U.S.C.G. Merchant Marine Exam

Third Assistant Engineer

Q535 General Subjects

(Sample Examination)

Choose the best answer to the following Multiple-Choice Questions:

1. The action necessary to use the steering gear room trick wheel when transferring the steering control from the wheelhouse to local control is to _____.

   A. Align the trick wheel to the rudder angle position before engaging
   B. Set the six-way control valve in the trick wheel position
   C. Open the power transfer switch before engaging the trick wheel
   D. Always place the rudder in the amidships position to engage the trick wheel

   Correct answer: A

2. Which of the following desalination plants will always require a sterilizer when providing water to a potable water system?

   A. Titanium plate type unit
   B. Reverse osmosis type unit
   C. Multi-stage flash type unit
   D. Submerged tube type unit

   Correct answer: B

3. Which of the listed reciprocating pump parts control the position of the pilot slide valve?

   A. Stay rods
   B. Adjusting of the tappet collars
   C. Moving tappets
   D. Movement of the main piston through the steam cylinder

   Correct answer: D

4. The illustration shown represents a blueprint of a metal _____. Illustration GS-0028

   A. rod with a conventional break
   B. tube with a broken-out section
   C. pipe with a missing center section
   D. bar with a sawn out section

   Correct answer: A

5. A roller bearing has an interference fit with the shaft upon which it is being installed. What thermal method of mounting the bearing would be most appropriate?

   A. Heating the bearing with an oxyacetylene torch
   B. Cooling the shaft with liquid refrigerant
   C. Heating the bearing in an oil-bath bearing heater
   D. Cooling the bearing with dry ice

   Correct answer: C

6. If the demister used in the device shown in the illustration is improperly installed, which of the following will occur? Illustration MO-0110

   A. The vacuum of the device will increase.
   B. The temperature of the device will decrease.
   C. Interstage leakage will cause a decrease in output.
   D. There will be an increase of chlorides measured at the distillate pump salinity cell.

   Correct answer: D

7. To add refrigerant to the high side of an air conditioning system, you should close the king valve and introduce the refrigerant through what valve in what state?

   A. charging valve as a liquid
   B. suction service valve as a liquid
   C. discharge service valve as a vapor
   D. condenser purge valve as a vapor

   Correct answer: A

8. Which of the conditions listed would indicate a large condenser tube leak within the distiller shown in the illustration? Illustration MO-0111

   A. An increase in distiller output resulting from the combination of jacket water and the distillate produced
   B. The activation of the salinity monitoring equipment's annunciator circuit
   C. A decrease in the level of the main engine expansion tank as indicated by a low-level alarm
   D. A slow continuous rise in the lube oil cooler outlet temperature indicated at device "4"

   Correct answer: B

9. For safe storage, the maximum allowable temperature to which refrigerant bottles should be exposed is what temperature?

   A. 100°F
   B. 125°F
   C. 150°F
   D. 175°F

   Correct answer: B

10. Suppose the pilot pressure is from 3 to 15 psig for the illustrated pneumatically operated, diaphragm actuated control valve. Assuming the control valve is trimmed for a linear response and the travel position indicator is calibrated in percentage, what would be the approximate pilot pressure if the position indicator showed the valve to be 75% open? Illustration GS-0051

    A. 4.5 psig
    B. 6.0 psig
    C. 7.5 psig
    D. 9.0 psig

    Correct answer: B

11. Which of the illustrated devices would be the LEAST accurate for the purposes of weighing-in a refrigerant charge? Illustration RA-0045

    A. A
    B. B
    C. C
    D. D

    Correct answer: C

12. All straight shank twist drills must be mounted or held in a _____.

    A. drill chuck
    B. drill socket
    C. Morse sleeve
    D. tapered sleeve

    Correct answer: A

13. Capacity control of a centrifugal refrigeration compressor can be accomplished by what means?

    A. varying the position of the prerotation inlet vanes
    B. varying the position discharge bypass valve
    C. varying the speed of the compressor
    D. all of the above

    Correct answer: D

14. A centrifugal pump gradually develops insufficient discharge pressure. What corrective action is required?

    A. Throttle in on the suction valve.
    B. Replace the lantern rings.
    C. Throttle in on the discharge valve.
    D. Replace the wearing rings.

    Correct answer: D

15. When using nitrogen to pressure leak test a system, the nitrogen cylinder should always be equipped with what device or feature?

    A. level indicator
    B. blue top
    C. pressure regulator
    D. temperature indicator

    Correct answer: C

16. When checking the oil level on a reciprocating air compressor fitted with a dipstick, under what conditions should the oil level be checked?

    A. With the compressor in the auto mode and currently not running
    B. With the compressor in the off mode incapable of starting
    C. With the compressor running at speed and loaded
    D. With the compressor running at speed and unloaded

    Correct answer: B

17. Standard filter/driers used in many commercial type refrigeration units may contain what type of substance?

    A. activated charcoal
    B. activated alumina or silica gel desiccant beads
    C. alcohol based liquid drying agents
    D. any of the above may be used

    Correct answer: B

18. What maintenance may be carried out on a thermostatic expansion valve?

    A. The rate action may be increased.
    B. The thermal bulb may be recharged.
    C. The proportional action may be varied.
    D. The inlet screen may be cleaned.

    Correct answer: D

19. How may a suspected tube leak on a shell-and-tube jacket water cooler most easily be located?

    A. Isolate, drain, and dry the saltwater side of the heat exchanger. Remove the waterbox inspection plates. Visually inspect the tube sheets for signs of seepage at each of the tube ends.
    B. Isolate, drain, and dry both the salt water and jacket water sides of the heat exchanger. Remove the waterbox inspection plates. Visually inspect the tube sheets for signs of seepage at each of the tube ends.
    C. Isolate, drain, and dry the saltwater side of the heat exchanger. Pressurize the sea water side with compressed air. Visually inspect the jacket water expansion tank for bubbles.
    D. Isolate, drain, and dry the jacket water side of the heat exchanger. Remove the shell inspection plates. Visually inspect the tubes along the tube lengths for seepage.

    Correct answer: A

20. What is the name of an internal passage of watertight construction fitted along the centerline between the double bottoms of some ships, usually from the forepeak to the forward machinery space bulkhead, used to carry pipe work along the length of the ship to the various holds or tanks?

    A. Vertical keel
    B. Bar keel
    C. Duct keel
    D. Pipe keel

    Correct answer: C

21. Which term represents how rapidly a speed control governor will complete a corrective action as the result of a load change?

    A. Deadband
    B. Power
    C. Sensitivity
    D. Promptness

    Correct answer: D

22. What statement is true concerning the arrangement and operation of the viscosity sensor as used for sensing the viscosity of heavy fuel oil?

    A. The viscosity sensor is fitted with a constant speed fixed capacity pump and a capillary tube which produces a pressure drop at constant flow which is proportional to the oil viscosity.
    B. The viscosity sensor is fitted with a constant speed fixed capacity pump and a capillary tube which produces a pressure drop at constant flow which is inversely proportional to the oil viscosity.
    C. The viscosity sensor is fitted with a constant speed variable capacity pump and a capillary tube which produces a pressure drop at variable flow which is proportional to the oil viscosity.
    D. The viscosity sensor is fitted with a constant speed variable capacity pump and a capillary tube which produces a pressure drop at variable flow which is inversely proportional to the oil viscosity.

    Correct answer: A

23. In a closed-loop process control system, what term is used to describe the action of measuring the difference between the actual result and the desired result and using that difference to drive the actual result toward the desired result?

    A. Deadband
    B. Feedback
    C. Instability
    D. Gain

    Correct answer: B

24. If an air compressor is fitted with a hand-off-auto (H-O-A) control station, what statement concerning operation is true?

    A. In the auto mode, the compressor will run continuously with unloading.
    B. In the off mode, the compressor will cycle on and off.
    C. In the hand mode, the compressor will run continuously with unloading.
    D. In the hand mode, the compressor will cycle on and off.

    Correct answer: C

25. How would you prevent the rudder from moving while a repair is made on the steering system using the illustrated actuator? Illustration GS-0116

    A. tighten the locking pins, item "H" at each position of item "I" to keep the rudder from swinging
    B. secure the valves in the supply and return lines
    C. screw in the locking pin, item "J"
    D. tighten the locking screws in item "S"

    Correct answer: B

26. In accordance with 33 CFR Subchapter O (Pollution), besides retention of ballast water onboard or use of approved onboard ballast water treatment equipment, what is another acceptable means for a vessel to be in compliance with the ballast water management regulations?

    A. Perform a complete ballast water exchange in an area no less than 3 nautical miles from any shore prior to discharging ballast in U.S. waters.
    B. Perform a complete ballast water exchange in an area no less than 12 nautical miles from any shore prior to discharging ballast in U.S. waters.
    C. Perform a complete ballast water exchange in an area no less than 25 nautical miles from any shore prior to discharging ballast in U.S. waters.
    D. Perform a complete ballast water exchange in an area no less than 200 nautical miles from any shore prior to discharging ballast in U.S. waters.

    Correct answer: D

27. Which of the following statements will be true if the position of the manual control lever, shown in the illustration, remains unchanged after the pump is placed on stroke? Illustration GS-0039

    A. Although oil will leak past part "B", the amount of pump stroke will be maintained until the control handle position is changed.
    B. Regardless of the control handle position, the pump will gradually return to neutral stroke.
    C. Although the control handle position was set, the pump displacement will fluctuate from zero to maximum flow rate until the handle is placed in its neutral position.
    D. Regardless of the control handle position, the pump will gradually move to full stroke.

    Correct answer: A

28. Referring to the illustrated bellows-type thermostatic steam trap, what statement is true concerning its operation? Illustration GS-0005

    A. When the bellows comes into contact with relatively cool condensate, the liquid within the bellows vaporizes resulting in bellows expansion and valve closing.
    B. When the bellows comes into contact with relatively cool condensate, the vapor within the bellows condenses resulting in bellows contraction and valve opening.
    C. When the bellows comes into contact with relatively hot steam, the vapor within the bellows condenses resulting in bellows contraction and valve opening.
    D. When the bellows comes into contact with relatively hot steam, the liquid within the bellows vaporizes resulting in bellows contraction and valve opening.

    Correct answer: B

29. The low-pressure cut-out switch settings vary with the refrigerant used and the temperature application. If the low-pressure cut-out switch for a particular application is set with a cut-in pressure of 5 psig, what would be the cut-out pressure if the differential is 7.5 psig?

    A. 5" Hg vac
    B. 0 psig
    C. 2.5 psig
    D. 12.5 psig

    Correct answer: A

30. Concerning air conditioning system steam heating coils, what statement is true?

    A. Steam heating coils are usually the header type and horizontally installed.
    B. Steam heating coils are usually the serpentine type and horizontally installed.
    C. Steam heating coils are usually the serpentine type and vertically installed.
    D. Steam heating coils are usually the header type and vertically installed.

    Correct answer: D

31. When a metal is undergoing heat treatment for the purposes of annealing, besides refining the grain structure, what is the determining characteristic of the metal?

