

MULTIZONE TO VARIABLE VOLUME CONTROL RETROFIT NEUTRAL DECK (WITH AND WITHOUT RETURN FAN) TEMPLATE DRAWINGS

GENERAL NOTES

1. THESE DRAWINGS ARE FOR A CONTROL SYSTEM RETROFIT TO CONVERT A MULTIZONE HVAC SYSTEM TO VARIABLE VOLUME
2. PROVIDE A COMPLETE, PROPERLY FUNCTIONING INSTALLATION IN CONFORMANCE WITH ALL APPLICABLE CODES, STANDARDS AND ORDINANCES, INCLUDING BUT NOT LIMITED TO: UFC 3-410-02 HEATING, VENTILATION, AND AIR CONDITIONING SYSTEMS, UFC 3-510-01 ELECTRICAL ENGINEERING, NFPA 70 NATIONAL ELECTRICAL CODE, AND THE LOCALLY ADOPTED BUILDING CODE AMENDMENTS.
3. UNLESS SPECIFIED OTHERWISE, PROVIDE ALL SUPERVISION, LABOR, MATERIALS, TRANSPORTATION, EQUIPMENT, HAULING AND SERVICES NECESSARY FOR COMPLETELY FINISHED AND OPERATIONAL MECHANICAL, ELECTRICAL, AND CONTROL SYSTEMS. PROVIDE ALL MINOR INCIDENTAL ITEMS SUCH AS OFFSETS, FITTINGS, ETC. REQUIRED AS PART OF THE WORK EVEN THOUGH NOT SPECIFICALLY SHOWN ON CONTRACT DOCUMENTS. THE CONTRACTOR SHALL PROVIDE AND INSTALL THE NUMBER OF ITEMS OF EQUIPMENT AS INDICATED ON THE DRAWINGS AND AS REQUIRED FOR COMPLETE SYSTEMS.
4. THESE DRAWINGS ARE DIAGRAMMATICAL IN NATURE AND SHOW THE GENERAL ARRANGEMENT OF PIPING, DUCTWORK, MECHANICAL, ELECTRICAL, AND CONTROLS EQUIPMENT AND APPURTENANCES, AND SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND THE WORK OF THEIR TRADES WILL PERMIT. BECAUSE OF THE SMALL SCALE OF THESE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS, AND ACCESSORIES WHICH MAY BE REQUIRED. INVESTIGATE THE STRUCTURAL AND FINISH CONDITIONS AFFECTING THE WORK AND PROVIDE SUCH FITTINGS AND ACCESSORIES AS MAY BE REQUIRED TO MEET SUCH CONDITIONS. VERIFY DIMENSIONS GOVERNING MECHANICAL, ELECTRICAL, AND CONTROLS WORK. DO NOT SCALE THE DRAWINGS FOR DIMENSIONS. TAKE DIMENSIONS, MEASUREMENTS, LOCATIONS, LEVELS, ETC. FROM THE ACTUAL FIELD CONDITIONS. NO EXTRA COMPENSATION SHALL BE CLAIMED OR ALLOWED ON ACCOUNT OF DIFFERENCES BETWEEN THE ACTUAL DIMENSIONS AND THOSE INDICATED ON THE DRAWINGS.
5. PERFORM ALL WORK IN A WORKMANLIKE MANNER. INSTALLATION SHALL CONCLUDE WITH A COMPLETE WORKING SYSTEM IN ALL RESPECTS. AVOID INTERFERENCE WITH ALL OTHER BUILDING SYSTEMS. IF CONFLICTS ARISE, REQUEST RESOLUTION FROM THE CONTRACTING OFFICER.
6. CONTRACTOR SHALL OBTAIN NECESSARY BUILDING PERMITS AND ARRANGE ALL REQUIRED INSPECTIONS WITH THE APPROPRIATE REGULATORY AGENCY. CONTRACTOR SHALL MAINTAIN RESPONSIBILITY FOR COMPLIANCE WITH ALL CODES OR STANDARDS WHICH AFFECT WORK. ALERT CONTRACTING OFFICER OF ALL ITEMS NOT DEPICTED ON DRAWINGS IN A CODE-COMPLYING MANNER. DO NOT PROCEED WITH FURTHER WORK UNTIL WRITTEN RESPONSE IS RECEIVED FROM CONTRACTING OFFICER.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ASPECTS OF JOB SITE SAFETY, VIOLATIONS WILL BE DOCUMENTED AND CORRECTIVE ACTION TAKEN.
8. CONTRACTOR IS RESPONSIBLE FOR PATCHING AND REPAIRING ALL PENETRATIONS IN OR DAMAGE TO WALLS OR CEILINGS THAT ARE A RESULT OF WORK.
9. CONTRACTOR SHALL OFFER GOV'T THE OPTION TO RETAIN POSSESSION OF ANY DEMOLISHED MATERIALS OR EQUIPMENT. CONTRACTOR SHALL REMOVE ALL DEMOLISHED MECHANICAL MATERIALS NOT RETAINED BY GOV'T FROM PROJECT SITE.
10. INSTALL ALL NEW EQUIPMENT AND DEVICES IN COMPLETE COMPLIANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS. ARRANGE ALL EQUIPMENT AND DEVICES TO PERMIT EASY REMOVAL OF PARTS WHICH MIGHT REQUIRE PERIODIC REPLACEMENT OR MAINTENANCE IN ACCORDANCE WITH THE MANUFACTURER'S REQUIRED SERVICE CLEARANCES EXCEPT WHERE NOTED OTHERWISE.

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MULTIZONE TO VARIABLE VOLUME
CONTROL RETROFIT
NEUTRAL DECK
TITLE SHEET AND INDEX OF DRAWINGS

