F60 Downflow Brining

Service Manual

IMPORTANT: Fill in pertinent information on page 3 for future reference.

MODEL F60

Job Specification Sheet

Job No. _____

Model No. _____

Water Test _____

Capacity Per Unit _____

Mineral Tank Size . _____ DiaMeter _____ Height

Brine Tank Size & Salt Setting per Regeneration: _____

Control Valve Specifications

1. Type of Timer (see pages 8-11)
   - A) 7 Day or 12 Day
   - B) 1,250 to 21,250 Gallon Meter or
     6,250 to 106,250 Gallon Meter or
     Other _____
   - C) Meter Wiring Package
     1. System #4 - 1 Tank; 1 Meter; Immediate or Delayed Regeneration
     2. System #5 - 2 Tanks; 2 Meters; Interlock
     3. System #6 - 2 Tanks; 1 Meter; Series Regeneration
     4. System #7 - 2 Tanks; 1 Meter; Alternator
2. Timer Program Settings
   - A) Backwash _____ min.
   - B) Brine & Slow Rinse _____ min.
   - C) Rapid Rinse _____ min.
   - D) Brine Tank Refill _____ min.
3. Drain Line Flow Controller _____ gpm
4. Brine Line Flow Controller _____ gpm
5. Injector Size # _____
6. Service Valve Operation Units (SVO)
   Size of Service Valve _____

MODEL F60

General Commercial Pre-Installation Check List

WATER PRESSURE: A minimum of 25 pounds of water pressure is required for regeneration valve to operate effectively.

ELECTRICAL FACILITIES: A continuous 115 volt, 60 Hertz current supply is required. (Other voltages available.) Make certain the current supply is always hot and cannot be turned off with another switch.

EXISTING PLUMBING: Condition of existing plumbing should be free from lime and iron buildup. Piping that is built up.

heavily with lime and/or iron should be replaced. If piping is clogged with iron, a separate iron filter unit should be installed ahead of the water softener.

LOCATION OF SOFTENER AND DRAIN: The softener should be located close to a drain.

BY-PASS VALVES: Always provide for the installation of a by-pass valve.

CAUTION: Water pressure is not to exceed 120 p.s.i., water temperature is not to exceed 100˚F, and the unit cannot be subjected to freezing conditions.

INSTALLATION INSTRUCTIONS

1. Place the softener tank where you want to install the unit making sure the unit is level and on a firm base.(Maximum 7 feet apart for twin units.)
2. All plumbing should be done in accordance with local plumbing codes. The pipe size for the drain line should be the same size as the drain line flow control connection. Water Meters are to be installed on soft water outlets. Twin units with (1) one Meter shall be installed on common soft water outlet of units.
3. Make sure that the floor is clean beneath the salt storage tank and that it is level.
4. Place approximately 13 of water above the grid plate (if used) in your salt tank Salt may be placed in the unit at this time.
5. Place in by-pass position. Turn on the main water supply. Open a cold soft water tap nearby and let run a few minutes or until the system is free from foreign material (usually solder) that may have resulted from the installation.
6. Place the by-pass in service position.
7. Manually index the softener control into “service” position and let water flow into the mineral tank. When water flow stops,close inlet valve, place control in “backwash” position to relieve head of air, then gradually open inlet valve to purge remaining air in tank. Return control to “service” position.
8. Electrical: All electrical connections must be connected according to codes. Use electrical conduit if applicable. Plug into power supply.

MODEL F60

Timer Setting Procedure

How To Set Days On Which Water Conditioner Is To Regenerate:

Rotate the skipper wheel until the number “1” is at the red pointer. Set the days that regeneration is to occur by sliding tabs on the skipper wheel outward to expose trip fingers. Each tab is one day. Finger at red pointer is tonight. Moving clockwise from the red pointer, extend or retract fingers to obtain the desired regeneration schedule.

How To Set The Time Of Day:

Press and hold the red button in to disengage the drive gear. Turn the large gear until the actual time of day is at the time of day pointer.

Release the red button to again engage the drive gear.

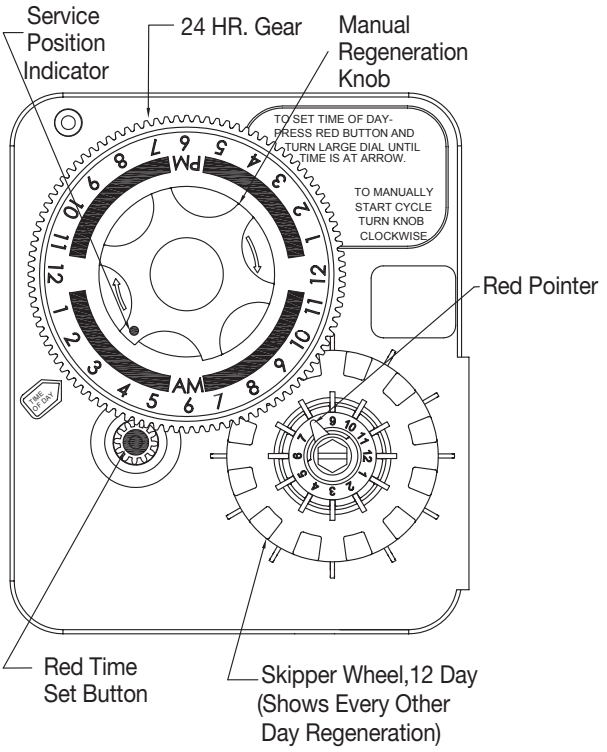
How To Manually Regenerate Your Water Conditioner At Any Time:

Turn the manual regeneration knob clockwise.

This slight movement of the manual regeneration knob engages the program wheel and starts the regeneration program.The black center knob will make one revolution in the following approximately three hours and stop in the position shown in the drawing. Even thought it takes three hours for this center knob to complete one revolution, the regeneration cycle of your unit might be set only one half of this time.In any event, conditioned water may be drawn after rinsewater stops flowing from the water conditioner drain line.

How to Adjust Regeneration Time:

1. Disconnect the power source.
2. Locate the three screws behind the manual regeneration knob by pushing the red button in and rotating the 24 hour dial until each screw appears in the cut out portion of the manual regeneration knob.
3. Loosen each screw slightly to release the pressure on the time plate from the 24 hour gear.
4. Locate the regeneration time pointer on the inside of the 24 hour dial in the cut out.
5. Turn the time plate so the desired regeneration time aligns next to the raised arrow.
6. Push the red button in and rotate the 24 hour dial. Tighten each of the three screws.
7. Push the red button and locate the pointer one more time to ensure the desired regeneration time is correct.
8. Reset the time of day and restore power to the unit.



MODEL F60

Regeneration Cycle Program Setting Procedure

How To Set Regeneration Cycle Program:
The regeneration cycle program on your water conditioner has been factory preset, however, portions of the cycle orprogram may be lengthened or shortened in time to suitlocal conditions.

