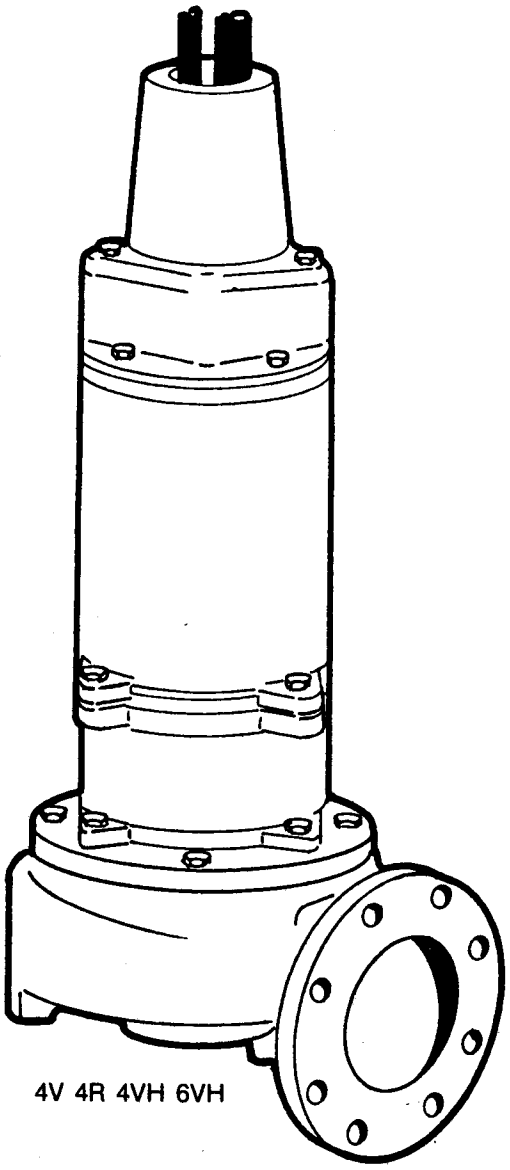
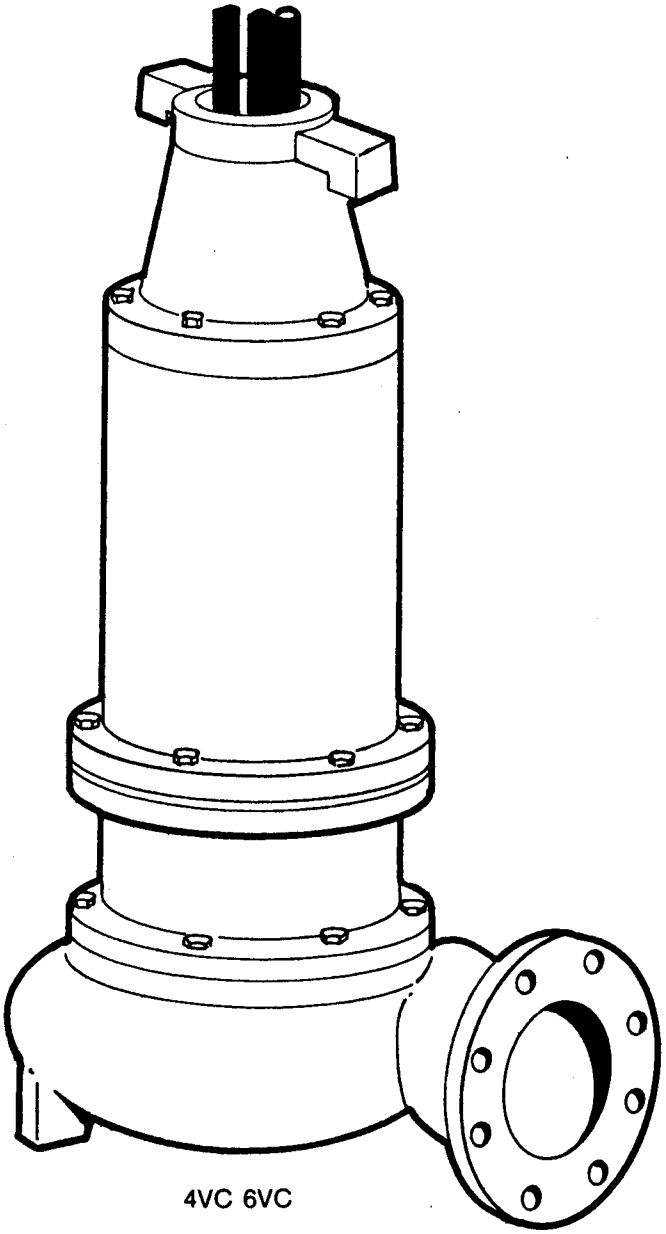
Myers®

Pentair Pump Group

4V, 4R, 4VH, 6VH, 4VC, 6VC Non-Clog Pumps Installation and Service Manual



4V 4R 4VH 6VH



4VC 6VC

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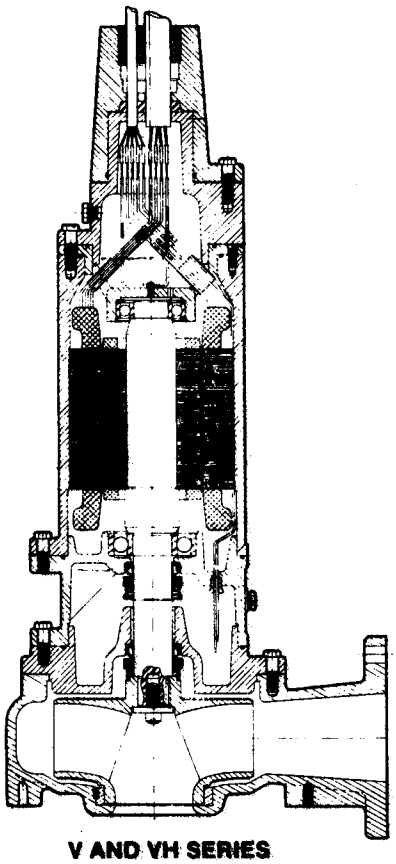
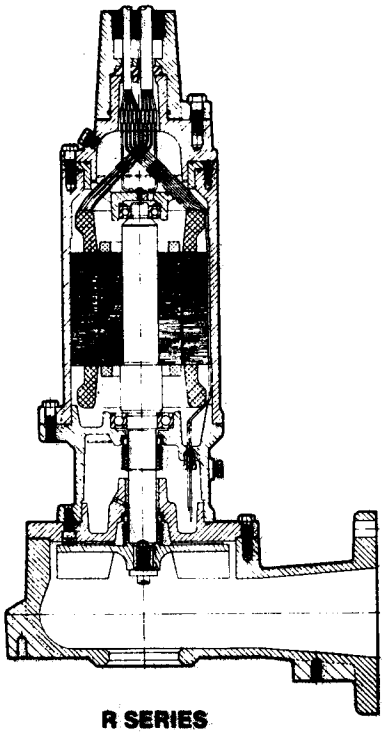


V AND VH SERIES

Fig. 1



R SERIES

Fig. 2

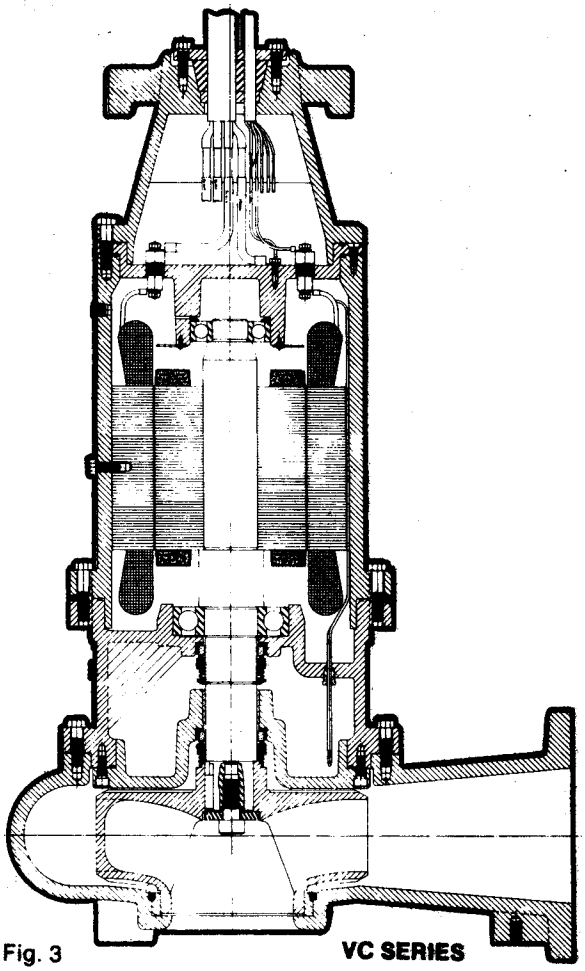


Fig. 3 VC SERIES

PUMP MODELS

These instructions cover the installation of the 4V, 4VH, 6VH, 4R, 4VC and 6VC series of non-clog pumps. All models are designed for handling raw sewage and waste water. Do not use for acid waste water.

The 4R series is made with a recessed impeller. All other models have 2 vane non-clog impellers. All models will pass 3" dia. solids.

