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03-98

- Ripple Fin® tubing
- Eurovent certified
- Selektion based on DT,
- Capacities for R 22, R 134a and R 404A

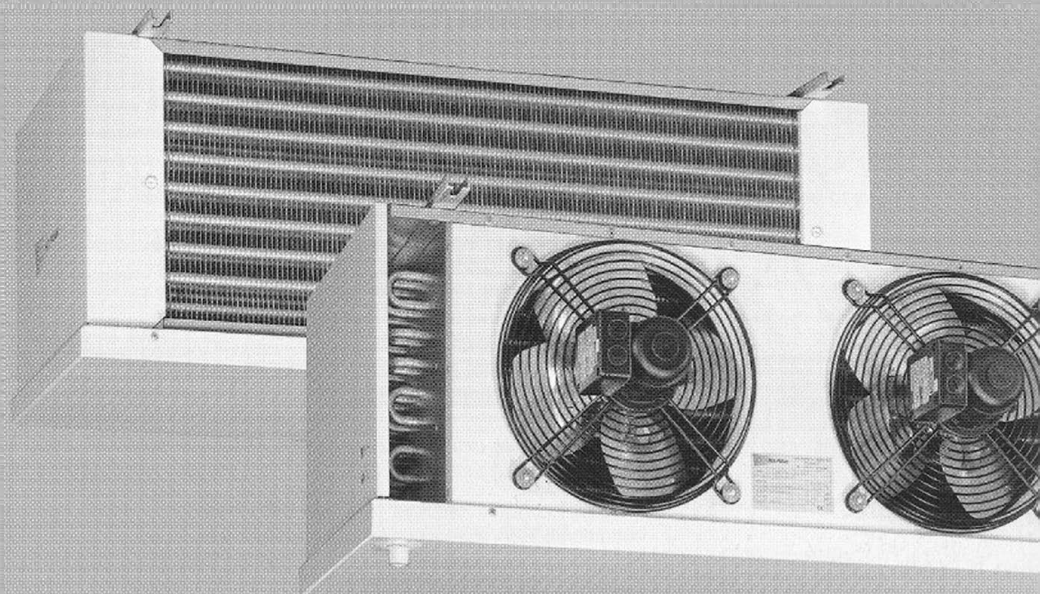


Blow Through **Unit Coolers**

LEX

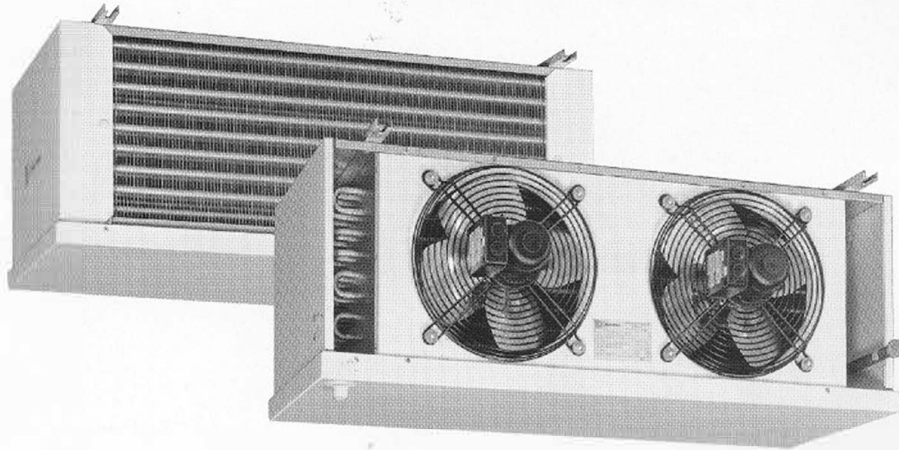
New air cooler generation with better performance

Capacities 1.5 - 40 kW



HELPMAN

participant of the
EUROVENT
certification programme

Blow Through Unit Coolers 1.5 - 40 kW**LEX****Eurovent**

Within Europe, a wide variety of published data on capacities are in use, generally depending on national standards.

