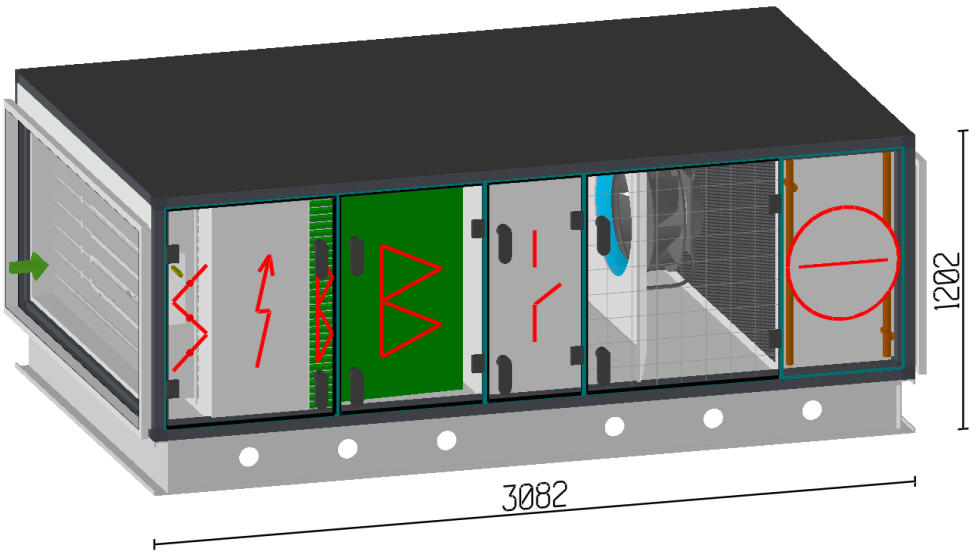
Unit no.: 20
Geniox Comfort 18.09IR - Roof
Weight: 833 / kg
Unit width: 1882 / mm



Air/fan data	Supply air		Units
Airflow (1.205 kg/m³)	2.53		m³/s
Face velocity (unit)	1.70		m/s
External pressure	350		Pa
Fan speed	1728		RPM
Motor; Voltage; Rated current	3.50; 3x400; 5.60		kW/V/A
Sound break out	60 dB(A)		
Power supply	3x400V + N + PE 50 Hz		
Consumed current	8.6 A		
Filter Supply / Extract	G4 - Coarse 65% + F7C CityFlo /		
Heating, electric	45.7 kW ; -5.0/10.0°C ; 3x400V		
Cooling coil, evaporation	36.5 kW ; 30.0/19.0°C		
Water circuit	7°C ; 2x5/8" / 2x1 1/8" Pipe connections		

Energy	Dimensioning	Average	Fans [kWh/year 8760 hours]
SFPv, clean filters including speed control	0.91 kW/(m³/s)	0.91 kW/(m³/s)	20165 kW

Systemair Fans&Spares Ltd.
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www.systemair.co.uk
info@systemair.co.uk

Winter

Temperature after [°C]	-5.0	-5.0	10.0	10.0	10.0	10.0	10.0	10.0
Humidity after [%]	100	100	34	34	34	34	34	34
Pressure drop [pa]	0	2	12	99	127	33	35	350
Pressure after function [pa]	-0	-2	-13	-112	-239	385	350	-
			45.70 kW	G4 - Coarse 65% Filter	F7C CityFlo Filter	Efficiency 68.9% (Total Pressure)		

Summer

Temperature after [°C]	30.0	30.0	30.0	30.0	30.0	30.0	19.0	19.0
Humidity after [%]	45	45	45	45	45	45	85	85
							36.52 kW	