All models with 4 in the model number have a 4" std. flange discharge.

All models with 6 in the model number have a 6" std. flange discharge.

The following table lists pump series with motor size, RPM and Phase.

VOLTAGES

All single phase motors are for 230 volts only. All three phase motors are either 200, 230, 460 or 575 volts. All 4VC and 6VC models are dual voltage 230 or 460. All 200 volt and 575 volt motors are single voltage.

HP	RPM	3 PHASE	SINGLE PHASE
R SERIES			
1	1150	Yes	Yes
1 1/2	1150	Yes	Yes
2	1150	Yes	Yes
3	1150	Yes	Yes
3	1750	Yes	Yes
5	1750	Yes	No
7 1/2	1750	Yes	No
V SERIES			
1	1150	Yes	Yes
1 1/2	1150	Yes	Yes
2	1150	Yes	Yes
3	1150	Yes	Yes
3	1750	Yes	Yes
5	1750	Yes	No
7 1/2 & 10	1750	Yes	No
VH SERIES			
3	1150	Yes	No
5	1150	Yes	No
5	1750	Yes	No
7 1/2	1750	Yes	Yes
10	1750	Yes	No
15	1750	Yes	No
VC SERIES			
2	860	Yes	No
3	860	Yes	No
5	860	Yes	No
5	1150	Yes	No
7 1/2	860	Yes	No
7 1/2	1150	Yes	No
10	1150	Yes	No
15	1150	Yes	No
15	1750	Yes	No
20	1150	Yes	No
20	1750	Yes	No
25	1750	Yes	No
30	1750	Yes	No
40	1750	Yes	No
50	1750	Yes	No
60	1750	Yes	

Table 1

DESCRIPTION OF PUMP

Drawings Fig. 1, Fig. 2 and Fig. 3 show sectional view of each of the pump types. For the 4R, 4V and 4VH models, pressure connectors are used on wire connections inside motor cover. The 4VC and 6VC series have terminal connections inside the motor cover. Power cord and cap can be removed without disturbing motor on 4VC and 6VC units.

WARNING: Only qualified persons shall conduct services and installations of this pump. The pump must be wired by a qualified electrician, using an approved starter box and switching device.

CAUTION: In the initial installation before sewage is admitted to basin, there, of course, is no danger on entering sump, but after sewage has been in basin, there is (DANGER). SEWAGE WATER GIVES OFF METHANE AND HYDROGEN SULFIDE GASES, BOTH OF WHICH ARE HIGHLY POISONOUS. NEVER ENTER WET WELL UNLESS COVER IS OPEN FOR A PERIOD TO ALLOW FRESH AIR TO ENTER BASIN, AN OUTSIDE BLOWER SHOULD BE USED TO PUMP CLEAN AIR INTO BASIN.

U.L. RECOMMENDS THE MAN IN BASIN HAVE ON A HARNESS WITH ROPE TO SURFACE SO THAT HE CAN BE PULLED OUT IN CASE OF ASPHYXIATION.

It is for this reason, Myers recommends the lift out check valve so that no service is required in the basin.

BEARINGS ARE DESIGNED FOR MINIMUM 50,000 HOURS B-10 LIFE.

SEAL FAILURE

All motors have a probe installed in seal chamber near the bottom so that any leakage past the lower seal into seal chamber is detected.

A red warning light at the control panel comes on if water enters seal chamber. This is an indicator only and does not stop motor, but warns that seal should be replaced within 2 to 3 weeks. LONGER RUNNING WITHOUT SEAL REPLACEMENT COULD DAMAGE MOTOR. See Fig's. 1, 2, 3. MOTOR MUST GO TO AUTHORIZED SERVICE STATION FOR SEAL REPLACEMENT

HEAT SENSOR

All motors have a heat sensing thermostat installed in top winding of motor. Any motor winding temperature above 248°F for 4R, 4V, 4VH, 6VH and 266°F for 4VC, 6VC will open thermostat and stop motor. Thermostat will automatically reset as soon as it has cooled.

CAUTION: WITH AUTOMATIC (RESET) MOTOR CAN START AT ANY TIME AFTER THERMOSTAT IS TRIPPED SO NEVER DO SERVICE WORK ON PUMP UNLESS POWER SUPPLY IS DISCONNECTED.

IMPORTANT: BE SURE HEAT SENSOR WIRES AND SEAL FAILURE WIRES ARE CONNECTED AT PANEL TERMINAL BLOCK. WARRANTY IS VOID IF WIRES ARE NOT CONNECTED OR ARE JUMPED.

MOTOR POWER CABLE AND CONTROL CABLE

Each pump motor is furnished with 25 feet of power and control cable. Longer lengths are available on request. See Table 2.

Each power cord has 4 conductors—white, black, red and green. For 3 phase, the red, black and white conductor connect to the 3 line leads and the green is connected to a good outside ground. Interchanging any two leads reverses the motor.

For single phase, the white and black leads connect to the two line terminals and the red connects to the start winding terminal. The green is for ground and must be connected to a good outside ground such as a water pipe or ground rod driven at least 8 feet in the ground.

The control cable has 5 conductors—black, white, red, orange and green. White and black connect to heat sensor terminals; red and orange connect to the seal failure terminals and green connects to the ground terminal.

APPLICATION

All Myers non-clog pumps can be used to pump raw sewage, storm water and other waste water. DO NOT USE FOR ACID WATER MAX. SOLID SIZE FOR ALL UNITS IS 3" DIAMETER.

SINGLE PHASE MOTORS

Single phase motors are for 230 volts only. A special control panel with start and run capacitors and start relay are required for these pumps.

THESE CONTROL PANELS MUST BE OBTAINED FROM F.E. MYERS CO. OR MUST BE APPROVED BY MYERS OR WARRANTY ON MOTOR IS VOID.

OIL FILLED

Motor chamber and seal chamber are oil filled for coolest running, best heat transfer and best lubrications for bearings and seals. Motor requires no oiling or greasing. Motor is sealed for life of bearings. Fig's. 1, 2, 3.

POWER CORD SIZES

Power cord size depends on motor HP size and voltage. Table 3 lists motor size and cable size depending on voltage.

Motors are generally furnished for single voltage, but the larger motors in the 4VC and 6VC pumps can be supplied for dual voltage. Dual voltage is for 230 or 460 volts. When ordering for dual voltage, the cord size for the lower voltage must be used. See wiring diagrams Fig. 7.

200 and 575 volt motors are single voltage only.

CAUTION: NEVER PULL PUMP OR WORK ON CONTROL BOX UNTIL INCOMING POWER IS DISCONNECTED. NEVER RUN MOTOR UNTIL GREEN GROUND CONDUCTOR IS CONNECTED TO GOOD OUTSIDE GROUND AT CONTROL BOX.

CORD SIZE TABLE

MOTOR HP	CABLE SIZE FOR 200 & 230 V.	CABLE SIZE FOR 460 & 575 V.	INSULATION TYPE 600 V.
1	14	14	SOW/SOW-A
2	14	14	SOW/SOW-A
3	14	14	SOW/SOW-A
5	10	14	SOW/SOW-A
7½	10	14	SOW/SOW-A
10	10	14	SOW/SOW-A
15	8	10	SOW/SOW-A
20	6	10	SOW/SOW-A
25	4	8	SOW/SOW-A
30	2	8	SOW/SOW-A
40	2	6	SOW/SOW-A
50	2	4	SOW/SOW-A

All power cords are 25 ft. long. Longer lengths are available on request. Check voltage drop table for cord size to use depending on length of offset from wet well. All control cords are 25 ft. long and are #18 type SJO. 300 volt insulation. Longer lengths are available.

Table 2

CABLE SIZE REQUIRED DEPENDING ON MAX. MOTOR AMPS, 3 PHASE VOLTAGE AND LENGTH OF OFFSET FROM WET WELL

MAX. AMPS	VOLTAGE	WIRE SIZE LENGTH							
		14	12	10	8	6	4	2	0
5	200	480	760	1190	1865				
5	230	550	875	1370	2140				
5	460	1105	1445	2740	4285				
5	575	1380	2180	3425	5355				
7	200	345	545	850	1330				
7	230	395	625	980	1530				
7	460	790	1245	1955	3060				
7	575	985	1560	2445	3825				
9	200	265	425	665	1035	1610			
9	230	305	485	760	1190	1850			
9	460	615	970	1525	2380	3700			
9	575	765	1215	1905	2975	4625			
12	200	300	315	495	775	1205			
12	230	230	365	570	895	1390			
12	460	460	730	1140	1785	2775			
12	575	575	910	1425	2230	3470			
15	200		240	375	585	905	1390		
15	230		275	430	620	1040	1600		
15	460		545	855	1390	2080	3200		
15	575		685	1070	1675	2500	4000		
20	200			300	465	725	1115	1690	
20	230			345	535	835	1280	1945	
20	460			685	1070	1665	2560	3885	
20	575			855	1340	2080	3200	4860	
26	200				360	560	855	1300	
26	230				415	640	985	1495	
26	460				825	1280	1970	2990	
26	575				1030	1600	2460	3740	
30	200				310	485	745	1130	
30	230				360	555	855	1295	
30	460				715	1110	1705	2590	
30	575				895	1390	2135	3240	
40	200				235	365	560	845	
40	230				270	420	640	975	
40	460				535	835	1280	1945	
40	575				670	1040	1600	2430	
75	200							450	610
75	230							520	700
75	460							1040	1395
75	575							1295	1745
100	200							340	455
100	230							390	525
100	460							770	1040
100	575							980	1310