    A. High tensile strength
    B. Change in chemical composition
    C. Induction of toughness
    D. Softened condition

    Correct answer: D

32. Concerning a conventional mooring winch, what statement is true?

    A. A high-capacity brake is required to hold a load approaching the breaking strength of the mooring line, but it is required to slip at a lower tension to avoid mooring line breakage.
    B. A high-capacity brake is required to hold a load exceeding the breaking strength of the mooring line. For reasons of safety, no slippage of the brake is permitted.
    C. A high-capacity brake is required to hold a load equal to the breaking strength of the mooring line. For reasons of safety, no slippage of the brake is permitted.
    D. A low-capacity brake is required to hold a load far below the breaking strength of the mooring line, but it is required to slip at a lower tension to avoid mooring line breakage.

    Correct answer: A

33. For marine-type shell-and-tube heat exchangers, what is the most common arrangement for baffles?

    A. Segmental
    B. Solid
    C. Doughnut
    D. Disc

    Correct answer: A

34. Referring to the illustration, note that the solenoid in line "C" is closed. The check valve in line "E" is open. The separator service pump is running. The check valve in line "G" is closed. Valve "B" is closed. Valve "D" is open. What is the operational status of the oily-water separator unit? Illustration GS-0175

    A. The oily-water separator is in the bilge water separation processing mode with water discharging overboard with an oil content less than 15 ppm.
    B. The oily-water separator is in the bilge water separation processing mode with water discharging back to the bilge water holding tank with an oil content less than 15 ppm.
    C. The oily-water separator is in the bilge water separation processing mode with water discharging overboard with an oil content greater than 15 ppm.
    D. The oily-water separator is in the bilge water separation processing mode with water discharging back to the bilge water holding tank with an oil content greater than 15 ppm.

    Correct answer: D

35. When accomplishing welding repairs using the electric arc welding process, what statement is true concerning the characteristics of a good quality weld when welding a single-V butt joint?

    A. There should be no overlap and no undercut at the toe of the weld.
    B. There should be overlap, but there should be no undercut at the toe of the weld.
    C. There should be no overlap, but there should be undercut at the toe of the weld.
    D. There should be both overlap and undercut at the toe of the weld.

    Correct answer: A

36. Under the federal regulations of 33 CFR Subchapter O (Pollution), if a vessel equipped with a Type III Marine Sanitation Device enters a body of water where the discharge of untreated sewage is prohibited, which of the following methods of securing the device to prevent the discharge of sewage is UNACCEPTABLE?

    A. Closing and tagging each valve leading to an overboard discharge.
    B. Using a non-releasable wire-tire to hold each valve leading to an overboard discharge in the closed position.
    C. Padlocking each valve leading to an overboard discharge in the closed position.
    D. Closing each valve leading to an overboard discharge and removing the handle.

    Correct answer: A

37. For an analog electronic transmission system for instrumentation and control purposes, what is a common industry standard for electronic signal current range?

    A. 0 to 10 mA
    B. 4 to 20 mA
    C. 1 to 10 A
    D. 4 to 20 A

    Correct answer: B

38. On a bearing using an oiling ring as a means of static oil feed, how often should the bottom of the bearing sump be drained of impurities?

    A. Every round
    B. Daily
    C. Bimonthly
    D. Annually

    Correct answer: C

39. What type of propeller consists of a flat disc set flush with the under surface of the vessel's hull with a number of vertical, rudder-like blades projecting from it?

    A. Cycloidal propeller
    B. Helicoidal propeller
    C. Tandem propeller
    D. Contra-rotating propeller

    Correct answer: A

40. If a micrometer were opened to a distance of 0.0001 inch, you would say the reading is _____.

    A. one ten thousandths of an inch
    B. ten one thousandths of an inch
    C. one millionth of an inch
    D. ten millionths of an inch

    Correct answer: A

41. When normal operating pressure is applied to the hydraulic oil in a high-pressure system, the oil _____.

    A. viscosity will increase
    B. viscosity will decrease
    C. floc point will increase
    D. volume will increase

    Correct answer: A

42. When securing a flash-type evaporator for an extended period of time, you should _____.

    A. completely drain the unit
    B. tightly seal the unit to exclude air
    C. fill the unit with descaling compound
    D. fill the unit with salt water

    Correct answer: A

43. Which of the listed components of a hydraulic system would enable the pump to be temporarily shut down, and yet still provide an instantaneous source of hydraulic force?

    A. Sump actuator
    B. Pressure compensator valve
    C. Accumulator
    D. Modulator

    Correct answer: C

44. The carbon seal ring of a refrigeration compressor crankshaft mechanical seal is held in position against the stationary ring face by using what device?

    A. snap ring
    B. woodruff key
    C. spring
    D. thrust washer

    Correct answer: C

45. Which statement is true concerning a liquid desiccant cargo-hold dehumidification system?

    A. Water vapor from the humid air inlet from the cargo-hold is condensed and absorbed into the liquid desiccant by means of a cooling coil located in the humidification chamber.
    B. Water from the humid air inlet from the cargo-hold is evaporated and driven out of the liquid desiccant by means of a heating coil located in the humidification chamber.
    C. Water from the humid air inlet from the cargo-hold is evaporated and driven out of the liquid desiccant by means of a cooling coil located in the humidification chamber.
    D. Water vapor from the humid air inlet from the cargo-hold is condensed and absorbed into the liquid desiccant by means of a heating coil located in the humidification chamber.

    Correct answer: A

46. If a reciprocating air compressor has cylinder suction or discharge valves that fail to properly seat, what statement is true concerning the result?

    A. The compressor would have shorter running periods at lower displacement capacity between operating cycles.
    B. The compressor would have longer running periods at lower displacement capacity between operating cycles.
    C. The compressor would have shorter running periods at higher displacement capacity between operating cycles.
    D. The compressor would have longer running periods at higher displacement capacity between operating cycles.

    Correct answer: B

47. A reciprocating refrigeration compressor may be tested for leaking discharge valves by stopping the compressor, turning the discharge service valve all the way in, and then turning the compressor over by hand. If the discharge valves are leaking, the high-side pressure gauge will show pressures which react in which way?

    A. rising and falling with each stroke
    B. increasing with each stroke
    C. decreasing to a vacuum
    D. decreasing with each stroke

    Correct answer: A

48. Both the direction of flow and fluid flow rate of a variable displacement radial piston pump are determined by the relative positions of the _____.

    A. pump shaft and horizontal ports
    B. pump shaft and central valve
    C. floating ring and pump shaft
    D. floating ring and cylinder body

    Correct answer: D

49. What statement is true concerning the effect of elevating the temperature of the oily-water mixture associated with an oily-water separator?

    A. Heating the oily-water mixture decreases the viscosity of the oil and increases the specific gravity differential between the oil and water.
    B. Heating the oily-water mixture decreases the viscosity of the oil and decreases the specific gravity differential between the oil and water.
    C. Heating the oily-water mixture increases the viscosity of the oil and decreases the specific gravity differential between the oil and water.
    D. Heating the oily-water mixture increases the viscosity of the oil and increases the specific gravity differential between the oil and water.

    Correct answer: A

50. What provision is made for sea chests for removal of ice from within the sea chest of a machinery space sea water cooling system during operation in icy waters?

    A. The ice may be removed by using the steaming out sea chest blow connection, if provided.
    B. The ice may be removed by using the chemical de-icing antifreeze connection, if provided.
    C. The ice may be removed by using the compressed air sea chest blow connection, if provided.
    D. The ice may be removed by using the fire main flushing connection, if provided.

    Correct answer: A

51. In the illustrated self-contained, internal-pilot, piston-operated temperature control valve, what statement is true concerning the pilot and main valves? Illustration GS-0045

    A. The pilot valve is downward seating and the main valve is upward seating.
    B. The pilot valve is upward seating and the main valve is downward seating.
    C. The pilot valve is upward seating and the main valve is upward seating.
    D. The pilot valve is downward seating and the main valve is downward seating.

    Correct answer: C

52. Referring to the illustrated dual duct multiple zone HVAC system, how is the space temperature directly controlled? Illustration RA-0043

    A. The space air temperature is controlled by automatically controlling the steam flow through the preheat coil.
    B. The space air temperature is controlled by automatically controlling the chilled water flow through the cooling coil.
    C. The space air temperature is controlled by automatically proportioning the cold and hot air streams at the mixing unit.
    D. The space air temperature is controlled by automatically controlling the steam flow through the reheat coil.

    Correct answer: C

53. You press start button on the hydraulic power unit shown in the illustration, and the motor does not start. The first thing you should check is the _____. Illustration GS-0161

    A. controller contactor operating coil
    B. suction strainer condition
    C. controller circuit breaker
    D. pump discharge relief valve setting is too low

    Correct answer: C

54. If the superheat setting of a thermostatic expansion valve is set too low, what would be the result, assuming that the system has a single evaporator?

    A. the suction line will be abnormally warm due to a reduced amount of refrigerant returning back to the compressor
    B. the box temperature will be pulled way down below the normal temperature range
    C. the suction line will be abnormally cold and liquid may flood back to the compressor
    D. the receiver level will be abnormally high due to a reduced amount of refrigerant returning back to the compressor

    Correct answer: C

55. Which of the following statements is true concerning the illustrated gauge manifold set? Illustration RA-0001

    A. Opening fully and back-seating the valve labeled "G" isolates the gauge labeled "A" from the port labeled "H".
    B. Closing the valve labeled "G" isolates the port labeled "H" from the port labeled "J".
    C. The valves labeled "G" and "C" must both be open to read system pressures on the respective gages labeled "A" and "B".
    D. Closing the valve labeled "G" isolates the port labeled "H" from the gauge labeled "A".

    Correct answer: B

56. As shown in figure "A" of the illustrated block diagram of a central operating system configured for direct digital control, what does the output system block "ANALOG D/A" represent? Illustration EL-0095

    A. It receives analog outputs from the CPU and conditions these to analog signals for transmission to the analog actuators.
    B. It receives analog outputs from the CPU and converts these to digital signals for transmission to the digital actuators.
    C. It receives digital outputs from the CPU and converts these to analog signals for transmission to the analog actuators.
    D. It receives digital outputs from the CPU and conditions these to digital signals for transmission to the digital actuators.

    Correct answer: C

57. What advantage does a 4-pipe hydronic heating/cooling system have over a 2-pipe hydronic heating/cooling system? Illustration GS-0192

    A. A 4-pipe hydronic heating/cooling system requires double the amount of piping as compared to a 2-pipe hydronic heating/cooling system serving the same number of zones.
    B. A 4-pipe hydronic heating/cooling system can serve twice as many zones as a 2-pipe hydronic heating/cooling system.
    C. A 4-pipe hydronic heating/cooling system requires one-half the amount of piping as compared to a 2-pipe hydronic heating/cooling system serving the same number of zones.
    D. A 4-pipe hydronic heating/cooling system allows simultaneous heating and cooling of different zones, whereas a 2-pipe hydronic heating/cooling system does not.

    Correct answer: D

58. Which of the following listed bulkhead types has the most rigorous standard for testing purposes?

    A. Wash bulkheads
    B. Non-watertight bulkheads
    C. Watertight bulkheads
    D. Oiltight bulkheads

    Correct answer: D

59. Under what conditions would the pre-treatment capabilities of a reverse osmosis freshwater generator MOST likely be overloaded, and as a result, these conditions should generally be avoided?

    A. Entering open seas
    B. Entering low temperature seas
    C. Entering high temperature seas
    D. Entering harbors

    Correct answer: D

60. A spur gear pump should be operated with the discharge valves _____.

    A. halfway opened
    B. fully opened
    C. throttled
    D. slightly opened

    Correct answer: B

61. When securing a sea water-cooled shell-and-tube heat exchanger for an extended period of time, what statement represents the recommended operating procedure?

