

MANUAL NUMBER 3A7637 | REVISION J | ENGLISH (US)

QUANTM® Electric Motor

For use in QUANTM electric-operated diaphragm (EODD) pumps. For fluid transfer applications. For professional use only.

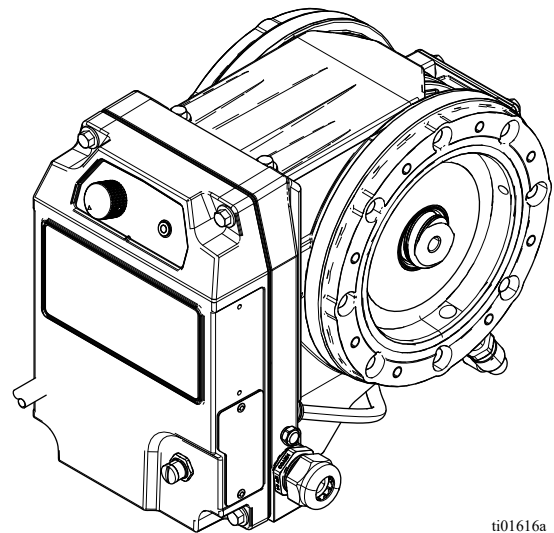


Important Safety Instructions

Read all warnings and instructions in this manual and related manuals before using the equipment. Save these instructions.



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CONTENTS



Models and Approvals	3	Install the Rotor	44
Related Manuals	7	Recalibrate the Motor	46
Safety Symbols	8	Recycling and Disposal	47
Warnings	9	End of Product Life	47
Technical Specifications	14	Parts	48
Configuration Matrix	15	Parts List	52
Motor Module Series Identification	21	Kits and Accessories	57
Repair	22	Part Kits	57
Prepare Equipment for Repair	22	Complete Rotor Repair Kits	57
Torque Instructions	23	Stator Cap Kits	57
Replace the Control Cover	23	Rotor Kits	57
Remove the Control Cover	24	Preload Hub and Nut Kits	57
Install the Control Cover	24	Cord/Cable Kits	58
Replace the Leak Sensor	25	Fan Kits	58
Remove the Leak Sensor	25	Control Knob Kits	59
Install the Leak Sensor	26	Motor Sensor Kits	59
Connect the Hoses and Fittings for Pumps for Use in Ordinary Locations	26	Motor Reseal Kit	59
Connect the Hoses and Fittings for Pumps for Use in Explosive Atmospheres or Hazardous (Classified) Locations	27	Control Board Kits	60
Hose Cut Lengths	28	Accessory Kits	61
Test the Leak Sensor	28	Leak Sensor Kits	61
Replace the Power Cord/Cable	29	Preload Nut Installation Tool Kits	61
Remove the Power Cord/Cable	30	Rotor Greasing Tool Kits	61
Install the Power Cord/Cable	30	I/O Cable Kits	61
Repair the Fan Assembly	31	Maintenance Bracket Stand	61
Remove the Fan Assembly	31	Electrical Schematics	62
Install the Fan Assembly	32	California Proposition 65	64
Repair the Control Knob Assembly	34		
Remove the Control Knob Assembly	35		
Install the Control Knob Assembly	35		
Replace the Control Board and Filter Board	36		
Remove the Control Board and Filter Board Assembly	37		
Install the Control Board and Filter Board Assembly	37		
Replace the Motor Sensor	38		
Remove the Motor Sensor Board	38		
Install the Motor Sensor Board	39		
Repair the Center Section	39		
Disassemble the Center Section	40		
Reassemble the Center Section	40		
Repair the Rotor and Shaft Assembly	40		
Remove the Rotor	41		
Re-Ball the Rotor	42		
Lubricate the Rotor and Shaft	43		

MODELS AND APPROVALS

Table 1-1: QUANTM® Industrial Motor Models and Approvals

LOCATION	APPROVALS	PART	MODEL	CONFIGURATION*
Ordinary Locations	 <p>COMPLIES WITH UL 1004-1 CSA C22.2 NO. 100</p>	25U100	i30	QTC-FC5
		2001058		QTC-FE5
		2005637		QTC-FC7
		2005661		QTC-FE7
		25U101	i80	QTD-FC1
		2001066		QTD-FE1
		2005641		QTD-FC7
		2005665		QTD-FE7
		25U102	i120	QTE-FC1
		2001070		QTE-FE1
		2005645		QTE-FC7
		2005669		QTE-FE7
	 	25U104	i30	QTC-FC2
		2001061		QTD-FE2
		2005638		QTC-FC8
		2005662		QTC-FE8
25U105		i80	QTD-FC2	
2001067			QTD-FE2	
2005642			QTD-FC8	
2005666			QTD-FE8	
25U106		i120	QTE-FC2	
2001071			QTE-FE2	
2005646			QTE-FC8	
2005670			QTE-FE8	
Hazardous (Classified) Locations	 <p>COMPLIES WITH UL 1004-1 CSA C22.2 NO. 100 UL 674 CSA C22.2 NO. 145</p> <p>CLASS I, DIVISION 1, GROUPS C, D T4</p>	25U116	i30	QTC-FC6
		2001063		QTC-FE6
		2005639		QTC-FC9
		2005663		QTC-FE9

MODELS AND APPROVALS

LOCATION	APPROVALS	PART	MODEL	CONFIGURATION*
	CLASS 1, ZONE 1, GROUP 11B	25U117 2001068 2005643 2005667	i80	QTD-FC3 QTD-FE3 QTD-FC9 QTD-FE9
		25U118 2001072 2005647 2005671	i120	QTE-FC3 QTE-FE3 QTE-FC9 QTE-FE9
Explosive Atmospheres	  II 2 G Ex db IIB T4 Gb Ta = -20C to +40C CML 23 ATEX 1367X IECEx CML 23.0124X	25U120 2001065 2005640 2005664	i30	QTC-FC4 QTC-FE4 QTC-FCA QTC-FEA
		25U121 2001069 2005644 2005668	i80	QTD-FC4 QTD-FE4 QTD-FCA QTD-FEA
		25U122 2001073 2005648 2005672	i120	QTE-FC4 QTE-FE4 QTE-FCA QTE-FEA








* See **Configuration Matrix** for detailed descriptions.

Table 1-2: QUANTM Industrial Motor Efficiency Rating

RATING	CONFIGURATION
IE5	All

MODELS AND APPROVALS

Table 1-3: QUANTM Hygienic Motor Models and Approvals

LOCATION	APPROVALS	PART	MODEL	CONFIGURATION*		
Ordinary Locations	 E115803	COMPLIES WITH UL 1004-1 CSA C22.2 NO. 100	25U108 26D767 2005649	h30	QHC-FF5 QHC-FF1 QHC-FF7	
		25U109 2005653	h80	QHD-FF1 QHD-FF7		
		25U110 2005657	h120	QHE-FF1 QHE-FF7		
	 	25U112 2005650	h30	QHC-FF2 QHC-FF8		
		25U113 2005654	h80	QHD-FF2 QHD-FF8		
		25U114 2005658	h120	QHE-FF2 QHE-FF8		
	Hazardous (Classified) Locations	 CLASS I, DIVISION I GROUPS C, D T4 CLASS 1, ZONE 1, GROUP IIB	COMPLIES WITH UL 1004-1 CSA C22.2 NO. 100	25U124 26D769 2005651	h30	QHC-FF6 QHC-FF3 QHC-FF9
			UL 674 CSA C22.2 NO. 145	25U125 2005655	h80	QHD-FF3 QHD-FF9
			25U126 2005659	h120	QHE-FF3 QHE-FF9	
Explosive Atmospheres	   II 2 G Ex db IIB T4 Gb Ta = -20C to +40C CML 23 ATEX 1367X IECEx CML 23.0124X	25U128 2005652	h30	QHC-FF4 QHC-FFA		
		25U129 2005656	h80	QHD-FF4 QHD-FFA		

MODELS AND APPROVALS

LOCATION	APPROVALS	PART	MODEL	CONFIGURATION*
		25U130 2005660	h120	QHE-FF4 QHE-FFA

* See **Configuration Matrix** for detailed descriptions.

Table 1-4: QUANTM Hygienic Motor Efficiency Rating

RATING	CONFIGURATION
IE5	All


RELATED MANUALS

ENGLISH MANUAL	DESCRIPTION
3A8572	QUANTM® Pumps, Instructions, Industrial Models
3A9286	QUANTM Pumps, Instructions, Hygienic Models
3A8946	QUANTM Pumps, Parts, Industrial Models
3A9287	QUANTM Pumps, Parts, Hygienic Models

SAFETY SYMBOLS

Standard safety symbols describe hazards that may be present and actions that must be taken to stay safe. This table describes the meaning of each symbol.

SYMBOL	MEANING
	Burn Hazard
	Cleaning Solvent Hazard
	Electric Shock Hazard
	Entanglement Hazard
	Equipment Misuse Hazard
	Fire and Explosion Hazard
	Moving Parts Hazard
	Pressurized Equipment Hazard
	Splash Hazard
	Toxic Fluid or Fumes Hazard
	Do Not Wipe with a Dry Cloth
	Eliminate Ignition Sources

SYMBOL	MEANING
	Follow Pressure Relief Procedure
	Ground Equipment
	Read Manual
	Ventilate Work Area
	Wear Personal Protective Equipment



Safety Alert Symbol

This symbol indicates: Attention! Become Alert! Look for this symbol throughout the manual to indicate important safety messages.

WARNINGS

The following warnings apply throughout this manual. Read, understand, and follow the warnings before using this equipment. Failure to follow these warnings can result in serious injury.



DANGER



SEVERE ELECTRIC SHOCK HAZARD

This equipment can be powered by more than 240 V. Contact with this voltage will cause death or serious injury.



Explosive Atmospheres or Hazardous (Classified) Locations Models (hard wired for permanent connection):

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

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

Ordinary Locations Models (cord and plug connection):

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

- Turn off and disconnect power cord before servicing equipment.
- Connect only to grounded electrical outlets.
- Only use 3-wire extension cords for single-phase models. Only use 4-wire extension cords for 3-phase models.
- Ensure ground prongs are intact on power and extension cords.
- Store indoors.
- Wait five minutes after disconnecting power cord before servicing.

 **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 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 in your pump manual.
- 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 fluid lines.
- **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.



SPECIFIC CONDITIONS OF USE

- Special fasteners used on the motor frame and the control enclosure shall only be replaced with identical type having the same tolerance grades.
- Motor must be installed per instructions in the correct orientation to prevent objects from falling into the opening.
- The length and gap of flameproof joints are larger and smaller than those specified by standard. No repair is permitted by end users. Contact manufacturer for service and parts.

 **WARNING**



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** in your pump manual 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 fluid lines, cords, or cables. Do not use fluid lines, cords, or cables to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.












PLASTIC PARTS CLEANING SOLVENT HAZARD





Many cleaning solvents can degrade plastic parts and cause them to fail, which could cause serious injury or property damage.

- Use only compatible solvents to clean plastic structural or pressure-containing parts.
- See **Technical Specifications** in all equipment manuals for materials of construction. Consult the solvent manufacturer for information and recommendations about compatibility.

 **WARNING**

  	<p>PRESSURIZED EQUIPMENT HAZARD</p> <p>Fluid from the equipment, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.</p> <ul style="list-style-type: none"> • Follow the Pressure Relief Procedure in your pump manual when you stop spraying/dispensing and before cleaning, checking, or servicing equipment. • Tighten all fluid connections before operating the equipment. • Check fluid lines and connections daily. Replace worn or damaged parts immediately.
	<p>PRESSURIZED ALUMINUM PARTS HAZARD</p> <p>Use of fluids that are incompatible with aluminum in pressurized equipment can cause serious chemical reaction and equipment rupture. Failure to follow this warning can result in death, serious injury, or property damage.</p> <ul style="list-style-type: none"> • Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents. • Do not use chlorine bleach. • Many other fluids may contain chemicals that can react with aluminum. Contact your material supplier for compatibility.
 	<p>THERMAL EXPANSION HAZARD</p> <p>Fluids subjected to heat in confined spaces, including fluid lines, can create a rapid rise in pressure due to the thermal expansion. Over-pressurization can result in equipment rupture and serious injury.</p> <ul style="list-style-type: none"> • Open a valve to relieve the fluid expansion during heating. • Replace fluid lines proactively at regular intervals based on your operating conditions.
 	<p>ENTANGLEMENT HAZARD</p> <p>Rotating parts can cause serious injury.</p> <ul style="list-style-type: none"> • Keep clear of moving parts. • Do not operate equipment with protective guards or covers removed. • Do not wear loose clothing, jewelry or long hair while operating equipment. • Equipment can start without warning. Before checking, moving, or servicing equipment, follow the Pressure Relief Procedure in your pump manual and disconnect all power sources.
	<p>BURN HAZARD</p> <p>Equipment surfaces and fluid that is heated can become very hot during operation. To avoid severe burns:</p> <ul style="list-style-type: none"> • Do not touch hot fluid or equipment.

 **WARNING**

 	<p>MOVING PARTS HAZARD</p> <p>Moving parts can pinch, cut, or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> • Keep clear of moving parts. • Do not operate equipment with protective guards or covers removed. • Equipment can start without warning. Before checking, moving, or servicing equipment, follow the Pressure Relief Procedure and disconnect all power sources.
	<p>TOXIC FLUID OR FUMES HAZARD</p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> • 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.
	<p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>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:</p> <ul style="list-style-type: none"> • Protective eyewear and hearing protection. • Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

TECHNICAL SPECIFICATIONS

The table provides important information related to the QUANTM® Electric Motor, including product attributes, measurements, and performance characteristics that support the use of the equipment.

Table 5-1: QUANTM Electric Motor

	US	Metric		
Environmental Temperature Range	-4°F to 104°F	-20°C to 40°C		
IP Ratings				
Ordinary Locations Models	IP66, Type 4X			
Explosive Atmospheres or Hazardous (Classified) Locations Models	IP66, Type 4X			
Electrical Ratings				
	Rated Voltage	Phase	Frequency	Current
h30 (QHC) models, F_1 motor	200–240 V	3	50/60 Hz	7.5 A
i30 (QTC) and h30 (QHC) models, F_2 motor	200–240 V	1	50/60 Hz	10 A
h30 (QHC) models, F_3 motor	200–240 V	3	50/60 Hz	7.5 A
i30 (QTC) and h30 (QHC) models, F_4 motor	200–240 V	1	50/60 Hz	10 A
i30 (QTC) and h30 (QHC) models, F_5 motor	100–120 V	1	50/60 Hz	12 A
i30 (QTC) and h30 (QHC) models, F_6 motor	100–120 V	1	50/60 Hz	12 A
i80 (QTD) and h80 (QHD) models, F_1 motor	200–240 V	3	50/60 Hz	7.5 A
i80 (QTD) and h80 (QHD) models, F_2 motor	200–240 V	1	50/60 Hz	15 A
i80 (QTD) and h80 (QHD) models, F_3 motor	200–240 V	3	50/60 Hz	7.5 A
i80 (QTD) and h80 (QHD) models, F_4 motor	200–240 V	1	50/60 Hz	15 A
i120 (QTE) and h120 (QHE) models, F_1 motor	200–240 V	3	50/60 Hz	7.5 A
i120 (QTE) and h120 (QHE) models, F_2 motor	200–240 V	1	50/60 Hz	15 A
i120 (QTE) and h120 (QHE) models, F_3 motor	200–240 V	3	50/60 Hz	7.5 A
i120 (QTE) and h120 (QHE) models, F_4 motor	200–240 V	1	50/60 Hz	15 A
All models, F_7, F_8, F_9, F_A motor	380–480 V	3	50/60 Hz	5.3 A
Circuit Protection				
Maximum Branch Circuit Protection Rating	20A, Inverse Time Circuit Breaker			
Short Circuit Current Rating	5 kA			
Note:				
All trademarks or registered trademarks are property of their respective owners.				

CONFIGURATION MATRIX

Record the model part number and configuration sequence found on your equipment identification plate (ID) to assist you when ordering replacement parts.

Model Part Number:

Configuration Sequence:

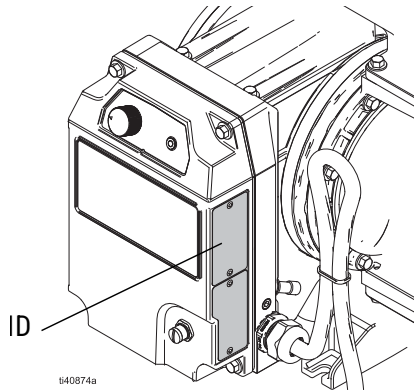


Figure 6-1: Identification Plate Location

For example, the configuration sequence that begins with QTC--FC1 specifies this configuration:

- **Q:** QUANTM® Brand
- **T:** Industrial Application

- **C:** 1 in. Port
- **- -:** placeholder for future use
- **FC1:** Drive Model

The remaining characters in the Configuration Sequence specify pump materials, connection, and options. See related pump manual. See **Related Manuals**.

