

## ***INTERNAL TRAINING*** ***Pressure transmitters - YCQ***



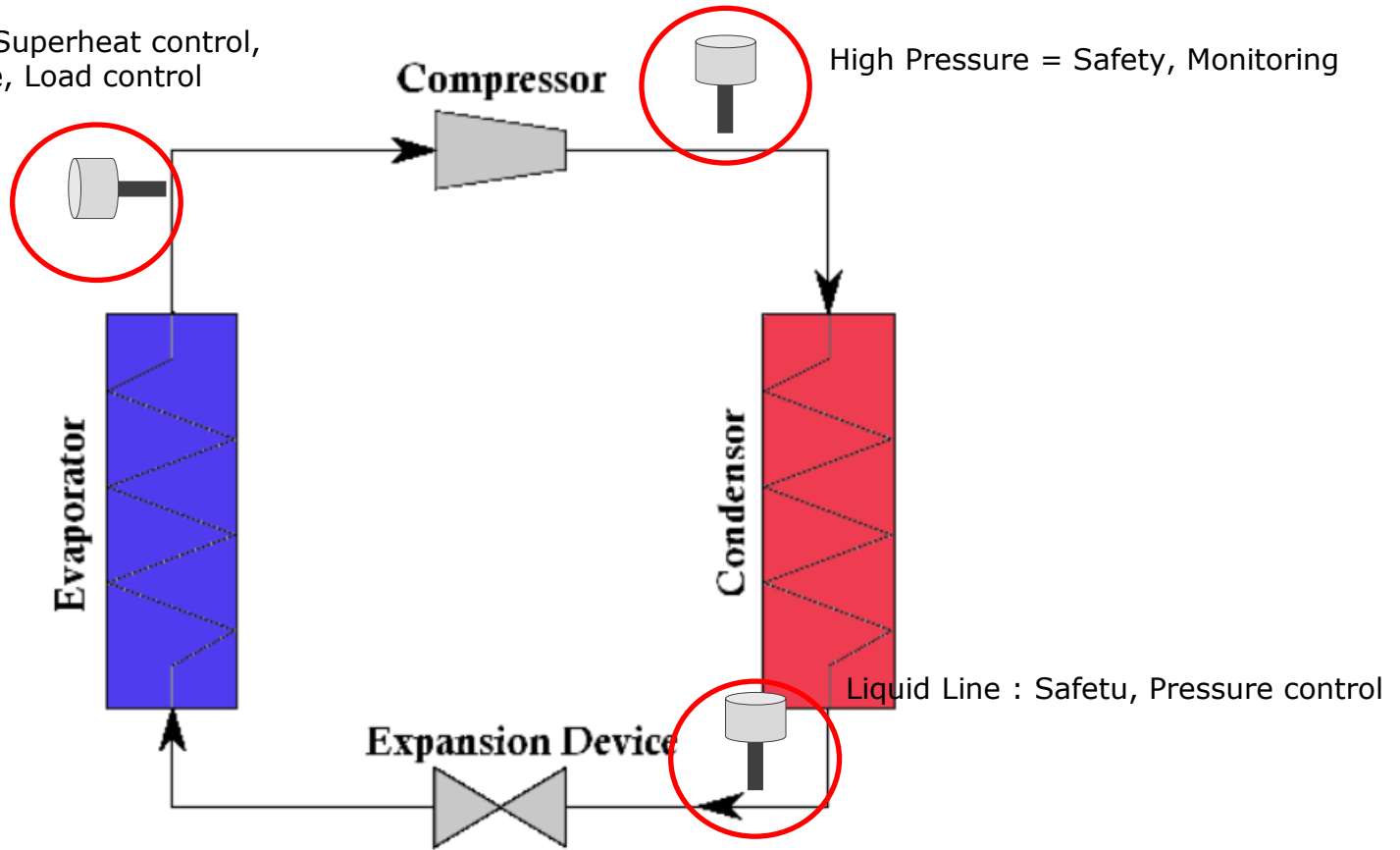
**Everything you need to know about  
SANHUA Pressure Transmitters  
| Reliable | Smart | Accurate |**

