DAVEY

VM Series
Vertical Multistage
Centrifugal Pump (50 & 60Hz)

Installation and Operating Instructions

PLEASE READ IMPORTANT CAREFULLY

Tested in compliance with AS/NZS 4020 for use in contact with safe drinking water

Please pass on these instructions to the operator of this equipment.

Contents:

Please read instructions carefully before installing and operating the pump

1. APPLICATIONS

Davey's latest range of high efficiency, non self priming vertical multistage pumps provide low noise, small footprint, very reliable as well as being easy to service and suit a wide number of applications.

1.1 Applications

Davey VMC pumps are designed for use with low viscosity, non flamable, non explosive liquids that are free from solids and fibers. Please consult your Davey dealer for specific application needs.

Boiler feeding and condensation system;

Water treatment, infiltration, filtration system

Food, beverage industry;

High building water supply;

Fire fighting system;

Industrial cleaning system;

Liquid transferring, circulating, boosting;

Hot water, cold water;

Irrigation applications.

1.2 Working conditions

Liquid temperature: -15ºC to +120ºC;

Flow rate range: 0.5-240m3/h;

Liquid pH range: pH- 0-14;

Max. ambient temperature: +40ºC;

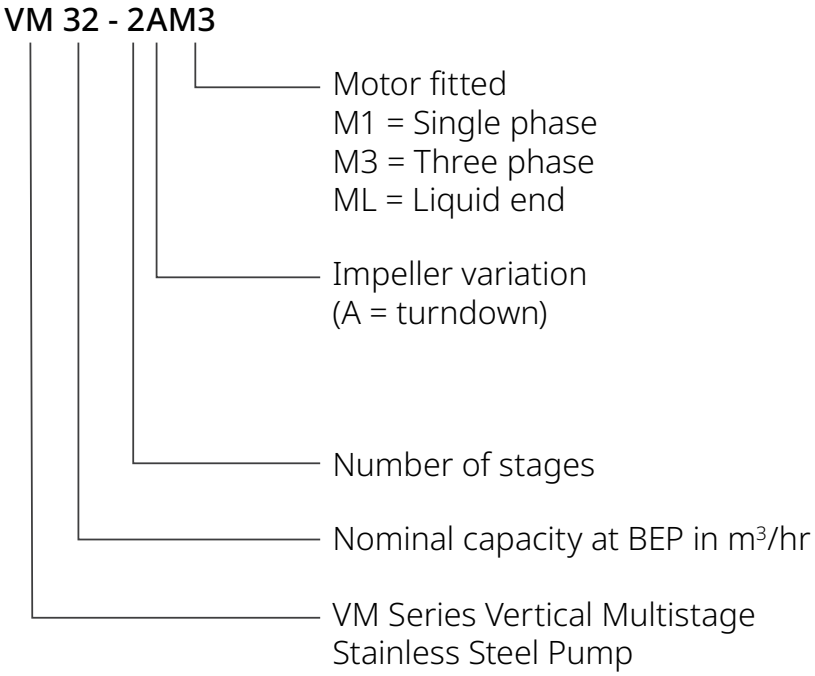
Max. altitude: 1000m;

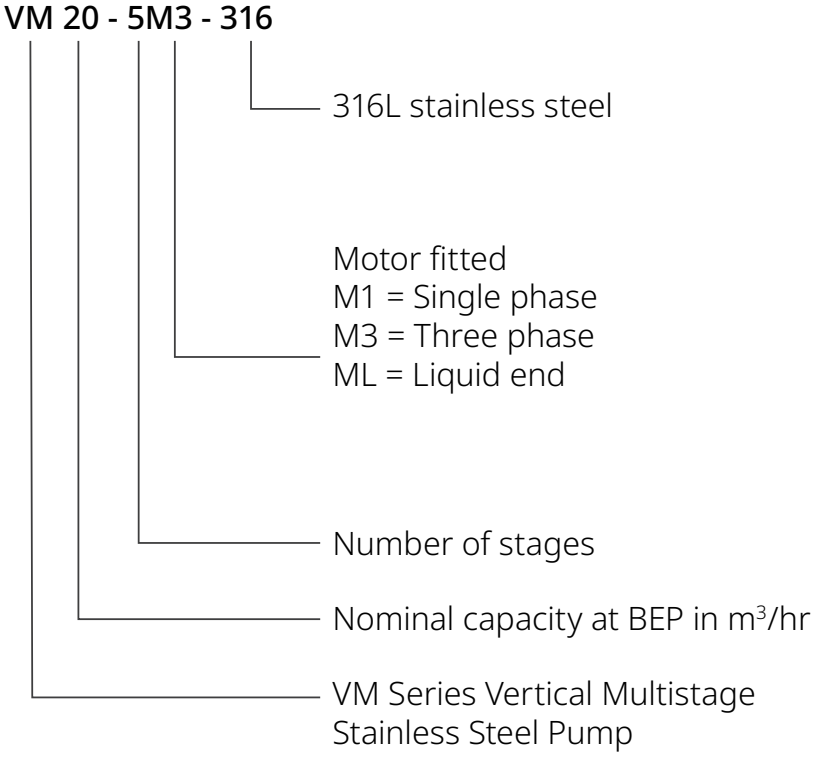
Min inlet pressure: Refer to NPSH curve;

Max. working pressure: See table 1A & table 1B.

When the specific gravity or viscosity of the pumped liquid is different than water, the shaft power of the pump will be increased. A larger motor will need to be selected. Please contact your Davey representative for more details.

2. IDENTIFICATION OF THE PUMP





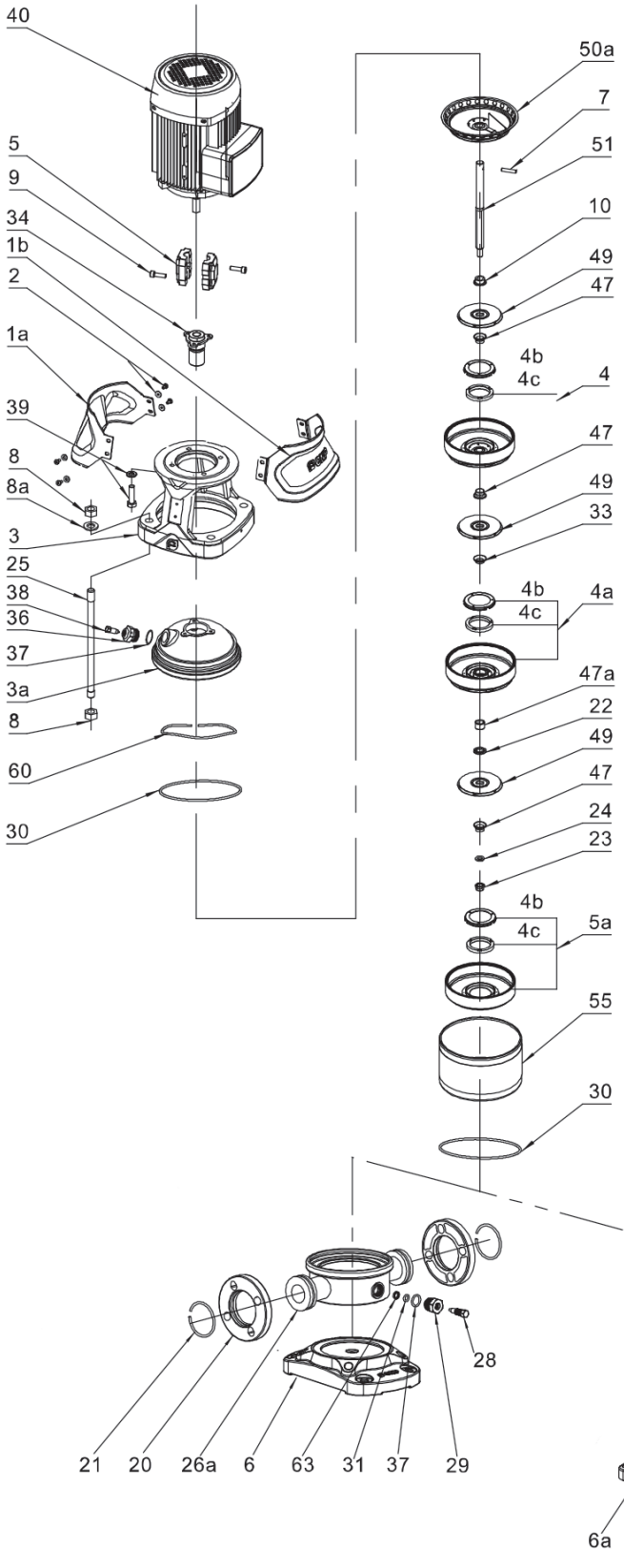
Allowed maximum working pressure for the pump 50Hz

Model	Max. working pressure (bar)
VM1,3,5,10,15,20 Flange, pipe thread	25
VM32	
VM32-1A to VM32-6B	16
VM32-6 to VM32-10B	30
VM42	
VM42-1A to VM42-4B	16
VM42-4 to VM42-6	25
VM42-7B to VM42-7	30
VM65	
VM65-1A to VM65-3	16
VM65-4B to VM65-52	25
VM90	
VM90-1A to VM90-3B	16
VM90-3A to VM90-4B	25
VM120, 150, 200	
VM120, 150, 200	20

3. STRUCTURE

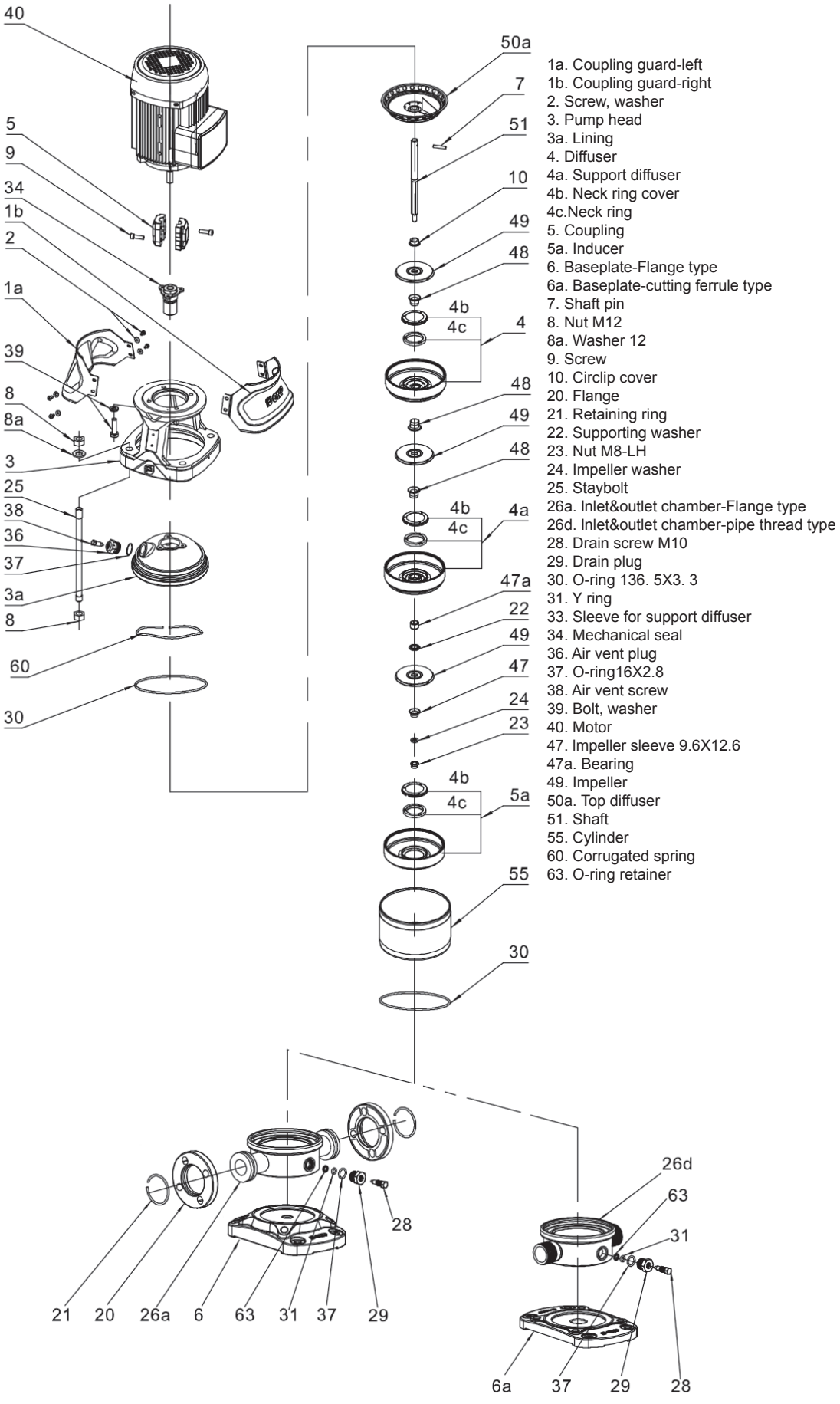
- Davey VMC pumps main components are: motor, pump head, diffusers, impellers, cylinder, inlet and outlet chamber, shaft, mechanical seal,etc. See drawing 1.
- The pump key components such as diffusers, impellers, cylinder and shaft are made of stainless steel. The pump head, inlet and outlet chamber are made from precision cast stainless steel.

