

**CHEM-AD™ SERIES C
DIAPHRAGM
METERING PUMP**

BOOK NO. IM 440.600AC UA ISSUE A

CHEM-AD™ SERIES C

EQUIPMENT SERIAL NO. _____

DATE OF START-UP _____

START-UP BY _____

Prompt service available from nationwide authorized service contractors.

ORDERING INFORMATION

In order for us to fill your order immediately and correctly, please order material by description and part number, as shown in this book. Also, please specify the serial number of the equipment on which the parts will be installed.

WARRANTY

Seller warrants for a period of one year after shipment that the equipment or material of its manufacture is free from defects in workmanship and materials. Corrosion or other decomposition by chemical action is specifically excluded as a defect covered hereunder, except this exclusion shall not apply to chlorination equipment. Seller does not warrant (a) damage caused by use of the items for purposes other than those for which they were designed, (b) damage caused by unauthorized attachments or modifications, (c) products subject to any abuse, misuse, negligence or accident, (d) products where parts not made, supplied, or approved by Seller are used and in the sole judgement of the Seller such use affects the products' performance, stability or reliability, and (e) products that have been altered or repaired in a manner in which, in the sole judgement of Seller, affects the products' performance, stability or reliability. **SELLER MAKES NO OTHER WARRANTY OF ANY KIND, AND THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS OF THE MATERIAL OR EQUIPMENT FOR ANY PARTICULAR PURPOSE EVEN IF THAT PURPOSE IS KNOWN TO SELLER.** If Buyer discovers a defect in material or workmanship, it must promptly notify Seller in writing; Seller reserves the right to require the return of such defective parts to Seller, transportation charges prepaid, to verify such defect before this warranty is applicable. In no event shall such notification be received by Seller later than 13 months after the date of shipment. No action for breach of warranty shall be brought more than 15 months after the date of shipment of the equipment or material.

LIMITATION OF BUYER'S REMEDIES. The **EXCLUSIVE REMEDY** for any breach of warranty is the replacement f.o.b. shipping point of the defective part or parts of the material or equipment. Any equipment or material repaired or replaced under warranty shall carry the balance of the original warranty period, or a minimum of three months. Seller shall not be liable for any liquidated, special, incidental or consequential damages, including without limitation, loss of profits, loss of savings or revenue, loss of use of the material or equipment or any associated material or equipment, the cost of substitute material or equipment, claims of third parties, damage to property, or goodwill, whether based upon breach of warranty, breach of contract, negligence, strict tort, or any other legal theory; provided, however, that such limitation shall not apply to claims for personal injury.

Statements and instructions set forth herein are based upon the best information and practices known to U.S. Filter/Wallace & Tiernan, Inc., but it should not be assumed that every acceptable safety procedure is contained herein. Of necessity this company cannot guarantee that actions in accordance with such statements and instructions will result in the complete elimination of hazards and it assumes no liability for accidents that may occur.

USFilter

WALLACE & TIERNAN PRODUCTS
1901 West Garden Road, Vineland, NJ 08360

INTRODUCTION

This technical manual contains all the necessary instructions for the installation, start-up, maintenance, and repair of the USFilter's Wallace & Tiernan Products (USF/W&T) Chem-Ad™ Series C Diaphragm Metering Pumps.



WARNING: TO AVOID POSSIBLE SEVERE PERSONAL INJURY OR DAMAGE TO THE EQUIPMENT, THIS EQUIPMENT SHOULD BE INSTALLED, OPERATED AND SERVICED ONLY BY TRAINED, QUALIFIED PERSONNEL WHO ARE THOROUGHLY FAMILIAR WITH THE ENTIRE CONTENTS OF THIS INSTRUCTION BOOK. WHEN DEALING WITH HAZARDOUS MATERIAL IT IS THE RESPONSIBILITY OF THE EQUIPMENT USER TO OBTAIN AND FOLLOW ALL SAFETY PRECAUTIONS RECOMMENDED BY THE MATERIAL MANUFACTURER/SUPPLIER. AVOID CONTACTING ELECTRICALLY HOT METER POSTS AND CIRCUIT BOARD COMPONENTS WHILE MAKING METER ADJUSTMENTS.

NOTE: When ordering material, always specify model and serial number of apparatus.

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VERY IMPORTANT SAFETY PRECAUTIONS

This page titled “Very Important Safety Precautions” provides, in brief, information of urgent importance relative to safety in the installation, operation, and maintenance of this equipment.

WARNING

TO AVOID POSSIBLE SEVERE PERSONAL INJURY OR EQUIPMENT DAMAGE, OBSERVE THE FOLLOWING:

THIS EQUIPMENT SHOULD BE INSTALLED, OPERATED, AND SERVICED ONLY BY TRAINED, QUALIFIED PERSONNEL WHO ARE THOROUGHLY FAMILIAR WITH THE ENTIRE CONTENTS OF THIS INSTRUCTION BOOK.

REPAIRS MAY ONLY BE CARRIED OUT WHEN THE PLUG IS DISCONNECTED FROM THE MAINS, OR WHEN THERE IS NO VOLTAGE.

ONLY ORIGINAL SPARE PARTS MUST BE USED FOR REPAIRS.

DO NOT DISCARD THIS INSTRUCTION BOOK UPON COMPLETION OF INSTALLATION. INFORMATION PROVIDED IS ESSENTIAL TO PROPER AND SAFE OPERATION AND MAINTENANCE.

ADDITIONAL OR REPLACEMENT COPIES OF THIS INSTRUCTION BOOK ARE AVAILABLE FROM:

USFILTER'S WALLACE & TIERNAN PRODUCTS
1901 WEST GARDEN ROAD
VINELAND, NEW JERSEY 08360
PHONE: (856) 507-9000
FAX: (856) 507-4125

NOTE

Minor part number changes may be incorporated into USF/W&T products from time to time that are not immediately reflected in the instruction book. If such a change has apparently been made in your equipment and does not appear to be reflected in your instruction book, contact your local USF/W&T sales office for information.

Please include the equipment serial number in all correspondence. It is essential for effective communication and proper equipment identification.





NOTES ON PROTECTIVE EQUIPMENT AND CLOTHING

The following Warning appears in several locations in this book. It is general in nature due to the variety of hazardous liquids this equipment is capable of handling.

WARNING: WHEN DEALING WITH HAZARDOUS MATERIAL, IT IS THE RESPONSIBILITY OF THE EQUIPMENT USER TO OBTAIN AND FOLLOW ALL SAFETY PRECAUTIONS RECOMMENDED BY THE MATERIAL MANUFACTURER/SUPPLIER.

It is good general practice to make use of protective equipment when handling any hazardous material.

IT IS RECOMMENDED THAT SUCH PROTECTIVE EQUIPMENT BE USED BY ALL PERSONS SERVICING THIS PUMP, ASSOCIATED PIPING, TUBING, VALVES, AND ACCESSORIES, WHEN THE EQUIPMENT IS HANDLING ANY HAZARDOUS MATERIAL.

1. Goggles, flexible fitting, hooded ventilation (per ANSI Z87.1)	
2. Face Shield (per ANSI Z87.1)	
3. Chemical Apron	
4. Chemical Gloves	

NOTE: (1) ANSI Z87.1 “practice for occupational.....eye and face protection” recommends goggles (#1 above) as the “preferred protection” when handling chemicals that present a hazard from splash, acid burns or fumes; for severe exposure, a face shield (#2 above) over the goggles is recommended.

(2) An eye flushing fountain and a deluge-type shower may be recommended or required by insurance carriers or governmental safety agencies, which should be consulted for specific requirements.

REGIONAL OFFICES**INSTALLATION, OPERATION, MAINTENANCE, AND SERVICE INFORMATION**

Direct any questions concerning this equipment that are not answered in the instruction book to the Reseller from whom the equipment was purchased. If the equipment was purchased directly from USFilter's Wallace & Tiernan Products (USF/W&T), contact the office indicated below.

UNITED STATES

1901 West Garden Road
Vineland, NJ 08360
TEL: (856) 507-9000
FAX: (856) 507-4125

CANADA

If the equipment was purchased directly from USF/W&T Canada, contact the nearest office indicated below.

ONTARIO

250 Royal Crest Court
Markham, Ontario
L3R3S1
(905) 944-2800

QUEBEC

243 Blvd. Brien
Bureau 210
Repentigny, Quebec
(514) 582-4266

MEXICO

If the equipment was purchased directly from USF/W&T de Mexico, contact the office indicated below.

Via Jose López Portillo No. 321
Col. Sta. Ma. Cuauhtepac, Tultitlan
Edo. México 54900
TEL: +52 55 2159 2976 / +52 55 2159 2989
FAX: +52 55 2159 2985

SECTION 1 - TECHNICAL DATA**List of Contents**

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Technical Data	1.1
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Chemical Resistance Guide	440.600.190.010A-F

1.1 Technical Data

Type	Mechanically Actuated Diaphragm Metering Pump
Model	Chem-Ad, Series C
Service	Metering of mild to very corrosive chemicals
Capacity range	Refer to Capacity Chart
Ambient Temperature	104° F (40° C)
Maximum Liquid Temperature	125° F (52° C)
Maximum Back Pressure	120 PSI (8 BAR) at 60 Hz 150 PSI (10 BAR) at 50 Hz
Suction Lift	6 ft of water
Accuracy	± 3% of full scale over 3-1/3:1 range
Valves	Threaded Valves Double ball, 5.07 - 17.12 GPH (16 - 54 L/H) Single Ball, 25.36 - 38.04 GPH (80 - 120 L/H)
Diaphragm	PTFE - EPDM composite Diaphragm
Drive unit	Electric Motor, metric with extended shaft
Stroke Adjustment E00/M00 and E30/M30 control modes:	One turn mechanical stroke adjustment, 10% increments, range 30 to 100%
Stroke Frequency Control E30/M30 control mode only:	Manual Rotary Knob, 10% increments, on local mode, range 100:1 0/4 - 20 mA input or pulse input on remote mode
Connection sizes USA Version:	1/2" NPT, male, 5.07, 7.93 & 17.12 GPH 1" NPT, male, 25.36 & 38.04 GPH
EURO Version:	6/12 tubing (mm ID/mm OD), 16, 25 & 54 L/H 12/21 tubing (mm ID/mm OD), 80 & 120 L/H PVC tube DN 20 (d25) and Stainless Steel G3/4

Alarm Output Signal

E30/M30 control mode only:

Empty Signal Output - Max. Load, 24V AC/DC, 3 Amps
Stroke Signal Output - Max. Load, 24V DC, 300 mA

Power Requirement

USA Version - 115 VAC, 60 Hz, Single Phase, 90 Watts
EURO Version - 230 VAC, 50 Hz, Single Phase, 90 Watts

1.2 Capacity and Pressure

Series C Pumps	Capacity			Pressure	
	GPH @ 60 Hz, 144 spm	LPH @ 60 HZ, 144 spm	LPH @ 50 Hz, 122 spm	PSI @ 60 Hz	BAR @ 50 Hz
1	5.07	19.2	16	120	10
2	7.93	30	25	120	10
3	17.12	64.8	54	120	10
4	25.36	96	80	50	4
5	38.04	144	120	35	3

NOTE: All data refer to a water temperature of 68° F (20° C).

1.3 Materials of Construction

Pump Component	Material of Construction
Pump Head	PVDF, Polypropylene, 316 Stainless Steel, PVC
Connection	PVDF, Polypropylene, 316 Stainless Steel, PVC
Diaphragm	PTFE-EPDM Composite Diaphragm
Valves	PVDF, 316 Stainless Steel, Polypropylene, (consists of PVDF inner parts)
Valve Balls	Glass, Ceramic, 316 Stainless Steel, Teflon
O-ring	Viton, EPDM, FFPM
Valve Spring	Elgiloy/Hastelloy C4
Housing and Finish	Thermoplastic, Blue per RAL 5007

1.4 Control Modes - See Figure 1.1

Standard USA Version (E00)	Optional USA Version (E30)
Motor Terminal Box Mechanical Stroke Adjustment (4)	Motor Terminal box Mode Switch (Remote-Off-Local) (10) Mechanical Stroke Adjustment (4) Stroke Frequency Control (9) Level Switch Connection (I) Alarm & Stroke Signal Output (III) Analog Input 0/4 - 20 mA or Pulse Input (II)
Standard EURO Version (M00)	Optional EURO Version (M30)
Motor Terminal Box Mechanical Stroke Adjustment (4)	Motor Terminal Box Mode Switch (Remote-Off-Local) (10) Mechanical Stroke Adjustment (4) Stroke Frequency Control (9) Level Switch Connection (I) Alarm & Stroke Signal Output (III) Analog Input 0/4 - 20 mA or Pulse Input (II)

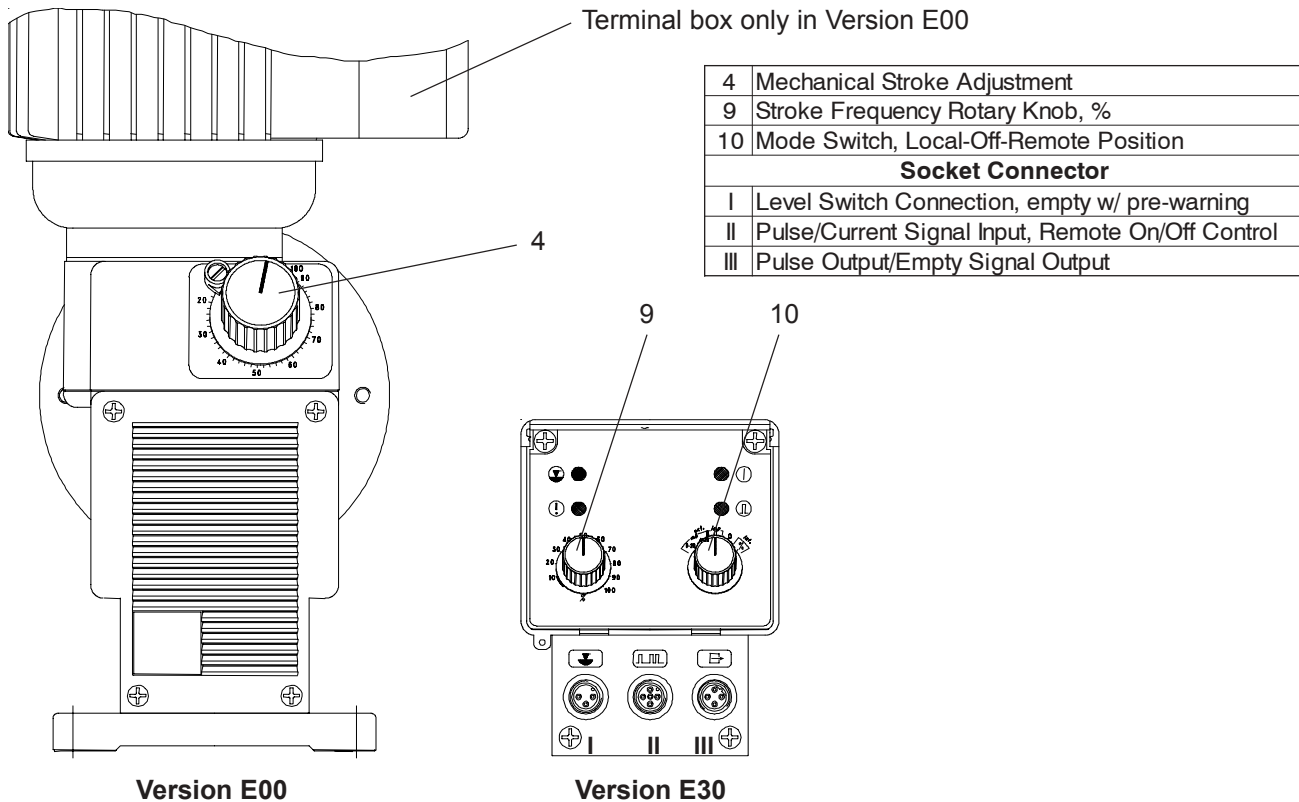









Figure 1.1 - Pumps Front Configuration

NOTE:

1. The socket connectors, I and II, must always be occupied, either by the protective cap with the corresponding symbol or the appropriate equipment connected.
2. Keep the protective cap secure in a place where it will not be lost.

1.5 Description of Symbols

SYMBOL	DESCRIPTIONS	CONTROL OPTION	INDICATOR LIGHT	MEANING
	Level pre-warning and empty	E30/M30	Blinking Red Light Steady Red Light	Warning that the storage tank is almost empty. Pump is still in operation. Storage is empty. Pump stopped.
	Fault Indicator	E30/M30	Steady Red Light	No signal is coming either from the level switch or 4 - 20 mA signal. Pump stopped.
	Operating Indicator	E30/M30	Steady Green Light	Pump is powered. Pump is either running or stopped
	Metering Indicator	E30/M30	Blinking Yellow Light according to frequency setting	Pump is electrically operating normally.
	Level Switch Connection	E30/M30	No Light Indication	See PIN Assignment on Section 2
	Pulse Input Current Signal Input Remote On/Off Switch	E30/M30	No Light Indication	See PIN Assignment on Section 2
	Empty Signal Output Stroke Signal Output	E30/M30	No Light Indication	See PIN Assignment on Section 2

INTRODUCTION

The following pages are offered as a general guide and indication of the suitability of various elastomers and plastics in use today with a wide range of industrial chemicals. The ratings are based, for the most part, on published literature of various plastic suppliers and elastomer manufacturers but, in some cases, they are considered the opinion of experienced compounders.

We cannot guarantee their accuracy nor assume responsibility for use thereof. Several factors must always be considered in using an elastomer or plastic part in service. The most important as we see them are:

TEMPERATURE OF SERVICE

Higher temperatures increase the effect of chemicals on plastic. The increase varies with the plastic and the chemical. The compound quite stable at room temperature might fail at elevated temperature.

CONDITIONS OF SERVICE

A compound that swells badly might still function well as a static seal yet fail in any dynamic application.

GRADE OF PLASTIC

Many types of plastic are available in different grades that vary greatly in chemical resistance.

THE COMPOUND ITSELF

Compounds designed with certain outstanding properties may be poorer in performance with a chemical than one designed especially for fluid resistance.

CAUTION: It is **NOT** recommended that USFilter/Wallace & Tiernan Chem-Ad Metering Pumps be used to handle **FLAMMABLE LIQUIDS**.

In light of the above factors, it is always best to TEST.

Statements and suggestions set forth herein are based upon the best information and practices known to USF/W&T. However, it should not be assumed either that information is complete on the subjects covered or that all possible circumstances, safety measures, precautions, etc., have been included. These statements and suggestions are not intended to reflect state, municipal, or insurance requirements or national safety codes; where applicable, those sources should be consulted directly. Moreover, since the conditions of use are beyond its control, USF/W&T makes no guarantee of results and assumed no liability in connection with the information contained herein.

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MATERIAL ANALYSIS OR DESCRIPTIONS

The following is typical analysis and description of the pump components named in Materials of Construction.

MATERIAL	ANALYSIS or DESCRIPTION
Ceramic	99% aluminum oxide
EPDM	Ethylene Propylene
GFPPL	Glass-filled polypropylene
Duran*** Glass	Borosilicate Glass, 81% SiO ₂ , 13% B ₂ O ₃ , 4% Na ₂ O/K ₂ O, 2% Al ₂ O ₃
Hastelloy C	High nickel-chrome alloy of the following analysis: Ni, 54%, Cr 15.5%, Co 2.5%, Mo 16%, W 4%, Fe 5.5%, C 0.08%, others 3%
Hypalon*	Chlorosulphonated polyethylene, CSM
Kalrez*	Perfluoroelastomer, FPM
Kynar**	Polyvinylidene fluoride, PVDF
PVC	Polyvinyl chloride
PE	Polyethylene
PP	Polypropylene
Stainless Steel, 316	AISI 316 Cr 16 - 18%, Ni 10-14%, C 0.08%, Mn 2%, Si 1%, P 0.045%, S 0.03%, Mo 2-3%
SAN	Styrene-Acrylonitrile
Teflon*	Fluorocarbon resin of tetrafluoroethylene polymer, TFE, PTFE
Viton*	Copolymer of vinylidene fluoride and perfluoropropylene or hexafluoropropylene, FKM, FEPM

* Teflon, Hypalon, Kalrez, and Viton are registered trademarks of E.I. DuPont Co.

