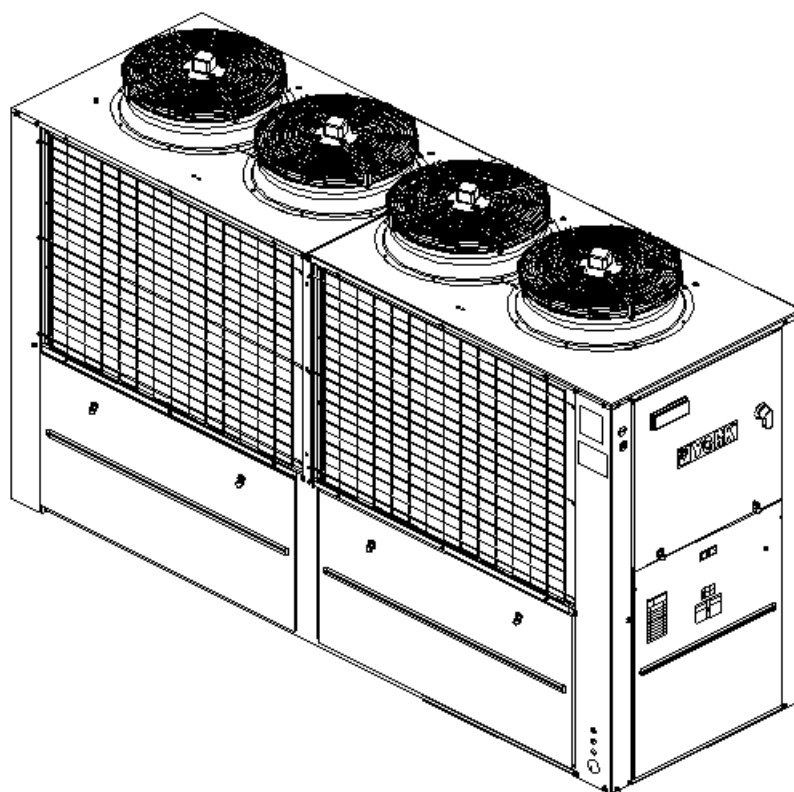




BY JOHNSON CONTROLS

# Air-condensed water chillers and heat pumps YLCA / YLHA



## Installation manual

Ref.: N-40287\_EN 0910



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# Installation manual

## 1.1 Safety instructions

This document contains the necessary information for the safe and efficient transportation, assembly and installation of the air conditioning unit. This guarantees the condition of the unit and its operating safety.

Only an authorised company may assemble the air conditioning unit.



### ATTENTION

*Only authorised companies with the appropriate technical resources and suitably trained personnel may install the air conditioning unit.*



### CAUTION

*The specialists responsible for installing the air conditioning unit must make sure they have all of the information and knowledge required to correctly install, test and deliver the unit. Johnson Controls Inc. shall not be considered responsible for any damage caused by installation of the unit that is no consistent with that described in this document or others specifically provided with the unit.*

During regular equipment installation, the fitter must pay special attention to certain situations in order to prevent injuries or damage to the unit.

Situations that could jeopardise the safety of the fitter or that of others nearby or that could put the unit itself at risk are clearly indicated in this manual.

A series of special symbols are used to clearly identify these situations.

Pay careful attention to these symbols and to the messages following them, as your safety and the safety of others depends on it.

## 1.2 Icons used in this document



### DANGER

- *The text following this symbol contains information and instructions relating directly to your safety and physical wellbeing.*
- *Not taking these instructions into account could lead to serious, very serious or even fatal injuries to you and others in the proximities of the unit.*

Information can also be found on safe procedures during unit handling. This will help reduce the risk of accidents.



### CAUTION

- *The text following this symbol contains information and instructions relating directly to your safety and physical wellbeing.*
- *Not taking these instructions into account could lead to minor injuries to you and others in the proximities of the unit.*
- *Not taking these instructions into account could lead to unit damage.*

Information can also be found on safe procedures during unit handling. This will help reduce the risk of accidents.



### NOTE

- *The text following this symbol contains information or instructions that may be of use or that is worthy of a more thorough explanation.*
- *Instructions regarding inspections to be made on unit parts or systems may also be included.*

## 1.3 Instructions for storage, transport, loading and unloading of the unit



### CAUTION

*Outdoor units must be moved and stored vertically to prevent oil from leaking from the compressor.*

#### Delivery inspection

The unit should be carefully inspected for visible damage or abnormalities as soon as it is received.

Any abnormalities or damage to the unit should be communicated to both the transportation and insurance company in writing.

#### Storage instructions

The unit should be stored in a place suitable to the purpose (warehouse or similar), protected from the weather, water, humidity and dust.

Cover the unit with a canvas of a suitable size.

The unit should be appropriately protected from knocks and dust, ensuring the protective parts it was supplied with remain in place. Where these are not in place, establish the necessary protection and barriers to keep vehicles or fork-lift trucks away.

#### Transport, loading and unloading of the unit

The units should only be handled by personnel from the company responsible for their installation.

Transport of the unit should be in such a manner that no damage is caused by faulty or inadequate mooring to the bed or body of the vehicle.

Where necessary, protect all of the edges of the unit against knocks and scratches and moor it to the bed or body of the vehicle using suitable textile belts or slings to keep it perfectly still.

Loading and unloading the unit from a truck or trailer should be on flat, solid ground using an appropriate crane with sufficient capacity.

### 1.3.1 Inspection

Upon reception, inspect the goods and notify the carrier and the insurance company, in writing, of any possible damage during transportation.

### 1.3.2 Disposal of packaging

The packaging is recyclable. Dispose of it in the appropriate place or take it to an appropriate collection centre. Respect the regulations in force for this type of waste in the country where the unit is being installed.

Packaging remains must be correctly disposed of. Improper disposal of packaging generates environmental problems that affect human life.

### 1.3.3 Disposal of the unit

When removing the unit, the components must be ecologically recovered. The refrigeration circuit is full of refrigerant that must be extracted and delivered to the gas manufacturer for recycling.



#### ATTENTION

*The refrigerant gas contains greenhouse-effect fluorinated gas covered by the Kyoto protocol.*

*Please see the specifications plate for type of gas and quantity per system.*

*GWP (Global Warning Potential): 2088*

There will be oil left in the hermetic compressor, therefore it must be delivered with the circuit sealed.

The air conditioner shall be deposited in the area established by local authorities, to facilitate its selective recovery.

### 1.3.4 Handling

The unit must be moved using the metal rails provided for its installation and transport

## 1.4 Selection guide (YLCA/YLHA)

#### Necessary information

The following information is needed to select a YLCA/YLHA water chiller:

- 1 Cooling capacity needed
- 2 Design cold water input and output temperatures.
- 3 Design water flow, if one of the temperatures of Point 2 above is unknown.
- 4 Design input temperature of air to condensing unit. Normally, this will be the design ambient temperature of summer air, unless influenced by the situation or other factors.
- 5 Altitude above sea level.
- 6 Design fouling factor of the evaporating unit.



#### NOTE

*Points 1, 2 and 3 should be related by means of the following formulae:*

$$\text{Cooling capacity kW} = \frac{\text{l/h cold water} \times \text{differential } ^\circ\text{C}}{860}$$

## SELECTION EXAMPLE

A chiller is required to chill water from 13°C to 7°C, with a cooling capacity of 119 kW.

There are also other design conditions:

- Ambient air entering the condensing unit 35°C
- Fouling factor: 0.044 m<sup>2</sup> °C/kW
- Altitude: Sea level

Taking a quick look at the table, we can see that a YLCA 120 unit gives an approximate required capacity of 117 kW.

As the factors appearing in Tables and *Altitude factors, see on page 12* are not applicable, the conditions will be as follows:

- Cooling capacity: 119 kW
- Power consumed: 40 kW
- Water temperature: 13°C to 7°C (Temp. difference of 6)

$$\text{Water flow} = \frac{119 \times 860}{6} = 17\,056 \text{ l/h}$$

Available pressure in hydraulic circuit of a unit with pack:

- From the table we infer that the YLCA 120 TP, with a 17 056 l/h flow, has an available pressure of 279 kPa.

Pressure drop in hydraulic circuit of a unit without pack:

- From the table we infer that the YLCA 120 T, with a 17 056 l/h flow, has an available pressure drop of 23 kPa.

Pressure drop in filter:

- From Table *Pressure drop in filters, see on page 16*, 2 ½" filter, we infer that with a 17 056 l/h flow, said filter has a pressure drop of 2.4 kPa.

### YLHA selection method

- 1 Determine the correct size of the YLHA unit by selecting a model from Tables 3, 4 and 5 that is closest to the cooling and heating capacities required in the design conditions of the water outlet and air inlet temperatures.
- 2 Apply fouling (Table 11) and altitude (Table 12) correcting factors to the capacity and power values that appear in the corresponding capacity tables in cool and heat. Make sure the corrected capacity is still sufficient for your needs.
- 3 Using the corrected capacities of the unit, select the design temperature differential, or the flow.
- 4 Check to make sure that these selections are within the YLCA/YLHA operating limits.

## YLHA SELECTION EXAMPLE

A YLHA heat pump operating at a 35°C ambient temperature should chill water from 13°C to 7°C, with a 112 kW cooling capacity.

A 110 kW heating capacity is required in 5°C design ambient temperature and a hot water output temperature of 40°C.

The fouling factor is 0.044 m<sup>2</sup> °C/kW, with the unit operating at sea level (no corrections). With a quick glance of capacity Tables 3 and 5, we see that a YLHA 120 heat pump gives the approximate required capacities of:

- Cooling capacity = 114 kW
- Total unit absorbed power = 43.2 kW
- Cold water temperature = 13 °C to 7 °C (Temp. diff. of 6 °C)
- Hot and cold water flow = 16 340/h
- Heating capacity = 110.1 kW
- Total unit absorbed power in heat mode = 35.8 kW
- Hot water output temperature = 40°C

$$\text{Hot water temp. dif-ferential} = \frac{110.1 \times 860}{16\,340} = 5.8 \text{ °C}$$

Thus, hot water return temperature is = 34.2°C

All values are within operating limits:

- Available pressure in hydraulic circuit of a unit with pack:
- From Table 6 we infer that the YLCA 120, with a 16 340 l/h flow, has an available pressure of 289 kPa.
- Pressure drop in hydraulic circuit of a unit without pack:
  - From the table we infer that the YLCA 120, with a 16 340 l/h flow, has an available pressure of 21 kPa.
- Pressure drop in filter.
  - From Table [Pressure drop in filters](#), see on page 16, 2 ½" filter, we infer that with a 16 340 l/h flow, said filter has a pressure drop of 2.2 kPa.



## 1.4.1 Selection guide with glycol (cooling only units)

### Necessary information

The following information is needed to select a YLCA water chiller:

- 1 Cooling capacity needed
- 2 Design cold water/glycol input and output temperatures.
- 3 Design water/glycol flow.
- 4 Design input temperature of air to condensing unit. Normally, this will be the design ambient temperature of summer air, unless influenced by the situation or other factors.
- 5 Altitude above sea level.
- 6 Design fouling factor of the evaporating unit.



### NOTE

Points 1, 2 and 3 should be related by means of the following formulae:

$$\text{Capacity (kW)} = \frac{\text{Temp. diff. (}^\circ\text{C)} \times \text{Flow (litres/sec.)}}{\text{Glycol factor}}$$

$$\text{Temp. diff. (}^\circ\text{C)} = \text{Liquid inlet Temp.} - \text{Liquid output Temp.}$$

To determine the glycol factor, please see [Glycol concentration and correcting tables](#), see on page 10 (Recommended ethylene glycol concentrations) for ethylene glycol or (Recommended propylene glycol concentrations) for propylene glycol. For design output temperature, please see the recommended glycol concentration and the glycol factor in this concentration. This is the minimum concentration to be used for design output temperature. If a greater concentration is required, the glycol factor can be determined by means of [Glycol concentration and correcting tables](#), see on page 10 (Ethylene glycol in other concentrations) or (Propylene glycol in other concentrations).

### Selection method

- 1 Determine the correct chiller model by selecting the one that is closest to the capacities required by the design conditions of the glycol outlet and air inlet temperatures.
- 2 Apply the fouling correcting factors that correspond to the fouling, altitude and glycol concentration factor, to the capacity and power values in the capacity tables. Make sure the corrected capacity is still sufficient for your needs.
- 3 Using the corrected capacities of the chiller, set the design temperature range, or the flow, to balance the formulae appearing in [Selection guide \(YLCA/YLHA\)](#), see on page 4.
- 4 Always recheck to make sure these selections are within the specified design limits.

### Selection example

A chiller is required to chill ethylene glycol from 1 a to -4°, with a capacity of 75 kW.

The following design conditions are applicable:

- Fouling factor: 0.088m °C/kW
- Altitude: 1,200m
- Ambient air: 25°C
- Glycol concentration: 30% w/w

For a -4°C ethylene glycol output, the concentration recommended in Figure 1 is 30%. Therefore, the specified concentration is appropriate.

From Table [Cooling capacities YLCA 40 ÷ 150 \(35% ethylene glycol\)](#), see on page 31, we infer that a YLCA-120 unit, at the established design conditions, gives a capacity of 76.8 kW and a consumption of 28.8 kW.

With the design fouling factor, use the capacity correcting factors x 0.987 and power x 0.995 (see [Fouling factors](#), see on page 9).

On design altitude, apply the capacity correcting factors x 9.973 and power x 1.020 (see [Altitude factors](#), see on page 12).

## 1.4 Selection guide (YLCA/YLHA)

On design glycol concentration, apply the capacity correcting factors x 1.015 and power x 1.005 (see [Correcting factors for other glycol concentrations, see on page 12](#)).

Applying these factors to the selection: YLCA -120

$$\text{Capacity} = 76.8 \times 0.987 \times 0.973 \times 1.015 = 74.9 \text{ kW}$$

$$\text{Comp. power} = 28.8 \times 0.995 \times 1.020 \times 1.005 = 29.4 \text{ kW}$$

For the specified glycol concentration and a -4C output temperature, Figure 3 shows a 0.248 glycol factor. Thus, the flow can be determined with the formula appearing in [Selection guide \(YLCA/YLHA\), see on page 4](#).

$$74.9 \text{ [kW]} = \frac{(1 - (-4)) \times \text{Flow [l / s]}}{0,248}$$

$$\text{Flow} = \frac{74.9 \times 0.248}{5} = 3.71 \text{ [l / s]} \text{ or } 13374 \text{ [l / h]}$$

This covers the Limits of Use.

The evaporating unit pressure drop can be determined by taking the water pressure drop value for a YLCA 120 unit and multiplying it by the correcting factor (see [Glycol concentration and correcting tables, see on page 10](#)) for a 30% concentration and an average temperature of -1.5°C, that is to say:

$$-1.5 \text{ °C} = \frac{1 + (-4)}{2}$$

$$16 \text{ kPa} \times 1.22 = 19.5 \text{ kPa.}$$

## 1.5 Technical data

### 1.5.1 Limits of use

Model	Voltage limits		Input air temperature to the coil DB				Water output temperature				Temperature diff. between water output and inlet	
	Nominal at 400		Operating cycle				Operating cycle				Mini- mum °C	Maxi- mum °C
	Mini- mum	Maxi- mum	Minimum °C		Maximum °C		Minimum °C		Maximum °C			
			Cold	Heat	Cold	Heat	Cold	Heat	Cold	Heat		
YLCA	342	436	-18	-	46	-	5(1)	-	15	-	3	7
YLHA				-10		20		30		50(2)		

- (1) At lower water temperatures, it is advisable to use glycol-type antifreeze mixtures. Minimum temp. with glycol -5°C
- (2) 50°C if the inlet air is 0°C.

#### Prior to final approval of the installation

Check:

- Voltage remains between 342 - 436 V.
- Power supply cable cross-section is at least as indicated in the corresponding wiring diagrams. The cable used for the unit power supply must be H05 RN - F.
- Operating instructions have been given to the user.
- The warranty card has been filled out.
- Maintenance instructions have been given, or a regular maintenance contract has been signed.

### 1.5.2 Correcting Factors

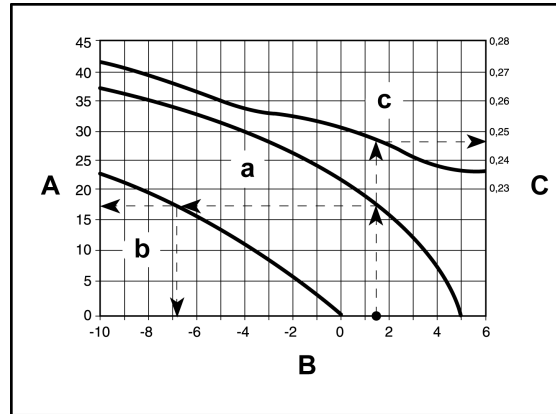
#### Fouling factors

Evaporator		
Fouling Factor m <sup>2</sup> °C/kW	Capacity factor	compressor absorbed power factor
0,044	1	1
0,088	0,987	0,995
0,176	0,964	0,985
0,352	0,926	0,962

## Glycol concentration and correcting tables

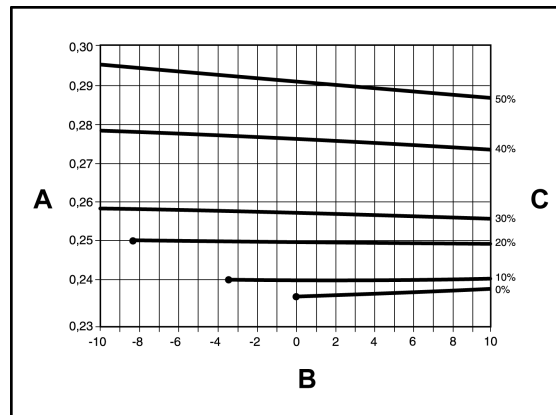
### Recommended ethylene glycol concentrations

- |   |   |   |   |
|---|---|---|---|
| A | % in weight   | a | Recommended concentration % in weight       |
| B | Outlet liquid temperature °C                          | b | Freeze point                                |
| C | Glycol factor L/S °C/kW in recommended concentrations | c | Glycol factor in recommended concentrations |



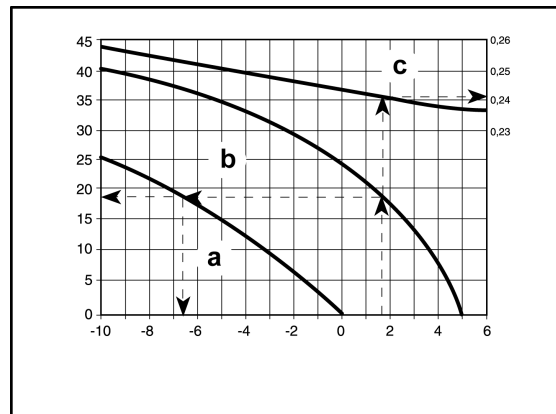
### Ethylene glycol in other concentrations.

