U.S.C.G. Merchant Marine Exam

Assistant Engineer – Limited

Q613 General Subjects

(Sample Examination)

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

1. What is meant by the term independent bilge suction?

   A. The means by which the machinery space bilge is pumped out by a pump normally used as a bilge pump but independent of any bilge manifolds or automatic bilge suction valves.
   B. The means by which the machinery space bilge is pumped out by a pump not normally used as a bilge pump but using either bilge manifolds or automatic bilge suction valves.
   C. The means by which a cargo-hold bilge is pumped out by a pump not normally used as a bilge pump but using either bilge manifolds or automatic bilge suction valves.
   D. The means by which a cargo-hold bilge is pumped out by a pump normally used as a bilge pump but independent of any bilge manifolds or automatic bilge suction valves.

   Correct answer: A

2. With regard to a ballast system associated with a dry cargo ship, what is the primary purpose of the fore peak and aft peak tanks?

   A. Correcting a condition of hogging or sagging of the vessel
   B. Adjusting the trim of the vessel
   C. Adjusting the overall draft of the vessel
   D. Correcting a list condition on the vessel

   Correct answer: B

3. Which of the following compressors would be used for a dead ship start-up of a ship's service diesel-generator on a motor ship?

   A. Emergency air compressor
   B. Topping air compressor
   C. Ship's service air compressor
   D. Starting air compressor

   Correct answer: A

4. Which of the following statements represents the proper procedural sequence for adjusting the metering rate of an in-line lubricator as used in a ship's service air system hose station? Assume that the pressure regulator has been properly set.

   A. Establish normal air flow. Determine drip rate. Further open needle valve to increase drip rate or further close needle valve to decrease drip rate, as appropriate.
   B. Establish normal air flow. Determine drip rate. Further open needle valve to decrease drip rate or further close needle valve to increase drip rate, as appropriate.
   C. Temporarily shut-off air flow. Determine drip rate. Further open needle valve to increase drip rate or further close needle valve to decrease drip rate, as appropriate. Re-establish normal air flow.
   D. Temporarily shut-off air flow. Determine drip rate. Further open needle valve to decrease drip rate or further close needle valve to increase drip rate, as appropriate. Re-establish normal air flow.

   Correct answer: A

5. If a belt-driven reciprocating air compressor is operating at a lower than design displacement capacity (in cubic feet per minute), which of the following would be a cause?

   A. Insufficiently tensioned drive belts
   B. Misalignment between the compressor and its driver
   C. Improperly lubricated bearings
   D. Excessively tensioned drive belts

   Correct answer: A

6. 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 "DIGITAL CONTACT" represent? Illustration EL-0095

   A. It receives analog outputs from the analog device sensors and conditions these as analog signals for CPU processing.
   B. It receives analog outputs from the analog device sensors and converts these to digital signals for CPU processing.
   C. It receives digital outputs from the binary device sensors and converts these to analog signals for CPU processing.
   D. It receives digital outputs from the binary device sensors and conditions these as digital signals for CPU processing.

   Correct answer: D

7. In a closed-loop process control system featuring negative feedback, what is the function of the error detector within the controller?

   A. The error detector computes the product of the measured value of the controlled variable and the desired value (setpoint).
   B. The error detector computes the difference between the measured value of the controlled variable and the desired value (setpoint).
   C. The error detector computes the quotient of the measured value of the controlled variable and the desired value (setpoint).
   D. The error detector computes the sum of the measured value of the controlled variable and the desired value (setpoint).

   Correct answer: B

8. After adding grease to a ball bearing with a hand-held grease gun, you should _____.

   A. Remove the grease fitting and leave open to allow excess grease to escape
   B. Save the used grease for chemical analysis
   C. Run the machine with the bearing housing drain plug open for a short while
   D. Close the bearing housing drain and add a little extra grease to compensate for air pockets in the bearing

   Correct answer: C

9. Which of the following freshwater generators has an operating principle that evaporates preheated sea water by causing it to undergo a pressure drop into a vacuum?

   A. Submerged tube unit
   B. Titanium plate unit
   C. Reverse osmosis unit
   D. Flash type unit

   Correct answer: D

10. Line "K" shown in the illustration is the _____. Illustration MO-0110

    A. Brine eductor inlet
    B. Feedwater inlet
    C. Distillate pump suction
    D. Brine eductor suction

    Correct answer: C

11. In the unit illustrated, the feedwater temperature is required to be increased to 165°F or greater and must exist at this temperature when leaving _____. Illustration GS-0053

    A. HX1
    B. FC1
    C. HX4
    D. HX5

    Correct answer: D

12. For the successful operation of a reverse osmosis freshwater generator, why is the high-pressure pump required to operate in the 750 to 1200 psig range for a discharge pressure?

    A. To successfully force the salt water through the pre-filter (or pre-filters)
    B. To overcome the pore size of the semi-permeable membrane
    C. To successfully force the salt water through the chemical pre-treatment device
    D. To overcome the osmotic pressure generated by the difference in solution concentrations

    Correct answer: D

13. What is the primary purpose of the lead-lag arrangement of the two potable water pumps supporting a typical potable water system?

    A. Enabling both potable water pumps to cycle on and off together in response to system demand changes.
    B. Enabling the lag pump to cycle on and off during periods of relatively low demand and the lead pump to assist the lag pump only when the demand is high.
    C. Enabling the lead pump to cycle on and off during periods of relatively low demand and the lag pump to assist the lead pump only when the demand is high.
    D. Enabling the lead pump to pump against a shut-off head during periods of relatively low demand and the lag pump to recirculate when the demand is high.

    Correct answer: C

14. Which term represents the ability of a speed control governor to maintain prime mover speed without hunting?

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

    Correct answer: A

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

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

    Correct answer: B

16. If a heat exchanger is designed to condense refrigerant vapor using central cooling fresh water as a condensing medium, what statement is true?

    A. The refrigerant vapor gains latent heat, the central cooling fresh water loses sensible heat.
    B. The refrigerant vapor loses latent heat, the central cooling fresh water loses latent heat.
    C. The refrigerant vapor loses sensible heat, the central cooling fresh water gains latent heat.
    D. The refrigerant vapor loses latent heat, the central cooling fresh water gains sensible heat.

    Correct answer: D

17. For a shell-and-tube heat exchanger, which tube pitch pattern would feature "see-through" lanes and would most easily allow external mechanical cleaning of the tubes?

    A. Rotated triangular tube pitch
    B. Square tube pitch
    C. Rotated square tube pitch
    D. Triangular tube pitch

    Correct answer: B

18. With an increase in temperature, the volume of hydraulic fluid _____.

    A. contracts
    B. remains constant if pressure decreases
    C. increases
    D. remains the same

    Correct answer: C

19. For the various sizes of tubing and wall thickness used in a hydraulic system, the inside diameter can be determined if it is remembered that the inside diameter equals the outside diameter less _____.

    A. the wall thickness
    B. 1.5 times the wall thickness
    C. 2 times the wall thickness
    D. 2.5 times the wall thickness

    Correct answer: C

20. Strainers are commonly used in hydraulic systems to _____.

    A. protect the directional control valves
    B. prevent solid particles from entering the pump
    C. prevent solid particles from entering the filter
    D. protect the pump from fine soluble contaminants

    Correct answer: B

21. To convert a vane type hydraulic pump to a hydraulic motor, which of the following would have to be done?

    A. Double the casing thickness.
    B. Provide small springs between the vanes and the base of the vane slots.
    C. Install an enlarged control ring around the rotor.
    D. Provide one additional slot and vane.

    Correct answer: B

22. With respect to lubricating oils, what statement is true concerning viscosity and viscosity index?

    A. Viscosity is a measure of an oil's internal resistance to flow and viscosity index is a measure of an oil's ability to resist change in viscosity as the temperature changes.
    B. Viscosity is a measure of an oil's resistance to emulsification and viscosity index is a measure of an oil's ability to resist change in viscosity as the temperature changes.
    C. Viscosity is a measure of an oil's ability to resist oxidation and viscosity index is a measure of an oil's ability to resist change in viscosity as the temperature changes.
    D. Viscosity is a measure of an oil's lubricity and viscosity index is a measure of an oil's ability to resist change in lubricity as the pressure changes.

    Correct answer: A

23. In a forced-feed lubrication system, what statement is true concerning lube oil reservoir/sump residence time?

    A. The lower the oil level, the longer the residence time, and the cooler the oil will be as delivered by the pump.
    B. The lower the oil level, the shorter the residence time, and the hotter the oil will be as delivered by the pump.
    C. The lower the oil level, the longer the residence time, and the hotter the oil will be as delivered by the pump.
    D. The lower the oil level, the shorter the residence time, and the cooler the oil will be as delivered by the pump.

    Correct answer: B

24. Adsorption filters are not commonly used in steam turbine or diesel engine lubricating systems because they _____.

    A. utilize exotic and expensive filtering media making them too costly for use
    B. remove additives from the lube oil
    C. can adsorb no more than five times their weight in water
    D. are only effective at temperatures below 100°F

    Correct answer: B

25. What is meant by the term toughness as it applies to a material?

    A. The ability to resist penetration
    B. The ability to resist continuous tension
    C. The ability to resist repeated application and release of force
    D. The ability to resist continuous compression

    Correct answer: C

26. In order to facilitate separation of oil from an oily-water mixture in an oily-water separator, what statement is true concerning the flow pattern of the oily-water?

    A. Ideally the flow of the oily-water should be high in flow rate and low in turbulence.
    B. Ideally the flow of the oily-water should be low in flow rate and high in turbulence.
    C. Ideally the flow of the oily-water should be high in flow rate and high in turbulence.
    D. Ideally the flow of the oily-water should be low in flow rate and low in turbulence.

    Correct answer: D

27. The line labeled "G", as shown in the illustration, would be identified as the _____. Illustration GS-0175

    A. Processed water outlet line
    B. Waste oil outlet line
    C. Clean water inlet line
    D. Oily bilge water inlet line

    Correct answer: B

28. Suppose the illustrated self-contained, internal-pilot, piston-operated temperature control valve is part of the temperature control system for a steam-heated heavy fuel oil service heater for a steam boiler. If there was an increase in demand for fuel by the boiler, what statement correctly represents how the valve would initially respond? Illustration GS-0045

    A. The fuel oil heater fuel outlet temperature would increase, causing the remote bulb pressure to increase and the thermostatic diaphragm to flex upward and through lever action, further open the pilot valve.
    B. The fuel oil heater fuel outlet temperature would decrease, causing the remote bulb pressure to decrease and the thermostatic diaphragm to flex upward and through lever action, further open the pilot valve.
    C. The fuel oil heater fuel outlet temperature would increase, causing the remote bulb pressure to increase and the thermostatic diaphragm to flex downward and through lever action, further close the pilot valve.
    D. The fuel oil heater fuel outlet temperature would decrease, causing the remote bulb pressure to decrease and the thermostatic diaphragm to flex downward and through lever action, further close the pilot valve.

    Correct answer: B

29. Referring to the illustrated pneumatically operated diaphragm actuated control valve, what statement is true? Illustration GS-0051

    A. The control valve is direct-acting and normally closed (NC).
    B. The control valve is indirect-acting and normally closed (NC).
    C. The control valve is indirect-acting and normally open (NO).
    D. The control valve is direct-acting and normally open (NO).

    Correct answer: D

30. In the illustration, line "D" is a/an _____. Illustration GS-0006

    A. hidden line
    B. sectioning line
    C. outline
    D. phantom line

    Correct answer: A

31. Which of the following propulsor types represents the proper terminology for electric propulsion where the drive motors are outside the ship's hull?

