**HHFlex**Modular solution for air handling









# **Systemair Worldwide** Improving the climate for your business

Systemair's products and solutions create a comfortable and healthy indoor climate in homes, workplaces, public areas and on ships.

## Our brand promise

### WE PUT OUR CUSTOMER FIRST

We meet our customers expectations and offer products and solutions based on their needs. From concept to completion, we are at our customers side.

### **WE SIMPLIFY**

We make our customers' jobs easier by turning complex systems into smart, easy and sustainable solutions.

#### **WE GUIDE**

We share our deep knowledge and experience to give our customers advice and guidance. This makes us a trustworthy partner.

### Systemair product solutions are:

- · Innovative and energy efficient
- · Simple to choose, install and
- Performance tested, measured and documented in every detail.

# **HHFlex** Undeniable facts!

HHFlex air handling units have a modular platform. This makes it possible to configure them in a completely customer and project-specific manner on the basis of the air flow required. The starting point is the application of high quality components in the form of heat recovery systems, humidifiers, filters, heat exchangers for cooling and heating, sound attenuators and, of course, various types of fans and drives.

The HHFlex is characterised by quality, a long life span, low maintenance costs and low energy costs - specific aspects to which Systemair attaches a great deal of value. User-friendliness was also an important element in the design of the HHFlex. Examples of this are the inspection options provided by large access doors and filters that are extremely easy to install.

The multitude of configuration options allows HHFlex air handling units to be custom-made for every application. The possibilities are virtually endless.

It is also possible to widen your horizons in relation to the application of HHFlex air handling units. HHFlex is not only a reliable choice for Non-residential buildings and Health facilities, the high expectations in relation to corrosion resistance and the stringent requirements of Atex explosionproofing in the Marine and Offshore market are also met.

Systemair also holds the Hygiene certificate in order to meet the stringent requirements that apply in hospitals and the pharmaceuticals industry.

HHFlex is a real all-rounder!

### Systemair: HHFlex - indoor installation

- $\bullet$  68 unit sizes of 1,000 m $^3$ /h to 125,000 m $^3$ /h and more.
- Free choice of configuration.
- High quality components, durable finish and low power consumption.
- Hygiene and Eurovent certified.
- EN1886: D2 / L1 / F9 / T2 / TB2



### Systemair: HHFlex - outdoor installation





- Supply and exhaust units separate, stacked, parallel, in-line or side by side.
- High quality weather-resistant finish.
- Inspection/service space for installation of accessories.
- Various choices of duct connections.

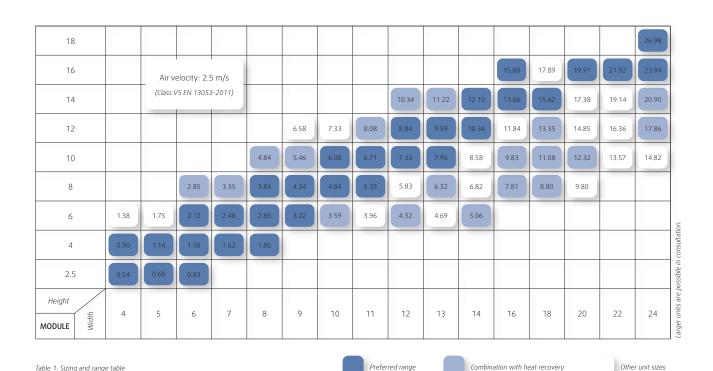
## Selection tables

# The possibilities are virtually endless

The selection tables emphasise the virtually infinite applications and possibilities of the HHFlex. There are a total of 68 different standard build sizes and within these build sizes the nominal selection range is roughly between  $0.25 \, \text{m}^3/\text{s}$  (1,000  $\, \text{m}^3/\text{h}$ ) and 31  $\, \text{m}^3/\text{s}$  (110,000  $\, \text{m}^3/\text{h}$ ).

Table 1 shows an increasing air flow in the preferred range. The table is based on an air velocity through the air handling unit of 2.5 m/s (class V5 EN 13053-2011).

Optimum selection is possible for every configuration and air flow. There are several possible set-up variants for the HHFlex. For example, air handling units can be both indoors and outdoors. Units can also be designed stacked, vertical and for ceiling installation.



