

Comparison of High-Pressure (2000 to 6000 psi or 137 to 411 bar) Reference Probes

	Regular HP Ref Probes (Base Model)	Patented Refillable Ref Probe (Model RF3)	Patented Refillable Ref Probe (Model RF4)	Patented Gas-Tolerant Ref Probe (Model GT)
Accuracy/ Stability	Good	Best , low liquid-junction potential	Better , refilling refreshes internal solution	Good, Same as Base Model
Probe Life	1 to 4 years	Long life (normally 2 to 5 years); Low-cost plug fitting may require replacement	Long life, Similar to Model RF3 Low-cost plug fitting may require replacement	1-4 years, Same as Base Model
Presence of high-pressure gases (CO ₂ , O ₂ , N ₂ , ...)	Severe Effect Require extremely SLOW depressurization (75 psi per 60 min); may reduce service life]	Some Effect Requires SLOW , but reasonable depressurization rate (75 psi or 5 bar per 90 seconds)	No Effect No need for slow depressurization	No Effect No need for slow depressurization, requires a pump for long term experiments
Effect of H ₂ S	Severe Effect	Some Effect	Some Effect	No Effect requires a pump for long term experiments
Temperature	Up to 305°C for most types To 400°C for special design	Up to 305°C for most types To 400°C for special design	Same as Model RF3 To 400°C for special design	Up to 220°C
Outflow Rate of Internal KCl	Extremely low; no need to refill KCl; maintenance free	Moderate, but comparable to commonly used low-pressure reference electrodes; when system is extremely sensitive to Cl⁻ , may use K ₂ SO ₄ instead of KCl	Adjustable between Base Model and RF3 at fabrication time	Extremely low; no need to refill KCl
Cost	Lowest (Base price)	Extra \$650	Extra \$995	Extra \$850—316SS Extra \$1250—C-276
Ease of use	Easiest (no additional connections, no refilling)	Easier No additional connections; Requires refilling of KCl solution, but refilling is as easy as refilling a common low-pressure reference or pH electrodes	Easy Same as RF3, except it requires one extra line (1/8" tubing) connected to gas inlet of autoclave	Not as easy Equalizer requires additional plumbing and procedures to operate
Port Size for installation	1/8", 1/4", 3/8", 1/2" NPT (at least 3/8" NPT if P > 5000 psi)	1/4", 3/8", 1/2" NPT (1/8" NPT for special design only, at least 3/8" NPT if P > 4000 psi)	1/4", 3/8", 1/2" NPT (1/8" NPT for special design only, at least 3/8" NPT if P > 4000 psi)	1/4", 3/8", 1/2" NPT (1/8" NPT for depth-non adjustable only; at least 3/8" NPT if P > 4000 psi)