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Fig. 1: Unit view (example version)

Type code

	FG	A	C	1	005	C	D	4
	FläktGroup	Condensing	Operating mode	Number of Compressors	Capacity stage	Serie	Refrigerant	Supply voltage
FG	FläktGroup Series							
A	Air cooled (outdoor installation)							
C	Chiller							
1	1 scroll compressor with inverter							
005-009	Units with connection type 4 (230 V / 1 / 50 Hz / N / PE): 005, 006, 007, 008, 009							
008-014	Units with connection type 1 (400 V / 3 / 50 Hz / N / PE): 008, 009, 010, 011, 012, 013, 014							
C	Unit series C							
D	Refrigerant R410A							
4	230 V / 1~ / 50Hz / N / PE							
1	400 V / 3~ / 50Hz / N / PE							

Fig. 2: Explanation of unit type code

Unit description

FläktGroup chiller with inverter scroll compressor

- Air-cooled for outdoor installation
- *) Units with built-in pump ErP 2021 compliant; units without pump ErP 2018 compliant; comfort cooling applications
- High energy efficiency at full and part-load mode
- Refrigerants R-410A
- Capacity range approx. 4 kW to 35 kW cooling capacity in 10 unit sizes
- Built-in pump optionally available, highly efficient, speed- or pressure-controlled
- Substructure buffer storage optionally possible (for water-glycol mixture)
- 1 refrigerant circuit
- 1 Fully hermetic scroll compressor with separate inverter
- Control range 25 to 100%
- Electronic expansion valve
- Cu/Al heat exchanger as condenser with horizontal air flow
- Optional with epoxy polymer coating (Option .I18)
- Standard delivery with protection grille
- Plate heat exchanger as evaporator, including frost-protection heating
- Direct-drive axial fans, 6-pole with contact protection against intrusion (IP54 protection)
- Fan speed control with transformer, which provides the fans with different voltages depending on the high pressure
- Water outlet temperature from -8 °C to +18 °C
- Air-inlet temperature from -10 °C to + 45 °C (for details see operating limits diagram)
- Power supply 230 V / 1 / 50 Hz / N / PE or 400V / 3 / 50 Hz / N / PE depending on model size available
- Numbered connecting terminals
- Automatic circuit breaker for the compressor circuit
- Pump relay for controlling an on-site chilled water pump
- FläktGroup controller, integrated mini control panel with dot matrix display and membrane keyboard
- Control of the water outlet temperature as a constant set point or as a ramp function depending on the outdoor temperature measured at the unit.
- For the electrical connections of the 400 V units (type FGAC 1008-1014 CD1), be sure to observe the correct phase sequence L1-L2-L3 (right rotating field)! Failure to observe this warning may result in damage to the unit!
- Flow switch installed inside the unit
- Safety valve 6 bar installed inside the unit. Opening prepared for blow-off line to be provided on site at the unit casing. Particularly when glycol is used, the regional regulations regarding a receptacle must be observed!
- Ventilation valve inside the unit casing
- Water filter DN25 (1" internal thread) or DN32 (1" internal thread) is part of the scope of delivery of the basic unit (supplied separately) and must be installed on site immediately before the unit inlet. *When planning, consider the pressure losses of the water filter! See separate data sheet.*
- Built-in expansion tank, prefilled to 1 bar, volume 2 L (units FGAC1005-1010), 5 L (units FGAC1011-1012), or 8 L (units FGAC1013-1014) (applies only to units with integrated pump)
- On site, pipe expansion joints must be installed to decouple vibrations, noise transmission and longitudinal expansion.
- All units of the FGAC 1005-1014 CD 4/1 series are Eurovent-certified.

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.

Options and accessories

Accessories for controls

Serial card for connection to a building management system or for master/slave control

- **Unit information can be called up via the Internet and LAN**
- **Unit connection to the building management system (BMS) using a serial card.**

The following protocols are used to transmit digital and analog values:
- Readout of general error message
- Retrieval of temperature and pressure values provided by the controller
- Enabling the unit
- Defining the chilled water set-point (outlet temperature)

Option .E14

- **Modbus (RS485),**

Modbus interface for connection to the building management system (delivered separately).

