

TABLE 1.1 Mechanisms of extinguishment by water mist and application


Mechanism	Application
Heat extraction	The drop size distribution, momentum and mass flow rate, must be sufficient to absorb a critical percentage of heat released by the fire
Oxygen displacement	Design to: <ol style="list-style-type: none"> 1. Enclose fire to contain evaporated water or 2. Use nozzle dynamics to force water vapor into the base of the fire
Radiant heat attenuation <ol style="list-style-type: none"> 1. To unburned surfaces 2. To burning surfaces 	Mist must: <ol style="list-style-type: none"> 1. Surround the fire, and 2. Penetrate the flame
Vapor/air dilution <ol style="list-style-type: none"> 1. By water vapor, and 2. By entrained air 	 <ol style="list-style-type: none"> 1. Significant for liquid fuel pool or spray fires. Must have enclosure or control of dynamic spray properties to distribute diluent over the fuel surface. 2. Nozzle design may influence air entrainment, hence dilution
Kinetic effect: <ol style="list-style-type: none"> 1. Reduce flame velocity 2. Accelerate combustion reaction 	<ol style="list-style-type: none"> 1. Applies to deflagration control by reducing velocity of the flame front, hence explosion overpressure 2. Unpredictable: mist may suppression or invigorate combustion

Table 2.1 Discharge Pressure for Each Sprinkler

Position	NO.1	NO.2	NO.3
Discharge pressure kgf/cm^2	3.42	3.45	3.48
Discharge water rate (Lpm)	144.18	145.28	145.84
Position	NO.4	NO.5	NO.6
Discharge pressure kgf/cm^2	3.42	3.45	3.48
Discharge water rate (Lpm)	144.18	145.28	145.84



Table 4.1 Fire Parameters in Different Protection Means

		Time to 325 K (sec)	Minimum Oxygen (%) at 1.0 m	Maximum CO (ppm) at 1.0 m
Non protection		--	9.45	over
Conventional sprinkler		176	18.74	772
4 nozzles	Shielded	73	18.2	672
	Unshielded	89	16.75	792
6 nozzles	Shielded	44	17.64	834
	Unshielded	40	19.42	972