NOTE:

Some configurations are not available. Check with your local distributor.

Table 6-1: QUANTM Pump Brand, Application, Port Size

BRAND		APPLICATION		PORT SIZE	
Q	QUANTM	T	Industrial	C	1 in.
		H	Hygienic	D	1-1/2 in.
				E	2 in.
				F*	3 in.
<p>Note:</p> <p>* Hygienic (QH-) models only.</p>					

CONFIGURATION MATRIX

Table 6-2: QUANTM® Motor Industrial Models

DRIVE		COAT	INPUT VOLTAGE	PHASE	LOCATION	CORD/CABLE TERMINATION
FC1*	Aluminum Direct Drive	Black powder coat	200–240 V	3	Ordinary	Cord with plug
FC2	Aluminum Direct Drive	Black powder coat	200–240 V	1	Ordinary	Cord with plug
FC3*	Aluminum Direct Drive	Black powder coat	200–240 V	3	Hazardous (Classified)	Cable with flying leads
FC4	Aluminum Direct Drive	Black powder coat	200–240 V	1	Explosive Atmospheres	Cable with flying leads
FC5	Aluminum Direct Drive	Black powder coat	100–120 V	1	Ordinary	Cord with plug
FC6	Aluminum Direct Drive	Black powder coat	100–120 V	1	Hazardous (Classified)	Cable with flying leads
FC7	Aluminum Direct Drive	Black powder coat	380–480 V	3	Ordinary (NA)†	Cable with flying leads
FC8	Aluminum Direct Drive	Black powder coat	380–480 V	3	Ordinary (WW)††	Cable with flying leads
FC9	Aluminum Direct Drive	Black powder coat	380–480 V	3	Hazardous (Classified) (NA)†	Cable with flying leads
FCA	Aluminum Direct Drive	Black powder coat	380–480 V	3	Explosive Atmospheres (WW)††	Cable with flying leads
FE1*	Aluminum Direct Drive	FEP**	200–240 V	3	Ordinary, Enhanced (Chemical)	Cord with plug
FE2	Aluminum Direct Drive	FEP**	200–240 V	1	Ordinary, Enhanced (Chemical)	Cord with plug
FE3*	Aluminum Direct Drive	FEP**	200–240 V	3	Hazardous (Classified), Enhanced (Chemical)	Cable with flying leads
FE4	Aluminum Direct Drive	FEP**	200–240 V	1	Explosive Atmospheres, Enhanced (Chemical)	Cable with flying leads

CONFIGURATION MATRIX

DRIVE		COAT	INPUT VOLTAGE	PHASE	LOCATION	CORD/CABLE TERMINATION
FE5	Aluminum Direct Drive	FEP**	100–120 V	1	Ordinary, Enhanced (Chemical)	Cord with plug
FE6	Aluminum Direct Drive	FEP**	100–120 V	1	Hazardous (Classified), Enhanced (Chemical)	Cable with flying leads
FE7	Aluminum Direct Drive	FEP**	380–480 V	3	Ordinary (NA)†, Enhanced (Chemical)	Cable with flying leads
FE8	Aluminum Direct Drive	FEP**	380–480 V	3	Ordinary (WW)††, Enhanced (Chemical)	Cable with flying leads
FE9	Aluminum Direct Drive	FEP**	380–480 V	3	Hazardous (Classified) (NA)†, Enhanced (Chemical)	Cable with flying leads
FEA	Aluminum Direct Drive	FEP**	380–480 V	3	Explosive Atmospheres (WW)††, Enhanced (Chemical)	Cable with flying leads

Notes:

* Not available with i30 (QTC)

** Fluorinated Ethylene Propylene

† North America

†† Worldwide

CONFIGURATION MATRIX

Table 6-3: QUANTM® Motor Hygienic Models

DRIVE		COAT	INPUT VOLTAGE	PHASE	LOCATION	CORD/CABLE TERMINATION
FF1	Aluminum Direct Drive	FEP*	200–240 V	3	Hygienic, Ordinary Locations	Cord with plug
FF2	Aluminum Direct Drive	FEP*	200–240 V	1	Hygienic, Ordinary Locations	Cord with plug
FF3	Aluminum Direct Drive	FEP*	200–240 V	3	Hygienic, Hazardous (Classified) Locations	Cable with flying leads
FF4	Aluminum Direct Drive	FEP*	200–240 V	1	Hygienic, Explosive Atmospheres	Cable with flying leads
FF5	Aluminum Direct Drive	FEP*	100–120 V	1	Hygienic, Ordinary Locations	Cord with plug
FF6	Aluminum Direct Drive	FEP*	100–120 V	1	Hygienic, Hazardous (Classified) Locations	Cable with flying leads
FF7	Aluminum Direct Drive	FEP*	380–480 V	3	Hygienic, Ordinary Locations (NA)†	Cable with flying leads
FF8	Aluminum Direct Drive	FEP*	380–480 V	3	Hygienic, Ordinary Locations (WW)††	Cable with flying leads
FF9	Aluminum Direct Drive	FEP*	380–480 V	3	Hygienic, Hazardous (Classified) Locations (NA)†	Cable with flying leads
FFA	Aluminum Direct Drive	FEP*	380–480 V	3	Hygienic, Explosive Atmospheres (WW)††	Cable with flying leads
<p>Notes:</p> <p>* Fluorinated Ethylene Propylene</p> <p>† North America</p> <p>†† Worldwide</p>						

CONFIGURATION MATRIX

Table 6-4: QUANTM® Motor Drive Selection, Industrial Models

MODEL	ORDINARY LOCATION (NEMA PLUG)	HAZARDOUS LOCATION (FLYING LEADS)	INPUT VOLTAGE	PHASE
North America				
i30 (QTC)	FC5	FC6	100–120 V	1
i80 (QTD)	FC1	FC3	200–240 V	3
i120 (QTE)	FC1	FC3	200–240 V	3
All	FC7 (Flying leads)	FC9	380–480 V	3
International				
i30 (QTC)	FC2	FC4	200–240 V	1
i80 (QTD)	FC2	FC4	200–240 V	1
i120 (QTE)	FC2	FC4	200–240 V	1
All	FC8 (Flying leads)	FCA	380–480 V	3
Enhanced (Chemical) - North America				
i30 (QTC)	FE5	FE6	100–120 V	1
i80 (QTD)	FE1	FE3	200–240 V	3
i120 (QTE)	FE1	FE3	200–240 V	3
All	FE7 (Flying leads)	FE9	380–480 V	3
Enhanced (Chemical) - International				
i30 (QTC)	FE2	FE4	200–240 V	1
i80 (QTD)	FE2	FE4	200–240 V	1
i120 (QTE)	FE2	FE4	200–240 V	1
All	FE8 (Flying leads)	FEA	380–480 V	3

CONFIGURATION MATRIX

Table 6-5: QUANTM® Motor Drive Selection, Hygienic Models

MODEL	ORDINARY LOCATION (NEMA PLUG)	HAZARDOUS LOCATION (FLYING LEADS)	VOLTAGE RANGE	PHASE
North America				
h30 (QHC)	FF1	FF3	200–240 V	3
	FF5	FF6	100–120 V	1
h80 (QHD)	FF1	FF3	200–240 V	3
h120 (QHE/QHF)	FF1	FF3	200–240 V	3
h30 (QHC), h80 (QHD), h120 (QHE)	FF7 (Flying leads)	FF9	380–480 V	3
International				
h30 (QHC)	FF2	FF4	200–240 V	1
h80 (QHD)	FF2	FF4	200–240 V	1
h120 (QHE/QHF)	FF2	FF4	200–240 V	1
h30 (QHC), h80 (QHD), h120 (QHE)	FF8 (Flying leads)	FFA	380–480 V	3

MOTOR MODULE SERIES IDENTIFICATION

The motor module series is identified in the serial number on the lower product tag on the side of the motor module. The series is identified by a letter in the fourth position from the left in the serial number.

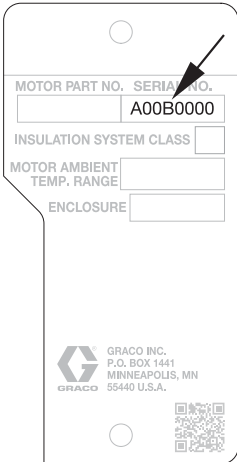







Figure 7-1: Motor Module Serial Number Location

REPAIR

⚠ DANGER				
				
<p>DANGER SEVERE ELECTRIC SHOCK HAZARD</p> <p>This equipment can be powered by more than 240 V. Contact with this voltage will cause death or serious injury.</p> <ul style="list-style-type: none"> • Turn off and disconnect power before servicing or repairing equipment. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations. <p>Do not modify or repair explosion proof joints, and use only the specified genuine Graco screws or bolts, torqued according to the instructions. Modifying explosion proof joints or using incorrect parts will invalidate the Explosive Atmospheres or Hazardous (Classified) Locations Certification of the equipment and may produce an explosion hazard.</p>				





Follow the **Pressure Relief Procedure** in your related pump manual whenever you see this symbol. See **Related Manuals**.


⚠ WARNING				
				
<p>This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as splashing fluid and moving parts, relieve the pressure when you stop operating and before cleaning, checking, or servicing the equipment. Follow the Pressure Relief Procedure in your related pump manual. See Related Manuals.</p> <p>Follow Prepare Equipment for Repair before performing any service or repair to the equipment.</p>				

NOTE:

Numbers surrounded by parentheses correspond to labeled parts in the figures or Parts diagrams. See **Parts**.

PREPARE EQUIPMENT FOR REPAIR

⚠ DANGER				
				
<p>DANGER SEVERE ELECTRIC SHOCK HAZARD</p> <p>This equipment can be powered by more than 240 V. Contact with this voltage will cause death or serious injury.</p> <ul style="list-style-type: none"> • Turn off and disconnect power before servicing or repairing equipment. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations. 				

⚠ WARNING				
				
<p>Models in Explosive Atmospheres or Hazardous (Classified) Locations: To avoid injury from fire and explosion, move the equipment to a non-explosive or non-hazardous location before performing any service or repair to the equipment.</p>				

Always complete the following procedure before performing any service or repair to the equipment.

1. Flush the equipment. See your related pump manual. See **Related Manuals**.
2. Relieve the pressure. Follow the **Pressure Relief Procedure**. See your related pump manual. See **Related Manuals**.
3. Turn off the equipment before performing any service or repair procedure:
 - a. Ensure that the control knob (22) is turned to off (fully counterclockwise).
 - b. Ensure that the LED light is on solid red.
4. Disconnect power to the equipment before performing any service or repair procedure. This will turn off the LED light.
5. If fluid lines are connected, disconnect them.

6. Optional: Mount the back of the pump (opposite side from the motor) to the maintenance bracket stand (see **Maintenance Bracket Stand**). This positions the pump facing up, enabling easy working access to the pump and motor. The stand can be mounted to a workbench through the mounting holes on the feet.
 - a. Loosen the four bolts that hold the logo plate (if present) to the pump.
 - b. Slide the bracket stand behind the bolts.
 - c. Tighten the bolts.
 - d. Before returning the pump to service, remove it from the bracket stand.

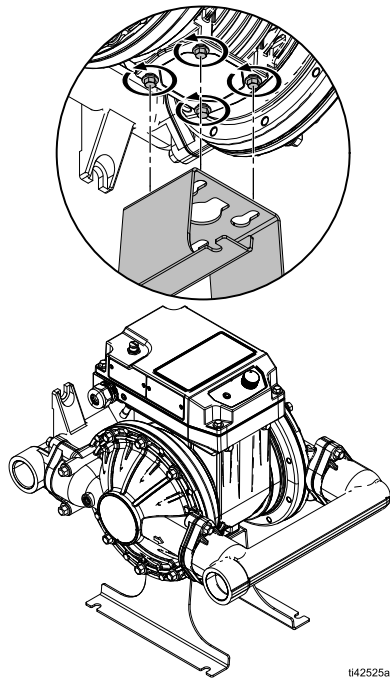


Figure 8-1: Maintenance Bracket Stand

TORQUE INSTRUCTIONS

To ensure proper sealing, torque fasteners using the following procedure.

1. Start all fasteners a few turns.
2. Tighten each fastener until each fastener is slightly under the torque specified in the instructions.
3. Tighten each fastener by 1/2 turn or less until each fastener is at the specified torque.

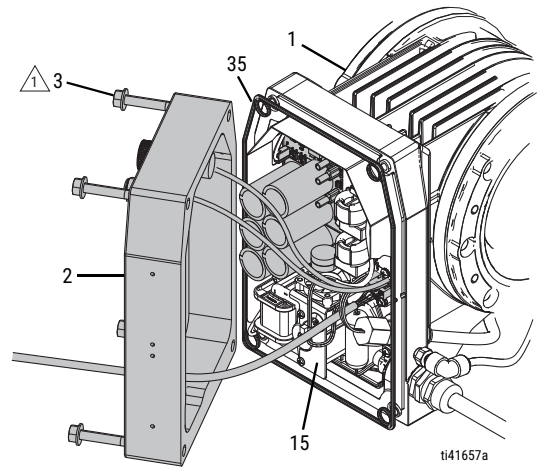
REPLACE THE CONTROL COVER

Perform this procedure to remove or install the control cover.

SUPPLIES

- 10 mm socket wrench

⚠ DANGER				
<p>DANGER</p> <p>SEVERE ELECTRIC SHOCK HAZARD</p> <p>This equipment can be powered by more than 240 V. Contact with this voltage will cause death or serious injury.</p> <ul style="list-style-type: none"> • Turn off and disconnect power before servicing or repairing equipment. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations. 				



Torque to 115 in-lb (13 N·m)

Figure 8-2: Control Cover

REMOVE THE CONTROL COVER

1. Follow **Prepare Equipment for Repair**.
2. Remove the fasteners (3) from the control cover (2).
3. Carefully remove the control cover (2):
 - a. Carefully tilt the control cover (2) away from the control board (15). See **Remove the Control Cover**.
 - b. Disconnect all wires from the control cover (2) to the control board (15). See **Electrical Schematics**.

NOTICE

Disconnect all wires before completely removing the control cover. To avoid damage to wires and connections, hold the cover in place at a tilted angle or rest the cover on a work surface while disconnecting wires.

- c. Remove the control cover (2) from the stator housing (1).
4. Inspect for wear or damage. Replace as needed.

INSTALL THE CONTROL COVER

1. Verify that power to the equipment is disconnected.
2. Install the gasket (35) into the groove on the stator housing (1).

NOTICE

To avoid damage to the control board, ensure that the gasket (35) is fully seated in the groove and that the control cover (2) is fully pressed to the stator housing (1).

3. Install the control cover (2):
 - a. Carefully hold the control cover (2) in place at an angle near the control board (15). See **Remove the Control Cover**.
 - b. If a thermal pad is included, verify that it is attached to the cover. If the pad has fallen off, place it on top of the capacitors before replacing the cover.

- c. Connect wires from the control cover (2) to the control board (15). See **Electrical Schematics**.

NOTICE

To avoid damage to wires, connections, control board, or motor, ensure all wires are connected to the correct location. See **Electrical Schematics**.

- d. Align the control cover (2) to the stator housing (1).
 - e. Insert the fasteners (3) into the control cover (2) and tighten. Torque fasteners to 115 in-lb (13 N·m).

NOTICE


To avoid damage to wires or the control board, do not pinch wires when installing the control cover (2) to the stator housing (1).

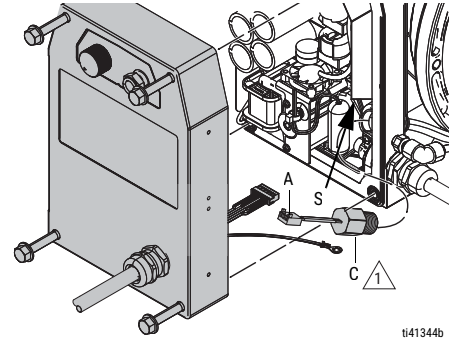
4. Verify that the control cover (2) contacts the stator housing (1) and the gasket (35) does not show.