Drawing 1-A VM1,3



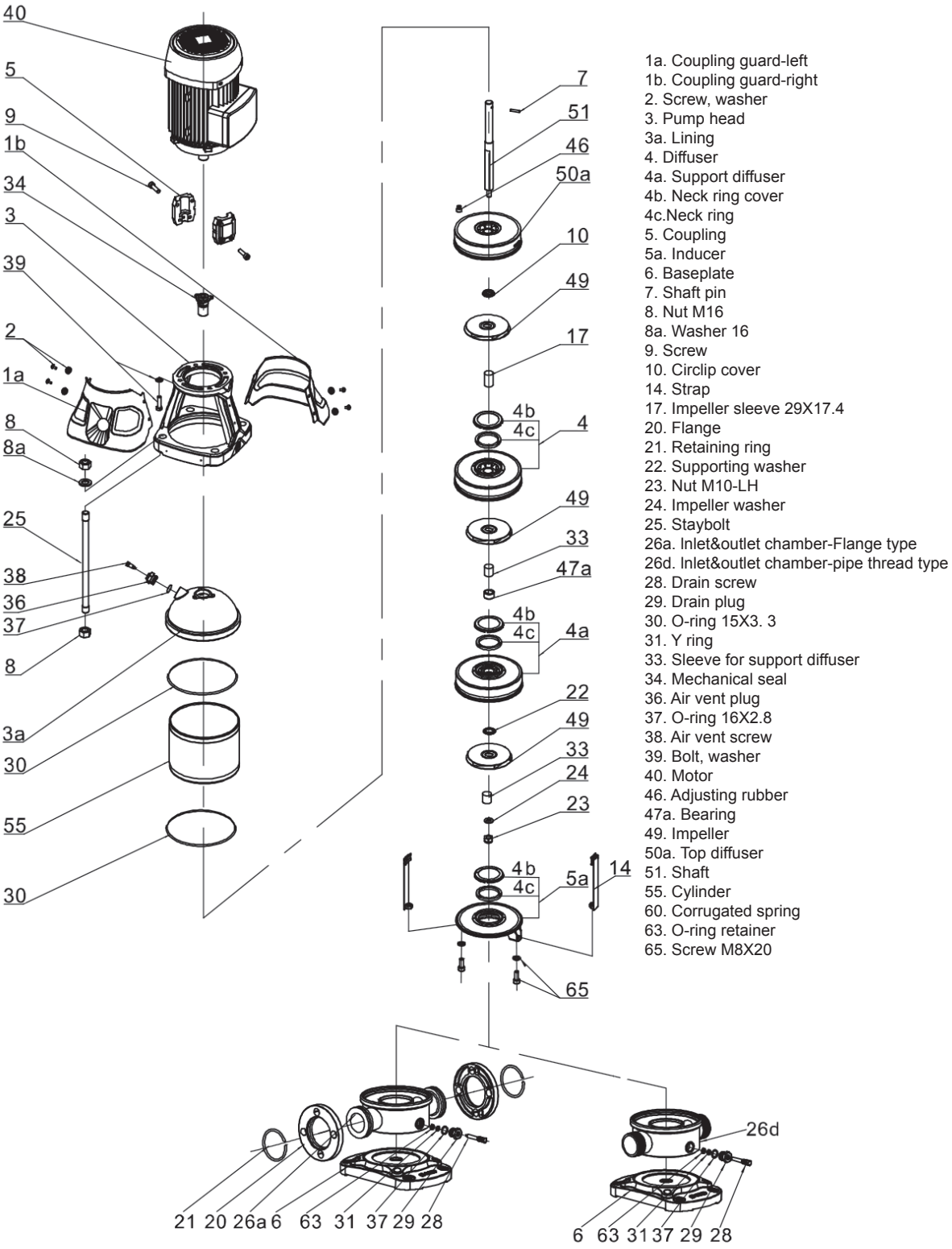
1a. Coupling guard-left
1b. Coupling guard-right
2. Screw, washer
3. Pump head
3a. Lining
4. Diffuser
4a. Support diffuser
4b. Neck ring cover
4c.Neck ring
5. Coupling
5a. Inducer
6. Baseplate-Flange type
6a. Baseplate-cutting ferrule type
7. Shaft pin
8. Nut M12
8a. Washer 12
9. Screw
10. Circlip cover
20. Flange
21. Retaining ring
22. Supporting washer
23. Nut M8-LH
24. Impeller washer
25. Staybolt
26a. Inlet&outlet chamber-Flange type
26d. Inlet&outlet chamber-pipe thread type
28. Drain screw M10
29. Drain plug
30. O-ring 136. 5X3. 3
31. Y ring
33. Sleeve for support diffuser
34. Mechanical seal
36. Air vent plug
37. O-ring16X2.8
38. Air vent screw
39. Bolt, washer
40. Motor
47. Impeller sleeve 9.6X12.6
47a. Bearing
49. Impeller
50a. Top diffuser
51. Shaft
55. Cylinder
60. Corrugated spring
63. O-ring retainer

Drawing 1-B VM5



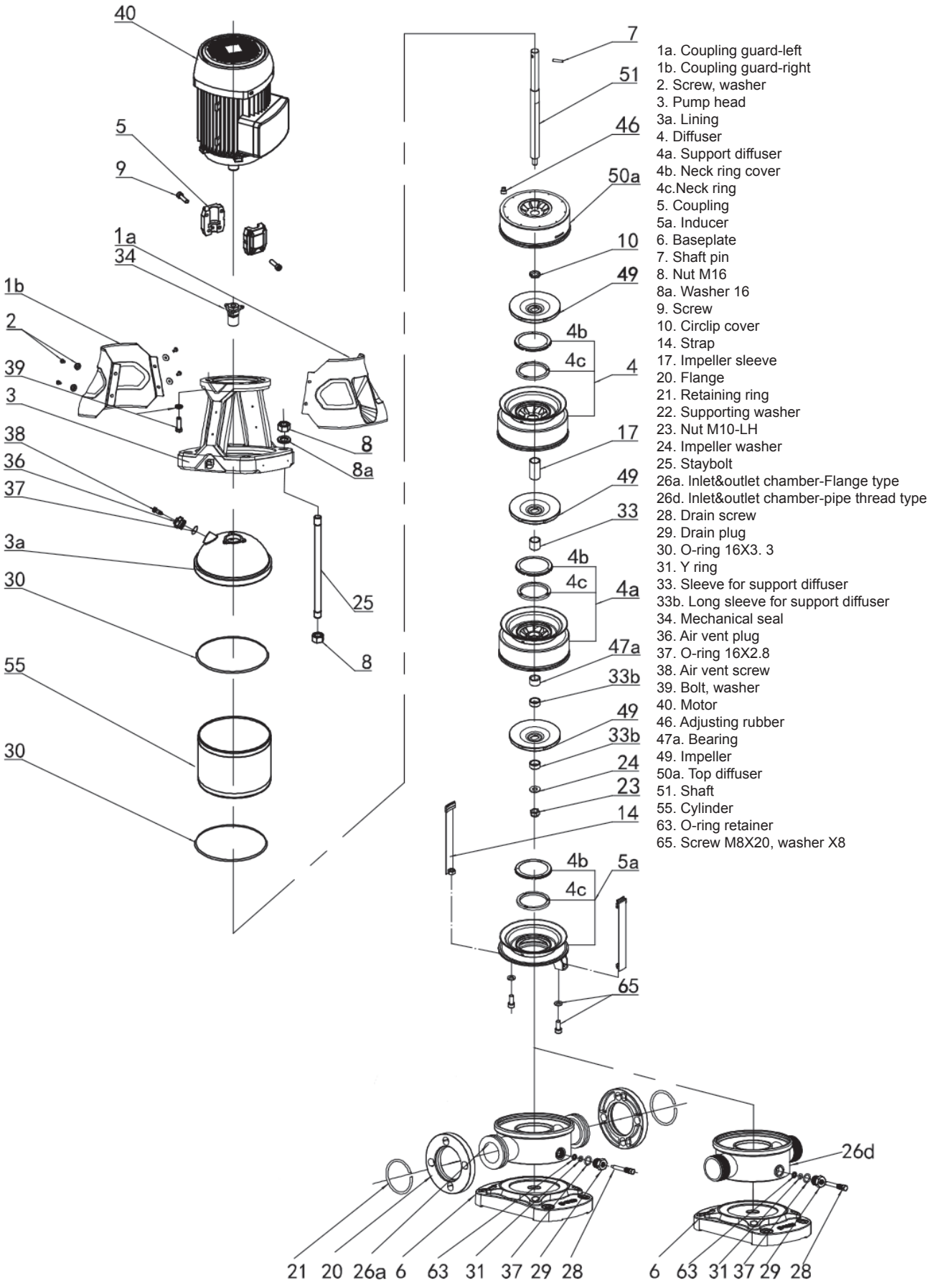
1a. Coupling guard-left
1b. Coupling guard-right
2. Screw, washer
3. Pump head
3a. Lining
4. Diffuser
4a. Support diffuser
4b. Neck ring cover
4c.Neck ring
5. Coupling
5a. Inducer
6. Baseplate-Flange type
6a. Baseplate-cutting ferrule type
7. Shaft pin
8. Nut M12
8a. Washer 12
9. Screw
10. Circlip cover
20. Flange
21. Retaining ring
22. Supporting washer
23. Nut M8-LH
24. Impeller washer
25. Staybolt
26a. Inlet&outlet chamber-Flange type
26d. Inlet&outlet chamber-pipe thread type
28. Drain screw M10
29. Drain plug
30. O-ring 136. 5X3. 3
31. Y ring
33. Sleeve for support diffuser
34. Mechanical seal
36. Air vent plug
37. O-ring16X2.8
38. Air vent screw
39. Bolt, washer
40. Motor
47. Impeller sleeve 9.6X12.6
47a. Bearing
49. Impeller
50a. Top diffuser
51. Shaft
55. Cylinder
60. Corrugated spring
63. O-ring retainer