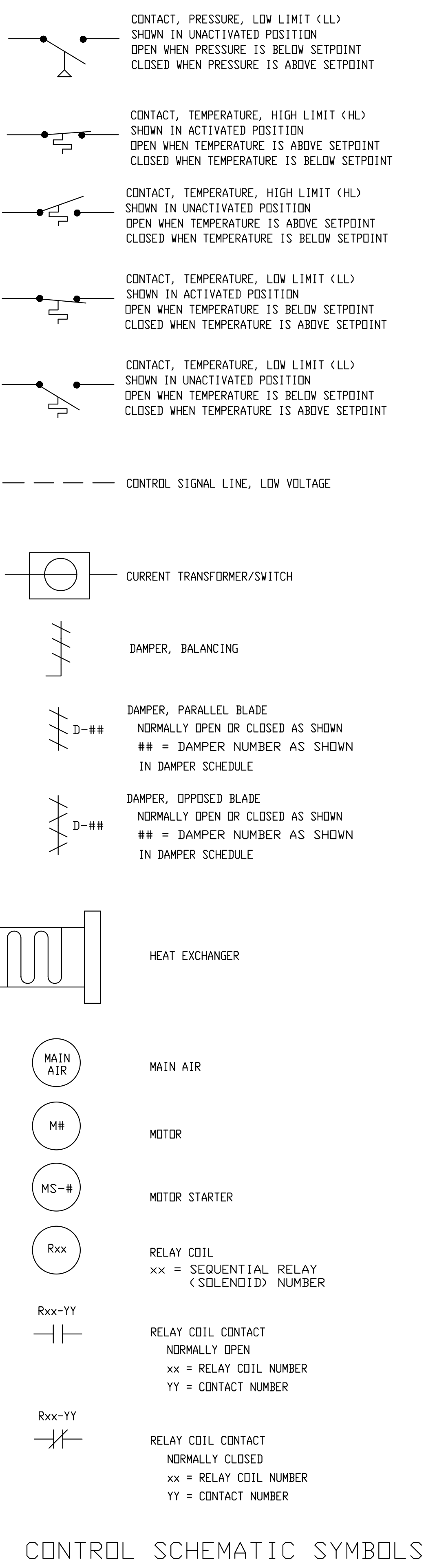
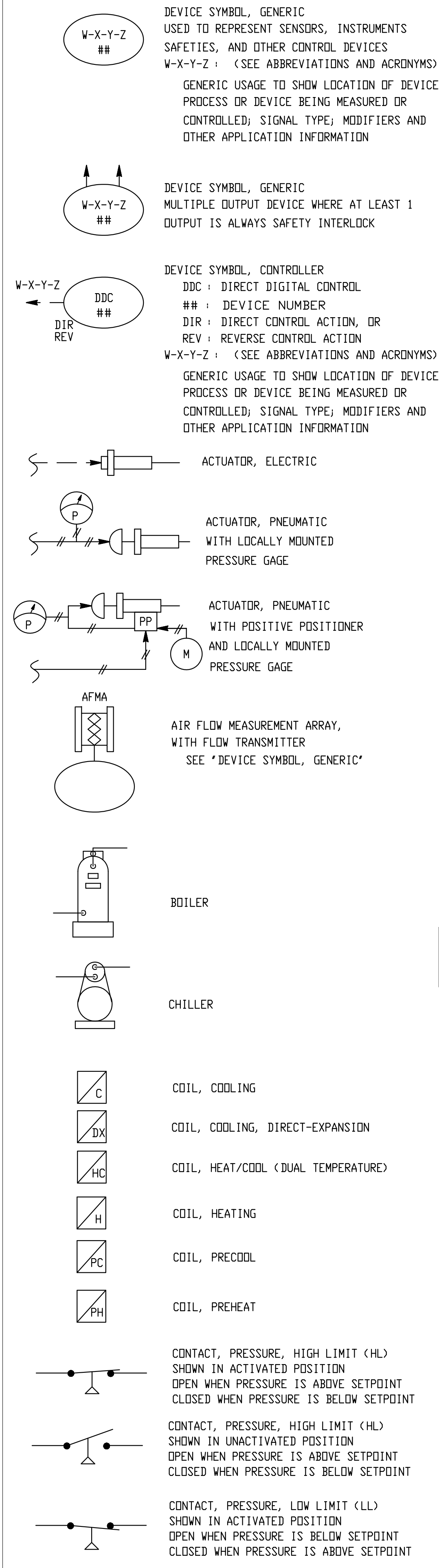
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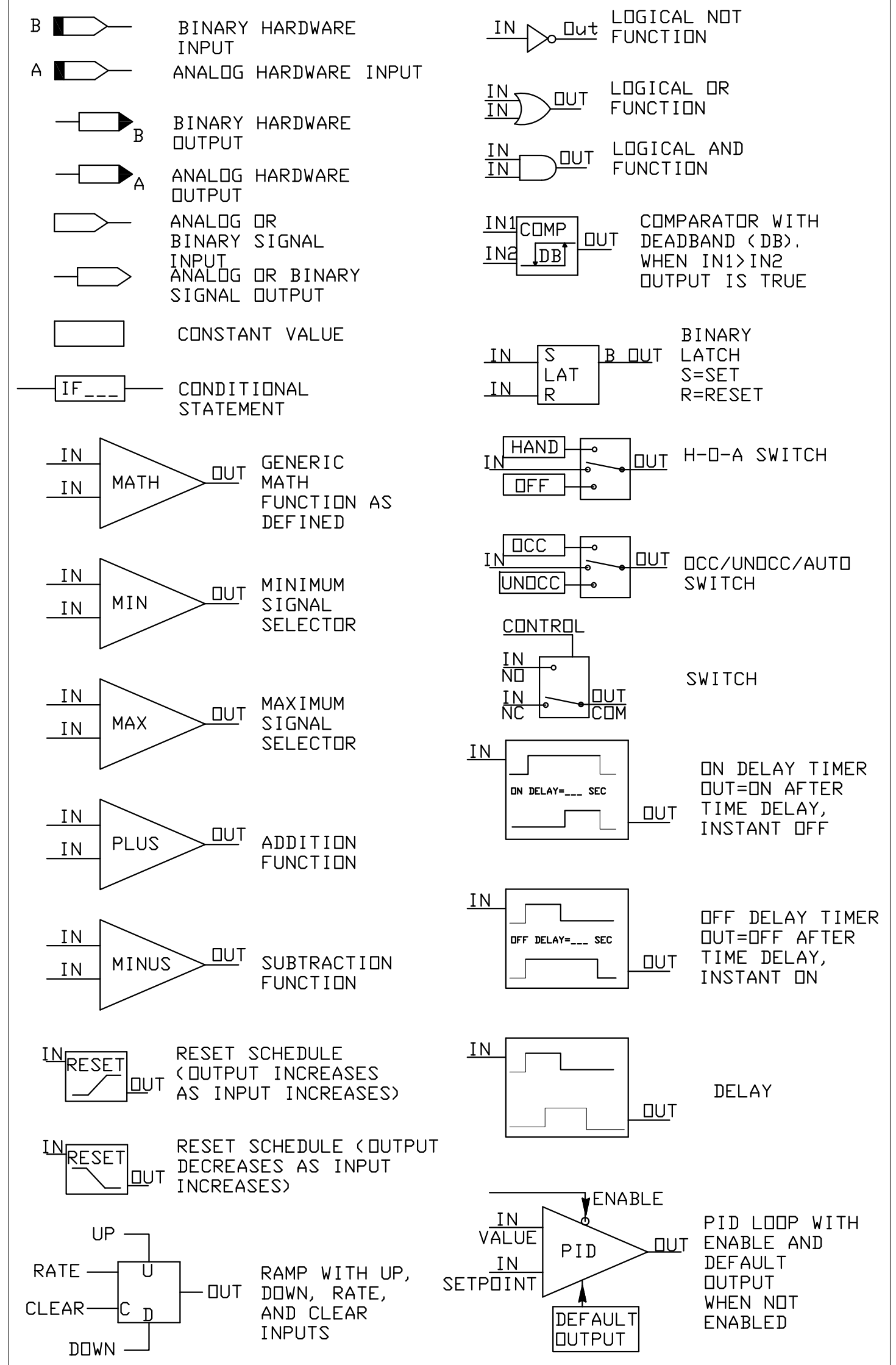
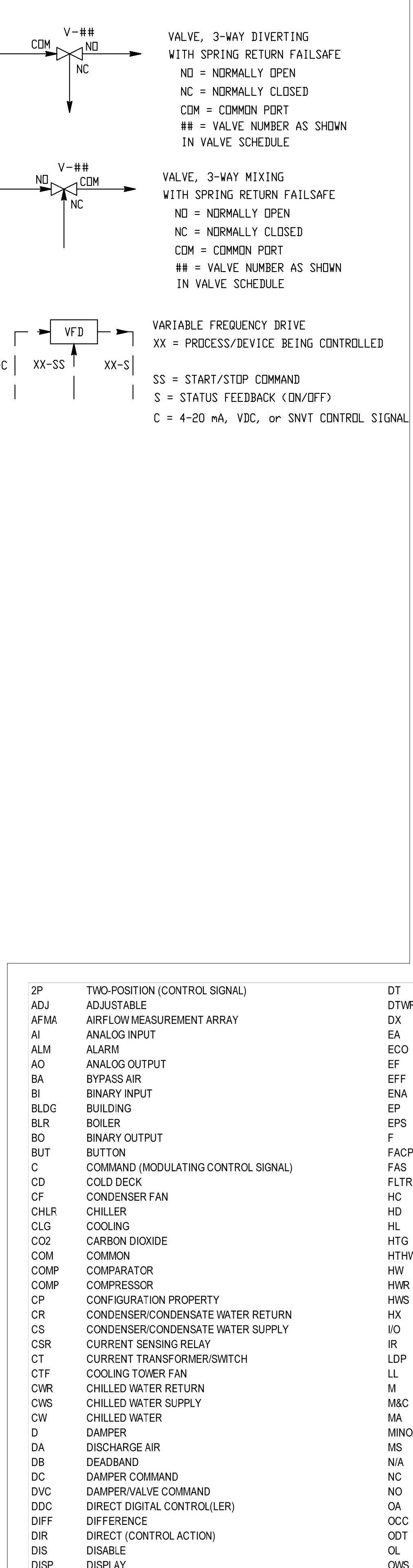
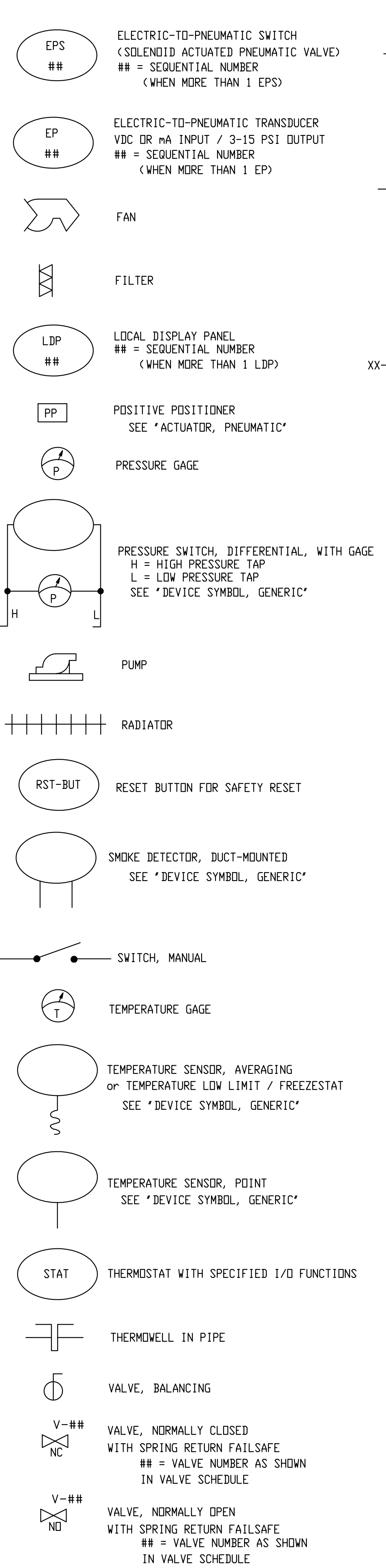
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CONTROL SCHEMATIC SYMBOLS



