



CO2 便利店解决方案

CO2 Solutions for C-Store

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我们的使命 OUR MISSION



我们为食品品质
保驾护航
WE HELP ENSURE
FOOD QUALITY



我们与环保同行
蓄力共赢
WE ARE ENVIRONMENTALLY
RESPONSIBLE
AND DRIVE SUSTAINABILITY



我们用尖端科技
赋能未来
WE EMPOWER
THE FUTURE THROUGH
CUTTING-EDGE TECHNOLOGY



我们让产业生态
效率革命
WE PROVIDE
INDUSTRY-LEADING
HIGH EFFICIENCY SOLUTIONS

做商用冷冻行业的领跑者。为减少食品浪费不懈努力，为食品安全保驾护航。

We lead the commercial refrigeration business. Our relentless effort contributes to reduce food waste and protect food safety.

以创新的技术、优异的质量、卓越的服务、严谨合规的商业道德和高效的管理，致力为客户提供节能环保，更佳全生命周期成本的整体解决方案。

Through innovative technologies, distinguished quality and services, strict business ethics, and efficient management, we are committed to provide our customers with energy efficient, environmental friendly, and better lifecycle cost solutions.

ENVIRONMENT FRIENDLY TO PROTECT THE BLUE PLANET



蒙特利尔协议 1987
Montreal Protocol



为避免氟氯碳化物对地球臭氧层继续造成恶化及损害，蒙特利尔议定书中对CFC-11, CFC-12, CFC-113, CFC-114, CFC-115等五项氟氯碳化物 (HCFCs) 及三项海龙的生产做了严格的管制规定并制定逐步淘汰计划

In order to prevent the CFCs in industrial products from continuing to cause deterioration and damage to the Earth's ozone layer, the 1985 Convention for the Vienna Convention for the Protection of the Ozone Layer was signed to state a series of stepped limits on CFC use, production and phase out plan



京都议定书 1997
Kyoto Protocol



1997年12月在日本京都由联合国气候变化框架公约参加国三次会议制定。其目标是“将大气中的温室气体含量稳定在一个适当的水平，进而防止剧烈的气候改变对人类造成伤害”

It was established in December 1997 in Kyoto, Japan, by the third meeting of the United Nations Framework Convention on Climate Change. The goal is to “stabilize the greenhouse gas content in the atmosphere at an appropriate level to prevent severe climate change from harming humans”



基加利修正案 2016
Kigali Amendment



2019年1月1日，“蒙特利尔议定书”基加利修正案生效。根据基加利修正案，各国承诺在未来30年内将氢氟碳化物 (HFCs) 的使用减少80%以上

On January 1, 2019 the Kigali Amendment to the Montreal Protocol came into force. Under the Kigali Amendment countries promised to reduce the use of hydrofluorocarbons (HFCs) by more than 80% over the next 30 years

CHINA'S ENVIRONMENTAL PROTECTION PERSEVERANCE



2017年9月12日《蒙特利尔议定书》缔结30周年纪念大会
Commemorative meeting of the 30th anniversary of the
Montreal Protocol

“我国要加快基加利修正案的批约进程，为修正案的实施做好充分的准备工作，并且要推动绿色低碳替代技术开发应用，大力发展臭氧层友好、气候友好、符合节能安全要求的替代技术。”

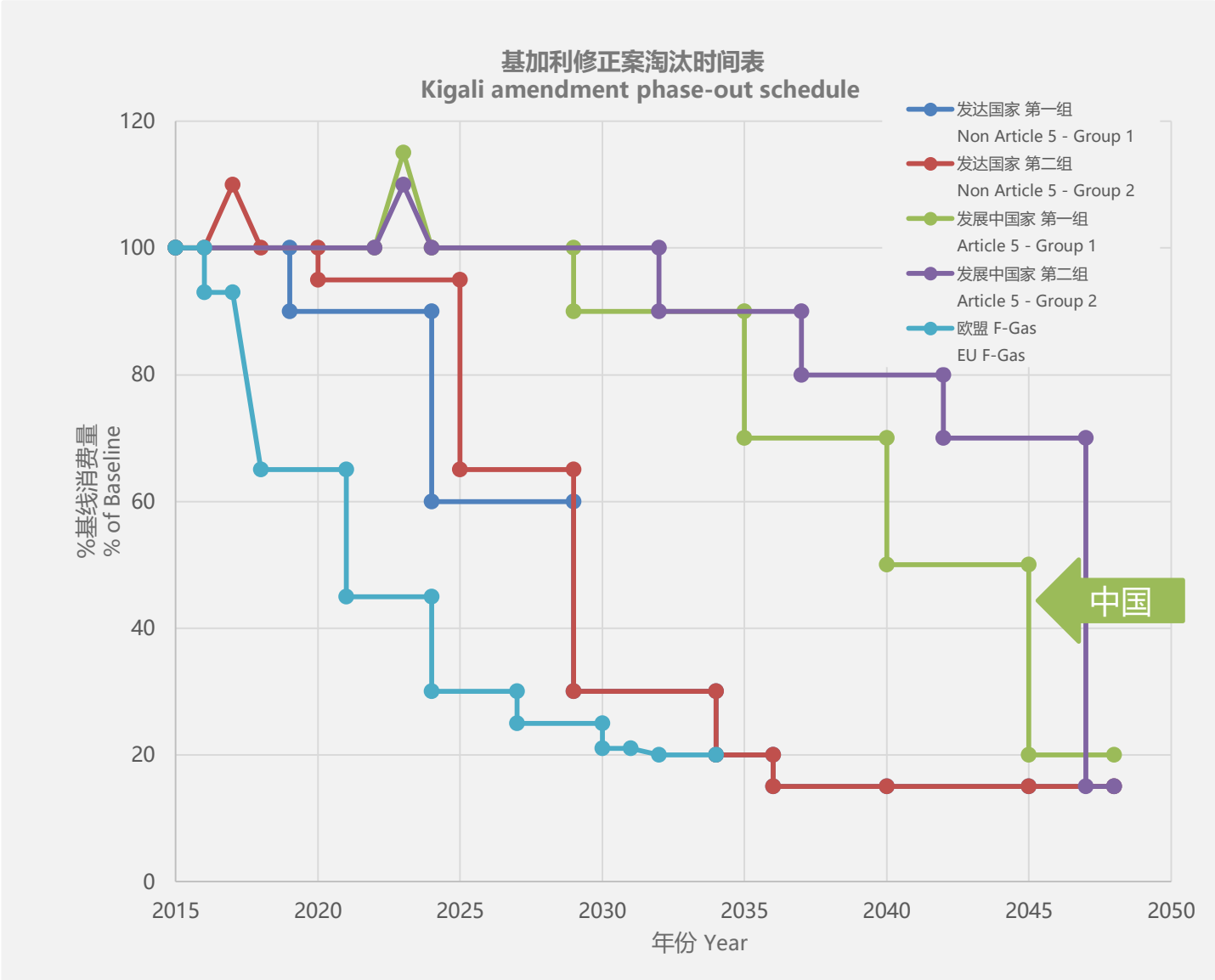
"China should speed up the ratification process of the Kigali amendment, fully prepare for the implementation of the amendment, and promote the development and application of green low-carbon alternative technologies, and vigorously develop the friendly, ozone-friendly and energy-saving safety requirements of the ozone layer. Alternative technology."