    A. The sea water side of the heat exchanger should be drained, then flushed with fresh water and left completely filled with fresh water.
    B. The sea water side of the heat exchanger should be left completely filled with sea water.
    C. The sea water side of the heat exchanger should be drained by opening the drain valves, while ensuring that the vent valves remain open while draining.
    D. The sea water side of the heat exchanger should be drained by opening the drain valves, while ensuring that the vent valves remain closed while draining.

    Correct answer: C

62. In order to distribute the side pressures over a wide area of the cylinder walls and liners, which of the listed types of pistons are used in modern low-pressure air compressors?

    A. Trunk
    B. Valve-in-head
    C. Barrel
    D. Differential

    Correct answer: A

63. The rudder torque capacity of the four ram steering gear illustrated, is rated at 44,210,000 inch-pounds with one power unit in operation. If the four ram system was able to be operated as a two ram system with both power units on line, what would be the available torque? Illustration GS-0067

    A. 11,052,500 inch-pounds
    B. 22,105,000 inch-pounds
    C. 44,210,000 inch-pounds
    D. 88,420,000 inch-pounds

    Correct answer: B

64. When one belt of a multiple V-belt drive requires replacing, what will be required?

    A. season the new belt prior to installation
    B. ensure the proper belt dressing is applied
    C. ensure the seasoned belts are reinstalled in their proper sequence
    D. replace the entire belt set

    Correct answer: D

65. If the drive belts on an air compressor were squealing during start-up, you should do which of the following?

    A. Check for a receiver outlet valve which may be partially closed.
    B. Check for a defective high-pressure cut-out switch.
    C. Check the air filter.
    D. Check the operation of the unloaders.

    Correct answer: D

66. Even though bilge keels do provide some improvement in longitudinal strength at the bilge radius, what is the primary purpose of the bilge keels?

    A. Dampen the tendency the ship has to roll
    B. Dampen the tendency the ship has to yaw
    C. Dampen the tendency the ship has to heave
    D. Dampen the tendency the ship has to pitch

    Correct answer: A

67. For a parallel axis single reduction gear, what statement is true?

    A. The drive pinion is the smaller of the two gears and rotates at a relatively high-speed. The driven gear is the larger of the two gears and rotates at a relatively low-speed.
    B. The drive pinion is the smaller of the two gears and rotates at a relatively low-speed. The driven gear is the larger of the two gears and rotates at a relatively high-speed.
    C. The drive pinion is the larger of the two gears and rotates at a relatively high-speed. The driven gear is the smaller of the two gears and rotates at a relatively low-speed.
    D. The drive pinion is the larger of the two gears and rotates at a relatively low-speed. The driven gear is the smaller of the two gears and rotates at a relatively high-speed.

    Correct answer: A

68. As shown in the illustrated flow diagram for a self-contained recovery unit designed for the recovery of refrigerants from high-pressure appliances as defined by the EPA Clean Air Act rules, what is the functional purpose of the item labeled "FS2"? Illustration RA-0032

    A. It automatically shuts down the recovery unit compressor when the discharge pressure becomes excessive.
    B. It automatically transitions the recovery unit from the direct liquid recovery mode to the direct vapor recovery mode.
    C. It automatically shuts down the recovery unit compressor when the recovery cylinder becomes 80% full.
    D. It automatically shuts down the recovery unit compressor when the refrigeration system has reached a depth of 15" Hg.

    Correct answer: B

69. In accordance with 33 CFR Subchapter O (Pollution), which type of Marine Sanitation Device (MSD) is used solely for the storage of sewage and flush water at ambient air pressure and temperature?

    A. Type I
    B. Type II
    C. Type III
    D. Type IV

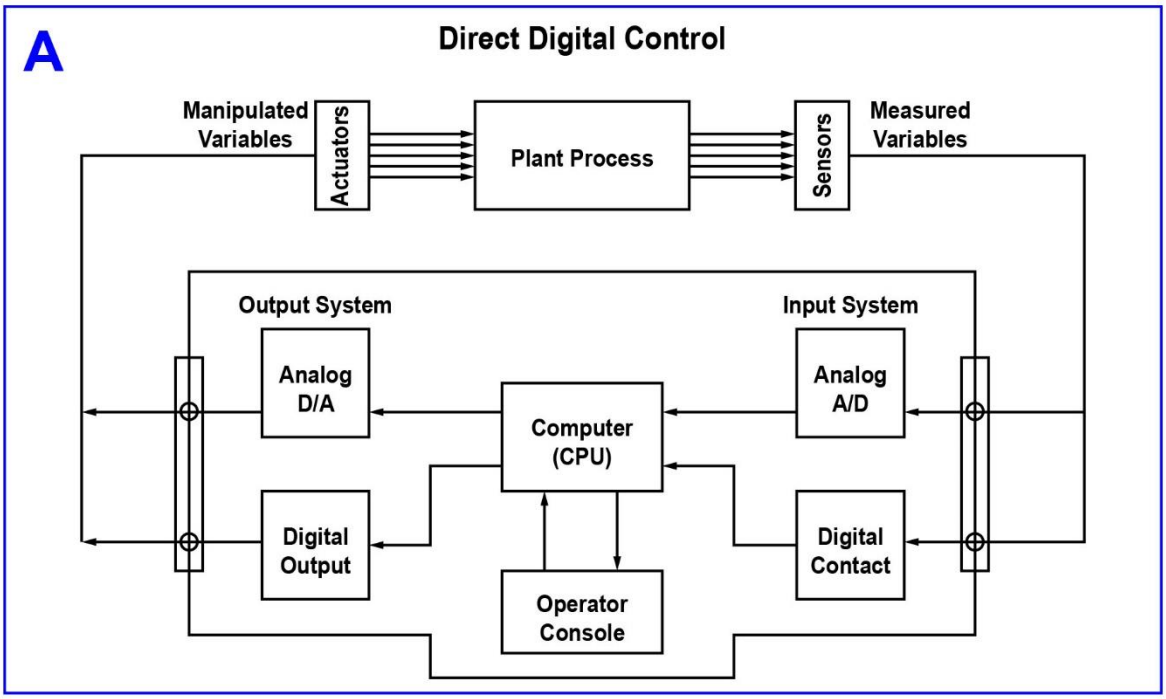
    Correct answer: C

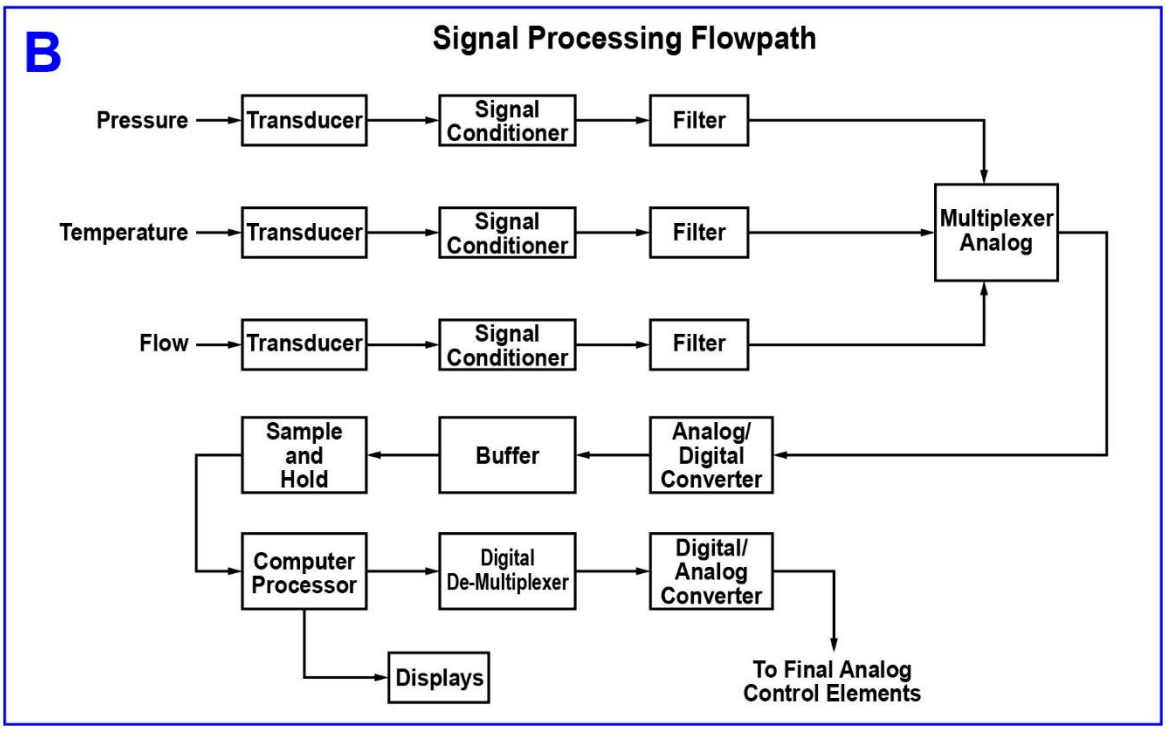
70. In a refrigeration system, from what location would air and non-condensable gases be removed by the use of a purge unit?

    A. the bottom of the receiver drain connection
    B. expansion valve equalizer connection
    C. the top of the condenser purge connection
    D. compressor oil fill connection