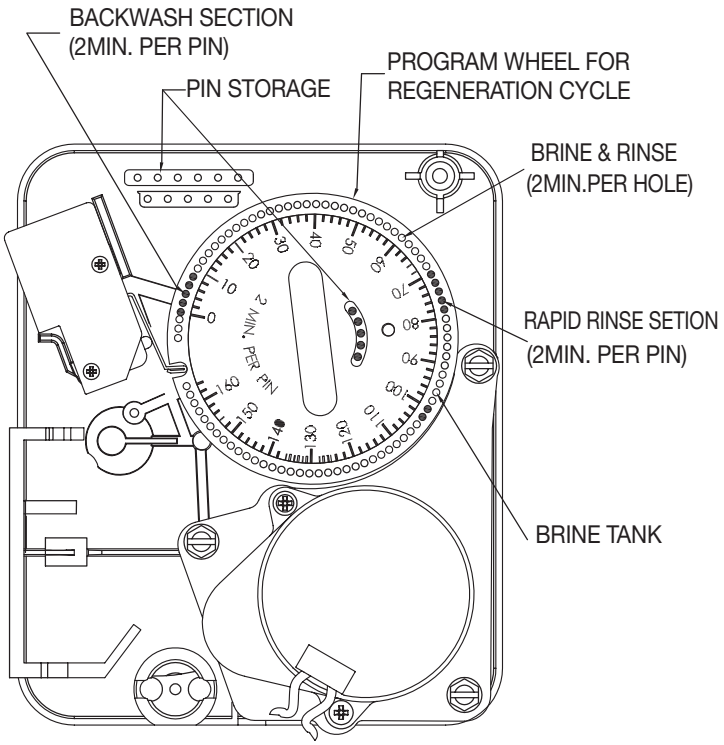
3200 & 321 0Series Timers (Figure to Right)
To expose cycle program wheel, grasp timer in upper left Hand corner and pull, releasing snap retainer and swinging timer to the right.
To change the regeneration cycle program, the program wheel must be removed. Grasp program wheel and squeeze protruding lugs toward center, lift program wheel off timer. (Switch arms may require movement to facilitate removal.)
Return timer to closed position engaging snap retainer in back plate. Make certain all electrical wires locate above snap retainer post.

Timer Setting Procedure for 3200 & 3210 Timer
How To Change The Length Of The Backwash Time:
The program wheel as shown in the drawing is in the service position. As you look at the numbered side of the program wheel, the group of pins starting at zero determines the length of time your unit will backwash. FOR EXAMPLE: If there are six pins in this section, the time of backwash will be 12 min. (2 min. per pin). To change the length of backwash time, add or remove pins as required. The number of pins times two equal the backwash time in minutes.

How To Change The Length Of Brine And Rinse Time:
The group of holes between the last pin in the backwash section and the second group of pins determines the length of time that your unit will brine and rinse (2 min. per hole).
To change the length of brine and rinse time, move the rapid rinse group of pins to give more or fewer holes in the brine and rinse section. Number of holes times two equals brine and rinse time in minutes.

How To Change The Length Of Rapid Rinse:
The second group of pins on the program wheel determines the length of time that your water Conditioner will rapid rinse (2 min. per pin).
To change the length of rapid rinse time, add or remove pins at the higher numbered end of this section as required. The number of pins times two equals the rapid rinse time in minutes.

How To Change The Length Of Brine Tank Refill Time:
The second group of holes in the program wheel determines the length of time that your water conditioner will refill the brine tank (2 min. per hole).
To change the length of refill time, move the two pins at the end of the second group of holes as required.
The regeneration cycle is complete when the outer microswitch is tripped by the two pin set at end of the brine tank refill section. The program wheel, however, will continue to rotate until the inner microswitch drops into the notch on the program wheel.



MODEL F60

Commercial Demand Regeneration Control Timer Settings

Typical Programming Procedure

Calculate the gallon capacity of the system, subtract the necessary reserve requirement and set the gallons required by lifting the gallon dial and rotating it so that the number of gallons required is aligned with the white dot on program wheel gear. Release and check for firm engagement with gear.

Note, drawing shows 8,750 gallon setting. The capacity (gallons) arrow denotes remaining gallons exclusive of fixed reserve.

Note:

To set Meter capacity at initial start-up either

1. Rotate manual regeneration knob one full revolution.

—or—

2. Rotate program wheel manually clockwise or counter clockwise and align white dot with capacity arrow.

This procedure must be followed any time the program wheel setting is changed.

How To Set The Time Of Day:

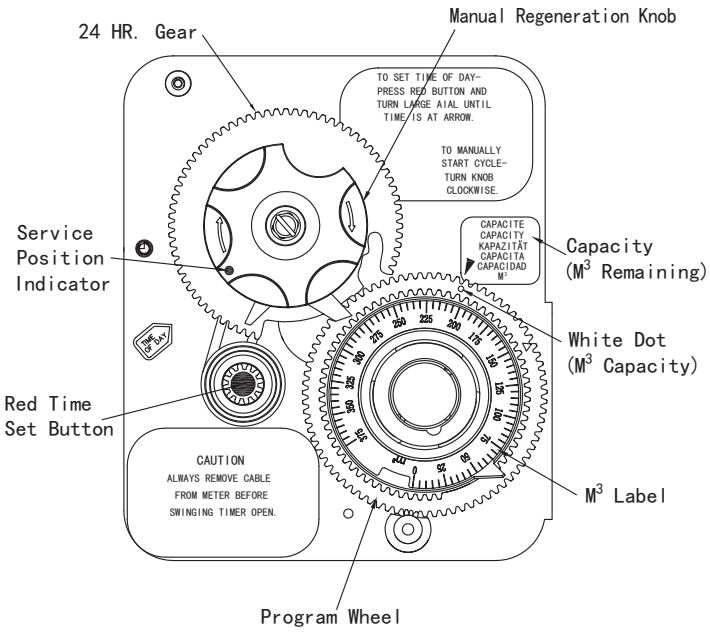
1. Press and hold the red button in to is engage the 24 hour gear.
2. Turn the 24 hour gear until the actual time of day is at the time of day pointer
3. Release the red button to again engage the 24 hour gear.

How To Manually Regenerate Your Water Conditioner At Any Time:

1. Turn the manual regeneration knob clockwise one “click.”
2. This slight movement of the manual regeneration knob engages the program wheel and starts the generation program.
3. The black center knob will make one revolution in the following approximately three hours and stop in the position shown in the drawing.
4. Even though it takes three hours for this center knob to complete one revolution, the regeneration cycle of your unit might be set for only one half of this time.
5. In any event, conditioned water may be drawn after rinse water stops flowing from the water conditioner drain line.