12 x 160 plus 98 = 2,018 mm

8.84 m<sup>3</sup>/s

The values above are indicated with white dots in the tables on page 5.

12 x 160 plus 98 = 2,018 mm excluding support

Width:

Height:

Nominal air flow-

Module size:

Exterior height:

Support height:

160 mm n x module plus 98 mm

n x module plus 98 mm

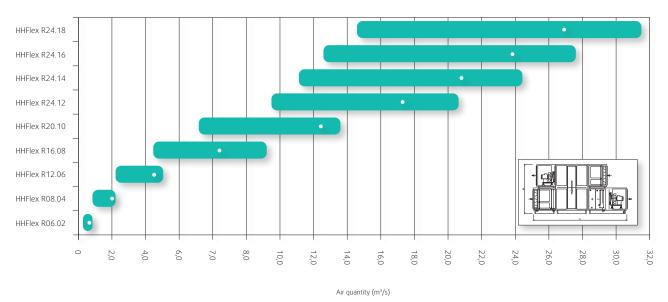


Table 2: Ouick selection table heat wheel

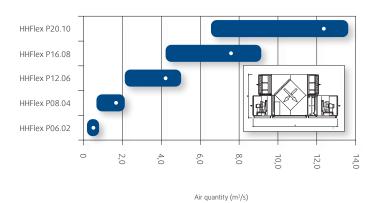


Table 3: Quick selection table cross flow heat exchanger

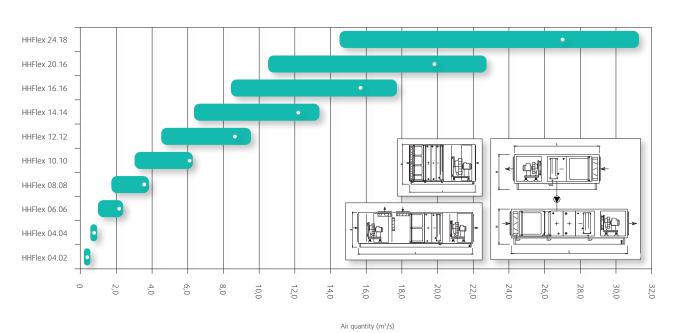


Table 4: Quick selection table supply unit, recirculation unit and run around coil supply and exhaust unit





## **Functions**

# All of the HHFlex functions in an overview

The HHFlex is a unique design, which offers infinite configurations and air handling unit compositions. The Eurovent Certified air handling units therefore offer a tailor-made solution on every customer demand. The wide range of fans, heat recovery applications and heat exchangers offer high end economic solutions.

### Here are some features of the HHFlex:

- 68 basic sizes
- Large number of possible combinations
- Certified selection software
- High quality coated and galvanized steel
- · Stainless steel
- Proven durability
- · Certified and low noise levels
- Heat recovery in three basic types
- Optimum energy efficiency possible
- Possibility to integrate special components

### Casing

Systemair air handling units consist of a steel profile construction developed in-house that includes doubleskinned panels and doors.

The 1 mm thick galvanised and coated steel tube

profiles produce a frame that is both rigid and light. The profiles are connected with ABS corner pieces for extreme leak-tightness and a stable construction. The inner and outer skin of the 60 mm thick panels are produced from galvanized sheet and stainless steel optional for panels and frames, inside and outside available. The panels can have an extra anti-corrosion treatment, and the high quality thermal insulation limits heat loss and gives the flooring a high rigidity for easy access. The panels are fastened from the outside for easy maintenance.

Assembly is simple and the result is a unit with smooth interior surfaces, suitable for hygienic applications. The high quality polymer coating (standard RAL 7035) on the exterior and/or interior means that the entire casing is extremely effectively protected against corrosion and UV radiation. It is also possible to choose a stainless steel or a sound insulating casing for the unit with an inertia mass wall construction for outstanding acoustical properties. Flat-packed delivery is also possible with an easy assembly on site.





