Instructions-Parts

High Pressure Equipment
A GRACO Company

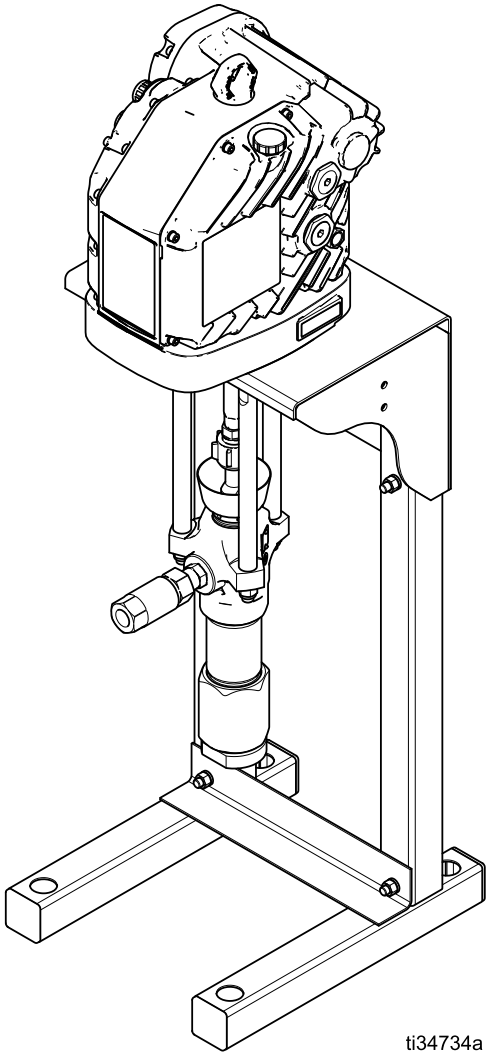
e710 DC 2–Ball Piston Pumps

3A6358A
EN

Electric drive piston pumps for supercritical gas extraction.
For professional use only.

Important Safety Instructions
Read all warnings and instructions in this manual. **Save these instructions.**

See Technical Specifications for Maximum Working Pressure.
See page 3 for model part numbers and approvals information.



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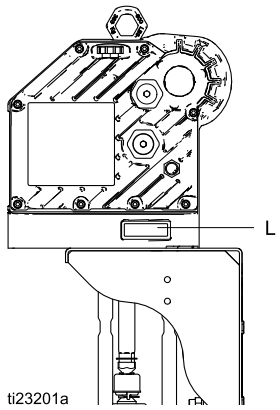
Contents

Models

The six digit part number for your equipment is printed on the equipment identification label (L). Refer to the table below for information regarding the configuration of your equipment.
See Pump Matrix, page 19, for a complete list of pump part numbers.



E-Flo DC Pump Part Number Configuration						
Voltage	**Part. No.**	**Lower Size**	**Motor Control**	**Approvals**	**Pump Materials**	**Packings**
220	30H000	220 CC	Basic	ATEX/FM-/IECEx	Stainless Steel	PTFE/UH-MWPE
	30H001	220 CC	Advanced			
	30H002	145 CC	Basic			
	30H003	145 CC	Advanced			
	EDEN01	220 CC	Basic			
	EDEN02	220 CC	Advanced			
	EDEN03	145 CC	Basic			
	EDEN04	145 CC	Advanced			

Pumps with Basic Motors

II 2 G
Ex db h IIA T3 Gb X

Pumps with Advanced Motors

II 2(1) G
Ex db h [ia Ga] IIA T3 Gb X

NOTE: See the E-Flo DC Motor manual for motor approvals information.

Related Manuals

Manual No.	Description
3A6316	Instructions-Parts Manual, e710 DC Motor
3A6317	Instructions-Parts Manual, e710 DC Motor, Three-Phase
3A2527	Instructions-Parts Manual, for E-Flo DC Control Module Kit
311827	Instructions-Parts Manual, Dura-Flo Lowers

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

⚠ WARNING

FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. Paint or solvent flowing through the pump equipment can cause static sparking. To help prevent fire and explosion:

- Use equipment only in well-ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static sparking).
- Ground all equipment in the work area. See **Grounding** instructions.
- Never spray or flush at high pressure.
- Keep work area free of debris, including solvent, rags, and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.
- Use only grounded hoses.
- Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are antistatic or conductive.
- **Stop operation immediately** if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.

Static charge may build up on plastic parts during cleaning and could discharge and ignite flammable vapors. To help prevent fire and explosion:

- Clean plastic parts only in well ventilated area.
- Do not clean with a dry cloth.
- Do not operate electrostatic guns in equipment work area.

SPECIAL CONDITIONS FOR SAFE USE

- To prevent the risk of electrostatic sparking, the equipment's non-metallic parts should be cleaned only with a damp cloth.
- The aluminum housing may spark upon impact or contact with moving parts, which may cause fire or explosion. Take precautions to avoid such impact or contact.
- All flameproof joints are critical to the integrity of the motor as approved for hazardous locations and are not repairable if damaged. Damaged parts must be replaced only with genuine Graco parts with no substitutions.

WARNING


ELECTRIC SHOCK HAZARD

This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.

- Turn off and disconnect power at main switch before disconnecting any cables and before servicing or installing equipment.
- Connect only to grounded power source.
- All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.

BURN HAZARD

Equipment surfaces and fluid that is heated can become very hot during operation. To avoid severe burns:

- Do not touch hot fluid or equipment.


MOVING PARTS HAZARD

Moving parts can pinch, cut, or amputate fingers and other body parts.

- Keep clear of moving parts.
- Do not operate equipment with protective guards or covers removed.
- Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the **Pressure Relief Procedure** and disconnect all power sources.





SKIN INJECTION HAZARD

High-pressure fluid from dispensing device, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. **Get immediate surgical treatment.**

- Do not point dispensing device at anyone or at any part of the body.
- Do not put your hand over the fluid outlet.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** when you stop dispensing and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses and couplings daily. Replace worn or damaged parts immediately.

WARNING

TOXIC FLUID OR FUMES HAZARD

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.

- Read Safety Data Sheets (SDSs) to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.

PERSONAL PROTECTIVE EQUIPMENT

Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. Protective equipment includes but is not limited to:

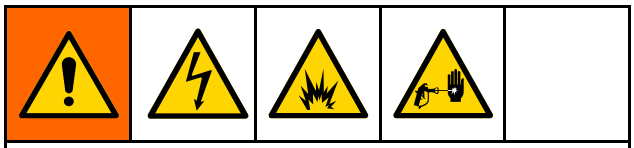
- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Specifications** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Specifications** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request Safety Data Sheets (SDSs) from distributor or retailer.
- Turn off all equipment and follow the **Pressure Relief Procedure** when equipment is not in use.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.

Installation



Installation of this equipment involves potentially hazardous procedures. Only trained and qualified personnel who have read and who understand the information in this manual should install this equipment.