- |   |                              |
|---|------------------------------|
| A | Glycol factor                |
| B | Outlet liquid temperature °C |
| C | Glycol factor                |



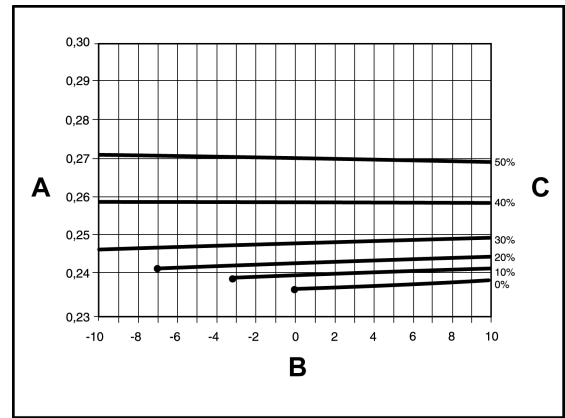
### Recommended propylene glycol concentrations

- |   |   |   |   |
|---|---|---|---|
| A | % in weight   | a | Recommended concentration % in weight       |
| B | Outlet liquid temperature °C                          | b | Freeze point                                |
| C | Glycol factor L/S °C/kW in recommended concentrations | c | Glycol factor in recommended concentrations |



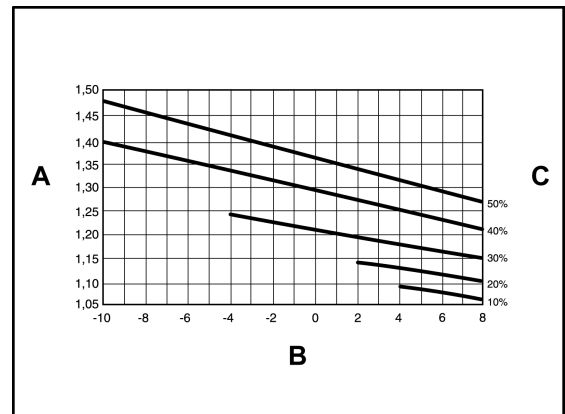
**Propylene glycol in other concentrations**

- A Glycol factor
- B Outlet liquid temperature °C
- C Glycol factor



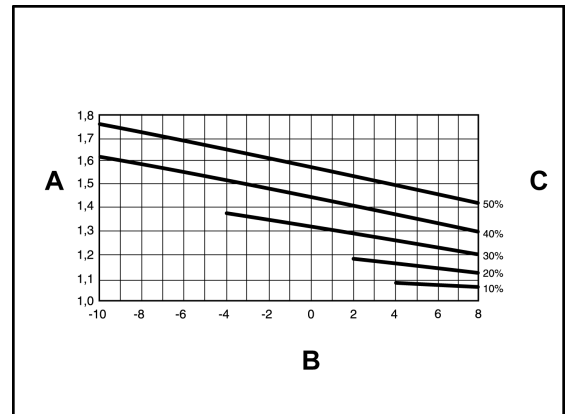
**Ethylene glycol pressure drop correcting factor**

- A Correcting Factor
- B Average liquid temperature °C
- C Glycol concentration P/P



**Propylene glycol pressure drop correcting factor**

- A Correcting Factor
- B Average liquid temperature °C
- C Glycol concentration P/P



### Correcting factors for other glycol concentrations

% in weight	Ethylene glycol		Propylene glycol	
	Capacity	Absorbed power	Capacity	Absorbed power
10	1,061	1,025	1,097	1,033
20	1,036	1,015	1,067	1,023
30	1,015	1,005	1,026	1,008
35	1	1	1	1
40	0,985	0,995	0,974	0,992
50	0,954	0,985	0,923	0,977

If it is necessary to select different glycol percentages, correct the capacity and absorbed power capacities of tables 2 and 4 (35% ethylene glycol), multiplying them by the coefficients indicated in the table.

### Altitude factors

Altitude	Capacity factor	compressor absorbed power factor
0	1	1
600	0,987	1,01
1200	0,973	1,02
1800	0,958	1,029
2400	0,943	1,038

**Pressure drop in the YLCA/YLHA 40 ÷ 150 hydraulic circuit without pack (no filter fitted)**

YLCA-YLHA model	Flow l/h	kPa	YLCA-YLHA model	Flow l/h	kPa
40	4750	13	80	9500	40
	5500	19		10000	43
	6250	26		11000	48
	7000	33		12000	53
	7750	42		13000	59
	8500	50		14000	65
	9250	61		15000	72
	10000	71		16000	79
	10750	84		17000	87
50	6500	25		18000	96
	7000	28		19000	107
	7500	31		20000	119
	8000	34	21000	132	
	8500	37	22000	145	
	9000	40	100	12000	45
	9500	44		13000	46
	10000	48		14000	47,5
	10500	52		15000	49,5
	11000	57		16000	52
	11500	62		17000	55
	12000	67		18000	60
	12500	72		19000	65
	13000	77		20000	70
13500	83	21000		75	
14000	89	22000		80	
14500	95	23000		85	
60	7500	36	24000	92	
	8000	38	-	-	
	8500	40,5	-	-	
	9000	43	-	-	
	9500	45,5	-	-	
	10000	48	120	15000	18
	10500	51		16000	20
	11000	54		17000	23
	11500	57		18000	25,5
	12000	60		19000	28
	12500	64		20000	31
	13000	68		21000	34
	13500	72		22000	37
	14000	76		23000	40
	14500	81		24000	43
	15000	86		25000	46
	15500	90,5		26000	49
	16000	95	27000	52,5	
	16500	100	28000	56,5	
	17000	105	29000	60	
		30000	63		
		31000	67		
		32000	70,5		
		33000	74,5		
		34000	78		

## 1.5 Technical data

YLCA-YLHA model	Flow l/h	kPa
150	18000	12,5
	19000	14
	20000	15,5
	21000	17,5
	22000	19,5
	23000	21,5
	24000	23,5
	25000	25,5
	26000	27,5
	27000	30
	28000	32,5
	29000	35
	30000	37,5
	31000	40
	32000	43
	33000	46
	34000	49
	35000	52
	36000	55
	37000	58
38000	61	
39000	64	
40000	67	
41000	70	
42000	73	



### Available pressure for the YLCA/YLHA 40 ÷ 150 hydraulic circuit with pack (no filter fitted)

YLCA-YLHA TP model	Flow l/h	kPa	YLCA-YLHA TP model	Flow l/h	kPa
40	4750	261	100	12000	245
	5500	218		13000	236
	6250	166		14000	226
	7000	105		15000	215
	7500	60		16000	201
	8000	13		17000	187
50	6500	149		18000	171
	7000	142		19000	153
	7500	135		20000	131
	8000	127		21000	110
	8500	119		22000	87
	9000	110		23000	57
	9500	100	24000	32	
	10000	90	120	15000	310
	10500	79		16000	295
	11000	68		17000	279
11500	56	18000		261	
12000	44	19000		241	
60	7500	233		20000	217
	8000	222		21000	187
	8500	210		22000	157
	9000	198	23000	123	
	9500	185	24000	90	
	10000	172	25000	55	
	10500	156	150	18000	249
	11000	140		19000	243
	11500	122		20000	237
	12000	105		21000	230
12500	86	22000		223	
13000	67	23000		215	
13500	47	24000		207	
80	9500	169		25000	199
	10000	164		26000	192
	10500	159		27000	183
	11000	154	28000	175	
	11500	148	29000	165	
	12000	143	30000	155	
	12500	137	31000	145	
	13000	131	32000	132	
	13500	124	33000	120	
	14000	118	34000	109	
	14500	111	35000	95	
	15000	103	36000	84	
	15500	96	37000	70	
	16000	87	38000	57	
	16500	79			
	17000	71			
17500	62				
18000	53				
18500	43				
19000	33				

Data with water at 10°C.

If using glycol, apply the correction factors indicated in section (Ethylene glycol pressure drop correcting factor and propylene glycol pressure drop correcting factors).

## Pressure drop in filters

### 1 1/2" filter

Water flow (l/h)	3500	4000	4500	5000	5500	6000	6500	7000	7500
kPa	1,3	2,6	4	5,4	6,9	8,4	10	11,6	13,3
Water flow (l/h)	8000	8500	9000	9500	10000	10500	11000	11500	11800
kPa	15	16,8	18,7	20,7	22,8	25	27,3	29,7	32

### 2" filter

Water flow (l/h)	6000	7000	8000	9000	10000	11000	12000	13000	
kPa	0,5	0,8	1,1	1,4	1,7	2	2,3	2,6	
Water flow (l/h)	14000	15000	16000	17000	18000	19000	20000		
kPa	2,9	3,3	3,7	4,1	4,6	5,1	6		

### 2 1/2" filter

Water flow (l/h)	15000	16000	17000	18000	19000	20000	21000	22000	23000	24000
kPa	2	2,2	2,4	2,7	3	3,3	3,6	4	4,4	4,8
Water flow (l/h)	25000	26000	27000	28000	29000	30000	31000	32000	33000	34000
kPa	5,2	5,6	6	6,5	7	7,5	8	8,5	9	9,7
Water flow (l/h)	35000	36000	37000	38000	39000	40000	41000	42000		
kPa	10,5	11,3	12,1	13	14	15	16	17		

Data with water at 10°C.

If using glycol, apply the correction factors indicated in section (Ethylene glycol pressure drop correcting factor and propylene glycol pressure drop correcting factors).

## 1.5.3 Physical data

### Physical data, YLCA units

#### Physical data

		YLCA (T and TP)							
Characteristics		40	50	60	80	100	120	150	
Cooling capacity	kW	39,6	52,1	60,5	72,6	101	119	151	
Capacity control	%	100	50-100			25-50-75-100			
Power supply	V/ph	400.3.50							
EER/OOP		3	2,9	3,1	2,9	2,9	2,9	2,8	
Compressor	Compressor consumption	kW	12,46	2 x 8.5	2 x 9.2	2 x 12.4	4 x 7.8	4 x 9.4	4 x 12.5
	Compressor amperage	A	23,5	2 x 15.5	2 x 16.7	2 x 24.6	4 x 16	4 x 17.7	4 x 23.5
	No. of compressors		1	2 (1 Tandem)			4 (2 tandem)		
	Compressor type		SCROLL						
	Oil charge	l	3,25	2 x 3.25			4 x 3.25		
Oil type		POLYOL ESTER OIL							
Evaporating unit type		PLATES							
Fan	No. of fans		2		3	4			
	Fan diameter	mm	560	630				710	
	Fan consumption	W	2 x 400	2 x 600		3 x 600	4 x 600		4 x 860
	Fan amperage	A	2 x 1.9	2 x 2.8		3 x 2.8	4 x 2.8		4 x 3.9
	Total air flow	m³/h	12300	18600		27500	36000		48000
	Sound power (standard / Low noise)	dB(A)	81 / 76	83 / 78	85 / 80	86 / 82	86 / 82	86 / 82	87 / 83
	Sound pressure at 5 m (standard / Low noise)	dB(A)	60 / 54	62 / 56	63 / 57	66 / 60	63 / 60	64 / 60	65 / 61
Sound pressure at 10 m (standard / Low noise)	dB(A)	54 / 48	56 / 50	57 / 51	60 / 54	57 / 54	58 / 54	59 / 55	
Refrigerant	Refrigerant type		R-410A						
	Refrigerant charge	kg	11	13	16	25	2 x 16.5	2 x 16.2	2 x 21
	No. of refrigerant circuits		1			2			
Water circuit	Nominal water flow	l/h	6820	8960	10400	13350	17600	20470	25970
	Water connection, female		1 1/4"		2"		2 1/2"		
	water filter, female		1 1/2"		2"		2 1/2"		
Dimensions	Length	mm	1500	2104		2944	3416		3770
	Width	mm	822	1011		1118	1101		
	Height	mm	1573	1600			2190		2263

#### Units with hydro kit (version P)

		YLCA (Version P)						
Characteristics		40	50	60	80	100	120	150
No. of pumps		1						
Available static pressure at nominal flow (without filter)(2)	kPa	115	110	160	126	190	205	192
Available static pressure at nominal flow (without filter)(3)	kPa	105	108	158	123	187	202	186
Pump consumption	W	1035	990	1515	1620	2395	3180	3400
Pump amperage	A	1,9	1,8	2,9	3,3	4,4	5,5	6,1
Unit water content	l	131	188	194	285	193	195	214
Expansion vessel volume	l	12		18		25		35
Tank capacity	l	115	170		260	152		
Safety valve setting	MPa (bar)	0,6 (6)						
Max. unit power supply consumption	kW	18,23	24,6	26,3	35,2	52,4	56,2	70,7
Max. unit current amperage	A	33	46,2	49,2	70,5	95,4	108	124
Start-up current (compressor)	A	174	118	118	174	118	118	174
Weight (1)	kg	380	580	611	785	1220	1286	1503

## 1.5 Technical data

- (1) Weights for the empty unit
- (2) Static pressure available, Eurovent certified
- (3) Pressure with clean filter

**Units without pack**

		YLCA						
Characteristics		40	50	60	80	100	120	150
Start-up current (compressor)	A	174	118	118	174	118	118	174
Water circuit pressure drop	kPa	75	40	51	61	54	32	27,5
Unit water content		4	6	6	7	12	12	14
Max. unit power supply consumption	kW	17,2	23,6	24,8	33,6	50	53	67,3
Max. current amperage	A	31	44,4	46,3	67,2	91	103	118
Weight (1)	kg	340	524	555	715	1124	1190	1415

- (1) Weights for the empty unit

## Physical data, YLHA units

### Physical data

		YLHA (T and TP)							
Characteristics		40	50	60	80	100	120	150	
Cooling capacity	kW	37,8	52	60,5	72,2	96	114	145	
Heating capacity	kW	38,6	52,5	59,6	74,7	104	119,6	150	
Capacity control	%	100	50-100			25-50-75-100			
Power supply	V/ph	400.3.50							
EER/OOP		2,8/3	3/2,9	3,1/3	2,7/2,8	2,7/2,8	2,6/3	2,8/2,8	
Compressor	Compressor consumption in cooling	kW	12,4	2 x 8	2 x 9.2	2 x 12.1	4 x 8.3	4 x 10.2	4 x 11.8
	Compressor consumption in heating	kW	11,7	2 x 8.3	2 x 9.2	2 x 12.2	4 x 8.7	4 x 9.2	4 x 12.5
	Compressor amperage in cooling	A	23,5	2 x 15	2 x 16.7	2 x 24.9	4 x 16	4 x 18.2	4 x 23.5
	Compressor amperage in heating	A	24,5	2 x 15.3	2 x 16.7	2 x 24.6	4 x 15.5	4 x 16.9	4 x 24.5
	No. of compressors		1	2 (1 Tandem)			4 (2 tandem)		
	Compressor type		SCROLL						
	Oil charge	l	3,25	2 x 3.25			4 x 3.25		
Oil type		POLYOL ESTER OIL							
Evaporating unit type		PLATES							
Fan	No. of fans		2		3	4			
	Fan diameter	mm	560	630				710	
	Fan consumption	W	2 x 400	2 x 600	3 x 600	4 x 600		4 x 860	
	Fan amperage	A	2 x 1.9	2 x 2.8	3 x 2.8	4 x 2.8		4 x 3.9	
	Total air flow	m <sup>3</sup> /h	12300	18600	27500	36000		48000	
	Sound power (standard / Low noise)	dB(A)	81 / 76	83 / 78	85 / 80	88 / 85	85 / 81	86 / 82	87 / 83
	Sound pressure at 5 m (standard / Low noise)	dB(A)	60 / 54	62 / 56	63 / 57	66 / 61	63 / 59	64 / 60	65 / 61
	Sound pressure at 10 m (standard / Low noise)	dB(A)	54 / 48	56 / 50	57 / 51	60 / 55	57 / 53	58 / 54	59 / 55
Refrigerant	Refrigerant type		R-410A						
	Refrigerant charge	kg	12,5	15,5	18	29	2 x 18	2 x 20	2 x 29
	No. of refrigerant circuits		1			2			
Water circuit	Nominal water flow	l/h	6500	8940	10400	12420	17600	19610	24940
	Water connection, female		1 1/4"	2"			2 1/2"		
	water filter, female		1 1/2"	2"			2 1/2"		
Dimensions	Length	mm	1500	2104		2944	3416		3770
	Width	mm	822	1011		1118	1101		
	Height	mm	1573	1600			2190		2263

### Units with hydro kit

		YLHA (Version P)						
Characteristics		40	50	60	80	100	120	150
No. of pumps		1						
Available static pressure at nominal flow (without filter)(2)	kPa	147	118	160	137	195	231	205
Available static pressure at nominal flow (without filter)(3)	kPa	137	117	158	134	192	228	200
Pump consumption	W	1035	990	1515	1580	2380	3180	3400
Pump amperage	A	1,9	1,8	2,9	3,2	4,4	5,5	6,1
Unit water content	l	131	188	194	285	193	195	214
Expansion vessel volume	l	12		18		25		35
Tank capacity	l	115	170		260	152		
Safety valve setting	MPa (bar)	0,6 (6)						
Max. unit power supply consumption	kW	17,38	23,9	26,3	34,2	52,4	56,2	74,5
Max. unit current amperage	A	36,2	45,1	49,2	69,8	95,4	108	120
Start-up current (compressor)	A	174	118	118	174	118	118	174
Weight (1)	kg	397	593	624	805	1250	1316	1535

## 1.5 Technical data

- (1) Weights for the empty unit
- (2) Static pressure available, Eurovent certified
- (3) Pressure with clean filter

## Units without pack

		YLHA						
Characteristics		40	50	60	80	100	120	150
Start-up current (compressor)	A	174	118	118	174	118	118	174
Pressure drop, cooling mode	kPa	70	37	51	56	53	29,5	25,5
Unit water content		4	6	6	7	12	12	14
Max. unit power supply consumption	kW	16,3	23	24,8	32,6	50	53	71,1
Max. current amperage	A	34,3	43,3	46,3	66,6	91	103	114
Weight (1)	kg	337	537	568	735	1154	1220	1445

- (1) Weights for the empty unit

## 1.5.4 Electrical specifications

Model	Power supply [V / ph (Hz)]	Compressor					Fans		Pump	
		Rated current [A]		Start-up current [A]	Standard Rating [kW]		Rated current [A]	Standard Rating [kW]	Rated current [A]	Standard Rating [kW]
		Cold	Heat		Cold	Heat				
YLCA 40	400/3 (50)	21,7	-	174	12,46	-	2 x 1.9	2 x 400	1,9	1035
YLHA 40		25,8	24,5		12,49	11,7				
YLCA 50		2 x 15.5	-	118	2 x 8.5	-	2 x 2.8	2 x 600	1,8	990
YLHA 50		2 x 15	2 x 15.3		2 x 8	2 x 8.3				
YLCA 60		2 x 16.7	-		2 x 9.20	-				
YLHA 60		2 x 16.7	2 x 16.7		2 x 9.20	2 x 9.20				
YLCA 80		2 x 24.6	-	174	2 x 12.4	-	3 x 2.8	3 x 600	3,3	1620
YLHA 80		2 x 24.9	2 x 24.6		2 x 12.1	2 x 12.2			3,2	1580
YLCA 100		4 x 16	-	118	4 x 7.8	-	4 x 2.8	4 x 600	4,4	2395
YLHA 100		4 x 16	4 x 15.5		4 x 8.3	4 x 8.4				
YLCA 120		4 x 17.7	-		4 x 9.4	-			5,5	3180
YLHA 120		4 x 18.2	4 x 16.9		4 x 10.2	4 x 9.2				
YLCA 150		4 x 23.5	-	174	4 x 12.53	-	4 x 3.9	4 x 860	6,1	3400
YLHA 150		4 x 23.5	4 x 24.5		4 x 11.8	4 x 12.5				