CONTROL LOGIC DIAGRAM SYMBOLS

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MULTI-ZONE TO VARIABLE VOLUME CONTROLS RETROFIT NEUTRAL DECK

SYMBOL LEGEND AND ABBREVIATIONS

SHEET IDENTIFICATION M-101
SHEET 2 OF 12

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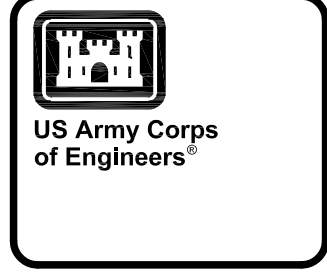
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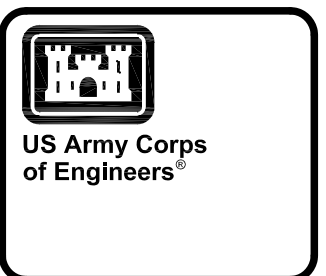
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NOTE: INSERT FLOOR PLANS SHOWING HVAC DUCTWORK, IF DESIRED, OR AS A SEPARATE DRAWING.
IF TAB IS INCLUDED IN THE PROJECT, PROVIDE ZONE AIRFLOW DRAWINGS SHOWING AIR DISTRIBUTION
OTHER SUGGESTED DRAWINGS INCLUDE MECHANICAL ROOM LAYOUT AND ANY OTHER AS-BUILT OF THE SYSTEM

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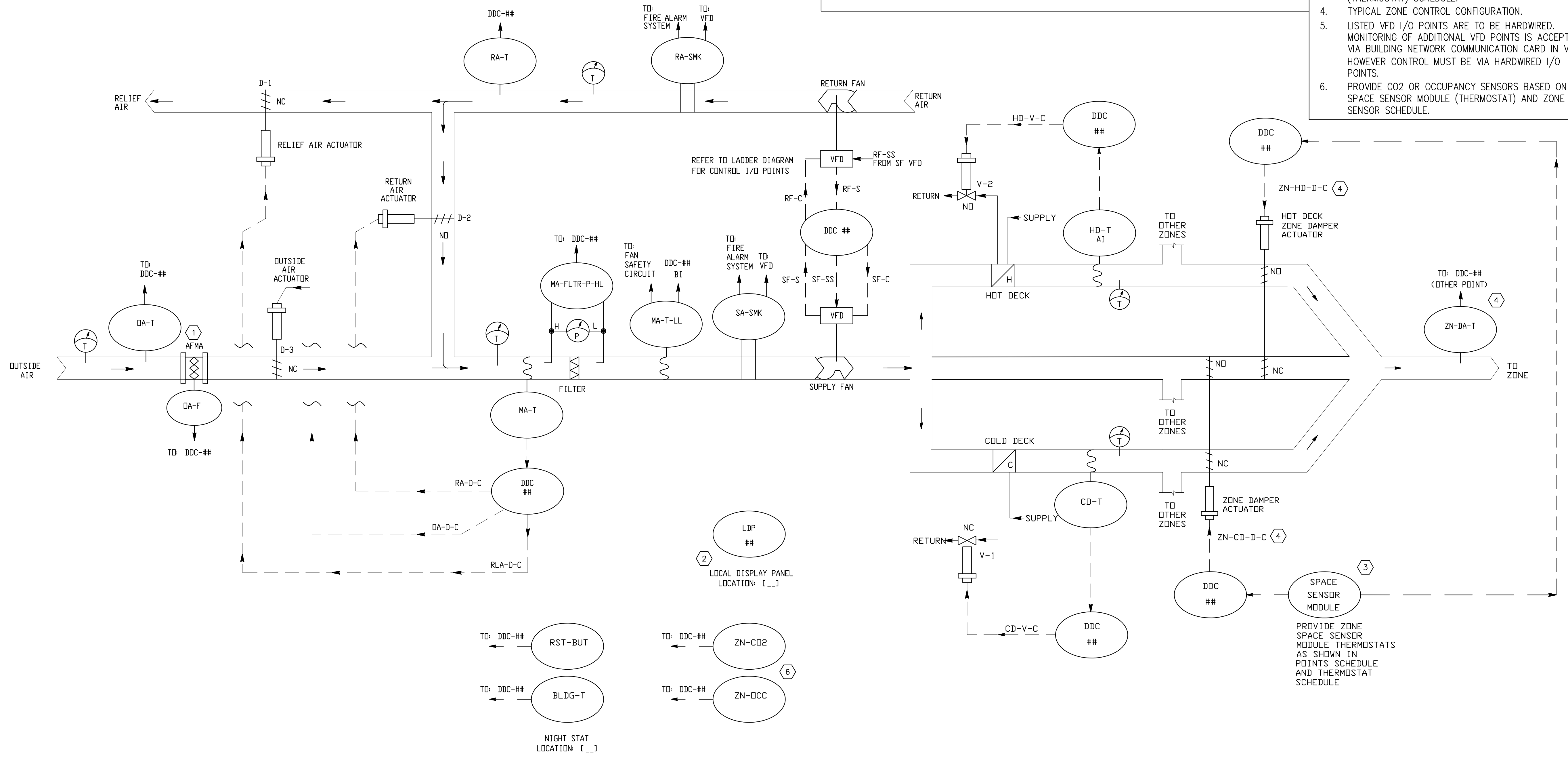
MULTIZONE TO VARIABLE VOLUME
CONTROLS RETROFIT
NEUTRAL DECK
FLOOR PLANS

