

Emission from CI Engine

- Invisible Emission
 - HC, CO, CO₂, NoX, SO₂
- Visible Emission
 - Smoke and Particular Matter

HC Emission from CI Engine

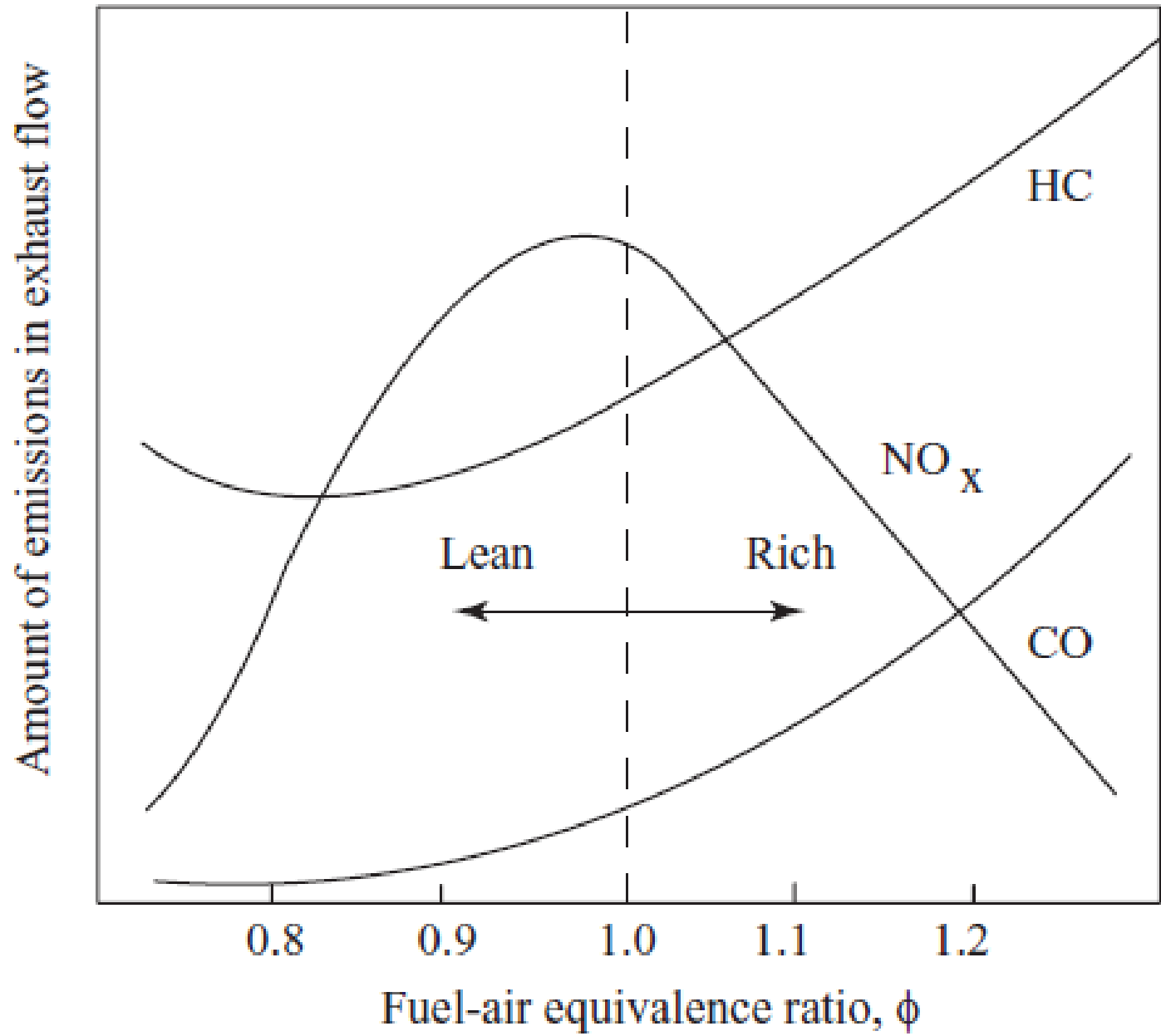
- Over leaning
- Under mixing / over mixing
- Sac volume
- Higher boiling and condensing temperature

