DATA SHEET

FläktGroup

CHILLER WITH REFRIGERANT R-454B

FGAC 4061-4121 BG2

Table of contents

Type code	1
Unit description	2
Options and accessories	3
Operating limits	10
General Data	12
Noise levels	
Footprint	
Anti-vibration mounts	
Electrical data	17
Terminal scheme	
Order-related documentation	



Fig. 1: Unit view (example)

Туре	code									
		FG	Α	С	4	061	В	G	2	
		Unit series	Condensing	Operating mode	Number of compressors	Capacity stage	Series	Refrigerant	Supply voltage	Unit model
FG	FläktGroup Series		-	-		-				
Α	Air cooled (outdoor installation)									
С	Chiller									
4	4 Scroll compressors									
061- 121	Capacity stages: 061, 071, 081, 091, 101, 111, 121									
В	Unit series A									
G	Refrigerant R-454B									
2	400 V / 3~ / 50 Hz / PE									
.SL .HE .D .SD .HD	Standard SL unit - super quiet model HE unit - high efficiency model Standard unit with desuperheater for partial heat recovery SD unit - super quiet version with desuperheater for partial heat recovery HD unit - highly efficient version with desuperheater for partial heat recovery									

Fig. 2: Explanation of unit type code

EXCELLENCE IN SOLUTIONS



Unit description

FläktGroup Chillers with scroll compressors

- Air-cooled for outdoor installation
- Refrigerant R-454B (GWP 466), safety class A2L according to ISO 817
- ErP 2021 compliant according to (EU) 2016/2281
- 7 unit sizes available
- 3 unit models:
 - Standard units
 - SL/SD units, super low noise with noise reduction of approx. 7dB(A)
 - HE/HD units, highly efficient with EEV, shell and tube heat exchanger and EC fans as standard
- Version with desuperheater for partial heat recovery optional (.D /.SD/ .HD units)
- High energy efficiency at full and part-load mode
- Capacity range approx. 152 kW to 338 kW cooling capacity
- Built-in pump or double pump (redundancy) optionally available, models with standard delivery head or increased delivery head, as well as on/off pump or speed-regulated pump with increased energy efficiency.
- Units with built-in pump or pumps are optionally available with built-in buffer tank
- 2 refrigerant circuits with 2 compressors each as tandem unit
- 4 quiet, low-vibration, fully hermetic scroll compressors
- Electronic expansion valves (EEV) standard on HE units, available as an option on standard and SL units
- Solenoid valves in the fluid lines standard on HE units, available as an option on standard and SL units
 EC fans as standard for HE units and unit types FGAC4061BG2(.D), FGAC4121BG2(.D); optionally
- EC fans as standard for HE units and unit types FGAC4061BG2(.D), FGAC4121BG2(.D); optionally available for all other units
- Al/Al micro-channel heat exchanger as condenser, optionally with coating
- Optionally with protective grating (optional)
- Plate heat exchanger as evaporator, incl. freeze protection heating for unit stand-by without glycol at ambient temperatures above -10 °C (standard and SL units)
- Shell and tube heat exchanger as evaporator, incl. antifreeze heating for unit stand-by without glycol at ambient temperatures above -10 °C (HE units)
- Built-in safety valve 6 bar
- Water outlet temperature -10 to +15 °C (partly depending on the outside temperature); or -8 to +15 °C for units with partial heat recovery
- Air inlet temperature up to min. -20 °C and max. +46 °C possible (depending on selected medium, water temperature and selected accessories; see operating limits diagram)
- Wind protected installation required for operation below -10 °C outdoor temperature
- If the temperature falls below the minimum air inlet temperature or exceeds the maximum air inlet temperature, the unit must be disabled
- Power supply 400V / 3~ / 50 Hz / PE
- Numbered connecting terminals
- Built-in phase sequence protection relay
- Automatic circuit breaker for load and control circuit
- Pump relay and, if necessary, 0-10 V output for controlling one or two on-site water pump(s) for units without built-in pump(s) (optional)
- FläktGroup controller
- Compact display with 8-line display
- Water-inlet temperature control as standard
- Setpoint shift with 4-20 mA signal as standard
- Demand limit contact to reduce electrical power consumption by deactivating compressors or their capacity stages (optional)
- Flow monitor for on-site mounting available as accessory (option .110/ .167)
- Water strainer for on-site mounting available as accessory (option .171/ .172)
- On-site pipe expansion joints must be installed to decouple vibrations, noise transmission and linear expansion
- All units of the FGAC 4061 4121 BG 1/2 (.SL/ .HE) series are Eurovent-certified.



Options and accessories

Mechanics accessories						
FGPE modules	 Built-in pump module Consisting of one pump or two parallel pumps with redundancy function. The water connections are equipped with internal screw threads. The other components are: Steel pipes, water vapour proof insulated Pump protection with overcurrent relay Pump control with pump supply line and overrun time Prevention of pump blockages through regular activation Pump modules assembled and wired by the manufacturer result in significant savings in installation costs. 					
	Pumps or two parallel pumps with standard delivery head or increased delivery head are available. All pumps are designed as on/off pumps or speed controlled with inverter.					
OptionsBuilt-in buffer tank to increase the.M04/.M05This results in considerable saving are: - Expansion tank (dimensioned for - Safety valve - Inlet, air vent and drain valve - Manometer			water volume of the system in installation costs. The other components ternal buffer tank)			
	.M04	500 L tank for unit sizes	4061-4091 (.D) 4061-4071 .SL/.SD 4061 .HE/.HD			
	.M05	700 L tank for unit sizes	4101-4121 (.D) 4081-4121 .SL/.SD 4071-4121 .HE/.HD			
	Only for units with built-in pumps					

Installation of accessories

Option .I01 -	Spring anti-vibration mounts Anti-vibration mounts with spring elements to minimize vibration transmission (supplied separately).
Option .102 -	Rubber anti-vibration isolator Anti-vibration mounts with rubber elements to minimize vibration transmission (supplied separately).
	FläktGroup recommends the use of rubber anti-vibration isolators. Alternatively, spring anti-vibration mounts can be used depending on the project specifications.
Option .104 -	Protection grille for air-cooled heat exchanger Protection grille on external sides of the air-cooled heat exchanger for protecting fins against damage due to shipping and weather.
Option .153 -	Side panels for the connection sides of the air-side heat exchangers
(only for standard and HE devices)	Side panels on each air-side heat exchanger as a protective cover to prevent damage and as visual and contact protection.



