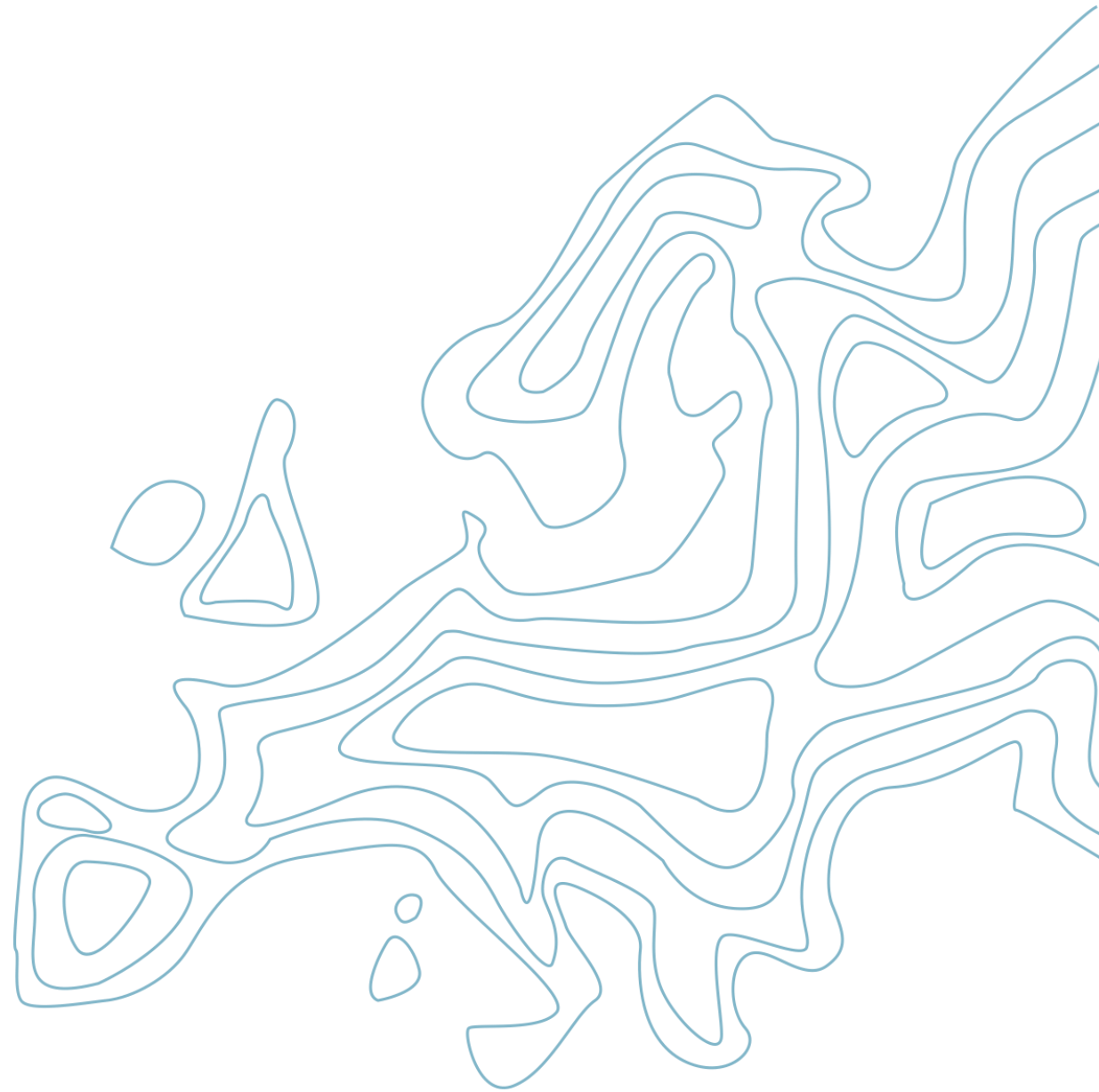


SANHUA

Solutions for Refrigeration Applications

A2L, R290 & CO₂ Components

sanhuaeurope.com





Nikolay Koev

Sales Manager EE

- Based in Bulgaria
- In charge of WHS & OEM business in Central and Eastern Europe



1. Sanhua Company

2. The Montreal Protocol | F-gas Regulation

3. New low GWP refrigerants scenario

4. SANHUA Solutions by Application

5. SANHUA Certification

6. SANHUA Refrigeration Portfolio | A2L, R290 & CO2

7. Sanhua Supporting Tools



SANHUA HOLDING GROUP OVERVIEW

SANHUA



Headquarter location
Hangzhou, Zhejiang, China

Established in
1984

Employees Year 2019
23.000 employees

Total turnover Year 2019
3.93 Billion USD

SANHUA HOLDING GROUP OVERVIEW

SANHUA

15

Production Bases

China, India, Mexico, U.S, Poland, Turkey

37

Sales Companies

Globally

4000+

Patents

23,000

Employees

Globally



SANHUA EUROPE OVERVIEW

SANHUA

Established in 2008, HQ in Madrid

Local Commercial Teams:

Iberia	Poland
Nordic	Russia
France & Benelux	Eastern Europe
Italy	Turkey
DACH	Middle East

Global Portfolio Management

Technical Portfolio Managers all over Europe



45 employees, incl. | Sales Managers & KAM | Technical Sales Managers | Portfolio Managers | Customer Service Assistants | Logistic, Finance, Marketing, etc.