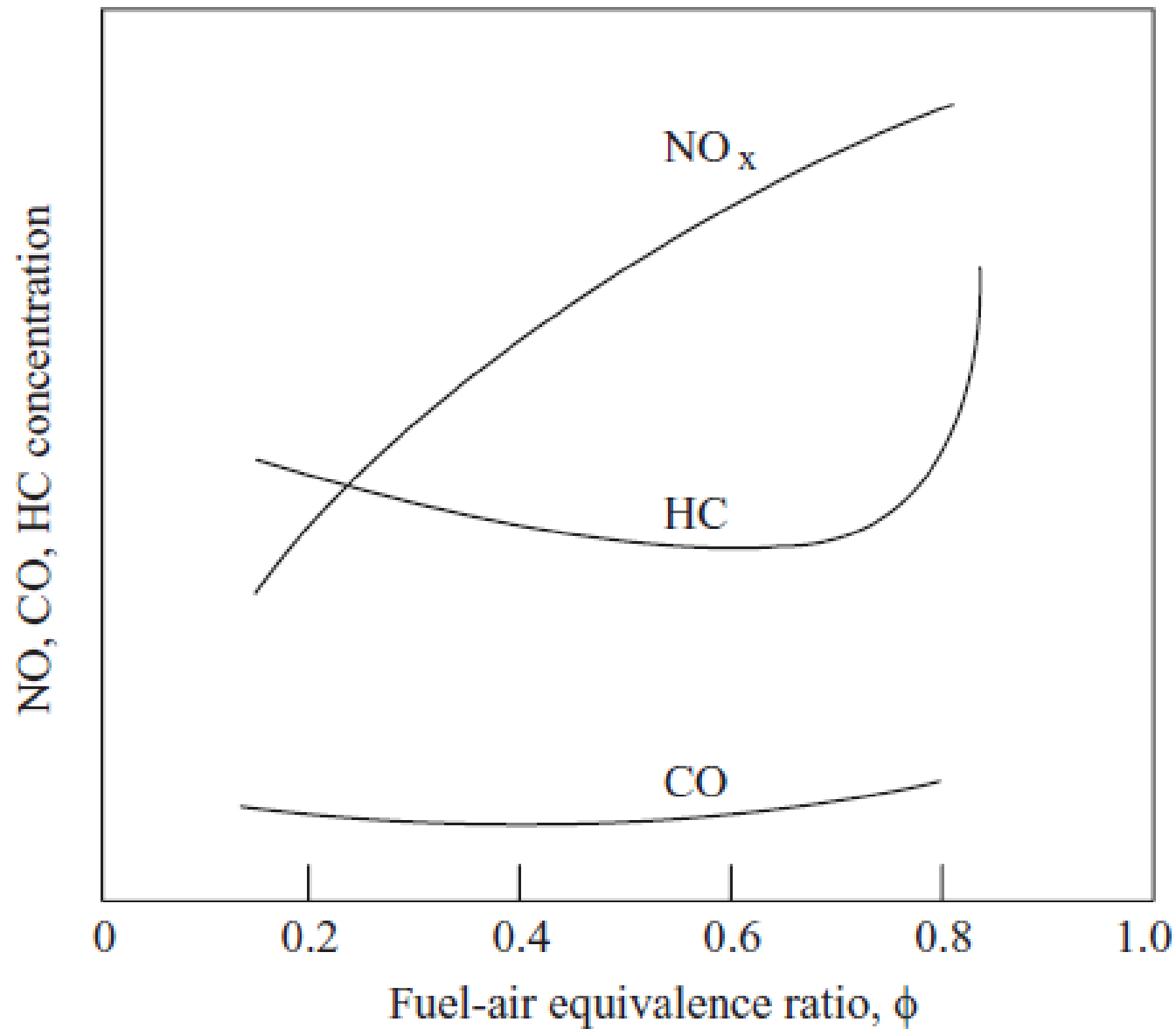
NoX Emission from CI Engine

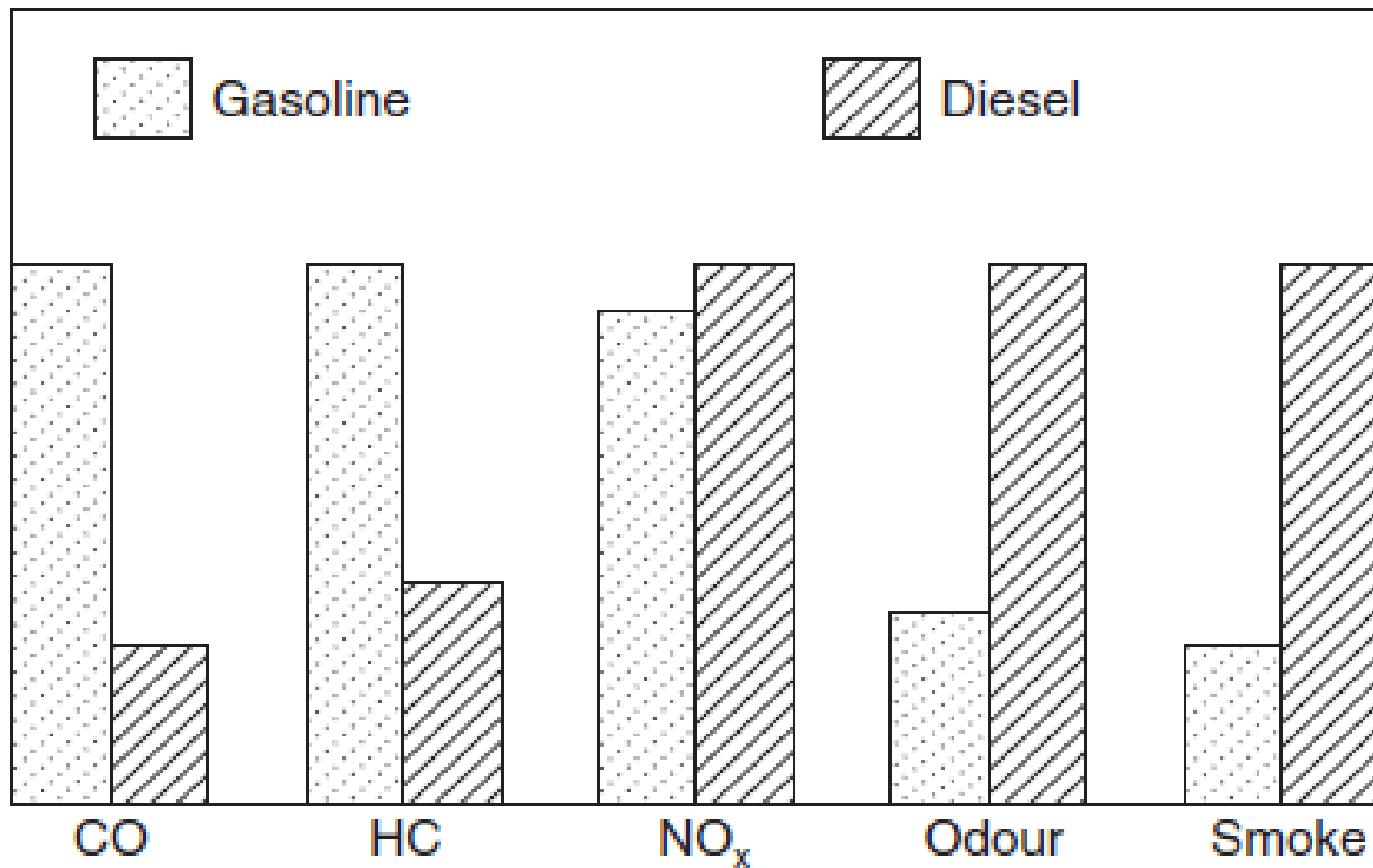
- Air Fuel Ratio
- Injection Advance
- Fuel Characteristics
- Intake air charge dilution

Smoke formation

- Types of fuel
- Fuel air ratio
- Injection system
- Load on engine
- Engine Speed
- Maintenance







