

TECHNICAL BROCHURE

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- Scroll compressor
- Horizontal Compact
- Reduced dimensions
- Ducted intake and discharge
- Centrifugal fans

DESCRIPTION

Heat Pumps and Cooling Units **Hcompact LE Series** are Air-Air horizontal packaged units of monobloc compact construction. They should be placed inside a building, safe from external damages, with access registers to fans, cooling circuit and electrical panel with easy removable panels. All units are tested and checked in factory. These series are developed from Hcompact L Series.

They are suitable for medium power installations, appropriated for commercial and industrial applications where the aesthetics of the facade should be preserved.

SERIES

Hcompact RLE Series

Air/air **cooling** packaged units with horizontal compact construction.

Hcompact ILE Series

Air/air **reversible** heat pumps packaged units with horizontal compact construction.

RANGE

Hcompact RLE - ILE Series: 1 cooling circuit, 1 scroll compressor, 4 models:

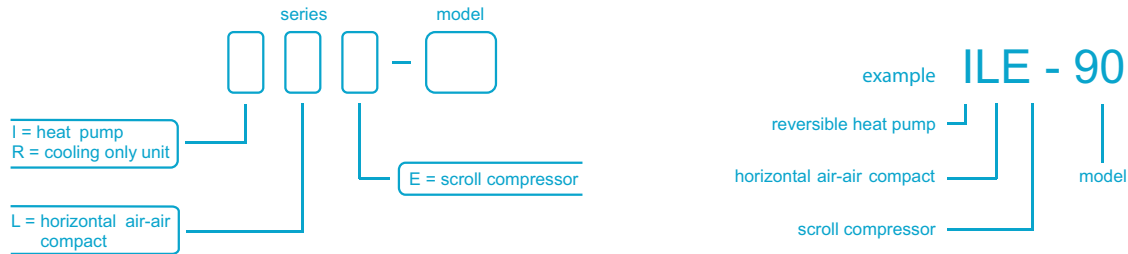
- 80 / 90 / 120 / 160.

OPERATING LIMITS

AIR INLET CONDITIONS		COOLING	HEATING
INTERNAL COIL	MINIMUM	14 °C WB	10 °C
	MAXIMUM	21 °C WB	27 °C
EXTERNAL COIL	MINIMUM	12 °C (*)	-7 °C WB
	MAXIMUM	43 °C	15 °C WB

(*) For units equipped with condensing pressure control, operating limit up to -7°C.

DESIGNATION



UNITS COMPOSITION

Standard equipment

- Casing in galvanised metal plate with polyester paint dried to the furnace and thermally isolated. Self-supporting chassis.

External circuit

- Centrifugal fan driven by belts and pulleys.
- Protection grille, in discharge.
- Condensates drain pan with asphalt paint. Independent drainage.
- Coil with copper tubes and aluminium fins.

Internal circuit

- Centrifugal fan, driven by belts and pulleys.
- Washable air filter.
- Condensates drain pan with asphalt paint. Independent drainage.
- Coil with copper tubes and aluminium fins.

Cooling circuit

- Scroll compressor mounted on anti-vibratory supports.
- Thermostatic expansion valve with external pressure equalization.
- Four ways reverse-cycle valve and crankcase heater (ILE Series).
- Anti-acid dryer filter.

Protections

- HP pressostat.
- Main door switch.
- Control circuit automatic switch.

- Compressor and motorfans line protection fuses.
- Fans thermal protection.

Electrical panel

- Complete electrical panel, totally wired.
- Ground plug.
- Fans and compressor contactors.

GESCLIMA electronic control (consult manual)

Control system with microprocessor composed of:

Control board

- Defrosting operation by external freon probe.
- Anti-frost operation by internal freon probe.
- Low pressure safety by temperature probe.
- High pressure safety by pressostat.
- Lack of freon detection test and probes failure.
- Anti-short-cycle timing.
- Communication board to integrate in a building management system BMS with Modbus protocol (optional).

Ambient thermostat: DOMO

- Operating modes: ventilation, cooling, heating, economic heating, automatic and dehumidification.
- Set points, time and ambient temperature display.
- Modification of operating parameters (set points, differential and timings).
- Time and daily scheduling. Night reduction mode.
- Alarm display.

OPTIONS

- Position of discharge of internal and/or external circuit.
- Coils of copper tubes and copper fins, or aluminium fins with polyurethane coating.
- Options for control and other controls.
- Compressor acoustic isolation.
- Optional electrical heaters.
- Hot water coil.
- Fouled filters differential pressostat.
- Condensing pressure control.
- Rubber antivibratory supports.
- Control system by ECONFORT zones.

Control system by ECONFORT zones

It allows to control up to 11 independent temperature zones, including:

- RLE / ILE unit.
- Relays board.
- Grilles or motorized dampers.
- Control electronic board of external fan (CVET).
- **ECONFORT** incorporates **Zone Thermostats** (1 by zone) with the following functions:
 - On-off switch.
 - Display with ambient temperature.
 - Set point selection.
 - Operating display (green led: cold; red: heat).

SOUND PRESSURE AND POWER LEVEL

A) **Sound power level** in the **external fan discharge**, should be taken into account for the silencer calculation:

RLE - ILE	80	90	120	160
dB(A)	74,4	76,3	83,5	83,3

B) **Sound power level** in the **internal fan discharge**, should be taken into account for the silencer calculation:

RLE - ILE	80	90	120	160
dB(A)	80,4	77,1	79,2	77,1

C) **Unit sound pressure level**, with the ducted discharge and intake, at 5 m., in free field, directivity 2 and at 1,5 m. distance from floor is:

RLE - ILE	80	90	120	160
dB(A)	68,1	68,6	69,2	73,1

NOTE: The sound pressure level depends on the installation conditions and therefore, it is given only as an approximate guide.