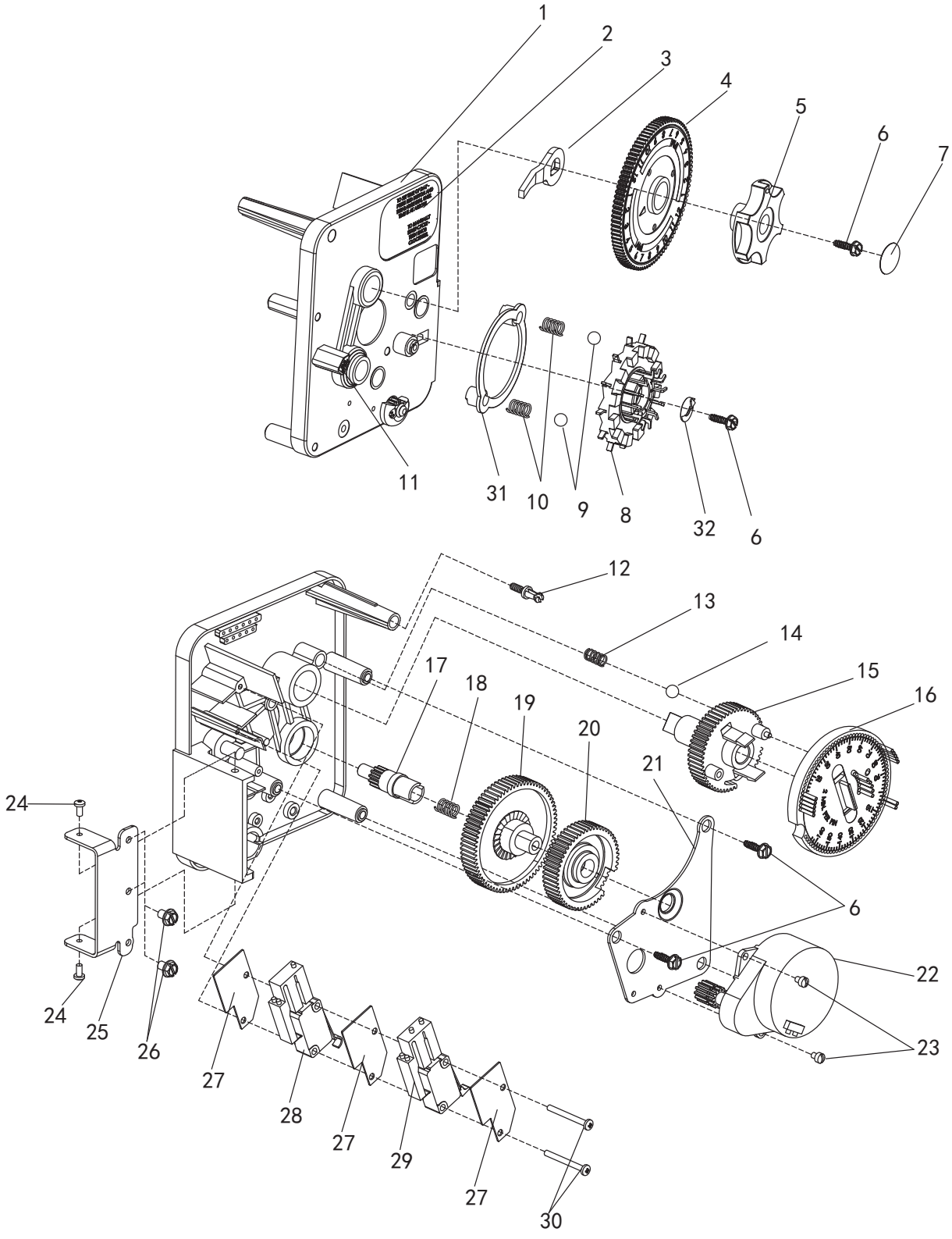
Immediate Regeneration Timers:

These timers do not have a 24 hour gear. Setting the gallons on the program wheel and manual regeneration procedure are the same as previous instructions.



MODEL F60

Timer Assembly (For Mechanical Clock)



MODEL F60

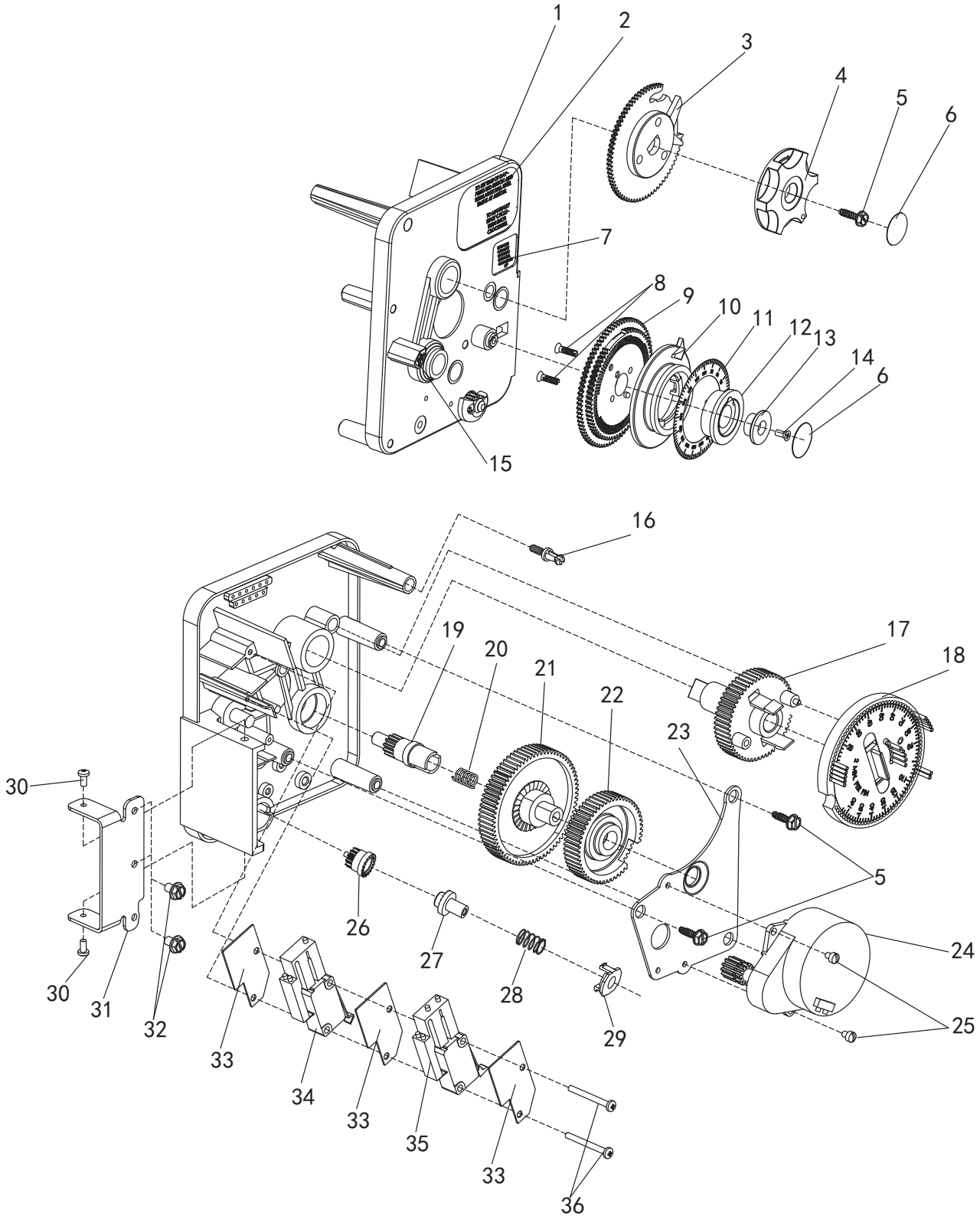
Timer Assembly (For Mechanical Clock)