DISTRIBUTION NETWORK

SANHUA



**GLOBAL FOOTPRINT &
LOCAL
SUPPORT**

SANHUA

*Global producer of high-quality
refrigeration components and
leading supplier in HVAC/R
industries since 1984*

**EMEA CENTRAL
WAREHOUSE**

- **LOCATION:** TYCHY (POLAND)

The MONTREAL PROTOCOL

SANHUA

EUROPE: F-GAS Regulation (517/2014)

Application	Refrigerants	Banned since
Domestic refrigerators and freezers	HFCs with GWP \geq 150	01/01/2015
Refrigerators and freezers for commercial use Refers to hermetically sealed equipment.	HFCs with GWP \geq 2500	01/01/2020
	HFCs with GWP \geq 150*	01/01/2022
Stationary refrigeration and air-conditioning equipment Multipack centralized refrigeration systems for commercial use with a rated capacity of less than 40 kW is included. Exception: equipment intended for application designed to cool products to temperatures below -50 °C. Blends with GWP<2500 that have components with a higher GWP (such as R-125) could still be used.	HFCs with GWP \geq 2500	01/01/2020
Multipack centralized refrigeration systems for commercial use with a rated capacity of 40 kW or more Exception: primary refrigerant circuit of cascade systems where HFC with a GWP of less than 1500 may be used. Existing installations prior to that date can use R-134a for service and maintenance until the end of life cycle of the installation. 40 kW applies to the refrigeration capacity of the system at rated conditions at ambient temperature of 32 °C.	HFCs with GWP \geq 150	01/01/2022
Movable room air-conditioning equipment Refers to hermetically sealed equipment which is movable between rooms by the end user, including window air-conditioners.	HFCs with GWP \geq 150	01/01/2020
Single split air-conditioning systems containing less than 3 kg of fluorinated greenhouse gases Refers to those systems for room air conditioning that consist of one outdoor unit and one indoor unit linked by refrigerant piping, needing installation at the site of use. The Regulation does not specify heating/cooling and type.	HFCs with GWP \geq 750	01/01/2025

The F-GAS regulation forbids the use of refrigerants with high GWP level as indicated in table

* This limit will grow to 500 grams (A3) and 1,2kg (A2L) according to new EN IEC 60335-2-89 (under approval)

New Low GWP Refrigerants Scenario

SANHUA

Domestic Household & Light Commercial Refrigeration



Period	Domestic Household Refrigeration	Light Commercial Refrigeration
Now	R1270 (A3; 1) – GWP=2	R404A (A1; 2) – GWP=3922
	R600a (A3; 1) – GWP=3	R452A (A1; 2) – GWP=2140
From 2020 to 2024	R1270 (A3; 1) – GWP=2	R448A (A1; 2) – GWP=1270
	R600a (A3; 1) – GWP=3	R449A (A1; 2) – GWP=1280
From 2025 to 2030	R1270 (A3; 1) – GWP=2	R290 (A3; 1) – GWP=3
	R600a (A3; 1) – GWP=3	R454C (A2L; 1) – GWP=146
		R455A (A2L; 1) – GWP= 145
		R290 (A3; 1) – GWP=3

Condensing Units, Commercial and Industrial racks



Period	Commercial Racks Condensing Units	Industrial Refrigeration
Now	R404A (A1; 2) – GWP=3922	R404A (A1; 2) – GWP=3922
	R452A (A1; 2) – GWP=2140	R744 (A1; 2) – GWP=1
From 2020 to 2024	R448A (A1; 2) – GWP=1270	R717 (B2L; 1) – GWP=0
	R449A (A1; 2) – GWP=1280	
From 2025 to 2030	R744 (A1; 2) – GWP=1	
	R448A (A1; 2) – GWP=1270	R744 (A1; 2) – GWP=1
	R449A (A1; 2) – GWP=1280	R717 (B2L; 1) – GWP=0
	R744 (A1; 2) – GWP=1	
	R744 (A1; 2) – GWP=1	R744 (A1; 2) – GWP=1
	R717 (B2L; 1) – GWP=0	R717 (B2L; 1) – GWP=0

SANHUA Solutions by Application

SANHUA

R290 Plug-in Cabinets with On/Off compressor



Application



Bottle Cooler



Ice Maker



Commercial Fridge



Plug in Cabinet



MDF / LDF / FDF Liquid Line Solenoid Valves

Many different solenoid valves lines with straight layout and high IP degree, compact version, with membrane or piston actuation.



FDF / LDF Hot gas defrost Solenoid valve

Special series with soft sealing to ensure very high tightness.



DTGM and DTGB Filter Driers & SYJ Sight glass

Special SS 1,5in3 filter drier or best in class solid core series.
Sight glass to ensure high visibility & transparency.



TXV RFGB06

Wide range with straight and angle layout ready the for the increased refrigerant charge limits.



SH & EU MCHE Condenser

Innovative and flexible MCHE Refrigerant Charge Reduction up to 70%.

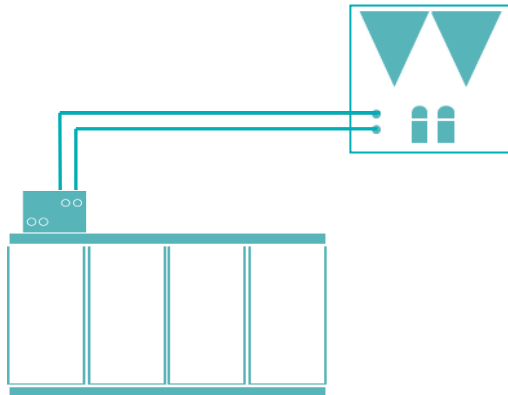
SANHUA Solutions by Application

SANHUA

R290 and R455A Semi Plug-in cabinets (water loop)



Application



Semi Plug-in cabinets (water loop)



YCQ Pressure Sensor

Solder connection for flammable refrigerants.



