The 4 types · side-by-side

Distributor-facing reading. Each row gives best-for, key trade-off, capacity, price band, and how many of SPC's tier slots carry an option at that product type.

PRODUCT TYPE	BEST FOR	KEY TRADE-OFF	TYPICAL CAPACITY	PRICE BAND	BRANDS SPC CARRIES
Vacuum Ejector / Generator VENTURI-DRIVEN · NO MOVING PARTS · RUNS ON SHOP AIR	**Distributed vacuum generation, no pump required.** Pick-and-place stations on existing pneumatic machines: the ejector mounts at the end-effector and converts compressed air directly to vacuum. SMC ZH is the platform: single-stage and multi-stage versions, vacuum levels to ~–84 kPa, flow rates matched to the cup size and cycle time.	CONSUMES COMPRESSED AIR WHENEVER VACUUM IS ON Ejectors are an ongoing air-cost line item: they don't make vacuum for free, they trade compressed air for it at roughly 3-7x the SCFM consumption versus an electric vacuum pump on continuous duty. Right answer for intermittent picks, distributed cells, and installs without electrical at the end-effector; wrong answer for continuous-vacuum process work where a central pump pays back.	Vacuum flow 4–220 L/min · -84 kPa max single-stage · multi-stage	$ – $$	1 / 5 · SMC ONLY
Vacuum Cup / Suction Cup DOZENS OF GEOMETRIES · MATCHED TO PART SURFACE	**The interface between the vacuum and the part.** Flat rigid parts (sheet metal, glass, PCBs) take flat or shallow-bellows cups; curved or compliant parts take deep-bellows cups; oily or textured surfaces want oil-resistant compound; hot-formed parts want silicone or fluorosilicone. SMC ZP catalog covers the geometry × material matrix: get the cup right and the install works.	WRONG GEOMETRY = DROPPED PARTS Mis-matched cup geometry is the #1 failure mode in vacuum pick-and-place: a flat cup on a curved part seals on one edge and dumps vacuum past the other; a deep bellows on a rigid flat part compresses unevenly and oscillates the pick. Match the cup to the surface geometry before sizing the ejector; the wrong cup can't be saved by a bigger ejector.	Diameters 2–200 mm · holding force scales with area NBR · silicone · FKM · fluorosilicone	$ – $$	1 / 5 · SMC ONLY

Replacement Vacuum Cup THE CONSUMABLE · 4-12 WEEK REPLACEMENT CADENCE	**The PM line item every vacuum customer underestimates.** Cups wear from the surface contact, the elastomer fatigues from vacuum cycling, and the sealing lip eventually loses its conformability. Production-duty installs replace every 4-12 weeks; quote a 6-month spare allowance on every initial cup sale. Same SMC ZP catalog, ordered as the replacement bare cup.	CUSTOMERS CONSISTENTLY UNDER-STOCK The cup is the cheapest line item on the install and the one most likely to take the line down when it fails: the customer always runs out before the next PO clears. Stock a working spare bank; cycle the new cup in at the first sign of holding-time drift, not when the cup actually fails.	Matched to OEM cup geometry + material bare cup only · cup + adapter	$	1 / 5 · SMC ONLY
Vacuum Sensor / Switch PLC FEEDBACK · CONFIRMS THE PICK BEFORE THE ARM MOVES	**Closes the cycle loop, no sensor, no dependable pick.** Mounts on the vacuum line between the ejector and the cup; signals the PLC when vacuum reaches a threshold (the part is held) so the robot can index. SMC ZSE pressure sensor with PNP/NPN switched output is the default; analog 4-20 mA versions feed diagnostic data on cup-wear trends.	SPEC'D OR SKIPPED, NEVER HALF-INSTALLED Vacuum sensors are the line item customers cut from initial quotes to save $100/station, and then call back six months later after the robot has dropped a thousand parts. Spec it on every vacuum end-effector quote; the savings on the cut are consumed by the first dropped-part incident.	Range to -100 kPa · digital + analog outputs switched · analog · IO-Link	$	1 / 5 · SMC ONLY

Reading the brand bench column: the bar shows how many of SPC's tier slots (Industry Leader · Emerging · Economical · adjacent) carry an option at that product type. A deep bench means a price-driven and a spec-driven option both close cleanly; a narrow bench means the available brands map closely to the technical requirements and the comparison stops being a tier choice.