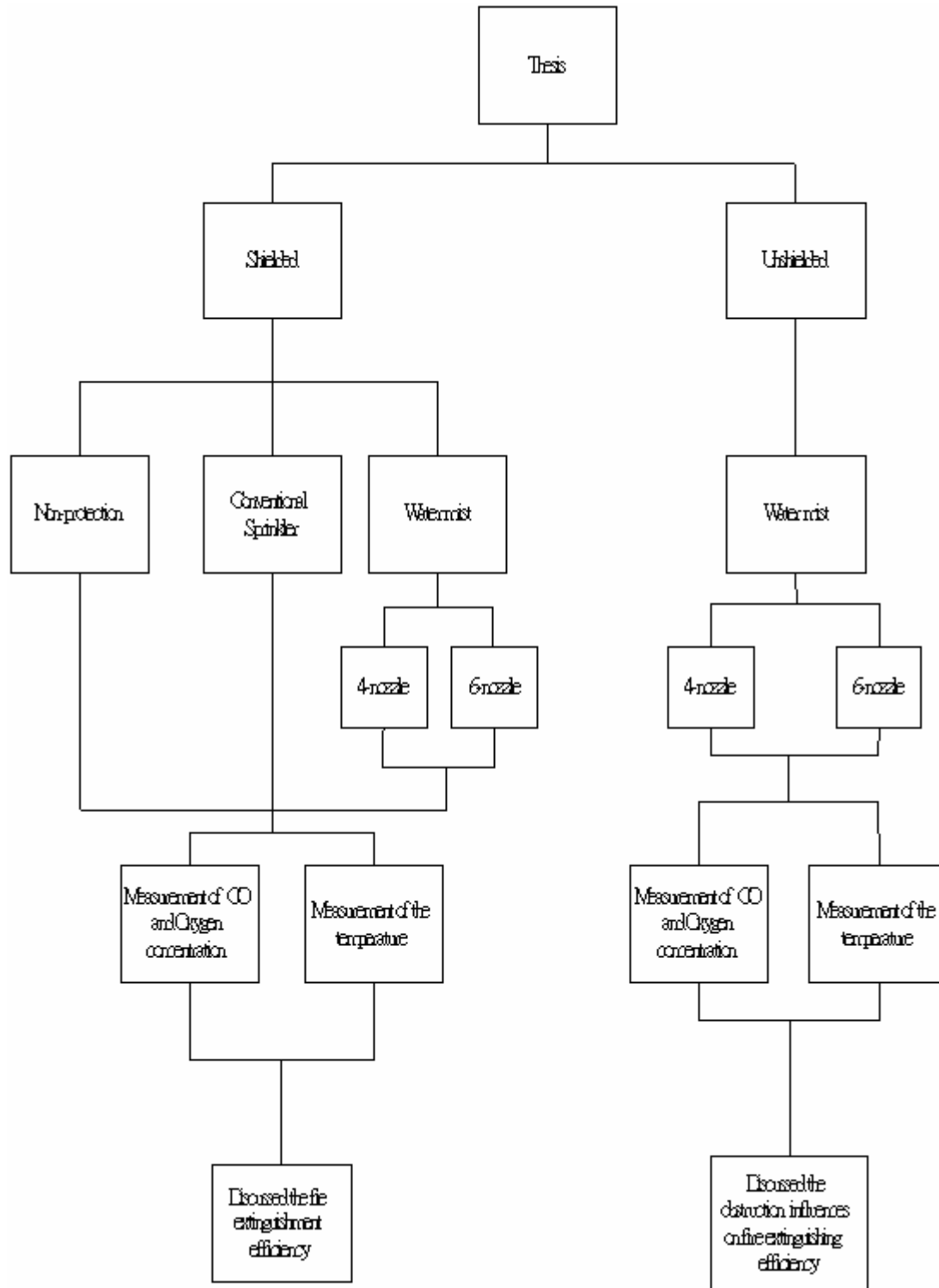
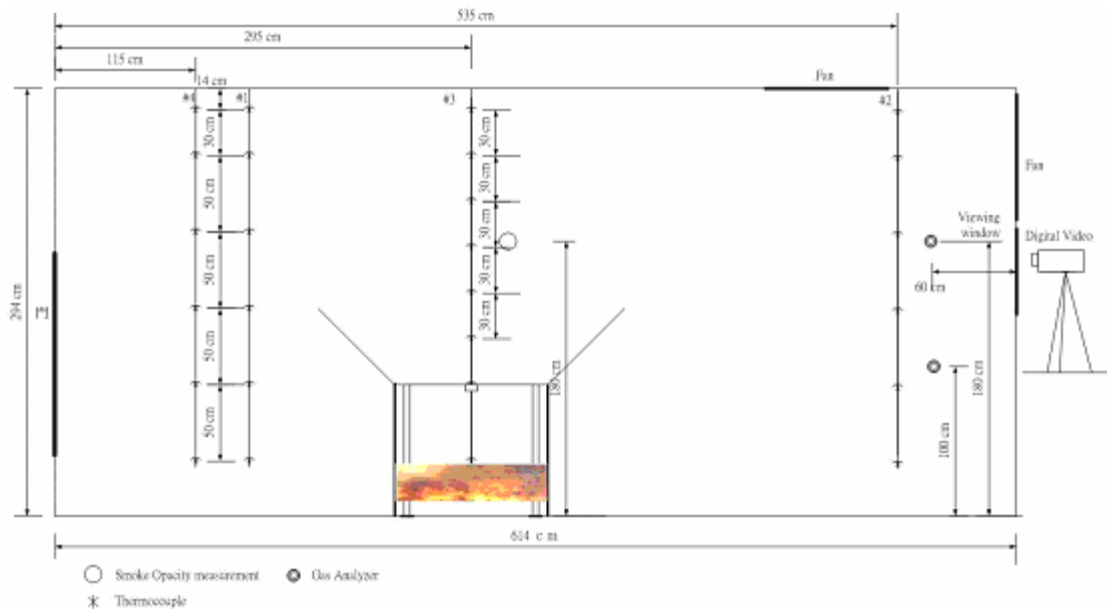