REPLACE THE LEAK SENSOR

SUPPLIES

- 7/8 in. open-end wrench
- 3/8 in. hex wrench
- 3/4 in. open-end wrench (for pumps for use in Ordinary Locations only)

⚠ DANGER				
				
DANGER				
SEVERE ELECTRIC SHOCK HAZARD				
This equipment can be powered by more than 240 V. Contact with this voltage will cause death or serious injury.				
<ul style="list-style-type: none"> • Turn off and disconnect power before servicing or repairing equipment. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations. 				



ti41344b

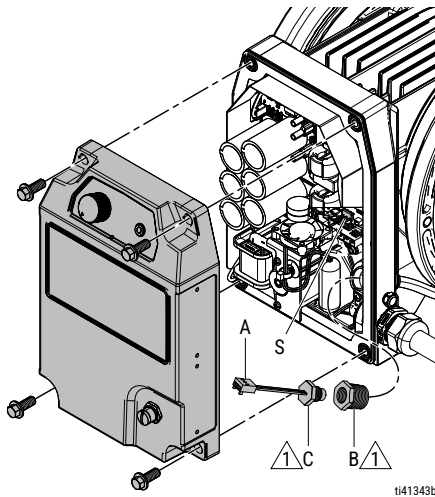
1 Apply Loctite 425 Assure thread sealant to the threads.

Figure 8-4: Leak Sensor, Pumps for Use in Explosive Atmospheres or Hazardous (Classified) Locations

REMOVE THE LEAK SENSOR

1. Follow **Prepare Equipment for Repair**.
2. Remove the control cover. See **Remove the Control Cover**.
3. Disconnect the leak sensor wire (A) from the port in the control housing (S).
4. **Pumps for Use in Ordinary Locations only:** Loosen the fitting (B) behind the leak sensor (C).

NOTICE
To avoid damage to the control board, ensure that fluid does not contact electrical components in the control housing.



ti41343b

1 Apply Loctite 425 Assure thread sealant to the threads.

Figure 8-3: Leak Sensor, Pumps for Use in Ordinary Locations

5. Remove the leak sensor (C) assembly and reducer fitting (B, if applicable) from the control housing (S).
6. Ensure there is no fluid in the leak sensor or in the control housing.
7. **Pumps for Use in Ordinary Locations only:** Disconnect the fitting (B) from the leak sensor (C).
8. Disconnect the hoses (F, H, if applicable) and fittings (D, J, if applicable, K, if applicable, N, if applicable) from the pump.
9. Inspect for wear or damage. Replace as necessary.

INSTALL THE LEAK SENSOR

1. Follow **Prepare Equipment for Repair**.
2. Apply Loctite 425 Assure watertight thread sealant to the threads on the leak sensor (C).
3. **For pumps for Use in Ordinary Locations only:**
 - Install the leak sensor (C) to the reducer fitting (B).
 - Apply Loctite 425 Assure watertight thread sealant to the threads on the reducer fitting (B).
4. Install the leak sensor (C) assembly to the control housing (S).

NOTICE

Ensure that the leak sensor is installed tightly so that fluid cannot enter the control housing. Do not overtighten. Excessive tightening could strip the leak sensor threads.

After reassembly, allow the thread sealant to cure for 12 hours, or per instructions of the manufacturer, prior to operating the system.

5. **Pumps for Use in Ordinary Locations only:** Securely tighten the reducer fitting (B) behind the leak sensor (C).
6. Connect the leak sensor wire (A) to the port in the control housing (S).
7. Install the control cover. See **Install the Control Cover**.
8. Connect the hoses and fittings as applicable to the pump. For instructions, see one of the following sections:

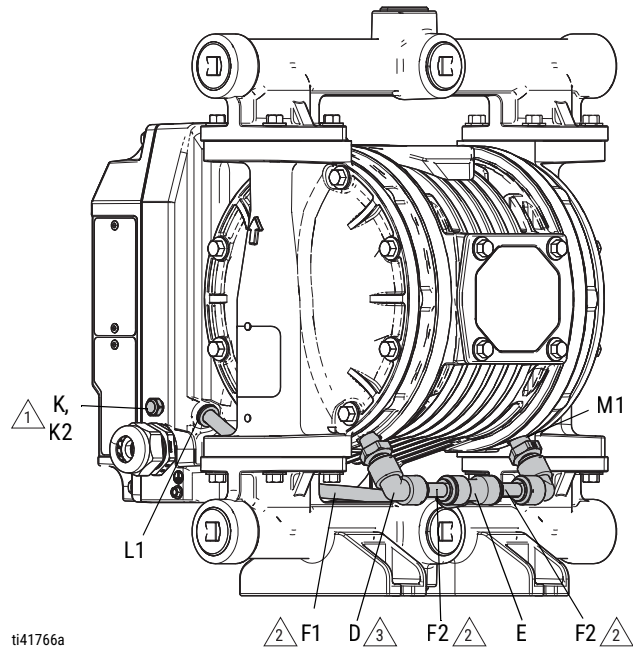
Connect the Hoses and Fittings for Pumps for Use in Ordinary Locations, or

Connect the Hoses and Fittings for Pumps for Use in Explosive Atmospheres or Hazardous (Classified) Locations.

CONNECT THE HOSES AND FITTINGS FOR PUMPS FOR USE IN ORDINARY LOCATIONS

NOTICE

Firmly tighten all connections to avoid leaks and damage to equipment parts.



ti41766a

1. Ensure the side port (K2) can breathe.
2. Cut to length.
3. Apply thread sealant to threads.

Figure 8-5: Typical Installation for Leak Sensor Hoses and Fittings for Pumps for Use in Ordinary Locations, Industrial Pump Shown

1. Cut the length of the hose (F) into three segments (F1 and F2). See **Hose Cut Lengths**.
 - a. Cut one long length of hose for F1.
 - b. Cut two short lengths of hose for F2.
2. Install each elbow fitting (D) into the bottom ports (M1).
3. Apply thread sealant to the threads of the elbow fittings (D).
4. Connect one end of each short length of hose (F2) to an elbow fitting (D).

REPAIR

5. Connect the open end of each short length of hose (F2) on each side of the tee union (E).
 6. Connect the long length of hose (F1) to the center port of the tee union (E).
 7. Connect the open end of the long length of hose (F1) to the quick connect port (L1).
 8. Install a breather fitting (K) in the side port (K2).
- NOTE:** The side port (K2) must be able to breathe for the leak sensor to work properly.
9. Firmly tighten all connections.

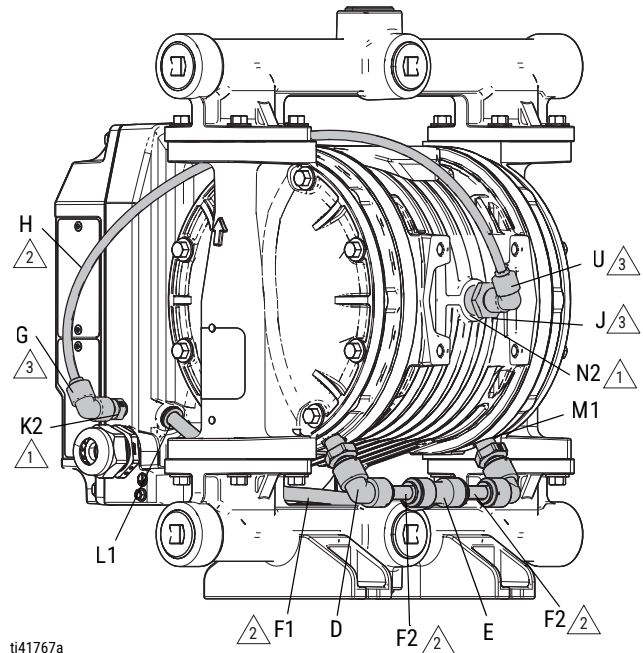
NOTICE

To avoid leaks and damage to equipment parts, ensure the hoses are fully seated in the fittings.

CONNECT THE HOSES AND FITTINGS FOR PUMPS FOR USE IN EXPLOSIVE ATMOSPHERES OR HAZARDOUS (CLASSIFIED) LOCATIONS

NOTICE

Firmly tighten all connections to avoid leaks and damage to equipment parts.



ti41767a

1 Ensure the side port (K2) and center section port (N2) are connected and sealed.

2 Cut to length.

3 Apply thread sealant to threads.

Figure 8-6: Typical Installation for Leak Sensor Hoses and Fittings for Pumps for Use in Explosive Atmospheres or Hazardous (Classified) Locations, Industrial Pump Shown


1. Cut the length of the hose (F) into three segments (F1 and F2). See **Hose Cut Lengths**.
 - a. Cut one long length of hose for F1.
 - b. Cut two short lengths of hose for F2.
2. Install each elbow fitting (D) into the bottom ports (M1).
3. Apply thread sealant to the threads of the elbow fittings (D).

REPAIR

4. Connect one end of each short length of hose (F2) to an elbow fitting (D).
5. Connect the open end of each short length of hose (F2) on each side of the tee union (E).
6. Connect the long length of hose (F1) to the center port of the tee union (E).
7. Connect the open end of the long length of hose (F1) to the quick connect port (L1).
8. Install an elbow fitting (G) in the side port (K2).
2. Cut two short lengths of hose for F2.

NOTE:

Apply thread sealant to the threads of the elbow fitting (G).

⚠ WARNING				
				
To avoid injury from fire and explosion, ensure the system is sealed with a connection between the side port (K2) and the center section port (N2).				

9. Connect one end of the hose (H) to the elbow fitting (G).
10. Connect an elbow fitting (U) to the bushing fitting (J).
11. Apply thread sealant to the threads of the bushing fitting (J).
12. Install the bushing fitting (J) assembly to the center section port (N2).
13. Connect the other end of the hose (H) to the elbow fitting (U).
14. Firmly tighten all connections.

NOTICE

Firmly tighten all connections to avoid leaks and damage to equipment parts.

HOSE CUT LENGTHS

Trim the hose length using a perpendicular (square) cut.

1. Cut one long length of hose for F1.

QT (INDUSTRIAL)				
PUMP CONFIGURATION	HOSE (F1)		HOSE (F2)	
	IN.	CM	IN.	CM
C	8-5/8	21.9	2-1/2	6.4
D	9-3/8	23.8	2-1/4	5.7
E	9-1/8	23.2	2-1/2	6.4

QH (HYGIENIC)					
PUMP CONFIGURATION		HOSE (F1)		HOSE (F2)	
		IN.	CM	IN.	CM
C	Food Grade	11-1/8	28.3	2.0	5.0
	Other	12-1/8	30.8	2.0	5.0
D	Food Grade	9-1/4	23.5	2-5/8	6.7
	Other	10.0	25.4	2-5/8	6.7
E	All	9-1/8*	23.2*	2-3/4	7.0

* Cut lengths may vary. Verify the distance between fittings and cut accordingly.

TEST THE LEAK SENSOR


1. Ensure that the pump is properly installed and set up for operation. See your related pump manual. See **Related Manuals**.
2. Start the pump to verify that the leak sensor is properly working. See your related pump manual.
 - If the leak sensor is not properly installed or working, the LED indicator on the pump will flash or the pump will not start.
 - If a leak is detected by the sensor, the LED indicator on the pump will flash.

REPLACE THE POWER CORD / CABLE

Repair kits are available (purchase separately). See **Kits and Accessories**.

SUPPLIES

- 1-5/16 in. open-end wrench
- P2 (0.8 mm) Phillips screwdriver

⚠ DANGER			
			
DANGER			
SEVERE ELECTRIC SHOCK HAZARD			
This equipment can be powered by more than 240 V. Contact with this voltage will cause death or serious injury.			
<ul style="list-style-type: none"> • Turn off and disconnect power before servicing or repairing equipment. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations. 			

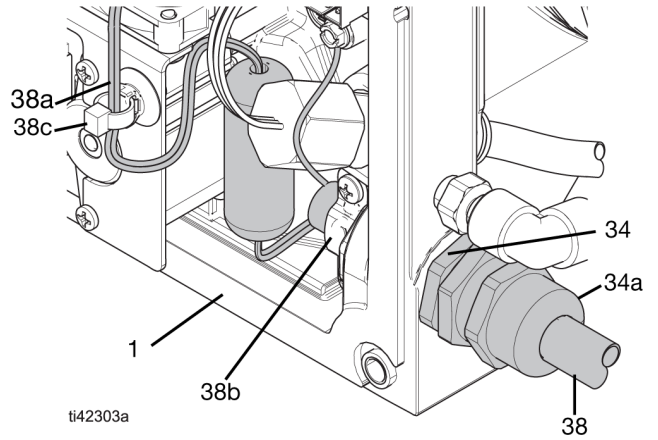


Figure 8-8: Power Cord/Cable (F_2 and F_4 motors)

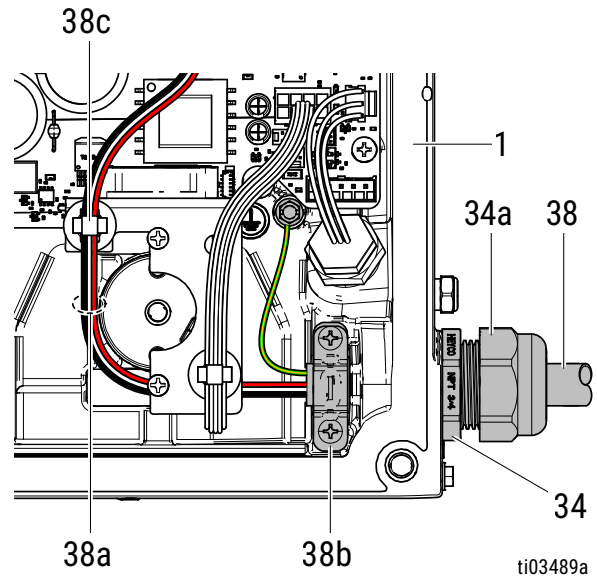


Figure 8-9: Power Cord/Cable (F_7 and F_8 motors)

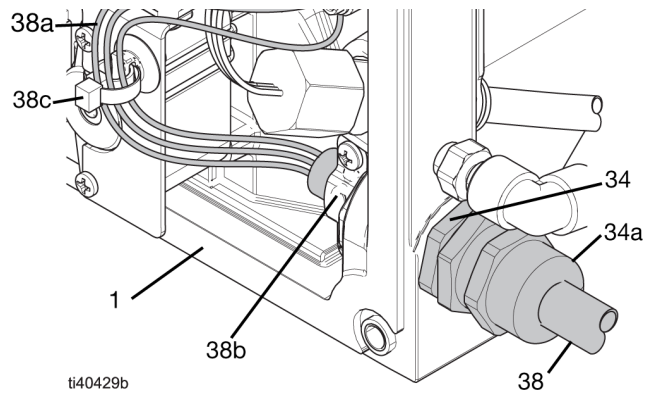


Figure 8-7: Power Cord/Cable (F_1, F_3, F_5, and F_6 motors)

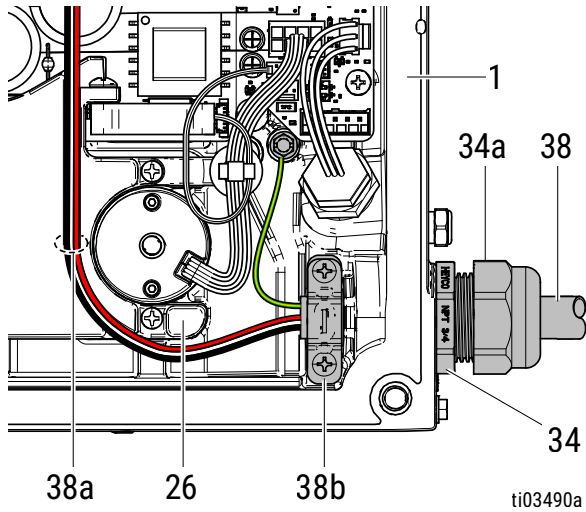


Figure 8-10: Power Cord/Cable (F_9 and F_A motors)

REMOVE THE POWER CORD / CABLE

1. Follow **Prepare Equipment for Repair**.
2. Follow **Remove the Control Cover**.
3. Disconnect the power cord/cable wires (38a) from the control board (15).

NOTE:

Take note of the orientation of the cord/cable clamp (38b) for installation.

4. Remove the power cord/cable (38) from the cord/cable tie (38c).
5. Loosen the outer strain relief bushing (34a). Do not remove.
6. Remove the cord/cable clamp (38b).
7. Gently pull the power cord/cable (38) and wires out of the stator housing (1).
8. Inspect for wear or damage. Replace as needed. If replacing, remove the ferrite and reinstall on the replacement cord/cable.

INSTALL THE POWER CORD / CABLE

1. Verify that the power cord/cable is not connected to a power source.
2. Reinstall the ferrite that you removed from the power cord/cable that you are replacing.

3. Insert the power cord/cable (38) and wires (38a) through the strain relief bushings (34a, 34) and stator housing (1).
4. Install a cord/cable tie (38c, not supplied).
5. Secure the power cord/cable (38) with the cord/cable tie (38c).
6. Connect power cord/cable wires (38a) to the control board (15). See **Electrical Schematics**.

NOTICE

To avoid damage to wires or control board, do not strain or kink power cord/cable wires.