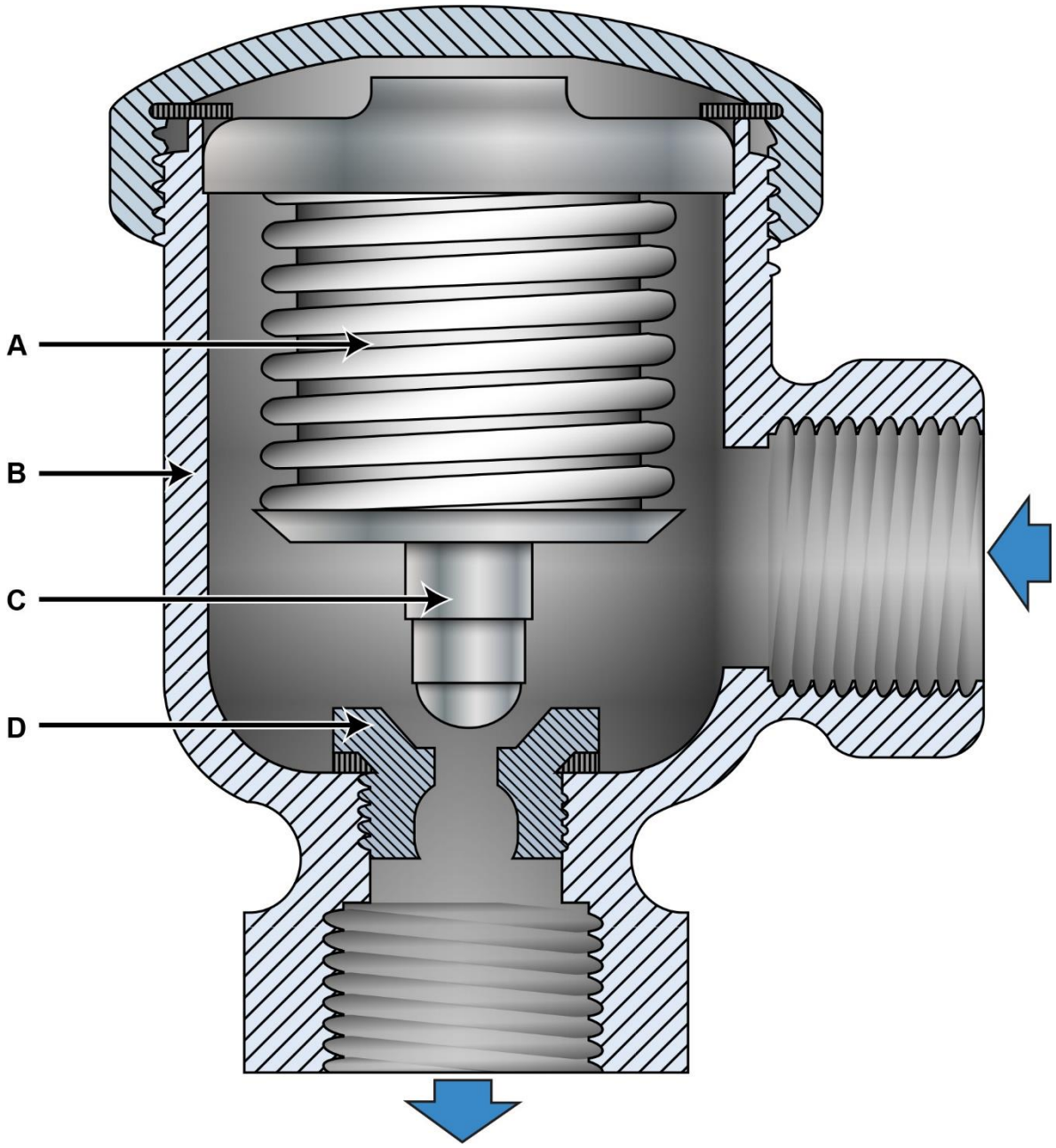
    Correct answer: C

EL-0095

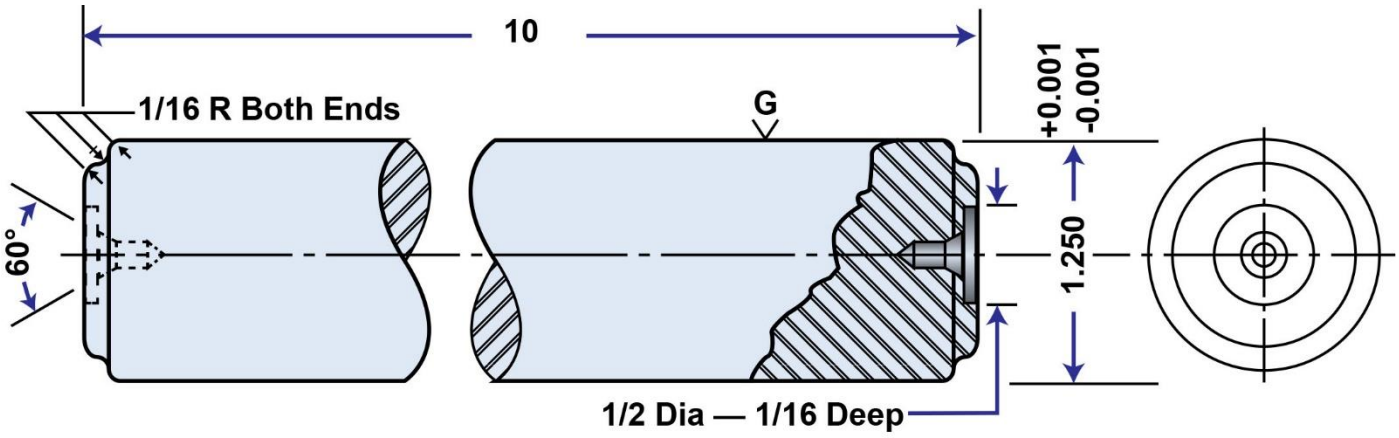




GS-0005

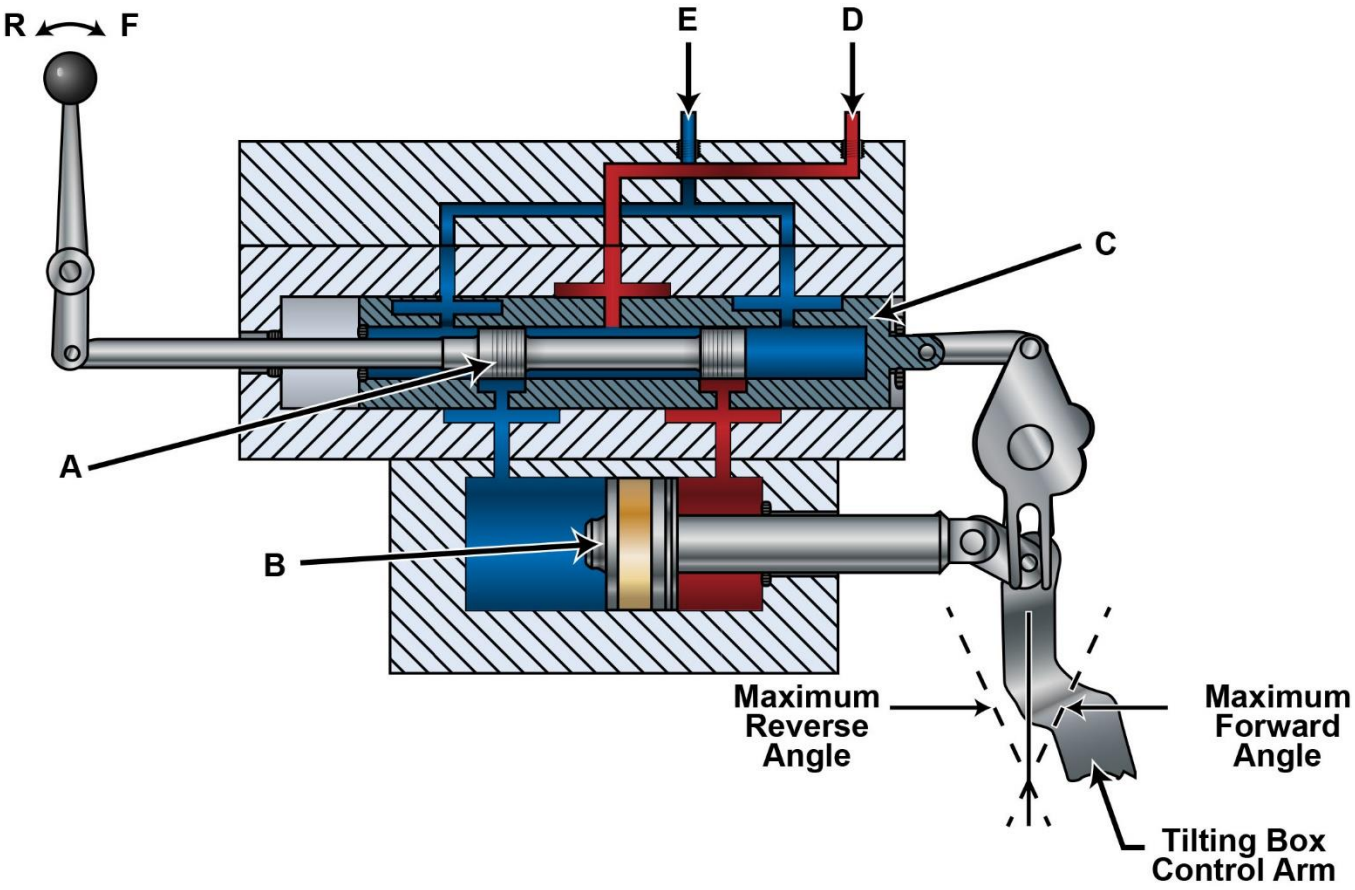


GS-0028

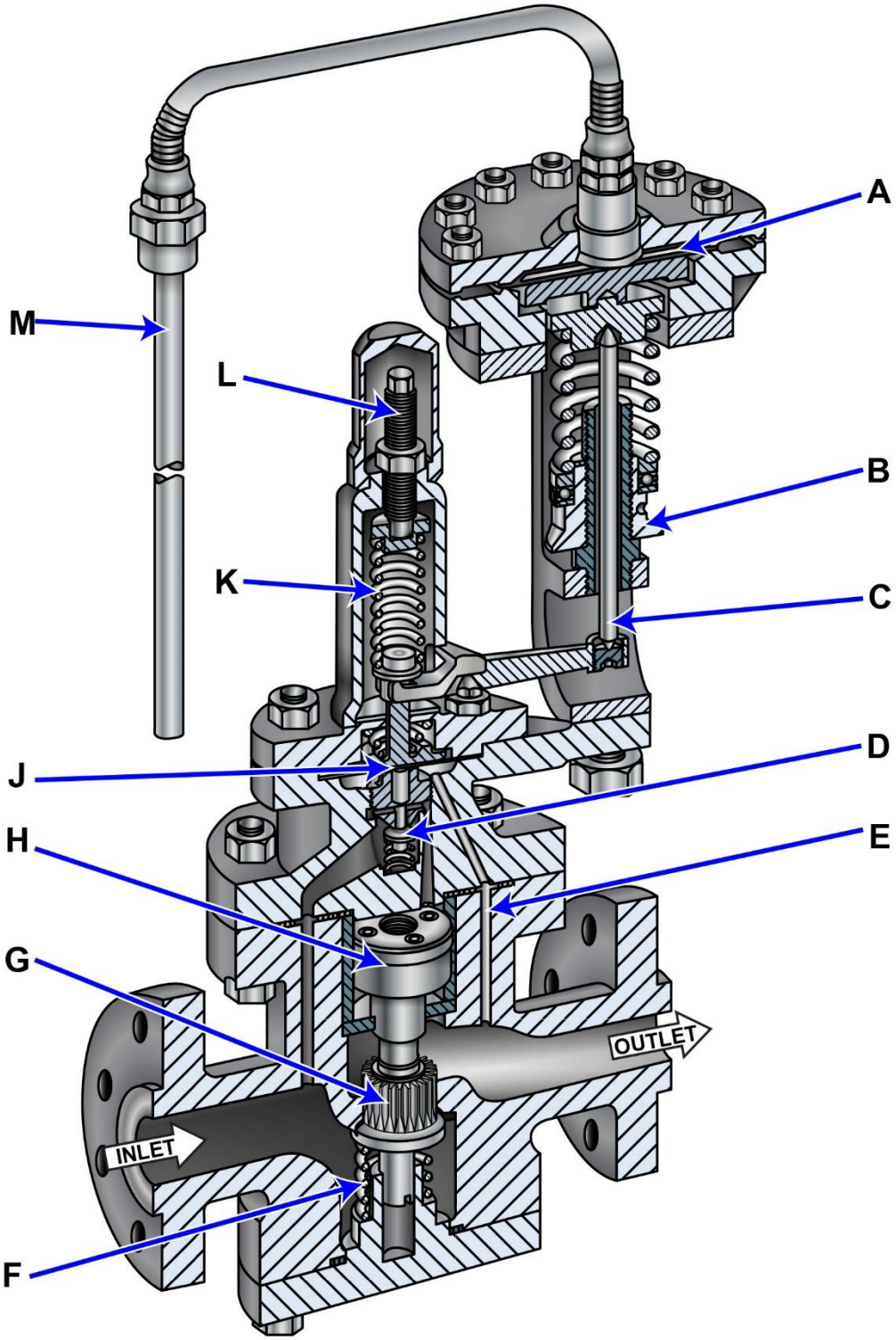


Allow 0.012 to 0.015 for Grinding

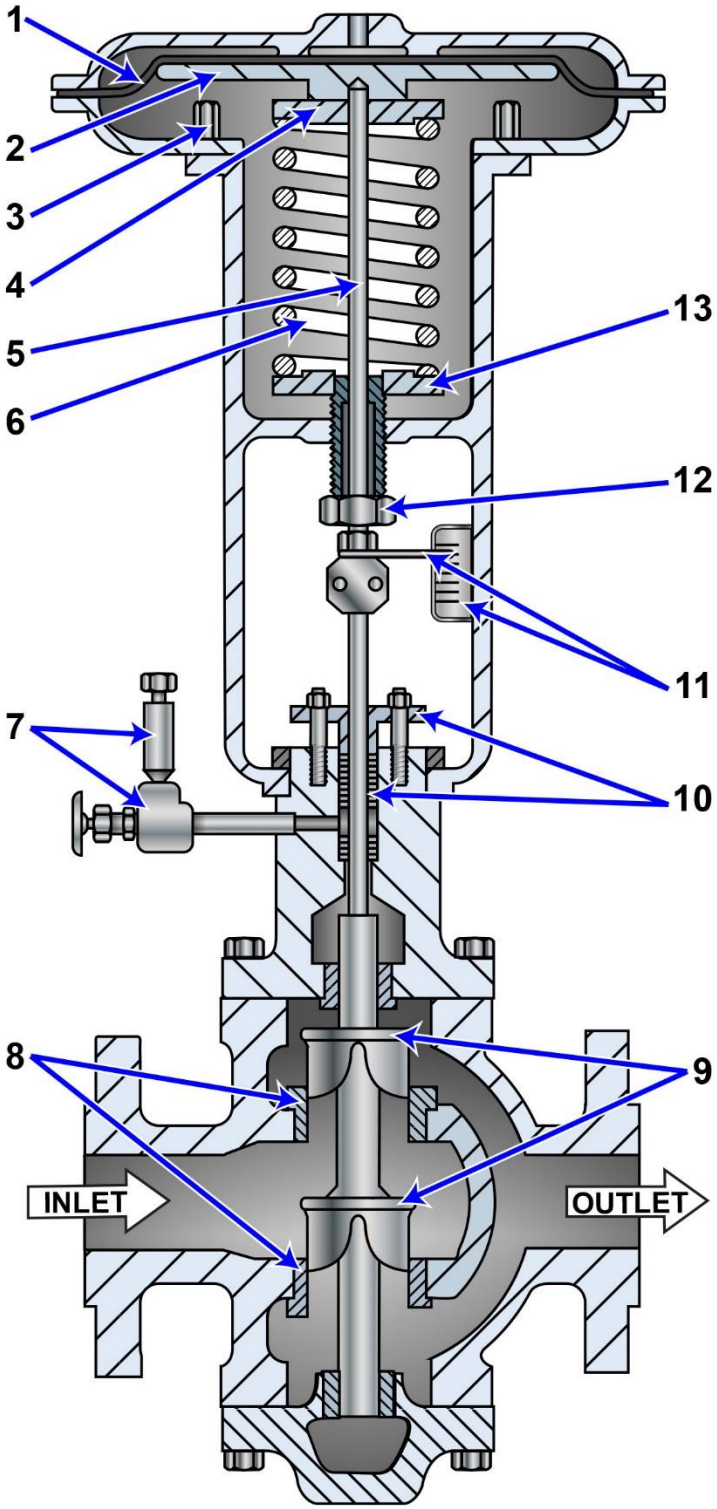