Location

When selecting the location for the equipment, keep the following in mind:

- There must be sufficient space on all sides of the equipment for installation, operator access, maintenance, and air circulation.
- Ensure that the mounting surface and mounting hardware are strong enough to support the weight of the equipment, fluid, hoses, and stress caused during operation.
- There must be a start/stop control (C) within easy reach of the equipment. See Typical Installation, page 8 .

Mount the Pump

Stand Mount

See Stand Mounting Hole Pattern, page 21

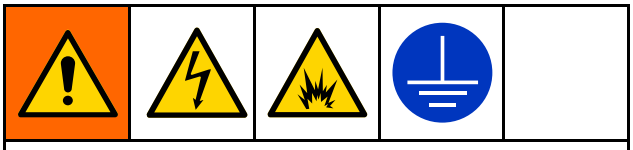
1. Select a level surface for the stand to be mounted to.
2. Secure the stand to the floor with M19 (5/8 in.) bolts. Use bolts that engage at least 152 mm (6 in.) into the floor to prevent the pump from tipping.
3. Use shims to level the pump as required.

Wall Mount

See Wall Mounting Hole Pattern, page 22.

1. Select a solid position on a wall for the mounting bracket. The wall should be capable of supporting the pump and accessories that will be attached to the bracket, any additional weight of the fluid used in the pump, and any stress or strain that may be applied during pump operation.
2. Drill four 7/16 in. (11 mm) diameter holes for the mounting bolts, approximately 5 ft (1.5 m) above the floor, using the wall bracket as a template. Use any of the three mounting hole groupings
3. Bolt the bracket securely to the wall. Use bolts designed to hold in the wall's construction.
4. Place the pump and accessories over the bracket's mounting holes and secure with screws (5) and washers (4) supplied.

Power Requirements



Improper wiring may cause electric shock or other serious injury if work is not performed properly.

- This equipment must be grounded. Connect only to a grounded power source.
- All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.

See Table 1 for power requirements. The system requires a dedicated circuit protected with a circuit breaker.

Table 1 . Power Supply Specifications

Model	Voltage	Phase	Hz	Power
EM0070	220 VAC	1	50/60	20 A
EM0071	220 VAC	1	50/60	20 A
EM1070	480 VAC	3	50/60	3 kVA
EM1071	480 VAC	3	50/60	3 kVA

Hazardous Area Cabling and Conduit Requirements

Explosion Proof

All electrical wiring in the hazardous area must be encased in Class I, Division I, Group D approved explosion-proof conduit. Follow all National, State, and Local electric codes.

A conduit seal (D) is required within 18 in. (457 mm) of the motor for the US and Canada. See Fig. 3.

All cables must be rated at 70°C (158°F).

Flame Proof (ATEX)

Use appropriate conduit, connectors, and cable glands rated for ATEX II 2 G. Follow all National, State, and Local electric codes.

All cable glands and cables must be rated at 70°C (158°F).

Typical Installation

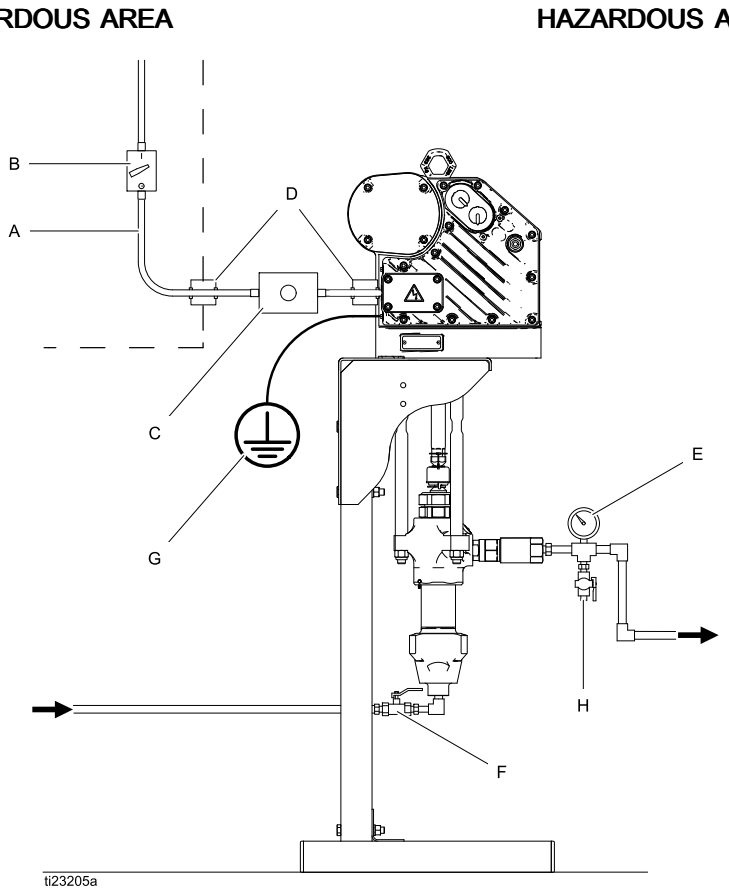
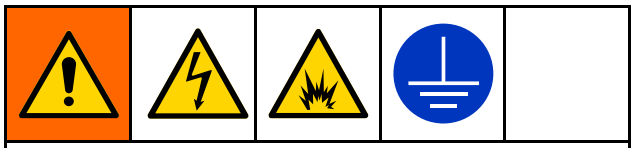


Figure 1 Typical Installation

Key for Fig. 1	
A	Electrical Supply (must be sealed conduit approved for use in hazardous locations)
B	Disconnect, with lock
C	Start/Stop Control (must be approved for use in hazardous locations)
D	Explosion Proof Conduit Seal. Required within 18 in. (457 mm) of the motor for the US and Canada.

Key for Fig. 1	
E	Fluid Pressure Gauge
F	Fluid Shutoff Valve
G	Pump Ground Wire. Two ground terminals are provided if local code requires redundant grounding connections.
H	Fluid Drain/Pressure Relief Valve

Connect the Power Supply



Improper wiring may cause electric shock or other serious injury if work is not performed properly.

- This equipment must be grounded. Connect only to a grounded power source.
- All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.

1. Ensure that the disconnect (B, Fig. 2) is shut off and locked out.

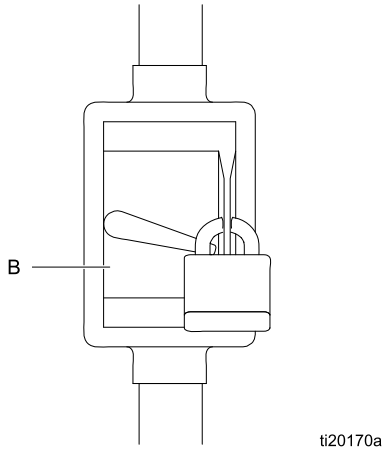


Figure 2 Locked Out Disconnect

2. See Figs. 3 and 4. Install a start/stop control (C) in the electrical supply line (A), within easy reach of the equipment. The start/stop control must be approved for use in hazardous locations.