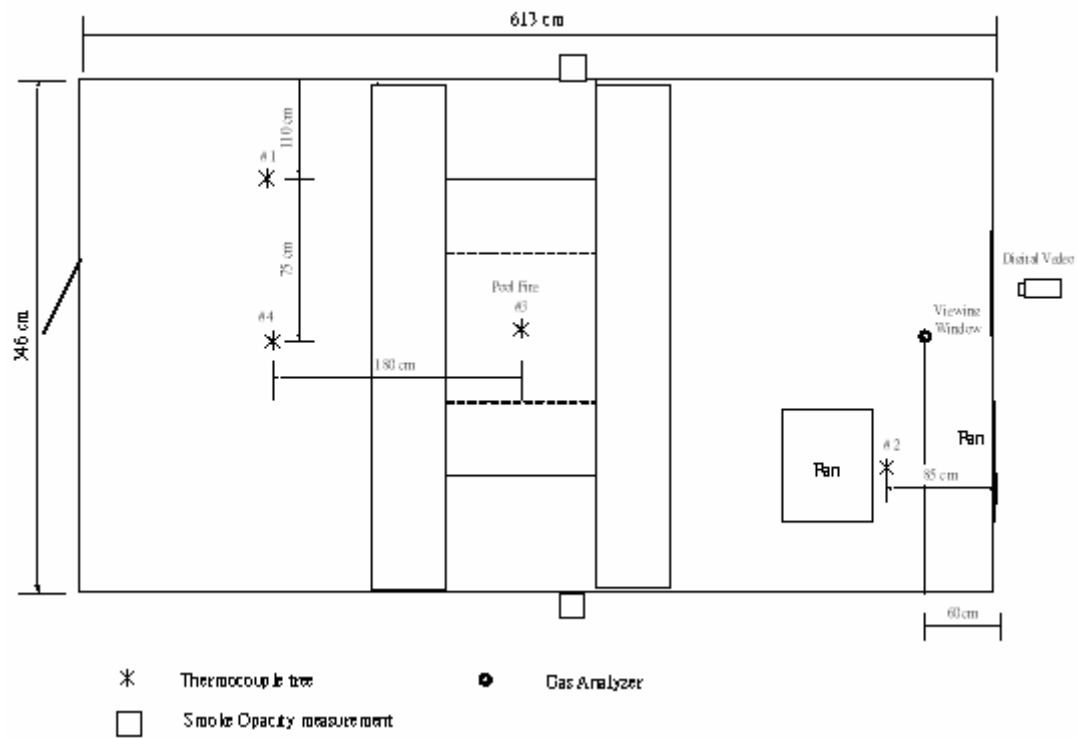