    A. Jet drive
    B. Azimuthing propulsor
    C. Podded propulsor
    D. Cycloidal propeller

    Correct answer: C

32. What statement is true concerning the arrangement of line shaft bearing housings?

    A. Line shaft bearing housings are typically split half pedestal type bearing housings.
    B. Line shaft bearing housings are typically single-piece pedestal type bearing housings.
    C. Line shaft bearing housings are typically split half flange type bearing housings.
    D. Line shaft bearing housings are typically single-piece flange type bearing housings.

    Correct answer: A

33. Concerning transverse fixed tunnel thrusters, what statement is true?

    A. Transverse fixed tunnel thrusters are oriented fore-to-aft, usually located at the stern of a vessel, and used for docking, undocking, and low-speed maneuvering.
    B. Transverse fixed tunnel thrusters are oriented fore-to-aft, usually located at the stern of a vessel, and used to supplement main propulsion for higher sustained speeds.
    C. Transverse fixed tunnel thrusters are oriented athwartships, usually located at the bow of a vessel, and used to supplement main propulsion for higher sustained speeds.
    D. Transverse fixed tunnel thrusters are oriented athwartships, usually located at the bow of a vessel, and used for docking, undocking, and low-speed maneuvering.

    Correct answer: D

34. Air leakage between the shaft and stuffing box packing in a centrifugal pump is prevented by _____.

    A. a compressed packing gland
    B. lantern rings between the packing rings
    C. a liquid seal
    D. the stuffing box gland

    Correct answer: C

35. If a centrifugal pump were continually operated with the discharge valve closed, the _____.

    A. motor controller overload would open
    B. pump would eventually overheat
    C. relief valve would continuously cycle open
    D. motor would overheat

    Correct answer: B

36. What should be done if localized scoring is discovered on a pump shaft sleeve during routine maintenance inspection?

    A. Reassemble the pump and provide more water leakoff for lubrication.
    B. Check for parallel alignment of the sleeve radial face to the sleeve bore.
    C. Correct the cause of scoring and install a new shaft sleeve.
    D. Reassemble the pump and set the governor to obtain a slower speed.

    Correct answer: C

37. The primary function of a centrifugal pump volute is to _____.

    A. convert velocity to pressure
    B. limit hydraulic end thrust
    C. initiate flow
    D. develop a high velocity liquid

    Correct answer: A

38. What type of pump is shown in the illustration? Illustration GS-0144

    A. Deep well centrifugal pump
    B. Simplex reciprocating pump
    C. Triple screw rotary pump
    D. Double screw rotary pump

    Correct answer: C

39. 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

40. A vessel is in compliance with federal regulations regarding the discharge of sewage by _____.

    A. holding all sewage onboard
    B. pumping the sewage ashore to an approved container
    C. treating sewage in an approved system
    D. all of the above

    Correct answer: D

41. When responding to a "right rudder" command from the amidships position, which part/parts of the steering cylinders illustrated will be subjected to the highest hydraulic pressure? Illustration GS-0137

    A. "C" and "I"
    B. "F" and "L"
    C. "F" only
    D. "C" only

    Correct answer: B

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

    Correct answer: D

43. What mode of heat transfer is associated with the transport of thermal energy within a body or between two bodies in direct contact?

    A. Convection
    B. Conduction
    C. Radiation
    D. Sublimation

    Correct answer: B

44. What statement represents the ideal gas law?

    A. For a given mass of a gas, the volume is inversely proportional to its pressure and directly proportional to its temperature.
    B. For a given mass of a gas, the volume is directly proportional to its pressure and directly proportional to its temperature.
    C. For a given mass of a gas, the volume is inversely proportional to its pressure and inversely proportional to its temperature.
    D. For a given mass of a gas, the volume is directly proportional to its pressure and inversely proportional to its temperature.

    Correct answer: A

45. Which of the following guidelines is considered to reflect good design practices for shipboard steam heating systems?

    A. Provide all units with a dirt trap and gate valve in the supply and a check valve on the return.
    B. Provide orifice-type bypasses for all traps and automatic valves.
    C. Provide a dirt pocket and strainer ahead of the steam trap on a unit heater return.
    D. Wherever possible, install vertical runs for condensate piping.

    Correct answer: C

46. In the illustrated terminal reheat multiple zone system, what statement represents the functioning of the supply air duct thermostats controlling the preheater steam flow and the cooling coil chilled water flow? Illustration RA-0042

    A. The thermostat controlling the preheater steam flow is set at the design cooling coil off-coil temperature to allow simultaneous flows.
    B. The thermostat controlling the preheater steam flow is set several degrees higher than the design cooling coil off-coil temperature to prevent simultaneous flows.
    C. The thermostat controlling the preheater steam flow is set several degrees lower than the design cooling coil off-coil temperature to prevent simultaneous flows.
    D. The thermostat controlling the preheater steam flow is set at the design cooling coil off-coil temperature to prevent simultaneous flows.

    Correct answer: C

47. In accordance with international MARPOL Annex I regulations and federal regulations under 33 CFR Subchapter O (Pollution), for vessels of 400 gross tons and above which are all required to carry an oily-water separator to process bilge slops, what is the design criteria in terms of maximum oil content of the overboard discharge?

    A. 3 parts per million
    B. 15 parts per million
    C. 100 parts per million
    D. 150 parts per million

    Correct answer: B

48. Probably the most useful troubleshooting tools used in a predictive maintenance management program for shipboard machinery are vibration meters, analyzers, and monitors. What is the term that represents the distance a mass travels in a given direction as a result of a part vibrating during its periodic or oscillatory motion?

    A. Vibration frequency
    B. Vibration acceleration
    C. Vibration velocity
    D. Vibration displacement

    Correct answer: D

49. Which of the devices shown in the illustration is designed for both inside and outside measurements? Illustration GS-0073

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

    Correct answer: C

50. No two drills from differing drill size series are of the exact same size, with the exception of the drills measured as 0.25 inch. These two drills are the 1/4 inch and the _____.

    A. "A" drill
    B. "E" drill
    C. No.1 drill
    D. No.80 drill

    Correct answer: B

51. The lathe tool shown as figure "N" in the illustration is commonly known as a _____. Illustration GS-0090

    A. furling tool
    B. hurling tool
    C. curling tool
    D. knurling tool

    Correct answer: D

52. If an oil-in-water content monitor uses a lamp emitting light in the visible spectra in conjunction with a reference photocell and a sampling photocell, what is the operating principle upon which this oil-in-water content monitor works?

    A. The monitor works on the absorption/scattering principle where the greater the oil content, the greater the amount of visible light detected by the sampling photoelectric cell as compared to the reference photoelectric cell.
    B. The monitor works on the fluorescence principle where the greater the oil content, the greater the amount of ultraviolet light detected by the sampling photoelectric cell as compared to the reference photoelectric cell.
    C. The monitor works on the absorption/scattering principle where the greater the oil content, the less the amount of visible light detected by the sampling photoelectric cell as compared to the reference photoelectric cell.
    D. The monitor works on the fluorescence principle where the greater the oil content, the less the amount of ultraviolet light detected by the sampling photoelectric cell as compared to the reference photoelectric cell.

    Correct answer: C

53. A horizontal electro-mechanical anchor windlass is equipped with two warping heads, two wildcats, two manual brake handwheels, two clutch control levers, and a multipoint lever-operated pedestal-mounted controller. What statement is true as it pertains to the operation of the windlass clutch control levers?

    A. The clutch control levers are used to engage and disengage the warping heads only. They have no control over the wildcats.
    B. The clutch control levers are used to engage and disengage both the warping heads and the wildcats.
    C. The clutch control levers are used to engage and disengage the wildcats only. They have no control over the warping heads.
    D. The clutch control levers are used to either engage or disengage the warping heads or the wildcats, depending upon the windlass design.

    Correct answer: C

54. What statement is true concerning the keel arrangements of a double bottomed ship?

    A. A ship with a "duct keel" has a single continuous longitudinal girder positioned along the centerline and perpendicular to the flat plate keel, and a ship with an "I-section keel" has two continuous longitudinal girders spaced apart and positioned on either side of the centerline and perpendicular to the flat plate keel.
    B. A ship with a "duct keel" has a single continuous transverse girder positioned along the centerline and perpendicular to the flat plate keel, and a ship with an "I-section keel" has two continuous transverse girders spaced apart and positioned on either side of the centerline and perpendicular to the flat plate keel.
    C. A ship with an "I-section keel" has a single continuous transverse girder positioned along the centerline and perpendicular to the flat plate keel, and a ship with a "duct keel" has two continuous transverse girders spaced apart and positioned on either side of the centerline and perpendicular to the flat plate keel.
    D. A ship with an "I-section keel" has a single continuous longitudinal girder positioned along the centerline and perpendicular to the flat plate keel, and a ship with a "duct keel" has two continuous longitudinal girders spaced apart and positioned on either side of the centerline and perpendicular to the flat plate keel.

    Correct answer: D

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

    Correct answer: C

56. What statement is true concerning the construction of watertight bulkheads?

    A. The strakes of the bulkhead are vertical and the stiffeners are horizontal and the bulkhead must have increasingly greater strength towards the base.
    B. The strakes of the bulkhead are horizontal and the stiffeners are vertical and the bulkhead must have increasingly greater strength towards the top.
    C. The strakes of the bulkhead are horizontal and the stiffeners are vertical and the bulkhead must have increasingly greater strength towards the base.
    D. The strakes of the bulkhead are vertical and the stiffeners are horizontal and the bulkhead must have increasingly greater strength towards the top.

    Correct answer: C

57. 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 penetration at the sides of the weld, but there should be penetration between passes.
    B. There should be no penetration at the sides of the weld, and there should be no penetration between passes.
    C. There should be penetration at the sides of the weld, and there should be penetration between passes.
    D. There should be penetration at the sides of the weld, but there should be no penetration between passes.

    Correct answer: C

58. On a ship with a continuously manned engine room, with a three-person watch rotation, what is the watch and rest period rotation?

    A. 4 hours on watch followed by 8 hours rest
    B. 6 hours on watch followed by 6 hours rest
    C. 8 hours on watch followed by 4 hours rest
    D. 8 hours on watch followed by 8 hours rest

    Correct answer: A

59. Which of the following refrigerants is normally classified as a low-pressure refrigerant based on a relatively high boiling point?

    A. HCFC-22
    B. HCFC-123
    C. HFC-23
    D. HFC-134A

    Correct answer: C

60. What is the physical state and pressure condition of refrigerant as it leaves a receiver in a typical refrigeration system?

    A. low-pressure vapor
    B. high-pressure liquid
    C. high-pressure vapor
    D. low-pressure liquid

    Correct answer: B

61. The safety heads of most large reciprocating compressors used in refrigeration systems are held in place by what means?

    A. heavy coil springs
    B. discharge pressure in the relief valve return line
    C. tack welding on the sides
    D. large Teflon gaskets

    Correct answer: A

62. 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 speed of the compressor
    C. varying the position discharge bypass valve
    D. all of the above

    Correct answer: D

63. Which of the following electrically operated refrigeration system valves would be most appropriate for use as a 2-position diverting hot gas bypass solenoid valve? Illustration RA-0019

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

    Correct answer: B

64. As shown in the illustrated refrigeration system piping schematic diagram with the various accessories and controls and equipped with an air-cooled condenser with high side pressure controls, what statement is true concerning the fan cycling control pressure switch? Illustration RA-0039

    A. With a condenser fitted with multiple electric-motor driven fans, the number of fans in use would increase under low ambient temperature conditions.
    B. With a condenser fitted with a single fan driven by a multi-speed electric motor, the fan speed would decrease under high ambient temperature conditions.
    C. With a condenser fitted with a single fan driven by a multi-speed electric motor, the fan speed would decrease under low ambient temperature conditions.
    D. With a condenser fitted with a single fan driven by a single-speed electric motor, the fan would cycle off under high ambient temperature conditions.