Item No.	Quantity	Part No.	Description
1	1	051-00078-00	Timer Housing
2	1	069-00180-00	Decal- Instructions
3	1	051-00074-00	Cycle Actuator Arm
4	1	099-00177-00	24 Hour Gear Assembly
5	1	051-00089-00	Knob
6	4	066-00002-00	Screw,tchw,NO.6-20x1/2,b,black,Zn,1022
7	1	069-00179-00	Button Decal
8	1	099-00176-00	Skipper Wheel Assembly
9	2	078-00008-00	Ball
10	2	058-00003-00	Spring –Detent- Skipper Wheel
11	1	069-00181-00	Decal- Time of Day
12	1	052-00013-00	Spring Clip
13	1	058-00002-00	Spring- Denent- Main Gear
14	1	051-00081-00	Plastic Ball-0.25inch Dia.
15	1	057-00023-00	Main Drive Gear
16	1	099-00178-00	Program Wheel(ST) Assembly
17	1	057-00016-00	Idler Pinion
18	1	058-00001-00	Spring- Idler
19	1	057-00014-00	Idler Gear
20	1	057-00013-00	Driver Gear
21	1	052-00046-00	Motor Mounting Plate
22	**1**	**053-00031-00**	**Motor2 Assembly (24V/50HZ)**
		053-00036-00	**Motor2 Assembly (24V/60HZ)**
23	3	066-00010-00	Screw,ccch,NO.6-32x1/8,Zn,1022
24	2	066-00011-00	Screw,ccch,NO.6-32UNCx1/4,Zn,1022
25	1	052-00041-00	Hinge Bracket
26	2	066-00012-00	Screw,tchw,NO.8-18x3/8,Zn,1022
27	3	052-00048-00	Insulator- Drive Assembly
28	**1**	**043-00003-00**	**Switch3**
29	**1**	**043-00002-00**	**Switch2**
30	2	066-00055-00	Screw, tcp, NO. M3-24x1.125,b,Zn,1022
31	1	051-00070-00	Skipper Wheel Ring
32	1	051-00071-00	Regeneration Pointer

Bold faced items are recommended spare parts

MODEL F60

Timer Assembly (For Mechanical Meter)



MODEL F60

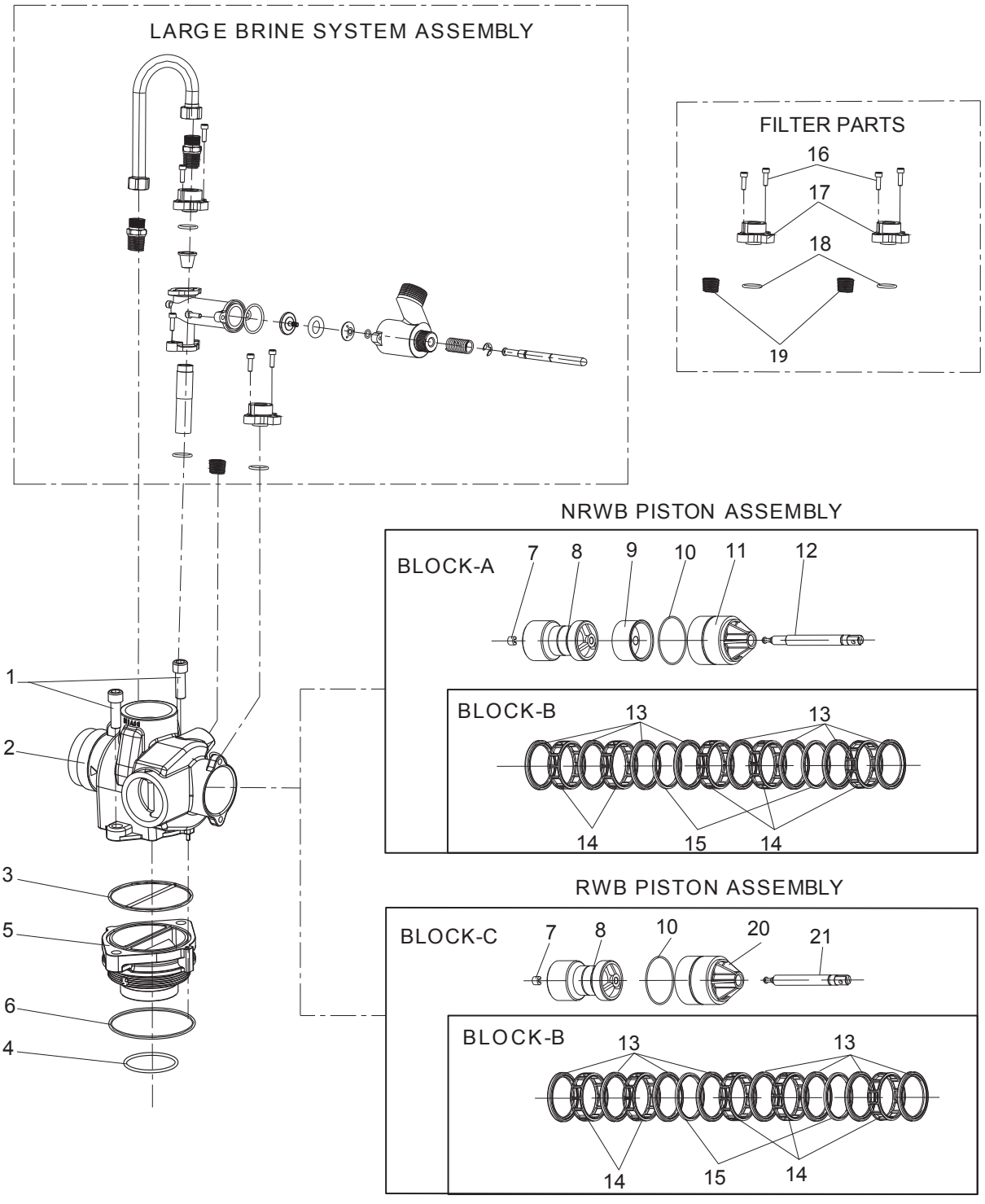
Timer Assembly (For Mechanical Meter)