3. Open the electrical compartment (S) on the motor.

4. Bring the supply wires into the electrical compartment through the 3/4–14 npt(f) inlet port. Connect the wires to the terminals, as shown in Figs. 3 and 4. Torque the terminal nuts to 25 in-lb (2.8 N•m) maximum. **Do not over-torque.**

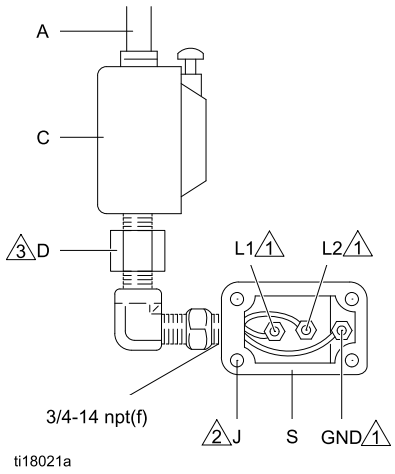


Figure 3 Connect the Power Wires, Single Phase

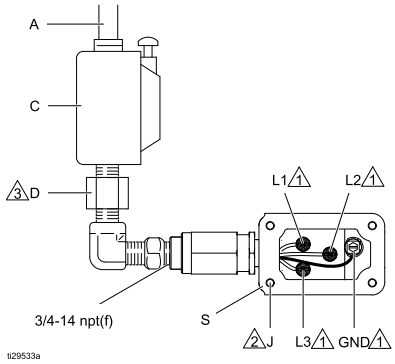
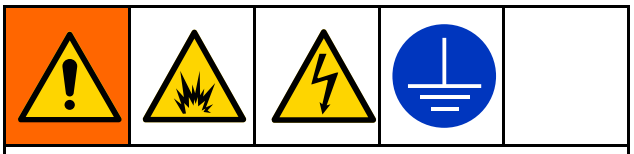


Figure 4 Connect the Power Wires, Three Phase

Notes for Figs. 3 and 4	
1	Tighten all terminal nuts to 25 in-lb (2.8 N•m) maximum. **Do not over-torque.**
2	Tighten cover screws to 15 ft-lb (20.3 N•m).
3	A conduit seal (D) is required within 18 in. (457 mm) of the motor for the US and Canada.

5. Close the electrical compartment. Torque the cover screws to 15 ft-lb (20.3 N•m).

Grounding



This equipment must be grounded to reduce the risk of static sparking and electric shock. Electric or static sparking can cause fumes to ignite or explode. Improper grounding can cause electric shock. Grounding provides an escape wire for the electric current.

1. Connect the supply ground wire in the electrical compartment as shown in Figs. 3 and 4.
2. Connect a ground wire as shown in Fig. 5. Loosen the ground screw and attach a ground wire (Y, Graco part 222011, not supplied). Tighten the ground screw securely. Connect the other end of the ground wire to a true earth ground.

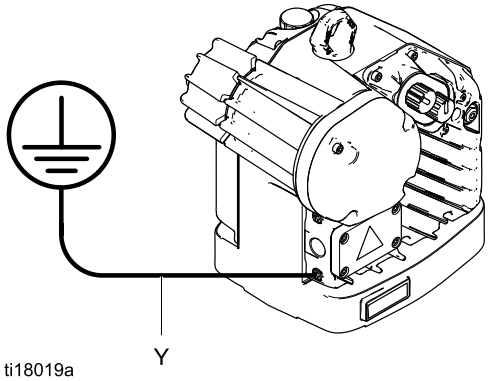


Figure 5 Ground Wire

NOTE: Advanced models require installation of a control module. All pumps connected to a common control module must be grounded to the same ground point. Different ground points (unequal potential) may cause current to flow through component cables, causing incorrect signals.

Pump	Control Module
30H000–003, EDEN01–04	24P822
30H004–007, EDEN05–08	17V232

3. **Fluid hoses:** Use only electrically conductive hoses with a maximum of 500 ft. (150 m) combined hose length to ensure grounding continuity. Check the electrical resistance of hoses. If total resistance to ground exceeds 25 megohms, replace hose immediately
4. **Fluid supply container:** Follow your local code.

Control Module Accessory

The Control Module Accessory is required with Advanced E-Flo DC motors to provide the interface for users to enter selections and view information related to setup and operation. See the Control Module Accessory Kit manual for installation and operation information.

Fluid Line Accessories

Install the following accessories as shown in Fig. 1, using adapters as necessary. All fluid lines and accessories must be rated to the maximum working pressure of 400 psi (2.8 MPa, 28.0 bar).

- **Fluid drain/pressure relief valve (H):** required in your system, to relieve fluid pressure in the hose and circulation system. Use a valve that is able to automatically relieve pressure at no more than 130% of your pump's maximum fluid working pressure. See Technical Specifications, page 25.
- **Fluid pressure gauge (E):** for more precise adjustment of the fluid pressure.
- **Fluid shutoff valve (F):** shuts off fluid flow.

Fill With Oil Before Using Equipment

See Fig. 5. Before using the equipment, open the fill cap (P) and add Graco Part No. 16W645 ISO 220 silicone-free synthetic gear oil. Check the oil level in the sight glass (K). Fill until the oil level is near the halfway point of the sight glass. The oil capacity is approximately 1.5 quarts (1.4 liters). **Do not overfill.**

NOTE: Two 1 quart (0.95 liter) bottles of oil are supplied with the equipment.

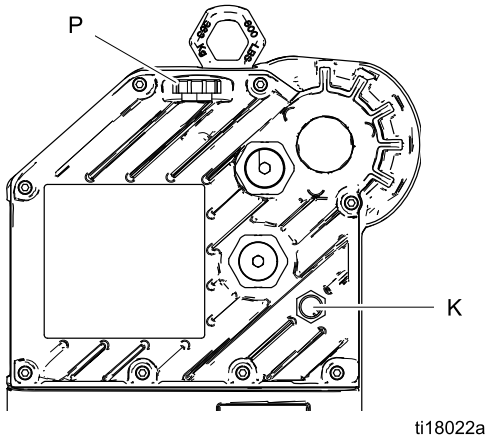


Figure 6 Sightglass and Oil Fill Cap

Flush Before Using Equipment

To avoid fire and explosion, always ground equipment and waste container. To avoid static sparking and injury from splashing, always flush at the lowest possible pressure.

The pump fluid section was tested with lightweight oil, which is left in the fluid passages to protect parts. To avoid contaminating your fluid with oil, flush the equipment with a compatible solvent before using the equipment.

Operation

Startup

To operate the pump, follow the Startup instructions for the Basic or Advanced motor in the Motor manual.

NOTE: The Advanced E-Flo DC motors require installation of the 24P822 Control Module Accessory Kit to provide the interface for users to enter selections and view information related to setup and operation.

