

NUMBER	TITLE	EXPLANATION
23 05 00	Common Work Results for HVAC	Includes: subjects common to multiple titles in Division 23. See: 01 80 00 for performance requirements of subjects common to multiple titles. 05 45 13 for mechanical metal supports. 13 48 00 for sound, vibration, and seismic control. 21 05 29 for hangers and supports for fire-suppression piping and equipment. 21 05 33 for heat tracing for fire-suppression piping. 21 05 48 for vibration and seismic controls for fire-suppression piping and equipment. 21 05 53 for identification for fire-suppression piping and equipment. 22 05 29 for hangers and supports for plumbing piping and equipment. 22 05 33 for heat tracing for plumbing piping. 22 05 48 for vibration and seismic controls for plumbing piping and equipment. 22 05 53 for identification for plumbing piping and equipment. 40 41 00 for process piping and equipment heat tracing.
23 05 05	Selective Demolition for Heating, Ventilating, and Air Conditioning (HVAC)	See: 02 41 19 for selective demolition for whole structure demolition.
23 05 13	Common Motor Requirements for HVAC Equipment	
23 05 16	Expansion Fittings and Loops for HVAC Piping	
23 05 17	Sleeves and Sleeve Seals for HVAC Piping	Includes: penetration methods into and through fire-rated and unrated walls, ceilings, and floors. Sealing of conduit penetrations against water is included. Does Not Include: firestopping requirements.
23 05 19	Meters and Gauges for HVAC Piping	
23 05 23	General-Duty Valves for HVAC Piping	
23 05 29	Hangers and Supports for HVAC Piping and Equipment	
23 05 33	Heat Tracing for HVAC Piping	
23 05 48	Vibration and Seismic Controls for HVAC	
23 05 48.13	Vibration Controls for HVAC	Includes: vibration-isolation supports and hangers; vibration-isolation equipment bases.
23 05 53	Identification for HVAC Piping and Equipment	
23 05 63	Anti-Microbial Coatings for HVAC Ducts and Equipment	
23 05 66	Anti-Microbial Ultraviolet Emitters for HVAC Ducts and Equipment	
23 05 93	Testing, Adjusting, and Balancing for HVAC	

NUMBER	TITLE	EXPLANATION
23 06 00	Schedules for HVAC	Includes: schedules of items common to multiple titles in Division 23.
		Notes: a schedule may be included on drawings, in the project manual, or a project book.
23 06 10	Schedules for Facility Fuel Service Systems	
23 06 20	Schedules for HVAC Piping and Pumps	
23 06 20.13	Hydronic Pump Schedule	
23 06 30	Schedules for HVAC Air Distribution	
23 06 30.13	HVAC Fan Schedule	
23 06 30.16	Air Terminal Unit Schedule	
23 06 30.19	Air Outlet and Inlet Schedule	
23 06 30.23	HVAC Air Cleaning Device Schedule	
23 06 50	Schedules for Central Heating Equipment	
23 06 50.13	Heating Boiler Schedule	
23 06 60	Schedules for Central Cooling Equipment	
23 06 60.13	Refrigerant Condenser Schedule	
23 06 60.16	Packaged Water Chiller Schedule	
23 06 70	Schedules for Central HVAC Equipment	
23 06 70.13	Indoor, Central-Station Air-Handling Unit Schedule	
23 06 70.16	Packaged Outdoor HVAC Equipment Schedule	
23 06 80	Schedules for Decentralized HVAC Equipment	
23 06 80.13	Decentralized Unitary HVAC Equipment Schedule	
23 06 80.16	Convection Heating and Cooling Unit Schedule	
23 06 80.19	Radiant Heating and Cooling Unit Schedule	
23 07 00	HVAC Insulation	Includes: thermal insulation of HVAC ducts, piping, and equipment.
		See: 07 21 00 for thermal insulation. 21 07 00 for fire-suppression insulation. 22 07 00 for plumbing insulation. 40 42 00 for process piping and equipment insulation.
23 07 13	Duct Insulation	
23 07 16	HVAC Equipment Insulation	
23 07 19	HVAC Piping Insulation	
23 08 00	Commissioning of HVAC	Includes: commissioning of items common to multiple titles in Division 23.
		See: 01 91 00 for commissioning of subjects common to multiple Divisions.

NUMBER	TITLE	EXPLANATION
23 09 00	Instrumentation and Control for HVAC	<p>Includes: items for operating and controlling HVAC equipment. Various types of controls and the sequence of operation describing the equipment operation.</p> <p>See: 13 50 00 for special instrumentation. 21 09 00 for instrumentation and control for fire-suppression systems. 22 09 00 for instrumentation and control for plumbing. 23 05 93 for testing, adjusting, and balancing for HVAC. 25 35 00 for integrated automation instrumentation and terminal devices for HVAC. 25 55 00 for integrated automation control of HVAC. 25 95 00 for integrated automation control sequences for HVAC.</p>
23 09 13	Instrumentation and Control Devices for HVAC	<p>Includes: piping, tubing, wiring, control panels, thermostats, aquastats, timers, recording and alarm devices, related to HVAC equipment.</p> <p>May Include: instrumentation and control devices as part of integrated automation.</p> <p>See Also: 25 35 00 for integrated automation instrumentation and terminal devices for HVAC. 25 55 00 for integrated automation control of HVAC.</p>
23 09 13.13	Actuators and Operators	
23 09 13.23	Sensors and Transmitters	
23 09 13.33	Control Valves	
23 09 13.43	Control Dampers	
23 09 23	Direct-Digital Control System for HVAC	<p>Includes: HVAC control equipment where control is done by a digital process using computers.</p> <p>May Include: direct-digital control system as part of integrated automation.</p> <p>Alternate Terms/Abbreviations: DDC: direct digital control.</p> <p>See: 40 94 00 for digital process controllers.</p> <p>See Also: 25 35 00 for integrated automation instrumentation and terminal devices for HVAC. 25 55 00 for integrated automation control of HVAC.</p>
23 09 23.11	Control Valves	Includes: control valves and actuators for DDC systems.