Bag filter

### Filters

All filter types are possible for the HHFlex:

- panel filters
- · bag filters
- pleated filters
- electrostatic filters
- chemical filters
- carbon filters
- HEPA filters

Slide-in filters can be removed from the outside with a single action. Build-in filters are accessible through an inspection space in the air handling unit. The HEPA filter is easy to install due to its fully welded heavy gauge construction, which allows the filter boxes to be positioned on a rigid support frame and to be able to seal according HEPA filter standards. It is possible to select carbon filters for filtering of aromatic substances. The HHFlex can be provided with maximum absorbant exposure for the highest capture efficiency.

### Dampers

The class 3 dampers are produced from aluminium or galvanised steel. The dampers can be configured for all situations. All dampers are suitable for actuator installation as standard. It is possible to apply an extra, acid-resistant, coating.

### Plug fans

The direct driven Systemair plug fans support ECtechnology. This technology enables the HHFlex to achieve optimum energy output and low operating costs. The plug fans are also extremely suitable for situations where V-belts are not permitted (VDI 6022). Plug fans can also be used for high capacities with the aid of traditional AC-motors, with efficiency classification IE2, IE3 or IE4.



Damper



Plug fan with PM-technology



Plug fan with EC-technology

## All of the HHFlex functions in an overview

#### Fans

Systemair has a wide range of indirectly driven fans. The V-belt drive has a simple, single-point tensioning device. The wide range can be divided into fans and motors that are available in 1 or 2 speeds or suitable for frequency inverter.

The motors used comply with the most recent ErPdirective motor fan combination and comply with IEC standard efficiency classes IE2, IE3 or IE4. There are various configurations possible for fans and motors. In addition, the entire set-up is provided with steel spring anti vibration mounts and is maintenance friendly.

### Heat recovery wheels

Systemair has three types of heat wheels in its range, namely condensation, hygroscopic and sorption rotors. All three supply an efficient form of energy recovery. The casing of the heat wheel fits tightly onto the casing of the air handling unit and is corrosion-resistant.

There are also various possible build-in constructions. The required humidification capacity and mechinal cooling can be reduced (up to 80%) if the sorption rotor is used. The section in which the heat recovery is located can be fitted with simple inspection spaces. This results in maintenance-friendly air handling units.

### Plate exchangers

In air handling units where separate air flows are required, it may be necessary to use a plate heat exchanger. Plate heat exchangers can be delivered with a standard or high level of efficiency. There are two versions of the plate heat exchanger. The heat recovery is controlled by a built-in face and bypass damper. The bottom of air handling units with plate exchangers is fitted with stainless steel draintrays on both the inlet and outlet side as standard.



Indirectly driven fan









### Run around coil system

The run around coil system is a system in which a mixture of water and glycol circulates between two elements. Run around coil systems are used when it is necessary to completely separate two air flows. Using the run around coil system makes the air handling unit ideally suited for situations in which hygiene is thé design parameter. In addition, this system is extremely flexible and therefore easy to use in various situations.

Heating coils

The most common types of heaters are hot water, electrical and steam heaters. The heater with hot water can be placed in any air handling unit. The casing is produced from galvanized or stainless steel and the heat exchangers are available in Cu/Al, Cu/AlPP, Cu/Cu, FeZn and stainless steel. The batteries are economically selected, specifically for the situation with the primary goal to keep energy costs low.

The heater can be fitted with a frost protection thermostat. This protects every circuit individually against freezing, which is ideal in combination with low temperature systems. The electric heater is completely integrated into the unit and can be positioned in accordance with the factory standards. This heater also has a wide range of capacities and switching options. Electric heaters are fitted with a safety screen and an overheat and fire thermostat.

### Cooling coils

The majority of coolers used are based on chilled water and direct expansion (DX). The DX cooler has connections that are easily accessible. The section with coolers can be expanded with plastic or galvanized droplet eliminators. The droplet eliminator is easy to remove, which makes the coil easy to clean and extremely maintenance and user-friendly. The unit is fitted with a stainless steel sloping condensation drain tray.



Electric heater





# All of the HHFlex functions in an overview

The coil frame is produced from galvanized or stainless steel and the heat exchangers are available in Cu/Al, Cu/AIPP, Cu/Cu, FeZn and stainless steel.

#### Sound attenuators

The sound attenuators can be specifically designed and positioned for every air handling unit. The values are calculated in accordance with ISO 7235:2003. The sound attenuators are supplied as standard with an erosionresistant top coating.