Option FGZAHCASCADE

- **Cascade control unit:**

Master/ slave control. Up to max. 4 identical devices of the same size (with the same firmware) can be used in a hydraulic circuit and connected to the cascade management. The cascade manager consists of a compact display that must be installed on site in an external control cabinet door. In addition, the option FGZAHPROBE must be ordered. This is a temperature sensor to be located in the common buffer, e.g. in the buffer tank FGHM100 or FGHM200. Depending on the difference between the setpoint and the common water outlet temperature, the individual devices are switched on or off. Each device requires its own built-in or on-site chilled water pump, which must also be controlled by the chiller.

Option FGZAHPROBE

- **Temperature sensor for cascade control unit**

Temperature sensor to be installed in the common buffer tank, e.g. buffer tank FGHM100 or FGHM200. The temperature sensor must be connected to the controller of the master unit.

Installation of accessories

Option .I02

- **Rubber isolator**

Anti-vibration isolators with rubber elements to minimize vibration transmission (supplied separately).
The on-site installation of suitable anti-vibration mounts is a prerequisite for warranty claims!

Option .I18

- **Corrosion-resistant coating for fins of Cu/Al heat exchanger.**

100% epoxy polymer coating for the entire air-cooled microchannel heat exchanger to protect against corrosion, UV radiation, and for increased weather resistance in moderate aggressive air pollution and for use in moderate salty air near the coast.

Option .I45

Piping connection kit for FGHM30/ FGHM60

Hydraulic connection between unit and buffer tank. A flexible, insulated pipe is supplied separately for on-site installation.

Mechanics accessories

Option FGHM30 or FGHM60

(except for unit size 1014)

- **Buffer tank 30 or 60 L (outdoor installation)**

Buffer tank for outdoor installation directly under the basic unit. Single-circuit buffer to ensure the minimum system content. Due to the risk of frost, the media circuit or the primary circuit with water-glycol mixture must be planned. Option I.45 must also be ordered for connection to the basic unit. Volume 30 liters (FGAC1005-1010 units) or 60 L (FGAC1011-1013 units).
See separate document "Planning aid FGAC1005-1014CD4/1" for the hydraulic components to be used!

Option FGHM100/ FGHM200

Buffer tank 100 L or 180 L (indoor installation)
The tank can be used for 1-circuit or 2-circuit systems.
Four pipework connections 1 ¼". When used as a 1-circuit buffer, 2 connections must be sealed by the customer with plugs. Two ½" connections for drain and air vent valves to be installed on site. Material steel welded with corrosion protection coating, closed-porous insulation, 50 mm.
See separate document "Planning aid FGAC1005-1014CD4/1" for the hydraulic components to be used!

Option FGHM35

Hydraulic separator 40 L (wall mounting, inside)
For hydraulic decoupling of primary circuit and secondary circuit in 2-circuit systems. Four connections 1 ". Connections for draining and air venting valves to be installed on site available. Material steel welded with corrosion protection coating, with insulation, 30 mm.
See separate document "Planning aid FGAC1005-1014CD4/1" for the hydraulic components to be used!

Pumps

Built-in chilled-water pump
High-efficiency pump Wilo, electronically controlled, glandless
See separate document "Planning aid FGAC1005-1014CD4/1" for the hydraulic components to be used!
Refer to separate pump data information sheet!

Operating limits

On the water side, the operating limits according to Table 1, and on the air and water side, the limits of the selected options according to the following operating limit chart must be observed.