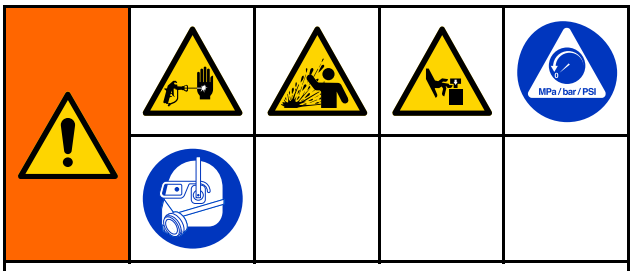
Prior to normal operation, run the pump at a slow speed until the fluid lines are primed and all air is forced out of the system.

Shutdown

Stop the pump at the bottom of its stroke to prevent fluid from drying on the exposed displacement rod and damaging the throat packings, and follow the Pressure Relief Procedure, page 12.

Pressure Relief Procedure

Follow the Pressure Relief Procedure whenever you see this symbol.



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid and moving parts, follow the Pressure Relief Procedure when you stop spraying and before cleaning, checking, or servicing the equipment.

1. Disengage the start/stop control (C). See Fig. 1.
2. Shut off and lock out the fused safety switch (B).
3. Open the fluid drain valve (H), having a waste container ready to catch drainage. Leave open until you are ready to operate again.

Flushing

To avoid fire and explosion, always ground equipment and waste container. To avoid static sparking and injury from splashing, always flush at the lowest possible pressure.

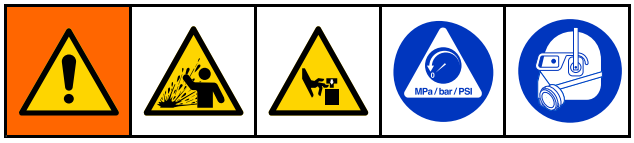
- Flush before changing fluids, before fluid can dry in the equipment, at the end of the day, before storing, and before repairing equipment.
- Flush at the lowest pressure possible. Check connectors for leaks and tighten as necessary.
- Flush with a fluid that is compatible with the fluid being dispensed and the equipment wetted parts.

Maintenance

Preventive Maintenance Schedule

The operating conditions of your particular system determine how often maintenance is required. Establish a preventive maintenance schedule by recording when and what kind of maintenance is needed, and then determine a regular schedule for checking your system.

Change the Oil



NOTE: Change the oil after a break-in period of 200,000–300,000 cycles. After the break-in period, change the oil once a year.

1. Remove power and perform the Pressure Relief Procedure, page 12.
2. See Fig. 6. Place a minimum 2 quart (1.9 liter) container under the oil drain port. Remove the oil drain plug (25). Allow all oil to drain from the motor.
3. Reinstall the oil drain plug (25). Torque to 25–30 ft-lb (34–40 N•m).
4. See Fig. 7. Open the fill cap (P) and add Graco Part No. 16W645 ISO 220 silicone-free synthetic gear oil. Check the oil level in the sight glass (K). Fill until the oil level is near the halfway point of the sight glass. The oil capacity is approximately 1.5 quarts (1.4 liters). **Do not overfill.**
5. Reinstall the fill cap.
6. Reconnect power.

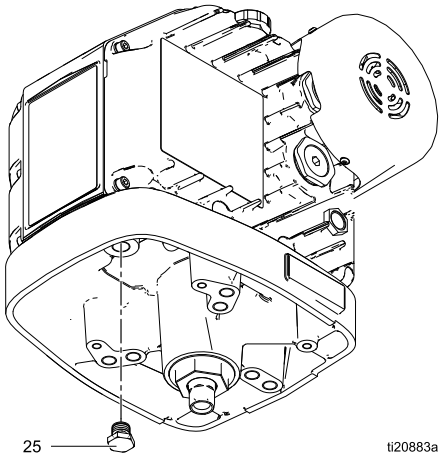


Figure 7 Oil Drain Plug

Check Oil Level

See Fig. 7. Check the oil level in the sight glass (K). The oil level should be near the halfway point of the sight glass when the unit is not running. If low, open the fill cap (P) and add Graco Part No. 16W645 ISO 220 silicone-free synthetic gear oil as required. The oil capacity is approximately 1.5 quarts (1.4 liters). **Do not overfill.**

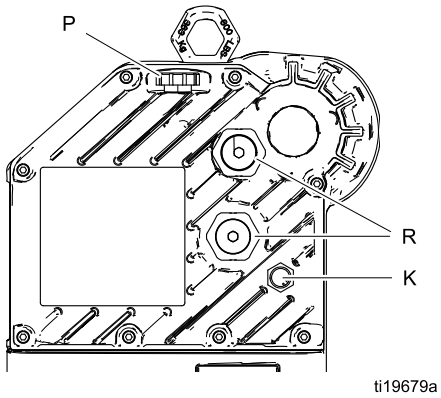


Figure 8 Sightglass and Oil Fill Cap

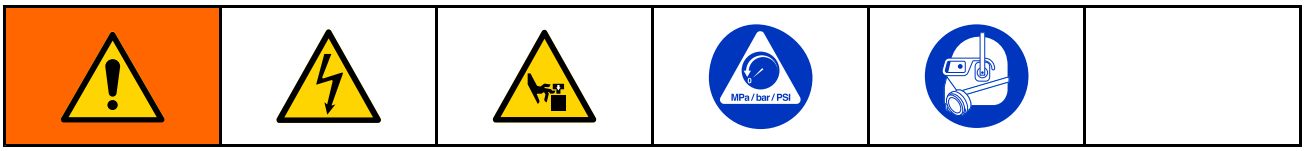
Bearing Pre-Load

See Fig. 7. The bearing pre-loads (R) are factory set and are not user adjustable. Do not adjust the bearing pre-loads.

Wet-Cups

Check the wet-cup daily. Keep the wet-cup 1/3 filled with Graco Throat Seal Liquid (TSL™) or compatible solvent.

Troubleshooting



NOTE: Check all possible remedies before disassembling the pump.

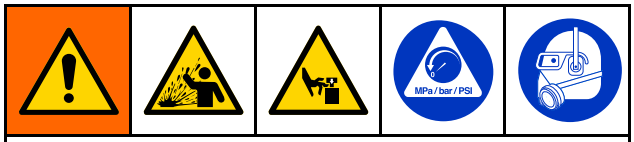
NOTE: The LED on the motor will blink if an error is detected. See **Error Code Troubleshooting** in the motor manual for further information.

