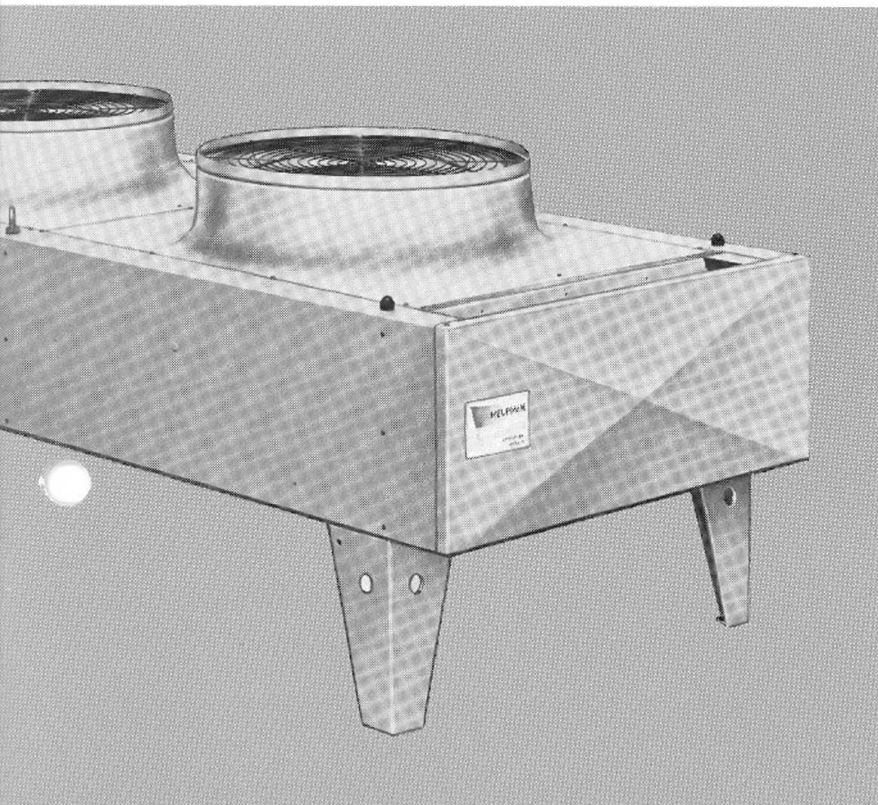


**HELPMAN**

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Aircooled  
condensers

LCY



## Aircooled condensers

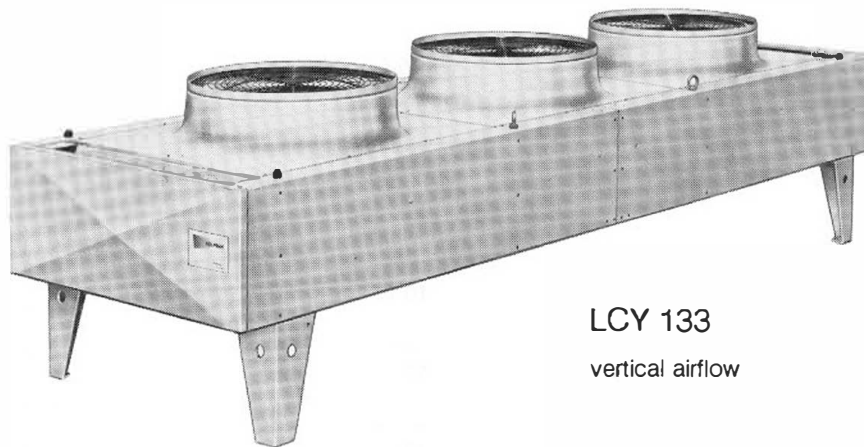
# LCY

### Contents

| Page  |                                     |
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| 4-5-6 | General information                 |
| 7     | Technical data                      |
| 8     | Capacity<br>Calculation factors     |
| 9     | Soundlevels                         |
| 10    | Dimensions<br>vertical airflow      |
| 11-12 | Dimensions<br>horizontal airflow    |
| 13    | Coupling headers<br>Extra high feet |
| 14    | Mounting<br>Transport               |

## Aircooled condensers

## LCY

**LCY 133**

vertical airflow

### Range

The LCY aircooled condenser range includes 16 models with 1 to 10 fans and duties from 43 to 550 kW at 15 K temperature difference.

### Design

Finned coil with aluminium fins and 1/2"OD copper tubing

Tube centres: 38 x 38 mm  
Fin spacing: 2. 25 mm

Casing and framework are of pregalvanised sheet steel (Sendzimir). Fanplate with fan discharge hood are of aluminium. The casing has an epoxy coating, light-grey (RAL 7035). Other colours are available as optional extra. All condensers are pressure tested at 25 bar, evacuated and provided with a dry nitrogen protection charge.

### Mounting

Standard mounting: vertical airflow. Horizontal airflow is possible.

For certain types horizontal airflow requires adaptation of refrigerant circuiting (see page 7) at an extra price.