Table 1: Operating limits of water (glycol) circuit

		Min	Max
Water inlet	[°C]	-5	26
Water outlet	[°C]	-8	18
dT (at water outlet > 5 °C)	[K]	4	8
dT (at water outlet ≤ 5 °C)	[K]	3	5
Glycol Concentration	[%]		40

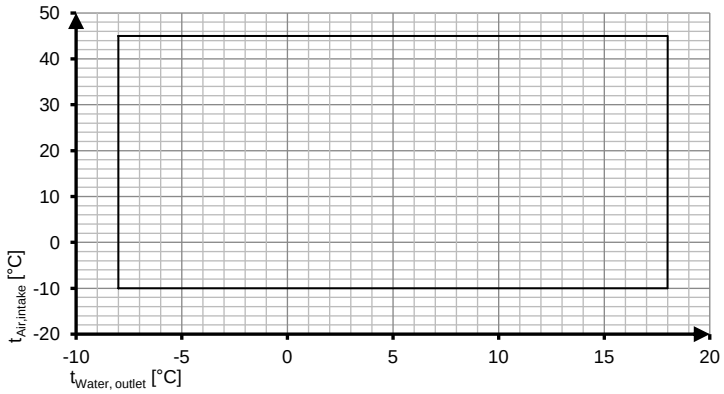


Fig. 3: General operating range

Notices

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

The unit must be protected from freezing at ambient temperatures less than 5°C.
Frost-protection heating for the evaporator is provided as standard.
In standby mode, frost protection is achieved by cyclically switching on the chilled-water pump as soon as the outdoor temperature falls below 4.5 °C (+/- 0.5 hysteresis) or the water temperature falls below 4.5 °C (deactivation if +7 °C is exceeded).
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. When using the external buffer tanks option FGHM30/60, the use of glycol is always mandatory.

General Specifications

Tab. 2: General data for 1-phase units (230 V / 1 / 50Hz / N / PE)

Unit type FGAC #### CD4			1005	1006	1007	1008	1009
Performance data (catalog) - [6]							
Refrigeration capacity [1]	Qe	[kW]	4.30	6.11	8.10	10.6	12.9
Power consumption [5]	P	[kW]	1.55	2.12	2.82	3.64	4.74
EER			2.77	2.88	2.87	2.91	2.72
ESEER			4.20	4.36	4.70	4.29	4.55
Chilled water flow rate	Ve	[l/s]	0.21	0.29	0.39	0.51	0.62
Pressure drop evaporator	Δpe	[kPa]	8.5	14.9	14.6	16.0	16.3
Residual delivery head pump [2]	Δpe	[kPa]	50.7	38.1	61.8	55.6	55.3
Pressure drop of water filter	Δpe	[kPa]	0.5	0.9	1.6	2.7	1.7
Residual delivery head after subtraction of filter	Δpe	[kPa]	50.2	37.2	60.2	52.9	53.6
ERP conformity							
SEER (ERP 2016/2281) [7]			3.8	3.8	4.13	3.93	4.23
η_S (ERP 2016/2281) [7]		[%]	149	149	162	154	166
ERP-compliant 2018 [7]			☑	☑	☑	☑	☑
SEER (ERP 2016/2281) [8]			4.38	4.43	4.93	4.39	4.78
η_S (ERP 2016/2281) [8]		[%]	172	174	194	172	188
ERP-compliant 2021 [8]			☑	☑	☑	☑	☑
Application			Comfort	Comfort	Comfort	Comfort	Comfort
Performance values according to EN14511-3:2011							
Refrigeration capacity [1]	Qe	[kW]	4.30	6.11	8.11	10.6	12.9
EER			2.82	2.92	2.92	2.92	2.74
ESEER			4.53	4.60	5.08	4.34	4.69
Eurovent Class			C	B	B	B	C
Controls			Step IV with black display				
fans			**Axial Fans**				
Fan Quantity		n	1	1	1	2	2
Total air volume flow		[m³/h]	3672	3528	3564	6264	5688
Compressor			**Scroll compressor with inverter**				
Number of compressors			1	1	1	1	1
Number of refrigeration circuits			1	1	1	1	1
Minimum part-load speed		[%]	25	25	25	25	25
Evaporator (cold-water side)							
Min. water mass flow	$V_{e,min}$	[l/s]	0.14	0.19	0.25	0.31	0.39
Max. water mass flow	$V_{e,max}$	[l/s]	0.36	0.50	0.64	0.81	1.06
MAX WORKING PRESSURES	p_{max}	[bar]	4.5	4.5	4.5	4.5	4.5
Minimum chilled water system content		[l]	30	43	57	74	90
Water charge of heat exchanger		[l]	1.0	1.0	1.5	1.8	2.0
Evaporator connection			1“	1“	1“	1“	1 ¼“
Refrigeration circuit charge							
Refrigerant R410A [3]		[kg]	1.45	2.10	3.55	3.60	3.65
Oil charge		[kg]	0.35	0.35	0.40	0.87	1.40
Electrical connection							
Main switch integrated			no	no	no	no	no
Max. cable dimensions Voltage supply L/N/PE		[mm²]	6	6	6	6	6
Dimensions and weight							
A (length)		[mm]	900	900	900	900	900
B (width)		[mm]	370	370	420	420	420
H (height)		[mm]	940	940	1240	1240	1240
Weight [4.5]		[kg]	75	80	95	110	125