Option .155 or .156 for SL units or .157 for HE units	-	Anti-corrosion coating for microchannel heat exchangers (MCHX) 100% epoxy polymer e-coating process for the entire air-cooled microchannel heat exchanger as protection against corrosion, UV radiation and for increased weather resistance to medium aggressive air pollution and use with medium salty air near the coast
Option .158	-	Display protection
Option .110 /.167	-	Flow monitor (supplied separately) with paddle for installation in hydraulic circuit at chilled water outlet. The on-site installation and wiring of the flow monitor is a prerequisite for warranty claims!
		Option .l67 Type 1 (unit size 4061-4091) Option .l10 Type 2 (unit size 4101-4121)
Option .171 to .172	-	Water strainer for installation in the hydraulic circuit at the unit inlet (supplied separately) A water strainer must be installed before the direct inlet into the heat exchanger(s) to protect the heat exchanger(s) from dirt and deposits. The "Y-type" water strainer has a mesh width of 0.9 mm. The filter insert can be removed without difficulty and cleaned for maintenance purposes without dismantling the valve body. Option .I71 Filter 3" (unit size 4061-4071) Option .I72 Filter 4" (unit size 4081-4121)
On request	-	 Cu/Al heat exchanger with corrosion protection coating for fins instead of microchannel heat exchanger. Anti-corrosion coating for fins of Cu/Al heat exchanger. The use of chemical cleaning methods and protective paint coating made of polyester resin ensures the following characteristics for the fins: Corrosion resistance in a salt-spray test according to ASTM B117 for at least 1000 hours UV durability Attention: Change in refrigerant charge volume and unit weight
On request	-	 Cu/Al heat exchanger with polyurethane paint coating instead of microchannel heat exchanger Cu/Al heat exchanger with polyurethane paint. The entire heat exchanger receives protective coating using polyurethane paint, so that the following qualities are ensured: Corrosion resistance in a salt-spray test according to ASTM B117 for at least 4000 hours UV durability Attention: Change in refrigerant charge volume and unit weight



Refrigeration circuit accessories

Option .R12 or .R11 for standard devices with option .E37	Electronic expansion valves (EEV) Instead of thermal expansion valves (TEV), one electronic expansion valve is used per refrigeration circuit. Additionally, the according hardware for the control			
(only for standard and SL devices)	of the EEVs is included. EEVs reduce the superheat of the refrigerant compared to TEVs, resulting in energy savings.			
02 001000,	Required for units that are operated at outdoor temperatures below -10 °C. Included as standard with HE devices.			
Option .R02	Shut-off valves for compressor suction side Service shut-off valve assembled for fast and easy maintenance			
Option .R10	Shut-off valves for compressor pressure side Service shut-off valve assembled for fast and easy maintenance			
Option .R01	Solenoid valves in the liquid lines Prevents refrigerant migration during standby phases when operating in winter.			
(only for standard and SL devices)	Required for units that are operated at outdoor temperatures below -10 °C. Required for devices with EEV (option .R11/ .R12). Included as standard with HE devices.			
Option .R13	High and low pressure gauges Refrigerant gauge for high and low pressure side for reading off current operating pressures.			
Option .R19	Safety valve in double model for high and low pressure side Two safety valves are connected via a changeover valve on the high and low pressure side each. By using a changeover valve a trouble-free and fast replacement of safety valves without refrigerant loss is possible for maintenance and service jobs.			
	Mandatory for devices with option .C02 (UDT / delivery to Poland).			
Option .R28 -	High-pressure control for operation at very low air-intake temperatures High-pressure control in the refrigeration circuit side to guarantee operation down			
FGAC4061BG2(.D), FGAC4121BG2(.D))	to -20 °C air-intake temperatures. Refer to the charts of operating envelopes for the exact operating limits. <u>Attention: Change in refrigerant charge volume and unit weight. Prices on</u>			
On request	request.			
	FläktGroup recommends this option only for projects with special requirements. Alternatively, the activation of the unit can be withdrawn if the outdoor temperature falls below the minimum value.			
Option .R29 -	High-pressure control for operation at very low air-intake temperatures			
(only for standard and SL units, except FGAC4061BG2(.D), FGAC4121BG2(.D))	High-pressure control in the refrigeration circuit side to guarantee operation down to -20 °C air inlet temperatures at water temperatures below 0 °C. Refer to the charts of operating envelopes for the exact operating limits. <u>Attention: Change in refrigerant charge volume and unit weight. Prices on</u> <u>request.</u>			
On request	FläktGroup recommends this option only for projects with special requirements. Alternatively, the activation of the unit can be withdrawn if the outdoor temperature falls below the minimum value.			



Electrical accessories

Option .E02	-	Cabling in colour sequence: L1: brown L2: black L3: grey The wiring of the load circuit for the unit is carried out in the following colour sequence: L1: brown, L2: black, L3: gray
		This colour sequence is frequently requested in Great Britain.
Option .E06	-	Soft starters for compressors Cannot be combined with reactive current compensators
Option .E13 /.E11	-	 Frost protection heating for operation without glycol suitable for stand-by units without glycol at ambient temperatures above -10 °C. Standard for units without pumps and without buffer tank .E13 Units with pump(s) without buffer tank .E11 Units with pump(s) and buffer tank
Option .E37	-	Standard operating range
(only for standard devices)		Operation up to an outside temperature of +5 °C based on water outlet temperatures of \geq 5 °C. Refer to the operating limit diagrams for the operating limits.
Option .E38	-	Standard operating range
(only for SL devices)		Operation up to an outside temperature of -10 °C based on water outlet temperatures of \geq 5 °C. Refer to the operating limit diagrams for the operating limits.
Option .E39	-	Extended operating range
(only for standard devices)		Operation up to an outside temperature of -10 °C based on water outlet temperatures of \geq 5 °C. Refer to the operating limit diagrams for the operating limits.
Option .E48 or .E49 for SL units	-	Extended operating range For operation with low outside temperatures or low water outlet temperatures. Refer to the operating limit diagrams for the operating limits.
Option .E50 or .E53 for SL units	-	Extended operating range For operation with low outside temperatures and low water outlet temperatures. Refer to the operating limit diagrams for the operating limits.
Option .E81 or .E82 for SL units	-	EC fans Continuously variable EC fans increase the SEER values of the unit.
(except for unit types FGAC4061BG2(.D) and		In order to meet the energy efficiency requirements of EU Directive EU 2016/2281, standard and SL units must be fitted with EC fans as an option in some cases, e.g. in combination with built-in on/off pumps.
FGAC4121BG2(.D))		EC fans are included as standard on HE units and on unit types FGAC4061BG2(.D) and FGAC4121BG2(.D).
On request	-	Variable setpoint temperature using outdoor temperature The setpoint temperature can be controlled in a variable manner depending on the outdoor temperature. In addition, an external temperature sensor is supplied for on-site mounting.
On request	-	Compensation of reactive current for individual compressor motors Individual PFC capacitors are connected in parallel to each compressor motor in order to reduce the idle current to a minimum and to improve the cos-phi of the unit.
		Cannot be combined with soft starters (option .E06).



