

# SANHUA

# SEK

Sanhua Electronic Kit

## Simple like never before

October 2020 - JG

**35** years  
Genes of  
Innovation

To be the

**[Game Changer]**



**Jerome Gigier**  
Technical Manager

- Based in France
- In charge of France, Iberia and Benelux
- Technical Support for customers and KAM
- Technical Manager for electronic components



# 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)

# SANHUA HVACR COMPONENTS

**SANHUA**



TXV  
REPLACEABLE ORIFFICE



TXV  
FIXED ORIFFICE



BALL VALVE



SOLENOID  
VALVE



SOLENOID  
VALVE



SOLENOID VALVE FOR  
REFRIGERATOR



SIGHT GLASS



FILTER DRIER



REPLACE  
CORE FILTER



CO<sub>2</sub> BALL VALVE



EEV  
CONTROLLER



STEP MOTOR  
EEV



ELECTRONIC  
EXPANSION VALVE



REVERSING  
VALVE



PRESSURE  
SWITCH



PLATE HEAT  
EXCHANGER



MCHE



CHECK VALVE



CHARGE VALVE



ANGLE VALVE



SERVICE VALVE



RECEIVER  
VALVE



PRESURE  
SENSOR



DRAIN PUMP



PRESSURE  
VESSELS



STAINLESS STEEL  
ASSEMBLY



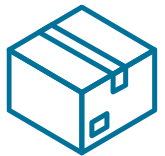
ROTARY  
COMPRESSOR



## Why did we create this kit ?



To compete TXV + Solenoid valve solution on refrigeration market



To have all the components in the same package



To have a very simple solution for final customers

## Plug & Play Solution

Upgrade your system  
with lowest investment



**New SEC61x**



YCQ Pressure Transducer



LPF Electric  
Expansion Valve



NTC Temperature Sensor



## KIT composition



# SANHUA ELECTRONIC KIT

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## KIT description

Model	Part No.	Valve Connection	Common products	Valve type
SEK10-01	10142000102	3/8" – 1/2"	SEC612-R4 -> Controller YCQC02L18 -> Pressure Transmitter YCQC02-013022 -> Packard Cable NTC2A1 -> Probe PQ-M24012-000008 -> EEV coil	LPF10-002
SEK14-01	10142000302			LPF14-002
SEK18-01	10142000502			LPF18-002
SEK24-01	10142000702			LPF 24-002
SEK10-02	10142000202	10 -12 mm		LPF10-003
SEK14-02	10142000402			LPF14-003
SEK18-02	10142000602			LPF18-003
SEK24-02	10142000802			LPF 24-003

Only the LPF valve changes from a kit to another one



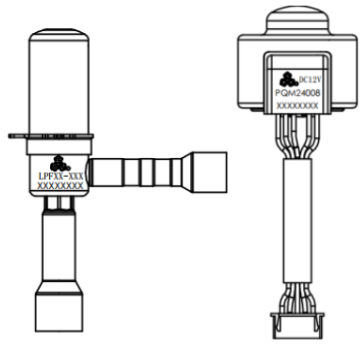
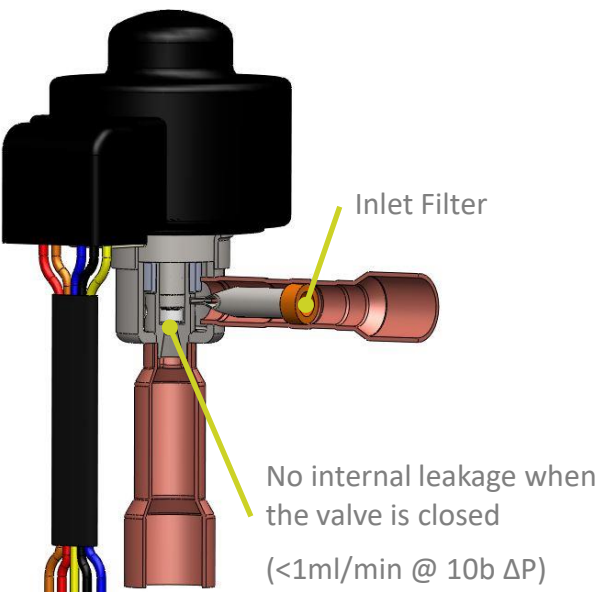
# SANHUA ELECTRONIC KIT