——摘自环保部部长在《蒙特利尔议定书》缔结30周年纪念大会上的讲话
Speech from the Minister of Environmental Protection at the 30th
Anniversary of the Montreal Protocol

中国HCFC/HFC制冷剂淘汰计划



CHINA HCFC/HFC REFRIGERANT PHASE OUT PLAN



发达国家 第一组 基线
Non Article 5- Group 1

基线年： 2011-2013
Baseline year: 2011-2013

基线消费量： HFC平均消费量的GWP值 + 15%的HCFC基线消费量
Baseline: average HFC consumption of GWP + 15% of HCFC baseline

发达国家 第二组
Non Article 5- Group 2

基线年： 2011-2013
Baseline year: 2011-2013

基线消费量： HFC平均消费量的GWP值 + 25%的HCFC基线消费量
Baseline: average HFC consumption of GWP + 25% of HCFC baseline

第二组： 白俄罗斯， 俄罗斯。 哈萨克斯坦， 塔吉克斯坦， 乌兹别克斯坦
Group 2: Belarus, Russia. Kazakhstan, Tajikistan, Uzbekistan

发展中国家 第一组
Article 5 - Group 1

基线年： 2020-2022
Baseline year: 2020-2022

基线消费量： HFC平均消费量（或生产量）的GWP值 + 65%的HCFC基线消费量
Baseline: average HFC consumption (or production) of GWP + 65% of HCFC baseline

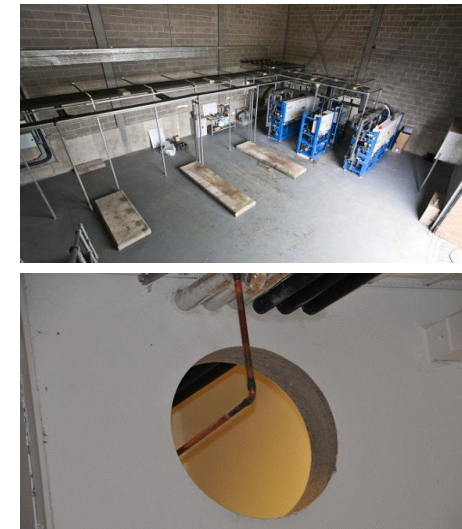
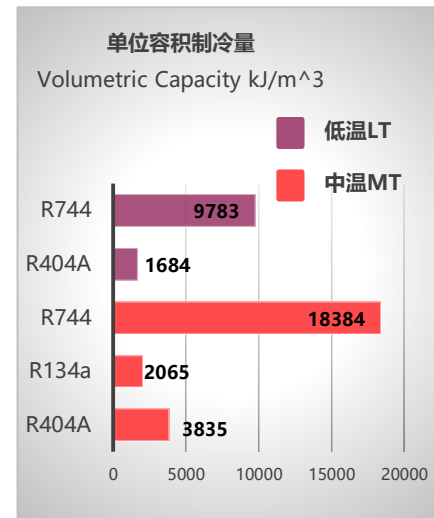
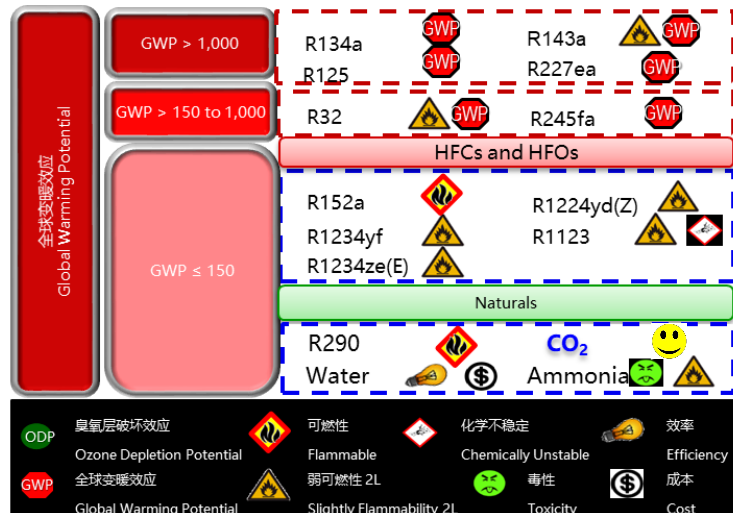
发展中国家 第二组
Article 5 - Group 2

基线年： 2024-2026
Baseline year: 2024-2026

基线消费量： HFC平均消费量（或生产量） + 65%的HCFC基线消费量
Baseline: average HFC consumption (or production) of GWP + 65% of HCFC baseline

第二组： 印度， 沙特， 巴基斯坦， 科威特， 巴林， 伊朗， 伊拉克， 阿曼， 卡塔尔， 阿联酋
Group 2: India, Saudi Arabia, Pakistan, Kuwait, Bahrain, Iran, Iraq, Oman, Qatar, United Arab Emirates

NATURAL REFRIGERANT CO2



❖ 绿色环保 Natural Refrigerant

- ❖ 全球变暖效应 GWP = 1
Global Warming Potential (GWP = 1)
- ❖ 臭氧层破坏效应 ODP = 0
Ozone Depletion Potential (ODP = 0)
- ❖ 天然物质 (工业生产流程的副产品)
Natural (by-product of other industrial processes)
- ❖ 制取成本低, 且广泛供应
Cost effective and available worldwide

❖ 安全可靠 Safe and Reliable

- ❖ 制冷剂分类等级为A1, 无毒, 不可燃
Classified A1, Non-flammable and Non-toxic
- ❖ 化学特性稳定, 无腐蚀性
Stable chemical properties, Non-corrosive

❖ 节能高效 High Efficiency

- ❖ 密度大, 传热性能好
High density and better heat transfer performance
- ❖ 单位容积制冷量分别比R404A/R134a高 6/9 倍
Volumetric capacity is 6/9 times higher than R404A/R134a.
- ❖ 粘度小, 流动损失小
Low viscosity and less pressure drop