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M-102
SHEET 3 OF 12



MULTIZONE TO VARIABLE VOLUME CONTROL SCHEMATIC

- GENERAL NOTES:**
- NOTE 1: CONTRACTOR MAY REUSE EXISTING DEVICES AND HARDWARE WHERE THEY MEET THE PROJECT SPECIFICATIONS AND REQUIREMENTS OTHERWISE NEW DEVICES AND HARDWARE SHALL BE PROVIDED.
 - NOTE 2: CONTRACTOR SHALL AFFIX PERMANENT TAGS/LABELS TO ALL DEVICES AS SPECIFIED
 - NOTE 3: CONTRACTOR SHALL LABEL ALL DDC I/O SIGNAL LINES: 4-20 mA, VDC, OR NETWORK VARIABLE
 - NOTE 4: CONTRACTOR SHALL SHOW A UNIQUE IDENTIFIER FOR EACH DEVICE. WERE MULTIPLE IDENTICAL DEVICES ARE SHOWN (FOR EXAMPLE; DDC CONTROLLER, OA SENSOR, OR EP TRANSDUCER) EACH SHALL BE SEQUENTIALLY NUMBERED. WHERE SEPARATE DDC CONTROLLER BUBBLES ARE USED TO REPRESENT/SHOW A COMMON (OR SINGLE) CONTROLLER EACH BUBBLE SHALL USE THE SAME IDENTIFIER AND NUMBER. DEVICE AND SIGNAL IDENTIFIERS SHALL BE CONSISTENT BETWEEN DRAWINGS.
- KEYED NOTES:**
1. PROVIDE AIRFLOW MEASUREMENT ARRAY AS SPECIFIED.
 2. PROVIDE LOCAL DISPLAY PANEL AND MOUNT IN THE MECHANICAL ROOM CLOSEST TO THE EQUIPMENT PROVIDING INFORMATION DISPLAYED BY THE LDP AND INSTALLED ON, ADJACENT TO, OR INSIDE THE DDC ENCLOSURE/CABINET. DISPLAY POINTS AS SPECIFIED IN THE POINTS SCHEDULE.
 3. PROVIDE SPACE SENSOR MODULE THERMOSTAT WITH FUNCTIONALITY SHOWN IN THE SPACE SENSOR MODULE (THERMOSTAT) SCHEDULE.
 4. TYPICAL ZONE CONTROL CONFIGURATION.
 5. LISTED VFD I/O POINTS ARE TO BE HARDWIRED. MONITORING OF ADDITIONAL VFD POINTS IS ACCEPTABLE VIA BUILDING NETWORK COMMUNICATION CARD IN VFD HOWEVER CONTROL MUST BE VIA HARDWIRED I/O POINTS.
 6. PROVIDE CO2 OR OCCUPANCY SENSORS BASED ON SPACE SENSOR MODULE (THERMOSTAT) AND ZONE SENSOR SCHEDULE.



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MULTIZONE TO VARIABLE VOLUME
CONTROLS RETROFIT
NEUTRAL DECK WITH RETURN FAN
CONTROLS SCHEMATIC

SHEET IDENTIFICATION
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SHEET 4 OF 12

