

# Baldwin™-Series Model 45 Dilution Probe

## Dilution Extraction Probes Eliminate Conditioning Systems & Heated Lines

- Selectable dilution ratios
- Out-of-stack orifice
- Dilution air pre-heater
- Optional fast loop bypass
- Plug-free operation
- Corrosion resistant
- Self-regulating temperature
- Wet basis measurement

Baldwin™ -Series Model 45 Dilution Probe conditioning systems from Perma Pure draw, filter and dilute sample gases in preparation for analysis. The out-of-stack conditioning system dilutes the sample gas 10 to 250 times with dry air, reducing the water vapor content and eliminating high-cost heated lines.

### Principle of Operation

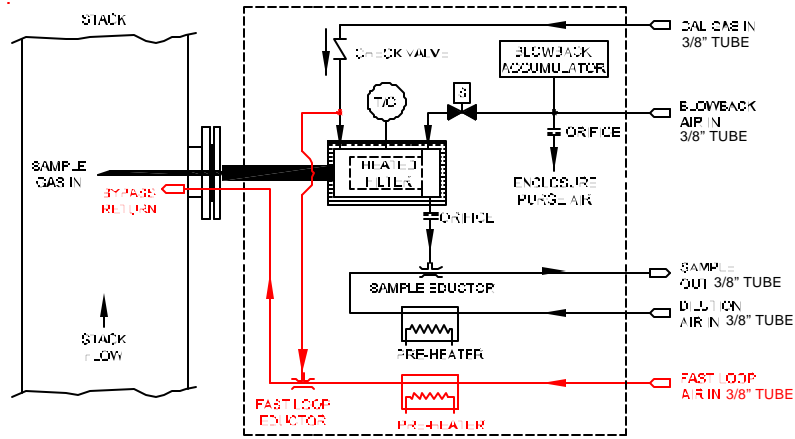
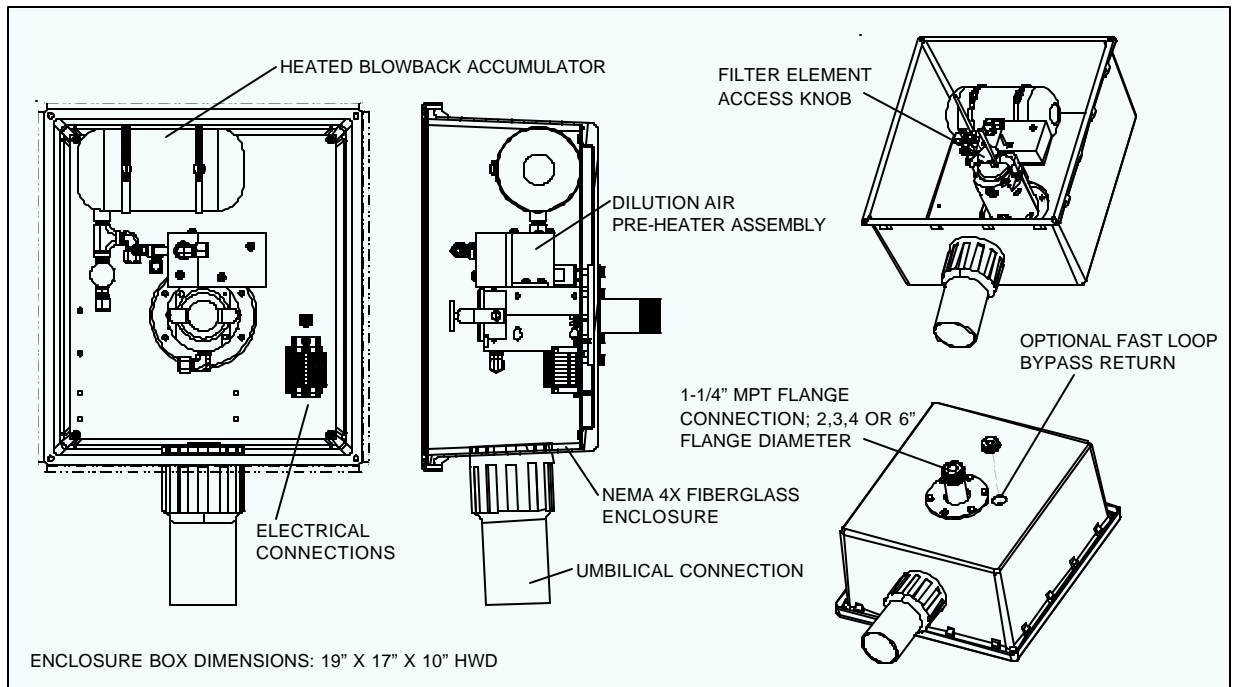
A precision, low flow, heated dilution eductor assembly driven by instrument quality air extracts sample gas from the process. The sample passes through a stinger and filter probe to remove particulate. The filter element is selected for its inertness to the sample gas; a ceramic element is standard.