For units without built-in pumps, one of the four following option numbers must be ordered to define the hardware control of the on-site pump:

Option .E04	-	Relay for actuating an on-site chilled water pump An on/off pump provided on-site is controlled via a floating contact.
Option .E34	-	Relay for actuating two parallel on-site chilled-water pumps Two on-site on/off pumps are controlled via two floating contacts. To increase system availability, the pumps are alternately activated by the controller; if one pump fails, the system automatically switches to the other pump permanently. The pumps must be fitted on-site with non-return valves.
Option .E30	-	0-10 V signal for controlling a customer supplied inverter chilled-water pump A speed-controlled inverter pump provided on-site is controlled by a 0-10 V signal. In addition, there is a floating contact for enabling the pump.
Option .E31	-	0-10 V signal for controlling two parallel inverter chilled-water pumps provided on-site Two on-site speed-regulated inverter pumps are controlled by a common 0-10 V signal. In addition, there are two floating contacts for activating the pumps. To increase system availability, the pumps are alternately activated by the release contact of the controller; if one pump fails, the system automatically switches to the other pump permanently. The pumps must be fitted on-site with non-return valves.

Accessories for controls

Option .E03	-	Operation message of compressor Floating contacts for status indication of each respective compressor.
Option .E22	-	2nd setpoint via on-site normally open contact. External switch-over between two setpoint values set for unit by closing an on-site floating contact. Raising the setpoint, e.g. during night operation, can realize significant savings potential.
		For devices with option .E22, the floating setpoint adjustment by means of a 4-20 mA signal cannot be used.
Option .E23	-	Demand limit / load limitation Reduction of electrical power consumption by deactivating compressors or their speed (demand limit switch) by opening an on-site floating contact. This function is used if a full electrical power supply is not available
Option .E19/E20	-	Second remote control connection for remote monitoring and control Up to 10 units in the same controller family can be connected to an additional remote control Option .E19 for remote controls up to 200 meters away Option .E20 for remote controls up to 500 meters away
Serial card for connection to a building management system or for master/slave control	-	Serial interface board for connecting the unit to a building management system (BMS) The following protocols are used to transmit digital and analog values: – Retrieval of alarm signals – Retrieval of temperature and pressure values provided by the controller – Operating status of individual compressors – Enabling the unit – Setpoint shift
Option .E14	-	Modbus (RS485), Built-in Modbus interface for connection to the building management system or for internal group communication with a sequencer



Option .E15	-	LonWorks®, Built-in LonWorks interface for connection to the building management system or to a sequencer
Option .E16	-	BACnet via IP, Built-in BACnet via IP interface for connection to the building management system or to a sequencer
Option .E17	-	BACnet via MS/TP RS485, Built-in BACnet via MS/TP RS485 interface for connection to the building management system
Option .E18	-	Sequencer without connection to a BMS: Upstream master/slave control. Up to a maximum 5 units of the FläktGroup controller family can be used in a hydraulic circuit and connected to a sequencer. The sequencer is supplied in a separate switch cabinet with two temperature sensors that must be installed in a common water inlet and outlet. Depending on the water inlet temperature, individual capacity steps or units are switched on or off. Every unit needs a serial card of Modbus type (option .E14) in order to communicate with the sequencer and its own chilled-water pump that also must be controlled by the chiller/heat pump.
Option .E24	-	Sequencer with connection to a BMS via Modbus protocol
Option .E25	-	Sequencer with integration to a BMS via LONWORKS® protocol
Option .E27	-	Sequencer with integration to a BMS via BACnet protocol MS/TP RS485



For units with built-in inverter pumps or on-site inverter pump(s), one of the following three option numbers must be ordered to define the software type of pump control:

Option .E84

Option .E85

(only when using

inverter pumps)

Setting constant pump speed

(only when using inverter pumps) on the device controller for pumps with variable speed. The speed is adjusted once during commissioning so that the required water-volume flow passes through the evaporator.

- VPS-D control

In order to exploit further potential energy savings, the speed of the on-site or installed inverter pump(s) is reduced to 50% in part-load mode. As far as possible, the Delta T at the evaporator is kept constant on the water side during part-load mode. VPS-D is intended for systems without system separation, a single-circuit buffer storage tank and a distributor with overflow to the collector. For the consumer circuits, additional on-site pumps with on-site control are required, which are usually designed as pressure-controlled inverter pumps in conjunction with 2-way valves at the consumers. Included in delivery are two separately supplied temperature sensors as well as an extended controller hardware with the required connection points. The temperature sensors must be installed on-site at the water inlet to the manifold and in the overflow pipe in immersion wells with heat-conducting paste. Measurement at the temperature sensors has a higher-ranking influence on the pump speed and always ensures an overflow from the inlet to the outlet.

It should be noted that

- the hydraulic system is designed so that the primary circuit pump(s) can always deliver at least 50% of the water volume. If this value is not reached, the unit will malfunction.
- the overflow line is designed for 50% of the nominal water flow rate
- the flow monitor is calibrated to a value of 35% of the nominal water volume flow. For this purpose, the maximum pipe cross-section in the area of the flow monitor must be observed in order to ensure proper functioning.
 Observe the separate planning instructions and hydraulic diagrams for VPS-D systems.

- VPS-E control

In order to exploit further potential energy savings, the speed of the on-site or installed inverter pump(s) is reduced to 50% in part-load mode. As far as possible, the Delta T at the evaporator is kept constant on the water side during part-load mode. VPS-E is intended for systems with system separation (plate heat exchangers) and a single-circuit buffer tank on the primary side. For the consumer circuits on the secondary side of the system separation (plate heat exchanger), one or more additional on-site pumps with on-site control are required, which are usually designed as pressure-controlled inverter pumps in conjunction with 2-way valves at the consumers. Alternatively, the system can be used for single circuit systems with single-circuit buffer and a single consumer with 3-way valve. A corresponding software for the function is included in the scope of delivery.