TECHNICAL CHARACTERISTICS

Hcompact LE Series		80	90	120	160
Cooling capacities	Cooling capacity ① (kW)	17,9	19,3	26,8	34,8
	Power input ③ (kW)	7,3	8,3	11,3	14,5
	EER Performance	2,4	2,3	2,4	2,4
Heating capacities	Heating capacity ② (kW)	18,4	20,2	27,8	36,5
	Power input ③ (kW)	6,5	7,3	9,6	12,3
	COP Performance	2,8	2,8	2,9	3,0
External circuit fan	Nominal air flow (m ³ /h)	6.500	7.000	10.000	12.200
	Avail. static pressure (mm.W.G.)	7	7	13	14
	Type	centrifugal			
	Number	1			
	Power (kW)	1,1	1,5	1,5	3
	r.p.m.	630	680	543	626
Internal circuit fan	Nominal air flow (m ³ /h)	4.000	4.600	6.000	7.000
	Avail. static pressure (mm.W.G.)	11	8	12	10
	Type	centrifugal			
	Number	1			
	Power (kW)	1,1	1,1	1,1	1,5
	r.p.m.	1.030	853	671	721
Compressor	Type	scroll			
	Number	1			
	Number of circuits	1			
Maximum power inputs	400 V / III ph / 50 Hz (A)	22,4	23,3	35,3	39,5
Refrigerant	Type	R-407c			
	RLE Load (kg)	4,2	4,6	4,5	4,3
	IL E Load (kg)	4,4	4,8	4,6	6,1
	Climate warming potential (CWP) ④	1652,5			
Dimensions	Length (mm)	1.825	1.825	2.481	2.481
	Width (mm)	1.445	1.445	1.911	1.911
	Height (mm)	701	701	820	820
Weight	RLE (kg)	350	402	484	542
	ILE (kg)	364	417	496	555
Condensates draining Ø		3/4"			

① Cooling capacity for internal temperature conditions 27 °C, 50 % RH (19 °C WB) and 35 °C of external temperature.

② Heating capacity for internal temperature conditions 21 °C and 6 °C WB of external temperature.

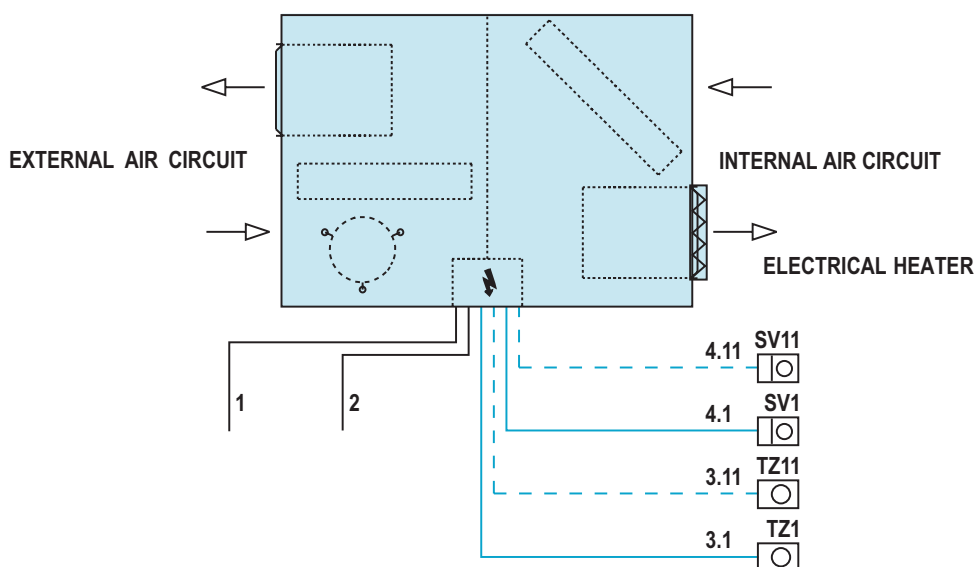
③ Compressor and motorfans power input in nominal conditions.

④ Climate warming potential of one kg of greenhouse-effect fluored gas relative to one kilogram of carbon dioxide over a period of 100 years.

MAXIMUM CURRENTS (A)

Hcompact LE Series		80	90	120	160
<i>Compressor</i>	400 V / III ph / 50 Hz	17	17	29	29
<i>External fan</i>	400 V / III ph / 50 Hz	2,7	3,6	3,6	6,9
<i>Internal fan</i>	400 V / III ph / 50 Hz	2,7	2,7	2,7	3,6
<i>Total</i>	400 V / III ph / 50 Hz	22,4	23,3	35,3	39,5

ELECTRICAL WIRING



The connections to execute are the following ones:

N°	Description	80	90	120	160
1	Power supply	230 I	3 + GND		
		400 III	3 + N + GND		
2	Ambient thermostat connection ①	2 x 1 mm ²			
3	Zone thermostats (11 maximum)	6 standard telephonic wires (RJ45 connector)			
4	Zone servomotor	2 x 0,75 mm ²			

The shaded connections (N° 3 and 4) are just possible with Econfort System.

① If the unit is going to be installed in an industrial ambient with high level of EMC interferences, it is recommended to shield the thermostat control wires.

ELECTRICAL HEATER (OPTIONAL)

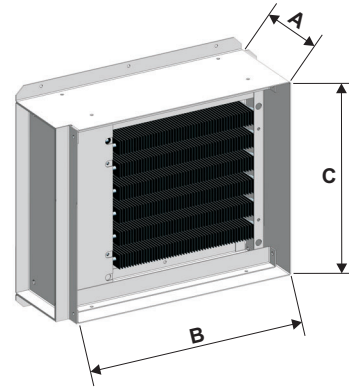
Available capacities

Assembly of electrical heaters in 1 stage. For more stages, it is necessary to consult possibility of incorporation to the unit and prices.

Hcompact LE Series	Voltage	400 V / III ph / 50 Hz					
	Power (kW)	3	6	9	12	15	18
80 / 90 / 120 / 160	Current (A)	4,3	8,7	13,0	17,3	21,7	26,0

Frame for assembly of the optional electrical heater at the fan supply outlet:

Hcompact LE Series	Power	Dimensions (mm)		
		A	B	C
80	3 to 6 kW	150	432	341
	9 to 12 kW	262	432	341
	15 to 18 kW	262	482	443
90	3 to 9 kW	150	482	443
	12 to 18 kW	262	482	443
120 / 160	3 to 9 kW	150	547	443
	12 to 18 kW	262	547	443



NOTE: This frame has lateral access for maintenance.