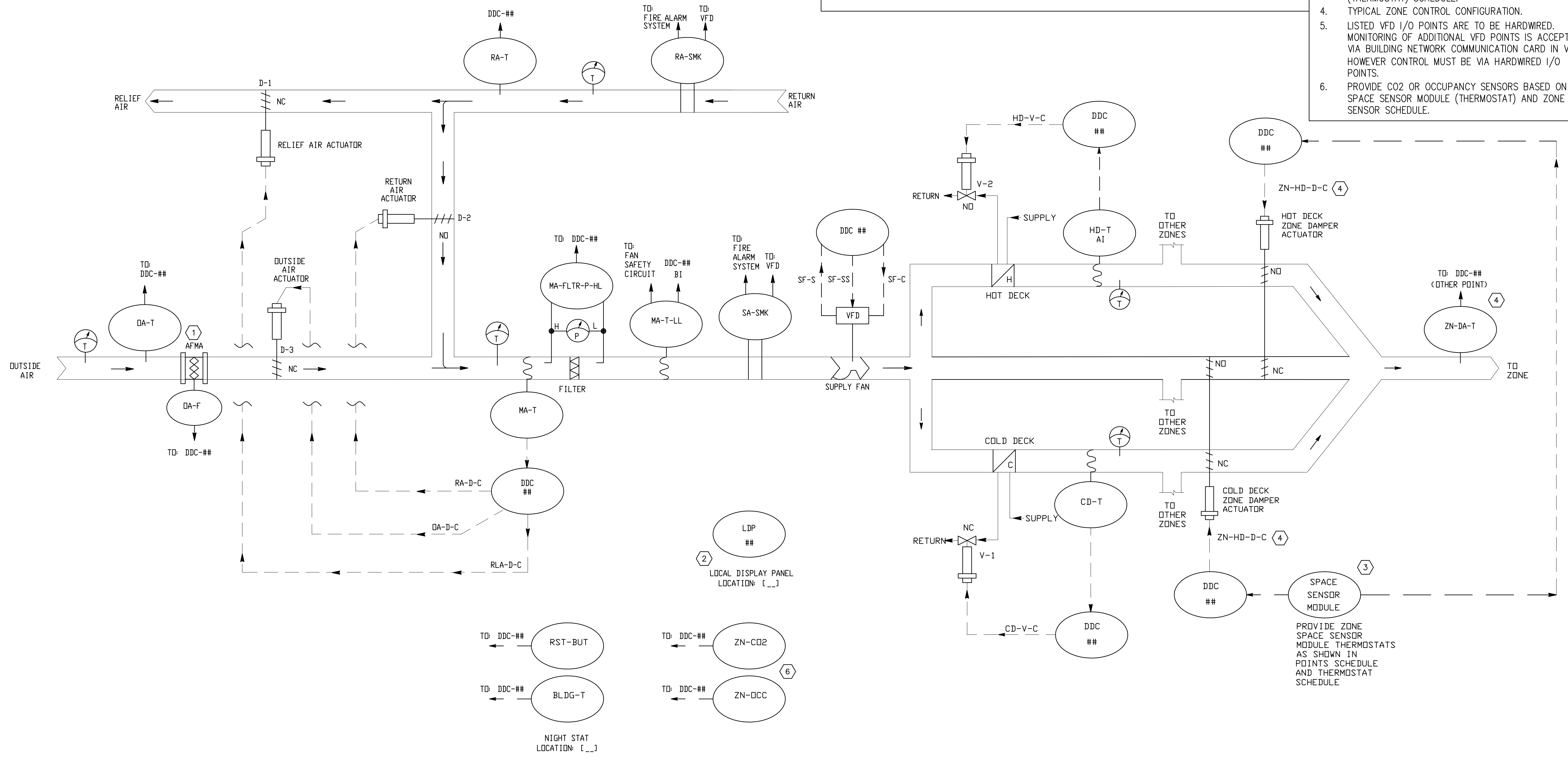


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MULTIZONE TO VARIABLE VOLUME
CONTROLS RETROFIT
NEUTRAL DECK WITHOUT RETURN FAN
CONTROLS SCHEMATIC

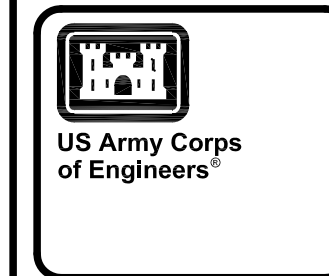
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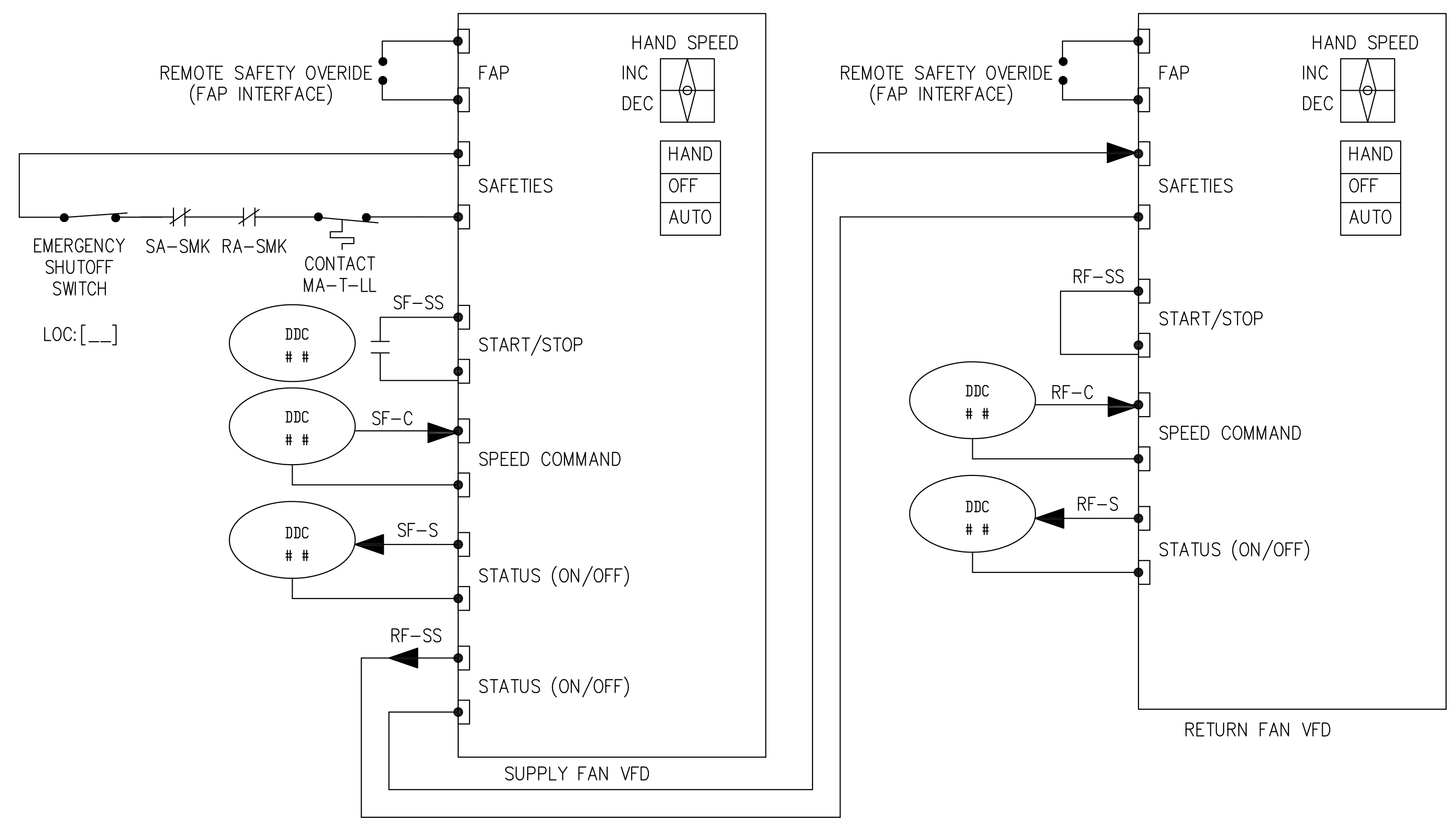
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GENERAL NOTES:

NOTE 1: THIS IS A FUNCTIONAL REPRESENTATION. CONTRACTOR WIRING MAY DIFFER.

NOTE 2: A SUPPLY FAN VFD WITH A SINGLE STATUS (ON/OFF) OUTPUT MAY USE AN INTERPOSING RELAY FOR THE SF-S AND RF-SIGNALS.

NOTE 3: RETURN FAN START/STOP INPUT IS JUMPERED "ON" SO THAT THE RETURN FAN OPERATION IS DEPENDENT ON THE SUPPLY FAN "ON/OFF" STATUS, FAP INTERFACE, AND SAFETIES.