It should be noted that

- the hydraulic system is designed so that the primary circuit pump(s) can always deliver at least 50% of the water volume. If this value is not reached, the unit will malfunction.
- the flow monitor is calibrated to a value of 35% of the nominal water volume flow. For this purpose, the maximum pipe cross-section in the area of the flow monitor must be observed in order to ensure proper functioning.

Observe the separate planning instructions and hydraulic diagrams for VPS-E systems.

Option .E86

. (only when using

inverter pumps)



Other accessories

Option .001	Packaging in timber crate and nylon foil The unit is supplied for shipping in a timber crate and is additionally shrink- wrapped in nylon foil to protect it from the weather and dirt.
Option .011	Packing of the unit with nylon cover The unit is shrink-wrapped in nylon foil for shipping and storage to protect it from weather and dirt.
Option .027 -	Refrigerant leak detection (Alarm) The compressor section is monitored for leaking refrigerant. A detected refrigerant leak is signalled by a fault message from the device controller.
Option .028 -	Refrigerant leak detection (compressor switch off) The compressor section is monitored for leaking refrigerant. In the event of refrigerant leakage, the compressor is switched off and an alarm signal is triggered by the controller.
Option .030 or .032 for SL devices or .024 for HE devices	Reinforced thermal insulation for the water-side heat exchanger To prevent condensation for units that are operated at outside temperatures below -10 °C.

Operating limits

On the water side, the operating limits according to table 1The air and water side must comply with the limits of the selected options as shown in Figure 7. The indicated limits change when used with or without glycol in the range of approx. +/- 2 K. The exact operating limits are output in the design program.

If operation at ambient temperatures below -10 $^{\circ}$ C is required, the unit must be installed sheltered from the wind (speeds < 0.5 m/s).

Tab. 1: Operating limits water (glycol) circuit

		Min	Мах
Water inlet (cooling)	[°C]	-7 or -5 for .D/.SD/.HD devices	23
Water outlet (cooling)	[°C]	-10 or -8 for .D/.SD/.HD devices	15
dT (for water outlet >5 °C) (cooling)	[K]	4	8
dT (for water outlet ≤5 °C) (cooling)	[K]	3	5
Water-inlet desuperheater (.D/.SD/.HD units)	[°C]	30	55
Water-outlet desuperheater (.D/.SD/.HD units)	[°C]	35	60
Glycol concentration	[%]		50

Chiller with refrigerant R-454B FGAC 4061-4121 BG2



 $t_{Water, outlet}$ Fig. 3: Standard operating limits for standard units 4071-4111; operation up to + 5 °C outdoor temperature at chilled water outlet temperatures \geq 5 °C (option .E37)



Fig. 5: Extended operating limits for standard units 4071-4111 (option .E48), or SL units (option .E49); diagram applies to devices with desuperheater. Units without desuperheater can be operated down to -10 °C water outlet temperature.



twater, outlet

Fig. 7: Standard operating limits for HE units and unit types FGAC4061BG2(.D) and FGAC4121BG2(.D) or extended operating limits for standard units with EC fan (option .E81), or SL units with EC fan (option .49); diagram applies to units with desuperheater. Units without desuperheater can be operated down to -10 °C water outlet temperature.



 $t_{\rm Water, \ outlet}$ Fig. 4: Standard operating limits for SL units (option .E38), as well as extended operating limits for standard units 4071-4111 (option .E39); diagram applies to devices with desuperheater. Units without desuperheater can be operated down to -10 °C water outlet temperature.



Fig. 6: Extended operating limits for standard units 4071-4111 (option .E50), or SL units (option .E53); diagram applies to units with desuperheater. Units without desuperheater can be operated down to -10 °C water outlet temperature.





Notices

For operational reasons, water at evaporator outlet temperatures below 5 °C must be protected from freezing by adding glycol. FläktGroup recommends the use of at least 30% ethylene glycol.

The unit must be protected from freezing at ambient temperatures lower than 5 °C. Frost protection heating for the water-side heat exchanger is provided as standard for this purpose. The frost protection heaters are designed for outdoor temperatures down to -10 °C. In installation locations where colder outdoor temperatures may occur, the unit must be configured with glycol.

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General Data

Tab. 2: General data for standard units with 4 compressors

Device type FGAC ### BG2		4061	4071	4081	4091	4101	4111	4121	
Performance data (catalog	g) - ⁵⁾								
Cooling capacity 1)	Qe	[kW]	158.1	186.3	209.1	238.2	277.6	296	313.6
Power consumption 2)	Р	[kW]	53.6	62.6	73.9	83	92.9	101.7	108.9
EER			2.95	2.98	2.83	2.87	2.99	2.91	2.88
Chilled water flow rate	Ve	[m³/h]	27.2	32.1	36.0	41.0	47.8	51.0	54.0
Chilled water pressure drop	∆ре	[kPa]	41.5	43.4	44	46.4	50.5	43.1	48.4
ERP conformity									
SEER (EU 2016/2281) 2)			4.22	4.25	4.15	4.29	4.2	4.19	4.23
η _S (EU 2016/2281) ²⁾		[%]	166	167	163	168	165	164	166
ERP-compliant 2021			Ø	Ø	Ø	Ø	Ø	Ø	Ø
Use			Comfort	Comfort	Comfort	Comfort	Comfort	Comfort	Comfort
Performance values acco	rding to	EN14511-3:	2011						
Cooling capacity 1)	Qe	[kW]	157.8	186	208.7	237.9	277.2	295.7	313.2
EER			2.91	2.93	2.79	2.83	2.95	2.88	2.84
Controls				Fläkt	Group controller	with TA software	and compact di	splay	
Fans									
Number of fans		n	4	4	4	4	6	6	6
Total air volume flow		[m³/h]	86292	83880	83880	81828	125820	125820	125820
Compressors					Sc	roll compresso	rs		
Number of compressors			4	4	4	4	4	4	4
Number of refrigeration circuits			2	2	2	2	2	2	2
Minimum part-load speed [9		[%]	25	25	25	25	25	25	25
Evaporator (chilled-water	side)								
Min. water mass flow	V _{e,min}	[m³/h]	4.667	5.5	6.139	7.056	8.25	8.778	9.306
Max. water mass flow	V _{e,max}	[m³/h]	13.17	15.5	17.22	17.22	19.11	19.11	19.11
Max. operating pressure	p _{max}	[bar]	10	10	10	10	10	10	10
Minimum chilled water system content		[1]	412	485	539	621	723	771	817
Water charge of heat excha	inger	[1]	8.6	10.5	12.3	15.1	18.9	23	23
Evaporator connection	VICT	AULIC ²⁾	3"	3"	3"	3"	3"	4"	4"
Refrigeration circuit charge	ge								
Refrigerant R-454B 3,7) (GW	P 466)	[kg]	16.7	18.5	24.1	24.2	27.4	31.7	31.8
Oil charge		[kg]	10.8	10.8	10.8	16	21.2	21.2	21.2
Connectable cable cross-	sections	6)							
Rectangular	Max	[mm]	20 x 5	20 x 5	20 x 5	20 x 5	2x25x5	2x25x5	2x25x5
Round	Max	[mm ²]	120	120	120	120	240	240	240
Dimensions and weight									
A (length)		[mm]	3160	3160	3160	3160	4335	4335	4335
B (width)		[mm]	2250	2250	2250	2250	2250	2250	2250
H (height)		[mm]	2170	2170	2170	2170	2170	2170	2170
Weight ^{4.7)}		[kg]	1540	1560	1570	1740	2210	2240	2250