## 1.6 Measurements, clearances and accesses

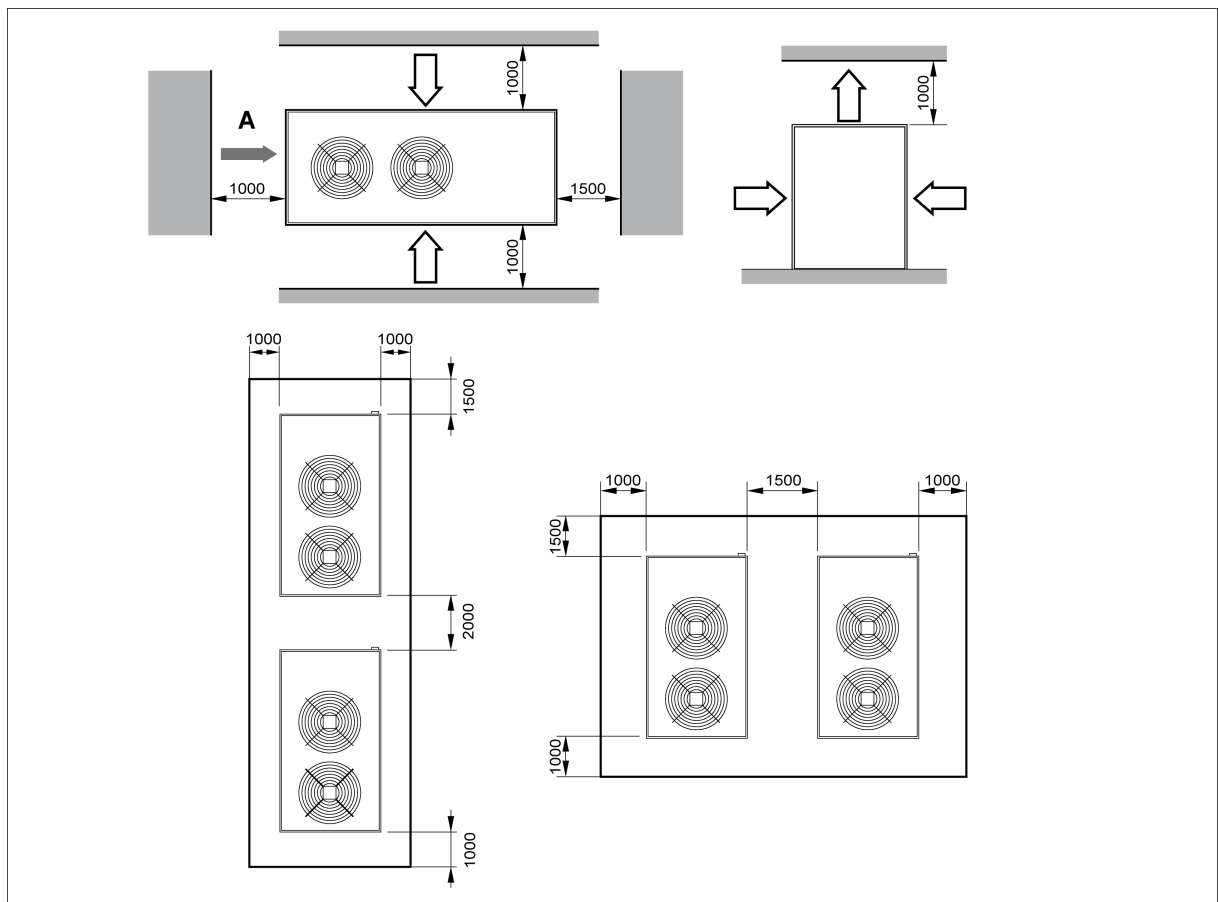
### 1.6.1 Clearances

When installing each unit, clearances should be left for:

- 1 Air inlet and discharge.
- 2 Maintenance servicing.
- 3 Power supply connections.

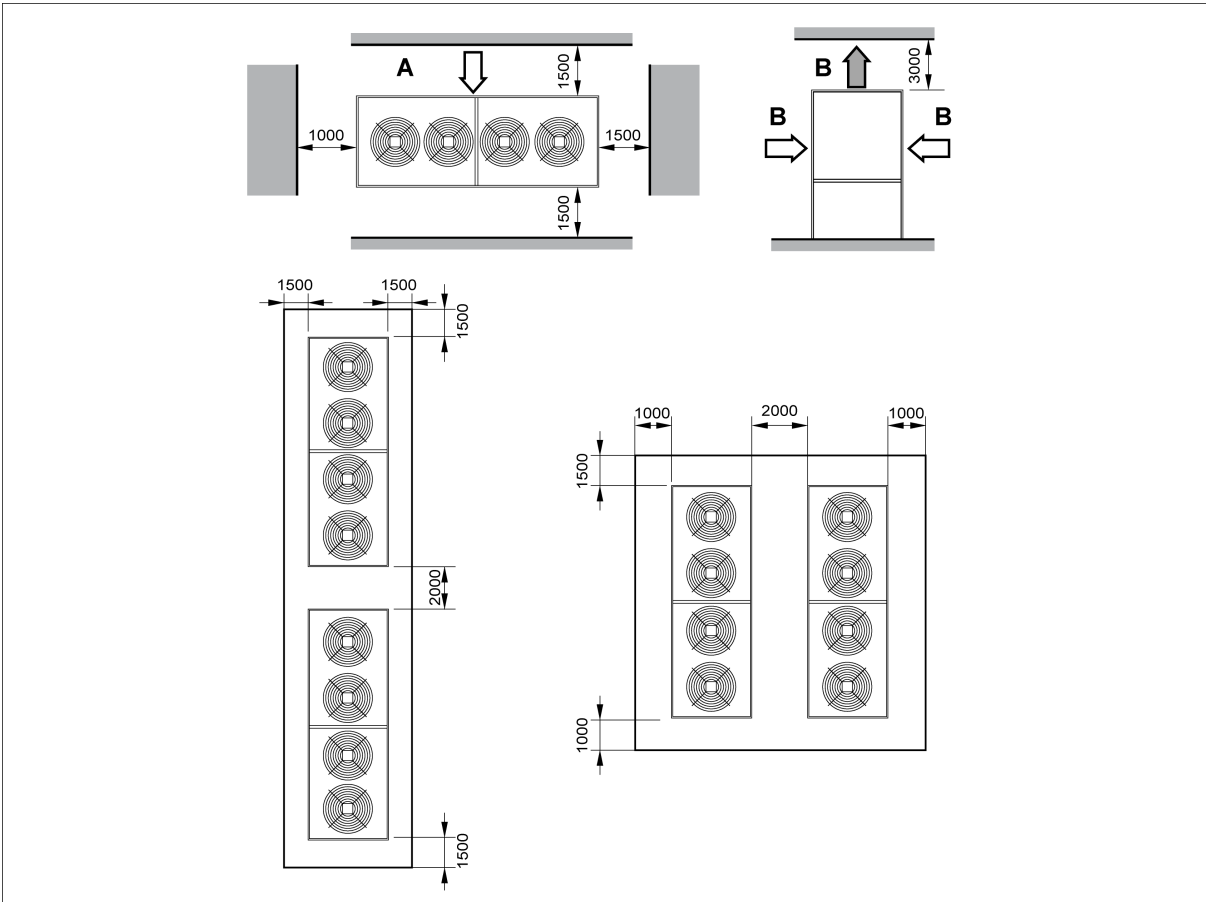
For proper operation, all minimum clearances shown on the general dimension diagrams should be respected always with regard to possible obstruction of air circulation of the work of a user.

#### Minimum technical clearance YLCA/YLHA 40 80



A Water inlet and outlet

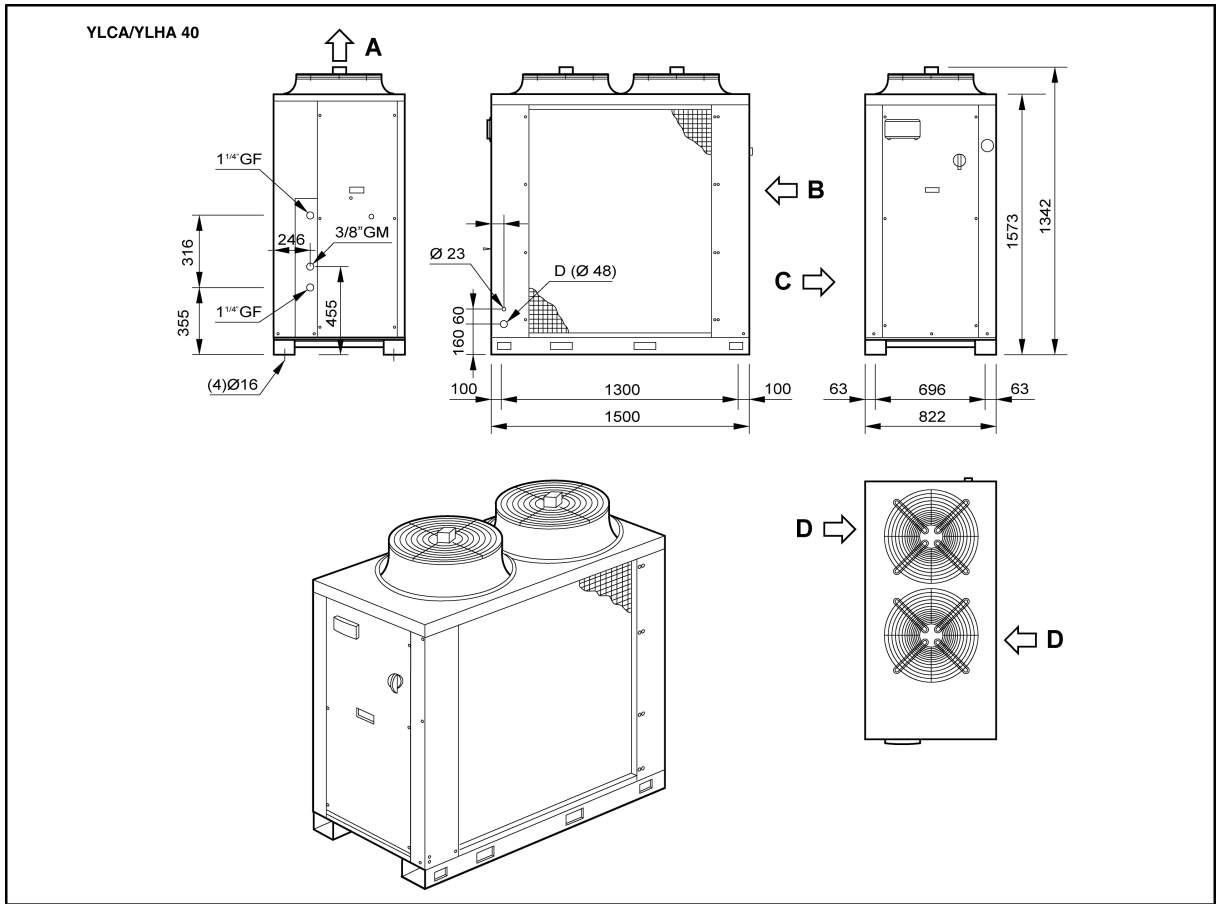
### Minimum technical clearance YLCA/YLHA 100 ÷ 150



- A Water inlet and outlet
- B Air



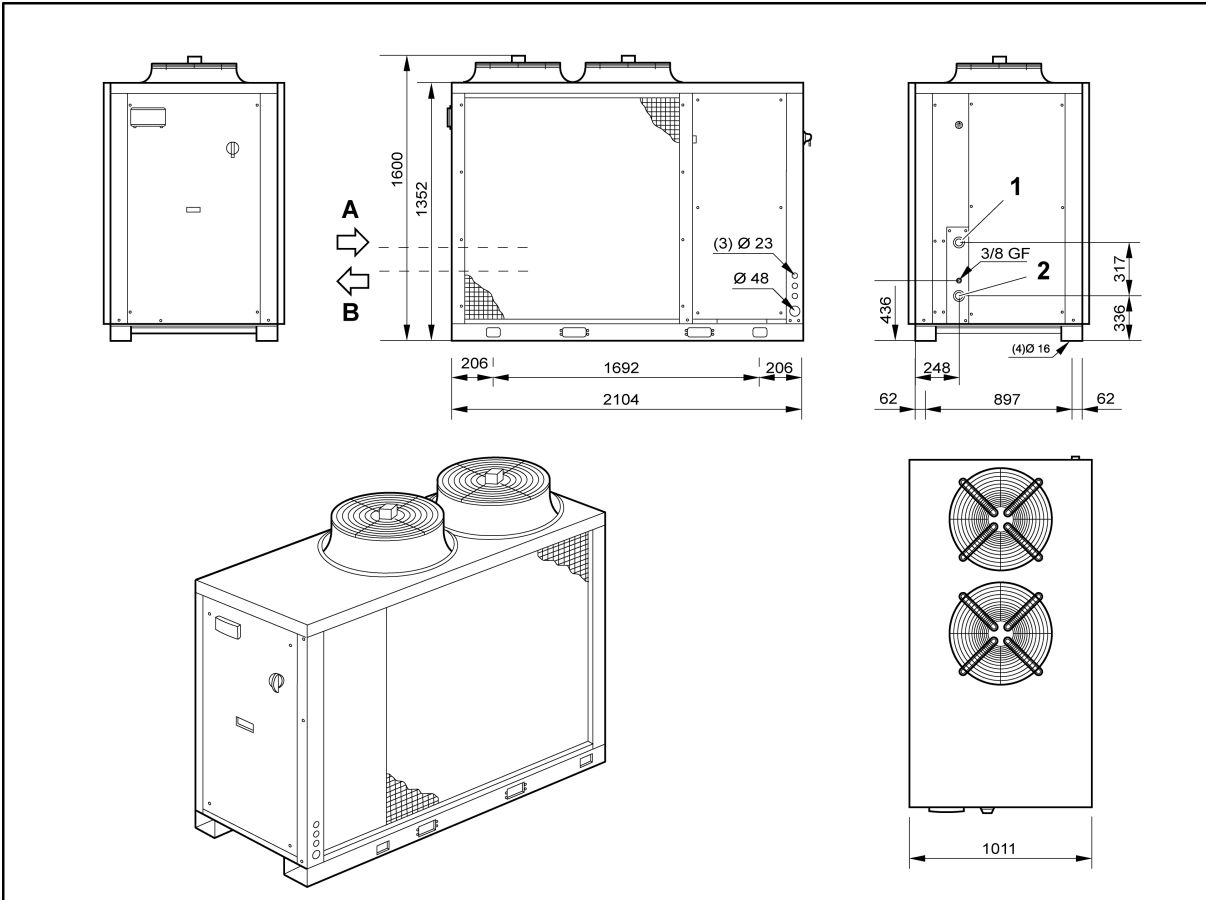
### 1.6.2 Dimensions and hydraulic connections (models YLCA/YLHA 40)



A Air outlet  
B Water inlet

C Water outlet  
D Air inlet

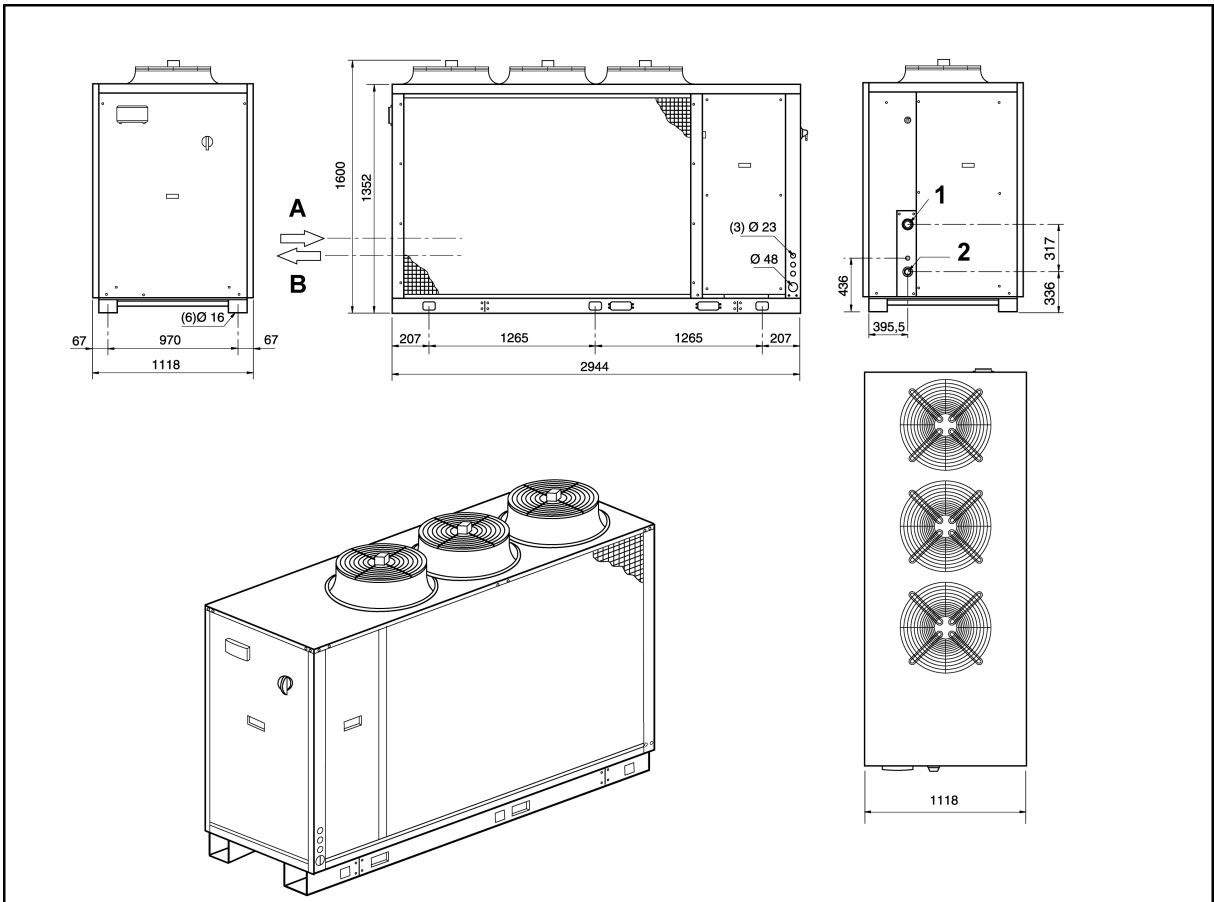
**1.6.3 Dimensions and hydraulic connections (models YLCA/YLHA 50 and 60)**