Standard vertical airflow is supplied unless indicated differently in the order.

### Fans

4-blade corrosion resistant aluminium fan blades. Diameter 762 mm.

## Aircooled condensers

**LCY**

### Fanmotors

Fanmotors are of totally enclosed design, class IP-55.

#### Standard

n= 930 rpm

750 W, 220-240/380-415/50/3

Motors are wired to a common terminal box (one box per condenser coil), located at the endplate on the liquid header side of the coil.

For application at ambient temperatures above 40 °C, special motors on request.

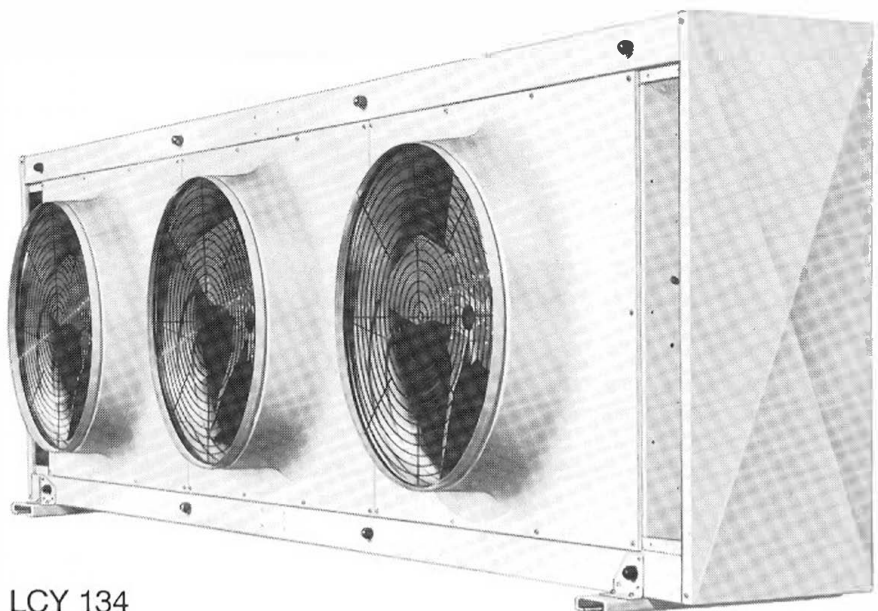
Available at extra charge:

- 1: n= 690 rpm  
370 W, 220-240/380-415/50/3
- 2: n= 325 rpm  
120 W, 220-240/380-415/50/3
- 3: 2 speed motors 935/425 rpm  
750/150 W, 380-415/50/3
- 4: n= 930 rpm  
750 W, 220-240/50/1
- 5: single phase motor suitable for speed regulation with Thyristor speed controller.  
750 W max., 220-240/50/1
- 6: motor suitable for 60 Hz supply  
n= 840 rpm  
660 W, 220-254/380-440/60/3

### Corrosion protection

The condensers do have a high corrosion resistance through selected materials, surface treatment and construction. For application in aggressive surroundings (coastal- and industrial areas) following designs are available at an extra charge:

- fins of seawater resistant aluminium alloy (57S/5052).
- fins of prepainted aluminium (capacity reduction of 7% to be considered).
- copper fins.
- finned coils chromated after assembling.