Problem	Cause	Solution
Pump output low on both strokes.	Inadequate power supply.	See Power Requirements, page 7 .
	Exhausted fluid supply.	Refill and reprime pump.
	Clogged fluid outlet line, valves, etc.	Clear.
	Worn piston packing.	Replace. See lower manual.
Pump output low on only one stroke.	Held open or worn ball check valves.	Check and repair. See lower manual.
	Worn piston packing.	Replace. See lower manual.
No output.	Improperly installed ball check valves.	Check and repair. See lower manual.
Pump operates erratically.	Exhausted fluid supply.	Refill and reprime pump.
	Held open or worn ball check valves.	Check and repair. See lower manual.
	Worn piston packing.	Replace. See lower manual.
Pump will not operate.	Inadequate power supply.	See Power Requirements, page 7 .
	Exhausted fluid supply.	Refill and reprime pump.
	Clogged fluid outlet line, valves, etc.	Clear.
	Fluid dried on piston rod.	Disassemble and clean pump. See lower manual. In future, stop pump at bottom of stroke.

Repair

Dura-Flo Lowers

Disassembly



To avoid crushing injuries or muscle strains, use caution when disconnecting the lower, it can weigh up to 25 kg (55 lbs).

1. Stop the pump at the bottom of its stroke.
2. Relieve the pressure. See the Pressure Relief Procedure, page 12.
3. Disconnect the hoses from the lower and plug the ends to prevent fluid contamination.
4. Loosen the coupling nut (11) and remove the collars (10). See Fig. 8.
5. Remove the coupling nut from the piston rod (R).
6. Unscrew the locknuts (8) from the tie rods (6).
7. Separate the motor (3) and lower (7).

To repair the lower, see the Dura-Flo Lower instruction manual. Contact your Graco representative for assistance.

Reassembly

NOTE: If the coupling adapter (9) and tie rods (6) have been disassembled from the motor (3), see Reassemble the Coupling Adapter and Tie Rods to the Motor, page 16

1. Assemble the coupling nut (11) to the piston rod (R). See Fig. 8.
2. Orient the lower (7) to the motor (3). Position the lower (7) on the tie rods (6). Lubricate the threads of the tie rods (6).
3. Screw the tie rod locknuts (8) onto the tie rods (6). Tighten the locknuts (8) and torque to 50-60 ft-lb (68-81 N•m).
4. Insert the collars (10) into the coupling nut (11). Tighten the coupling nut (11) onto the coupling adapter (9) and torque to 90–100 ft-lb (122–135 N•m).
5. Flush and test the pump before reinstalling it in the system. Connect hoses and flush the pump. While it is pressurized, check for smooth operation and leaks. Adjust or repair as necessary before reinstalling in the system. Reconnect the pump ground wire before operating.

NOTE: When used with E-Flo DC motors, Dura-Flo lowers require check valve (35) to be installed.

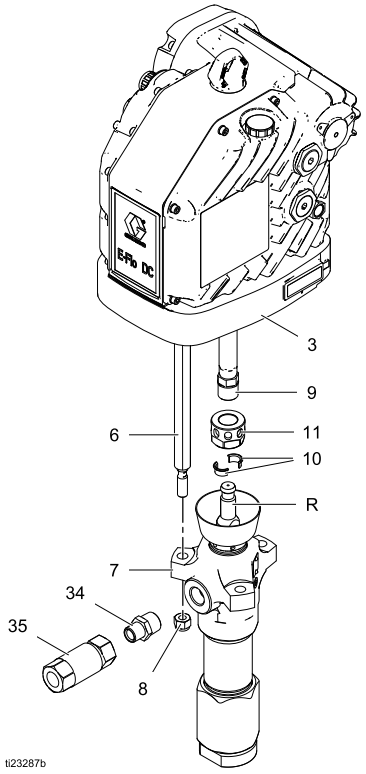


Figure 9 Dura-Flo Pump Assembly

Reassemble the Coupling Adapter and Tie Rods to the Motor

NOTE: Use this procedure only if the coupling adapter (9) and tie rods (6) have been disassembled from the motor (3), to ensure proper alignment of the motor shaft to the piston rod (R).

1. See Fig. 10. Screw the tie rods (6) into the motor (3) and torque to 50-60 ft-lb (68-81 N•m).
2. Screw the coupling adapter (9) into the motor shaft and torque to 90–100 ft-lb (122–135 N•m).
3. Reassemble the pump to the motor. Use the applicable instructions for your pump; Dura-Flo, page 15.

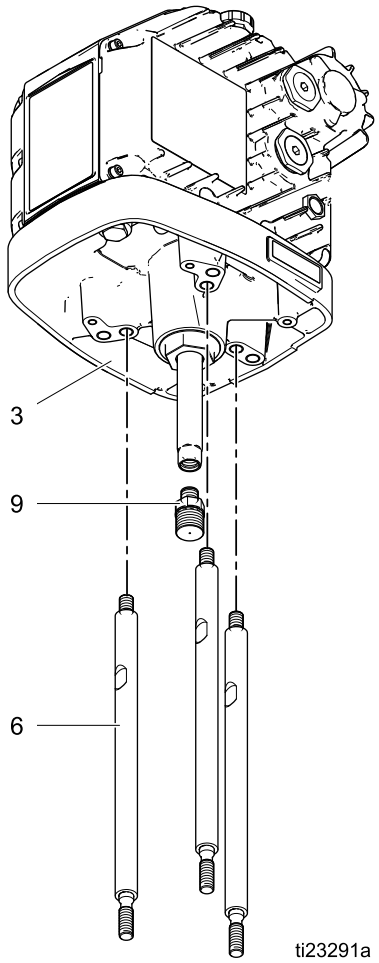
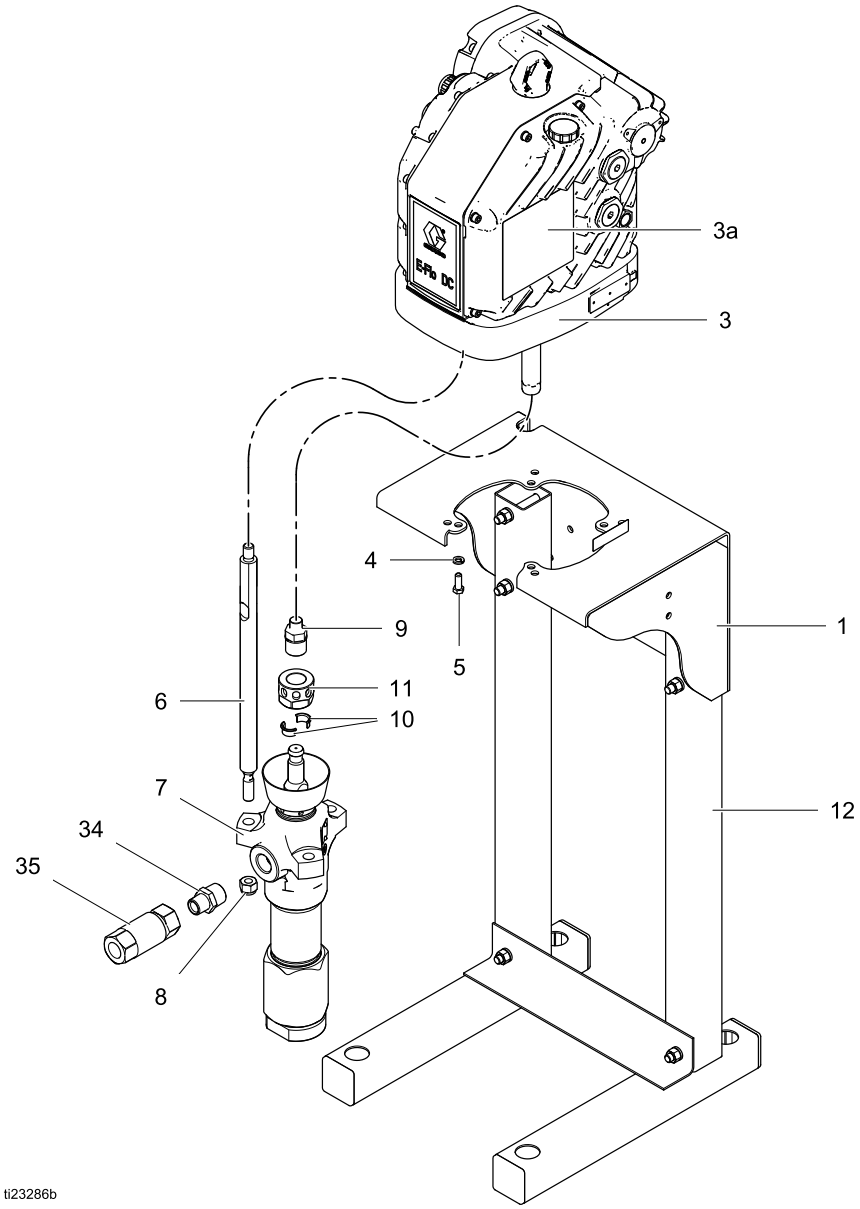


