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FLUID & AIR HANDLING
TECHNOLOGIES

NEWARK ENGINEERING PTE LTD

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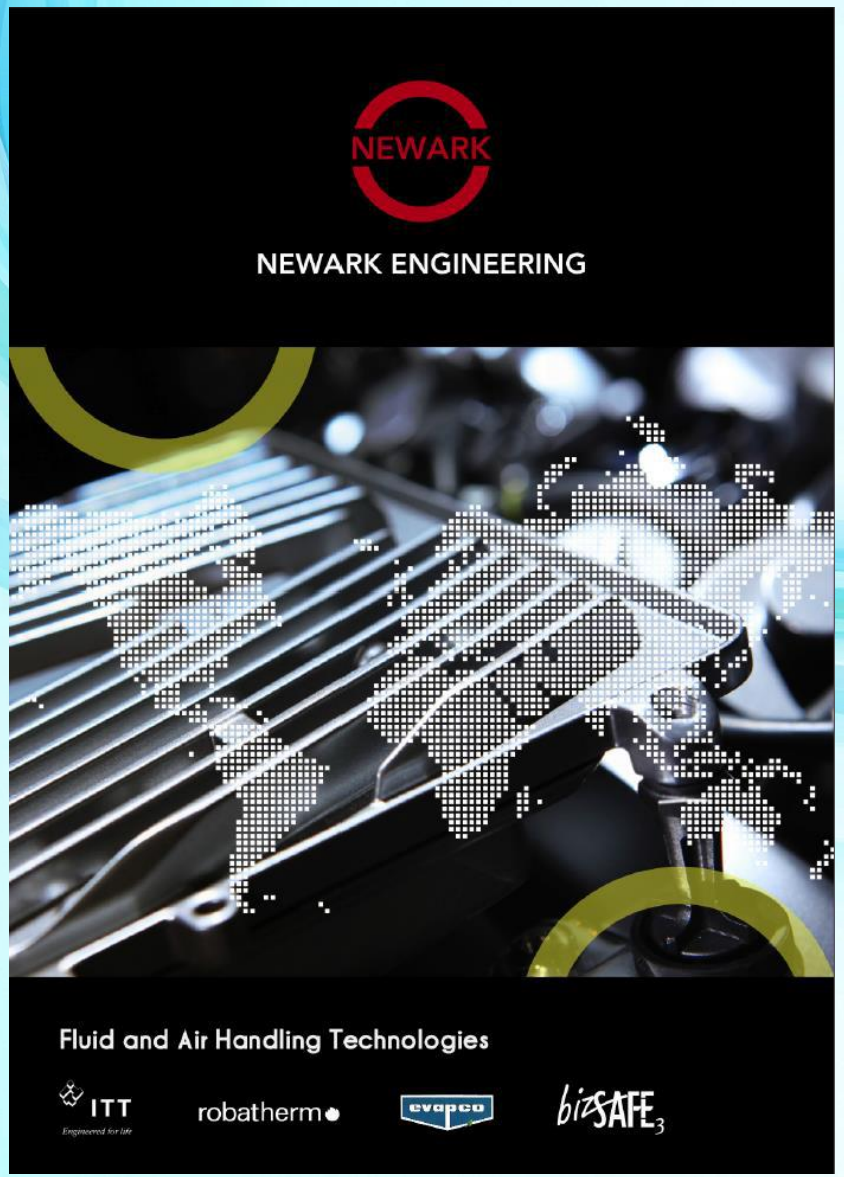
ARMSTRONG

evapco





Since 1992…

25 years of experience in Fluid & Air Handling…

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Robatherm Head Office in Burgau, Germany



Robatherm Factory in Amata, Thailand

- *INTERIOR – SPACE CONSTRAINT WITH TECHNOLOGY SOLUTION*
- *WEATHER PROOF – OUTDOOR EMPLOYMENT*
- *HYGIENE – HOSPITALITY, PHARMA & FOOD*
- *MECH. & THERMAL CHARACTERISTIC – TB1 (BEST IN MARKET)*
- *FAN – PLUG FAN*
- *HEAT RECOVERY – RECYCLING OF ENERGY*
- *CERTIFICATIONS*
- *PROJECT REFERENCES*

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INTERIOR VERSION



- **Flexibility**
- **Design to fit**
- **Different solutions (Heat recovery, dehumidifying, Space Constraint)**