HOT WATER COILS (OPTIONAL)

Two rows hot water coil

Two rows hot water coil for assembly in duct

Hcompact LE Series		80	90	120	160
Nominal air flow	(m ³ /h)	4.000	4.600	6.000	7.000
Heating capacity (water 80/60°C and air 21°C)	(kW)	33	35	51	56
Air pressure drop	(mm.w.g.)	3,7	4,6	3,5	4,5
Water pressure drop	(m.w.g.)	1,0	1,2	1,2	1,4
Ø Hydraulic connections:l/O		1 1/4"	1 1/4"	1 1/2"	1 1/2"

COOLING CAPACITY (kW)

EXTERNAL TEMPERATURE 35 °C

RLE ILE	Flow m ³ /h	Internal air temperature											
		23 °C / 50 % RH			25 °C / 50 % RH			27 °C / 50 % RH			29 °C / 50 % RH		
		Pft	Pfs	Pa	Pft	Pfs	Pa	Pft	Pfs	Pa	Pft	Pfs	Pa
80	3.200	14.5	13.8	6.1	15.8	14.2	6.0	17.2	15.0	5.9	18.2	15.4	5.9
	4.000	15.1	14.1	6.2	16.5	14.7	6.1	17.9	15.5	6.0	18.9	15.9	6.0
	4.400	15.4	15.3	6.3	16.8	16.0	6.4	18.2	15.7	6.1	19.2	16.1	6.1
90	3.600	16.1	15.1	6.5	17.4	15.7	6.6	18.6	16.2	6.6	19.9	16.6	6.6
	4.600	16.7	15.6	6.6	18.1	16.2	6.6	19.3	16.7	6.6	20.7	17.1	6.7
	4.800	17.0	15.8	6.7	18.4	16.4	6.7	19.6	16.9	6.7	21.0	17.3	6.7
120	4.800	22.6	18.4	9.0	24.2	18.9	9.0	25.9	19.5	9.0	27.6	19.9	9.1
	6.000	23.5	21.1	9.0	25.1	21.7	9.0	26.8	22.3	9.1	28.5	22.8	9.1
	6.600	23.7	22.3	9.0	25.3	23.0	9.0	27.0	23.6	9.1	28.7	24.2	9.2
160	5.800	29.6	23.4	11.4	31.7	24.1	11.5	33.9	24.6	11.6	36.1	25.1	11.7
	7.000	30.5	25.8	11.5	32.6	26.6	11.6	34.8	27.3	11.7	37.0	27.9	11.8
	7.300	30.8	26.6	11.5	32.9	27.4	11.6	35.1	28.1	11.7	37.3	28.7	11.8

Pft: Total cooling capacity in kW

Pfs: Sensible cooling capacity in kW

Pa: Compressor power input in kW

CORRECTION COEFFICIENT OF COOLING CAPACITY

Cooling capacity correction coefficients

CORRECTION COEFFICIENT DEPENDING ON EXTERNAL TEMPERATURE K1

External Temperature	30	32	36	38	40	43
K1 Coefficient	1.07	1.04	0.98	0.96	0.93	0.89

$$PFT = Pft \times K1 \times K2$$

$$PF2 = Pfs \times K1 \times K3$$

CORRECTION COEFFICIENT DEPENDING ON RELATIVE HUMIDITY K2 AND K3

Relative Humidity	40%	50%	60%	70%
K2 Coefficient	0.97	1.00	1.05	1.10
K3 Coefficient	1.10	1.00	0.92	0.84

Power input correction coefficients

CORRECTION COEFFICIENT DEPENDING ON EXTERNAL TEMPERATURE K4

External Temperature	30	32	36	38	40	43
K4 Coefficient	0.95	0.98	1.01	1.03	1.05	1.08

$$PA = Pa \times K4 \times K5$$

CORRECTION COEFFICIENT DEPENDING ON RELATIVE HUMIDITY K5

Relative Humidity	40%	50%	60%	70%
K5 Coefficient	0.97	1.00	1.05	1.10

HEATING CAPACITY (kW)

INTERNAL TEMPERATURE 21 °C

ILE	Flow m ³ /h	External air temperature °C WB											
		-5 °C		-2,5 °C		0 °C		2,5 °C		6 °C		10 °C	
		Pc	Pa	Pc	Pa	Pc	Pa	Pc	Pa	Pc	Pa	Pc	Pa
80	3.200	13.3	5.0	14.2	5.1	15.3	5.2	16.4	5.2	18.3	5.4	20.8	5.6
	4.000	13.4	4.8	14.3	4.9	15.4	5.0	16.5	5.0	18.4	5.2	20.9	5.4
	4.400	13.5	4.7	14.4	4.8	15.5	4.9	16.6	4.9	18.5	5.1	21.0	5.3
90	3.600	15.1	5.3	16.1	5.4	17.2	5.5	18.3	5.7	20.0	5.9	22.6	6.1
	4.600	15.2	5.1	16.2	5.2	17.3	5.3	18.4	5.4	20.2	5.6	22.8	5.7
	4.800	15.3	5.1	16.3	5.1	17.4	5.2	18.5	5.3	20.3	5.5	22.9	5.7
120	4.800	20.2	7.4	21.6	7.5	23.0	7.6	24.9	7.7	27.6	7.8	30.7	7.9
	6.000	20.4	7.1	21.8	7.1	23.2	7.2	25.1	7.3	27.8	7.4	30.9	7.5
	6.600	20.6	6.9	22.0	6.9	23.4	7.0	25.3	7.1	28.0	7.2	31.1	7.3
160	5.800	26.4	9.3	28.2	9.5	30.1	9.6	32.5	9.7	36.2	9.9	40.1	10.2
	7.000	26.7	8.9	28.5	9.1	30.4	9.2	32.8	9.3	36.5	9.5	40.4	9.8
	7.300	26.9	8.7	28.7	8.9	30.6	9.0	33.0	9.1	36.7	9.3	40.6	9.6