Commissioning Data

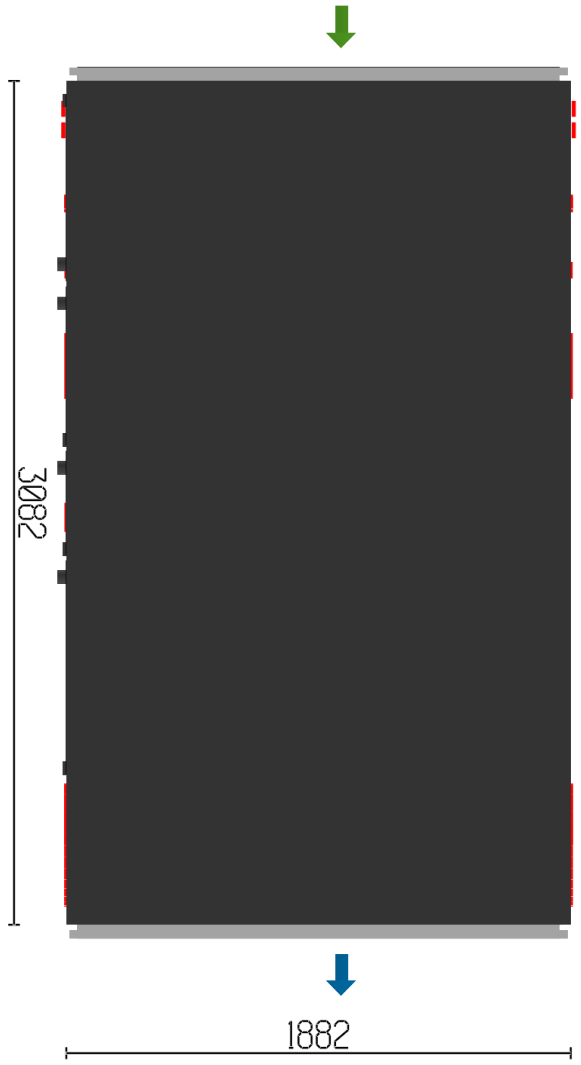
	Supply	Extract	Unit
Pressure drop clean filters	61	-	Pa
Fans absorbed power clean filters	-	-	kW

Alternative working points

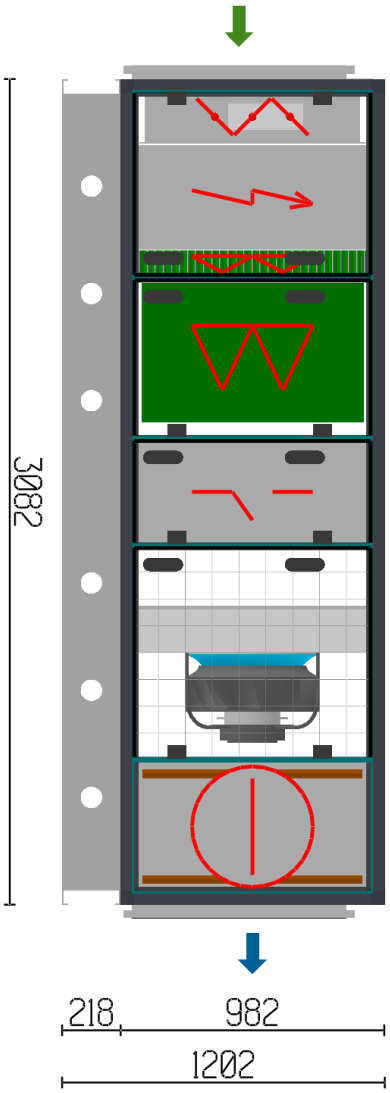
	Dim./Max								Average
Airflow, Supply, m³/s	2.53								2.53
Airflow, Extract, m³/s	2.53								2.53
External pressure drop, Supply	350								
SFPv, kW/(m³/s)	0.91								0.91
SFPe, kW/(m³/s)	1.05								1.05
Electric heating , Capacity, kW	45.7								45.7
Cooling coil, Capacity, kW	36.5								36.5
Sound data dB(A)									
Supply air	84								
Outdoor air	74								
Sound break out	60								
Operation hours	8760								