Fig. 1.1 Scheme diagram of the thesis



(a)



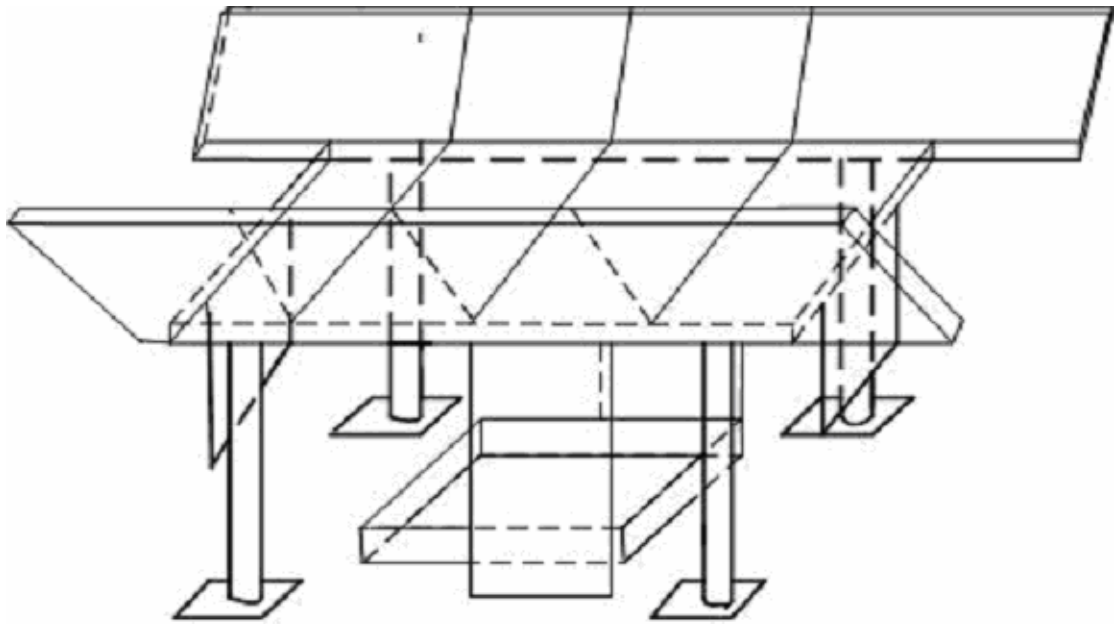


Fig. 2.2 the schematic configuration of simulated turbine