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## Main Technical Features: Electronic Expansion Valve

LPF from size 1.0 to 2.4 according to the kit  
code number (so from ~0.7 to 16 kW)

+ the coil PQ-M24



Items	Description
Rated Voltage	12V DC( $\pm 10\%$ )
Excitation Mode	1-2 phase excitation, uni-polar-500 steps
Excitation Rate	30–90 pps
Current and Resistance	260mA, $46 \pm 3.7 \Omega/\text{phase}(20^\circ\text{C})$
Medium Temp.	$-40^\circ\text{C} / +70^\circ\text{C}$ (duty cycles $\leq 40\%$ )
Ambient Temp.	$-40^\circ\text{C} / +60^\circ\text{C}$ (duty cycles $\leq 40\%$ )
Relative Humidity	0 to 95% RH
Design Pressure	42 bar
MOPD	35 bar

Valve Model	Evap Temp ( $^\circ\text{C}$ )	Max cooling capacity [kW]				
		Cond. Temp. @ $45^\circ\text{C}$ , SH=6K, SBC=2K				
		R404A	R449A	R452A	R513A	R455A
LPF10	-30	3.0	4.3	3.2	2.8	4.0
	-20	3.1	4.4	3.3	2.9	4.2
	-10	3.2	4.5	3.4	3.0	4.3
	0	3.2	4.5	3.4	3.0	4.3
	10	3.1	4.3	3.3	2.9	4.2
LPF14	-30	5.7	8.2	6.0	5.3	7.7
	-20	6.0	8.4	6.2	5.6	7.9
	-10	6.1	8.5	6.4	5.7	8.1
	0	6.1	8.4	6.4	5.7	8.2
	10	5.9	8.2	6.3	5.5	8.0
LPF18	-30	7.9	11.4	8.3	7.4	10.6
	-20	8.2	11.6	8.6	7.7	11.0
	-10	8.4	11.8	8.8	7.9	11.2
	0	8.4	11.7	8.9	7.9	11.3
	10	8.1	11.3	8.7	7.7	11.1
LPF24	-30	10.8	15.5	11.3	10.1	14.5
	-20	11.3	15.9	11.8	10.5	15.0
	-10	11.5	16.1	12.1	10.8	15.3
	0	11.5	16.0	12.1	10.8	15.4
	10	11.1	15.5	11.9	10.5	15.2

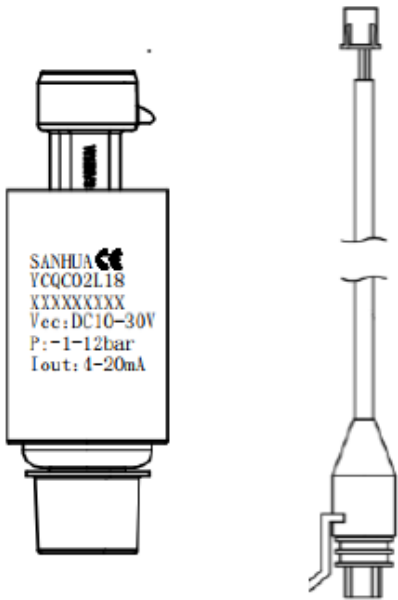
# SANHUA ELECTRONIC KIT

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## Main Technical Features: Pressure Transmitter

Pressure transducer and Packard cable with  
2m length

Items	Description
Voltage Supply	10–30 Vdc
Output	4–20mA
Pressure Range	-1 ~ 12 bar
Test Pressure	52.5 bar
Accuracy	±0.8% F.S. (-40~ +40°C)
Protection class	IP 67
Connection Type	Thread SAE – 1/4" 7/16-20UNF
Electrical Connector	Packard connector





# SANHUA ELECTRONIC KIT

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## Main Technical Features: Temperature Sensor



Items	Description
Type	NTC 5K $\Omega$ at 25°C
Wire	2x0.5mm <sup>2</sup> -2m length
Protection Class	IP 67
Accuracy	±0.3°C (below 25°C)
Temperature Range	-50 ~ 50°C



# SANHUA ELECTRONIC KIT

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## KIT Description: Refrigerants

The kit is suitable with all the refrigerants integrated in the SEC expected the CO<sub>2</sub>



R404A	R134a	R407C	R507	R1234ze
R1234yf	R450A	R513A	R448A	R449A
R452A	R245fa	R23	R407A	R407F
R124	R407H	R454C	R455A	

Please, noted that AC refrigerants (R410a, R32...) are not in this list, because pressure range are not suitable with LPF.