Operational hours yearly **8760**

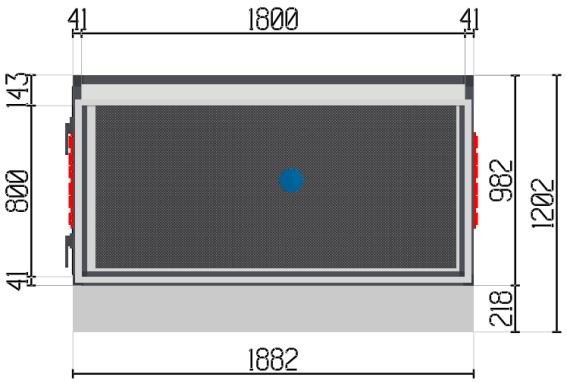
Plan view



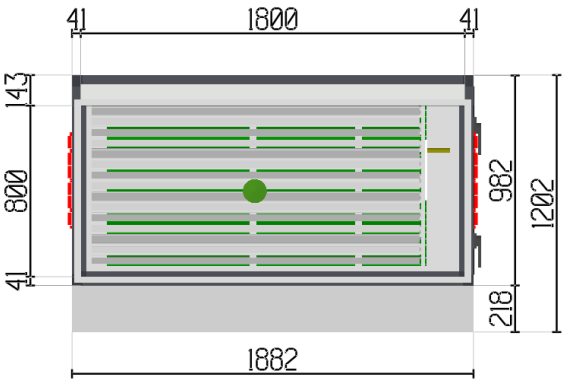
Access side



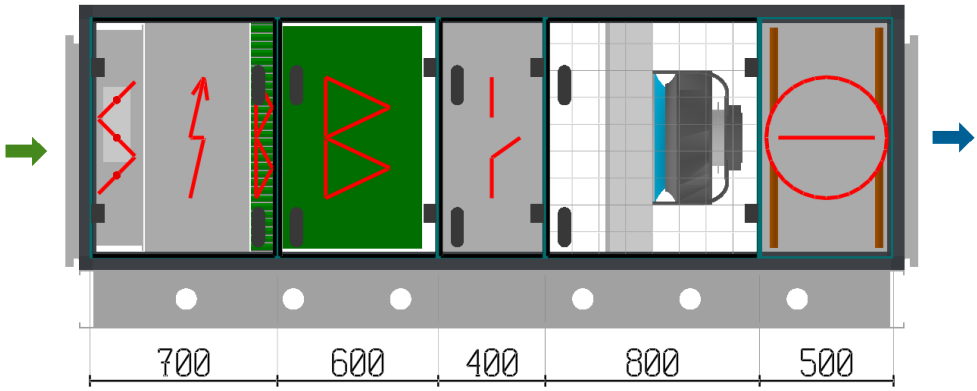
Right end

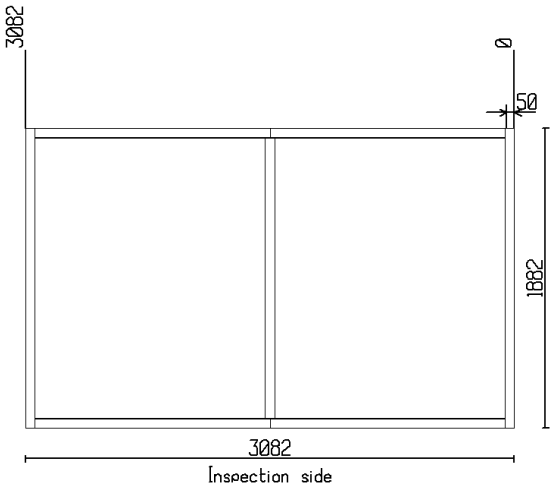


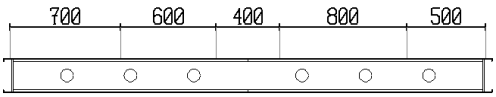
Left end



Doors and panels dimensions






700
600
400
800
500

Technical specification

Unit

Frequency band [Hz] Sound power level	63 [dB]	125 [dB]	250 [dB]	500 [dB]	1K [dB]	2K [dB]	4K [dB]	8K [dB]	Total [dB(A)]
Supply air	74	78	85	82	79	73	69	64	84
Outdoor air	70	71	78	73	65	59	55	55	74
Sound break out	65	65	62	57	56	50	44	30	60