Most in use by the leading manufacturers are national and international standards like DIN, ENV, NEN and ASHRAE.

Due to this, customers have not been able to make objective product comparisons, since data published on capacities were based on DT₁, DTM, dry or wet conditions, with or without certification, etc.

To meet the European requirements on EN standards, the European Refrigeration Industry embodied by Eurovent has set standards to guarantee an independent certification procedure for forced convection air cooled condensers based on ENV 327 and unit air coolers based on ENV 328. Being an active member of Eurovent, the capacities of the Helpman commercial cooler programme, as given in the technical documentation, are based on ENV 328.

(Evaporating temperature $t_e = -8\text{ }^\circ\text{C}$,
8 K temperature difference between air-on temperature and evaporating temperature DT₁.)

In order to enable aircooler selection for operating conditions, technical documentation should also give capacities for humid/frosted conditions. According to Eurovent these 'frosted conditions' are to be calculated by multiplying 'dry capacities' with a factor 1.15. These data can be found in the capacity tables, in the columns "frosted conditions".

CE Marking

All coolers and condensers produced by Helpman comply with the EC Machinery Directive 89/392. In this respect all equipment is provided with extensive product information and a 2B Certificate.

CE-marking of complete cooling installations is obligatory as per 1 January 1995. The CE-marking support of Helpman cooling components therefore offers full service to refrigeration installers to meet the requirements on CE marking of cooling installations.

DT₁**Selection Example DT₁**

| | |
|---------------------------|--------|
| Selected cooler model | LEX |
| Selected fin spacing | 7 mm |
| Required cooling capacity | 6.8 kW |
| Air-on temperature | -16 °C |
| Evaporating temperature | -25 °C |
| Refrigerant | R 22 |

The calculation is based on the tables on page 4.

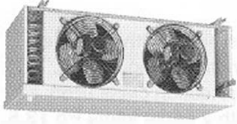
- 1) $DT_1 = -16 - (-25) = 9\text{ K}$
- 2) Correction factor (table) : 1.09
- 3) Multiply required capacity with correction factor :
 $6.8\text{ kW} \times 1.09 = 7.4\text{ kW}$.
- 4) A cooler has to be selected in column R 22, frosted DT₁, with a nominal capacity of 7.4 kW.

For the above mentioned conditions a LEX 16 - 7 unit cooler with nominal capacity of 7.4 kW can be selected.

Blow Through Unit Coolers

1.5 - 40 kW

LEX



Nominal Capacities (kW)

| Cooler type | R 22 frosted DT ₁ | R 134a frosted DT ₁ | R 404A frosted DT ₁ | For reference only dry conditions DT ₁ | | |
|-------------------------|------------------------------|--------------------------------|--------------------------------|---|--------|--------|
| | | | | R 22 | R 134a | R 404A |
| Fin spacing 4 mm | | | | | | |
| LEX 2-4 | 1.5 | 1.3 | 1.5 | 1.3 | 1.1 | 1.3 |
| LEX 4-4 | 1.9 | 1.5 | 1.8 | 1.7 | 1.3 | 1.6 |
| LEX 6-4 | 2.8 | 2.4 | 2.8 | 2.4 | 2.1 | 2.5 |
| LEX 8-4 | 4.7 | 4.1 | 4.7 | 4.1 | 3.5 | 4.1 |
| LEX 10-4 | 4.7 | 4.4 | 4.8 | 4.1 | 3.8 | 4.2 |
| LEX 12-4 | 5.9 | 5.6 | 6.2 | 5.1 | 4.9 | 5.4 |
| LEX 14-4 | 6.5 | 6.4 | 7.1 | 5.7 | 5.6 | 6.2 |
| LEX 16-4 | 8.7 | 8.4 | 9.3 | 7.5 | 7.3 | 8.1 |
| LEX 18-4 | 9.7 | 8.7 | 9.8 | 8.5 | 7.6 | 8.6 |
| LEX 20-4 | 12.8 | 10.8 | 12.7 | 11.2 | 9.4 | 11.0 |
| LEX 22-4 | 16.1 | 13.0 | 15.4 | 14.0 | 11.3 | 13.4 |
| LEX 24-4 | 20.0 | 16.1 | 19.2 | 17.4 | 14.0 | 16.7 |
| LEX 26-4 | 26.0 | 23.0 | 26.0 | 22.6 | 20.0 | 22.6 |
| LEX 28-4 | 32.8 | 29.0 | 33.2 | 28.5 | 25.2 | 28.9 |
| LEX 30-4 | 40.3 | 32.5 | 38.5 | 35.0 | 28.3 | 33.4 |