Item No.	Quantity	Part No.	Description
1	1	051-00078-00	Timer Housing
2	1	069-00188-00	Decal- Instructions2
3	1	057-00011-00	Cycle Actuator Gear- SM
4	1	051-00089-00	Knob
5	4	066-00002-00	Screw,tchw,NO.6-20x1/2,b,black,Zn,1022
6	2	069-00179-00	Button Decal
7	1	069-00186-00	Gallons Label
8	2	066-00008-00	Screw-PSWA
9	1	057-00012-00	Progran Skipper Wheel
10	1	051-00049-00	Dial
11	1	069-00043-00	Quantity Label-40ton
	1	069-00184-00	Quantity Label-200ton
	1	069-00185-00	Quantity Label-375ton
	1	069-01125-00	Quantity Label-1200ton
12	1	051-00050-00	Retainer-PSWA
13	1	051-00068-00	Program Wheel Retainer
14	1	066-00026-00	Screw,tcc,NO.6-20x1/2,JIS SUS304
15	1	069-00181-00	Decal- Time of Day
16	1	052-00013-00	Spring Clip
17	1	057-00024-00	Main Drive Gear(SM)
18	1	099-00192-00	Program Wheel(SM) Assembly
19	1	057-00016-00	Idler Pinion
20	1	058-00007-00	Spring- Idler
21	1	057-00014-00	Idler Gear
22	1	057-00013-00	Driver Gear
23	1	052-00046-00	Motor Mounting Plate
24	**1**	**053-00031-00**	**Motor2 Assembly 24V/50HZ**
		053-00036-00	**Motor2 Assembly 24V/60HZ**
25	3	066-00010-00	Screw,ccch,NO.6-32x1/8,Zn,1022
26	1	057-00021-00	Drive Pinion- Program Wheel
27	1	051-00085-00	Clutch Drive Pinion
28	1	058-00004-00	Spring
29	1	051-00069-00	Spring Retainer
30	2	066-00011-00	Screw,ccch,NO.6-32UNCx1/4,Zn,1022
31	1	052-00041-00	Hinge Bracket
32	2	066-00012-00	Screw,tchw,NO.8-18x3/8,Zn,1022
33	3	052-00048-00	Insulator- Drive Assembly
34	1	043-00004-00	Switch4
35	1	043-00002-00	Switch2
36	2	066-00055-00	Screw,tcp,NO.M3-24x1.125,b,Zn,1022

Bold faced items are recommended spare parts

MODEL F60

Assembly Drawings and Part Numbers
F60 Control Valve Assembly



MODEL F60

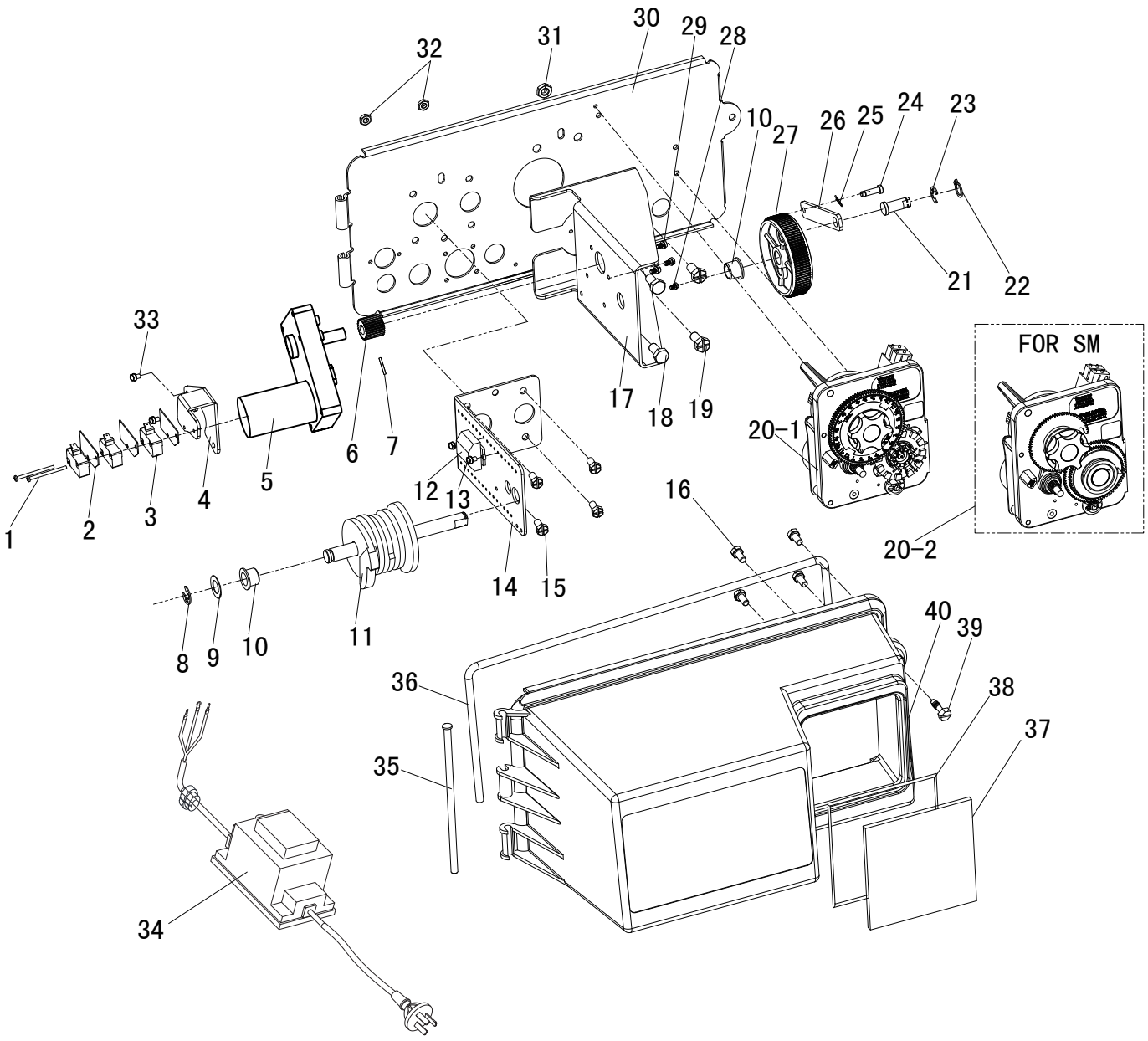
Assembly Drawings and Part Numbers
F60 Control Valve Assembly Parts List

