

Pressure Switch or Pressure Transmitter? — Setpoints, Ranges and the Stocked XM, SPKT and AKS Options

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Choosing between an electromechanical pressure switch and an electronic transmitter: fixed safety cut-outs versus continuous control signals, adjustability and covers (XMA/XMX), high-pressure Nautilus switches, and the Carel SPKT / Danfoss AKS ratiometric and 4–20 mA transmitter ranges in stock.

Two instruments, two jobs

A pressure switch opens or closes a contact at a set pressure — simple, self-contained, functional with no controller, and the right device for hard safety functions (HP cut-out with manual reset) and simple pump/compressor cycling. A pressure transmitter streams the measurement continuously (4–20 mA or ratiometric 0.5–4.5/0–5 V) into a controller that does the deciding — mandatory for electronic superheat control, floating head pressure, VFD control and data logging. Modern plants carry both: transmitters for control, switches as the independent last line.

Switch selection (XM family and relatives)

Range brackets the setpoint in its middle third: stocked general-purpose bodies include externally adjustable with transparent cover — XMAV06 1–6 bar, XMAV25 3.5–25 bar — and internally adjustable with black cover (tamper-resistant): XMXA06, XMXA12 1.3–12 bar, XMXA25.

High-pressure duty: Nautilus-class switches reach the condenser side — XMLB300 22–300 bar; transmitter-line mounting brackets (XMLPZLV01) support the matching XMLP sensors.

Refrigeration-specific controls: Penn P77 switches (P77BEB 3–30 bar HP, P77AAA LP " 0.5–7 bar) with stated differentials; protect any switch on a pulsating line with a damping loop (1.5 m loop).

Contacts and reset: changeover contacts standard; choose manual-reset variants for trip functions that must be acknowledged.

Transmitter selection (SPKT / SPK / AKS / XMED)

Range | Output | Stocked |

" 1...4.2 bar | 0–5 V ratiometric | Carel SPKT0053R0 |

" 1...9.3 / " 1...12.8 bar | 0–5 V | SPKT0013R0, SPKT00E1S0 |

0...10 / " 0.5...7 bar | 4–20 mA | SPKT0011C0, SPKT0021C0, SPK1000000 |

0...30 / 0...34.5 bar | 4–20 mA / 0–5 V | SPKT0031C0, SPKT0033R0, SPK3000000 |

0...44.8 / 0...45 bar (CO2 subcritical) | 4–20 mA / 0–5 V | SPKT00B1C0, SPKT00B6R0 steel |

0...60 / 0...150 bar (CO2 transcritical) | 0–5 V / 4–20 mA | SPKT00G1S0, SPKT00D8C0 |

" 1...12 / " 1...159 bar | Ratiometric | Danfoss AKS 32R, AKS 2050 |

3000 psi, 0.5–4.5 V | Ratiometric | XMED3K0PT130 |

Ratiometric vs 4–20 mA: ratiometric (0.5–4.5 V or 0–5 V of the 5 V supply) is the refrigeration-controller convention (Carel, Danfoss inputs) over short runs; 4–20 mA wins on long runs and electrically noisy plants because the signal is immune to voltage drop. Match the controller input first, then the range so the normal operating point sits at 30–70 % of span, then the connector (female/male M12-style per listing).

Installation and verification

Mount transmitters above the tapping where condensate could collect, use a valve or Schrader access for service (core tool), and on CO2 pick the range that covers standstill pressure, not just running pressure. Verify annually against a calibrated gauge at two points; log zero offsets. Switches get a functional trip test — drive pressure through the setpoint and record actual trip value and differential; a safety HP cut-out that has never been tripped on purpose is an assumption, not a protection. Controllers and the rest of the loop are covered in the controls guide.

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