

PX2 Series and PX3 Series Heavy Duty Pressure Transducers for Potential Use in Industrial HVAC/R Applications

An Application Note

Background

Heating, ventilation, air conditioning and refrigeration (HVAC/R) systems help maintain an acceptable indoor environment. The three components of an HVAC/R system are:

1. **Heating:** The process of bringing heat to an area. A Heating System is the use of a boiler, furnace or heat pump to heat water, steam or air and distributing it to the area.
2. **Ventilation:** The process of changing air in an area to change the temperature and improving air quality by removing moisture, dust, smoke and other airborne particles.
3. **Air Conditioning and Refrigeration:** Heat can be removed by absorbing and discharging heat through the use of a refrigeration cycle.

Due to the high cost of energy, HVAC/R systems need to be efficient. Controlling the compressor suction and discharge pressure to match refrigeration needs will help increase efficiency and reduce energy cost.

Solutions

The PX2 and PX3 Series are designed to provide continuous monitoring of compressor outlet pressure, chiller outlet pressure, evaporator coil outlet pressure, and cooling tower supply pressure to help control the flow of heating/cooling media during partial load conditions. (See Figure 1.) The PX2 and PX3 Series are compatible with common hydrofluorocarbon (HFC) refrigerants such as R410 and R134A. In addition, the PX3 Series is compatible with next generation low global warming potential (GWP) refrigerants such as R32, R1234ZE, and R448A (Solstice® N40).

For Honeywell heavy duty pressure transducers designed for use with ammonia refrigerants, please see the SPT Series, 19 mm Series, or 13 mm Series.

Figure 1. PX2 Series and PX3 Series Heavy Duty Pressure Transducers in Potential HVAC/R Applications