Drawing 1-C VM10



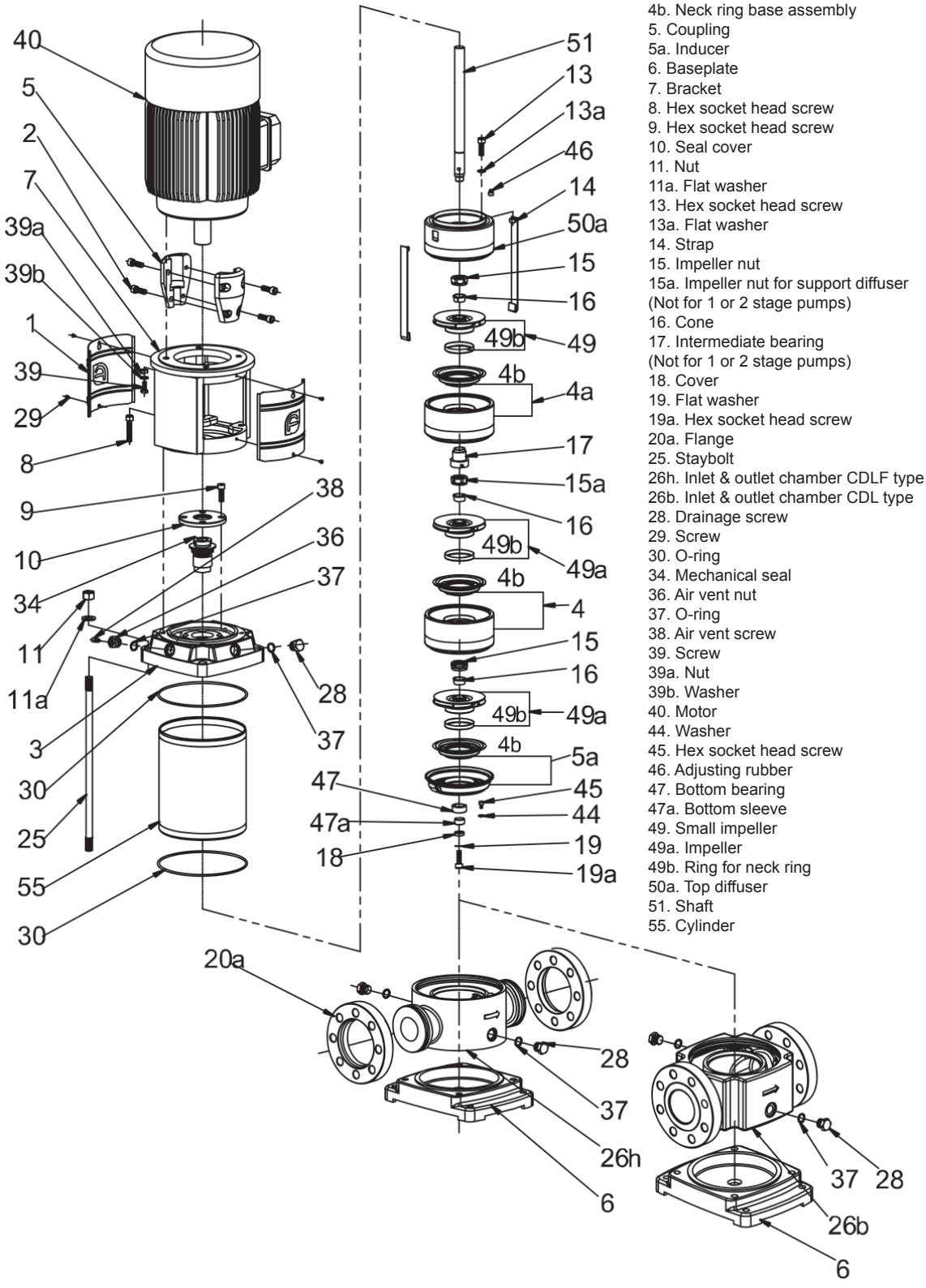
1a. Coupling guard-left
1b. Coupling guard-right
2. Screw, washer
3. Pump head
3a. Lining
4. Diffuser
4a. Support diffuser
4b. Neck ring cover
4c.Neck ring
5. Coupling
5a. Inducer
6. Baseplate
7. Shaft pin
8. Nut M16
8a. Washer 16
9. Screw
10. Circlip cover
14. Strap
17. Impeller sleeve 29X17.4
20. Flange
21. Retaining ring
22. Supporting washer
23. Nut M10-LH
24. Impeller washer
25. Staybolt
26a. Inlet&outlet chamber-Flange type
26d. Inlet&outlet chamber-pipe thread type
28. Drain screw
29. Drain plug
30. O-ring 15X3. 3
31. Y ring
33. Sleeve for support diffuser
34. Mechanical seal
36. Air vent plug
37. O-ring 16X2.8
38. Air vent screw
39. Bolt, washer
40. Motor
46. Adjusting rubber
47a. Bearing
49. Impeller
50a. Top diffuser
51. Shaft
55. Cylinder
60. Corrugated spring
63. O-ring retainer
65. Screw M8X20

Drawing 1-D VM15,20



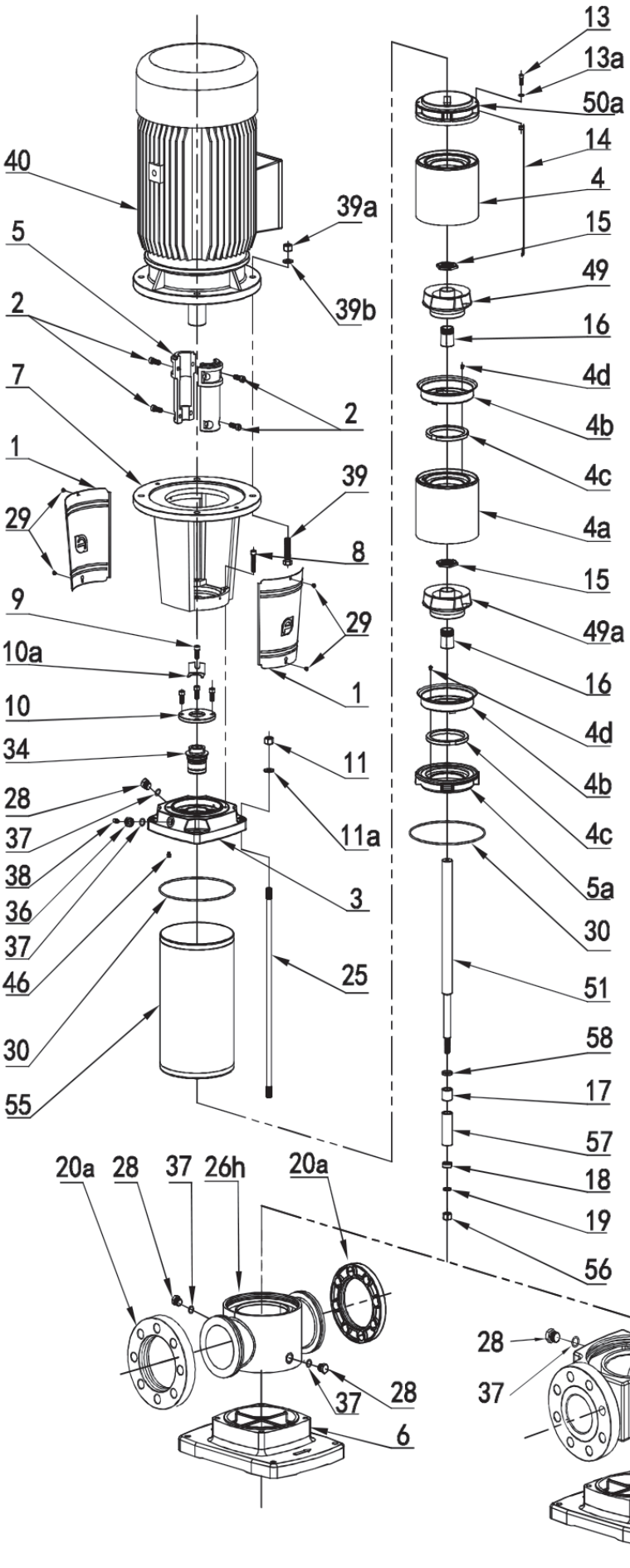
1a. Coupling guard-left
1b. Coupling guard-right
2. Screw, washer
3. Pump head
3a. Lining
4. Diffuser
4a. Support diffuser
4b. Neck ring cover
4c.Neck ring
5. Coupling
5a. Inducer
6. Baseplate
7. Shaft pin
8. Nut M16
8a. Washer 16
9. Screw
10. Circlip cover
14. Strap
17. Impeller sleeve
20. Flange
21. Retaining ring
22. Supporting washer
23. Nut M10-LH
24. Impeller washer
25. Staybolt
26a. Inlet&outlet chamber-Flange type
26d. Inlet&outlet chamber-pipe thread type
28. Drain screw
29. Drain plug
30. O-ring 16X3. 3
31. Y ring
33. Sleeve for support diffuser
33b. Long sleeve for support diffuser
34. Mechanical seal
36. Air vent plug
37. O-ring 16X2.8
38. Air vent screw
39. Bolt, washer
40. Motor
46. Adjusting rubber
47a. Bearing
49. Impeller
50a. Top diffuser
51. Shaft
55. Cylinder
63. O-ring retainer
65. Screw M8X20, washer X8

Drawing 1-E VM32,42,65,90



1. Coupling guard
2. Hex socket head screw
3. Pump head
4. Diffuser (Not for 1 stage pump)
4a. Support diffuser (Not for 1 or 2 stage pumps)
4b. Neck ring base assembly
5. Coupling
5a. Inducer
6. Baseplate
7. Bracket
8. Hex socket head screw
9. Hex socket head screw
10. Seal cover
11. Nut
11a. Flat washer
13. Hex socket head screw
13a. Flat washer
14. Strap
15. Impeller nut
15a. Impeller nut for support diffuser
(Not for 1 or 2 stage pumps)
16. Cone
17. Intermediate bearing
(Not for 1 or 2 stage pumps)
18. Cover
19. Flat washer
19a. Hex socket head screw
20a. Flange
25. Staybolt
26h. Inlet & outlet chamber CDLF type
26b. Inlet & outlet chamber CDL type
28. Drainage screw
29. Screw
30. O-ring
34. Mechanical seal
36. Air vent nut
37. O-ring
38. Air vent screw
39. Screw
39a. Nut
39b. Washer
40. Motor
44. Washer
45. Hex socket head screw
46. Adjusting rubber
47. Bottom bearing
47a. Bottom sleeve
49. Small impeller
49a. Impeller
49b. Ring for neck ring
50a. Top diffuser
51. Shaft
55. Cylinder

Drawing 1-F VM120,150,200



1. Coupling guard
2. Hex socket head screw
3. Pump head
4. Diffuser (Not for 1 stage pump)
4a. Support diffuser (Not for 1 or 2 stage pumps)
4b. Neck ring cover
4c. Neck ring
4d. Screw
5. Coupling
5a. Inducer
6. Baseplate
7. Bracket
8. Hex socket head screw
9. Hex socket head screw
10. Seal cover
11. Nut
11a. Flat washer
13. Socket hex cap screw
13a. Flat washer
14. Strap
15. Impeller nut
16. Impeller shaft sleeve
17. Shaft sleeve
18. Cover
19. Washer 14
20a. Flange
25. Staybolt
26h. Inlet & outlet chamber CDLF type
26b. Inlet & outlet chamber CDL type
28. Drainage gag
29. Screw
30. O-ring
34. Mechanical seal
36. Air vent nut
37. O-ring
38. Air vent screw
39. Screw
39a. Nut
39b. Washer
40. Motor
46. Adjusting rubber
49. Small impeller
49a. Impeller
49b. Ring for neck ring
50a. Top diffuser
51. Shaft
55. Cylinder
56. Fasten screw
57. Inlet impeller sleeve
58. Washer

4. INSTALLATION INSTRUCTIONS

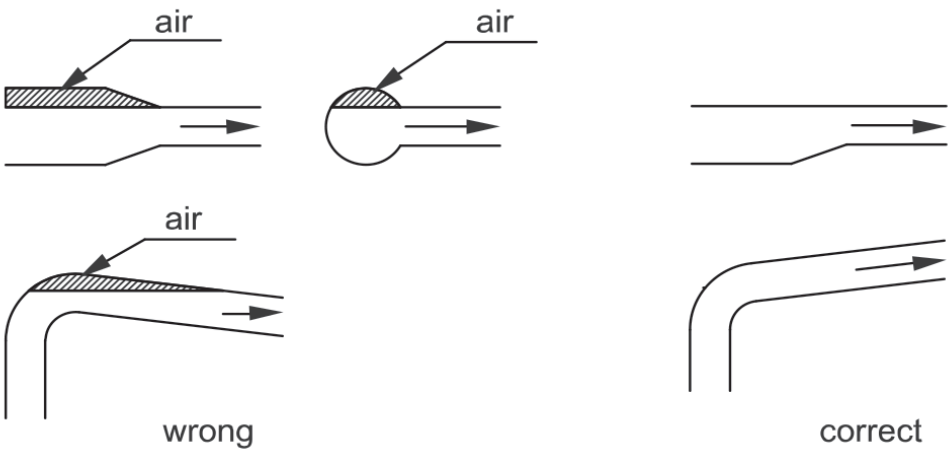
4.1 Installation reminder

- Pump shall be installed in a well-ventilated and frost free place. It shall be kept at least 150mm from enclosure walls, in order for motor fan cooling.
- To keep inlet wear to a minimum please try to use the shortest inlet pipework as possible.
- A check valve must be installed on the discharge pipelines.
- Please install you Davey VMC pump on a solid, flat and level base to minimise any operational movement. Please ensure all pipe work is supported as not to place undue stress on the pump / pipe connections.

When installing the pump, the motor must not be installed upside down.

- The mark on the inlet and outlet chamber indicates the liquid flowing direction, before startup, check the flow direction is correct direction.
- Install the pipes so that air locks do not occur, especially on the suction side of the pump. See drawing 2.

Drawing 2



4.2 Electrical connection

- The electrical connection should be carried out by an authorized electrician in accordance with local regulations.
- The operating voltage and frequency are marked on the motor nameplate. Make sure that the motor is suitable for the electricity supply on which it will be used and the motor terminal connection is correct. You will find a wiring diagram in the terminal box.
- The motor must be fitted with starting protection, to prevent unstable voltage or overload, The motor shall be earthed well.

Before removing the terminal box cover and before removing/dismantling the pump, make sure that the electricity supply has been switched off.

5. STARTING AND MAINTENANCE

Before starting, read the warning sticker carefully on the pump sleeve.

Before commencing any works on the pump please ensure the system pressure has been relieved and the pump has been isolated from flow.

Before removing the terminal box cover and before removing/dismantling the pump, make sure that the electricity supply has been switched off.

1. Do not start the pump until it has been filled with liquid .
   - Positive suction head installation:

     Close the valve on the discharge side of the pump and release the air vent screw, slowly open the valve on the suction side. Tighten the air vent screw when a steady stream of liquid runs out of it.
   - Negative suction head installation:

Attention: Must fit a check valve on the suction side.