NUMBER	TITLE	EXPLANATION
23 09 23.12	Control Dampers	Includes: control dampers and actuators for DDC systems.
23 09 23.13	Energy Meters	Includes: thermal and electric power energy meters that connect to DDC systems.
23 09 23.14	Flow Instruments	Includes: airflow sensors, switches, and transmitters; liquid flow meters, sensors, switches, and transmitters.
23 09 23.16	Gas Instruments	Includes: carbon-dioxide sensors, transmitters, and monitoring systems; oxygen monitoring systems; VOC sensors and transmitters. Alternate Terms/Abbreviations: VOC: volatile organic compound.
23 09 23.17	Level Instruments	Includes: liquid-level switches, sensors, and transmitters.
23 09 23.18	Leak Detection Instruments	Includes: point- and cable-type leak-detection switches.
23 09 23.19	Moisture Instruments	Includes: moisture switches, sensors, and transmitters.
23 09 23.21	Motion Instruments	Includes: PIR, Ultrasonic, and dual-technology motion sensors. Alternate Terms/Abbreviations: PIR: post incident report.
23 09 23.22	Position Instruments	Includes: position limit switches for use in DDC systems for HVAC.
23 09 23.23	Pressure Instruments	Includes: air and liquid pressure sensors, switches, and transmitters.
23 09 23.24	Speed Instruments	Includes: speed switches for DDC controls for HVAC.
23 09 23.27	Temperature Instruments	Includes: air temperature sensors, switches, RTD transmitters; liquid and steam temperature sensors, switches, and transmitters. Alternate Terms/Abbreviations: RTD: resistance temperature device.

DIVISION 23

NUMBER	TITLE	EXPLANATION
23 09 23.33	Vibration Instruments	Includes: vibration switches and transmitters connected to DDC systems for HVAC.
23 09 23.43	Weather Stations	Includes: weather stations connected to DDC for HVAC to help maintain air quality and temperature control in light of outside weather conditions.
23 09 33	Electric and Electronic Control System for HVAC	Includes: HVAC control equipment where the devices are powered with electricity. See: 40 93 00 for process analog controllers/recorders.
23 09 43	Pneumatic Control System for HVAC	Includes: HVAC control equipment where the devices are powered with compressed air. See: 22 15 00 for general service compressed-air systems. 40 93 00 for process analog controllers/recorders.
23 09 53	Pneumatic and Electric Control System for HVAC	Includes: HVAC control equipment where the devices are powered with electricity and compressed air. See: 22 15 00 for general service compressed-air systems. 40 93 00 for process analog controllers/recorders.
23 09 93	Sequence of Operations for HVAC Controls	Includes: description of how the HVAC equipment is intended to operate.
23 09 93.11	Sequence of Operation for HVAC DDC	Includes: descriptions of operational sequences for HVAC control system.

23 10 00 Facility Fuel Systems

Includes: fuel systems associated with a structure.

See: 11 11 00 for vehicle service equipment.
26 32 13 for engine generators.
28 42 00 for gas detection and alarm.
28 43 00 for fuel oil detection and alarm.
33 50 00 for site fuel distribution utilities.

NUMBER	TITLE	EXPLANATION
23 11 00	Facility Fuel Piping	Includes: fuel piping, valves, piping specialties, and other components within, under, or closely associated with a structure. See: 23 24 00 for internal-combustion engine piping. 33 52 00 for hydrocarbon transmission and distribution. 40 21 00 for liquid fuels process piping. 40 21 23 for fuel oils process piping.
23 11 13	Facility Fuel-Oil Piping	
23 11 16	Facility Gasoline Piping	
23 11 23	Facility Natural-Gas Piping	
23 11 26	Facility Liquefied-Petroleum Gas Piping	
23 12 00	Facility Fuel Pumps	Includes: fuel pumps within or closely associated with a structure. See: 33 52 00 for hydrocarbon transmission and distribution.
23 12 13	Facility Fuel-Oil Pumps	
23 12 16	Facility Gasoline Dispensing Pumps	
23 12 26	Facility Liquefied-Petroleum Gas Pumps	
23 13 00	Facility Fuel-Storage Tanks	Includes: fuel tanks under or closely associated with a structure. See: 09 97 13 for storage tank coatings. 33 56 00 for site fuel storage tanks. 41 52 19 for material storage tanks. 43 41 13 for gas and liquid pressure vessels.
23 13 13	Facility Underground Fuel-Oil, Storage Tanks	
23 13 13.13	Double-Wall Steel, Underground Fuel-Oil, Storage Tanks	
23 13 13.16	Composite, Steel, Underground Fuel-Oil, Storage Tanks	
23 13 13.19	Jacketed, Steel, Underground Fuel-Oil, Storage Tanks	
23 13 13.23	Glass-Fiber-Reinforced-Plastic, Underground Fuel-Oil, Storage Tanks	
23 13 13.33	Fuel-Oil Storage Tank Pumps	
23 13 23	Facility Aboveground Fuel-Oil, Storage Tanks	
23 13 23.13	Vertical, Steel, Aboveground Fuel-Oil, Storage Tanks	
23 13 23.16	Horizontal, Steel, Aboveground Fuel-Oil, Storage Tanks	
23 13 23.19	Containment-Dike, Steel, Aboveground Fuel-Oil, Storage Tanks	
23 13 23.23	Insulated, Steel, Aboveground Fuel-Oil, Storage Tanks	
23 13 23.26	Concrete-Vaulted, Steel, Aboveground Fuel-Oil, Storage Tanks	
23 13 26	Facility Aboveground Liquefied-Petroleum Gas Storage Tanks	