** Kynar is a registered trademark of Atochem North America, Inc.

*** Duran is a registered trademark of Schott.

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CHEMICAL	PLASTIC						ELASTOMER							METAL	
	PVC	PVDF	GFPPL	Polyethylene	Polypropylene	SAN	Kalrez	Teflon	Hypalon	EPDM	Viton	Glass	Ceramic	Hastelloy C	316 SS
Acetic Acid, 5%	B	D	A	A	H	A	N	A	C	A	C	A	A	H	H
Acetic Acid, 80%	C	D	C	B	E	E	G	A	E	C	C	A	A	H	B
Acetic Acid, Glacial	C	D	C	B	G	E	X	A	E	B	C	A	A	H	B
Acetic Anhydride	C	C	A	X	G	E	A	A	A	C	C	A	A	H	B
Aluminum Chloride	F	A	A	A	H	A	A	A	A	A	A	A	A	B	B
Aluminum Flouride	F	A	A	X	H	A	X	A	A	A	A	C	X	G	E
Aluminum Sulfate	A	A	A	A	H	A	A	A	A	A	A	A	A	A	B
Ammonia, 10%	A	A	A	B	X	A	A	A	A	B	A	A	A	N	A
Ammonium Chloride	A	A	A	A	H	A	A	A	A	A	A	A	N	H	B
Ammonium Nitrate	A	A	A	X	H	A	A	A	A	A	A	A	A	B	A
Ammonium Persulfate	A	A	A	X	H	A	X	A	A	A	A	A	A	X	E
Ammonium Phosphate	A	A	A	X	H	A	X	A	A	A	A	A	A	A	A
Ammonium Sulfate	A	A	A	A	H	A	A	A	B	A	B	A	A	A	B
Amyl Alcohol	C	A	X	X	H	C	A	A	B	B	B	A	A	A	A
Aniline	C	B	C	B	H	C	A	A	B	B	A	A	A	A	A
Aqua Ammonia	A	A	A	B	X	B	A	A	B	A	B	A	A	C	A
Aqua Regia	C	A	X	B	X	C	X	A	B	B	A	A	A	C	C
Arsenic Acid	A	A	A	X	H	A	A	A	C	X	A	A	N	A	B
Barium Chloride	A	A	A	X	H	A	A	A	B	X	A	A	A	A	E
Barium Sulfate	A	A	A	X	H	A	A	A	A	X	A	N	A	N	B
Beer	A	A	A	B	H	A	A	A	A	A	A	A	A	A	A
Benzaldehyde	C	B	C	X	X	C	A	A	C	B	C	A	A	A	A
Benzoic Acid	A	A	A	A	H	E	A	A	C	C	A	A	A	A	B
Borax (Sodium Borate)	A	H	A	B	H	X	A	A	B	A	A	A	N	A	A
Boric Acid	A	A	A	A	H	A	A	A	B	A	A	A	A	A	A
Bromine Water	C	A	C	X	C	X	X	A	C	B	A	A	A	A	C
Butyric Acid	D	A	A	X	H	B	B	A	C	C	B	A	A	A	B
Calcium Bisulfite	A	A	A	A	H	X	A	A	A	C	A	N	A	A	B
Calcium Chloride	A	A	A	A	H	A	A	A	A	A	A	A	A	A	C
Calcium Hypochlorite	A	A	C	A	G	A	A	A	A	B	B	A	B	H	C
Calcium Sulfate	A	A	A	X	H	A	A	A	A	B	A	N	N	A	B
Carbon Tetrachloride	E	A	C	C	C	X	A	A	C	C	A	A	A	A	B
Chlorine Dioxide	B	A	E	X	C	X	X	A	C	C	A	A	X	X	C
Carbonic Acid	A	A	A	X	H	A	A	A	B	C	B	A	N	A	B
Chloroacetic Acid	A	C	D	X	C	C	A	A	C	C	C	N	A	A	C
Chlorofoam	C	A	E	X	C	C	A	A	C	C	B	A	A	A	A
Chlorosulfonic Acid	E	C	E	C	C	C	A	A	C	C	C	A	A	A	B

RATING KEY

A – Acceptable
 B – Satisfactory where minor attack is acceptable
 C – Not recommended
 N – Information Lacking
 X – Unknown

D – Good to 70° F (20° C)
 E – Good to 80° F (27° C)
 F – Good to 125° F (52° C)
 G – Good to 150° F (65.5° C)
 H – Good to 185° F (85° C)

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CHEM-AD™ SERIES C

CHEMICAL	PLASTIC						ELASTOMER							METAL	
	PVC	PVDF	GFPPL	Polyethylene	Polypropylene	SAN	Kalrez	Teflon	Hypalon	EPDM	Viton	Glass	Ceramic	Hastelloy C	316 SS
Chromic Acid, 10%	A	A	A	A	H	A	A	A	A	C	A	A	A	B	B
Chromic Acid, 30%	A	A	A	A	H	A	A	A	A	C	A	A	A	B	B
Chromic Acid, 50%	C	A	A	B	G	B	A	A	A	C	A	A	A	B	E
Citric Acid	A	A	A	A	H	A	A	A	A	A	A	A	A	A	B
Copper Chloride	A	A	A	B	H	A	A	A	B	B	B	A	A	A	C
Copper Cyanide	A	A	A	X	H	A	A	A	A	N	B	N	A	A	A
Copper Nitrate	A	A	A	X	H	A	A	A	B	B	B	A	A	B	A
Copper Sulfate	A	A	A	A	H	A	A	A	B	B	B	A	A	A	B
Cresylic Acid (50%)	B	A	X	X	X	X	A	A	C	C	A	A	A	A	A
Ethyl Chloride	C	A	E	X	X	C	A	A	C	A	A	A	A	A	A
Ethylene Glycol	A	A	A	X	G	A	A	A	B	A	B	A	A	A	B
Fatty Acids	A	A	A	C	X	G	A	A	C	C	B	A	A	A	A
Ferric Chloride	A	A	A	A	H	A	A	A	B	A	B	A	A	B	C
Ferric Nitrate	A	A	A	C	H	A	A	A	B	A	B	A	A	B	B
Ferric Sulfate	A	A	A	C	H	A	A	A	B	A	B	A	A	A	B
Ferrous Chloride	A	A	A	A	H	A	A	A	B	B	B	A	A	C	C
Ferrous Sulfate	A	A	A	B	H	A	A	A	B	B	B	A	A	B	B
Fluoboric Acid	F	A	A	C	H	B	X	A	B	B	H	N	C	H	B
Fluosilicic Acid	F	A	A	A	H	B	A	A	H	X	B	C	C	H	B
Formaldehyde, 40%	D	G	H	B	H	A	B	A	B	A	C	A	A	H	A
Formic Acid	C	A	H	B	H	C	B	A	B	B	C	A	A	H	B
Freon 12 (Wet)	N	B	C	X	N	X	N	A	E	B	A	A	A	H	C
Furfural	C	X	N	X	N	X	A	A	N	B	C	A	A	H	B
Glycerine (Glycerol)	D	A	A	X	H	A	A	A	B	A	B	A	A	H	A
Hydrobromic Acid, 20%	D	A	A	B	H	X	A	A	A	B	D	A	D	D	C
Hydrochloric Acid, 0-25%	D	A	A	B	H	A	A	A	B	E	A	A	D	D	C
Hydrochloric Acid, 25-37%	D	A	A	B	D	B	A	A	B	E	N	A	N	D	C
Hydrofluoric Acid, 10%	G	A	A	A	H	B	A	A	A	B	H	C	C	H	C
Hydrofluoric Acid, 30%	G	A	B	B	F	C	A	A	A	E	F	C	C	F	C
Hydrofluoric Acid, 60%	X	A	B	C	N	C	A	A	B	B	D	C	C	N	C
Hydrofluosilicic, 20%	A	A	A	A	X	B	A	A	X	A	B	C	C	N	B
Hydrogen Peroxide, 30%	F	A	A	B	H	B	A	A	A	B	A	A	N	N	C
Hydrogen Peroxide, 50%	E	A	X	B	N	X	A	A	A	C	A	A	N	N	C
Hydrogen Peroxide, 90%	N	A	X	B	N	C	A	A	B	C	A	A	N	N	C
Hydrogen Sulfide,AQ.SOL.	A	A	A	X	X	B	A	A	B	A	B	F	N	N	B

RATING KEY

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CHEM-AD™ SERIES C

CHEMICAL	PLASTIC						ELASTOMER							METAL	
	PVC	PVDF	GFPPL	Polyethylene	Polypropylene	SAN	Kalrez	Teflon	Hypalon	EPDM	Viton	Glass	Ceramic	Hastelloy C	316 SS
Ketones	C	C	C	X	C	C	X	A	C	X	C	A	A	A	A
Lactic Acid	C	N	A	A	D	C	A	A	B	A	F	A	A	A	N
Lead Acetate	F	A	A	X	H	A	A	A	C	A	C	A	A	A	A
Lubricating Oil	F	A	E	B	H	A	A	A	B	C	A	A	A	A	A
Magnesium Chloride	F	A	A	A	H	A	A	A	A	A	A	A	A	A	N
Magnesium Nitrate	F	A	A	X	H	A	N	A	A	B	A	A	A	A	A
Magnesium Sulfate	F	A	A	A	H	A	A	A	A	A	A	A	A	A	A
Maleic Acid	F	A	A	X	X	C	A	A	A	C	A	A	A	A	B
Methylene Chloride	C	B	C	X	C	C	A	A	C	C	N	A	A	A	A
Napthalene	D	A	E	X	D	C	A	A	C	C	F	F	A	A	A
Nickel Chloride	F	A	A	A	H	A	A	A	H	A	H	A	A	A	N
Nickel Sulfate	F	A	A	A	H	A	A	A	A	A	H	A	A	A	A
Nitric Acid, 10%	F	A	A	A	D	F	A	A	A	B	A	A	N	H	A
Nitric Acid, 20%	F	H	A	B	D	C	A	A	F	C	A	A	N	F	H
Nitric Acid, 50%	N	F	E	E	D	C	A	A	N	C	C	A	N	D	F
Nitric Acid, Anhydrous	C	C	C	C	C	C	A	A	C	X	C	A	N	D	F
Nitro Benzene	C	F	E	X	D	C	A	A	C	C	N	A	A	A	A
Oils and Fats	F	A	A	X	F	X	N	A	X	C	A	A	A	A	A
Oleic Acid	D	A	E	C	D	C	A	A	N	B	D	A	A	F	A
Oleum	C	C	X	C	X	C	A	A	C	X	A	A	A	X	X
Oxalic Acid	D	F	A	B	F	B	A	A	H	B	A	A	A	F	C
Phenol	C	F	B	E	C	A	A	A	C	B	A	A	A	A	H
Phosphoric Acid, 0-50%	D	A	A	A	H	B	A	A	A	B	H	A	A	A	F
Phosphoric Acid, 50-100%	D	A	B	B	H	B	A	A	A	C	H	A	A	F	N
Polymer	B	A	A	A	X	A	A	A	A	A	A	A	A	X	B
Polyphosphate	A	A	A	A	X	X	X	A	A	A	A	X	A	X	A
Potassium Bicarbonate	F	A	A	B	X	A	A	A	B	A	X	N	A	X	B
Potassium Bromide	F	A	A	B	H	A	A	A	H	A	B	N	A	H	F
Potassium Carbonate	F	A	A	B	H	A	A	A	H	A	B	H	N	F	F
Potassium Chlorate	F	A	A	B	H	A	A	A	H	B	B	A	A	F	F
Potassium Chloride	F	A	A	A	H	A	A	A	H	A	B	N	A	H	N
Potassium Cyanide	F	A	A	X	H	A	A	A	H	B	B	F	A	F	A
Potassium Dichromate	F	A	A	B	H	A	A	A	H	B	B	H	A	F	A
Potassium Hydroxide	H	F	A	A	H	C	A	A	H	B	C	C	C	H	H
Potassium Nitrate	F	A	A	A	H	A	A	A	H	B	H	H	A	F	F
Potassium Permanganate	F	A	A	A	F	A	A	A	F	B	F	F	A	A	H
Potassium Sulfate	F	A	A	A	H	A	A	A	H	A	A	F	A	F	H

RATING KEY

A – Acceptable
 B – Satisfactory where minor attack is acceptable
 C – Not recommended
 N – Information Lacking
 X – Unknown

D – Good to 70° F (20° C)
 E – Good to 80° F (27° C)
 F – Good to 125° F (52° C)
 G – Good to 150° F (65.5° C)
 H – Good to 185° F (85° C)

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CHEMICAL	PLASTIC						ELASTOMER							METAL	
	PVC	PVDF	GFPPL	Polyethylene	Polypropylene	SAN	Kalrez	Teflon	Hypalon	EPDM	Viton	Glass	Ceramic	Hastelloy C	316 SS
Soaps	F	A	A	E	H	A	A	A	A	D	A	A	A	A	A
Sodium Acetate	F	A	A	A	H	A	A	A	A	A	N	A	A	F	A
Sodium Aluminate	B	A	A	A	X	A	A	A	A	A	A	X	A	X	A
Sodium Bicarbonate	F	A	A	A	H	A	A	A	A	A	A	G	A	F	A
Sodium Bisulfate	F	A	A	A	H	A	F	A	A	A	A	G	A	F	A
Sodium Bisulfite	F	A	A	A	X	A	F	A	A	A	A	C	A	X	A
Sodium Carbonate	F	A	A	A	H	A	A	A	A	A	A	F	N	F	A
Sodium Chlorate	F	A	A	A	H	A	A	A	A	A	A	N	A	F	F
Sodium Chloride	F	A	A	A	H	A	A	A	A	A	A	F	A	F	N
Sodium Cyanide	F	A	A	X	H	A	X	A	A	A	A	A	A	A	A
Sodium Hexametaphosphate	F	A	C	A	X	X	A	A	A	A	A	X	A	X	X
Sodium Hydroxide, 20%	D	H	A	A	H	B	A	A	A	A	A	C	C	A	A
Sodium Hydroxide, 50%	N	F	A	B	H	B	A	A	A	N	D	C	C	A	A
Sodium Hypochlorite	F	A	E	A	H	A	A	A	A	A	H	G	A	F	C
Sodium Nitrate	F	A	A	A	H	A	A	A	A	A	D	A	A	F	A
Sodium Silicate	F	A	A	A	H	A	A	A	A	A	A	N	A	F	H
Sodium Sulfate	F	A	A	A	H	A	A	A	A	A	A	A	A	A	A
Sodium Sulfide	F	A	A	A	H	A	A	A	A	A	A	X	A	H	B
Stannic Chloride	F	A	A	A	H	A	X	A	N	N	A	A	A	H	C
Stearic Acid	F	A	E	C	X	C	A	A	X	B	A	A	A	X	A
Stoddards Solvents	C	X	X	X	X	X	X	A	X	C	A	A	X	X	A
Sulfuric Acid, 0-10%	D	A	A	A	H	C	A	A	A	A	A	A	A	A	N
Sulfuric Acid, 10-75%	N	A	A	E	F	C	G	A	C	C	A	A	H	F	C
Sulfuric Acid, 75-95%	N	A	E	E	N	C	E	A	C	C	A	A	F	F	C
Sulfuric Acid, 95-100%	C	N	E	E	N	C	E	A	C	C	H	A	F	F	C
Tannic Acid	F	A	A	B	H	X	A	A	A	B	A	A	A	H	F
Tanning Liquors	F	A	A	A	X	X	X	A	X	C	A	A	A	X	A
Tartaric Acid	F	A	A	X	H	C	A	A	D	D	A	H	A	A	A
Trichloroethylene	C	A	E	C	C	X	D	A	C	C	A	A	A	A	N
Tricresylphosphate	C	A	X	X	X	X	X	A	C	B	A	X	A	X	X
Urea	A	A	A	X	H	X	N	A	N	X	C	A	A	A	B
Vinegar	A	A	A	A	H	A	A	A	A	A	B	A	A	A	A
White Liquor (Acid)	A	A	X	X	X	C	X	A	X	X	A	A	A	X	A
Zinc Chloride	A	A	A	A	H	A	A	A	B	A	B	A	A	A	B
Zinc Sulfate	A	A	A	A	H	A	A	A	A	A	A	A	A	D	A
Zinc Orthophosphate	A	A	A	A	X	X	X	A	A	X	A	N	X	X	A

RATING KEY

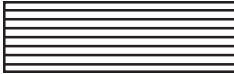
A – Acceptable
 B – Satisfactory where minor attack is acceptable
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D – Good to 70° F (20° C)
 E – Good to 80° F (27° C)
 F – Good to 125° F (52° C)
 G – Good to 150° F (65.5° C)
 H – Good to 185° F (85° C)

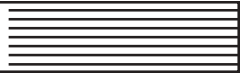
CHEMICAL RESISTANCE GUIDE

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CHEM-AD™ SERIES C



SECTION 2 - INSTALLATIONS

List of Contents

	PARA./DWG.NO.
General Information	2.1
Unpacking	2.2
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Dimensions	2.4
Suction and Discharge Connection	2.5
Electrical Connection	2.6
Socket Connector, PIN Assignment	2.7
Illustrations	
Metering Pumps - Typical Installation	
Suction Lift	440.600.110.010
Flooded Suction	440.600.110.020
Flooded Suction & Vent Riser	440.600.110.030
Metering Pumps - Installation Wiring	440.600.130.010

2.1 General Information

To provide satisfactory service, the metering pump must be installed in accordance with the instructions that follow. Operational difficulties, lack of accuracy, and possible damage to the pump mechanism may occur if these instructions are not followed properly.

2.2 Unpacking

When the pump is unpacked, check all items inside the box. There are bags of various connection parts. Make sure that no parts are discarded with the packaging material. Whenever possible, unpack the equipment at the installation site.

2.3 Mounting the Pump

Pump location is important to the operation of the pump. Select a place that is dry and that provides a level base for the pump. Allow work space around the pump for inspections, adjustment and servicing. Be sure it is near a power supply and located where the discharge line may be conveniently run to the point of application.

When installing the equipment, proceed as follows:

- a. Mount the pump on the bench, shelf, or level pad on which it will be located.
- b. Select the appropriate dimension and/or installations drawing to be sure the location will meet all requirements. Refer to the following typical installation drawings: Suction Lift Installation, Dwg. 440.400.110.030; Flooded Suction Installation, Dwg. 440.400.110.040; Flooded Suction and Vent Riser, Dwg. 440.400.110.050.
- c. Connect to a power supply matching the characteristics specified in the motor name plate and in accordance with local electrical code requirements. Sufficient flexibility must be provided in the connection to permit adjustments. Be sure to provide a shut-off switch in the power supply. A terminal box at the back of the motor is provided for wiring the pump. 115 VAC, 60 Hz, single phase is required for a USA Version pump and for EURO Version pump the power requirement is 230 VAC, 50 Hz, single phase both 90 watts and properly grounded. (Refer to Installation Wiring, Dwg. 440.400.130.010.)

NOTE: Field wiring must conform to local electrical code

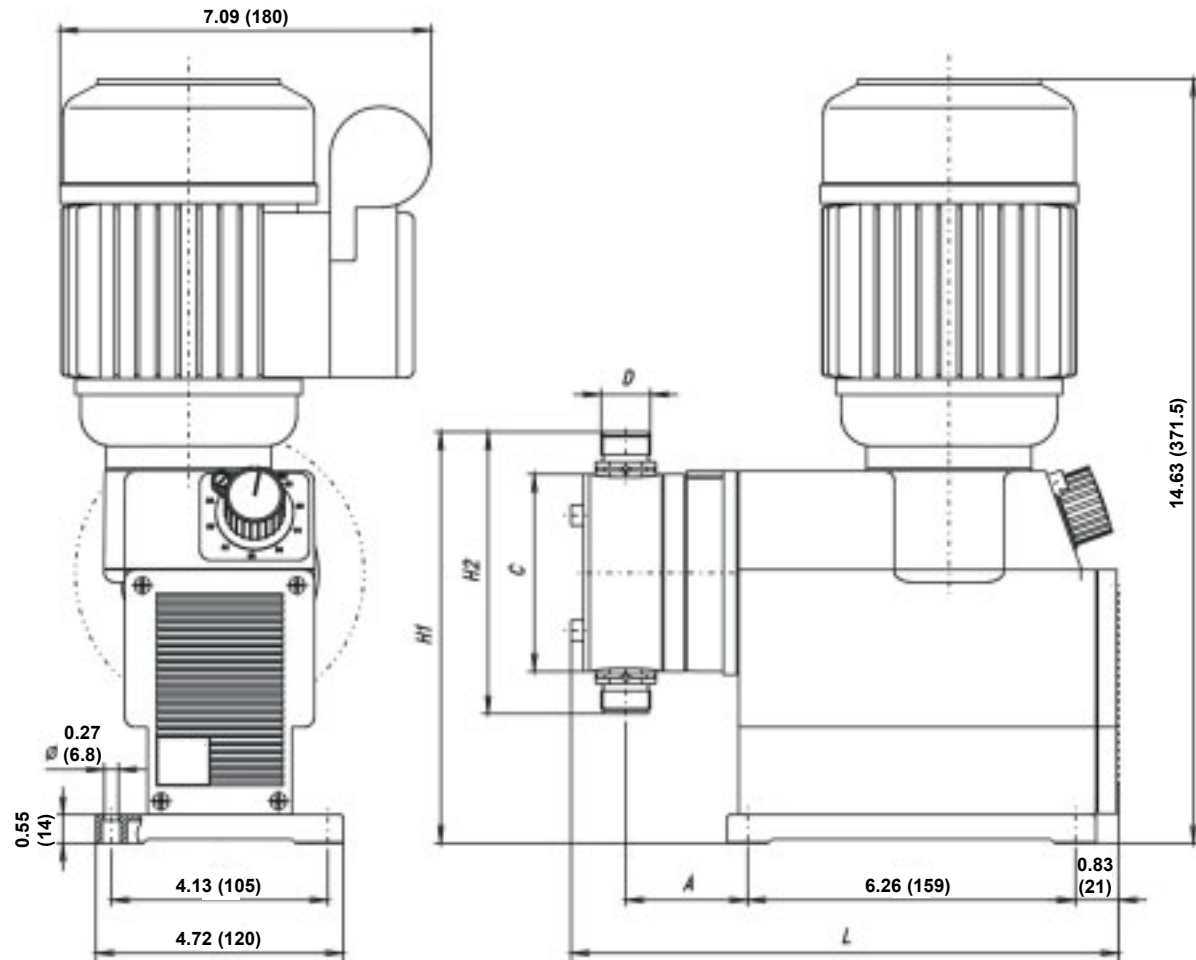
- d. If a pulsation dampener is required to reduce pressure peaks, install it in the discharge line. The dampener will minimize vibrations and reduce wear due to long lines and/or high stroking speeds.
- e. Connect rigid pipe or tubing to the suction connection on the pump and run a line without traps to the bottom of the solution container. Install a strainer.