    Correct answer: C

65. Refrigeration systems using forced air circulation evaporators have a tendency to cause rapid dehydration of produce in chill boxes. Which of the following will minimize this dehydration?

    A. the air is circulated slowly over a large evaporator with a minimum temperature differential
    B. the air is circulated rapidly over a small evaporator with a maximum temperature differential
    C. the air is circulated slowly over a large evaporator with a maximum temperature differential
    D. the air is circulated rapidly over a small evaporator with a minimum temperature differential

    Correct answer: A

66. In a refrigeration system, the bulb for the thermal expansion valve is always located where?

    A. at the evaporator coil outlet
    B. at the evaporator coil inlet
    C. at the beginning of the bottom row of the evaporator coils
    D. in the middle of the evaporator coils

    Correct answer: A

67. As shown in figure "B" of the illustrated self-contained recovery unit connection diagrams, what is the recovery method supported by the connection scheme? Illustration RA-0033

    A. direct liquid recovery
    B. vapor recovery/push-pull
    C. liquid recovery/push-pull
    D. direct vapor recovery

    Correct answer: D

68. Concerning the charging of refrigerant into a vapor compression refrigerating system, which of the following is true?

    A. when charging as a liquid it should be to the high side only
    B. when charging as a liquid it should be to the low side only
    C. when charging as a liquid it may be to the low or high side
    D. when charging as a vapor it should be directly to the receiver only

    Correct answer: A

69. In general, the thermal bulb for a thermal expansion valve used in a reciprocating air conditioning system is usually charged with what substance?

    A. distilled water
    B. bees wax
    C. the same refrigerant as the system
    D. mercuric sulfate

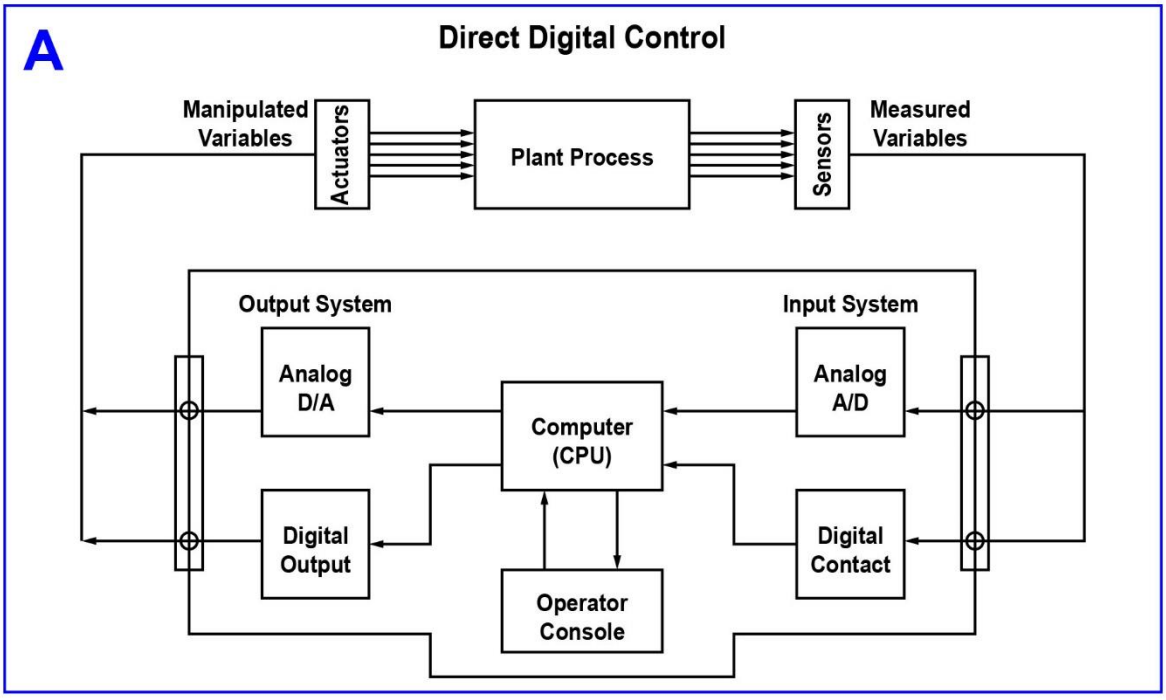
    Correct answer: C

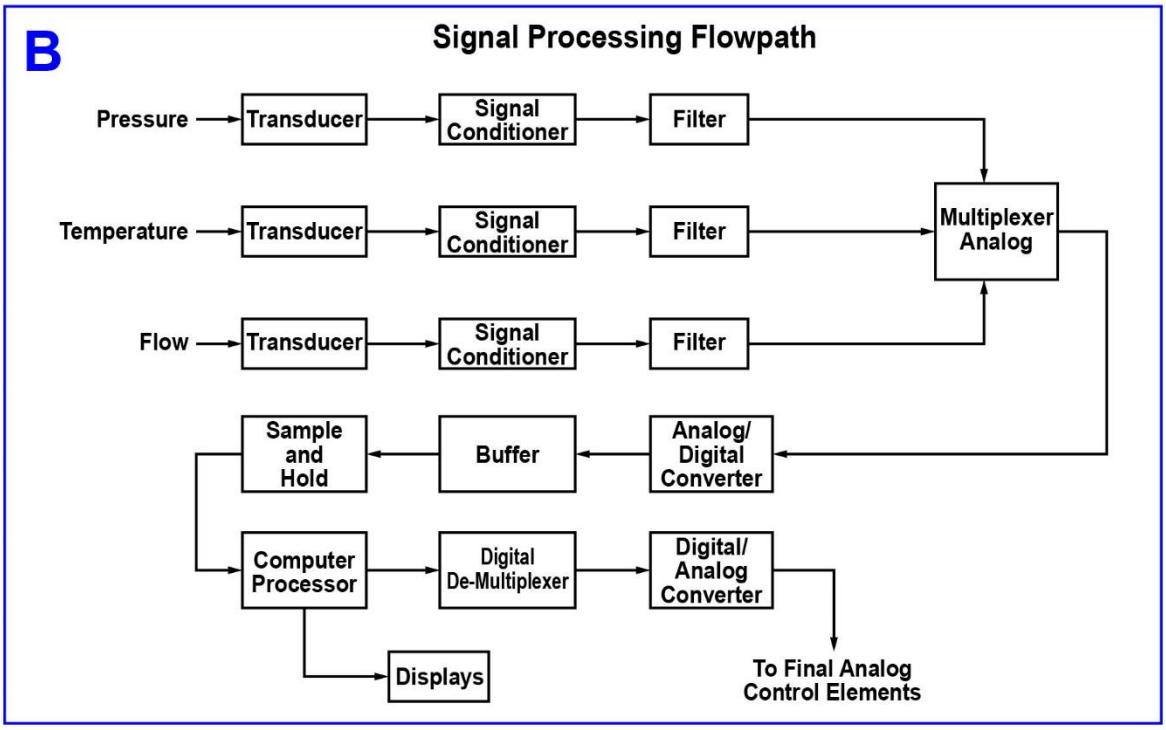
70. The introduction of outside air to the air conditioning system is 90°F with a relative humidity of 60%. The air has been conditioned to 70°F with a relative humidity of 80%. Using the psychrometric chart, shown in the illustration, determine the quantity of moisture removed from one pound of the conditioned air. Illustration RA-0022

