



Commercial Refrigeration O Series Pressure Controls UNI-LINE® PRODUCT KNOWLEDGE

© 2009 Invensys. All Rights Reserved.

The names, logos, and taglines identifying the products and services of Invensys are proprietary marks of Invensys or its subsidiaries. All third party trademarks and service marks are the proprietary marks of their respective owners.

Subjects We Will Cover In This Session

- Overview
- Technical terms, acronyms and definitions
- Existing product line
- Features
- Quiz
- Manufacturers
- Where to find answers
- Q&A

What Are The Differences Between Air Conditioning Vs. Commercial Refrigeration?

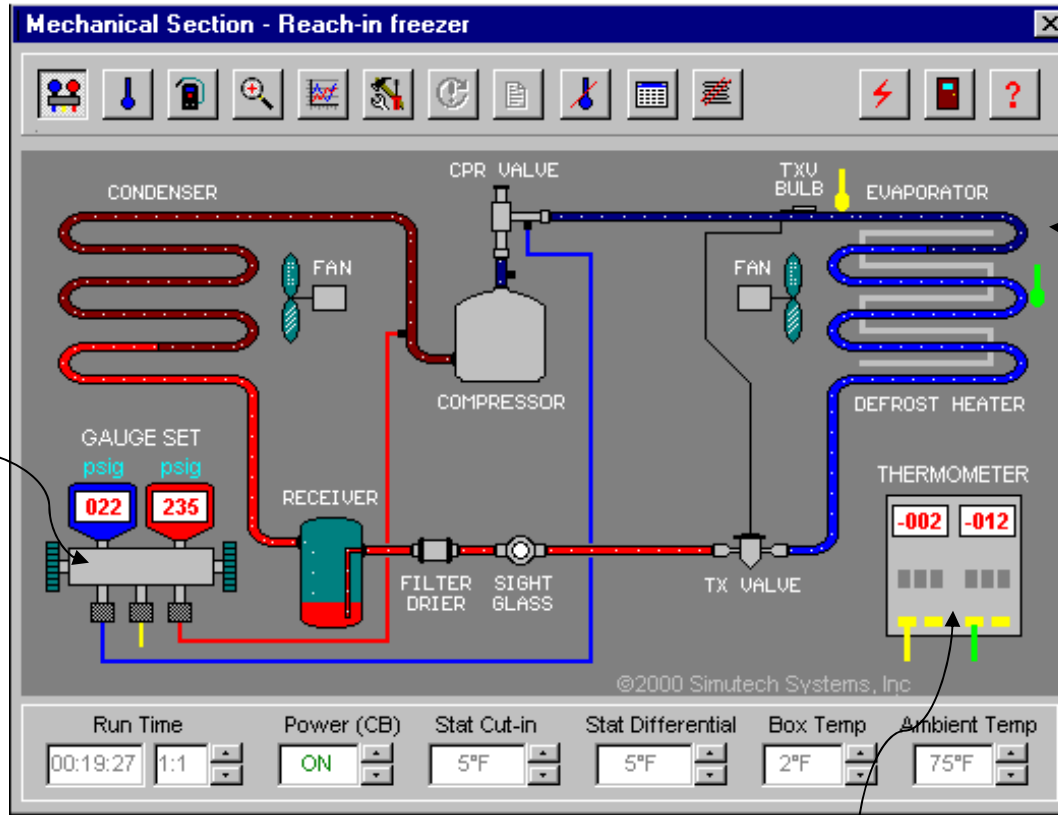
Scientific Principals are Similar however Refrigeration systems have:

- Operation Time 24 / 7
- Defrost Cycles
- Load Changes
- Product Specific vs. Personal Comfort
- Energy Conservation Important
 - Commercial Refrigeration Energy is More Critical than A/C systems

Technical Terms and Definitions

psig	Pounds per Square Inch Gauge
psia	Pounds per Square Inch Absolute
BTU	British Thermal Unit
Conduction	Flow of heat with solids
Convection	Flow of heat with fluids (or gas)
Radiation	Flow of heat with air (or space)
Superheat	Heat added to a refrigerant in the evaporator just after it changes from <i>liquid to gas</i> up to the compressor.
Sub Cooling	The difference in temperature in the condenser just after it changes from <i>gas to liquid</i> up to the expansion device.
TXV	Thermal Expansion Valve