Fig.2.3 The picture of the pendent sprinkler

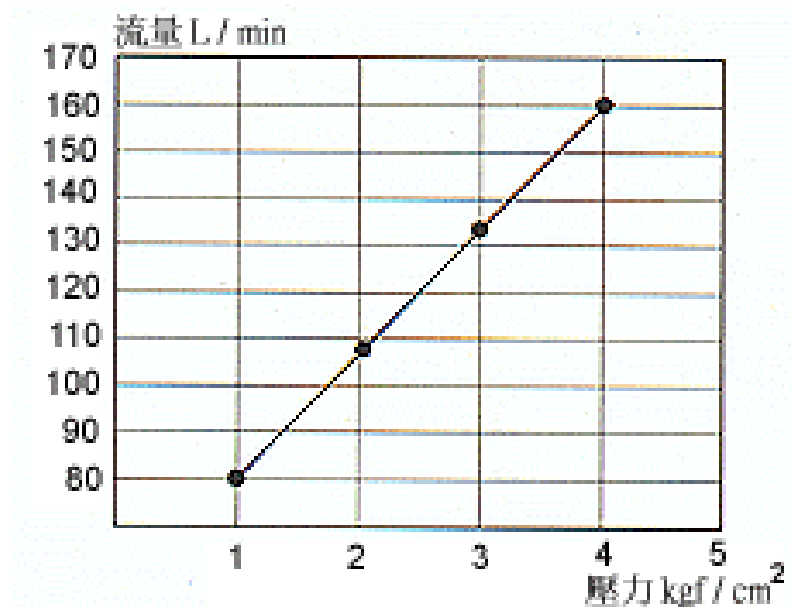
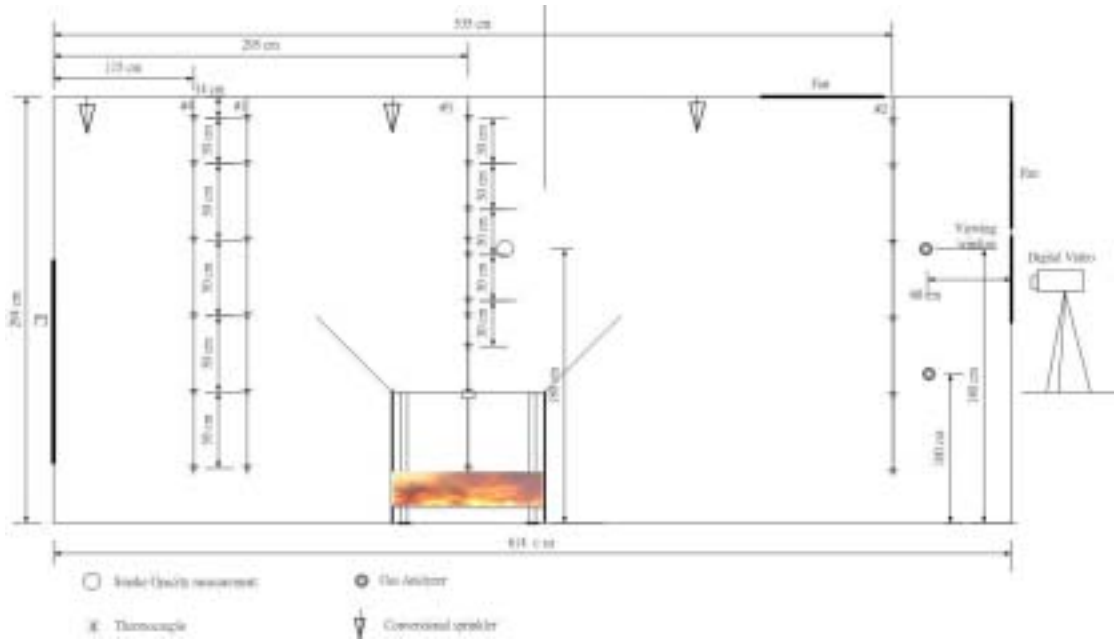
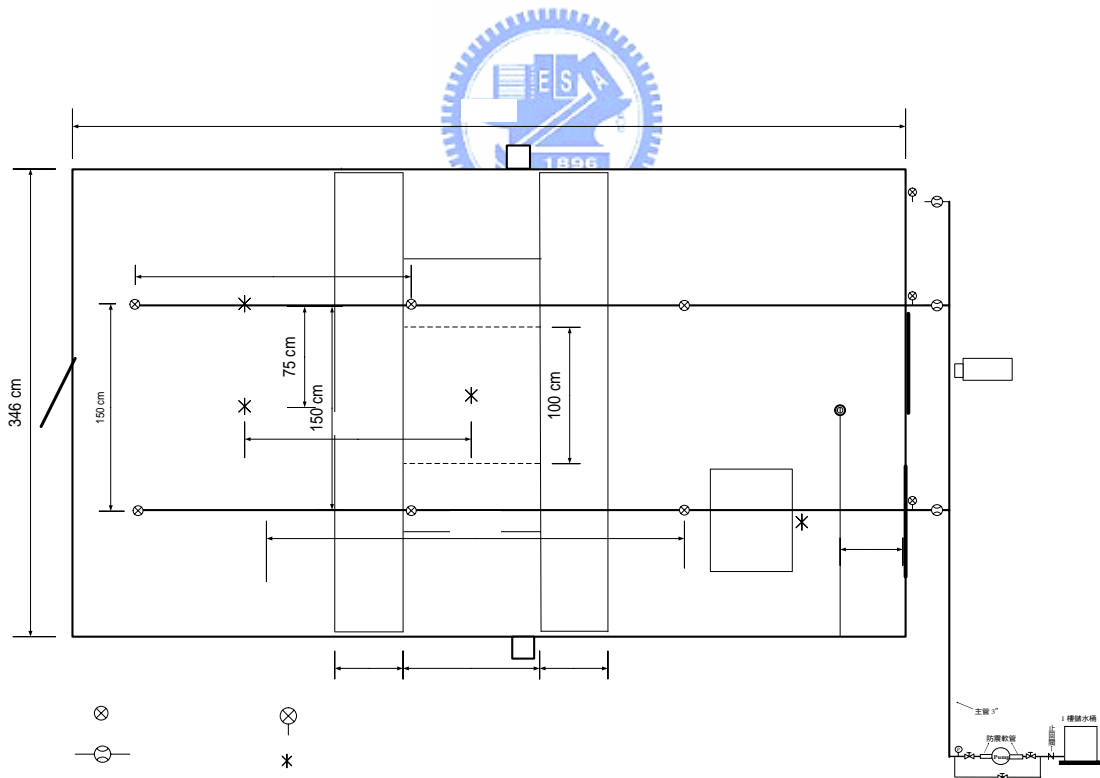


