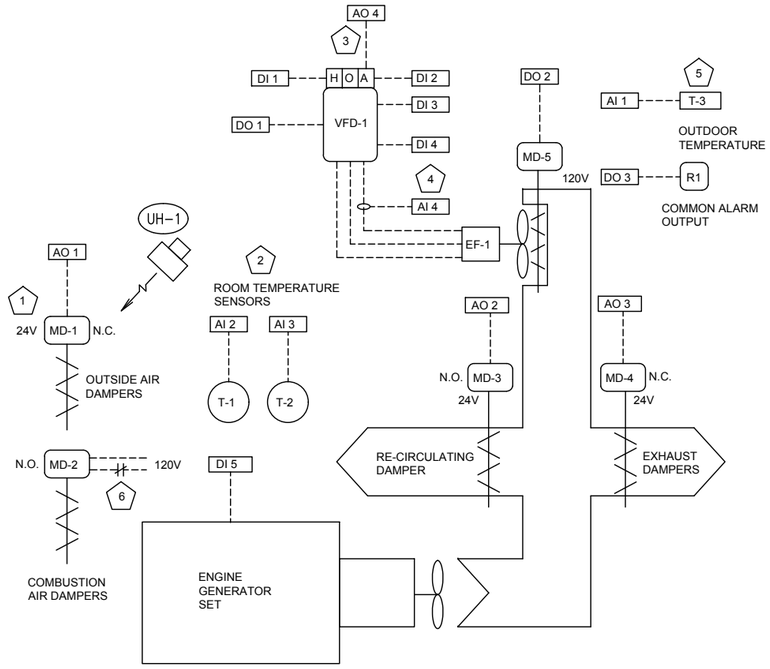
METRIC

ALL DIMENSIONS SHOWN ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE NOTED.

NOTES:

1. ALL REQUIRED 24 V POWER SUPPLIED FROM BAS PANEL.
2. MOUNT WHERE INDICATED IN PLAN VIEW
3. HOA SWITCH MOUNTED ON VFD PANEL.(BY MECHANICAL CONTRACTOR)
4. CURRENT SENSOR PROVIDED BY MECHANICAL CONTRACTOR, INSTALLED IN STARTER BY ELECTRICAL CONTRACTOR.
5. MOUNT ON OUTSIDE NORTH WALL OR ON A WALL WITH SUN SHIELD AND ISOLATE FROM ALL SOURCES OF HEAT.
6. CONTACT TO OPEN WHEN GENERATOR TURNS ON, WIRED BY ELECTRICAL CONTRACTOR.



GENERATOR ROOM VENTILATION CONTROLS

GENERATOR ROOM VENTILATION CONTROL INPUT/OUTPUT SUMMARY

LOCATION	POINT TYPE	POINT NO.	DESCRIPTION	COMMENTS.
NW	AI	1	OUTSIDE AIR TEMPERATURE SENSOR T-3	
GR	AI	2	ROOM TEMPERATURE SENSOR T-1	
GR	AI	3	ROOM TEMPERATURE SENSOR T-2	
GR	AI	4	EF-1 FAN STATUS (ON/OFF/BELT BROKEN)	SMART CURRENT SENSOR
GR	AO	1	OUTSIDE AIR DAMPERS MD-01 CONTROL	
GR	AO	2	RECIRCULATION AIR DAMPER MD-03 CONTROL	
GR	AO	3	EXHAUST AIR DAMPERS MD-04 CONTROL	
GR	AO	4	EXHAUST FAN EF-1 SPEED CONTROL (VFD)	
GR	DI	1	EXHAUST FAN HOA SWITCH 'HAND' POSITION INDICATION	
GR	DI	2	EXHAUST FAN HOA SWITCH 'AUTO' POSITION INDICATION	
GR	DI	3	VFD FAULT	
GR	DI	4	VFD RUN STATUS	
GR	DI	5	GENERATOR RUN STATUS	
GR	DO	1	EXHAUST FAN VFD STATUS ON/OFF CONTROL (VFD)	
GR	DO	2	EXHAUST FAN MD-05 CONTROL	
GR	DO	3		