NUMBER	TITLE	EXPLANATION
23 20 00	HVAC Piping and Pumps	Includes: HVAC piping, pumps, and water treatment for a structure. See: 23 05 93 for testing, adjusting, and balancing for HVAC. 23 09 00 for instrumentation and control for HVAC. 33 60 00 for site hydronic and steam energy utilities.
23 21 00	Hydronic Piping and Pumps	Includes: chilled condenser and hot water piping, valves, piping specialties, pumps, and other components within a structure. See: 21 30 00 for fire pumps. 22 11 23 for domestic water pumps. 33 61 00 for site hydronic energy distribution.
23 21 13	Hydronic Piping	
23 21 13.13	Underground Hydronic Piping	
23 21 13.23	Aboveground Hydronic Piping	
23 21 13.33	Ground-Loop Heat-Pump Piping	
23 21 16	Hydronic Piping Specialties	
23 21 23	Hydronic Pumps	
23 21 23.13	In-Line Centrifugal Hydronic Pumps	
23 21 23.16	Base-Mounted, Centrifugal Hydronic Pumps	
23 21 23.19	Vertical-Mounted, Double-Suction Centrifugal Hydronic Pumps	
23 21 23.23	Vertical-Turbine Hydronic Pumps	
23 21 29	Automatic Condensate Pump Units	
23 22 00	Steam and Condensate Piping and Pumps	Includes: steam and condensate piping, valves, piping specialties and other components within a structure. See: 33 63 00 for site steam energy distribution. 40 11 00 for steam process piping.
23 22 13	Steam and Condensate Heating Piping	
23 22 13.13	Underground Steam and Condensate Heating Piping	
23 22 13.23	Aboveground Steam and Condensate Heating Piping	
23 22 16	Steam and Condensate Heating Piping Specialties	
23 22 23	Steam Condensate Pumps	
23 22 23.13	Electric-Driven Steam Condensate Pumps	
23 22 23.23	Pressure-Powered Steam Condensate Pumps	
23 23 00	Refrigerant Piping	Includes: refrigerant piping, valves, piping specialties, refrigerant, and other components within a structure. See: 28 44 00 for refrigerant detection and alarm.

NUMBER	TITLE	EXPLANATION
23 23 13	Refrigerant Piping Valves	
23 23 16	Refrigerant Piping Specialties	
23 23 19	Refrigerant Safety Relief Valve Discharge Piping	
23 23 23	Refrigerants	
23 24 00	Internal-Combustion Engine Piping	Includes: piping for internal-combustion engines other than fuel piping. See: 23 11 00 for facility fuel piping. 23 51 00 for breechings, chimneys, and stacks. 26 32 13 for engine generators. 40 15 00 for combustion system gas piping.
23 24 13	Internal-Combustion Engine Remote-Radiator Coolant Piping	
23 24 16	Internal-Combustion Engine Exhaust Piping	
23 25 00	HVAC Water Treatment	Includes: water treatment equipment for hot water, chilled water, steam, and condenser water systems. One-shot feeders, automatic chemical feed systems, manual chemical feed systems, and chemicals. See: 22 31 00 for domestic water softeners. 22 32 00 for domestic water filtration equipment.
23 25 13	Water Treatment for Closed-Loop Hydronic Systems	
23 25 16	Water Treatment for Open Hydronic Systems	
23 25 19	Water Treatment for Steam System Feedwater	
23 25 23	Water Treatment for Humidification Steam System Feedwater	
23 25 26	Electronic Water Conditioning for HVAC Systems	
23 25 33	HVAC Makeup-Water Filtration Equipment	Includes: water softeners, RO equipment, multimedia filters, self-cleaning strainers, bag-and cartridge-type filters, and centrifugal separators.
23 30 00	HVAC Air Distribution	Includes: ducts, duct accessories, fans, volume control equipment, and air inlets and outlets. See: 23 05 93 for testing, adjusting, and balancing for HVAC. 23 09 00 for instrumentation and control for HVAC.

NUMBER	TITLE	EXPLANATION
23 31 00	HVAC Ducts and Casings	Includes: duct materials and fabrication, including duct hangers and supports. See: 23 07 13 for duct insulation. 23 33 46 for flexible ducts. 23 33 53 for duct liners.
23 31 13	Metal Ducts	
23 31 13.13	Rectangular Metal Ducts	
23 31 13.16	Round and Flat-Oval Spiral Ducts	
23 31 13.19	Metal Duct Fittings	
23 31 16	Nonmetal Ducts	
23 31 16.13	Fibrous-Glass Ducts	
23 31 16.16	Thermoset Fiberglass-Reinforced Plastic Ducts	
23 31 16.19	PVC Ducts	
23 31 16.26	Concrete Ducts	
23 31 19	HVAC Casings	
23 32 00	Air Plenums and Chases	Includes: plenums and chases formed by general construction work results used for HVAC air distribution. See: 09 50 00 for suspended ceilings. 09 69 00 for access flooring. 13 48 00 for sound, vibration, and seismic control. 23 31 00 for HVAC ducts and casings.
23 32 13	Fabricated, Metal Air Plenums	
23 32 33	Air-Distribution Ceiling Plenums	
23 32 36	Air-Distribution Floor Plenums	
23 32 39	Air-Distribution Wall Plenums	
23 32 43	Air-Distribution Chases Formed by General Construction	
23 32 48	Acoustical Air Plenums	
23 33 00	Air Duct Accessories	Includes: dampers, duct access panel and test holes, flexible duct connectors, turning vanes and extractors, and sound attenuators. Balancing, back draft, fire, smoke, and combination fire and smoke dampers. See: 23 07 13 for duct insulation. 23 09 00 for instrumentation and control for HVAC. 23 31 00 for HVAC ducts and casings.
23 33 13	Dampers	
23 33 13.13	Volume-Control Dampers	
23 33 13.16	Fire Dampers	
23 33 13.19	Smoke-Control Dampers	
23 33 13.23	Backdraft Dampers	