Fin spacing 7 mm

| | | | | | | |
|----------|------|------|------|------|------|------|
| LEX 2-7 | 1.3 | 1.2 | 1.3 | 1.1 | 1.0 | 1.2 |
| LEX 4-7 | 1.7 | 1.4 | 1.7 | 1.5 | 1.2 | 1.4 |
| LEX 6-7 | 2.5 | 2.2 | 2.5 | 2.2 | 1.9 | 2.2 |
| LEX 8-7 | 4.1 | 3.7 | 4.3 | 3.6 | 3.3 | 3.7 |
| LEX 10-7 | 3.7 | 3.6 | 4.0 | 3.2 | 3.2 | 3.5 |
| LEX 12-7 | 5.0 | 4.9 | 5.3 | 4.4 | 4.3 | 4.6 |
| LEX 14-7 | 5.5 | 5.5 | 6.0 | 4.8 | 4.8 | 5.2 |
| LEX 16-7 | 7.4 | 7.3 | 8.0 | 6.4 | 6.3 | 7.0 |
| LEX 18-7 | 8.5 | 7.8 | 8.8 | 7.4 | 6.8 | 7.6 |
| LEX 20-7 | 11.4 | 10.0 | 11.4 | 9.9 | 8.7 | 9.9 |
| LEX 22-7 | 14.5 | 12.4 | 14.3 | 12.6 | 10.7 | 12.4 |
| LEX 24-7 | 18.1 | 15.6 | 17.8 | 15.7 | 13.5 | 15.5 |
| LEX 26-7 | 22.8 | 21.2 | 23.4 | 19.8 | 18.4 | 20.4 |
| LEX 28-7 | 28.5 | 26.5 | 29.3 | 24.8 | 23.0 | 25.5 |
| LEX 30-7 | 36.5 | 31.0 | 35.9 | 31.7 | 27.0 | 31.2 |

Capacities

Frosted Conditions

- Lightly frosted coil.
- Relative humidity 85 %
- Suction gas superheating 62 % of the temperature difference (DT₁), with a minimum of 3.5 K
- Refrigerant liquid temperature 30 °C (for t₀ = -20 °C and below; liquid temperature 10 °C).

DT₁

The nominal capacities stated, are based on -8 °C evaporating temperature (t₀) and 8 K difference between air-on and evaporating temperature. (ENV 328, Condition II)

t₀

Evaporating temperature t₀ is the saturated temperature according to the pressure at the suction outlet of the cooler.

Dry Conditions

Cooling capacity where no condensation or ice build-up occurs on the coil (100% sensible cooling). This condition is used by Cecomaf to standardise capacity ratings but should not be used when selecting coolers.