A conditioned source of instrument air connects to the dilution eductor. The flow through the critical orifice in the eductor creates the vacuum that pulls the sample gas through the dilution probe system. This air mixes with the sample, diluting the gas to a lower concentration and dew point. The dilution air and sample gas flow rate may be set by selecting a different orifice size. This orifice is made from precisely machined Monel. The design of the orifice restricts the gas flow to achieve sonic levels or the speed of sound, eliminating the effects of pressure fluctuations downstream.

To maintain a constant dilution ratio, the precision dilution eductor draws the sample in at a slow rate of 25-700 cc/min. An optional fast loop eductor is available to reduce lag time between the probe tip and filter body, ensuring adequate sample supply.



Model Number	4P-45
Enclosure	NEMA 4X fiberglass with 3/8" Rubatex/silicone insulation 19" x 17" x 10" HWD; 25 lbs w/o stinger & flange
Electrical requirements	Probe: 90-260 VAC, 50/60 Hz, 600 Watts Blowback solenoid: 120 VAC standard, 230 VAC (optional 24 VDC)
Dilution ratios	250:1, 100:1, 40:1, 10:1
Max. sample gas inlet temperature	45°F / 230°C with silicone rubber O-rings 600°F / 318°C with Kalrez® o-rings
Filter element	2 micron, 3" ceramic, 90 cc internal volume, standard (optional Teflon®, SS, SS mesh 0.1-20µm)
Filter housing	316L stainless steel, 160 cc internal volume (optional Durinert® or Teflon coating)



### TECHNICAL SPECIFICATIONS

Dilution air flow	1-10 lpm; 50 psig minimum
Dilution air purity	-20°C dewpoint, less than 1 ppm CO, CO <sub>2</sub> , NO <sub>x</sub> , SO <sub>x</sub>
Critical flow dilution orifice	Monel
Orifice vacuum	-15 "Hg
Stack gas absolute pressure range	-10 "H <sub>2</sub> O to +20 psig
Temperature control, filter holder	400°F / 204°C aluminum heat jacket
Temperature control, diluter	400°F / 204°C aluminum heat jacket
Control thermocouple	type K
Monitoring thermocouple, optional	type K, terminated on terminal strip
Heater jacket	machined aluminum with (2) 300 W cartridge heaters
Temperature control	external by user, optional heater/blowback controller
Over temperature switch	external by dilution sample probe controller option Integral, surface mount, set at 350°C
Warm up time	2 hours
Blowback tank volume	1.5 liters, 10 liters at 90 psig
Blowback frequency	By experience, minimum once every 24 hours
Blowback duration	2 seconds
Blowback solenoid	2 way, 3/8" orifice, pilot operated
Fast loop eductor	Option as specified
Fast loop air pressure	50 psig
Fast loop supply air flowrate	10 lpm
Fast loop sample bypass flow	5-7 lpm



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