Casing	
Panels	Steel sheets coated with aluzinc AZ185
Frame profiles	Steel profiles coated with zinc z275 and powder coated
Mullion profiles	Steel profiles coated with aluzinc AZ185
Corners	ABS
Insulation	60 mm mineral wool / Density 60 kg/m3
Corrosion protection	Class C4 according to EN ISO 12944-2:2000
Operating pressure	0 - 2000 Pa (Geniox10 - Geniox31)
	0 - 1500 Pa (Geniox36 - Geniox44)
Operating temperatures	-40/+40 °C (Standard)
	-40/+60 °C (Special design)
Classifications	EN 1886, 2. edition 2008
Mechanical Strength	Class D1(M)
Casing air leakage	-400 Pa: Class L2(M)
	+700 Pa: Class L2(M)
Filter by-pass leakage	-400 Pa: Class G1-F9
	+400 Pa: Class G1-F9
Thermal transmittance	Class T2(M)
Thermal bridging factor	Class TB2(M)

Acoustic insulation of casing	Octave band Hz	Insulation dB
	63	10
	125	17
	250	24
	500	27
	1000	28
	2000	28
	4000	32
	8000	40
Roof	Polyvinyl chloride roof	

Control system

Language in controller menu	English	
Control panel delivered	Yes	
External communication	BACnet, IP	
Temperature control	Supply air temperature control	
Fan control	Air flow control m³/h	
Damper motor supply air	Motor spring return	
Coil configuration	Cooling	
DX cooling control signals	Cooling capacity of DX by 0-10 V signal	
Fire guards	Preconfigured for ext.fire signal	
For selection of sensors - study flow chart in control system printout		

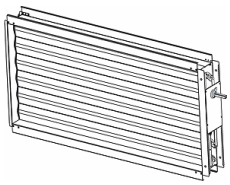
Mains power supply for control system

Switch board data	Supply cable	L1 + L2 + L3 + N + PE	
	Voltage	3x400	VAC
	Hz	50	Hz
	Fuse for fan (in main cabinet)	10	A
	Rated fuse PSCC max (in main cabinet)	10	kA
	Max. consumed current	8.6	A
	Max. consumed current in neutral wire	3.0	A
	Minimum fuses for unit (L1-L2-L3)	10	A
	Minimum fuses for unit (L1-L2-L3-N)	10	A
The installer must ensure that protection of the mains power supply relating to frequency converters is according to local statutory requirements. By one or more 400 VAC motors, HPFI type B must be installed.			

The electrical installation (wiring, mounting of components, connection plugs, etc.) for the unit is done as an machine installation according to 60204-1

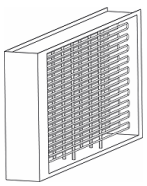
The supply unit consist of

Damper



Pressure drop	2	Pa
Damper blades	Standard	

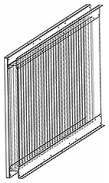
Heating coil



Air flow		2.53	m³/s
Pressure drop		12	Pa
Air temperature before/after		-5.0/10.0	°C
Air relative humidity before/after		100/34	%
Capacity		45.70	kW
Number of steps		Modulating	
Steps	1	2	
Rated power	23.5	23.5	kW
Voltage	3x400	3x400	V
Current, Amp.	33.9	33.9	A

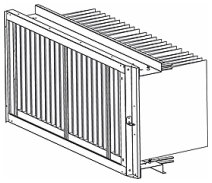
	Connection side	Service side	

Filter



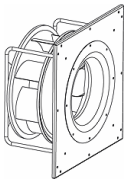
Dimensioning pressure drop	99	Pa
Initial pressure drop/Final pressure drop	61/137	Pa
Velocity, face area	1.93	m/s
Velocity, filter area	0.86	m/s
Filter class	G4 - Coarse 65%	
Filter size	6x[495x368x44]	
Filter length	44	mm

Filter



Dimensioning pressure drop	127	Pa
Initial pressure drop/Final pressure drop	68/186	Pa
Velocity, face area	1.93	m/s
Velocity, filter area	0.11	m/s
Filter class	F7C CityFlo	
Filter size	2x[490x392x25] + 4x[592x392x25]	
Filter length	520	mm
Filter description	City-Flo XL	