7. Tighten the outer strain relief bushing (34a). Securely tighten.
8. Install the cord/cable clamp (38b). Securely tighten the fasteners on the cord/cable clamp (38b).

NOTE:

Orient the cord/cable clamp (38b) as originally installed on your equipment model.

9. Follow **Install the Control Cover**.


REPAIR THE FAN ASSEMBLY

Repair kits are available (purchase separately). See **Kits and Accessories**.

SUPPLIES

- 10 mm socket wrench
- P2 (0.8 mm) Phillips screwdriver
- Thermal paste
- Screw extractor
- Fan press tool*

* Available in kits (purchase separately). See **Fan Kits**.

 DANGER			
DANGER			
SEVERE ELECTRIC SHOCK HAZARD			
This equipment can be powered by more than 240 V. Contact with this voltage will cause death or serious injury.			
<ul style="list-style-type: none"> • Turn off and disconnect power before servicing or repairing equipment. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations. 			

REMOVE THE FAN ASSEMBLY

1. Follow **Prepare Equipment for Repair**.
2. Remove the fasteners (3) from the fan guard (32).
3. Remove the fan guard (32) from the stator housing (1).
4. Remove the fan propeller (25) from the motor shaft (24d).
5. Follow **Remove the Control Cover**.
6. Disconnect the fan cable (28b) and motor cable (24c) from the control board (15). See **Electrical Schematics**.
7. Remove the fasteners (26) from the fan motor (24) assembly.
8. Remove the fan motor (24) assembly from the stator housing (1).

9. Disassemble the fasteners (29), fan (28), mounts (27, 24b), and fan motor (24).
10. Inspect for wear or damage. Replace as needed.

NOTE:

Carefully inspect the motor bearing (23) for wear or damage. Only remove the motor bearing (23) if replacing. If applicable, use a screw extractor to remove the motor bearing (23).

NOTE:

Bearings (23) are not included in 480 V Ordinary Location motors.

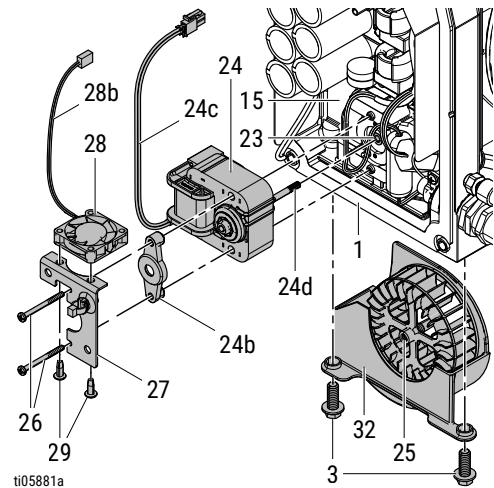


Figure 8-11: Fan Assembly, 200–240 V Models

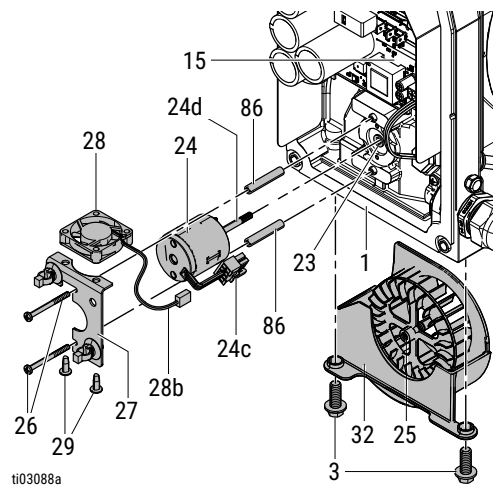
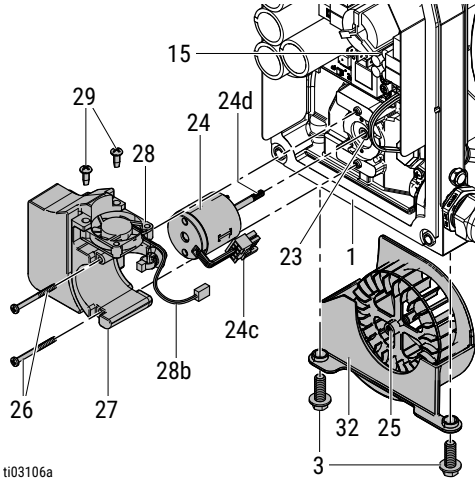


Figure 8-12: Fan Assembly, 380–480 V Models, Ordinary Locations

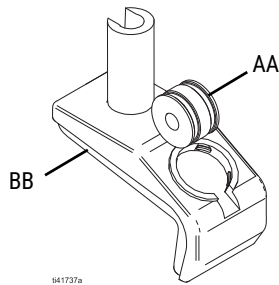


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Figure 8-13: Fan Assembly, 380–480 V Models, Explosive Atmospheres or Hazardous (Classified) Locations

INSTALL THE FAN ASSEMBLY

1. Verify that power to the equipment is disconnected.
2. Use the fan press tool to install the fan propeller (25) and fan motor (24):
 - a. Separate the press bushing (AA) from the fan holster (BB) on the fan press tool.



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Figure 8-14: Fan Press Tool

- b. If the motor bearing (23) was removed: Insert the press bushing (AA) into the motor bearing. Lightly tap on the press bushing (AA) to install the motor bearing (23).

NOTE:

The motor bearing (23) will sit slightly raised from the surface of the stator housing (1).

NOTICE

To avoid damage to the motor bearing (23), do not use excessive force when tapping in the motor bearing (23). If needed, use a rubber mallet to tap on the press bushing (AA).

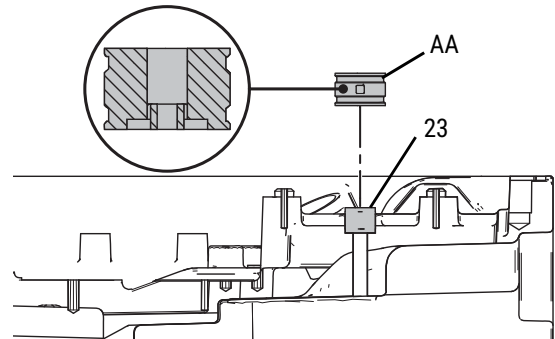


Figure 8-15: Press Bushing on Motor Bearing

- c. Insert the fan propeller (25) into the holster (BB).
- d. Insert the fan propeller (25) with holster (BB) into the stator housing (1). Ensure the hole for the fan motor shaft (24d) aligns with the center of the fan propeller (25).
- e. Apply thermal paste to the contact surface between the fan motor (24) and stator housing (1).
- f. Insert the fan rotor (24d) into position on the stator housing (1).

NOTICE

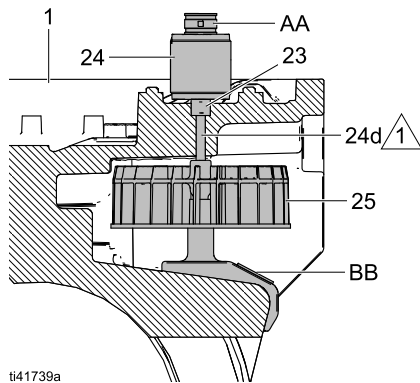
To avoid damage to wires, do not pinch wires when installing the fan motor assembly.

- g. Insert the press bushing (AA) onto the fan motor shaft (24d).

- h. Lightly tap the press bushing (AA) to connect the fan motor shaft (24d) to the fan propeller (25).

NOTICE

To avoid damage to the fan assembly, do not use excessive force when tapping on the motor shaft (24d). If needed, use a rubber mallet to tap on the press bushing (AA).



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1 Ensure that the fan motor shaft (24d) is completely pressed in to the fan propeller (25). Ensure that only the smooth part of the shaft is visible.

Figure 8-16: Fan and Motor Assembly with Fan Press Tool

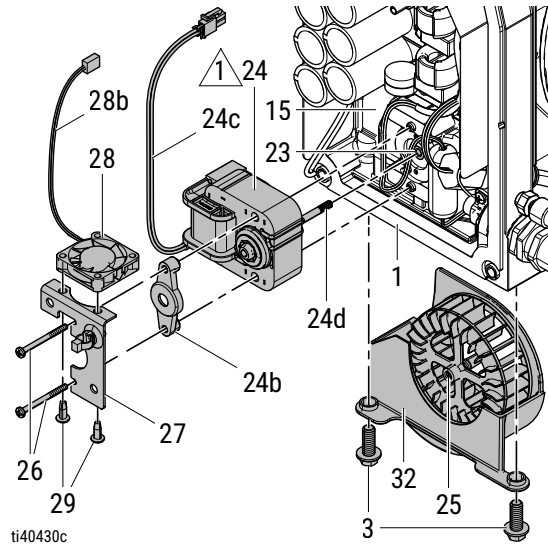
- i. Remove the fan press bushing (AA) and fan holster (BB).
3. Assemble the fan assembly (28), fasteners (29), and mounts (24a, 24b).
 4. Apply thread sealant to fasteners (26).
 5. Hold the fan (28) assembly in place and install the fasteners (26) through the fan assembly. Torque fasteners (26) to 20 in-lb (2.3 N·m).
 6. Connect the fan cable (28b) and fan motor cable (24c) to the control board (15). See **Electrical Schematics**.

NOTICE

To avoid damage to wires, do not pinch wires. Use the tie provided to hold wires in place and tucked away from pinch points.

7. Install the fan guard (32) around the fan propeller (25).

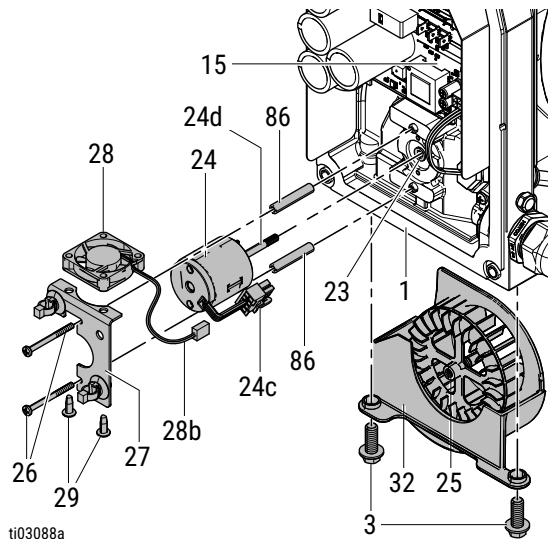
8. Install the fasteners (3) into the fan guard (32). Securely tighten.
9. Spin the fan propeller (25) by hand to ensure the propeller can fully and easily turn.
10. Follow **Install the Control Cover**.



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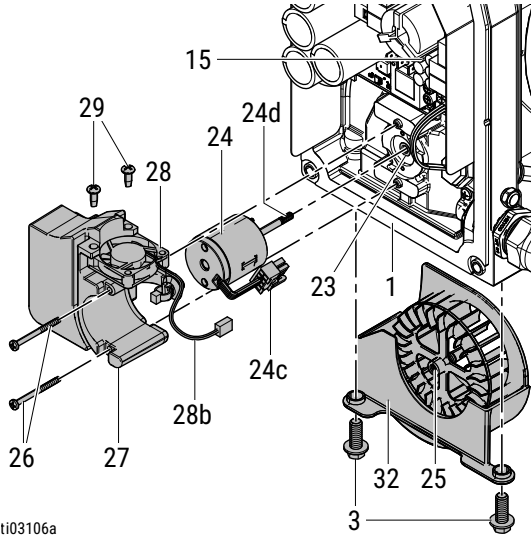
1 Apply thermal paste to the contact surface between the fan motor (24) and stator housing (1).

Figure 8-17: Fan Assembly, 200-240 V Models



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Figure 8-18: Fan Assembly, 380-480 V Models, Ordinary Locations



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Figure 8-19: Fan Assembly, 380–480 V Models, Explosive Atmospheres or Hazardous (Classified) Locations)

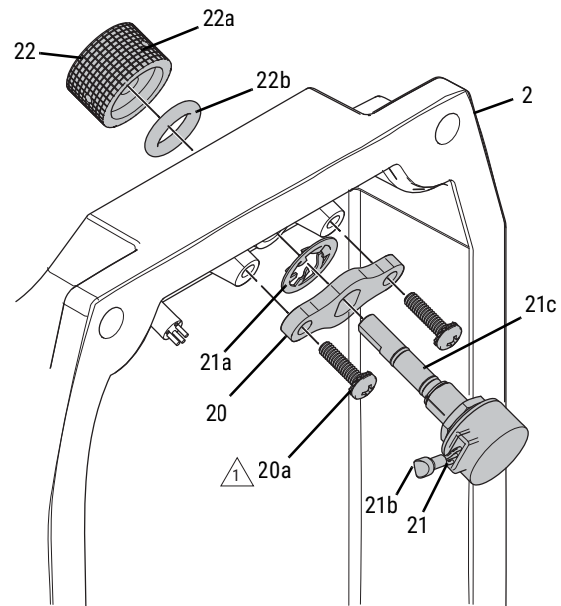
REPAIR THE CONTROL KNOB ASSEMBLY

Repair kits are available (purchase separately). See **Kits and Accessories**.

SUPPLIES

- 2 mm hex key
- 13 mm open-end wrench
- P2 (0.8 mm) Phillips screwdriver

⚠ DANGER			
			
DANGER			
SEVERE ELECTRIC SHOCK HAZARD			
<p>This equipment can be powered by more than 240 V. Contact with this voltage will cause death or serious injury.</p> <ul style="list-style-type: none"> • Turn off and disconnect power before servicing or repairing equipment. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations. 			



ti40436a

1 ⚠ Torque to 20 in-lb (2.3 N·m)

Figure 8-20: Control Knob Assembly

REMOVE THE CONTROL KNOB ASSEMBLY

1. Follow **Prepare Equipment for Repair**.
2. Follow **Remove the Control Cover**.
3. Loosen the control knob fasteners (22a). Remove the control knob (22) and seal (22b).
4. On the back of the control cover (2), remove the fasteners (20a) on the control knob mounting bracket (20).
5. Remove the encoder (21) assembly from the control cover (2).
6. Loosen the push-nut (21a) on the encoder (21) assembly. Remove the control knob mounting bracket (20).
7. Inspect for wear or damage. Replace as needed.

INSTALL THE CONTROL KNOB ASSEMBLY

1. Verify that power to the equipment is disconnected.
2. Prepare the new encoder (21) by verifying that only one nut is installed on the thread of the encoder, and that the nut is screwed down, making contact with the encoder body. If a second nut is present, discard it.
3. Insert the encoder (21) into the control knob mounting bracket (20).
4. Install the push-nut (21a) onto the encoder (21), making contact with the mounting bracket (20).
5. Apply anti-seize lubricant to the shaft of the encoder (21).
6. Insert the encoder (21) assembly into the control knob hole on the control cover (2).

NOTE:

Ensure that the encoder wire (21b) is correctly oriented to easily connect the wire to the control board.

7. Insert the fasteners (20a) through the control knob mounting bracket (20).
8. Torque the fasteners (20a) to 20 in-lb (2.3 N·m).
9. Install the seal (22b) on the control knob (22).


10. Install the control knob (22) onto the shaft (21c) on the control cover (2). Ensure the mark on the control knob is aligned with the off (0) position on the control label (40).
11. Securely tighten the control knob fasteners (22a). Ensure the control knob (22) turns properly.
12. Follow **Install the Control Cover**.

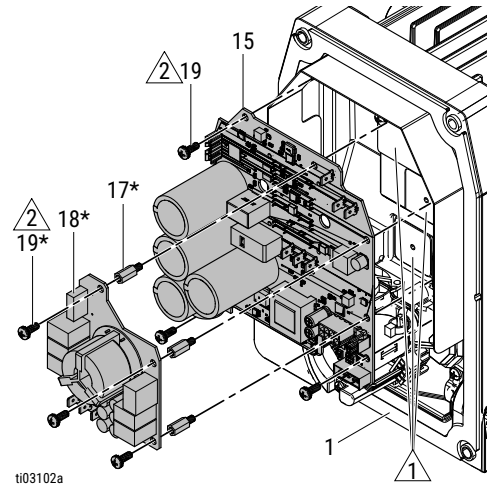
REPLACE THE CONTROL BOARD AND FILTER BOARD

Repair kits are available (purchase separately). See **Kits and Accessories**.

SUPPLIES

- P2 (0.8 mm) Phillips screwdriver
- Thermal paste

⚠ DANGER			
			
DANGER			
SEVERE ELECTRIC SHOCK HAZARD			
This equipment can be powered by more than 240 V. Contact with this voltage will cause death or serious injury.			
<ul style="list-style-type: none"> • Turn off and disconnect power before servicing or repairing equipment. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations. 			