Performance data for input parameters: chilled water temperatures (inlet/outlet) 12/7 °C; outside-air temperature 35 °C; values partially rounded off Applies to units in standard configuration without pumps For exact refrigerant charge volume, refer to the unit name plate Related to the entire unit (without pump, without buffer tank) Data apply to input parameters as described under 1) and without glycol; required when using glycol conversion Please observe the regionally applicable safety regulations and constructional conditions relevant to the dimensioning of the inlet. Applies to units without option .R29 and with microchannel heat exchanger

1) 2) 3) 4) 5) 6) 7)

Chiller with refrigerant R-454B FGAC 4061-4121 BG2

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Tab. 3: General data for SL units with 4 compressors

Device type FGAC #### BG2.SL		4061	4071	4081	4091	4101	4111	4121	
Performance data (catalo	g) - ⁵⁾								
Cooling capacity 1)	Qe	[kW]	152.6	172.7	205.7	231.6	253.4	284.2	299.7
Power consumption ²⁾	Р	[kW]	52.6	66.0	72.7	83.5	96.8	102.0	111.8
EER			2.90	2.62	2.83	2.77	2.62	2.79	2.68
Chilled water flow rate	Ve	[m³/h]	26.3	29.7	35.4	39.9	43.6	48.9	51.6
Chilled water pressure drop	∆ре	[kPa]	38.6	37.3	42.6	43.9	42.1	39.7	44.2
ERP conformity									
SEER (EU 2016/2281) 2)			4.1	4.21	4.21	4.26	4.16	4.19	4.1
ηs (EU 2016/2281) ²⁾		[%]	161	166	166	167	163	165	161
ERP-compliant 2021			V	Ø	Ø	Ø	Ø	Ø	V
Use			Comfort	Comfort	Comfort	Comfort	Comfort	Comfort	Comfort
Performance values acco	rding to	EN14511-3:	2011						
Cooling capacity 1)	Qe	[kW]	152.2	172.4	205.4	231.3	253.1	283.9	299.4
EER			2.86	2.58	2.79	2.74	2.59	2.76	2.65
Controls				Fläkt	Group controller	with TA software	and compact di	splay	
Fans						Axial fans			
Number of fans		n	4	4	6	6	6	8	8
Total air volume flow		[m³/h]	47412	47412	73080	71136	71136	97416	97416
Compressors					So	roll compresso	rs		
Number of compressors			4	4	4	4	4	4	4
Number of refrigeration circuits			2	2	2	2	2	2	2
Minimum part-load speed		[%]	25	25	25	25	25	25	25
Evaporator (chilled-water	side)								
Min. water mass flow	$V_{e,min}$	[m³/h]	4.667	5.5	6.139	7.056	8.25	8.778	9.306
Max. water mass flow	V _{e,max}	[m³/h]	13.17	15.5	17.22	17.22	19.11	19.11	19.11
Max. operating pressure	p _{max}	[bar]	10	10	10	10	10	10	10
Minimum chilled water syst content	em	[1]	412	485	539	621	723	771	817
Water charge of heat excha	anger	[1]	8.6	10.5	12.3	15.1	18.9	23	23
Evaporator connection	VICT	AULIC ²⁾	3"	3"	3"	3"	3"	4"	4"
Refrigeration circuit char	ge								
Refrigerant R-454B 3,7) (GW	/P 466)	[kg]	15.5	19.1	25.7	27.3	27.4	36.3	36.4
Oil charge		[kg]	10.8	10.8	10.8	16	21.2	21.2	21.2
Connectable cable cross-	sections	6)							
Rectangular	Max	[mm]	20 x 5	20 x 5	20 x 5	20 x 5	2x25x5	2x25x5	2x25x5
Round	Max	[mm²]	120	120	120	120	240	240	240
Dimensions and weight									
A (length)		[mm]	3160	3160	4335	4335	4335	5510	5510
B (width)		[mm]	2250	2250	2250	2250	2250	2250	2250
H (height)		[mm]	2170	2170	2170	2170	2170	2170	2170
Weight 4.7)		[kg]	1590	1610	1910	2080	2260	2640	2650

Performance data for input parameters: chilled water temperatures (inlet/outlet) 12/7 °C; outside-air temperature 35 °C; values partially rounded off Applies to units in standard configuration without pumps For exact refrigerant charge volume, refer to the unit name plate Related to the entire unit (without pump, without buffer tank) Data apply to input parameters as described under 1) and without glycol; required when using glycol conversion Please observe the regionally applicable safety regulations and constructional conditions relevant to the dimensioning of the supply line. Applies to units without option .R29 and with microchannel heat exchanger

1) 2) 3) 4) 5) 6) 7)

FläktGroup[®]