WARNING: TO AVOID POSSIBLE SEVERE PERSONAL INJURY OR DAMAGE TO EQUIPMENT CONSULT YOUR USE/W & T REPRESENTATIVE IF THE PUMP IS TO BE USED UNDER CONDITIONS OTHER THAN ORIGINALLY SPECIFIED AND IF THERE IS ANY QUESTION REGARDING THE SIZE OF THE DISCHARGE LINE

2.4 Dimensions

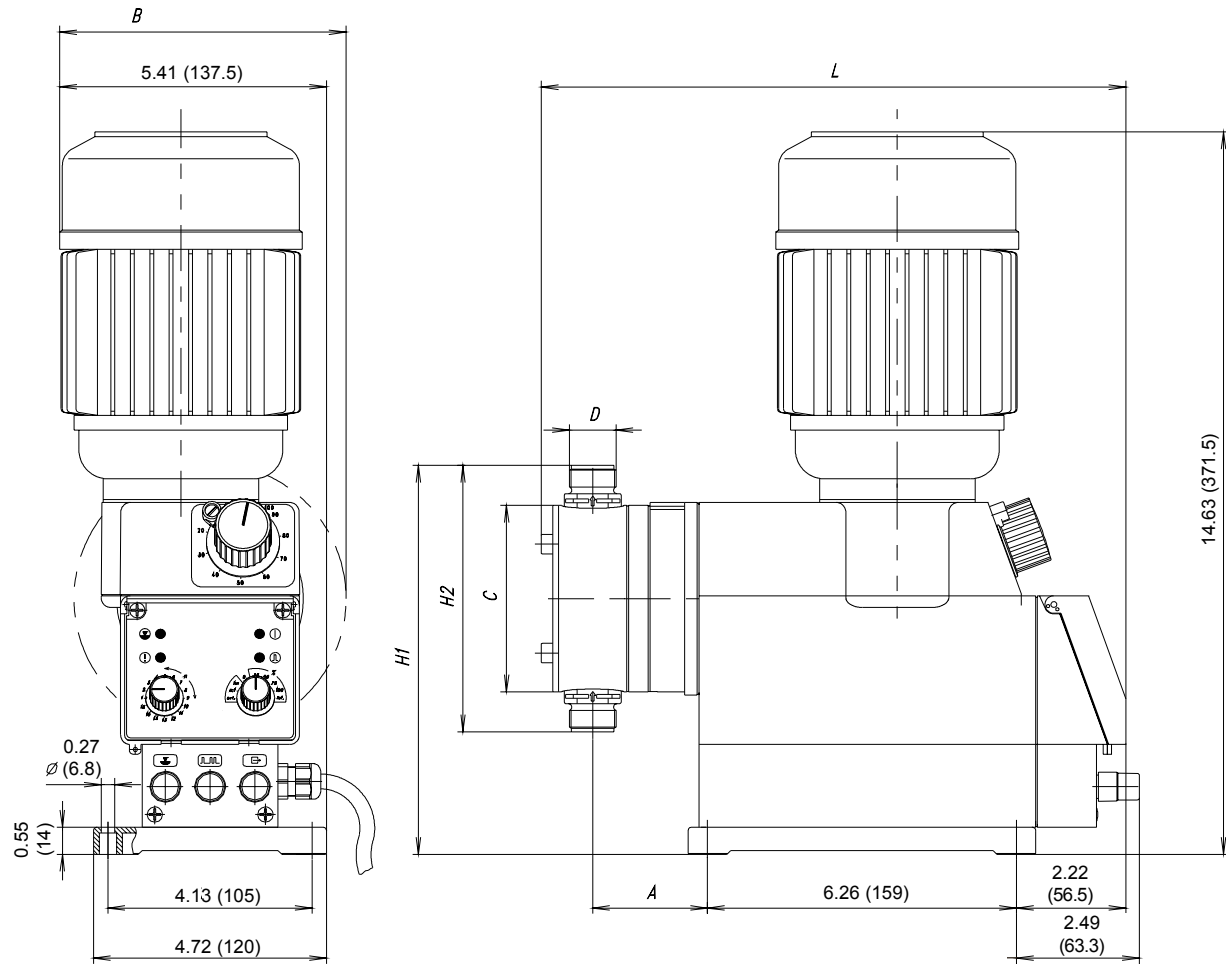
2.4.1 Chem-Ad Series C - Model E00



CAPACITY	DIMENSIONS inches (mm)					
g/h (l/h)	A	C	L	H1	H2	D
4.23 (16)	2.32 (59)	3.78 (96)	10.45 (265.5)	7.87 (200)	5.39 (137)	5/8"
6.60 (25)	2.32 (59)	3.78 (96)	10.45 (265.5)	7.87 (200)	5.39 (137)	5/8"
14.27 (54)	2.48 (63)	3.78 (96)	10.53 (267.5)	7.87 (200)	5.39 (137)	5/8"
21.13 (80)	2.93 (74.5)	5.12 (130)	11.52 (292.5)	8.65 (219.3)	6.91 (175.5)	1-1/4"
31.70 (120)	2.93 (74.5)	5.51 (140)	11.59 (294.5)	8.83 (224.3)	7.30 (185.5)	1-1/4"

Figure 2.1 - Dimensions - Chem-Ad Series C - Model E00

2.4.2 Chem-Ad Series C - Model E30



CAPACITY	DIMENSIONS inches (mm)					
g/h (l/h)	A	C	L	H1	H2	D
4.23 (16)	2.32 (59)	-	11.85 (301)	7.87 (200)	5.39 (137)	5/8"
6.60 (25)	2.32 (59)	-	11.85 (301)	7.87 (200)	5.39 (137)	5/8"
14.27 (54)	2.48 (63)	-	11.93 (303)	7.87 (200)	5.39 (137)	5/8"
21.13 (80)	2.93 (74.5)	5.51 (140)	12.91 (328)	8.65 (219.3)	6.91 (175.5)	1-1/4"
31.70 (120)	2.93 (74.5)	5.71 (145)	12.99 (330)	8.83 (224.3)	7.30 (185.5)	1-1/4"

Figure 2.2 - Dimensions - Chem-Ad Series C - Model E30

2.5 Suction and Discharge Connection (See Figure 2.3)

For USA Version pump, the connection is a one-piece adapter that is screwed into the valve with O-ring (16) seal and 1/2" NPT male thread. This is for pump capacities 5.07, 7.93, and 17.12 GPH. See Dwg. 440.600.000.210. For pump capacities 25.36 and 38.04 it is an insert with 1" NPT male thread that is secured by a union nut (13) and sealed by an O-ring (16). See Dwg. 440.600.000.220.

For EURO Version pump, the connection is available as a set consisting of taper part (15), union nut (13), and clamping piece (14), for tubing sizes 6/12, 12/21 (mm ID/mm OD).

Refer to Section 6 for part numbers.

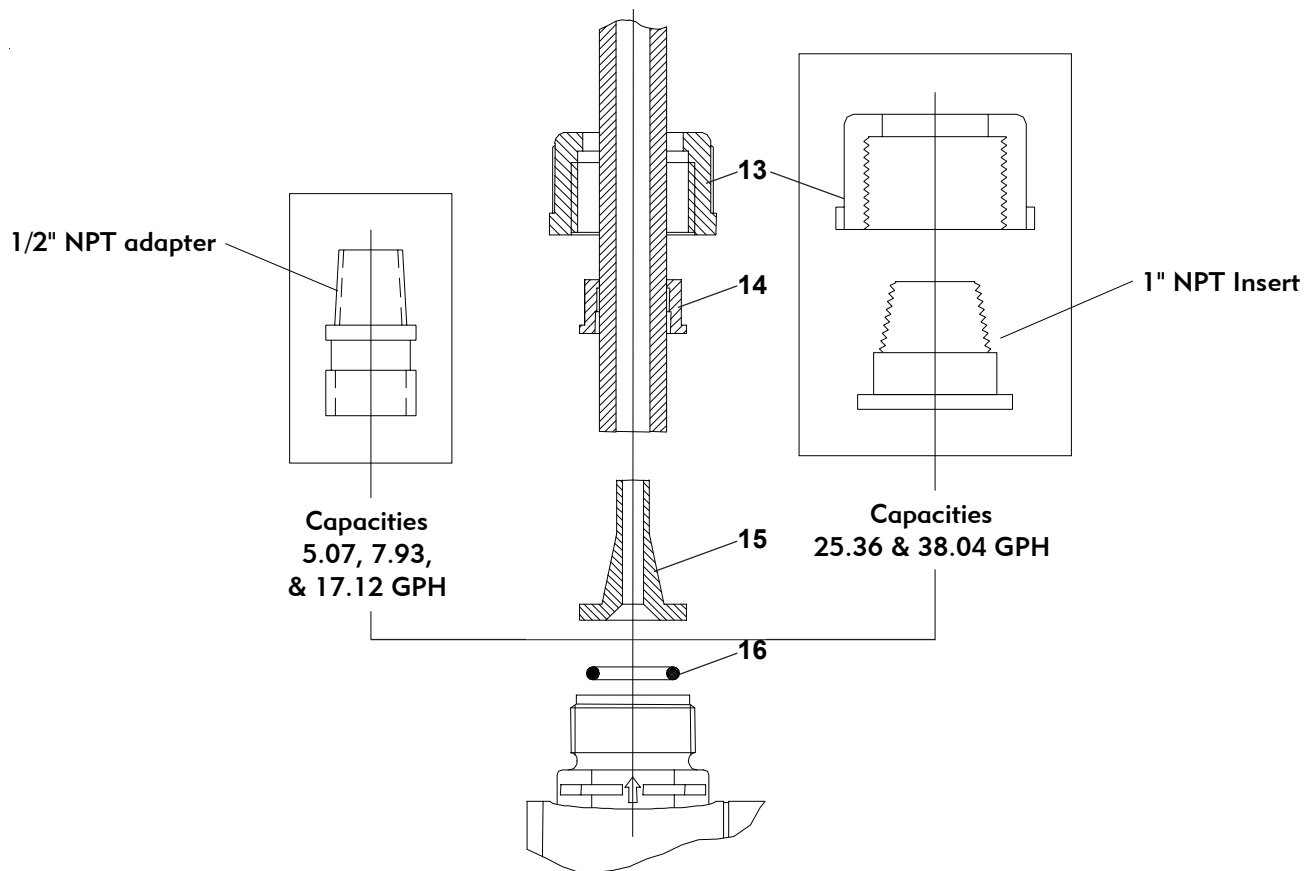


Figure 2.3 - Suction and Discharge Connections

2.6 Electrical Connection

A six-foot cable with a three-prong grounded plug, US standard, is provided with the USA version of the Chem-Ad Series A pumps. It can be plugged into a US standard outlet with 115 VAC, single phase. Refer to paragraph 1.2, Capacity, Pressure, and Power Consumption, for correct wattage. For the metric version, a cable with a EURO plug is provided.

2.7 Socket Connector, PIN Assignment

Included in the bag of loose parts are the plugs for the socket connections. They are all keyed to connect properly to the right PIN in the socket connector. Look at the socket terminal and check for the available PIN connections. Connector I has 3-PIN connections, Connector II has 5-PIN connections and Connector III has 4-PIN connections. Wired accordingly.

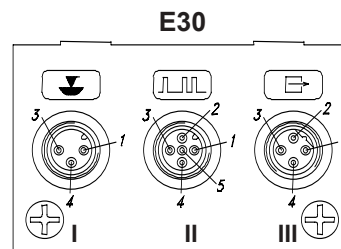
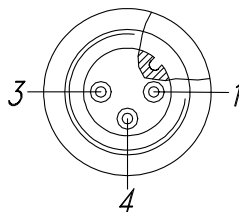


Figure 2.4 - Socket Connector

2.7.1 Connector I

- Tank empty signal input, PIN #3 and PIN #4 (Dry contact). Contact is open the pump is stopped.
- Pre-warning signal input, PIN #1 and PIN #4 (Dry contact). Contact is open pre-warning but the pump continues to operate.



1	Reserve signal input, brown
3	Empty signal input, blue
4	Ground (common), black

Figure 2.9 - Connector I

2.7.2 Connector II

- a. Remote On/Off, PIN #3 and PIN #4 (Dry contact). Contact is closed the pump is running.

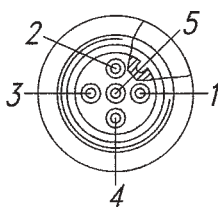
NOTE: If the remote On/Off is not used, PIN # 3 and PIN # 4 must be bridged

- b. Pulse Input, PIN #2 and PIN #4. Contact is closed, a pulse is processed.

Minimum pulse length is 15 milli-seconds = 1 stroke

Maximum pulse is 122 pulses per min. = Continuous running for 50 or 60 Hz

- c. 5 V output, PIN #1 and PIN #4. Connect to a sensor requiring 5VDC power with maximum load of 80 mA.
- d. 0/4 - 20 mA input, PIN # 5 and PIN # 4. Connect to equipment with 0/4 - 20 mA output.



1	Output 5 V, brown
2	Pulse Input, white
3	Remote On/Off
4	Ground (common), black
5	Input 0/4 - 20 mA

Figure 2.10 - Connector II

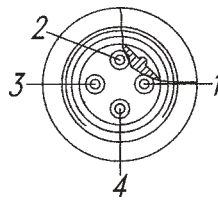
2.9.3 Connector III

- Empty signal output, PIN #1 and PIN #2 (Floating relay contact). Contact is closed when pump is in fault mode or tank is empty. When storage tank is almost empty (pre-warning), relay output contact is on and off with every stroke with local flashing red LED.

NOTE: Maximum load is 24V AC/DC, 3 amps. Will require a 24V AC/DC external power supply to trigger the relay coil.

- Stroke signal output, PIN #3 and PIN #4 (floating relay contact).
1 pulse = 1 stroke

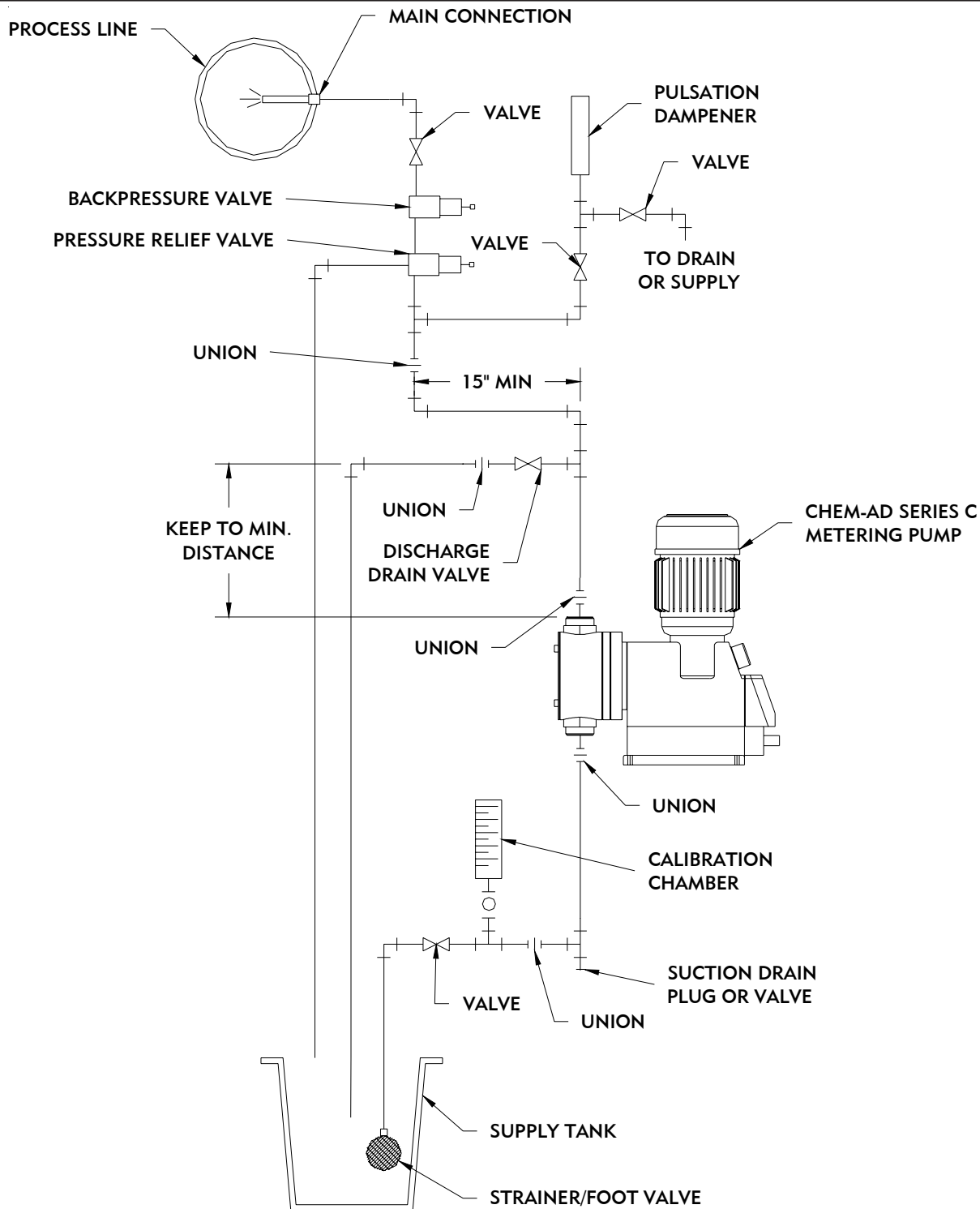
NOTE: Maximum load is 24V, DC, 300 mA. Will require a 24 VDC external power supply to trigger the relay coil.



1	Empty Signal Output, brown
2	Empty Signal Output, white
3	Stroke Signal Output, blue (+)
4	Stroke Signal Output, black (-)

Figure 2.11 - Connector III

NOTE: The color code allocation applies only to the standard cable supplied from the factory.



WARNING: TO AVOID POSSIBLE SEVERE PERSONAL INJURY, WHEN HAZARDOUS CHEMICALS ARE PUMPED AND/OR ELEVATED TEMPERATURES/PRESSURES ARE ENCOUNTERED, USE RIGID PIPE.

METERING PUMPS - TYPICAL INSTALLATION - Suction Lift

440.600.110.010

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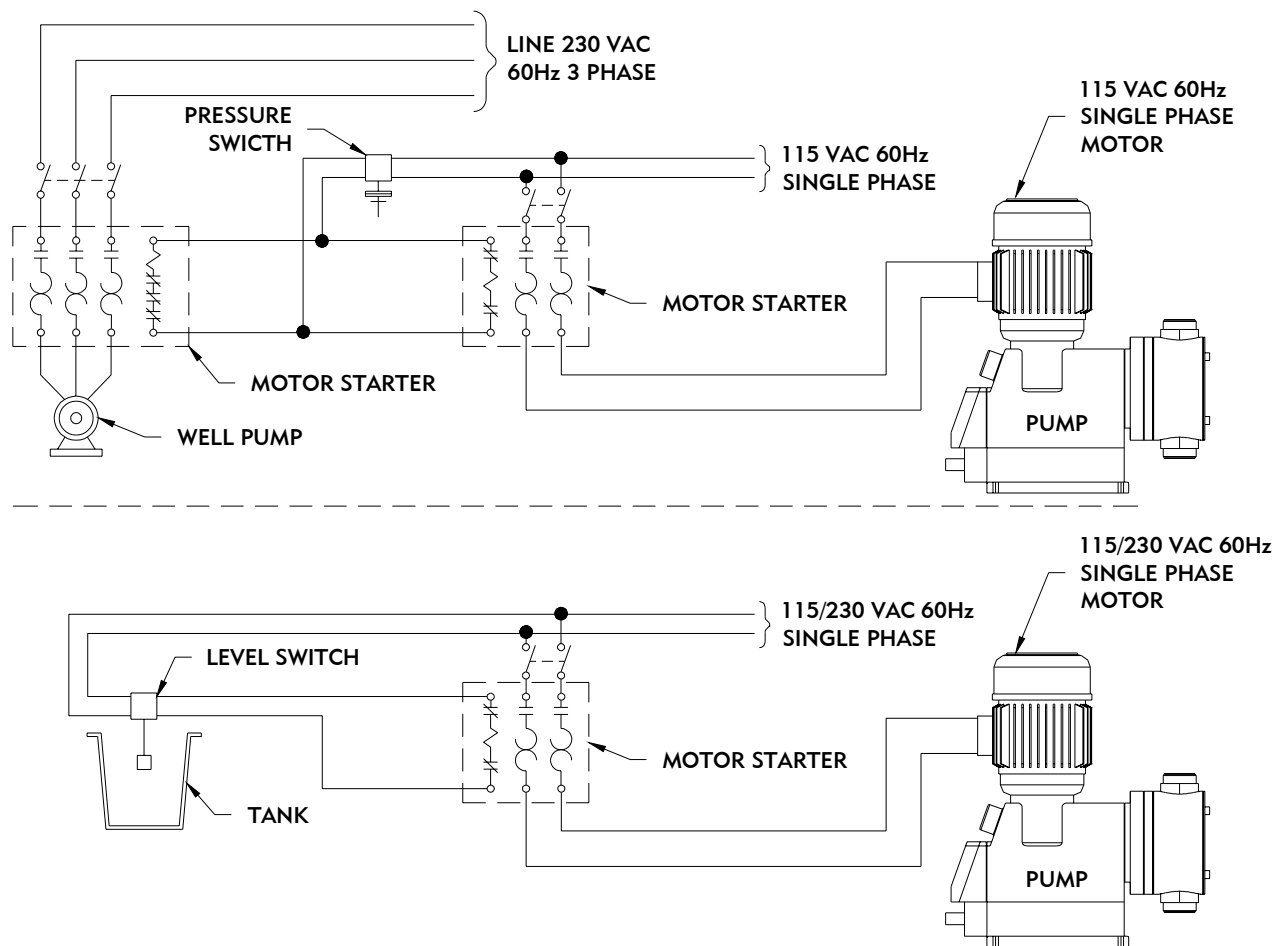
440.600.110.020

23



440.600.110.030

24



NOTES: ——— FIELD WIRING (NOT BY USFILTER/W&T) MUST CONFORM TO LOCAL ELECTRICAL CODES.
ALL VOLTAGES SHOULD BE 50/60Hz.

METERING PUMPS - INSTALLATION WIRING
- For Intermittent Start-Stop Operation

440.600.130.010

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CHEM-AD™ SERIES C

SECTION 3 - OPERATION**List of Contents**

	PARA. NO.
Preparation for Operation	3.1
Theory of Operation	3.2
Capacity in Relation to Stroke Length	3.3

3.1 Preparation for Operation

- a. Fill the container with solution.