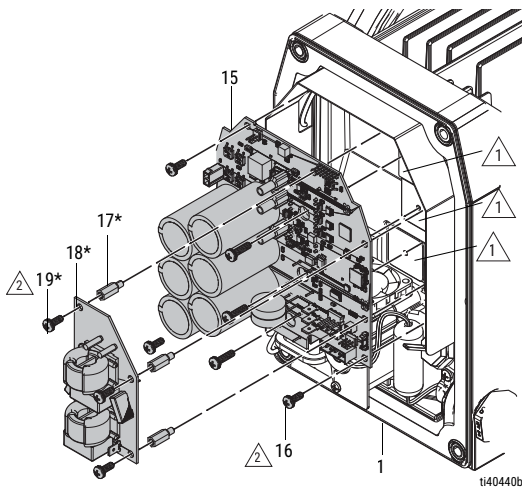


1 Apply a thin layer of thermal paste.

2 Torque to 20 in-lb. (2.3 N·m).

* Not applicable for all models.

Figure 8-22: Control Board and Filter Board, 380–480 V Models



1 Apply a thin layer of thermal paste.

2 Torque to 20 in-lb. (2.3 N·m).

* Not applicable for all models.

Figure 8-21: Control Board and Filter Board, 200–240 V Models

REMOVE THE CONTROL BOARD AND FILTER BOARD ASSEMBLY

1. Follow **Prepare Equipment for Repair**.
2. Follow **Remove the Control Cover**.
3. Disconnect all wires to the control board (15) and filter board (18, if applicable). See **Electrical Schematics**.

NOTICE

To avoid damage to wires, connections, or control board, disconnect all wires before removing the control board.

4. If applicable, remove fasteners (19), filter board (18), and spacers (17).
5. Remove the control board fasteners (16).
6. Carefully grip the edges of the control board (15) and gently remove the control board from the stator housing (1).

NOTICE

To avoid damage to the control board, do not pull by components on the control board. Instead, remove the control board by gripping the edges of the control board base.

7. Inspect for wear or damage. Replace as needed.

INSTALL THE CONTROL BOARD AND FILTER BOARD ASSEMBLY

Follow these steps to install the Control Board and Filter Board Assembly.

NOTICE

To avoid damage to the circuit board, ensure the proper number of thermal pads are used. See **Control Board Kits**.

1. Verify that power to the equipment is disconnected.
2. If needed, apply a thin layer of thermal paste where indicated in **Install the Control Board and Filter Board Assembly**.
3. Hold wires away from the stator housing (1) and insert the control board (15) into the stator housing.
4. Hold the control board (15) in place. At the same time, install the control board fasteners (16). Torque to 20 in-lb (2.3 N·m).


5. If applicable, install spacers (17), filter board (18), and fasteners (19). Securely tighten the fasteners (19).
6. If applicable, connect the filter board (18) power brown cable to L1 and blue cable to L2 on the control board. See **Electrical Schematics**.
7. Connect all wires to the control board (15) and filter board (18, if applicable). See **Electrical Schematics**.
8. Follow **Install the Control Cover**.
9. Follow **Recalibrate the Motor**.

REPLACE THE MOTOR SENSOR

Repair kits are available (purchase separately). See **Kits and Accessories**.

SUPPLIES

- 10 mm socket wrench
- T15 Torx screwdriver
- 3 mm hex key wrench
- Dielectric grease

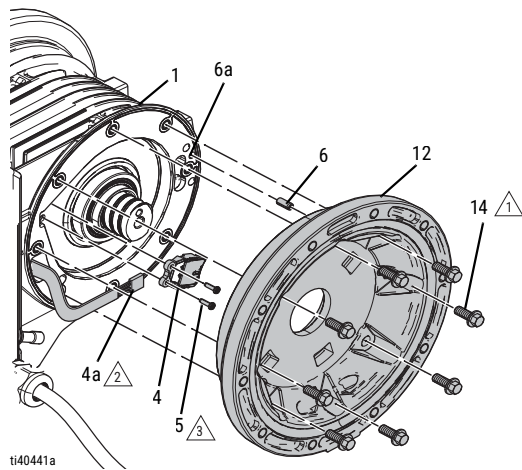
⚠ DANGER			
			
DANGER			
SEVERE ELECTRIC SHOCK HAZARD			
This equipment can be powered by more than 240 V. Contact with this voltage will cause death or serious injury.			
<ul style="list-style-type: none"> • Turn off and disconnect power before servicing or repairing equipment. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations. 			

REMOVE THE MOTOR SENSOR BOARD

1. Follow **Prepare Equipment for Repair**.
2. Remove the air-side plate. See related pump manual. See **Related Manuals**.
3. Remove the fasteners (14) from the sensor-side stator cap (12).
4. Carefully remove the sensor-side stator cap (12) from the stator housing (1).

NOTICE
To avoid damage to the motor sensor or wires, gently remove the sensor-side stator cap (12). Do not jolt the sensor-side stator cap when removing.

5. Disconnect the motor sensor cable (4a) from the motor sensor (4).
6. Remove the fasteners (5) from the motor sensor (4).
7. Remove the motor sensor (4) from the stator housing (1).
8. Inspect for wear or damage. Replace as needed.



1 Torque to 110 in-lb (12 N·m)

2 Apply dielectric grease.

3 Torque to 20 in-lb (2.3 N·m)

Figure 8-23: Motor Sensor

REPAIR

INSTALL THE MOTOR SENSOR BOARD

1. Verify that power to the equipment is disconnected.
2. Ensure all surfaces are clean.
3. Apply dielectric grease to the connector on the motor sensor cable (4a).
4. Connect the motor sensor cable (4a) to the motor sensor (4).
5. Align the motor sensor (4) on the stator housing (1), then push the sensor until it clicks into place. Install the fasteners (5) into the motor sensor (4). Torque the fasteners (5) to 20 in-lb (2.3 N·m).
6. Carefully install the sensor-side stator cap (12):
 - a. Align the pin (6) in the stator cap (12) with the pin hole (6a) on the stator housing (1) and gently insert the stator cap (12). Ensure the stator cap is properly set in place.

NOTICE

To avoid damage to the motor sensor or wires, gently insert the sensor-side stator cap (12) into place. Do not jolt the sensor-side stator cap when installing.

- b. Install the fasteners (14) into the sensor-side stator cap (12). Torque to 110 in-lb (12 N·m). See **Torque Instructions**.
7. Follow **Recalibrate the Motor**.

REPAIR THE CENTER SECTION

Repair kits are available (purchase separately). See **Kits and Accessories**.

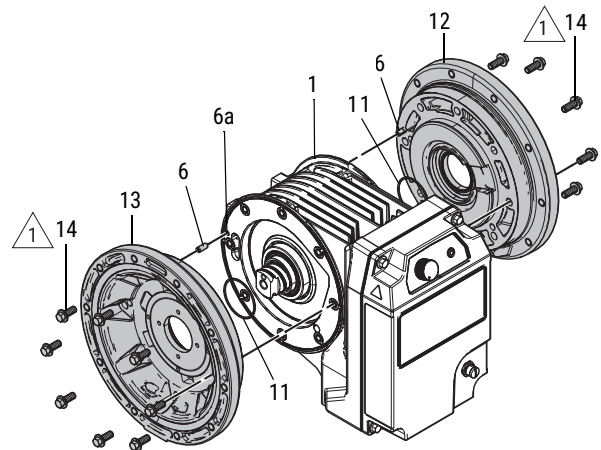
SUPPLIES

- 10 mm socket wrench

WARNING



To avoid injury, keep clear of moving and rotating parts.



ti40442a

1 Torque to 110 in-lb (12 N·m)

Figure 8-24: Center Section, Load-Side

DISASSEMBLE THE CENTER SECTION

1. Follow **Prepare Equipment for Repair**.
2. Follow **Remove the Rotor**.
3. Remove the fasteners (14) from the stator caps (12, 13).
4. Remove the stator caps (12, 13).

NOTICE
To avoid damage to the motor sensor or wires, gently remove the sensor-side stator cap (12). Do not jolt the sensor-side stator cap when removing.

5. Remove the seals (11, 47) from the stator caps (12, 13). When you remove the seal (47), you will also remove the hub (8).
6. Inspect for wear or damage. Replace as needed.

REASSEMBLE THE CENTER SECTION

1. Verify that power to the equipment is disconnected.
2. Carefully install the sensor-side stator cap (12):
 - a. Install the seal (11) in the stator cap (12).
 - b. Align the pin (6) in the stator cap (12) with the pin hole (6a) on the stator housing (1) and gently insert the stator cap (12). Ensure the stator cap is properly set in place. See **Install the Motor Sensor Board**.

NOTICE
To avoid damage to the motor sensor or wires, gently insert the sensor-side stator cap (12) into place. Do not jolt the sensor-side stator cap when installing.



- c. Install the fasteners (14) into the sensor-side stator cap (12). Torque to 110 in-lb (12 N·m). See **Torque Instructions**.
3. Follow **Install the Rotor**.

REPAIR THE ROTOR AND SHAFT ASSEMBLY

SUPPLIES

- Preload nut installation tools*
- Rotor greasing tool*
- 1 in. (25 mm) open-end wrench
- 1/2 in. square drive socket wrench extension

* Kits are available (purchase separately). See **Kits and Accessories**.

WARNING				
				
To avoid injury, keep clear of moving and rotating parts.				

REMOVE THE ROTOR

1. Follow **Prepare Equipment for Repair**.
2. Remove the air side plate on both sides of the equipment. See related pump manual. See **Related Manuals**.
3. Use the preload nut installation tools and an applicable wrench to remove the preload nut (9) and hub (8) from the load-side stator cap (13).
4. Remove the load-side stator cap (13).

NOTICE

To avoid damage to the motor sensor, do not remove components from the side with sensor-side stator cap (12). Only remove components from the side with the load-side stator cap (13).

5. On the sensor-side, turn the shaft (7a) until it protrudes from the load-side stator cap (12).

NOTICE

To avoid damage to the rotor or equipment, do not remove the shaft (7a) from the rotor (7). Removing the shaft will cause the rotor balls to dislodge from the rotor and the rotor will not function properly.

6. Use an applicable wrench to firmly hold the flat of the shaft (7a) in place. Ensure that the rotor and shaft assembly (7, 7a) does not rotate. At the same time, on the sensor-side, carefully tap the shaft to disengage the rotor and shaft assembly (7, 7a) from the stator housing (1). Tap until the rotor and shaft assembly emerge from the load-side stator cap (13).

NOTICE

To avoid damage to the shaft or rotor, do not use excessive force when tapping out the rotor and shaft assembly (7, 7a). If needed, use a rubber mallet to disengage the rotor and shaft assembly.

7. Remove the rotor and shaft assembly (7, 7a) from the stator housing (1).

8. Remove the seals (11) from the stator caps (12, 13).

NOTE:
Do not remove the shaft (7a) from the rotor (7).

NOTICE

To avoid damage to the rotor or equipment, do not remove the shaft (7a) from the rotor (7). Removing the shaft will cause the rotor balls to dislodge from the rotor and the rotor will not function properly. If the rotor balls dislodge, follow **Re-Ball the Rotor**.

9. Remove the seal (47) from the hub (8).
10. Inspect for wear or damage. Replace as needed.

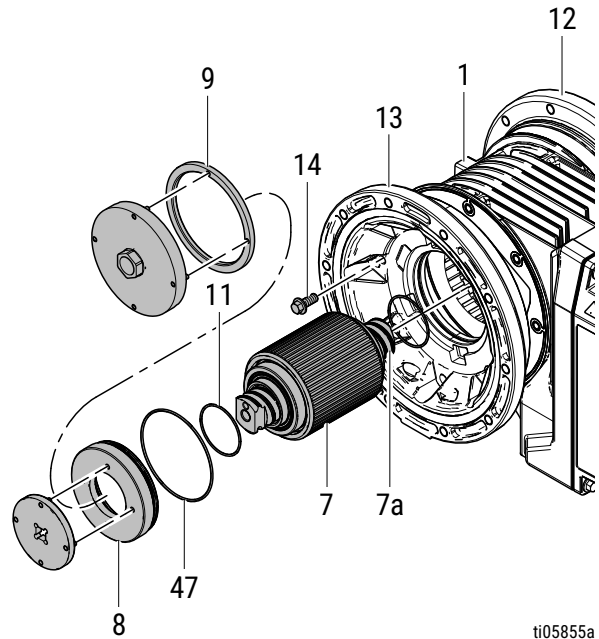


Figure 8-25: Rotor and Shaft Assembly, Load-Side

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RE - BALL THE ROTOR

NOTICE

If the shaft (7a) was removed or partially removed from the rotor (7), some or all of the rotor balls will dislodge from the rotor, causing the rotor to malfunction. To avoid damage to the equipment, recover the dislodged balls and re-ball the rotor.

1. Follow **Remove the Rotor**.
2. Prepare a container to catch the remaining loose rotor balls.
3. Slowly rotate the shaft (7a) out of the rotor assembly (7) to remove the rotor balls.

NOTE:

Ensure that all rotor balls are removed from the shaft and rotor assembly (7, 7a). Check inside the rotor (7) for any remaining rotor balls.

4. Clean the grease from the shaft (7a) and the rotor assembly (7). You will regrease the shaft when you reinstall the rotor.
5. Reinstall and rotate the shaft into the rotor until you can see the feeder port next to the end of the shaft without the wrench flat.

NOTE:

There is a ball feeder port at both ends of the rotor.

6. Hold the rotor so that the rotor balls can drop into the feeder port by gravity.

7. Reload the rotor balls one at a time into the feeder port until all of them are reloaded.

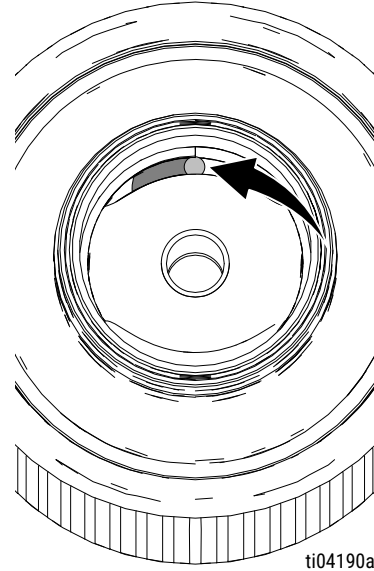
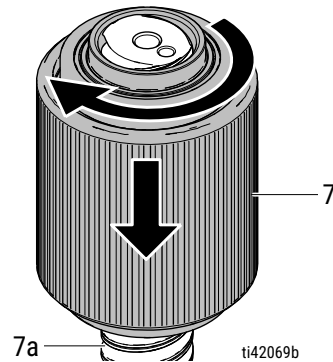


Figure 8-26: Load Each Rotor Ball into the Feeder Port

8. Rotate the rotor (7) up and down the shaft (7a) to set the rotor balls into the shaft threads.

Figure 8-27: Rotate the Shaft and Rotor



9. Follow **Install the Rotor**.

LUBRICATE THE ROTOR AND SHAFT

Use the rotor greasing tool to liberally apply grease to the rotor (7) and shaft (7a).

SUPPLIES

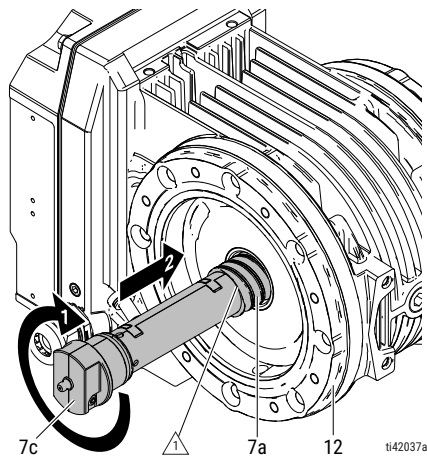
- Rotor greasing tool*
- Lubriplate Synxtreme HD-2 grease or equivalent NLGI Grade 2 synthetic grease with calcium sulfonate base

* Kits are available (purchase separately). See **Kits and Accessories**.

1. Follow **Prepare Equipment for Repair**.
2. On the sensor-side, use an applicable wrench to firmly hold the flat of the shaft (7a) in place. Ensure that the rotor and shaft assembly (7, 7a) does not rotate. At the same time, on the load-side, thread the rotor greasing tool (7c) into the shaft (7a) until fully joined.

NOTICE

To avoid equipment damage, do not rotate the shaft (7a) while threading the rotor greasing tool (7c) into the shaft. Only turn the rotor greasing tool (7c).



1 Ensure that the meeting point is fully joined (no gap).

Figure 8-28: Insert Rotor Greasing Tool

3. Turn the rotor greasing tool into the center of the rotor (7) until the shaft (7a) fully protrudes from the sensor-side stator cap (13).