Correction Factors R 404A / DT₁

| DT ₁ K | Evaporating Temperature (t ₀) °C | | | | | | | | | |
|----------------------|--|------|------|------|------|------|------|------|------|------|
| | +5 | 0 | -5 | -8 | -10 | -15 | -20 | -25 | -30 | -35 |
| 6 | 1.22 | 1.32 | 1.41 | 1.48 | 1.54 | 1.60 | 1.65 | 1.70 | 1.77 | |
| 7 | 1.01 | 1.09 | 1.17 | 1.24 | 1.30 | 1.36 | 1.41 | 1.47 | 1.54 | |
| 8 | 0.85 | 0.92 | 0.97 | 1.00 | 1.03 | 1.12 | 1.18 | 1.23 | 1.29 | 1.37 |
| 9 | 0.73 | 0.80 | 0.86 | 0.92 | 0.98 | 1.03 | 1.09 | 1.16 | 1.24 | |
| 10 | 0.64 | 0.70 | 0.75 | 0.81 | 0.87 | 0.92 | 0.98 | 1.05 | 1.13 | |
| 11 | 0.56 | 0.61 | 0.67 | 0.72 | 0.77 | 0.83 | 0.89 | 0.96 | 1.05 | |

Correction Factors R 22 / DT₁

| DT ₁ K | Evaporating Temperature (t ₀) °C | | | | | | | | | |
|----------------------|--|------|------|------|------|------|------|------|-----|-----|
| | +5 | 0 | -5 | -8 | -10 | -15 | -20 | -25 | -30 | -35 |
| 6 | 1.10 | 1.20 | 1.31 | 1.42 | 1.53 | 1.62 | 1.66 | | | |
| 7 | 0.93 | 1.01 | 1.11 | 1.22 | 1.32 | 1.40 | 1.46 | | | |
| 8 | 0.80 | 0.88 | 0.95 | 1.00 | 1.05 | 1.16 | 1.24 | 1.30 | | |
| 9 | 0.70 | 0.77 | 0.85 | 0.94 | 1.03 | 1.12 | 1.18 | | | |
| 10 | 0.61 | 0.68 | 0.76 | 0.84 | 0.93 | 1.02 | 1.09 | | | |
| 11 | 0.55 | 0.61 | 0.68 | 0.76 | 0.85 | 0.94 | 1.01 | | | |

Correction Factors R 134a / DT₁

| DT ₁ K | Evaporating Temperature (t ₀) °C | | | | | | | | | |
|----------------------|--|------|------|------|------|------|------|------|------|------|
| | +5 | 0 | -5 | -8 | -10 | -15 | -20 | -25 | -30 | -35 |
| 6 | 1.10 | 1.23 | 1.35 | 1.44 | 1.52 | 1.57 | 1.63 | 1.69 | 1.79 | |
| 7 | 0.93 | 1.05 | 1.15 | 1.23 | 1.30 | 1.36 | 1.41 | 1.48 | 1.57 | |
| 8 | 0.81 | 0.90 | 0.97 | 1.00 | 1.05 | 1.14 | 1.19 | 1.25 | 1.31 | 1.41 |
| 9 | 0.71 | 0.80 | 0.88 | 0.95 | 1.01 | 1.07 | 1.12 | 1.19 | 1.28 | |
| 10 | 0.63 | 0.71 | 0.78 | 0.85 | 0.91 | 0.97 | 1.02 | 1.09 | 1.18 | |
| 11 | 0.56 | 0.64 | 0.71 | 0.77 | 0.83 | 0.88 | 0.94 | 1.01 | 1.10 | |