❖ 系统紧凑 Small Footprint

- ❖ 机组占地小, 节省机房空间
Small footprint, saving space area
- ❖ 管路小, 制冷剂充注量少
Small pipe and less refrigerant charge amount
- ❖ 减少管路成本及安装时间
Less cost on piping system and installation

开利冷冻品牌与CO2技术创新之路



CARRIER REFRIGERATION BRAND & CO2 INNOVATION



开利CO2系统市场领先地位



CARRIER CO2 SYSTEM LEADING THE MARKET

2018年底, 全球市场选择CO2作为制冷剂: (来源于SHECCO)

By the end of 2018, global market uses CO2: (source from SHECCO)

- ❖ 全球范围内的应用数量: > 20000
Application quantity among the world: > 20000
- ❖ Carrier和Green & Cool的市场份额: 50%
Carrier / G&C share in the market:: 50%
- ❖ CO2跨临界相对于其他CO2系统, 订单趋势: > 75%
CO2 TC vs others, order trend: > 75%



600+
专利
Patents

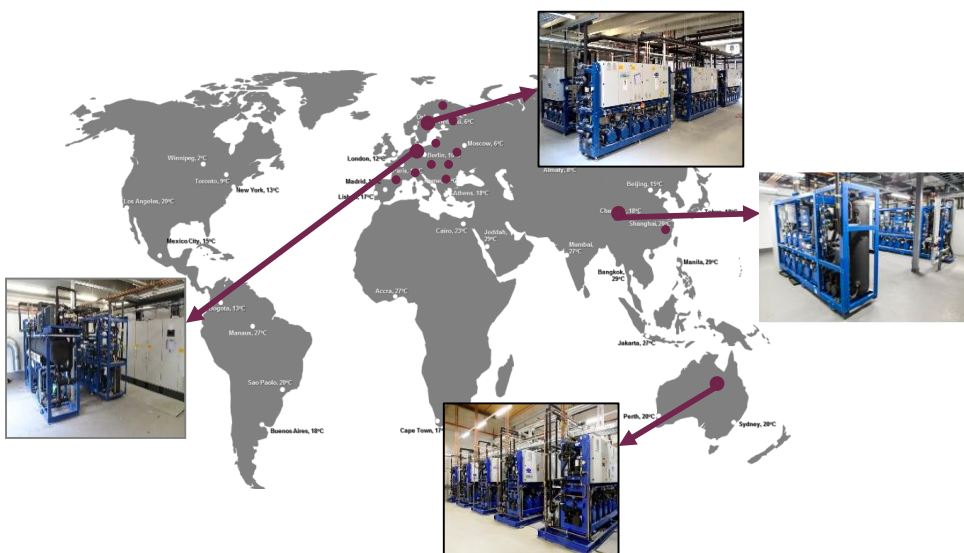


10,000+
欧洲项目
Installations in Europe

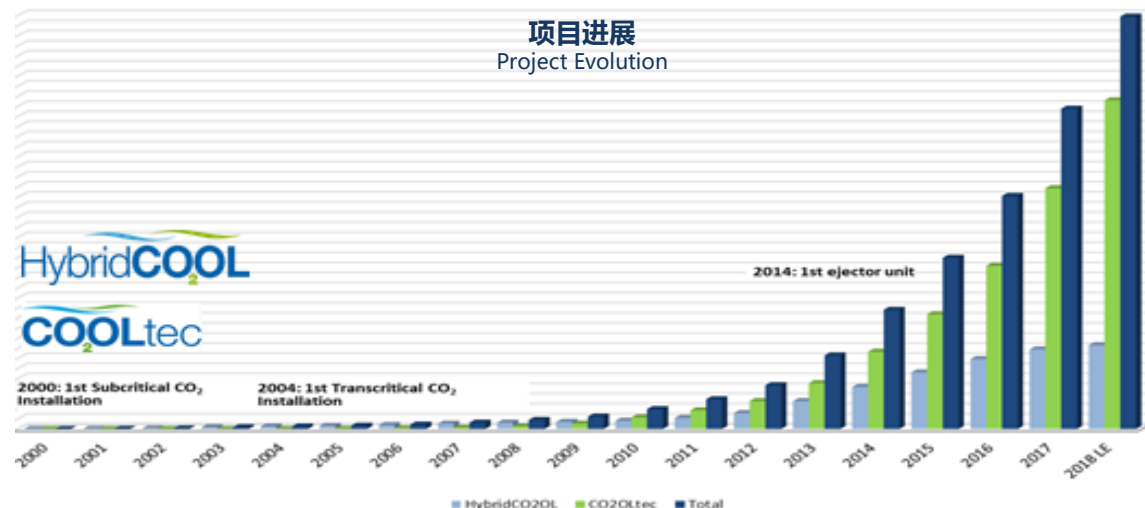


20+ years
行业经验
设计, 制造, 安装及售后
experiences
in design, production,
installations and after services