Figure 10 Pump Assembly

Parts

Dura-Flo Pump Assembly

See Models, page 3 for an explanation of the pump part number.



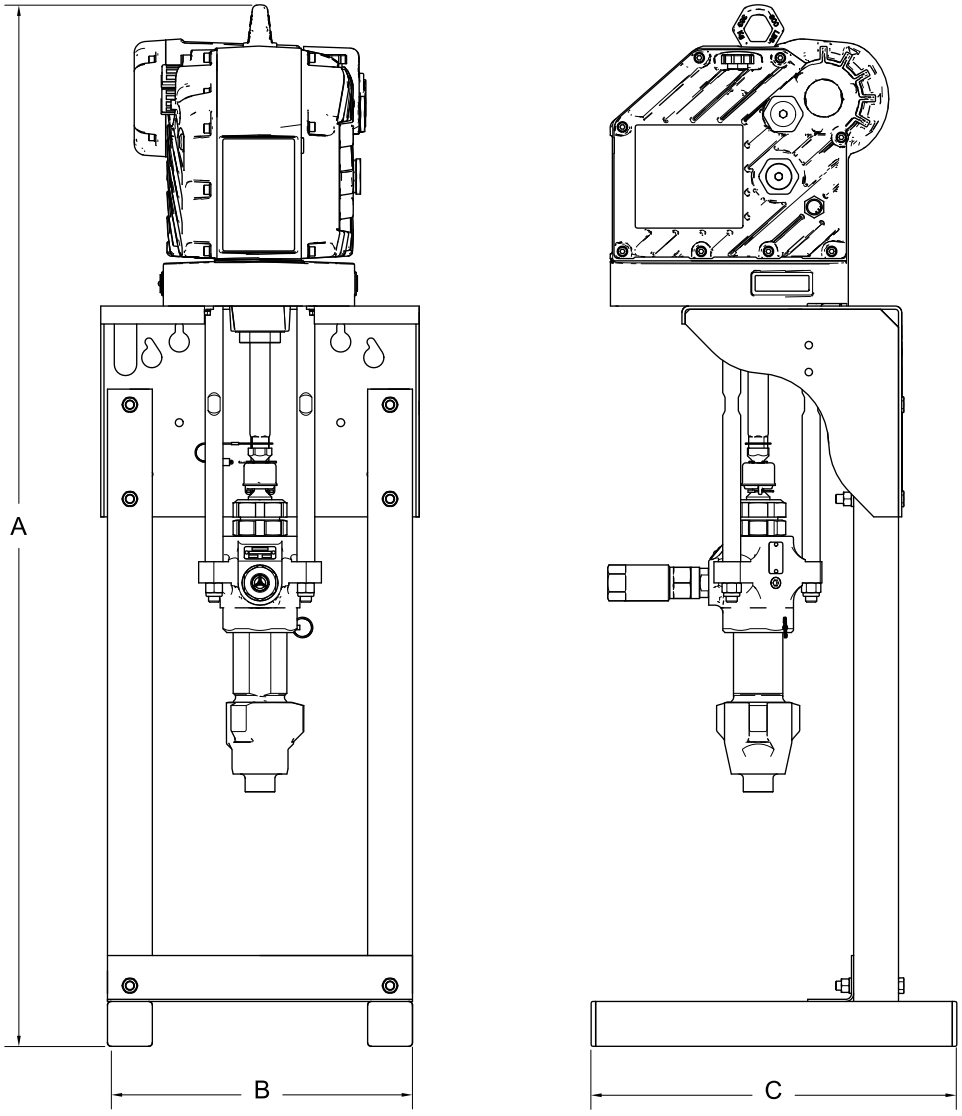
Ref	Part	Description	Qty
1	See Pump Matrix, page 19	KIT, mounting bracket, pump; includes items 4 and 5; see manual 311619	1
3	See Pump Matrix, page 19	MOTOR; Basic or Advanced; see motor manual; includes items 3a and 3b	1
3a▲	16M130	LABEL, warning	1
3b	16W645	OIL, gear, synthetic; ISO 220 silicone-free; 1 quart (0.95 liter); not shown	2
4	See Pump Matrix, page 19	WASHER	4
5	See Pump Matrix, page 19	BOLT	4
6	15H562	ROD, tie	3
7	See Pump Matrix, page 19	PUMP, displacement; see lower manual	1
8	101712	NUT, lock	3
9	15H370	ADAPTER	1
10	184129	COLLAR, coupling	2
11	186925	NUT, coupling	1
12	See Pump Matrix, page 19	STAND, floor	1
34	See Pump Matrix, page 19	FITTING	1
35	24S039	VALVE, check	1

▲ Replacement Danger and Warning labels, tags, and cards are available at no cost.