- **Customised Products**

- Solutions in 102 mm modular dimensions

- Air output from 1,000 m³/h to 320,000 m³/h



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WEATHER PROOF VERSION



- **Secure protection against the weather**
- **Long lifespan**



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HYGIENE VERSION



- Safe and hygienic
- Easy to clean – Smooth Stainless Steel Floor
- Easy to maintain – Accessible from both sides
- Certified by ILH Berlin
- Inner casing galvanized & anti-microbial powder coated

MECHANICAL & THERMAL CHARACTERISTICS

Housing Characteristic	Class attained by Robatherm (DIN EN 1886)
Thermal Bridging	TB1
Thermal Transmittance	T2
Air Tightness	L1 (M)
Filter Bypass Leakage	F9
Casing Strength	D1 (suction side) D2 (pressure side) (M)

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Thermal Bridging (DIN EN 1886)

Definition : An area of an object which has a significantly higher heat transfer than the surrounding materials resulting in **reduction in thermal insulation** of the object.

Robatherm: **TB1** (highest class), k_b = 0.75 or above

Consequences of low Thermal Bridging Factor (k_b):

Condensation forms easily

Energy loss

Reduce AHU life span

Practical example: Condensation risk in summer

Basic conditions		Condensation starts at	
Installation indoors		TB4 (k_b=0,30)	22 °C, 71 % r. h.
Operating mode	summer	TB3 (k_b=0,45)	22 °C, 76 % r. h.
Temperature after chiller	14 °C	TB2 (k_b=0,60)	22 °C, 82 % r. h.
Mech. equipment room temp.	22 °C	TB1 (k_b=0,75)	22 °C, 89 % r. h.

Thermal Transmittance (DIN EN 1886)

Definition : A measure for an AHU's **heat loss per square meter and Kelvin**. Thermal transmittance coefficients are determined for the overall casing construction.

Robatherm: **T2** (second highest class)

Tested using noncombustible mineral wool and market standard insulation thicknesses

Consequences of high thermal transmittance coefficient:

Higher power consumption

Reduce efficiency of AHU

Energy loss

Filter Bypass Leakage (DIN EN 1886)

Definition : A measure for leakage occurs at the **filter frame** of an AHU. DIN EN 1886 allows **maximum leakages** of up to 0.5% with F9 filters. F9 is the highest tightness class with lowest filter bypass leakage.

Robatherm: **F9** (Test pressure: ±400 Pa)

Tested using noncombustible mineral wool and market standard insulation thicknesses

Consequences of high filter bypass leakage:

Risk of contamination

Loss of Energy

Critical for hygiene purpose (Hospital OT)

FAN- PLUG FAN



Up to 1800 Pa, 60,000 CMH

- **Easy to clean and maintain**
- **Reliable**
- **Higher overall efficiency compared to Centrifugal Fan**
- **VSD compatible**
- **No belt loss**
- **Integrated VSD**

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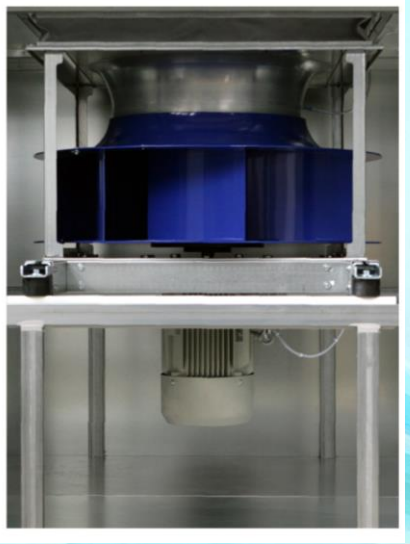
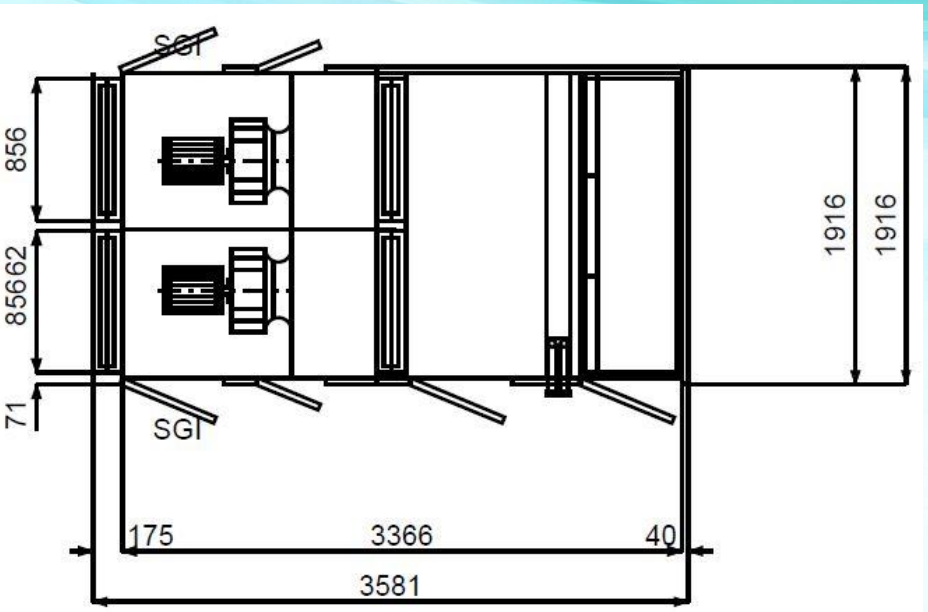
CONFIGURATION OF PLUG FAN