GS-0039



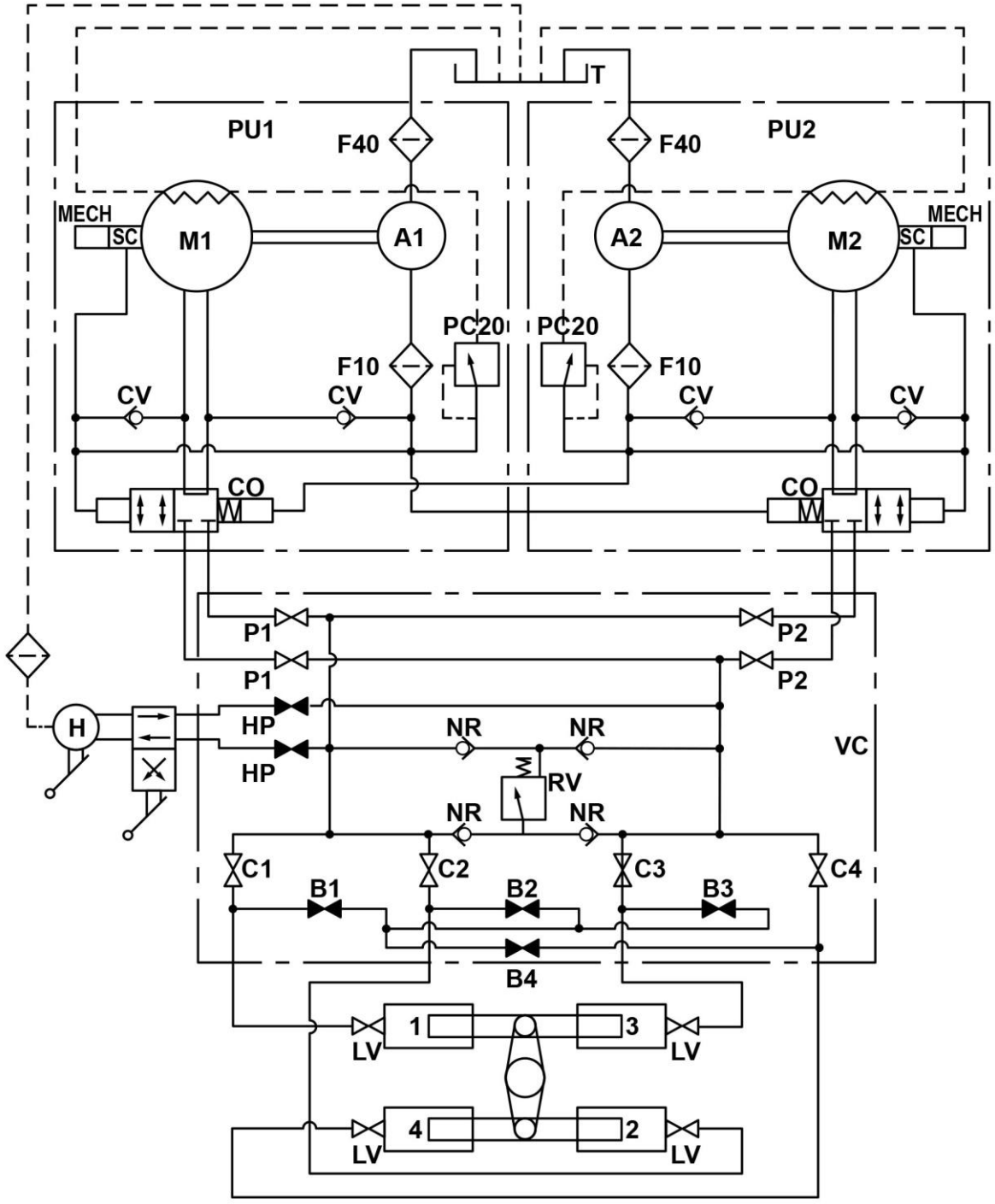
GS-0045



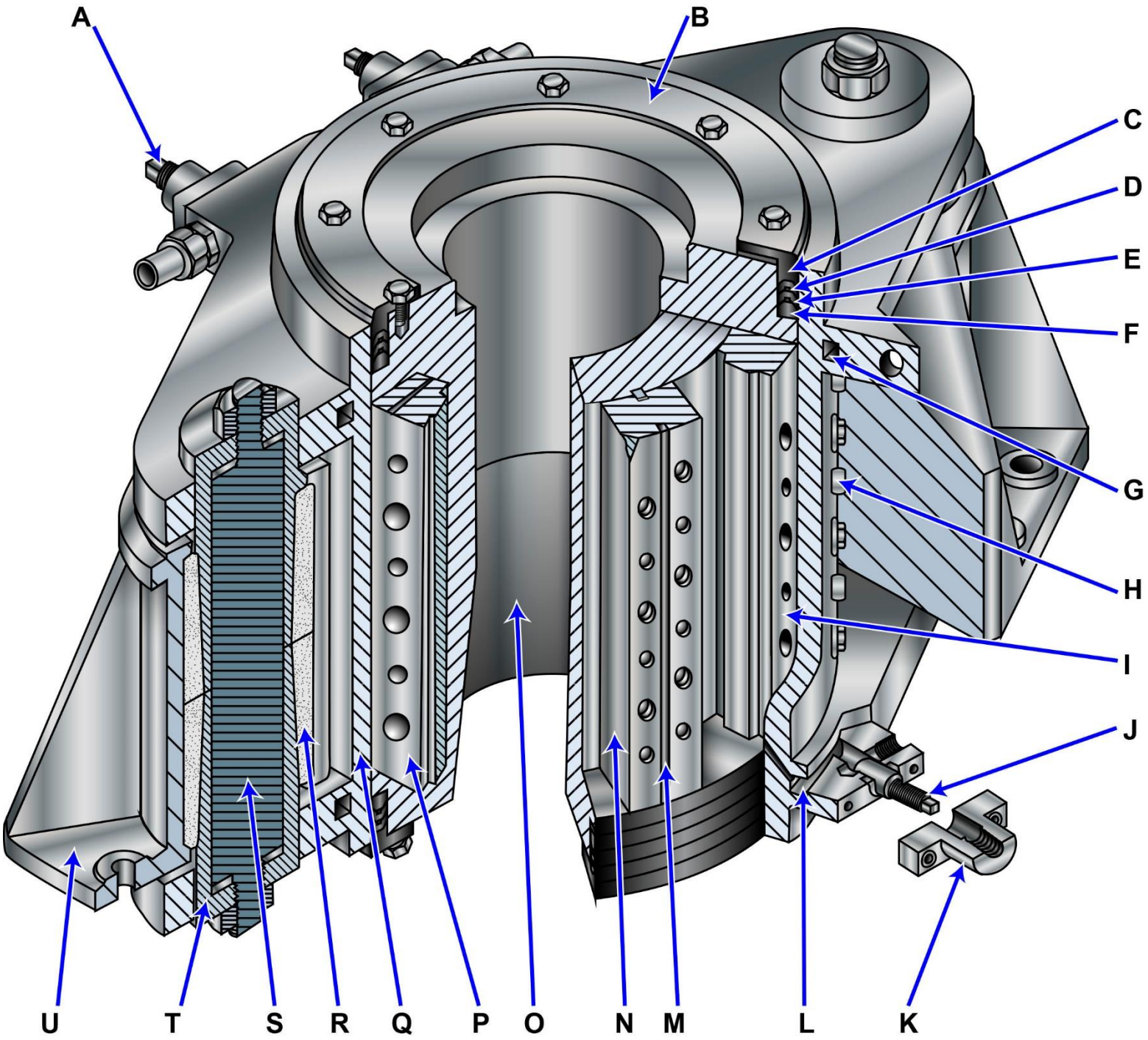
GS-0051



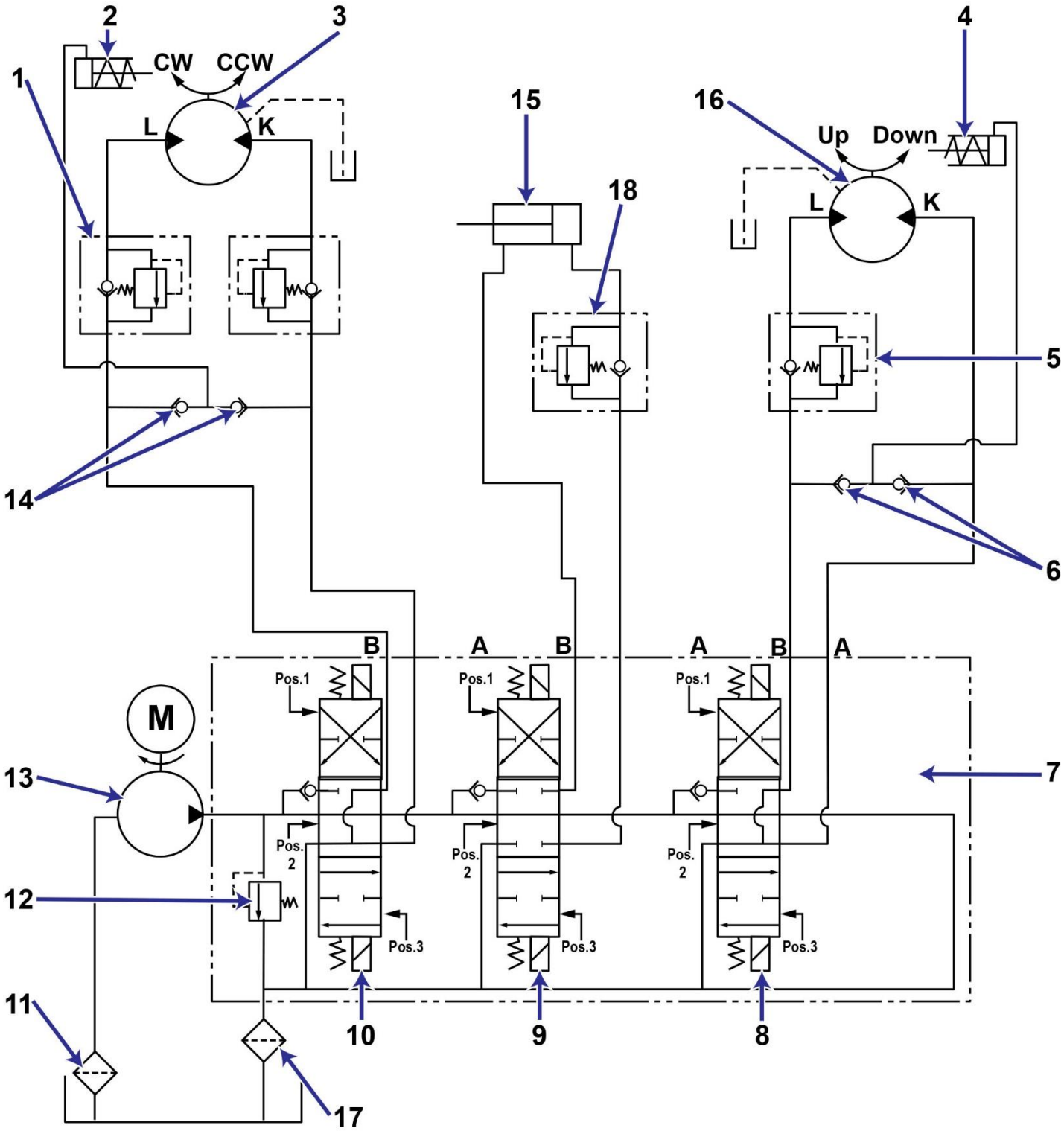
GS-0067



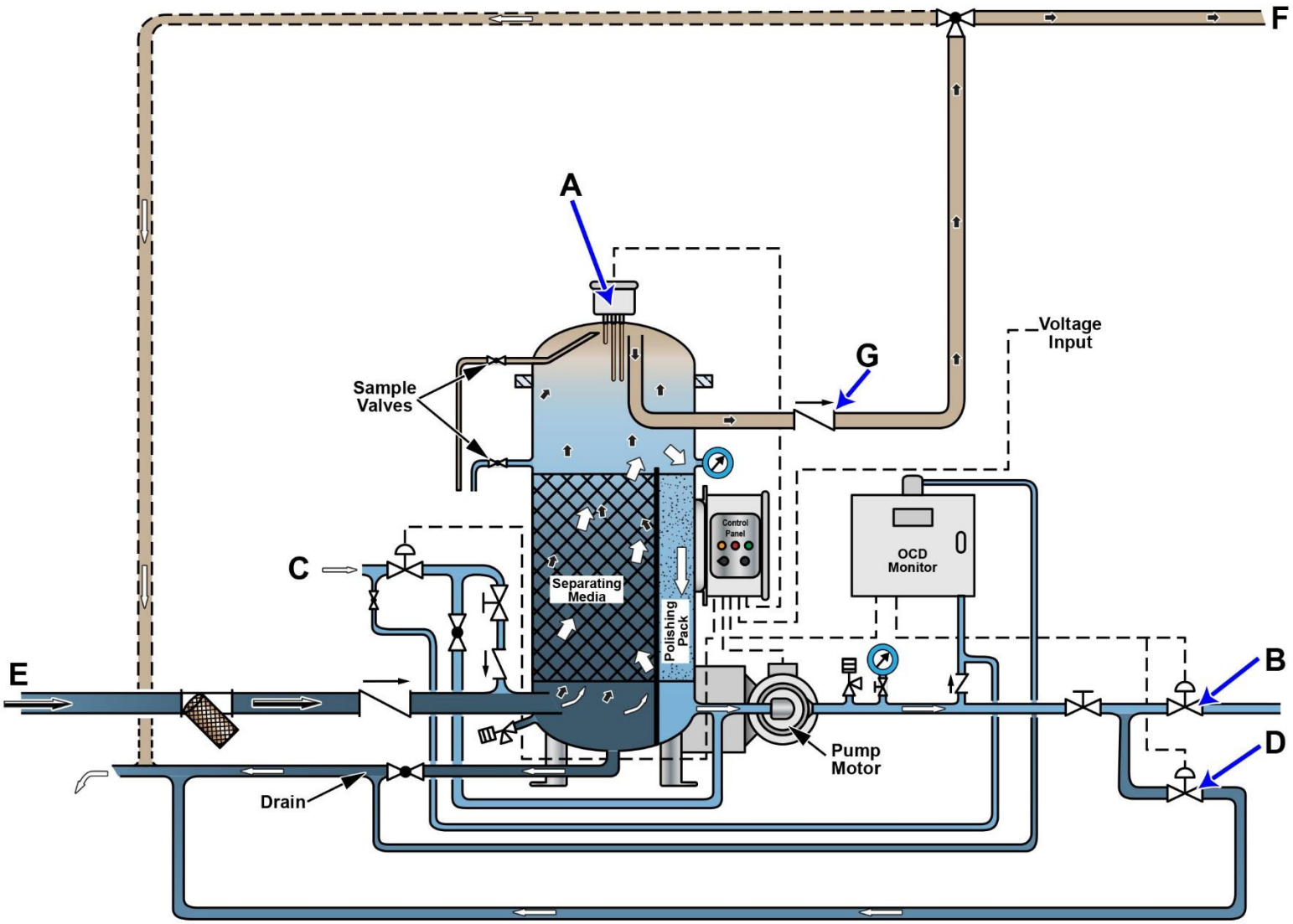
GS-0116



GS-0161

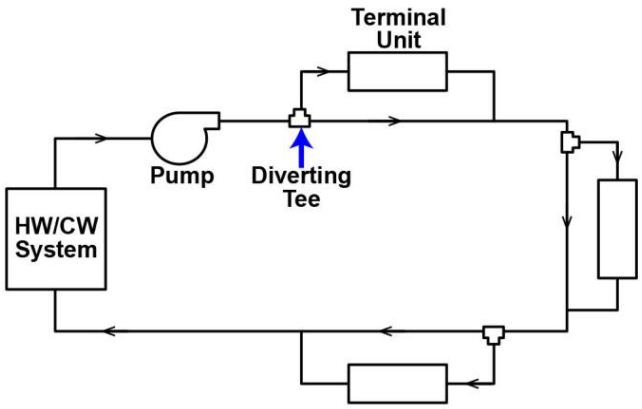


GS-0175

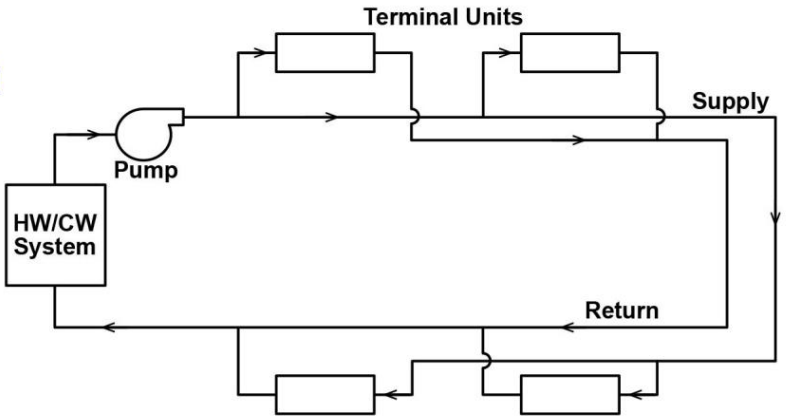