### **Humidifiers**

In situations in which the indoor climate is additionally controlled on the basis of the moisture content of the ventilation air, the unit can be fitted with humidification. The isothermic steam humidification is highly standardized. The patented venturi and vortex plate guarantee a short absorption process. Adiabatic humidification is preferred in terms of energy consumption. A hygienic version of the traditional spray and wet-cell humidifier is also available.

The infrasonic humidifier, whereby reverse osmosis water is atomised at high pressure, is the most optimum solution in all aspects. The special technology makes it possible to fit an almost maintenance free and hygienic humidifier to the air handling unit.



Electric steam generator



Infrasonic hunidifier

## **Standardisation**

# Powerful performance and guaranteed quality

Systemair participates in platforms geared to develop and maintain European and international air handling standards. The air handling units produced by Systemair meet these standards. Both units deliver high level performance in the area of hygiene and sustainability qualifications. Two European standards have been formulated that describe the properties of the casing construction and performance of the unit, components and sections. These are the following standards:

- EN1886 "Air handling units Mechanical performance"
- EN13053 "Air handling units Ratings and performance for units, components and sections"

The HHFlex series is Eurovent certified for its classifications and performance in accordance with the European standards EN1886 and EN13053. For maximum hygiene it is possible to produce the HHFlex completely in accordance with all standards that are applicable to a hygienic solution.

Certification of this hygiene application is carried out by an independent institute. This hygiene certification represents a qualified hygiene standard, whereby testing is related to all relevant European standards and guidelines. These guidelines define the specific requirements for a hygienic version of an air handling unit to the smallest detail.

The purpose of Eurovent certification is to reinforce customers' confidence. All mechanical features and performance are measured and checked regularly on the basis of extremely specific prescriptions, procedures and test regulations. Deviations from certain values are not tolerated.

This strict execution and inspection by the Eurovent Certification Institute guarantees the performance of a design and the reliability of the power consumption. These designs have Energy Labelling.







The performance of HHFlex is certified by Eurovent with the following classification in accordance with EN1886:

- · Mechanical strength D2
- · Air leakage class L1
- Filter bypass class F9
- Thermal transmittance class T2
- Thermal bridging factor TB2

The Eurovent certified performance is related to the EN13053 with zero-tolerance in relation to the technical specifications

Hygiene guidelines and standards:

VDI-6022 part 1, VDI-3808 part 1, Ohnorm H-6021, SWKI VA Ohnorm H-6020.

# Dimensions and weights

# Several configurations and unit types

The HHFlex is known for its virtually infinite options. A suitable solution can be devised for any situation. As the unit has so many options it is impossible to include everything in a single overview. The tables on the next page give an impression of the strength of the HHFlex.

These tables display a number of air handling units and their specifications. Table 5 shows nine models of an air handling unit with a heat wheel. *Table 6* shows five models of the countercurrent plate exchanger, and table 7 shows ten models of and air handling unit with recirculation. Table 8 shows ten models of a supply unit and table 9 shows ten models of a run around coil exhaust unit. Finally, table 10 shows ten models of a run around coil supply unit.

All tables show four variants of the unit: the height, width and depth measurements and the weight of the unit. Our air handling units can be fitted with features including infrasonic humidification, steam humidification, de-humidification, reversible water or DX heaters and coolers and sound attenuators. There are also carbon, absolute, chemical and electrostatic filters. Finally, our HHFlex air handling units can be fitted with integrated controls (plug & play).

Naturally, you are completely free to contact us if you would like more information about a custom-made solution and the possibilities of the HHFlex.



Reference Systemair: Rabobank head office – Utrecht, The Netherlands

The Rabobank Administration Centre was taken into use in 2011. The building is 105 metres high, which makes it the highest office building in Utrecht. Systemair supplied eight air handling units that supply a total of 335,000 m<sup>3</sup>/h of air for this building, otherwise known as 'The Binoculars'

Sorption heat wheels are used to save energy. Besides heating, this application also produces savings in relation to the humidification and cooling of ventilation air.