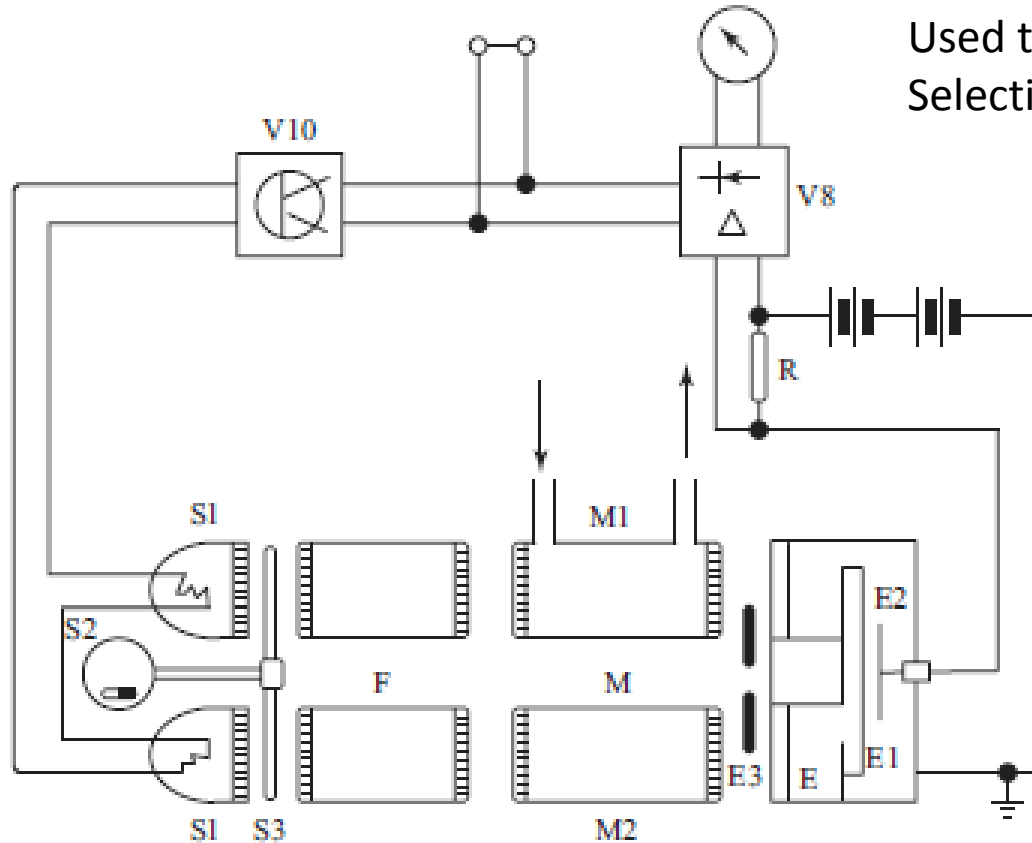
3.16. Comparison of emissions and odour from gasoline and diesel engines.

Modification in CI Engine to Reduce Emission

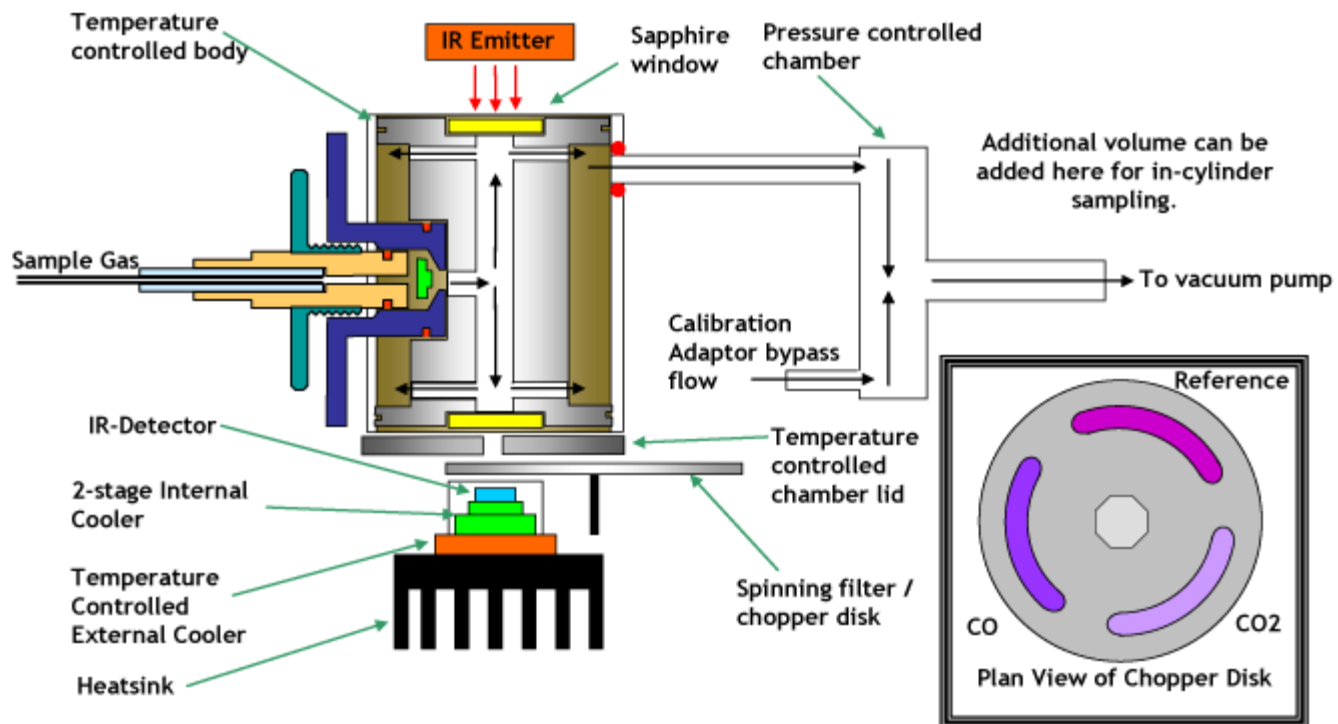
- HC Emission
- NoX emission
- Particulate matter