    A. 20 grains
    B. 30 grains
    C. 40 grains
    D. 50 grains

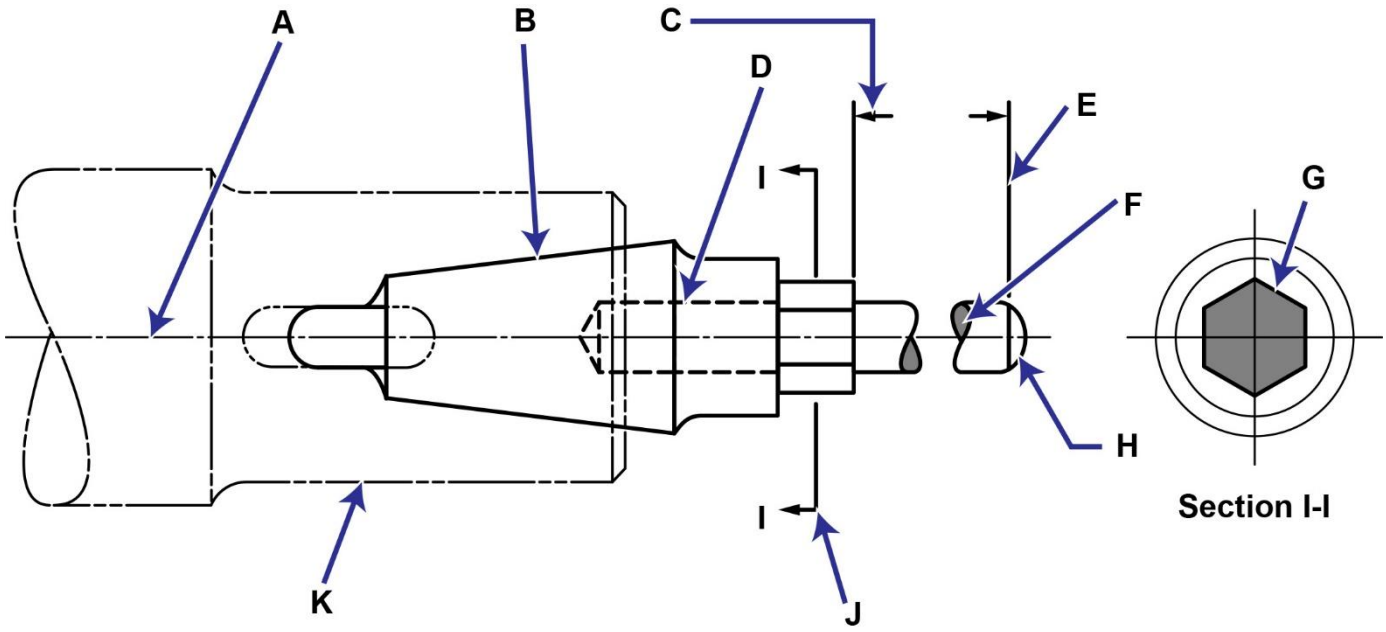
    Correct answer: C

EL-0095

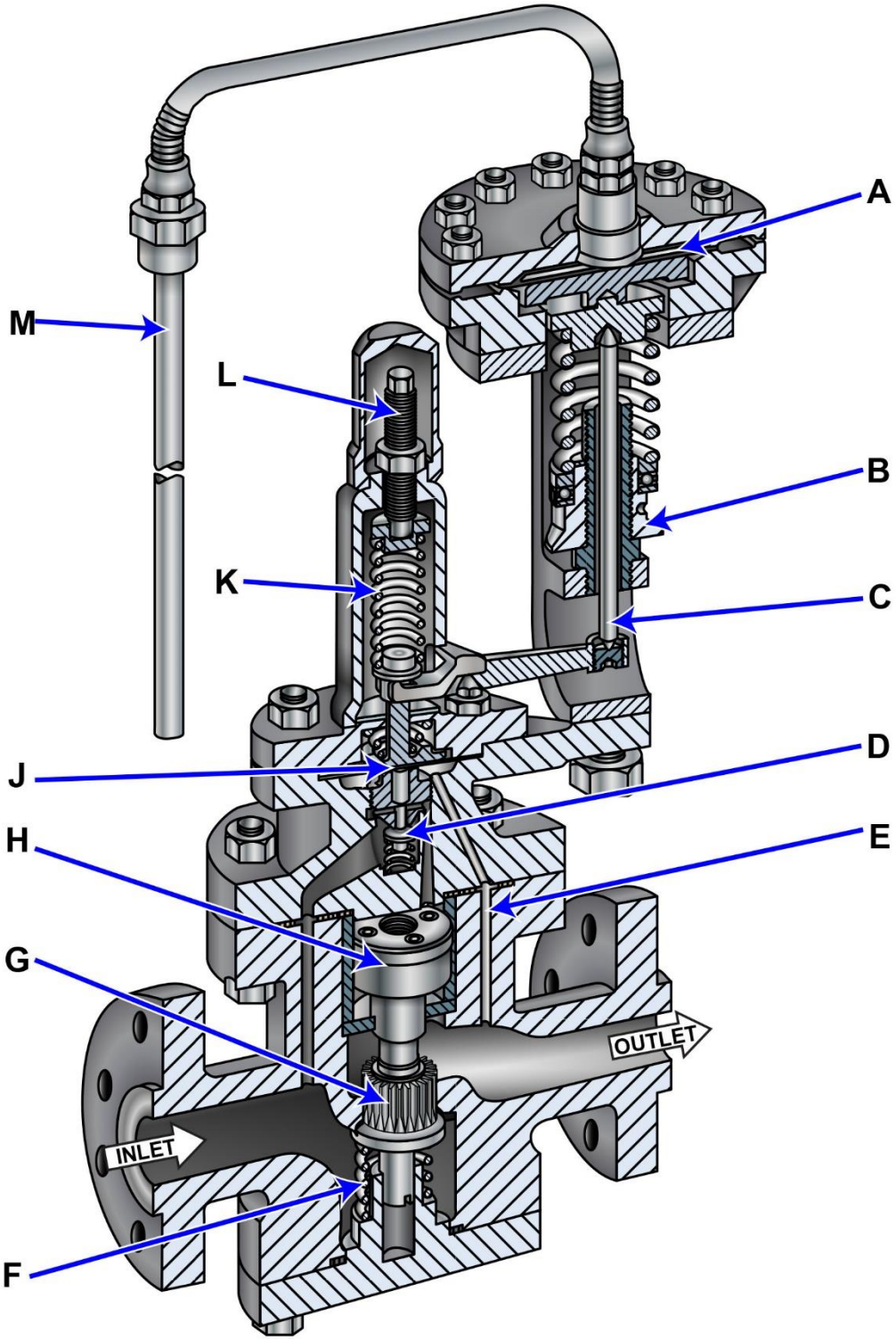




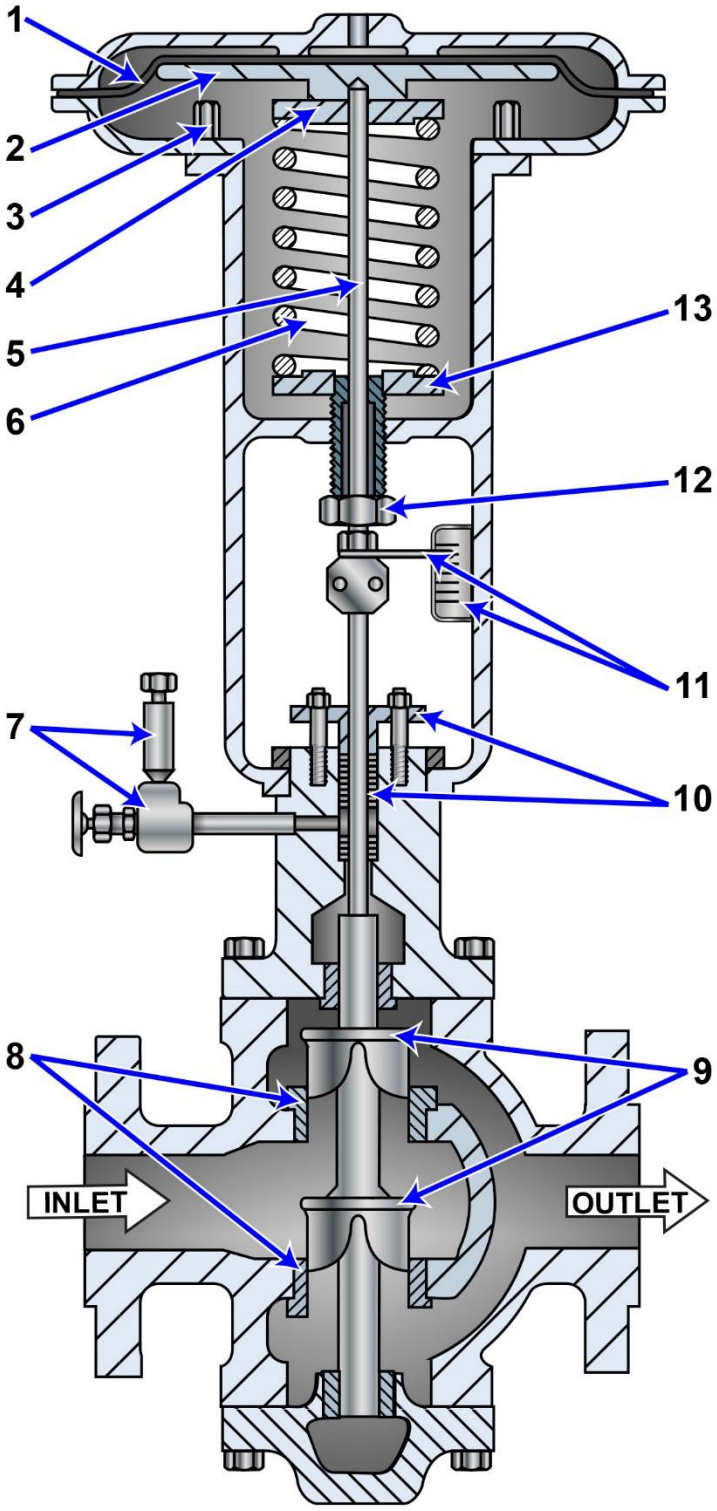
GS-0006



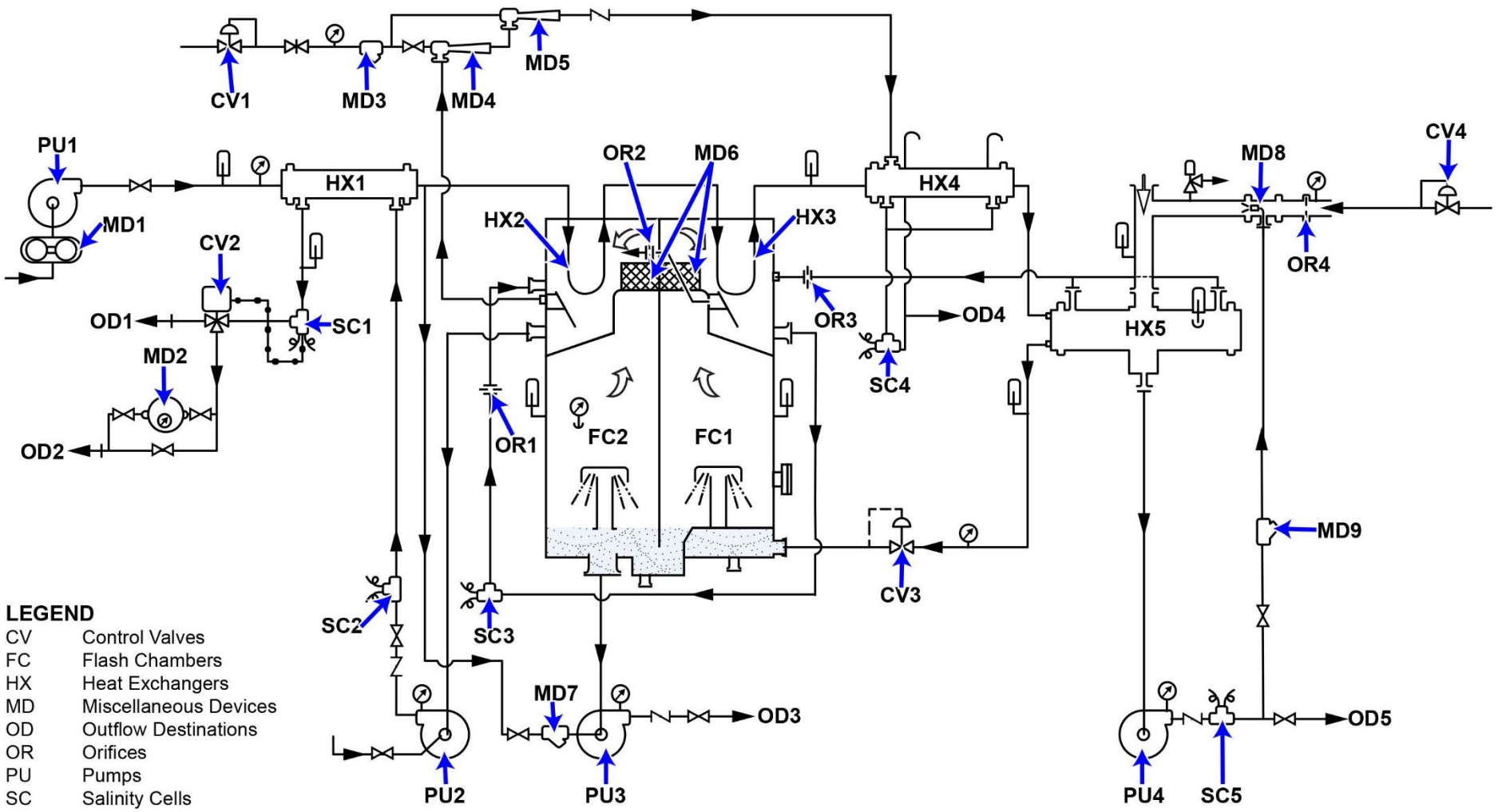
GS-0045



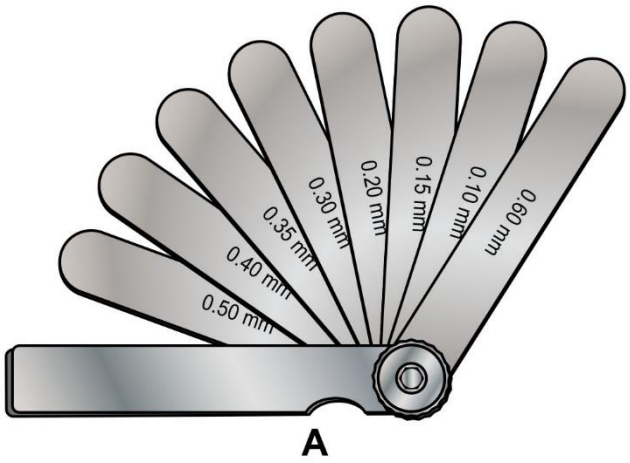
GS-0051



GS-0053



GS-0073



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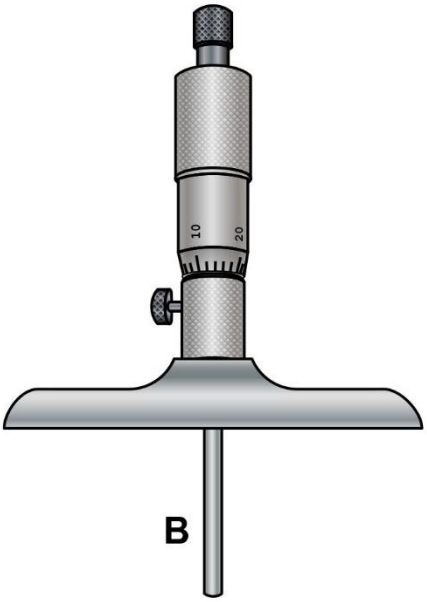