Blow Through Unit Coolers 1.5 - 40 kW

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Dimensions / Connections

| Cooler type | Dimensions mm | | | | | | | Shipp. vol. m ³ | Cooler weight | | Coil surface | | Int. vol. dm ³ | Refrig. conn. | |
|-------------------------|---------------|------|-----|-----|-----|-----|------|----------------------------|---------------|---------|---------------------|---------------------|---------------------------|---------------|----------------|
| | A | B | D | F | G | H | K | | 4 mm kg | 7 mm kg | 4 mm m ² | 7 mm m ² | | inlet O.D. | suction O.D.S. |
| LEX 2 - • | 598 | 412 | 465 | 365 | - | 360 | 380 | 0.3 | 18 | 17 | 7.7 | 4.7 | 2.1 | ½" | ½" |
| LEX 4 - • | 658 | 472 | 495 | 395 | - | 430 | 440 | 0.3 | 22 | 21 | 11.2 | 6.7 | 3.0 | ½" | ½" |
| LEX 6 - • | 658 | 472 | 605 | 503 | - | 430 | 440 | 0.3 | 27 | 25 | 16.8 | 10.1 | 4.0 | ½" | ⅝" |
| LEX 8 - • | 788 | 602 | 640 | 503 | - | 505 | 570 | 0.6 | 38 | 35 | 26.1 | 15.7 | 6.0 | ½" | 22 mm |
| LEX 10 - • | 1106 | 920 | 495 | 395 | - | 430 | 880 | 0.5 | 35 | 32 | 22.4 | 13.5 | 6.0 | ½" | 22 mm |
| LEX 12 - • | 1106 | 920 | 605 | 503 | - | 430 | 880 | 0.5 | 42 | 38 | 33.6 | 20.2 | 6.8 | ½" | 28 mm |
| LEX 14 - • | 970 | 692 | 710 | 520 | 35 | 600 | 660 | 0.6 | 50 | 46 | 35.2 | 21.2 | 8.0 | ½" | 28 mm |
| LEX 16 - • | 1110 | 792 | 750 | 520 | 35 | 675 | 760 | 0.7 | 65 | 61 | 46.4 | 27.9 | 10.4 | ½" | 28 mm |
| LEX 18 - • | 1460 | 1180 | 690 | 500 | 35 | 520 | 1140 | 1.0 | 71 | 65 | 52.2 | 31.4 | 11.6 | ½" | 35 mm |
| LEX 20 - • | 1640 | 1360 | 710 | 520 | 35 | 600 | 1320 | 1.3 | 95 | 88 | 70.5 | 42.4 | 15.5 | ⅝" | 35 mm |
| LEX 22 - • | 1880 | 1560 | 750 | 520 | 35 | 675 | 1520 | 1.7 | 120 | 111 | 92.8 | 55.9 | 20.4 | ⅝" | 42 mm |
| LEX 24 - • | 1880 | 1560 | 950 | 630 | 110 | 825 | 1520 | 2.2 | 139 | 128 | 116.0 | 69.8 | 28.2 | ⅝" | 42 mm |
| LEX 26 - • | 2650 | 2328 | 750 | 520 | 35 | 675 | 2290 | 2.3 | 172 | 159 | 139.8 | 84.2 | 30.9 | ⅝" | 54 mm |
| LEX 28 - • | 2650 | 2328 | 920 | 630 | 110 | 825 | 2290 | 3.0 | 202 | 186 | 174.7 | 105.2 | 39.8 | ⅝" | 54 mm |
| LEX 30 - • ¹ | 3420 | 3098 | 920 | 630 | 110 | 825 | 3050 | 3.9 | 278 | 256 | 232.7 | 140.1 | 51.1 | ⅝" | 54 mm |