### Why not the CO<sub>2</sub>?

Because the LPF max pressure is 42 bar, and the YCQC is not suitable with CO<sub>2</sub> pressure range.

### Solution

Offer the components one by one, separately, with LPF-D (60 bar) or DPF-R (140 bar), and YCQ suitable with CO<sub>2</sub> pressure range.

# SANHUA ELECTRONIC KIT

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## KIT Selection

The only variable between all the kits is the LPF size. So the selection is driven by the capacity of the evaporator.

You will find simple capacities tables in the datasheet or you can use QuickFinder for others points.

Valve Model	Evap Temp (°C)	Max cooling capacity [kW]				
		Cond. Temp. @45°C, SH=6K, SBC=2K				
		R404A	R449A	R452A	R513A	R455A
LPF10	-30	3.0	4.3	3.2	2.8	4.0
	-20	3.1	4.4	3.3	2.9	4.2
	-10	3.2	4.5	3.4	3.0	4.3
	0	3.2	4.5	3.4	3.0	4.3
	10	3.1	4.3	3.3	2.9	4.2
LPF14	-30	5.7	8.2	6.0	5.3	7.7
	-20	6.0	8.4	6.2	5.6	7.9
	-10	6.1	8.5	6.4	5.7	8.1
	0	6.1	8.4	6.4	5.7	8.2
	10	5.9	8.2	6.3	5.5	8.0
LPF18	-30	7.9	11.4	8.3	7.4	10.6
	-20	8.2	11.6	8.6	7.7	11.0
	-10	8.4	11.8	8.8	7.9	11.2
	0	8.4	11.7	8.9	7.9	11.3
	10	8.1	11.3	8.7	7.7	11.1
LPF24	-30	10.8	15.5	11.3	10.1	14.5
	-20	11.3	15.9	11.8	10.5	15.0
	-10	11.5	16.1	12.1	10.8	15.3
	0	11.5	16.0	12.1	10.8	15.4
	10	11.1	15.5	11.9	10.5	15.2

QuickFinder

File Options Language Help Back Copy

Conditions

Refrigerant: R449A Cooling Capacity: 3 kW Discharge Temperature: 70.71 °C

Condensing Temperature: 45 °C Superheat: 7 K Upstream line pressure drop: 0.2 bar

Evaporating Temperature: -10 °C Subcooling: 5 K Downstream line pressure drop: 0 bar Search

Please select the position: Liquid Line Choose the Product Series [LPF1.0]

Radio	Series	Max. Capacity[kW]	Min. Capacity[kW]	Load	Dpactual[bar]	PS/MWP[bar]	Max. OPD [bar]	MOPD Rev. [bar]	Max Step	Message
<input checked="" type="radio"/>	LPF1.0	4.7	0	63.8%	17.1	42	35	21	500	
<input type="radio"/>	LPF1.4	8.9	0	33.6%	17.1	42	35	21	500	the product will run at the
<input type="radio"/>	LPF1.8	12.3	0	24.3%	17.1	42	35	21	500	the product will run at the
<input type="radio"/>	LPF2.4	16.9	0	17.8%	17.1	42	35	15	500	