Fig. 2.4 The pressure-charge rate relationship configuration



(a)



(b)

Fig. 2.5 The layout of conventional sprinkler protection test (a) Front view and (b) Bird's-eye view

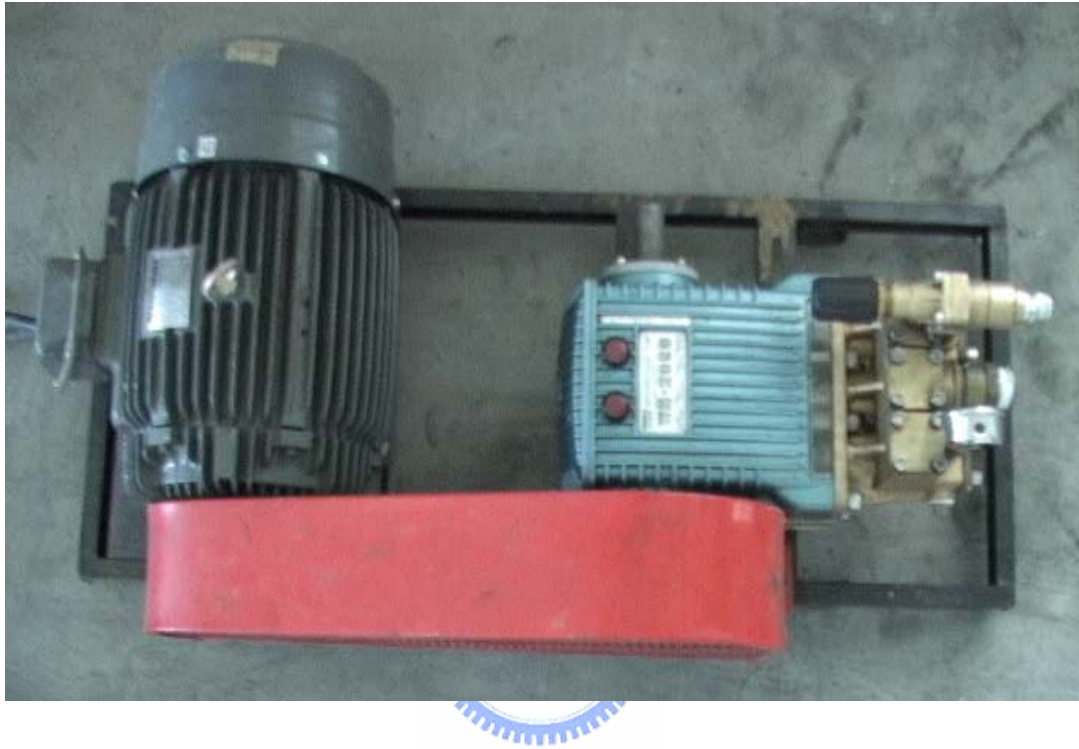
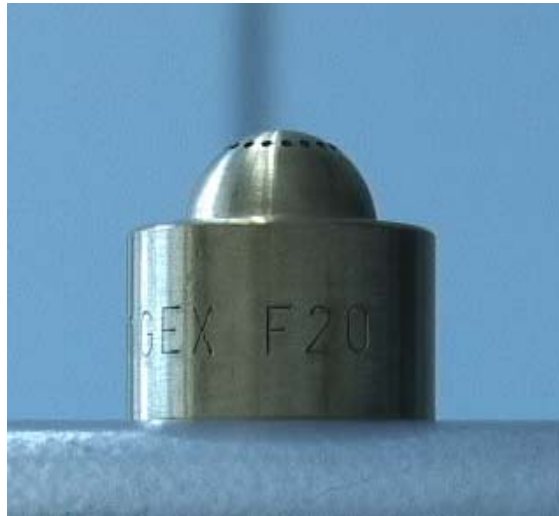