Tab. 4: General data for HE units with 4 compressors

Device type FGAC #### BG2.HE		4061	4071	4081	4091	4101	4111	4121	
Performance data (catalog)	- ⁵⁾								
Cooling capacity 1)	Qe	[kW]	167.1	197.0	226.0	255.8	289.8	316.8	337.9
Power consumption 2)	Р	[kW]	49.9	59.5	66.8	77.3	88.1	94.3	102.0
EER - Energy Efficiency			2.25	2 21	2.29	2 21	2 20	2.26	2 21
Ratio			5.55	3.31	5.50	5.51	5.29	5.50	5.51
Chilled water flow rate	Ve	[m³/h]	28.8	33.9	38.9	44.0	49.9	54.5	58.2
Chilled water pressure drop	∆ре	[kPa]	24	33.4	54.8	48.3	33.6	40.2	45.7
ERP conformity									
SEER (EU 2016/2281) 2)			4.44	4.54	4.63	4.68	4.65	4.6	4.54
η _s (EU 2016/2281) ²⁾		[%]	175	178	182	184	183	181	179
ERP-compliant 2021					Ø	V	V	Ø	Ø
Use			Comfort	Comfort	Comfort	Comfort	Comfort	Comfort	Comfort
Performance values accord	ding to I	EN14511-3:	:2011						
Cooling capacity 1)	Qe	[kW]	166.9	196.7	225.6	255.4	289.5	316.4	337.5
EER			3.31	3.27	3.32	3.26	3.25	3.32	3.27
Controls				Fläkt	Group controller	with TA software	and compact di	splay	
Fans	Fans Axial fans								
Number of fans		n	4	6	6	6	6	8	8
Total air volume flow [m ³ /h]		[m³/h]	81828	125820	122724	122724	122724	163620	163620
Compressors					Sc	roll compresso	rs		
Number of compressors			4	4	4	4	4	4	4
Number of refrigeration circui	its		2	2	2	2	2	2	2
Minimum part-load speed [%]		[%]	25	25	25	25	25	25	25
Evaporator (chilled-water s	ide)								
Min. water mass flow	V _{e,min}	[m³/h]	4.944	5.806	6.611	7.556	8.472	9.333	10.03
Max. water mass flow	V _{e,max}	[m³/h]	13.92	16.19	16.33	18.94	23.75	25.78	25.78
Max. operating pressure	p _{max}	[bar]	10	10	10	10	10	10	10
Minimum chilled water system content	n	[1]	435	513	589	666	755	825	880
Water charge of heat exchan	iger	[1]	41.4	41.4	35.8	39.6	86	86	86
Evaporator connection	VICT	AULIC ²⁾	3"	3"	3"	3"	3"	4"	4"
Refrigeration circuit charge	e								
Refrigerant R-454B 3,7) (GWP	9 466)	[kg]	21.9	27.9	33.1	35.7	35.8	40.1	41.5
Oil charge		[kg]	10.8	10.8	10.8	16	21.2	21.2	21.2
Connectable cable cross-se	ections	6)							
Rectangular	Max	[mm]	20 x 5	20 x 5	20 x 5	20 x 5	2x25x5	2x25x5	2x25x5
Round	Max	[mm²]	120	120	120	120	240	240	240
Dimensions and weight									
A (length)		[mm]	3160	4335	4335	4335	4335	5510	5510
B (width)		[mm]	2250	2250	2250	2250	2250	2250	2250
H (height)		[mm]	2170	2170	2170	2170	2170	2170	2170
H (neight) [mm] 2170 2170 2170 2170 2170 2170 2170 2170									

2) 3) 4) 5) 6) 7)

Performance data for input parameters: chilled water temperatures (inlet/outlet) 12/7 °C; outside-air temperature 35 °C; values partially re Applies to units in standard configuration without pumps For exact refrigerant charge volume, refer to the unit name plate Related to the entire unit (without pump, without buffer tank) Data apply to input parameters as described under 1) and without glycol; required when using glycol conversion Please observe the regionally applicable safety regulations and constructional conditions relevant to the dimensioning of the supply line. Applies to units without option .R28 and with microchannel heat exchanger



Noise levels

Tab. 5: Noise level

	Total so	und level	Octave band [Hz]							
					:	Sound pow	er level [dB]		
Unit type FGAC	Sound power [dB(A)] ¹⁾	Sound pressure level [dB(A)] 10 m ²⁾	63	125	250	500	1000	2000	4000	8000
			Stand	dard units						
4061BG2 (.D)	92	60	96	94	93	90	87	82	77	72
4071BG2 (.D)	92	60	96	94	93	90	87	82	77	72
4081BG2 (.D)	93	61	97	95	94	91	88	83	78	73
4091BG2 (.D)	94	62	98	96	95	92	89	84	79	74
4101BG2 (.D)	95	63	99	97	96	93	90	85	80	75
4111BG2 (.D)	95	63	99	97	96	93	90	85	80	75
4121BG2 (.D)	95	63	99	97	96	93	90	85	80	75
SL units (super low noise units)								-		
4061BG2.SL/SD	82	50	85	83	82	81	76	71	67	62
4071BG2.SL/SD	83	51	86	84	83	82	77	72	68	63
4081BG2.SL/SD	83	51	86	84	83	82	77	72	68	63
4091BG2.SL/SD	84	52	87	85	84	83	78	73	69	64
4101BG2.SL/SD	84	52	87	85	84	83	78	73	69	64
4111BG2.SL/SD	86	54	89	87	86	85	80	75	71	66
4121BG2.SL/SD	86	54	89	87	86	85	80	75	71	66
		Н	IE units (hig	gh efficient	units)					
4061BG2.HE/HD	92	60	96	94	93	90	87	82	77	72
4071BG2.HE/HD	93	61	97	95	94	91	88	83	78	73
4081BG2.HE/HD	94	62	98	96	95	92	89	84	79	74
4091BG2.HE/HD	95	63	99	97	96	93	90	85	80	75
4101BG2.HE/HD	95	63	99	97	96	93	90	85	80	75
4111BG2.HE/HD	96	64	100	98	97	94	91	86	81	76
4121BG2.HE/HD	97	65	101	99	98	95	92	87	82	77

Data on operating conditions Data applies only to water inlet and discharge temperatures of 12 °C/ 7 C° and outside-air temperatures of 35 °C.

1) Specification of sound power (EUROVENT certified value)

The manufacture determines the sound power value for Eurovent-certified units in accordance with ISO 9614 standard. This certification expressly refers to sound power in dB(A), which thus constitutes obligatory data in this case.