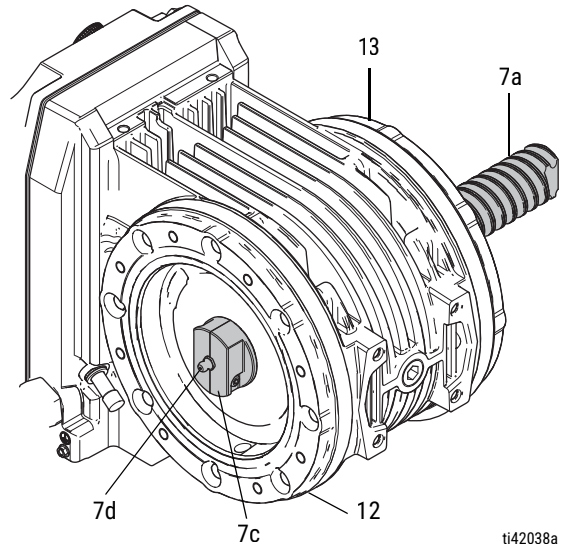


Figure 8-29: Rotor Greasing Tool

4. Clean and inspect the shaft (7a) for wear or damage. Replace as needed.
5. Use the grease port (7d) on the rotor greasing tool (7c) to fill the shaft area with clean grease. Fill until clean grease emerges from the edges of the rotor greasing tool (7c).

NOTICE

To avoid equipment damage, liberally apply grease on the shaft (7a).

6. Turn the shaft (7a) to reinsert the shaft into the rotor (7). Turn until the rotor greasing tool (7c) fully emerges from the load-side stator cap (12).

NOTE:

Do not disconnect the shaft from the rotor greasing tool when reinserting the shaft into the rotor.

NOTICE

To avoid equipment damage, do not rotate the rotor greasing tool (7c) to reinsert the shaft into the rotor. Only turn the shaft (7a).

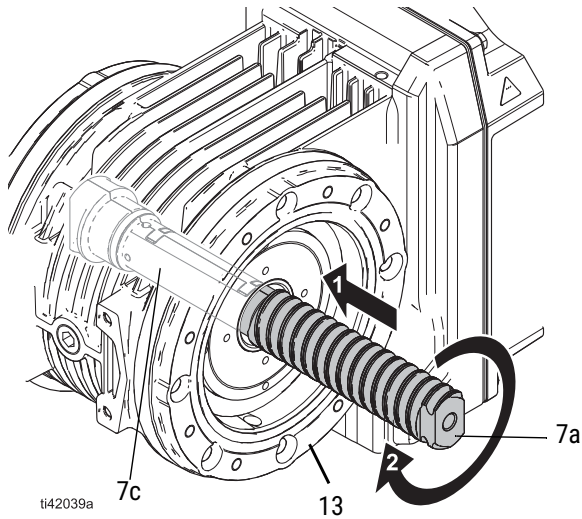


Figure 8-30: Remove Rotor Greasing Tool

7. Use an applicable wrench to firmly hold the flat of the shaft (7a) in place. At the same time, disconnect the rotor greasing tool from the shaft (7a).
8. Clean the internal threads on the shaft (7a) to remove excess grease.

Ensure the meeting point is fully joined (no gap).

INSTALL THE ROTOR

1. Verify that power to the equipment is disconnected.
2. Reach inside the stator housing (1) to install one seal (11) onto the stator cap (12).
3. Insert the rotor and shaft assembly (7, 7a) into the stator housing (1).

NOTE:

Grease the tapered rotor bearings before inserting into the stator housing.

NOTE:

Ensure the flat of the shaft (7a) faces toward the load-side stator cap (13).

NOTE:

The outer-ring lip of the rotor (7) will sit slightly raised from the stator housing (1).

4. Install the seal (47) on the hub (8).
5. Assemble the other seal (11) to the hub (8).

6. Install the preload nut and hub (9, 8) on the load-side cap (13):
 - a. Apply anti-seize lubricant to the threads of the hub (8).
 - b. Thread the preload hub (8) onto the load-side stator cap (13). Ensure the lips of the preload hub (8) face toward the center of the rotor (7).
 - c. Spin the hub (8) until the seal (47) touches the bore of the cap (13).
 - d. Install the load-side stator cap (13) onto the stator housing (1). First, install the seal (11) in the stator cap (13). See **Reassemble the Center Section**.
 - e. Align the pin (6) in the stator cap (13) with the pin hole (6a) on the stator housing (1) and gently insert the stator cap (13). Ensure the stator cap is properly set in place. See **Reassemble the Center Section**.
 - f. Install the fasteners (14) into the stator cap (13). Torque to 110 in-lb (12 N·m). See **Torque Instructions**.
 - g. Insert the preload hub installation tool into the preload hub (8).
 - h. Use an applicable wrench on the preload hub installation tool to torque the preload hub (8) to 20 ft-lb (27 N·m).
 - i. Remove the preload hub installation tool, and temporarily install an M12 washer and an M12 bolt into the rotor.
7. Use an applicable wrench on the M12 bolt to manually spin the rotor at least ten revolutions to ensure the bearings have been seated correctly, and that the rotor spins within the stator.
8. Remove the temporary M12 washer and M12 bolt from the rotor. Discard or keep for future rotor installations.

NOTE:

Washer and bolt are provided in Rotor Replacement kits. If reusing the existing rotor, use a washer with outside diameter 1.75 inches (45mm).

- l. Loosen the preload hub (8) by one quarter rotation, then retorque to 10 ft-lb (13 N·m).

NOTE:
To ensure the rotor can properly spin, be careful to not overtighten the preload hub (8).

- m. Using a marker, mark the location of the hub (8) relative to the stator cap (13).

NOTICE
To avoid equipment damage, do not overtighten the preload hub (8).

- n. Install the preload nut (9).
- o. Use an applicable wrench on the preload nut installation tool to torque the nut (9) to 80 ft-lb (108 N·m).

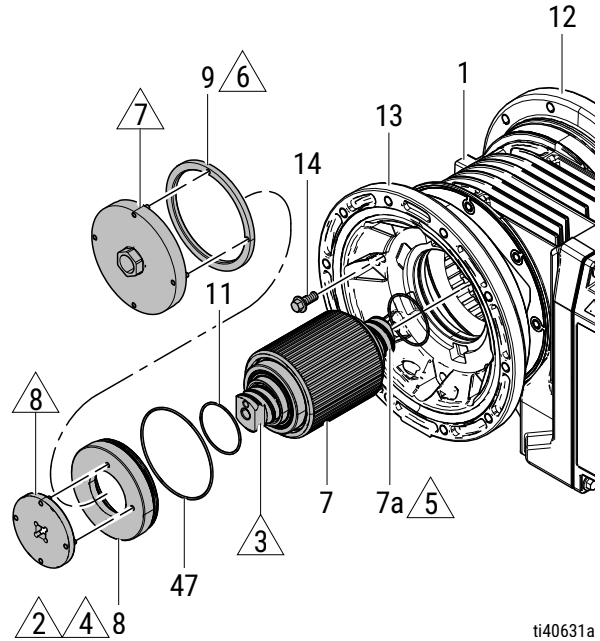
NOTE:
Ensure that the hub (8) does not rotate while torquing the nut (9).

NOTICE
To avoid equipment damage, use a wrench to hold the hub (8) in place so that it does not rotate while torquing the nut (9).

- p. Remove the preload nut installation tool.
 - q. Verify that the hub (8) did not rotate from the marked location relative to the stator cap (13).
7. Lubricate the rotor (7) and shaft (7a). See **Lubricate the Rotor and Shaft**.

NOTICE
To avoid equipment damage, liberally apply grease on the shaft (7a).

- 8. Follow **Recalibrate the Motor**.



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- △ 2 Lips must face toward center housing (1).
- △ 3 Face shaft flat opposite the sensor-site stator cap (12).
- △ 4 Torque to 20 ft-lb (27 N·m). Spin the rotor at least ten revolutions. Loosen the preload hub by one quarter rotation, then retorque to 9 ft-lb (12 N·m).
- △ 5 Do not remove the shaft (7a) from the rotor (7).
- △ 6 Torque to 80 ft-lb (108 N·m).
- △ 7 Preload Nut Installation Tool, included in kit 25V370.
- △ 8 Preload Nut Installation Tool, included in kit 25V370.

Figure 8-31: Rotor and Shaft Assembly, Load-side

RECALIBRATE THE MOTOR

For motor modules Series B or later, recalibrate the motor after installing a new control board, motor sensor, rotor, or retorquing the preload hub and nut. Recalibrate after you reassemble the motor module but before you install the diaphragms or fluid section.

To identify the Series of the motor module, see **Motor Module Series**.

1. Turn the control knob (22) fully counterclockwise (off).
2. Power up the motor module.
3. Turn the control knob (22) clockwise (on) to approximately 50 percent or higher.

The rotor (7) begins to spin. The LED (37) turns yellow.

4. Wait for approximately 20 revolutions (10 seconds).

The rotor (7) momentarily stops. Then it slowly spins one revolution and stops. Then it reverses direction and slowly spins one revolution.

- If the calibration was successful, the rotor (7) begins to spin and the LED (37) turns yellow.
- If the calibration was unsuccessful, the rotor (7) stops spinning and the LED (37) flashes an error code (seven blinks). Ensure that the rotor is not being restricted during calibration and is free to spin, then repeat this procedure.


5. Turn the control knob (22) fully counterclockwise (off), and remove power.
6. Install the diaphragms and finish reassembling the pump.

RECYCLING AND DISPOSAL

Properly recycle and dispose of the equipment at the end of its useful life.

END OF PRODUCT LIFE

At the end of the product's useful life, dismantle and recycle it in a responsible manner.

- Perform the **Pressure Relief Procedure**.
- Drain and dispose of fluids according to applicable regulations. Refer to the material manufacturer's Safety Data Sheet.
- Remove motors, batteries, circuit boards, LCDs (liquid crystal displays), and other electronic components. Recycle according to applicable regulations.
- Do not dispose of batteries or electronic components with household or commercial waste. 
- Deliver remaining product to a recycling facility.

PARTS

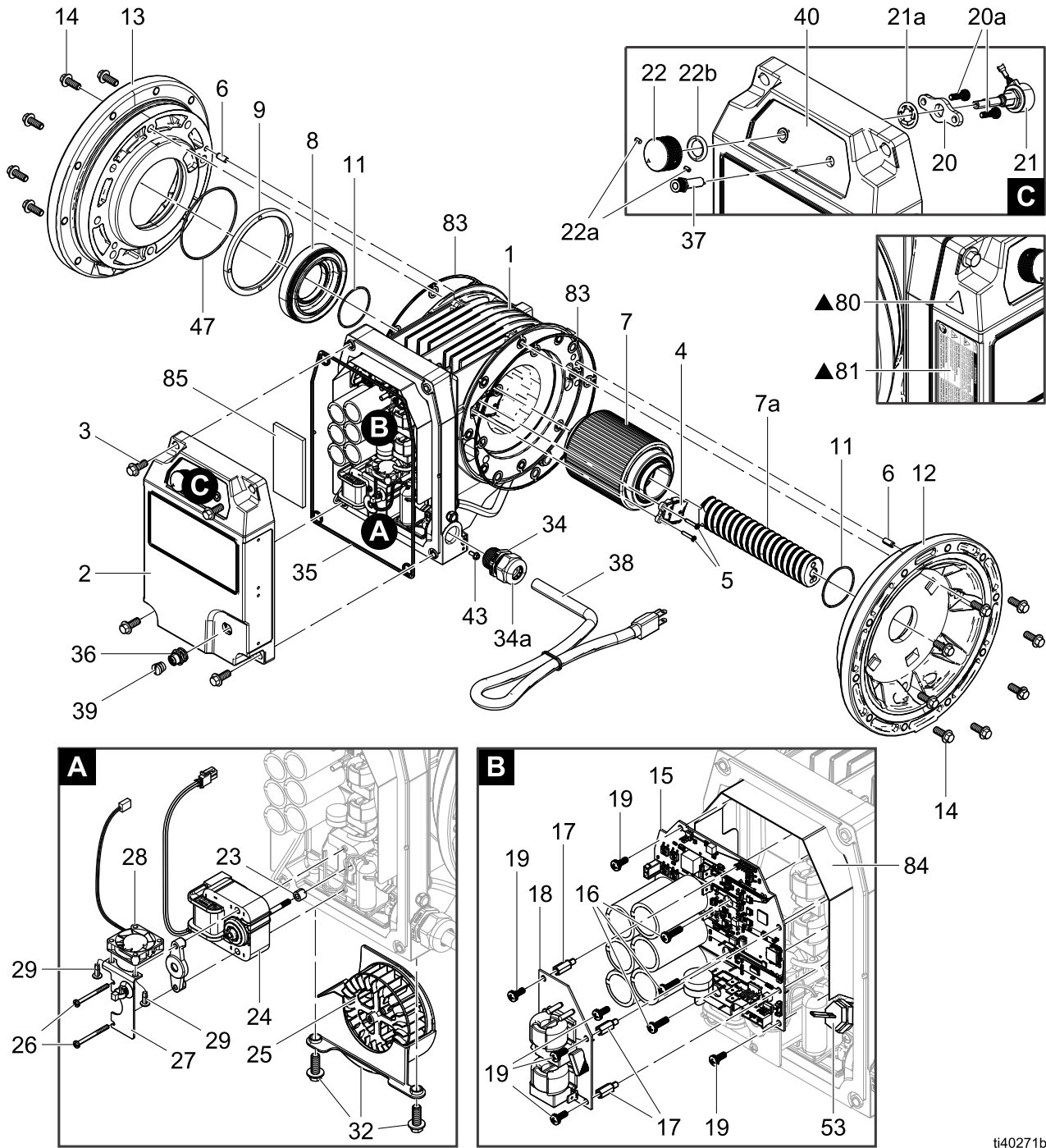
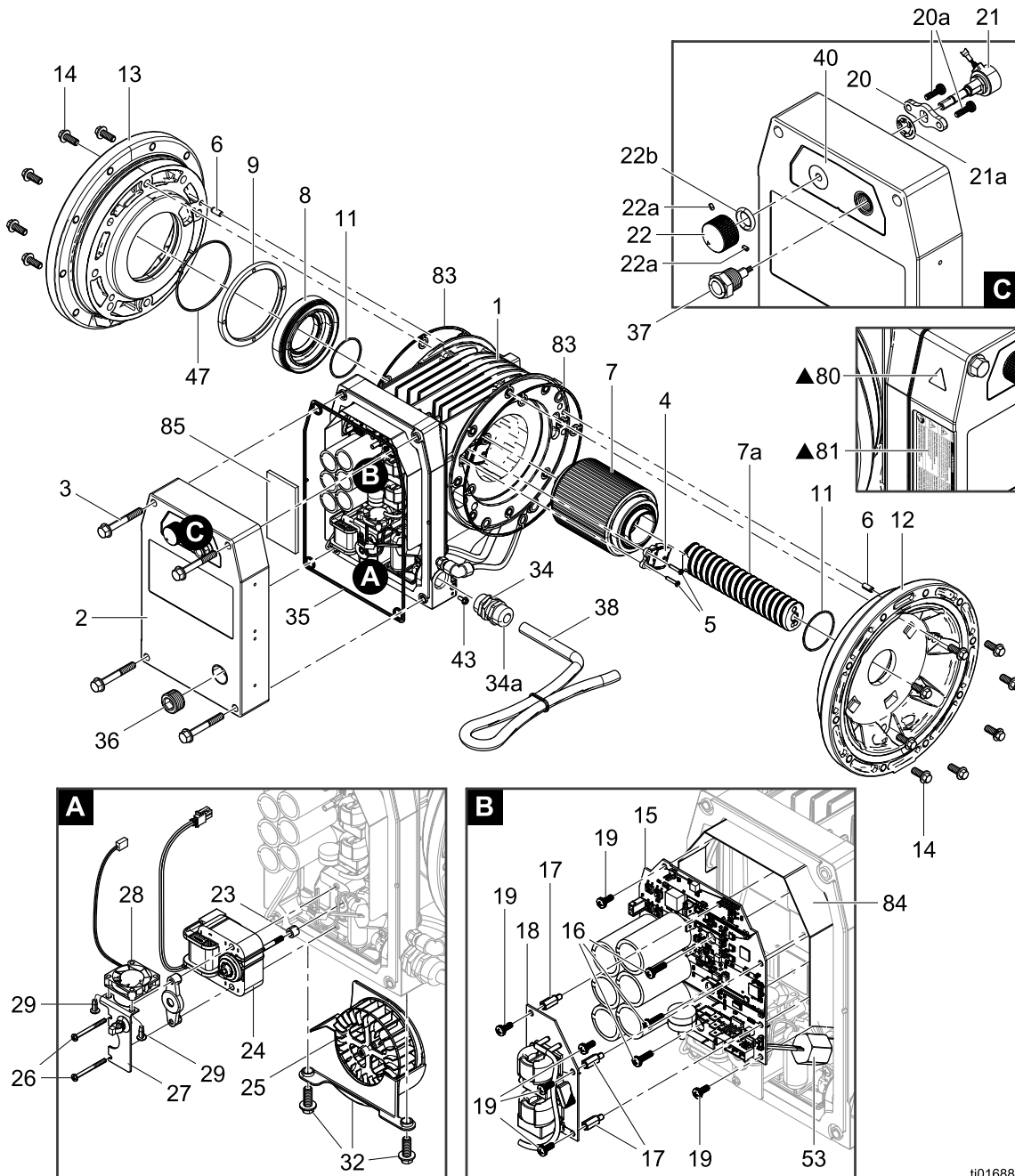