WARNING: TO AVOID POSSIBLE SEVERE PERSONAL INJURY, USE EXTREME CARE TO AVOID CONTACT WITH THE MATERIAL. CONSULT YOUR CHEMICAL SUPPLIER FOR INSTRUCTIONS IN THE PREPARATION OF SOLUTIONS AND THE HANDLING OF CHEMICALS.

- b. Start the pump, turn the mechanical stroke adjustment to 100% and wait until the line is primed completely. Keep the speed (stroke frequency) high and adjust the required dosage by the mechanical stroke adjustment. If the installation is flow proportional (E30 control options) and the pump is controlled by a 4 - 20 mA signal, do the adjustment of dosage in local mode.
- c. The mechanical stroke adjustment is a knob (4) with a notch followed by a line as a pointer to read the graduation directly from 0% to 100%. Adjust only when the pump is running. The screw lock (17) must be loosened by about one turn before the knob can be turned. Recommended minimum stroke length is 30%. See Figure 3.1.

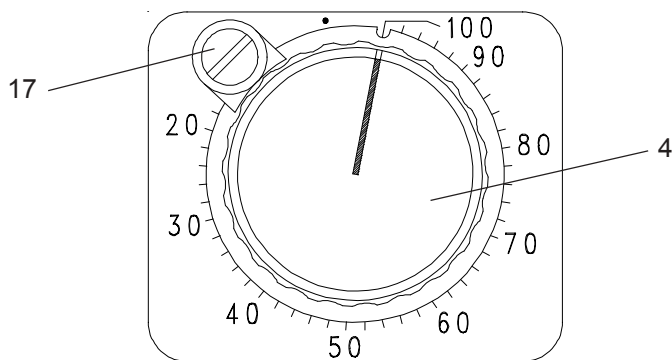


Figure 3.1 - Mechanical Stroke Adjustment Knob

3.1.1 Metering Capability

The reproducible metering accuracy is $\pm 3\%$ of full scale over 3.33:1 range with the manually adjustable stroke length knob. Stroke length setting from 30% and below is not recommended.

With the E30/M30 control option the frequency of the stroke can be adjusted infinitely from 0 to 144 spm (60 Hz) or 0 to 122 spm (50 Hz) in percent reading by a rotary knob. The control switch in local position. When the control switch in remote position, the stroke frequency is con-

trolled by 4 - 20 mA signal or pulse, disabling the stroke frequency rotary knob.

3.1.2 Strength of Solution

Appropriate dilution of the solution will modify the concentration and therefore the feed rate. This will increase or decrease the amount of solution to be pumped per unit time. Adjusting the solution concentration can match the feed rate with the pump's capabilities and enhance the metering repeatability.

3.1.3 Calibrating the Pump

Perform the calibration on the suction side of the pump against actual back pressure. Proceed as follows when using the following calibration column:

AAC2549 (500 ML)
AAC2552 (1000 ML)
AAC2555 (2000 ML)

- a. Fill up the calibration column over the "0" line.
- b. Close the suction valve and open the valve to the calibration column.
- c. Re-set the stopwatch to zero, start the pump and watch the liquid level as it goes down.
- d. As soon as the liquid level hits the "0" line, start the stopwatch.
- e. Keep an eye on the liquid level and the stopwatch.
- f. After exactly **one minute** read the graduation level.
- g. The number corresponding to the graduation is the flow in GPH or ML/MIN.

If the flow rate for one minute is too small and does not show very well in the column graduation, do the test for a longer time period. Use the ML/min graduation to get the flow. Divide it by the run time in minutes to get milliliters per minute (ML/MIN). Multiply ML/MIN by 0.01585 to get GPH.

3.2 Theory of Operation

Chem-Ad Series C is a mechanically actuated diaphragm metering pump driven by an electric motor (10). A flat diaphragm (5) between the pump head (11) and the pump housing moves backward and forward that produces the pumping action through two ball checks (2, 3) inside the pumping chamber (9). An eccentric/cam (1) moves the diaphragm (5) forward and a spring (6) push it back towards a stop (8). The stop position is adjusted by turning the stroke control knob (4). At zero stroke the stop is all the way in preventing the diaphragm plunger to return against the cam. At full stroke the stop is retracted, allowing the diaphragm plunger to ride the full lobe of the cam which corresponds to the full capacity of the pump. See Figure 3.2.

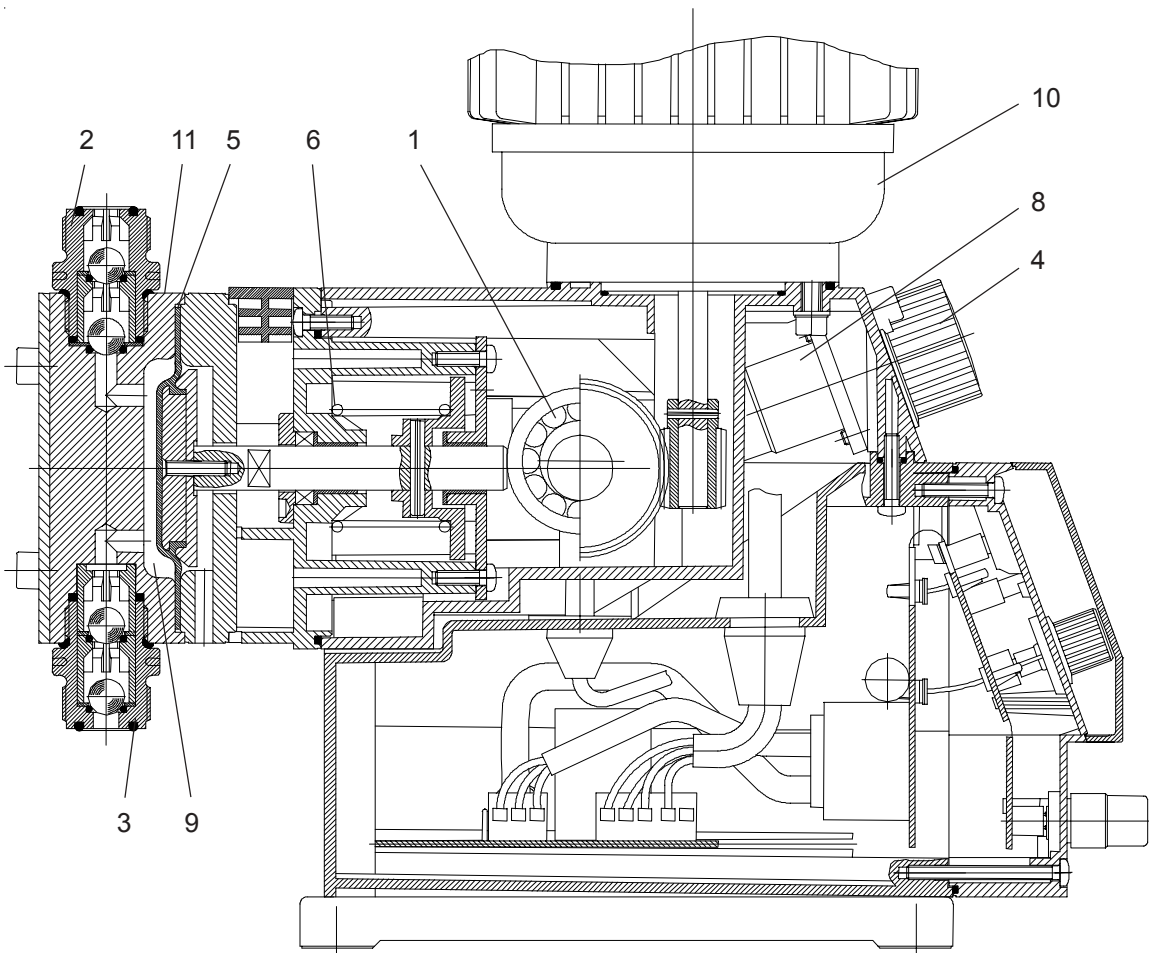


Figure 3.2 - Pump Cutaway

3.3 Capacity in Relation to Stroke Length

3.3.1 Capacity vs. Stroke Length

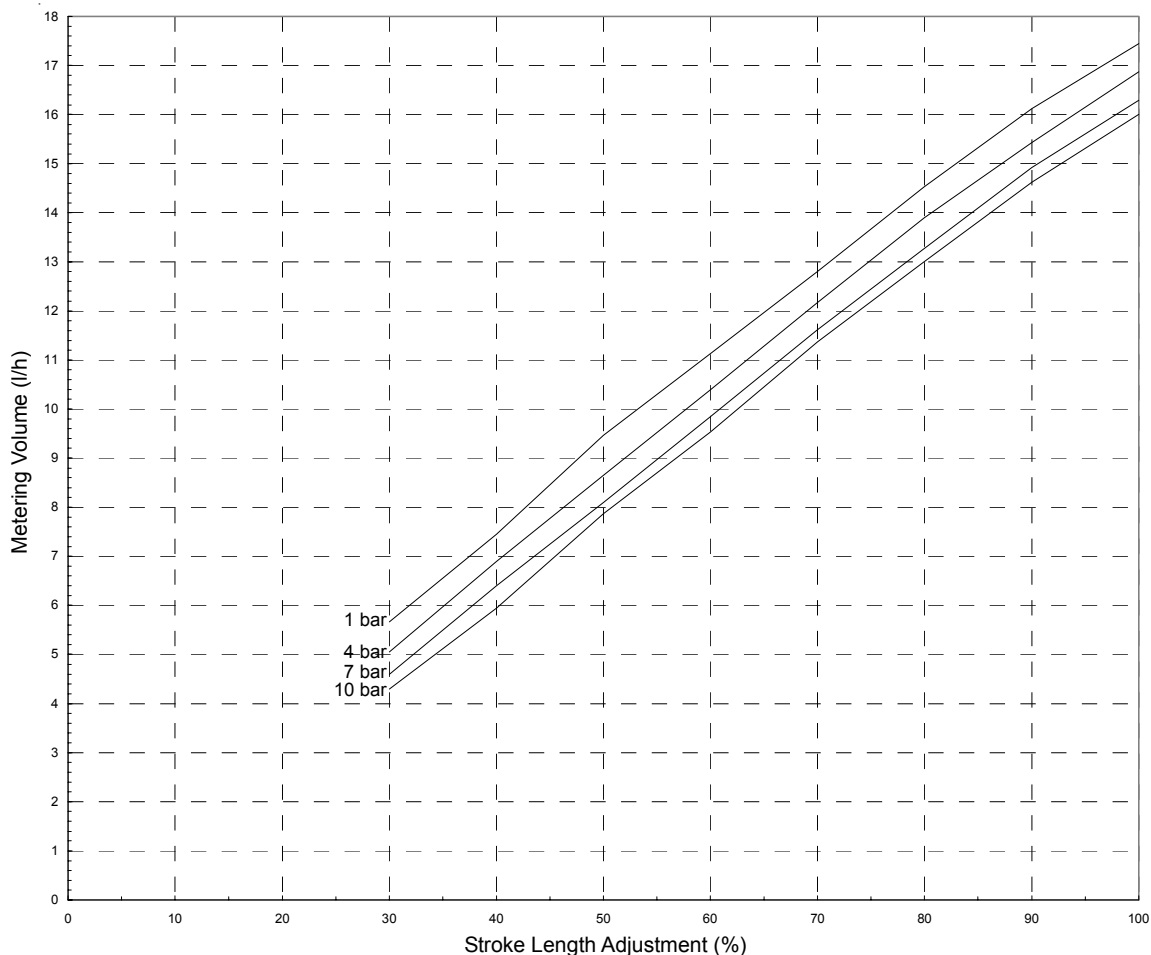
The following graphs represent the flow for different stroke length setting and back pressures. When using these graphs the capacity is within +15% -5% of rated value with water at 68° F (20° C). For metering accuracy, it is recommended that the lowest stroke length setting is 30%.

For USA Version pump, running at 60Hz, in order to get the equivalent capacity in gallon per hour, multiply the reading in liters per hour taken from these graphs by 0.3118. The maximum back pressure of USA Version pump is 120 PSI (8 Bar).

- Series C1

USA Version - capacity 5.07 GPH at 60 Hz., 120 PSI

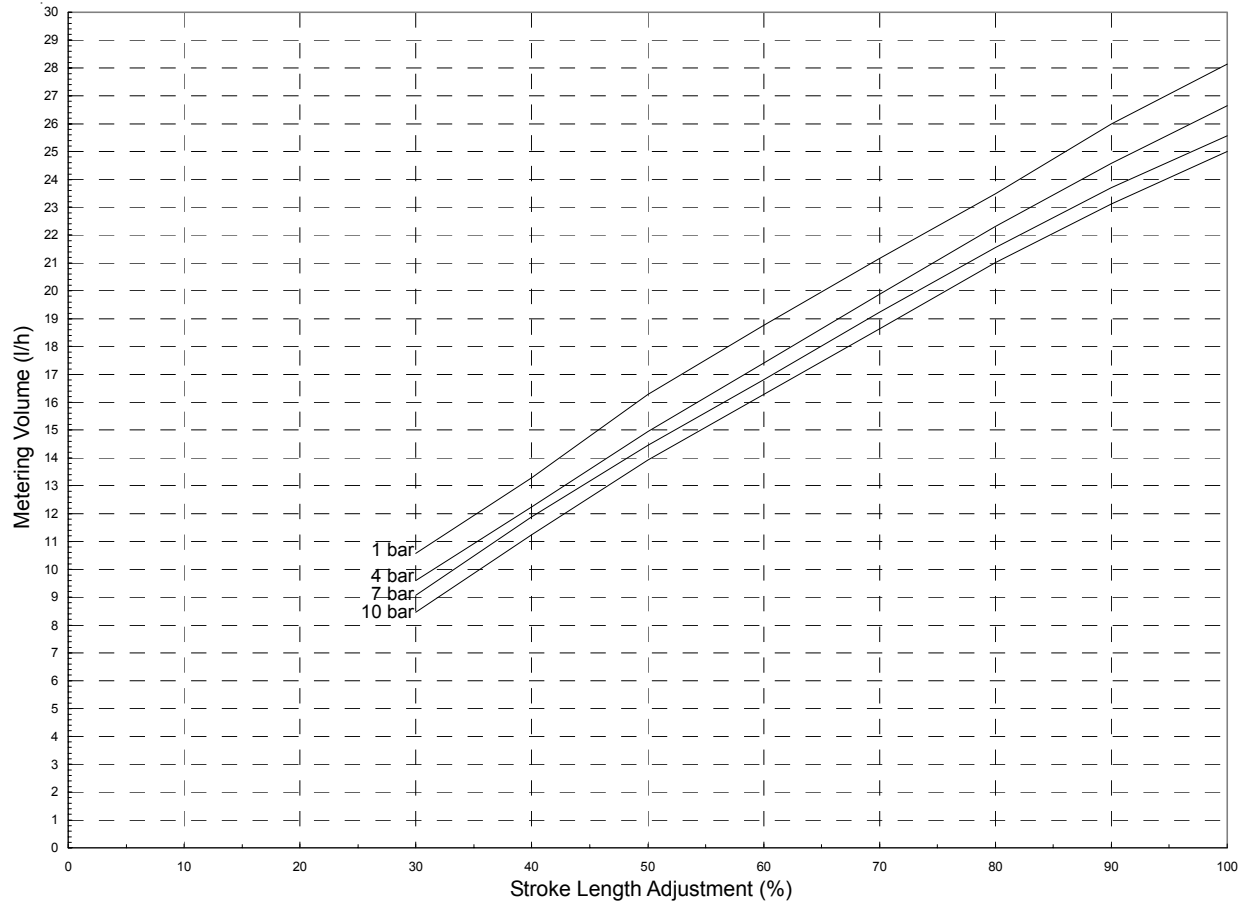
EURO Version - capacity 1 l/hr at 50 Hz, 10 Bar



- Series C2

USA Version - capacity 7.93 GPH at 60 Hz., 120 PSI

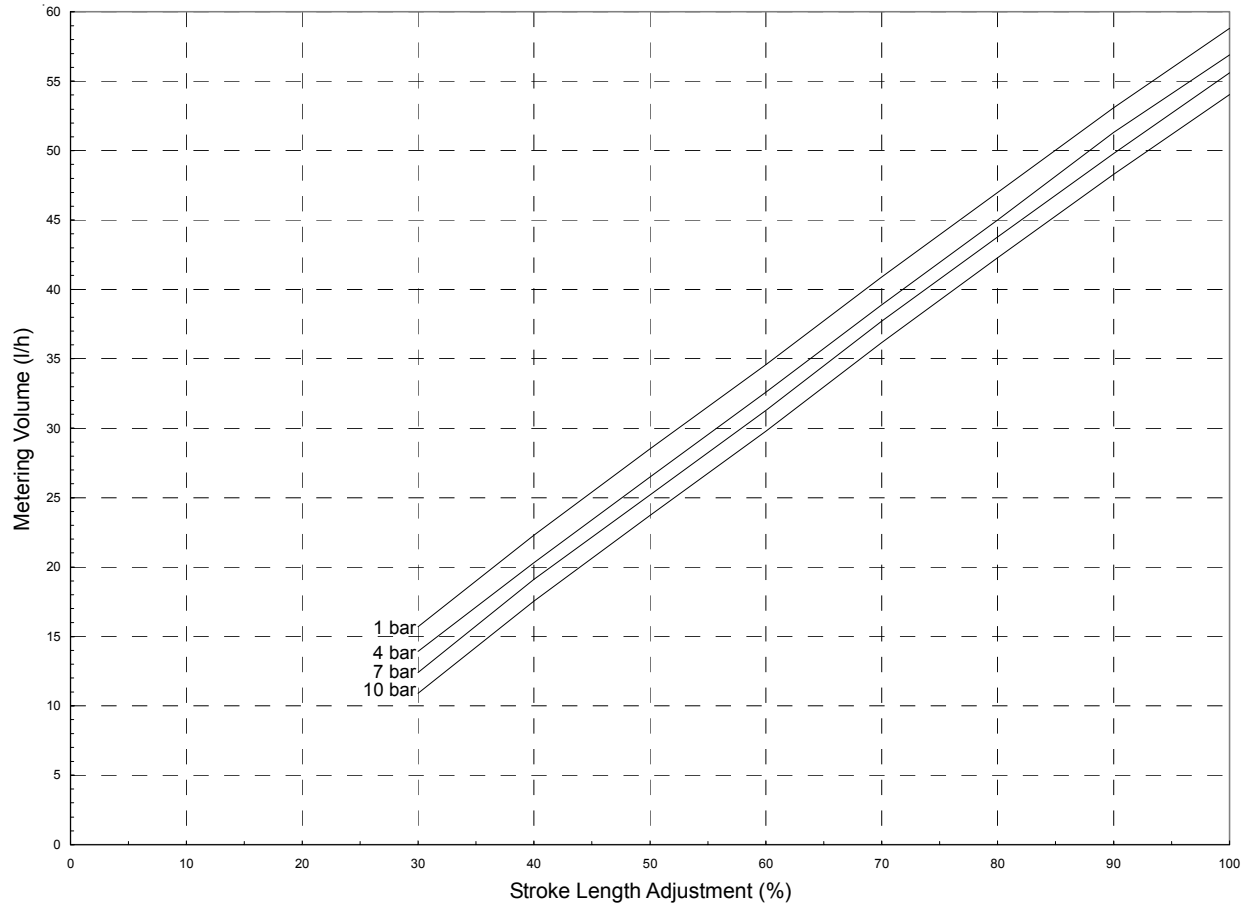
EURO Version - capacity 2 l/hr at 50 Hz, 10 Bar



- Series C3

USA Version - capacity 17.12 GPH at 60 Hz 120 PSI

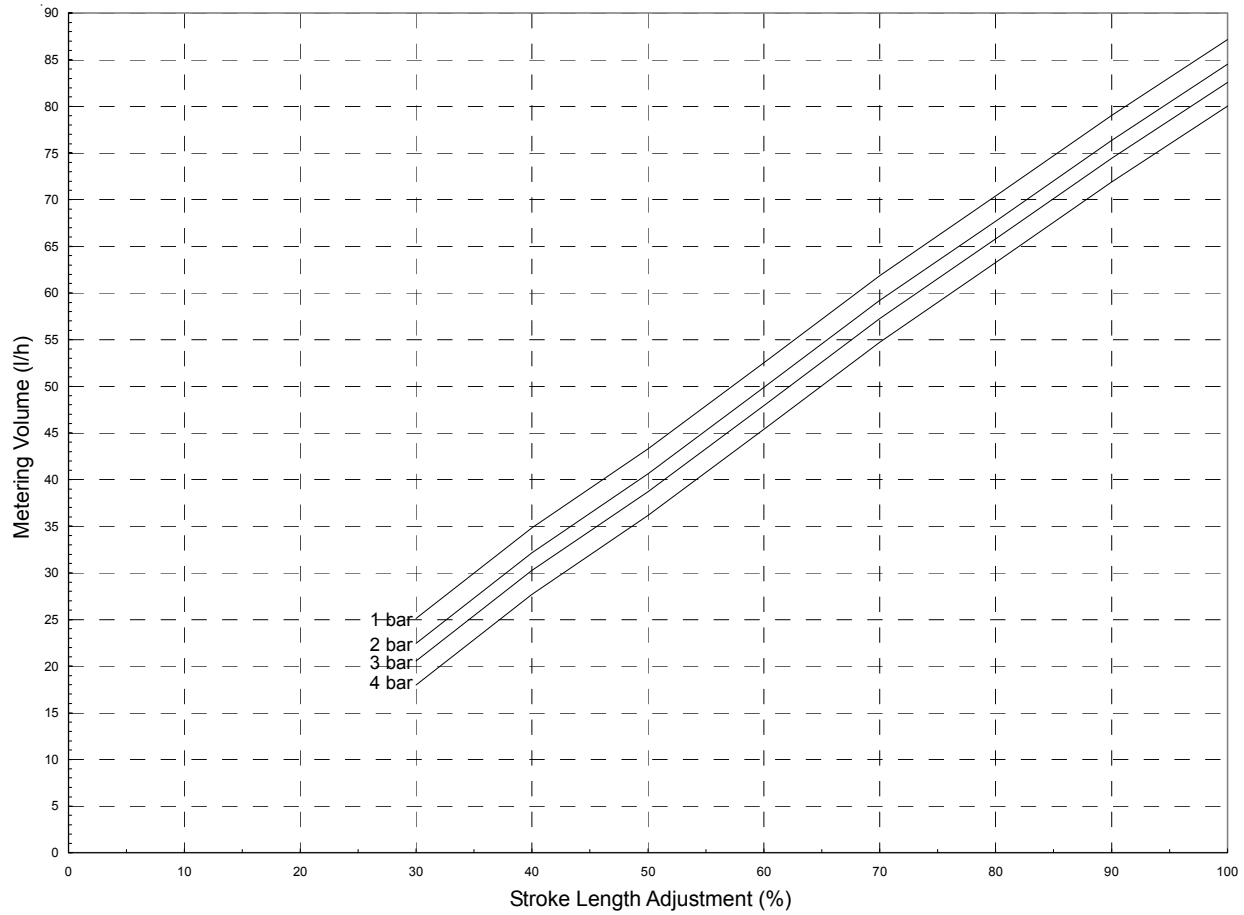
EURO Version - capacity 5 l/hr at 50 Hz, 10 Bar