2) Specification of sound pressure level

The sound pressure level is determined according to enveloping surface method with a reflecting plane (Q = 2). The distance of

10 m refers to the external dimensions of the unit. For sound pressure level the following corrections can be used:

Sound pressure level at 5 m: +5 dB as compared to sound pressure level at 10 meters distance Sound pressure level at 15 m: -3 dB as compared to sound pressure level at 10 meters distance Sound pressure level at 20 m: -6 dB as compared to sound pressure level at 10 meters distance Only an externally engaged acoustics engineer should carry out specific sound level calculations to be valid for your installation site.



R3

1500

R4

1500

Footprint



Fig. 9: Required clearances (example)

Anti-vibration mounts

Tab. 7: Required vibration dampers depending on the unit version (applies only to units with microchannel condenser)

Tab. 6: Clearances

4061-4121

CLEARANCE FOR AIR SUPPLY!

depicted maintenance clearance by many times.

[mm]

Unit must be able to freely discharge air upwards. Air short-circuiting must be impossible! The necessary clearances near and over the unit may exceed the

R1

1500

R2

2300

	Spring	vibration damper (Opt	ion .l01)	Rubber anti-vibration isolators (option .102)						
	FläktGr	oup individual part des	ignation	FläktGroup individual part designation						
Unit type FGAC	Units without pump(s)	Units with pump(s) and without buffer tank	Units with pump(s) and with buffer tank	Units without pump(s)	Units with pump(s) and without buffer tank	Units with pump(s) and with buffer tank				
			Standard units			-				
4061BG2 (.D)	2x SR21-800 + 4x SR21-550H	2x SR21-800+ 4x SR21-550H	4x SR21-550H + 2x SR21-800	6 x FZ-200-57	6 x FZ-400-51	6 x FZ-400-51				
4071BG2 (.D)	2x SR21-800 + 4x SR21-550H	6x SR21-550H	4x SR21-550H + 2x SR21-800	6 x FZ-200-57	6 x FZ-400-51	6 x FZ-400-51				
4081BG2 (.D)	2x SR21-800 + 4x SR21-550H	6x SR21-550H	4x SR21-550H + 2x SR21-800	6 x FZ-200-57	6 x FZ-400-51	6 x FZ-400-51				
4091BG2 (.D)	2x SR21-800 + 4x SR21-550H	6x SR21-550H	4x SR21-550H + 2x SR21-800	6 x FZ-400-51	6 x FZ-400-51	6 x FZ-400-51				
4101BG2 (.D)	2x SR21-800 + 4x SR21-550H	2x SR21-800 + 4x SR21-550H	6x SR21-800	6 x FZ-400-51	6 x FZ-400-51	6 x FZ-400-51				
4111BG2 (.D)	2x SR21-800 + 4x SR21-550H	2x SR21-800 + 4x SR21-550H	6x SR21-800	6 x FZ-400-51	6 x FZ-400-51	6 x FZ-400-57				
4121BG2 (.D)	2x SR21-800 + 4x SR21-550H	2x SR21-800 + 4x SR21-550H	6x SR21-800	6 x FZ-400-51	6 x FZ-400-51	6 x FZ-400-57				
	SL units (super low noise units)									
4061BG2.SL/SD	2x SR21-800 + 4x SR21-550H	2x SR21-800 + 4x SR21-550H	4x SR21-550H + 2x SR21-800	6 x FZ-200-57	6 x FZ-400-51	6 x FZ-400-51				
4071BG2.SL/SD	2x SR21-800 + 4x SR21-550H	6x SR21-550H	4x SR21-550H + 2x SR21-800	6 x FZ-200-57	6 x FZ-400-51	6 x FZ-400-51				
4081BG2.SL/SD	2x SR21-800 + 4x SR21-550H	2x SR21-800 + 4x SR21-550H	6x SR21-800	6 x FZ-400-51	6 x FZ-400-51	6 x FZ-400-51				
4091BG2.SL/SD	2x SR21-800 + 4x SR21-550H	2x SR21-800 + 4x SR21-550H	6x SR21-800	6 x FZ-400-51	6 x FZ-400-51	6 x FZ-400-51				
4101BG2.SL/SD	2x SR21-800 + 4x SR21-550H	2x SR21-800 + 4x SR21-550H	6x SR21-800	6 x FZ-400-51	6 x FZ-400-51	6 x FZ-400-57				
4111BG2.SL/SD	2x SR21-1200 + 6x SR21-550H	2x SR21-1200 + 6x SR21-550H	2x SR21-1200 + 6x SR21-550H	8 x FZ-400-51	8 x FZ-400-51	8 x FZ-400-57				
4121BG2.SL/SD	2x SR21-1200 + 6x SR21-550H	2x SR21-1200 + 6x SR21-550H	2x SR21-1200 + 6x SR21-550H	8 x FZ-400-51	8 x FZ-400-51	8 x FZ-400-57				
		HE u	nits (high efficient units)						
4061BG2.HE/HD	2x SR21-800 + 4x SR21-550H	6x SR21-550H	4x SR21-550H + 2x SR21-800	6 x FZ-400-51	6 x FZ-400-51	6 x FZ-400-51				
4071BG2.HE/HD	2x SR21-800 + 4x SR21-550H	2x SR21-800 + 4x SR21-550H	6x SR21-800	6 x FZ-400-51	6 x FZ-400-51	6 x FZ-400-51				
4081BG2.HE/HD	2x SR21-800 + 4x SR21-550H	2x SR21-800 + 4x SR21-550H	6x SR21-800	6 x FZ-400-51	6 x FZ-400-51	6 x FZ-400-51				
4091BG2.HE/HD	2x SR21-800 + 4x SR21-550H	2x SR21-800 + 4x SR21-550H	6x SR21-800	6 x FZ-400-51	6 x FZ-400-51	6 x FZ-400-51				
4101BG2.HE/HD	2x SR21-800 + 4x SR21-550H	2x SR21-800 + 4x SR21-550H	6x SR21-800	6 x FZ-400-51	6 x FZ-400-51	6 x FZ-400-51				
4111BG2.HE/HD	2x SR21-1200 + 6x SR21-550H	2x SR21-1200 + 6x SR21-550H	2x SR21-1200 + 6x SR21-550H	8 x FZ-400-51	8 x FZ-400-51	8 x FZ-400-57				
4121BG2.HE/HD	2x SR21-1200 + 6x SR21-550H	2x SR21-1200 + 6x SR21-550H	2x SR21-1200 + 6x SR21-550H	8 x FZ-400-51	8 x FZ-400-51	8 x FZ-400-57				

NOTICE!