# YCQ – Pressure Transmitters



## Pressure Transmitter - Applications

Low Pressure = Superheat control,  
Suction pressure, Load control



# YCQ – Pressure Transmitters

Pressure Transmitters models



**YCQ series**

**YCQB**  
Voltage output

0.5-3.5V  
0.5-4.5V

3 wires

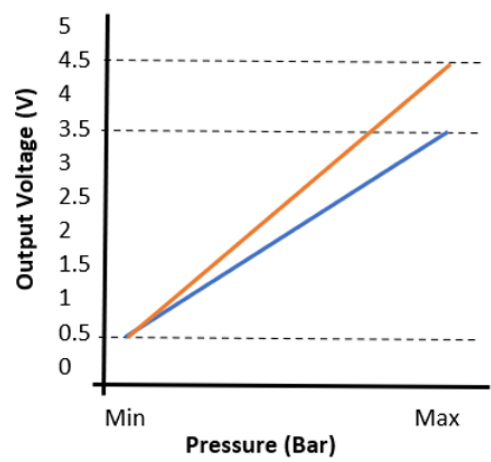
In many countries =  
ratiometric models

**YCQC**  
Current output

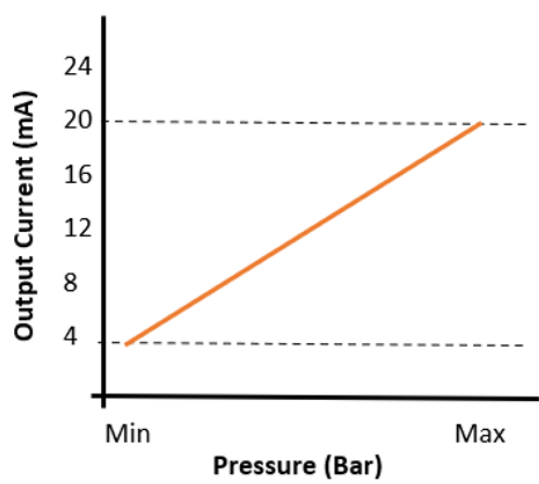
4-20 mA

2 wires  
Long distance

YCQB



YCQC



Recently : 0-10V  
Version,  
but not in DS

# YCQ – Pressure Transmitters

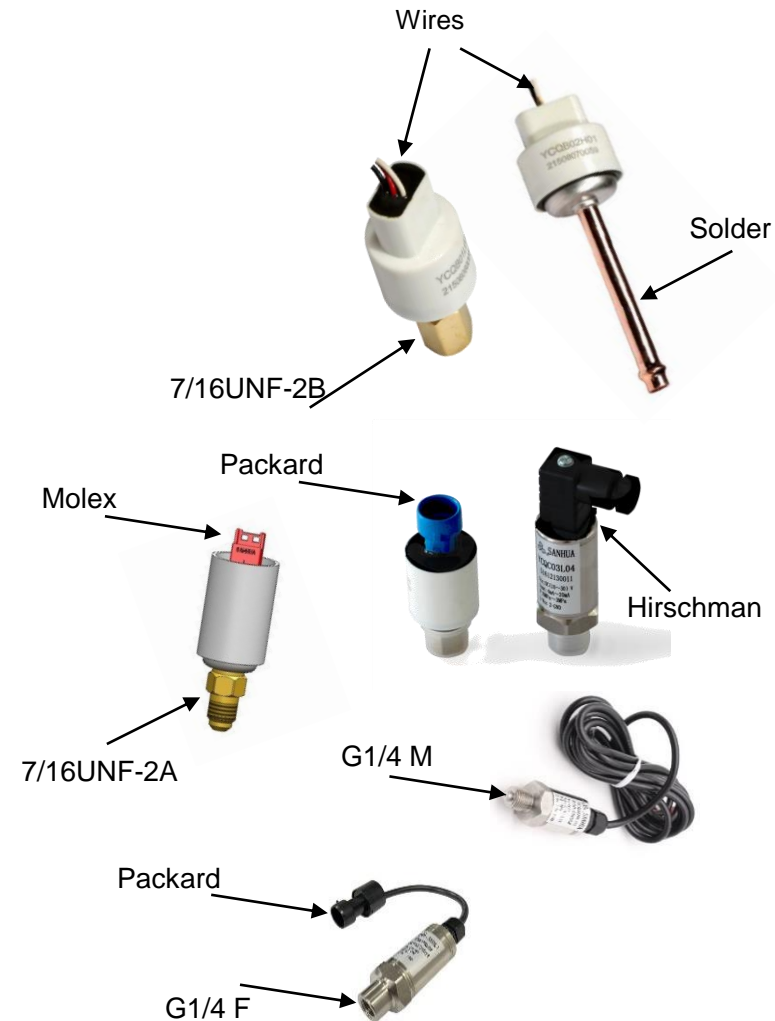
## Connection Types

### Pressure connection :

- Flare (7/16UNF-2B=Female) – Most common
- Flare (7/16UNF-2A = Male)
- Solder connections (1/4")
- G 1/4 (High pressure models)
- G 3/8

### Electrical connection:

- Cables
- Packard
- Hirschman
- Molex
- M12
- M16



All the combination doesn't exist, check in the DS first, and ask R&D if possible to have -> CPS procedure

# YCQ – Pressure Transmitters



## Technical Features - **YCQB**

Technical features must be checked with the DS and the drawing, but depend on the model.

Typical data :

Ambient Temp : -40 to 80°C

Medium Temp : -40 to 150°C

Pressure range : 0-20 bar / 0-30 bar / 0-50 bar / 0-90 bar ....

Refrigerants : HFC- HFO – HC (A1 / A2 / A3)

Power supply : 5 Vdc

Output signal : 0.5 - **3.5 V** is for SEC61  
0.5 - **4.5 V** is for others controllers

Working current : ≤ 10mA