Table 3

MAKING ELECTRICAL CONNECTIONS

1. Level controls are held by support bracket and cords are adjusted for proper depth.
   a. Lower turnoff control should be set so that pump stops when water level is about at top of check valve or straight through casting.
   b. Upper turn-on control is set to start pump when level is at height specified above pump.
   c. Override control is set at height specified above upper turn-on control.
   d. Alarm control is set about 6" to 12" above override control.
   e. No control should be set above inlet invert.
2. If control panel is mounted directly on basin top the power and control wires are taken directly to control box and are sealed in the cord plate with cord grip connectors.
3. If panel is installed remote from basin the cords can be taken through a conduit to control panel, or junction box can be used in the basin to make connections. The Myers junction box has a built-in sealing connector to seal the outgoing wires. If other than Myers junction box is used a separate sealing connector must be used where wires leave the basin. See Wiring Diagrams 4, 5, 6.
   CAUTION: IF CORDS ARE TAKEN DIRECTLY THROUGH A CONDUIT TO CONTROL BOX A SEAL FITTING MUST BE USED AT INLET OF CONDUIT TO PREVENT GAS VAPORS FROM GETTING TO CONTROL BOX. THIS TYPE OF INSTALLATION IS GENERALLY NOT RECOMMENDED BECAUSE THE SEALING CEMENT MUST BE BROKEN TO REMOVE A CORD. EXPLOSION PROOF -- SPECIAL INSTRUCTIONS ARE REQUIRED FOR EXPLOSION PROOF INSTALLATION. CONSULT FACTORY.

SINGLE PHASE MOTORS

Single phase pumps have only one rotation and do not need to be checked.

THREE PHASE MOTORS

Rotation for three phase motors must be checked. The pump impeller should rotate counter clockwise when looking at the suction end of pump. To reverse rotation, interchange any two line leads to motor.

WARRANTY IS VOID IF HEAT SENSOR AND SEAL FAILURE WIRES ARE NOT CONNECTED PROPERLY TO CONTROL BOX TERMINAL STRIP.

CAUTION: PUMP MOTOR IS NOT TO BE TAKEN APART IN THE FIELD. MOTORS UNDER WARRANTY MUST BE SERVICED BY MYERS AUTHORIZED REPAIR STATION OR BE SENT TO FACTORY.

50 CYCLE PUMPS

All Myers 60 cycle non-clog, three phase pumps can operate on 50 cycle power at reduced performance. See curve sheets. 60 cycle, 460 volt pumps should operate on 380 volt, 50 cycle. Single phase, 60 cycle, 230 volt pumps can operate on 220 volts, single phase, 50 cycle.

REMOVING PUMP CASE AND IMPELLER

In case of wear, damage due to dropping, plugged pump, or replacing a defective motor, the pump volute case and impeller can be removed in the field.

1. Remove bolts between seal housing flange and volute case. The motor and impeller can now be lifted off as a unit.
2. If necessary to remove impeller, lay pump on its side. With a screwdriver bend the tabs of the lockwasher away from the head of the hex head bolt.
3. Loosen and remove the bolt by turning counterclockwise. Since Loctite™ is used to secure the bolt and is applied to the shaft/impeller interface, heating of the shaft end to 450° to 500° F will usually be required.
4. Impeller is mounted by a straight fit with driving key. Pry evenly on opposite impeller sides with two large screwdrivers or small bars behind the impeller.
5. Set motor on end with shaft up after removing impeller so that oil will not drain past the seal.

REPLACING IMPELLER AND PUMP CASE

1. Apply Loctite™ #680: before assembly, in keyway, in the impeller bore (lower shaft O.D.), and on the threads of the hex head cap screw.
2. Before placing the impeller on the shaft, be sure the mechanical seal and its spring are in place.
3. Position retaining washer with long pin extension in keyway.
4. Assemble hex head cap screw and tighten securely. Torque, using torque wrench, to values in table below.

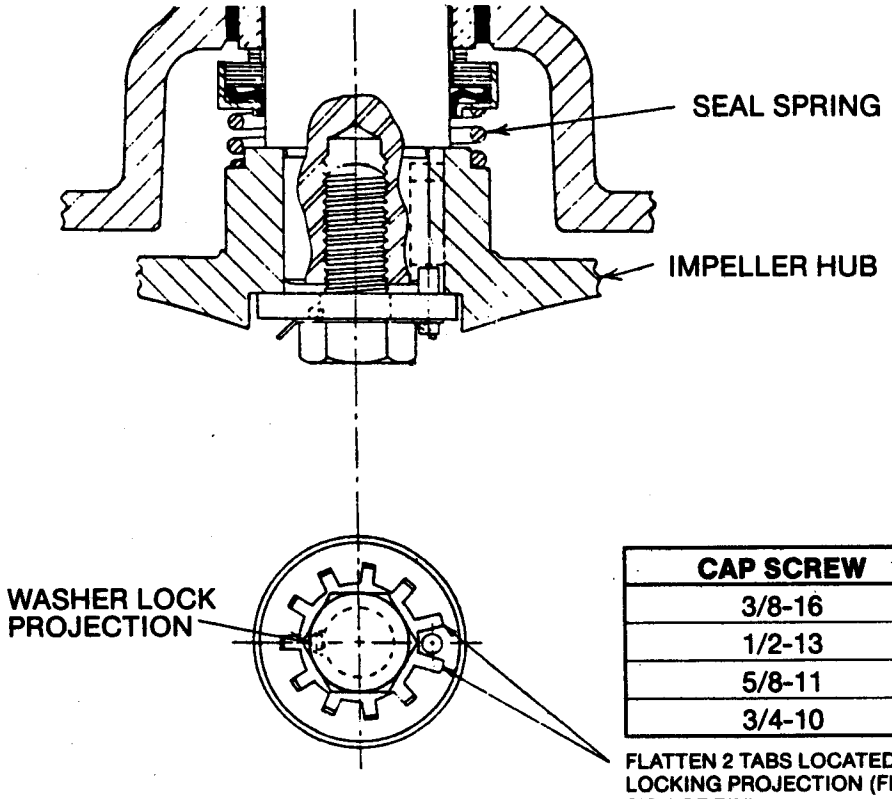


Fig. 8

CAP SCREW	TORQUE VALUE
3/8-16	20 ft.-lbs.
1/2-13	43 ft.-lbs.
5/8-11	93 ft.-lbs.
3/4-10	128 ft.-lbs.

FLATTEN 2 TABS LOCATED 180° FROM WASHER LOCKING PROJECTION (FLATTEN ONE ON EACH SIDE OF PIN).

AFTER ASSEMBLY OF HEX HEAD CAP SCREW, BEND REMAINING TABS AGAINST HEX HEAD.

MOTOR WINDING RESISTANCE, MAX. AMPS, LOCKED ROTOR AMPS
SINGLE PHASE MOTORS, V AND R SERIES

CATALOG NO.	MOTOR HP	RPM	VOLTS	RESISTANCE IN OHMS			MAX. AMPS	LOCKED ROTOR AMPS	CODE LETTER
				BLACK TO WHITE	BLACK TO RED	WHITE TO RED			
4V10M6-21 4R10M6-21	1	1150	230	2.12	10.10	12.22	9.0	35.0	K
4V15M6-21 4R15M6-21	1½	1150	230	1.84	8.80	10.64	.0	42.0	H
4V20M6-21 4R20M6-21	2	1150	230	1.17	5.47	6.54	18.0	60.0	H
4V30M6-21 4R30M6-21	3	1150	230	1.17	5.47	6.64	21.0	60.0	H
4V30M4-21 4R30M4-21	3	1750	230	.83	2.38	3.21	17.5	96.0	J
4V50M4-21 4R50M4-21	5	1750	230	.45	2.12	2.57	34.0	136.0	G