LPF EEV

Stepper motor Technology
Extremely high internal tightness.



TXV RFGB06 & RFKH

Wide range with straight and angle layout ready the for the increased refrigerant charge limits.



MDF / LDF / FDF Solenoid Valves



DTGM and DTGB Filter Driers & SYJ Sight glass



SEC61x
Superheat controller

Advanced PID algorithm to ensure accurate automatic adjustment of superheat.

SANHUA Solutions by Application

SANHUA

R744 Remote cabinet and Cold room systems



Application



R744 Remote cabinet

R744 Cold room



YCQ Pressure Sensor
Special model for CO₂



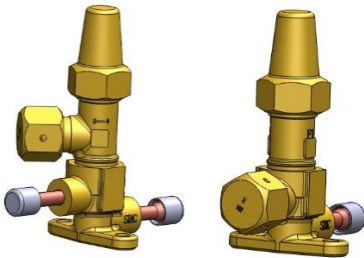
LPF-D EEV
Stepper motor Technology
Extremely high internal tightness.



Remote display
Remote display used as copy key



Ultracap
Ultracapacitor to close the valve if main supply cuts off



CSV Service Valve
MOP 120bar



SEC61x
Superheat controller
Advanced PID algorithm to ensure accurate automatic adjustment of superheat.

SANHUA Solutions by Application

SANHUA

R744 Remote cabinet and Cold room systems



Application



R744 Remote cabinet

R744 Cold room



CBVT Ball valves

Bi-metal ODF or SS butt welding connection. MOP 140bar.



CBV Ball valves

Wide range suitable for sub-critical applications. MOP 60bar.



BCV Check valves

High reliability due to laser welding design. MOP 140bar.



GZJA series

Factory brazed Sub-assembly
Ball Valve + Check Valve
MOP 90bar



DTG-D Filter Drier

MOP 90bar



GDF Solenoid Valve

MOP 140bar

Coming soon

SANHUA Solutions by Application

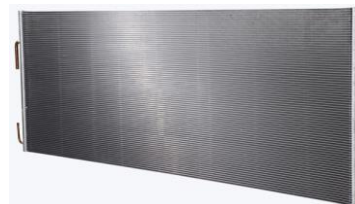
R455A / R454C Condensing units and systems



Application



R455A / R454C
Condensing units



SD MCHE condenser



Liquid Receiver



MDF / LDF / FDF Liquid
Line Solenoid Valves



YCV Check valves



DTG Filter Drier and
SYJ Sight Glass



SEK EEV Kit



SSV Service valve

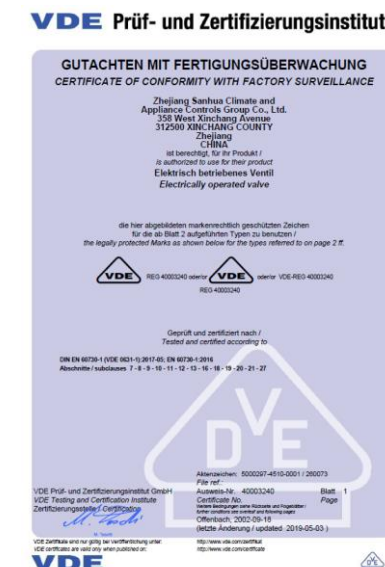


RFKH TXV



SBV Ball valves

SANHUA





A2L





Product Line Series

R290






SANHUA Refrigeration Portfolio

SANHUA

Features

-  Two independent SPDT contacts in dual models: independent LP/HP alarm
-  Double bellows for HP available
-  European PED IV certification as “safety device”
-  Extensive factory tests, exceeding EN12263 requirements

General Specification

-  Applicable for HCFC, HFC, HFO refrigerants
for Flammable (A2L & A3) refrigerants: under development
-  Capacity / Size: Single – LP and HP; Double – LP/HP
-  Medium temperature TS min./max. -40°C /+120°C
-  LP pressure range -0.5~7 bar; HP pressure range 6~32 bar
-  Certification: PED cat.IV (TUV Rheinland)







PS Series








SANHUA Refrigeration Portfolio

SANHUA

Features

-  Extremely high internal tightness, which is as good as with solenoid valves
-  Precise proportional flow regulation
-  Snap-on coil for easier installation
-  Coil with IP67 works safely in extremely environment
-  Applicable for oil-free system; built-in strainer at inlet
-  Flow direction: Uniflow

General Specification

-  Applicable for all common HFCF, HFC, HFO and HC
-  Cooling capacity: from 0.5 to 17.3 kW (R290)
-  Medium temperature TS min./max.: -40°C / +70°C (duty cycle rate below 40%)
-  Design Pressure: 42 bar, MOPD: 35 bar
-  Certifications: Compliance with the EN 60335-2-24 / 2-40 / 2-89 (VDE)

LPF Series



SANHUA Refrigeration Portfolio

SANHUA

Features

- ⚙️ Applicable for reversible systems like heat pumps: bidirectional flow
- 🔊× Optimized flow path design for noise reduction
- ⬡ Wide range
- ⊗ High MOP – 49 bar

General Specification

- ⬡ Applicable for all common HCFC, HFC, HFO, HC
- ❄️ Cooling capacity: from 0.5 to 110 kW (R290)
1 to 164 kW (for R32) – PS=49bar
- 🌡️ Medium temperature TS min./max.: -40°C / +85°C
(duty cycle rate below 50%)
- 🕒 Design Pressure: 49 bar, MOPD: 35 bar
- 🛡️ Certifications: Compliance with the EN 60335-2-24 / 2-40 / 2-89 (VDE)