Figure 10-1: Motor Module, 200–240 V, Ordinary Locations

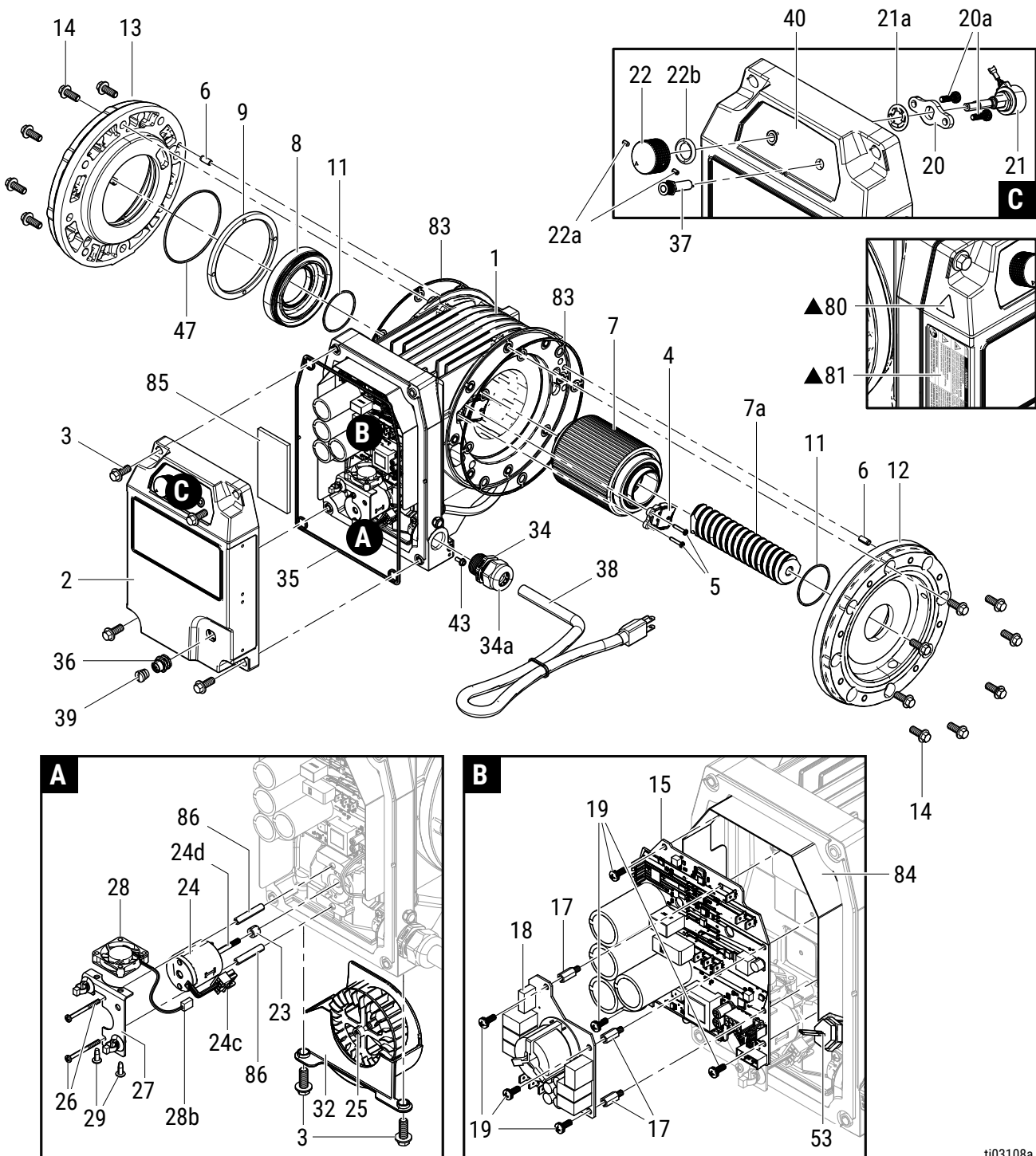
PARTS



ti01688b

Figure 10-2: Motor Module, 200-240 V, Explosive Atmospheres or Hazardous (Classified) Locations

PARTS



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Figure 10-3: Motor Module, 380–480 V, Ordinary Locations

PARTS

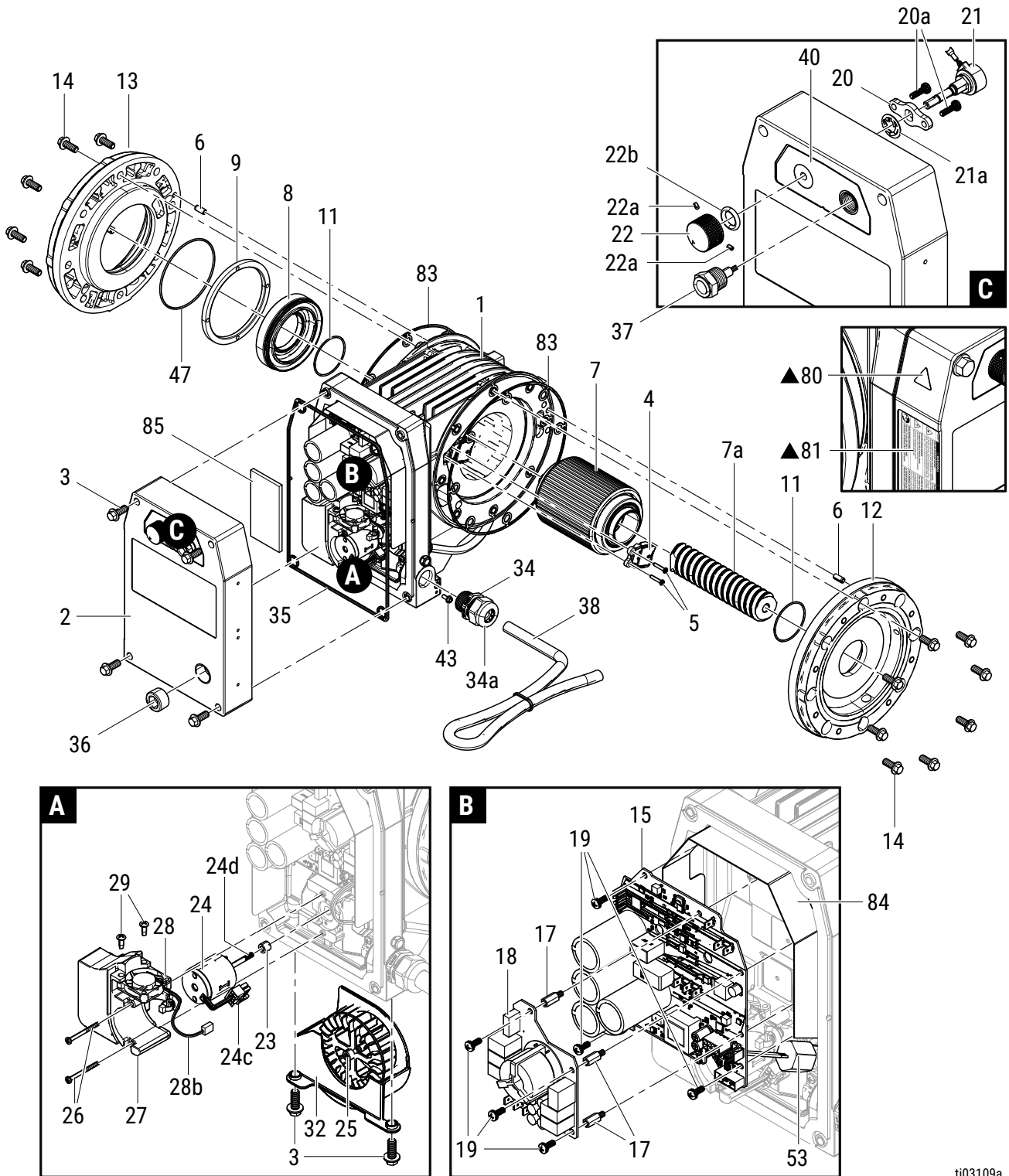


Figure 10-4: Motor Module, 380–480 V, Explosive Atmospheres or Hazardous (Classified) Locations

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PARTS

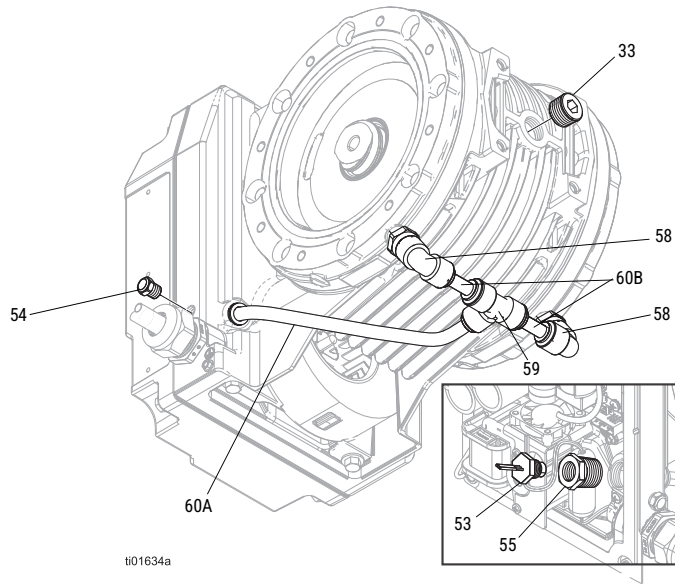


Figure 10-5: Leak Sensor, Ordinary Locations

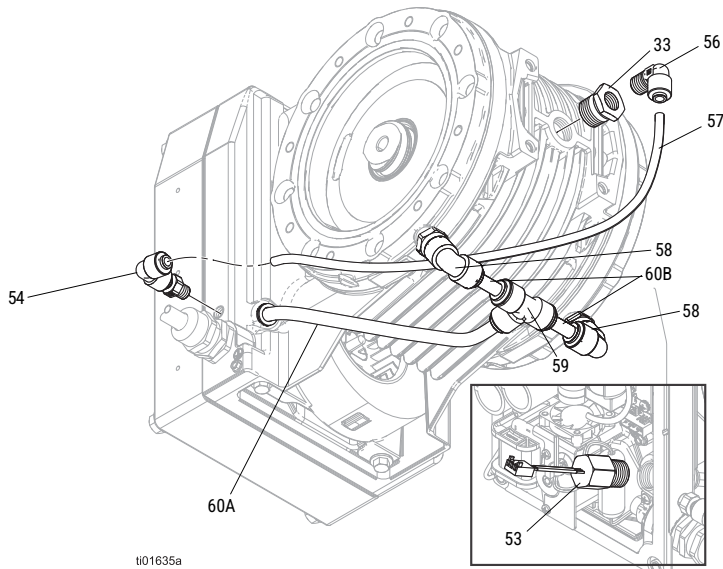


Figure 10-6: Leak Sensor, Explosive Atmospheres or Hazardous (Classified) Locations

PARTS

PARTS LIST

Reference numbers correspond to callouts in the figures shown in **Parts**.

REF.	PART	DESCRIPTION	QTY.
1‡	- - -	STATOR	1
2		COVER, control	1
	25V123	for Industrial (QT) models in Ordinary Locations	
	25V124	for Hygienic (QH) models in Ordinary Locations	
	25V125	for Industrial (QT) models in Explosive Atmospheres or Hazardous (Classified) Locations	
	25V126	for Hygienic (QH) models in Explosive Atmospheres or Hazardous (Classified) Locations	
3	19C157	SCREW, hex washer, M8 x 20; for i30 (QTC), i80 (QTD), i120 (QTE) Ordinary Location	4
	19F961	SCREW, hex head washer, M8 x 60,CS; for i30 (QTC), i80 (QTD), i120 (QTE) Hazardous (Classified) Location	4
	15Y149	BOLT, hex head, M8 x 1.25 x 20 mm; for h30 (QHC), h80 (QHD), h120 (QHE) Ordinary Location	4
	19F897	SCREW, hex wash, M8 x 60, SST, patch; for h30 (QHC), h80 (QHD), h120 (QHE) Hazardous (Classified) Location	4
	115643	SCREW, hex washer, M8 x 25; for i30 (QTC) Ordinary Location i80 (QTD) Ordinary Location i120 (QTE) Ordinary Location	4
	112178	BOLT, hex head, M8 x 1.25 x 25 mm; for h30 (QHC) Ordinary Location h80 (QHD) Ordinary Location h120 (QHE) Ordinary Location	4

PARTS

REF.	PART	DESCRIPTION	QTY.
4‡	- - -	SENSOR, motor, assembly	1
5	18G070	FASTENER, self-tapping, 6-19 x 0.75 in. stainless steel	2
6	18A535	PIN, straight slotted spring, 1/4 in. x 9/16 in.	2
7‡	- - -	ROTOR, assembly	1
7a‡	- - -	SHAFT, ball screw	1
8‡	- - -	HUB, preload alignment (with bearing race)	1
9‡	- - -	NUT, preload	1
11‡	- - -	SEAL	2
12‡	- - -	CAP, stator, sensor-side (with bearing race)	1
13‡	- - -	CAP, stator, load-side	1
14	19C157	SCREW, hex washer, M8 x 20; for i30 (QTC) Ordinary Location and Hazardous (Classified) Location, i80 (QTD) Ordinary Location and Hazardous (Classified) Location, i120 (QTE) Ordinary Location and Hazardous (Classified) Location	16
	19C158	SCREW, FHS, M8 x 16, SST; for h30 (QHC) Ordinary Location and Hazardous (Classified) Location	16
	15Y149	BOLT, hex head, M8 x 1.25 x 20 mm; for h30 (QHC), h80 (QHD) Ordinary Location and Hazardous (Classified) Location, h120 (QHE) Ordinary Location and Hazardous (Classified) Location	16
15‡	- - -	BOARD, control assembly, motor drive	1
16	18A538	FASTENER, pan head, M8-32 x 9/16 in.	3

REF.	PART	DESCRIPTION	QTY.
17	16G799	SPACER, standoff, M8-32 x 0.5 in.; FC2, FC4, FE2, FE4, FF2, FF4 models	3
18‡	- - -	BOARD, assembly, line filter; FC2, FC4, FE2, FE4, FF2, FF4, FC8, FC9, FCA, FE8, FE9, FEA, FF8, FF9, FFA models	1
19	19C206	FASTENER pan head, external tooth lock washer, M8-32 x 7/16 in.	6
20‡	- - -	BRACKET, control knob	1
20a‡	- - -	FASTENER, pan head, control knob bracket	2
21‡	- - -	ENCODER, control	1
21a‡	- - -	NUT, push	1
22‡	- - -	KNOB, control	1
22a‡	- - -	FASTENER, hex head	2
22b‡	- - -	SEAL, packing	1
23‡	- - -	BEARING, sleeve; not included in 480 V Ordinary Location motors	1
24‡	- - -	MOTOR, fan	1
25‡	- - -	FAN, propeller	1
26	18F382	FASTENER, pan head, M6-32 x 1-1/2 in.	2
27	- - -	BRACKET, fan, 40 x 40 mm	1
28	2009029	FAN, DC, 40 x 40 x 10 mm; includes 27, 29 (Fx1, 2, 3, 4, 5, 6)	1
	2009030	FAN, DC, 40 x 40 x 10 mm; includes 27, 29 (Fx7, 8)	1
	2009031	FAN, DC, 40 x 40 x 10 mm; includes 27, 29 (Fx9, A)	1
29	- - -	SCREW	2
32	25V136	GUARD, fan, squirrel cage; 3-phase	1