Item No.	Quantity	Part No.	Description
1	2	066-00028-00	Screw M12*35
2	1	052-00279-00	FT Valve Body (NPT)
	1	052-00060-00	FT Valve Body (BSP)
3	1	060-00042-00	Valve-Tank Adapter Seal
4	**1**	**060-00083-00**	**O-Ring-229 (US)**
	1	**060-00043-00**	**O-Ring-230 (Metric)**
5	1	052-00067-00	Adapter-Top Mount 4"-8 Th'd (Metric)
6	**1**	**060-00033-00**	**Valve -Tank Adapter O-Ring -240**
7	1	051-00171-00	Clip-Piston Rod
8	**1**	**052-00061-00**	**Piston**
9	**1**	**052-00062-00**	**Piston Assembly (NRWB)**
10	1	060-00021-00	O-Ring-035
11	1	051-00167-00	Black End Plug (NRWB)
12	1	052-00063-00	Piston Rod
13	**8**	**060-00084-00**	**Seal**
14	**5**	**051-00165-00**	**Spacer**
15	**2**	**051-00166-00**	**Narrow Spacer**
16	4	066-00029-00	Screw-Hex-HD
17	2	052-00068-00	Cover
18	**2**	**060-00023-00**	**O-Ring -116**
19	2	052-00074-00	Pipe Plug-1/2” (NPT)
20	1	051-00415-00	White End Plug (RWB)
21	1	052-00097-00	FT Piston Rod

Bold faced items are recommended spare parts.

MODEL F60

Control Drive Assembly (For 60 Mechanical)



MODEL F60

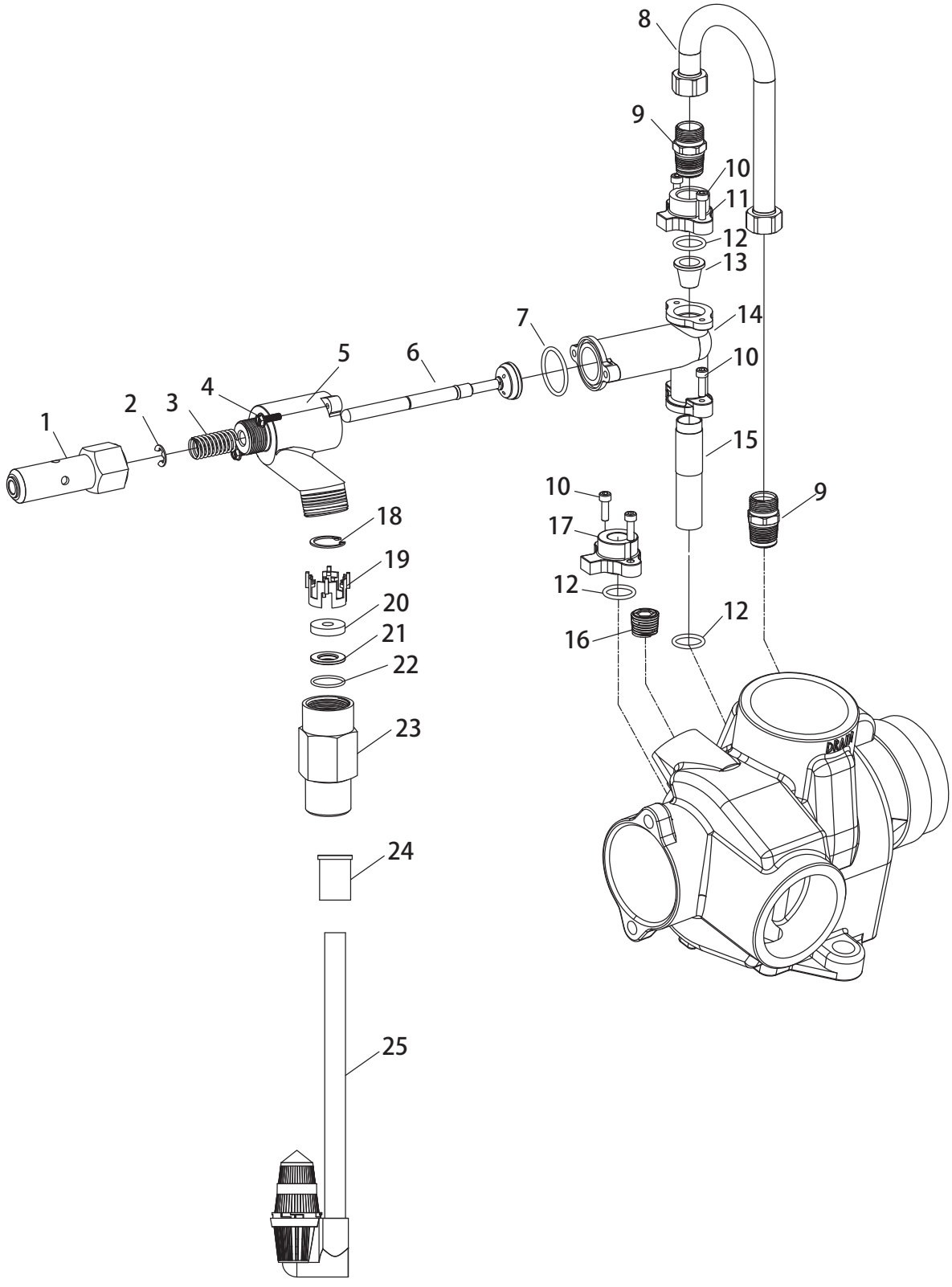
Control Drive Assembly (For 60 Mechanical)

Item No.	Quantity	Part No.	Description
1	2	066-00038-00	Screw
2	3	052-00049-00	Insulator - Drive Assembly
3	3	043-00009-00	Switch 1
4	1	052-00091-00	Bracket-Switch Mounting
5	**1**	053-00035-00	Motor 1 Assembly 24V
6	1	057-00038-00	Motor Gear
7	1	068-00015-00	Gear Pin
8	1	068-00010-00	Retaining ring ”E”
9	1	052-00093-00	Washing
10	2	051-00179-00	Bushing
11	1	099-00741-00	Cam Assembly
12	1	099-00724-00	Terminal Strip
13	2	066-00036-00	Screw
14	1	052-00089-00	Bracket-Brine Side
15	4	066-00035-00	Screw
16	4	066-00041-00	Screw
17	1	052-00090-00	Bracket-Motor Mounting
18	2	066-00030-00	Screw
19	2	066-00034-00	Screw
20-1	1	099-02893-00	Timer Assembly (24V/50HZ)
20-2	1	099-02895-00	Timer Assembly (24V/50HZ)-SM
21	1	052-00082-00	Bearing-Drive Link
22	1	068-00002-00	Retaining ring
23	1	068-00011-00	Retaining ring ”E”
24	1	052-00083-00	Pin-Drive Link
25	1	068-00017-00	Clip
26	1	052-00092-00	Drive Link
27	1	057-00027-00	Drive Gear
28	1	066-00039-00	Screw
29	3	066-00015-00	Screw
30	1	052-00088-00	Back Plate
31	2	066-00031-00	Nut
32	4	066-00032-00	Nut
33	2	066-00066-00	Screw
34	1	042-00025-00	Power Cord 2 Flat
35	1	051-00407-00	Pin, Hinge
36	1	060-00054-00	Seal, Cover
37	1	051-00416-00	Window
38	1	060-00089-00	Seal, Window
39	1	052-00087-00	Screw-Cover
40	1	051-00168-00	Cover, Black

Bold faced items are recommended spare parts.