Close the valve on the discharge side of the pump and release the air vent nut, inject liquid into the hole, Tighten the air vent nut when the pump and suction pipelines are full of liquid.

Pay attention to the direction of the air vent plug hole and take care to ensure that the escaping water does not cause injury to persons or damage to the motor or other components.

Pay special attention to the risk of injury caused by scalding hot water.

2. Check before start the pump:
   - Whether the foundation bolts is tightened;
   - Whether the voltage of power supply is normal;
   - Whether there is leakage of pipelines;
   - Whether the suction valve is fully open;
   - If fitted pressure gauge, check whether the pressure metering range is suitable;
   - Ensure pressure gauges are of suitable range for the pump size.
3. Check rotating direction

   Briefly switch on the power. supply and view the rotary direction by viewing the motor fan. Arrow on the pump head indicates the correct direction of rotation.That is, from the motor end, pump shall run counter-clockwise. If direction is not correct swap power supply and briefly try again.
4. Frequency of starts and stops

   Pump can not be started and stopped frequently. For motor power

   ≤4kW, starting times shall more than 100 times per hour; for motor power
   >4kW, starting times shall not be more than 20 times per hour.
5. Please ensure the pump used is suitable for the application used, as incorrect application may result in over heating.
6. Frost protection

   Measures to provide frost protection should be taken when ambient temperature is less than 0°C. Pumps which are not being used should be drained to avoid damage from freezing.
7. Regularly check pump for the following:
   - Whether pump operation pressure is in the required range
   - Whether there is leakage of pump and pipelines
   - That motor is in operating temperature
   - Clean/replace strainer
8. Pump shall be cleaned and stored appropriately when it is not used for a long time.

6. DISMANTLING AND ASSEMBLY

1. Summary

If it is necessary to dismantle the pump because of failure, please follow the instructions below.

Refer to drawing 1 to see pump structure.

1.1 Before dismantling

- Disconnect the electricity supply to the motor.
- Relieve system pressure and isolate flow
- Close the valve to avoid fluid outflow of pump.
- Note the centre of gravity of the pump to prevent it from overturning

1.2 Before assembly

- Clean and check all parts.
- Replace defective parts with new parts.

1.3 During assembly

- Tighten fasteners to required torque as stated in table 2.

Table 2 – Fastener torques

Pos.	Name	Dim.	Quantity	Torque(N-m)
9	Screw	M6	4	23-25
		M8		45-50
		M10		80-85
		M16		100-110
8	Nut	M12	4	45-50
		M16		95-100
		M20		110-120
23	Nut	M8LH	1	25-30
		M10LH		30-35
		M14LH		70-75
		M16LH		80-90
19a	Screw	M8LH	1	25-30

1.4 After assembly

- Turn the coupling by hand, it should be free.
- Connect the pump with pipelines, test it, it should run well.

2. Motor

2.1 Dismantling

- Remove the screws (pos. 2) together with the coupling guard (pos. 1a, 1b).
- Remove the screws (pos. 9) together with the coupling halves (pos. 5) and the shaft pin (pos. 7 VM32-VM200 Without this part).
- Remove the motor bolts (pos. 39).
- Pull the motor off the pump head (pos. 3 VM1-VM20) or Bracket (pos.7, VM32-VM200).

2.2 Assembly

- Reverse steps 2.1 to assemble motor.
- Check that the gaps of either side of the coupling halves are equal.
- Tighten the screws(pos. 9) symmetrical and evenly by required torque as per table 2.

3. Mechanical seal

3.1 Dismantling

3.1.1 VM1,3,5,10,15,20

- Remove the motor (Power > 4kW) and the coupling. See 2.1 Dismantling.
- Slacken the three screws of mechanical seal (pos. 34) by approximately a quarter turn so that the mechanical seal is just free of the shaft (pos.51).
- Pull the mechanical seal off the pump head (pos.3) or lining (pos.3a)

3.1.2 VM32-VM200

- Remove the motor(no need for power >5.5kw) and coupling, refer to 2.1 dismantling.
- Remove seal cover(pos.10) and four screws (pos.11).
- Slacken 3 screws of mechanical seals(pos.34) by about a quarter turn to make the mechanical seal fall off the shaft (pos.51).
- Remove mechanical seal from pump head (pos.3)

3.2 Assembly

3.2.1 VM1,3,5,10,15,20

- Moisten the shaft end with soapy water.
- Press mechanical seal down on the shaft. Screw the mechanical seal into the pump head or lining and tighten it.
- Fit the motor to the pump head.
- Tighten the bolts (pos.39) symmetrically.
- Fit the shaft pin (pos. 7) into the shaft pin hole and fit the coupling halves (pos. 5) on the shaft. Tighten the screws (pos.9) in coupling (but not tightly). Check that the gaps of either side of the coupling halves are equal.
- Insert a suitable screwdriver between the top of the coupling and the pump head, and press the shaft/coupling down against stop. Then Insert the screwdriver between the bottom of the coupling and the mechanical seal, raise the shaft/the coupling to 1.5mm.
- Hold the shaft/the coupling in this position and tighten the four screws in the coupling (pos. 9) by the required torque as per Table 2.
- Tighten the three screws of mechanical seal.
- Fit the coupling guard (pos. 1a, 1b) and fasten the screws (pos. 2).

3.2.2 VM32-VM200

- Moisten the shaft end with soap water.
- Press mechanical seal down on to the shaft, put it into pump head (pos. 3), tighten screw (pos.11) and three screws of mechanical seal. Then lift the shaft and insert shaft height setting tool (pos.10a).
- Fit the motor to the pump head.
- Tighten the bolts (pos.39) symmetrically.
- Fit the coupling (pos.5) to the shaft. Tighten four screws(pos.9) in coupling to torque required in Table 2. (make sure distance of either side of coupling halves are equal)
- Remove shaft height setting tool (pos.10a).
- Fit the coupling guard (pos.1) and tighten screws (pos.2).

4. Dismantling and assembly of bare shaft pump without motor

4.1 Dismantling

4.1.1 VM1,3,5,10,15,20

- Remove the shaft seal. See 3.1 Dismantling.
- Remove the screws together with the washers (pas. 8).
- Loosen the pump head (pas. 3) with a light blow on the edge and lift it.
- Remove lining (pos 3a)
- Remove top diffuser(pos. 50a) (Not for VM10,15,20)
- Remove the cylinder(pos. 55)
- Lift the diffuser stack off the inlet & outlet chamber (pos.26) .
- Remove inducer (pos. 5a)(Not for VM10,15,20)

4.1.2 VM32,42,65,90

- Remove mechanical sea, refer to 3.1 dismantling.
- Remove screws (pos.12).
- Remove bracket (pos.7)
- Remove nut and washer(pos.8 8a)
- Remove pump head (pos.3) by tapping at the edge of it.
- Remove cylinder (pos.55).
- Lift the diffuser stacks from inlet and outlet chamber (pos.26).

4.1.3 VM120,150,200

- Remove mechanical sea,refer to 3.1 dismantling.
- Remove screws (pos.12 no this step for power >45kw pumps)
- Remove nut and washer (pos.8, Ba, no this step for power: 545kw pumps).
- Remove bracket (pos.7)
- Remove nut and washer (pos.88a)
- Remove pump head(pos.3) by tapping at the edge of it.
- Remove cylinder (pos.55).
- Lift the diffuser stacks from inlet and outlet chamber(pos.26).

4.2 Assembly

- Reserve the steps of 4.1 to assemble pump body.
- Lubricate O-ring (pos.30) by edible oil or soap water.
- Direction of air vent nut(pos.36) shall be same with drain plug (pos.29) of inlet and outlet chamber (used for VM1-20);
- Direction of air vent nut (pos.36) shall be same with the inlet of inlet and outlet chamber (used for VM32-200)
- Tighten screws (pos.8) symmetrically by torque required in Table 2.

5. Diffuser stack for model

5.1 Dismantling and assembly of diffuser stack for model VM1,3,5

5.1.1 Dismantling

- Remove the diffuser stack. See 4.1 Dismantling
- Insert a suitable screwdriver in the shaft (pos.51) pin hole to prevent it turning. Remove nut (pos.23), impeller washer (pos.24)
- Remove the diffuser stack components: impeller (pos.49), diffuser (pos. 4), bearing (pos.47a), impeller sleeve(pos.47), support diffuser (pos.4a). See drawing 5-A, 5-B.

5.1.2 Assembly

- Reverse steps of 5.1 to assemble diffuser stack.
- Fit the components on the shaft. See drawing 5-A, 5-B Order of assembly for diffusers and impellers.
- Tighten the nuts (pas. 23) by the required torque as Table 2 indicated.

5.2 Dismantling and assembly of diffuser stack for model VM10, 15, 20

5.2.1 Dismantling

- Remove the diffuser stack. See 4.1 Dismantling
- Remove screw, washer (pos.65)
- Remove straps (pos.14), inducer (pos.5a)
- Insert a suitable screwdriver in the shaft (pos.51) pin hole to prevent it turning. Remove nut (pos.23), impeller washer (pos.24)
- Remove the diffuser stack components: impeller (pos.49), diffuser (pos. 4), bearing (pos.47a), support diffuser (pos.4a). See drawing 5-C, 5-D.

5.2.2 Assembly

- Reverse steps of 6.1 to assemble diffuser stack.
- Fit the components on the shaft. See drawing 5-C, 5-D
  Order of assembly for diffusers and impellers.
- Tighten the nuts (pos. 23) by the required torque as Table 2 indicated.

5.3 Dismantling and assembly of diffuser stack for VM32, 42, 65, 90

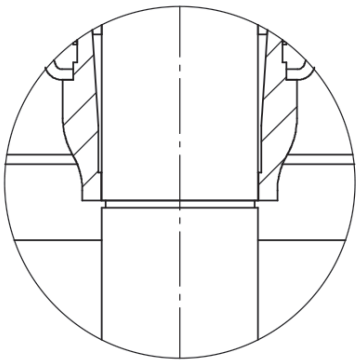
5.3.1 Dismantling

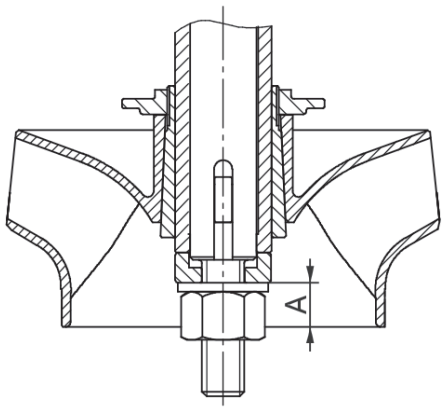
- Remove the diffuser stack.refer to 4.1 Dismantling.
- Remove screw and washer (pos.65).
- Remove straps (pos.14) inducer (pos.5a) and top diffuser (pos.50a)
- Remove impeller nut (pos.15), impeller sleeve (pos.16), impeller (pos.49, 49a), diffuser (pos.4), support nut(pos.15), sleeve(pos.17), support diffuser (pos.4a). Refer to Fig. 5-E, 5-F, 5-G and 5-H.

5.3.2 Assembly

- Reverse the steps of 5.3.1 to assemble diffuser stack.
- Fit the components by reffering to Fig. 5-E, 5-F, 5-G and 5-H.
- The position of the first impeller and shaft can refer to Fig.3.
- Tighten the screws (pos.19a) by the torque required in Table 2 (on following pages).