NUMBER	TITLE	EXPLANATION
23 33 19	Duct Silencers	
23 33 23	Turning Vanes	
23 33 33	Duct-Mounting Access Doors	
23 33 38	Duct Security Bars	
23 33 43	Flexible Connectors	
23 33 46	Flexible Ducts	
23 33 53	Duct Liners	
23 34 00	HVAC Fans	<p>Includes: various types of fans for air distribution. Ceiling fans and exhaust fans.</p> <p>Alternate Terms/Abbreviations: air curtains: air doors.</p> <p>See: 23 31 00 for HVAC ducts and casings. 23 38 00 for ventilation hoods.</p>
23 34 13	Axial HVAC Fans	
23 34 16	Centrifugal HVAC Fans	
23 34 23	HVAC Power Ventilators	
23 34 33	Air Curtains	
23 34 39	High-Volume, Low-Speed Propeller Fans	<p>Includes: fans, motors, gearboxes, and drives.</p> <p>Alternate Terms/Abbreviations: commercial ceiling fans.</p>
23 35 00	Special Exhaust Systems	<p>Includes: exhaust systems with a special specific purpose. Sawdust collection includes inlets, ducts, fans, and collection bins or cyclones. Exhaust systems for vehicle repair facilities, vehicle and engine test facilities, engine-generator exhaust systems, and engine-driven fire-pump exhaust systems.</p> <p>See: 23 40 00 for HVAC air cleaning devices. 44 11 16 for industrial dust collectors.</p>
23 35 13	Dust Collection Systems	
23 35 13.13	Sawdust Collection Systems	
23 35 16	Engine Exhaust Systems	
23 35 16.13	Positive-Pressure Engine Exhaust Systems	
23 35 16.16	Mechanical Engine Exhaust Systems	
23 35 33	Listed Kitchen Ventilation Exhaust System	<p>Includes: fire-rated kitchen ventilation systems intended chiefly for commercial applications.</p> <p>See Also: 23 31 00 for HVAC ducts and casings for non-rated kitchen ventilation systems. 23 38 13 for listed commercial-kitchen hoods.</p>

NUMBER	TITLE	EXPLANATION
23 36 00	Air Terminal Units	Includes: air terminal units involving heat transfer and forced air supply. Alternate Terms/Abbreviations: VAV: variable air volume.
23 36 13	Constant-Air-Volume Units	
23 36 16	Variable-Air-Volume Units	
23 37 00	Air Outlets and Inlets	Includes: devices used to supply or remove air from a space or building. See: 08 90 00 for louvers and vents. 09 58 00 for air outlets and inlets integral with integrated ceiling assemblies. 09 69 00 for air outlets and inlets integral with access flooring. 23 38 00 for ventilation hoods.
23 37 13	Diffusers, Registers, and Grilles	
23 37 13.43	Security Registers and Grilles	Includes: registers and grilles used in detention facilities.
23 37 16	Fabric Air Distribution Devices	
23 37 23	HVAC Gravity Ventilators	
23 37 23.13	HVAC Gravity Dome Ventilators	
23 37 23.16	HVAC Gravity Louvered-Penthouse Ventilators	
23 37 23.19	HVAC Gravity Upblast Ventilators	
23 38 00	Ventilation Hoods	Includes: ventilation hoods and equipment with fire-suppression systems for commercial kitchens. May Include: laboratory fumes hoods connected to HVAC system. See: 11 53 13 for recirculating laboratory fume hoods. 21 20 00 for fire extinguishing systems. See Also: 11 44 00 for commercial-kitchen hoods. 11 53 13 for laboratory fume hoods.
23 38 13	Commercial-Kitchen Hoods	
23 38 13.13	Listed Commercial-Kitchen Hoods	
23 38 13.16	Standard Commercial-Kitchen Hoods	
23 38 16	Fume Hoods	

NUMBER	TITLE	EXPLANATION
23 40 00	HVAC Air Cleaning Devices	Includes: devices of a variety of types to clean distribution air. Alternate Terms/Abbreviations: HEPA: high-efficiency particulate air (filter). ULPA: ultra-low penetration air (filter). SULPA: super ultra-low penetration air (filter). See: 23 31 00 for HVAC ducts and casings. 23 35 13 for sawdust collection systems. 44 11 00 for particulate control equipment.
23 41 00	Particulate Air Filtration	
23 41 13	Panel Air Filters	
23 41 16	Renewable-Media Air Filters	
23 41 19	Washable Air Filters	
23 41 23	Extended Surface Filters	
23 41 33	High-Efficiency Particulate Filtration	
23 41 43	Ultra-Low Penetration Filtration	
23 41 46	Super Ultra-Low Penetration Filtration	
23 42 00	Gas-Phase Air Filtration	
23 42 13	Activated-Carbon Air Filtration	
23 42 16	Chemically-Impregnated Adsorption Air Filtration	
23 42 19	Catalytic-Adsorption Air Filtration	
23 43 00	Electronic Air Cleaners	
23 43 13	Washable Electronic Air Cleaners	
23 43 16	Agglomerator Electronic Air Cleaners	
23 43 23	Self-Contained Electronic Air Cleaners	
23 50 00	Central Heating Equipment	Includes: boilers, feedwater equipment, and draft accessories; furnaces; heaters; heat exchangers; and breechings, chimneys, and stacks. See: 23 05 93 for testing, adjusting, and balancing for HVAC. 23 07 16 for HVAC equipment insulation. 23 09 00 for instrumentation and control for HVAC. 23 11 00 for facility fuel piping. 23 21 00 for hydronic piping and pumps. 23 22 00 for steam and condensate piping and pumps. 33 61 00 for site hydronic energy distribution. 33 63 00 for site steam energy distribution. 42 10 00 for process heating equipment.