1) Performance data for input parameters: chilled water temperatures (inlet/outlet) 12/7°C; ambient temperature 35°C; values partially rounded off
2) Pump optional; subtract filter pressure loss from residual delivery head
3) For exact refrigerant charge volume, refer to the unit identification plate.
5) based on the entire unit (without pump)
6) Data apply to input parameters as described under 1) and without glycol; required when using glycol conversion
7) Applies for units without pump
8) Applies for units with pump

Tab. 3: General data for 3-phase units (400 V / 3 / 50Hz / N / PE)

Unit type FGAC #### CD1			1008	1009	1010	1011	1012	1013	1014
Performance data (catalog) - [6]									
Refrigeration capacity [1]	Qe	[kW]	10.7	13.3	15.5	20.6	25.0	29.8	35.1
Power consumption [5]	P	[kW]	3.64	4.74	5.44	7.20	8.69	10.0	11.8
EER			2.94	2.81	2.85	2.86	2.88	2.98	2.97
ESEER			4.36	4.57	4.14	4.12	4.26	4.15	4.29
Chilled water flow rate	Ve	[l/s]	0.51	0.64	0.74	0.99	1.20	1.43	1.68
Pressure drop evaporator	Δpe	[kPa]	16.3	17.3	20.3	23.9	20.4	18.4	23.7
Residual delivery head pump [2]	Δpe	[kPa]	52.7	51.7	76.7	66.3	60.3	90.0	73.5
Pressure drop of water filter	Δpe	[kPa]	2.7	1.8	2.5	4.4	6.5	9.2	12.7
Residual delivery head after subtraction of filter	Δpe	[kPa]	50.0	49.9	74.2	61.9	53.8	80.8	60.8
ERP conformity									
SEER (ERP 2016/2281) [7]			4.00	4.25	3.90	3.83	4.09	4.11	4.13
η_S (ERP 2016/2281) [7]		[%]	157	167	153	150	160	161	162
ERP-compliant 2018 [7]			☑	☑	☑	☑	☑	☑	☑
SEER (ERP 2016/2281) [8]			4.46	4.8	4.31	4.31	4.52	4.52	4.57
η_S (ERP 2016/2281) [8]			176	189	169	169	178	178	180
ERP-compliant 2021 [8]			☑	☑	☑	☑	☑	☑	☑
Application			Comfort	Comfort	Comfort	Comfort	Comfort	Comfort	Comfort
Performance values according to EN14511-3:2011									
Refrigeration capacity [1]	Qe	[kW]	10.7	13.3	15.5	20.6	25.0	29.9	35.2
EER			2.95	2.82	2.87	2.88	2.90	3.01	3.00
ESEER			4.42	4.69	4.20	4.20	4.36	4.27	4.39
Eurovent Class			B	C	C	C	B	B	B
Controls			Step IV with black display						
Fans			**Axial Fans**						
Fan Quantity		n	2	2	2	1	2	2	2
Total air volume flow		[m³/h]	6264	6120	5904	8136	13536	15120	17496
Compressor			**Scroll compressor with inverter**						
Number of compressors			1	1	1	1	1	1	1
Number of refrigeration circuits			1	1	1	1	1	1	1
Minimum part-load speed		[%]	25	25	25	25	25	25	25
Evaporator (cold-water side)									
Min. water mass flow	$V_{e,min}$	[l/s]	0.33	0.39	0.47	0.61	0.75	0.89	1.06
Max. water mass flow	$V_{e,max}$	[l/s]	0.86	1.06	1.22	1.64	2.00	2.39	2.81
MAX WORKING PRESSURES	p_{max}	[bar]	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Minimum chilled water system content		[l]	75	93	109	144	175	209	246
Water charge of heat exchanger		[l]	1.8	2.0	2.1	2.5	3.1	4.2	4.9
Evaporator connection			1“	1 ¼“	1 ¼“	1 ¼“	1 ¼“	1 ½“	1 ½“
Refrigeration circuit charge									
Refrigerant R410A [3]		[kg]	3.60	3.65	2.75	4.15	5.75	6.45	6.90
Oil charge		[kg]	0.87	1.40	1.40	1.40	1.40	2.30	2.30
Electrical connection									
Main switch integrated			no	no	no	yes	yes	yes	yes
Max. cable dimensions Voltage supply L1/L2/L3/N/PE		[mm²]	4	4	4	16 (10)	16 (10)	16 (10)	16 (10)
Dimensions and weight									
A (length)		[mm]	900	900	900	1450	1450	1450	1700
B (width)		[mm]	420	420	420	550	550	550	650
H (height)		[mm]	1240	1240	1390	1200	1700	1700	1700
Weight [4.5]		[kg]	110	125	135	190	250	270	305

