

表7 - 13 C E C / H W (1) 月間仮想給湯負荷、給湯負荷の計算

| 物 販 店 舗 | UD 1 | ND 1 | UD 2 | ND 2 | UD 3 | ND 3 | UHV | UV | NV |
|-----------------|-----------------------------|------|--|-----------|-----------|-------------------------|-----------|----------------------------------|----------------------------------|
| ホテル・旅館 | RR | UHR | UR | NR | RP | UHP | UP | NP | |
| 病 院 | RB | UHB | UB | NB | | | | | |
| | 0.98 | 290 | 290 | 637 | RUHN * 1 | 1.810E+05 | RUN * 2 | 1.810E+05 | |
| *1 物販店舗等: RUHN= | UDI × ND1+UHV × NV, | | ホテル等: RUHN= RR × UHR × NR+RP × UHP × NP, | | | 病院等: RUHN= RB × UHB × N | | | |
| *2 物販店舗等: RUN = | UDI × ND1+UV × NV, | | ホテル等: RUN = RR × UR × NR+RP × UP × NP, | | | 病院等: RUN= RB × UB × NB | | | |
| 地域名 | 月 | DAYM | VHM | VM | TAM | THSM | TSM | QHSM | QSM |
| 東 京 | 1 | 31 | 5.612E+06 | 5.612E+06 | 5.55 | 7.20 | 7.20 | 8.438E+08 | 8.438E+08 |
| 外気温の 地域記号 | 2 | 28 | 5.069E+06 | 5.069E+06 | 5.10 | 6.82 | 6.82 | 7.703E+08 | 7.703E+08 |
| 18 | 3 | 31 | 5.612E+06 | 5.612E+06 | 8.59 | 9.79 | 9.79 | 7.828E+08 | 7.828E+08 |
| 換算係数 地域番号 | 4 | 30 | 5.431E+06 | 5.431E+06 | 13.89 | 14.30 | 14.30 | 6.547E+08 | 6.547E+08 |
| E | 5 | 31 | 5.612E+06 | 5.612E+06 | 18.73 | 18.42 | 18.42 | 5.794E+08 | 5.794E+08 |
| 係数 a | 6 | 30 | 5.431E+06 | 5.431E+06 | 21.90 | 21.12 | 21.12 | 4.991E+08 | 4.991E+08 |
| 0.8516 | 7 | 31 | 5.612E+06 | 5.612E+06 | 25.21 | 23.94 | 23.94 | 4.493E+08 | 4.493E+08 |
| 係数 b | 8 | 31 | 5.612E+06 | 5.612E+06 | 26.53 | 25.07 | 25.07 | 4.226E+08 | 4.226E+08 |
| 2.473 | 9 | 30 | 5.431E+06 | 5.431E+06 | 23.15 | 22.19 | 22.19 | 4.747E+08 | 4.747E+08 |
| TH | 10 | 31 | 5.612E+06 | 5.612E+06 | 17.47 | 17.35 | 17.35 | 6.046E+08 | 6.046E+08 |
| 番号 | 11 | 30 | 5.431E+06 | 5.431E+06 | 12.70 | 13.29 | 13.29 | 6.777E+08 | 6.777E+08 |
| 43 | 12 | 31 | 5.612E+06 | 5.612E+06 | 8.09 | 9.36 | 9.36 | 7.929E+08 | 7.929E+08 |
| 方法 | RUHN × * 3 | | RUN × * 3 | | 表 7 - 3 | a × + b | 設定温 | $4.2 \times$ $\times (TH -)$ | $4.2 \times$ $\times (TH -)$ |
| *2 | VHPSMのある時はRUHN × + VHPSMとする | | VHD * 4 | | 1.810E+05 | QHSM | 7.552E+09 | QSM | 7.552E+09 |
| *3 | VPSMのある時はRUN × + VPSMとする | | | | | | | | |
| *4 | x / | | | | | | | | |

