constant service all year | | 1 | | 0.0 W | 0.00 |
| Constant service during heating season | | 1 | | 0.0 W | 0.00 |
| Time-controlled service during heating season | Behovsstyret pumpe | 1 | | 75.0 W | 0.60 |
| Combi-pump (const. during heating season) | | 1 | | 0.0 W | 0.00 |
| **Heating pipes** | | | | | |
| Pipe lengths in supply and return | l (m) | Loss (W/mK) | b | Outdoor comp (J/N) | Unused summer (J/N) |

| Domestic hot water | |
|---|---|
| Description | Varmt brugsvand |
| Hot-water consumption, average for the building | 100.0 litre/year per m² of floor area |
| Domestic hot water temp. | 55.0 °C |
| **Hot-water tank** | |
| Description | VBV Beholder |

| Hot-water tank | |
|---|---|
| Number of hot-water containers | 1.0 |
| Tank volume | 150.0 liter |
| Supply temperature from central heating | 70.0 °C |
| El. heating of DHW | No |
| Solar heat tank with heating coil | No |
| Heat loss from hot-water tank | 2.3 W/K |
| Temp. factor for setup room | 0.0 |

| Charging pump | |
|---|---|
| Effect | 50.0 W |
| Controled | Yes |
| Charge effect | 10.0 kW |

| Heat loss from connector pipe to DHW tank | | | |
|---|---|---|---|
| Length | Loss | b | Description |
| 2.0 m | 0.2 W/K | 0.00 | Varmerør 1" |
| 0.0 m | 0.0 W/K | 0.00 | |

| Cirkulating pump for DHW | |
|---|---|
| Description | PumpCirc |
| Number | 1.0 |
| Effect | 0.0 W |
| Number | 0.0 |
| Effect | 0.0 W |
| Reduction factor | 1.00 W |
| El. tracing of discharge water pipe | No |

| Domestic hot water discharge pipes | | | |
|---|---|---|---|
| Pipe lengths in supply and return | l (m) | Loss (W/mK) | b |
| | 0.0 | 0.00 | 0.000 |

| Water heaters | |
|---|---|
| **Electric water heater** | |
| Description | Elvandvarmer |
| Share of DHW in separate el. water heaters | 0.0 |

| Electric water heater | |
|---|---|
| Heat loss from hot-water tank | 0.0 W/K |
| Temp. factor for setup room | 0.00 |

| Gas water heater | |
|---|---|
| Description | Gasvandvarmer |
| Share of DHW in separate gas water heaters | 0.0 |
| Heat loss from hot-water tank | 0.0 W/K |
| Efficiency | 0.0 |
| Pilot flame | 0.0 W |
| Temp. factor for setup room | 0.00 |

| Boiler | |
|---|---|
| Description | God kondenserende gaskedel |
| Fuel | Gas |
| Number of boilers | 1 |
| Nominal effect | 28.0 kW |
| Share of nominal effect for DHW production, - | 1.0 |

| Nominal efficiencies | | | | |
|---|---|---|---|---|
| Type | Load | Efficiency | Boiler temp. | Correction |
| Full load | 1.0 | 0.96 | 70.0 °C | 0.001 -/°C |
| Partial load | 0.3 | 1.05 | 35.0 °C | 0.001 -/°C |

| Idle loss | | | | |
|---|---|---|---|---|
| Type | Load | Loss factor | Share for room | Temp. dif. |
| Idle | 0.0 | 0.005 | 0.75 | 30.0 °C |

| Operating | |
|---|---|
| Boiler temp., min | 0.0 °C |
| Temp. factor for setup room | 0.00 |
| Fan | 150.0 W |
| El for automatics | 7.0 W |

| District heat exchanger | |
|---|---|
| Description | Ny fjernvarmeveksler |
| Nominal effect | 55.0 kW |

| District heat exchanger | |
|---|---|
| Heat loss | 1.2 W/K |
| DHW heating through exchanger | No |
| Exchanger temperature, min | 0.0 °C |
| Temp. factor for setup room | 0.00 |
| Automatics, stand-by | 0.0 W |

| Other room heating | |
|---|---|
| **Direct el for room heating** | |
| Description | Supplerende direkte rumopvarmning |
| Share of floor area | 0.0 |
| **Wood stoves, gas radiators etc.** | |
| Description | |
| Share of floor area | 0.0 |
| Efficiency | 0.0 |
| Air flow requirement | 0.0 m³/s |

| Solar heating plant | | |
|---|---|---|
| Description | Nyt solvarmeanlæg | |
| Type | Domestic hot water | |
| **Solar collector** | | |
| Area 0.0 m² | Start 0.8 | - |
| Coefficient of heat loss a1 3.5 W/m²K | Coefficient of heat loss a2 0.0 W/m²K | Anglefactor 0.0 |
| Orientation | Slope 0.0 ° | - |
| Horizon 0.0 ° | Left 0.0 ° | Right 0.0 ° |
| **Solar collector pipe** | | |
| Length 0.0 m | Heat loss 0.00 W/mK | Circuit 0.8 |
| **Electricity** | | |
| Pump in solar collector circuit 0.0 W | Automatics, stand-by 0.0 W | |

| Heat pumps | |
|---|---|
| Description | Ny varmepumpe |
| Type | Domestic hot water |
| Share of heating requirement | 0.0 |
| **El. driven heat pump** | |

| - | Room heating | DHW |
|---|---|---|
| Nominal effect | 0.0 kW | 0.0 kW |
| Nominal COP | 0.00 | 0.00 |
| Rel. COP at 50% load | 0.00 | 0.00 |

| **Test temperatures** | | |
|---|---|---|
| - | Room heating | DHW |
| Cold side | 0.0 °C | 0.0 °C |
| Warm side | 0.0 °C | 0.0 °C |

| **Type** | | |
|---|---|---|
| - | Room heating | DHW |
| Cold side | Earth hose | Earth hose |
| Warm side | Room air | - |

| **Additional** | | |
|---|---|---|
| - | Room heating | DHW |
| Special auxiliary tool | 0.0 W | 0.0 W |
| Automatics, stand-by | 0.0 W | 0.0 W |

| **Heat pumps connected with ventilation** | | |
|---|---|---|
| - | Room heating | DHW |
| Temp. Efficiency for HRV before heat pump | 0.00 | 0.00 |
| Dim. air supply temperature | 0.0 °C | - |
| Air flow requirement | 0.00 m³/s | 0.00 m³/s |

| **Solar cells** | |
|---|---|
| Description | Solar cells on traingle roof |

| **Solar cells** | | |
|---|---|---|
| Area 39.0 m² | Orientation S | Slope 45.0 ° |
| Horizon 0.0 ° | Left 0.0 ° | Right 0.0 ° |

| **Additional** | |
|---|---|
| Peak power 0.180 kW/m² | Efficiency 0.96 |