NUMBER	TITLE	EXPLANATION
23 51 00	Breechings, Chimneys, and Stacks	Includes: double-wall and single-wall chimneys, breechings, and stacks. See: 04 50 00 for refractory masonry. 22 34 00 for fuel-fired domestic water heaters. 23 24 16 for internal-combustion engine exhaust piping. 23 52 00 for heating boilers. 23 54 00 for furnaces. 23 55 00 for fuel-fired heaters. 40 15 00 for combustion system gas piping. 40 47 00 for refractories.
23 51 13	Draft Control Devices	
23 51 13.11	Draft Control Fans	Includes: draft-inducer fans, venturi-draft-inducer fans, mechanical-draft vent fans, vent exhaust fans, and combustion-air fans.
23 51 13.13	Draft-Induction Fans	
23 51 13.16	Vent Dampers	
23 51 13.19	Barometric Dampers	
23 51 16	Fabricated Breechings and Accessories	
23 51 19	Fabricated Stacks	
23 51 23	Gas Vents	
23 51 33	Insulated Sectional Chimneys	
23 51 43	Flue-Gas Filtration Equipment	
23 51 43.13	Gaseous Filtration	
23 51 43.16	Particulate Filtration	
23 52 00	Heating Boilers	Includes: gas and oil fuel-fired, solid fuel-fired, and electric boilers and generators for both hot water and steam systems. See: 23 11 00 for facility fuel piping. 23 25 00 for HVAC water treatment. 23 51 00 for breechings, chimneys, and stacks. 23 53 00 for heating boiler feedwater equipment. 42 11 00 for process boilers.
23 52 13	Electric Boilers	
23 52 16	Condensing Boilers	
23 52 16.13	Stainless-Steel Condensing Boilers	
23 52 16.16	Aluminum Condensing Boilers	
23 52 17	Low Mass Boilers	
23 52 19	Pulse Combustion Boilers	
23 52 23	Cast-Iron Boilers	

NUMBER	TITLE	EXPLANATION
23 52 33	Water-Tube Boilers	
23 52 33.13	Finned Water-Tube Boilers	
23 52 33.14	Flexible Water-Tube Boilers	Includes: flexible water-tube boilers with burners, controls and accessories, suitable for use in steam or hot water systems fired by natural gas, propane, or fuel oil. Includes controls, hot water or steam boiler trim, and natural gas, propane, or fuel oil-fired burner.
23 52 33.16	Steel Water-Tube Boilers	
23 52 33.19	Copper Water-Tube Boilers	
23 52 39	Fire-Tube Boilers	
23 52 39.13	Scotch Marine Boilers	
23 52 39.16	Steel Fire-Tube Boilers	
23 52 83	Boiler Blowdown Systems	
23 53 00	Heating Boiler Feedwater Equipment	Includes: equipment to remove oxygen and other dissolved gases in boiler feed. See: 23 52 00 for heating boilers.
23 53 13	Boiler Feedwater Pumps	
23 53 16	Deaerators	
23 54 00	Furnaces	Includes: gas and oil fuel-fired, and electric furnaces. See: 23 11 00 for facility fuel piping. 23 51 00 for breechings, chimneys, and stacks. 42 14 00 for industrial furnaces.
23 54 13	Electric-Resistance Furnaces	
23 54 16	Fuel-Fired Furnaces	
23 54 16.13	Gas-Fired Furnaces	
23 54 16.16	Oil-Fired Furnaces	
23 55 00	Fuel-Fired Heaters	Includes: gas and oil fuel-fired duct, radiant, and unit heaters. See: 23 11 00 for facility fuel piping. 23 51 00 for breechings, chimneys, and stacks. 23 82 39 for unit heaters.
23 55 13	Fuel-Fired Duct Heaters	
23 55 13.13	Oil-Fired Duct Heaters	
23 55 13.16	Gas-Fired Duct Heaters	
23 55 23	Gas-Fired Radiant Heaters	
23 55 23.13	Low-Intensity Gas-Fired Radiant Heaters	
23 55 23.16	High-Intensity Gas-Fired Radiant Heaters	

NUMBER	TITLE	EXPLANATION
23 55 33	Fuel-Fired Unit Heaters	
23 55 33.13	Oil-Fired Unit Heaters	
23 55 33.16	Gas-Fired Unit Heaters	

23 56 00 Solar Energy Heating Equipment

Includes: equipment powered by solar energy.

See: 22 33 30 for residential, collector-to-tank, solar-electric domestic water heaters.

26 31 00 for photovoltaic collectors.

48 14 00 for solar energy electrical power generation equipment.

23 56 13	Heating Solar Collectors
23 56 13.13	Heating Solar Flat-Plate Collectors
23 56 13.16	Heating Solar Concentrating Collectors
23 56 13.19	Heating Solar Vacuum-Tube Collectors
23 56 16	Packaged Solar Heating Equipment
23 56 23	Solar Air-Heating Panels

23 57 00 Heat Exchangers for HVAC

Includes: equipment used to transfer heat from one medium to another.

See: 22 35 00 for domestic water heat exchangers.

23 21 00 for hydronic piping and pumps.

23 22 00 for steam and condensate piping and pumps.

23 72 00 for air-to-air energy recovery equipment.

42 13 00 for industrial heat exchangers and recuperators.