表7 - 14 C E C / H W (2) - 1 月間先止まり配管損失熱量の計算

| 管種、管径 | U Y k | Y k | U Y k Y k | 月 | D A Y M | V Y M | T S M | Q Y M |
|----------------------|--------|-----------|-----------|-----|---------|-------------------|-------|-------------------------------|
| 中央棟病室系_Z u - L__2 0 | 0.312 | 588.000 | 183.456 | 1 | 31 | 22603.000 | 7.20 | 5.012E+06 |
| 中央棟病室以外_Z u - L__2 5 | 0.533 | 480.000 | 255.840 | 2 | 28 | 20416.000 | 6.82 | 4.560E+06 |
| 外来棟_Z u - L__2 0 | 0.312 | 150.000 | 46.800 | 3 | 31 | 22603.000 | 9.79 | 4.767E+06 |
| | | | | 4 | 30 | 21874.000 | 14.30 | 4.198E+06 |
| | | | | 5 | 31 | 22603.000 | 18.42 | 3.947E+06 |
| | | | | 6 | 30 | 21874.000 | 21.12 | 3.572E+06 |
| | | | | 7 | 31 | 22603.000 | 23.94 | 3.423E+06 |
| | | | | 8 | 31 | 22603.000 | 25.07 | 3.316E+06 |
| | | | | 9 | 30 | 21874.000 | 22.19 | 3.474E+06 |
| | | | | 10 | 31 | 22603.000 | 17.35 | 4.049E+06 |
| | | | | 11 | 30 | 21874.000 | 13.29 | 4.291E+06 |
| | | | | 12 | 31 | 22603.000 | 9.36 | 4.807E+06 |
| 番 号 | | | | 番 号 | | | | |
| 方 法 | 表7 - 8 | | x | 方 法 | * 1 | 表7 - 13 | | $4.2 \times \times (T P -)$ |
| T P | 60 | | | | * 1 | N Y x U Y k Y k x | | |
| N Y | 1.5 | U Y k Y k | 486.096 | | | Q Y M | | 4.942E+07 |

表7 - 15 C E C / H W計算表 (3) - 1 給湯配管・熱交換器一次側配管、貯湯槽熱損失係数、間欠運転に伴う損失の計算

| 部 位 | i (ゾ-ン) | j (管径、管種) | U L i j | V L i j | L i j | U L L i j | V L L i j |
|------------|---------|----------------|---------|---------|--------|-----------|-----------|
| 給湯配管系 P | 3 | 2 0__Z u - L | 0.231 | | 4.7 | 1.086 | |
| " P | 3 | 2 5__Z u - L | 0.270 | | 124.7 | 33.669 | |
| " P | 3 | 3 2__Z u - L | 0.308 | | 305.4 | 94.063 | |
| " P | 3 | 4 0__Z u - L | 0.346 | | 327.4 | 113.280 | |
| " P | 3 | 5 0__Z u - L | 0.420 | | 1072.1 | 450.282 | |
| " P | 3 | 6 5__Z u - L | 0.493 | | 358.7 | 176.839 | |
| " P | 3 | 8 0__Z u - L | 0.565 | | 27.7 | 15.650 | |
| " P | 3 | 1 0 0__Z u - L | 0.606 | | 135.0 | 81.810 | |
| " V + F | 3 | 2 5__Z u - L | 1.077 | | 6.0 | 6.462 | |
| " V + F | 3 | 3 2__Z u - L | 1.316 | | 27.0 | 35.532 | |
| " V + F | 3 | 4 0__Z u - L | 1.556 | | 6.0 | 9.336 | |
| " V + F | 3 | 5 0__Z u - L | 2.035 | | 37.5 | 76.313 | |
| " V + F | 3 | 6 5__Z u - L | 2.514 | | 10.5 | 26.397 | |
| " V + F | 3 | 8 0__Z u - L | 2.993 | | 1.5 | 4.490 | |
| " V + F | 3 | 1 0 0__Z u - L | 3.950 | | 3.0 | 11.850 | |
| U L L 3 小計 | | | | | | 1137.059 | 0.000 |
| 熱源系行き管 P | 1 | 8 0__S G P | 0.387 | | 10.0 | 3.870 | |
| " P | 1 | 1 0 0__S G P | 0.466 | | 10.0 | 4.660 | |
| " V + F | 1 | 8 0__S G P | 3.359 | | 1.5 | 5.039 | |
| " V + F | 1 | 1 0 0__S G P | 4.309 | | 4.5 | 19.391 | |
| 熱源系還り管 P | 1 | 3 2__S G P | 0.354 | | 8.0 | 2.832 | |

CEC/HW計算表(3)-2 給湯配管・熱交換器一次側配管、貯湯槽熱損失係数、間欠運転に伴う損失の計算

| 部 位 | i (ゾ-ン) | j (管径、管種) | ULij | VLi j | Li j | ULLij | VLLij |
|-------|---------|-----------|-------|-------|------|--------|-------|
| " P | 1 | 40_SGP | 0.388 | | 5.0 | 1.940 | |
| " P | 1 | 50_SGP | 0.457 | | 10.0 | 4.570 | |
| " V+F | 1 | 32_SGP | 1.610 | | 6.0 | 9.660 | |
| " V+F | 1 | 40_SGP | 1.832 | | 3.0 | 5.496 | |
| " V+F | 1 | 50_SGP | 2.281 | | 3.0 | 6.843 | |
| ULL1 | 小計 | | | | | 64.301 | 0.000 |