- A Water inlet
- B Water outlet

- 1 2" GF (Inlet)
- 2 2" GF (Outlet)

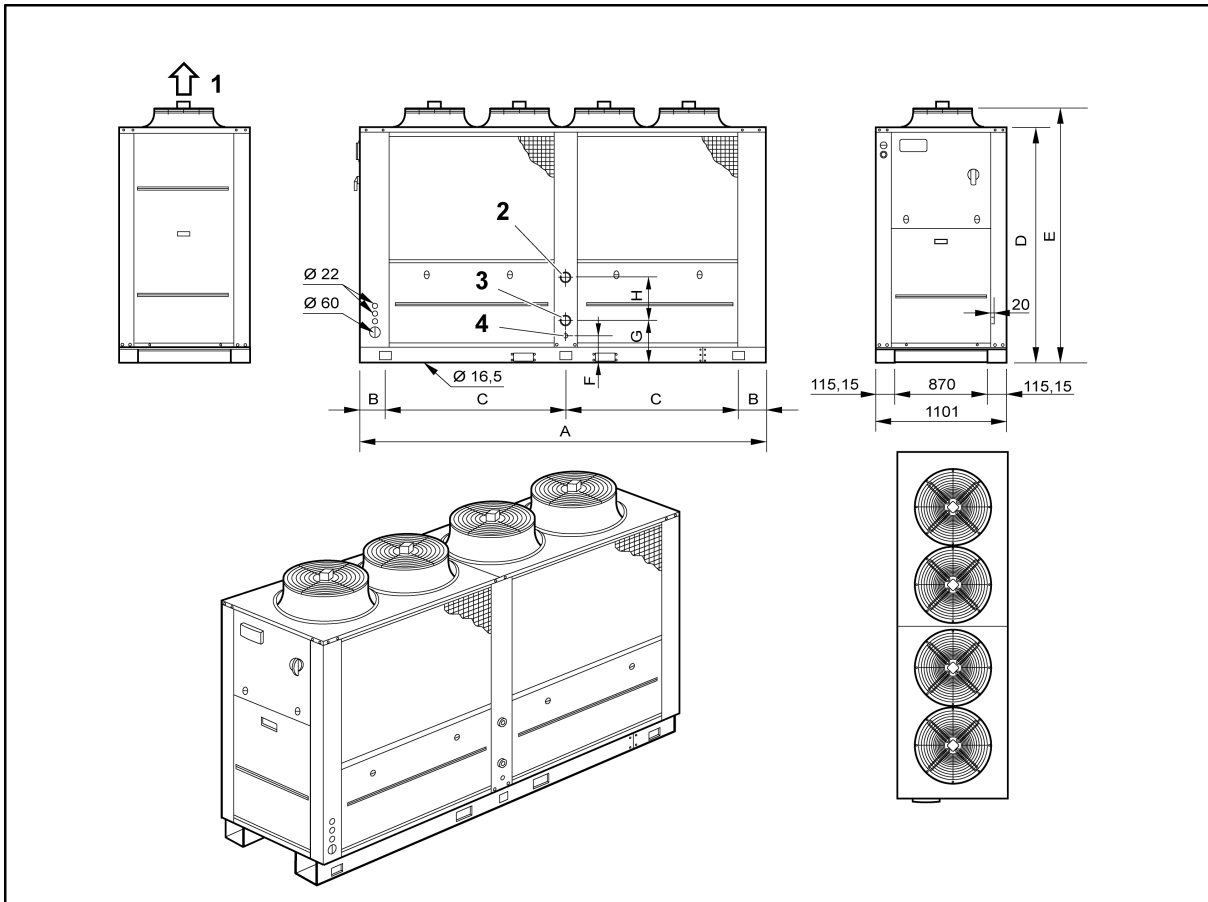
### 1.6.4 Dimensions and hydraulic connections (models YLCA/YLHA 80)



A Water inlet  
B Water outlet

1 2" GF (Inlet)  
2 2" GF (Outlet)

### 1.6.5 Dimensions and hydraulic connections (models YLCA/YLHA 100, 120 and 150)



- |   |                        |   |                       |
|---|------------------------|---|-----------------------|
| 1 | Air outlet             | 3 | Water inlet Ø2 1/2" G |
| 2 | Water outlet Ø2 1/2" G | 4 | Drain Ø20 x 20        |

Model	A	B	C	D	E	F	G
YLCA/YLHA 100 and 120	3 416	183	1 525	1 942	2 190	199	289
YLCA/YLHA 150	3 770	255	1 630	1993	2 263	145	211

## 1.7 Cooling capacities YLHA

### 1.7.1 Cooling capacities YLHA 40 ÷ 150

YLHA model	Water outlet temp. °C	Outdoor ambient temperature °C DB (80% RH)															
		20		25		30		32		35		40		43		46	
		Ca-pacity	Abs. power	Ca-pacity	Abs. power	Ca-pacity	Abs. power	Ca-pacity	Abs. power	Ca-pacity	Abs. power	Ca-pacity	Abs. power	Ca-pacity	Abs. power	Ca-pacity	Abs. power
		kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
40	5	41,15	10,5	40,3	10,9	38,33	11,8	36,8	12,45	35,08	13,1	31	14,5	30,1	14,9	29,1	15,3
	6	42,73	10,6	41,8	11	39,84	11,9	38,2	12,55	36,41	13,2	32,9	14,6	31,15	15	29,38	15,4
	7	44,9	10,7	43,44	11,1	41,37	12	39,7	12,65	37,82	13,3	34,8	14,7	33	15,1	31,21	15,5
	8	45,47	10,8	44,58	11,2	42,52	12,1	40,8	12,75	38,87	13,4	35,92	14,8	34,1	15,2	32,2	15,6
	10	47,92	11	47,05	11,4	44,82	12,3	43	12,95	40,98	13,6	38,24	15	36,27	15,4	34,31	15,8
	12	50,36	11,2	49,52	11,6	47,21	12,5	45,3	13,15	43,16	13,8	40,49	15,2	38,41	15,6	36,34	16
	15	57,22	11,5	53,23	11,9	50,75	12,8	48,7	13,45	46,4	14,1	44,01	15,5	41,76	15,9	39,51	16,4
50	5	56,1	13,9	54,9	14,5	52,2	15,5	50,5	16,3	48,9	17,1	44,2	19,4	41,8	20,6	39,5	21,8
	6	57,7	14	56,4	14,6	53,7	15,6	52,1	16,4	50,4	17,2	45,7	19,5	43,3	20,7	40,9	21,9
	7	59,3	14,1	58	14,7	55,2	15,7	53,6	16,5	52	17,3	47,2	19,6	44,8	20,8	42,3	22
	8	61,2	14,2	59,8	14,8	56,9	15,8	55,3	16,6	53,7	17,4	48,7	19,7	46,2	20,9	43,8	22,1
	10	64,9	14,3	63,5	14,9	60,4	15,9	58,8	16,8	57,1	17,6	51,8	19,9	49,2	21,1	46,6	22,3
	12	68,7	14,5	67,2	15,1	63,9	16,1	62,2	17	60,5	17,8	55	20,1	52,2	21,3	49,4	22,4
	15	74,4	14,8	72,8	15,4	69,2	16,4	67,4	17,3	65,6	18,1	59,7	20,4	56,7	21,6	53,8	22,7
60	5	67,1	15,5	64,05	16,4	60,56	17,73	58,42	18,66	56,28	19,6	52	21,47	49,51	22,51	47,02	23,55
	6	69,45	15,58	66,3	16,48	62,68	17,81	60,41	18,76	58,15	19,7	53,61	21,58	51,05	22,63	48,48	23,67
	7	71,8	15,65	68,54	16,56	64,8	17,9	62,65	18,95	60,5	19,6	55,22	21,7	52,57	22,75	49,93	23,8
	8	73,81	15,74	70,46	16,66	66,61	18	64,17	18,95	61,72	19,91	56,83	21,81	54,11	22,86	51,39	23,92
	10	77,83	15,93	74,3	16,86	70,24	18,22	67,69	19,17	65,14	20,13	60,05	22,04	51,17	23,1	54,3	24,17
	12	81,85	16,11	78,13	17,05	73,87	18,43	71,22	19,39	68,57	20,35	63,28	22,27	60,25	23,34	57,22	24,42
	15	87,9	16,4	83,91	17,35	79,33	18,76	76,53	12,72	73,73	20,68	68,12	22,61	64,86	23,71	61,6	24,8
80	5	78	20,7	76,4	21,8	72,3	23,5	69,7	24,8	67,2	26	62,1	28,5	59,1	29,9	57	30,9
	6	80,9	20,8	79,1	21,9	74,8	23,6	72,1	24,9	69,4	26,1	64	28,6	60,9	30	58,5	31,2
	7	83,8	20,9	81,8	22	77,3	23,7	74,8	24,9	72,2	26	65,9	28,8	62,7	30,2	59,6	31,6
	8	86,6	21,1	84,1	22,1	79,5	23,9	76,6	25,1	73,7	26,4	67,8	28,9	64,6	30,3	61,3	31,7
	10	91,7	21,3	88,7	22,4	83,8	24,2	80,8	25,4	77,7	26,7	71,7	29,2	68,2	30,6	64,8	32,1
	12	96	21,6	93,2	22,6	88,2	24,4	85	25,7	81,8	27	75,5	29,5	71,9	31	68,3	32,4
	15	103,2	22,4	100,1	23	94,7	24,9	91,3	26,2	88	27,4	81,3	30	77,4	31,4	74	32,9
100	5	106,8	28,4	104	30,1	96,6	32,7	93,7	33,8	89,3	34,4	82	38,1	77,4	39,5	74,5	42
	6	109,2	28,9	106,6	30,5	99,4	33	96,5	34,1	92,1	34,8	84,9	38,7	80,5	40,1	77,7	42,4
	7	111,5	29,4	109,2	31	102,1	33,4	99,2	34,6	96	35,5	87,9	39,3	83,6	40,6	80,8	42,7
	8	114,9	29,9	111,8	31,6	105	33,7	102,1	35,2	97,9	36,2	90,9	40	86,8	41,2	84	43
	10	102,2	30,7	117,1	32,4	110,4	34,4	107,7	36,2	103,7	36,9	97	40,6	92,9	41,8	90,3	43,7
	12	125,7	31,4	122,6	33,1	115,6	35,7	112,9	36,9	108,8	38,6	102,1	41,3	98	42,8	94,1	44,7
	15	133,4	34	130,4	35,5	123,4	37,9	120,7	38,8	116,7	40,2	109,8	42,6	105,6	44	99,8	45,4
120	5	126,8	34,6	123,5	36,6	114,7	39,8	111,2	41,1	106	41,9	97,3	46,3	92	48,1	88,4	51,1
	6	129,7	35,1	126,5	37,2	118	40,2	114,6	41,5	109,4	42,3	100,9	47,1	95,6	48,8	92,3	51,5
	7	132,4	35,7	129,7	37,8	121,3	40,6	117,8	42,1	114	43,2	104,4	47,8	99,2	49,4	96	51,9
	8	136,5	36,4	132,8	38,5	124,6	41	121,2	42,8	116,3	44,1	108	48,6	103,1	50,1	99,7	52,3
	10	142,7	37,4	139,1	39,5	131,1	41,9	127,9	44,1	123,1	44,9	115,1	49,4	110,4	50,8	107,2	53,1
	12	149,2	38,2	145,6	40,3	137,3	43,5	134	44,9	129,2	46,9	121,3	50,2	116,4	52,1	111,7	54,4
	15	158,4	41,4	154,8	43,2	146,6	46,1	143,3	47,2	138,5	48,9	130,4	51,8	125,4	53,6	118,6	55,3
150	5	161,2	40,5	157,1	42,8	145,9	46,6	141,5	48,1	134,9	49,1	123,8	54,2	117	56,4	112,5	59,9
	6	165	41,2	161	43,5	150,1	47,1	145,7	48,6	139,2	49,5	128,3	55,2	121,6	57,2	117,3	60,4
	7	168,4	41,9	165	44,2	154,3	47,5	149,9	49,3	145	50,6	132,8	56	126,2	57,9	122,1	60,8
	8	173,6	42,7	168,9	45,1	158,5	48	154,1	50,1	147,9	51,7	137,3	57	131,1	58,7	126,8	61,3
	10	181,6	43,8	176,9	46,2	166,8	49,1	162,7	51,7	156,6	52,6	146,5	57,9	140,4	59,5	136,3	62,2
	12	189,8	44,7	185,2	47,2	174,6	51	170,5	52,6	164,4	55	154,3	58,8	148	61,1	142,1	63,8
	15	201,5	48,5	196,9	50,6	186,4	54	182,3	55,3	176,2	57,3	165,8	60,7	159,5	62,7	150,8	64,8

1.7 Cooling capacities YLHA

1.7.2 Cooling capacities YLHA 40 ÷ 150 (35% ethylene glycol)

YLHA model	Water outlet temp. °C	Outdoor ambient temperature °C DB (80% RH)															
		20		25		30		32		35		40		43		46	
		Ca-pacity kW	Abs. power kW	Ca-pacity kW	Abs. power kW	Ca-pacity kW	Abs. power kW	Ca-pacity kW	Abs. power kW	Ca-pacity kW	Abs. power kW	Ca-pacity kW	Abs. power kW	Ca-pacity kW	Abs. power kW	Ca-pacity kW	Abs. power kW
40	-5	26,35	7,39	25,27	8,04	24,18	8,8	23,73	9,13	22,9	10,21	21,18	10,6	20,18	11,2	19,11	11,88
	-4	27,86	7,61	26,69	8,26	25,34	9,04	24,82	9,37	22,73	10,45	22,03	10,89	20,89	11,5	19,64	12,29
	-2	30,58	8,03	29,42	8,67	27,82	9,5	27,18	9,85	26,09	10,94	23,98	11,42	22,65	12,08	21,14	12,84
	0	33,32	8,44	32,27	9,11	30,61	9,97	29,63	10,34	28,38	11,43	25,99	11,99	24,47	12,67	22,59	13,4
	2	37,19	8,85	35,28	9,58	33,33	10,46	32,27	10,85	30,85	11,94	28,14	12,57	26,43	13,27	24,76	13,96
	4	40,1	9,3	38,32	10,07	36,06	10,98	34,89	11,38	33,3	12,45	30,25	13,18	28,33	13,89	26,47	14,78
50	-5	34,8	10,4	33,3	11,3	31,7	12,2	31	12,6	29,8	13,3	27,3	14,5	25,9	15,3	24,4	16,1
	-4	36,7	10,6	35	11,5	33,2	12,5	32,4	12,9	31,2	13,6	28,7	14,9	27,1	15,6	25,5	16,6
	-2	40	11,2	38,5	12	36,4	13,1	35,6	13,5	34,3	14,2	31,5	15,6	29,7	16,4	27,8	17,3
	0	43,4	11,7	42,1	12,6	40	13,7	38,9	14,2	37,5	14,9	34,4	16,3	32,5	17,1	30,2	18
	2	48,1	12,2	45,9	13,2	43,6	14,3	42,5	14,8	40,9	15,6	37,6	17	35,5	17,9	33,5	18,7
	4	51,5	12,7	49,7	13,7	47,2	14,9	46,1	15,4	44,4	16,2	40,7	17,7	38,5	18,6	36,4	19,7
60	-5	40,54	11,76	38,72	12,75	36,87	13,87	36,01	14,33	34,69	15,07	31,82	16,47	30,11	17,31	28,44	18,23
	-4	42,65	12,05	40,78	13,04	38,64	14,2	37,74	14,66	36,36	15,42	33,34	16,87	31,55	17,72	29,65	18,82
	-2	46,59	12,64	44,83	13,64	42,38	14,86	41,41	15,35	39,9	16,14	36,6	17,62	34,61	18,55	32,37	19,6
	0	50,52	13,23	49,02	14,26	46,59	15,52	45,27	16,04	43,6	16,87	40,02	18,45	37,82	19,4	35,09	20,38
	2	55,96	13,82	53,4	14,91	50,73	16,21	49,45	16,75	47,63	17,62	43,71	19,27	41,32	20,26	39,02	21,17
	4	59,9	14,41	57,78	15,55	54,88	16,9	53,62	17,46	51,67	18,38	47,39	20,09	44,83	21,12	42,35	22,34
80	-5	48,4	15,6	46,2	16,9	44	18,4	43	19	41,4	20	38	21,8	35,9	23	33,9	24,2
	-4	50,9	16	48,7	17,3	46,1	18,8	45	19,4	43,4	20,5	39,8	22,4	37,7	23,5	35,4	25
	-2	55,6	16,8	53,5	18,1	50,6	19,7	49,4	20,4	47,6	21,4	43,7	23,4	41,3	24,6	38,6	26
	0	60,3	17,6	58,5	18,9	55,6	20,6	54	21,3	52	22,4	47,8	24,5	45,1	25,7	41,9	27
	2	66,8	18,3	63,7	19,8	60,5	21,5	59	22,2	56,8	23,4	52,2	25,6	49,3	26,9	46,6	28,1
	4	71,5	19,1	69	20,6	65,5	22,4	64	23,2	61,7	24,4	56,6	26,7	53,5	28	50,5	29,6
100	-5	64,3	21,3	61,4	23,1	58,5	25,1	57,1	26	55	27,3	50,5	29,8	47,8	31,4	45,1	33
	-4	67,7	21,8	64,7	23,6	61,3	25,7	59,9	26,6	57,7	27,9	52,9	30,5	50,1	32,1	47	34,1
	-2	73,9	22,9	71,1	24,7	67,3	26,9	65,7	27,8	63,3	29,2	58,1	31,9	54,9	33,6	51,4	35,5
	0	80,2	24	77,8	25,8	73,9	28,1	71,8	29,1	69,2	30,5	63,5	33,4	60	35,1	55,7	36,9
	2	88,8	25	84,7	27	80,5	29,4	78,5	30,3	75,6	31,9	69,4	34,9	65,6	36,7	61,9	38,3
	4	95	26,1	91,7	28,2	87,1	30,6	85,1	31,6	82	33,3	75,2	36,4	71,1	38,2	67,2	40,5
120	-5	76,4	25,9	73	28,1	69,5	30,6	67,9	31,6	65,4	33,2	60	36,3	56,7	38,2	53,6	40,2
	-4	80,4	26,6	76,8	28,8	72,8	31,3	71,1	32,3	68,5	34	62,8	37,2	59,5	39,1	55,9	41,5
	-2	87,8	27,9	84,5	30,1	79,9	32,7	78	33,8	75,2	35,6	69	38,8	65,2	40,9	61	43,2
	0	95,2	29,2	92,4	31,4	87,8	34,2	85,3	35,4	82,2	37,2	75,4	40,7	71,3	42,8	66,1	44,9
	2	105,5	30,5	100,6	32,9	95,6	35,7	93,2	36,9	89,8	38,8	82,4	42,5	77,9	44,7	73,5	46,7
	4	112,9	31,8	108,9	34,3	103,4	37,2	101	38,5	97,4	40,5	89,3	44,3	84,5	46,5	79,8	48,9
150	-5	97,2	30,4	92,8	32,9	88,4	35,8	86,3	37	83,1	38,9	76,3	42,5	72,2	44,7	68,2	47,1
	-4	102,2	31,1	97,7	33,7	92,6	36,7	90,5	37,8	87,1	39,8	79,9	43,5	75,6	45,8	71,1	48,6
	-2	111,7	32,6	107,4	35,2	101,6	38,4	99,2	39,6	95,6	41,7	87,7	45,5	82,9	47,9	77,6	50,6
	0	121,1	34,2	117,5	36,8	111,7	40,1	108,5	41,4	104,5	43,5	95,9	47,6	90,6	50,1	84,1	52,6
	2	134,1	35,7	128	38,5	121,6	41,8	118,5	43,2	114,2	45,5	104,7	49,7	99	52,3	93,5	54,6
	4	143,6	37,2	138,5	40,1	131,5	43,6	128,5	45,1	123,8	47,5	113,6	51,9	107,4	54,5	101,5	57,7

Abs. power = Includes compressor and fan consumption.