Fan , Plug

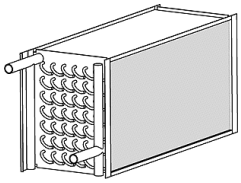


Air flow	2.53	m³/s
External pressure	350	Pa
Pressure drop	33	Pa
Static pressure	659	Pa
Total pressure	724	Pa
Fan speed	1728	RPM
Maximum fan speed	1860	RPM
Total efficiency by static pressure, incl. motor and speed control	62.7	%
Total efficiency by total pressure, incl. motor and speed control	68.9	%
K-factor (p=1.2 kg/m³)	252	
Fan type - Medium	GR50C-ZID.GG.CR	
ErP efficiency n(stat,A)	67.2	%
ErP efficiency class N(actual)/ N(target)	72.0 / 62	
ErP-conformity	Yes	
Direct drive		

Motor

Motor type	EC motor	
Motor types-size	ZID.GG.CR	
Motor protection	Built-in	
Rated power	3.50	kW
Speed (nominal)	1860	RPM
Current, Amp.	5.60	A
Voltage	3x400	V
Consumed power from mains power supply, including speed control	2.66	kW
Safety screen	1	pcs

Cooling coil, DX



Air flow	2.53	m³/s
Pressure drop air, wet coil with condensate droplets	35	Pa
Pressure drop air, dry coil	33	Pa
Air temperature before/after	30.0/19.0	°C
Air relative humidity before/after	45/85	%
Total cooling capacity	36.52	kW
Sensible cooling in % of total cooling	92	%
Face velocity	2.14	m/s
Condensate	0.1	l/min
Refrigerant	R410A	
Refrigerant temperature	7.0	°C
Coil volume	8.8	l
Connection side	Service side	
Connection size inlet/outlet	2x5/8" / 2x1 1/8"	
Tube material	Cu	
Fin material	Al	
Fin spacing	2.5	mm
No. of rows	3	
Drip tray material	Stainless steel	
Coil code	GXK-18-D65-Y-3-4-780-1513-2.5-CU-Al-H-5/8	

Feet or baseframe

Feet or baseframe	Baseframe	
Baseframe height	218	mm
Corrosion protection	Galvanized Z275	

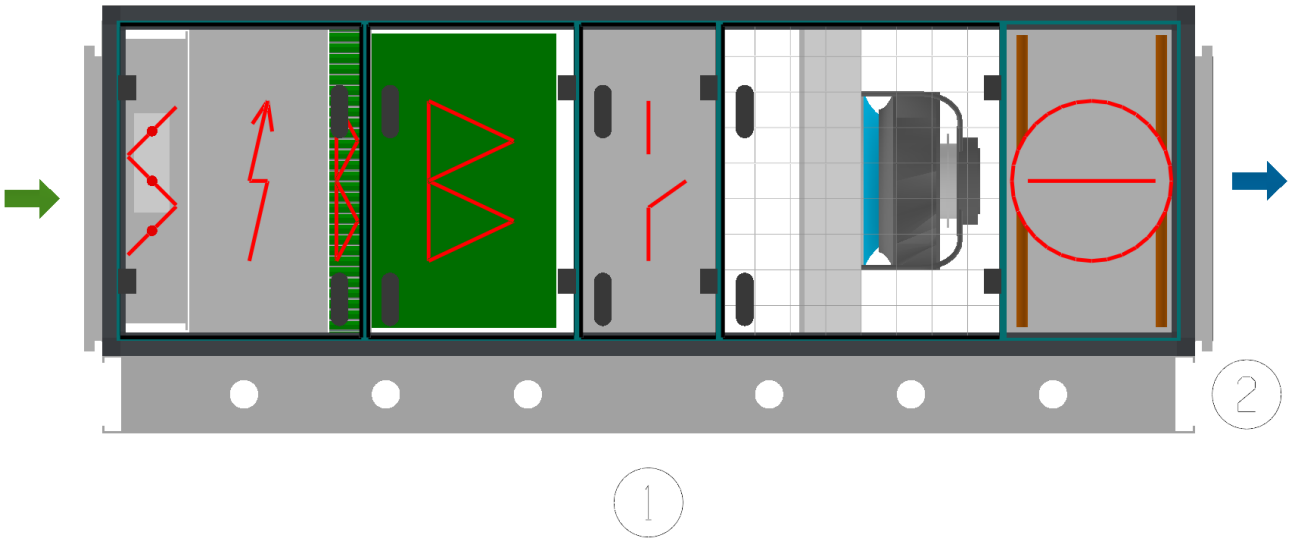
Ridgid duct connection, 30 mm EP/LSM profile