Typical Accuracy : ±2.0% FS (-40°C ~ 85°C) / ±2.0% FS (-40°C ~ 120°C) / ±0.8% FS (-40°C ~ 40°C)

Air tightness : ≤2.83g/a @42 Bar

Max Pressure : 52.5 bar / 75 bar / 135 bar / 225 bar

Burst pressure (min.): 175 Bar / 250 bar

Enclosure : IP66

# YCQ – Pressure Transmitters



## Technical Features - **YCQC**

Technical features must be checked with the DS and the drawing, but depend on the model.

Typical data :

Ambient Temp : -40 to 80 °C

Medium Temp : -40 to 150 °C

Pressure range : 0-20 bar / 0-30 bar / 0-50 bar / 0-90 bar ....

Refrigerants : HFC- HFO – HC (A1 / A2 / A3)

Power supply : 10 to 30 Vdc

Output signal : 4 – 20 mA (suitable with SEC61 and others controllers)

Typical Accuracy :  $\pm 0.8\%$  FS (-40°C ~ 40°C)

Air tightness :  $\leq 2.83\text{g/a}$  @42 Bar

Max Pressure : 52.5 bar / 75 bar / 135 bar / 225 bar

Burst pressure (min.): 175 Bar / 250 bar

Enclosure : IP66

# YCQ – Pressure Transmitters



## Certification

All the YCQ are in Category **a4p3** for the PED directive (2014/68/EU)

The declaration mentioned -30 / 120°C for all the YCQB/C from 0 to 50 bar

The Low Voltage Directive (LVD) 2014/35/EU, is not applicable for such product due to the voltage is < 75Vdc.

Additional tests to be suitable with the

DIN EN 60730-1 (for Household appliances)

DIN EN 60335-2-24 (for Household appliances)

DIN EN 60335-2-40 (Heat pumps, AC, Dehumidifiers)

DIN EN 60335-2-89 (for commercial refrigerating appliances)

VDE confirmed that our YCQ are not a source of ignition in normal operation.