23 57 13	Steam-to-Steam Heat Exchangers
23 57 16	Steam-to-Water Heat Exchangers
23 57 19	Liquid-to-Liquid Heat Exchangers
23 57 19.13	Plate-Type, Liquid-to-Liquid Heat Exchangers
23 57 19.16	Shell-Type, Liquid-to-Liquid Heat Exchangers
23 57 33	Direct Geoexchange Heat Exchangers
	Includes: continuous sealed underground closed-loop heat exchanger with one refrigerant supply tube and one refrigerant return tube.
	See: 23 71 00 for thermal storage of energy.
	48 16 00 for geothermal energy electrical power generation equipment.

NUMBER	TITLE	EXPLANATION
23 60 00	Central Cooling Equipment	<p>Includes: building space cooling equipment and equipment to reject heat from the refrigeration process.</p> <p>May Include: freezing equipment for ice rinks.</p> <p>See: 23 05 93 for testing, adjusting, and balancing for HVAC. 23 07 16 for HVAC equipment insulation. 23 09 00 for instrumentation and control for HVAC. 23 11 00 for facility fuel piping. 23 21 00 for hydronic piping and pumps. 23 76 00 for evaporative air-cooling equipment. 33 61 00 for site hydronic energy distribution. 42 20 00 for process cooling equipment.</p> <p>See Also: 13 18 00 for ice rinks.</p>
23 61 00	Refrigerant Compressors	<p>Includes: various types of compressors used in the refrigeration process.</p> <p>See: 28 44 00 for refrigerant detection and alarm.</p>
23 61 13	Centrifugal Refrigerant Compressors	
23 61 13.13	Non-Condensable Gas Purge Equipment	
23 61 16	Reciprocating Refrigerant Compressors	
23 61 19	Scroll Refrigerant Compressors	
23 61 23	Rotary-Screw Refrigerant Compressors	
23 62 00	Packaged Compressor and Condenser Units	<p>Includes: compressors used in the refrigeration process in combination with condensing units used to reject heat from the refrigeration process.</p> <p>See: 28 44 00 for refrigerant detection and alarm.</p>
23 62 13	Packaged Air-Cooled Refrigerant Compressor and Condenser Units	
23 62 23	Packaged Water-Cooled Refrigerant Compressor and Condenser Units	
23 62 46	Packaged Variable-Refrigerant-Flow Air-Conditioning Systems	
23 63 00	Refrigerant Condensers	<p>Includes: condensing units used to reject heat from the refrigeration process.</p> <p>See: 28 44 00 for refrigerant detection and alarm. 42 23 00 for process condensers and evaporators.</p>
23 63 13	Air-Cooled Refrigerant Condensers	

NUMBER	TITLE	EXPLANATION
23 63 23	Water-Cooled Refrigerant Condensers	
23 63 33	Evaporative Refrigerant Condensers	
23 64 00	Packaged Water Chillers	Includes: various types of chillers used for building space cooling. See: 42 22 00 for process chillers and coolers. 42 22 13 for centrifugal process chillers and coolers. 42 22 16 for reciprocating process chillers and coolers. 42 22 23 for rotary process chillers and coolers.
23 64 13	Absorption Water Chillers	
23 64 13.13	Direct-Fired Absorption Water Chillers	
23 64 13.16	Indirect-Fired Absorption Water Chillers	
23 64 16	Centrifugal Water Chillers	
23 64 16.13	Air-Cooled Centrifugal Water Chillers	
23 64 16.16	Water-Cooled Centrifugal Water Chillers	
23 64 19	Reciprocating Water Chillers	
23 64 23	Scroll Water Chillers	
23 64 23.13	Air-Cooled Scroll Water Chillers	
23 64 23.16	Water-Cooled Scroll Water Chillers	
23 64 26	Rotary-Screw Water Chillers	
23 64 26.13	Air-Cooled, Rotary-Screw Water Chillers	
23 64 26.16	Water-Cooled, Rotary-Screw Water Chillers	
23 64 33	Modular Water Chillers	Includes: water- and air-cooled, packaged, modular water chillers.
23 64 33.13	Air-Cooled, Modular Water Chillers	
23 64 33.16	Water-Cooled, Modular Water Chillers	
23 65 00	Cooling Towers	Includes: factory- and field-assembled cooling towers used to reject heat from the refrigeration process. See: 31 00 00 for earthwork. 35 00 00 for waterway and marine construction. 42 21 00 for process cooling towers.
23 65 13	Forced-Draft Cooling Towers	
23 65 13.13	Open-Circuit, Forced-Draft Cooling Towers	
23 65 13.16	Closed-Circuit, Forced-Draft Cooling Towers	
23 65 14	Induced-Draft Cooling Towers	
23 65 14.13	Open-Circuit, Induced-Draft Counterflow Cooling Towers	Includes: open-circuit cooling tower in which airflow and condenser-water flow are in opposing directions.

NUMBER	TITLE	EXPLANATION
23 65 14.14	Open-Circuit, Induced-Draft Crossflow Cooling Towers	Includes: open-circuit cooling tower in which airflow is horizontal across cascading condenser-water flow and fan draws air through the tower.
23 65 14.16	Closed-Circuit, Induced-Draft Counterflow Cooling Towers	Includes: closed-circuit cooling tower in which airflow is drawn through condenser-water flowing through closed-circuit piping system.
23 65 14.17	Closed-Circuit, Induced-Draft Combined-Flow Cooling Towers	Includes: closed-circuit cooling tower in which airflow is drawn through sides of tower condenser-water flowing through closed-circuit piping system; induced-draft fan is mounted on top of tower.
23 65 16	Natural-Draft Cooling Towers	
23 65 23	Field-Erected Cooling Towers	
23 65 33	Liquid Coolers	

23 70 00 Central HVAC Equipment

Includes: equipment that serves a total HVAC system.

See: 23 05 93 for testing, adjusting, and balancing for HVAC.
 23 07 16 for HVAC equipment insulation.
 23 09 00 for instrumentation and control for HVAC.
 23 11 00 for facility fuel piping.
 23 21 00 for hydronic piping and pumps.
 33 61 00 for site hydronic energy distribution.