- Series C4

USA Version - capacity 25.36 GPH at 60 Hz., 50 PSI

EURO Version - capacity 8 l/hr at 50 Hz, 4 Bar

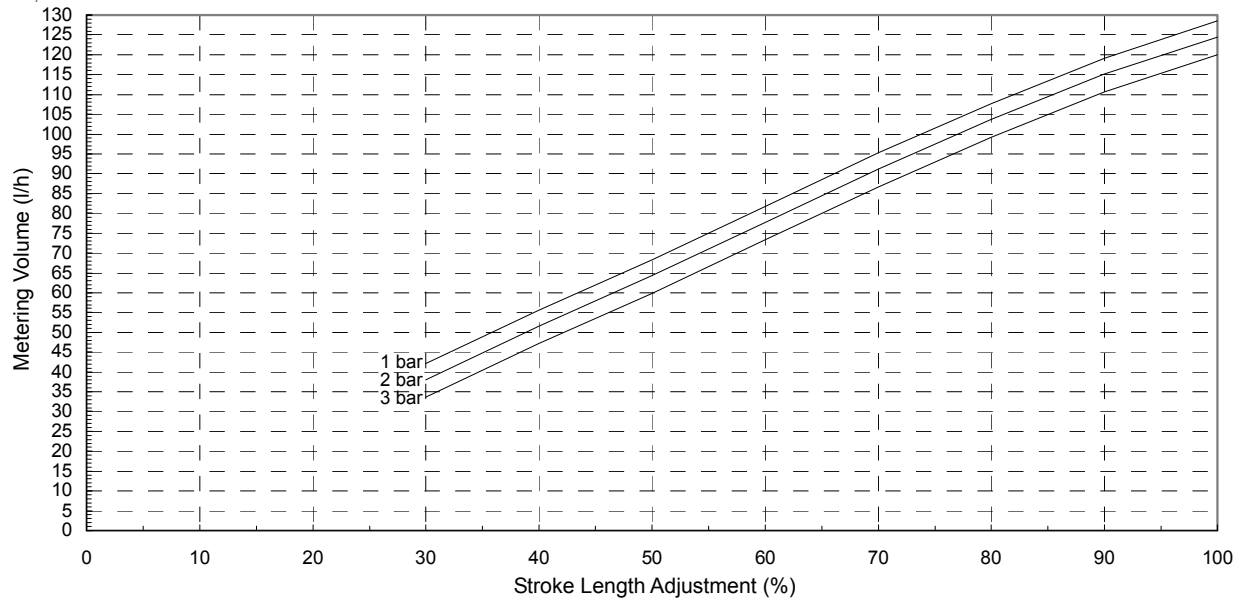


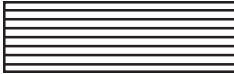
CHEM-AD™ SERIES C

- Series C5

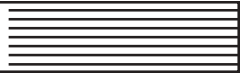
USA Version - capacity 38.04 GPH at 60 Hz., 35 PSI

EURO Version - capacity 120 l/hr at 50 Hz, 3 Bar





CHEM-AD™ SERIES C





SECTION 4 - SERVICE

List of Contents

	PARA. NO.
General Information	4.1
Periodic Cleaning	4.2
Periodic Preventive Maintenance	4.3
Corrective Maintenance	4.4
Troubleshooting	4.5
Warning Summary	1 Page

NOTE: This Instruction Book assumes that the customer has the right tools that are necessary to service the pump safely and efficiently. The customer must also know how to use them properly. There are certain notes, cautions, and warnings included in the book; each one is there for a specific purpose. **NOTES** provide added information that will help complete a particular procedure. **CAUTIONS** are given to prevent an error that could damage the pump. **WARNINGS** remind the user to be especially careful in those areas where carelessness can cause personal injury.



WARNING: TO AVOID POSSIBLE SEVERE PERSONAL INJURY OR EQUIPMENT DAMAGE FROM BEING SPRAYED WITH LIQUID UNDER PRESSURE, PRIOR TO DISASSEMBLY OF PIPE CONNECTIONS, REFER TO DETAILED INSTRUCTION ON RELIEVING PRESSURE AND DRAINING.

4.1 General Information

4.1.1 Routine Maintenance

Routine maintenance of the metering pump consists of two operations:

- Periodic cleaning: To remove contaminants and deposits formed on parts in contact with the solutions
- Periodic preventive maintenance: To disassemble, inspect, clean, and replace recommended parts.

4.1.2 Corrective Maintenance

This is performed (as required, at unscheduled intervals) to correct a discrepant operating non-operating condition. A troubleshooting table (refer to Table 4.2) lists possible fault conditions and corrective actions as a guide for service personnel.

4.2 Periodic Cleaning

4.2.1 Cleaning Pumping Head Parts

If difficulty is encountered in pumping the solution where hard water is known to have been used in the preparation of the solution, remove the pumping head parts for cleaning (refer to Paragraph 4.4.1 for head removal). The effects of hard water are indicated by a white coatings on all parts in contact with the solution. This coating is most easily removed by soaking the parts in 5% hydrochloric acid, commonly obtainable in drug

store. The commercial grade of hydrochloric acid—known as muriatic acid—is also suitable for this purpose. Where the above condition is known to exist, pump the acid solution to the pump head for approximately five minutes as a periodic preventive maintenance schedule.



WARNING: TO AVOID POSSIBLE SEVERE PERSONAL INJURY, USE EXTREME CARE TO AVOID CONTACT WITH THE MATERIAL. CONSULT YOUR CHEMICAL SUPPLIER FOR INSTRUCTIONS IN THE PREPARATION OF SOLUTIONS AND HANDLING OF CHEMICAL

4.2.2 Cleaning Clogged Solution Tube

Where solution joins water being treated and that water contains considerable hardness, there may be deposit formed inside the solution tube at the point of application. In time, this can completely plug this tube and the deposit must be removed. The best method is by dissolving the deposit as described in paragraph 4.2.1 Where this condition is known to exist, clean the solution tube as a part of routine maintenance.

4.3 Periodic Preventive Maintenance

To minimize unscheduled shut down and ensure maximum service life, perform periodic maintenance at specified intervals while the equipment is in satisfactory condition. Table 4.1 lists the interval, maintenance operation, and the preventive maintenance kits required. Before starting the work, ensure that the appropriate preventive maintenance kits are in stock. Refer to Section 6 - Preventive Maintenance Kits and Spare Parts List for the appropriate maintenance kit.

NOTE: Although all parts are designed for long service life, it is recommended that routine maintenance be performed to safeguard unexpected downtime.

Table 4.1 - Scheduled Maintenance Index

INTERVAL	MAINTENANCE OPERATION	PM KIT
Quarterly, shorter intervals if running 24 hours a day	Inspect suction and discharge valves for leaks: Refer to Figure 4.1 Suction and Discharge valves, O-rings (2, 3) Drain Hole (A) on pump head (if there is a leak the diaphragm is cracked) Head Screws (16), torque to 26-36 inch-lbs (3-4 Nm)	If parts are needed: Refer to Section 6 for PM Kits. Order the Connection Kit (USA or EURO Version).
Every 4000 hours of operation	Change the diaphragm (4).	Refer to Section 6. Order a Head Kit
Annually	Change all valve sets.	Refer to Section 6. Order a Valve Kit.

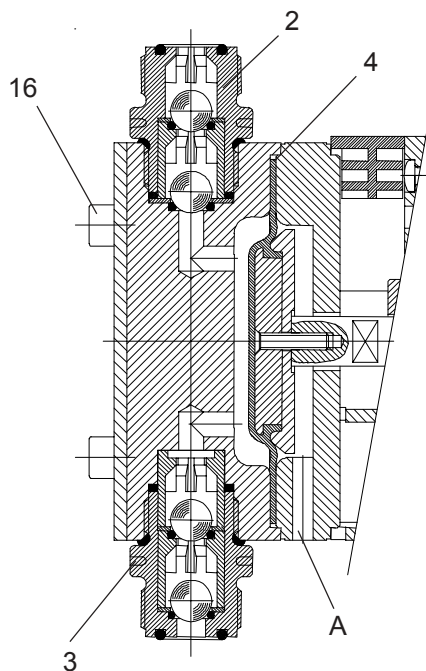


Figure 4.1 - Parts to Check for Leaks

4.4 Corrective Maintenance



WARNING: TO AVOID CONTACT WITH THE MATERIAL AND POSSIBLE SEVERE PERSONAL INJURY WHEN SERVICING HEADS AND/OR VALVES. FOLLOW THE PROCEDURES IN THIS SECTION FOR DISASSEMBLY.



WARNING: USE EXTREME CARE TO AVOID CONTACT WITH THE MATERIAL AND POSSIBLE SEVERE PERSONAL INJURY, WHEN HANDLING HAZARDOUS MATERIAL, OBSERVE ALL SAFETY PRECAUTIONS RECOMMENDED BY THE MATERIAL MANUFACTURER/SUPPLIER.



CAUTION: To prevent possible equipment damage, the solution must never be allowed to freeze in the pump. If freezing condition is present when pump is shut-off, drain the pump head and all solution lines prior to shut-off.

Corrective maintenance is performed as required to correct a discrepant operating or non-operating condition. A troubleshooting table is provided to guide service personnel in diagnosing and correcting most common troubles.

Routine maintenance procedures includes the elimination of solution leaks when they are found, to avoid corrosion damage. Flush away spilled solution with water and wipe the parts clean and dry.

Maintain gasketed joints in good condition. Keep an adequate supply of gaskets and O-rings available so that repair of leaks can be accomplished without delay. It is a good practice to discard used gaskets and O-rings, replacing them with new material each time a joint is broken.

4.4.1 Removing Pump from Service and Replacement of Valves, Pump Head, Diaphragm, and Casing Bellows



WARNING: USE EXTREME CARE TO AVOID CONTACT WITH THE MATERIAL AND POSSIBLE SEVERE PERSONAL INJURY WHEN USING HAZARDOUS MATERIAL. OBSERVE ALL SAFETY PRECAUTIONS, APPROPRIATE PROTECTIVE CLOTHING AND EYE PROTECTION WHEN HANDLING HAZARDOUS MATERIAL.

Procedures for the assembly and disassembly of parts for pump maintenance are referenced in the following paragraph.

4.4.2 Draining System of Hazardous Material



WARNING: TO AVOID POSSIBLE SEVERE PERSONAL INJURY FROM BEING SPRAYED BY LIQUID UNDER PRESSURE, ALLOW THE SYSTEM TO DRAIN FULLY BEFORE ATTEMPTING TO DISASSEMBLE PIPING AND REMOVING VALVES AND/OR HEAD.

- a. Disconnect power from the pump or unplug the pump.
- b. Close the discharge shutoff valves.
- c. For flooded suction, close the suction shutoff valve to prevent the backflow of liquid when suction lines are disconnected.
- d. Open the suction drain valve and drain the suction line of liquid.
- e. Open the discharge drain valve to relieve pressure and drain the line.
- f. The tubing connections can now be disconnected.

4.4.3 Replacement of the Suction and Discharge Valves



WARNING: TO AVOID POSSIBLE SEVERE PERSONAL INJURY, USE EXTREME CARE TO AVOID CONTACT WITH LIQUID PRESENT IN THE HEAD. ALLOW THE SUCTION VALVE TO FALL INTO A SUITABLE CONTAINER AND CATCH THE LIQUID.



WARNING: TO AVOID POSSIBLE SEVERE PERSONAL INJURY, USE EXTREME CARE TO AVOID CONTACT WITH THE LIQUID PRESENT BETWEEN THE DISCHARGE DRAIN VALVE AND THE UNIT BELOW. FLUSH ANY SPILLED LIQUID IMMEDIATELY.

- a. Disconnect the discharge and suction connections per paragraph 4.4.2.
- b. Unscrew the suction and the discharge valves.
- c. Wash the valves thoroughly with water to remove any chemical.
- d. The valve can be disassembled to check for any dirt trapped inside. It can be re-used after cleaning if there is no evidence of defect. Refer to Figure 4.2 for the valve assembly, pump capacities 5.07, 7.93, and 17.12 GPH (16, 25, and 54 l/hr).

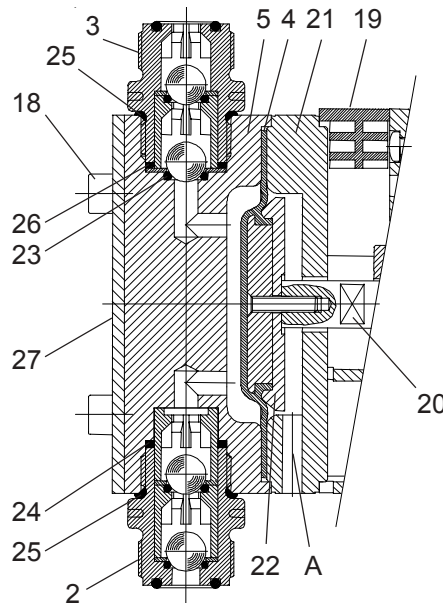


CAUTION: For discharge valve disassembly, carefully push from the top end. For suction valve, push from the bottom end. Take care to avoid having the parts fall out.

- e. Inspect all the parts for any defect. Replace the whole valve if any part is defective. They are available as a complete assembly in the PM Kit.
- f. For re-assembly look for the direction of the arrow. The arrow must point upwards.

NOTE: The suction and discharge valve housings are different from one another. To assemble the valves follow Figure 4.2.

- g. To install the discharge valve, position the O-ring (23) at the bottom of the pump head discharge opening followed by the retainer (26) and one ball.
- h. Position the O-ring (25) at the valve shoulder and screw it in hand tight, watch for the direction of the arrow.
- i. To install the suction valve, position two O-rings onto the valve, one at the valve shoulder (25) and the other at the valve guide (24). Watch for the direction of the arrow.



2	Suction Valve
3	Discharge Valve
4	Diaphragm
5	Pump Head
18	Head Screws
19	Plug
20	Wrench Location
21	Intermediate Plate
22	Back-Up Ring
23	O-ring, 6 mm OD
24	O-ring, 16 mm OD
25	O-ring, 18 mm OD
26	Retainer
27	Pressure Plate

Figure 4.2 - Valves Assembly

4.4.4 Replacement of Diaphragm and Pump Head

- a. Drain the pump head of chemical and disconnect all the lines per paragraph 4.4.2.
- b. Remove the suction and discharge valves per paragraph 4.4.3.
- c. Loosen four head screws (18). Refer to Figure 4.2.
- d. Remove pump head (5) and set aside.
- e. Pry out plug (19), and insert an open end (8mm) to location (20) to prevent the plunger from rotating.

NOTE: The diaphragm (4) and the intermediate piece (21) may need to be twisted in order for the wrench to engage in the right location.

- f. Unscrew the diaphragm unit (4) and back-up ring (22).
- g. Screw in a new diaphragm unit (4) and back-up ring (22) gently until stop. Hand tight only.
- h. Remove the open end wrench and turn the diaphragm and the intermediate piece (21) as one unit until the housing holes are aligned and the leak drain hole (A) is pointing downward.
- i. Install the head and tighten diagonally to 26-36 inch-lbs (3-4 Nm).
- j. The head screws (18) must be re-torque to 26-36 inch-lbs (3-4 Nm) after running the pump for 24 hours.

4.4.5 Gearbox

The mechanical components in the drive mechanism are not serviceable. It is grease lubricated and does not require any maintenance.

4.5 Troubleshooting

The troubleshooting procedures are limited to fault isolation to a defective item. Potential problems that could be at fault and recommendations for corrective actions are listed in Table 4.2. There are faults that can be fixed by the customer and faults that can only be fixed by person with electronic knowledge. In such a case the whole electronic board must be replaced.

Table 4.2 - Troubleshooting

FAULT CONDITION	POSSIBLE CAUSE	CORRECTIVE ACTION
METERING PUMP DOES NOT WORK, GREEN LED OFF.	Incorrect voltage, no power or fuse blown. Main cable damage or plug defective.	Check power supply and cable.
PUMP DOES NOT PRIME EVEN WITHOUT BACK PRESSURE, MAXIMUM STROKE, AND SPEED.	Suction and discharge valves leaks, stuck due to dirt or dry.	Remove and rinse the valves.
	Gas accumulates at the pump head and suction line.	Check for cavitation. Install a vented riser if flooded suction. Dilute the liquid, especially Sodium Hypochlorite.
	Suction and discharge shut-off valves closed.	Open valves.
	Strainer is clogged.	Clean strainer.
	There is leakage in suction line.	Check and repair leaks.
NO FEED RATE ON POINT OF APPLICATION, THOUGH PUMP IS PUMPING.	Pressure is too high.	Check the pressure at the main line.
	Suction valve is leaking or dirty.	Clean suction valve.
	Pressure relief valve is relieving (if equipped) or defective.	Adjust pressure relief valve to proper relief pressure. Change or repair the pressure relief valve if defective.
METERING HEAD IS LEAKING AND LIQUID IS EMERGING BETWEEN THE HEAD AND INTERMEDIATE PLATE.	Metering head is loose.	Tighten the head screws diagonally to 26-36 inch-lbs (3-4 Nm).
	Diaphragm rupture.	Replace diaphragm.
LIQUID IS LEAKING THROUGH THE INTERMEDIATE PLATE DRAIN LINE.	Diaphragm rupture.	Replace diaphragm.
LEVEL LED FLASHES.	Storage tank is near empty.	Re-fill storage tank.
LEVEL LED IS CONSTANTLY ON.	Storage tank is empty.	Re-fill storage tank.
	Loose jumper plug or missing on connector I.	Check that the plug is properly plugged in.

Table 4.2 - Troubleshooting (Cont'd)

FAULT CONDITION	POSSIBLE CAUSE	CORRECTIVE ACTION
LEVEL LED FLASHES DESPITE FULL STORAGE TANK.	Float is blocked	Release float.
	Loose jumper plug or suction pipe assembly connector is loose or dirty.	Check the connector and clean the contacts.
	Suction pipe assembly cable is defective.	Replace or repair the cable.
PUMP NOT WORKING (RED LED NOT INDICATING FAULT).	Metering lock in operation (PIN #3 and #4 of connector II must be bridged).	Attach jumper plug to connector II. Clean contacts of plug.
METERING PUMP DOES NOT WORK, EVEN THOUGH ON SWITCH OR YELLOW LED FLASHES (E30/M30 ONLY).	Air in the pump head.	Bent head or loose head screws.
	Metering volume too low.	Increase the stroke length setting.
	Metering system blocked.	Internal fault, replace electronic board.
	Metering without request being made.	Internal fault, replace electronic board.
ERROR SIGNAL LED LIGHTS UP, E30/M30.	Metering valve clogged.	Clean and rinse valves.
	On E30/M30 operating with 4-20 mA signal the current is interrupted.	Establish the signal current.
	Back pressure is too high. NOTE: Once the cause of fault is corrected, turn off the power to acknowledge the error signal.	Check discharge lines.
METERING PUMP DOES NOT OPERATE DESPITE RESET OF FAULT MESSAGE AND THE POWER IS RESTORED, E30/M30.	Motor protection turned off by thermal cut-off.	Let the motor temperature cool down.
METERING PUMP NOT WORKING, NO GREEN LIGHT LED DISPLAY.	Main cable damage.	Replace main cable.

WARNING LABEL

The following warning labels are attached to the equipment.

AAA3759: TO REVENT POSSIBLE SEVERE PERSONAL INJURY DUE TO BEING SPRAYED WITH HAZARDOUS LIQUID UNDER PRESSURE DO NOT DISCONNECT DISCHARGE TUBE/PIPE/MAIN CONNECTION WITHOUT FIRST RELIEVING PRESSURE AND DRAINING DISCHARGE LINE SEE INSTRUCTION BOOK FOR DETAILED GUIDANCE

AAA1020: THIS EQUIPMENT MAY HANDLE HAZARDOUS MATERIALS WHICH CAN CAUSE SEVERE PERSONAL INJURY, OBSERVE FOLLOWING:

THIS EQUIPMENT MUST BE INSTALLED, OPERATED, SERVICED BY TRAINED QUALIFIED PERSONELL, WHO ARE THROUGHLY FAMILIAR WITH THE CONTENTS OF THE INSTRUCTION BOOK.

TURN OFF POWER BEFORE SERVICING TO AVOID ELECTRICAL SHOCK

REFER TO THE SAFETY PRECAUTIONS OF THE SUPPLIER OF THE HAZARDOUS MATERIAL AND THE EQUIPMENT INSTRUCTION BOOK FOR FURTHER IMPORTANT DETAILS AND PRECAUTIONS.

USE APPROPRIATE PROTECTIVE CLOTHING AND EYE PROTECTION AS RECOMMENDED BY THE CHEMICAL MANUFATURER.