DPF series







SANHUA Refrigeration Portfolio

SANHUA

Features

-  Advanced PID algorithm to ensure accurate automatic adjustment of superheat
-  Quick-Safe prevention of low and high superheat to ensure the system operating well at any conditions
-  Small size, rail mounting design, easy to install
-  Energy efficient, achieving the most efficient use of the evaporator

General Specification

-  Applicable for various refrigerants
-  Installation method: DIN railsnap-in or wall mounting with screws
-  Compatible with Sanhua DPF and LPF valves
-  Certification: UL, CE Declaration according to EMC




SEC 61x Series






SANHUA Refrigeration Portfolio

SANHUA

Features

-  XHP Connector for SEC61x Controller
-  Available with lead wire direct connector or with Packard and Molex socket connections
-  Different pressure ranges and different level of accuracy

General Specification

-  Applicable for HCFC, HFC, HC, HFO, R32 refrigerants
-  YCQB Ratiometric models with output signal: 0,5V to 3,5V or 0,5V to 4,5V
YCQC models with 4-20mA output signal
-  Certification: Compliance with EN 60335-2-24/40/89 (VDE)





YCQ Series








SANHUA Refrigeration Portfolio

SANHUA

Features

-  Stainless steel capillary, sensing bulb and valve head
-  Precise and smooth flow regulation
-  Patented diaphragm design for less hysteresis and better consistency
-  Wide range: MBP/LBP models, w/wo MOP

General Specification

-  Applicable for HCFC, HFC, HFO refrigerants
-  Cooling capacity: from 1 to 21 kW (R448A/R449A @ +4.4/38°C)
-  Medium temperature TS min./max.: -40°C / +70°C;
extended to -60°C / +70°C for range B models
-  Max. operating pressure PS: 4.6 MPa (46 bar)
-  Certification: PED Art.4.3






RFKH Series








SANHUA Refrigeration Portfolio

SANHUA

Features

-  Compact design with build-in orifice
-  All connections pipes are completely in copper
-  Valves with MOP, Bleed function can be provided to assure reliable compressor operation
-  Applicable in a wide evaporation temperature range
-  Reliable and consistent performance of superheat control

General Specification

-  Special series designed for application with R290
-  Cooling capacity: from 0,6 to 7 kW (R290, +4,4°C/+38°C)
-  Medium temperature TS min./max.: -40°C / +70°C
-  Max. operating pressure PS: 3,5 MPa (35 bar)
-  Certification: PED Art.4.3





RFGB Series








SANHUA Refrigeration Portfolio

SANHUA

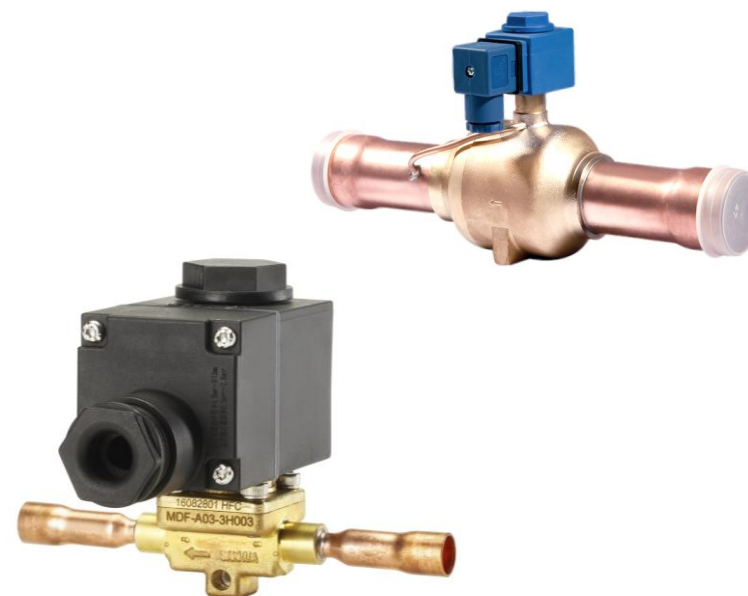
Features

-  High MOP (45/49bar), high MOPD – 31 bar
-  Wide range with Direct or Pilot operated models, different connections
-  Coils are double sealed, watertight and safe, IP67
-  High reliability, extensive factory tests

General Specification

-  Applicable for all common HCFC, HFC, HFO, HC
-  Capacity / Size: Kv = 0,16 ÷ 25 m³/h
-  Medium temperature TS min./max.: -40°C/140°C
-  Maximum Operating Pressure: 4,5/4,9 MPa (45/49 bar)
-  Certification: PED cat.II (TUV Rheinland); Compliance with the EN 60335-2-24 / 2-40 / 2-89 (VDE)





MDF Series








SANHUA Refrigeration Portfolio

SANHUA

Features

-  Direct or Piston Type actuation
-  Compact design, Angle or Straight shape
-  Cost-efficient solution
-  LDF soft sealing design / very low internal leakage

General Specification

-  Applicable for all common HCFC, HFC, HFO, HC
-  Capacity / Size: LDF: Kv = 0,12 to 1,1 m3/h
FDF: Kv = 0,08 to 3,5 m3/h
-  Medium temperature TS min./max.: -30°C/+120°C
-  Max. operating pressure PS: 4.5Mpa
-  Certification: Compliance with the EN 60335-2-24 / 2-40 / 2-89 (VDE)