Product Family: LPF

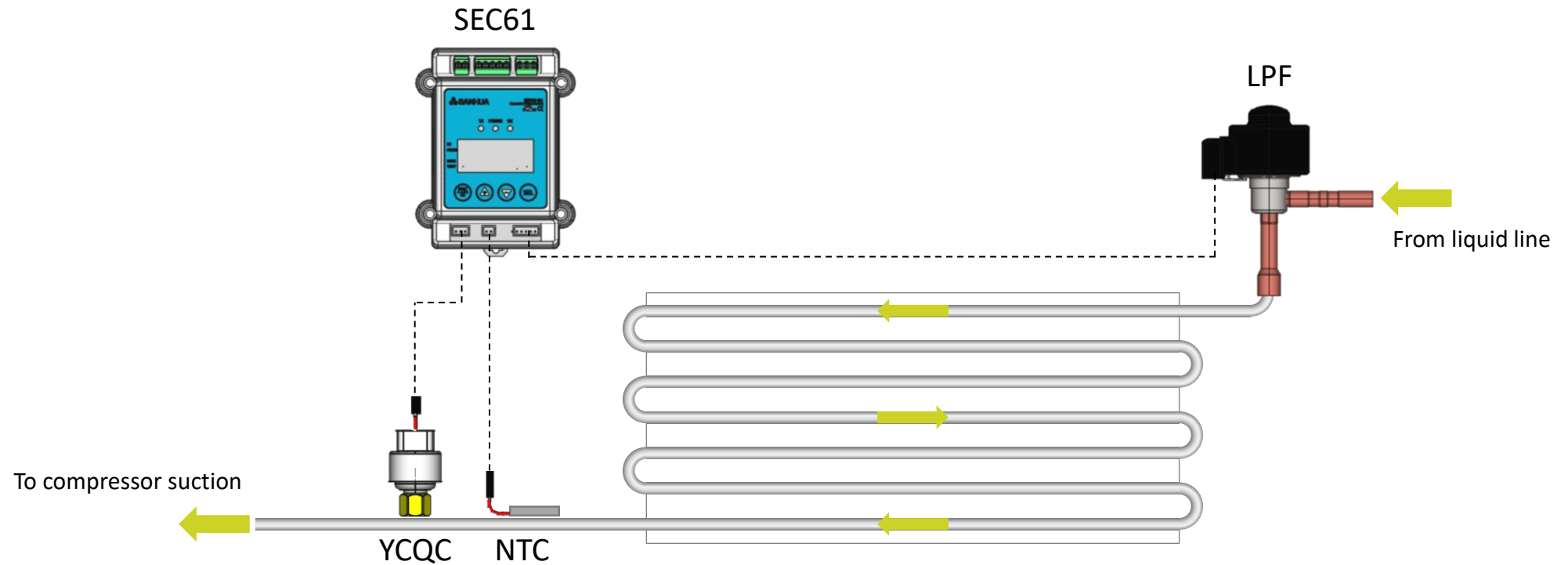
Choose the Product Model

Radio	Series	Model	Connection Type	Inlet A	Outlet B	Velocity[m/s]
<input type="radio"/>	LPF1.0	LPF10-002	Solder	3/8	1/2	0.30
<input type="radio"/>	LPF1.0	LPF10-003	Solder	1/4	3/8	0.65
<input type="radio"/>	LPF1.0	LPF10-004	Solder	10mm	12mm	0.27
<input type="radio"/>	LPF1.0	LPF10-005	Solder	6mm	10mm	0.74

Description: Mainly for commercial refrigeration, commercial

## KIT Installation

Please refer to the Sanhua Installation guide, you will find all the information to install correctly the SEK and its components.