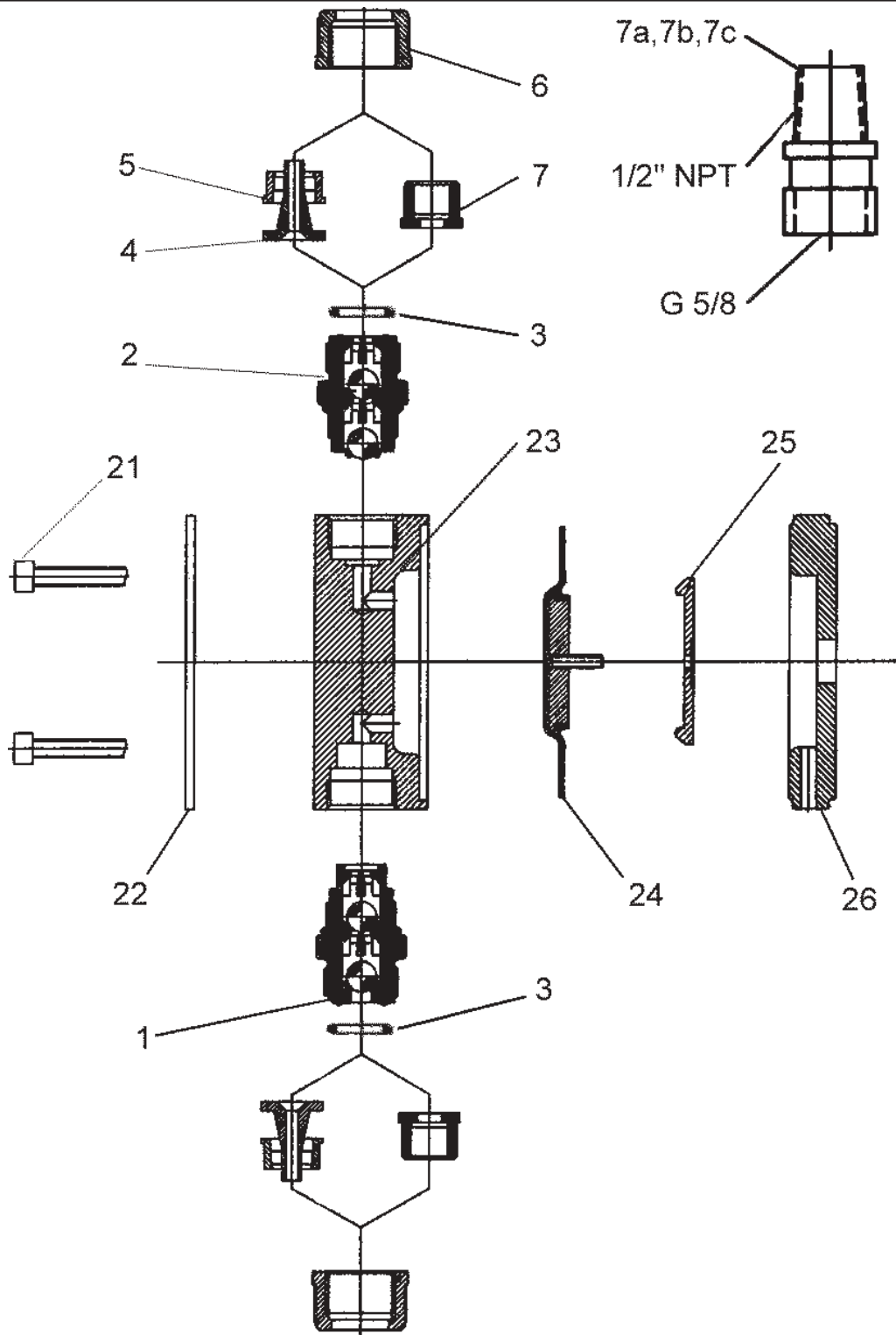


CHEM-AD™ SERIES C

SECTION 5 - ILLUSTRATIONS**List of Contents**

	DWG. NO.
Parts	
Chem-Ad Series C	
Capacity 5.07 to 17.12 GPH (16 to 54 l/hr)	440.600.000.210A-C
Capacity 25.36 to 38.04 GPH (80 to 120 l/hr) ..	440.600.000.220A-C

CHEM-AD™ SERIES C



NOTE: FOR PARTS LIST, SEE DWGS. 440.600.000.210B&C.

CHEM-AD METERING PUMP SERIES C
- CAPACITY 5.07 to 17.12 GPH (16 to 54 L/HR) - PARTS

440.600.000.210A

ISSUE 0 3-03

CHEM-AD™ SERIES C

KEY NO.	PART NO.	DESCRIPTION
1	AAB6565	SUCTION VALVE, COMPLETE, G 5/8, PVDF, NO SPRING
1a	AAC2426	SUCTION VALVE, COMPLETE, G 5/8, STAINLESS STEEL, NO SPRING
2	AAB6574	PRESSURE VALVE, COMPLETE, G 5/8, PVDF, NO SPRING
2a	AAC2429	PRESSURE VALVE, COMPLETE, G 5/8, STAINLESS STEEL, NO SPRING
3	AAB6577	O-RING VITON B
4	AAB6580	TAPERED PART PVC for PVC FABRIC (ID/OD) 6/12
	OR	
	AAB6583	TAPERED PART 1.4305 for PVC FABRIC (ID/OD) 6/12
	OR	
	AAB8602	TAPERED PART PVC for PVC FABRIC (ID/OD) 10x3
	OR	
	AAB8995	TAPERED PART PVDF for PVC FABRIC (ID/OD) 10x3
5	AAB658	CLAMPING PIECE PVC for PVC FABRIC (ID/OD) 6/12
	OR	
	AAB6589	CLAMPING PIECE 1.4305 for PVC FABRIC (ID/OD) 6/12
	OR	
	AAB8605	CLAMPING PIECE PVC for PVC FABRIC (ID/OD) 10x3
	OR	
	AAB8998	CLAMPING PIECE PVDF for PVC FABRIC (ID/OD) 10x3
6	AAB6592	UNION NUT PVDF
7	AAB6595	INSERTION PART STN. STL. G 1/4 CONN. THD.(for conn. of stn. stl. tube G 1/4)
7a	AAC2513	ADAPTER - G 5/8 TO 1/2" NPT MALE, PVDF
7b	AAC2516	ADAPTER - G 5/8 TO 1/2" NPT MALE, STN. STL.
7c	AAB2519	ADAPTER - G 5/8 TO 1/2" NPT MALE, PP
21	AAB6616	PUMP HEAD SCREW
22	AAB6619	PRESSING PLATE

WHEN ORDERING MATERIAL ALWAYS SPECIFY MODEL AND SERIAL NUMBER OF APPARATUS

CHEM-AD METERING PUMP SERIES C
- CAPACITY 5.07 to 17.12 GPH (16 to 54 L/HR) - PARTS

440.600.000.210B

ISSUE 0 3-03

CHEM-AD™ SERIES C

KEY NO.	PART NO.	DESCRIPTION
23	AAB8506	PUMP HEAD 16 l/hr PP
	OR	
	AAB8509	PUMP HEAD 25 l/hr PP
	OR	
	AAB8512	PUMP HEAD 54 l/hr PP
	OR	
	AAB6622	PUMP HEAD 16 l/hr PVDF
	OR	
	AAB6625	PUMP HEAD 25 l/hr PVDF
	OR	
	AAB6628	PUMP HEAD 54 l/hr PVDF
	OR	
	AAB6631	PUMP HEAD 16 l/hr VA
	OR	
	AAB6634	PUMP HEAD 25 l/hr VA
	OR	
	AAB6637	PUMP HEAD 54 l/hr VA
	OR	
	AAC2432	PUMP HEAD 16 l/hr PVC
	OR	
	AAC2435	PUMP HEAD 25 l/hr PVC
	OR	
	AAC2438	PUMP HEAD 54 l/hr PVC
24	AAB6640	DIAPHRAGM 16 l/hr
	OR	
	AAB6643	DIAPHRAGM 25 l/hr
	OR	
	AAB6646	DIAPHRAGM 54 l/hr
25	AAB6649	SUPPORTING DISK 16 l/hr
	OR	
	AAB6652	SUPPORTING DISK 25 l/hr
	OR	
	AAB6655	SUPPORTING DISK 54 l/hr
26	AAB6658	INTERMEDIATE PLATE 16 l/hr
	OR	
26	AAB6661	INTERMEDIATE PLATE 25 l/hr

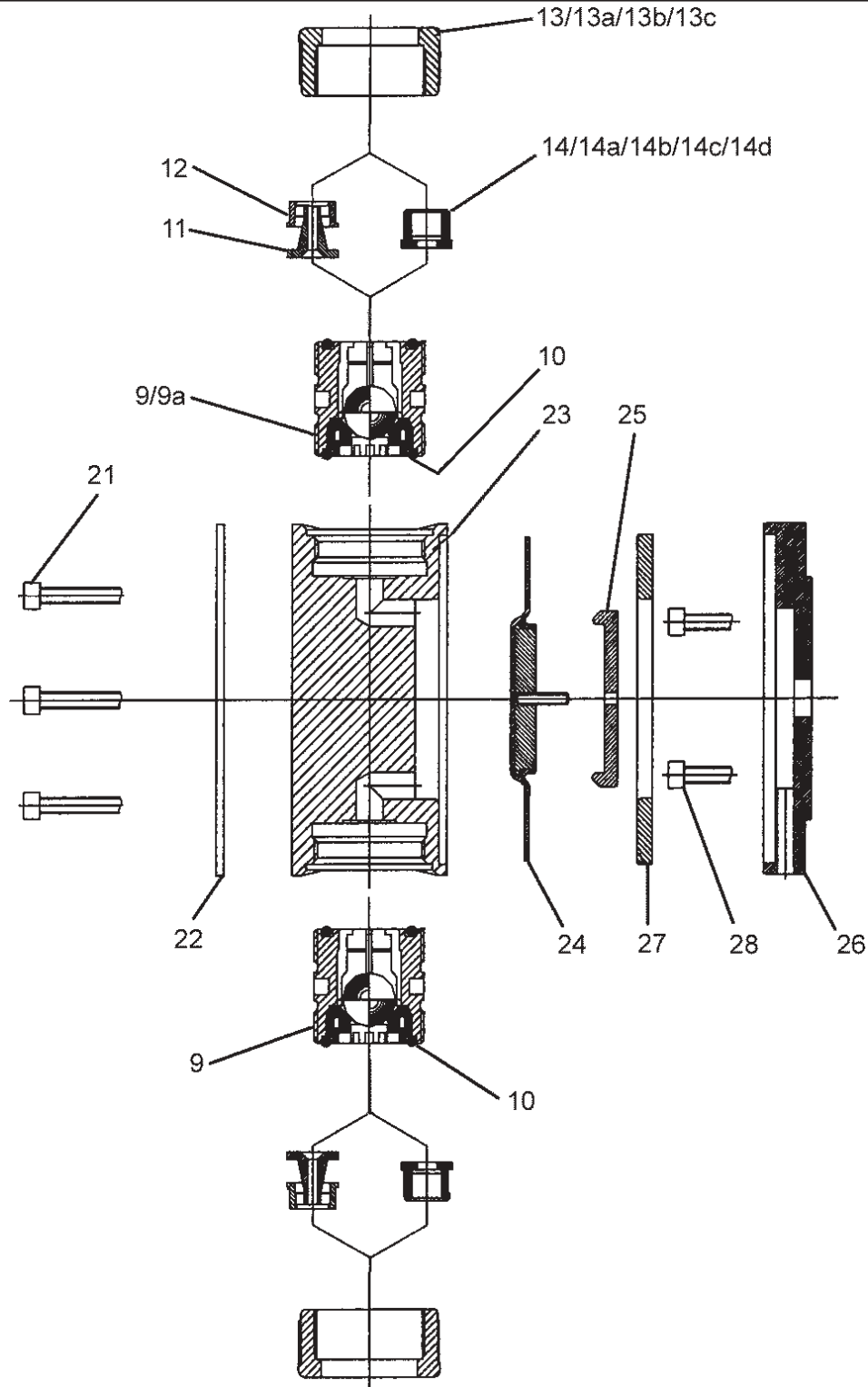
WHEN ORDERING MATERIAL ALWAYS SPECIFY MODEL AND SERIAL NUMBER OF APPARATUS

CHEM-AD METERING PUMP SERIES C
- CAPACITY 5.07 to 17.12 GPH (16 to 54 L/HR) - PARTS

440.600.000.210C

ISSUE 0 3-03

CHEM-AD™ SERIES C



NOTE: FOR PARTS LIST, SEE DWGS. 440.600.000.210B&C.

CHEM-AD METERING PUMP SERIES C
- CAPACITY 25.36 TO 38.04 GPH (80 TO 120 L/HR) - PARTS

440.600.000.220A

ISSUE 0 3-03

CHEM-AD™ SERIES C

KEY NO.	PART NO.	DESCRIPTION
9	AAB6667	SUCTION/PRESSURE VALVE, COMPLETE, G 1 1/4, 80-120 l/hr PVDF, GLASS BALL. VITON B SEAL
9a	AAC2462	SUCTION/PRESSURE VALVE, COMPLETE, G 1 1/4, 80-120 l/hr STAINLESS STEEL
10	AAB6670	O-RING, VITON FOR SUCTION/PRESSURE CONNECTION G 1 1/4
11	AAB6673	PVC TAPERED PART FOR PVC-FABRIC (int.Ø/ext.Ø) 12/21
	OR	
	AAB6676	TAPERED PART 1.4571 FOR PVC-FABRIC (int.Ø/ext.Ø) 12/21
12	AAB6679	PVC CLAMPING PIECE FOR PVC-FABRIC (int.Ø/ext.Ø) 12/21
	OR	
	AAB6682	CLAMPING PIECE 1.4305 FOR PVC-FABRIC (int.Ø/ext.Ø) 12/21
13	AAB6685	UNION NUT G 1 1/4 PVC
13a	AAB6688	UNION NUT G 1 1/4 STN. STL.
13b	AAC1 819	UNION NUT G 1 1/4 PVDF
13c	AAC2393	UNION NUT G 1 1/4 PP
14	AAB6691	FOR CONNECTION OF STAINLESS STEEL TUBE G 3/4: INSERTION PART STN. STL., G 3/4 CONNECTION THREAD
14a	AAC2378	INSERTION PART, 1" NPT, PVDF
14b	AAC2381	INSERTION PART, 1" NPT, PVC
14c	AAC2384	INSERTION PART, 1" NPT, STN. STL.
14d	AAC2387	INSERTION PART, 1" NPT, PP
21	AAB6697	PUMP HEAD SCREW 80 l/hr
	OR	
	AAB6700	PUMP HEAD SCREW 120 l/hr
22	AAB6703	PRESSING PLATE 80 l/hr
	OR	
	AAB6706	PRESSING PLATE 120 l/hr

WHEN ORDERING MATERIAL ALWAYS SPECIFY MODEL AND SERIAL NUMBER OF APPARATUS

CHEM-AD METERING PUMP SERIES C
- CAPACITY 25.36 TO 38.04 GPH (80 TO 120 L/HR) - PARTS

440.600.000.220B

ISSUE 0 3-03

CHEM-AD™ SERIES C

KEY NO.	PART NO.	DESCRIPTION
23	AAB8515	PUMP HEAD 80 l/hr PP
	OR	
	AAB8518	PUMP HEAD 120 l/hr PP
	OR	
	AAB6709	PUMP HEAD 80 l/hr PVDF
	OR	
	AAB6712	PUMP HEAD 120 l/hr PVDF
	OR	
	AAB6715	PUMP HEAD 80 l/hr STN. STL.
	OR	
24	AAB6718	PUMP HEAD 120 l/hr STN.STL.
	OR	
	AAC2441	PUMP HEAD 80 l/hr PVC
	OR	
25	AAC2444	PUMP HEAD 120 l/hr PVC
	AAB6721	DIAPHRAGM 80 l/hr
26	OR	
	AAB6724	DIAPHRAGM 120 l/hr
	AAB6727	SUPPORTING DISK 80 l/hr
27	OR	
	AAB6730	SUPPORTING DISK 120 l/hr
28	AAB6733	INTERMEDIATE PLATE 80 l/hr
	OR	
29	AAB6736	INTERMEDIATE PLATE 120 l/hr
	AAB6739	INTERMEDIATE RING 80 l/hr
30	OR	
	AAB6742	INTERMEDIATE RING 120 l/hr
31	AAB6745	SCREW

WHEN ORDERING MATERIAL ALWAYS SPECIFY MODEL AND SERIAL NUMBER OF APPARATUS

CHEM-AD METERING PUMP SERIES C
- CAPACITY 25.36 TO 38.04 GPH (80 TO 120 L/HR) - PARTS

440.600.000.220C

ISSUE 0 3-03



CHEM-AD™ SERIES C



SECTION 6 - PREVENTIVE MAINTENANCE KITS AND ACCESSORIES

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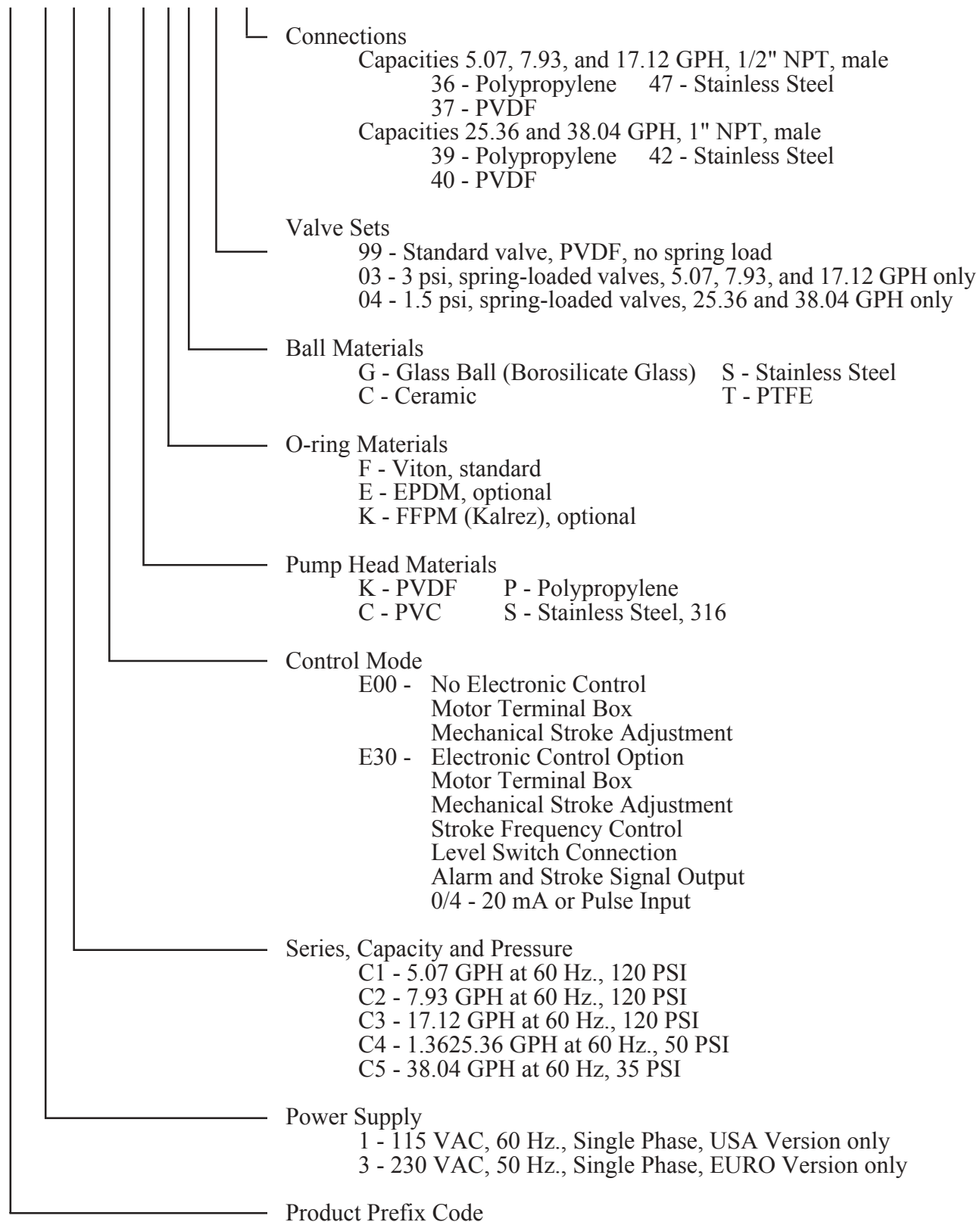
	PARA. NO.
Configuration Code	6.1
Preventive Maintenance Kit	6.2
Accessories	6.3

6.1 Configuration Code

To order the correct maintenance kit or spare parts the configuration of the pump must be known. The configuration number is also the ordering code of that particular pump. Every pump has a data plate attached to it and there you will find a configured alpha numeric code starting with “CM” and followed by thirteen (13) numbers or letters. See samples that follow.