MODEL F60

Assembly Drawings and Part Numbers
Large Brining System Assembly



MODEL F60

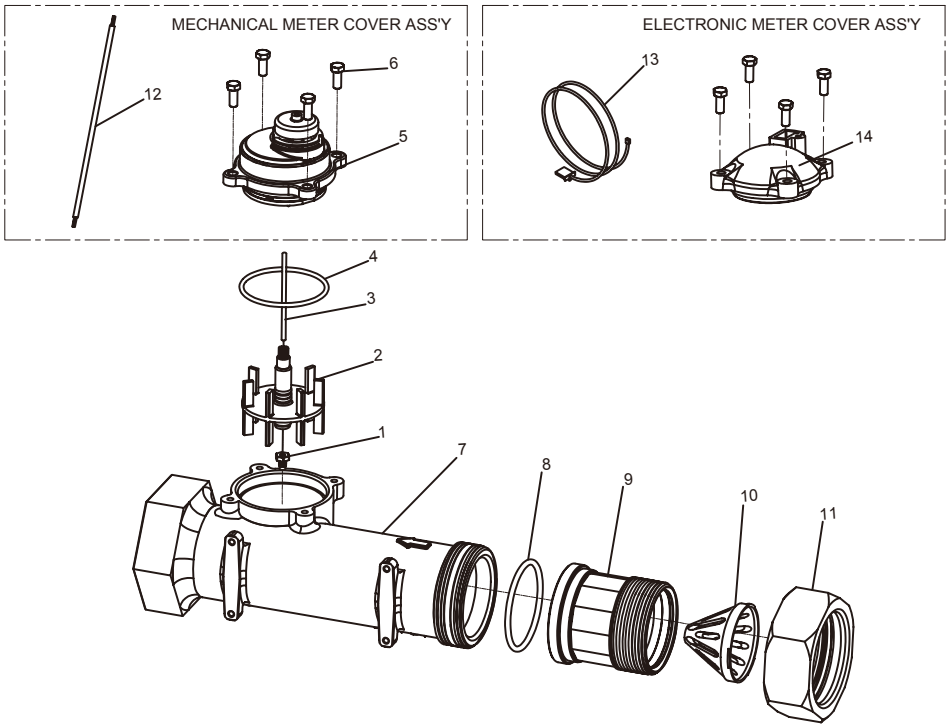
Assembly Drawings and Part Numbers
Large Brining System Assembly Parts List

Item No.	Quantity	Part No.	Description
1	1	052-00081-00	Stem Guide Assembly
2	1	068-00011-00	Retaining Ring
3	1	058-00006-00	Spring
4	2	066-00005-00	Screw
5	1	052-00280-00	Brine Valve Body (NPT)
	1	052-00064-00	Brine Valve Body (BSP)
6	1	099-00717-00	Brine Valve Stem Assembly
7	1	060-00049-00	O-Ring -124
8	1	052-00298-00	Brine Tube Assembly
9	2	052-00296-00	Tube Fitting
10	6	066-00029-00	Screw-Hex, HD
11	1	052-00066-00	Injector Cap
12	3	060-00023-00	O-Rings -116
13	1	051-00176-00	10# Injector Nozzle
	1	051-00174-00	8# Injector Nozzle
14	1	052-00065-00	Injector Body
15	1	051-00175-00	10# Injector Throat
	1	051-00172-00	8# Injector Throat
16	1	052-00074-00	Pipe Plug-1/2" (NPT)
17	1	052-00068-00	Injector Plug
18	1	068-00008-00	Retaining Ring
19	1	051-00182-00	Spring Clip
20	1	060-00058-00	RFC Washer-10 gpm
21	1	051-00185-00	Filter Sheet
22	1	060-00046-00	O-Ring-AS020
23	1	052-00283-00	1" RFC Housing (NPT)
	1	052-00076-00	1" RFC Housing (BSP)
24	1	051-00325-00	1"Female NPT*1"Slip
25	1	051-00119-00	1″ Air Check

Bold faced items are recommended spare parts .

MODEL F60

Assembly Drawings and Part Numbers
2" Flow Meter Assembly & Parts List



Item No.	Quantity	Part No.	Description
1	1	052-00086-00	Impeller Shaft Retainer
2	1	099-01851-00	Impeller
3	1	052-00085-00	Impeller Shaft
4	1	060-00026-00	O-Ring
5	1	099-00734-00	Meter Cover Assembly (Mechanical)
6	4	066-00020-00	Screw-Hex Hd,M5*12
7	1	052-00320-00	2″ Meter Body (NPT)
	1	052-00070-00	2″ Meter Body (BSP)
8	1	060-00030-00	O-Ring-227
9	1	052-00321-00	Nipple Quick Connect (NPT)
	1	052-00071-00	Nipple Quick Connect (BSP)
10	1	051-00181-00	Flow Straightener
11	1	052-00072-00	Nut Quick Connect
12	1	061-00003-00	Meter Cable Assembly (17.5″)
13	1	047-00013-00	Meter Cable Assembly (99.5″)
	1	047-00038-00	Meter Cable Assembly (300″)
14	1	099-01754-00	Meter Cover Assembly (Electronic)

Bold faced items are recommended spare parts .

PROBLEM	CAUSE	CORRECTION
1. Softener fails to regenerate.	A.Electrical service to unit has been interrupted. B. Timer is defective. C. Power failure	A. Assure permanent electrical service (check fuse, plug, pull chain or switch). B. Replace timer. C. Reset time of day.
2. Hard water.	A.By-pass valve is open. B. No salt in brine tank. C.Insufficient water flowing into brine tank. D. Hot water tank hardness. E . Leak at distributor tube. F. Internal valve leak.	A. Close by-pass valve. B. Add Salt to brine tank and maintain salt level above water level. C. Check brine tank fill time and clean brine line flow control if plugged. D. Repeated flushing of the hot water tank is required. E. Make sure distributor tube is not cracked. Check O-ring and tube pilot. F. Replace seals and spacers and/or piston.
3. Unit used too much salt	A. Improper salt setting. B. Excessive water in brine tank.	A. Check salt usage and saltsetting. B. See Problem No.7.
4. Loss of water pressure.	A. Iron buildup in line to water conditioner. B. Iron buildup in water conditioner. C. Inlet of control plugged due to foreign material broken loose from pipe by recent work done on plumbing system.	A. Clean line to water conditioner. B. Clean control and add mineral cleaner to mineral bed. Increase frequency of regeneration. C. Remove pistons and clean control.
5. Loss of mineral through drain line	A. Air in water system. b. Improperly sized drain line flow control.	A. Assure that well system has proper air eliminator control. Check for dry well condition. B. Check for proper drain rate.
6. Iron in conditioned water.	A. Fouled mineral bed.	A. Check backwash,brine draw and brine tank fill. Increase frequency of regeneration. Increase backwash time.