PARTS

REF.	PART	DESCRIPTION	QTY.
33	103778	PLUG, 1/2 in. npt(f); for models in Ordinary Locations; stainless steel	1
	114475	BUSHING, pipe, 1/2 in. NPT x 1/4 in. NPT; for models in Explosive Atmospheres or Hazardous (Classified) Locations; stainless steel	1
34		BUSHING, strain relief	1
	19B642	for models in Explosive Atmospheres (i30, i80, i120)	
	19D671	for models in Explosive Atmospheres (h30, h80, h120)	
	-- ‡	for models in Hazardous (Classified) Locations	
	20A460	for models in Ordinary Locations	
34a	---	BUSHING, outer strain relief; <i>included with Ref. 34</i>	1
35	20B302	GASKET, control cover	1
36		CONNECTOR or PLUG	1
	20B403	PLUG, 3/4-NPT; for models in Explosive Atmospheres or Hazardous (Classified) Locations	
	19B637	CONNECTOR, I/O M12 cable assembly; for models in Ordinary Locations	
37		HARNESS, wiring with light, LED indicator	1
	19B643	for models in Explosive Atmospheres or Hazardous (Classified) Locations	
	19B939	for models in Ordinary Locations	
38‡	---	CORD/CABLE, power	1
39		PLUG, screw, M12	

REF.	PART	DESCRIPTION	QTY.
	-- -*	for models in Explosive Atmospheres or Hazardous (Classified) Locations	0
	17C443	for models in Ordinary Locations	1
40		LABEL, EODD control	1
	19C039	for models in Explosive Atmospheres or Hazardous (Classified) Locations	
	19C095	for models in Ordinary Locations	
41	19B616*	CLAMP, cable; <i>not shown</i>	1
41a	112380*	SCREW, <i>not shown</i>	2
43	111593	FASTENER, grounding	2
47‡	---	SEAL, packing	2
53	---	SENSOR, leak	1
54	--- †	BREATHER	1
	--- **	FITTING, elbow swivel, 1/8 in. NPT	
55†	---	FITTING, reducer	1
56**	---	FITTING, elbow, 1/4 in. NPT; 1/4 in. hose port	1
57**	---	HOSE, 1/4 in. outer diameter	1
58	---	FITTING, elbow swivel, 1/4 in. NPT; 3/8 in. hose port	2
59	---	UNION, tee	1
60	---	HOSE, 3/8 in. outer diameter	1
80▲	15K616	LABEL, safety	1
81▲	20A345	LABEL, safety, warning	1
83‡	---	GASKET, stator	2
84	2000158	SHIELD, wire	1
85		PAD, thermal	

PARTS

REF.	PART	DESCRIPTION	QTY.
	- - -	for models in North America, Ordinary Locations	0
	- - -	for i80 and i120 models in EU, Ordinary Locations	2

REF.	PART	DESCRIPTION	QTY.
	- - -	for models in Hazardous (Classified) Locations	0
	- - -	for models in Explosive Atmospheres	1

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

- - - Not available separately.

* Part not shown in parts diagram.

‡ See **Kits and Accessories**.

† Ordinary locations only.

** Hazardous locations only.

KITS AND ACCESSORIES

PART KITS

Part kits are available (purchase separately).

COMPLETE ROTOR REPAIR KITS

MODEL	KIT NO.	KITS INCLUDE
i30 (QTC)	2002420	• 1 rotor (7)
i80 (QTD)	2002383	• 1 stator cap (12, 6)
i120 (QTE)	2002384	• 1 preload hub (8)
h30 (QHC)	2002421	• 2 rotor o-rings (11)
h80 (QHD)	2002422	• 1 hub o-ring (47)
h120 (QHE)	2002423	• 4 seat o-rings
		• 2 diaphragm o-rings
		• 1 anti-seize
		• 1 preload nut (9)

NOTE:

A Complete Rotor Repair Kit is recommended when wear or damage exists on the rotor (7) and the outer bearing races located in the sensor-side stator cap (12) and preload hub (8).

If a complete rebuild is not required, individual Rotor Kits are available.

STATOR CAP KITS

MODEL	KIT NO.	KITS INCLUDE
i30 (QTC-FC)	25V129	• 1 sensor-side stator cap (12)
i30 (QTC-FE)	2009548	
h30 (QHC)	25V130	• 1 load-side stator cap (13)
i80 (QTD-FC)	25V131	
i80 (ATD-FE)	2009549	
h80 (QHD)	25V132	
i120 (QTE-FC)	25V133	
i120 (QTE-FE)	2009550	
h120 (QHE)	25V134	

ROTOR KITS

MODEL	KIT NO.	KITS INCLUDE
i30 (QTC)	25F122	• 1 rotor (7) with bearing
h30 (QHC)		• 1 shaft (7a)
i80 (QTD)	25F123	• 2 fasteners (For shipping purposes only. Discard.)
h80 (QHD)		• 2 washers (For shipping purposes only. Discard.)
i120 (QTE)	25F124	
h120 (QHE)		

PRELOAD HUB AND NUT KITS

MODEL	KIT NO.	KITS INCLUDE
i30 (QTC)	2014315	• 1 preload hub (8)
h30 (QHC)		• 1 preload nut (9)
i80 (QTD)	25V127	• 1 anti-seize
h80 (QHD)		
i120 (QTE)		
h120 (QHE)		

KITS AND ACCESSORIES

CORD / C A B L E K I T S

LOCATION	MODEL	MOTOR CONFIGURATION CODE	KIT NO.
Ordinary Locations	h30 (QHC)	F_1	19B738*
	i80 (QTD)		
	h80 (QHD)		
	i120 (QTE)	F_7	2003677*
	h120 (QHE)		
	All		
	All	F_8	2003089*
	i30 (QTC)	F_2	19B739*
	h30 (QHC)		
	All	F_A	2003089*
	i80 (QTD)	F_2	19B740*
	h80 (QHD)		
	i120 (QTE)		
h120 (QHE)			
i30 (QTC)	F_5	19B741*	
h30 (QHC)			
Hazardous (Classified) Locations	h30 (QHC)	F_3	2001047†
	i80 (QTD)		2001045†
	h80 (QHD)		2001047†
	i120 (QTE)		2001045†
	h120 (QHE)		2001047†
	i30 (QTC)	F_6	2001046†
	h30 (QHC)		2001048†
	i30 (QTC)	F_9	2003678†
	i80 (QTD)		
i120 (QTE)			

LOCATION	MODEL	MOTOR CONFIGURATION CODE	KIT NO.
	h30 (QHC) h80 (QHD) h120 (QHE)		2003679†
Explosive Atmospheres	All	F_4	19B823*
	All	F_A	2003089*

*Kits include:

- 1 power cord/cable (38)

†Kits include:

- 1 power cord/cable (38)
- 1 bushing strain relief (34)

F A N K I T S

MODEL	KIT NO.	KITS INCLUDE
120/240 V	25F100	<ul style="list-style-type: none"> • 1 bearing sleeve (23) • 1 fan motor (24) • 1 fan propeller (25) • 1 cable tie • 1 fan press tool
480 V	2008825	<ul style="list-style-type: none"> • 1 fan motor (24) • 1 fan propeller (25) • 1 cable tie • 1 fan press tool
All	25F101	<ul style="list-style-type: none"> • 1 fan propeller (25) • 1 fan press tool

KITS AND ACCESSORIES

CONTROL KNOB KITS

MODEL	KIT NO.	DESCRIPTION
Industrial (QT)	25F102	For Industrial (QT) models in Ordinary Locations
	25F103	For Industrial (QT) models in Explosive Atmospheres or Hazardous (Classified) Locations
Hygienic (QH)	25F104	For Hygienic (QH) models in Ordinary Locations
	25F105	For Hygienic (QH) models in Explosive Atmospheres or Hazardous (Classified) Locations

Kits include:

- 1 control knob bracket (20)
- 2 fasteners (20a)
- 1 control encoder (21)
- 1 push nut (21a)
- 1 control knob (22) with 2 fasteners, hex head (22a)

- 1 seal (22b)
- 1 packet of anti-seize lubricant

MOTOR SENSOR KITS

MODEL	KIT NO.	KITS INCLUDE
i30 (QTC) h30 (QHC) i80 (QTD) h80 (QHD) i120 (QTE) h120 (QHE)	25F120	• 1 motor sensor assembly (4)

MOTOR RESEAL KIT

MODEL	KIT NO.	KITS INCLUDE
All	2006210	• 2 seal, FKM (11) • 2 o-ring, Buna-N (47) • 2 gasket, stator (83)

KITS AND ACCESSORIES

CONTROL BOARD KITS

KIT NO.	FOR USE WITH EQUIPMENT		KITS INCLUDE
	MODEL	VOLTAGE	
25F113	QUANTM TC, HC (i30, h30)	120 V, 240 V	1 board assembly
25F114	QUANTM TD, HD (i80, h80)		1 tube thermal paste
25F115	QUANTM TE, TF, HE, HF (i120, h120)		9 screws 2 thermal pads
25F117	QUANTM TC, HC (i30, h30)	230 V	1 board assembly
25F118	QUANTM TD, HD (i80, h80)		1 tube thermal paste
25F119	QUANTM TE, TF, HE, HF (i120, h120)		1 board assembly line filter 9 screws 2 thermal pads 3 standoffs
2006577	QUANTM TC, HC (i30, h30)	480 V (NA)*	1 board assembly
2006578	QUANTM TD, HD (i80, h80)		1 tube thermal paste
2006579	QUANTM TE, TF, HE, HF (i120, h120)		8 screws
2006580	QUANTM TC, HC (i30, h30)	480 V (WW)**	1 board assembly
2006581	QUANTM TD, HD (i80, h80)		1 tube thermal paste
2006582	QUANTM TE, TF, HE, HF (i120, h120)		1 board assembly line filter 8 screws 3 standoffs
<p>Notes:</p> <p>* North America</p> <p>** Worldwide</p>			

KITS AND ACCESSORIES

ACCESSORY KITS

Accessory kits are available (purchase separately).

LEAK SENSOR KITS

LOCATIONS	KIT NO.	KITS INCLUDE
Ordinary Locations	25F108	<ul style="list-style-type: none"> • 1 level switch sensor • 1 reducer fitting • 2 elbow swivels (1/4 in. NPT, 3/8 in. hose port) • 1 tee union • 1 hose (30 in. long, 3/8 in. outer diameter) • 1 breather
Explosive Atmospheres or Hazardous (Classified) Locations	25F109	<ul style="list-style-type: none"> • 1 level switch sensor • 2 elbow swivels (1/4 in. NPT, 3/8 in. hose port) • 1 tee union • 1 hose (30 in. long, 3/8 in. outer diameter) • 1 elbow swivel (1/8 in. NPT) • 1 hose (20 in. long, 1/4 in. outer diameter) • 1 pipe bushing • 1 elbow (1/4 in. NPT; 1/4 in. hose port)

PRELOAD NUT INSTALLATION TOOL KITS

KIT NO.	KITS INCLUDE
25V370	<ul style="list-style-type: none"> • 2 preload installation plates

ROTOR GREASING TOOL KITS

KIT NO.	KITS INCLUDE
25V176	<ul style="list-style-type: none"> • 1 greaser cartridge • 1 packet of lubricant

I/O CABLE KITS

MODEL	KIT NO.	KITS INCLUDE
Models in Explosive Atmospheres or Hazardous (Classified) Locations	25V080	<ul style="list-style-type: none"> • 1 gland, 3/4 in. NPT • 1 cable • 1 cable clamp • 2 fasteners • 1 ground fastener

MAINTENANCE BRACKET STAND

KIT NO.	KITS INCLUDE
18F978	STAND, maintenance bracket

ELECTRICAL SCHEMATICS

These tables provide detailed electrical schematics for the QUANTM® electric motor, including component layouts and connection details.

Table 12-1: Power Cord/Cable Wire Connection

MOTOR	N	L1	L2	L3	L1/B	L2/N	G
F_1, F_3	---	Black	White	Red	---	---	Green (ground wire)
F_2, F_4	---	---	---	---	Brown (filter board)	Blue (filter board)	
F_5, F_6	White	Black	---	---	---	---	
F_7, F_9	---	Black	White	Red	---	---	
F_8, F_A	---	Brown	Black	Gray	---	---	Green/ Yellow

ELECTRICAL SCHEMATICS

KEY

- 4a** Motor sensor cable
- 21b** Control knob encoder wire
- 28b** Fan cable
- 24c** Fan motor cable
- 36** I/O port/cable
- 37** LED indicator
- LS** Leak Sensor
 - 1 – Control Mode (Series C and later); Leak Sensor (Series B and earlier). See **Motor Module Series**.
- AP**
 - 2 – Auto Prime

Refer to the pump Instruction manual for switch settings. See **Related Manuals**.
- MA** Motor wire: black wire, white band
- MB** Motor wire: black wire, black band
- MC** Motor wire: black wire, red band

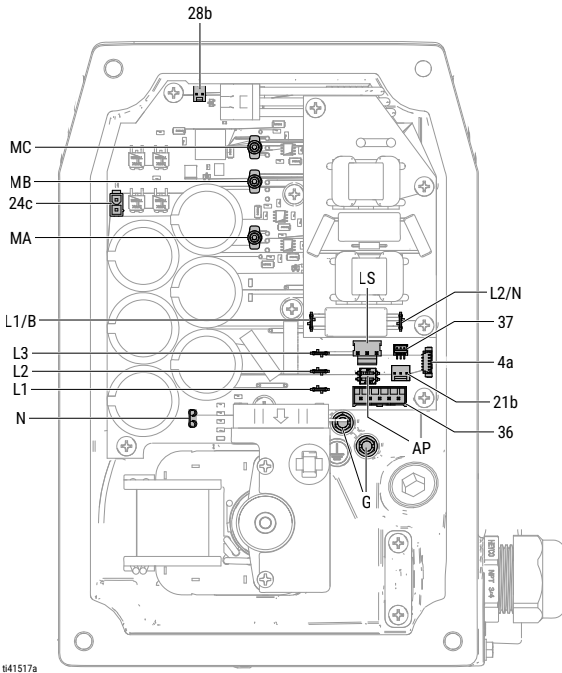


Figure 12-1: 200-240 V Models

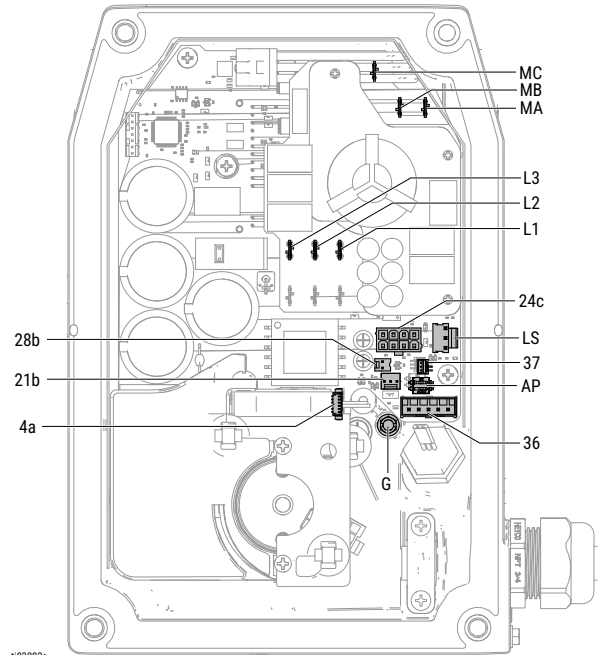


Figure 12-2: 380-480 V Models, Ordinary Locations

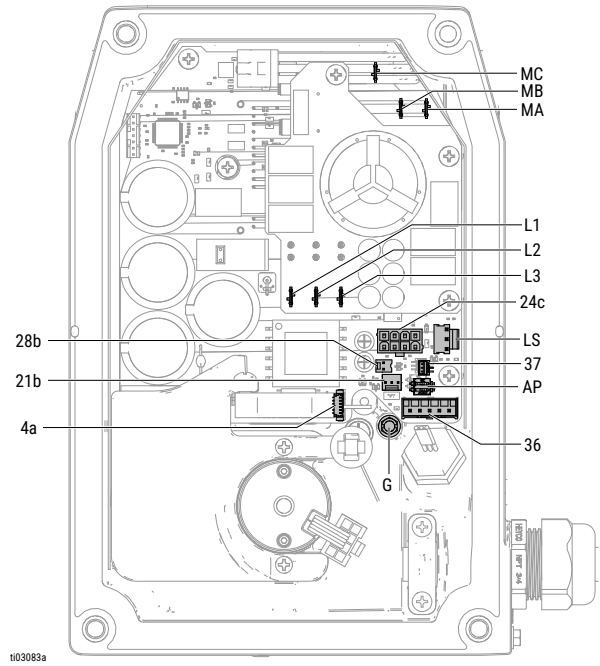



Figure 12-3: 380-480 V Models, Explosive Atmospheres or Hazardous (Classified) Locations

CALIFORNIA PROPOSITION 65

CALIFORNIA RESIDENTS

 **WARNING** Cancer and reproductive harm – www.P65warnings.ca.gov.

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