Pc: Total heating capacity in kW

Pa: Compressor power input in kW

CORRECTION COEFFICIENT OF HEATING CAPACITY

CORRECTION COEFFICIENT DEPENDING ON INTERNAL TEMPERATURE K1 AND K2

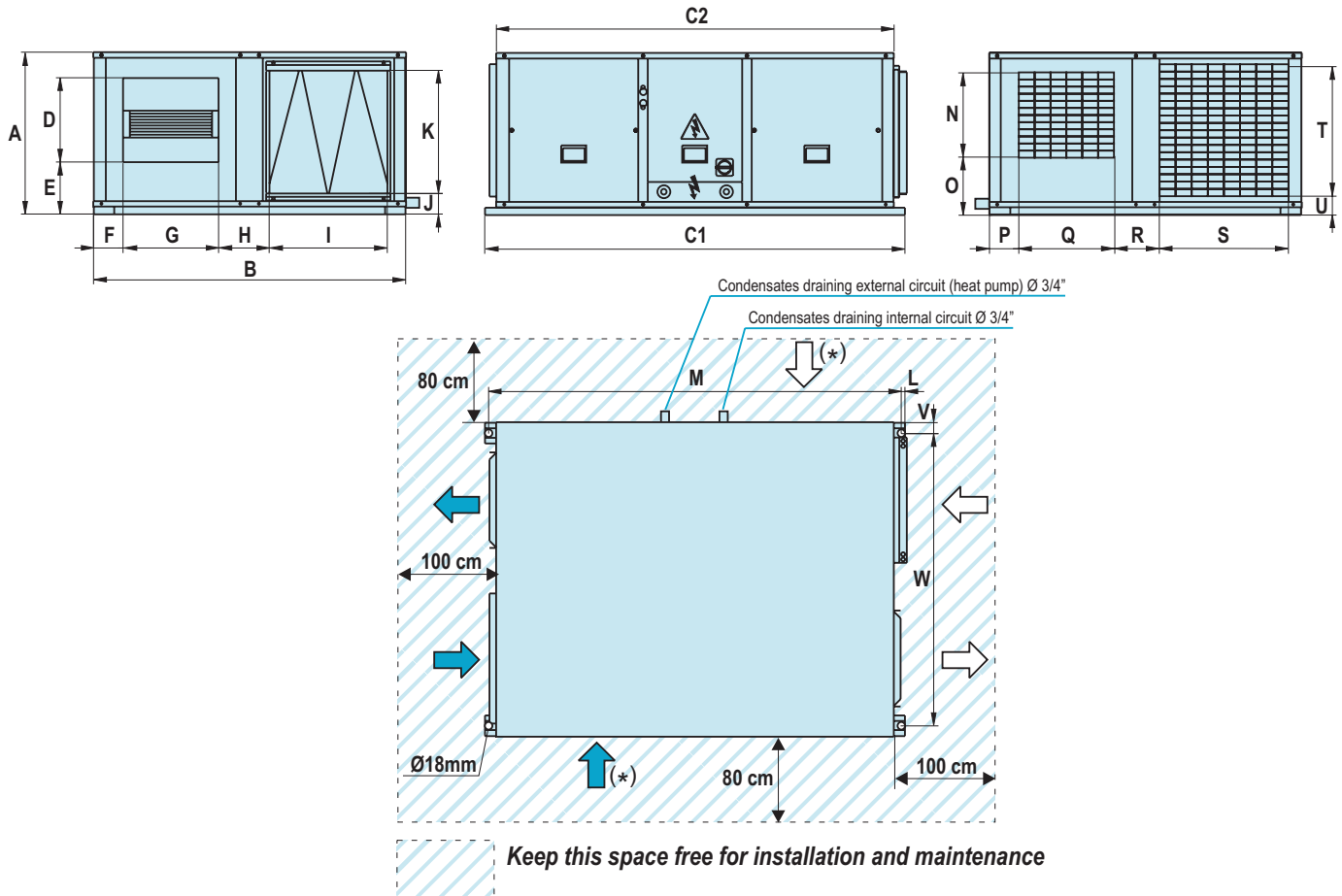
Internal Temperature	17	19	21	23	25	27
K1 Coefficient	1.06	1.02	1.00	0.97	0.95	0.97
K2 Coefficient	0.96	0.98	1.00	1.02	1.04	1.06

$$PC = Pc \times K1$$

$$PA = Pa \times K2$$

DIMENSIONS SCHEME HCOMPACT LE SERIES (mm)

RLE / ILE MODELS - 80 / 90



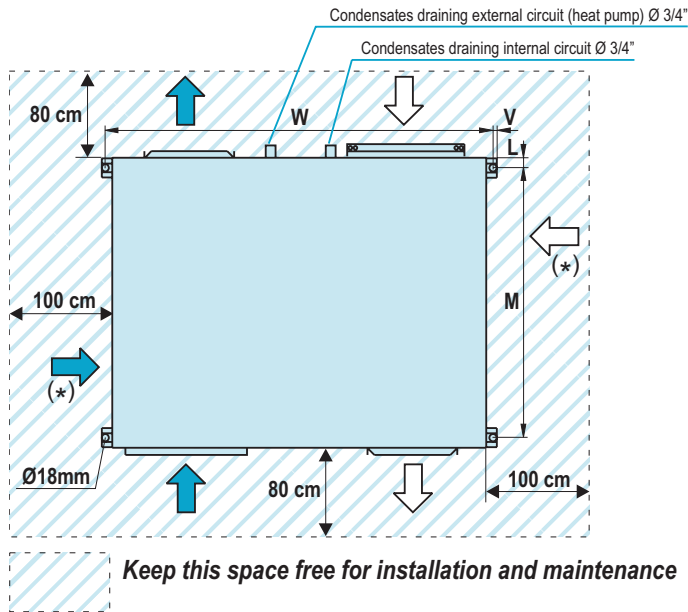
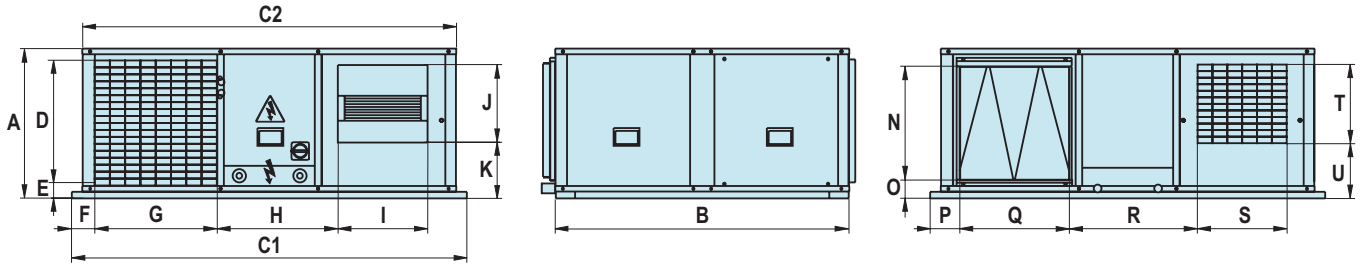
Model	A	B	C1	C2	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
80	701	1445	1825	1745	297	171	195	339	268	604	96	522	14	1797	410	235	124	475	194	608	573	67	39,5	1366
90	701	1445	1825	1745	349	171	159	403	240	604	96	522	14	1797	410	235	124	475	194	595	573	67	39,5	1366

(*) Both in the internal air circuit and in the external circuit, the return panel can be located in any of the two positions indicated in the previous drawing, since both panels are easily interchangeable, with the purpose of leaving it on site at the convenience of each installation.