GR = GENERATOR ROOM

NW = NORTH WALL

GENERATOR ROOM VENTILATION CONTROL SEQUENCE

TEMPERATURE SENSORS T-1 AND T-2 ARE USED TO MAINTAIN THE TEMPERATURE IN THE GENERATOR ROOM. IF EITHER TEMPERATURE SENSOR FAILS, THE OTHER SENSOR WILL ASSD UME CONTROL AND AN ALARM WILL BE GENERATED BY THE BUILDING AUTOMATION SYSTEM (BAS). OTHERWISE, THE AVERAGE OF THE TWO SENSORS WILL BE USED FOR CONTROL PURPOSES.

UNDER NORMAL CONDITIONS THE VFD HAND-OFF-AUTO (HOA) SWITCH IS IN THE 'AUTO' POSITION, RE-CIRCULATION DAMPER MD-3 IS OPEN, AND THE OUTSIDE AIR AND EXHAUST DAMPERS MD-1 AND MD-4 ARE CLOSED. THE COMBUSTION AIR DAMPER MD-2 IS HELD IN THE CLOSED POSITION.

VENTILATION WITH GENERATOR OFF

ON A INITIAL RISE IN ROOM TEMPERATURE, THE RE-CIRCULATION DAMPER MD-3 REMAINS OPEN AND THE OUTSIDE AIR AND EXHAUST DAMPERS (MD-1 AND MD-4) MODULATE TO MAINTAIN THE ROOM TEMPERATURE SETPOINT OF 35°C. ON A FURTHER RISE IN TEMPERATURE, MD-3 CLOSES, MD-1 AND MD-4 REMAIN FULLY OPEN, MD-5 OPENS AND THE VFD IS ENABLED AND VARIES THE SPEED OF EXHAUST FAN EF-1 BETWEEN MINIMUM AND MAXIMUM SPEED SETTINGS TO MAINTAIN THE ROOM TEMPERATURE SETPOINT. WHEN THE FAN IS FIRST STARTED IT RAMPS UP TO THE REQUIRED SPEED SETTING OVER A PERIOD OF 30 SECONDS.

IF THE OUTDOOR TEMPERATURE IS GREATER THAN 35°C, EF-1 IS LIMITED TO OPERATING AT THE MINIMUM SPEED SETTING.
THE REVERSE SEQUENCE OCCURS ON A DROP IN ROOM TEMPERATURE.

VENTILATION WITH GENERATOR ON

UPON START-UP OF THE GENERATOR, THE COMBUSTION AIR DAMPER MD-2 OPENS AND MD-1, MD-3 AND MD-4 ARE MODULATED TO MAINTAIN THE ROOM TEMPERATURE AT 35°C. ON A FURTHER RISE IN TEMPERATURE, MD-1 AND MD-4 REMAIN FULLY OPEN, MD-5 OPENS AND THE VFD IS ENABLED AND VARIES THE SPEED OF EXHAUST FAN EF-1 BETWEEN MINIMUM AND MAXIMUM SPEED SETTINGS TO MAINTAIN THE ROOM TEMPERATURE SETPOINT.

BACK-UP CONTROL AND ALARMS

IN THE EVENT THAT DAMPER CONTROL IS LOST DUE TO THE FAILURE OF THE BAS, PLACING THE VFD HOA SWITCH IN THE 'HAND' POSITION WILL CAUSE THE OUTSIDE AIR AND EXHAUST DAMPERS TO GO FULLY OPEN AND ALLOW THE FAN SPEED TO BE CONTROLLED FROM THE KEYPAD ON THE VFD PANEL. IF PLACED IN THE 'OFF' POSITION, THE DAMPERS SHALL CLOSE AND THE FAN WILL BE OFF. THESE ACTIONS SHOULD BE TAKEN ONLY IN THE EVENT THAT A HIGH OR LOW TEMPERATURE ALARM IS INDICATED BY THE BAS OR THE OUTSIDE AND RETURN AIR DAMPERS ARE OBSERVED TO BE INAPPROPRIATELY POSITIONED
(E.G. 1 - OUTSIDE AND EXHAUST DAMPERS FULLY OPEN ON A COLD WINTER DAY CAUSING A LOW TEMPERATURE ALARM - CLOSE DAMPERS
2 - GENERATOR RUNNING AND OUTSIDE AND EXHAUST DAMPERS CLOSED CAUSING A HIGH TEMPERATURE ALARM - OPEN DAMPERS AND SET FAN AT APPROPRIATE SPEED SETTING).

