HUMIDEX CONTROL SYSTEM

PREFACE

The requirement arose to maintain the humidex level below thirty, based on the Occupational Health Clinic for Ontario Workers chart on page three of this report.

A control system was developed controlling the occupied space humidex level below thirty, while using enthalpy comparison control of return air to outdoor air assuring the lesser cooling load on the cooling coils.

As per the graph on page two both the humidex target and enthalpy targets were met.

CONTENT

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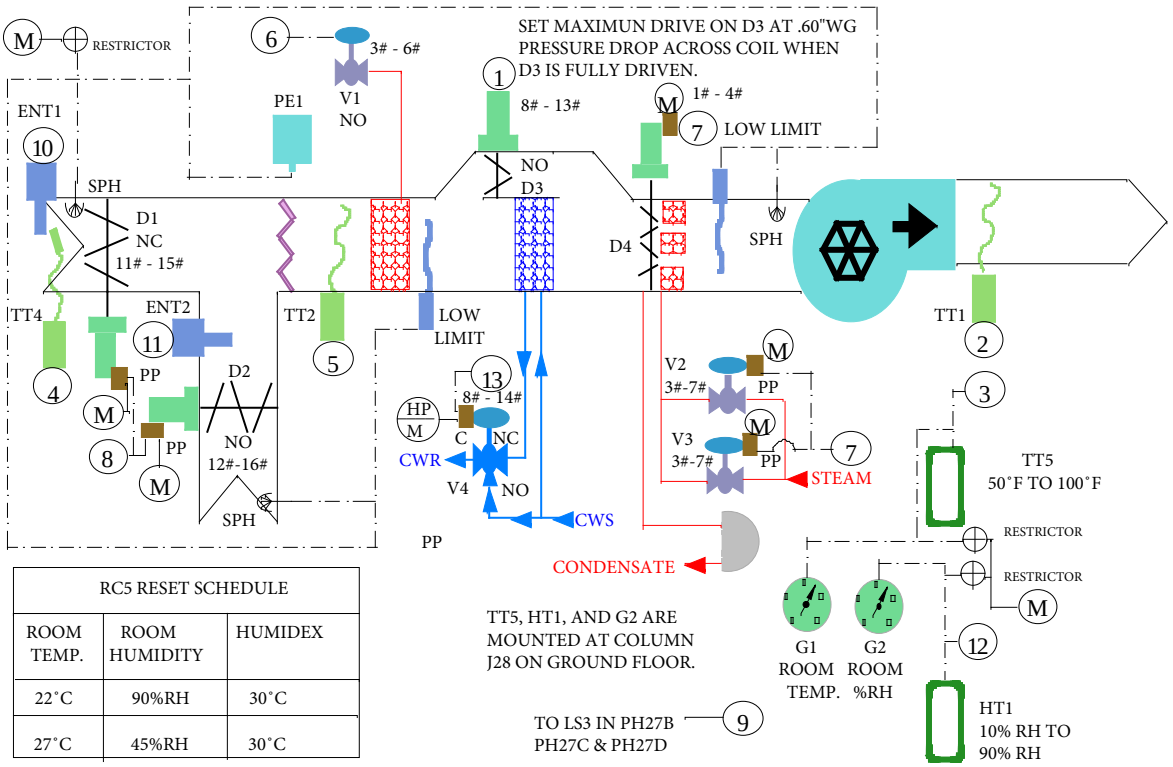
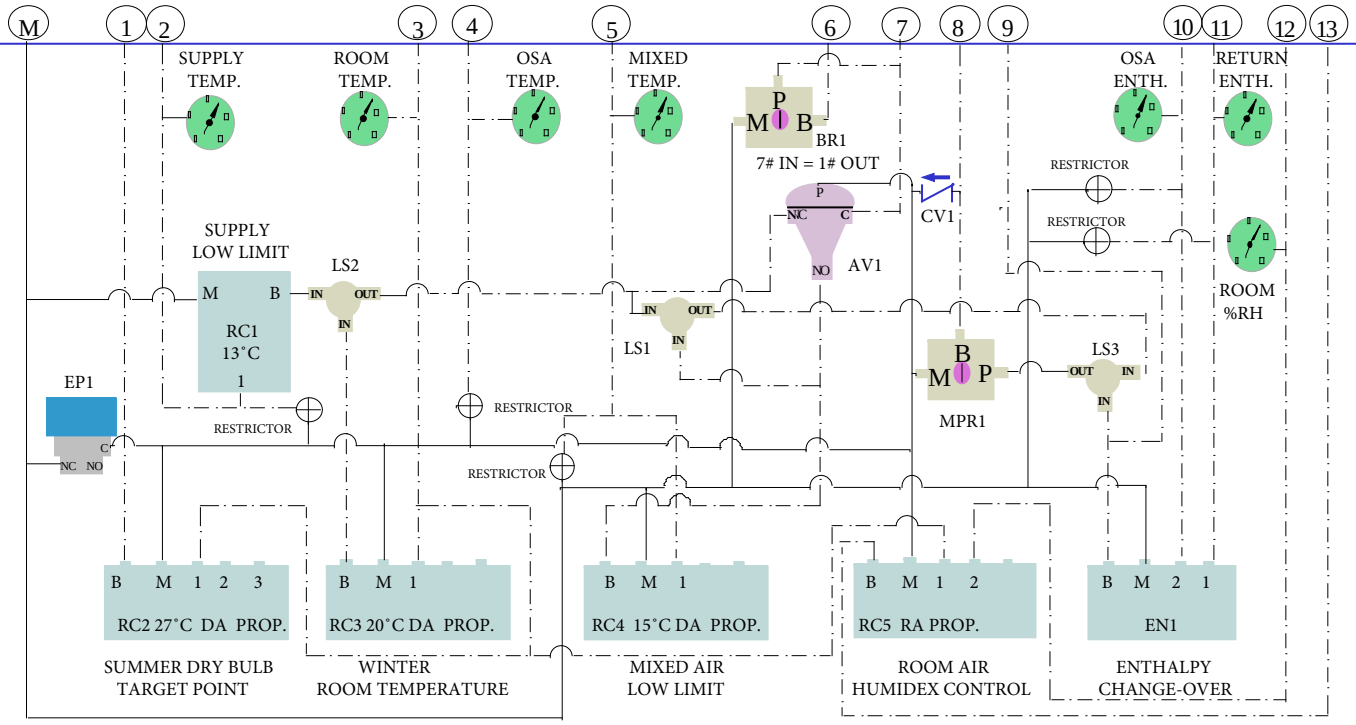
HUMIDEX CONTROL LOGIC WITH ENTHALPY CONTROL LOGIC