HEAT WHEEL UNIT		UNIT TYPES												
HEAI WHEEL UNII				R12.06		R20.10		R24.14	R24.16 5,538 4,653 4,774 7,480 5,538 4,653 5,734 7,965 5,538 4,653 6,472 8,590	R24.18				
	Height	1,218	1,698	2,338	2,978	3,618	4,258	4,898	5,538	6,178				
	Width	1,058	1,378	2,018	2,658	3,298	3,938	4,013	4,653	4,973				
	Length	3,494	3,494	3,494	3,654	3,974	4,294	4,614	4,774	5,094				
WITHOUT COILS	Weight	785	1,060	1,690	2,415	3,755	4,875	5,680	7,480	8,455				
	Height	1,218	1,698	2,338	2,978	3,618	4,258	4,898	5,538	6,178				
	Width	1,058	1,378	2,018	2,658	3,298	3,938	4,013	4,653	4,973				
	Length	3,814	3,974	3,974	4,294	4,614	5,094	5,512	5,734	5,894				
WITH HEATING COIL	Weight	820	1,120	1,785	2,590	3,985	5,200	6,155	7,965	8,885				
	Height	1,218	1,698	2,338	2,978	3,618	4,258	4,898	5,538	6,178				
	Width	1,058	1,378	2,018	2,658	3,298	3,938	4,013	4,653	4,973				
	Length	4,294	4,454	4,454	4,774	5,094	5,672	5,992	4,898     5,538       4,013     4,653       4,614     4,774       5,680     7,480       4,898     5,538       4,013     4,653       5,512     5,734       6,155     7,965       4,898     5,538       4,013     4,653       5,992     6,472	6,632				
WITH HEATING AND COOLING COIL	Weight	875	1,205	2,340	2,830	4,270	5,755	6,600	8,590	9,640				

Table 5: Types of heat wheel unit - Dimensions and weights of the same types as the 'Selection Tables' section.

COUNTERCURRENT PLATE				UNIT TYPES		
EXCHANGERS UNIT			P08.04	P12.06		P20.10
	Height	1,218	1,698	2,338	2,978	3,618
	Width	1,058	1,378	2,018	2,658	3,298
	Length	3,654	4,454	5,094	5,094	6,054
WITHOUT COILS	Weight	740	1,155	1,960	2,730	4,310
	Heigth	1,218	1,698	2,338	2,978	3,618
	Width	1,058	1,378	2,018	2,658	3,298
	Length	4,134	4,934	5,574	5,414	6,374
WITH HEATING COIL	Weight	785	1,220	2,070	2,830	4,460
	Heigth	1,218	1,698	2,338	2,978	3,618
	Width	1,058	1,378	2,018	2,658	3,298
	Length	4,614	5,414	6,054	5,894	7,014
WITH HEATING AND COOLING COIL	Weigth	850	1,305	2,210	3,070	4,960

Table 6: Types of countercurrent plate exchanger unit - dimensions and weights of the same types as the 'Selection Tables' section.

### Additional information for table 5 to 10:

- Dimensions expressed in mm.
- Weight expressed in kg.
- Extra length for pre-heating battery: 160 mm.
- Extra length for inspection space: 480 mm.
- Dimensions include the height of the support frame 160 mm. 62 mm is sufficient in the majority of cases.
- Selections based on standard conditions.

DESIDENT ATION UNIT		UNIT TYPES										
RECIRCULATION UNIT		04.02	04.04	06.06	08.08	10.10	12.12	14.14	16.16	20.16 2,818 3,298 2,978 2,010 2,818 3,298 4,196 2,580 2,818 3,298 4,676 3,035	24.18	
	Heigth	658	898	1,218	1,538	1,858	2,178	2,498	2,818	2,818	3,138	
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298	3,938	
	Length	1,058	1,058	1,218	1,538	1,698	1,858	2,178	2,658	2,978	2,178	
WITHOUT COILS	Weigth	150	150	230	530	1,218	725	945	1,475	2,010	1,625	
	Heigth	658	898	1,218	1,538	1,858	2,178	2,498	2,818	2,818	3,138	
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298	3,938	
	Length	2,178	2,178	2,338	2,658	2,818	3,138	3,458	3,778	4,196	3,396	
WITH HEATING COIL	Weigth	235	255	370	570	760	1,090	1,500	1,925	2,580	2,355	
	Heigth	658	898	1,218	1,538	1,858	2,178	2,498	2,818	2,818	3,138	
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298	3,938	
	Length	2,658	2,658	2,818	3,138	3,298	3,458	3,778	3,938	2,818 3,298 2,978 2,010 2,818 3,298 4,196 2,580 2,818 3,298 4,676	4,196	
WITH HEATING AND COOLING COIL	Weigth	285	310	460	700	935	1,290	1,660	2,185	3,035	3,170	