GS-0192

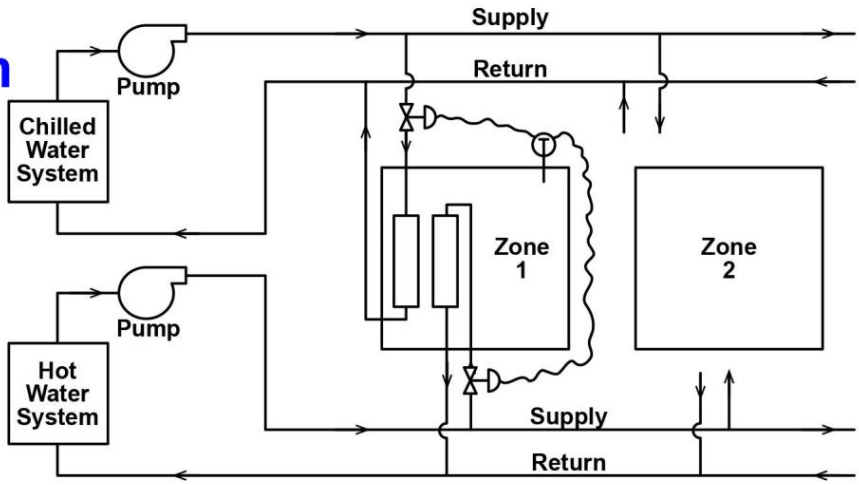
One-Pipe Water System



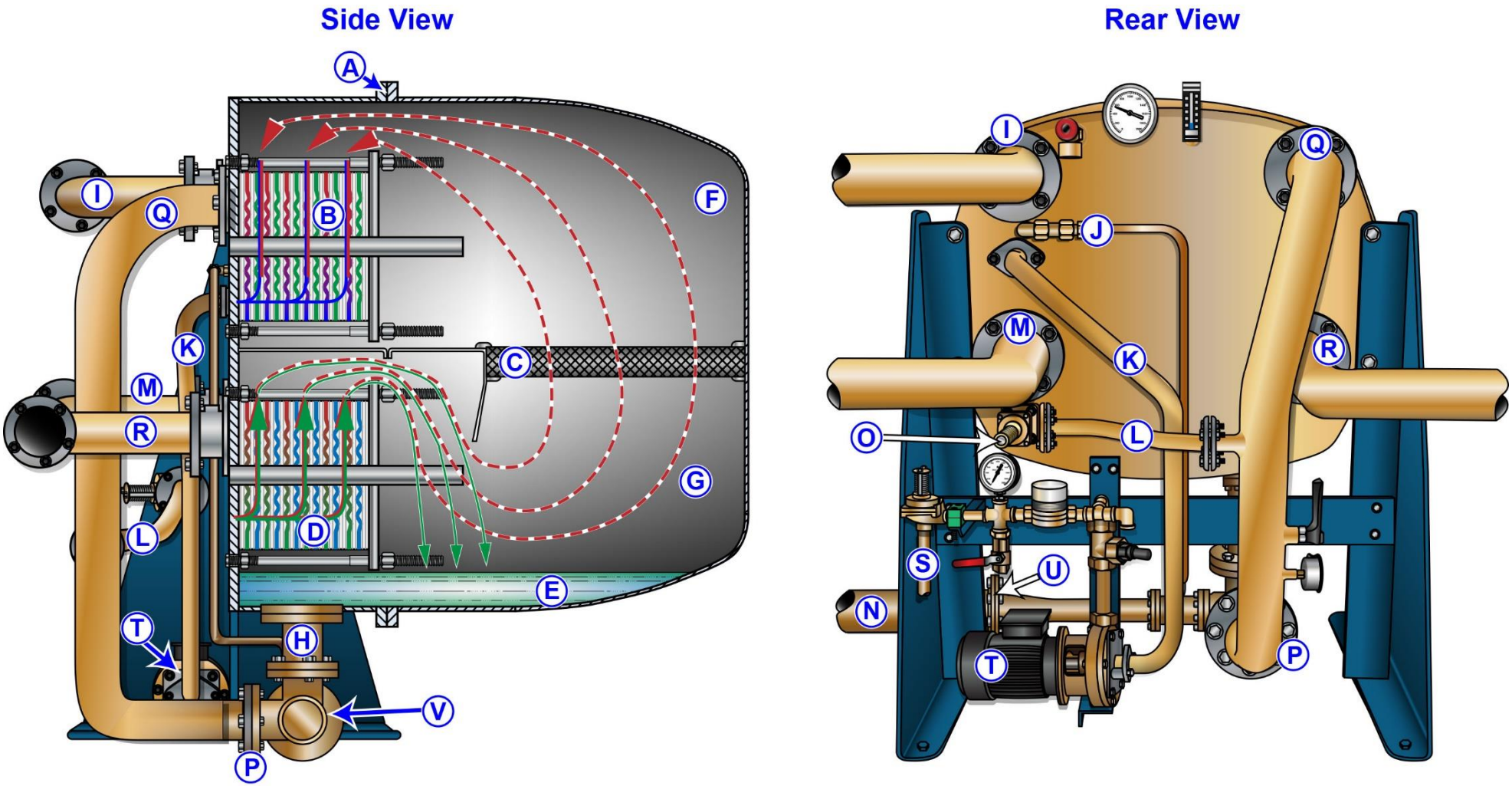
Two-Pipe Water System



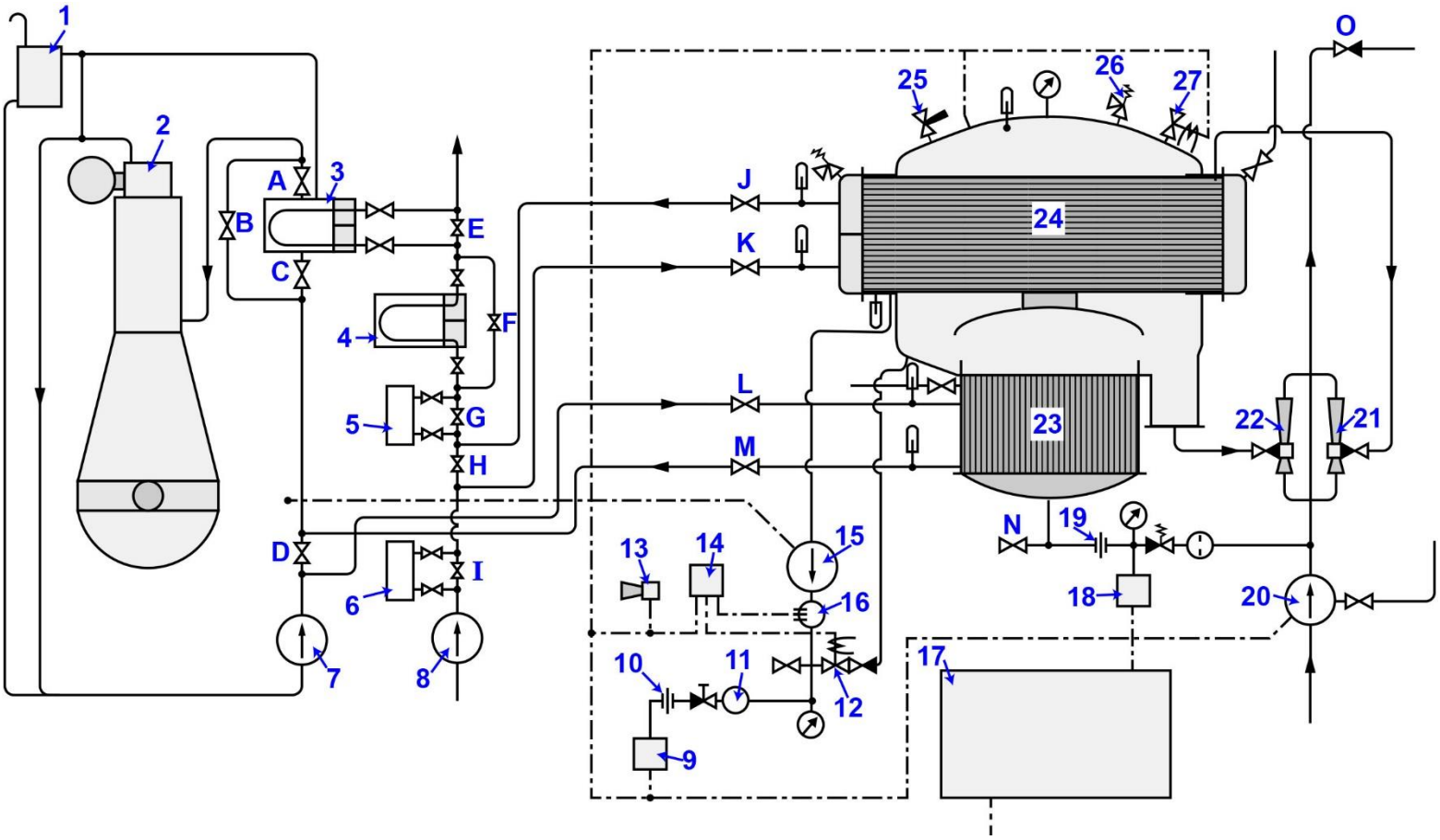
Four-Pipe Water System



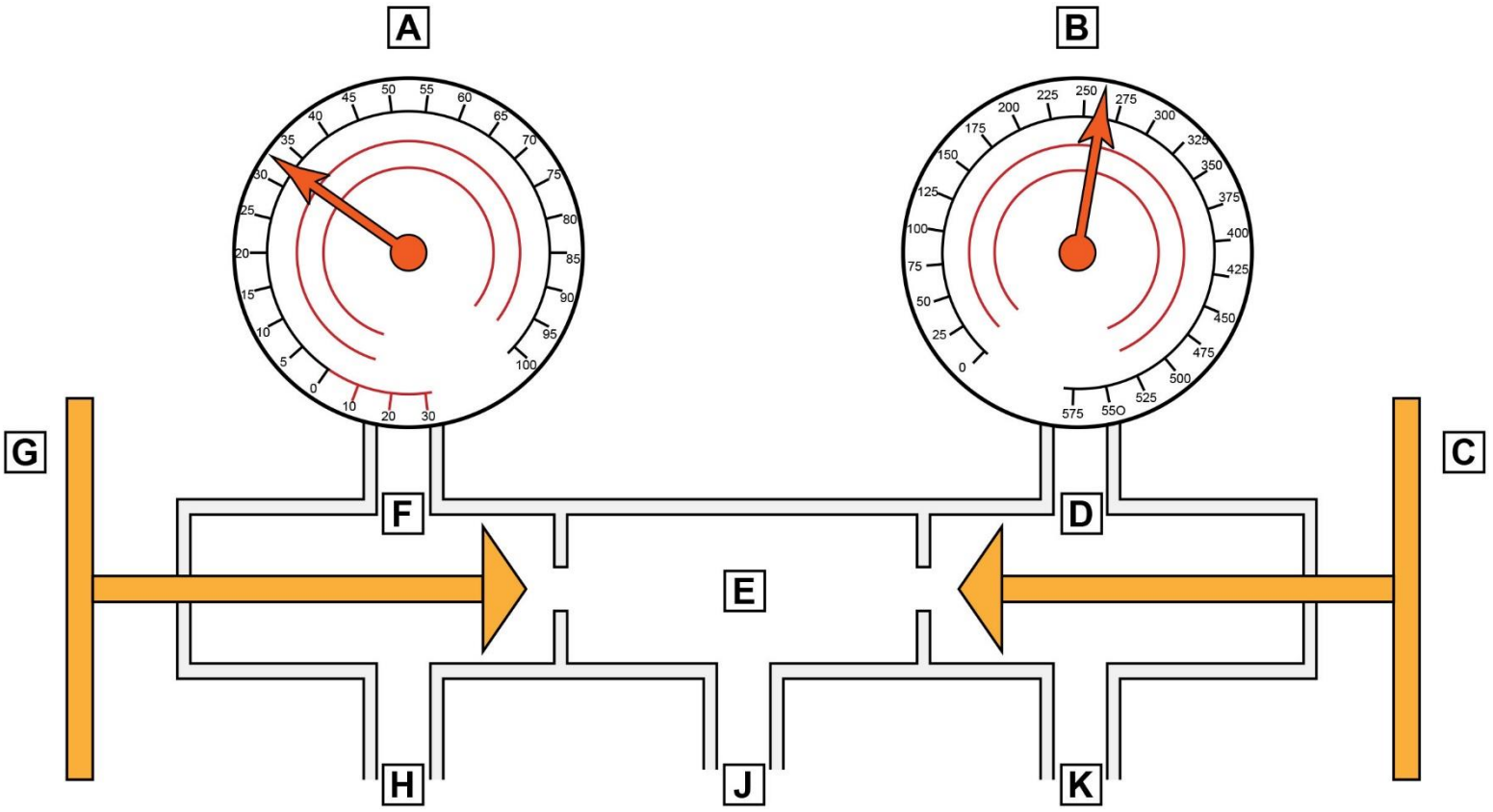
MO-0110



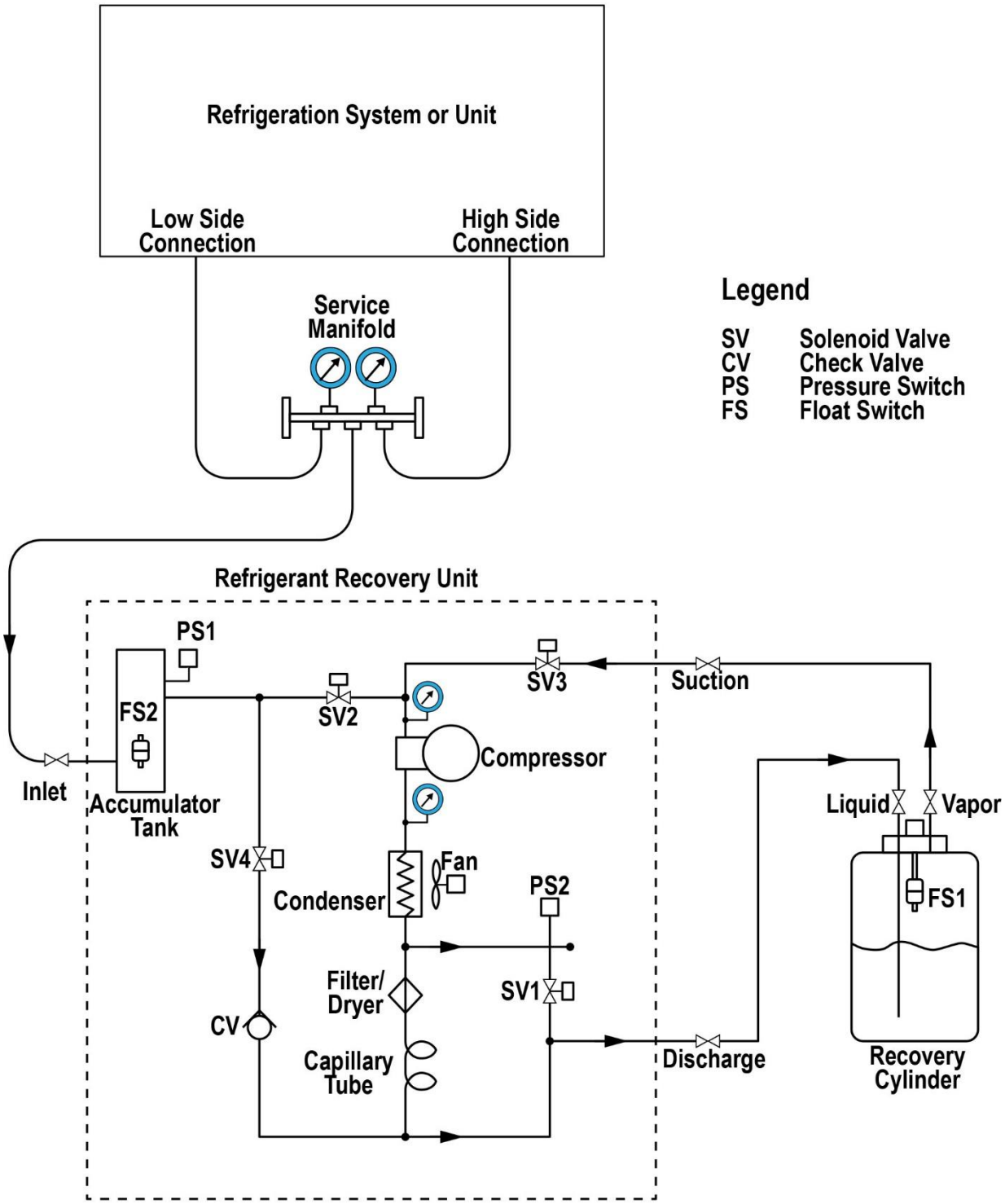