Plug Fan with Vertical Axis

- Air flow direction up or down
- Reduced pressure loss
- Reduce space requirements



Multiple Plug Fan Configuration

- 100% Redundancy Options
- Separate chamber with dampers

OTHER OPTIONS OF FANS



Centrifugal Fan

- Up to 1800 Pa, 150,000 CMH
- Belt Driven
- Capable of high flow rate
- More space required
- More maintenance work



EC Fan

- Smaller size
- IE4 motor (standard)
- Redundancy available with multiple fans configuration
- Lower noise level
- Up to 1000 Pa, 10,000 CMH
- VSD integrated to motor

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HEAT RECOVERY

HEAT RECOVERY SOLUTION

- HEAT ROTOR EXCHANGER
- PLATE HEAT EXCHANGER
- RUN-AROUND COIL SYSTEM
- HEAT PIPE

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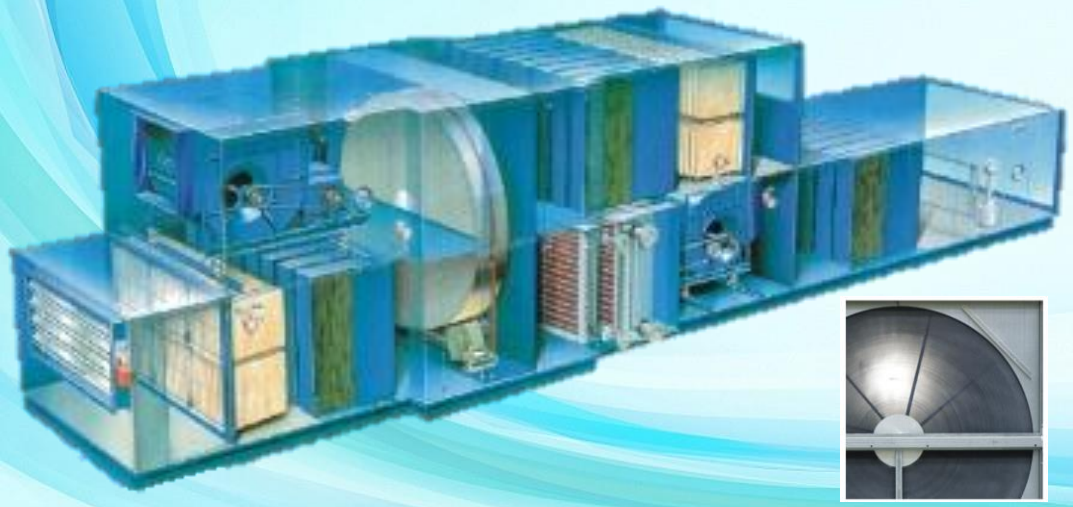
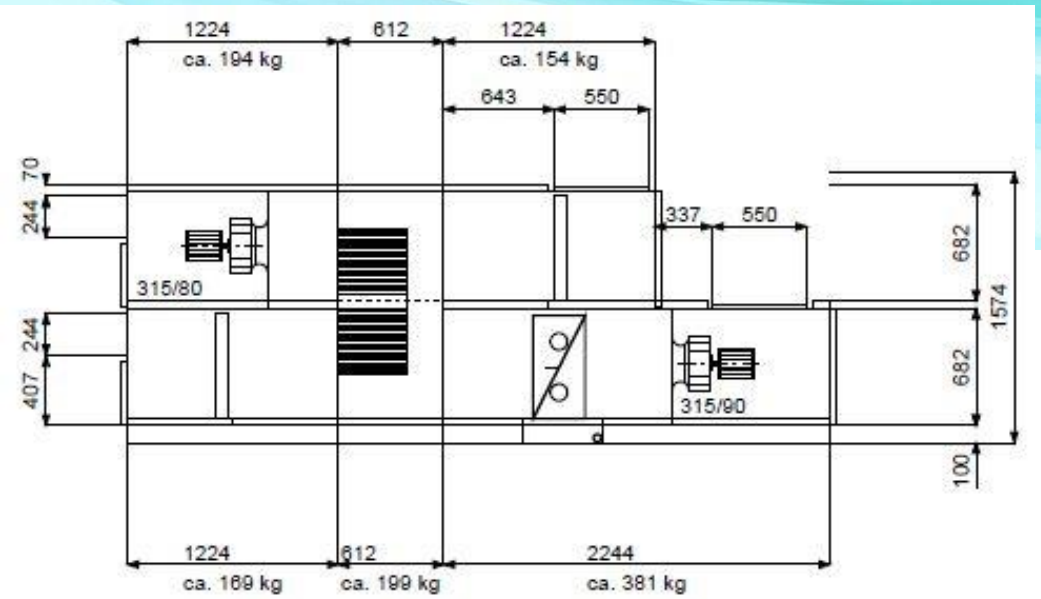
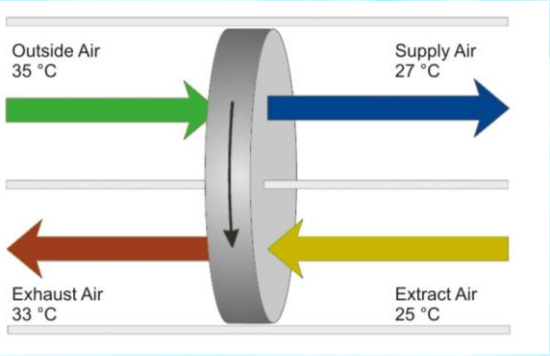
HEAT RECOVERY