# SANHUA ELECTRONIC KIT

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## KIT Installation

How to connect the electrical wires on the SEC

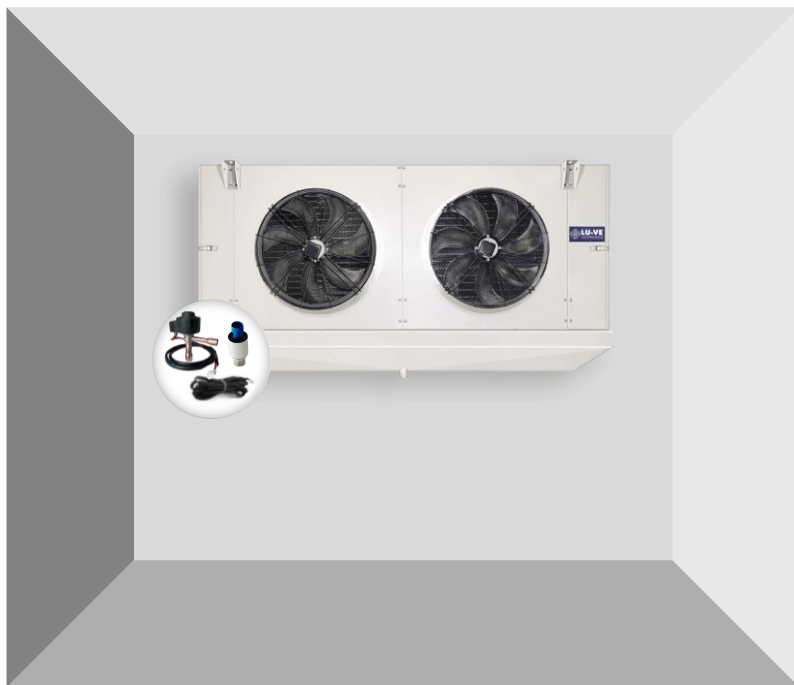


# SANHUA ELECTRONIC KIT

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## KIT Installation

Controller outside a cold room.



Electrical panel

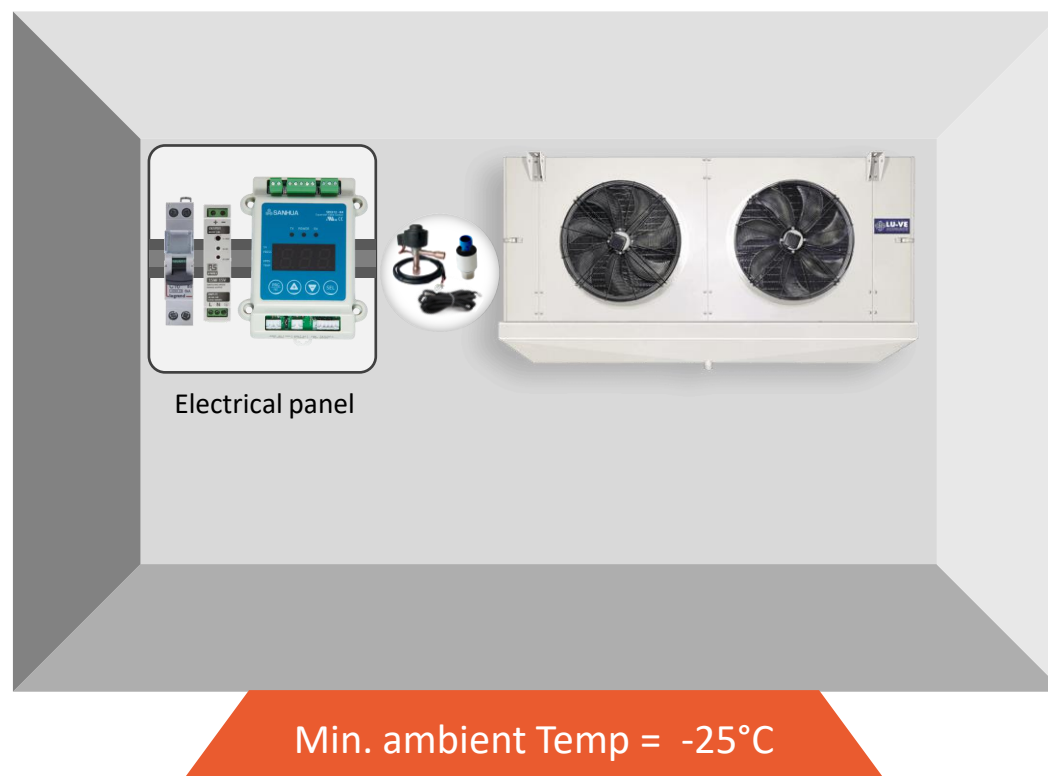


# SANHUA ELECTRONIC KIT

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## KIT Installation

Controller inside a cold room



## SEC Setting

The SEC is delivered with default values able to run immediately the installation.

Only one parameter has to be set by the installer it's the refrigerant type "rFy" in the 2Pr menu.