**LCY 134**

horizontal airflow

# Aircooled condensers

# LCY

## Capacities

## Soundlevels

| Type    | Capacity   |     |     |     | Fans | airvolume<br>m <sup>3</sup> /h, n= 930 | Soundlevel dB(a) |        |     |     | Max. number<br>of circuits<br>available |     |
|---------|------------|-----|-----|-----|------|----------------------------------------|------------------|--------|-----|-----|-----------------------------------------|-----|
|         | td = 15 K* |     |     |     |      |                                        | number           | n= 930 | 690 | 425 |                                         | 325 |
|         | kW         |     |     |     |      |                                        |                  |        |     |     |                                         |     |
| LCY     | n= 930     | 690 | 425 | 325 |      |                                        |                  |        |     |     |                                         |     |
| LCY 113 | 43         | 36  | 29  | 25  | 1    | 15500                                  | 56               | 49     | 38  | 35  | 10                                      |     |
| LCY 114 | 53         | 43  | 33  | 27  | 1    | 15000                                  | 56               | 49     | 38  | 35  | 10                                      |     |
| LCY 123 | 90         | 76  | 58  | 50  | 2    | 31000                                  | 59               | 52     | 41  | 38  | 15                                      |     |
| LCY 124 | 108        | 89  | 65  | 54  | 2    | 30000                                  | 59               | 52     | 41  | 38  | 15                                      |     |
| LCY 133 | 137        | 118 | 89  | 79  | 3    | 46500                                  | 61               | 54     | 43  | 40  | 15                                      |     |
| LCY 134 | 158        | 133 | 98  | 81  | 3    | 45000                                  | 61               | 54     | 43  | 40  | 30                                      |     |
| LCY 143 | 180        | 154 | 115 | 100 | 4    | 62000                                  | 62               | 55     | 44  | 41  | 30                                      |     |
| LCY 144 | 216        | 180 | 133 | 108 | 4    | 60000                                  | 62               | 55     | 44  | 41  | 30                                      |     |
| LCY 154 | 275        | 230 | 168 | 135 | 5    | 75000                                  | 63               | 56     | 45  | 42  | 30                                      |     |
| LCY 223 | 180        | 154 | 115 | 100 | 4    | 62000                                  | 62               | 55     | 44  | 41  | 30                                      |     |
| LCY 224 | 216        | 180 | 133 | 108 | 4    | 60000                                  | 62               | 55     | 44  | 41  | 30                                      |     |
| LCY 233 | 274        | 236 | 178 | 158 | 6    | 93000                                  | 64               | 57     | 46  | 43  | 30                                      |     |
| LCY 234 | 316        | 266 | 196 | 162 | 6    | 90000                                  | 64               | 57     | 46  | 43  | 60                                      |     |
| LCY 243 | 360        | 308 | 230 | 199 | 8    | 124000                                 | 65               | 58     | 47  | 44  | 60                                      |     |
| LCY 244 | 432        | 360 | 266 | 216 | 8    | 120000                                 | 65               | 58     | 47  | 44  | 60                                      |     |
| LCY 254 | 550        | 460 | 336 | 270 | 10   | 150000                                 | 66               | 59     | 48  | 45  | 60                                      |     |

### Capacity

The basic capacity ratings are for R22 and R502 at a td\* of 15 K and ambient temperatures up to 35 °C.

\*td = difference between condensing temperature and ambient temperature.

Capacities are directly proportional with other temperature differences between 10 and 20 K.

For correction-factors on capacity: see page 8.

### Capacity control

For multifan models capacity can be controlled by cycling one or more fans. Capacity control on all models is also possible by using 2-speed or speed regulated single phase motors. The fan compartments are separated by baffle plates.

### Soundlevel dB(a)

The soundlevels in the table are the results of tests carried out in free field conditions. The values are measured in the horizontal plane at a distance of 10 m around the condenser with an A-filter. Values may deviate depending on situations at site.

### Multi circuiting

Condensers can be supplied (at extra charge) with more separated coil sections.

### Applications as liquid cooler

The condenser can also be used as liquid cooler, for instance cooling back of cooling water in watercooled plants.

## Aircooled condensers

## LCY

### Technical data

| Type    | Refrigerant connections |        |      | Internal volume<br>dm <sup>3</sup> | Cooling surface<br>m <sup>2</sup> | Weight kg |         |
|---------|-------------------------|--------|------|------------------------------------|-----------------------------------|-----------|---------|
|         | mm ODS<br>in            | out    |      |                                    |                                   | alu. fins | Cu fins |
| LCY 113 | 1 x 35                  | 1 x 28 | * ** | 16                                 | 135                               | 158       | 248     |
| LCY 114 | 1 x 35                  | 1 x 28 | **   | 22                                 | 179                               | 178       | 298     |
| LCY 123 | 1 x 42                  | 1 x 35 | **   | 32                                 | 269                               | 276       | 456     |
| LCY 124 | 1 x 42                  | 1 x 35 | **   | 42                                 | 359                               | 316       | 556     |
| LCY 133 | 1 x 54                  | 1 x 42 | **   | 48                                 | 404                               | 394       | 664     |
| LCY 134 | 1 x 54                  | 1 x 42 |      | 63                                 | 538                               | 454       | 814     |
| LCY 143 | 1 x 67                  | 1 x 54 | *    | 64                                 | 538                               | 518       | 878     |
| LCY 144 | 1 x 67                  | 1 x 54 |      | 84                                 | 717                               | 598       | 1080    |
| LCY 154 | 1 x 67                  | 1 x 54 |      | 104                                | 897                               | 742       | 1340    |
| LCY 223 | 2 x 42                  | 2 x 35 | **   | 64                                 | 538                               | 552       | 912     |
| LCY 224 | 2 x 42                  | 2 x 35 | **   | 84                                 | 717                               | 632       | 1110    |
| LCY 233 | 2 x 54                  | 2 x 42 | **   | 96                                 | 807                               | 788       | 1330    |
| LCY 234 | 2 x 54                  | 2 x 42 |      | 126                                | 1076                              | 908       | 1630    |
| LCY 243 | 2 x 67                  | 2 x 54 | *    | 128                                | 1076                              | 1030      | 1750    |
| LCY 244 | 2 x 67                  | 2 x 54 |      | 168                                | 1434                              | 1190      | 2150    |
| LCY 245 | 2 x 67                  | 2 x 54 |      | 208                                | 1793                              | 1470      | 2670    |

\* Type LCY 113, 143 and 243 do have the connections on both sides. The other types have the inlet- and outlet- connections at the same side.