Heat Rotor Exchanger

- **Reuse energy from <u>extract air to treat fresh air</u>**
- **High Efficiency**
- **Short Housing**
- **Risk of cross-contamination**
- **Require motor**





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HEAT RECOVERY



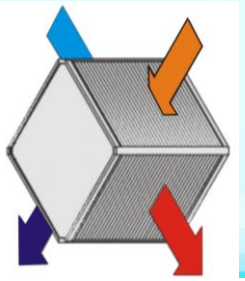
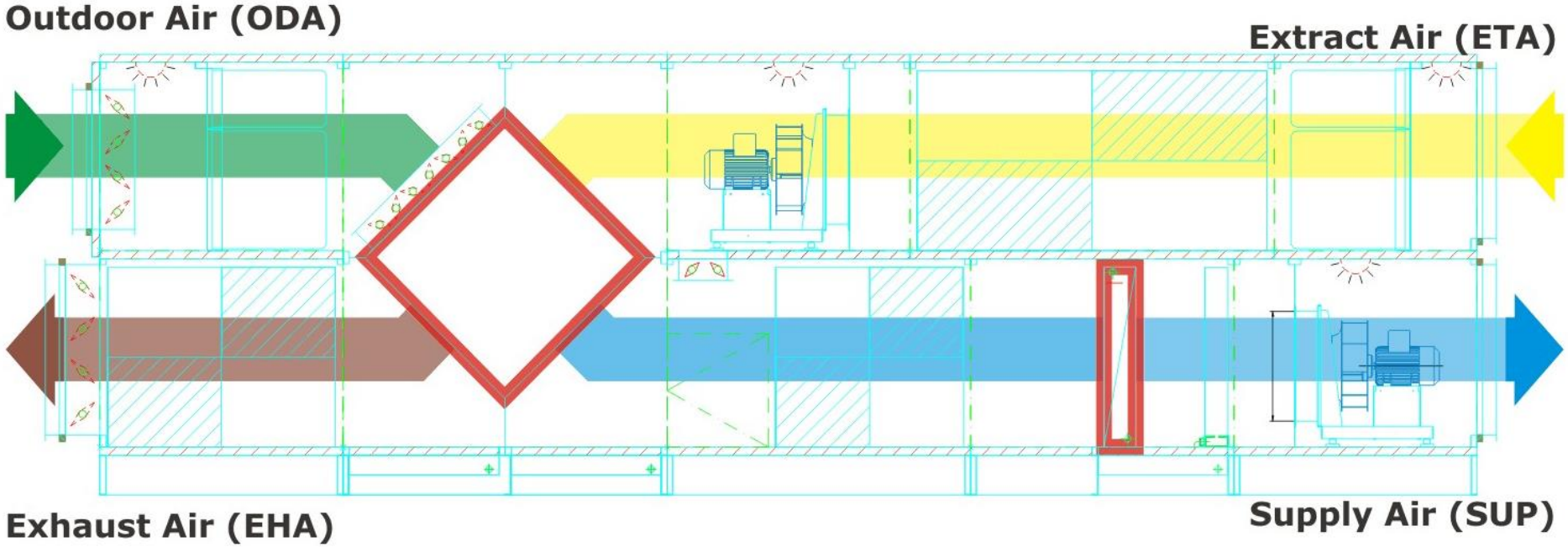


