# STANDARD DX REFRIGERATION SYSTEM SETTINGS

1. Defines standard LPCO, HPCO, HGBP, and Pressure Relief pressure settings.
2. Defines standard Superheat and Subcool settings.
3. All pressures as [psig] unless otherwise noted.

## TEMPERATURE SETTINGS

### SUPERHEAT
- Recommended superheat will range 10 - 20 Deg. F

### SUBCOOLING
- Recommended subcooling will range 7 - 12 Deg. F

DX units will be charged to achieve proper subcooling.

## LOW SIDE PRESSURE SETTINGS

<table>
<thead>
<tr>
<th>REFRIGERANT</th>
<th>R-22</th>
<th>R-134a</th>
<th>R-410a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Pressure Cutout [LPCO SAFETY]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUT OUT</td>
<td>52</td>
<td>25</td>
<td>93</td>
</tr>
<tr>
<td>[Sat T]</td>
<td>[28 °F]</td>
<td>[29 °F]</td>
<td>[28 °F]</td>
</tr>
<tr>
<td>CUT IN</td>
<td>57</td>
<td>32</td>
<td>100</td>
</tr>
<tr>
<td>[Sat T]</td>
<td>[32 °F]</td>
<td>[37 °F]</td>
<td>[31 °F]</td>
</tr>
</tbody>
</table>

**NOTES**

LPCO pressure switch is located in the suction line.

[R410A] LPCO settings meet system requirements and match Johnson Controls P70 series pressure switches:

1) Min Differential DP of 7 psi
2) Currently using Open High, Close Low

[R134a] LPCO pressure switch settings to be determined

## HOT GAS BYPASS Valve Settings

| Full Open/Rated Capacity | 53 | 26 | 95 |
| [Sat T] | [28 °F] | [30 °F] | [29 °F] |

| Valve Opens | 58 | 33 | 108 |
| [Sat T] | [32 °F] | [38 °F] | [35 °F] |

**NOTES**

HGBP valves typically require >= 6 °F evaporator temperature change for full capacity.
HIGH SIDE PRESSURE SETTINGS for systems WITHOUT HIGH SIDE PRESSURE RELIEF

<table>
<thead>
<tr>
<th>High Pressure Cutout [HPCO SAFETY]</th>
<th>CUT OUT</th>
<th>375</th>
<th>375</th>
<th>575</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[Sat T]</td>
<td>[149 °F]</td>
<td>[178 °F]</td>
<td>[145 °F]</td>
</tr>
</tbody>
</table>

**NOTES**

The HPCO pressure switch is located in the discharge line.

**HPCO switch should be:**
1) Non-adjustable
2) Manual reset
3) Open on pressure rise

**NOTE:** HPCO settings meet system requirements and matches Johnson controls P100 series pressure switches

**P settings in this section apply to:** Systems with no receivers and/or high side pressure relief

---

HIGH SIDE PRESSURE SETTINGS for systems WITH HIGH SIDE PRESSURE RELIEF

**PRESSURE RELIEF VALVE SETTINGS**

<table>
<thead>
<tr>
<th>---</th>
<th>450</th>
<th>675</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Sat T]</td>
<td>[193 °F]</td>
<td>[155 °F]</td>
</tr>
</tbody>
</table>

**Receiver Design Pressure**

[Standard Refrigeration receivers] --- 450 675

**High Pressure Cutout [HPCO SAFETY]**

<table>
<thead>
<tr>
<th>CUT OUT</th>
<th>375</th>
<th>375</th>
<th>575</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Sat T]</td>
<td>[149 °F]</td>
<td>[178 °F]</td>
<td>[145 °F]</td>
</tr>
</tbody>
</table>

Max Setting per UL 1995 --- 405 607

**NOTES**

The HPCO pressure switch is located in the discharge line.

**HPCO switch should be:**
1) Non-adjustable
2) Manual reset
3) Open on pressure rise

**HPCO <= 90% of Pressure Relief Valve** setting per UL 1995 and ASHRAE 15

**NOTE:** HPCO settings meet system and code requirements and match Johnson controls P100 series pressure switches

**P settings in this section apply to:**
- Systems with either receiver P relief or discharge line P relief
- 410A: Systems with [640 <= high side pressure relief <= 675 psig], if system has a high side pressure rating of < 650 psig, custom engineer HPCO and pressure relief
- 134a: Systems with [xxx <= high side pressure relief <= 450 psig], if system has a high side pressure rating of < xxx psig, custom engineer HPCO and pressure relief

**For all refrigerants:**
- Pressure relief valve setting <= Receiver rated pressure
- Pressure relief valve setting does NOT have to be <= other refrigeration components (for example, Sporlan liquid line filter driers are rated to 650 psig) because only designed to protect the receiver
- HPCO setting is also limited to protect compressors from high temperatures
## Energy Labs Current Standard HPCO/LPCO Switches

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>MFG</th>
<th>MODEL</th>
<th>SPECIFICATIONS</th>
<th>ELI PN</th>
</tr>
</thead>
</table>
| LPCO [410A] | Johnson Controls | P70CA-1C | - Open High, Close Low  
- Range 20 – 100 psig / Differential 7 psi min  
- 36 in. Cap wi/ ¼” flare nut  
- Max. Bellows Overrun P 325 psig | 10-PRSW-0220 |
| LPCO [134a] | ---       | ---       | *To Be Determined*                                                              | ---      |
| HPCO [410A] | Johnson Controls | P100DA-86C | - Open on Pressure Rise  
- High Limit  
- OPEN: 575 psig  
- CLOSE: Lockout, Manual Reset  
- ¼” female flare fitting with Schrader valve | 10-PRSW-0231 |
| HPCO [134a] | Johnson Controls | P100DC-3C | - Open on Pressure Rise  
- High Limit  
- OPEN: 375 psig  
- CLOSE: Lockout, Manual Reset  
- ¼” female flare fitting with Schrader valve | 10-PRSW-0100 |

### Revision Section Change Description

<table>
<thead>
<tr>
<th>Revision</th>
<th>Section</th>
<th>Change Description</th>
<th>By:</th>
<th>Approved By:</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>ALL</td>
<td>ORIGINAL RELEASE</td>
<td>MJA</td>
<td>FQK</td>
<td>14-Feb-11</td>
</tr>
</tbody>
</table>