Refrigeration System



Pressure Control



Frost build up
Defrost Control



Temperature Control



Capillary Connection

- Capillary Tube Connected Directly into Refrigeration Line
- Male and Female Connections



O Series Pressure Control Types

- Low Pressure
- High Pressure
- Dual Pressure



Pressure Controls – O Series

- Over 36 Million O series controls have been produced since 1936
- Multiple pressure ranges for most refrigerant types
- Unique **Lexan** cover and captive set screw
- Offers a **Super Cap** for vibration protection
- Ranco® O Series can also be Temperature Control
- Be careful to not confuse O Series:
 - **O10-1402** (Pressure)
 - **O10-1409** (Temperature)



Pressure Controls Selection Guide

Reset	Switch	Control Type	Operating Range and Differential (See table)	Connection Style (See table)	Typical UL / CSA Ratings ¹				
					VAC (60 Hz)	FLA	LRA	NIA	PD, VA
Auto	SPST	O10	A,B,C,D,E	1,2,3	24 120 240	24	144	24	144 720 720
		O11	A,B,F						
		O12	Low (A) High (G or H)						
Manual	Low (J) High (H)								
Auto	SPDT	O16	A,B,C,D,E,N		120 240 240 ²	17 17 20	102 102 80	24 24	720 720
Manual			F						
Auto	DPST	O20	A,B,C,D,E	120 240	24 24	144 144	24 24	125 125	
Auto / Manual	SPST or SPDT	G20	K	1,2	120 / 240 ³ 120 / 208 ⁴	20 20	78 78		
		G23	L		240 277	8.3 7	39 42		

	Operating Range	Differential
A	12" Hg to 50 PSI	5 to 35 PSI
B	10" Hg to 100 PSI	10 to 40 PSI
C	50 to 150 PSI	10 to 40 PSI
D	100 to 250 PSI	20 to 100 PSI
E	100 to 400 PSI	40 to 150 PSI
F	150 to 450 PSI	40 to 150 PSI
G	100 to 250 PSI	50 PSI Fixed
H	150 to 450 PSI	70 PSI Fixed
J	10" Hg to 100 PSI	Fixed
K	5" Hg to 100 PSI Fixed	Fixed
L	100 to 450 PSI Fixed	Fixed

1. Capillary with 1/4" sweat tube (depth stop, optional)
2. Capillary with female flare nut (core depressor, optional)
3. Male flare
4. Female flare nut (core depressor, optional)

Quiz Question #1

What is the difference between psig vs. psia?

- A) Gauge is 14.6 points above Average pressure value.
- B) Gauge is 14.6 points above Absolute pressure value.
- C) Gauge is 14.6 points below Absolute pressure value.

Replacements: Single Pressure Controls

SKU #	Description	Reset	Range PSI	Differential PSI	Switch	Pressure Connection	Cap. Length	Replaces
010-1401	Low Pressure Controls	Auto	12" to 50	5 to 35	SPST-Opens Low	1/4" SAE male flare		Honeywell: L414A, Johnson: P70AN-8, P70AA-157, P70AN-9, P70AA-64
010-1402	Low Pressure Controls	Auto	12" to 50	5 to 35	SPST-Opens Low	1/4" SAE flare nut	36"	Honeywell: P420B, Johnson: 970AB-29, P70AA-123, P70AC-9, P70AB-12, P70AB-40, P70AA-47, P70AB-44

Dual Pressure Controls

- Combines high and low pressure limit control into one unit
- Low pressure cycles compressor depending on suction pressure
- High pressure controls high pressure shutdown



Dual Pressure Common Parts

SKU #	Description	Low Press. (Open Low) Reset	Low Press. (Open Low) Cut-In PSI	Low Press. (Open Low) Diff. PSI	High Press. (Open High) Reset	High Press. (Open High) Cut-Out PSI	High Press. (Open High) Diff. PSI	Capillary Length	Replaces
012-1505	O12 Series-SPST Switch	Auto	12" to 50	5 to 35	Auto	100 to 250	50 Fixed	Has 1/4" SAE male flare.	Honeywell: L413A
012-1506	O12 Series-SPST Switch	Auto	12" to 50	5 to 35	Auto	100 to 250	50 Fixed	36" Has 1/4" SAE flare nut.	Honeywell: P421B, Johnson: P70LA-88
012-1502	O12 Series-SPST Switch	Auto	12" to 50	5 to 35	Auto	150 to 450	70 Fixed	36" Has 1/4" SAE flare nut.	JOHNSON: P70LA-87, P70LA-96
012-4842	O12 Series-SPST Switch	Auto	12" to 50	5 to 35	Convertible	150 to 450	70 Fixed	Has 1/4" SAE male flare.	