20+
中国项目
Installations in China



项目进展
Project Evolution

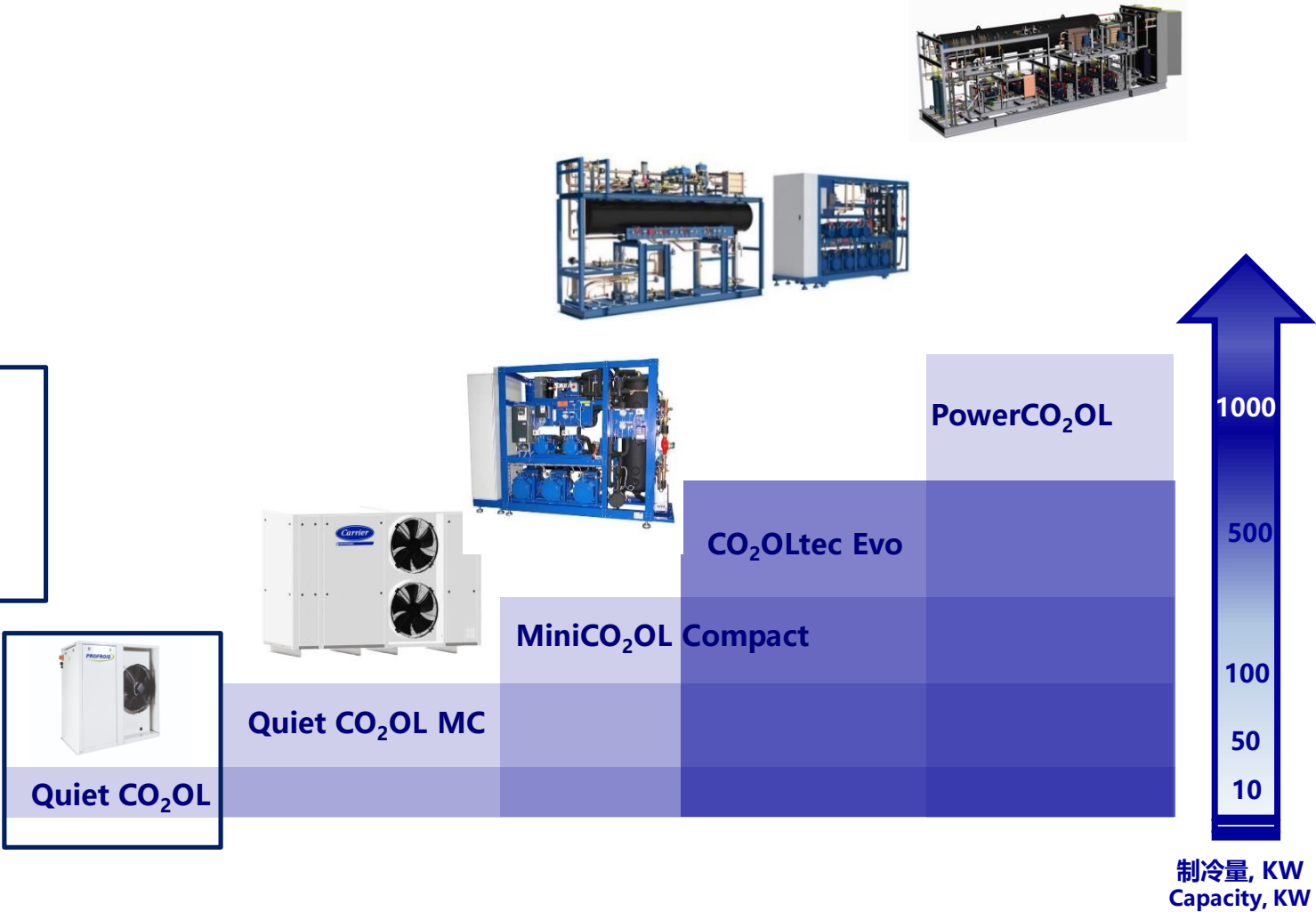


12018年11月状态, 包含亚临界和跨临界, 包含所有品牌
1Status as of end November 2018. Transcritical & subcritical, all brands

开利CO2产品全系列解决方案



CARRIER CO2 PRODUCT FAMILY



QuietCO₂OL机组概要

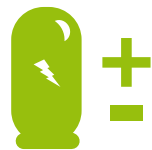
QuietCO₂OL UNIT



QuietCOOL™



制冷
Refrigeration



变频压缩机
Inverter-driven
compressors



风冷系列
Air-cooled



水冷系列
Water-cooled



- ❖ 中温: 0,8 to 9,1 kW¹
MT: 0,8 to 9,1 kW¹
- ❖ 低温: 1,3 to 6,4 kW²
LT: 1,3 to 6,4 kW²
- ❖ 中温 : 1 全封转子压缩机, 25 to 100 rps
MT : 1 hermetic rotary compressor, 25 to 100 rps
- ❖ 低温 : 2 全封转子压缩机, 45 to 100 rps
LT : 2 hermetic rotary compressors, 45 to 100 rps
- ❖ 机组制冷量可以从25%到100%连续调节
Continuous unit capacity variation from 25 to 100%
- ❖ 超低噪音(风扇是CDU噪音的主要来源)
Very Low noise (fan is the dominant source in this CDU)
- ❖ 风冷全系列(6个型号)
Air-cooled version complete range (6 models)
- ❖ 水冷全系列(6个型号)
Water-cooled version complete range (6 models)

¹ MT: -8°C SST, +32°C 环温ambient

² LT: -32°C SST, +32°C 环温ambient

QuietCO₂OL多场景适应性

QuietCO₂OL APPLICATIONS



多应用场景 Multiple Applications



- ❖ 便利店
Convenience stores
- ❖ 小型超市
Small supermarkets
- ❖ 加油站
Gas station
- ❖ 小折扣机店
Small discounter
- ❖ 中小型冷库
Small and medium cold rooms
- ❖ 现有商店扩建
Small and medium cold rooms

优异性能 Premier Performance

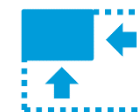


适用于多种气候类型; 从-30°C 到 +43°C
Suitable for multiple climates;
from -30°C to +43°C

非常低的噪音和振动
Very low noise and vibration



MT : 单压缩机 LT : 双压缩机
MT : Single Compressor
LT : Dual Compressor



紧凑的设计增强的可维修性
Compact design with
enhanced serviceability



节能设计 2018
EcoDesign 2018

QuietCO₂OL客户价值



QuietCO₂OL CUSTOMER VALUE



❖ 所有装置的可持续解决方案

A sustainable solution for all installations

- ❖ CO₂ = 自然制冷剂, GWP = 1
CO₂ = Natural Refrigerant - GWP = 1
- ❖ A1 制冷剂 (无毒, 不可燃)
A1 Refrigerant (non-toxic, non-flammable)

❖ 适合每个应用的完整和优化的范围

A complete and optimized range for every application

- ❖ 4 种尺寸,适用于 1 至 10kW 的中温应用
4 sizes for medium temperature applications from 1 to 10kW
- ❖ 2 种尺寸,适用于 0.5 至 7kW 的低温应用
2 sizes for low temperature applications from 0.5 to 7 kW

❖ 配备全封转子压缩机

Equipped with rotary hermetic compressors

- ❖ 低噪音 (37 dB(A) @ 10 m for 7 kW MT)
Low noise level (37 dB(A) @ 10 m for 7 kW MT)
- ❖ 振动减少
Vibration reduction

❖ 配备调速器的压缩机

Compressor equipped with an electronic speed controller

- ❖ 快速连续地适应变化的负载
Fast and continuous adaptation to load variations
- ❖ 减少启停次数
Reduction of on-off cycles