For High Pressure models (Co2 application) :

Separated declaration mentioned -40 / 125°C for all the YCQB/C from 80 to 160 bar

Compliant with REACH and RoHS



# YCQ – Pressure Transmitters

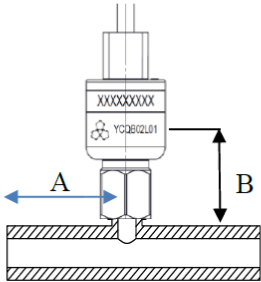
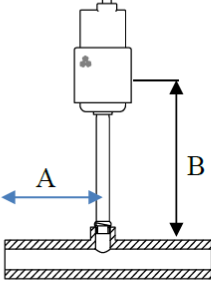


## Max Refrigerant Temperature

All the YCQB/C are suitable with refrigerant temperature till 150°C if the installation respects the following recommendation.  
 However, all the YCQ drawings were not updated (no resources), so you could still meet some drawings with 120 or 130 or 150°C.

The most critical issue with high temperature, is the electronic part. To not damage this electronic inside the YCQ, customers have to respect the distance A and B given below.

**YCQB or YCQC  
Flare and Brazed**

Maxi Medium Temperature	Ambient Temperature	Distance "A"	Distance "B" Flare	Distance "B" Brazed
[ °C ]	[ °C ]	[ mm ]	[ mm ]	[ mm ]
150	60	>30	40	70