Top Five Ranco® O Series Pressure Controls

1. O10-2054
2. O10-1402
3. O10-1483
4. O16-108
5. O12-1549



Commercial Refrigeration Super Cap™

- Super Cap Capillary Protection System
- Provides 10 times more vibration protection
- Uses unique vibration-dampening cone
- Light weight copper alloy tubing
- Available on all single and dual O series pressure controls



Quiz Question #2

Super cap is an important feature because:

- A) Compressors vibrate
- B) Capillary tubes break
- C) Super caps can withstand 10 times the vibration over traditional pressure controls
- D) All of the above

Manufacturers of Pressure Controls

- Johnson Controls – Penn
- Danfoss
- Ranco®

Ranco advantages include:

- Lexan Cover
- Super Cap
- Application Specific

Find Refrigeration Products on Website

Sub Categories for: Refrigeration

[ID-Digifrost Controllers](#)
[IS Split Controllers](#)
[IC-Universal Controllers](#)
[Controller Accessories](#)
[Televis Communication Software for ID, IS and](#)
[Commercial Refrigeration Defrost Controls](#)
[Domestic Defrost Timers](#)
[Cold Controls](#)
[Temporary Cold Control](#)
[Cold Controls Canadian Models](#)
[Motors](#)
[Fan Blades](#)
[Icemaker Valves](#)
[Ice-Select Solenoid](#)
[Ice Machine Valves](#)
[Electronic Refrigeration Control](#)
[ETC Commercial Temperature Controls](#)
[ETC Temperature Sensor](#)
[Temperature Controls](#)
[Pressure Temperature Controls](#)
[Lube Oil Controls](#)
[Room Air Conditioner Controls](#)
[Ice Machine Controls](#)
[Water Cooler Controls](#)
[Reversing Valves](#)
[Heat Pump Controls](#)
[Fan Controls](#)
[Motor Protectors](#)
[Pressure Operators](#)
[Time Delay Sequencers](#)
[Vibration Switches](#)
[Refrigeration Service Parts](#)

www.Uni-Line.com

Click on [Refrigeration](#)

Website Tools: www.Uni-Line.com

UNI-LINE®

[About Us](#) [Careers](#) [Contact Us](#)

[Uni-Line Home](#)

[Products](#)

[Customer Support](#)

[Online Services](#)

Search Options

By Part # or Keyword

Categories

Thermostats

Enter part numbers

Welcome to the Uni-Line Catalog

Access to Uni-Line® product data is easier than ever. Now you can quickly search for the information you need on HVAC, commercial refrigeration, appliance and thermostat products. Linked with literature, [cross reference guides](#) and [FAQ Knowledge Database](#), you'll see the Uni-Line difference with just a few clicks.

See The Difference



Click here if you saw our ad in Contractor Excellence Magazine.

RANCO Innovation you expect.

Product Categories

- Thermostats
- Zoning
- Indoor Air Quality
- Alarms and Detectors
- Heating
- Refrigeration
- Cooking

Customer Support

- Customer Service
- Technical Service
- Dealer Price Information

Online Services

- Customer Toolbox
- Product Cross Reference
- Distributor Locator
- Publication Zone
- Contractor ID

Click here for more information

Cross reference

When You Have Uni-Line® Questions

Telephone:

Technical Service 1-800-445-8299

Technical Service Fax 1-630-260-7294

Customer Service 1-800-304-6563

Customer Service Fax 1-800-426-0804

Website:

Uni-Line® Catalog Website: www.Uni-Line.com

Cross Reference Website: www.uni-line.com/templates/xrefsearch.aspx

General Information Websites for:

Robertshaw®, Paragon®, Eliwell™, Ranco®, and Publication Zone®

www.InvensysControls.com

www.RobertshawTstats.com

www.ToolBox.InvensysControls.com



Invensys®, Robertshaw®, Paragon®, Ranco®, Eliwell™, Uni-Line®, and Make the Connection™ are propriety marks of Invensys or its subsidiaries. All third party trademarks and service marks are the propriety marks of their respective owners.

© 2009 Invensys Controls. All rights reserved.