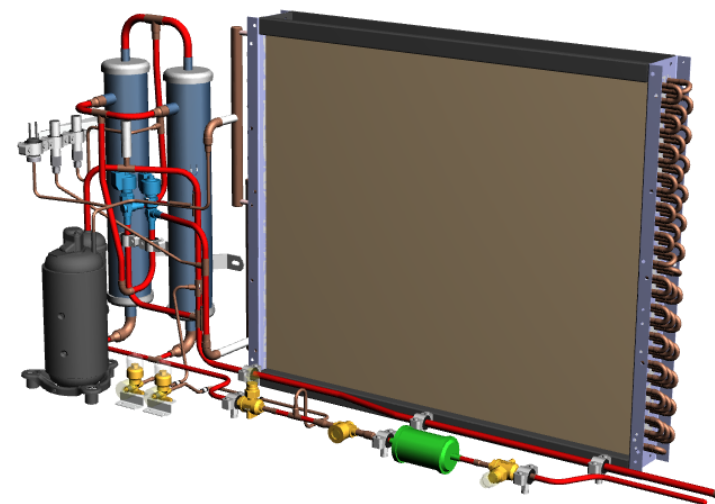
QuietCO₂OL客户价值



QuietCO₂OL CUSTOMER VALUE



- ❖ **经济高效的解决方案 vs. 半封闭解决方案**
Cost-effective solution Vs Semi Hermetic solutions
- ❖ **季节能效比满足2018 Eco-Design法规**
With SEPR matching to 2018 ECO design regulation
- ❖ **设计满足PED类别1**
Designed for PED Category 1
- ❖ **安装简单且经济 (最大80bar -> 不需要安全阀)**
Simple and economic installation (max 80 bar → no safety relief valves)
- ❖ **无需定期检查**
No periodic inspections needed
- ❖ **装置涵盖各种安装需求**
Units covering a wide range of installations
- ❖ **在同一CO₂回路上进行多组连接**
Multi-station connection on the same CO₂ loop
- ❖ **预设独立单元**
Preset stand alone unit
- ❖ **单位可以与任何类型的常规品牌一起使用**
Unit can be used with any kind of regulation brands
- ❖ **工厂已经预设完成, 便于调试**
Delivered with factory presets for easy commissioning



QuietCO₂OL客户价值



QuietCO₂OL CUSTOMER VALUE



- ❖ **法国制造**
Manufactured in France
 - ❖ 230V / 1 / 50 Hz → 3个型号: MT30, MT50 and LT75
 - ❖ 400V / 3N / 50 Hz → 3个型号: MT67, MT100 and LT167
- ❖ **经过验证的设计**
Proven design
 - ❖ 产品设计理念是结合了Profroid现有系列产品和我们领先的CO₂专业知识
General concept based on existing Profroid ranges combined with our leading CO₂ expertise
- ❖ **轻松维护**
Easy maintenance
 - ❖ 主要部件都易于检修（压缩机，控制阀.....）
Main components are easily accessible (compressor, control valves,...)
- ❖ **Profroid提供零备件，主要是欧洲货源**
Spare parts available at Profroid and mainly European sources
 - ❖ 包括用于工厂生产的压缩机库存
Including compressor stock for factory production