Product	Dimensions (width x height)	
Outdoor	1800x800 mm	
Supply	1800x800 mm	

Section about shipping

Product	Dimensions (width x height x length), incl. packaging	Weight, Inc. Packaging	Weight of unit
AHU1-3282	1982 x 1320 x 3282 mm	836 kg	833 kg
	The unit sections are delivered mounted on base frame.		

Weights



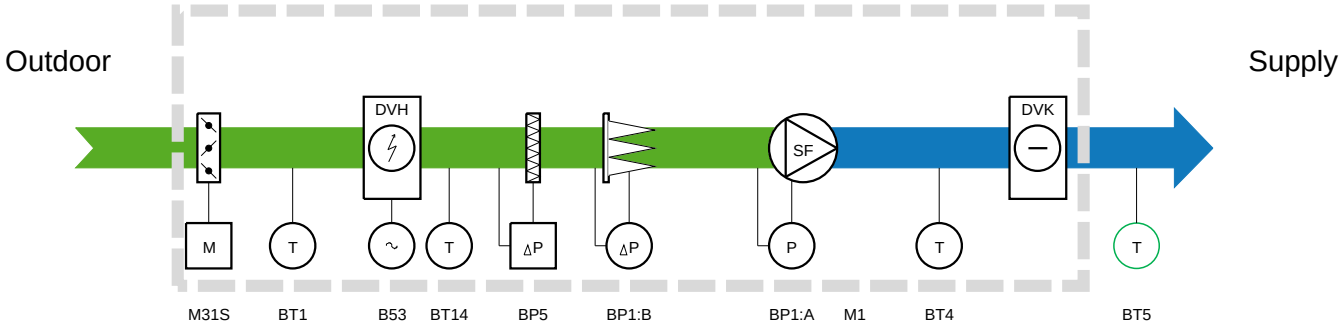
Section No	Section Code	Function Code	Weight of function kg	Weight of section kg
1	Casing Length 3082 mm			586
		Casing	364	
		Damper	29	
		Heating coil	4	
		Filter	18	
		Filter	18	
		Control system	5	
		Fan	73	
		Cooling coil	76	
2	Baseframe Length 3082 mm			133
	Other components			114
	Weight of unit			833

Integrated Systemair control system

The air handling unit is built with a complete and fully integrated control system - based on one Systemair E28 controller mounted in the cabinet. The air handling unit can either run stand alone or cabled against a building management system

Before shipment the unit has been assembled and has passed a final functional test and inspection. Order-specific set-up and parameters are stored in the controllers during this process. The test report is delivered along with the air handling unit.

Flow chart



Components in red are not delivered

Detailed technical specification

External components	Symbol Name	Cable number	Page/ Column	Terminals	HW I/O
Power supply, pre-heater coil, electrical	B53		25 : 8	L1 L2 L3 N PE	3*400V+PE
Supply air tempemperature	BT5	W355	21 : 3	X3: 19-20	AI2
Normal speed	Ext. Sig.	W581	19 : 4	X5: 2-3	DI2
Reduced speed		W580	19 : 1	X5: 1-2	DI1
Unit stop		W583	20 : 14	X5: 11-14	DI8
Start signal	Ext. FAN		19 : 2	X3: 3-4	DO1
Ready/Alarm signal			19 : 3	X3: 5-6	DI2
0-10V Control signal			19 : 3	X3: 7-8	AO1
External fire signal			19 : 15	X4: 4-6	DI5
Internal components					
Damper motor on/off - spring return -					