Drawing 3 & 4





5.4 Dismantling and assembly of diffuser stack for VM120, 150, 200

5.4.1 Dismantling

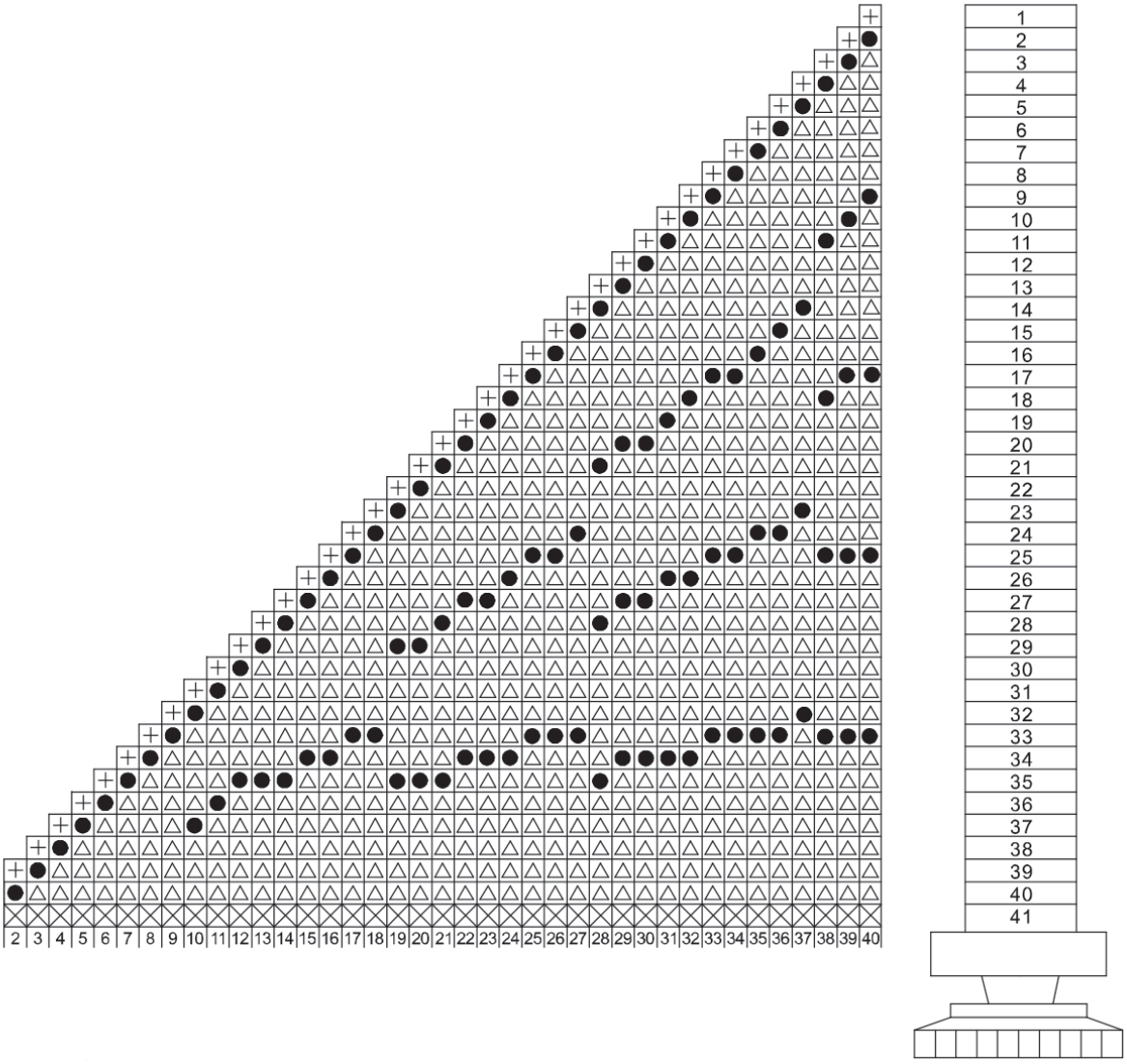
- Remove the diffuser stack.refer to 4.1 Dismantling.
- Remove screw and washer(pos.65).
- Remove straps (pos.14) and inducer (pos.5a)
- Remove top diffuser (pos.50a) diffuser (pos.4) impeller nut (pos.15) impeller (pos.49 49a) impeller sleeve(pos.16) support diffuser (pos.4a). Remove nut (pos.23) washer (pos.19) cover (pos.18) inlet impeller sle eve (pos.57) sleeve (pos.17) support washer (pos.58)

5.4.2 Assembly

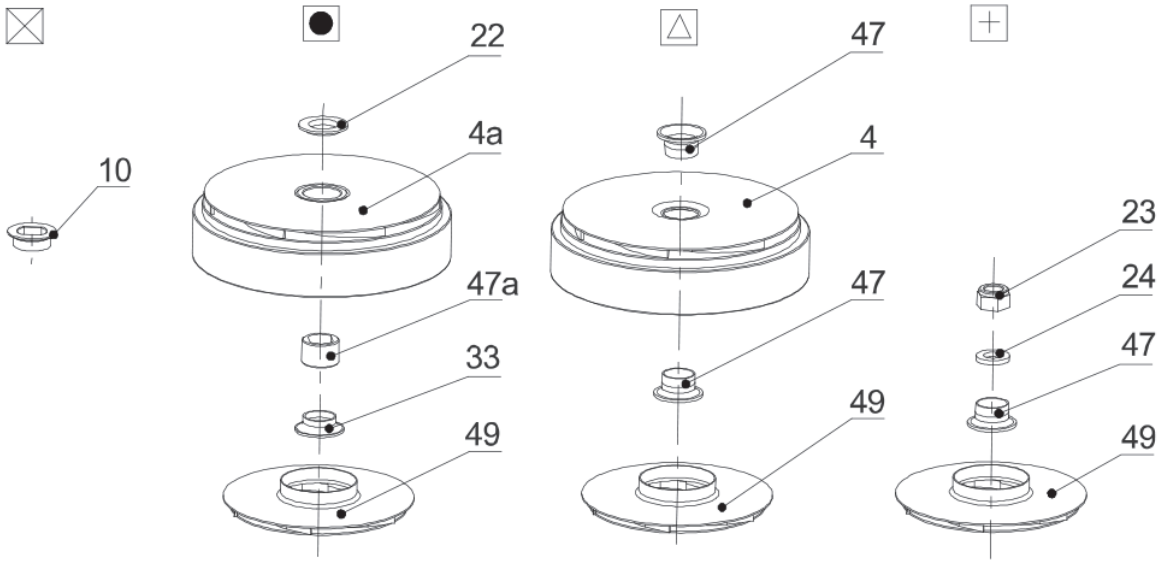
- Reverse the steps of 5.4.1 to assemble diffuser stack.
- The position of the first impeller and shaft can refer to Fig.4.
  Make sure dimension A is: 14.3mm for VM120, 150; 25.5mm for VM200
- For pumps with small impeller, fit them to the outlet end; for pump with two different size small impellers, fit the smaller one to the outlet end.

7. ORDER OF ASSEMBLY FOR DIFFUSERS AND IMPELLERS

1. See drawing 5-A for assembling order of VM1, 3.

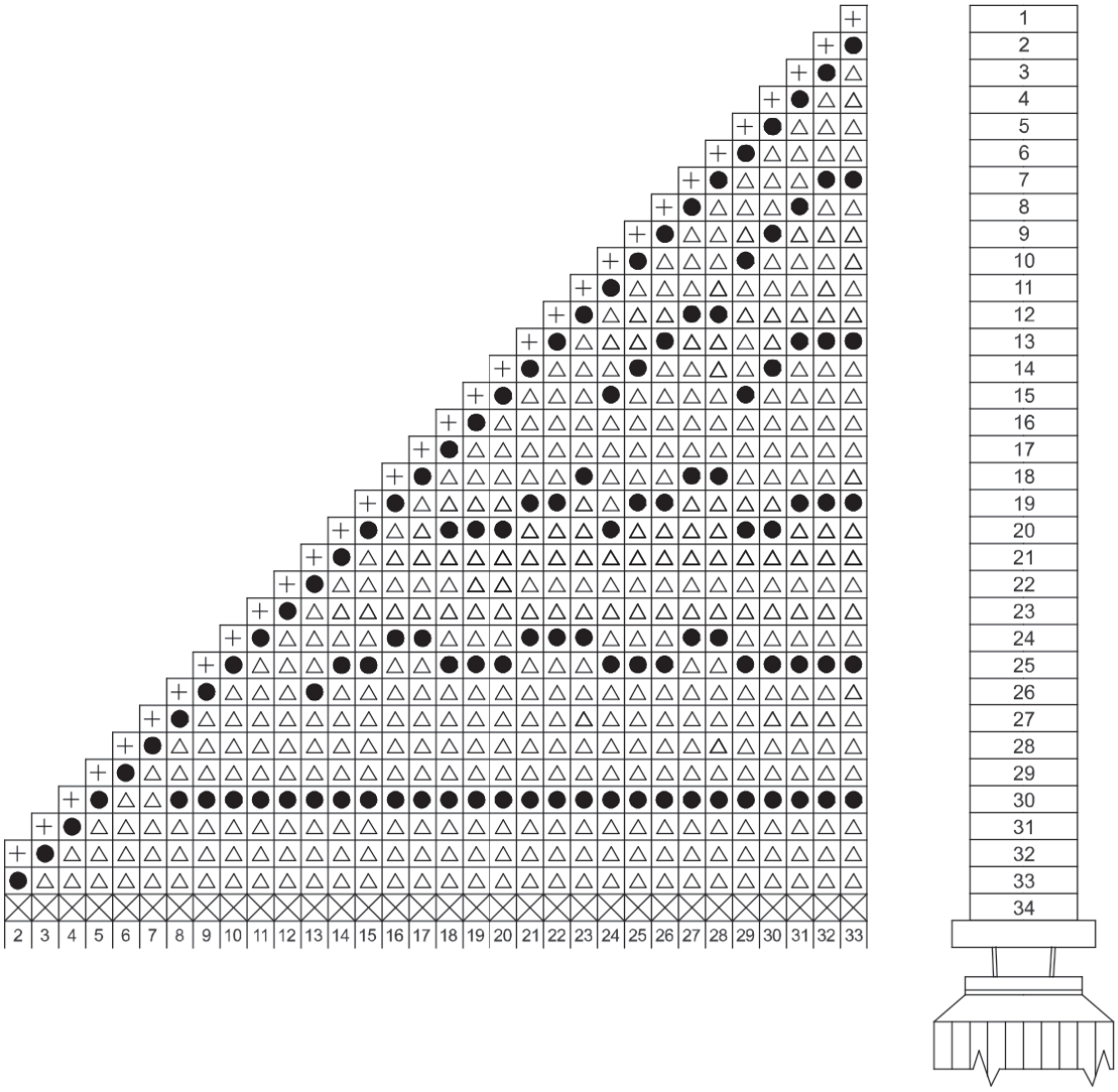


Symbol information

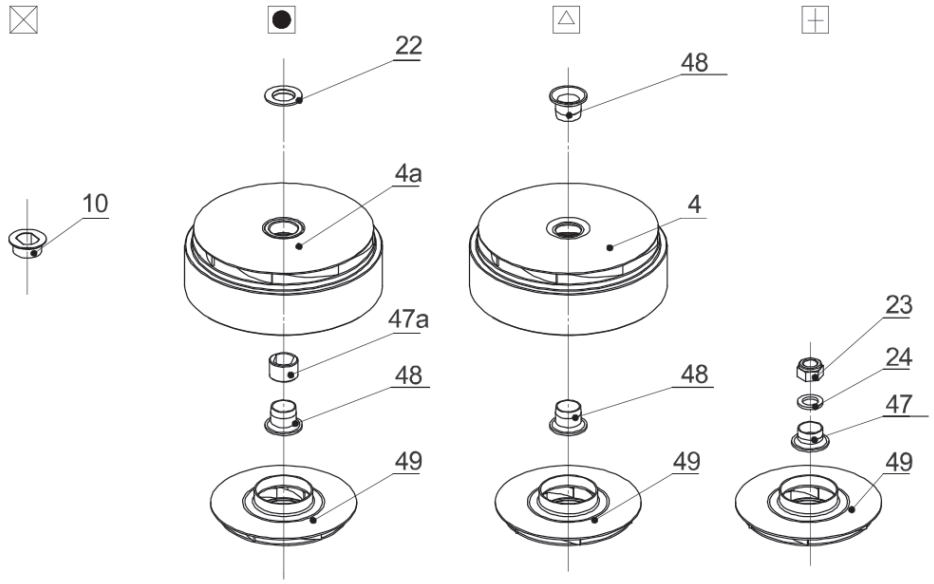


Drawing 5-A VM1, 3 assembling order.