Plate & Frame Exchanger

- Reuse energy from extract air to treat fresh air
- Integrated air bypass
- Separate airways
- Does not require motor
- No cross-contamination



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HEAT RECOVERY



Run Around Coil System

- **Coil design with highest counter current ratio**
- **Multiple units combinable in one heat recovery system**
- **Precool fresh air & reheat offcoil air**
- **Separate Air Flow**
- **Energy savings**

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HEAT RECOVERY



Heat Pipe

- **Space Saving**
- **Isolated Airstream**
- **Low Maintenance as no moving parts**
- **In Cu/Cu, Cu/Al, or Al**
- **Energy Saving**

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CERTIFICATIONS



EUROVENT CERTIFICATION COMPANY SCRL
62 Bd de Sébastopol 75003 Paris FRANCE - RCS Paris B 393 363 460 - Code APE : 748K

Certification Diploma N° :
98.10.002

EUROVENT Certification Company certifies that
Air Handling Units
from
ROBATHERM GMBH+Co.KG
Located at
Industriestrasse 26 Postfach 1160 , 89325 Burgau Germany
Range
RMC|RZ
Software for calculation of performances
INTAP Version 2.6
Trade name
ROBATHERM
have been assessed according the requirements of following standard
OM-5-2006

The list of certified products is displayed at :
http://www.eurovent-certification.com

Manufacturing places
Burgau , Germany
Rayong , Thailand

ROBATHERM GMBH+Co.KG
is authorised to use the EUROVENT Certification mark in accordance with the rules specified in the Operational Manual
OM-5-2006

Jacques BENOIST
Director of certification

Approval date : 30/10/98
Re-checked on : 30/10/06

Valid until : 30/10/09



ZERTIFIKAT ◆ CERTIFICATE ◆ 認証証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

TÜV SÜD Management Service

ZERTIFIKAT

Die Zertifizierungsstelle
der TÜV Management Service GmbH
bescheinigt, dass das Unternehmen

robatherm GmbH + Co. KG
Industriestraße 26
D-89331 Burgau

robatherm Co., Ltd.
Amata City Industrial Estate
7 / 208 Moo 6, Mab
Yangporn, Pluakdaeng
Rayong 21140, Thailand

für den Geltungsbereich

Entwicklung, Produktion, Verkauf,
Montage und Kundendienst von wärme- und
klimatechnischen Geräten

ein Qualitätsmanagementsystem
eingeführt hat und anwendet.
Durch ein Audit, Bericht-Nr. **70006281**
wurde der Nachweis erbracht, dass die Forderungen der

ISO 9001: 2000

erfüllt sind. Dieses Zertifikat ist gültig bis **2008-06-05**
Zertifikat-Registrier-Nr. **12 100 20078 TMS**

München, 2005-06-29

TGA-ZM-07-02

TÜV Management Service GmbH · TÜV SÜD Gruppe · Zertifizierstelle · Ridlerstrasse 65 · 80339 München · Germany