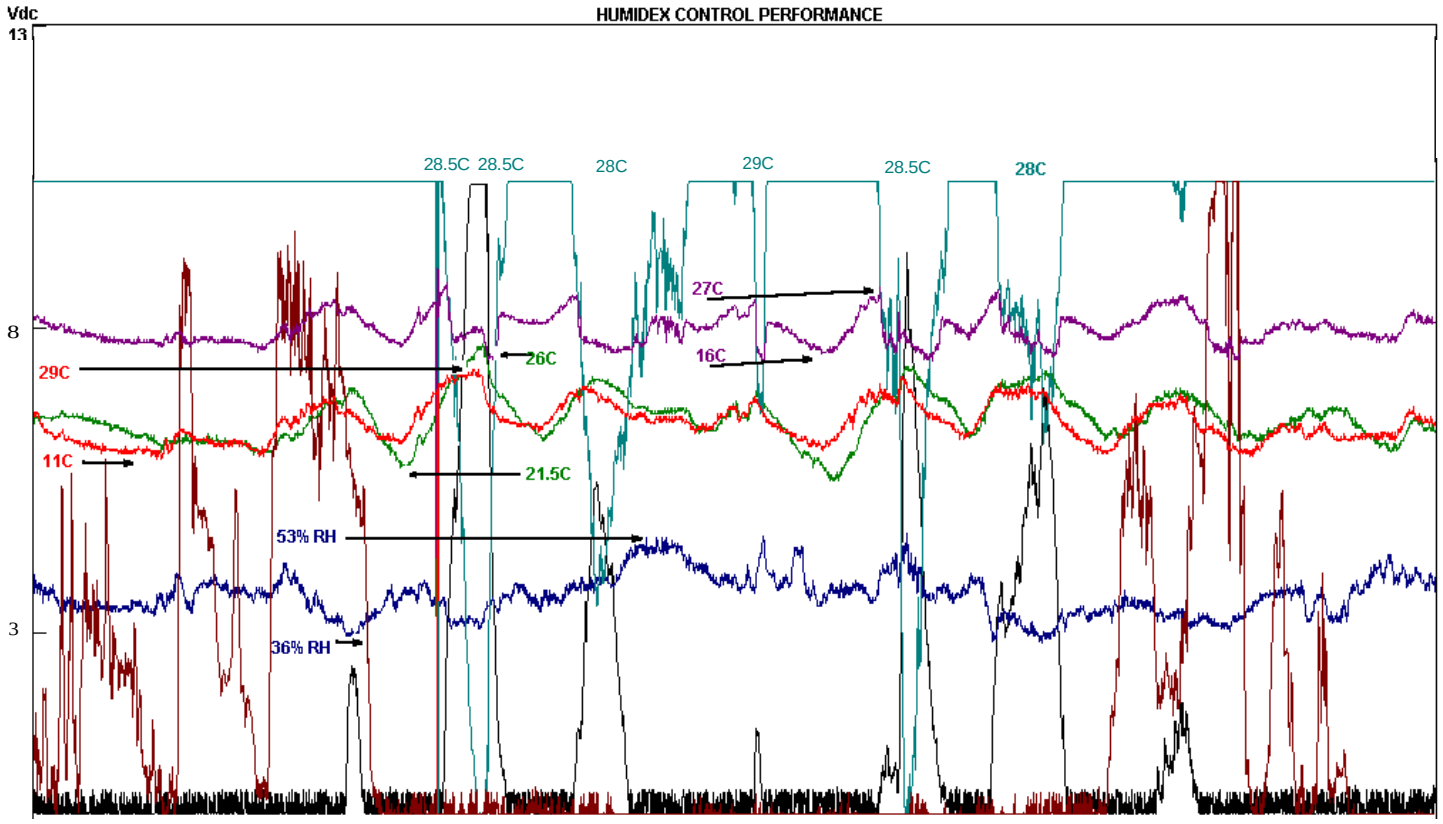
RC5 RESET SCHEDULE		
ROOM TEMP.	ROOM HUMIDITY	HUMIDEX
22˚C	90%RH	30˚C
27˚C	45%RH	30˚C