outdoor air	M31S	W331S	24 : 2	X3: 32-34	DO6
Guard for pre-filte, supply	BP5	W363	19 : 6	X3: 36-37	DI4
Pressure over filter, extract	BP1:B	W611	16 : 1	X6: 1-2-3-4	DPT 5: B
Outdoor air temperature	BT1	W341	16 : 1	DPT 6: In1	DPT 6: In1
Pressure transmitter - supply fan	BP1:A	W611	16 : 1	X6: 1-2-3-4	DPT 5: A
EC fan, supply 1	M1	W601	17 : 2	X6: 1-2-4	Bus adr. 1
		W101	12 : 2	F1: 1-3-5-PE	
Temperature efficiency	BT4	W343	16 : 3	DPT 5: In2	DPT 5: In2
Pre-heating electrical	B53	W353	25 : 2	X3: 43-45	DI8
			25 : 4	X3: 41-44	AO5
			25 : 8	X3: 51-K8:14	DO7
Pre-heat temperature - electrical coil	BT14	W369	22 : 4	X3: 25-27	UI2

Cabinet and mains supply

The cabinet with terminal blocks, relays, fuses, 24 V DC power supply and controller is mounted according to the supplied wiring diagram. The controller is configured according to the customer’s order and confirmed in the order confirmation. Specification is also delivered with the unit. On the site mains power supply must be connected directly to the cabinet. The installer on site has full responsibility to ensure that any unit/installation which requires additional protection of the mains power supply relating to frequency converters or any other such device is all carried out according to local statutory requirements.

The supply disconnecting device for the unit is not included. But supply disconnecting device is available without cable and uninstalled or alternatively with cable and installed - see the order confirmation.

External electrical components

If the unit is designed for supply air, the unit is provided with a temperature sensor for the supply air provided with 10 metres of cable, and must be connected to the terminals in the cabinet by the installer.

Depending on the customer’s choice there are terminals in the cabinet for;

- pressure transmitter in duct for pressure control
- valve for heating and circulation pump for heating coil
- temperature sensor for frost protection of the hot water heating coil
- electrical heating coil
- valve for cooling with chilled water.
- other sensors

The above-mentioned components are not provided with cable and the above-mentioned components are delivered uninstalled.

Control panel with 10 m cable is not connected to controller.

Controller and control panel

The control panel must be connected by cable (10 m) to the controller in the cabinet, and the programming and normal handling is carried out from the control panel with display and buttons - the Systemair Control Panel - the SCP. The protection class of the control panel is IP 41. Communication between the panel and the controller in the cabinet is possible with up to 100 metres of cable. The installer must use cable with 4 cores - path cable - also called Ethernet cable - shielded twisted PDS cat6 AWG23 LAN network cable.

Schedules

The regulator has individual schedules for start, stop and high/low air flow rate for each week-day as well as schedules for holidays.

The regulator has automatic summer-winter-time change over.

Outside normal operating hours, free cooling is available according to settings.

Access rights - passwords

There are 3 different log-on levels

- Operator level or basic level - (no password) - access to read values and to change user relevant settings concerning schedules, temperature, air flow and to cancel alarm and even to restart the system after having removed the reason that triggered the alarm.
- Service level (password) - access to change fundamental values, access to store new settings, access to restart the system according to user's own former settings or original factory settings.
- System level which has the highest authority level (special password) with full read/write access to all settings and parameters (also access to the configuration of the whole system)

Alarms and safety functions

If an alarm condition occurs, the Alarm LED on the control panel will flash. The LED will continue to flash as long as there are unacknowledged alarms. Alarms are logged in the alarm list. The list shows the type of alarm, date and time for the alarm and alarm class - A, B or C:

- Alarm type A will stop the fans and close the dampers or switch the unit to a special mode according to the configuration
- Alarm type B is only to inform the users of a failure. The unit is still running as well as possible
- Alarm type C - only to inform the user that the unit has been switched away from automatic running mode to manual control

For frost protection of the heating coil with hot water a temperature sensor is installed in a return circuit of the coil. The control signal to the mixing valve is kept at a level that secures that water return temperature is at all times kept at a factory set minimum. This protection is also active when the unit is not running. This extended system offers maximum protection safety. If the water temperature is getting too low anyway, the unit including fans is shut down.