Non Dispersive Infra-red (NDIR) Unit

Used to measure CO and CO₂
 Selective Absorption of infrared energy

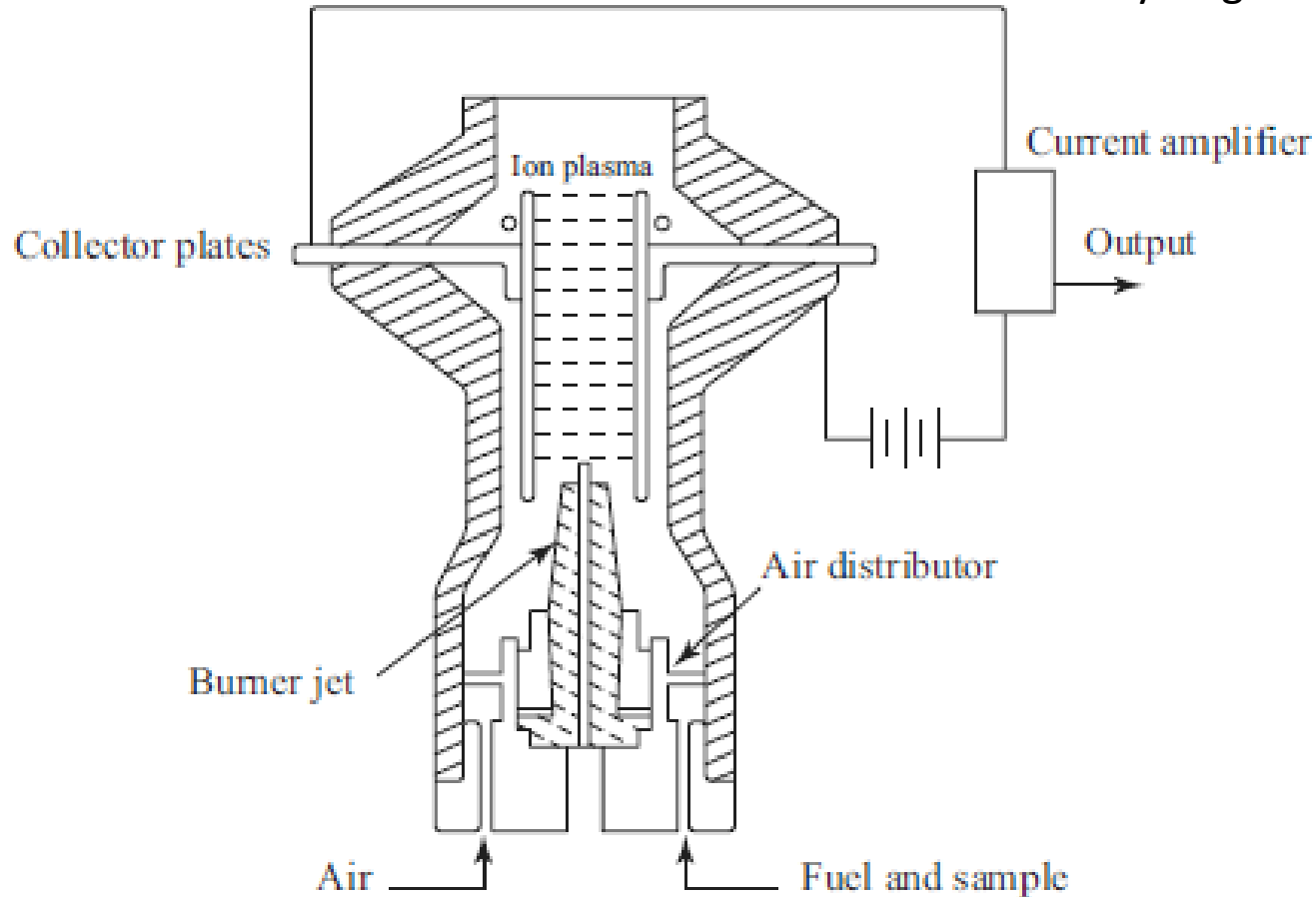


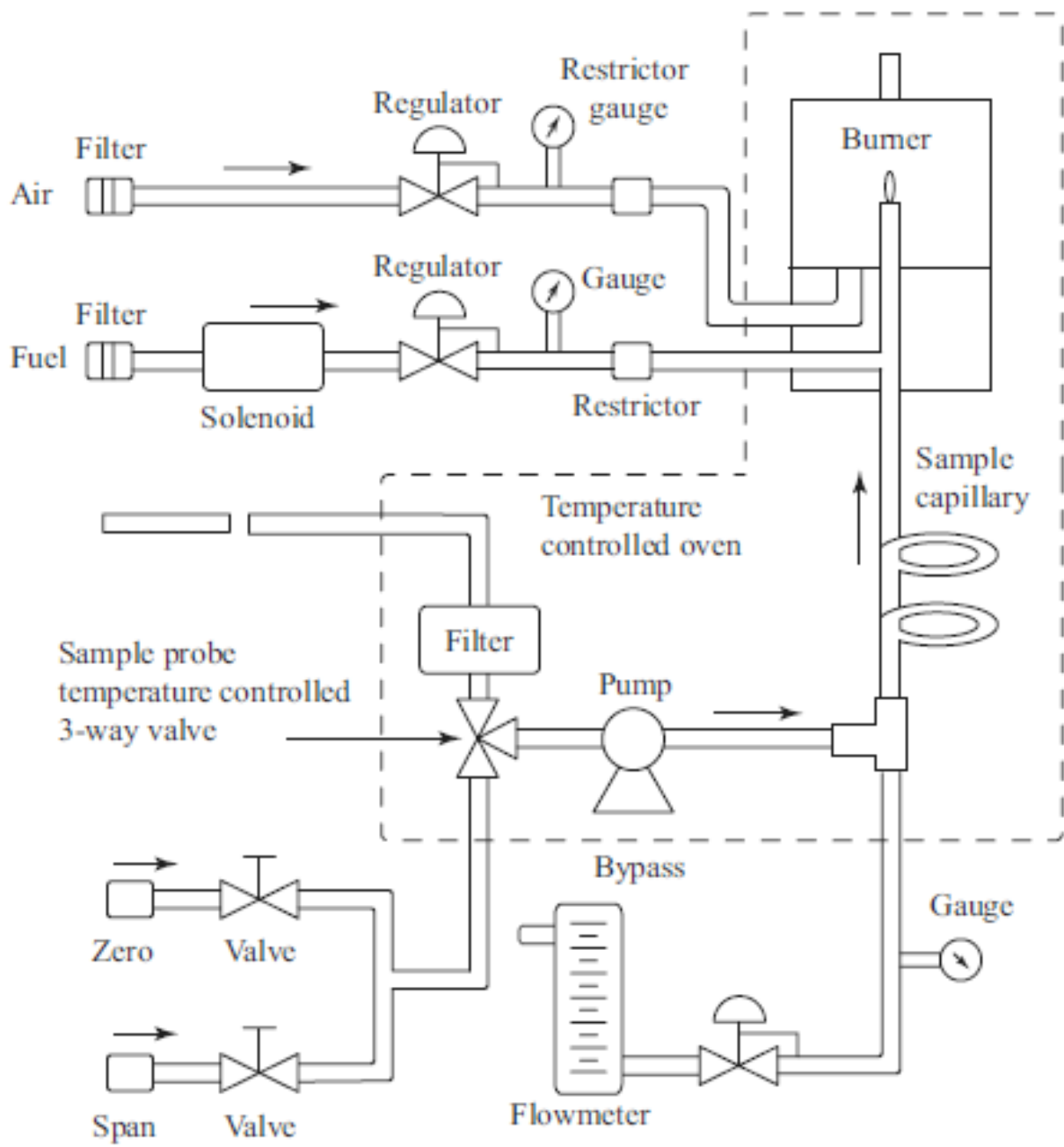
E	Receiver	M1	Sample cell
E1	Diaphragm	M2	Reference cell
E2	Fixed counter electrode	R	High impedance resistor
E3	Receiver trimmer	S1	I R sources
F	Filter cell	S2	Motor
G	DC supply	S3	Shutter wheel
M	Measuring cell	V8	Amplifier
		V10	Mains stabilization