3 PHASE MOTORS V AND R SERIES

CATALOG NO.	MOTOR HP	RPM	VOLTS	RESISTANCE IN OHMS			MAX. AMPS	LOCKED ROTOR AMPS	CODE LETTER
				BLACK TO WHITE	BLACK TO RED	WHITE TO RED			
4V10M6-03 4R10M6-03	1	1150	200	4.31	4.31	4.31	7.4	23.8	K
4V10M6-23 4R10M6-23	1	1150	230	5.36	5.36	5.36	6.4	20.7	K
4V10M6-43 4R10M6-43	1	1150	460	21.45	21.45	21.45	3.2	10.4	K
4V10M6-53 4R10M6-53	1	1150	575	33.80	33.80	33.80	2.6	8.3	K
4V15M4-03 4R15M4-03	1½	1150	200	3.02	3.02	3.02	9.8	33.4	J
4V15M4-23 4R15M4-23	1½	1150	230	3.69	3.69	3.69	8.5	29.0	J
4V15M6-43 4R15M6-43	1½	1150	460	14.75	14.75	14.75	4.2	14.5	J
4V15M6-53 4R15M6-53	1½	1150	575	23.70	23.70	23.70	3.3	11.6	J
4V20M6-03 4R20M6-03	2	1150	200	2.24	2.24	2.24	12.0	56.0	L
4V20M6-23 4R20M6-23	2	1150	230	2.44	2.44	2.44	10.5	49.0	L
4V20M6-43 4R20M6-43	2	1150	460	9.75	9.75	9.75	5.2	24.5	L
4V20M6-53 4R20M6-53	2	1150	575	18.35	18.35	18.35	4.2	19.6	L
4V30M6-03 4R30M6-03	3	1150	200	2.24	2.24	2.24	16.8	56.0	H
4V30M6-23 4R30M6-23	3	1150	230	2.44	2.44	2.44	14.0	49.0	H
4V30M6-43 4R30M6-43	3	1150	460	9.75	9.75	9.75	7.0	24.5	H
4V30M6-53 4R30M6-53	3	1150	575	18.35	18.35	18.35	5.6	19.6	H
4V30M4-03 4R30M4-03	3	1750	200	1.29	1.29	1.29	15.5	100.0	N
4V30M4-23 4R30M4-23	3	1750	230	1.45	1.45	1.45	13.0	87.0	N
4V30M4-43 4R30M4-43	3	1750	460	5.80	5.80	5.80	6.5	43.5	N
4V30M4-53 4R30M4-53	3	1750	575	11.15	11.15	11.15	5.2	34.8	N
4V50M4-03 4R50M4-03	5	1750	200	.74	.74	.74	21.6	110.0	J
4V50M4-23 4R50M4-23	5	1750	230	.88	.88	.88	18.0	96.0	J
4V50M4-43 4R50M4-43	5	1750	460	3.54	3.54	3.54	9.0	48.0	J
4V50M4-53 4R50M4-53	5	1750	575	5.69	5.69	5.69	7.2	38.4	J
4V75M4-03 4R75M4-03	7½	1750	200	.45	.45	.45	32.2	159.0	J
4V75M4-23 4R75M4-23	7½	1750	230	.58	.58	.58	28.0	138.0	J
4V75M4-43 4R75M4-43	7½	1750	460	2.34	2.34	2.34	14.0	69.0	J
4V75M4-53 4R75M4-53	7½	1750	575	3.68	3.68	3.68	11.2	55.0	J
4V100M4-03	10	1750	200	.45	.45	.45	37.0	159.0	F
4V100M4-23	10	1750	230	.58	.58	.58	32.0	138.0	F
4V100M4-43	10	1750	460	2.34	2.34	2.34	16.0	69.0	F
4V100M4-53	10	1750	575	3.68	3.68	3.68	13.0	55.2	F

SINGLE PHASE MOTORS VH SERIES

CATALOG NO.	MOTOR HP	RPM	VOLTS	RESISTANCE IN OHMS			MAX. AMPS	LOCKED ROTOR AMPS	CODE LETTER
				BLACK TO WHITE	BLACK TO RED	WHITE TO RED			
4VHS75M4-21	7½	1750	230	.49	.93	1.42	34	137	D

3 PHASE MOTORS VH SERIES

CATALOG NO.	MOTOR HP	RPM	VOLTS	RESISTANCE IN OHMS			MAX. AMPS	LOCKED ROTOR AMPS	CODE LETTER
				BLACK TO WHITE	BLACK TO RED	WHITE TO RED			
4VH30M6-03 6VH30M6-03	3	1150	200	.98	.98	.98	15.9	77	K
4VH30M6-23 6VH30M6-23	3	1150	230	1.25	1.25	1.25	13.8	67	K
4VH30M6-43 6VH30M6-43	3	1150	460	5.02	5.02	5.02	7.0	33	K
4VH30M6-53 6VH30M6-53	3	1150	575	7.64	7.64	7.64	5.5	27	K
4VH50M6-03 6VH50M6-03	5	1150	200	.59	.59	.59	24.0	115	J
4VH50M6-23 6VH50M6-23	5	1150	230	.82	.82	.82	21.0	100	J
4VH50M6-43 6VH50M6-43	5	1150	460	3.27	3.27	3.27	10.5	50	J
4VH50M6-53 6VH50M6-53	5	1150	575	5.11	5.11	5.11	8.4	40	J
4VH50M4-03 6VH50M4-03	5	1750	200	.77	.77	.77	21.0	115	J
4VH50M4-23 6VH50M4-23	5	1750	230	1.00	1.00	1.00	18.0	100	J
4VH50M4-43 6VH50M4-43	5	1750	460	4.00	4.00	4.00	9.0	50	J
4VH50M4-53 6VH50M4-53	5	1750	575	6.28	6.28	6.28	7.2	40	J
4VH75M4-03 6VH75M4-03	7½	1750	200	.379	.379	.379	30.0	153	H
4VH75M4-23 6VH75M4-23	7½	1750	230	.44	.44	.44	26.0	133	H
4VH75M4-43 6VH75M4-43	7½	1750	460	1.95	1.95	1.95	13.0	66	H
4VH75M4-53 6VH75M4-53	7½	1750	575	3.08	3.08	3.08	10.0	53	H
4VH100M4-03 6VH100M4-03	10	1750	200	.302	.302	.302	40.0	204	H
4VH100M4-23 6VH100M4-23	10	1750	230	.40	.40	.40	35.0	178	H
4VH100M4-43 6VH100M4-43	10	1750	460	1.60	1.60	1.60	17.5	89	H
4VH100M4-53 6VH100M4-53	10	1750	575	2.48	2.48	2.48	14.0	71	H
4VHS100M4-03 6VHS100M4-03	10	1750	200	3.02	3.02	3.02	40.0	204	H
4VHS100M4-23 6VHS100M4-23	10	1750	230	.40	.40	.40	35.0	178	H
4VHS100M4-43 6VHS100M4-43	10	1750	460	1.60	1.60	1.60	17.5	89	H
4VHS100M4-53 6VHS100M4-53	10	1750	575	2.48	2.48	2.48	14.0	71	H
4VH150M4-03 6VH150M4-03	15	1750	200	.241	.241	.241	60.0	272	G
4VH150M4-23 6VH150M4-23	15	1750	230	.31	.31	.31	52.0	236	G
4VH150M4-43 6VH150M4-43	15	1750	460	1.25	1.25	1.25	26.0	118	G
4VH150M4-53 6VH150M4-53	15	1750	575	1.94	1.94	1.94	21.0	94	G
4VH200M4-03 6VH200M4-03	20	1750	200	.241	.241	.241	72.0	272	E
4VH200M4-23 6VH200M4-23	20	1750	230	.31	.31	.31	60.0	236	E
4VH200M4-43 6VH200M4-43	20	1750	460	1.25	1.25	1.25	30.0	118	E
4VH200M4-53 6VH200M4-53	20	1750	575	1.94	1.94	1.94	25.5	94	E

Table 5

MOTOR WINDING RESISTANCE, MAX, AMPS, LOCKED ROTOR AMPS FOR 4VC AND 6VC SERIES PUMPS 3 PHASE MOTORS 860 AND 1150 RPM

CATALOG NO.	MOTOR HP	RPM	VOLTS	RESISTANCE IN OHMS			MAX. AMPS	LOCKED ROTOR AMPS	CODE LETTER
				BLACK TO WHITE	BLACK TO RED	WHITE TO RED			
4VC20M8-03 6VC20M8-03	2	860	200	.758	.758	.758	10.8	48.3	K
4VC20M8-23 6VC20M8-23	2	860	230	1.00	1.00	1.00	9.5	42.0	K
4VC20M8-43 6VC20M8-43	2	860	460	4.01	4.01	4.01	4.8	21.0	K
4VC20M8-53 6VC20M8-53	2	860	575	6.25	6.25	6.25	3.8	16.8	K
4VC30M8-03 6VC30M8-03	3	860	200	.758	.758	.758	15.6	58.8	H
4VC30M8-23 6VC30M8-23	3	860	230	1.00	1.00	1.00	13.7	51.1	H
4VC30M8-43 6VC30M8-43	3	860	460	3.83	3.83	3.83	6.8	25.6	H
4VC30M8-53 6VC30M8-53	3	860	575	6.25	6.25	6.25	5.4	20.4	H
4VC50M8-03 6VC50M8-03	5	860	200	.47	.47	.47	24.1	103.5	J
4VC50M8-23 6VC50M8-23	5	860	230	6.25	6.25	6.25	21.0	90.0	J
4VC50M8-43 6VC50M8-43	5	860	460	2.32	2.32	2.32	10.5	45.0	J
4VC50M8-53 6VC50M8-53	5	860	575	3.90	3.90	3.90	8.4	36.0	J
4VC75M8-03 6VC75M8-03	7½	860	200	.35	.35	.35	30.3	149.0	H
4VC75M8-23 6VC75M8-23	7½	860	230	.46	.46	.46	26.4	130.0	H
4VC75M8-43 6VC75M8-43	7½	860	460	1.84	1.84	1.84	13.2	65.0	H
4VC75M8-53 6VC75M8-53	7½	860	575	2.88	2.88	2.88	10.6	52.0	H
4VC50M6-03 6VC50M6-03	5	1150	200	.50	.50	.50	19.3	106.0	J
4VC50M6-23 6VC50M6-23	5	1150	230	.67	.67	.67	16.8	92.0	J
4VC50M6-43 6VC50M6-43	5	1150	460	2.32	2.32	2.32	8.4	46.0	J
4VC50M6-53 6VC50M6-53	5	1150	575	4.18	4.18	4.18	6.7	37.0	J
4VC75M6-03 6VC75M6-03	7½	1150	200	.359	.359	.359	27.0	147.0	H
4VC75M6-23 6VC75M6-23	7½	1150	230	.47	.47	.47	23.6	128.0	H
4VC75M6-43 6VC75M6-43	7½	1150	460	1.91	1.91	1.91	11.8	64.0	H
4VC75M6-53 6VC75M6-53	7½	1150	575	2.98	2.98	2.98	9.4	51.0	H
4VC100M6-03 6VC100M6-03	10	1150	200	.255	.255	.255	34.3	197	H
4VC100M6-23 6VC100M6-23	10	1150	230	.337	.337	.337	30.0	172	H
4VC100M6-43 6VC100M6-43	10	1150	460	1.35	1.35	1.35	15.0	86	H
4VC100M6-53 6VC100M6-53	10	1150	575	2.10	2.10	.210	12.0	69	H
4VC150M6-03 6VC150M6-03	15	1150	200	.184	.184	.184	48.0	276	H
4VC150M6-23 6VC150M6-23	15	1150	230	.243	.243	.243	44.0	240	H
4VC150M6-43 6VC150M6-43	15	1150	460	1.07	1.07	1.07	22.0	120	H
4VC150M6-53 6VC150M6-53	15	1150	575	1.52	1.52	1.52	17.6	96	H
4VC200M6-03 6VC200M6-03	20	1150	200	.132	.132	.132	66.3	333	G
4VC200M6-23 6VC200M6-23	20	1150	230	.175	.175	.175	58.0	290	G
4VC200M6-43 6VC200M6-43	20	1150	460	.75	.75	.75	29.0	145	G
4VC200M6-53 6VC200M6-53	20	1150	575	1.09	1.09	1.09	23.0	116	G