23 71 00 Thermal Storage

Includes: equipment to store thermal energy for use in heating and/or cooling and with charging or discharging this energy at a controllable rate.

See: 23 57 33 for direct geexchange heat exchanger.
 48 16 00 for geothermal energy electrical power generation equipment.

23 71 13	Thermal Heat Storage
23 71 13.13	Room Storage Heaters for Thermal Storage
23 71 13.16	Heat-Pump Boosters for Thermal Storage
23 71 13.19	Central Furnace Heat-Storage Units
23 71 13.23	Pressurized-Water Thermal Storage Tanks
23 71 16	Chilled-Water Thermal Storage
23 71 19	Ice Storage
23 71 19.13	Internal Ice-on-Coil Thermal Storage
23 71 19.16	External Ice-on-Coil Thermal Storage
23 71 19.19	Encapsulated-Ice Thermal Storage
23 71 19.23	Ice-Harvesting Thermal Storage

NUMBER	TITLE	EXPLANATION
23 71 19.26	Ice-Slurry Thermal Storage	
23 72 00	Air-to-Air Energy Recovery Equipment	Includes: air-to-air type energy recovery units. See: 23 57 00 for heat exchangers for HVAC.
23 72 13	Heat-Wheel Air-to-Air Energy-Recovery Equipment	
23 72 16	Heat-Pipe Air-to-Air Energy-Recovery Equipment	
23 72 19	Fixed-Plate Air-to-Air Energy-Recovery Equipment	
23 72 23	Packaged Air-to-Air Energy-Recovery Units	
23 73 00	Indoor Central-Station Air-Handling Units	Includes: indoor units consisting of fans, coils, dampers, control devices, and other accessories. Assembly of standard produced components or assembly of custom designed components. May Include: filters with unit. See: 23 81 00 for decentralized unitary HVAC equipment. See Also: 23 40 00 for HVAC air cleaning devices.
23 73 13	Modular Indoor Central-Station Air-Handling Units	
23 73 23	Custom Indoor Central-Station Air-Handling Units	
23 73 33	Indoor Indirect Fuel-Fired Heating and Ventilating Units	
23 73 33.13	Indoor Indirect Oil-Fired Heating and Ventilating Units	
23 73 33.16	Indoor Indirect Gas-Fired Heating and Ventilating Units	
23 73 39	Indoor, Direct Gas-Fired Heating and Ventilating Units	
23 74 00	Packaged Outdoor HVAC Equipment	Includes: outdoor units consisting of fans, coils, dampers, control devices and other accessories. Units may be for single-zone, multizone, and variable-air-volume applications. Units may be mounted on the roof or at grade level. Assembly of standard, readily available stock components. May Include: filters with unit. See Also: 23 40 00 for HVAC air cleaning devices.
23 74 13	Packaged, Outdoor, Central-Station Air-Handling Units	
23 74 16	Packaged Rooftop Air-Conditioning Units	
23 74 16.11	Packaged, Small-Capacity, Rooftop Air-Conditioning Units	Includes: six tons and smaller units. Rooftop heating, cooling, and ventilating units, and roof-mounting curbs and accessories.

NUMBER	TITLE	EXPLANATION
23 74 16.12	Packaged, Intermediate-Capacity, Rooftop Air-Conditioning Units	Includes: 7.5- to twenty-five-ton units. Rooftop heating, cooling, and ventilating units, and roof-mounting curbs and accessories.
23 74 16.13	Packaged, Large-Capacity, Rooftop Air-Conditioning Units	Includes: units larger than twenty-five tons. Rooftop heating, cooling, and ventilating units, and roof-mounting curbs and accessories.
23 74 23	Packaged, Outdoor, Heating-Only Makeup-Air Units	
23 74 23.13	Packaged, Direct-Fired, Outdoor, Heating-Only Makeup-Air Units	
23 74 23.16	Packaged, Indirect-Fired, Outdoor, Heating-Only Makeup-Air Units	
23 74 33	Dedicated Outdoor-Air Units	
23 75 00	Custom-Packaged Outdoor HVAC Equipment	Includes: outdoor unitary equipment that may consist of heat recovery, service vestibules, boilers, chillers, and space for other mechanical equipment. Units may be mounted on the roof or at grade level. Units may be for single-zone, multizone, and variable-air-volume applications; and can have multiple separate air handlers incorporated into a single unit. Assembly of non-standard customized or custom-built components, or a combination of standard components with non-standard customized or custom-built components.
23 75 13	Custom-Packaged, Outdoor, Central-Station Air-Handling Units	
23 75 16	Custom-Packaged, Rooftop Air-Conditioning Units	Includes: rooftop heating, cooling, and ventilating units and roof-mounting curbs and accessories.
23 75 23	Custom-Packaged, Outdoor, Heating and Ventilating Makeup-Air Units	
23 75 33	Custom-Packaged, Outdoor, Heating and Cooling Makeup Air-Conditioners	
23 76 00	Evaporative Air-Cooling Equipment	Includes: equipment used to reject heat from the refrigeration process by evaporation. Alternate Terms/Abbreviations: evaporative air coolers: swamp coolers. See: 23 60 00 for central cooling equipment. 23 81 00 for decentralized unitary HVAC equipment. 42 23 00 for process condensers and evaporators.
23 76 13	Direct Evaporative Air Coolers	
23 76 16	Indirect Evaporative Air Coolers	
23 76 19	Combined Direct and Indirect Evaporative Air Coolers	