### 1.7.3 Heating capacities YLHA 40 ÷ 150

YLHA model	Water outlet temp. °C	Outdoor ambient temperature °C DB (80% RH)																	
		-15		-10		-5		0		5		7		10		15		20	
		Ca- pacity kW	Abs. pow- er kW	Ca- pacity kW	Abs. pow- er kW	Ca- pacity kW	Abs. pow- er kW	Ca- pacity kW	Abs. pow- er kW	Ca- pacity kW	Abs. pow- er kW	Ca- pacity kW	Abs. pow- er kW	Ca- pacity kW	Abs. pow- er kW	Ca- pacity kW	Abs. pow- er kW	Ca- pacity kW	Abs. pow- er kW
40	30	16,6	7,6	21,3	8,2	28,5	8,5	36,7	9	37,8	9,1	39,6	9,3	42,5	9,4	46,9	9,4	51,2	9,5
	35	16	8,6	20,7	8,9	25,4	9,5	34,8	10	36,9	10,1	39,3	10,3	41,4	10,4	45,6	10,4	49,9	10,5
	40	13,8	9,5	20	9,7	23,2	10,5	32,2	11,2	35,5	11,3	38,9	11,5	40,2	11,6	44,3	11,6	48,4	11,7
	45	-	-	19,3	10,8	20,8	11,4	29,5	12,4	34,1	12,5	38,6	12,6	39	12,6	43	12,7	47	12,8
	50	-	-	18,1	11,4	19,7	12,1	27	13,3	32,5	13,4	37,9	13,5	36,7	13,6	39,1	13,7	45,6	13,8
50	30	22,6	10,8	28,9	11,8	38,8	12,2	49,9	12,9	51,5	13	53,9	13,3	57,8	13,4	63,7	13,4	69,7	13,5
	35	21,8	12,3	28,1	12,7	34,6	13,5	47,3	14,3	50,1	14,4	53,4	14,7	56,3	14,8	62	14,8	67,8	14,9
	40	-	-	27,3	13,8	31,5	14,9	43,8	16	48,3	16,2	52,9	16,4	54,7	16,5	60,2	16,5	65,9	16,6
	45	-	-	-	-	28,4	16,3	40,2	17,6	46,4	17,8	52,5	17,9	53,1	18	58,5	18,1	63,9	18,2
	50	-	-	-	-	26,8	17,2	36,7	19	44,2	19,1	51,6	19,3	49,9	19,4	53,1	19,5	62	19,6
60	30	25,6	12	32,8	13	44	13,4	56,6	14,3	58,4	14,4	61,1	14,7	65,6	14,8	72,4	14,9	79,1	14,9
	35	24,7	13,6	31,9	14	39,3	14,9	53,7	15,8	56,9	16	60,6	16,2	63,9	16,3	70,4	16,4	77	16,5
	40	21,3	14,9	30,9	15,2	35,8	16,5	49,7	17,7	54,9	17,9	60,1	18,1	62,1	18,2	68,4	18,3	74,8	18,4
	45	0	0	29,8	17	32,2	18	45,6	19,5	52,6	19,7	59,6	19,8	60,2	19,9	66,4	20	72,5	20,1
	50	0	0	28	18	30,4	19	41,7	21	50,1	21,2	58,6	21,3	56,7	21,5	60,3	21,6	70,4	21,7
80	30	32,1	16	41,2	17,3	55,2	17,9	71	19	73,2	19,2	76,6	19,6	82,3	19,7	90,7	19,8	99,2	19,9
	35	31	18,1	40	18,7	49,2	19,9	67,3	21	71,3	21,3	76	21,6	80,1	21,8	88,2	21,9	96,5	22
	40	-	-	38,8	20,3	44,8	22	62,3	23,6	68,8	23,8	75,3	24,2	77,8	24,3	85,7	24,4	93,7	24,5
	45	-	-	-	-	40,3	24	57,1	26	66	26,2	74,7	26,4	75,5	26,5	83,2	26,6	90,9	26,8
	50	-	-	-	-	-	-	52,3	28	62,8	28,2	73,4	28,4	71	28,6	75,6	28,8	88,3	29
100	30	44,5	22,5	57,3	24,4	76,8	25,2	98,8	26,7	101,9	27	106,7	27,5	114,5	27,7	126,3	27,8	138,1	27,9
	35	43,2	25,5	55,7	26,2	68,5	27,9	93,7	29,6	99,3	29,9	105,8	30,4	111,5	30,6	122,8	30,7	134,4	31
	40	-	-	54	28,6	62,8	30,9	86,8	33,2	95,7	33,5	104,9	33,9	108,4	34,1	119,3	34,3	130,5	34,5
	45	-	-	-	-	56,2	33,8	79,6	36,5	91,9	36,9	104	37,1	105,1	37,3	115,8	37,4	126,6	37,7
	50	-	-	-	-	53	35,6	72,8	39,3	87,5	39,6	102,2	39,9	98,9	40,2	105,2	40,5	122,9	40,7
120	30	51,2	24	65,9	26	88,3	26,9	113,6	28,5	117,2	28,8	122,7	29,4	131,7	29,6	145,2	29,7	158,8	29,8
	35	49,7	27,2	64,1	28	78,8	29,8	107,8	31,6	114,2	31,9	121,7	32,5	128,2	32,6	141,3	32,8	154,6	33
	40	42,7	29,8	62,1	30,5	72,2	33	99,8	35,4	110,1	35,8	120,6	36,2	124,6	36,4	137,2	36,6	150	36,8
	45	0	0	59,8	34,1	64,6	36	91,5	39	105,6	39,4	119,6	39,6	120,9	39,8	133,2	39,9	145,6	40,2
	50	0	0	56,2	36	61	38	83,7	42	100,6	42,3	117,5	42,6	113,7	42,9	121	43,2	141,3	43,4
150	30	64,2	32,4	82,7	35,1	110,8	36,3	142,5	38,5	147	38,9	153,9	39,7	165,2	40	182,1	40,1	199,1	40,3
	35	62,3	36,7	80,4	37,8	98,8	40,3	135,2	42,6	143,3	43,1	152,6	43,9	160,8	44,1	177,2	44,3	193,8	44,6
	40	53,5	40,3	77,9	41,2	90,5	44,6	125,1	47,8	138,1	48,3	151,3	48,9	156,3	49,2	172,1	49,5	188,2	49,7
	45	0	0	75	46	81	48,7	114,8	52,6	132,5	53,2	150	53,5	151,6	53,8	167,1	54	182,6	54,3
	50	0	0	70,5	48,7	76,5	51,4	105	56,7	126,2	57,2	147,4	57,5	142,6	58	151,7	58,4	177,2	58,7

Integrated heating capacity includes the defrost cycles

Abs. power = Includes compressor and fan consumption.

## 1.8 Cooling capacity YLCA

### 1.8.1 Cooling capacities YLCA 40 ÷ 150

YLCA Model	Water outlet temp. °C	Outdoor ambient temperature °C DB (80% RH)															
		20		25		30		32		35		40		43		46	
		Ca-pacity	Abs. power	Ca-pacity	Abs. power	Ca-pacity	Abs. power	Ca-pacity	Abs. power	Ca-pacity	Abs. power	Ca-pacity	Abs. power	Ca-pacity	Abs. power	Ca-pacity	Abs. power
		kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
40	5	42,09	10,3	41	10,9	39,14	12,04	38,19	12,45	33,79	13,12	32,51	14,61	30,81	15,49	28,9	16,51
	6	43,05	10,4	42	11	40,69	12,11	39,66	12,52	38,19	13,19	34,5	14,68	32,66	15,65	30,81	16,64
	7	43,9	10,5	43	11,1	41,2	12,18	41,21	12,58	39,66	13,26	36,49	14,75	34,57	15,83	32,73	16,85
	8	46,52	10,6	45,26	11,2	43,42	12,25	42,31	12,65	40,77	13,33	37,67	14,82	35,68	15,9	33,76	16,98
	10	49,02	10,8	47,77	11,4	45,78	12,31	44,67	12,72	42,98	13,4	40,1	14,88	37,96	15,97	35,97	17,05
	12	51,53	11	50,28	11,6	48,21	12,31	47,03	12,72	45,26	13,4	42,46	14,95	40,25	16,03	38,11	17,12
	15	55,29	11,4	54,03	11,9	51,28	12,38	50,57	12,79	48,65	13,46	46,15	15,02	43,71	16,03	41,43	17,18
50	5	56,2	14,45	54,98	15,06	52,3	16,08	50,63	16,91	48,96	17,74	44,27	20,16	41,92	21,37	39,58	22,58
	6	57,79	14,54	56,53	15,16	53,78	16,18	52,15	17,01	50,53	17,85	45,76	20,27	43,38	21,49	41	22,7
	7	59,39	14,63	58,1	15,25	55,27	16,28	53,69	17,12	52,1	17,96	47,26	20,38	44,84	21,59	42,42	22,8
	8	61,28	14,71	59,95	15,33	57,03	16,37	55,41	17,21	53,8	18,06	48,82	20,48	46,33	21,69	43,84	22,9
	10	65,06	14,88	63,65	15,51	60,55	16,56	58,88	17,41	57,21	18,27	51,95	20,68	49,32	21,89	46,69	23,1
	12	68,84	15,06	67,34	15,7	64,06	16,76	62,34	17,62	60,61	18,49	55,07	20,89	52,3	22,1	49,53	23,3
	15	74,51	15,32	72,89	15,97	69,34	17,05	67,55	17,93	65,76	18,81	59,81	21,2	56,83	22,4	53,86	23,6
60	5	67,1	15,5	64,05	16,4	60,56	17,73	58,42	18,66	56,28	19,6	52	21,47	49,51	22,51	47,02	23,55
	6	69,45	15,58	66,3	16,48	62,68	17,81	60,41	18,76	58,15	19,7	53,61	21,58	51,05	22,63	48,48	23,67
	7	71,8	15,65	68,54	16,56	64,8	17,9	62,65	18,75	60,5	19,6	55,22	21,7	52,57	22,75	49,93	23,8
	8	73,81	15,74	70,46	16,66	66,61	18	64,17	18,95	61,72	19,91	56,83	21,81	54,11	22,86	51,39	23,92
	10	77,83	15,93	74,3	16,86	70,24	18,22	67,69	19,17	65,14	20,13	60,05	22,04	57,17	23,1	54,3	24,17
	12	81,85	16,11	78,13	17,05	73,87	18,43	71,22	19,39	68,57	20,35	63,28	22,27	60,25	23,34	57,22	24,42
	15	87,9	16,4	83,91	17,35	79,33	18,76	76,53	19,72	73,73	20,68	68,12	22,61	64,86	23,71	61,6	24,8
80	5	85,36	21,04	82,16	22,26	77,67	24,06	74,93	25,33	72,18	26,6	66,69	29,14	63,5	30,55	61,3	31,65
	6	88,46	21,14	85,04	22,37	80,4	24,18	77,49	25,45	74,58	26,73	68,76	29,29	65,47	30,71	62,86	31,92
	7	91,23	21,4	86,95	22,67	81,98	24,4	80,36	25,45	77,6	26,6	70,82	29,45	67,43	30,88	64,04	32,3
	8	94,67	21,36	90,37	22,6	85,44	24,55	82,3	25,72	79,17	27,02	72,89	29,6	69,4	31,03	65,92	32,46
	10	99,83	21,62	95,3	22,88	90,1	24,73	86,83	26,02	83,56	27,32	77,02	29,91	73,33	31,35	69,65	32,8
	12	104,98	21,86	100,22	23,13	94,75	25,01	91,35	26,31	87,96	27,61	81,16	30,22	77,28	31,68	73,39	33,14
	15	112,74	22,61	107,63	23,55	101,75	25,46	98,16	26,76	94,56	28,07	87,37	30,69	83,19	32,17	79,54	33,66
100	5	109	27	106,2	28,6	98,6	31,1	95,6	32,1	91,2	32,8	83,7	36,2	79,1	37,7	76	40
	6	111,5	27,5	108,8	29,1	101,5	31,4	98,5	32,5	94	33,1	86,7	36,9	82,2	38,2	79,3	40,3
	7	113,8	28	111,5	29,6	104,3	31,8	101,3	32,9	98	33,8	89,8	37,4	85,3	38,7	82,5	40,6
	8	117,3	28,5	114,1	30,1	107,1	32,1	104,2	33,5	100	34,5	92,8	38	88,6	39,2	85,7	41
	10	122,7	29,3	119,6	30,9	112,7	32,8	109,9	34,5	105,8	35,1	99	38,7	94,9	39,8	92,2	41,6
	12	128,3	29,9	125,2	31,5	118	34	115,2	35,1	111,1	36,7	104,3	39,3	100,1	40,8	96	42,6
	15	136,2	32,4	133,1	33,8	126	36,1	123,2	36,9	119,1	38,3	112,3	40,6	107,8	41,9	101,9	43,3
120	5	132,3	32	128,9	33,9	119,7	36,8	116,1	38	110,7	38,8	101,6	42,9	96	44,6	92,3	47,3
	6	135,4	32,5	132,1	34,4	123,2	37,2	119,6	38,4	114,2	39,2	105,3	43,6	99,8	45,2	96,3	47,7
	7	138,2	33,1	135,4	35	126,6	37,6	123	39	119	40	109	44,3	103,6	45,8	100,2	48,1
	8	142,4	33,7	138,6	35,6	130,1	38	126,5	39,6	121,4	40,8	112,7	45	107,6	46,4	104,1	48,5
	10	149	34,6	145,2	36,6	136,9	38,8	133,5	40,8	128,5	41,6	120,2	45,8	115,2	47,1	111,9	49,2
	12	155,8	35,4	151,1	37,6	143,3	40,3	139,9	41,6	134,9	43,4	126,6	46,5	121,5	48,3	116,6	50,4
	15	165,3	38,3	161,6	40	153	42,7	149,6	43,7	144,6	45,3	136,1	48	130,9	49,6	123,8	51,2
150	5	162,7	46	81,4	23	151,9	49,4	147,3	51	140,5	52	128,9	57,5	58,8	31,6	117,6	63,2
	6	168,6	46,3	84,3	23,2	156,3	49,9	151,8	51,5	144,9	52,5	133,6	58,5	61	31,8	121,9	63,6
	7	174,5	46,7	87,3	23,3	160,6	50,4	156,1	52,2	151	53,6	138,3	59,3	63,1	32	126,3	64
	8	180,4	47	90,2	23,5	165,1	50,9	160,5	53,1	154	54,7	143	60,3	65,3	32,2	130,6	64,4
	10	192,2	47,7	96,1	23,8	173,7	52	169,4	54,7	163,1	55,7	152,5	61,3	69,7	32,6	139,3	65,3
	12	204,1	48,4	102,1	24,2	181,8	54	177,5	55,7	171,2	58,2	160,6	62,3	74	33	148	66,1
	15	221,8	49,4	110,9	24,7	194,1	57,2	189,8	58,6	183,5	60,7	172,7	64,3	80,5	33,7	161	67,3