Table 5 Cont'd

MOTOR WINDING RESISTANCE, MAX, AMPS, LOCKED ROTOR AMPS FOR 4VC AND 6VC SERIES PUMPS 1750 RPM

CATALOG NO.	MOTOR HP	RPM	VOLTS	RESISTANCE IN OHMS			MAX. AMPS	LOCKED ROTOR AMPS	CODE LETTER
				BLACK TO WHITE	BLACK TO RED	WHITE TO RED			
4VC150M4-03 6VC150M4-03	15	1750	200	.196	.196	.196	50.6	215.0	E
4VC150M4-23 6VC150M4-23	15	1750	230	.245	.245	.245	44.0	187.0	E
4VC150M4-43 6VC150M4-43	15	1750	460	.98	.98	.98	22.0	93.5	E
4VC150M4-53 6VC150M4-53	15	1750	575	1.57	1.57	1.57	17.6	74.8	E
4VC200M4-23 6VC200M4-23	20	1750	230	.154	.154	.154	60.0	290.0	G
4VC200M4-43 6VC200M4-43	20	1750	460	.66	.66	.66	30.0	145.0	G
4VC200M4-53 6VC200M4-53	20	1750	575	.96	.96	.96	24.0	108.0	G
4VC250M4-23 6VC250M4-23	25	1750	230	.138	.138	.138	76.0	366.0	G
4VC250M4-43 6VC250M4-43	25	1750	460	.55	.55	.55	38.0	183.0	G
4VC250M4-53 6VC250M4-53	25	1750	575	.88	.88	.88	30.4	146.0	G
4VC300M4-23 6VC300M4-23	30	1750	230	.118	.118	.118	94.0	452.0	G
4VC300M4-43 6VC300M4-43	30	1750	460	.47	.47	.47	47.0	226.0	G
4VC300M4-53 6VC300M4-53	30	1750	575	.752	.752	.752	37.6	181.0	G
4VC400M4-23 6VC400M4-23	40	1750	230	.086	.086	.086	122.0	580.0	G
4VC400M4-43 6VC400M4-43	40	1750	460	.35	.35	.35	61.0	290.0	G
4VC400M4-53 6VC400M4-53	40	1750	575	.539	.539	.539	48.8	232.0	G
4VC500M4-23 6VC500M4-23	50	1750	230	.086	.086	.086	134.0	580.0	E
4VC500M4-43 6VC500M4-43	50	1750	460	.35	.35	.35	67.0	290.0	E
4VC500M4-53 6VC500M4-53	50	1750	575	.539	.539	.539	54.0	232.0	E
4VC600M4-23 6VC600M4-23	60	1750	230	.086	.086	.086	158.0	580.0	C
4VC600M4-43 6VC600M4-43	60	1750	460	.35	.35	.35	79.0	290.0	C
4VC600M4-53 6VC600M4-53	60	1750	575	.539	.539	.539	63.0	232.0	C

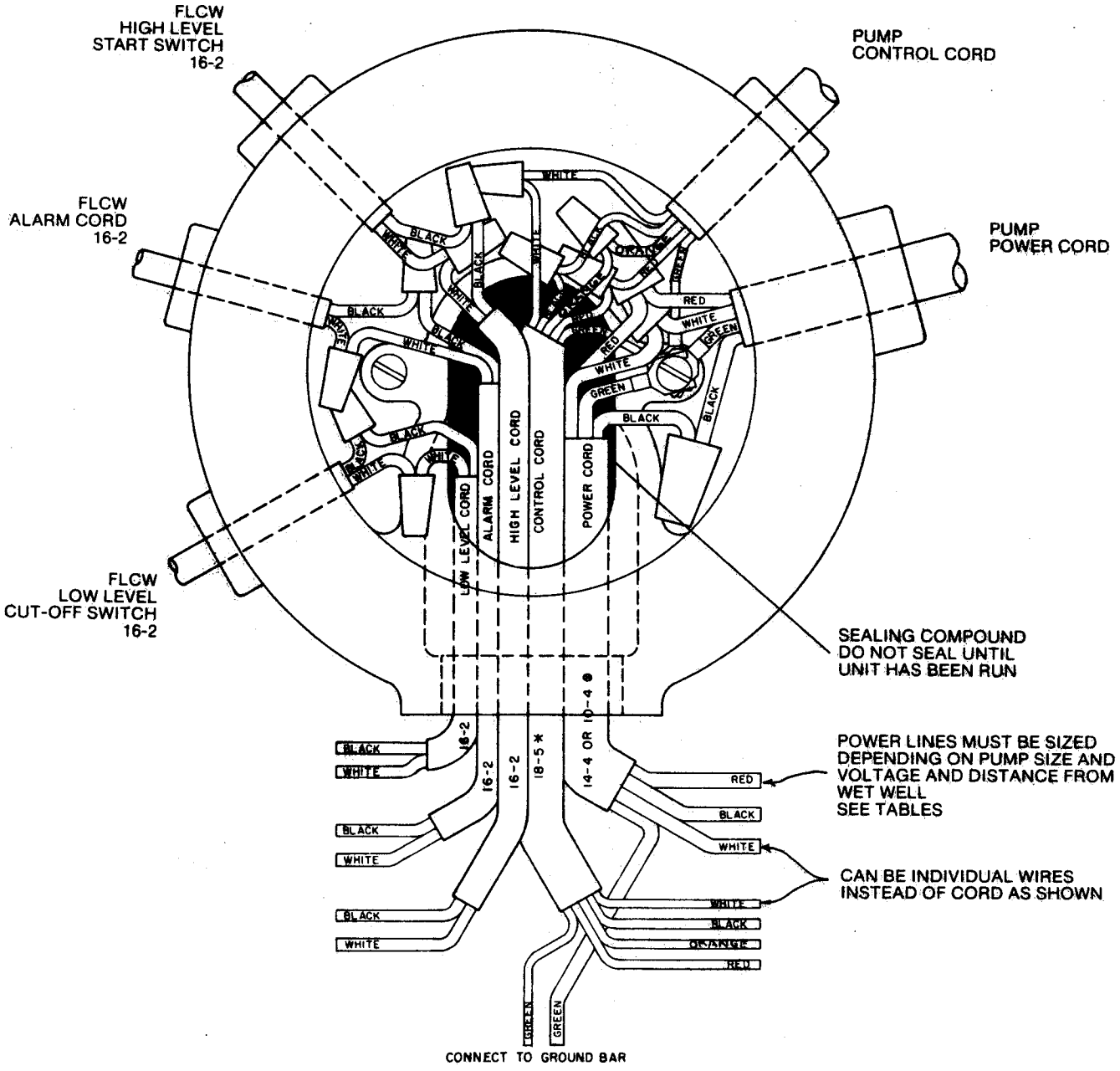
CODE LETTER	LOCKED ROTOR KVA/HP
A	0 - 3.15
B	3.15 - 3.55
C	3.55 - 4.0
D	4.0 - 4.5
E	4.5 - 5.0
F	5.0 - 5.6
G	5.6 - 6.3
H	6.3 - 7.1
J	7.1 - 8.0
K	8.0 - 9.0
L	9.0 - 10.0
M	10.0 - 11.2
N	11.2 - 12.5

$$3\text{Ø KVA/HP} = \frac{\text{LOCKED ROTOR AMPS} \times 1.73 \times \text{VOLTS}}{1000 \times \text{HP}}$$

$$1\text{Ø KVA/HP} = \frac{\text{LOCKED ROTOR AMPS} \times \text{VOLTS}}{1000 \times \text{HP}}$$

Table 5 Cont'd

IN SUMP CONNECTION BOX, SIMPLEX SYSTEM, FLCW 3 BALL CONTROL



*GAGE DEPENDS ON HORSEPOWER OF PUMP.