FDF Series







LDF Series








SANHUA Refrigeration Portfolio

SANHUA

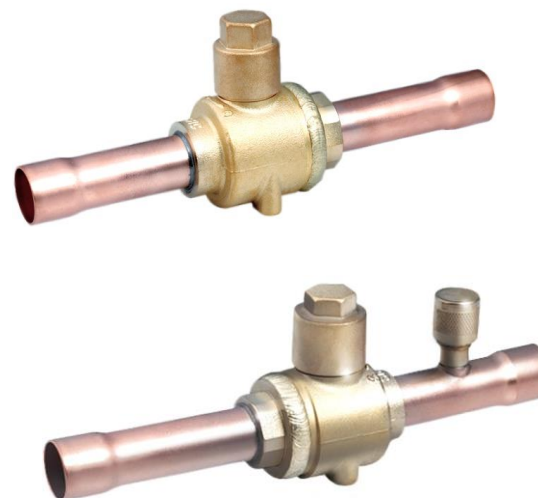
Features

-  Straightway type, full port, low pressure drops, cost-effective
-  Valve body and valve seat with welded structure, with high product reliability
-  Bidirectional flow
-  Special sealing materials to prevent internal leakage

General Specification

-  Applicable for all common HCFC, HFC, HFO, HC
-  Capacity size: SBV/SBV-R from 1/4" to 2" 5/8 (6mm to 67mm)
RBV-R from 1/4" to 2" 1/8 (6mm to 54mm)
-  SBV / SBV-R Medium temperature TS min./max.: -40°C / +120°C
RBV-R Medium temperature TS min./max.: -60°C/+160°C
-  SBV-R / RBV-R max. operating pressure PS: 4,9 MPa (49 bar)
SBV max. operating pressure PS: 4,5 MPa (45 bar)
-  Certification: PED cat.II (TUV Rheinland)

SBV / SBV-R Series






RBV-R Series








SANHUA Refrigeration Portfolio

SANHUA

Features

-  YCVS / YCVS-R series: Piston type check valves
CCV series: Magnetic type check valves
-  YCVSH & YCVSH-R models with reinforced spring, applicable to compressor discharge pipes in single or multi compressor systems
-  Low pressure drops during operation

General Specification

-  Applicable for all common HCFC, HFC, HFO, HC refrigerants
-  Capacity / Size: YCVS / YCVS-R: $K_v = 0,56$ to $29,1 \text{ m}^3/\text{h}$
CCV: $K_v = 0,6$ to $5,5 \text{ m}^3/\text{h}$
-  YCVS / YCVS-R Medium temperature TS min./max.: -50°C / $+150^\circ\text{C}$
CCV Medium temperature TS min./max.: -40°C / $+160^\circ\text{C}$
-  YCVS Max. operating pressure PS: 4,6 (46bar)
YCVS-R & CCV Max. operating pressure PS: 4,9 MPa (49 bar)
-  Certification: PED cat.II (TUV Rheinland)

YCVS / YCVS-R Series



CCV Series



SANHUA Refrigeration Portfolio

SANHUA

Features

- DTG series: Uni Directional
- ↔ STG series: Bi-Directional
- Filtering fineness: 20µm
- High moisture absorption
- High corrosion resistance 500h SST

General Specification

- Applicable for all common HCFC, HFC, HFO, HC
- DTG: Capacity/Size: 1,5 inch³ ÷ 75 inch³
STG: Capacity/Size: 5 inch³ ÷ 30 inch³
- Medium temperature TS min./max.: -30°C / +120°C
- Max. operating pressure PS max.: 48,3/49 bar
- Certification: Certification: PED Art.4.3

DTG Series







STG Series








SANHUA Refrigeration Portfolio

SANHUA

Features

-  High precision color indicator
-  Indicator pasted closely to the glass to prevent surface contamination
-  Solid and corrosion resistant brass material
-  New Annular humidity color indicator.
Full port passage with low pressure drop

General Specification

-  Applicable for HCFC, HFC, HFO, HC
-  Capacity / Size: from 6 mm to 22 mm
-  Medium temperature TS min./max.: -50°C / +80°C
-  Max. operating pressure PS: 46/49 bar
-  Certification: PED Art.4.3

SYJ / SYJ-R series









Product Line Series

R744






SANHUA Refrigeration Portfolio

SANHUA

Features

-  Extremely high internal tightness, which is as good as with solenoid valves
-  Precise proportional flow regulation
-  Snap-on coil for easier installation
-  Coil with IP67 works safely in extremely environment
-  Applicable for oil-free system; built-in strainer at inlet
-  Flow direction: Uniflow

General Specification

-  Applicable for R744
-  Cooling capacity: from 0.2 to 27.3 kW (R744)
-  Medium temperature TS min./max.: -40°C / +70°C (duty cycle rate below 40%)
-  Design Pressure: 60 bar, MOPD: 35 bar
-  Certifications: Compliance with the EN 60335-2-24 / 2-40 / 2-89 (VDE)





LPF-D Series






SANHUA Refrigeration Portfolio

SANHUA

Features

-  Advanced PID algorithm to ensure accurate automatic adjustment of superheat
-  Quick-Safe prevention of low and high superheat to ensure the system operating well at any conditions
-  Small size, rail mounting design, easy to install
-  Energy efficient, achieving the most efficient use of the evaporator

General Specification

-  Applicable for various refrigerants
-  Installation method: DIN railsnap-in or wall mounting with screws
-  Compatible with Sanhua DPF and LPF valves