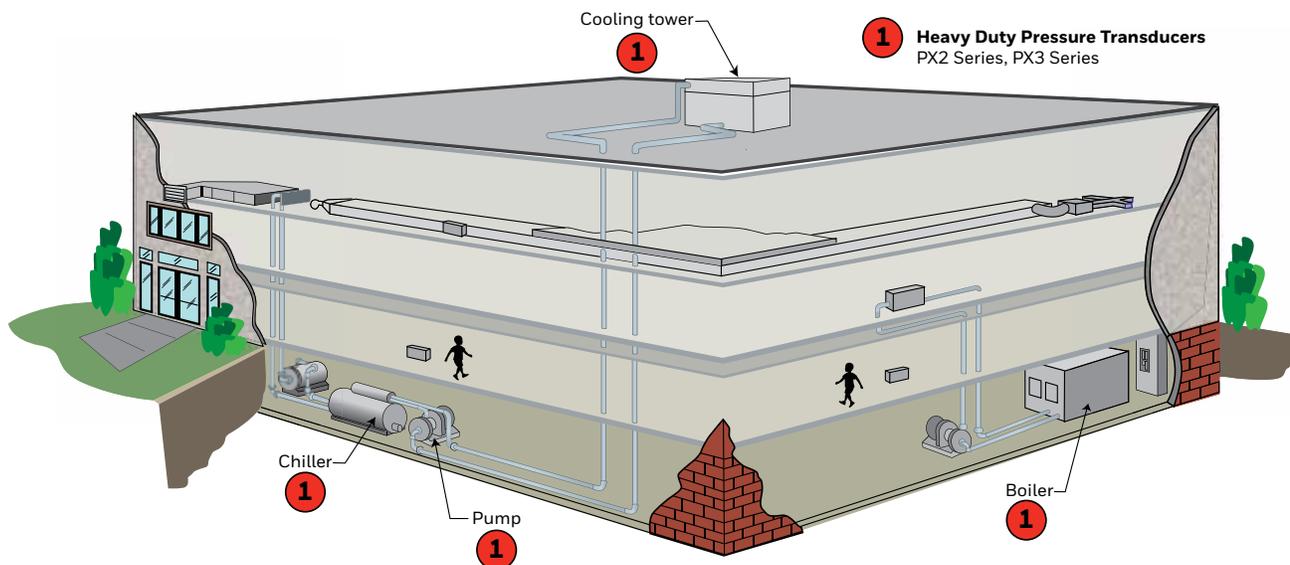


Table 1: PX2 Series and PX3 Series General Comparison

CHARACTERISTIC	PX2 SERIES	PX3 SERIES
OPERATING, COMPENSATED, AND STORAGE TEMPERATURE RANGE	 <p>-40°C to 125°C [-40°F to 257°F]</p>	 <ul style="list-style-type: none"> • Metri-Pack 150: -40°C to 125°C [-40°F to 257°F] • DIN male (EN 175301-803): -40°C to 125°C [-40 °F to 257°F] • Cable harness: <ul style="list-style-type: none"> - PVC: -40°C to 100°C [-40°F to 212°F] - XLPE: -40°C to 125°C [-40°F to 257°F]
TOTAL ERROR BAND	<ul style="list-style-type: none"> • ±2 %FSS: -40 °C to 125 °C [-40 °F to 257 °F] 	<ul style="list-style-type: none"> • ±1 %FSS: -20°C to 85°C [-4°F to 185°F] (optimal) • ±2 %FSS: below -20°C [-4°F] and above 85°C [185°F]
PRESSURE RANGE	<ul style="list-style-type: none"> • 1 bar to 70 bar • 15 psi to 1000 psi • 100 kPa to 7 MPa 	<ul style="list-style-type: none"> • 1 bar to 50 bar • 15 psi to 700 psi
PRESSURE REFERENCE	<ul style="list-style-type: none"> • Absolute • Sealed gage • Vented gage 	<ul style="list-style-type: none"> • Absolute • Sealed gage
PRESSURE PORT MATERIAL	stainless steel 304	<ul style="list-style-type: none"> • Threaded ports: brass C36000 (lead (Pb) content: 3.7% max.) • Tube port: copper (per ASTM B 280, lead (Pb) free) and brazing alloy
OUTPUT TRANSFER FUNCTION	<ul style="list-style-type: none"> • Ratiometric: <ul style="list-style-type: none"> - 5.0 V: 10 %Vs to 90 %Vs - 5.0 V: 5 %Vs to 95 %Vs - 3.3 V: 10 %Vs to 90 %Vs - 3.3 V: 5 %Vs to 95 %Vs • Regulated: <ul style="list-style-type: none"> - 1 Vdc to 6 Vdc - Regulated: 0.25 Vdc to 10.25 Vdc - Regulated: 0.5 Vdc to 4.5 Vdc - Regulated: 1 Vdc to 5 Vdc • Current: 4 mA to 20 mA 	<ul style="list-style-type: none"> • Ratiometric to 5 Vdc supply: 0.5 Vdc to 4.5 Vdc • Ratiometric to 3.3 Vdc supply: 0.33 Vdc to 2.97 Vdc • Current: 4 mA to 20 mA
EMC (RADIATED IMMUNITY) cable length =1,5 m	100 V/m per ISO 11452-2	<ul style="list-style-type: none"> • Ratiometric: 200 V/m per ISO 11452-2 • Current: 140 V/m per ISO 11452-2
INGRESS PROTECTION	IP65, IP67, IP69K (depends on electrical connector type)	<ul style="list-style-type: none"> • Metri-Pack 150: IP67 • DIN male (EN 175301-803C): IP65 • Cable harness: IP65, IP67, IP69K
EXTERNAL FREEZE/ THAW RESISTANCE	not specified	>6 cycles from -30°C to 50°C [-22°F to 122°F]
MEDIA COMPATIBILITY	<ul style="list-style-type: none"> • Common HFC refrigerants (e.g. R410A) • Low GWP refrigerants (e.g. R32, R1234ZE) • Engine oil, brake fluid, hydraulic fluid 	<ul style="list-style-type: none"> • Common HFC (hydrofluorocarbon) refrigerants (R410A and R134A) • Low global warming potential (GWP) refrigerants (R448A/Solstice® N40, R32 and R1234ZE) • Engine oil • Petroleum-based hydraulic fluids (Mobil DTE 25) • Brake fluids (DOT3) • Dry air

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