1) Performance data for input parameters: chilled water temperatures (inlet/outlet) 12/7°C; ambient temperature 35°C; values partially rounded off
2) Pump optional; subtract filter pressure loss from residual delivery head
3) For exact refrigerant charge volume, refer to the unit identification plate.
5) based on the entire unit (without pump)
6) Data apply to input parameters as described under 1) and without glycol; required when using glycol conversion
7) Applies for units without pump
8) Applies for units with pump

Noise levels

Tab.4: Noise levels

	Total sound level		Octave band [Hz]							
			Sound power 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
Standard units										
1005CD4	64	33	64	65	63	62	57	56	52	41
1006CD4	65	34	64	65	64	62	58	59	53	42
1007CD4	66	35	67	68	65	66	59	56	52	48
1008CD4/1	69	38	70	71	68	69	62	59	55	49
1009CD4/1	70	39	71	72	69	70	63	60	56	50
1010CD1	74	43	73	74	63	74	67	65	64	52
1011CD1	74	43	73	74	63	74	67	65	64	52
1012CD1	75	43	73	74	65	75	68	66	65	52
1013CD1	76	44	74	75	66	76	69	67	66	53
1014CD1	77	45	75	76	67	77	70	68	67	54

Data on operating conditions
Data applies only to water inlet and outlet temperature of 12 °C/ 7 C° and ambient air temperatures of 35 °C.

1) Specification of sound power (EUROVENT certified value)
Manufacturer 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.

Footprint

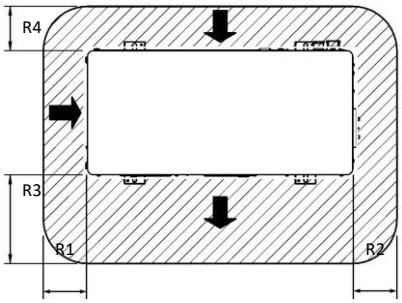


Fig. 4: Required clearances (example)

CLEARANCE FOR AIR SUPPLY!
Unit must be able to freely discharge air to the side. Air short-circuiting must be impossible! The necessary clearances near and over the unit may exceed the depicted maintenance clearance by many times.