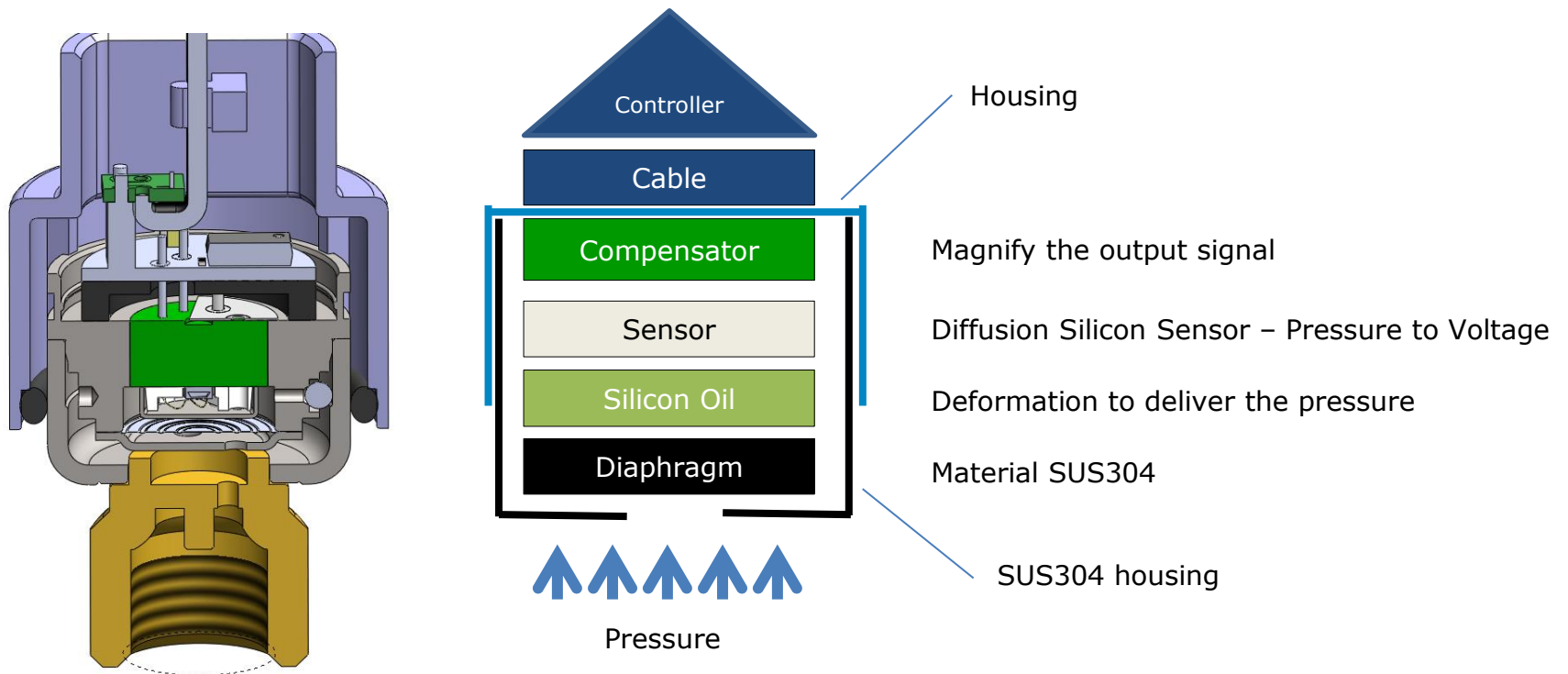


# YCQ – Pressure Transmitters



## How it works

Pressure transmitter converts the Pressure to analog signal, signal uses by controllers.  
The signal output is proportional to the measured pressure (ratio metric)



# YCQ – Pressure Transmitters

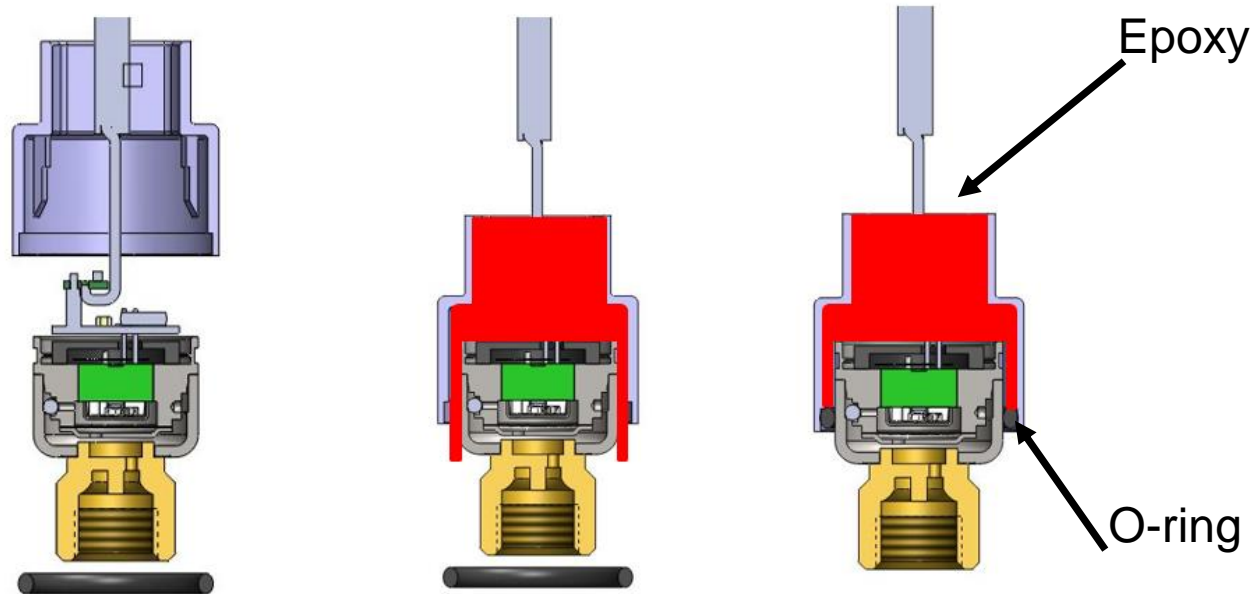
## Enclosure



To ensure a good enclosure of our product, Sanhua injects Epoxy material.