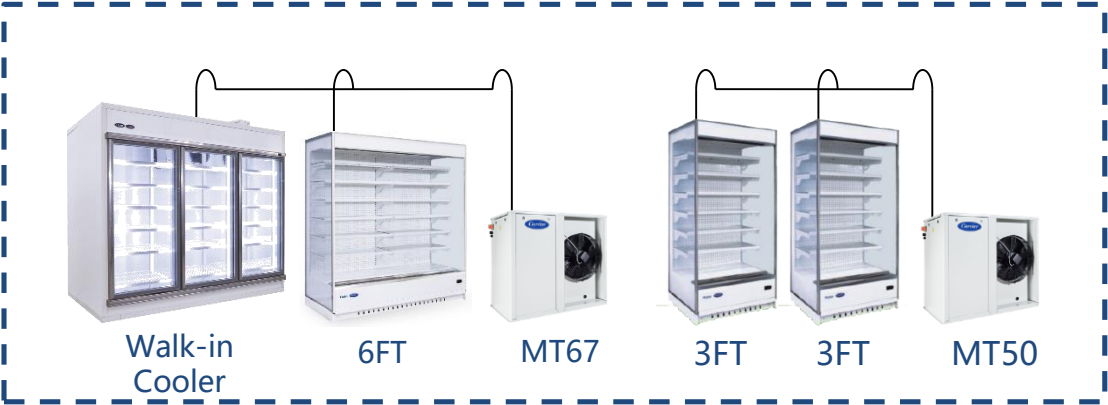
QuietCO₂OL罗森解决方案一



QuietCO₂OL SOLUTION 1 FOR LAWSON

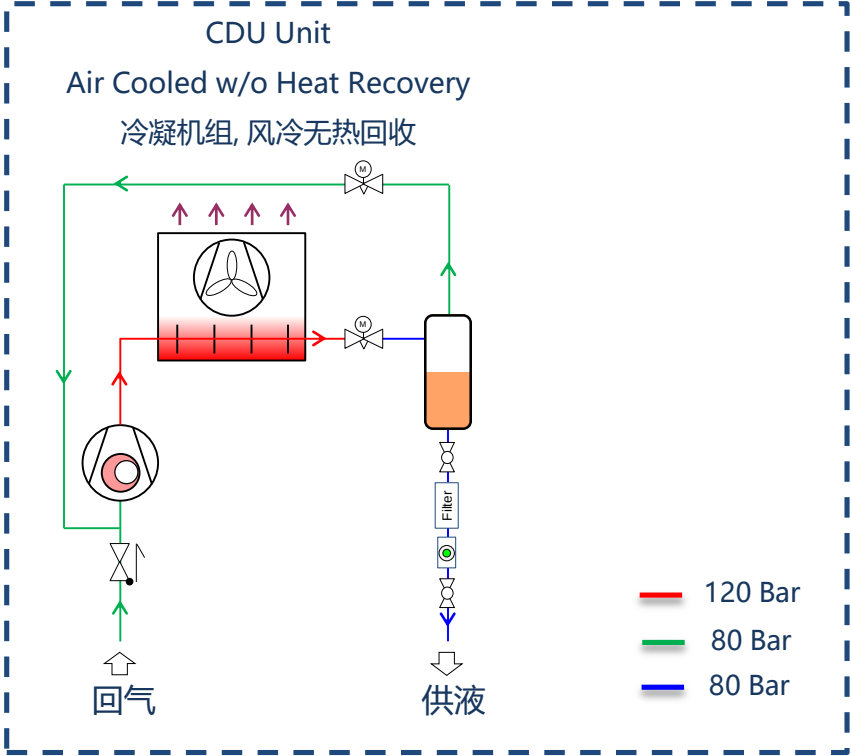


店铺配置



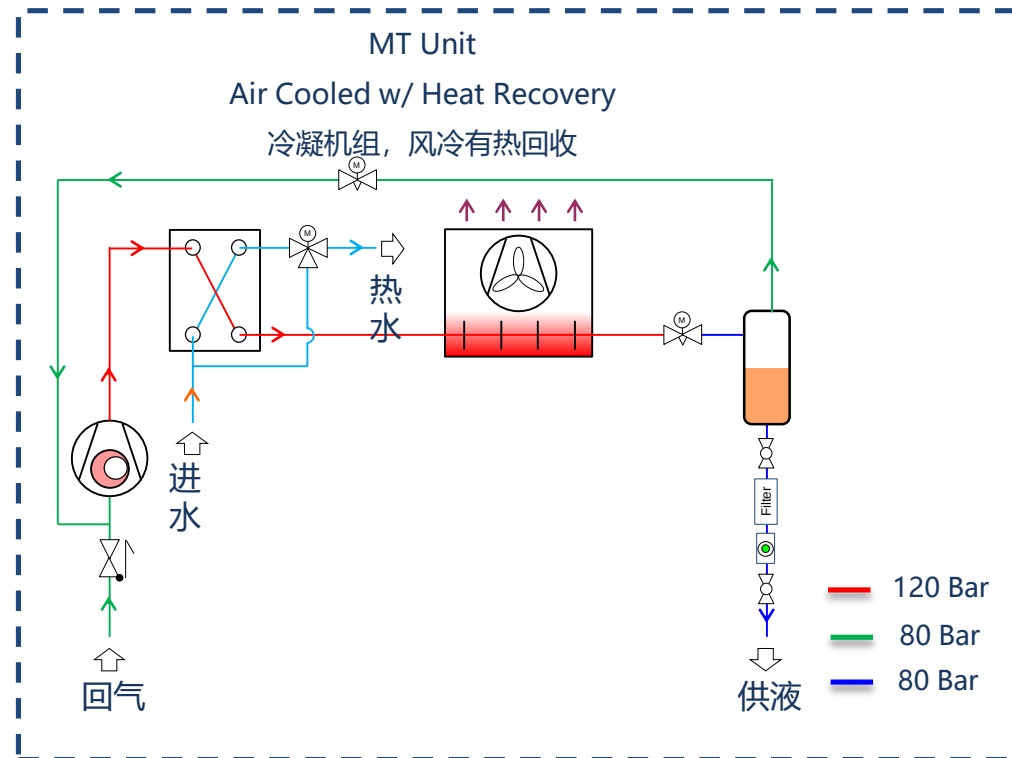
#	柜子	数量	描述	制冷量/W	SST°C
1	CLCR855	1	3ft	1310	-5
2	CLCR855	1	3ft	1310	-5
3	CLCR1710	1	6ft	2350	-5
4	CWC4-22	1	Walk-in cooler	1900	-5

方案一



QuietCOOL²

方案二

17

QuietCO₂OL机组性能



QuietCO₂OL PERFORMANCE



机组 Unit	应用 Application	制冷量 (KW) Cooling Capacity			COP	SEER
		名义 Nominal	最大 Max	最小 Min		
QuietCO2OL MT30	中温 MT	2.25	0.80	3.21	1.76	-
QuietCO2OL MT50	中温 MT	3.41	2.19	4.87	1.76	-
QuietCO2OL MT67	中温 MT	5.02	1.79	7.18	-	2.48
QuietCO2OL MT100	中温 MT	6.82	2.43	9.74	-	2.47
QuietCO2OL LT75	低温 LT	2.04	1.31	2.92	-	1.89
QuietCO2OL LT167	低温 LT	4.54	2.92	6.48	-	1.82

初始条件:
Initial conditions:

- T0= -8°C (中温) T0= -32°C (低温) 环境温度 T = +32°C
T0= -8°C (MT) T0= -32°C (LT) T ambient = +32°C
- Eco 设计条件 : SST -10 or -35°C / 32°C 环境温度
Eco design conditions : SST -10 or -35°C / 32°C ambient temperature
- COP =性能系数
COP = Coefficient of Performance
- SEPR =季节能效比 (Eco-Design 指令)
SEPR = Seasonal Energy Performance Ratio (Eco-design Directive)



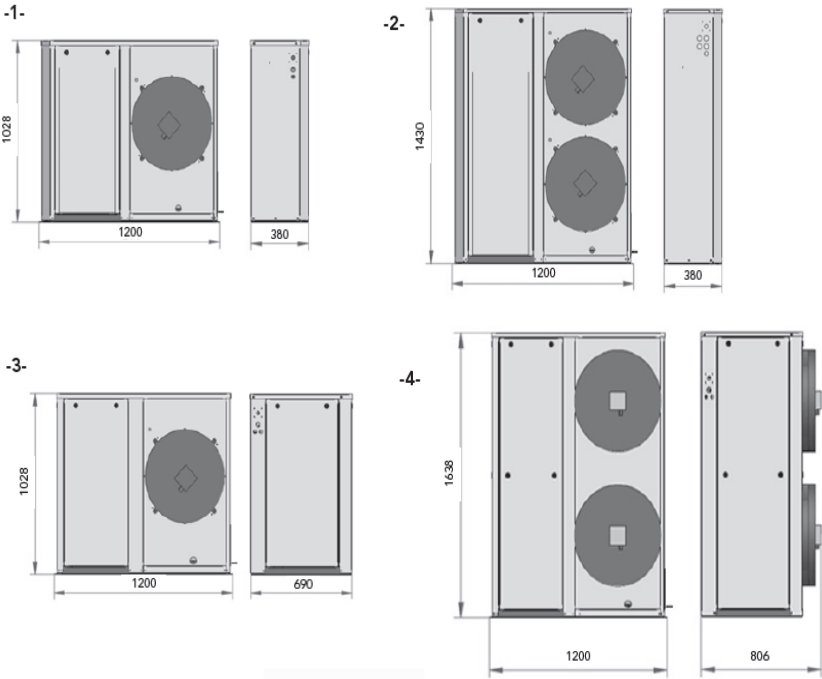
QuietCO₂OL机组尺寸和重量



QuietCO₂OL UNIT DIMENSION AND WEIGHT



温度范围 Temperature Range	中温 MT				低温 LT	
型号 Model	30MT	50MT	67MT	100MT	75LT	167LT
图片 Figure	图1 Fig1			图2 Fig2	图3 Fig3	图4 Fig4
重量 Weight	125 KG	130 KG	160 KG	185 KG	185 KG	210 KG



- ❖ 设计适合欧洲托盘 (1200 x 800 mm).
Designed to fit Euro pallet (1200 x 800 mm).
- ❖ 图 1 和 2 个小单元安装在一个欧洲托盘上。
Fig. 1 and 2 small units are fitting on one Euro pallet.