SEC 61x Series






SANHUA Refrigeration Portfolio

SANHUA

Features

-  XHP Connector for SEC61x Controller
-  Available with lead wire direct connector or with Packard, Molex and Quick On socket connections
-  Different pressure ranges and different level of accuracy

General Specification

-  Applicable for HCFC, HFC, HC, HFO, R32 refrigerants
-  YCQB Ratiometric models with output signal: 0,5V to 3,5V or 0,5V to 4,5V
YCQC models with 4-20mA output signal
-  Compliance with EN 60335-2-24/40/89 (VDE)





YCQ Series








SANHUA Refrigeration Portfolio

SANHUA

Features

-  Straightway type, full port, low pressure drops, cost-effective
-  Valve body and valve seat with welded structure, with high product reliability
-  CBVT with Bi-metal connections (for K65) or with Stainless-Steel Butt-Welding connections SS pipes
-  Bidirectional flow

General Specification

-  Applicable for R744 (CO₂)
-  CBV connection size from 1/4" to 2" 1/8 (6mm to 54mm)
CBVT connection size from 1/4" to 1" 5/8 (6mm to 42mm)
-  Medium temperature TS min./max.: -40°C / +150°C
-  CBV max. operating pressure PS: 6,0 MPa (60 bar)
CBVT Max. operating pressure PS:14 MPa; (burst pressure: 42MPa)
-  Certification: PED Art.4.3, PED Cat.I (self declaration)

CBV Series



CBVT Series



SANHUA Refrigeration Portfolio

SANHUA

Features

- Ensure the correct flow direction
- ⊞ High reliability by furnace and laser welding
- ⚡ High efficiency with low pressure drop
- 💧 Low internal leakage

General Specification

- ⊞ Applicable for sub & trans-critical R744 systems
- 🌡 Medium temperature TS min./max.: -40°C / +150°C
- 🕒 Max. operating pressure PS: 9,0 MPa (90 bar) or 14,0 MPa (140bar)
- 🛡 Certification: PED Art.4.3




BCV Series








SANHUA Refrigeration Portfolio

SANHUA

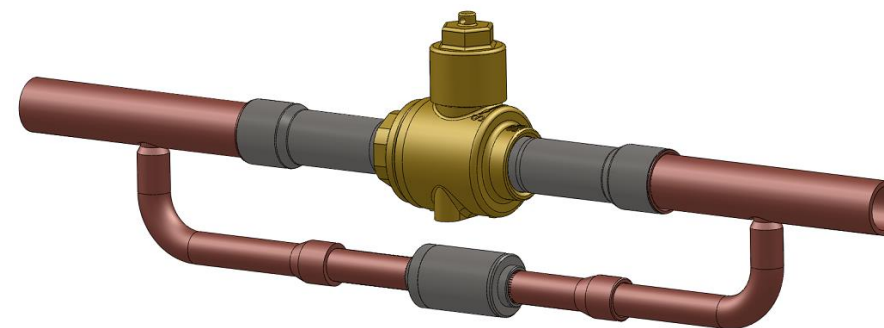
Features

-  Factory brazed sub-assembly Ball valve CBVT + Check valve BCV
-  Facilitate the installation process on site
-  Factory built and tested subassembly

General Specification

-  Applicable for R744 systems
-  Connection size from 3/8" to 1 1/8"
-  Medium temperature TS min./max.: -40°C / +90°C
-  Max. operating pressure PS: 9,0 MPa (90 bar)
-  Certification: PED Art.4.3

CBV Series



MICRO-CHANNEL HEAT EXCHANGERS








**SANHUA DELIVERED OVER 5 MILLION
MCHE CONDENSERS (CO&HP) AND
EVAPORATORS HELPING TO IMPROVE
SYSTEM EFFICIENCY BY UP TO 30%**








SANHUA Refrigeration Portfolio

SANHUA

Features

-  Standard range specifically designed for Plug-in refrigeration applications.
-  Minimized internal volume to reduce the refrigerant charge
-  Low FPI ratio to avoid dust accumulation (FPI : 12.7)
-  Standard Alloy, perfect corrosion resistance for indoor applications
-  Price competitive vs. F&T heat exchangers
-  Coils come with housing and fan collar
-  Cover whole reciprocating compressor capacity range

General Specification

-  Refrigerants: HCFC, HFC, HC, HFO
-  Capacity: from 0,2 kW up to 5,5 kW (R290, dT15,1-3 m/s)
-  Number of fans from 1 to 3
-  Fan diameter from $\varnothing 170$ to $\varnothing 350$
-  Certification: PED Art.4.3