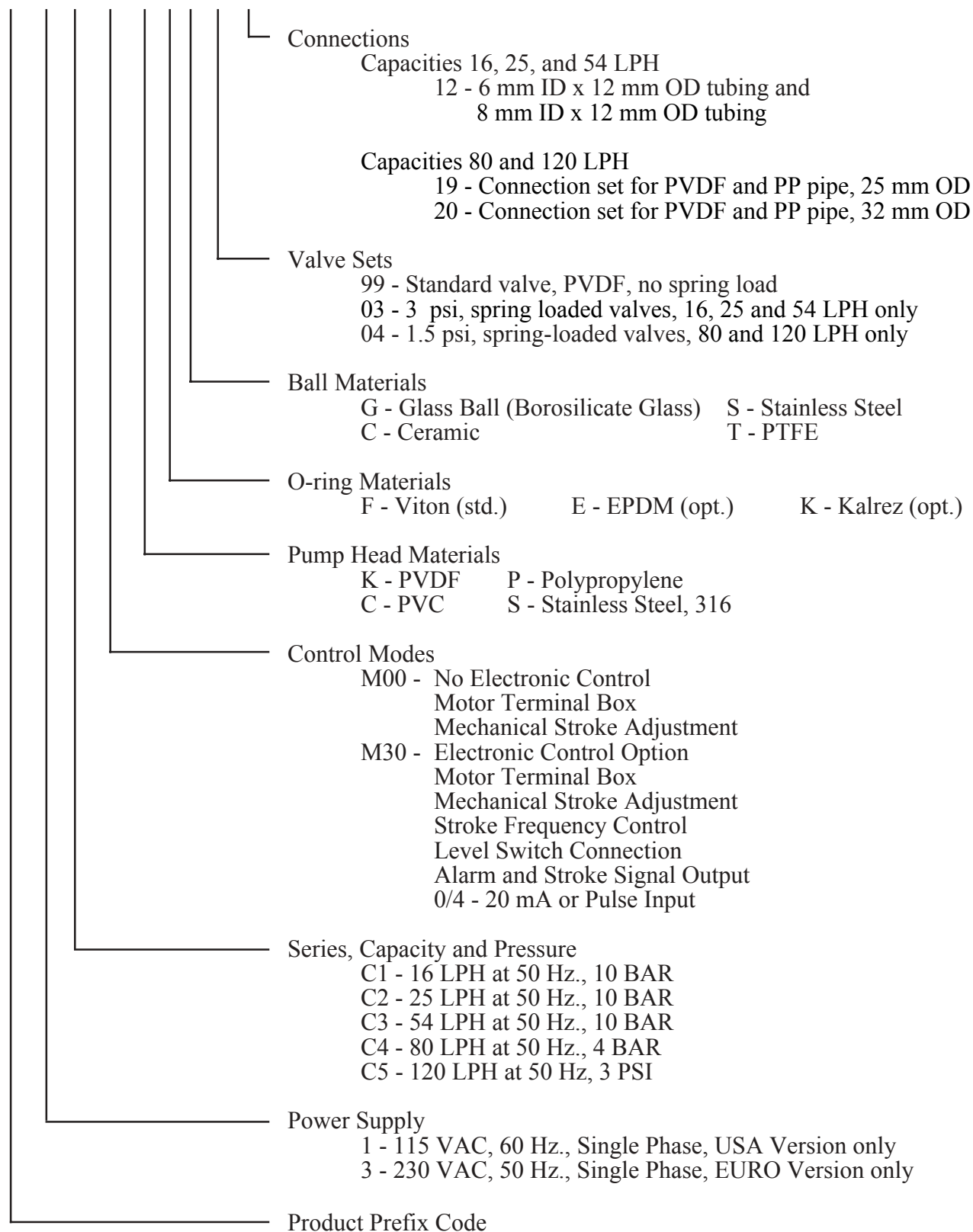
6.1.1 USA Version

CM 1 C4 E30 K F G 99 36



6.1.2 EURO Version

CM 3 C4 M30 K F G 99 12



6.2 Maintenance Kits

6.2.1 Series C - Maintenance Kit - Capacity 5.07 to 17.12 GPH (16 to 54 l/hr)

The Maintenance Kit consists of all the parts necessary to perform regular required maintenance for the pump for convenient ordering. Refer to Figure 6.1 for a diagram of the parts that comprise each particular kit.

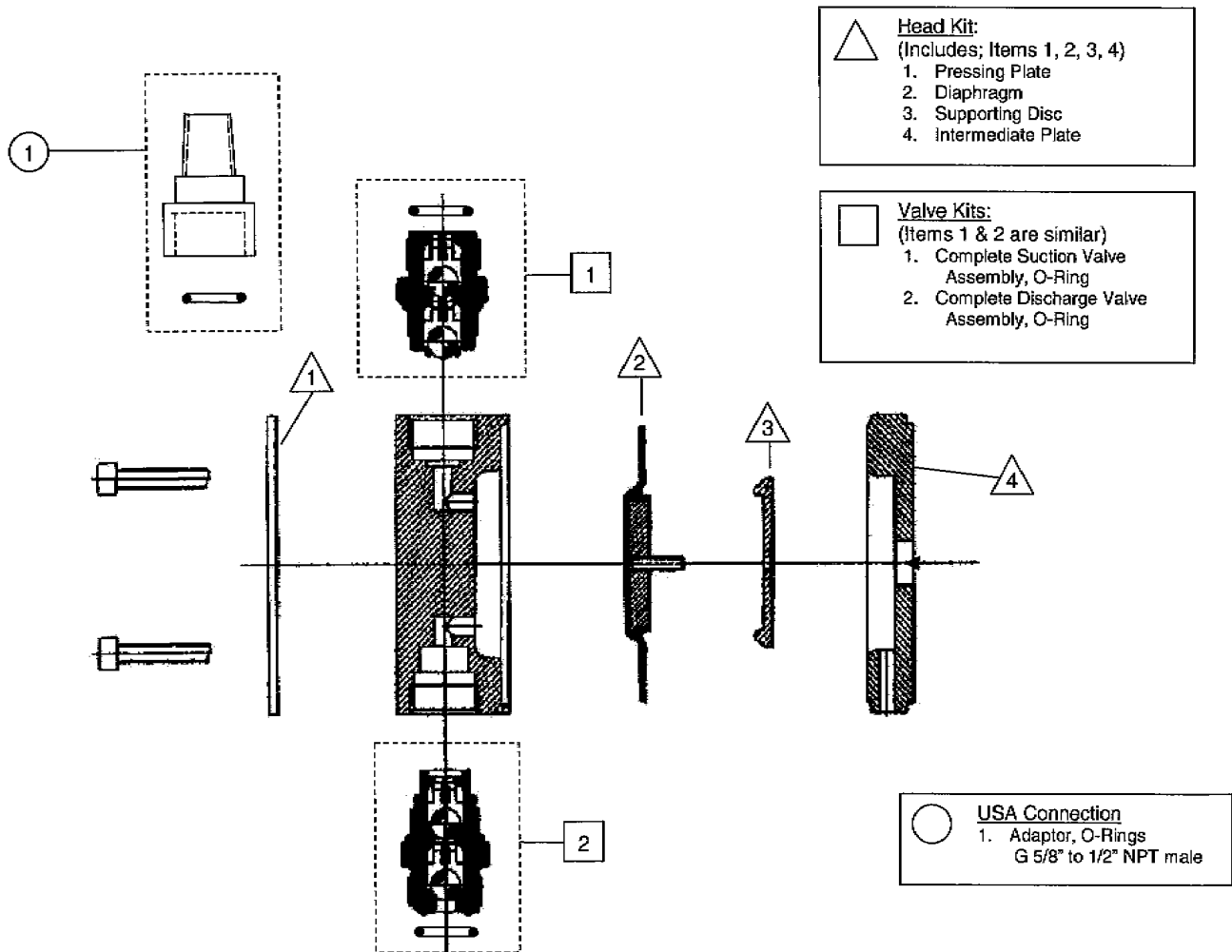


Figure 6.1 - Capacity 5.07 to 17.2 GPH (16 to 54 l/hr) Maintenance Kit Parts Reference

6.2.1.1 Head Kit

NOTE: Order one (1) kit per pump.

Description - See Figure 6.1	Part Number	Kit Part Number USA or METRIC Version Pump
Head Kit for Series C, 5.07 GPH, (16 l/h) Consists of: Pressing plate Diaphragm Supporting Disc Intermediate Plate	AAB6619 AAB6640 AAB6649 AAB6658	AAC3755
Head Kit for Series C, 7.93 GPH, (25 l/h) Consists of: Pressing plate Diaphragm Supporting Disc Intermediate Plate	AAB6619 AAB6643 AAB6652 AAB6661	AAC3758
Head Kit for Series C, 17.12 GPH, (54 l/h) Consists of: Pressing plate Diaphragm Supporting Disc Intermediate Plate	AAB6619 AAB6646 AAB6655 AAB6664	AAC3761

6.2.1.2 USA Connection Kit

NOTE: Order two (2) kits per pump.

Description - See Figure 3	USE/W&T Part Number	Kit Part Number
Adapter, G5/8 to 1/2" NPT, male, PVDF VITON O-ring	AAC2513 AAB6577	AAC3992
Adapter, G5/8 to 1/2" NPT, male, PVDF EPDM O-ring	AAC2513 AAC3995	AAC3998
Adapter, G5/8 to 1/2" NPT, male, PVDF KALREZ O-ring	AAC2513 AAC4001	AAC4004
Adapter, G5/8 to 1/2" NPT, male, POLYPROPYLENE VITON O-ring	AAC2519 AAB6577	AAC4007
Adapter, G5/8 to 1/2" NPT, male, POLYPROPYLENE EPDM O-ring	AAC2519 AAC3995	AAC4013
Adapter, G5/8 to 1/2" NPT, male, POLYPROPYLENE KALREZ O-ring	AAC2519 AAC4001	AAC4019
Adapter, G5/8 to 1/2" NPT, male, STAINLESS STEEL VITON O-ring	AAC2516 AAB6577	AAC4022
Adapter, G5/8 to 1/2" NPT, male, STAINLESS STEEL EPDM O-ring	AAC2516 AAC3995	AAC4028
Adapter, G5/8 to 1/2" NPT, male, STAINLESS STEEL KALREZ O-ring	AAC2516 AAC4001	AAC4034

6.2.1.3 Metric Connection Kit

NOTE: Order two (2) kits per pump.

Description	Part Number
Complete set of Connector, G5/8, VITON, PVC taper part and clamping piece, PVDF union nut. 6 mm ID x 8 mm OD hose 6 mm ID x 12 mm OD PVC-textile reinforced hose 6 mm ID x 8 mm OD PTFE - tube 8 mm OD stainless tube 8 mm ID x 12 mm OD PVC tube	AAC4037 AAC4040 AAC4043 AAC4046 AAC4049
Complete set of connector, G5/8 to 6 mm ID x 12 mm OD, PVC textile reinforced hose PVDF taper part, clamping piece, union nut with VITON O-ring	AAC4052
Complete set of connector, G5/8 to 6 mm ID x 12 mm OD, PVC textile reinforced hose PVDF taper part, clamping piece, union nut with EPDM O-ring	AAC4055
Complete set of connector, G5/8 to 6 mm ID x 12 mm OD, PVC textile reinforced hose PVC taper part, clamping piece, PVDF union nut with VITON O-ring	AAC4040
Complete set of connector, G5/8 to 6 mm ID x 12 mm OD, PVC textile reinforced hose PVC taper part, clamping piece, PVDF union nut with EPDM O-ring	AAC4061
Complete set of connector, G5/8 to 6 mm ID x 12 mm OD, PVC textile reinforced hose STAINLESS STEEL taper part, clamping piece, union nut with VITON O-ring	AAC4064
Complete set of connector, G5/8 to 6 mm ID x 12 mm OD, PVC textile reinforced hose STAINLESS STEEL taper part, clamping piece, union nut with EPDM O-ring	AAC4067

6.2.1.4 Valve Kits - USA and EURO Versions

NOTE: Order one (1) kit per pump.

VALVE KITS WITHOUT SPRING, PVDF HOUSING MATERIAL	
Description	USA or METRIC Version Pump Part Number
Complete SUCTION/DISCHARGE valve assembly, Series C, no spring, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with CERAMIC BALL and VITON O-ring	AAC3764
Complete SUCTION/DISCHARGE valve assembly, Series C, no spring, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with CERAMIC BALL and EPDM O-ring	AAC3767
Complete SUCTION/DISCHARGE valve assembly, Series C, no spring, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with CERAMIC BALL and KALREZ O-ring	AAC3770
Complete SUCTION/DISCHARGE valve assembly, Series C, no spring, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with GLASS BALL and VITON O-ring	AAB6565 (SUCTION) AAB6574 (DISCHARGE)
Complete SUCTION/DISCHARGE valve assembly, Series C, no spring, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with GLASS BALL and EPDM O-ring	AAC3773
Complete SUCTION/DISCHARGE valve assembly, Series C, no spring, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with GLASS BALL and KALREZ O-ring	AAC3776
Complete SUCTION/DISCHARGE valve assembly, Series C, no spring, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with PTFE BALL and VITON O-ring	AAC3779
Complete SUCTION/DISCHARGE valve assembly, Series C, no spring, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with PTFE BALL and EPDM O-ring	AAC3782
Complete SUCTION/DISCHARGE valve assembly, Series C, no spring, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with PTFE BALL and KALREZ O-ring	AAC3785
Complete SUCTION/DISCHARGE valve assembly, Series C, no spring, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with STAINLESS STEEL BALL and VITON O-ring	AAC3788
Complete SUCTION/DISCHARGE valve assembly, Series C, no spring, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with STAINLESS STEEL BALL and EPDM O-ring	AAC3791
Complete SUCTION/DISCHARGE valve assembly, Series C, no spring, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with STAINLESS STEEL BALL and KALREZ O-ring	AAC3794

6.2.1.4 Valve Kits - USA and EURO Versions (Cont'd)

NOTE: Order one (1) kit per pump.

VALVE KITS WITHOUT SPRING, STAINLESS STEEL HOUSING MATERIAL	
Description	USA or METRIC Version Pump Part Number
Complete SUCTION/DISCHARGE valve assembly, Series C, no spring, 5.07 - 17.12 GPH, (16 - 54 l/h), STAINLESS STEEL housing STAINLESS STEEL BALL and VITON O-ring	AAC3869
Complete SUCTION/DISCHARGE valve assembly, Series C, no spring, 5.07 - 17.12 GPH, (16 - 54 l/h), STAINLESS STEEL housing STAINLESS STEEL BALL and EPDM O-ring	AAC3872
Complete SUCTION/DISCHARGE valve assembly, Series C, no spring, 5.07 - 17.12 GPH, (16 - 54 l/h), STAINLESS STEEL housing STAINLESS STEEL BALL and KALREZ O-ring	AAC3878

NOTE: For polypropylene and PVC head material order valve kits
with PVDF housing material.

6.2.1.4 Valve Kits - USA and EURO Versions (Cont'd)

NOTE: Order one (1) kit per pump.

SPRING LOADED VALVE KITS, PVDF HOUSING MATERIAL	
Description	USA or METRIC Version Pump Part Number
Complete SUCTION/DISCHARGE valve assembly, Series C, 3 psi spring load, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with GLASS BALL and VITON O-ring	AAC3881
Complete SUCTION/DISCHARGE valve assembly, Series C, 3 psi spring load, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with GLASS BALL and EPDM O-ring	AAC3884
Complete SUCTION/DISCHARGE valve assembly, Series C, 3 psi spring load, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with GLASS BALL and KALREZ O-ring	AAC3887
Complete SUCTION/DISCHARGE valve assembly, Series C, 3 psi spring load, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with PTFE BALL and VITON O-ring	AAC3890
Complete SUCTION/DISCHARGE valve assembly, Series C, 3 psi spring load, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with PTFE BALL and EPDM O-ring	AAC3893
Complete SUCTION/DISCHARGE valve assembly, Series C, 3 psi spring load, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with PTFE BALL and KALREZ O-ring	AAC3896
Complete SUCTION/DISCHARGE valve assembly, Series C, 3 psi spring load, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with STAINLESS STEEL BALL and VITON O-ring	AAC3899
Complete SUCTION/DISCHARGE valve assembly, Series C, 3 psi spring load, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with STAINLESS STEEL BALL and EPDM O-ring	AAC3902
Complete SUCTION/DISCHARGE valve assembly, Series C, 3 psi spring load, 5.07 - 17.12 GPH, (16 - 54 l/h), PVDF housing with STAINLESS STEEL BALL and KALREZ O-ring	AAC3905

NOTE: For polypropylene and PVC head material order valve kits with PVDF housing material.

6.2.1.4 Valve Kits - USA and EURO Versions (Cont'd)

NOTE: Order one (1) kit per pump.

SPRING LOADED VALVE KITS, STAINLESS STEEL HOUSING MATERIAL	
Description	USA or METRIC Version Pump Part Number
Complete SUCTION/DISCHARGE valve assembly, Series C, 3 psi spring load, 5.07 - 17.12 GPH, (16 - 54 l/h), STAINLESS STEEL housing and ball with VITON O-ring	AAC3980
Complete SUCTION/DISCHARGE valve assembly, Series C, 3 psi spring load, 5.07 - 17.12 GPH, (16 - 54 l/h), STAINLESS STEEL housing and ball with EPDM O-ring	AAC3983
Complete SUCTION/DISCHARGE valve assembly, Series C, 3 psi spring load, 5.07 - 17.12 GPH, (16 - 54 l/h), STAINLESS STEEL housing and ball with KALREZ O-ring	AAC3989

6.2.2 Series C - Maintenance Kit - Capacity 25.36 to 38.04 GPH (80 to 120 l/hr)

The Maintenance Kit consists of all the parts necessary to perform regular required maintenance for the pump for convenient ordering. Refer to Figure 6.2 for a diagram of the parts that comprise each particular kit.

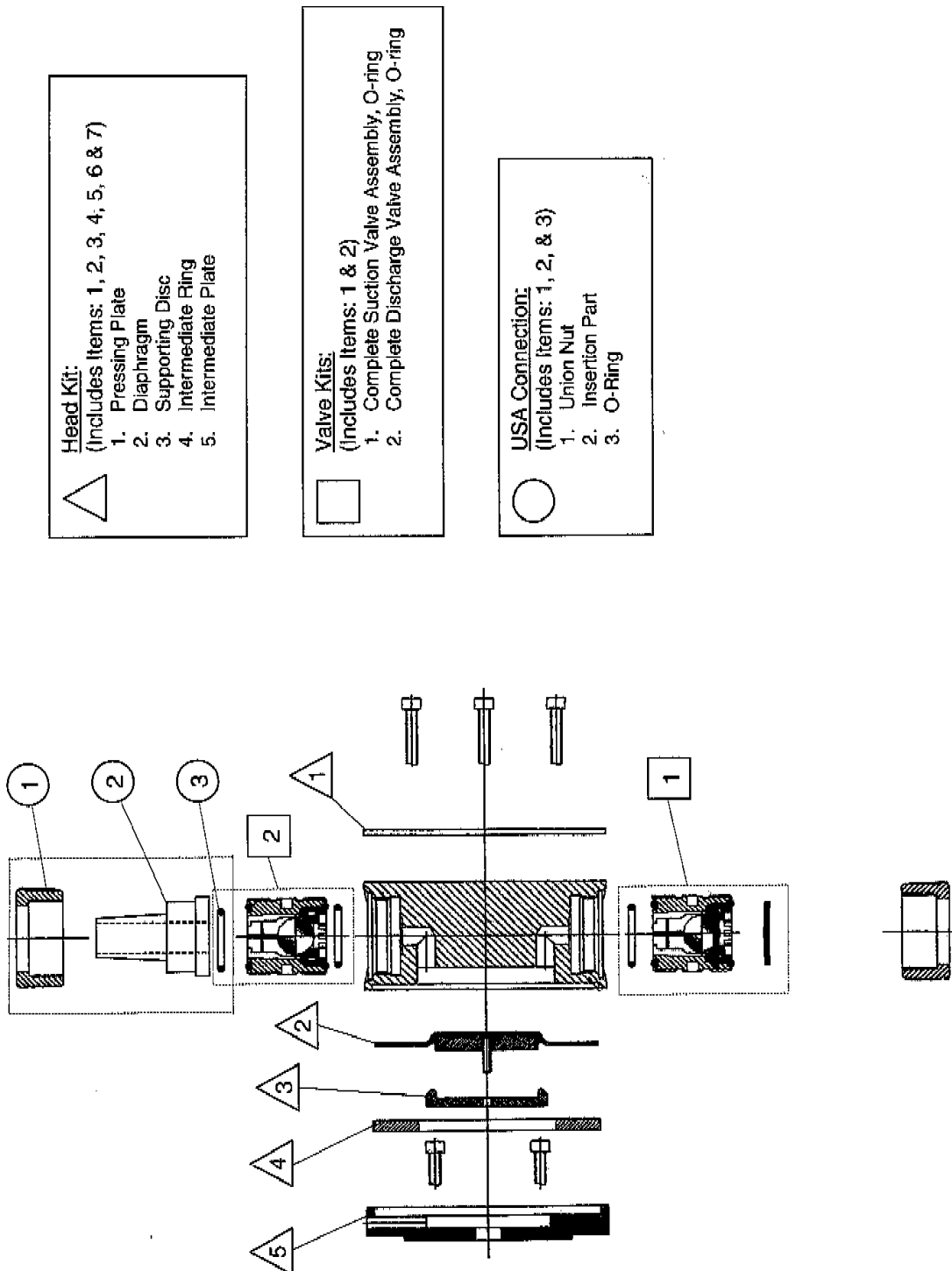


Figure 6.2 - Capacity 25.36 to 38.04 GPH (80 to 120 l/hr) Maintenance Kit Parts Reference

6.2.2.1 Head Kit - Capacity 25.36 to 38.04 GPH (80 to 120 l/hr)

NOTE: Order one (1) kit per pump.

Description - See Figure 6.2	Part Number	Kit Part Number USA or METRIC Version Pump
Head Kit for Series C, 25.36 GPH, (80 l/h) Consists of: Pressing plate Diaphragm Supporting Disc Intermediate Plate Intermediate Ring	AAB6703 AAB6721 AAB6727 AAB6733 AAB6739	AAC4070
Head Kit for Series C, 38.04 GPH, (120 l/h) Consists of: Pressing plate Diaphragm Supporting Disc Intermediate Plate Intermediate Ring	AAB6706 AAB6724 AAB6730 AAB6736 AAB6742	AAC4073

6.2.2.2 USA Connection Kit - Capacity 25.36 to 38.04 GPH (80 to 120 l/hr)

NOTE: Order two (2) kits per pump.