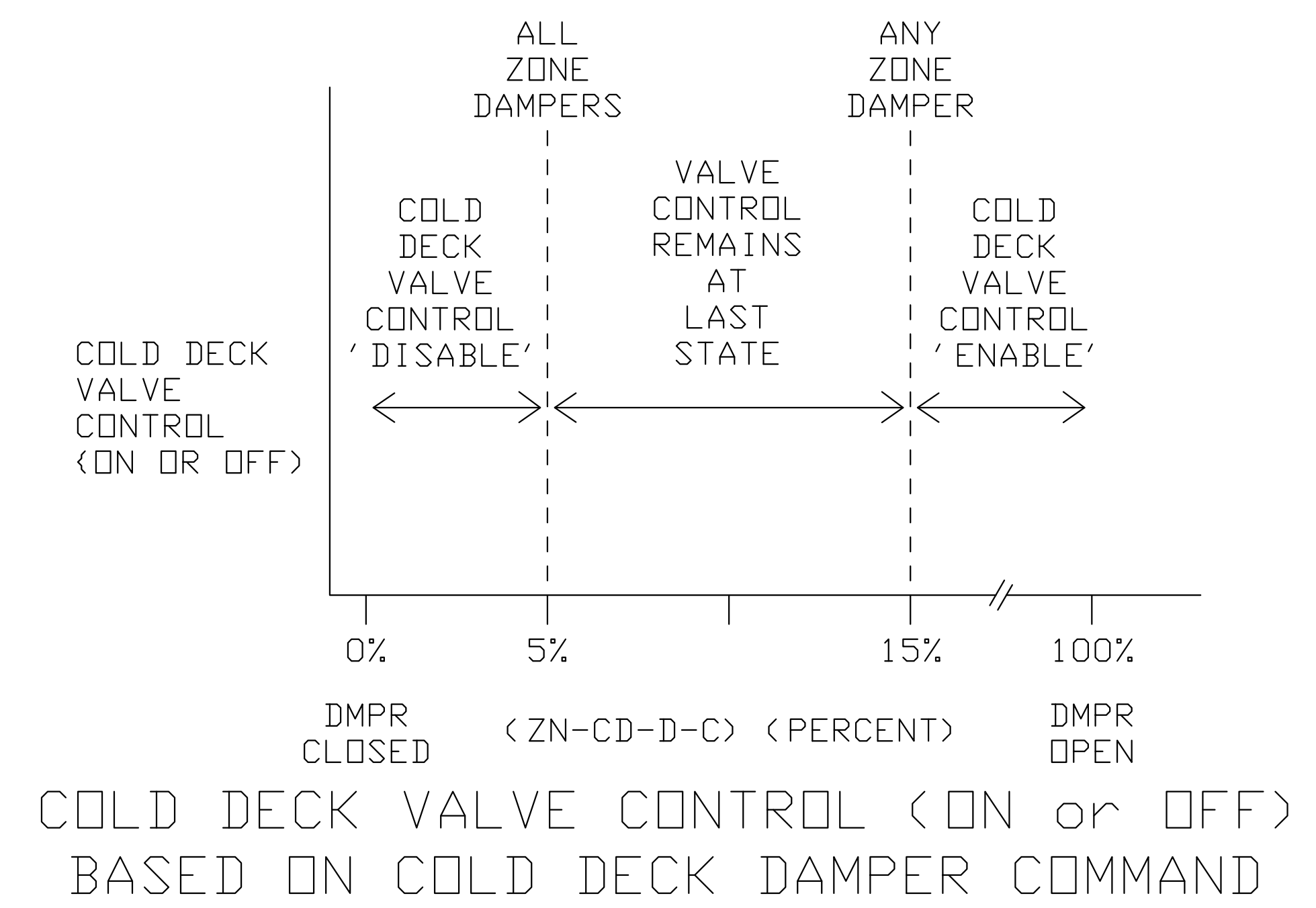
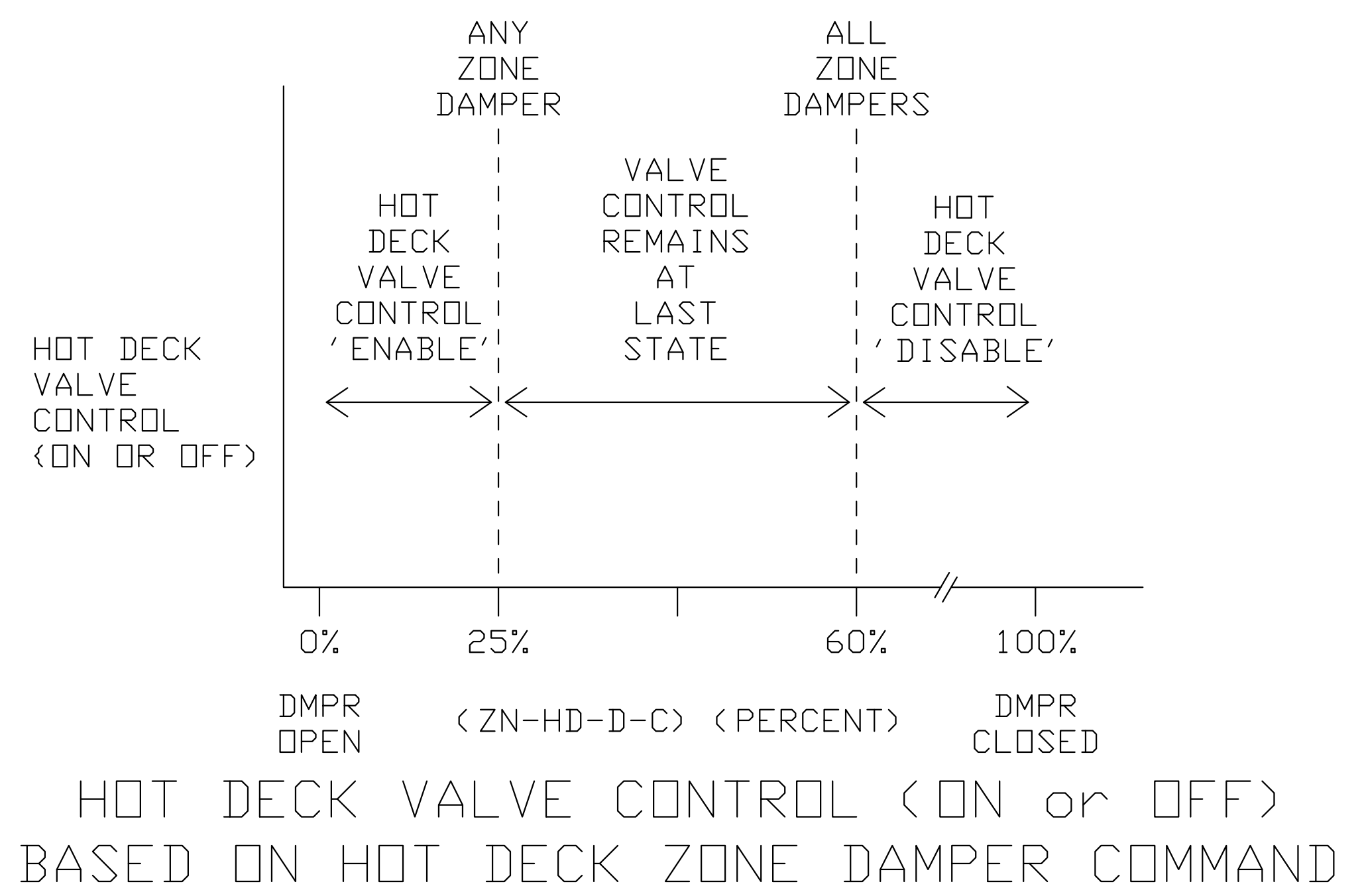
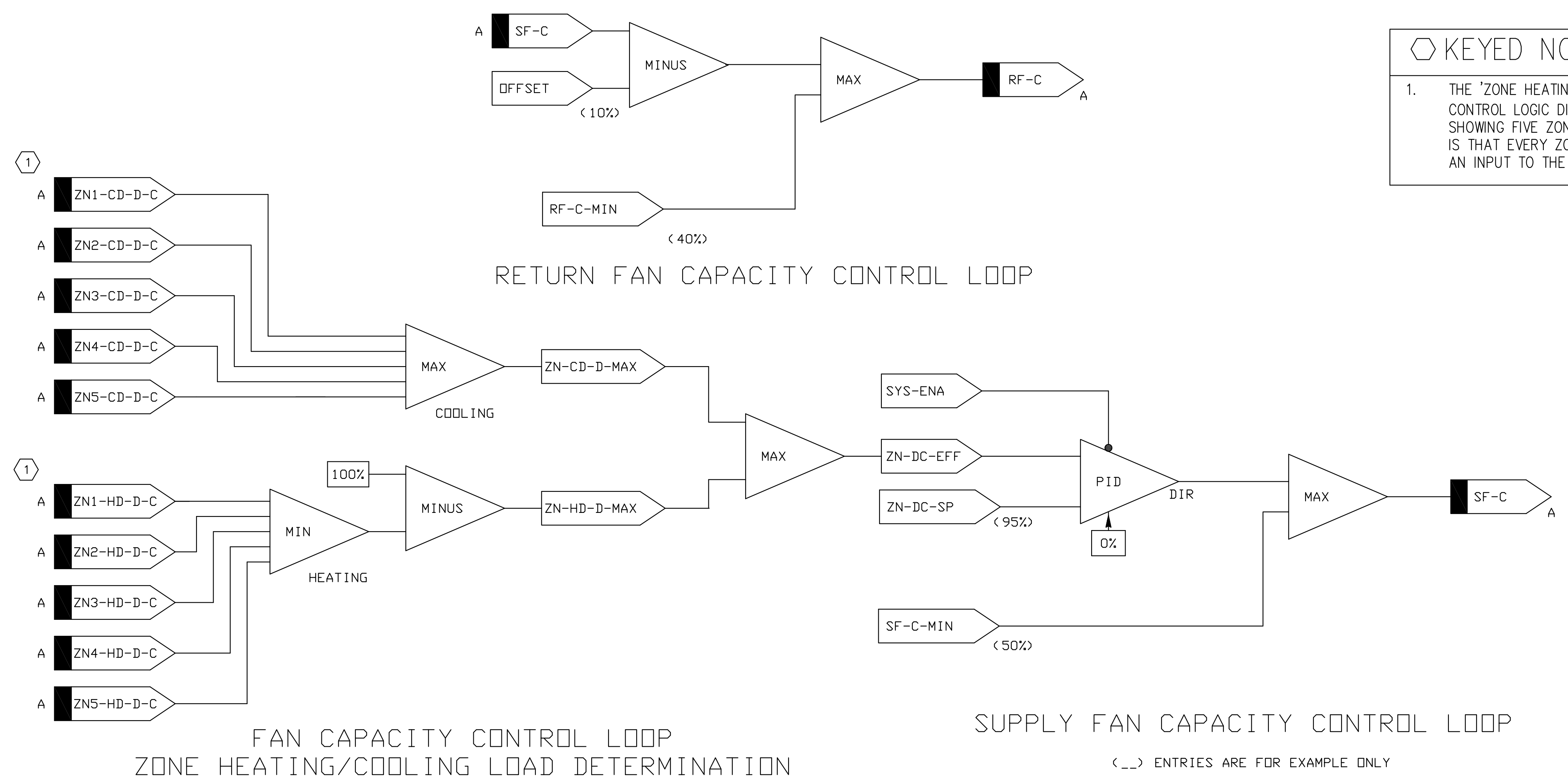
LADDER DIAGRAM