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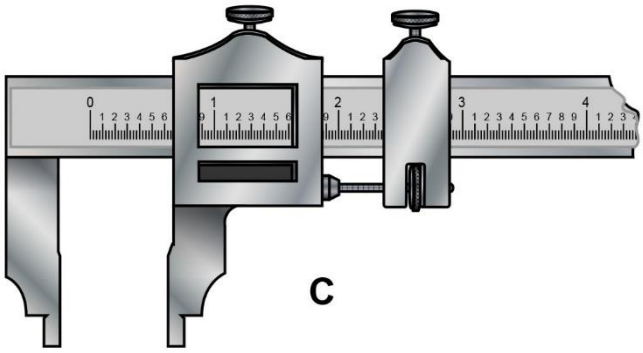

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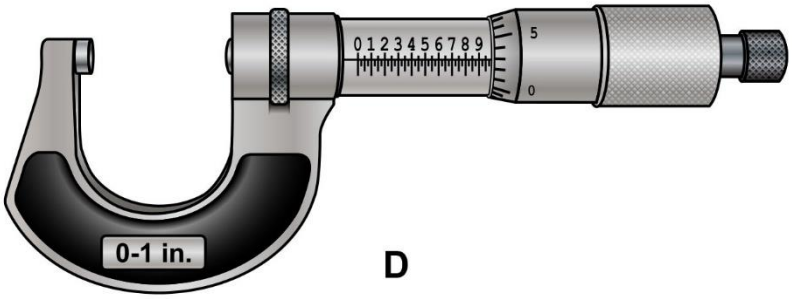
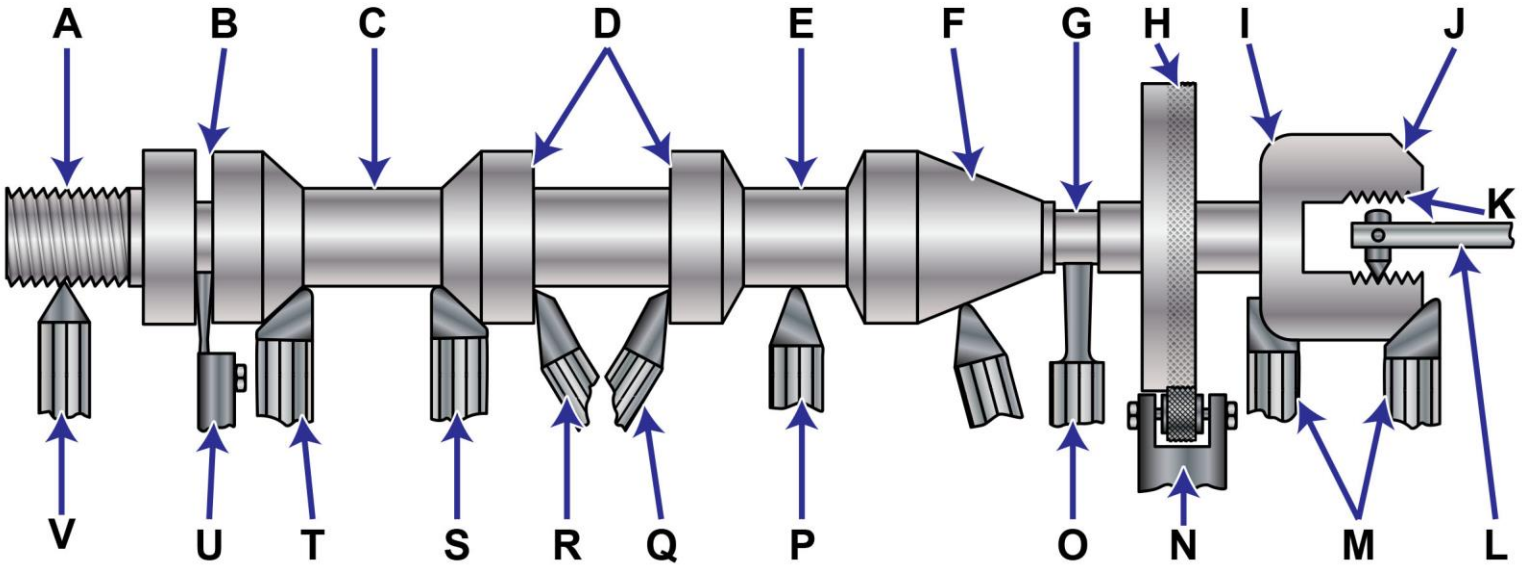
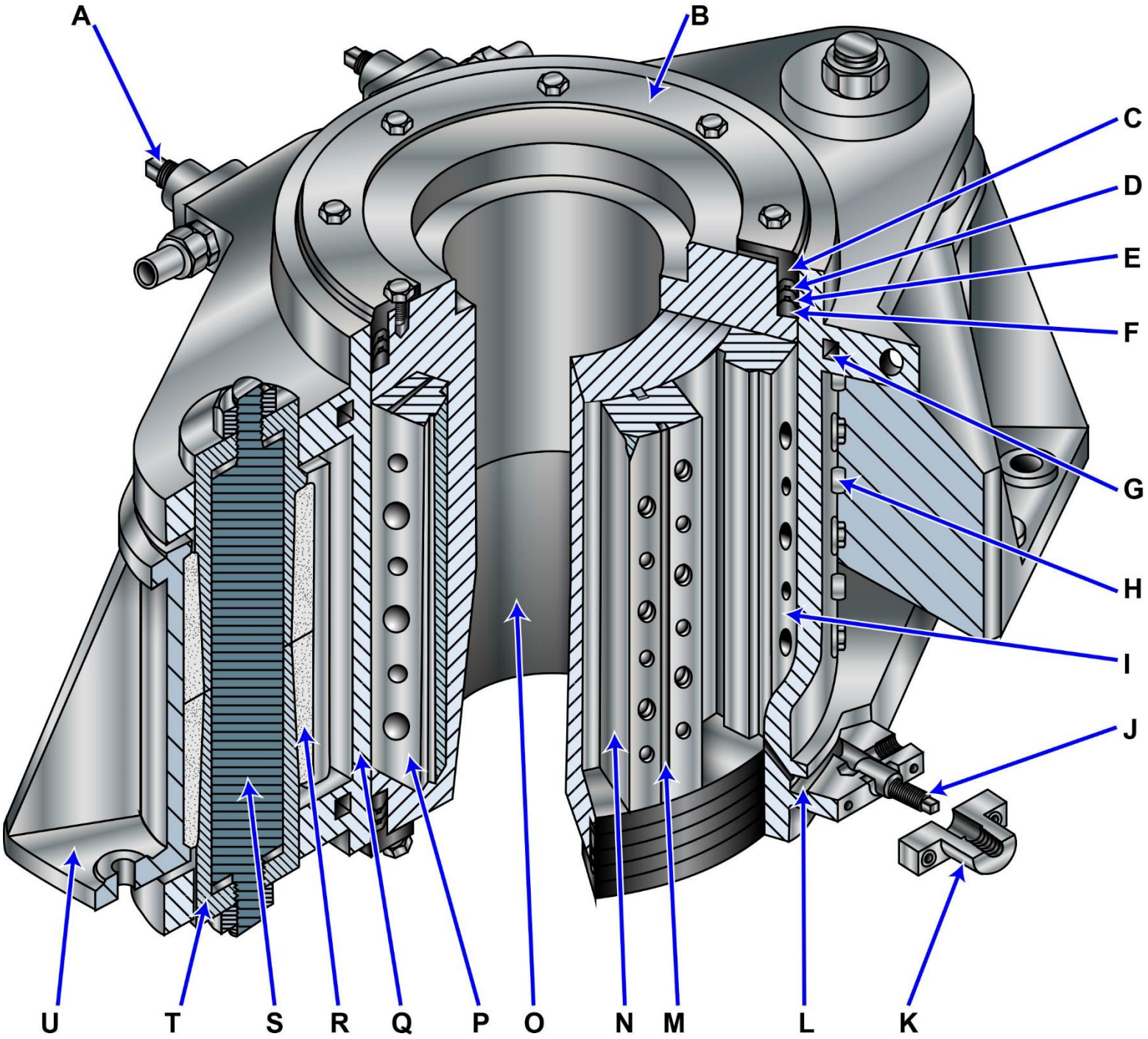