FIG. 4

IN SUMP CONNECTION BOX, DUPLEX SYSTEM, FLCW 4 BALL CONTROL

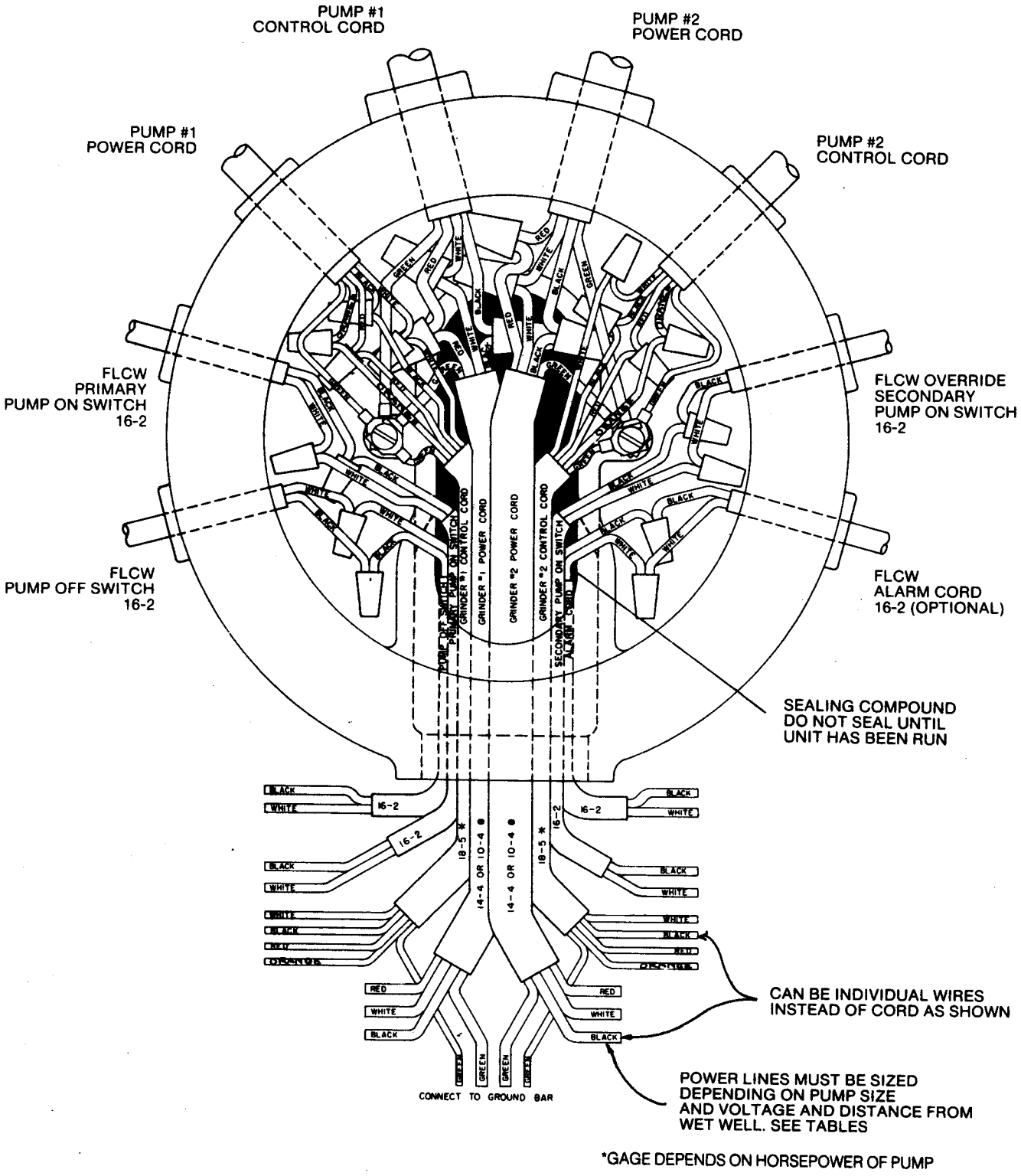


FIG. 5

WIRING DIAGRAM

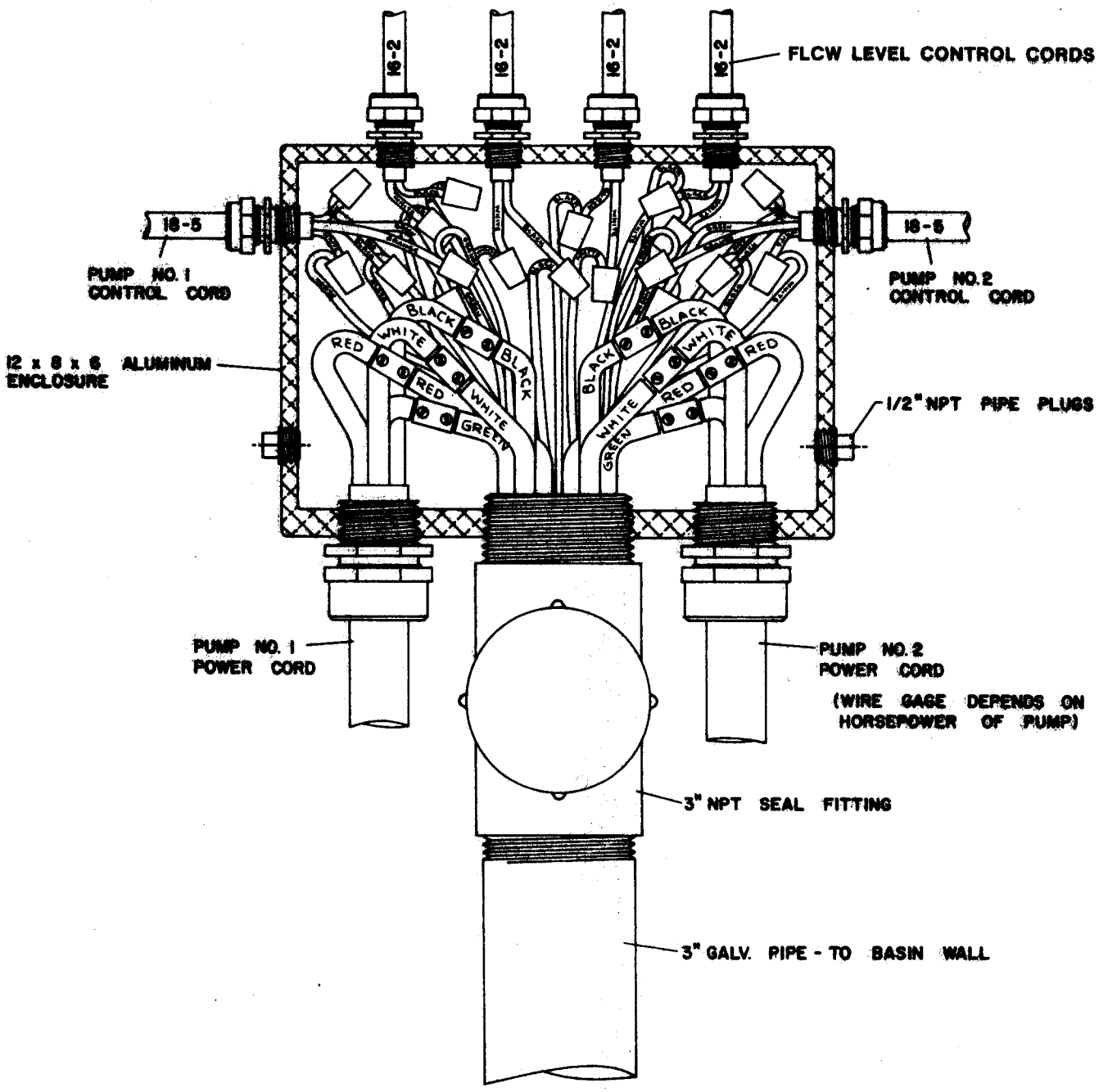
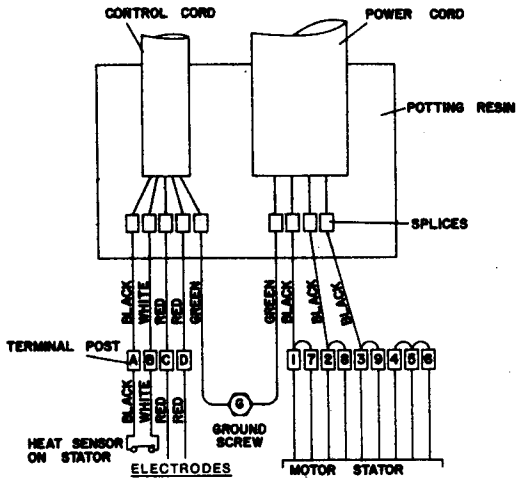
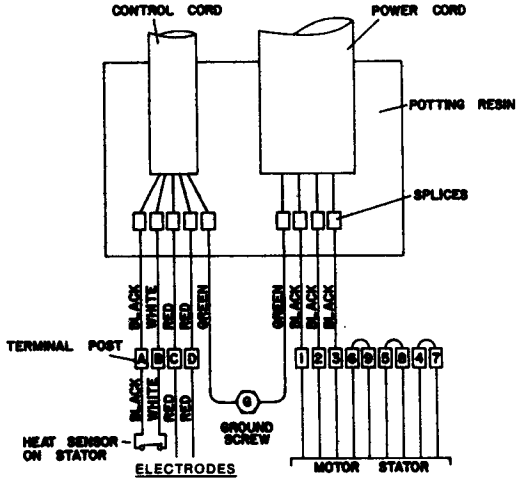