Pump Matrix

Pump Part No.	Pump Series	Mounting Bracket (Ref 1)	Floor Stand (Ref 12)	Motor (Ref 3)	Washer (Ref 4)	Bolt (Ref 5)	Lower Pump (Ref 7)	Fitting (Ref 34)
30H000	A	255143	256193	EM0070	100133	100101	L220SS	15M805
30H001				EM0071				
30H002				EM0070			241177	190724
30H003				EM0071				
EDEN01				EM0070			L220SS	15M805
EDEN02				EM0071				
EDEN03				EM0070			241177	190724
EDEN04				EM0071				

Dimensions

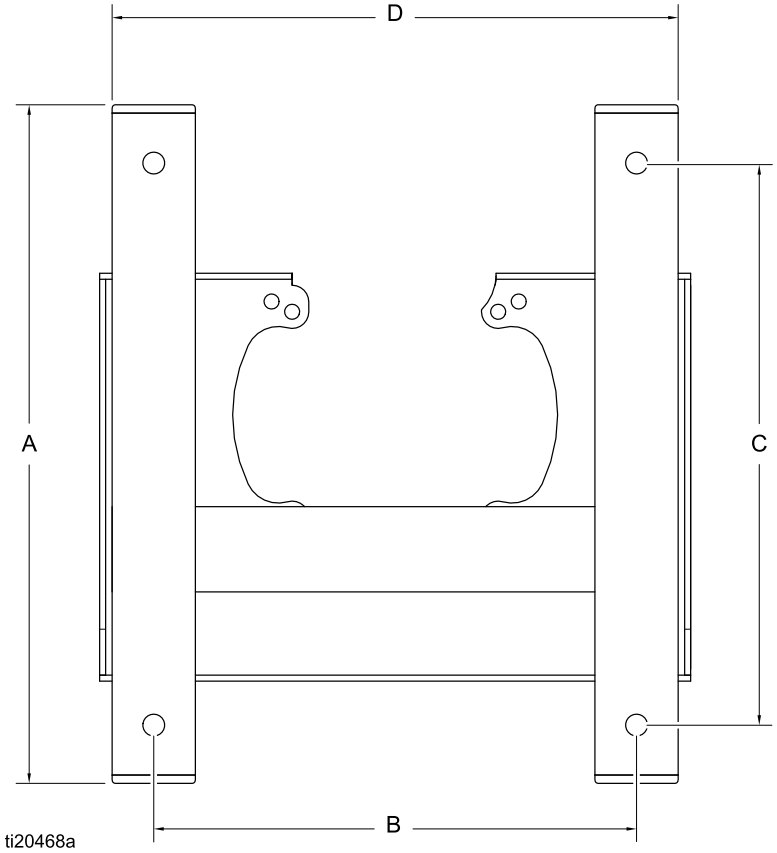


ti23207a

A	B	C
58.00 in. (1473 mm)	17.00 in. (432 mm)	19.88 in. (505 mm)

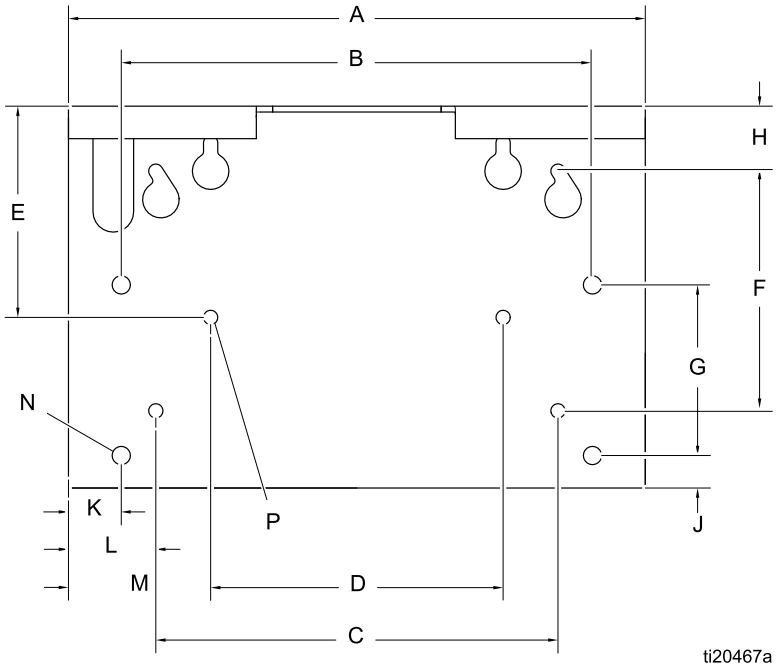
Mounting Hole Patterns

Stand Mount



Dimension	Measurement
A	19.88 in. (505 mm)
B	14.50 in. (368 mm)
C	16.88 in. (429 mm)
D	17.00 in. (432 mm)

Wall Mount



Dimension	Measurement
A	17.8 in. (451 mm)
B	14.5 in. (368 mm)
C	12.4 in. (314 mm)
D	9.0 in. (229 mm)
E	5.4 in. (137 mm)
F	7.4 in. (187 mm)
G	5.3 in. (133 mm)
H	2.0 in. (51 mm)
J	1.0 in. (25 mm)
K	1.6 in. (41 mm)
L	2.7 in. (69 mm)
M	4.4 in. (112 mm)
N	Four 0.562 in. (14 mm) diameter holes for mounting to stand
P	Four 0.438 in. (11 mm) diameter holes for mounting to wall

Performance Charts

To find the fluid pressure (psi/bar/MPa) at a specific fluid flow (gpm/lpm) and percentage of maximum force:

1. Locate the desired fluid flow in the scale at the bottom of the chart.
2. Follow the vertical line up to the intersection with the selected percentage of maximum force (see the **Key** below).
3. Follow left to the vertical scale to read the fluid outlet pressure.

Key to Performance Charts

NOTE: The charts show the motor operating at 100%, 70%, and 40% of maximum force. These values are approximately equivalent to an air motor operating at 100, 70, and 40 psi.