\*\* Only suitable for horizontal airflow with special header arrangement.

### Type indication

f.i.: LCY 1 2 3

- 1- Number of coils \_\_\_\_\_
- 2- Number of fans per coil \_\_\_\_\_
- 3- Number of tuberows in airdirection \_\_\_\_\_

# Aircooled condensers

# LCY

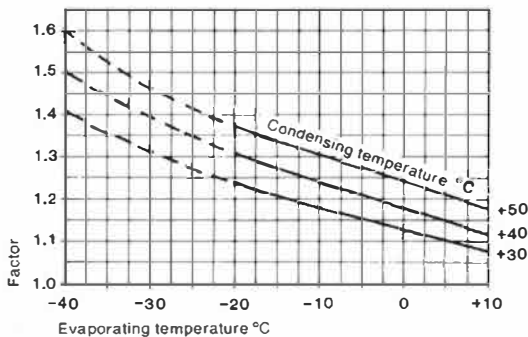
## Factors for calculation of the condenser capacity

The condenser capacity is the compressor capacity multiplied with the factor from the diagram.

The diagrams are valid for R12, R22 and R502. At evaporating temperatures below -20 °C the condenser capacity has to be calculated from the compressor capacity at -20 °C, or a starting control should be used to protect the compressors from high starting loads.

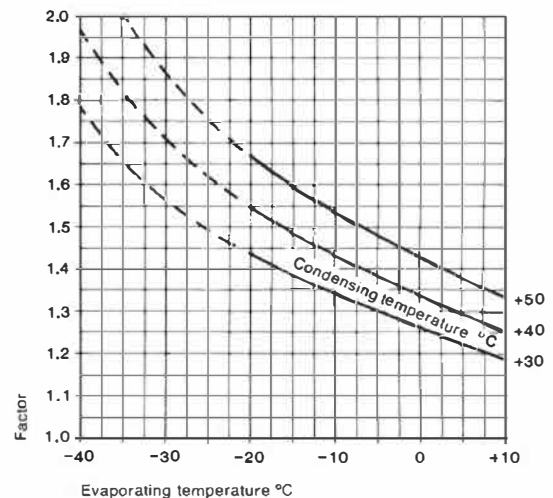
### OPEN compressors

#### SEMI-HERMETIC compressors (motor air/water cooled)



#### SEMI-HERMETIC compressors (motor suctiongas cooled)

#### HERMETIC compressors



## Correction factors capacity

|                                                       |          | Correction factor |
|-------------------------------------------------------|----------|-------------------|
| Ambient temperature                                   | 35 °C    | 1.00              |
|                                                       | 40 °C    | 0.95              |
|                                                       | 50 °C    | 0.90              |
| Altitude above sea level                              | 0 m      | 1.00              |
|                                                       | 500 m    | 0.97              |
|                                                       | 1000 m   | 0.93              |
|                                                       | 1500 m   | 0.90              |
|                                                       | 2000 m   | 0.86              |
|                                                       | 2500 m   | 0.83              |
| Refrigerant                                           | R22/R502 | 1.00              |
|                                                       | R12      | 0.95              |
| Application of motors suitable for 60 Hz, n = 840 rpm |          | 0.95              |

## Example

What capacity has a LCY 124 in an ambient temperature of 40 °C, refrigerant R12, altitude at sealevel and equipped with motors for 60 Hz:

Nominal capacity at td = 15 K: 108 kW

Correction factors:  
 t = 40 °C 0.95  
 R12 0.95  
 altitude 1.00  
 60 Hz motors 0.95