Fig. 2.6 The picture of high pressure pump

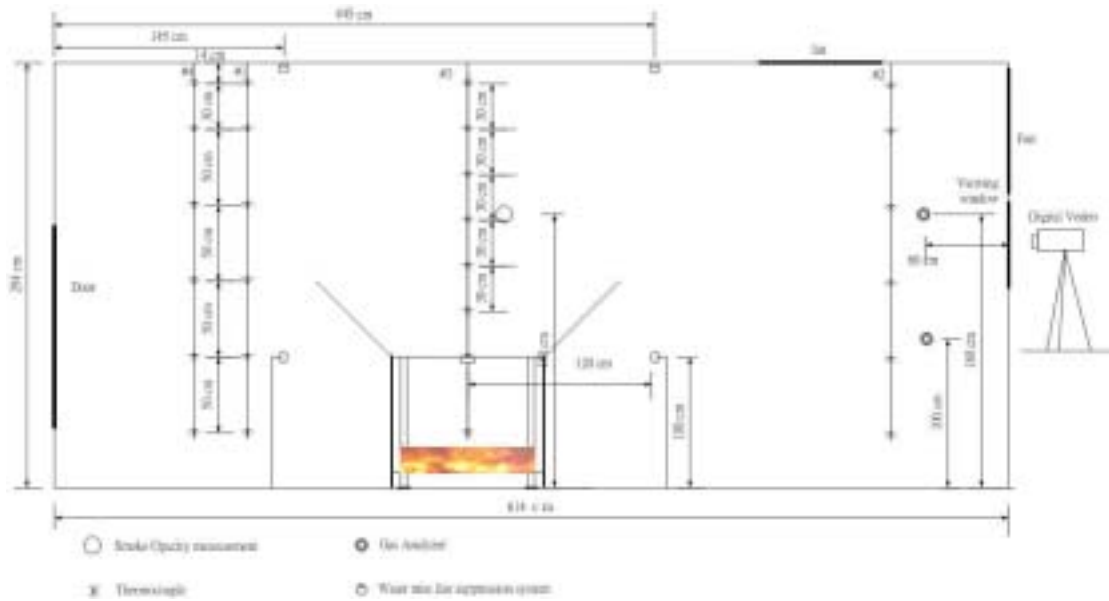


(a)