The epoxy is a material very hard when it's dry and protect completely the internal parts from the external environment.

So it's not the plastic housing that some customer are claiming which guarantee the good enclosure, but the injected epoxy.



# YCQ – Pressure Transmitters



## Qualification tests

Before releasing a new product, Sanhua proceed to a lot of qualification tests. Some big customers are interesting to know them so good to know that we have some documents to share with them.

If the YCQ is customized (specific) Sanhua is able to make all the main requested qualification tests on this customized product.

For example :

Ambien Temp change : From  $-40^{\circ}\text{C}$  (1 hour) to  $85^{\circ}\text{C}$  (1 hour), 500 times, and test the accuracy, insulation resistance

Electrostatic immunity test

Over voltage test

UV test

Response time test

Vibration tests : check the accuracy, insulation resistance... after acceleration on X/Y/Z direction at different temperature

Torque tests : for the Pressure connector and the Electrical connector

...

# YCQ – Pressure Transmitters



## Electrostatic

YCQ are sensible of electrostatic interferences, so customers can damage them just in touching the Packard pins with fingers, or during operation detect an abnormal pressure. After analyzes in Sanhua lab, YCQ was not defective, just electrostatic environment influenced the analog signal.

The Sanhua recommendation is to not install the low voltage wires from YCQ with cables within high voltage.



# YCQ – Pressure Transmitters

## Accessories

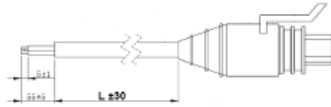


Sanhua can offer the cables, from the YCQ to the customer's controller.  
Note that our SEC61 uses XHP connector.

We have standard models in the DS, but easy to adapt to the customers requests via a CRS.

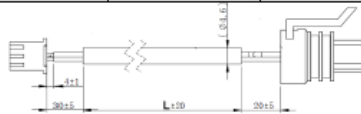
### Packard Cables IP 67 with 3 wires

Model Name	Part Number	Connector Type	Total Cable Length	Terminal
YCQB02-013050	20185034002	Packard	1500 mm	Lead Wires
YCQB02-013056	20185034102	Packard	5000 mm	Lead Wires



### Packard Cables IP 55 + XHP connector with 3 wires

Model Name	Part Number	Connector Type	Total Cable Length	Terminal
YCQB02-013054	20185016702	Packard	6000 mm	XHP-3
YCQB02-013055	20185016802	Packard	9000 mm	XHP-3



### Packard Cables IP 67 + XHP connector with 3 wires

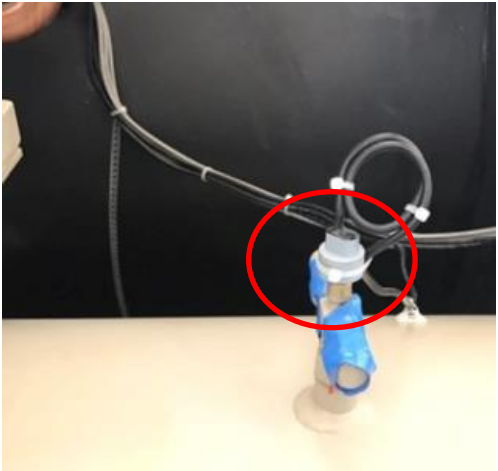
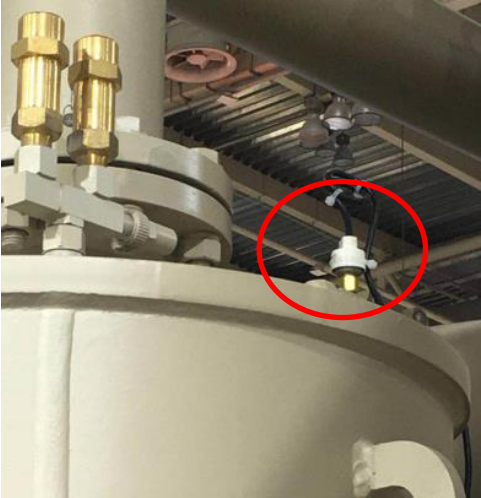
Model Name	Part Number	Connector Type	Total Cable Length	Terminal
YCQC02-013022	20185038202	Packard	2000 mm	XHP-3
YCQC02-013023	20185039602	Packard	5000 mm	XHP-3
YCQC02-013024	20185039702	Packard	9000 mm	XHP-3