Corrected capacity:  
 0.95x0.95x1.00x0.95x108 = 92.5 kW



**Aircooled condensers**

**LCY**

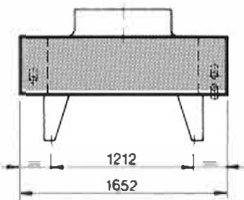
**Soundlevels dB(a)**

| Type    | Distance 5 m |     |     |     | Distance 10 m |    |     |     | Distance 15 m |     |    |     | Distance 25 m |     |     |    |     |     |     |     |
|---------|--------------|-----|-----|-----|---------------|----|-----|-----|---------------|-----|----|-----|---------------|-----|-----|----|-----|-----|-----|-----|
|         | n=           | 930 | 690 | 425 | 325           | n= | 930 | 690 | 425           | 325 | n= | 930 | 690           | 425 | 325 | n= | 930 | 690 | 425 | 325 |
| LCY 113 |              | 62  | 55  | 44  | 41            |    | 56  | 49  | 38            | 35  |    | 52  | 45            | 34  | 31  |    | 48  | 41  | 30  | 27  |
| LCY 114 |              | 62  | 55  | 44  | 41            |    | 56  | 49  | 38            | 35  |    | 52  | 45            | 34  | 31  |    | 48  | 41  | 30  | 27  |
| LCY 123 |              | 65  | 58  | 47  | 44            |    | 59  | 52  | 41            | 38  |    | 55  | 48            | 37  | 34  |    | 51  | 44  | 33  | 30  |
| LCY 124 |              | 65  | 58  | 47  | 44            |    | 59  | 52  | 41            | 38  |    | 55  | 48            | 37  | 34  |    | 51  | 44  | 33  | 30  |
| LCY 133 |              | 67  | 60  | 49  | 46            |    | 61  | 54  | 43            | 40  |    | 57  | 50            | 39  | 36  |    | 53  | 46  | 35  | 32  |
| LCY 134 |              | 67  | 60  | 49  | 46            |    | 61  | 54  | 43            | 40  |    | 57  | 50            | 39  | 36  |    | 53  | 46  | 35  | 32  |
| LCY 143 |              | 68  | 61  | 50  | 47            |    | 62  | 55  | 44            | 41  |    | 58  | 51            | 40  | 37  |    | 54  | 47  | 36  | 33  |
| LCY 144 |              | 68  | 61  | 50  | 47            |    | 62  | 55  | 44            | 41  |    | 58  | 51            | 40  | 37  |    | 54  | 47  | 36  | 33  |
| LCY 154 |              | 69  | 62  | 51  | 48            |    | 63  | 56  | 45            | 42  |    | 59  | 52            | 41  | 38  |    | 55  | 48  | 37  | 34  |
| LCY 223 |              | 68  | 61  | 50  | 47            |    | 62  | 55  | 44            | 41  |    | 58  | 51            | 40  | 37  |    | 54  | 47  | 36  | 33  |
| LCY 224 |              | 68  | 61  | 50  | 47            |    | 62  | 55  | 44            | 41  |    | 58  | 51            | 40  | 37  |    | 54  | 47  | 36  | 33  |
| LCY 233 |              | 70  | 63  | 52  | 49            |    | 64  | 57  | 46            | 43  |    | 60  | 53            | 42  | 39  |    | 56  | 49  | 38  | 35  |
| LCY 234 |              | 70  | 63  | 52  | 49            |    | 64  | 57  | 46            | 43  |    | 60  | 53            | 42  | 39  |    | 56  | 49  | 38  | 35  |
| LCY 243 |              | 71  | 64  | 53  | 50            |    | 65  | 58  | 47            | 44  |    | 61  | 54            | 43  | 40  |    | 57  | 50  | 39  | 36  |
| LCY 244 |              | 71  | 64  | 53  | 50            |    | 65  | 58  | 47            | 44  |    | 61  | 54            | 43  | 40  |    | 57  | 50  | 39  | 36  |
| LCY 254 |              | 72  | 65  | 54  | 51            |    | 66  | 59  | 48            | 45  |    | 62  | 55            | 44  | 41  |    | 58  | 51  | 40  | 37  |

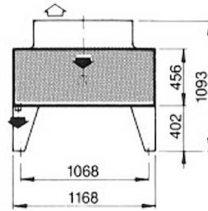
## Aircooled condensers

## LCY

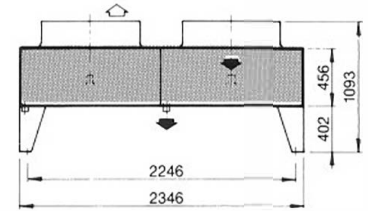
### Vertical airflow



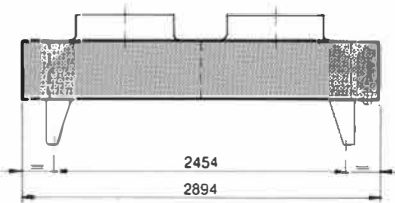
LCY 113/114



LCY range 1..

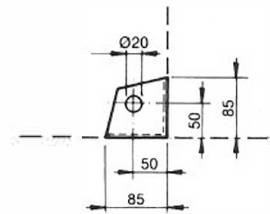


LCY range 2..