AN ALARM IS GENERATED BY THE BAS IF:
1) THE HOA SWITCH IS PLACED IN THE 'HAND' OR 'OFF' POSITIONS.
2) THE BAS IS COMMANDING THE FAN TO RUN BUT THE FAN OR VFD STATUS INDICATES 'OFF'. THE FAN STATUS POINT SHALL DETECT THE DIFFERENCE BETWEEN A FAN 'OFF' OR 'BELT BROKEN' CONDITION.*
3) A VFD FAULT CONDITION IS SENSED.
4) THE ROOM TEMPERATURE IS LESS THAN 10°C OR GREATER THAN 40°C.
5) A LOSS OF POWER TO THE BAS OCCURS.

ALARM MONITORED BY CHUBB SECURITY SYSTEM IS ALSO PRESENT.

ALL ALARMS ASSOCIATED WITH THE GENERATOR VENTILATION SYSTEM ARE GANGED TOGETHER THROUGH SOFTWARE TO A COMMON BAS OUTPUT. THIS OUTPUT ACTIVATES A COMMON ALARM RELAY LOCATED IN THE RELAY BOX NEXT TO THE BAS. THE COMMON ALARM RELAY IS MONITORED BY CHUBB SECURITY SYSTEM AND THE PROCESS CONTROL SYSTEM SO THAT THE PLANT OPERATOR IS MADE AWARE OF ANY HVAC PROBLEMS IN THE GENERATOR ROOM. TO DETERMINE THE SPECIFIC PROBLEM, AN OPERATOR MUST GO TO THE HVAC DISPLAY PANEL MOUNTED ON THE BAS, AND REQUEST THE ALARM SUMMARY DISPLAY.

*APPROPRIATE PRESETS TO BE DETERMINED BY THE CONTROL CONTRACTOR AT THE TIME OF SYSTEM SETUP.

UNIT HEATER CONTROL

UNIT HEATER UH-1 WILL BE CONTROLLED WITH BAS. ROOM SENSORS T-1 AND T-2 WILL PROVIDE THE MEAN TEMPERATURE TO BAS TO CONTROL THE UH-1 WHEN THE GENSET IS OFF. BAS WILL MODULATE THE UH-1 TO MAINTAIN THE ROOM TEMPERATURE TO SET POINT DURING WINTER OPERATION. BAS WILL TURN OFF THE UH-1 WHEN THE GENSET STARTS.

NOTE:
THIS DRAWING IS PROVIDED FOR INSTRUCTIONAL DESIGN PURPOSES ONLY BASED ON METROLINX GO TRANSIT DESIGN GUIDELINES AND REQUIREMENTS. THE CONSULTANT SHALL VERIFY FOR LOCAL CODE COMPLIANCE, EXISTING SITE CONDITIONS AND INTER DISCIPLINARY DRAWING COORDINATION. ALL DIMENSIONS AND SPECIFICATIONS SHOULD BE VERIFIED BY CONSULTANT AND/OR CONTRACTOR BEFORE ACTUAL CONSTRUCTION BEGINS.

METROLINX PROJECT NO. XXXXXX

REFERENCE DRAWINGS		ISSUE			REVISIONS		
DWG NO.	TITLE	NO.	DATE	ISSUED FOR	REV.	DATE	

DRAWN BY: X.X.X. YY/MM/DD	DESIGNED BY: YY/MM/DD
CHECKED BY: YY/MM/DD	APPROVED BY: YY/MM/DD
SCALE: 1:XXX	FULL SIZE ONLY

METROLINX

GENERATOR ROOM VENTILATION SYSTEM CONTROL DRAWING

CONTRACT NO.	DWG. NO.	REV.	SHEET
XX–200X–EN–XXX	M–700	0	