CBV Series

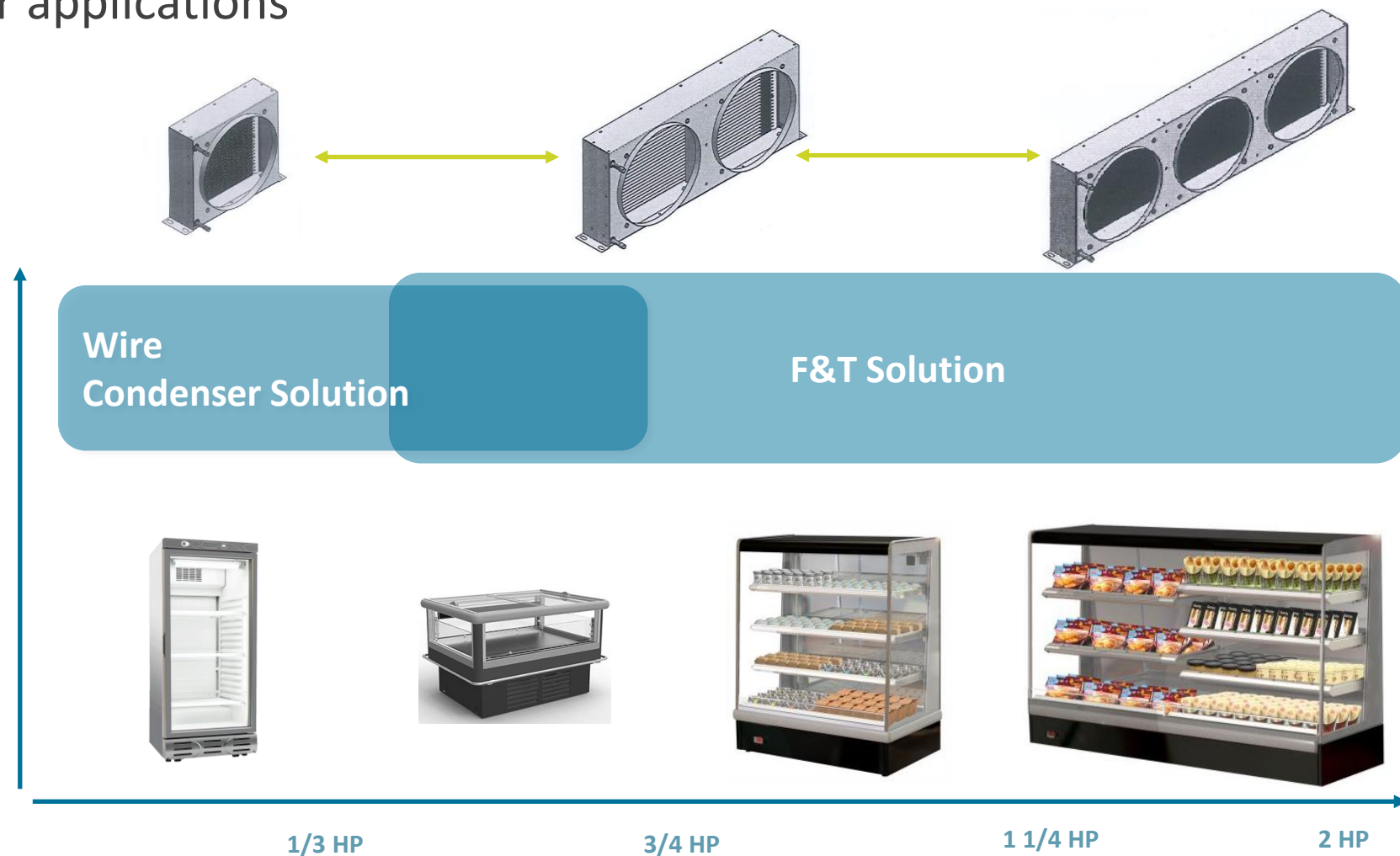


SANHUA Refrigeration Portfolio

SANHUA

We have a solution to cover all
reciprocating compressor applications





EU & SH Range






SANHUA Refrigeration Portfolio

SANHUA

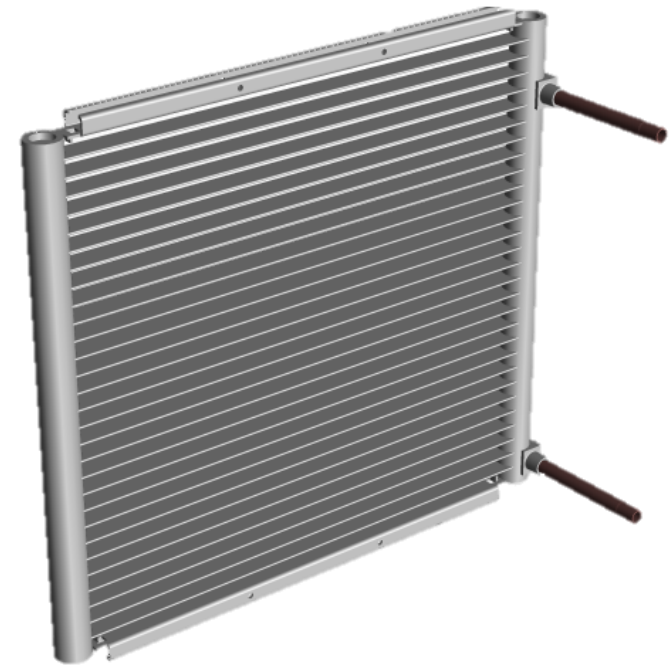
Features

-  Standard range specifically designed for Condensing Units
-  Minimized internal volume to reduce refrigerant charge
-  Long Life Aluminum Alloy to withstand different outdoor conditions
-  Copper pipes for easy connection to the system

General Specification

-  Refrigerants: HCFC, HFC, HC, HFO
-  Capacity: from 2,5 kW to 85 kW (R410A, dT15, 3 m/s)
-  Certification: PED Cat.I / Cat.II