## 1.8.2 Cooling capacities YLCA 40 ÷ 150 (35% ethylene glycol)

YLCA Model	Water outlet temp. °C	Outdoor ambient temperature °C DB (80% RH)															
		20		25		30		32		35		40		43		46	
		Ca-pacity kW	Abs. power kW	Ca-pacity kW	Abs. power kW	Ca-pacity kW	Abs. power kW	Ca-pacity kW	Abs. power kW	Ca-pacity kW	Abs. power kW	Ca-pacity kW	Abs. power kW	Ca-pacity kW	Abs. power kW	Ca-pacity kW	Abs. power kW
40	-5	27,64	7,38	26,5	8,03	25,35	8,78	24,88	9,11	24,1	10,2	22,21	10,59	21,16	11,18	20,04	11,86
	-4	29,22	7,6	27,99	8,24	26,57	9,03	26,03	9,35	23,83	10,43	23,1	10,87	21,9	11,49	20,6	12,27
	-2	32,07	8,01	30,85	8,65	29,17	9,49	28,5	9,83	27,36	10,92	25,15	11,4	23,75	12,06	22,17	12,82
	0	34,94	8,43	33,84	9,1	32,1	9,95	31,07	10,32	29,76	11,41	27,26	11,97	25,66	12,65	23,69	13,38
	2	39	8,83	37	9,57	34,95	10,45	33,84	10,83	32,35	11,92	29,51	12,55	27,71	13,25	25,96	13,38
	4	42,05	9,29	40,19	10,06	37,81	10,96	36,59	11,36	34,92	12,44	31,72	13,16	29,71	13,87	27,76	14,75
50	-5	34,91	10,78	33,34	11,68	31,75	12,71	31,01	13,13	29,87	13,81	27,4	15,09	25,93	15,86	24,49	16,7
	-4	36,73	11,05	35,12	11,95	33,27	13,01	32,5	13,43	31,31	14,13	28,71	15,45	27,17	16,24	25,53	17,24
	-2	40,12	11,58	38,6	12,5	36,5	13,61	35,66	14,07	34,36	14,79	31,52	16,15	29,8	16,99	27,87	17,96
	0	43,5	12,12	42,21	13,07	40,12	14,22	38,99	14,7	37,55	15,45	34,46	16,9	32,57	17,78	30,22	18,68
	2	48,19	12,66	45,98	13,66	43,69	14,85	42,58	15,35	41,02	16,15	37,64	17,66	35,59	18,56	33,6	19,4
	4	51,58	13,2	49,76	14,25	47,26	15,48	46,17	16	44,49	16,84	40,81	18,41	38,6	19,35	36,47	20,47
60	-5	40,54	11,76	38,72	12,75	36,87	13,87	36,01	14,33	34,69	15,07	31,82	16,47	30,11	17,31	28,44	18,23
	-4	42,65	12,05	40,78	13,04	38,64	14,2	37,74	14,66	36,36	15,42	33,34	16,87	31,55	17,72	29,65	18,82
	-2	46,59	12,64	44,83	13,64	42,38	14,86	41,41	15,35	39,9	16,14	36,6	17,62	34,61	18,55	32,37	19,6
	0	50,52	13,23	49,02	14,26	46,59	15,52	45,27	16,04	43,6	16,87	40,02	18,45	37,82	19,4	35,09	20,38
	2	55,96	18,32	53,4	14,91	50,73	16,21	49,45	16,75	47,63	17,62	43,71	19,27	41,32	20,26	39,02	21,17
	4	59,9	14,41	57,78	15,55	54,88	16,9	53,62	17,46	51,67	18,38	47,39	20,09	44,83	21,12	42,35	22,34
80	-5	51,99	15,96	49,66	17,3	47,29	18,82	46,19	19,45	44,49	20,45	40,81	22,35	38,62	23,49	36,47	24,74
	-4	54,71	16,36	52,3	17,7	49,56	19,27	48,41	19,89	46,63	20,92	42,77	22,89	40,47	24,05	38,02	25,54
	-2	59,75	17,16	57,5	18,51	54,36	20,16	53,11	20,83	51,18	21,91	46,95	23,92	44,39	25,17	41,52	26,6
	0	64,8	17,96	62,87	19,36	59,75	21,06	58,07	21,77	55,93	22,89	51,33	25,04	48,51	26,33	45,01	27,66
	2	71,78	18,75	68,49	20,23	65,07	22	63,42	22,73	61,1	23,92	56,06	26,15	53	27,49	50,05	28,73
	4	76,82	19,55	74,11	21,1	70,39	22,93	68,77	23,69	66,27	24,95	60,78	27,27	57,5	28,66	54,32	30,32
100	-5	65,7	20,3	62,7	22	59,7	23,9	58,3	24,7	56,2	26	51,5	28,4	48,8	29,9	46,1	31,4
	-4	69,1	20,8	66,1	22,5	62,6	24,5	61,1	25,3	58,9	26,6	54	29,1	51,1	30,6	48	32,4
	-2	75,5	21,8	72,6	23,5	68,7	25,6	67,1	26,5	64,6	27,8	59,3	30,4	56,1	32	52,4	33,8
	0	81,8	22,8	79,4	24,6	75,5	26,8	73,3	27,7	70,6	29,1	64,8	31,8	61,3	33,5	56,8	35,2
	2	90,7	23,8	86,5	25,7	82,2	27,9	80,1	28,9	77,2	30,4	70,8	33,2	66,9	34,9	63,2	36,5
	4	97	24,8	93,6	26,8	88,9	29,1	86,9	30,1	83,7	31,7	76,8	34,7	72,6	36,4	68,6	38,5
120	-5	79,7	24	76,2	26	72,5	28,3	70,8	29,2	68,2	30,8	62,6	33,6	59,2	35,3	55,9	37,2
	-4	83,9	24,6	80,2	26,6	76	29	74,2	29,9	71,5	31,5	65,6	34,4	62,1	36,2	58,3	38,4
	-2	91,6	25,8	88,2	27,8	83,4	30,3	81,4	31,3	78,5	32,9	72	36	68,1	37,8	63,7	40
	0	99,4	27	96,4	29,1	91,6	31,7	89	32,7	85,8	34,4	78,7	37,6	74,4	39,6	69	41,6
	2	110,1	28,2	105	30,4	99,8	33,1	97,3	34,2	93,7	36	86	39,3	81,3	41,3	76,8	43,2
	4	117,8	29,4	113,6	31,7	107,9	34,5	105,5	35,6	101,6	37,5	93,2	41	88,2	43,1	83,3	45,6
150	-5	101,2	32,2	96,6	34,9	92	37,9	89,9	39,2	86,6	41,2	79,4	45	75,1	47,3	71	49,8
	-4	106,5	33	101,3	35,7	96,4	38,8	94,2	40,1	90,7	42,2	83,2	46,1	78,8	48,5	74	51,5
	-2	116,3	34,6	111,9	37,3	105,8	40,6	103,3	42	99,6	44,1	91,4	48,2	86,4	50,7	80,8	53,6
	0	126,1	36,2	122,3	39	116,3	42,4	113	43,9	108,8	46,1	99,9	50,4	94,4	53,1	87,6	55,7
	2	139,7	37,8	133,3	40,8	126,3	44,3	123,4	45,8	118,9	48,2	109,1	52,7	103,1	55,4	97,4	57,9
	4	149,5	39,4	144,2	42,5	137	46,2	133,8	47,7	128,9	50,3	118,3	55	111,9	57,7	105,7	61,1

Abs. power = Includes compressor and fan consumption.

## 1.9 Instructions for installation and connection of the unit

### 1.9.1 Characteristics of the location

Before locating the unit, make sure you have received the appropriate product by checking the specifications described on the outside of same.

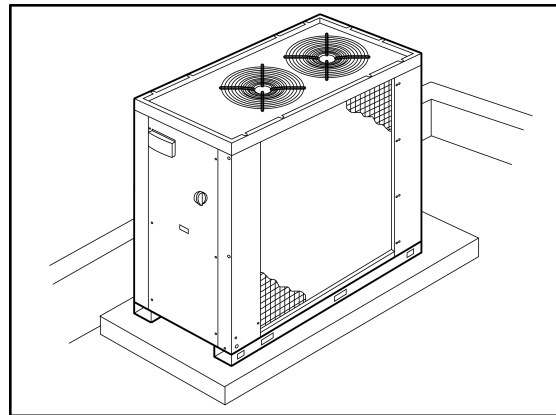
The unit should be placed on a perfectly horizontal plane, making sure the base can support the weight of the unit.

If vibration-free operation is required, the unit can be placed on a cork or similar anti-vibratory base, or fastened to the base with anti-vibratory plates or supports.

### 1.9.2 Specifications for the foundation or anchoring of the unit

Where the unit is to be installed at ground level, the characteristics of the ground it will sit on must be taken into account.

Characteristics, such as acceptable surface firmness, must be suitable for the foundation the unit requires.



### 1.9.3 Hydraulic connections

The hydraulic connections of the water inlet and outlet of the unit should be carried out respecting the inlet and outlet directions indicated.

Galvanised iron or copper piping can be used, with dimensions no lower than those indicated, and keeping in mind the pressure drops at said connections and in the internal exchanger of the installation.

Pump dimensioning should be carried out in accordance with a nominal flow that allows an  $\Delta t$  within the operating limits.

In all cases, a flow switch should be installed so as to avoid the possibility of operation without water flow.

An adequate expansion vessel for the total volume of the water in the installation should also be installed in the water return piping.

During the winter season, with outdoor temperatures below 0°C, take precautions to avoid freezing of the water in the piping network.

Usually, a filling solution is applied to the circuit with an antifreeze mixture (glycol).

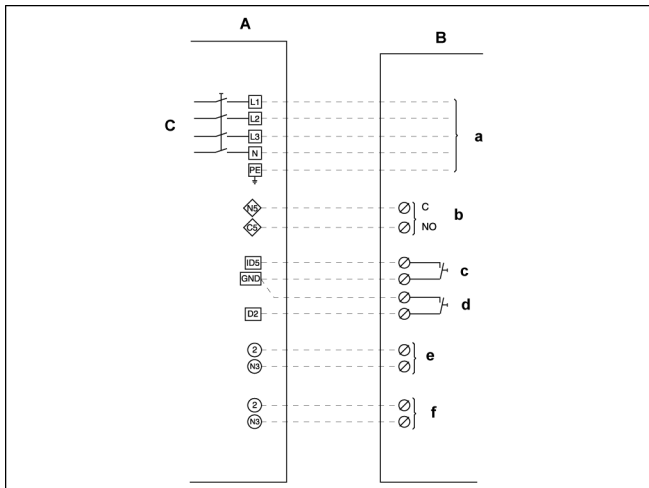
## 1.9.4 Preparation and connecting to the various utilities

### Electricity. Power and control

#### Wiring diagrams

#### Electrical installation YLCA / YLHA 40

- |   |  |   |  |
|---|--|---|--|
| A | YLCA / YLHA terminal strip   | c | Remote ON / OFF switch   |
| B | Outdoor terminal strip   | d | Remote COOL / HEAT switch<br>CLOSED = COOL<br>OPEN = HEAT<br>(YLHA units only) |
| C | Main switch  | e | Auxiliary heater   |
| a | Supply (400 - 3 + N - ph - 50 Hz)  | f | Pump relay (max. 2A resist. at 230 Vac)<br>(version with no Hydro kit only)    |
| b | General alarm (voltage-free inverter contact max. 2A resist. at 230 Vac) |   |  |



- |   |                            |       |                                       |
|---|----------------------------|-------|---------------------------------------|
| □ | YLCA / YLHA strip terminal | ◇     | Voltage-free terminal strip contact A |
| ∅ | Outdoor unit terminals     | - - - | Client's electrical installation      |
| ○ | 230 Vac terminal           |       |                                       |

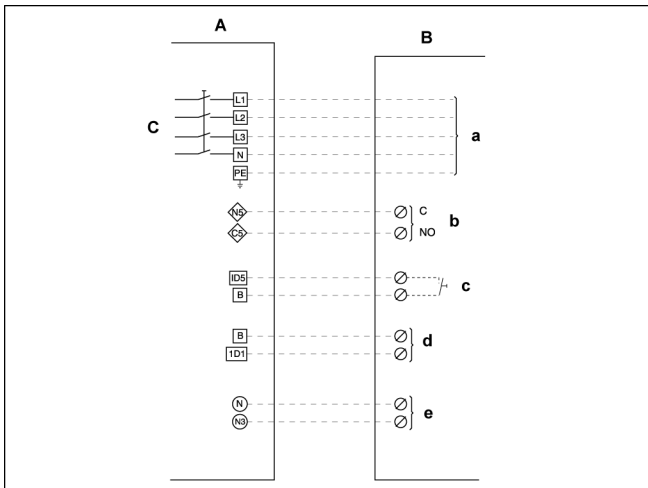


#### CAUTION

*The cable used for the unit power supply must be H05 RN - F*

### Electrical installation, YLCA 50, 60 and 80

- |   |                                   |   |  |
|---|-----------------------------------|---|--|
| A | YLCA terminal strip               | b | General alarm (voltage-free inverter contact max. 2A resist. at 230 Vac) |
| B | Outdoor terminal strip            | c | Remote ON / OFF switch   |
| C | Main switch                       | d | Pump heat protectors<br>Auxiliary contacts<br>Pump contacts              |
| a | Supply (400 - 3 + N - ph - 50 Hz) | e | Pump relay (max. 2A resist. at 230 Vac)<br>(Hydro kit version only)      |



- |   |                        |       |                                     |
|---|------------------------|-------|-------------------------------------|
| □ | Strip terminals        | ◇     | Voltage-free terminal strip contact |
| ∅ | Outdoor unit terminals | - - - | Client's electrical installation    |
| ○ | 230 Vac terminal       |       |                                     |

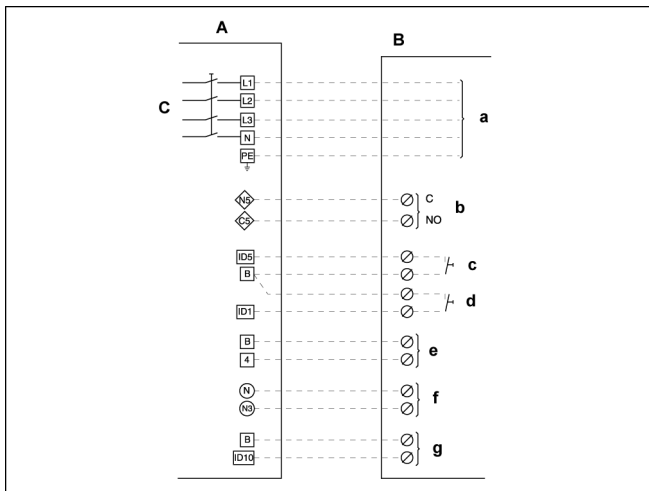


**CAUTION**

*The cable used for the unit power supply must be H05 RN - F*

## Electrical installation YLHA 50, 60 and 80

- |   |  |   |   |
|---|--|---|---|
| A | YLHA terminal strip  | c | Remote ON / OFF switch  |
|   |  |   | Remote COOL / HEAT switch   |
| B | Outdoor terminal strip   | d | CLOSED = COOL<br>OPEN = HEAT<br>(YLHA units only)                   |
| C | Main switch  | e | Pump heat protectors<br>Auxiliary contacts<br>Pump contactors       |
| a | Supply (400 - 3 + N - ph - 50 Hz)  | f | Pump relay (max. 2A resist. at 230 Vac)<br>(Hydro kit version only) |
| b | General alarm (voltage-free inverter contact max. 2A resist. at 230 Vac) | g | General outdoor protection  |



- |   |                                |       |  |
|---|--------------------------------|-------|--|
| □ | Strip terminals<br>YLCA / YLHA | ◇     | Voltage-free terminal strip contact<br>YLCA / YLHA |
| ∅ | Outdoor unit terminals         | - - - | Client's electrical installation                   |
| ○ | 230 Vac terminal               |       |  |

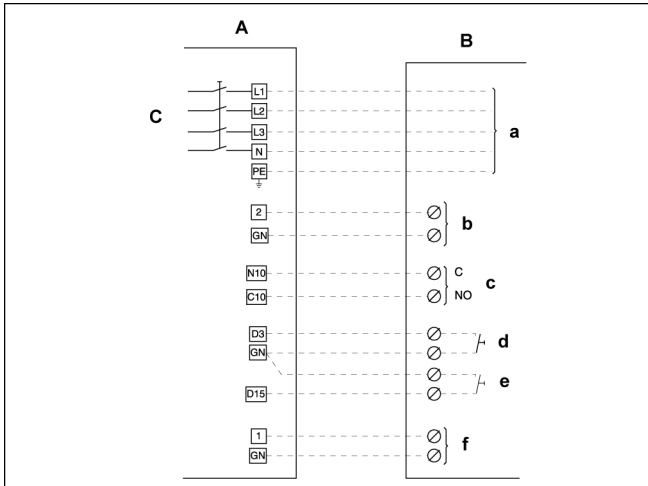


### CAUTION

*The cable used for the unit power supply must be H05 RN - F*

**Electrical installation YLCA/YLHA 100, 120 and 150**

- |   |                                   |   |  |
|---|-----------------------------------|---|--|
| A | YLCA / YLHA terminal strip        | c | General alarm (voltage-free inverter contact max. 2A resist. at 230 Vac)       |
| B | Outdoor terminal strip            | d | Remote ON / OFF switch   |
| C | Main switch                       |   | Remote COOL / HEAT switch<br>CLOSED = COOL<br>OPEN = HEAT<br>(YLHA units only) |
| a | Supply (400 - 3 + N - ph - 50 Hz) | e |  |
| b | Flow switch                       | f | General outdoor protection   |



□ Strip terminals

- - - Client's electrical installation

∅ Outdoor unit terminals

**⚠ CAUTION**

*The cable used for the unit power supply must be H05 RN - F*

## 1.10 Instructions for starting up the unit

### 1.10.1 Start-up

About 45 seconds after powering the unit, the start-up display is activated.

Default language: English.

#### 1st Display. START-UP

(information on water temperature/unit status)

- Water inlet temperature
- Water outlet temperature
- Unit status (ON/OFF)

Press "down" to access the second display.

#### 2nd Display. STATUS AND OPERATING MODE SELECTION

Status selection **ON/OFF** (with **ENTER**, **Up** and **Down**).

On the heat pump units, select the **COOL/HEAT** operating mode (with **ENTER**, **Up** and **Down**).

Press **ESC** to return to the 1st display.

#### SYSTEM CONFIGURATION

(For authorised servicing personnel only)

#### 3rd Display. ENTER PASSWORD

The 3rd Enter password display is accessed by pressing **Up** from the 1st display (**Start-up**), or **Down** from the 2nd display (**Status / operating mode selection**)

- 1 From the **Enter password** display, press **ENTER**.
- 2 Enter the password using the **Up** key.
- 3 Press **ENTER** to access the 4th **Menu** display.

#### 4th Display. MENU

From this display we can access a set of submenus that provide information on the unit or allow for its operating parameters to be configured. These submenus are as follows:

-/-	Sensors	Sensors config.
-A-	Antifreeze	Antifreeze
-B-	Input/output	Input/output
-c-	Compressors	Comps. conf.
-d-	Defrost	Defrost
-F-	Condensation (fans)	Condensation
-H-	Unit configuration	Unit config.
-P-	Alarms	Alarm settings
-r-	Temperature control	Control param.
-Fr-	Software version / language selection	Soft. version
-t-	Time (not available)	Time config.

To enter a submenu:

- 1 Select it using the **Up** or **Down** key and then activate it using the **ENTER** key
- 2 Once the parameters are set with the **ENTER**, **Up** and **Down** keys, press **Prg** to confirm the modification and return to the **MENU** display.
- 3 To exit the **MENU** display, press the **Esc** key.

## 1.11 Unit sound power spectrum data

### 1.10.2 Rotational direction of Scroll compressors

The Scroll compressors and the fans only operate correctly if they rotate in the correct direction. All of the motors and compressors in the unit are connected so that they rotate correctly.

If the compressors are not connected correctly and are rotating in the wrong direction:

- The compressor will not compress.
- Operating noise will be abnormal.
- Electricity consumption (A) will be low.
- They overheat.

The phase detector must have both LEDs lit for correct operation:

- Green LED lit means: Power ON.
- Yellow LED lit means: Relay ON.

## 1.11 Unit sound power spectrum data

### Standard models

YLCA-YLHA standard models							
Frequency (Hz)	40	50	60	80	100	120	150
125 Hz	84	70	77	78	73	78	75
250 Hz	79	79	81	80	81	80	79
500 Hz	80	73	83	79	83	81	85
1,000 Hz	75	76	78	76	75	79	77
2,000 Hz	71	69	73	74	71	75	70
4,000 Hz	65	63	64	65	62	68	63
8,000 Hz	59	56	59	58	56	63	55
Sound power level dB (A)	81	83	85	86	86	86	87

### Low noise models

YLCA-YLHA low noise models							
Frequency (Hz)	40	50	60	80	100	120	150
125 Hz	79	71	73	75	75	75	76
250 Hz	74	73	75	76	76	76	78
500 Hz	75	74	76	77	77	77	79
1,000 Hz	70	67	70	73	73	73	73
2,000 Hz	66	62	65	59	59	59	68
4,000 Hz	60	53	54	58	58	58	59
8,000 Hz	54	48	50	53	53	53	54
Sound power level dB (A)	76	78	80	82	82	82	83

## 1.12 Unit installation data

Please complete the following data to register the full details of the installation and the start-up inspection.