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MULTI-ZONE TO VARIABLE VOLUME
CONTROLS RETROFIT
NEUTRAL DECK WITH RETURN FAN
LADDER DIAGRAM

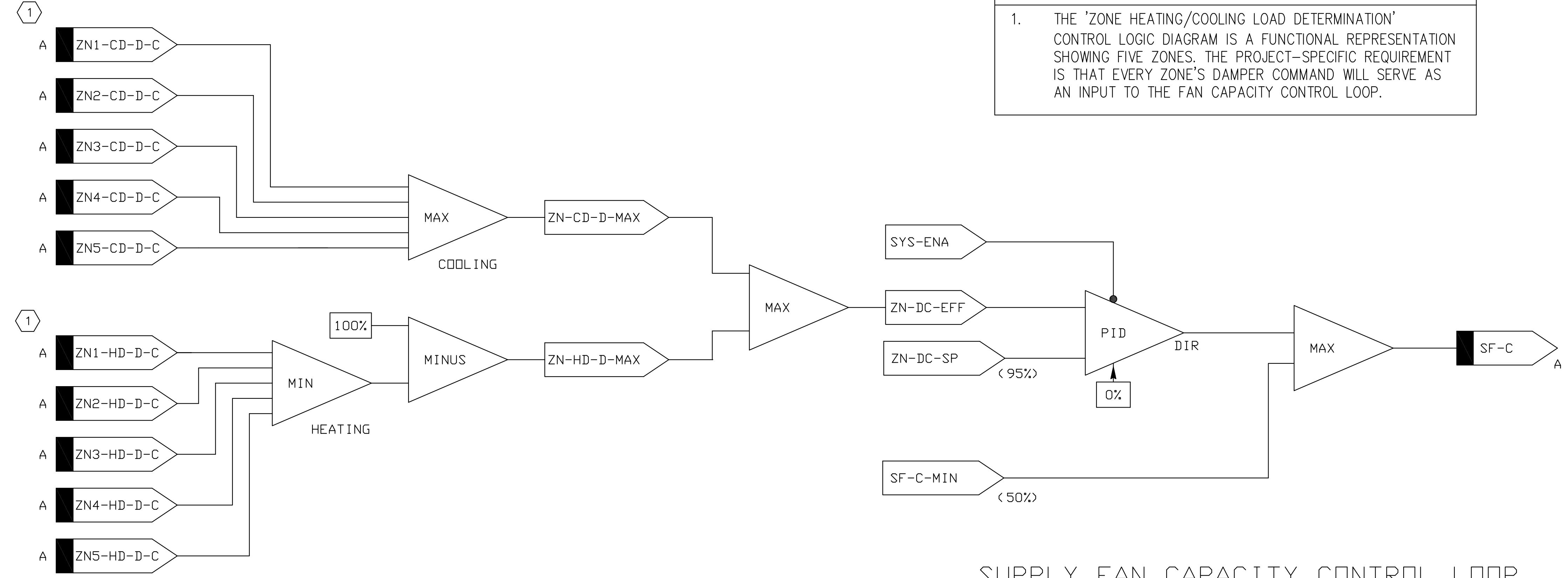
KEYED NOTES:

1. THE 'ZONE HEATING/COOLING LOAD DETERMINATION' CONTROL LOGIC DIAGRAM IS A FUNCTIONAL REPRESENTATION SHOWING FIVE ZONES. THE PROJECT-SPECIFIC REQUIREMENT IS THAT EVERY ZONE'S DAMPER COMMAND WILL SERVE AS AN INPUT TO THE FAN CAPACITY CONTROL LOOP.