CBV Series



SANHUA Refrigeration Portfolio

SANHUA

SD Range



F&T Solution



6 HP

12 HP

18 HP

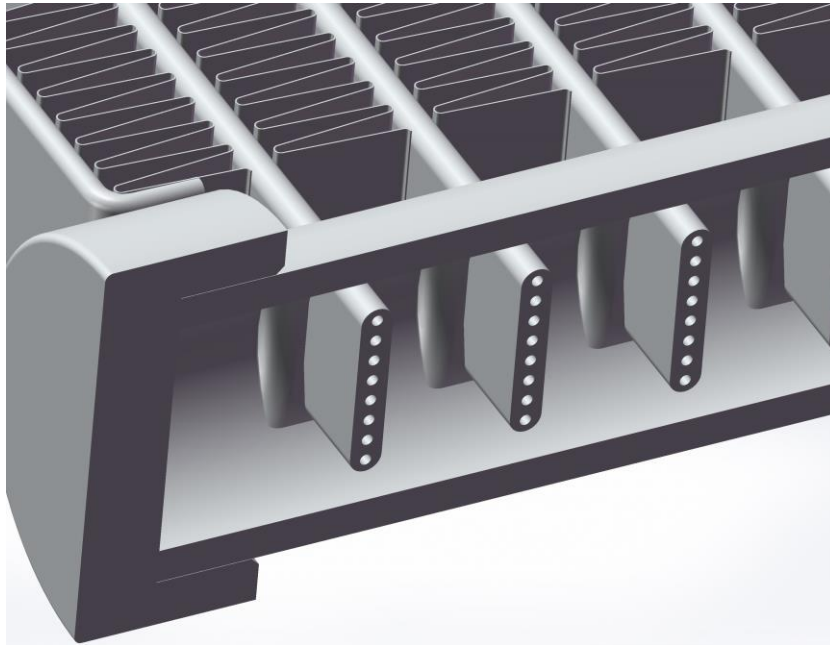
24 HP



SANHUA Refrigeration Portfolio

SANHUA

CO₂ Gas Cooler for all applications

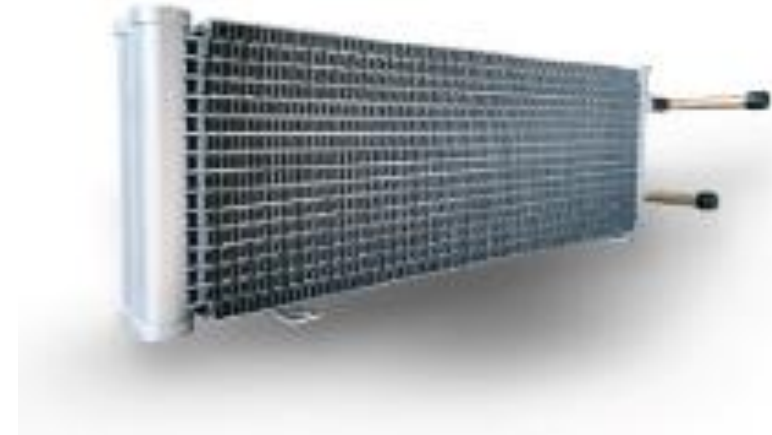


CO₂ Tube



General Tube

MCHE Evaporators



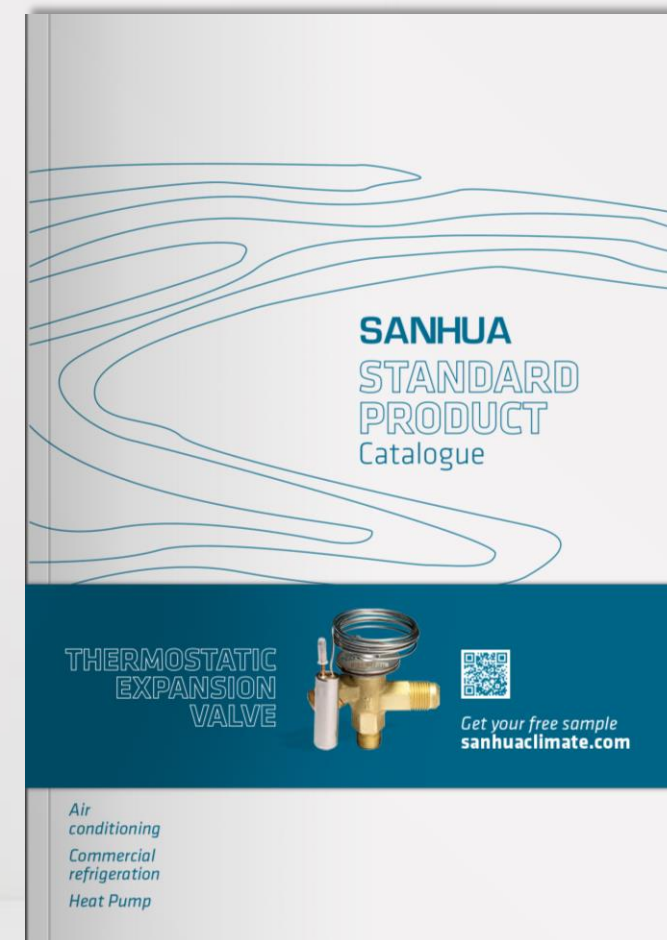
- First product launch will be released for medium temperature applications
- Second product launch will be released for negative temperature applications

SANHUA supporting tools

SANHUA



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SANHUA's Added Value

SANHUA

OEM

- Open for customization
- Wide possibility of lab tests
- High quality and reliability
- Excellent price/performance ratio

Wholesalers

- Wide product portfolio
- Products according F-gas/EU standards
- Warehouse in Poland / fast delivery
- Strong local presence and support

Installers

- Wide range of known brand
- Products fulfill industry requirements
- Opportunity for cost savings
- Strong local presence and support
- High quality and customer-oriented warranty policy
- Cross reference list and Selection Software

End users

- Opportunity for cost savings
- Products proven by years in the fields
- High quality and customer-oriented warranty policy
- Energy efficiency optimization

CHILLING IDEAS
WORLDWIDE

SANHUA

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