SEQUENCE OF OPERATION

When the fan is off the outside air damper is closed, the return air damper is open and the steam valves are controlled by the mixed air low limit controller.

When the fan is running the steam valves (V1), (V2), (V3) and (D3) and the mixing dampers (D1), (D2) are modulated in sequence, such that on a drop in room temperature: first the free cooling modulates back to the minimum ventilation position, then the steam valve (V1) opens as required; then V2 and V3 are opened and next D3 exposes the coil to an air flow if required. This loop is limited in the supply air to a minimum of 13°C and limited to a minimum in the mixed air at 15°C. When the outside air, enthalpy is greater than the return air enthalpy, D1 and D2 return to the minimum ventilation position. Enthalpy controller (EN1) from PH27A sends its signal to low selector (LS3) allowing free cooling with the air stream containing the lesser BTU content.



COLOUR LEGEND

RED----Outdoor air temperature
Green---Return air temperature
Purple---Supply air temperature
Black----Branch summer dry bulb bypass dampers
Brown—enthalpy branch signal
BLUE----Humidex branch (cooling valve)

Humidex Heat Stress Response Plan

Temp (in oC)	RH = 100%	95%	90%	85%	80%	75%	70%	65%	60%	55%	50%	45%	40%	35%	30%	25%	20%	15%	10%	Temp (in oC)
49																			50	49
48																			49	48
47																		50	47	47
46																		49	46	46
45	NEVER IGNORE ANYONE'S SYMPTOMS DESPITE YOUR MEASUREMENTS!!!																50	47	45	45
44	Humidex	Action															49	46	43	44
43	45+	stop work														49	47	45	42	43
42	43-44	75% relief													50	48	46	43	41	42
41	40-42	50% relief													48	46	44	42	40	41
40	38-39	25% relief												49	47	45	43	41	39	40
39	34-37	warning & double water											49	47	45	43	41	39	37	39
38	30-33	alert & water										49	47	45	43	42	40	38	36	38
37	25-29	water as needed									49	47	45	44	42	40	38	37	35	37
36									50	49	47	45	44	42	40	39	37	35	34	36
35								50	48	47	45	43	42	40	39	37	36	34	33	35
34							49	48	46	45	43	42	40	39	37	36	34	33	31	34
33					50	48	47	46	44	43	41	40	39	37	36	34	33	32	30	33
32			50	49	48	46	45	44	42	41	40	38	37	36	34	33	32	30	29	32
31	50	49	48	47	45	44	43	42	40	39	38	37	35	34	33	32	30	29	28	31
30	48	47	46	44	43	42	41	40	39	37	36	35	34	33	31	30	29	28	27	30
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28	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	28
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26	39	38	37	36	35	34	33	33	32	31	30	29	28	27	26	25				26
25	37	36	35	34	33	33	32	31	30	29	28	27	26	26	25					25
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22	31	30	30	29	28	27	27	26	25	25										22
21	29	29	28	27	26	26	25													21