Table 7: Types of recirculation unit - dimensions and weights of the same types as in the 'Selection Tables' section.



### HHFlex air handling units

SUPPLY UNIT		UNIT TYPES										
SUPPLY UNIT			04.04	06.06	08.08	10.10	12.12	14.14	16.16	20.16	24.18	
	Heigth	858	898	1,218	1,538	1,858	2,178	2,498	2,818	2,818	3,138	
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298	3,938	
	Length	2,818	1,058	1,218	1,538	1,698	1,858	2,178	2,658	2,978	2,178	
WITHOUT COILS	Weigth	150	150	230	360	530	725	945	1,475	2,010	1,625	
	Heigth	658	898	1,218	1,538	1,858	2,178	2,498	2,818	2,818	3,138	
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298	3,938	
	Length	2,178	2,178	2,338	2,658	2,818	3,138	3,458	3,778	4,196	3,396	
WITH HEATING COIL	Weigth	235	255	370	570	760	1,090	1,500	1,925	2,580	2,355	
	Heigth	658	898	1,218	1,538	1,858	2,178	2,498	2,818	2,818	3,138	
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298	3,938	
	Length	2,658	2,658	2,818	3,138	3,298	3,458	3,778	3,938	4,676	4,196	
WITH HEATING AND COOLING COIL	Weigth	285	310	460	700	935	1,290	1,660	2,185	3,035	3,170	

Table 8: Types of supply unit - dimensions and weights of the same types as the 'Selection tables' section.

RUN AROUND COIL EXHAUST UNIT		UNIT TYPES										
	Heigth	858	898	1,218	1,538	1,858	2,178	2,498	2,818	2,818	3,138	
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298	3,938	
	Length	2,178	2,178	2,338	2,658	2,818	2,978	3,618	3,938	4,356	3,556	
	Weigth	245	270	410	625	860	1,195	1,760	2,260	2,965	2,955	

Table 9: Types of run around coil exhaust unit - dimensions and weights of the same types as the 'Selection tables' section.

RUN AROUND COIL SUPPLY UNIT		UNIT TYPES										
RUN AROUND COIL SUPPLY U	NII		04.04	06.06	08.08	10.10	12.12	14.14	16.16		24.18	
	Heigth	858	898	1,218	1,538	1,858	2,178	2,498	2,818	2,818	3,138	
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298	3,938	
	Length	2,178	2,178	2,338	2,658	2,978	3,138	3,458	4,258	4,356	3,716	
	Weigth	230	255	390	605	860	1,210	1,590	2,600	2,905	2,990	
	Heigth	858	898	1,218	1,538	1,858	2,178	2,498	2,818	2,818	3,138	
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298	3,938	
	Length	2,498	2,498	2,658	2,978	3,298	3,458	3,778	4,578	4,676	4,036	
WITH HEATING COIL	Weigth	255	290	440	675	955	1,330	1,745	2,790	3,170	3,285	
	Heigth	858	898	1,218	1,538	1,858	2,178	2,498	2,818	2,818	3,138	
	Width	738	738	1,058	1,378	1,698	2,018	2,338	2,658	3,298	3,938	
	Length	2,978	2,978	3,138	3,458	3,778	4,098	4,258	5,058	5,156	4,676	
WITH HEATING AND COOLING COIL	Weigth	305	345	540	810	1,130	1,625	2,025	3,160	3,590	3,995	

 $Table\ 10: Types\ of\ run\ around\ coil\ supply\ unit\ -\ dimensions\ and\ weights\ of\ the\ same\ types\ as\ the\ 'Selection\ tables'\ section.$ 

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