Tab.5: Clearances

ALL UNIT SIZES		R1	R2	R3	R4
Required clearances	[mm]	400	400	900	400

Anti-vibration isolators

Tab. 6: Required anti-vibration mounts depending on unit model

Unit type FGAC…	FläktGroup sales number (complete as accessory)	FläktGroup individual part designation
Standard units		
1005CD4	FGZAC1005CD.I02	4 x AA/30/N
1006CD4	FGZAC1006CD.I02	4 x AA/30/N
1007CD4	FGZAC1007CD.I02	4 x AA/30/N
1008CD4/1	FGZAC1008CD.I02	4 x AA/50/N
1009CD4/1	FGZAC1009CD.I02	4 x AA/50/N
1010CD1	FGZAC1010CD.I02	4 x AA/50/N
1011CD1	FGZAC1011CD.I02	4 x AA/50/N
1012CD1	FGZAC1012CD.I02	4 x AA/50/N
1013CD1	FGZAC1013CD.I02	4 x AA/50/N
1014CD1	FGZAC1014CD.I02	4 x AA/100/N

NOTICE!

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

Electrical data

Tab. 7: Electrical data

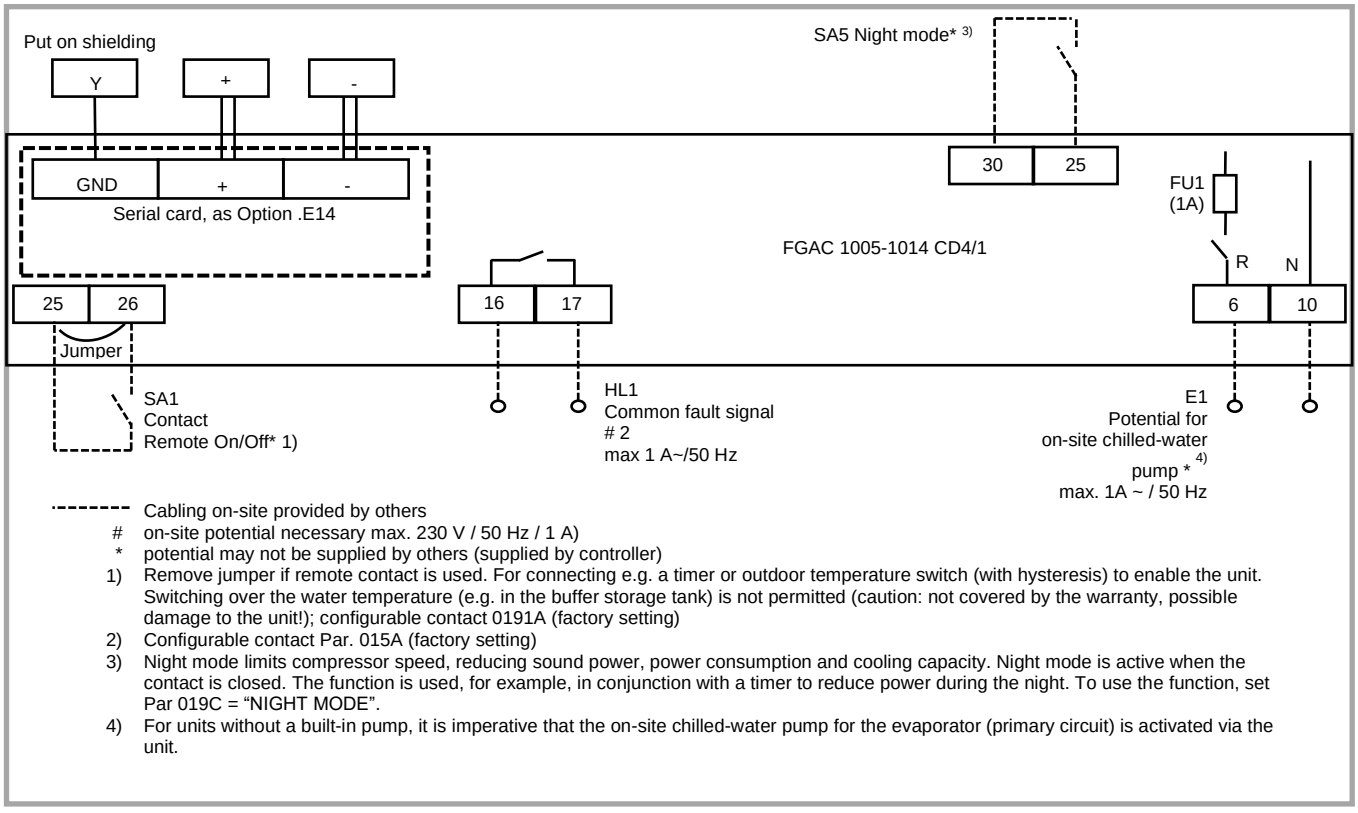
Air Handling Unit Type			Compressor			Fans[3]		Total [1) 2) 3)]			
FGAC…	Power supply	n	F.L.I. [kW]	F.L.A. [A]	L.R.A. [A]	F.L.I. [kW]	F.L.A [A]	F.L.I. [kW]	F.L.A. [A]	S.A.	S.A. With Soft
Standard units											
1005CD4	230/1/50	1	1.88	8.1	N/A	0.12	1	1.94	8	N/A	N/A
1006CD4	230/1/50	1	2.73	11.7	N/A	0.12	1	2.74	12	N/A	N/A
1007CD4	230/1/50	1	3.56	15.5	N/A	0.12	1	3.67	16	N/A	N/A
1008CD4	230/1/50	1	4.84	21.6	N/A	0.25	2	4.925	23	N/A	N/A
1009CD4	230/1/50	1	6.40	24.3	N/A	0.25	2	6.53	25	N/A	N/A
1008CD1	400/3+N/50	1	2.70	10.4	N/A	0.25	2	3.13	13	N/A	N/A
1009CD1	400/3+N/50	1	5.60	14.5	N/A	0.25	2	5.93	17	N/A	N/A
1010CD1	400/3+N/50	1	7.00	15.1	N/A	0.25	2	7.39	18	N/A	N/A
1011CD1	400/3+N/50	1	8.60	16.50	N/A	0.60	3	9.39	20	N/A	N/A
1012CD1	400/3+N/50	1	10.10	22.90	N/A	0.79	4	11.3	29	N/A	N/A
1013CD1	400/3+N/50	1	12.20	22.20	N/A	1.10	6	13.7	29	N/A	N/A
1014CD1	400/3+N/50	1	14.50	32.40	N/A	1.04	6	16	39	N/A	N/A