Complete the blank fields or mark the appropriate box, as applicable.



## 1.12.1 List of tests for unit start-up

Please complete the following forms to register the full details of the installation and the start-up inspection.

Complete the blank fields or mark the appropriate box, as applicable.

### Company performing installation

Company performing installation	
Installing technician	
Name project number	
Location of the unit	
Address of the unit location	
Person in charge of the building or property where the unit is installed	
Installation work start date	
Unit model number	
Unit serial number	
Plate and version	
Thermostat, model and version	

### General inspection of the unit

	Visual appearance
	Levelling of the unit
	Check the unit for transport, loading and unloading damage
	Unit installed with sufficient clearance
	Check the circuit for the presence of oil (significant refrigerant leaks).
	Terminals and connections correctly secured in the control panel and accessories
	Air filters installed
	Condensate drain pipe and drain trap installed correctly
	Thermostat and connection cabling installed correctly
	Air duct installation complete and correct
	Accessories and planned options installed (if applicable)

### Inspection of the air supply fan

	Drive belt and pulleys aligned and correctly fastened
	Drive belt tension correctly adjusted
	Verification of direction of rotation

### Inspection of compressors

	Verification that direction of rotation is correct
--	--

## 1.12.2 Start-up Data

### Electrical data

	Rating plate	Actual
Power supply	Check specifications in the Installation Manual	
Control voltage		
Fan consumption (A)		
Consumption of condenser fan 1 (A)		
Consumption of condenser fan 2 (A)		
Consumption of compressor 1 (A)		
Consumption of compressor 2 (A)		
Consumption of supply fan (A)		
Electric heater 1 (Optional)		
Electric heater 2 (Optional)		

### Cool and heat modes

Refrigerant circuit. Compressor 1		
Mode	Value	
Subcooling (min. 8 K, max. 18 K)	C	Liquid pressure ____ bar
		Liquid temperature ____ C
Overheating (min. 4 K, max. 10 K)	C	Suction pressure ____ bar
		Suction temperature ____ C
	Complete liquid line checked in sight glass	
	Correct oil level checked in sight glass	

Refrigerant circuit. Compressor 2		
Mode	Value	
Subcooling (min. 8 K, max. 18 K)	C	Liquid pressure ____ bar
		Liquid temperature ____ C
Overheating (min. 4 K, max. 10 K)	C	Suction pressure ____ bar
		Suction temperature ____ C
	Complete liquid line checked in sight glass	
	Correct oil level checked in sight glass	

### Air flow values

	m <sup>3</sup> h
Design	
Measured	

### Air temperature

Mode (cool or heat)	Temperature (C)
Outdoor air	
Supply air	
Return air	
Indoor air mix (if economiser is fitted)	

### Options

Heating mode (hot water coil)	
Air temperature	
Capacity ____ (kW)	Temperature (C)
Supply air (at 100 %)	
Return air	

Hydraulic circuit		
	Temperature (C)	Pressure (bar)
Water inlet		
Water outlet		

### Others

Outdoor fan 1	Type or model	
		Surge protection adjusted
Outdoor fan 2	Type or model	
		Surge protection adjusted
Indoor fan	Type or model	
		Surge protection adjusted
Belts	Type or model	
Economiser		Minimum outdoor air setting

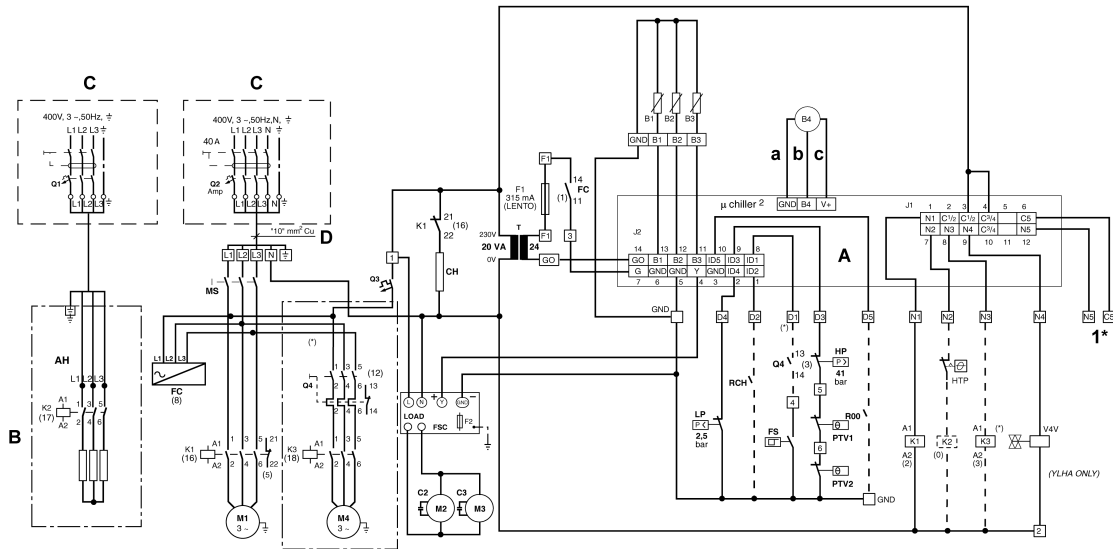


# 1.13 Wiring diagrams

## 1.13.1 Unit wiring diagrams

### Wiring diagram, YLCA/YLHA 40, 400.3.50

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20



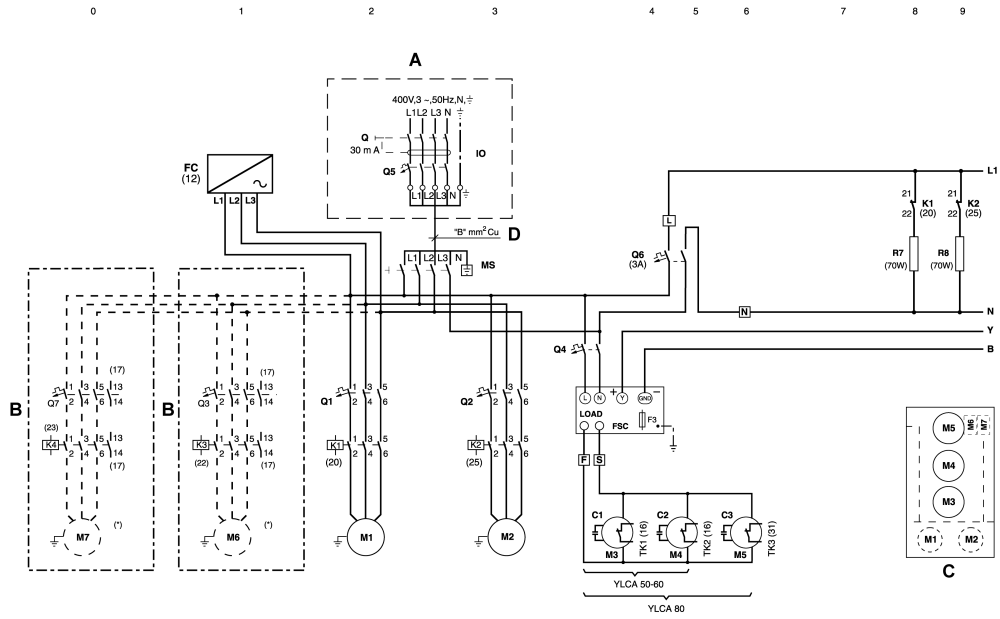
1-262993  
YLCA/YLHA 40  
400.3.50

## 1.13 Wiring diagrams

(\*) On units with hydro kit only

1*	Alarm	HTP	Heater thermal protection
A	Electronic control	K1	Compressor contactor
B	The components in the box are standard accessories supplied by the manufacturer	K2	Auxiliary heater contactor
C	The components in the box are not supplied by the manufacturer	K3	Pump contactor (TC units)
D	"B" mm <sup>2</sup> Cu	LAK	Low ambient kit accessory
a	Green wire	LP	Low-pressure switch (2.5 bar)
b	White wire	M1	Compressor
c	Black wire	M2	Fan Motor 1
AH	Auxiliary heater	M3	Fan Motor 2
B1	Water inlet temperature sensor (NTC)	M4	Pump (TC units)
B2	Water outlet temperature sensor (NTC)	MS	Main switch
B3	Outdoor temperature sensor (NTC)	Q1	Back-up heater magneto-thermal protector
B4	Ratiometric pressure sensor	Q2	General compressor magneto-thermal protector
C2, C3	Fan condenser	Q3	General magnetic-thermal protector, 230V / Fan / Pump / Sump heater
CH	Compressor sump heater	Q4	Pump magneto-thermal protector (TC units)
F1	24V electronic control fuse	R00	Remote ON / OFF switch
F2	Fan speed controller fuse	RCH	Remote COOL / HEAT switch
FC	Phase control	T	230 / 24V 20VA transformer
FS	Water flow switch (TC units)	TK1, TK2	Fan heat switch
FSC	Fan speed controller	V4V	4-way valve
HP	High-pressure switch (41 bar)		

### Wiring diagrams YLCA 50, 60 and 80 (μC2), 400.3.50

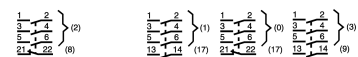
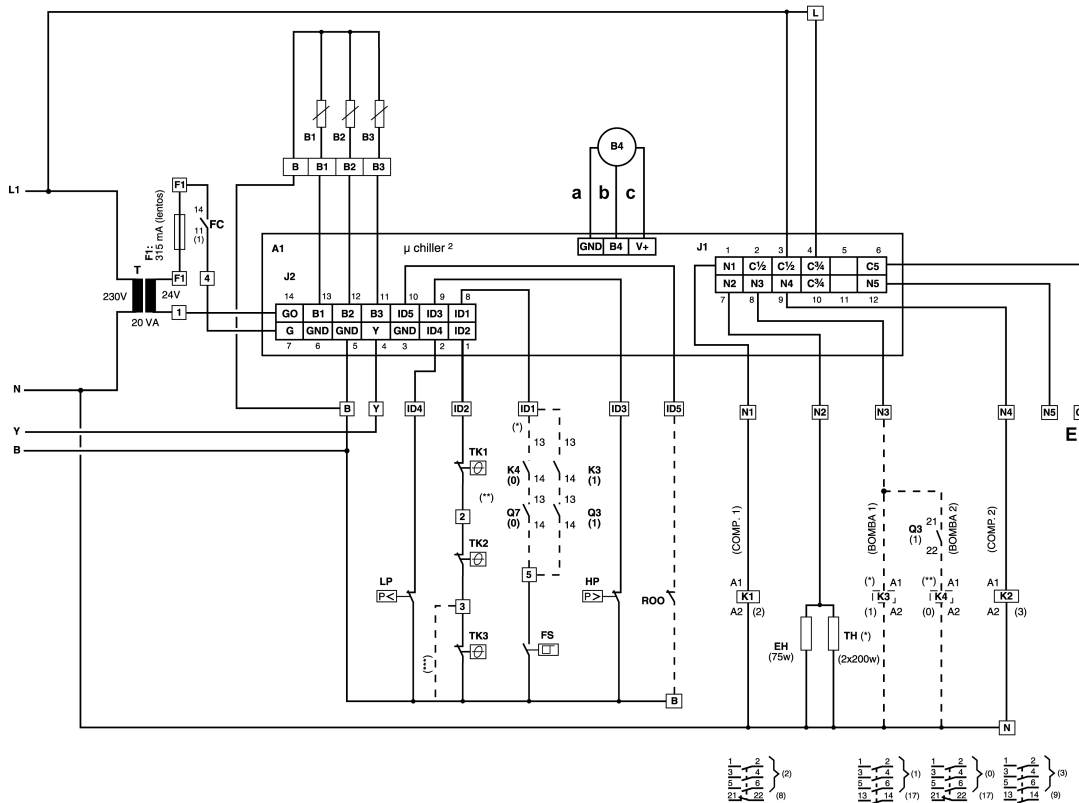


I-2585a (1 de 2)  
YLCA 50, 60 y 80 (μC2)  
400.3.50

YLCA	Q5	D
50	63	3 x 25 + GND, N
60	80A	3 x 25 + GND, N
80	100A	3 x 35 + GND, N

1.13 Wiring diagrams

10 11 12 13 14 15 16 17 18 19 20 21 22 23 25 26



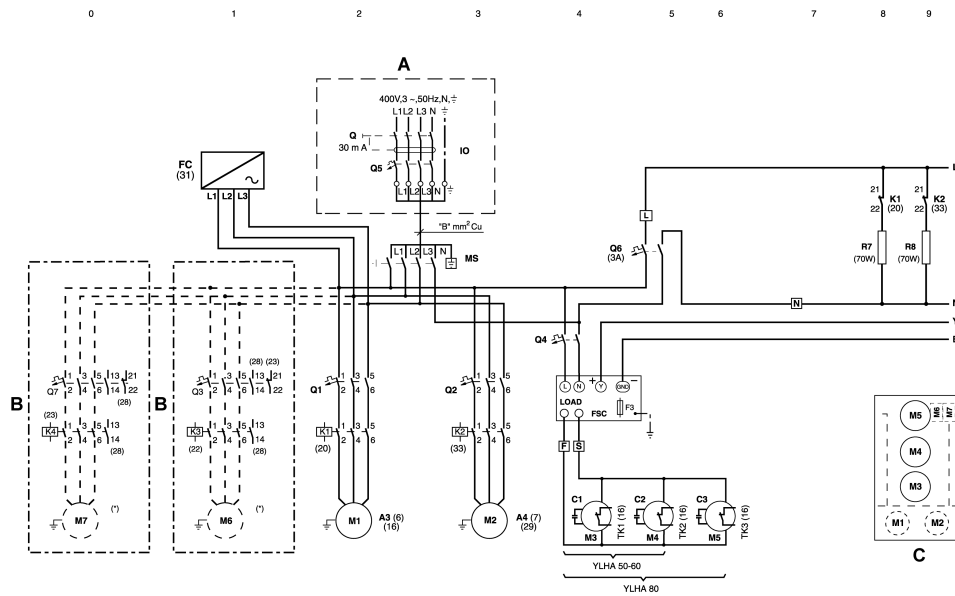
I-2585a (2 de 2)  
YLCA 50, 60 y 60 (µC2)  
400.3.50

- (\*) On units with hydro kit only
- (\*\*) On units with hydro kit and two pumps only
- (\*\*\*) On 50 and 60 units only

A	The components in the box are not supplied by the manufacturer	FS	Water flow switch
B	The components in the box are standard accessories supplied by the manufacturer	FSC	Fan speed controller
C	Motor position	HP	High-pressure switch (automatic reset)
D	"B" mm <sup>2</sup> Cu	LP	Low-pressure switch (automatic reset)
E	Alarm	K1, K2	Compressor contactor 1 and 2
a	Green wire	K3, K4	Pump contactor 1 and 2
b	White wire	M1, M2	Compressor 1 and 2
c	Black wire	M2	Fan Motor 1
A1	Control module	M3, M4, M5	Fan motors
B1	Water inlet temperature sensor (NTC)	M6, M7	Pump 1 and 2
B2	Water outlet temperature sensor (NTC)	MS	Main switch
B3	Outdoor temperature sensor (NTC)	Q	Circuit breakers
B4	Ratiometric pressure sensor	R7	Sump heater compressor 1
C1, C2, C3	Fan motor condenser	R8	Sump heater compressor 2
EH	Evaporating unit heater	R00	Remote ON / OFF switch
F1	A1 and A2 protecting fuses (315 mA slow)	RCH	Remote COOL / HEAT switch
F2	Fan speed controller fuse	T	230 / 24V 20VA transformer
FC	Phase control	TK1, TK2, TK3	Fan heat protectors M3, M4 and M5

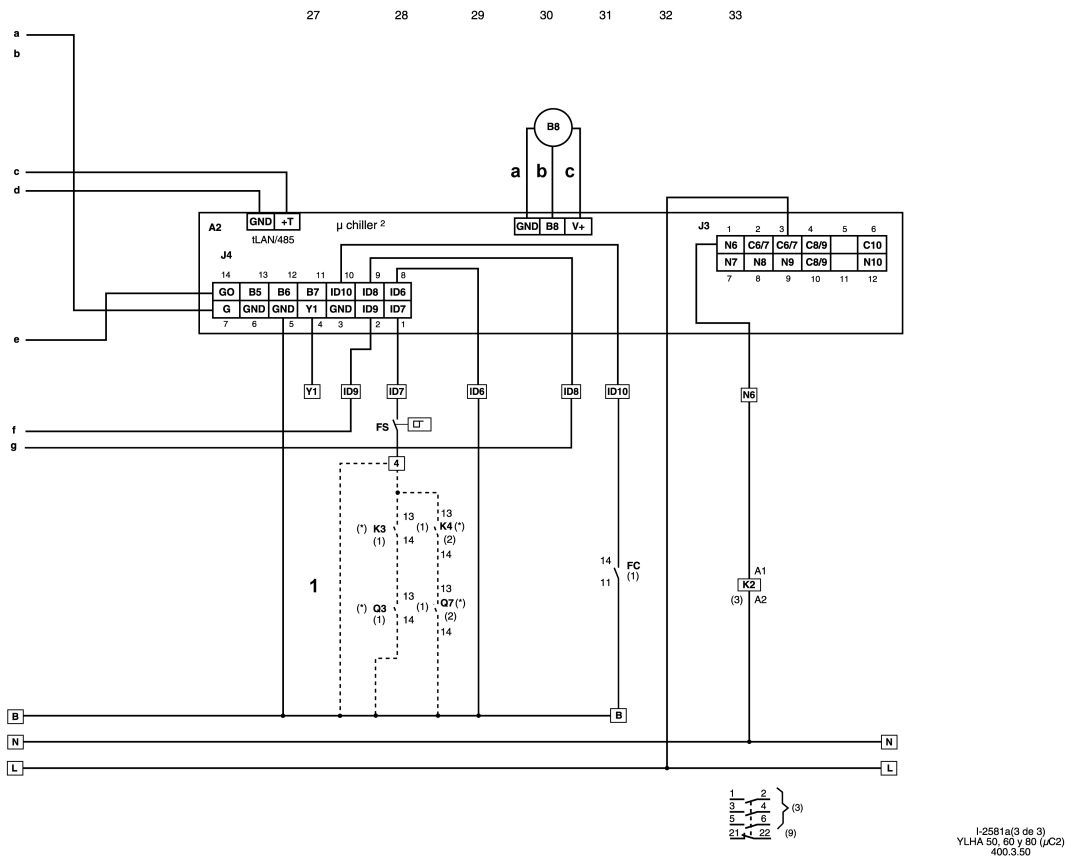
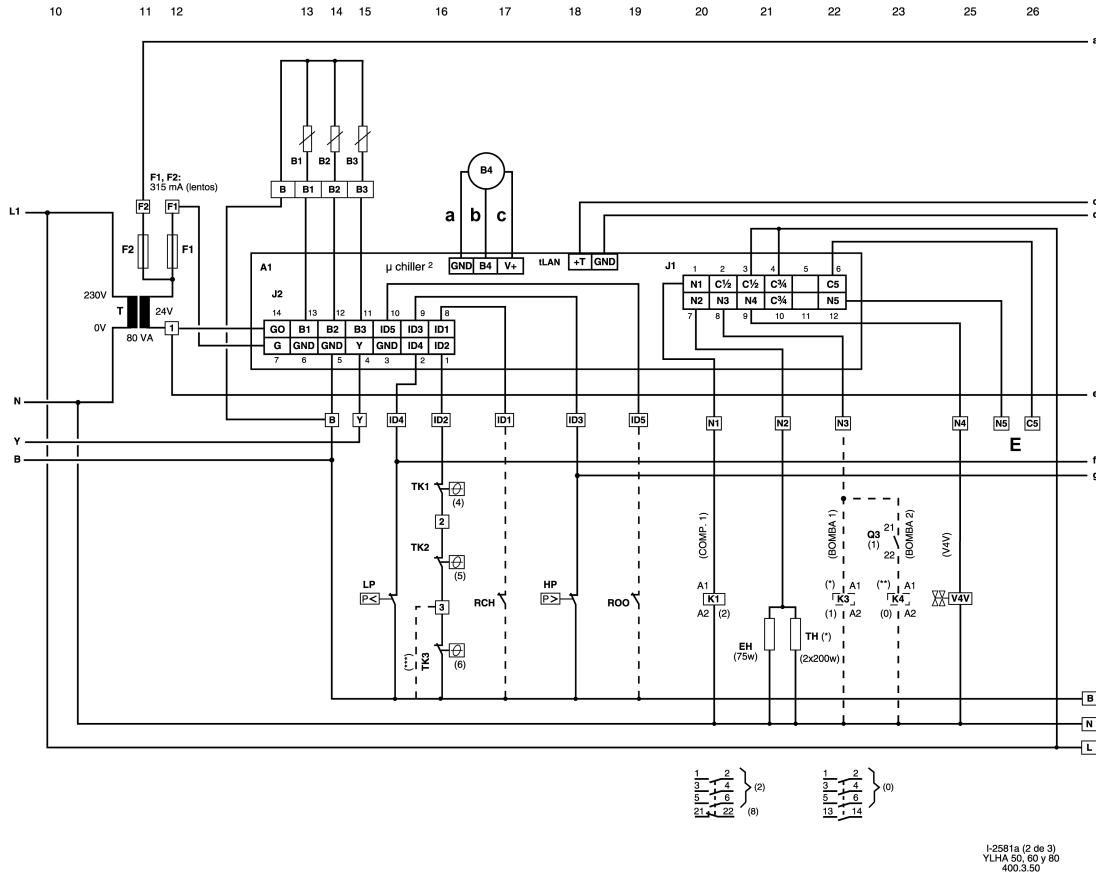