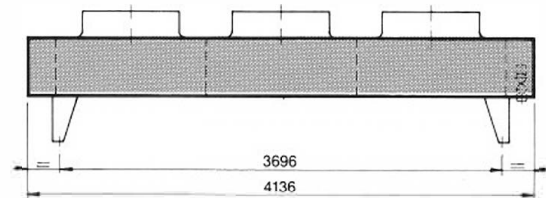


LCY 123/124

LCY 223/224

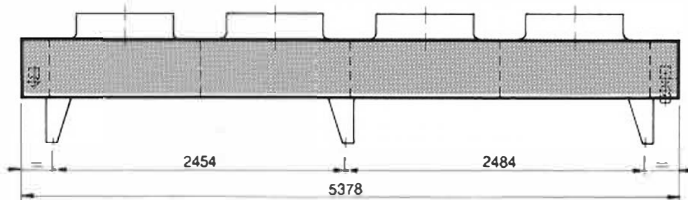


Bottom view  
mounting feet



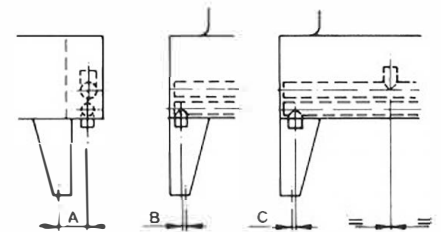
LCY 133/134

LCY 233/234

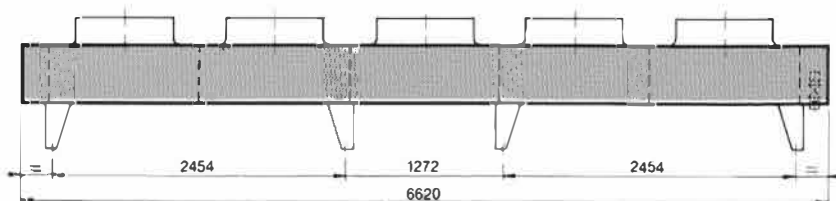


LCY 143/144

LCY 243/244



| Liquid out | A   | B  | C |
|------------|-----|----|---|
| ∅ 28       | 125 | 10 |   |
| 35         | 125 | 5  |   |
| 42         | 130 | 0  | 0 |
| 54         | 135 |    | 5 |



LCY 154

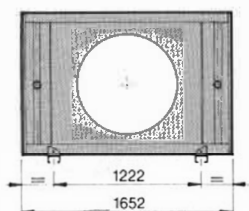
LCY 254

## Aircooled condensers

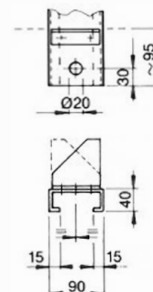
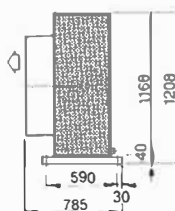
## LCY

Horizontal airflow

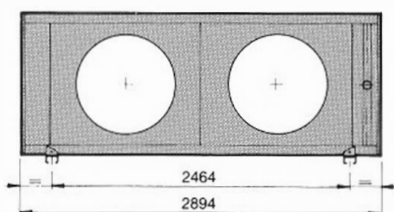
LCY range 1..



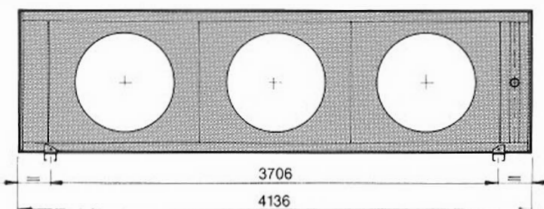
LCY 113/114



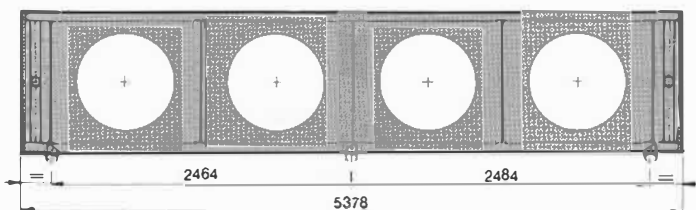
Mounting detail



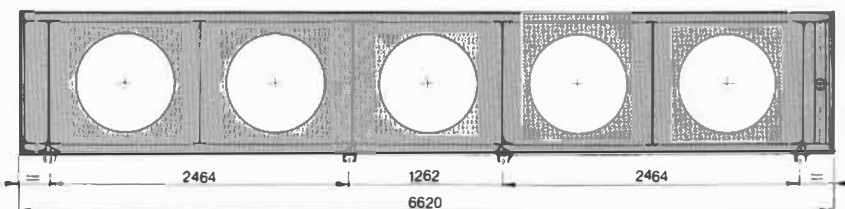
LCY 123/124



LCY 133/134



LCY 143/144



LCY 154

Horizontal airflow

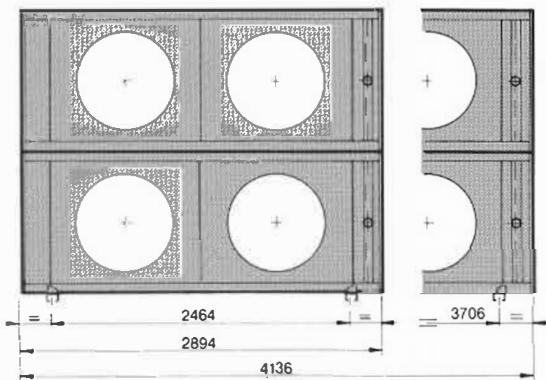
Types LCY 113, 114, 123, 124 and 133, are only available for horizontal airflow on special delivery at extra price.

**Aircooled condensers**

**LCY**

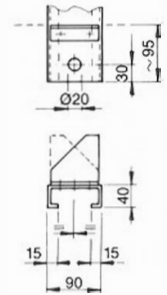
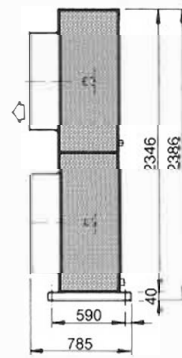
Horizontal airflow

LCY range 2..