MO-0111



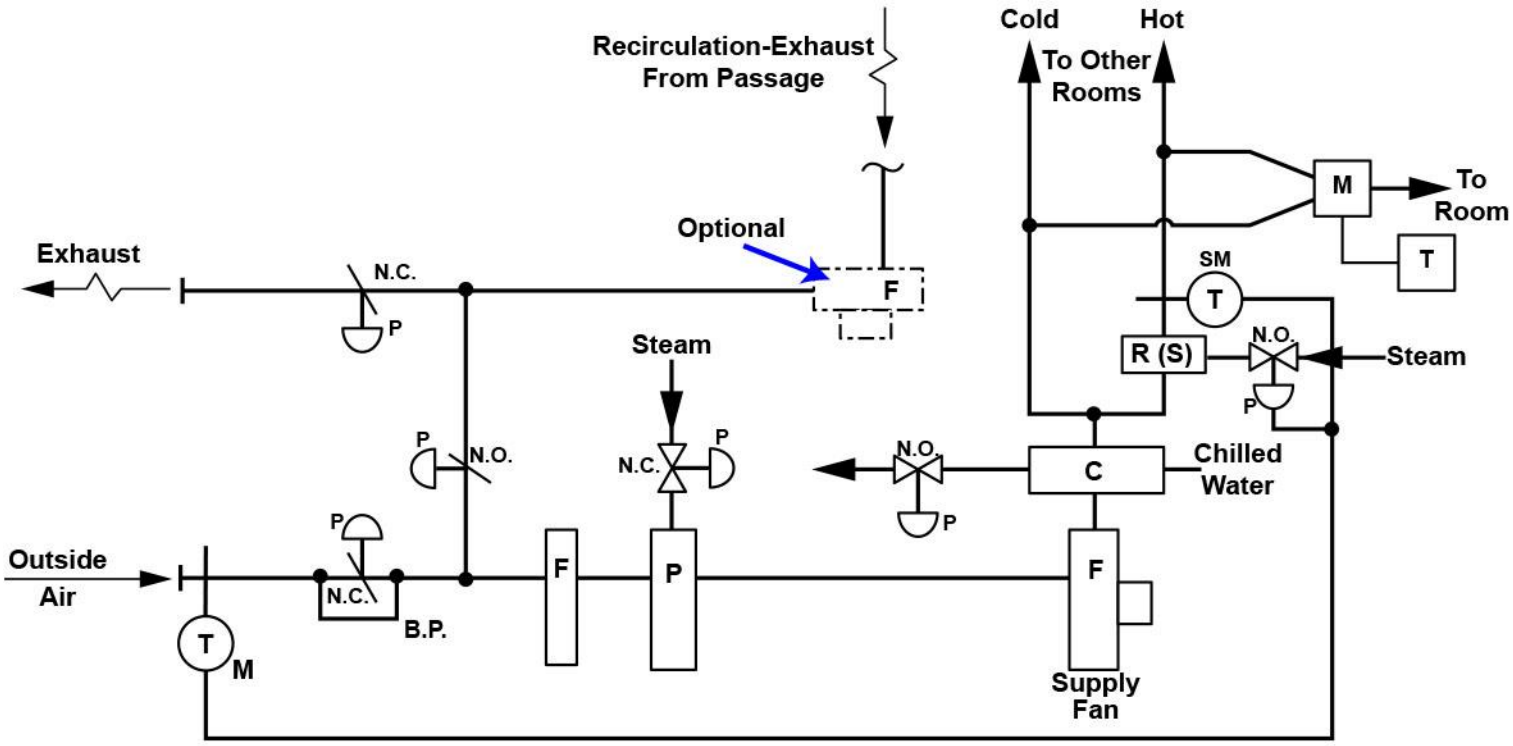
RA-0001



RA-0032



RA-0043

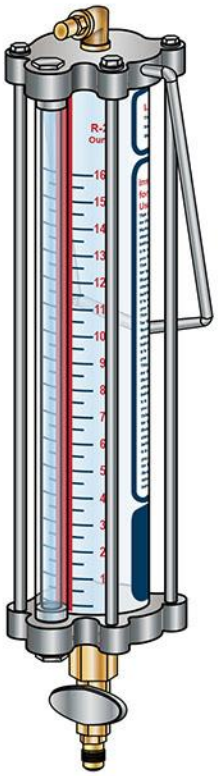


LEGEND

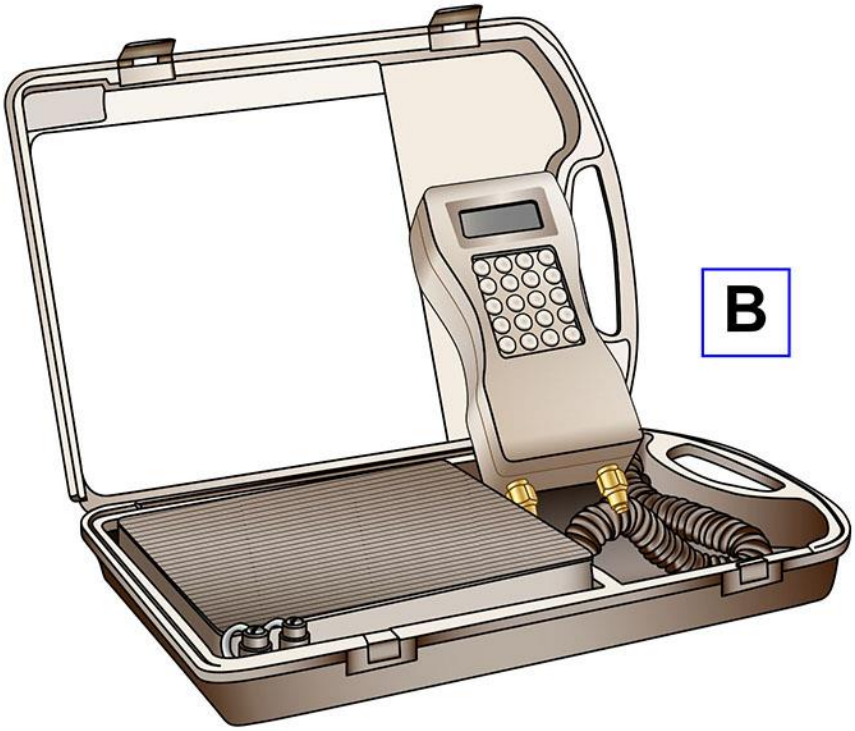
F	Fan	T	Room Thermostat
F	Filter	T	Duct Thermostat
C	Cooling Coil		Pneumatic Damper and Motor
P	Preheater (Steam)		Pneumatic Relay
R (S)	Reheater (Steam)	N.C.	Normally Closed (Valve or Damper)
M	Dual Duct Air Mixing Unit	N.O.	Normally Open (Valve or Damper)
		B.P.	Minimum Outside Air Bypass
		P	Positive Positioning Relay
		M	Sub-Master
		SM	Master

RA-0045

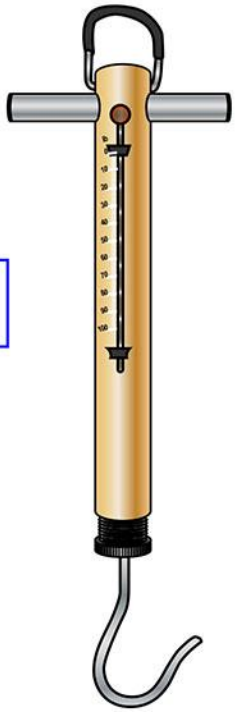
A



B



C



D