If the units are operated without the appropriate anti-vibration mounts, the warranty is void!



Electrical data

Tab. 8: Electrical data

Unit type				Compressors		Fa	ns ³⁾		Tota	1) 2) 3)	
FGAC	Voltage supply	n	F.L.I. [kw]	F.L.A. [A]	L.R.A. [A]	F.L.I. [kw]	F.L.A [A]	F.L.I. [kw]	F.L.A. [A]	S.A.	S.A. With Soft
				Standard	units		-				
4061BG2 (.D)	400/3/50	4	4x15.36	4x24.9	4x172	6.8	12	69	116	263	190
4071BG2 (.D)	400/3/50	4	2x15.36+2x21.4	2x24.9+2x34.2	2x172+2x211	8	16	82	135	311	227
4081BG2 (.D)	400/3/50	4	4x21.4	4x34.2	4x211	8	16	94	153	330	245
4091BG2 (.D)	400/3/50	4	2x21.4+2x27	2x34.2+2x42.5	2x211+2x210	8	16	105	170	338	253
4101BG2 (.D)	400/3/50	4	4x27	4x42.5	4x210	12	24	120	195	362	278
4111BG2 (.D)	400/3/50	4	2x27+2x34.5	2x42.5+2x55.1	2x210+2x326	12	24	135	220	491	360
4121BG2 (.D)	400/3/50	4	4x34.5	4x55.1	4x326	10.2	18	150	245	516	379
				Standard units + EC f	ans (Option .E81)		-				
4071BG2 (.D)	400/3/50	4	2x15,36+2x21,4	2x24,9+2x34,2	2x172+2x211	6,8	12	82	135	311	227
4081BG2 (.D)	400/3/50	4	4x21,4	4x34,2	4x211	6,8	12	94	153	330	245
4091BG2 (.D)	400/3/50	4	2x21,4+2x27	2x34,2+2x42,5	2x211+2x210	6,8	12	105	170	338	253
4101BG2 (.D)	400/3/50	4	4x27	4x42,5	4x210	10,2	18	120	195	362	278
4111BG2 (.D)	400/3/50	4	2x27+2x34,5	2x42,5+2x55,1	2x210+2x326	10,2	18	135	220	491	360
	<u> </u>			SL units (super lo	w noise units)	- 	-	-	_		
4061BG2.SL/SD	400/3/50	4	4x15.36	4x24.9	4x172	4.8	16	66	116	263	194
4071BG2.SL/SD	400/3/50	4	2x15.36+2x21.4	2x24.9+2x34.2	2x172+2x211	4.8	16	78	135	311	227
4081BG2.SL/SD	400/3/50	4	4x21.4	4x34.2	4x211	7.2	24	93	161	338	253
4091BG2.SL/SD	400/3/50	4	2x21.4+2x27	2x34.2+2x42.5	2x211+2x210	7.2	24	104	178	347	261
4101BG2.SL/SD	400/3/50	4	4x27	4x42.5	4x210	7.2	24	115	195	362	278
4111BG2.SL/SD	400/3/50	4	2x27+2x34.5	2x42.5+2x55.1	2x210+2x326	9.6	32	133	228	499	368
4121BG2.SL/SD	400/3/50	4	4x34.5	4x55.1	4x326	9.6	32	148	253	524	393
SL units (super low noise units) + EC fan (Option .E82)											
4061BG2.SL/SD	400/3/50	4	4x15,36	4x24,9	4x172	6,8	12	66	116	263	194
4071BG2.SL/SD	400/3/50	4	2x15,36+2x21,4	2x24,9+2x34,2	2x172+2x211	6,8	12	78	135	311	227
4081BG2.SL/SD	400/3/50	4	4x21,4	4x34,2	4x211	10,2	18	93	161	338	253
4091BG2.SL/SD	400/3/50	4	2x21,4+2x27	2x34,2+2x42,5	2x211+2x210	10,2	18	104	178	347	261
4101BG2.SL/SD	400/3/50	4	4x27	4x42,5	4x210	10,2	18	115	195	362	278
4111BG2.SL/SD	400/3/50	4	2x27+2x34,5	2x42,5+2x55,1	2x210+2x326	13,6	24	133	228	499	368
4121BG2.SL/SD	400/3/50	4	4x34,5	4x55,1	4x326	13,6	24	148	253	524	393
				HE units (high ef	fficient units)						
4061BG2.HE/HD	400/3/50	4	4x15.36	4x24.9	4x172	3.72	8	67	113	261	186
4071BG2.HE/HD	400/3/50	4	2x15.36+2x21.4	2x24.9+2x34.2	2x172+2x211	5.58	12	79	132	309	223
4081BG2.HE/HD	400/3/50	4	4x21.4	4x34.2	4x211	5.58	12	93	155	332	241
4091BG2.HE/HD	400/3/50	4	2x21.4+2x27	2x34.2+2x42.5	2x211+2x210	5.58	12	104	172	340	249
4101BG2.HE/HD	400/3/50	4	4x27	4x42.5	4x210	5.58	12	115	188	356	266
4111BG2.HE/HD	400/3/50	4	2x27+2x34.5	2x42.5+2x55.1	2x210+2x326	7.44	16	130	214	485	352
4121BG2.HE/HD	400/3/50	4	4x34.5	4x55.1	4x326	7.44	16	145	239	510	377

All values refer to units without built-in pumps. For units with built-in pumps, the pump data must be added.

Number of compressors EI. FULL LOAD INPUT n F.L.I.

F.L.A. L.R.A. Operating current

Starting current of each compressor Starting current of entire unit S.A.

Please observe the regionally applicable safety regulations and constructional conditions relevant to the dimensioning of the supply line. Please observe the regionally applicable standards for cable cross-sections and backup fuses. Voltage tolerance: max. 10%, 1) 2) voltage imbalance

between phases: max. 3%.

3) Values are based on the total number of fans operating at maximum speed.



Terminal scheme



Fig. 10: Terminal scheme

Order-related documentation

NOTICE!

For detailed planning, please only use the order-related documentation. Detailed dimensional drawings can be obtained on request from your responsible FläktGroup sales office. Specifications and technical data are subject to regular updates. The manufacturer reserves the right to make necessary changes to information without prior written notice.





FläktGroup



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