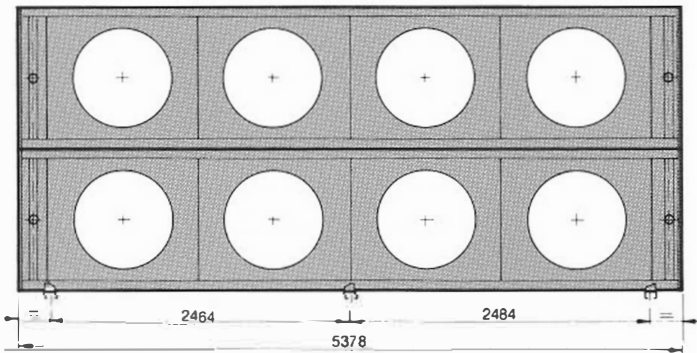


LCY 223/224

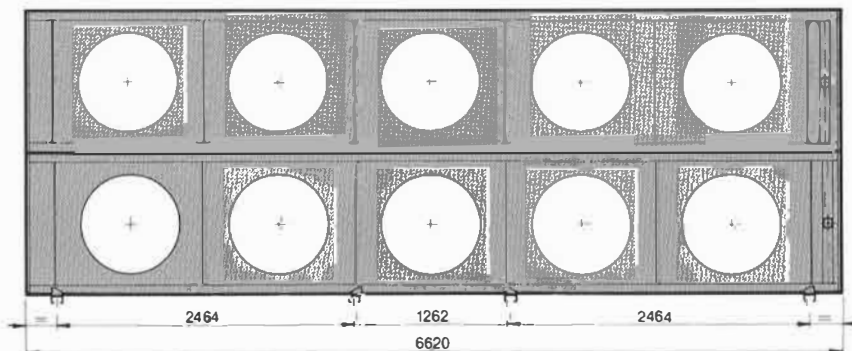
LCY 233/234



Mounting detail



LCY 243/244



LCY 254

Horizontal airflow

Types LCY 223, 224 and 233, are only available for horizontal airflow on special delivery at extra price.

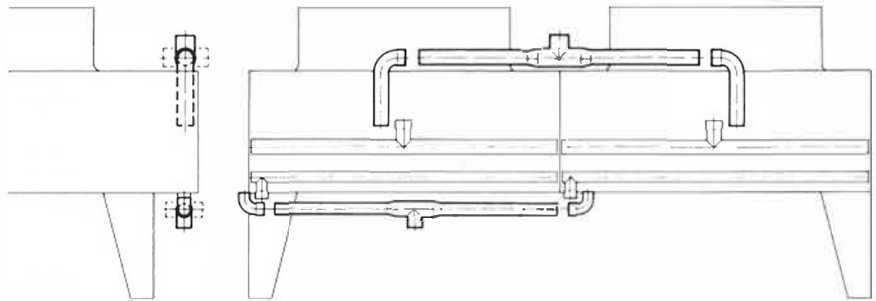
## Aircooled condensers

## LCY

### Coupling headers

The condensers type LCY 223 - 254 are equipped with 2 finned coils, each having a pair of in- and outlet connections.

As optional extra coupling headers can be supplied. These coupling headers are supplied in loose parts having soldering connections.



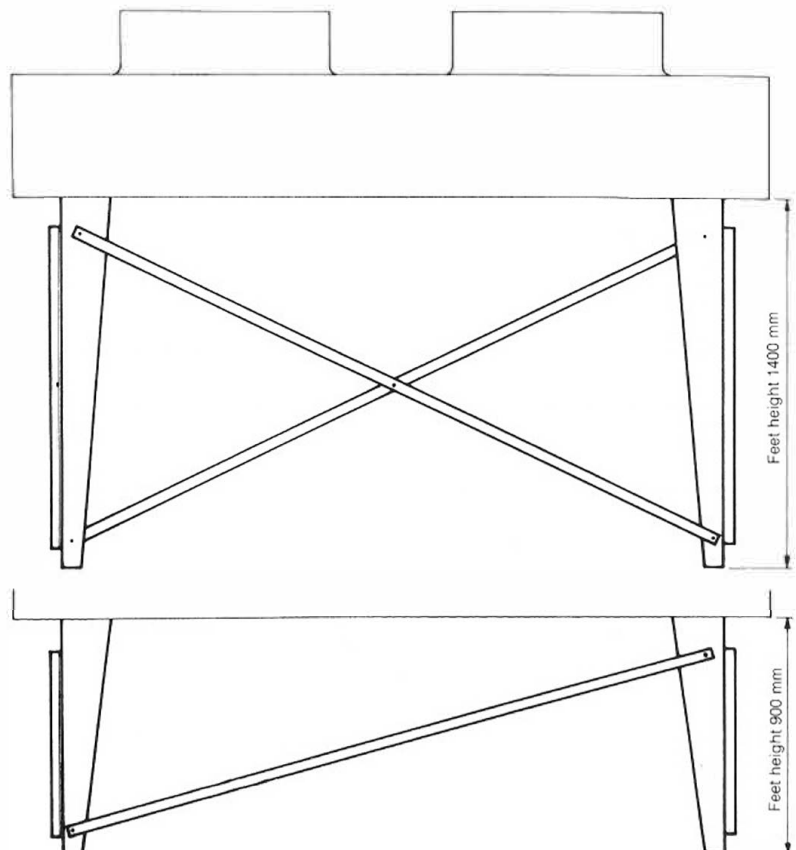
| Type    | Central connection mm |            |
|---------|-----------------------|------------|
|         | gas in                | liquid out |
| LCY 223 | 54                    | 42         |
| LCY 224 | 54                    | 42         |
| LCY 233 | 67                    | 54         |
| LCY 234 | 67                    | 54         |
| LCY 243 | 80                    | 67         |
| LCY 244 | 80                    | 67         |
| LCY 254 | 80                    | 67         |