D

GS-0090



GS-0116



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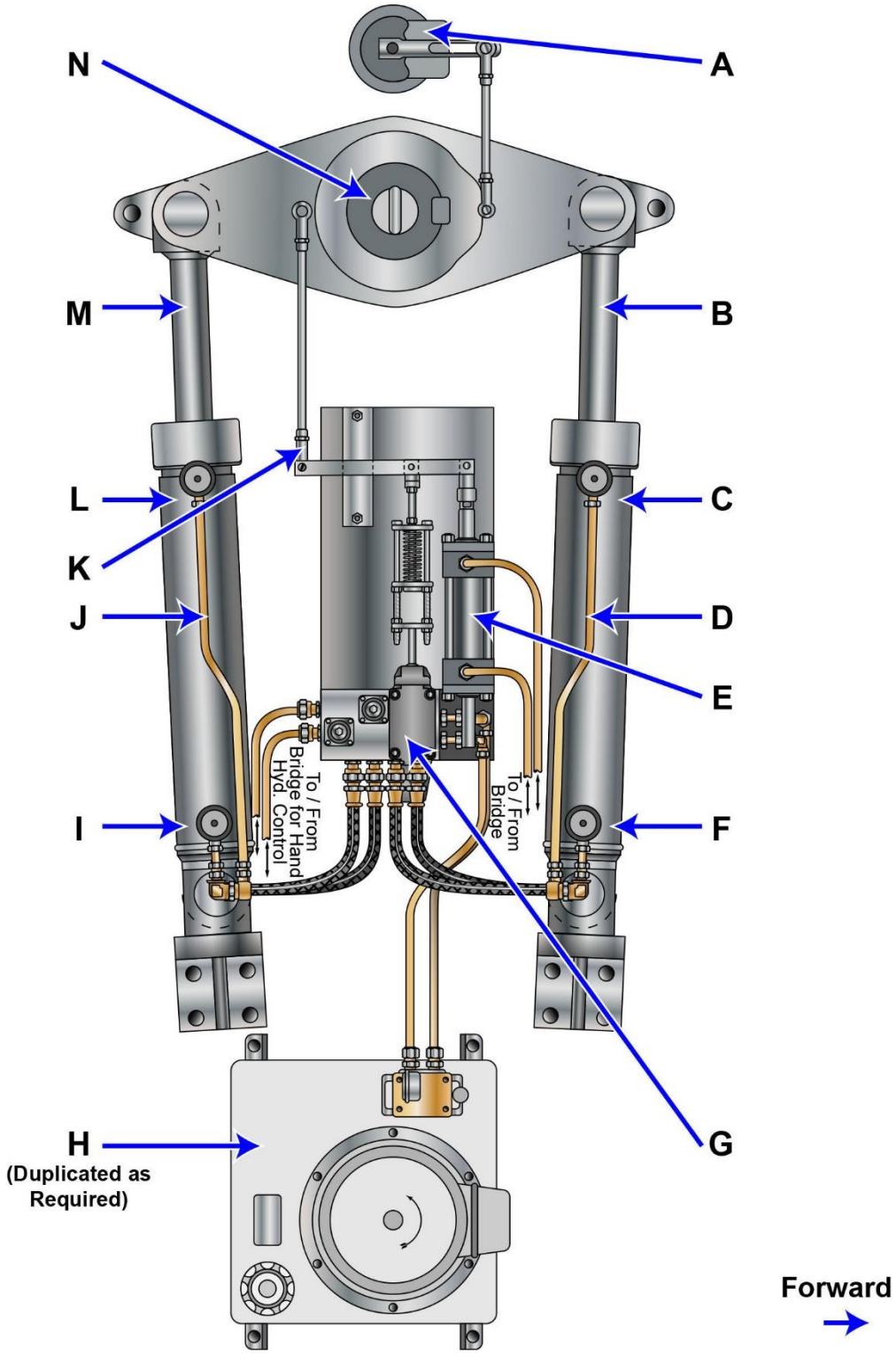
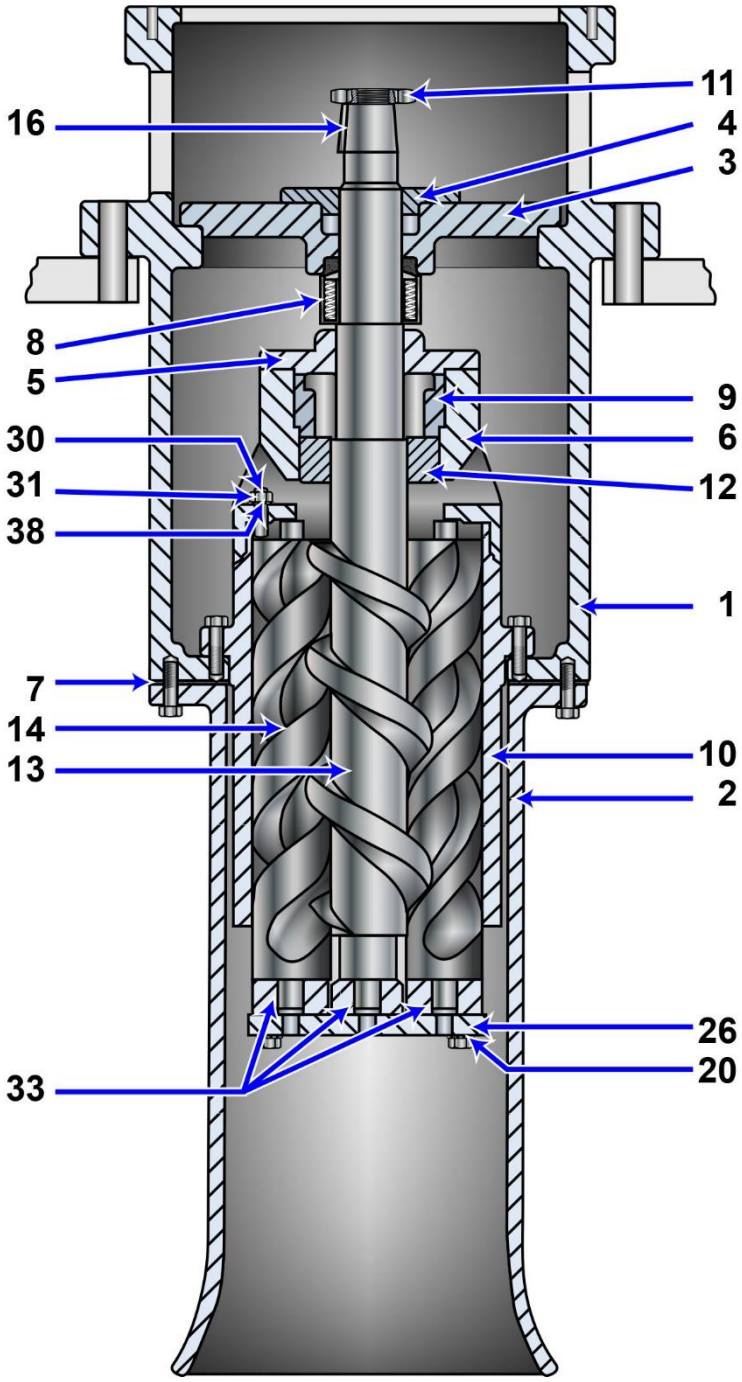
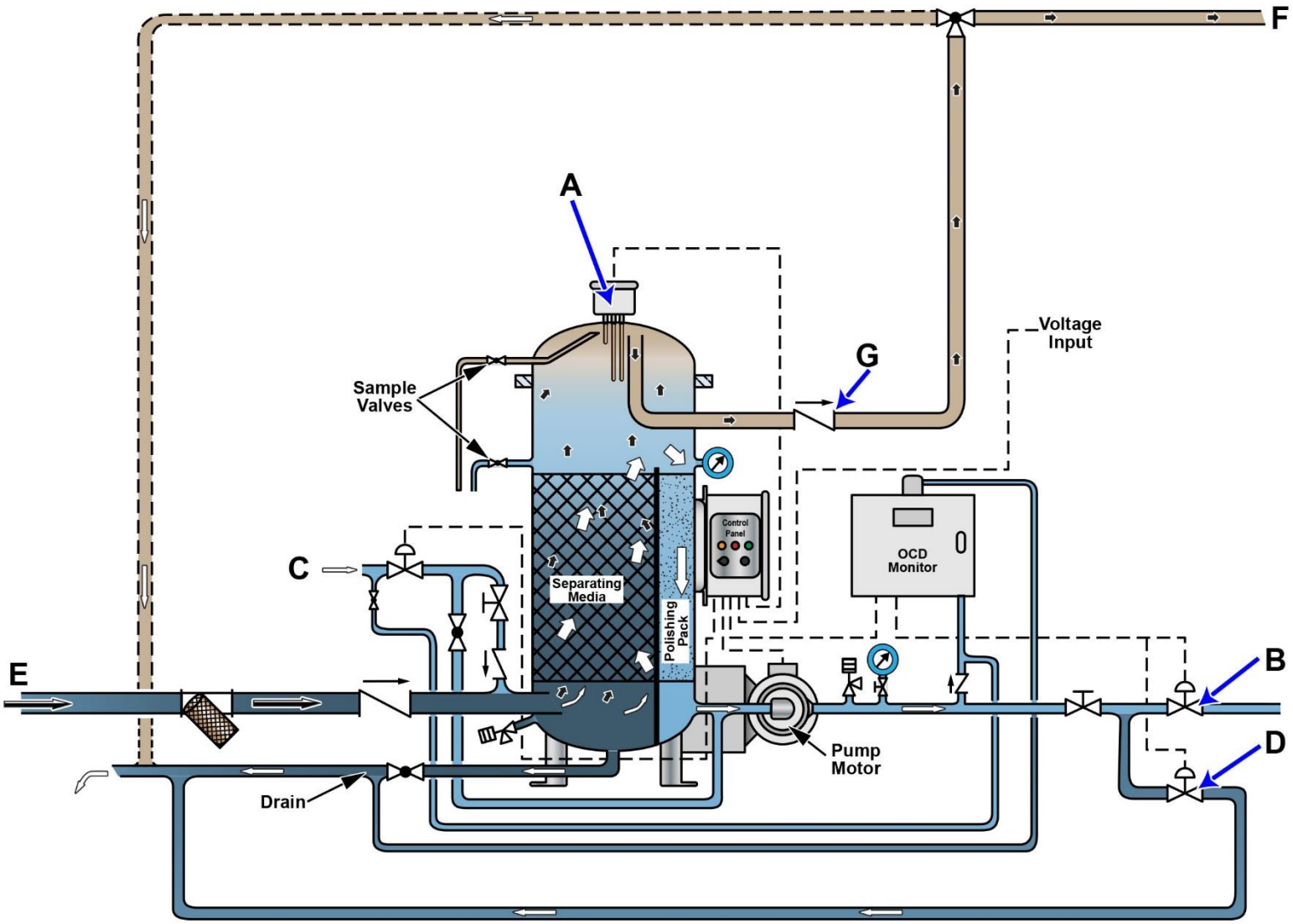


GS-0144

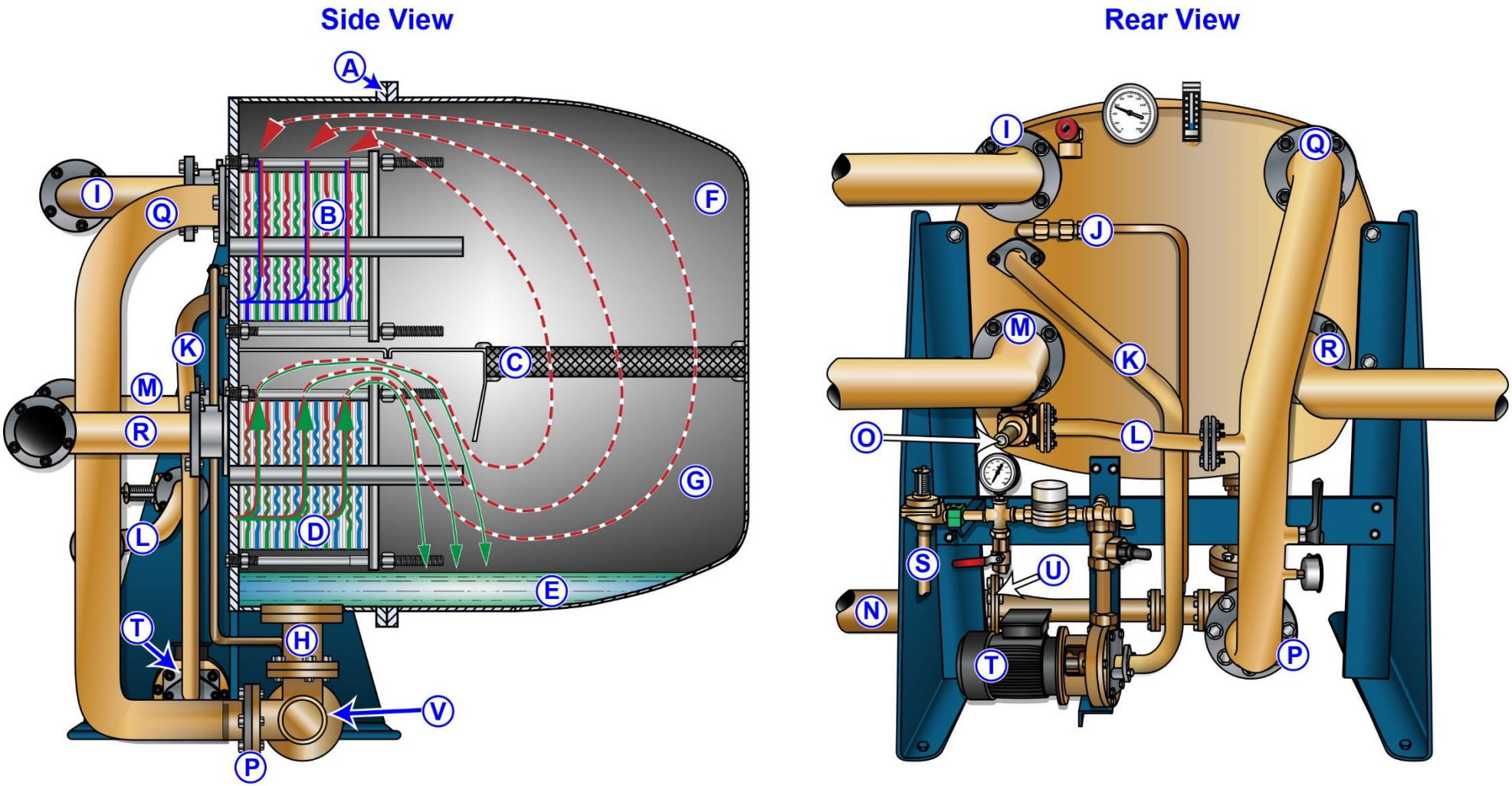


PC NO.	NAME	Material
1	Pump Case	Cast Steel
2	Inlet Bell	Cast Steel
3	Seal Housing	Cast Steel
4	Packing Gland	Gun Metal
5	Bearing Retainer	Bearing Bronze
6	Balance Rotor Housing	Bearing Bronze
7	Gasket	Plant Fiber
8	Mechanical Seal for 2, 3, 8" Dia. Shaft	Steel & Syn. Rubber
9	Spacer	Bearing Bronze
10	Rotor Housing	Bearing Bronze
11	Check Nut	Steel
12	Balance Piston	Steel
13	Power Rotor	Steel
14	Idler Rotor	Steel
15	Socket Head Set Screw 1/4 – 20 x 7/16" long	Steel
16	Key	Steel
17	Bolt 3/8" - 16 x 1" long	Steel
18	Bolt 3/8" - 16 x 1 1/4" long	Steel
19	External Tooth Lockwasher	Steel
20	External Tooth Lockwasher	Steel
21	Bolt 1/4" – 13 x 1 1/4" Long	Steel
22	Socket Head Pipe Plug – 1/8" Size	Brass
23	Inlet Bell	Cast Steel
24	Bolt 1/2" – 13 x 1 /2" Long	Steel
25	Spacer	Steel Pipe
26	Thrust Plate	Steel
27	Gasket	Plant Fiber
28	Oil Balance Tube	Steel
29	O Ring	Syn. Rubber
30	Stud 5/8" – 11" x 3 1/4" Long	Steel
31	Nut 5/8" – 11" THDS.	Steel
32	Bolt 1/2" – 13 x 4 1/2" Long	Steel
33	Thrust Shoe	Bearing Bronze
34	Lacing Wire 1/16" Dia. x 16 ft. Lg. (Cut to Suit)	Monel
35	Pkg. Ring for 2 3/8" Dia. Shaft 1/4" SQ	Symbol 430
36	Bolt 3/8" – 16" x 1 3/4" Long	Steel
37	Stud 3/4" – 10 x 3" Long	Steel
38	External Tooth Lockwasher	Steel
39	Spring Pin 3/32" x 3/8" Long	Steel
40	Name Plate (Serial)	Brass Sheet
41	Name Plate (Caution)	Brass Sheet
42	Name Plate (Rotation)	Brass Sheet