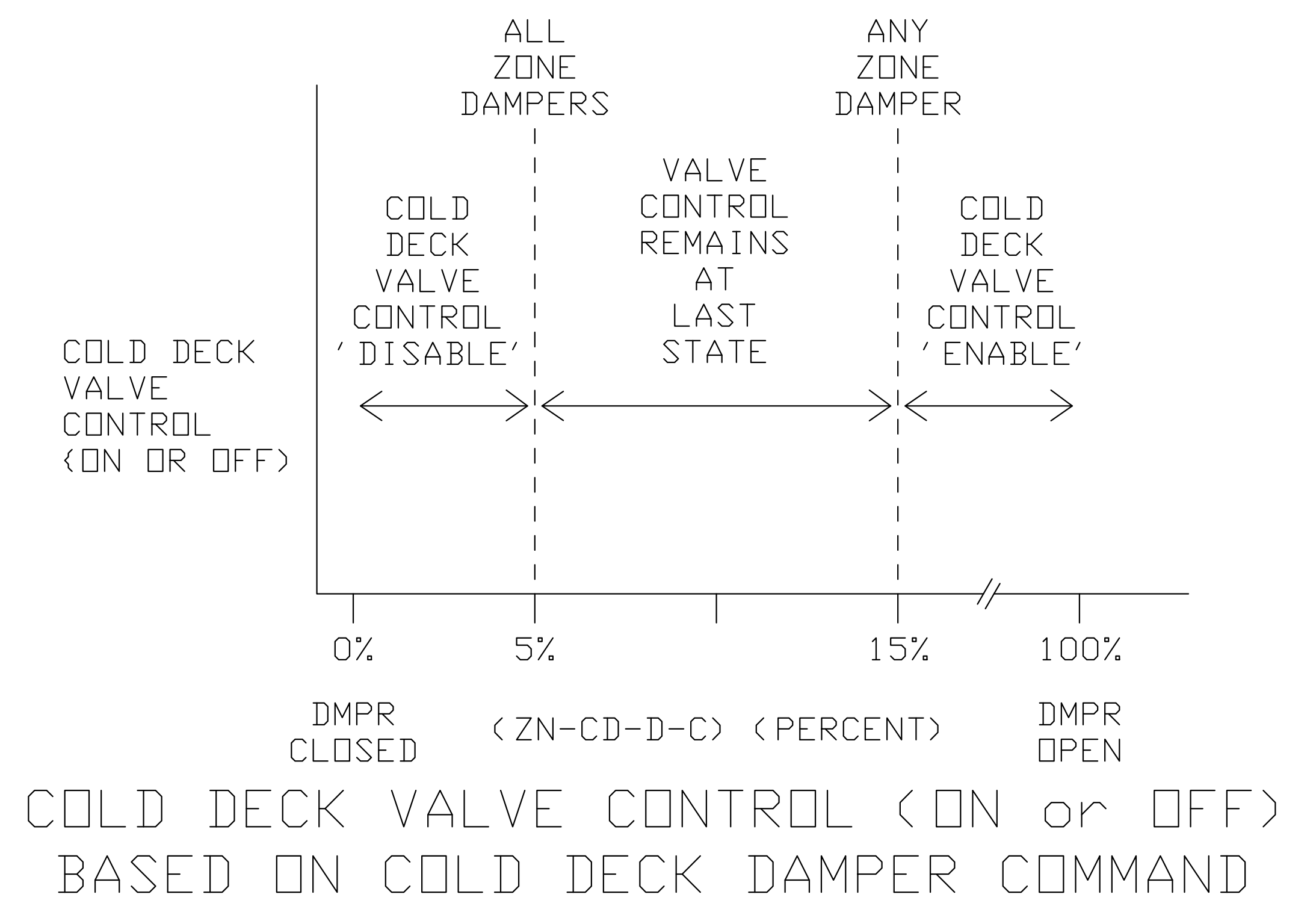
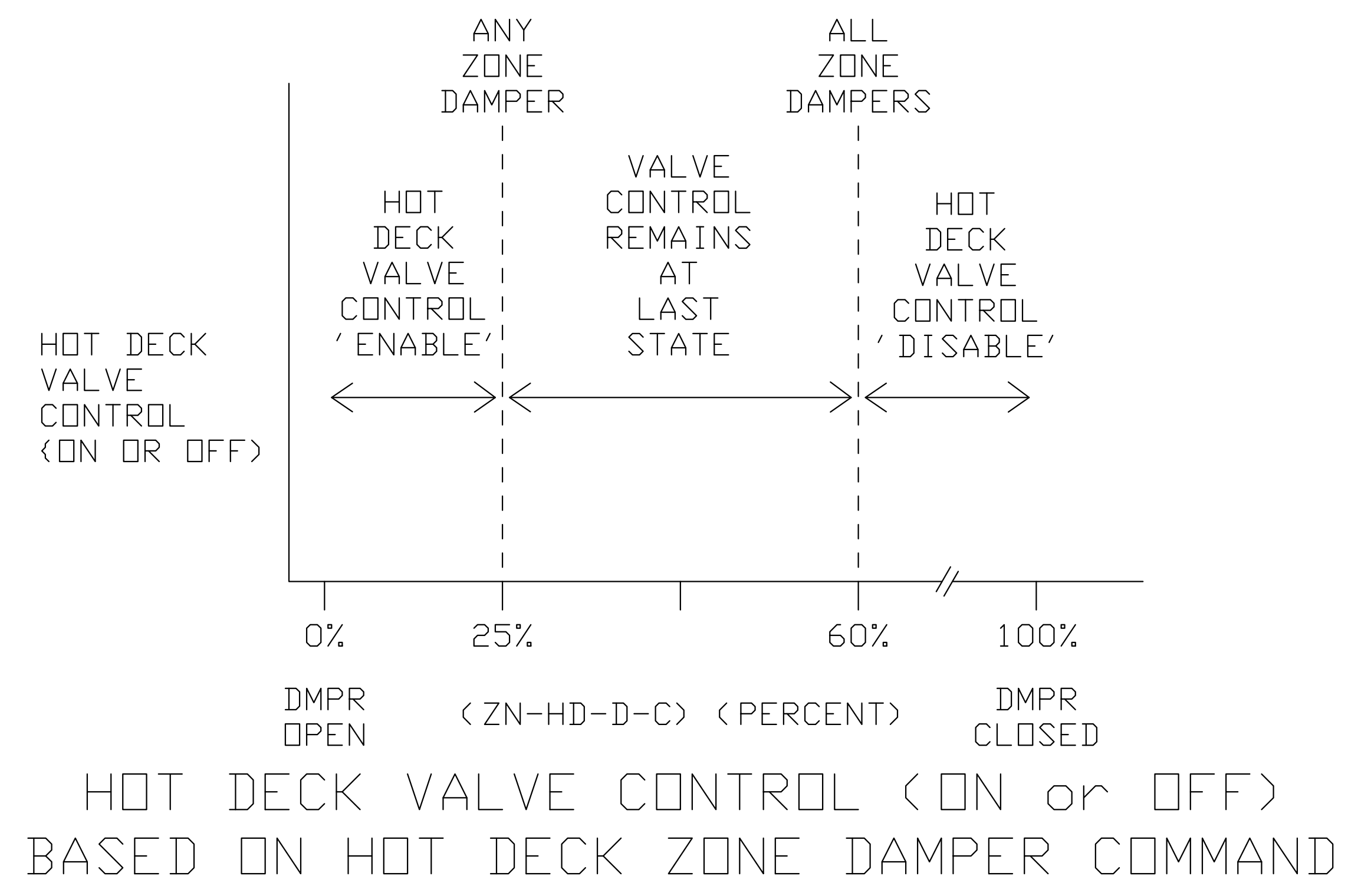
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MULTI-ZONE TO VARIABLE VOLUME CONTROLS RETROFIT NEUTRAL DECK WITH RETURN FAN CONTROL LOGIC DIAGRAMS



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FAN CAPACITY CONTROL LOOP ZONE HEATING/COOLING LOAD DETERMINATION
 SUPPLY FAN CAPACITY CONTROL LOOP
 () ENTRIES ARE FOR EXAMPLE ONLY



US Army Corps of Engineers

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MULTI-ZONE TO VARIABLE VOLUME CONTROLS RETROFIT NEUTRAL DECK WITHOUT RETURN FAN CONTROL LOGIC DIAGRAMS

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M-624c2
 SHEET 9 OF 12