Alarm signal

A relay with potential free contact is mounted in the board. The potential free contact is activated by alarm.

Flexible System

A qualified service technician - on the site and at the request of the user - will be able to adapt the regulation further to the requirements of the users;

- The air flow regulation can be changed between several methods that are constant air volume through the fans, constant pressure in the ducts, CO2 dependant control or humidity dependant.
- The temperature control mode can be changed between room temperature control, supply air temperature control and outdoor compensation of the selected temperature.
- In addition to the fixed schedule, an external start signal for extended operation is available.
- In addition or as an alternative to the fixed schedule, an external start/stop input signal is available.
- A large number of other alternative functions are optional.

Supply air temperature control

- The control of the supply air temperature is based on the value from the sensor mounted by the installer in the supply air duct. The sensor is delivered with 10 m cable.

The supply air temperature is controlled by a PI-regulator (PI control loop). The set-point for the supply temperature can be adjusted on the control panel. The supply air temperature is kept at the set-point value by controlling the capacity of the heat exchanger, heating coil and cooling coil (if installed). The control of all capacities is fully modulating.

Air flow control - m3/h

The air flow rate of supply or extract air is controlled separately. The supply or extract air at Normal and Reduced airflow in m³/h is set separately on the control panel.

The actual air flow is displayed on the control panel. On the fan a pressure transducer measures the difference between the pressure before the inlet cone of the fan and the pressure in the measuring probe in the inlet cone. Through a formula with a factor for each fan size, the output signal from the pressure transducer is calculated by the controller to the actual airflow in m³/h.

Cabinet integrated in or on Geniox 10-Geniox 18

The cabinet is integrated in or on the air handling unit according to the technical documentation.

Preheater - electrical

The unit is delivered with an electrical preheater in the airflow before the heat recovery. The main controller in the cabinet delivers a 0-10V DC signal for control of the heater capacity. The separate controller beside the heater in the same section as the heater converts the 0-10V DC signal to the

heating capacity required. The electric heater is not supplied from the cabinet in the air handling unit as the cabinet is not designed to supply the heater with power. No power supply cables are connected to the electric heater. The separate controller is without supply disconnecting device.

Damper - supply air, spring-return motor

The damper is opened and closed by a spring-return damper motor - torque 20 Nm - running time 150/16 seconds.

Prepared for external fire signal

The unit is prepared for external fire signal. When the unit receives a fire signal the unit shuts down. When the unit has been shut down by a fire signal, the unit has to be restarted on the control panel. This sequence can be changed to start up unit when the external fire signal disappears. There are 2 terminals for external fire signal in the board.

Filter guard over panel filter and filter guard over bag filter

Filter guard over panel filter and filter guard over bag filter installed and connected to the controller for display of alarm when the mechanically set limit is exceeded.

No communication prepared for communication to WEB or BMS (CTS) systems

The controller includes hardware and ports that can later be programmed by a skilled technician according to demands from the user for 3 alternative methods that are;

Communication as WEB-master to PC and Android telephone

Communication to BMS via MODBUS RTU, TCP/IP and RS485

Communication to BMS via BACnet IP and MS/TP(RS485)

Free cooling with additional outdoor temperature sensor and with room sensor

The outdoor temperature is measured by a sensor that must be installed outside by the installer. If the outdoor temperature after midnight is below the room temperature set point and the actual room temperature is above the set point temperature, the fans start during the summer to cool down the building during night.

The function is only active before and after time scheduled operation. All parameters can be set individually. When conditions for room temperature is reached the unit stops. After 1 hour the system will start up again if the room temperature is too high again.

External start/stop of the unit

A digital input can force the unit to start although the timer says the running mode should be “off”. The unit will run as long as the digital input is closed. Normal speed or reduced speed must be preselected. The cabinet has been prepared with additional terminals for the connection of cable. Cable is not delivered by Systemair.

DX-cooling - control of capacity

Signal from the controller is 0-10 V DC

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