2. See drawing 5-B for assembling order of VM5.

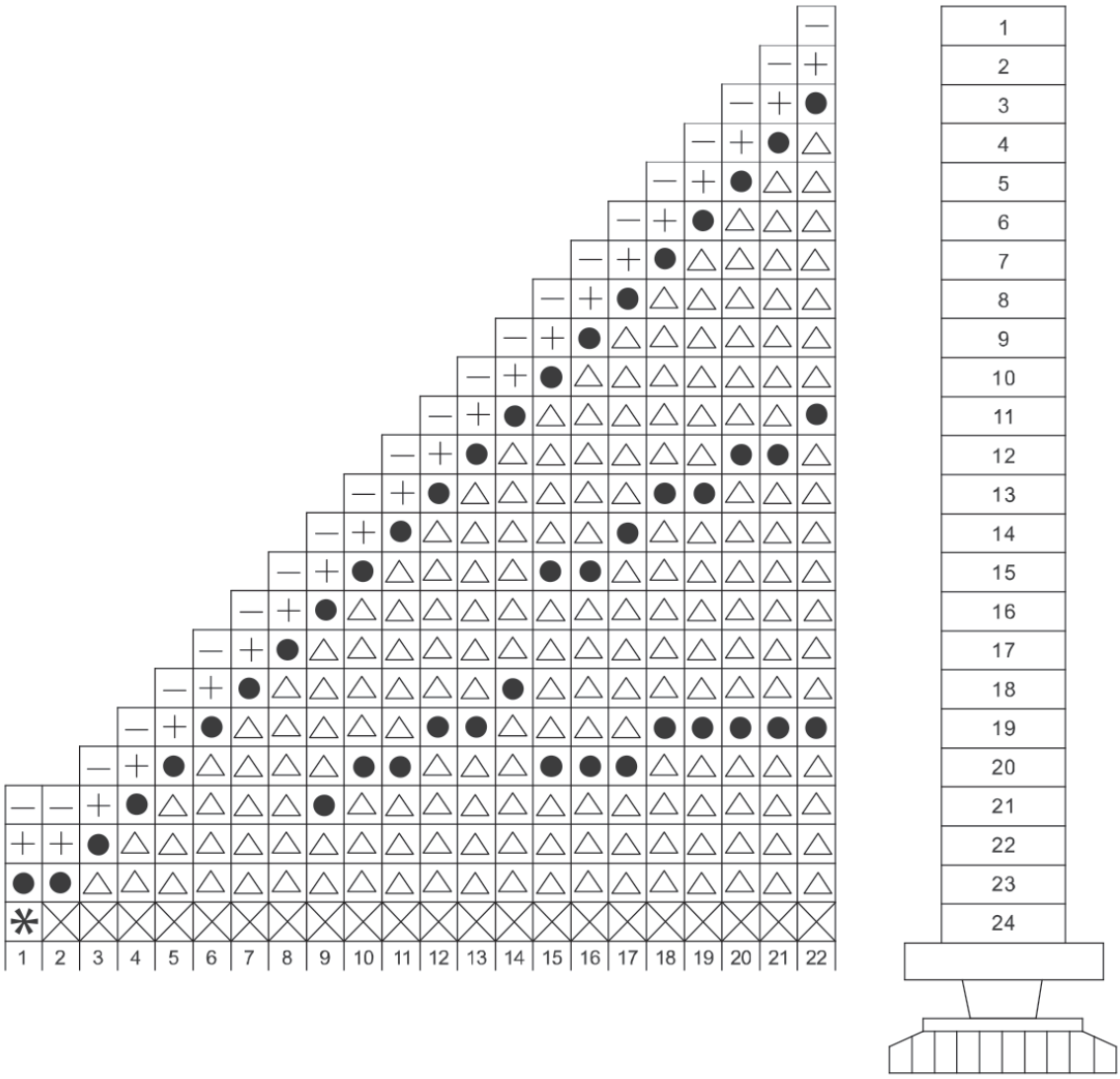


Symbol information

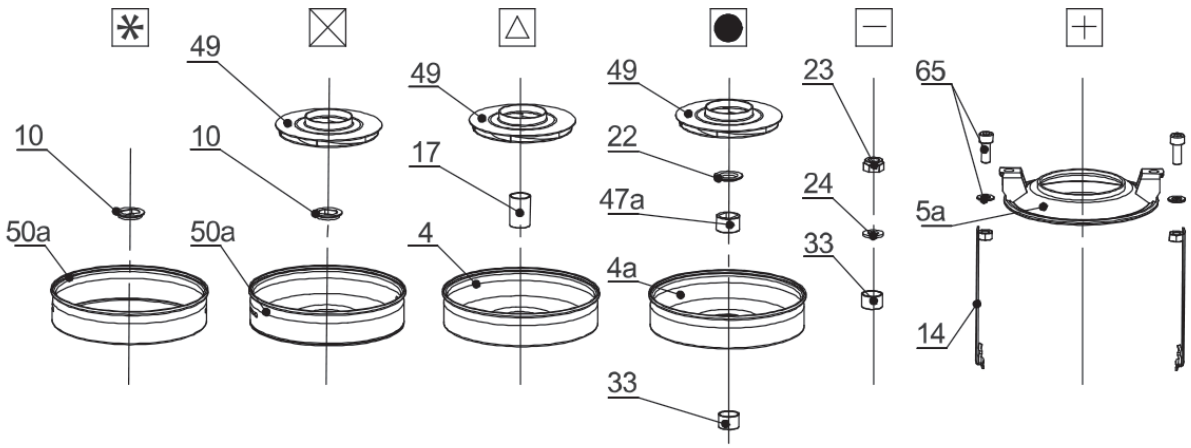


Drawing 5-B VM5 assembling order.

3. See drawing 5-C for assembling order of VM10.

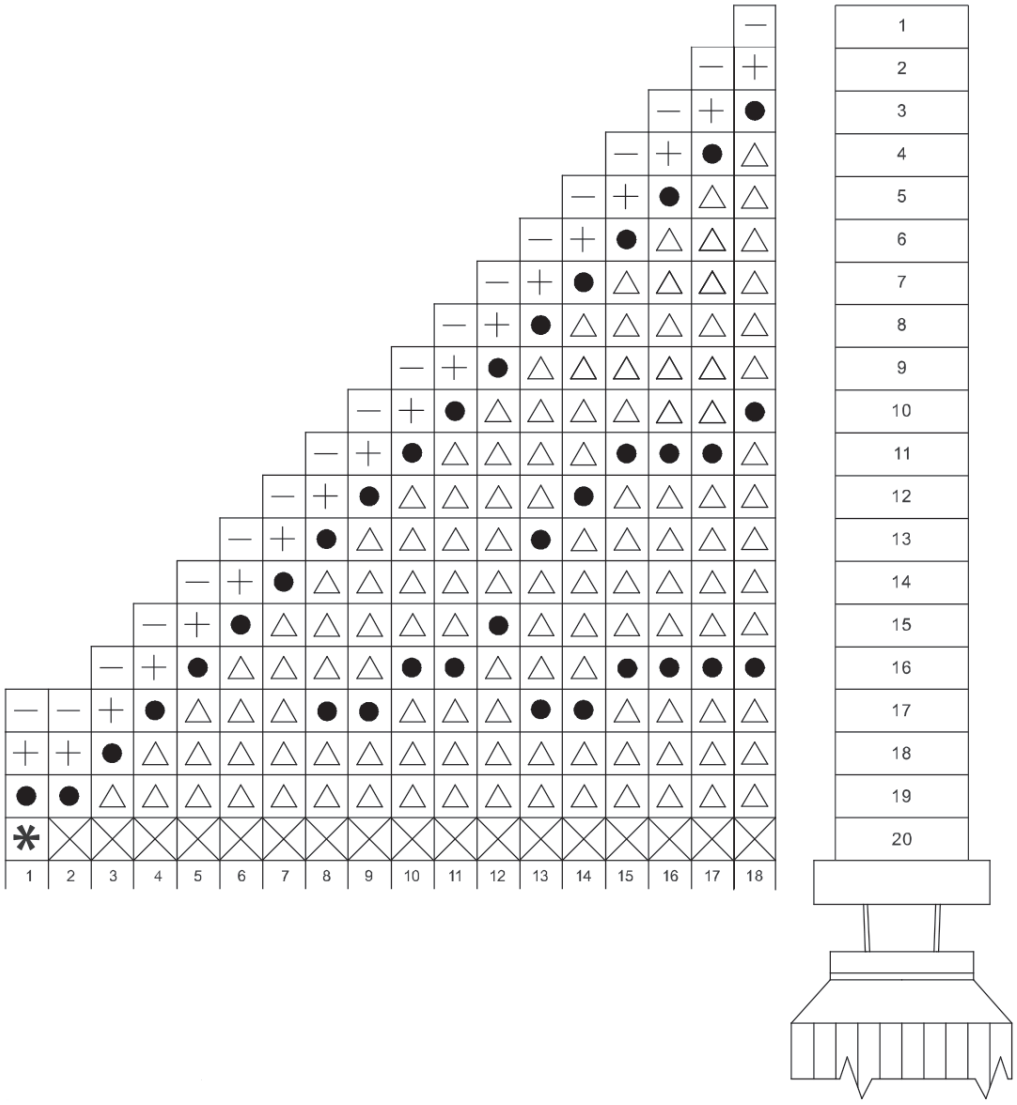


Symbol information

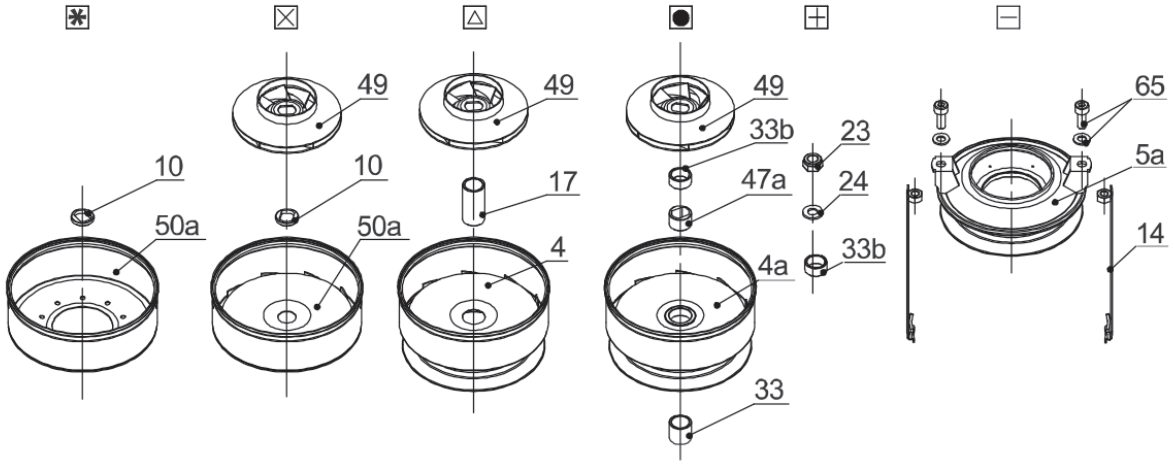


Drawing 5-C VM10 assembling order.