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方 法

表7-10 表7-8

× ×

| | i (ゾ-ン) | RT | CT*1 | ST | CST*2 | VT | L *3 |
|----------|----------|-------|---------------------|--------|--------|---------------|-----------|
| 貯湯槽 | 1 | 1.786 | 0.527 | 44.0 | 23.192 | 14.000 | 2508.200 |
| | | *1 | CT = 1 / (1/9 + RT) | | *2 | CST = CT × ST | *3 = Li j |
| TR | ULL1 | ULL2 | ULL3 | ULL1Q | ULL2Q | CST | |
| 24 | 64.301 | 0.000 | 1137.059 | 0.000 | 0.000 | 23.192 | |
| T1*4 | VLL1 | VLL2 | VLL3 | VLL1Q | VLL2Q | | |
| 0 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | |
| CT*5 | C1*6 | C2*6 | C3*6 | C1Q*7 | C2Q*7 | | |
| 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | |
| DT *8 | D1*9 | D2*9 | D3*9 | D1Q*10 | D2Q*10 | | |
| 2003.789 | 5555.606 | 0.000 | 98241.898 | 0.000 | 0.000 | | |

*5 CT = 1 - exp(-0.86 × TI × CST / VT)
 *6 Ci = 1 - exp(-0.86 × TI × ULLi / VLLi)
 *7 CkQ = 1 - exp(-0.86 × TI × ULLkQ / VLLkQ)
 *8 DT = 3.6 × TR × CST + 4.2 × CT × VT
 *9 Di = 3.6 × TR × ULLi + 4.2 × Ci × VLLi
 *10 DkQ = 3.6 × TR × ULLkQ + 4.2 × CkQ × VLLkQ

表7 - 1 6 C E C / H W計算表 (4) 月間給湯配管・熱交換器一次側配管、貯湯槽損失熱量の計算

| TP | TT | TQ 1 | TQ 2 | TQ * 1 | D 1 | D 2 | D 3 | D Q 1 | D Q 2 | D T |
|----|----|------|------|--------|-----------|-----------|-----------|-----------|-----------|-----------|
| 60 | 60 | 170 | 80 | 125 | 5.556E+03 | 0.000E+00 | 9.824E+04 | 0.000E+00 | 0.000E+00 | 2.004E+03 |

*1 TQ=(TQ1+TQ2)/2

| 月 | TPA 1 M | TPA 2 M | TPA 3 M | TQAM | TTAM | TP - | TP - | TP - | TQ 1 - | TQ 2 - | TT - |
|----|---------|---------|---------|------|------|---------|---------|---------|--------|--------|------|
| | | | | | | TPA 1 M | TPA 2 M | TPA 3 M | TQAM | TQAM | TTAM |
| 1 | 22 | 5.55 | 13.78 | 22 | 22 | 38 | 54.45 | 46.22 | 148 | 58 | 38 |
| 2 | 22 | 5.10 | 13.55 | 22 | 22 | 38 | 54.90 | 46.45 | 148 | 58 | 38 |
| 3 | 22 | 8.59 | 15.30 | 22 | 22 | 38 | 51.41 | 44.70 | 148 | 58 | 38 |
| 4 | 22 | 13.89 | 17.95 | 22 | 22 | 38 | 46.11 | 42.05 | 148 | 58 | 38 |
| 5 | 22 | 18.73 | 20.36 | 22 | 22 | 38 | 41.27 | 39.64 | 148 | 58 | 38 |
| 6 | 26 | 21.90 | 23.95 | 26 | 26 | 34 | 38.10 | 36.05 | 144 | 54 | 34 |
| 7 | 26 | 25.21 | 25.60 | 26 | 26 | 34 | 34.79 | 34.40 | 144 | 54 | 34 |
| 8 | 26 | 26.53 | 26.27 | 26 | 26 | 34 | 33.47 | 33.73 | 144 | 54 | 34 |
| 9 | 26 | 23.15 | 24.57 | 26 | 26 | 34 | 36.85 | 35.43 | 144 | 54 | 34 |
| 10 | 22 | 17.47 | 19.73 | 22 | 22 | 38 | 42.53 | 40.27 | 148 | 58 | 38 |
| 11 | 22 | 12.70 | 17.35 | 22 | 22 | 38 | 47.30 | 42.65 | 148 | 58 | 38 |
| 12 | 22 | 8.09 | 15.05 | 22 | 22 | 38 | 51.91 | 44.95 | 148 | 58 | 38 |