QuietCO₂OL产品系列



QuietCO₂OL PRODUCT FAMILY

QuietCOOL™



风冷系列
Air-cooled



标准系列 :

Standard Versions

- ❖ 机组配备AC风扇
Units with AC Fan

Polar套件系列(用于在低环境温度下运行<-15°C):

Polar Kit Versions (for operation in low ambient temperatures < -15oC)

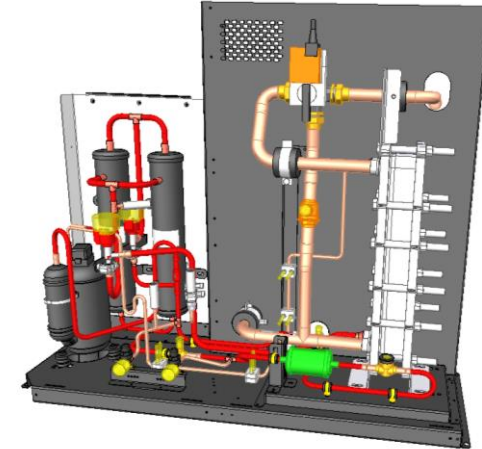
- ❖ EC风机
EC Fan
- ❖ 加热器 + 恒温器,在最冷条件下保护部件
Heater & thermostat, protecting components during coldest conditions

(注: 没有Polar套件,无法订购 EC 风扇)

(Note: EC fans cannot be ordered without the Polar Kit)



水冷系列
Water-cooled



水冷系列 :