FIG. 6

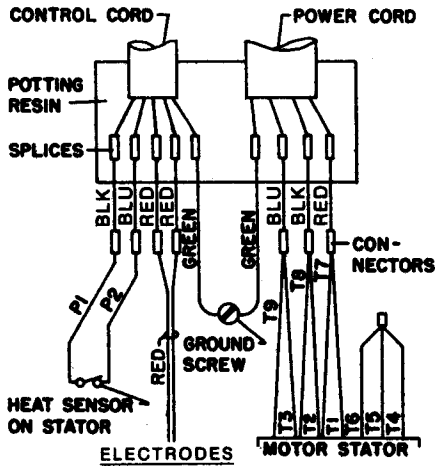
WIRING DIAGRAMS



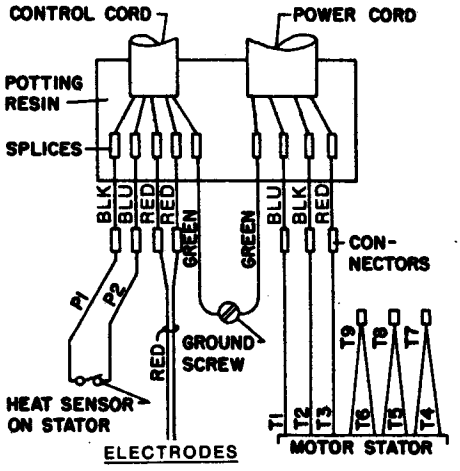
230 VOLT-THREE PHASE
4VC AND 6VC SERIES



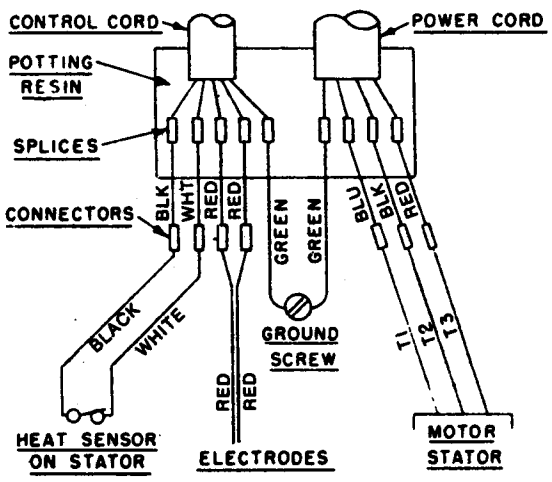
460 VOLT-THREE PHASE
4VC AND 6VC SERIES



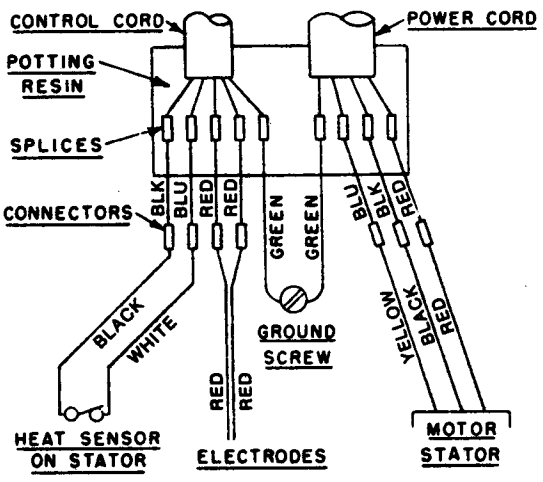
230 VOLT-THREE PHASE
R, V AND VH SERIES



460 VOLT-THREE PHASE
R, V AND VH SERIES



200 AND 575 VOLT-THREE PHASE
R, V, VH AND VC SERIES



230 VOLT-SINGLE PHASE
R AND V SERIES

FIG. 7

CHECK LIST IF PUMP DOES NOT OPERATE PROPERLY

CHECKING FOR MOISTURE IN MOTOR

Use ohmmeter and set on highest scale. Readings on the large power cord between any of the conductors red, black, white to green conductor or motor housing should be more than 500,000 ohms. Motor probably will run with a lower reading, but if pump is out of service and reading is below 500,000 ohms the motor housing and stator should be removed and baked in a drying oven at 220°F. To be serviced only at authorized service station.

Readings should be taken with line leads disconnected from terminal strip.

RESISTANCE OF WINDINGS

Every motor winding has a fixed resistance. Winding must check close to the values given in tables to operate properly. This winding resistance also shows if motor is connected for voltage being used.

Use ohmmeter for this test and set on scale to read directly in ohms.

TROUBLE CHECK LIST

Troubles listed are generally caused by the pump. Other trouble can occur from faulty control box operation. These will be listed with the control box instructions.

CONDITION

Pump runs but does not pump liquid from basin.

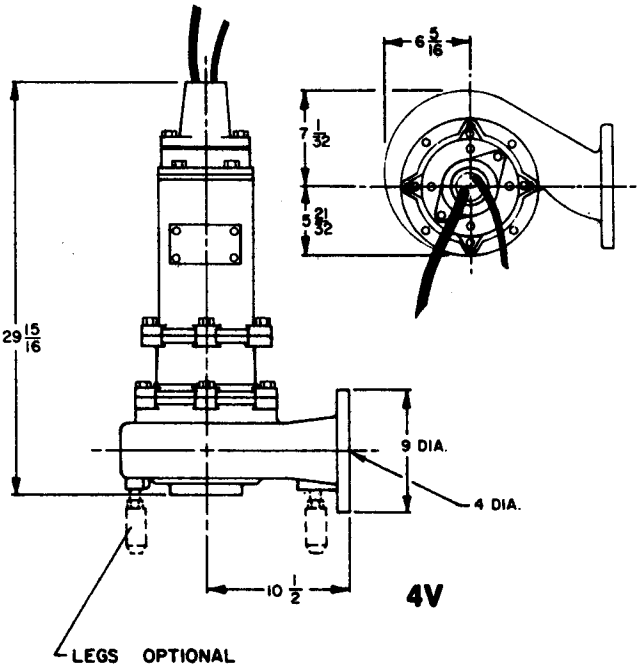
PROBABLE CAUSE

1. Pump impeller may be air locked, this occasionally occurs on a new installation, see page 3. Start and stop pump several times to purge air. Be sure air vent hole in volute case is clean. See dwg. fig. 5.
2. Run additional water into basin so that pump will be submerged deeper to clear air.
3. If pump is three phase, rotation may be wrong. See instructions for checking proper rotation. See page 6.
4. If pump has been installed for some time and does not pump, it may be clogged at inlet.
5. Discharge gate valve may be closed.
6. Discharge check valve may be clogged or have a broken clapper or spring.
7. Discharge head may be too high. Check elevation. Maximum pump head at zero flow is shown on pump curve sheet.
8. If above checks do not locate trouble, motor rotor may be loose on shaft which allows motor to run but will not turn impeller or only at low RPM.