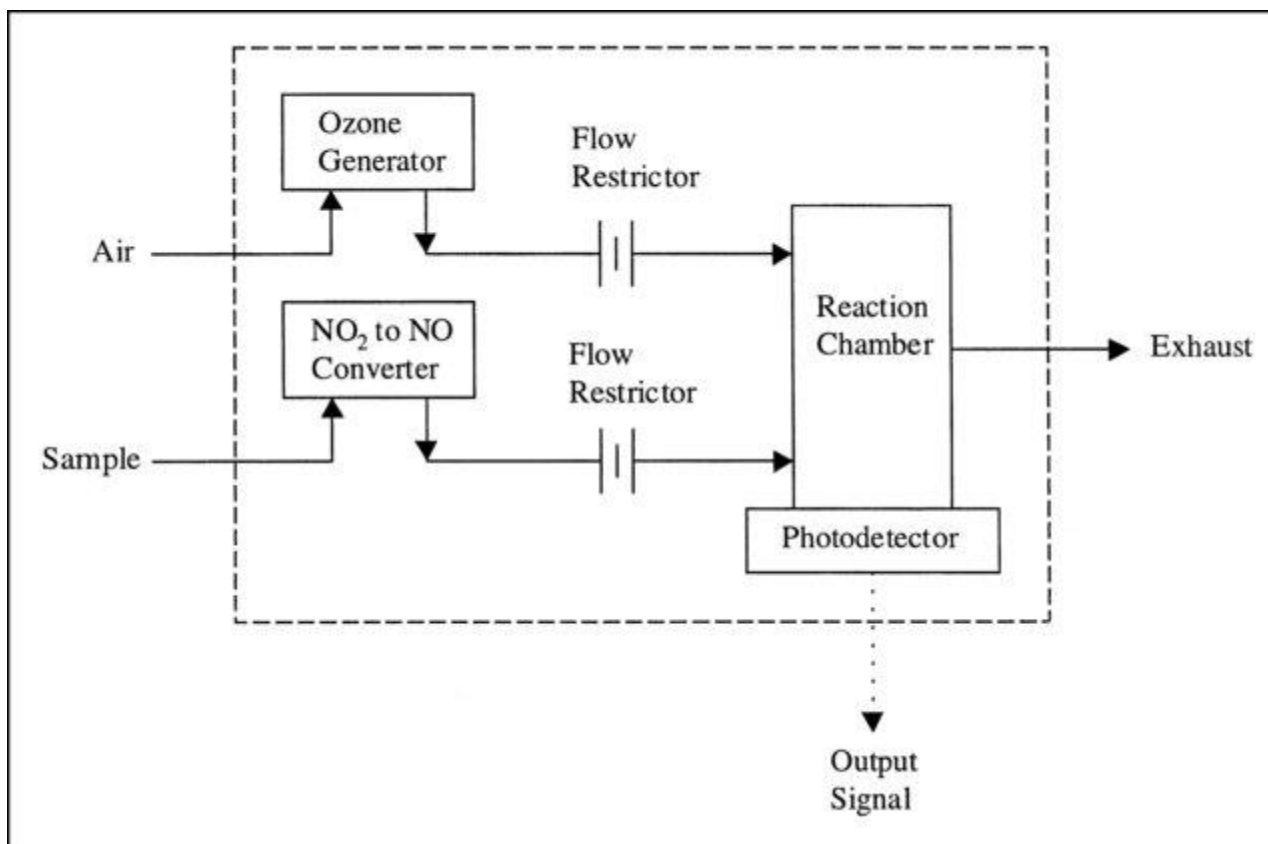
Flame Ionization Detector (FID)

Used to measure HC
Pure hydrogen-air flame are ion free





Chemiluminescence Analyzer



Hartridge smoke meter