LEGEND:

- INTERNAL CIRCUIT
- EXTERNAL CIRCUIT
- POWER SUPPLY AND ELECTRICAL PANEL
- DOOR SWITCH

RLE / ILE MODELS - 80 / 90 (OPTIONAL ASSEMBLY)



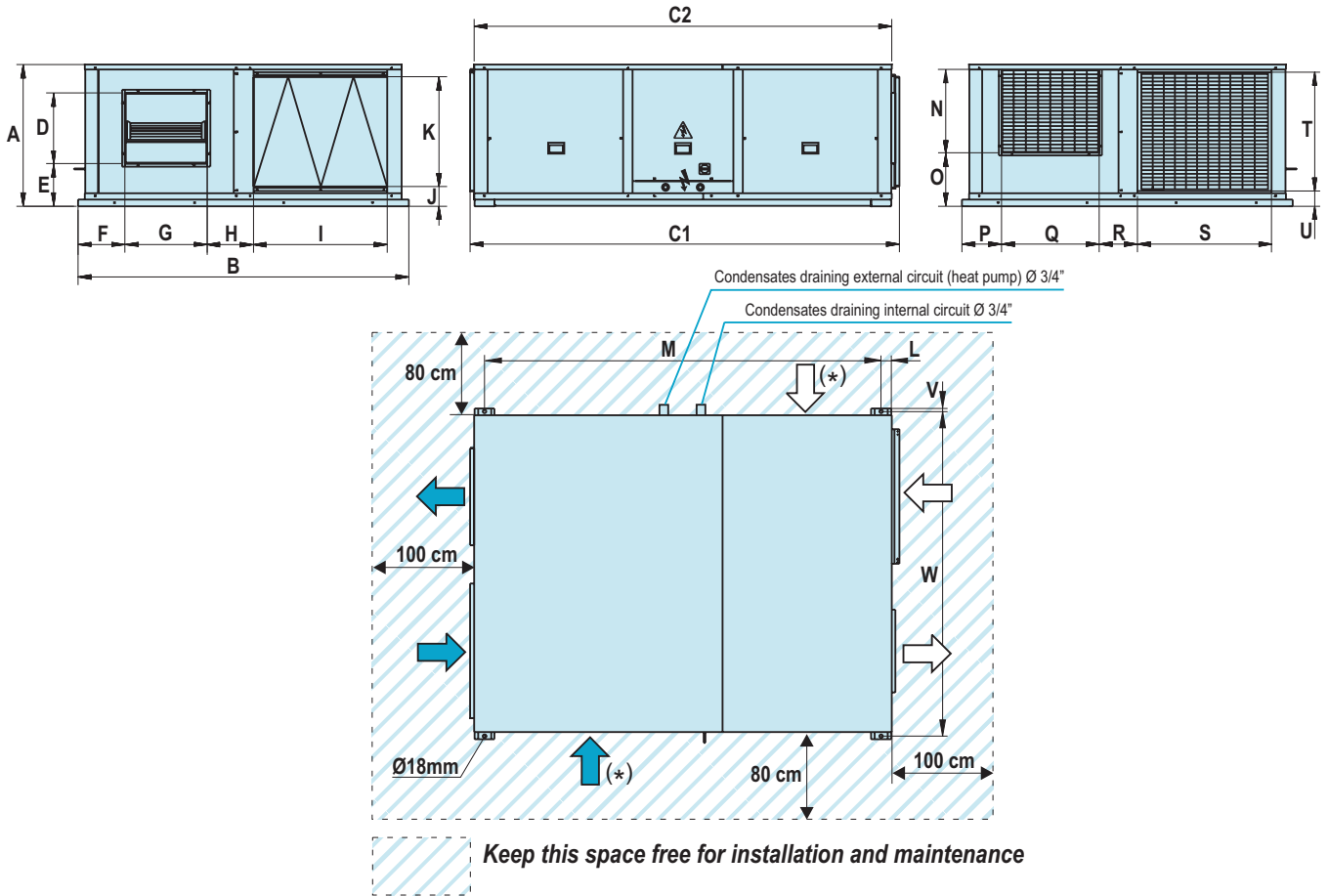
Model	A	B	C1	C2	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
80	701	1445	1825	1745	573	67	84	608	494	339	297	171	39,5	1366	522	96	79	604	568	475	410	235	14	1797
90	701	1445	1825	1745	573	67	84	608	494	403	349	171	39,5	1366	522	96	79	604	540	475	410	235	14	1797

(*) Both in the internal air circuit and in the external circuit, the return panel can be located in any of the two positions indicated in the previous drawing, since both panels are easily interchangeable, with the purpose of leaving it on site at the convenience of each installation.

LEGEND:

- INTERNAL CIRCUIT
- EXTERNAL CIRCUIT
- POWER SUPPLY AND ELECTRICAL PANEL
- DOOR SWITCH

RLE / ILE MODELS - 120 / 160



Model	A	B	C1	C2	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
120	820	1911	2481	2412	410	247	272	477	265	778	115	633	60,5	2291	484	309	228	564	221	778	687	87	17,5	1876
160	820	1911	2481	2412	410	247	272	477	265	778	115	633	60,5	2291	484	309	228	564	221	778	687	87	17,5	1876

(*) Both in the internal air circuit and in the external circuit, the return panel can be located in any of the two positions indicated in the previous drawing, since both panels are easily interchangeable, with the purpose of leaving it on site at the convenience of each installation.

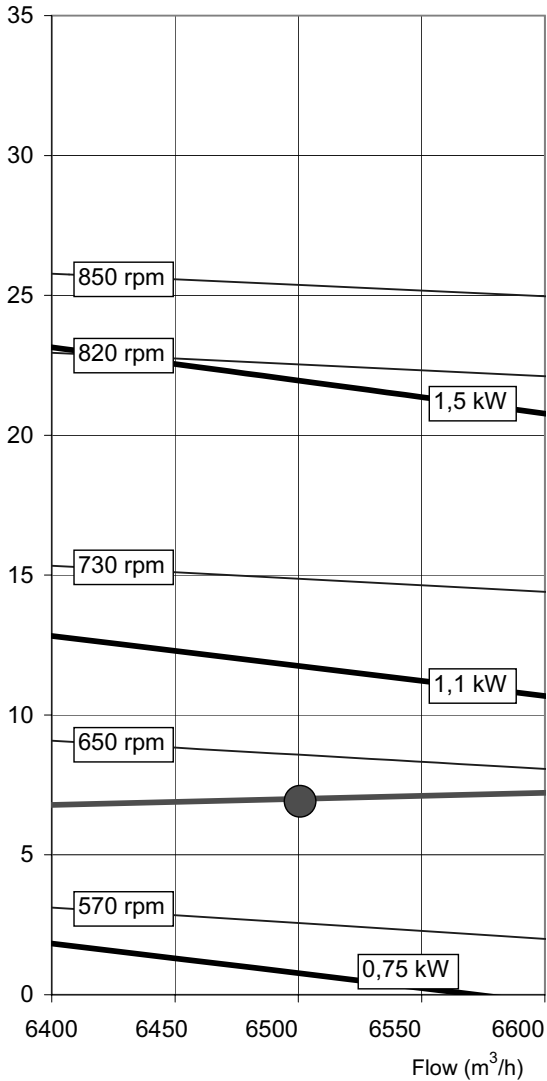
LEGEND:

- INTERNAL CIRCUIT
- EXTERNAL CIRCUIT
- POWER SUPPLY AND ELECTRICAL PANEL
- DOOR SWITCH

EXTERNAL FAN CHARACTERISTICS

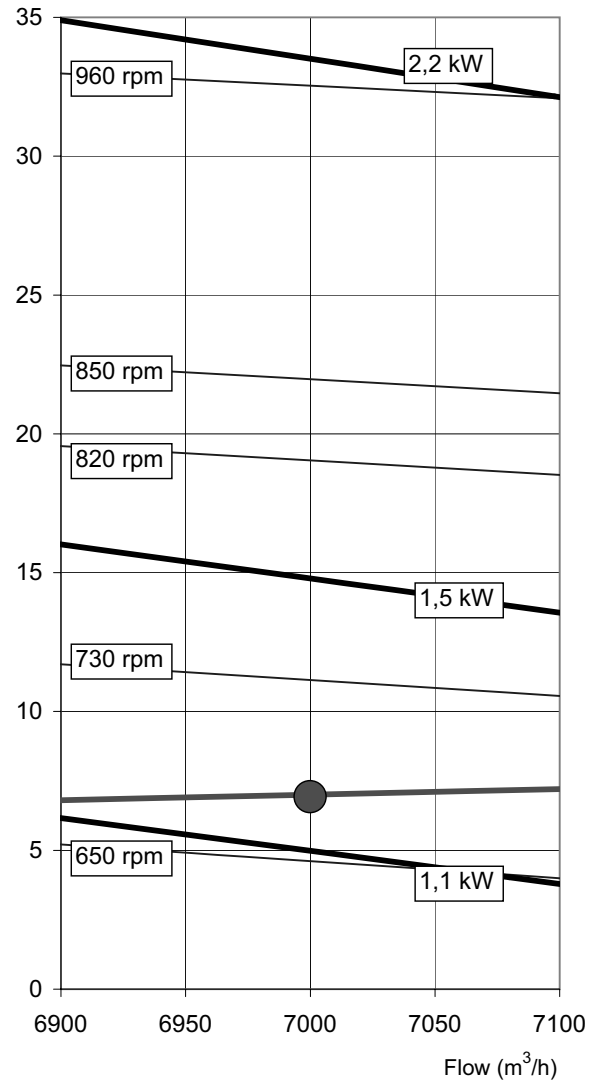
LE-80

Nom. Flow: 6.500 m³/h
 Avail. Press. (mm.W.G.) Avail. Press.: 7 mm.W.G.



LE-90

Nom. Flow: 7.000 m³/h
 Avail. Press. (mm.W.G.) Avail. Press.: 7 mm.W.G.



NOTE: The graphic point shows the operating nominal point. The curve that passes through this point is the nominal installation curve (this curve shows the aspect of other possible curves of installation).

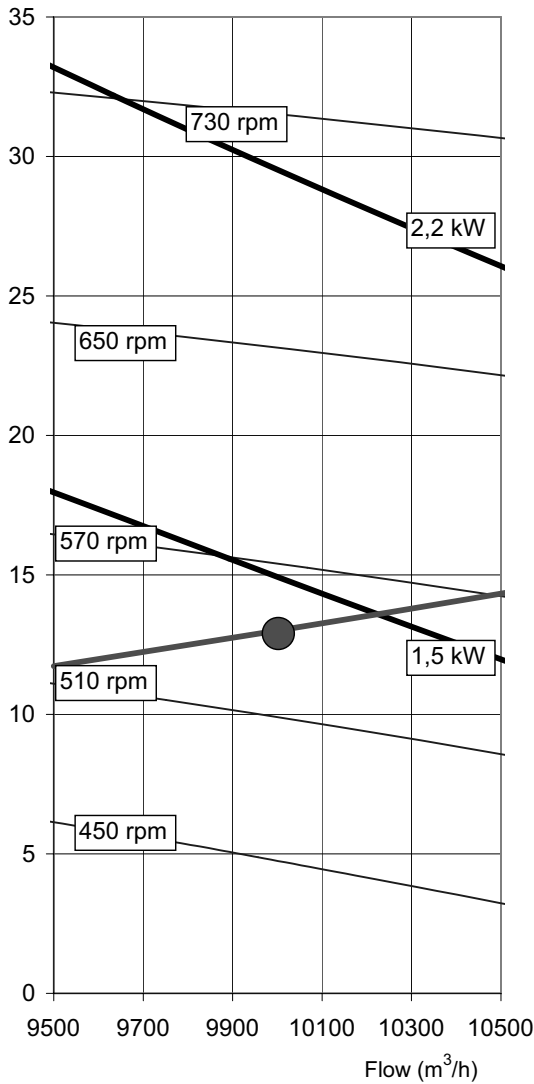
For triphasic models, the motor to select is that whose curve is above the operating point.

If there is a motor change, consult the price supplement.

EXTERNAL FAN CHARACTERISTICS

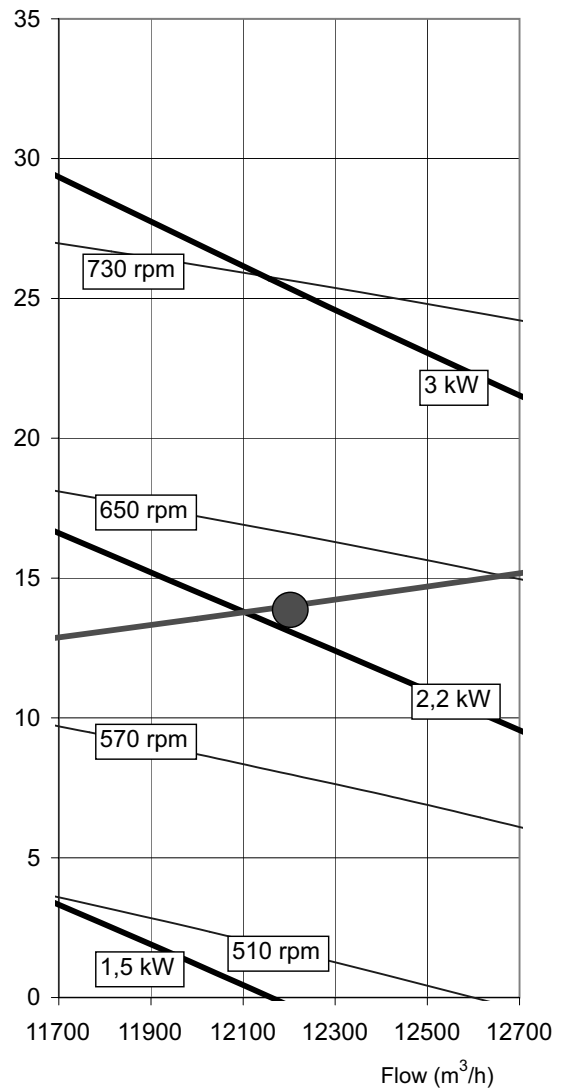
LE-120

Nom Flow: 10.000 m³/h
 Avail. Press. (mm.W.G.) Avail. Press.: 13 mm.W.G.