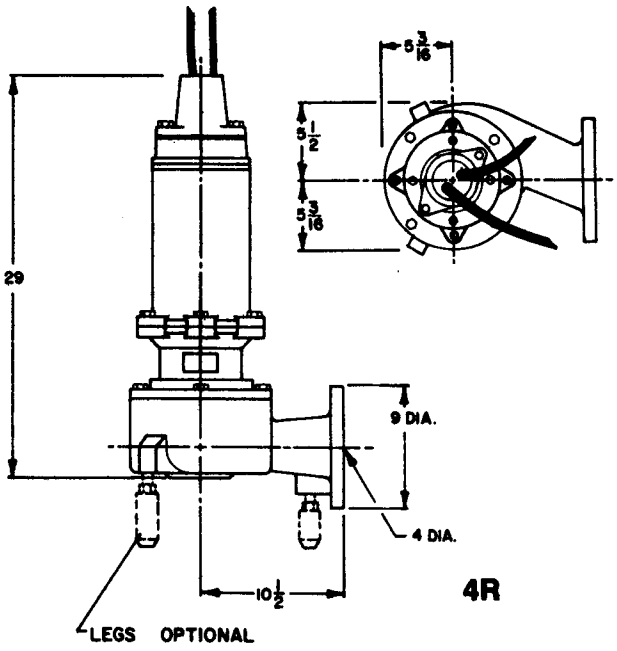
CONDITION	PROBABLE CAUSE
Red light comes on at control box.	This indicates some water has leaked past the lower seal and has entered the seal chamber and made contact with the electrode probe. Pump must be removed from basin within approximately two (2) weeks for replacement of lower seal. This preventative repair will save an expensive motor.
Overload trips at control box and alarm buzzer or flashing red light comes on due to high water level in basin.	1. Push in on red reset button to reset overload. If overload trips again after short run, pump has some damage and must be removed from basin for checking. 2. Trouble may be from clogged impeller causing motor to overload or could be from failed motor. 3. Trouble may be from faulty component in control box. Always check control box before removing pump.
Yellow run light stays on continuously.	1. Indicates H-O-A switch may be in the hand position. 2. Level control switch may have failed causing pump to continue to operate when water is below lower control. 3. Impeller may be partially clogged causing pump to operate at very reduced capacity. 4. Gate valve or check valve may be clogged causing low pump flow. 5. Pump may be air logged. See page 3.
Circuit breaker trips.	1. Reset breaker by pushing clear down on handle then back to on position. If breaker trips again in few seconds it indicates excessive load probably caused by a short in the motor or control box. Check out instructions given with control box before pulling pump. 2. If this condition happens after an electrical storm, motor or control box may be damaged by lightning. 3. Resistance reading of the motor with lead wires disconnected from the control box can determine if trouble is in motor or control box.

CONDITION	PROBABLE CAUSE
Pump is noisy and pump rate is low.	1. Impeller may be partially clogged with some foreign objects causing noise and overload on the motor. 2. Impeller may be rubbing on wear ring due to bent shaft or misalignment. 3. Pump may be operating too close to shut-off. Check head.
Grease and solids have accumulated around pump and will not pump out of basin.	1. Lower control switch may be set too high. 2. Run pump on hand operation for several minutes with small amount of water running into basin to clean out solids and grease. This allows pump to break suction and surge which will break up the solids. If level switch is set properly this condition generally will not occur. 3. Trash and grease may have accumulated around floats causing pump to operate erratically.

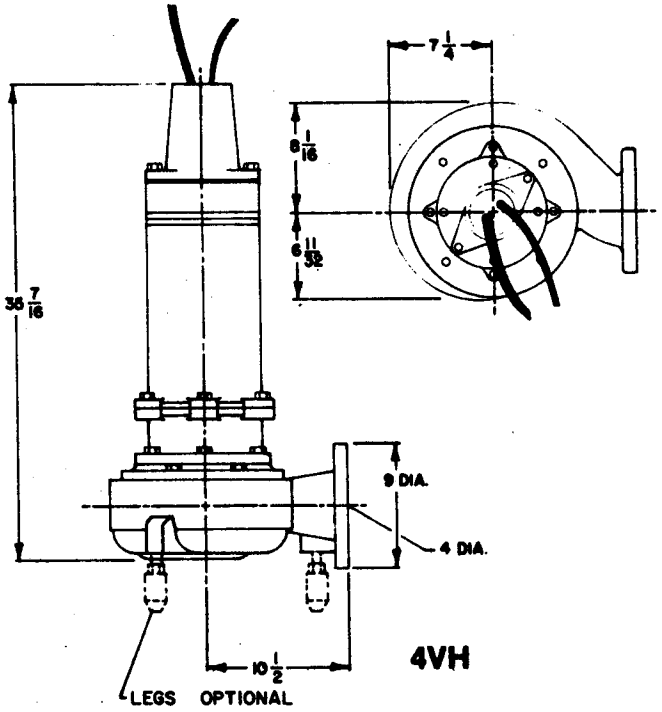
PUMP DIMENSIONS



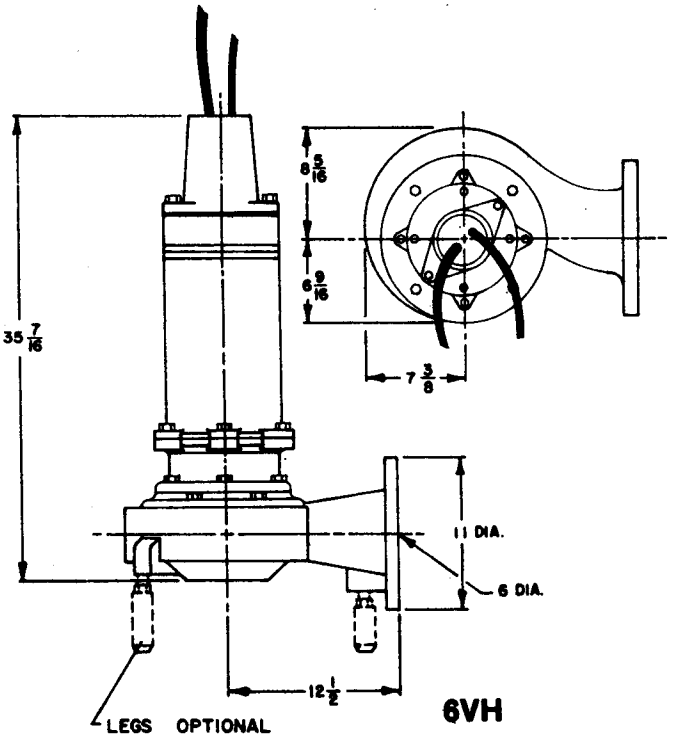
4V



4R

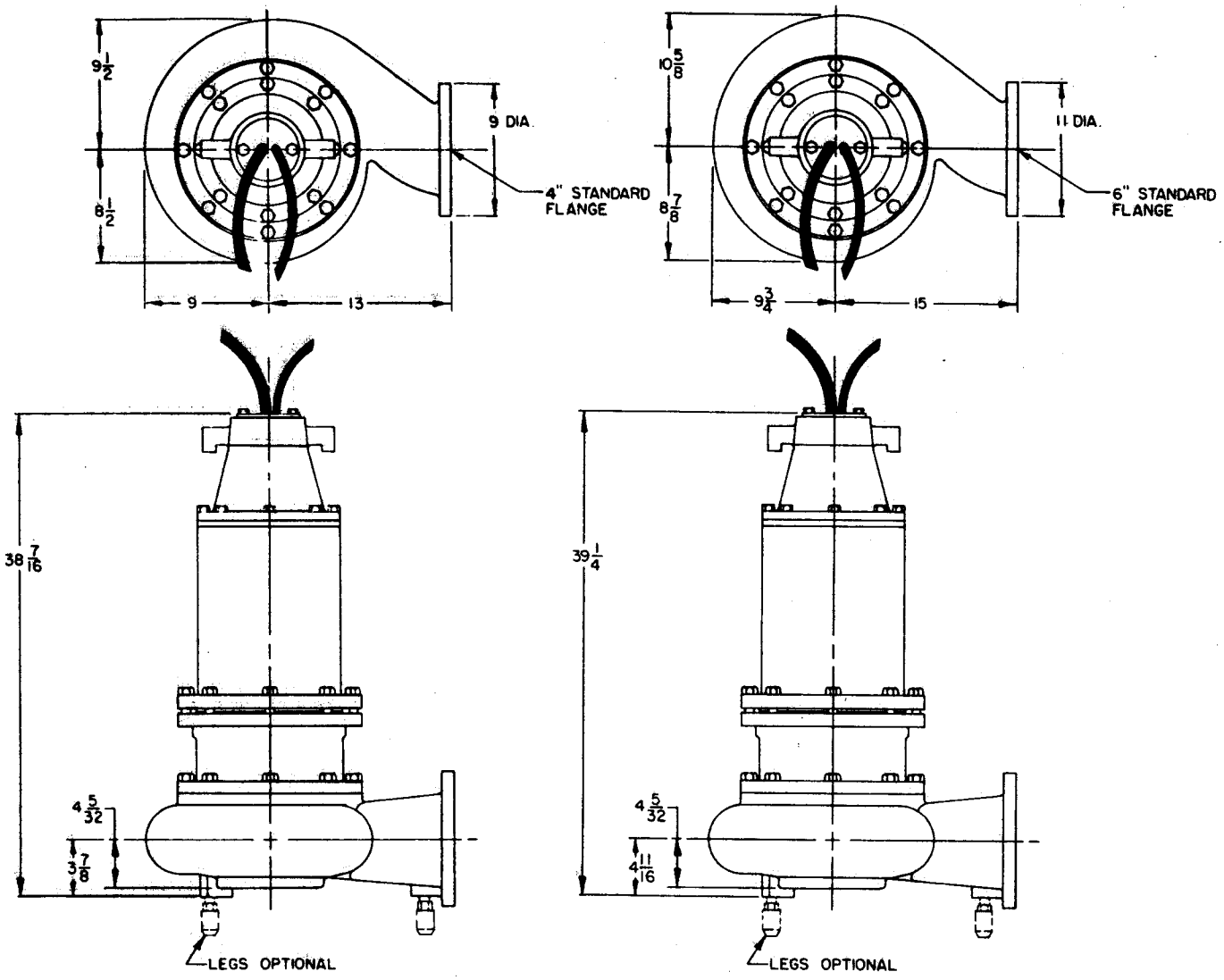


4VH



6VH

PUMP DIMENSIONS



4VC **· 6VC**

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