	Pressure
Max Pressure	—Ⓐ—
70% Pressure	—Ⓑ—
40% Pressure	—Ⓒ—

	Motor Amps/Watts
Max Pressure	– –Ⓐ– –
70% Pressure	– –Ⓑ– –
40% Pressure	– –Ⓒ– –

Table 2 220 V DC Motor with Dura-Flo 145 Lower

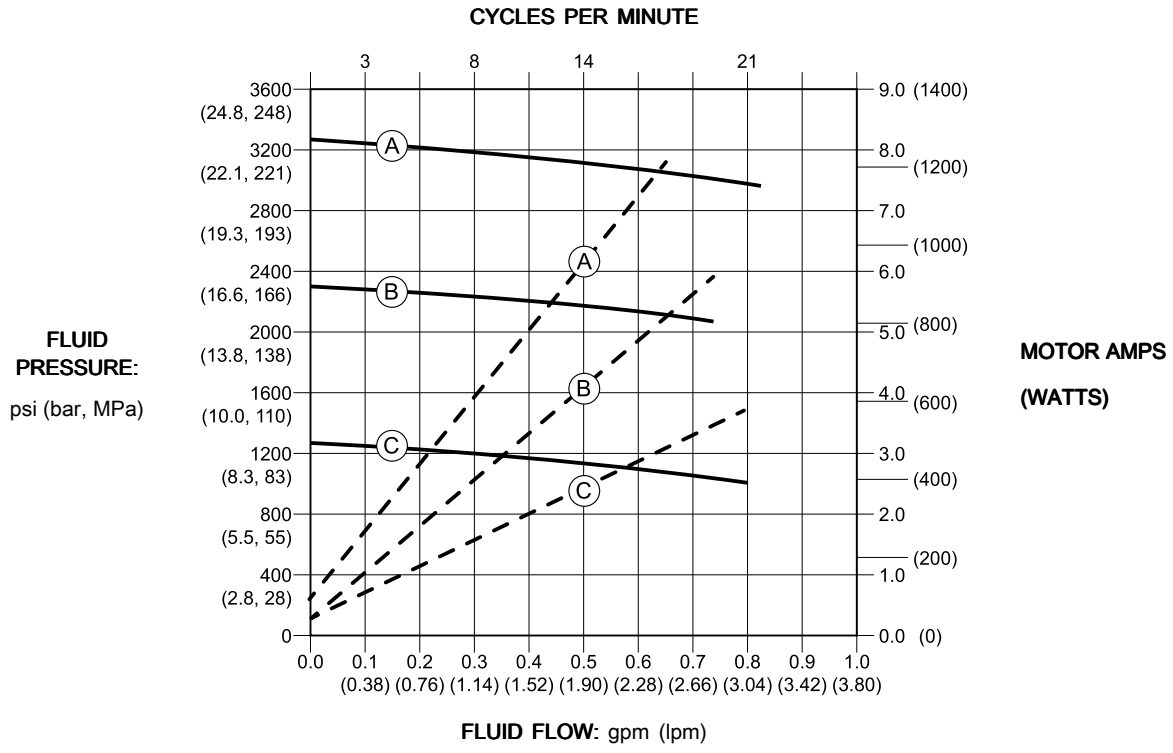
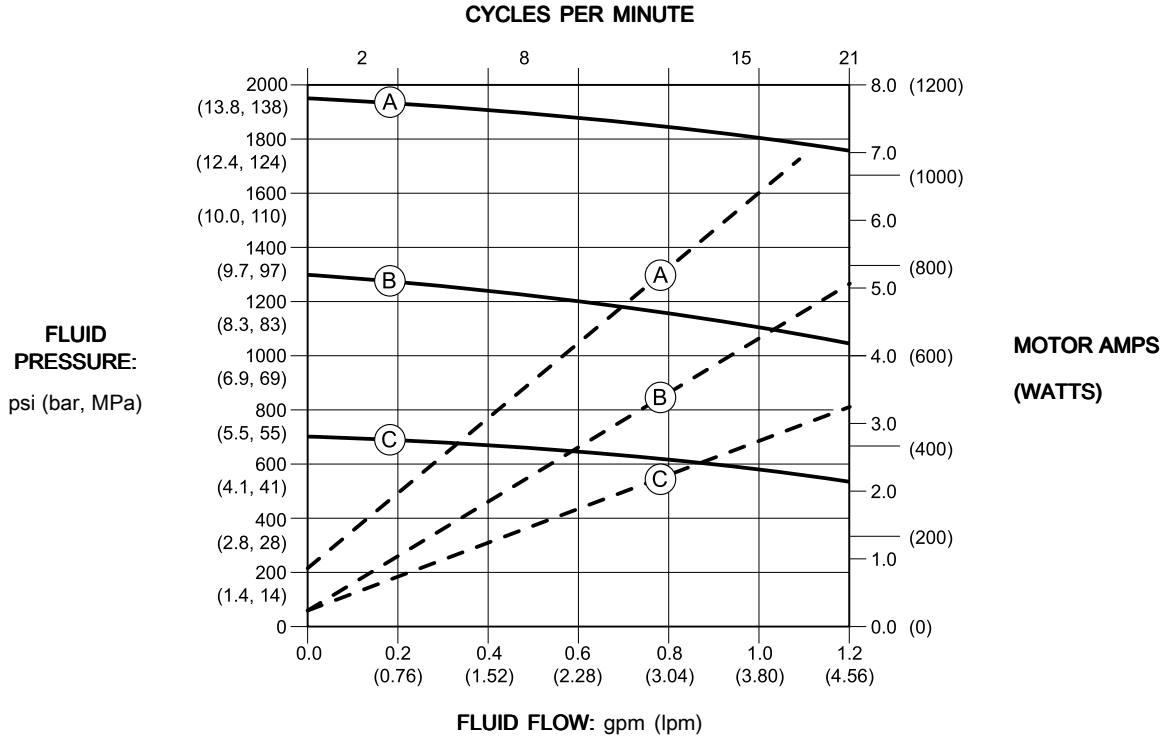


Table 3 220 V DC Motor with Dura-Flo 220 Lower



Technical Specifications

E-Flo DC Pumps	U.S.	Metric
Maximum fluid working pressure		
Models H03000, H03001, EDEN01, and EDEN02	2030 psi	14 MPa, 140 bar
Models H03002, H03003, EDEN03, and EDEN04	3040 psi	20.96 MPa, 209.6 bar
Maximum potential fluid pressure	436000/v (volume of lower in cc) = psi	3000/v (volume of lower in cc) = bar
Maximum continuous cycle rate	20 cpm	
Maximum Flow	Maximum flow is determined by the size of the pump lower. See Performance Charts, page 23.	
Input voltage	200–250 Vac, single phase, 50/60 Hz	
Input current	20 A maximum	
Power inlet port size	3/4–14 npt(f)	
Ambient temperature range	32–104°F	0–40°C
Sound data	Less than 70 dB(A)	
Oil capacity	1.5 quarts	1.4 liters
Oil specification	Graco Part No. 16W645 ISO 220 silicone-free synthetic gear oil	
Weight	Pump package (motor, 1000cc lower, stand, and tie rods): 220 lb	Pump package (motor, 1000cc lower, stand, and tie rods): 99.8 kg
Fluid inlet size	1–1/2 npt(f)	
Fluid outlet size	3/4 npt(f) [145cc-180cc] 1 npt(f) [220cc-290cc]	
Wetted parts	See Lower Pump manual.	

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Graco High Pressure Equipment Company warrants all equipment referenced in this document which is manufactured by Graco High Pressure Equipment Company and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco High Pressure Equipment Company, Graco High Pressure Equipment Company will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco High Pressure Equipment Company to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco High Pressure Equipment Company's written recommendations.

This warranty does not cover, and Graco High Pressure Equipment Company shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco High Pressure Equipment Company component parts. Nor shall Graco High Pressure Equipment Company be liable for malfunction, damage or wear caused by the incompatibility of Graco High Pressure Equipment Company equipment with structures, accessories, equipment or materials not supplied by Graco High Pressure Equipment Company, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco High Pressure Equipment Company.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco High Pressure Equipment Company distributor for verification of the claimed defect. If the claimed defect is verified, Graco High Pressure Equipment Company will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

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Original Instructions. This manual contains English, MM 3A6358
Graco Headquarters: Minneapolis

International Offices: Belgium, China, Japan, Korea

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