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

n Number of compressors
F.L.I. El. FULL LOAD INPUT
F.L.A. Operating current
L.R.A. Starting current of each compressor
S.A. Starting current of entire unit

1) Please observe the regionally applicable safety regulations and constructional conditions relevant to the dimensioning of the supply line.
2) Please observe the regionally applicable standards for cable cross-sections and backup fuses. Voltage tolerance: max. 10%, voltage imbalance between phases: max. 3%.
3) Values are based on the total number of fans operating at maximum speed.

Terminal scheme



Cabling on-site provided by others
\# on-site potential necessary max. 230 V / 50 Hz / 1 A)
* potential may not be supplied by others (supplied by controller)
1) Remove jumper if remote contact is used. For connecting e.g. a timer or outdoor temperature switch (with hysteresis) to enable the unit. Switching over the water temperature (e.g. in the buffer storage tank) is not permitted (caution: not covered by the warranty, possible damage to the unit!); configurable contact 0191A (factory setting)
2) Configurable contact Par. 015A (factory setting)
3) Night mode limits compressor speed, reducing sound power, power consumption and cooling capacity. Night mode is active when the contact is closed. The function is used, for example, in conjunction with a timer to reduce power during the night. To use the function, set Par 019C = “NIGHT MODE”.
4) For units without a built-in pump, it is imperative that the on-site chilled-water pump for the evaporator (primary circuit) is activated via the unit.

Fig. 5: Terminal scheme