NUMBER	TITLE	EXPLANATION
23 80 00	Decentralized HVAC Equipment	Includes: equipment that serves a portion of an HVAC system. See: 23 05 93 for testing, adjusting, and balancing for HVAC. 23 07 16 for HVAC equipment insulation. 23 09 00 for instrumentation and control for HVAC. 23 21 00 for hydronic piping and pumps.
23 81 00	Decentralized Unitary HVAC Equipment	Includes: equipment types that contain all the components of the refrigeration process within a single package. Air- and water-source heat pumps. See: 23 73 00 for indoor, central-station air-handling units. 23 76 00 for evaporative air-cooling equipment.
23 81 13	Packaged Terminal Air-Conditioners	
23 81 13.11	Packaged Terminal Air-Conditioners, Through-Wall Units	Includes: heating and cooling units; with electric heat, hydronic heat, or heat-pump configurations.
23 81 13.12	Packaged Terminal Air-Conditioners, Freestanding Units	Includes: heating and cooling units; with electric heat, hydronic heat, or heat-pump configurations.
23 81 13.13	Packaged Terminal Air-Conditioners, Outdoor, Wall-Mounted Units	Includes: heating and cooling units; with electric heat, hydronic heat, or heat-pump configurations.
23 81 16	Room Air-Conditioners	
23 81 19	Self-Contained Air-Conditioners	
23 81 19.13	Small-Capacity Self-Contained Air-Conditioners	
23 81 19.16	Large-Capacity Self-Contained Air-Conditioners	
23 81 23	Computer-Room Air-Conditioners	
23 81 23.11	Small-Capacity, Computer-Room Air-Conditioners, Floor Mounted Units	Includes: six tons (21 kW) and smaller units. Cooling-only units.
23 81 23.12	Large-Capacity, Computer-Room Air-Conditioners, Floor-Mounted Units	Includes: seven tons (25 kW) and larger units. Cooling-only units.
23 81 23.13	Computer-Room Air-Conditioners, Ceiling Mounted Units	Includes: cooling-only units.
23 81 23.14	Computer-Room Air-Conditioners, Console Units	Includes: cooling-only units.
23 81 23.16	Computer-Room Air-Conditioners, Rack Mounted, Space-Cooling Units	Includes: cooling-only units.

NUMBER	TITLE	EXPLANATION
23 81 23.18	Computer-Room, Rack-Cooling Equipment	Includes: cooling-only units.
23 81 26	Split-System Air-Conditioners	
23 81 26.13	Small-Capacity Split-System Air-Conditioners	
23 81 26.16	Large-Capacity Split-System Air-Conditioners	
23 81 29	Variable Refrigerant Flow HVAC Systems	
23 81 43	Air-Source Unitary Heat Pumps	
23 81 46	Water-Source Unitary Heat Pumps	
23 81 49	Ground-Source Unitary Heat Pumps	
23 82 00	Convection Heating and Cooling Units	Includes: terminal units with water, steam, and electric coils.
		See: 05 58 19 for custom formed metal heating/cooling unit covers.
		23 55 33 for fuel-fired unit heaters.
		42 12 00 for process heaters.
23 82 13	Valance Heating and Cooling Units	
23 82 14	Chilled Beams	
23 82 16	Air Coils	
23 82 16.11	Hydronic Air Coils	Includes: air coils with hot- and chilled-water transfer medium.
23 82 16.12	Steam Air Coils	Includes: air coils with steam transfer medium.
23 82 16.13	Refrigerant Air Coils	Includes: air coils with refrigerant transfer medium.
23 82 16.14	Electric-Resistance Air Coils	Includes: air coils with electric-resistance element.
23 82 19	Fan Coil Units	
23 82 23	Unit Ventilators	
23 82 26	Induction Units	
23 82 29	Radiators	
23 82 33	Convectors	
23 82 36	Finned-Tube Radiation Heaters	
23 82 39	Unit Heaters	
23 82 39.13	Cabinet Unit Heaters	
23 82 39.16	Propeller Unit Heaters	
23 82 39.19	Wall and Ceiling Unit Heaters	
23 82 41	Water-to-Water Heat Pumps	

NUMBER	TITLE	EXPLANATION
23 83 00	Radiant Heating and Cooling Units	Includes: electric cables and hydronic piping used for radiant heating for space heating or snow and ice control. See: 21 05 33 for heat tracing for fire-suppression piping. 22 05 33 for heat tracing for plumbing piping. 23 05 33 for heat tracing for HVAC piping. 23 55 23 for gas-fired radiant heaters. 32 13 00 for rigid paving. 40 41 00 for process piping and equipment heat tracing.
23 83 13	Radiant-Heating Electric Cables	
23 83 13.16	Radiant-Heating Electric Mats	
23 83 16	Radiant Heating and Cooling Hydronic Piping	
23 83 23	Radiant-Heating Electric Panels	
23 83 26	Radiant Heating and Cooling Hydronic Panels	
23 83 33	Electric Radiant Heaters	
23 84 00	Humidity Control Equipment	Includes: equipment that either adds moisture or removes moisture from a medium in order to control the humidity. See: 13 11 00 for swimming pools. 13 18 00 for ice rinks. 42 23 19 for process humidifiers. 42 31 00 for gas dryers and dehumidifiers.
23 84 13	Humidifiers	
23 84 13.13	Heated-Pan Humidifiers	
23 84 13.16	Wetted-Element Humidifiers	
23 84 13.19	Atomizing Humidifiers	
23 84 13.23	Direct-Steam-Injection Humidifiers	
23 84 13.26	Jacketed, Steam Humidifiers	
23 84 13.29	Self-Contained Steam Humidifiers	
23 84 13.33	Portable Humidifiers	
23 84 16	Mechanical Dehumidification Units	
23 84 16.13	Outdoor, Mechanical Dehumidification Units	
23 84 16.16	Indoor, Mechanical Dehumidification Units	
23 84 16.33	Portable Dehumidifiers	
23 84 19	Desiccant Dehumidification Units	