

The following standard specification is intended to be edited according to the specifics of the project. Brackets [] and areas shaded in gray [e.g. format] indicate requirements that are optional depending upon the type of system being provided or per instructions associated with the [] and project requirements. Consult with University's Representative and campus stakeholders.

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SECTION 23 08 00 COMMISSIONING OF HVAC

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Commission all systems and equipment listed in the table below per the requirements of Section 01 91 00 Commissioning. The Installation/Start-up Verification (ISV) and Functional Performance Test (FPT) forms listed are required [and will be provided by the University]. Refer to the project website for standard commissioning forms.

[Edit the table and the checklists as required by the project.]

Equipment/System	ISV Form	FPT Form
Testing, Adjusting, and Balancing for HVAC	ISV-23 05 93	FPT-23 05 93
Instrumentation and Control for HVAC (Building EMS)	ISV-23 09 00-1	FPT-23 09 00-1
Instrumentation and Control for HVAC (Laboratory Air Flow Control Systems)	ISV-23 09 00-2	FPT-23 09 00-2
Chilled Water Systems	N/A	FPT-23 21 00-1
Heating Water Systems	N/A	FPT-23 21 00-2
Condenser Water Systems	N/A	FPT-23 21 00-3
Hydronic Piping (Chilled Water and Heating Hot Water)	ISV- 23 21 13	w/ FPT-23 21 00-1 w/ FPT-23 21 00-2
Hydronic Pumps	ISV-23 21 23	w/ FPT-23 21 00-1 w/ FPT-23 21 00-2 w/ FPT-23 21 00-3
Steam and Condensate Heating Piping	ISV-23 22 13	N/A
Steam Condensate Pumps	ISV-23 22 23	w/ FPT-23 21 00-2
HVAC Water Treatment	ISV-23 25 00	N/A
Metal Ducts	ISV-23 31 13	N/A
HVAC Fans	ISV-23 34 00	w/ FPT-23 75 00
Air Terminal Units	ISV-23 36 16	w/ FPT-23 75 00
Heating Boilers	ISV-23 52 00	w/ FPT-23 21 00-2
Heat Exchangers for HVAC	ISV-23 57 00	w/ FPT-23 21 00-1 w/ FPT-23 21 00-2
Packaged Water Chillers	ISV-23 64 00	w/ FPT-23 21 00-1
Cooling Towers	ISV-23 65 00	w/ FPT-23 21 00-3
Air Handling Systems	ISV-23 75 00	FPT-23 75 00
Split-System Air-Conditioners	ISV-23 81 26	N/A
Fan Coil Units	ISV-23 82 19	FPT-23 82 19
Induction Units	ISV-23 82 26	w/ FPT-23 75 00

1.2 RELATED WORK AND DOCUMENTS

- A. Section 01 79 00 Demonstration and Training
 - B. Section 01 91 00 Commissioning
 - C. Division 23 Heating, Ventilating, and Air Conditioning
- 1.3 COMMISSIONING DEFINITIONS AND ABBREVIATIONS

- A. Refer to Section 01 91 00 Commissioning.

1.4 REFERENCE STANDARDS

- A. Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Guidelines
- B. American Society for Testing and Materials (ASTM)
- C. Associated Air Balance Counsel (AABC) Guidelines for Balancing Procedures and Documentation

1.5 SUBMITTALS

- A. Submit commissioning documents for all equipment and systems listed in table above per the requirements of Section 01 91 00 Commissioning.

PART 2 - PRODUCTS

2.1 INSTRUMENTATION

- A. Refer to Section 01 91 00 Commissioning.

PART 3 - EXECUTION

3.1 INSTALLATION/START-UP VERIFICATION

- A. Perform all checks and tests included in the ISV checklists and complete the checklists as specified in Section 01 91 00 Commissioning.

3.2 FUNCTIONAL PERFORMANCE TESTS

- A. Perform all checks and tests included in the FPT checklists and complete the checklists as specified in Section 01 91 00 Commissioning.

3.3 TRAINING OF UNIVERSITY PERSONNEL

- A. Provide training of University's personnel for the number of hours specified in the table below and as specified in Section 01 79 00 Demonstration and Training.

[Edit the table as required by the project. Project Manager to coordinate with A&E Engineering and O&M Facilities]

Equipment/System	Section Number	Orientation Hours	Training Hours	DVD Recording
Instrumentation and Control for HVAC (Building EMS)	23 09 00	TBD	TBD	N/A
Instrumentation and Control for HVAC (Laboratory Air Flow Control Systems)	23 09 00	TBD	TBD	N/A
Chilled Water Systems	23 21 00	2	4	N/A
Heating Water Systems	23 21 00	2	4	N/A
Condenser Water Systems	23 21 00	2	4	N/A
Steam and Condensate Systems	23 22 13	1	2	N/A
Air Handling Systems	23 75 00	4	8	N/A

END OF SECTION 23 08 00