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方法 表 7 - 1 表 7 - 3 *2 表7-9 表7-9
*2 =(+)/2

| 月 | DAYM | HP 1 M | HP 2 M | HP 3 M | HQ 1 M | HQ 2 M | HTM | Q P M | Q Q M | Q T M |
|----|------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 1 | 31 | 1.722E+05 | 0.000E+00 | 3.045E+06 | 0.000E+00 | 0.000E+00 | 6.212E+04 | 1.473E+08 | 0.000E+00 | 2.360E+06 |
| 2 | 28 | 1.556E+05 | 0.000E+00 | 2.751E+06 | 0.000E+00 | 0.000E+00 | 5.611E+04 | 1.337E+08 | 0.000E+00 | 2.132E+06 |
| 3 | 31 | 1.722E+05 | 0.000E+00 | 3.045E+06 | 0.000E+00 | 0.000E+00 | 6.212E+04 | 1.427E+08 | 0.000E+00 | 2.360E+06 |
| 4 | 30 | 1.667E+05 | 0.000E+00 | 2.947E+06 | 0.000E+00 | 0.000E+00 | 6.011E+04 | 1.303E+08 | 0.000E+00 | 2.284E+06 |
| 5 | 31 | 1.722E+05 | 0.000E+00 | 3.045E+06 | 0.000E+00 | 0.000E+00 | 6.212E+04 | 1.273E+08 | 0.000E+00 | 2.360E+06 |
| 6 | 30 | 1.667E+05 | 0.000E+00 | 2.947E+06 | 0.000E+00 | 0.000E+00 | 6.011E+04 | 1.119E+08 | 0.000E+00 | 2.044E+06 |
| 7 | 31 | 1.722E+05 | 0.000E+00 | 3.045E+06 | 0.000E+00 | 0.000E+00 | 6.212E+04 | 1.106E+08 | 0.000E+00 | 2.112E+06 |
| 8 | 31 | 1.722E+05 | 0.000E+00 | 3.045E+06 | 0.000E+00 | 0.000E+00 | 6.212E+04 | 1.086E+08 | 0.000E+00 | 2.112E+06 |
| 9 | 30 | 1.667E+05 | 0.000E+00 | 2.947E+06 | 0.000E+00 | 0.000E+00 | 6.011E+04 | 1.101E+08 | 0.000E+00 | 2.044E+06 |
| 10 | 31 | 1.722E+05 | 0.000E+00 | 3.045E+06 | 0.000E+00 | 0.000E+00 | 6.212E+04 | 1.292E+08 | 0.000E+00 | 2.360E+06 |
| 11 | 30 | 1.667E+05 | 0.000E+00 | 2.947E+06 | 0.000E+00 | 0.000E+00 | 6.011E+04 | 1.320E+08 | 0.000E+00 | 2.284E+06 |
| 12 | 31 | 1.722E+05 | 0.000E+00 | 3.045E+06 | 0.000E+00 | 0.000E+00 | 6.212E+04 | 1.434E+08 | 0.000E+00 | 2.360E+06 |

番号
方法 * 3 * 4 * 5 * 6 * 7 * 8 * 9 * 1 0 21
* 1 1
* 3 = x D 1 * 4 = x D 2 * 5 = x D 3 * 6 = x D 1 Q * 7 = x D 2 Q * 8 = x D T
* 9 = x + x + x * 1 0 = x + x * 1 1 = x 21 = x

表7 - 17 C E C / H W計算表 (5) 循環ポンプ動力の一次エネルギー - 換算及びC E C / H W計算

| | Q H S M 仮想給湯 負荷 | Q S M 給湯負荷 | Q P M 給湯配管 損失熱量 | Q Y M 先止配管 損失熱量 | Q O M 一次側配管 損失熱量 | Q T M 貯湯槽 損失熱量 | Q M * 1 | | |
|------------------------------|-----------------------|---------------|-----------------------|-----------------------|------------------------|----------------------|---------------|------------------------|--------------------|
| 番号 | 7.552E+09 | 7.552E+09 | 1.527E+09 | 4.942E+07 | 0.000E+00 | 2.681E+07 | 9.155E+09 | | |
| | | | | | | | * 1 = + + + + | | |
| | E H | E B | Q B | E E | E T E | E P E | E T 1 | E P 1 | Q E |
| 番号 | 0.95 | 0.790 | 1280 | 10250 | 3136.9 | 1.800 | 8760 | 0.750 | 1.252E+08 |
| 方法 | | | | | * 2 | | T R x 3 6 5 | | * 3 |
| * 2 = 1 . 5 x / (3600 x x) | | | | | | | | | * 5 = |
| * 3 = E E x (x + x) | | | | | * 4 = / (x) + | | | | |
| 年間給湯消費 エネルギー * 4 | 年間仮想 給湯負荷 * 5 | L * 6 | V H D * 7 | L / V H D * 8 | * 6 表 7 - 1 5 | * 7 表 7 - 1 3 | | C E C / H W 基準値 * 9 | C E C / H W 計算値 |
| 1.232E+10 | 7.552E+09 | 2508.20 | 1.810E+05 | 13.85 | * 8 = 1 x 値 | * 9 表 7 - 1 2 | | 1.70 | 1.632 |