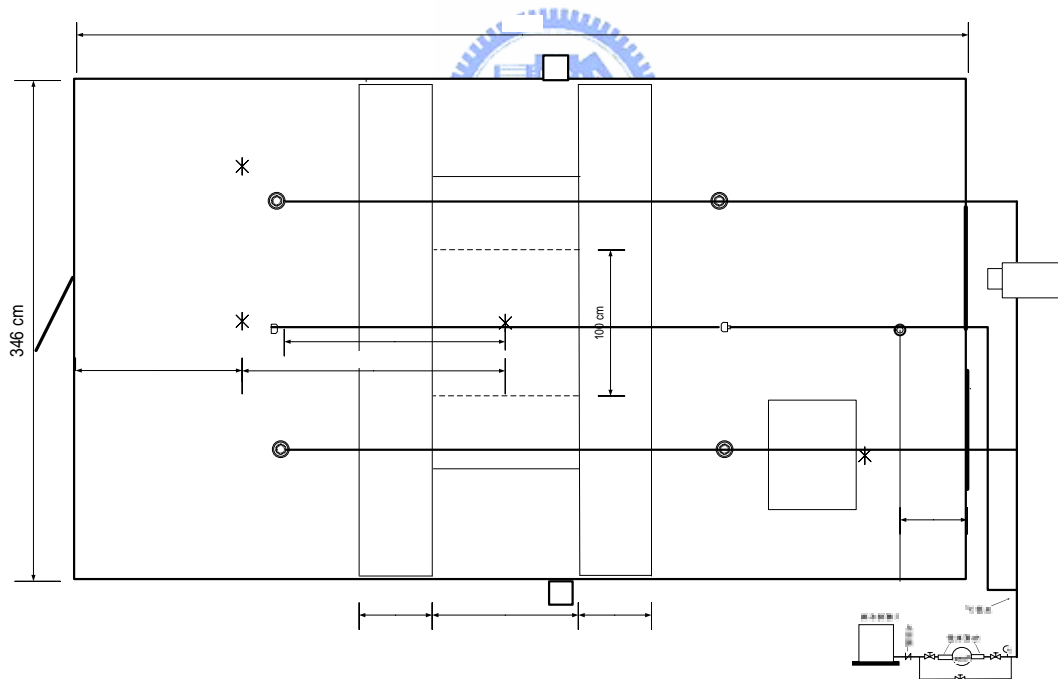


(b)

Fig. 2.7 The picture of high pressure system nozzle (a) Front view and (b) Side view



(a)



(b)

Fig. 2.8 Schematic drawing of water mist fire suppression protection test (a) Front view and (b) Bird's-eye view



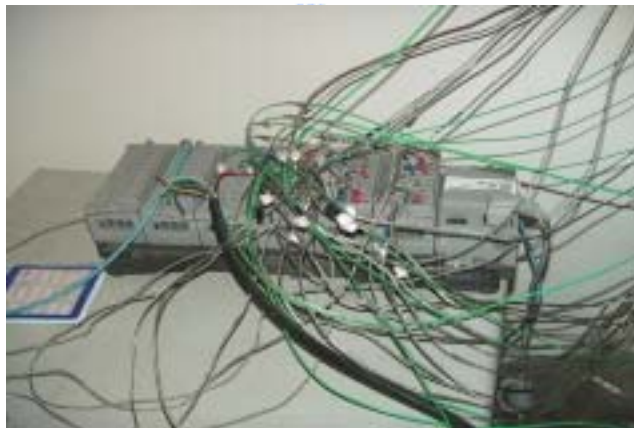
Fig. 2.9 The picture of gas analyzer



Fig. 2.10 The picture of thermocouple tree



(a)



(b)

Fig. 2.11 The picture of DA-100 (a) Data Processor (b) Data Collector



Fig. 2.12 The picture of single processor



Fig. 2.13 The picture of the transceiver

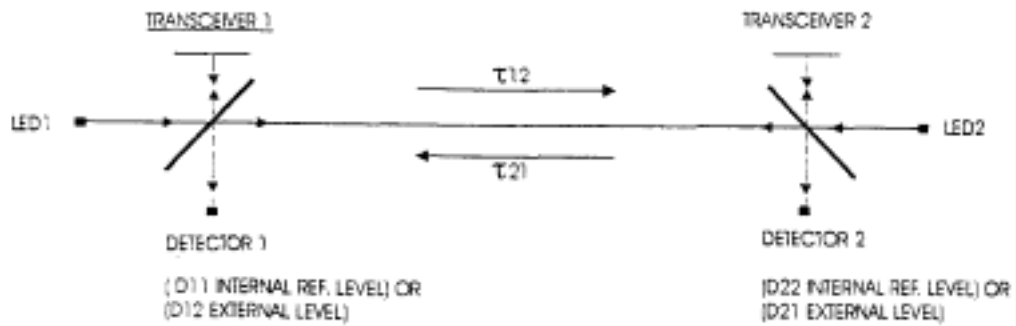


Fig 2.14 Schematic principle of Operation