GS-0175



MO-0110



RA-0019

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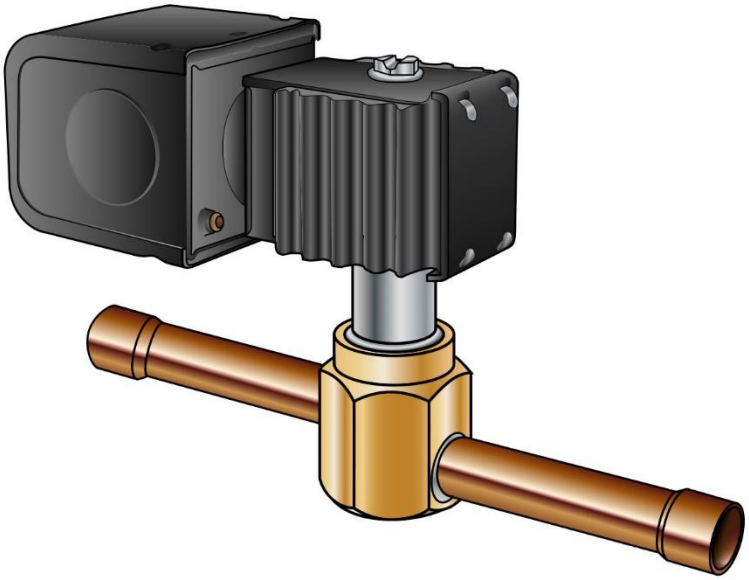

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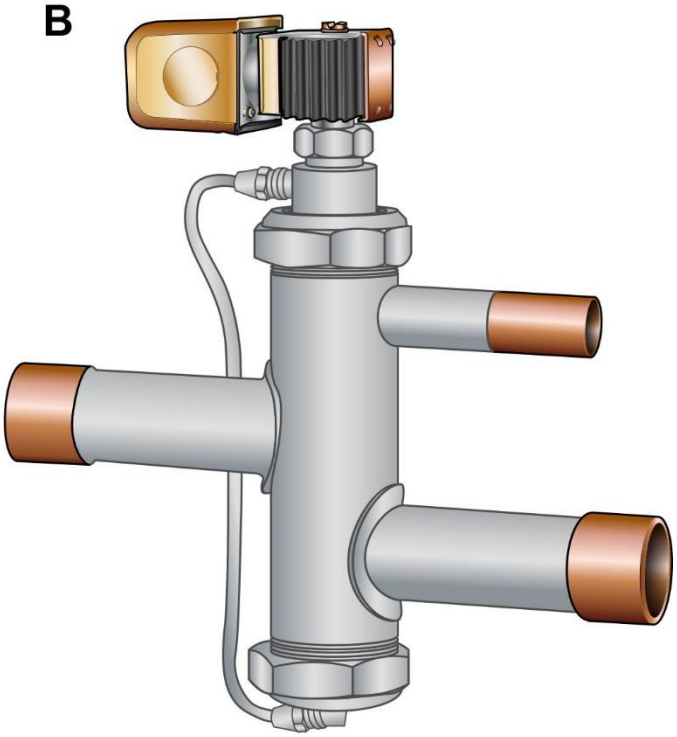

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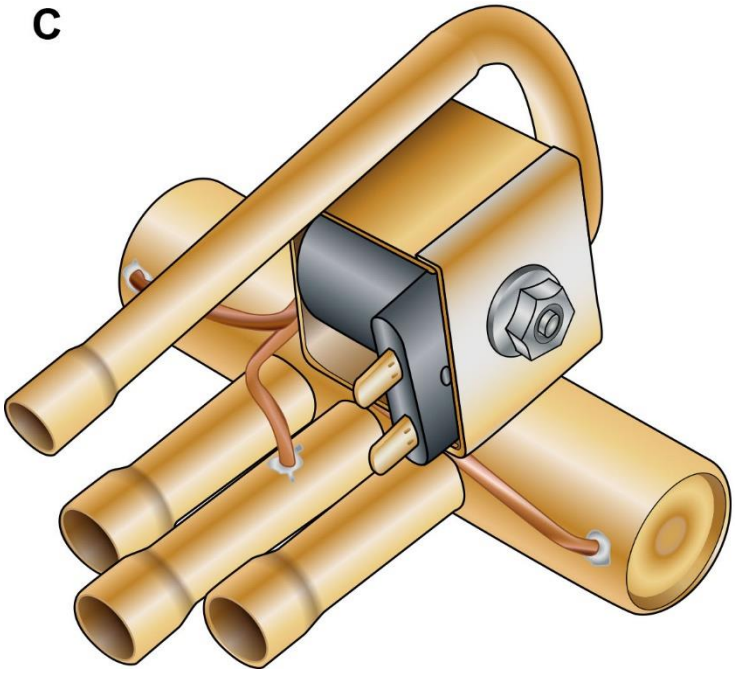

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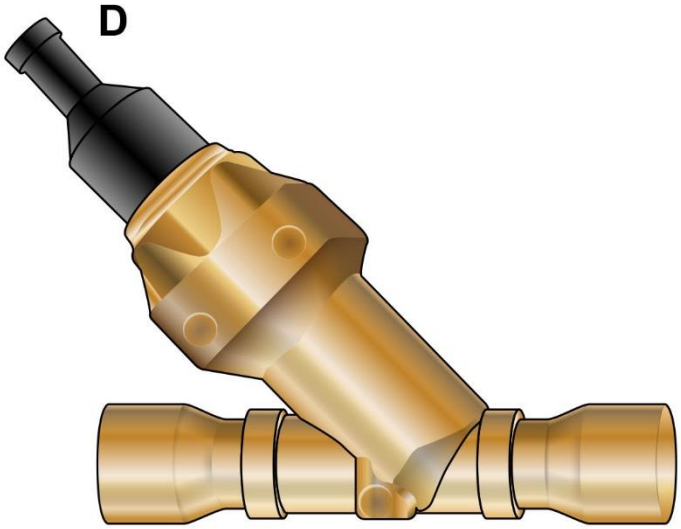
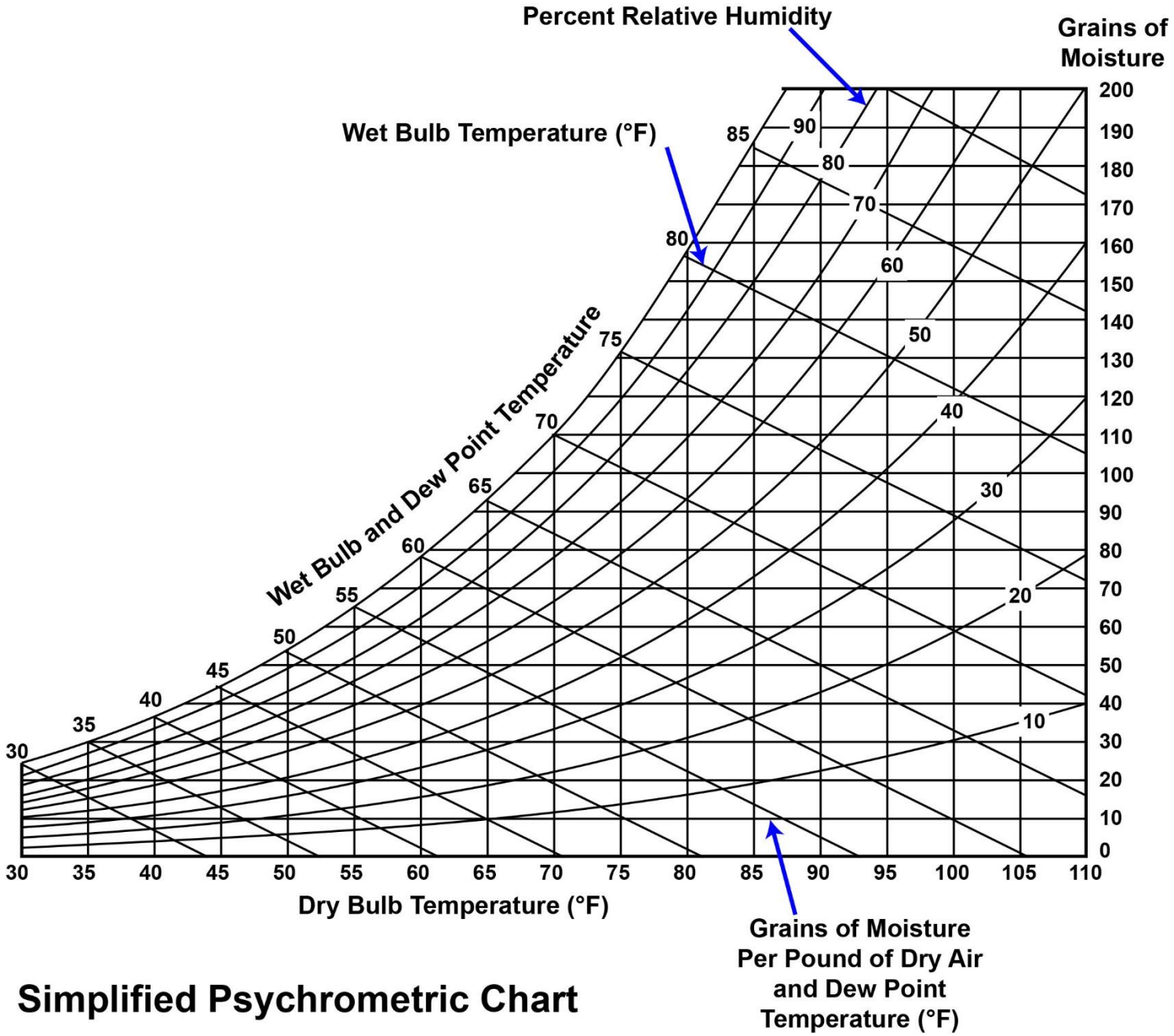
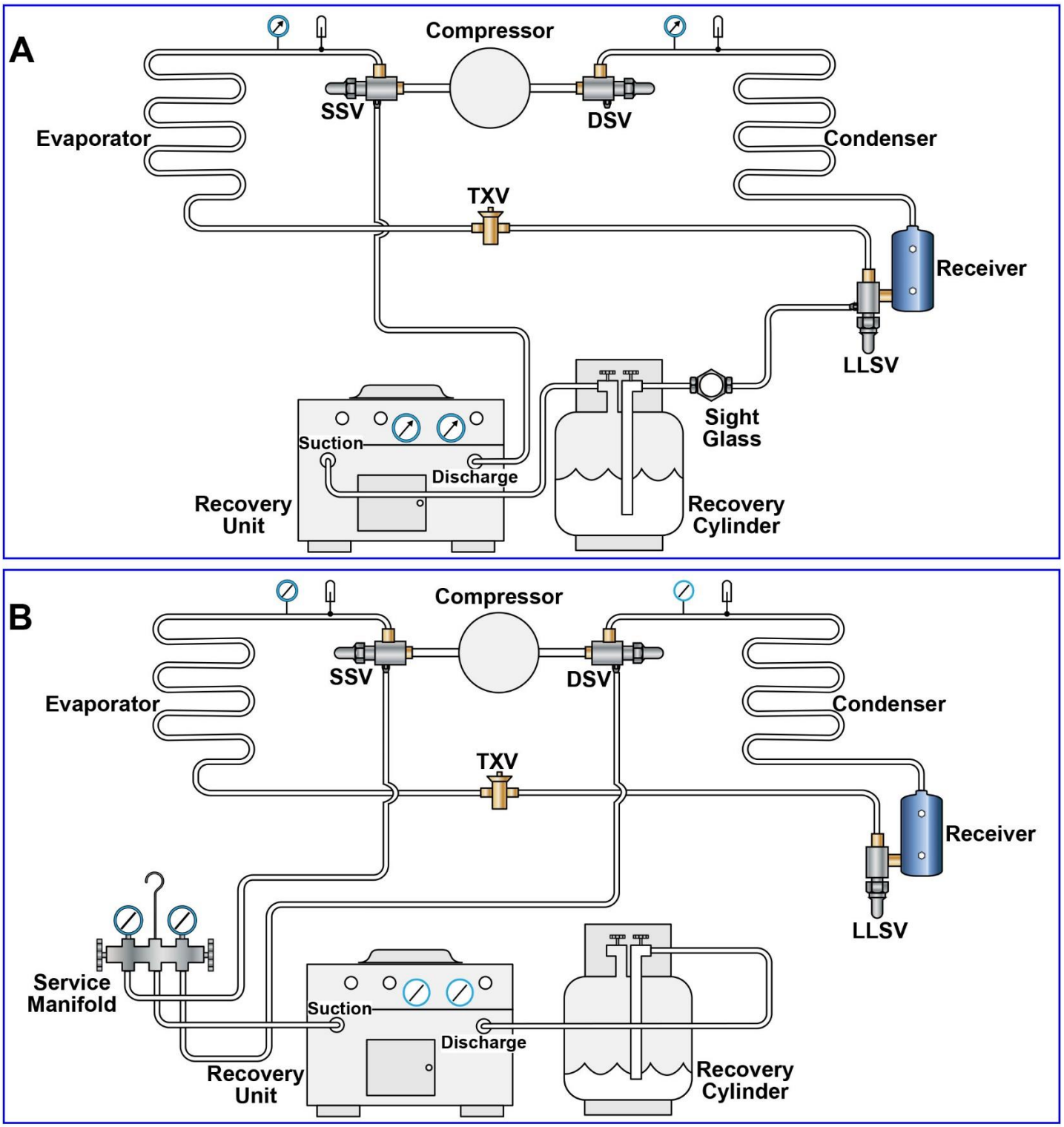