### Extended feet

Extended feet can be supplied as optional extra. These feet are supplied separately. The standard feet height leaves 402 mm free space under the condenser.

Extended feet are available for heights of 650, 900 and 1400 mm.

The 900 and 1400 mm feet do have truss beams.



## Aircooled condensers

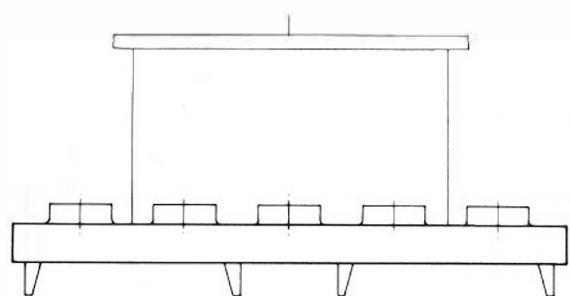
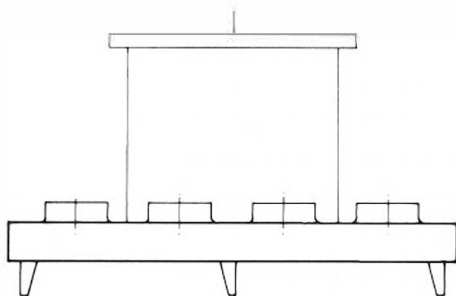
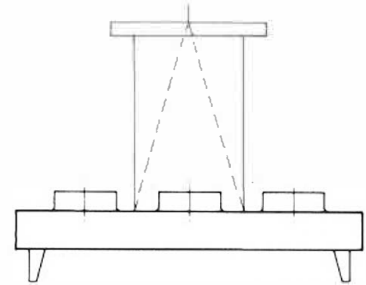
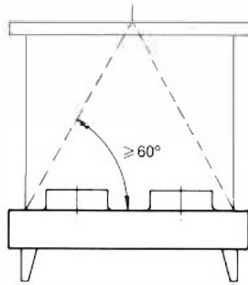
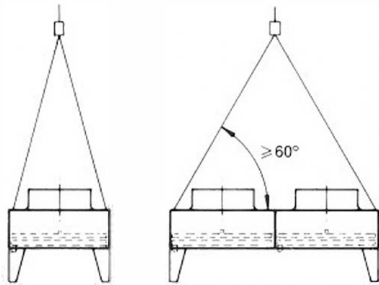
## LCY

### Transport

All types are provided with lifting lugs. To avoid damage during hoisting, a hoisting beam shall be used, by which the given angles are to be considered. Beware of shocks during transport and handling.

### Mounting

Refrigerant connections are to be soldered free of tension. When connecting more condensers in parallel the pressure drop on the refrigerant side has to be considered.



### Thermal overload relay settings

| Motorspeed<br>rpm | Duty<br>Watt | Voltage<br>Volt      | Ampèrage<br>Ampère |
|-------------------|--------------|----------------------|--------------------|
| 930               | 750          | 220-240/380-415/50/3 | 2.9 / 5            |
| 690               | 370          | 220-240/380-415/50/3 | 1.5 / 2.6          |
| 325               | 120          | 220-240/380-415/50/3 | 1.2 / 2            |
| 935/425           | 750/150      | 380-415/50/3         | 3.1 / 1.1          |
| 930               | 750          | 220-240/50/1         | 8                  |
| 865 variable      | 750          | 220-240/50/1         | 8.4*               |
| 840               | 660          | 220-254/380-440/60/3 | 2.8 / 4.8          |

(ambient temperature -10 °C)

\*value at highest speed

**Apparatenfabriek Helpman N.V.**

Postbus 44  
9700 AA Groningen

Tel. (050) 26 26 15

Fax (050) 26 48 78