LE-160

Nom Flow: 12.200 m³/h
 Avail. Press. (mm.W.G.) Avail. Press.: 14 mm.W.G.



NOTE: The graphic point shows the operating nominal point. The curve that passes through this point is the nominal installation curve (this curve shows the aspect of other possible curves of installation).

For triphasic models, the motor to select is that whose curve is above the operating point.

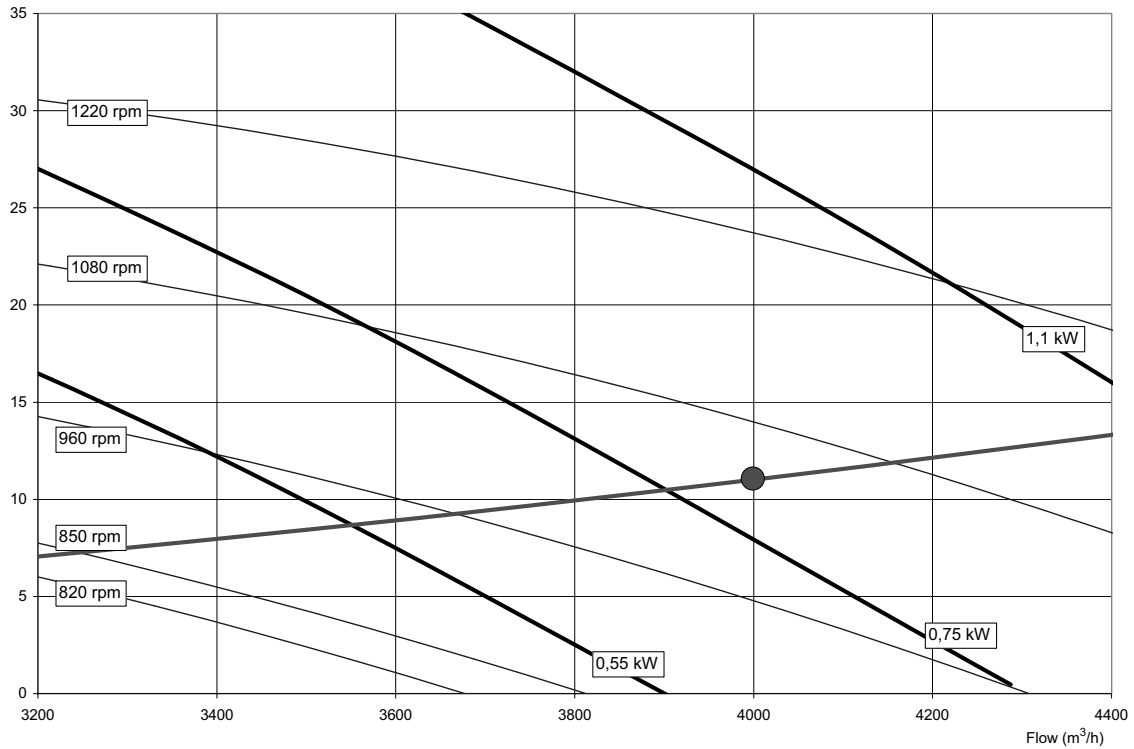
If there is a motor change, consult the price supplement.

INTERNAL FAN CHARACTERISTICS

LE-80

Avail. Press. (mm.W.G.)

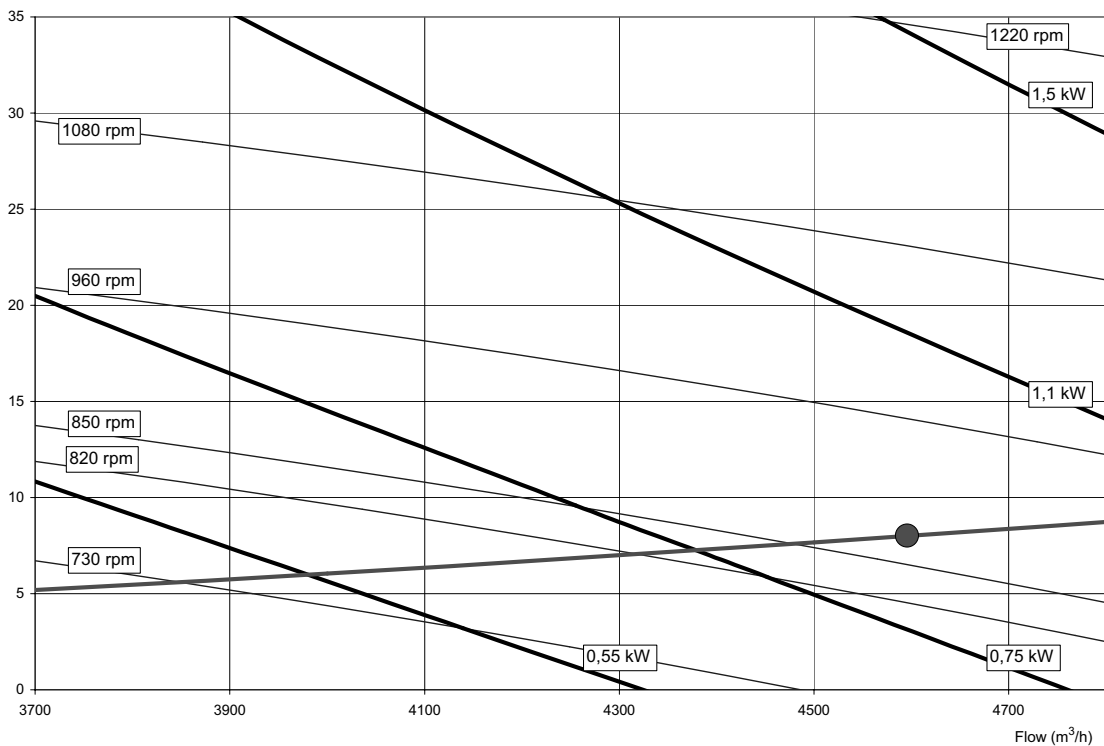
Nom. Flow: 4.000 m³/h
Avail. Press.: 11 mm.W.G.