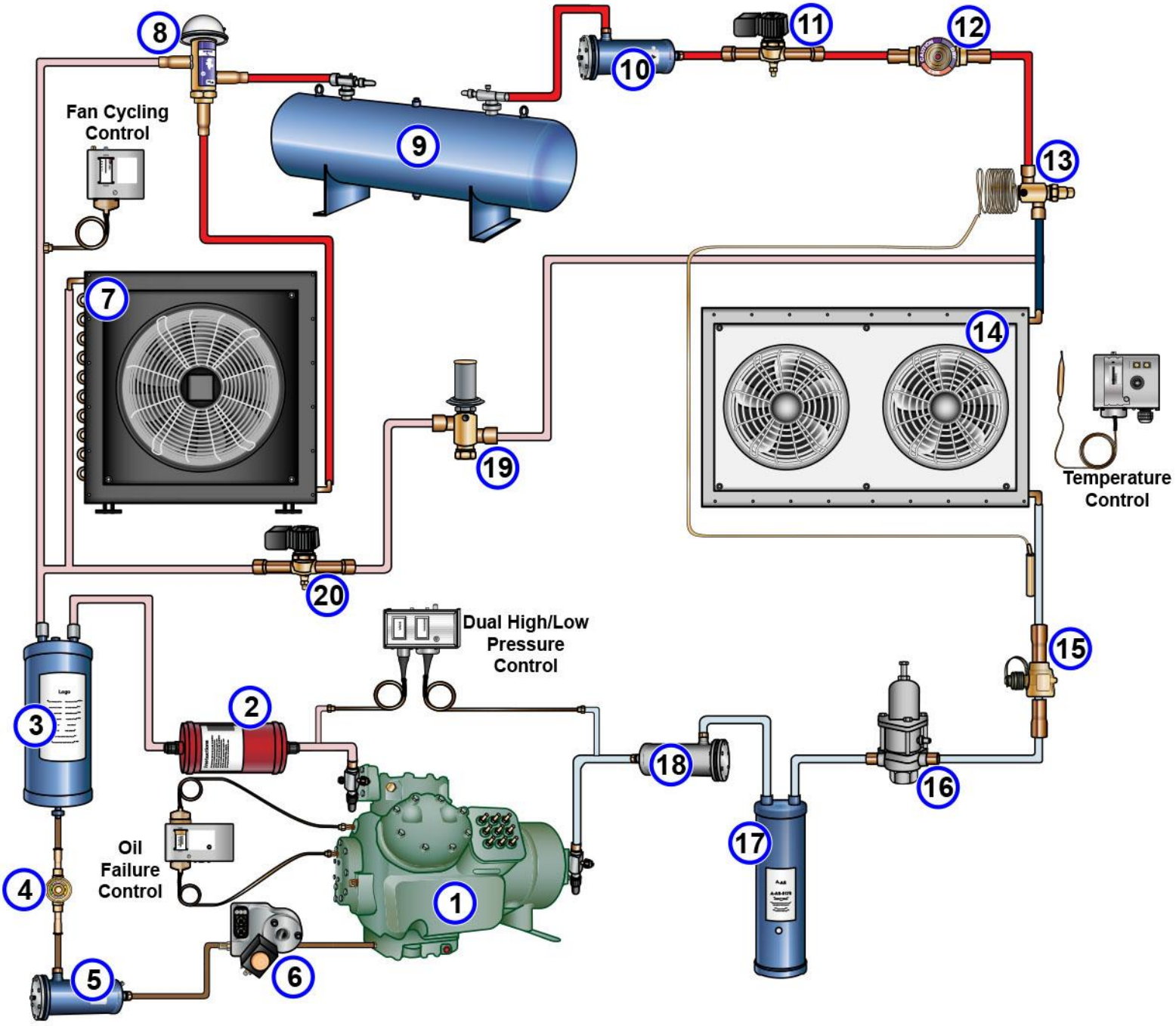
RA-0022



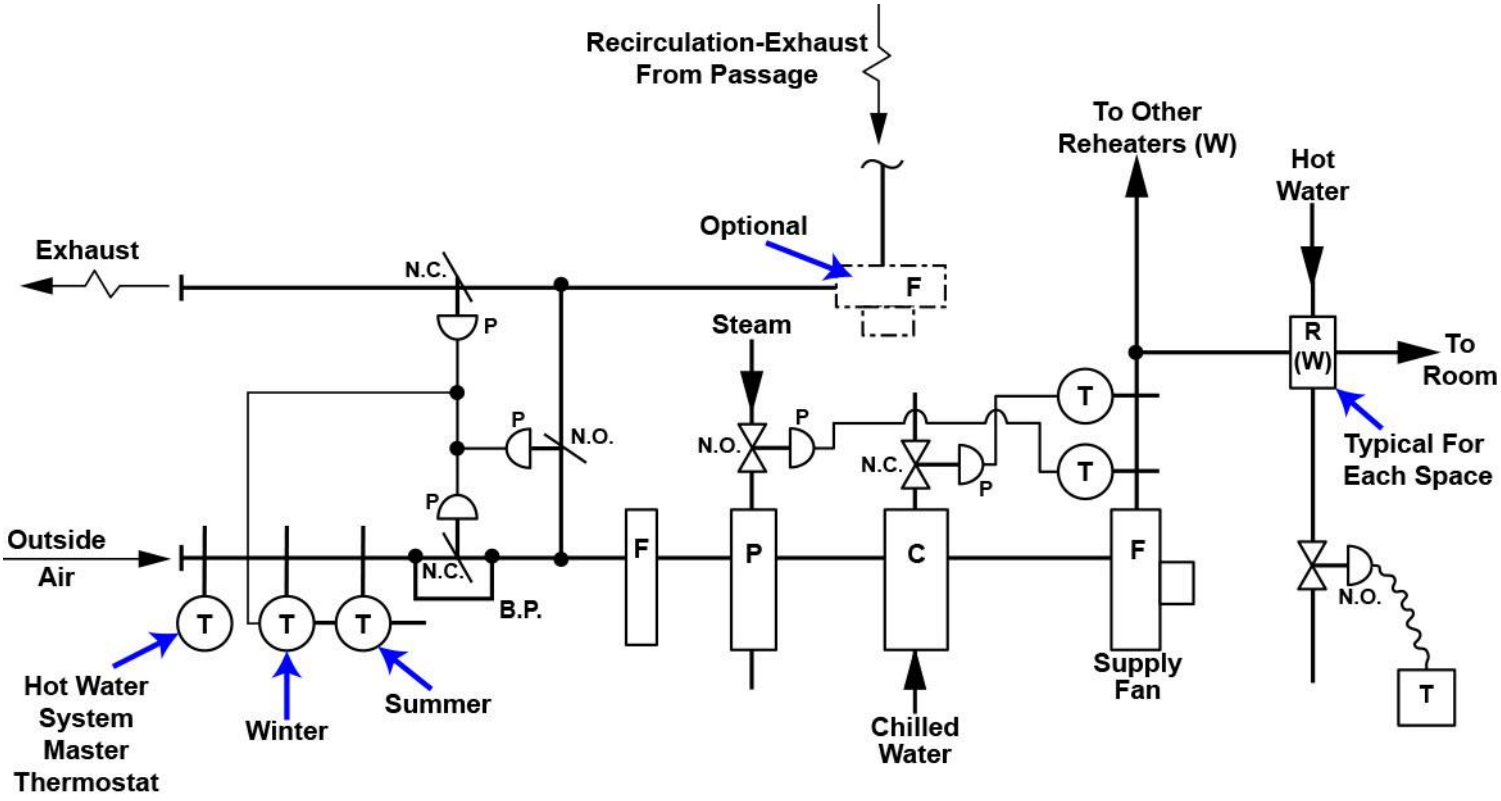
RA-0033



RA-0039



RA-0042



LEGEND

F — Fan	T — Room Thermostat
F — Filter	T — Duct Thermostat
C — Cooling Coil	Pneumatic Damper and Motor
P — Preheater (Steam)	Pneumatic Relay
R (W) — Reheater (Water)	N.C. — Normally Closed (Valve or Damper)
	N.O. — Normally Open (Valve or Damper)
	B.P. — Minimum Outside Air Bypass
	P — Positive Positioning Relay