INSTITUT FÜR LUFTHYGIENE
Luft und Wasser: Planung, Analysen, Sanierungskonzepte

ILH BERLIN

HYGIENE-KONFORMITÄTSPRÜFUNG
(Kurzfassung)

robatherm-Lüftungszentralgeräte der Baureihen RMC und RZ

Gegenstand der Prüfung
Im Auftrag der Fa. Fa. robatherm GmbH, Industriestraße 26, D-89325 Burgau, Deutschland wurde überprüft, inwieweit die Hygieneanforderungen der VDI 6022, Blatt 1 (04/06), der VDI 3803 (10/02), der DIN 1946, Teil 4 (1/1994 und Entwurf 04/2005), der ÖNORM H 6021 (09/03), der ÖNORM H 6020-1 (09/1999) der SWKI VA104-01 (04/06), der SWKI 99-3 (03/04) und der DIN EN 13779 (05/05) von den Lüftungszentralgeräten der Baureihen RMC und RZ eingehalten werden. Zur Erstellung des vorliegenden Gutachtens wurden am 25. und 26.09.2006 Mustergeräte der o.g. Baureihen im Werk der Fa. robatherm, Burgau mit den in Kap. 2.1 der Langfassung zu diesem Prüfbericht aufgeführten Komponenten besichtigt sowie verschiedene Datenblätter, technische Dokumentationen und Prüfberichte (vgl. Gutachten Langfassung, Kap. 2) ausgewertet.

Zusammenfassung des Prüfergebnisses
Die Prüfung des o.g. Gerätemusters sowie die Sichtung der zur Verfügung gestellten Unterlagen und prüfbaren Belege ergaben, dass die Hygieneanforderungen der o.g. Regelwerke von den Lüftungsgeräten der geprüften Baureihe eingehalten werden (vgl. Gutachten Langfassung).

Die Übereinstimmung der überprüften robatherm-Lüftungszentralgeräte der Baureihen RMC und RZ den Hygieneanforderungen der o.g. Regelwerke wird daher bestätigt.

Gültigkeitszeitraum: 06.2007 – 05.2010 (3 Jahre)

Institut für Lufthygiene geprüft RLT-Hygiene 2007-2010

Hygienerelevante Merkmale
VDI 6022 (D)
VDI 3803 (D)
ÖNORM H 6021 (A)
SWKI VA104-01 (CH)
DIN EN 13779 (EU)
DIN 1946 Teil 4 (D)
SWKI 99-3 (CH)
ÖNORM H 6020-1 (A)

geprüft durch ILH BERLIN
Registriernummer: HKP/D/002b/Bro/0607/0510/MZ

Gutachter: Dr.-Ing. M. Möritz
Berlin, den 15.06.2007

EUROVENT

- Guarantees that the required performance data are correct
- According to DIN, EN and ISO standards

Process Quality

- Quality management system
- DIN EN ISO 9001:2000

Hygiene Certificate

- Hygiene Guidelines

VDI 6022, VDI 3803 (D), ÖNORM H 6021 (A), SWKI VA104-01 (CH), DIN EN 13779 (D)

- Hospital guidelines

DIN 1946 part 4 (D), SWKI 99-3 (CH), ÖNORM H 6020-1 (A)

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PROJECT REFERENCES

No	Project	Year	Type
1	HI TECH DATA	2016	Indoor Hygiene
2	SHANGRI-LA HOTEL	2016	Indoor Hygiene
3	BAXTER BIOSCIENCE MANUFACTURING SARL SINGAPORE	2015	Indoor Hygiene
4	HOLIDAY INN SHOPPING-MSCT, SG	2015	Indoor Hygiene
5	BAXTER BIOSCIENCE MANUFACTURING SARL SINGAPORE	2014	Indoor Hygiene
6	HOLIDAY INN SINGAPORE	2014	Indoor Unit
7	PHILIP ELECTRONIC SINGAPORE	2014	Indoor Unit
8	JURONG GENERAL HOSPITAL	2014	Antimicrobial
9	LANXESS	2014	Weather Proof
10	YETI-S	2013	Indoor Unit
11	HOLIDAY INN SINGAPORE	2013	Indoor Unit
12	YETI-S	2013	Indoor Unit
13	BAXTER BIOSCIENCE MANUFACTURING SARL SINGAPORE	2013	Indoor Unit
14	3M TUAS INNOVATION	2013	Indoor Unit
15	PHILIP ELECTRONIC SINGAPORE	2013	Weather Proof
16	THERMO FISHER SCIENTIFIC	2013	Indoor Unit

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THANK YOU