All the other parameters can keep the default values and it's not necessary to move the deep switches.

Refrigerant setting is in **2Pr** menu, use   to find the parameter **rFy**



Add.	Code	Description	Default
40062	rFy	Refrigerant	0(R22)

Select your refrigerant value in the refrigerants list below :

0	R22	7	R1234YF	14	R744(CO2)	21	R124
1	R404A	8	R290	15	R744(N2O)	22	R717
2	R410A	9	R450A	16	R32	23	R407H
3	R134A	10	R513A	17	R245FA	24	R454C
4	R407C	11	R448A	18	R23	25	R455A
5	R507	12	R449A	19	R407A		
6	R1234ZE	13	R452A	20	R407F		

The superheat setpoint = 6K by default

If you want to adjust it, you have to change the parameter "SH" in the 1Pr menu.

Target superheat is in **1Pr**, use   to find the parameter **SH** and your wished value.

Add.	Code	Description	Default
40001	SH	Target superheat	6





# SANHUA ELECTRONIC KIT

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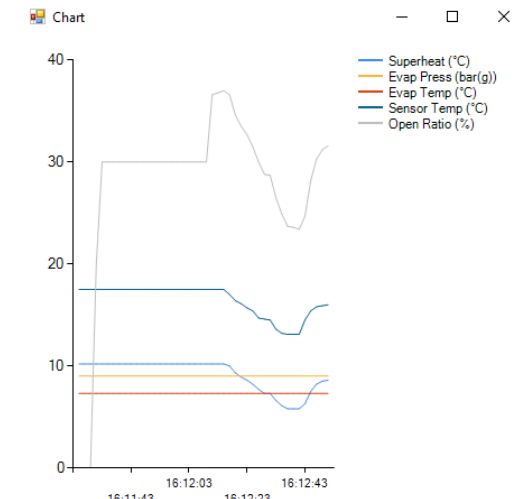
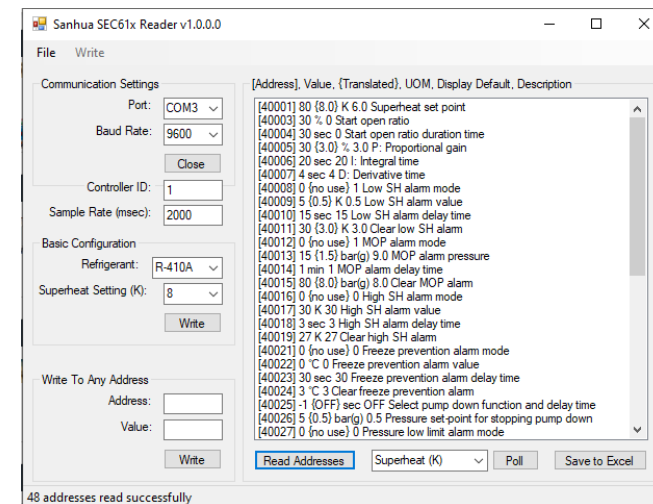
## SEC Setting

For trained people, advanced function are possible

- Valve prepositioning (to avoid Low Pressure cutoff)
- PID parameters (to make more stable the superheat)
- MOP function (to protect the compressor)
- Manual control (for tests)

## Modbus with RS485 port is in standard on the SEC

You can connect it to a supervision system, to read all the values or for a short period, to check the installation during the commissioning, you can use the Sanhua software.



# SANHUA ELECTRONIC KIT

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## Accessories

The Sanhua software can be used also to make a copy from a controller to a new controller.

Or you can use our Manual Operation Device to make this copy.



Sanhua could supply:



The 230V -> 24V  
Transformer



The ultracapacitor, necessary to close the valve if the main supply voltage cut off.  
If no Ultracapacitor, Sanhua recommends to add a NC\* solenoid valve.

\* NC = Normally Closed

# SANHUA ELECTRONIC KIT

Example installation in a cold room

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Before



After



# SANHUA ELECTRONIC KIT

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Installation video - <https://youtu.be/NWpGr2N9kUY>





Thank you for your attention.

**[sanhuaeurope.com](http://sanhuaeurope.com)**

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