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Fans / Electric Defrost

| Cooler type | Fans 50 Hz | | | | | | | Electric defrost | | | | | |
|-------------|------------|--------------|------------------------|------------------------|--------------------------|--------------------------------|---|------------------|--------------------|-----------|----------------------------|------------|--|
| | number | dia-meter mm | air volume fin spacing | | air ² throw m | sound ³ level dB(A) | fan power nominal / absorbed ⁴ | | number of elements | | defrost power ⁵ | | |
| | | | 4 mm m ³ /h | 7 mm m ³ /h | | | 220/1 W | 380/3 W | coil | drip tray | kW | reduced kW | |
| LEX 2 - • | 1 | 254 | 1030 | 1080 | 10 | 48 | 30/80 | 30/65 | 1 | 1 | 1.28 | - | |
| LEX 4 - • | 1 | 305 | 1490 | 1570 | 12 | 50 | 30/100 | 30/100 | 1 | 1 | 1.76 | - | |
| LEX 6 - • | 1 | 305 | 1420 | 1500 | 12 | 50 | 30/100 | 30/100 | 2 | 1 | 2.64 | - | |
| LEX 8 - • | 1 | 356 | 2490 | 2620 | 15 | 53 | 70/160 | 90/145 | 2 | 1 | 3.0 | - | |
| LEX 10 - • | 2 | 305 | 2970 | 3130 | 15 | 53 | 30/100 | 30/100 | 1 | 1 | 3.2 | - | |
| LEX 12 - • | 2 | 305 | 2860 | 3010 | 15 | 53 | 30/100 | 30/100 | 2 | 1 | 4.8 | - | |
| LEX 14 - • | 1 | 406 | 3360 | 3540 | 15 | 57 | 70/230 | 90/215 | 5 | 1 | 4.5 | 3.4 | |
| LEX 16 - • | 1 | 457 | 4430 | 4660 | 20 | 60 | 220/380 | 250/400 | 5 | 1 | 6.0 | 4.5 | |
| LEX 18 - • | 2 | 356 | 4980 | 5240 | 20 | 56 | 70/160 | 90/145 | 2 | 1 | 5.4 | - | |
| LEX 20 - • | 2 | 406 | 6730 | 7080 | 20 | 60 | 70/230 | 90/215 | 5 | 1 | 8.4 | 6.3 | |
| LEX 22 - • | 2 | 457 | 8850 | 9320 | 20 | 63 | 220/380 | 250/400 | 5 | 1 | 13.2 | 9.9 | |
| LEX 24 - • | 2 | 508 | 11000 | 11600 | 20 | 66 | 220/430 | 250/480 | 5 | 1 | 13.2 | 9.9 | |
| LEX 26 - • | 3 | 457 | 13000 | 14000 | 20 | 65 | 220/380 | 250/400 | 5 | 1 | 19.2 | 14.4 | |
| LEX 28 - • | 3 | 508 | 16600 | 17500 | 20 | 68 | 220/430 | 250/480 | 5 | 1 | 19.2 | 14.4 | |
| LEX 30 - • | 4 | 508 | 22200 | 23400 | 20 | 69 | 220/430 | 250/480 | 10 | 2 | 24.0 | 18.0 | |

1) LEX 30 :
3 mounting channels, dist. ½ B = 1549 mm
2 water drains, 1" BSP male, distance 1700 mm

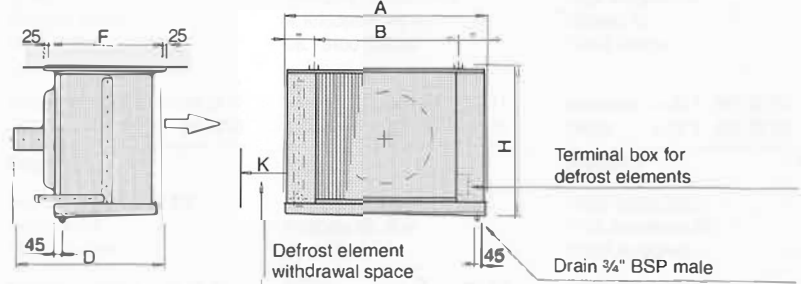
2) Air throw at t = 20 °C.
Minimum air velocity = 0.25 m/s.

3) Sound levels are the results of tests carried out in free field conditions. The values are measured in the horizontal plane at a distance of 5 meter with an A-filter. Values may deviate depending on situations at site.

4) Fan power is given per motor. Absorbed fan power is measured with coil face area blocked for 75 % and ambient temperature 20 °C.

5) Total defrost power is based on 220 V.
For 240 V this value increases by 20 %.

LEX 2 - 12



LEX 14 - 30