### Wiring diagrams YLHA 50, 60 and 80 ( $\mu C_2$ ), 400.3.50



I-2581a (1 de 3)  
YLHA 50, 60 Y 80  
400.3.50

YLHA	Q5	D
50	63A	3 x 25 + GND, N
60	80A	3 x 25 + GND, N
80	100A	3 x 35 + GND, N

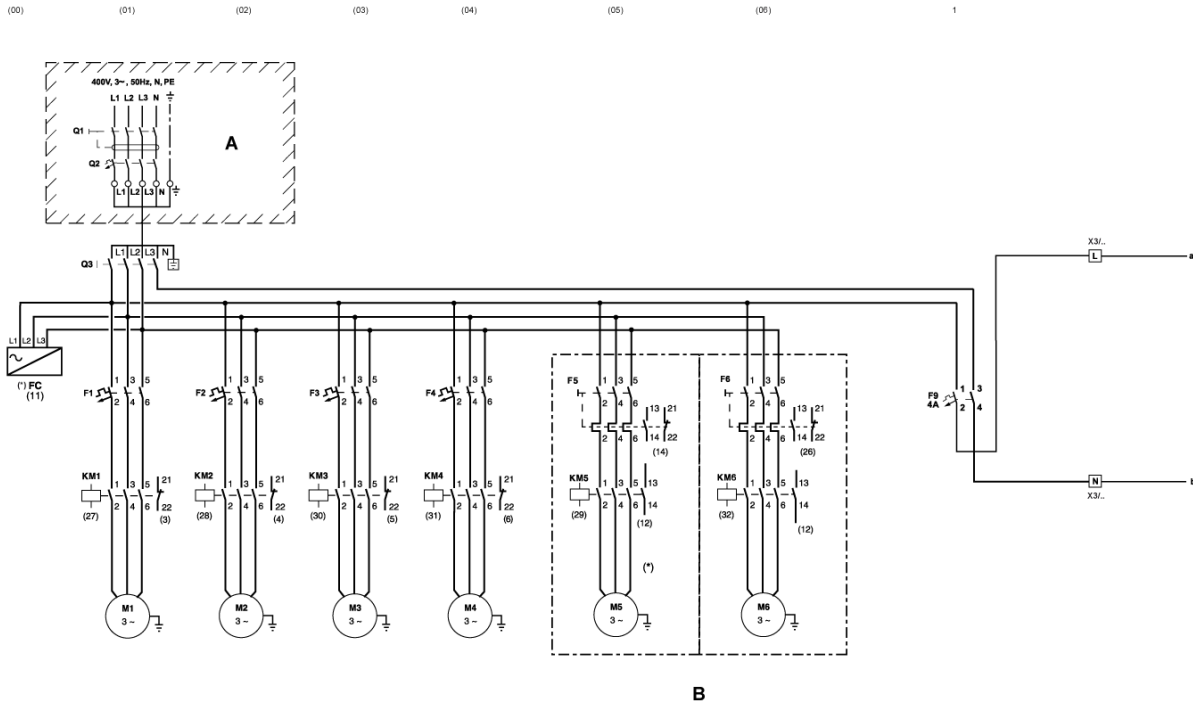


- (\*) On units with hydro kit only
- (\*\*) On units with hydro kit and two pumps only
- (\*\*\*) On 50 and 60 units only
- (1) Units without pump

A	The components in the box are not supplied by the manufacturer	FS	Water flow switch
B	The components in the box are standard accessories supplied by the manufacturer	FSC	Fan speed controller
C	Motor position	HP	High-pressure switch (automatic reset)
D	"B" mm <sup>2</sup> Cu	LP	Low-pressure switch (automatic reset)
E	Alarm	K1, K2	Compressor contactor 1 and 2
a	Green wire	K3	Pump contactor
b	White wire	M1, M2	Compressor 1 and 2
c	Black wire	M3, M4, M5	Fan motors
A1	Base control module	M6, M7	Pump 1 and 2
A2	Expansion module	MS	Main switch
B1	Water inlet temperature sensor (Transducer)	Q	Circuit breakers
B2	Water outlet temperature sensor (Transducer)	R7	Sump heater compressor 1
B3	Outdoor temperature sensor (NTC)	R8	Sump heater compressor 2
B4	Cooling pressure, fan speed control A1 fan module (NTC)	R00	Remote ON / OFF switch
B8	Cooling pressure, fan speed control A2 fan module (NTC)	RCH	Remote COOL / HEAT switch
C1, C2, C3	Fan motor condensers	T	230 / 24V transformer
EH	Evaporating unit heater	TH	Tank heater
F1, F2	A1 and A2 protecting fuses (315 mA slow)	TK1, TK2, TK3	Fan heat protectors M3, M4 and M5
F3	Fan speed controller fuse	V4V	4-way valves (on YLHA only)
FC	Phase control		

1.13 Wiring diagrams

Wiring diagrams YLCA / YLHA 100, 120 and 150 (μC3) 400.3.50



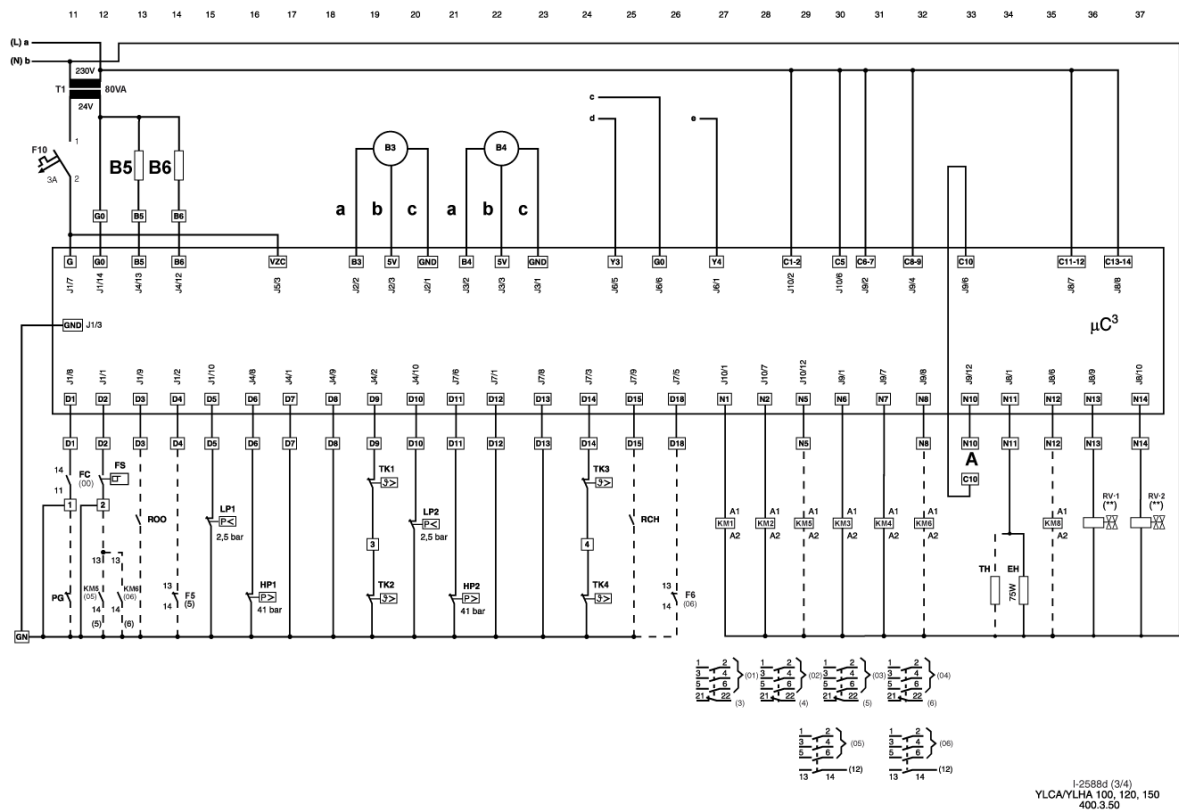
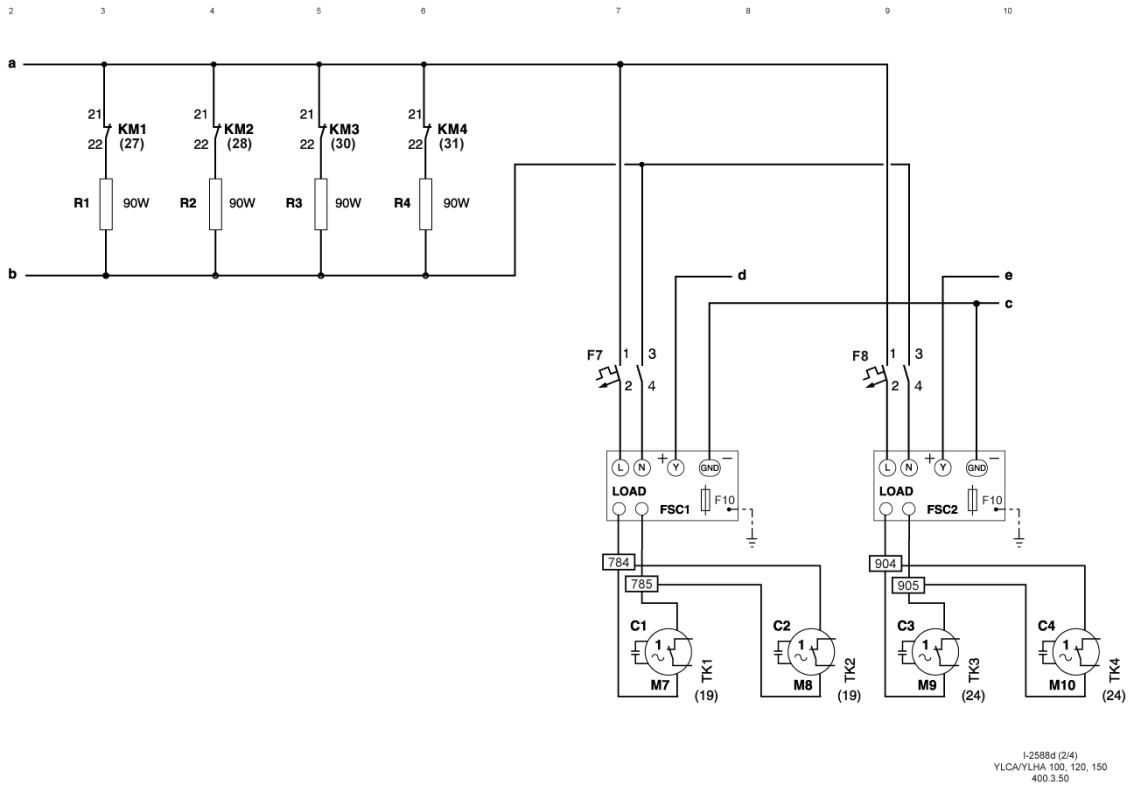
I-2588d (1/4)  
YLCA/YLHA 100, 120, 150  
400.3.50

A	The components in the box are not supplied by the manufacturer
B	The components in the box are standard accessories supplied by the manufacturer

(\*) On units with hydro kit only

(\*)FC If the unit has power and the digital input D1 is open, check that the sequence of phases L1, L2, L3 is correct

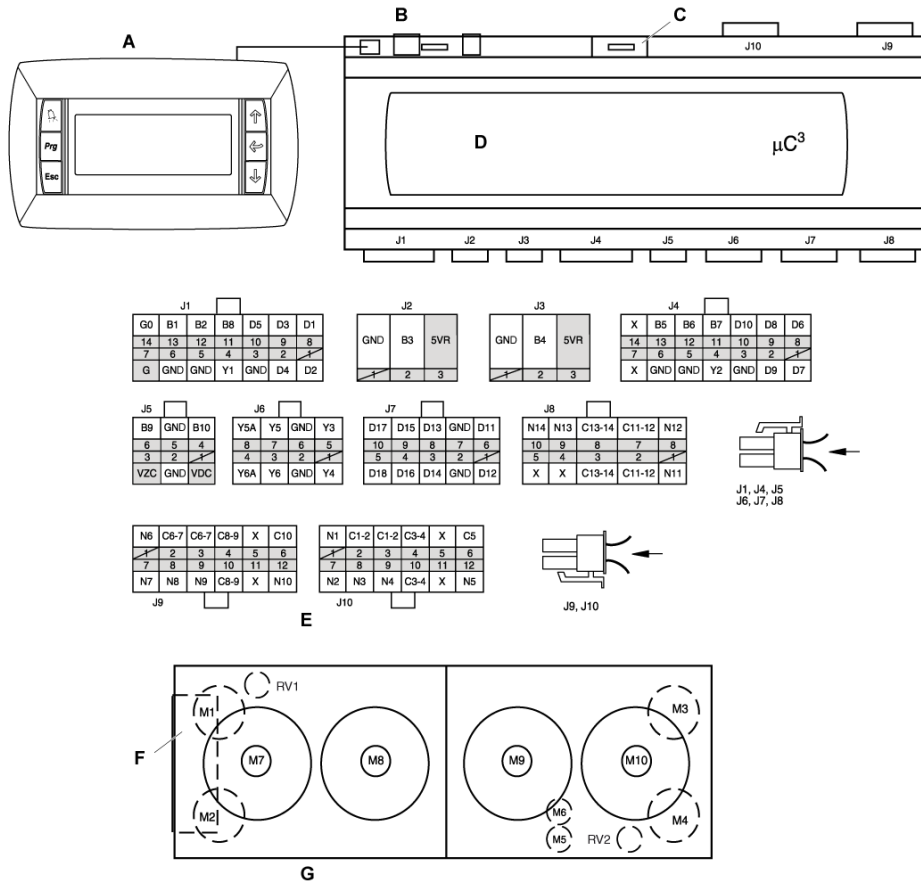
Model	Q2 [A]	Cross-section B mm <sup>2</sup>	F1 [A]	F2 [A]	F3 [A]	F4 [A]	F5 [A] REG	F6 [A] REG	F7 [A] REG	F8 [A] REG
100	100	5 x 35	25	25	25	25	5,4	5,4	8	8
120	125	5 x 50	25	25	25	25	6	6	8	8
150	160	5 x 50	32	32	32	32	6,8	6,8	10	10



## 1.13 Wiring diagrams

(\*\*) Pm YLHA  
units only N10 - C10 = Voltage-free contact (-A- general protection alarm)

a	White	c	Green
b	Black		



L-2558d (4/4)  
YLCA/VLJA 100, 120, 150  
400.3.50

A	Keyboard-display terminal	FSC1, FSC2	Circuit 1 and 2 fan speed controllers
B	Terminal connection	F10 (FSC1, FSC2)	Fuses of the fan speed controllers
C	Programmable key connection	HP1, HP2	High-pressure switches, circuits 1 and 2
D	Control module	KM1, KM2, KM3, KM4	Compressor contactors
E	Identification of the connectors and their terminals	KM5, KM6	Pump contactors
F	Control box	KM8	Back-up heater contactor
G	Distribution of motors and valves	LP1, LP2	Low-pressure switches, circuits 1 and 2
L	phase	M1, M2, M3, M4	Compressor motors
N	Neutral	M5, M6	Pump motors
B3, B4	Coil pressure sensors, circuits 1 and 2	M7, M8, M9, M10	Fan motors
B5	Water inlet temperature sensor (NTC)	$\mu C_3$	Microchiller controller 3
B6	Water outlet temperature sensor (NTC)	Q2	Main switch
C1, C2, C3, C4	Fan condensers	Q3	Main switch
EH	Evaporating unit antifreeze heater	R1, R2, R3, R4	Compressor sum heaters
F1, F2, F3, F4	Compressor circuit breakers	RCH	Remote cool / heat
F5, F6	M5 and M6 pump circuit breakers	ROO	Remote on / off
F7, F8	Circuit 1 and 2 fan circuit breakers	RV1, RV2	4-way valves, circuits 1 and 2
F9	Operating circuit breakers	TH	Tank antifreeze heater
F10	Controller $\mu c$ circuit breaker <sub>3</sub>	TK1, TK2, TK3, TK4	Fan heat protectors
FC	Phase control (compressor rotational direction)	T1	230 / 24, 80 VA transformer
FS	Water flow switch		