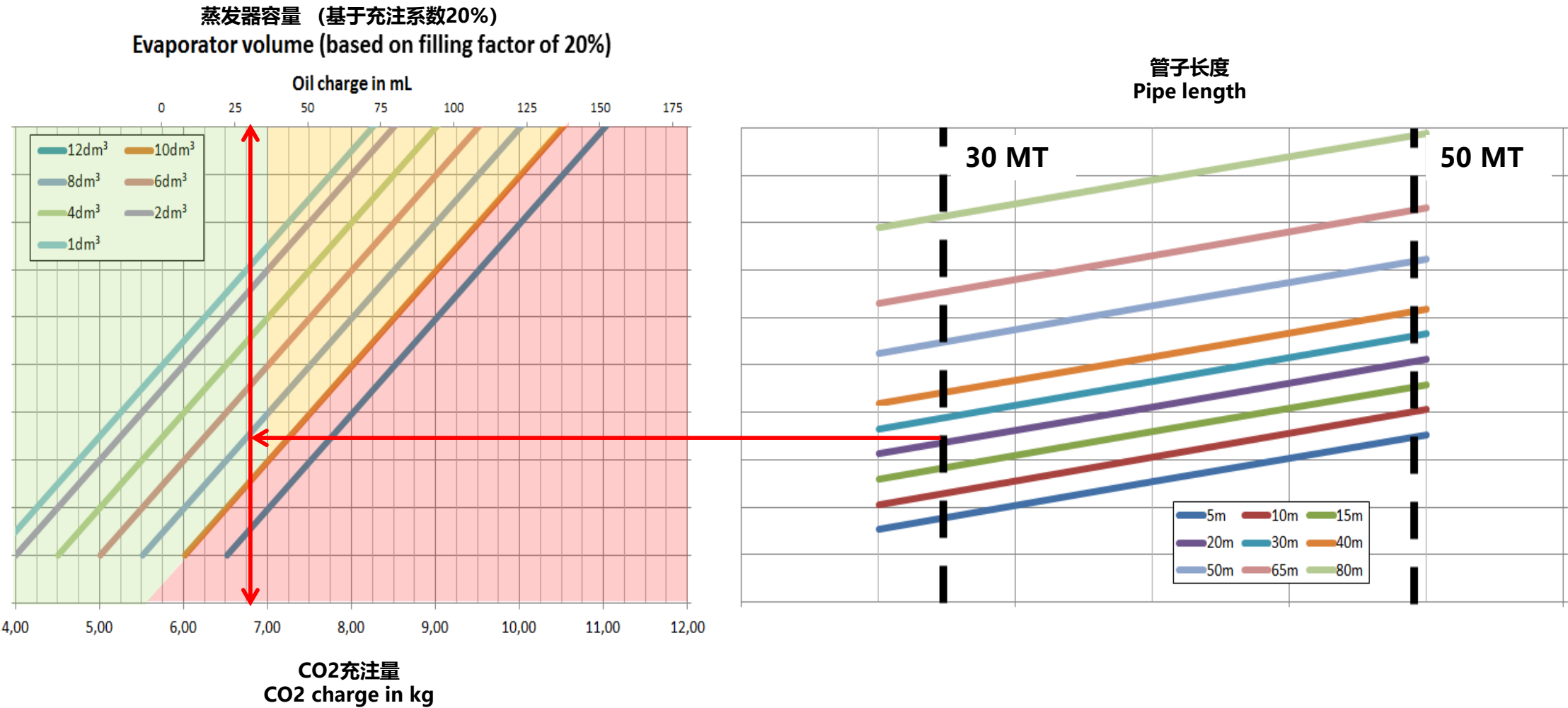
Water-cooled Versions

- ❖ 全系列,配有板式热交换器
Full range available with plate heat exchangers

QuietCO₂OL制冷剂油充注



QuietCO₂OL REFRIGERANT AND OIL CHARGE

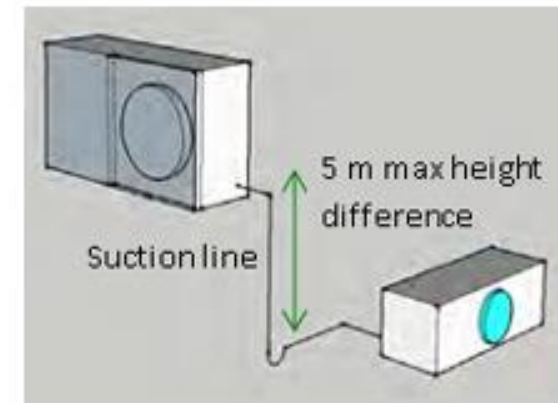
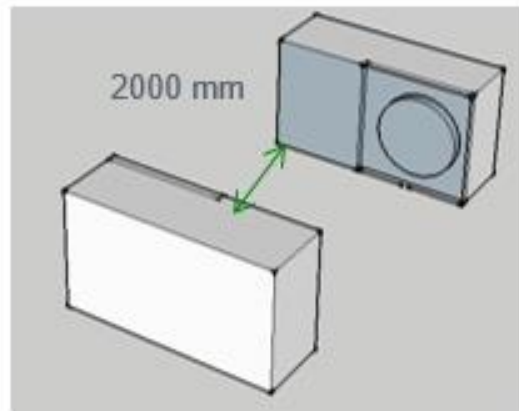
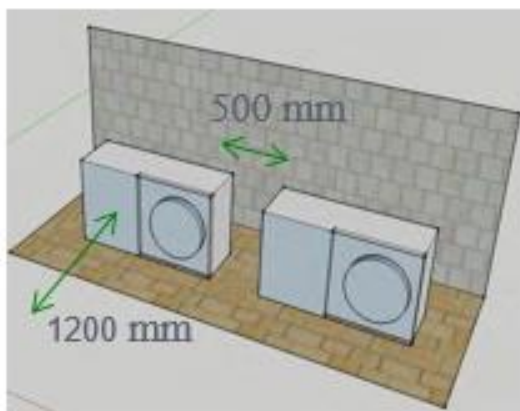
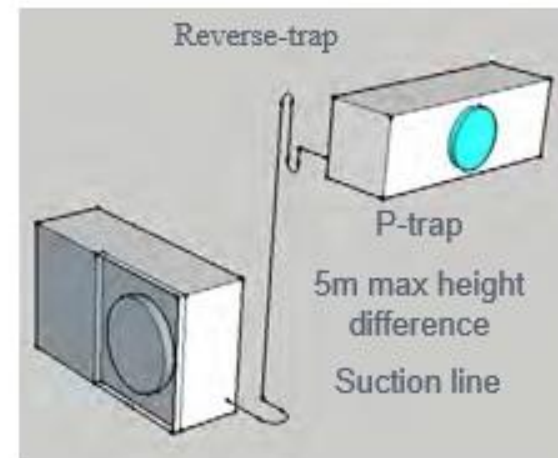
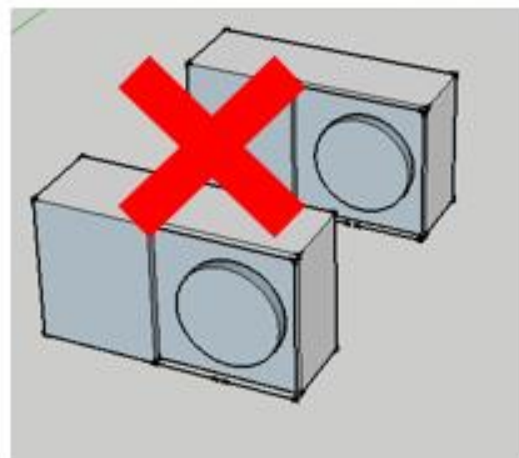
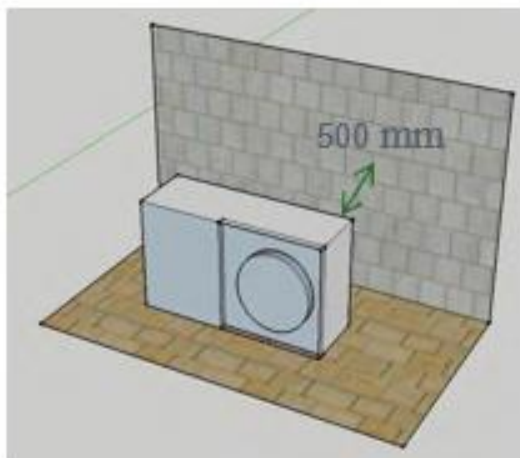


QuietCO₂OL机组安装

QuietCO₂OL INSTALLATION



QuietCOOL™



QuietCO₂OL工程案例

QuietCO₂OL CASE STUDY



ALDI SÜD Asbach (MT100)



ALDI SÜD Monschau (LT167)



ALDI SÜD Nideggen (3xMT100)



开利中国CO2技术实力及实施能力



CO2 R&D CENTER TECHNOLOGY AND CAPABILITIES



CO2 展示厅和测试中心
Showroom and Test Center

- ❖ 提供CO2的服务应用产品培训
Provide CO2 product and application training
- ❖ CO2蒸发器的验证测试
CO2 evaporator testing and verification
- ❖ CO2亚临界和跨临界机组的性能测试
CO2 sub-critical/Transcritical system performance test



- ❖ 从2010年开始，德国研发中心逐渐对上海研发中心的工程师进行CO2的主题培训
Experts from CO2 R&D center Germany have provided training to SRDC engineers since 2010
- ❖ 超过30名的研发工程师在德国的CO2培训中心进行培训，专注于CO2的产品，结构，零部件选型，测试等等
Over 30 engineers have been trained in CO2 R&D center
- ❖ 2018年8月，中国团队总共9人（研发，工程，服务，市场）去欧洲接受了为期三周的培训
9 engineers from engineering, application, service and marketing team travelled to Europe for technical training for 3 weeks in August 2018

开利中国CO2系统测试及仿真能力

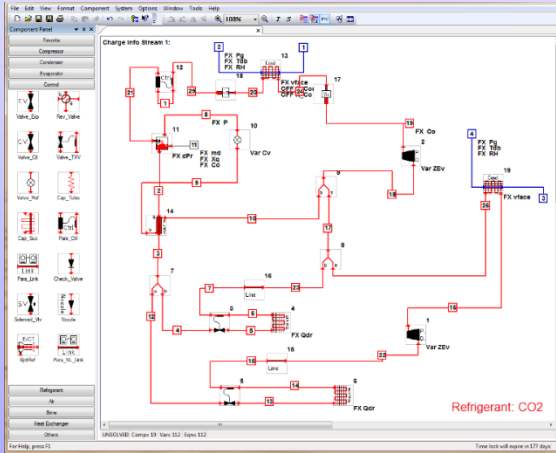


CO2 R&D LAB TEST AND SIMULATION CAPABILITIES

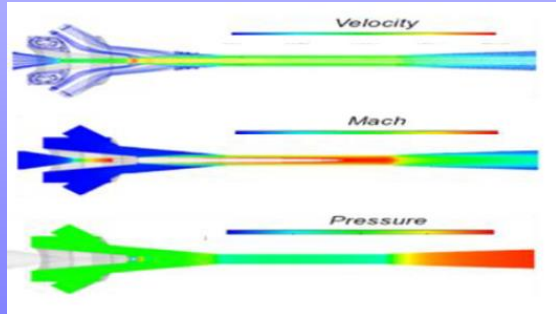


CO2 实验测试
CO2 Lab Test Capability

❖ 跨临界CO2系统仿真
Trans-critical CO2 System Modeling



❖ 喷射器CFD仿真
Ejector CFD Modeling



CO2 系统模拟仿真
CO2 Modeling and Simulation

感谢您的关注!

Thanks for your attention