PROBLEM	CAUSE	CORRECTION
7. Excessive water in brine tank	A. Plugged drain line flow control. B. Plugged injector system. C. Timer not cycling. D. Foreign material in brine valve. E. Foreign material in brine line flow control.	A. Check flow control. B. Clean injector and screen. C. Replace timer. D. Replace brine valve seat and clean valve. E. Clean brine line flow control.
8. Softener fails to draw brine.	A. Drain line flow control is plugged. B. Injector is plugged. C. Line pressure is too low. D. Internal Control Leak.	A. Clean drain line flow control. B. Clean injector. C. Increase line pressure to 25 P.S.I. min. D. Check drive motor and switches.
9. Control cycles continuously.	A. Missadjusted, broken or shorted switch.	A. Determine if switch or timer is faulty and replace it, or replace complete power head.
10. Drain flows continuously.	A. Valve is not programming correctly. B. Foreign material in control. C. Internal control leak	A. Check timer program and positioning of control. Replace power head assembly if not positioning properly. B. Remove power head assembly and inspect bore, remove foreign material and check control in various regeneration positions. C. Replace seals and piston assembly.

General Service Hints

Problem: Softener Delivers Hard Water.

Cause could be that . . . Reserve Capacity Has Been Exceeded.

Correction: Check salt dosage requirements and reset program wheel to provide additional reserve.

Cause could be that . . . Program Wheel Is Not Rotating With Meter Output.

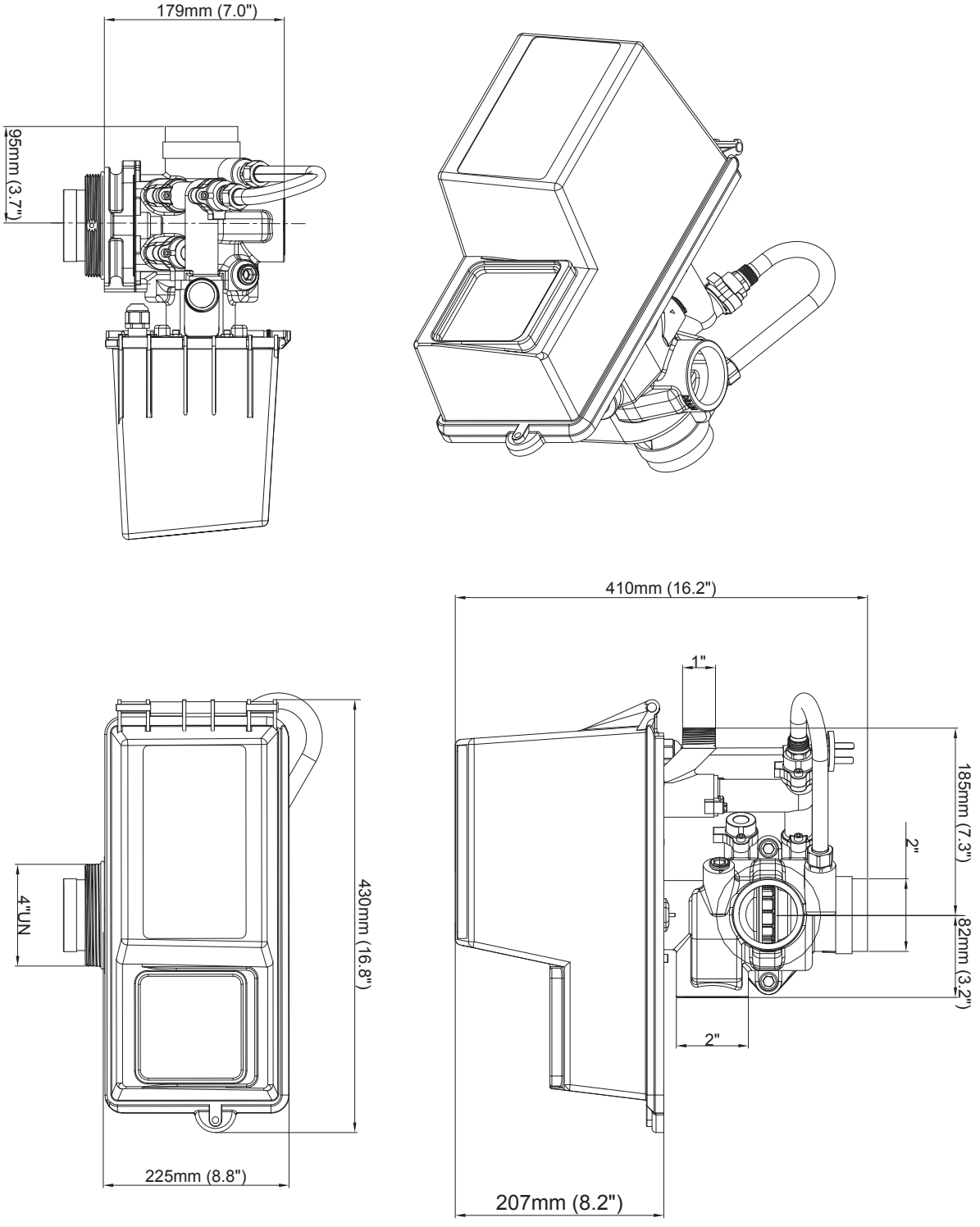
Correction: Pull cable out of meter cover and rotate manually. Program wheel must rnove without binding and clutch must give positive “clicks” when program wheel strikes regeneration stop. If it does not, replace timer.

Cause could be that . . . Meter Is Not Measuring Flow.

Correction: Check meter with meter checker.

MODEL F60

Dimensional Drawing



Assembly Drawings and Part Numbers

MODEL F60

Assembly Kits

Piston Kits 100-00016-00 Piston Kits-RWB 100-00017-00 Piston Kits-NRWB	**Injector** 099-01670-00 #8 Injector Assembly 099-01671-00 #10 Injector Assembly
Seals & Spacers 100-00044-00 F60 Spacers & Seals	**Large 1” Brine Valve** 100-00058-00 Brine Valve Assembly
Meter(2" Electronic Flow Meter) 100-00038-00 99.5" Cable 100-00041-00 300" Cable	**Meter**(2" Extended Mechanical Flow Meter) 100-00042-00
RFC Washers 060-00122-00 10.0G	**RFC Housing Assembly** 100-00143-00 1” NPT Refill Flow Control with 10 gpm washer 100-00144-00 1” BSP Refill Flow Control with 10 gpm washer
BWFC Washers 060-00072-00 0G 060-00047-00 25G	**BWFC Housing Assembly** 100-00149-00 2” NPT 50G 100-00151-00 2” BSP 50G 100-00150-00 2” NPT 100G 100-00152-00 2” BSP 100G

Notes

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