4. See drawing 5-D for assembling order of VM15, 20.

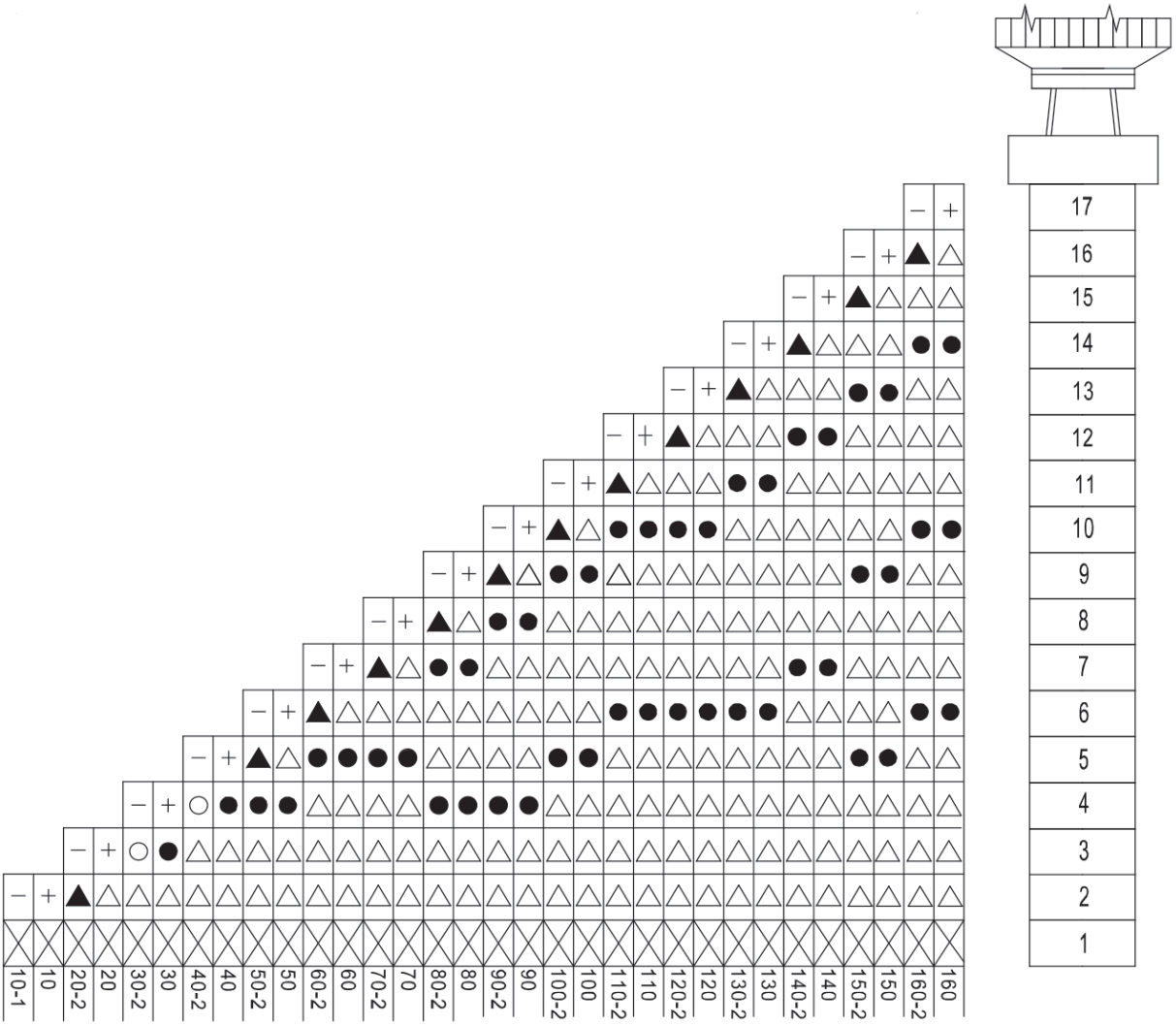


Symbol information

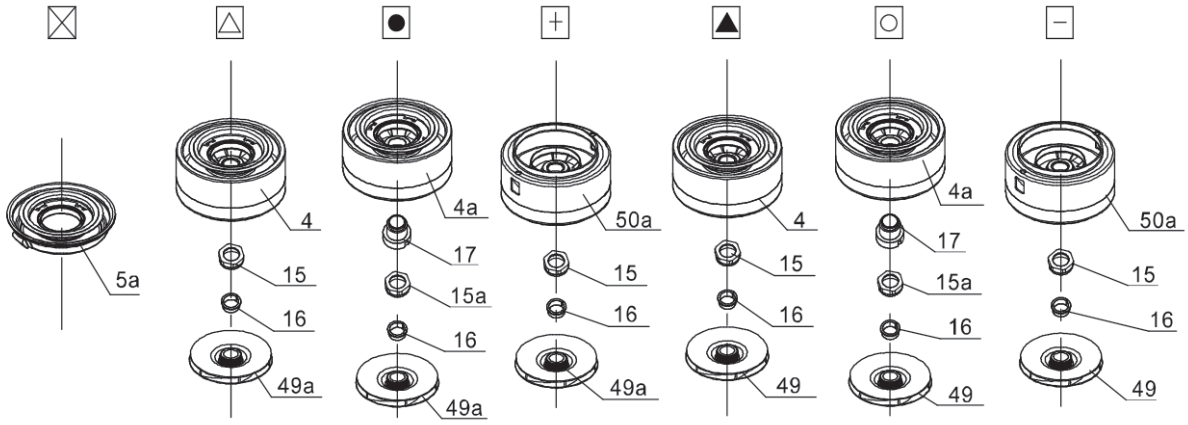


Drawing 5-D VM15, 20 assembling order.

5. See drawing 5-E for assembling order of VM32.

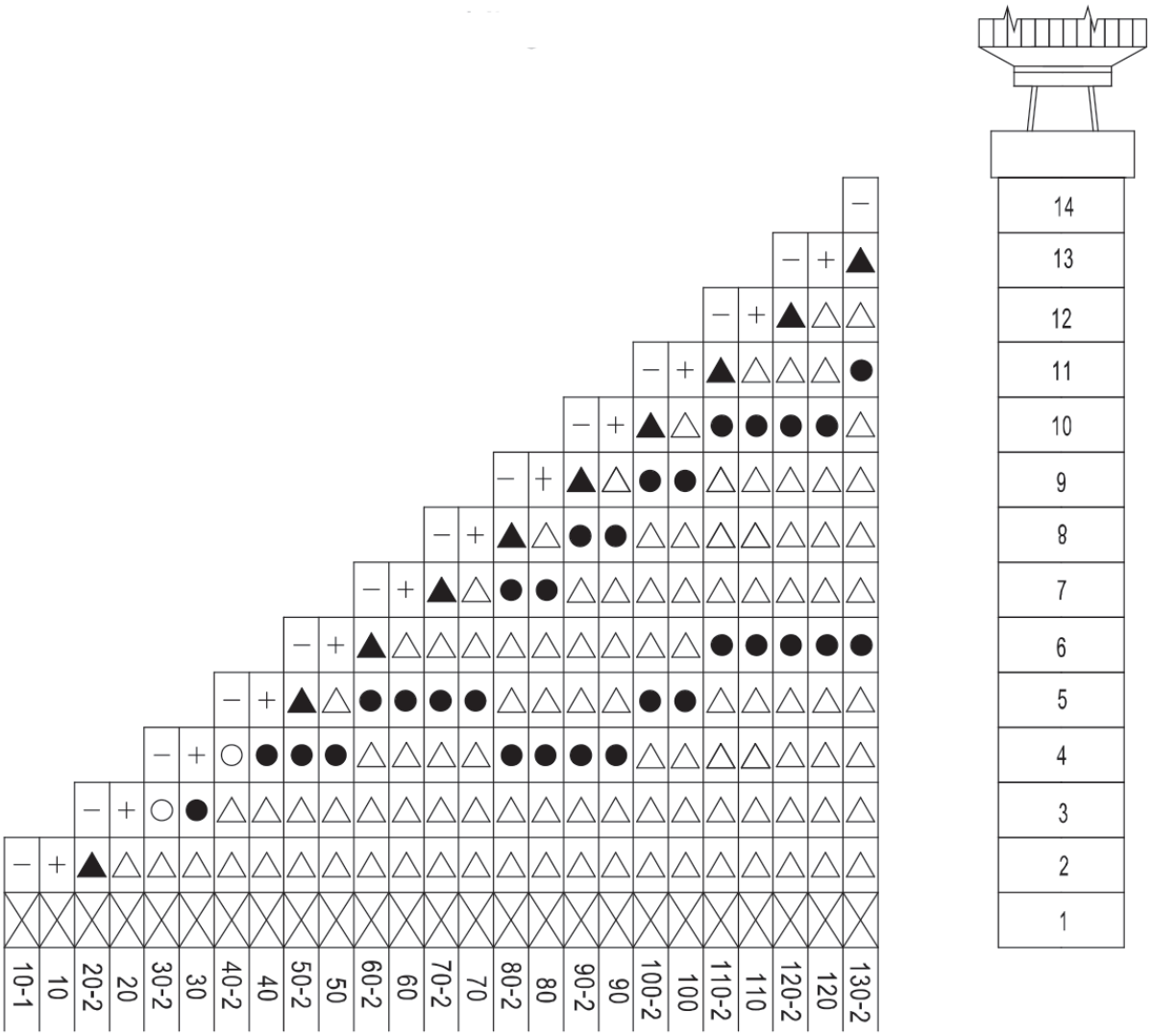


Symbol information

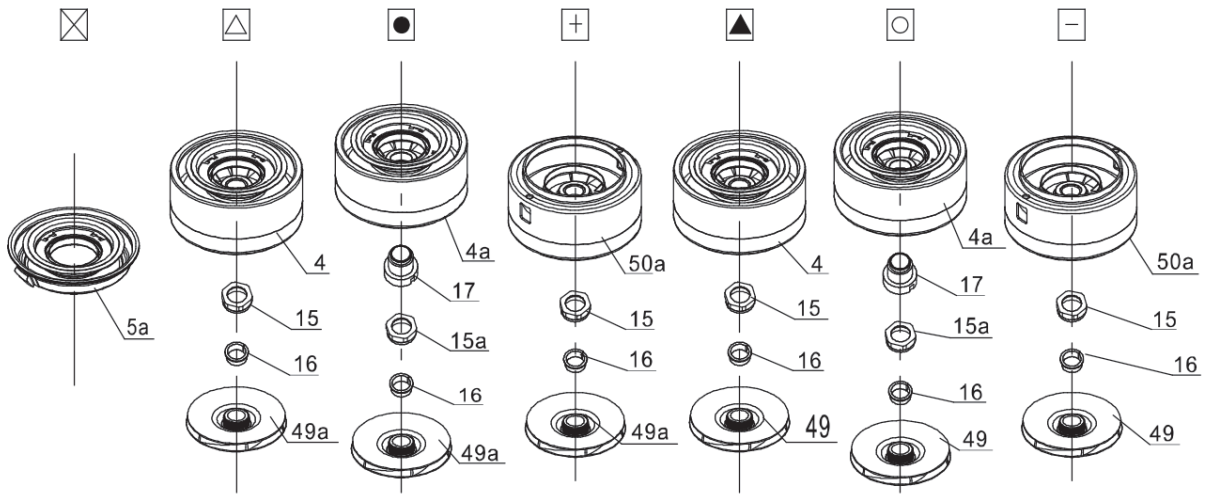


Drawing 5-E VM32 assembling order.

6. See drawing 5-F for assembling order of VM42.

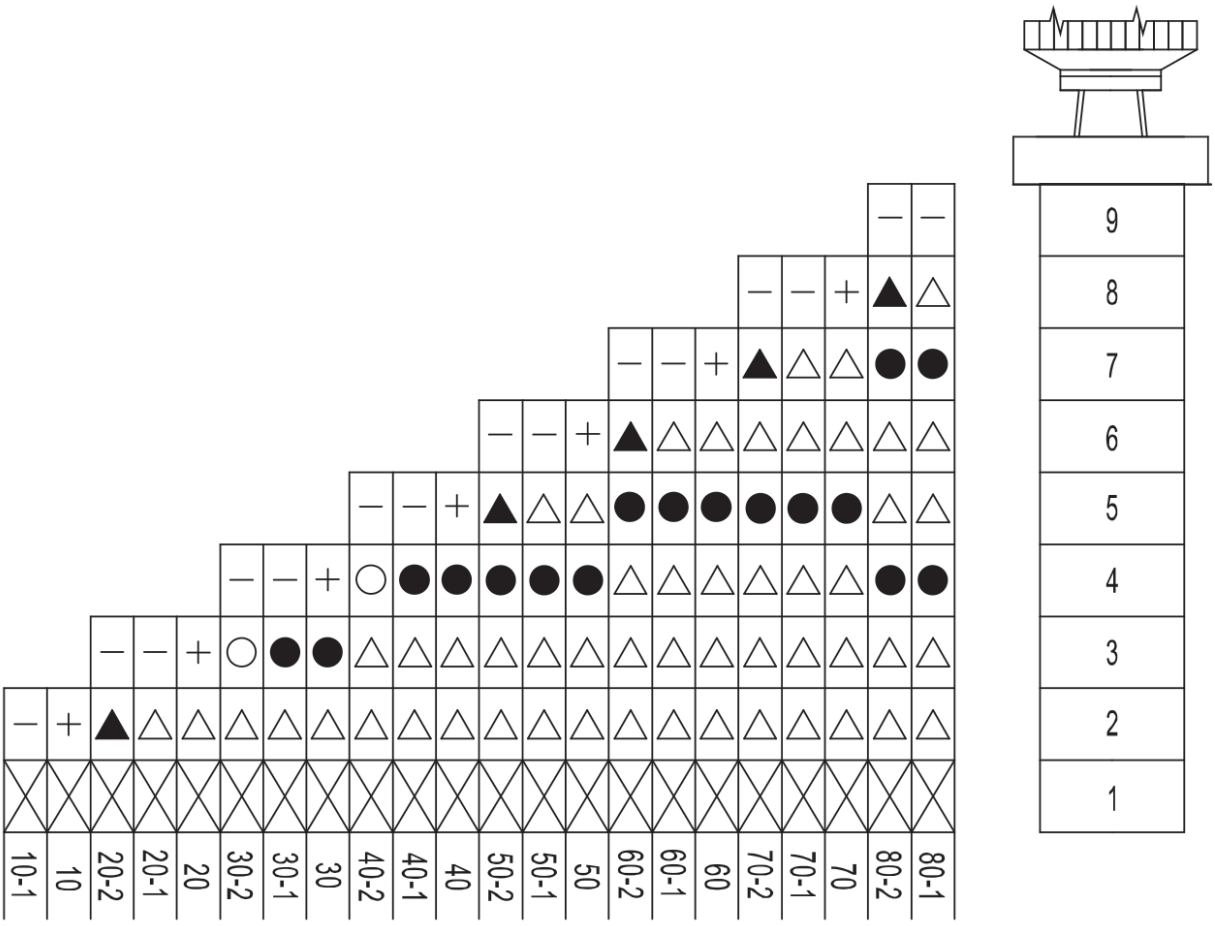


Symbol information

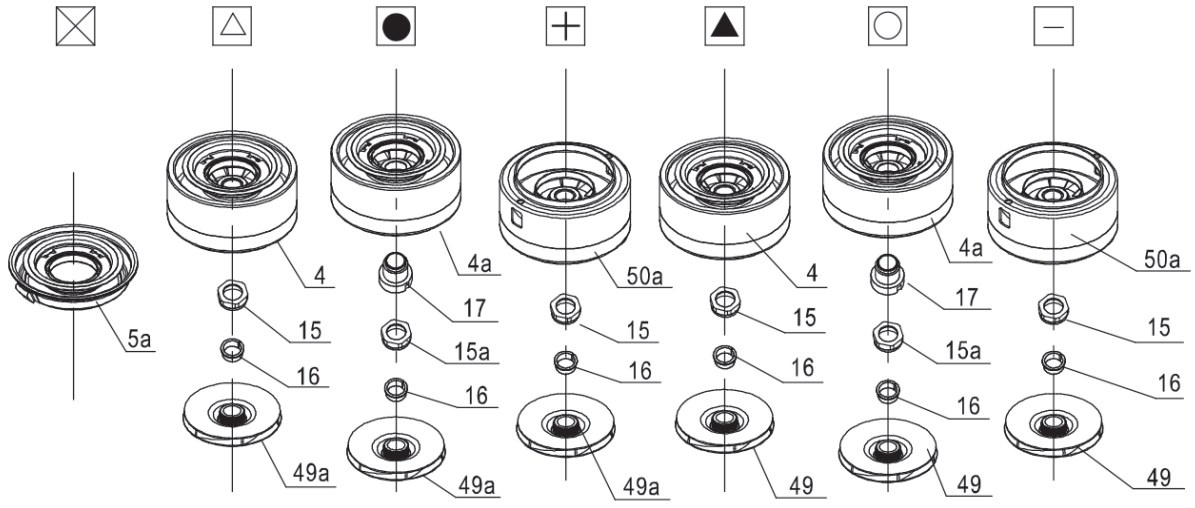


Drawing 5-F VM42 assembling order.