7 YCQ cables							
	Pin 1	Pin 2	Pin 3	Pin 4	Controller connector	Cable Length	YCQ Connector
YCQB Cables	+Vcc	GND	Output signal			mm	
YCQB02-013050	Black	Green	White	-		1500	
YCQB02-013051	Red	Black	White	-		1500	
YCQB02-013052	Red	Black	White	-		5000	
YCQB02-013054	Red	Black	White	-		6000	
YCQB02-013055	Red	Black	White	-		9000	
YCQB02-013056	Black	Green	White	-		5000	
YCQB02-013080	Red	Black	White	-		7000	
YCQC cables	+Vcc	Output signal					
YCQC02-013017	Red	Black	-	-		4000	
YCQC02-013019	Red	Black	-	-		2000	
YCQC02-013022	Black	Green	White	-		2000	
YCQC02-013023	Black	Green	White	-		5000	
YCQC02-013024	Black	Green	White	-		9000	
YCQC02-013080	Red	Black	-	-		7000	

# YCQ – Pressure Transmitters

## Some customers examples



# YCQ – Pressure Transmitters

## Competitors

DANFOSS – AKS

Saginomiya- NSK

Honeywell

Dixell

Eliwell

ALCO

Johnson Controls-Huba

Carel

...



# YCQ – Pressure Transmitters

## Documentations



### Declaration

### Datasheet

### Instructions

**PRODUCT DATA**

#### Pressure Sensors

#### YCQB

Pressure sensors are widely used in Air Conditioning, Refrigeration and Heat Pump system. Using a 5V excitation input these sensors provide a 0.5-3.5 V or 0.5-4.5 V ratiometric signal output proportional to the pressure of the medium.  
This device requires no end user amplification.  
Pressure sensors permit to control and guarantee the system working under safe and stability condition.

#### Features

- Overall features: Applied high performance digital circuit which has good linear, small temperature excursion and high level
- Small size and simple installation
- Models available with lead wire direct
- Stability: Applied superior pressure core
- Diversification: different pressure range

#### General Specification

- Applicable for HFC / HFO / flammable
- Relative humidity: 0 to 95% RH
- Installation position: preferably with v
- Certifications: UL/CSA and declaration

#### Electrical Specification

- Supply Voltage : 5V ± 0.25V DC
- Current Consumption : Max. 10 mA
- Response Time : 10 ms
- Insulation Resistance 4 : Min. 100 MΩ
- Load Resistance : Min. 10 kΩ
- Protection Class : IP66/IP67

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**PRODUCT DATA**

#### Pressure Sensor

#### YCQC

Pressure sensors are widely used in Air Conditioning, Refrigeration and Heat Pump system. YCQC pressure sensor uses a DC 10-30V excitation input to provide a 4-20 mA signal output proportional to the pressure of the medium. This device requires no end user amplification. Pressure sensors permit to control and guarantee the system working under safe and stability condition.