Description - See Figure 6.2	USF/W&T Part No.	Kit Part No.
PVC Connection		
Connection Kit, G 1-1/4 to 1" NPT, male, PVC with VITON O-ring Consists of: Union Nut, G 1-1/4 , PVC Insertion Part, 1" NPT, male, PVC VITON O-ring	AAC2390 AAC2507 AAC1552	AAC4325
Connection Kit, G 1-1/4 to 1" NPT, male, PVC with EPDM O-ring Consists of: Union Nut, G 1-1/4 , PVC Insertion Part, 1" NPT, male, PVC EPDM O-ring	AAC2390 AAC2507 AAC1555	AAC4328
Connection Kit, G 1-1/4 to 1" NPT, male, PVC with KALREZ O-ring Consists of: Union Nut, G 1-1/4 , PVC Insertion Part, 1" NPT, male, PVC KALREZ O-ring	AAC2390 AAC2507 ---	AAC4331
PVDF Connection		
Connection Kit, G 1-1/4 to 1" NPT, male, PVDF with VITON O-ring Consists of: Union Nut, G 1-1/4 , PVDF Insertion Part, 1" NPT, male, PVDF VITON O-ring	AAC1819 AAC2456 AAC1552	AAC4334
Connection Kit, G 1-1/4 to 1" NPT, male, PVDF with EPDM O-ring Consists of: Union Nut, G 1-1/4 , PVDF Insertion Part, 1" NPT, male, PVDF EPDM O-ring	AAC1819 AAC2456 AAC1555	AAC4337
Connection Kit, G 1-1/4 to 1" NPT, male, PVDF with KALREZ O-ring Consists of: Union Nut, G 1-1/4 , PVDF Insertion Part, 1" NPT, male, PVDF KALREZ O-ring	AAC1819 AAC2456 AAC4355	AAC4340

6.2.2.2 USA Connection Kit (Cont'd)

NOTE: Order two (2) kits per pump.

Description - See Figure 6.2	USF/W&T Part No.	Kit Part No.
Polypropylene Connection		
Connection Kit, G 1-1/4 to 1" NPT, male, POLYPROPYLENE with VITON O-ring Consists of: Union Nut, G 1-1/4 , POLYPROPYLENE Insertion Part, 1" NPT, male, POLYPROPYLENE VITON O-ring	AAC2393 AAC2510 AAC1552	AAC4343
Connection Kit, G 1-1/4 to 1" NPT male, POLYPROPYLENE with EPDM O-ring Consists of: Union Nut, G 1-1/4 , POLYPROPYLENE Insertion Part, 1" NPT, male, POLYPROPYLENE EPDM O-ring	AAC2393 AAC2510 AAC1555	AAC4346
Connection Kit, G 1-1/4 to 1" NPT male, POLYPROPYLENE with KALREZ O-ring Consists of: Union Nut, G 1-1/4, POLYPROPYLENE Insertion Part, 1" NPT, male, POLYPROPYLENE KALREZ O-ring	AAC2393 AAC2510 AAC4358	AAC4349
Stainless Steel Connection		
Connection Kit, G 1-1/4 to 1" NPT male, STAINLESS STEEL with VITON O-ring Consists of: Union Nut, G 1-1/4 STAINLESS STEEL Insertion Part, 1" NPT, male, STAINLESS STEEL VITON O-ring	AAB6688 AAC2459 AAC1552	AAC4352
Connection Kit, G 1-1/4 to 1" NPT, male, STAINLESS STEEL with EPDM O-ring Consists of: Union Nut, G 1-1/4 , STAINLESS STEEL Insertion Part, 1" NPT, male, STAINLESS STEEL EPDM O-ring	AAB6688 AAC2459 AAC1555	AAC4361
Connection Kit, G 1-1/4 to 1" NPT, male, STAINLESS STEEL with KALREZ O-ring Consists of: Union Nut, G 1-1/4, STAINLESS STEEL Insertion Part, 1" NPT, male, STAINLESS STEEL KALREZ O-ring	AAB6688 AAC2459 AAC4367	AAC4364

6.2.2.3 Metric Connection Kit - Capacity 80 to 120 l/hr (25.36 to 38.04 GPH)

NOTE: Order two (2) kits per pump.

Descriptions	Part No.	Kit Part No.
12 mm ID x 21 mm OD PVC - Textile reinforced hose		
POLYPROPYLENE Union Nut, G 1 1/4 Taper Part Clamping Piece O-ring, VITON	AAC2393 AAC4418 AAC4421 AAC1552	AAC4370
POLYPROPYLENE Union Nut, G 1 1/4 Taper Part Clamping Piece O-ring, EPDM	AAC2393 AAC4424 AAC4427 AAC1555	AAC4373
PVDF Union Nut, G 1 1/4 Taper Part Clamping Piece O-ring, VITON	AAC1819 AAC4430 AAC4433 AAC1552	AAC4376
PVDF Union Nut, G 1 1/4 Taper Part Clamping Piece O-ring, EPDM	AAC1819 AAC4436 AAC4439 AAC1555	AAC4379
PVC Union Nut, G 1 1/4 Taper Part Clamping Piece O-ring, VITON	AAC2390 AAC4442 AAC4445 AAC1552	AAC4382
PVC Union Nut, G 1 1/4 Taper Part Clamping Piece O-ring, EPDM	AAC2390 AAC4448 AAC4451 AAC1555	AAC4385
STAINLESS STEEL Union Nut, G 1 1/4 Taper Part Clamping Piece O-ring, VITON	AAB6688 AAC4454 AAC4457 AAC1552	AAC4388
STAINLESS STEEL Union Nut, G 1 1/4 Taper Part Clamping Piece O-ring, EPDM	AAC6688 AAC4460 AAC4463 AAC1555	AAC4391

6.2.2.3 Metric Connection Kit (Cont'd)

NOTE: Order two (2) kits per pump.

Descriptions	Part No.	Kit Part No.
PVC tube DN20 (D25) Suction and Discharge Lines or Stainless Steel, G3/4		
PVDF Union Nut, G 1 1/4 Insertion part (welded bush) O-ring, VITON	AAC1819 AAC4466 AAC1552	AAC4394
PVDF Union Nut, G 1 1/4 Insertion part (welded bush) O-ring, EPDM	AAC1819 AAC4469 AAC1555	AAC4397
POLYPROPYLENE Union Nut, G 1 1/4 Insertion part (welded bush) O-ring, VITON	AAC2393 AAC4472 AAC1552	AAC4400
POLYPROPYLENE Union Nut, G 1 1/4 Insertion part (welded bush) O-ring, EPDM	AAC2393 AAC4475 AAC1555	AAC4403
STAINLESS STEEL Union Nut, G 1 1/4 Insertion part, threaded, G3/4 O-ring, VITON	AAB6688 AAC4484 AAC1552	AAC4412
STAINLESS STEEL Union Nut, G 1 1/4 Insertion part, threaded, G3/4 O-ring, EPDM	AAC6688 AAC4484 AAC1555	AAC4415

NOTE: For PVC head material order connection kits with PVDF material.

6.2.2.4 Valve Kits - USA and EURO Versions

NOTE: Order two (2) kits per pump.

VALVE KITS WITHOUT SPRING, PVDF HOUSING MATERIAL	
Description - See Figure 6.2	USA or METRIC VERSION PUMP
Complete Valve Assembly, no spring PVDF housing with CERAMIC BALL and VITON O-ring	AAC4103
Complete Valve Assembly, no spring PVDF housing with CERAMIC BALL and EPDM O-ring	AAC4106
Complete Valve Assembly, no spring PVDF housing with CERAMIC BALL and KALREZ O-ring	AAC4109
Complete Valve Assembly, no spring PVDF housing with GLASS BALL and VITON O-ring	AAB6667
Complete Valve Assembly, no spring PVDF housing with GLASS BALL and EPDM O-ring	AAC4112
Complete Valve Assembly, no spring PVDF housing with GLASS BALL and KALREZ O-ring	AAC4115
Complete Valve Assembly, no spring PVDF housing with PTFE BALL and VITON O-ring	AAC4118
Complete Valve Assembly, no spring PVDF housing with PTFE BALL and EPDM O-ring	AAC4121
Complete Valve Assembly, no spring PVDF housing with PTFE BALL and KALREZ O-ring	AAC4124
Complete Valve Assembly, no spring PVDF housing with STAINLESS STEEL BALL and VITON O-ring	AAC4127
Complete Valve Assembly, no spring PVDF housing with STAINLESS STEEL BALL and EPDM O-ring	AAC4130
Complete Valve Assembly, no spring PVDF housing with STAINLESS STEEL BALL and KALREZ O-ring	AAC4133

NOTE: For PVC head material order valve kits with PVDF housing material.

6.2.2.4 Valve Kits - USA and EURO Versions (Cont'd)

NOTE: Order two (2) kits per pump.

VALVE KITS WITHOUT SPRING, POLYPROPYLENE HOUSING MATERIAL	
Description - See Figure 6.2	USA or METRIC VERSION PUMP
Complete Valve Assembly, no spring POLYPROPYLENE housing with CERAMIC BALL and VITON O-ring	AAC4136
Complete Valve Assembly, no spring POLYPROPYLENE housing with CERAMIC BALL and EPDM O-ring	AAC4139
Complete Valve Assembly, no spring POLYPROPYLENE housing with CERAMIC BALL and KALREZ O-ring	AAC4142
Complete Valve Assembly, no spring POLYPROPYLENE housing with GLASS BALL and VITON O-ring	AAB6667
Complete Valve Assembly, no spring POLYPROPYLENE housing with GLASS BALL and EPDM O-ring	AAC4145
Complete Valve Assembly, no spring POLYPROPYLENE housing with GLASS BALL and KALREZ O-ring	AAC4148
Complete Valve Assembly, no spring POLYPROPYLENE housing with PTFE BALL and VITON O-ring	AAC4151
Complete Valve Assembly, no spring POLYPROPYLENE housing with PTFE BALL and EPDM O-ring	AAC4154
Complete Valve Assembly, no spring POLYPROPYLENE housing with PTFE BALL and KALREZ O-ring	AAC4157
Complete Valve Assembly, no spring POLYPROPYLENE housing with STAINLESS STEEL BALL and VITON O-ring	AAC4160
Complete Valve Assembly, no spring POLYPROPYLENE housing with STAINLESS STEEL BALL and EPDM O-ring	AAC4163
Complete Valve Assembly, no spring POLYPROPYLENE housing with STAINLESS STEEL BALL and KALREZ O-ring	AAC4166

6.2.2.4 Valve Kits - USA and EURO Versions (Cont'd)

NOTE: Order two (2) kits per pump.

VALVE KITS WITHOUT SPRING, STAINLESS STEEL HOUSING MATERIAL	
Description - See Figure 6.2	USA or METRIC VERSION PUMP
Complete Valve Assembly, no spring STAINLESS STEEL housing and BALL, VITON O-ring	AAC4205
Complete Valve Assembly, no spring STAINLESS STEEL housing and BALL, EPDM O-ring	AAC4208
Complete Valve Assembly, no spring STAINLESS STEEL housing and BALL, KALREZ O-ring	AAC4211

6.2.2.4 Valve Kits - USA and EURO Versions (Cont'd)

NOTE: Order two (2) kits per pump.

SPRING LOADED VALVE KIT, PVDF HOUSING MATERIAL	
Description - See Figure 6.2	USA or METRIC VERSION PUMP
Complete Valve Assembly, 1.5 psi Spring Load PVDF housing with CERAMIC BALL and VITON O-ring	AAC4214
Complete Valve Assembly, 1.5 psi Spring Load PVDF housing with CERAMIC BALL and EPDM O-ring	AAC4217
Complete Valve Assembly, 1.5 psi Spring Load PVDF housing with CERAMIC BALL and KALREZ O-ring	AAC4220
Complete Valve Assembly, 1.5 psi Spring Load PVDF housing with GLASS BALL and VITON O-ring	AAB6667
Complete Valve Assembly, 1.5 psi Spring Load PVDF housing with GLASS BALL and EPDM O-ring	AAC4223
Complete Valve Assembly, 1.5 psi Spring Load PVDF housing with GLASS BALL and KALREZ O-ring	AAC4226
Complete Valve Assembly, 1.5 psi Spring Load PVDF housing with PTFE BALL and VITON O-ring	AAC4229
Complete Valve Assembly, 1.5 psi Spring Load PVDF housing with PTFE BALL and EPDM O-ring	AAC4232
Complete Valve Assembly, 1.5 psi Spring Load PVDF housing with PTFE BALL and KALREZ O-ring	AAC4235
Complete Valve Assembly, 1.5 psi Spring Load PVDF housing with STAINLESS STEEL BALL and VITON O-ring	AAC4238
Complete Valve Assembly, 1.5 psi Spring Load PVDF housing with STAINLESS STEEL BALL and EPDM O-ring	AAC4241
Complete Valve Assembly, 1.5 psi Spring Load PVDF housing with STAINLESS STEEL BALL and KALREZ O-ring	AAC4244

NOTE: For PVC head material order valve kits with PVDF housing material.

6.2.2.4 Valve Kits - USA and EURO Versions (Cont'd)

NOTE: Order two (2) kits per pump.

SPRING LOADED VALVE KIT, POLYPROPYLENE HOUSING MATERIAL	
Description - See Figure 6.2	USA or METRIC VERSION PUMP
Complete Valve Assembly, 1.5 psi Spring Load POLYPROPYLENE housing with CERAMIC BALL and VITON O-ring	AAC4247
Complete Valve Assembly, 1.5 psi Spring Load POLYPROPYLENE housing with CERAMIC BALL and EPDM O-ring	AAC4250
Complete Valve Assembly, 1.5 psi Spring Load POLYPROPYLENE housing with CERAMIC BALL and KALREZ O-ring	AAC4253
Complete Valve Assembly, 1.5 psi Spring Load POLYPROPYLENE housing with GLASS BALL and VITON O-ring	AAC4613
Complete Valve Assembly, 1.5 psi Spring Load POLYPROPYLENE housing with GLASS BALL and EPDM O-ring	AAC4256
Complete Valve Assembly, 1.5 psi Spring Load POLYPROPYLENE housing with GLASS BALL and KALREZ O-ring	AAC4259
Complete Valve Assembly, 1.5 psi Spring Load POLYPROPYLENE housing with PTFE BALL and VITON O-ring	AAC4262
Complete Valve Assembly, 1.5 psi Spring Load POLYPROPYLENE housing with PTFE BALL and EPDM O-ring	AAC4265
Complete Valve Assembly, 1.5 psi Spring Load POLYPROPYLENE housing with PTFE BALL and KALREZ O-ring	AAC4268
Complete Valve Assembly, 1.5 psi Spring Load POLYPROPYLENE housing with STAINLESS STEEL BALL and VITON O-ring	AAC4271
Complete Valve Assembly, 1.5 psi Spring Load POLYPROPYLENE housing with STAINLESS STEEL BALL and EPDM O-ring	AAC4274
Complete Valve Assembly, 1.5 psi Spring Load POLYPROPYLENE housing with STAINLESS STEEL BALL and KALREZ O-ring	AAC4277

6.2.2.4 Valve Kits - USA and EURO Versions (Cont'd)

NOTE: Order two (2) kits per pump.

SPRING LOADED VALVE KIT, PVC HOUSING MATERIAL	
Description - See Figure 6.2	USA or METRIC VERSION PUMP
Complete Valve Assembly, 1.5 psi Spring Load STAINLESS STEEL housing and BALL, VITON O-ring	AAC4316
Complete Valve Assembly, 1.5 psi Spring Load STAINLESS STEEL housing and BALL, EPDM O-ring	AAC4319
Complete Valve Assembly, 1.5 psi Spring Load STAINLESS STEEL housing and BALL, KALREZ O-ring	AAC4322

6.2.3 Electronic Board Assembly and Electric Motor, USA Version - 115 VAC, 60 Hz

All Series C	Electronic Board		Brake Board		Electric Motor	
	E00	E30	E00	E30	E00	E30
	NA	AAC5189	NA	AAC5192	AAC2462	AAC2537

6.2.4 Electronic Board Assembly and Electric Motor, EURO Version - 230 VAC, 50 Hz

All Series C	Electronic Board		Brake Board		Electric Motor	
	M00	M30	M00	M30	M00	M30
	NA	AAC5228	NA	AAC5231	AAC5162	AAC5147

6.3 Accessories

6.3.1 Suction Pipe Assembly With Double Empty Signal Report

NOTE: Check the height of the container to be used and order the suction pipe assembly that is more or less six inches higher than the container.

Order length of hose long enough from the top end of the suction line to the suction valve of the pump at its intended location. Suction lift must not exceed six feet (two meters.)

Length	Tube, O-ring, and Ball Material	5.07- 17.12 gph (16 - 54 l/h)	25.36 - 38.04 gph (80 - 120 l/h)
		Part Number	Part Number
18.7 inches/475 mm	PVC, Viton, Glass Ball	AAB7036	AAB7087
28.5 inches/725 mm		AAB7039	AAB7090
36.4 inches/975 mm		AAB7042	AAB7093
44.3 inches/1125 mm		AAB7045	AAB7096
55.1 inches/1400 mm		AAB7732	AAB7744
18.7 inches/475 mm	PVC, Viton, PTFE Ball	AAB7048	AAB7099
28.5 inches/725 mm		AAB7051	AAB7102
36.4 inches/975 mm		AAB7054	AAB7105
44.3 inches/1125 mm		AAB7057	AAB7108
55.1 inches/1400 mm		AAB7735	AAB7747
18.7 inches/475 mm	PVC, EPDM, Glass Ball	AAB7060	AAB7111
28.5 inches/725 mm		AAB7063	AAB7114
36.4 inches/975 mm		AAB7066	AAB7117
44.3 inches/1125 mm		AAB7069	AAB7120
55.1 inches/1400 mm		AAB7738	AAB7750
18.7 inches/475 mm	PVC, EPDM, PTFE Ball	AAB7072	AAB7123
28.5 inches/725 mm		AAB7075	AAB7126
36.4 inches/975 mm		AAB7078	AAB7129
44.3 inches/1125 mm		AAB7081	AAB7132
55.1 inches/1400 mm		AAB7741	AAB7753

Includes the following features:

- Check valve
- Suction Strainer
- Level pre-warning Contact
- Empty Signal Contact, normally close
- Hose Connections:
6/12mm (5.07-17.12gph), 12/21mm (25.36-38.04gph)

Material and Specifications:

- Tube Diameter, 32 mm
- Turn-on voltage, 48V AC/DC maximum
- Current, 0.5 amps
- Rupturing Capacity, 8 W/8VA

6.3.2 Multi-Function Valve

NOTE: For the valve requiring 6/12mm tubing connections, order package AAB7000 for Polypropylene or AAB6985 for PVDF.

Capacity 5.07-17.12gph (16-54l/h)		
Housing and O-ring Material	Pressure Relief Range	Part Number
PVDF, Viton	15 - 75 psi (1 - 5 Bar)	AAB6973
	75 - 150 psi (5 - 10 Bar)	AAB6976
PVDF, EPDM	15 - 75 psi (1 - 5 Bar)	AAB6979
	75 - 150 psi (5 - 10 Bar)	AAB6982
Polypropylene, Viton	15 - 75 psi (1 - 5 Bar)	AAB6988
	75 - 150 psi (5 - 10 Bar)	AAB6991
Polypropylene, EPDM	15 - 75 psi (1 - 5 Bar)	AAB6994
	75 - 150 psi (5 - 10 Bar)	AAB6997

NOTE: For the valve requiring 12/21mm tubing connections, order package AAB7033 for polypropylene or AAB7018 for PVDF.

Capacity 25.36-38.04gph (80-120l/h)		
Housing and O-ring Material	Pressure Relief Range	Part Number
PVDF, Viton	15 - 75 psi (1 - 5 Bar)	AAB7003
	75 - 150 psi (5 - 10 Bar)	AAB7006
PVDF, EPDM	15 - 75 psi (1 - 5 Bar)	AAB7009
	75 - 150 psi (5 - 10 Bar)	AAB7012
Polypropylene, Viton	15 - 75 psi (1 - 5 Bar)	AAB7021
	75 - 150 psi (5 - 10 Bar)	AAB7024
Polypropylene, EPDM	15 - 75 psi (1 - 5 Bar)	AAB7027
	75 - 150 psi (5 - 10 Bar)	AAB7030

6.3.3 Foot Valve

NOTE: Order connection adapter P49445 for 1/2" FNPT or P49446 for 1" FNPT.

Material	Capacity/Connection	Ball	O-rings	Part Number
PVC housing with Polypropylene screen	10 gph (1/2 FNPT) 70 gph (1" FNPT)	Viton	Viton	G590

6.3.4 Back Pressure Valve

Housing Material	Connections	Maximum Flow	Pressure Range & Temperature Limits	Diaphragm & O-ring	Part Number
PVC	3/4" NPT inlet and outlet	62.5 gph	25 to 170 psi 35 - 120° F	TFE faced Hypalon O-ring	U26658
Kynar			25 to 170 psi 35 - 180° F	TFE faced Viton O-ring	U26659

6.3.5 Pressure Relief Valve

Housing Material	Connections	Maximum Flow	Pressure Range & Temperature Limits	Diaphragm & O-ring	Part Number
PVC	3/4" NPT inlet and outlet	62.5 gph	25 to 170 psi 35 - 120° F	TFE faced Hypalon O-ring	U26654
Kynar			25 to 170 psi 35 - 180° F	TFE faced Viton O-ring	U26655

6.3.6 Main Connections

Connections	Material	Flow Capacity GPH	Part Numbers
1/2" OD tubing	PVC	20	U21641
3/4" FNPT	Kynar	104	U23856

6.3.7 Calibration Column

Flow Rate	Capacity	End Connections	Part Numbers
0-8 GPH	1000 mL	3/4" FNPT	AAC2552
0-32 GPH	2000 mL	1" FNPT	AAC2555
0-64 GPH	4000 mL	1" FNPT	AAC2558

6.3.8 Electrical Accessories

Description	Part Number
Connection cable assembly, 16.4 ft/ 5 M length	
For empty signal input with straight 4-pin plug	AAB6112
For pulse input with straight 4-pin plug	AAB6115
For pulse or current input, E30, with straight 5-pin plug	AAB6118
For empty signal or stroke signal output with straight 4-pin plug	AAB6121