LE-90

Avail. Press. (mm.W.G.)

Nom. Flow: 4.600 m³/h
Avail. Press.: 8 mm.W.G.



NOTE: The graphic point shows the operating nominal point. The curve that passes through this point is the nominal installation curve (this curve shows the aspect of other possible curves of installation).

For triphasic models, the motor to select is that whose curve is above the operating point.

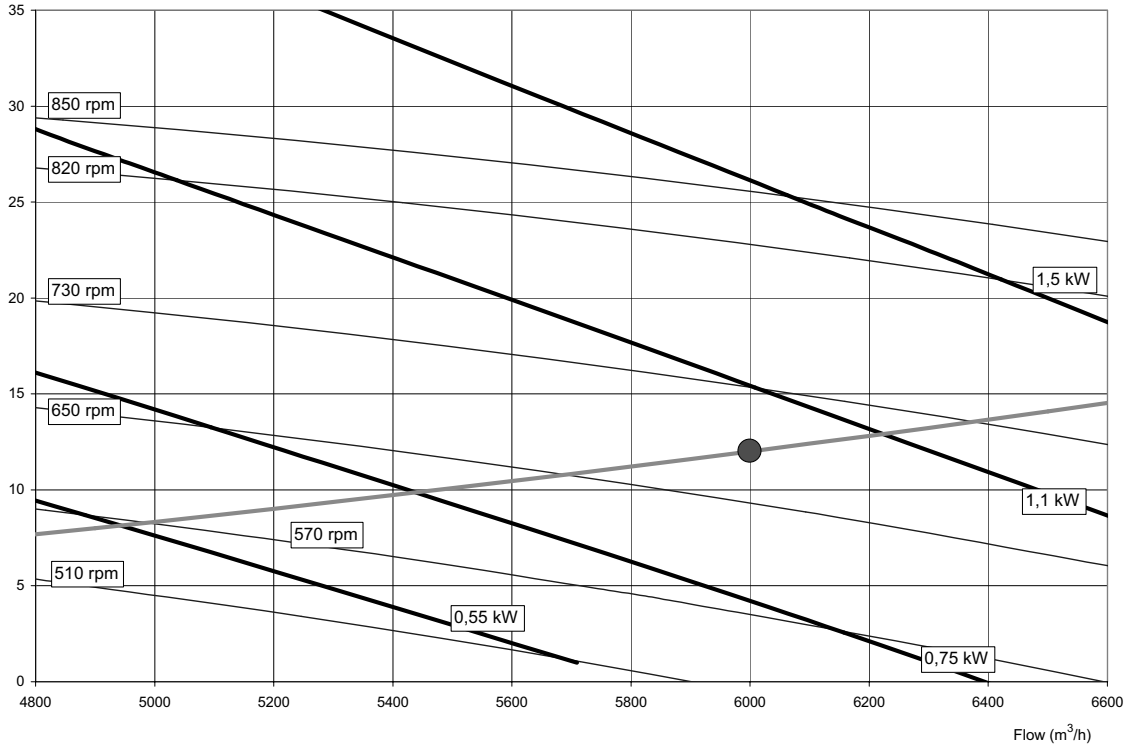
If there is a motor change, consult the price supplement.

INTERNAL FAN CHARACTERISTICS

LE-120

Avail. Press. (mm.W.G.)

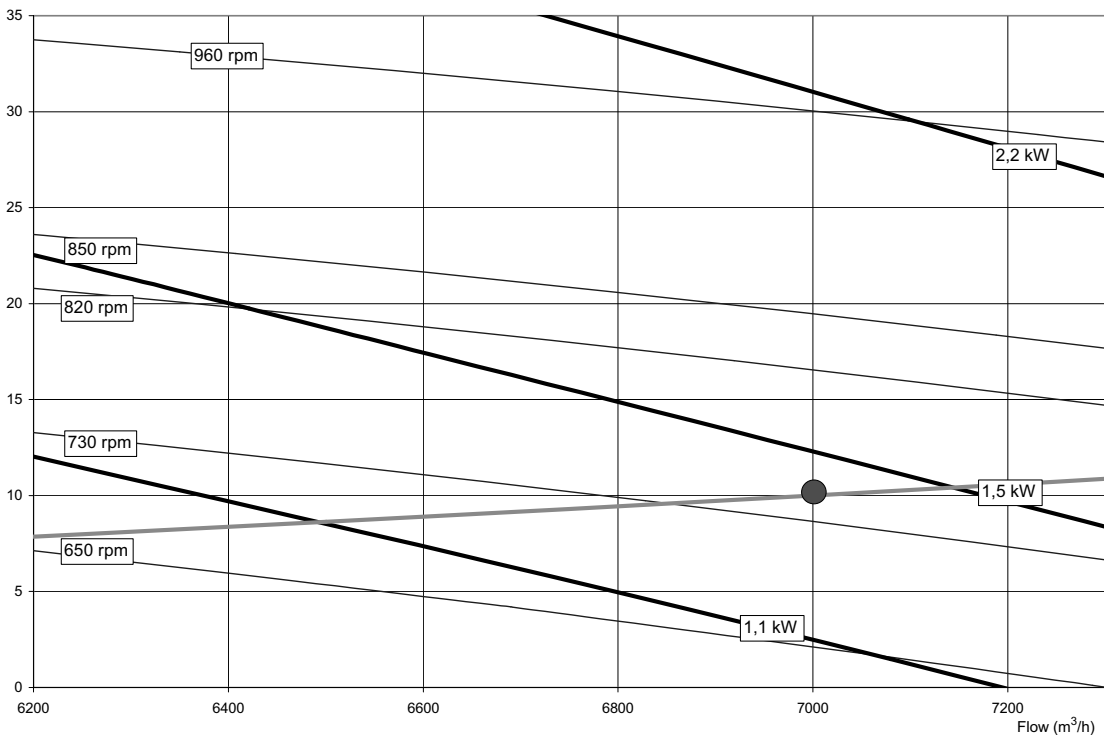
Nom. Flow: 6.000 m³/h
Avail. Press.: 12 mm.W.G.



LE-160

Avail. Press. (mm.W.G.)

Nom Flow: 7.000 m³/h
Avail. Press.: 10 mm.W.G.



NOTE: The graphic point shows the operating nominal point. The curve that passes through this point is the nominal installation curve (this curve shows the aspect of other possible curves of installation).

For triphasic models, the motor to select is that whose curve is above the operating point.

If there is a motor change, consult the price supplement.