7. See drawing 5-G for assembling order of VM65.

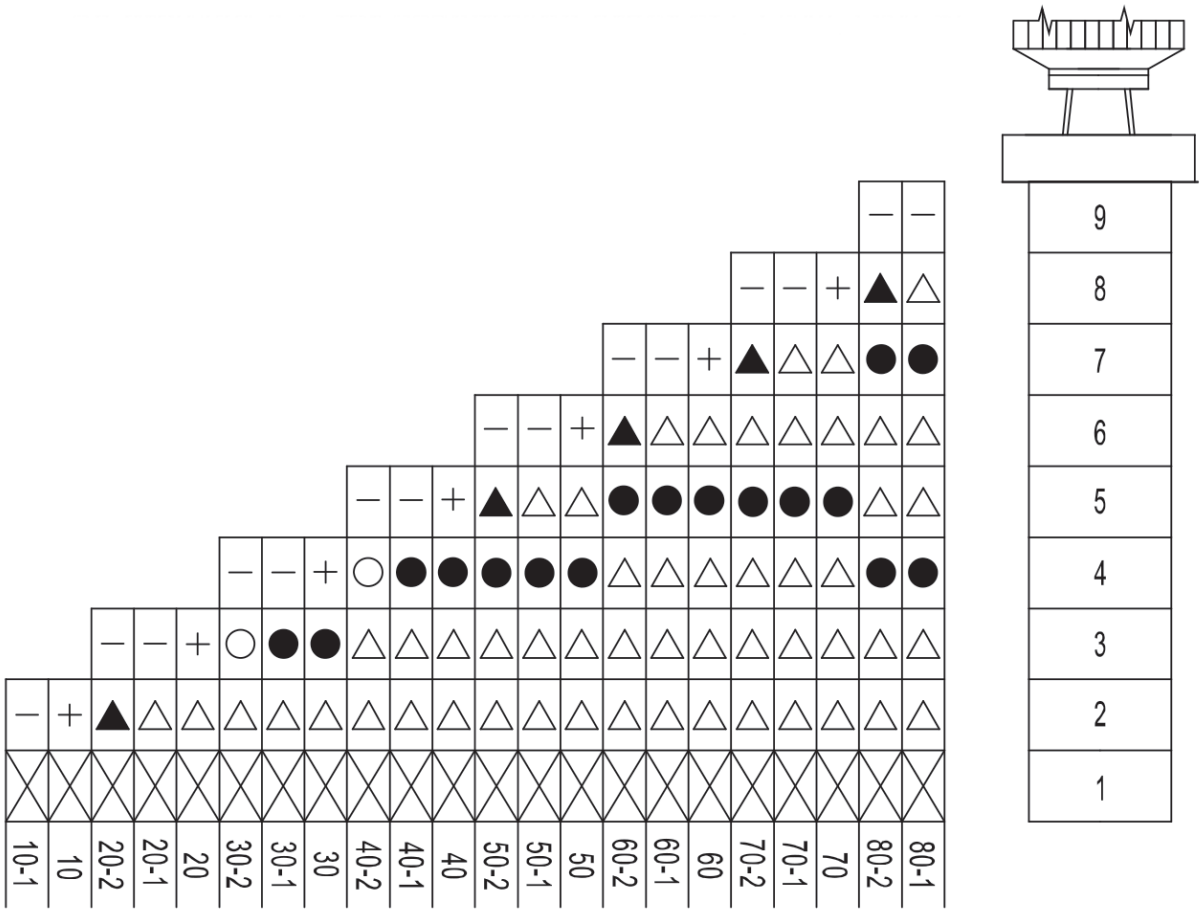


Symbol information

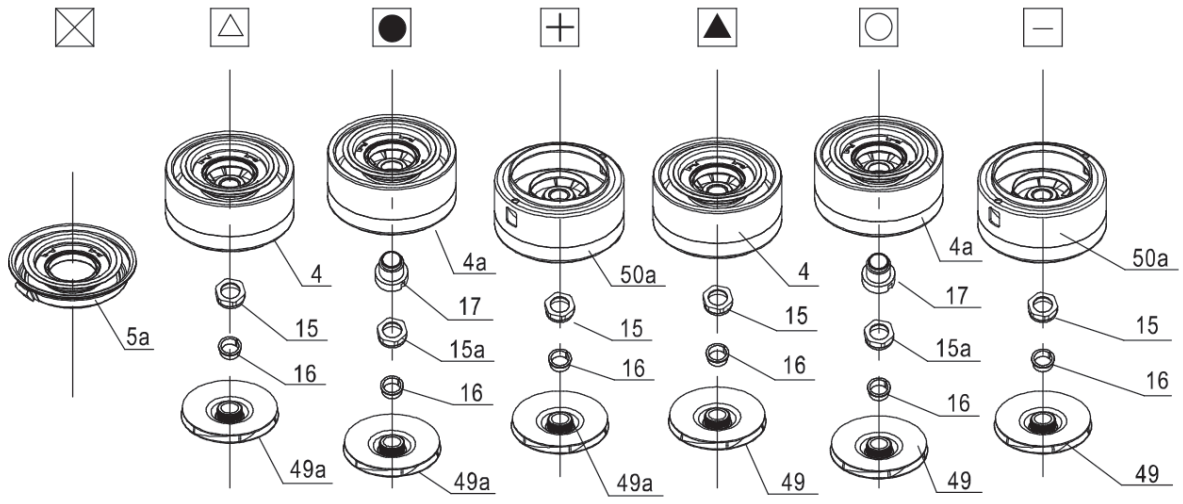


Drawing 5-G VM65 assembling order.

8. See drawing 5-H for assembling order of VM90.



Symbol information



Drawing 5-H VM90 assembling order.

8. FAULT FINDING

Before removing the terminal box cover, make sure that the power supply has been switched off.

Fault	Cause	Solution
Motor does not run when started.	a) Power supply failure. b) Fuses are blown. c) Motor overloaded. d) Motor starter failure. e) Control circuit is defective. f) Motor is defective.	a) Check power supply. b) Replace fuses. c) Check pump system. d) Replace starter. e) Replace control circuit. f) Repair motor. g) Check capacitors on single phase models.
Motor-protective circuit breaker trips out immediately when supply is switched on.	a) Fuses are blown. b) Contacts in motor-protective circuit breaker are faulty. c) Cable connection is loose or faulty. d) Motor winding is defective. e) Pump mechanically blocked. f) Motor-protective circuit breaker setting is too low. g) Start / run capacitors are faulty.	a) Replace fuses. b) Check or replace starter. c) Check cables or power supply. d) Replace motor. e) Check amd clean impurities. f) Reset motor-protective circuit breaker. g) Check capacitors on single phase models. h) Refer to VFD control manual. i) Replace start/run capacitors.
Motor-protective circuit breaker trips out occasionally.	a) Motor-protective circuit breaker setting is too low. b) Power supply failed periodically. c) Low voltage at peak times.	a) Set the motor-protective circuit breaker correctly. b) Check power supply. c) Add voltage stable device
Motor-protective circuit breaker has not tripped out but the pump does not run	a) Contacts in motor-protective circuit breaker are faulty. b) Control circuit is defective.	a) Check or replace motor protective circuit breaker. b) Replace control circuit.
Pump performance not constant.	a) Pump inlet pressure is too low (cavitation). b) Suction pipe/pump partly blocked by impurities. c) Pump draws in air. d) Pump runs in the wrong direction of rotation.	a) Check the suction conditions. b) Clean the suction pipe/pump. c) Check the suction conditions. d) Change the motor running direction. e) Bleed air from system.
Pump runs but gives no water.	a) Suction pipe/pump blocked by impurities. b) Foot or non-return valve blocked in closed position. c) Leakage in suction pipe. d) Air in suction pipe or pump.	a) Clean the suction pipe/pump. b) Repair the foot or non-return valve. c) Repair the suction pipe. d) Re-priming, vent air.
Abnormal vibration or noise.	a) Leakage in suction pipe. b) Suction pipe is too small or partly blocked by impurities. c) Air in suction pipe or pump. d) Pump mechanically blocked. e) Motor bearing failure. f) Stack height incorrect	a) Repair the suction pipe. b) Install larger suction pipe or clean the suction pipe. c) Re-priming, vent air. d) Repair pump. e) Replace motor bearing. f) Adjust stack height
Leakage in mechanical seal.	a) Mechanical seal is defective.	a) Replace the mechanical seal.

NOTES

Davey Warranty

Davey Water Products Pty Ltd (Davey) warrants all products sold will be (under normal use and service) free of defects in material and workmanship for a minimum period of one (1) year from the date of original purchase by the customer as marked on the invoice, for specific warranty periods for all Davey products visit daveywater.com.

This warranty does not cover normal wear and tear or apply to a product that has:

- been subject to misuse, neglect, negligence, damage or accident
- been used, operated or maintained other than in accordance with Davey's instructions
- not been installed in accordance with the Installation Instructions or by suitably qualified personnel
- been modified or altered from original specifications or in any way not approved by Davey
- had repairs attempted or made by other than Davey or its authorised dealers
- been subject to abnormal conditions such as incorrect voltage supply, lightning or high voltage spikes, or damages from electrolytic action, cavitation, sand, corrosive, saline or abrasive liquids,

The Davey warranty does not cover replacement of any product consumables or defects in products and components that have been supplied to Davey by third parties (however Davey will provide reasonable assistance to obtain the benefit of any third-party warranty).

To make a warranty claim:

- If the product is suspected of being defective, stop using it and contact the original place of purchase. Alternatively, phone Davey Customer Service or send a letter to Davey as per the contact details below
- Provide evidence or proof of date of original purchase
- If requested, return the product and/or provide further information with respect to the claim. Returning the product to the place of purchase is at your cost and is your responsibility.
- The warranty claim will be assessed by Davey on the basis of their product knowledge and reasonable judgement and will be accepted if:
  - a relevant defect is found
  - the warranty claim is made during the relevant warranty period; and
  - none of the excluded conditions listed above apply
- The customer will be notified of the warranty decision in writing and if found to be invalid the customer must organise collection of the product at their expense or authorise its disposal.

If the claim is found to be valid Davey will, at its option, repair or replace the product free of charge.

The Davey warranty is in addition to rights provided by local consumer law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

For any internet connected products the consumer is responsible for ensuring a stable internet connection. In the event of a network failure the consumer will need to address the concern with the service provider. Use of an App is not a substitute for the User's own vigilance in ensuring the product is working to expectation. Use of a Smart Product App is at the User's own risk. To the fullest extent permitted by law Davey disclaims any warranties regarding the accuracy, completeness or reliability of App data. Davey is not responsible for any direct or indirect loss, damage or costs to the User arising from its reliance on internet connectivity. The User indemnifies Davey against any claims or legal actions from them or others relying on internet connectivity or App data may bring in this regard.

Products presented for repair may be replaced by refurbished products of the same type rather than being repaired. Refurbished parts may be used to repair the products. The repair of your products may result in the loss of any user-generated data. Please ensure that you have made a copy of any data saved on your products.

To the fullest extent permitted by law or statute, Davey shall not be liable for any loss of profits or any consequential, indirect or special loss, damage or injury of any kind whatsoever arising directly or indirectly from Davey products. This limitation does not apply to any liability of Davey for failure to comply with a consumer guarantee applicable to your Davey product under local laws and does not affect any rights or remedies that may be available to you under local laws.

For a complete list of Davey Dealers visit our website (daveywater.com) or call:

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