#### Features

- Overall features: Applied high performance digital circuit which has good linear, small temperature shift and high level of accuracy over wide operating range
- Small size and simple installation; models available with Packard connector or wires
- Stability: Applied superior pressure core, good stability under strict process control

#### General Specification

- Applicable for R32 and others HFC/HFO refrigerants
- Relative humidity: 0 to 95% RH
- Installation position: preferably with vertical axis and sensor upwards
- Certifications: UL/CSA and declaration according to EMC directive

#### Electrical Specification

- Supply Voltage : from 10V to 30V DC
- Rated Output Signal: from 4 to 20 mA
- Voltage dependency : < 0.05% FS/10 V
- Current Limitation (linear output signal up to 1.5 x rated range) : 28 mA
- Signal Span (Vrs) : 16 V
- Insulation Resistance 2 : Min. 100 MΩ
- Protection Class : IP65/IP66

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**INSTRUCTIONS**

#### Pressure Transmitter YCQB and YCQC series

Applicable to fluids and refrigerants of GROUP 1 and 2, according to Directive 2014/68/EU  
Some models are suitable with water, please refer to the datasheet.

	YCQB	YCQC
Voltage	5 VDC	10-30 VDC
Output Signal	0.5 – 3.5V or 0.5-4.5V *	4-20mA
Pressure range *	From 0 to 150 bar	
Maximum Operating pressure *	52.5 bar or 75 bar or 135 bar or 225 bar	
Burst Pressure *	≥ 3 x Maximum Operating Pressure	
Temperature range *	from -40°C or -30°C to +80°C or +120 or +150°C	
Mechanical Connection *	7/16-UNF Male or Female – Solder – G ¼- G 3/8	
Electrical Connection *	Cable + XHP - Packard – Hirschman – Molex – M12	
IP enclosure rating *	IP 66 or 67	

\* Depending on the model – Refer to the model in hand and/or the YCQ drawing

**1** Disconnect all the supply voltage to avoid electric damage and shock.  
Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel.  
No responsibility is assumed by Sanhua for any consequences arising out of the use of this material.

**2** **OUTPUT CHARACTERISTICS**

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浙江三花制冷集团有限公司  
Zhejiang Sanhua Climate& Appliance Controls Group Co., Ltd  
Add: 368 West Xinchang Avenue, 312500.Xinchang, Zhejiang, China  
Authorized Representative: Ilan Peleg  
Authorized Company: Sanhua International Europe S.L.  
Tel: +34 91 654 46 92 Mob: +34 6 15 83 37 02 E-Mail: Ilan@sanhuaeurope.com  
Address: C/ José Celestino Mutis, 4, 21 28703 San Sebastian de los Reyes - Spain

#### The EU Declaration of Conformity

Issued in accordance with  
The Pressure Equipment Directive 2014/68/EU

**The manufacturer's name and address:**  
Company: Zhejiang Sanhua Climate& Appliance Controls Group Co., Ltd  
Address: 368 West Xinchang Avenue, 312500.Xinchang, Zhejiang, China  
Authorized Representative: Ilan Peleg  
Authorized Company: Sanhua International Europe S.L.  
Tel: +34 91 654 46 92 Mob: +34 6 15 83 37 02 E-Mail: Ilan@sanhuaeurope.com  
Address: C/ José Celestino Mutis, 4, 21 28703 San Sebastian de los Reyes - Spain

**Declaration:**  
Pressure transmitters (YCQB, YCQC series), shown in Tables 1, are classified "Pressure accessories" in the sense of the Pressure Equipment Directive 2014/68/EU, Article 2 point (5).  
The Refrigerant proper to the Group 2 as defined in article 13 (1) (b) of Directive 2014/68/EU.

**Description of Products:**  
Table 1:

SANHUA SERIES	MODELS	MAX P5(bar)	TS (°C)	PEE category	Module Annex III PED Directive 2014/68/EU
YCQB	YCQB08xxx	80	-40~125	Art. 4.3	-
	YCQB09xxx	90	-40~125	Art. 4.3	-
	YCQB10xxx	100	-40~125	Art. 4.3	-
	YCQB11xxx	110	-40~125	Art. 4.3	-
	YCQB12xxx	120	-40~125	Art. 4.3	-
	YCQB13xxx	130	-40~125	Art. 4.3	-
	YCQB14xxx	140	-40~125	Art. 4.3	-
	YCQB15xxx	150	-40~125	Art. 4.3	-
	YCQB16xxx	160	-40~125	Art. 4.3	-