

MiniMate Microprocessor Controlled Parts Manual 60 Hz

Liebert Corporation may make improvements and/or changes in the products described in the document at any time without notice. Part numbers and technical information are subject to change without prior notice.

Liebert Corporation assumes no responsibility and disclaims all liability for incidental or consequential damages resulting for use of this information from errors or omissions. mini-MATE™ MICROPROCESSOR CONTROL PARTS MANUAL 60 HERTZ

Disclaimer of Warranties and Limitation of Liabilities

The authors and editors have taken every precaution to ensure accuracy and completeness in this manual. The authors and editors make no expressed or implied warranty of any kind with regard to the documentation in this manual. Liebert Corporation assumes no responsibility, and disclaims all liability for incidental or consequential damages resulting from the use of this information or from errors or omissions. Liebert Corporation may make improvements and/or changes in the product(s) described in this manual at any time. Information in this manual is subject to change at any time and does not represent a commitment on the part of Liebert Corporation.

A **Reader Comment Form** is provided at the back of this manual. If the form has been removed, address comments to: Liebert Corporation, Customer Service & Support Division, 250 East Wilson Bridge Road, Suite 100, CS&S Documentation Support Group, Worthington, OH 43085. Liebert Corporation may use or distribute the information you supply in any way it believes appropriate without incurring any obligation whatever.

Liebert® and the Liebert logo are registered trademarks of Liebert Corporation. mini-MATE® is a trademark of Liebert Corporation.

Copyright © 1991 by Liebert Corporation All rights reserved

Printed in the United States of America

TABLE OF CONTENTS

| SECTION | РА | GE |
|---------|--|-----|
| 1 | EVAPORATOR/WATER GLYCOL/CHILLED WATER 1.5 TON MME018E, MME018A, MME020WG, MME23C | 1-1 |
| | Electronic/Electrical | 1-3 |
| | Capacitor | |
| | Contactor | |
| | Circuit Breaker | |
| | Relay | |
| | Transformer | |
| | Miniature Screwdriver | |
| | PCB, Microprocessor | |
| | PCB, Interface | |
| | PCB, Temperature/Humidity | |
| | Humidifier Assembly | 1-4 |
| | Electrical Components | |
| | Humidifier Components | |
| | Reheat Assembly | 1-5 |
| | Electrical Components | |
| | Reheat Components | |
| | Piping/Coil/Compressor | 1-6 |
| | Coil, Condenser | |
| | Coil, Evaporator | |
| | Compressor | |
| | Drain Pan | |
| | Filter Drier | |
| | Freezestat | |
| | Liquid Level Switch | |
| | Valve, Chill Water | |
| | Valve, Expansion | |
| | Valve, Solenoid | |
| | Valve, Water Regulator | |

TABLE OF CONTENTS (Continued)

SECTION PAGE Blower Wheel amd Housing Fan Motor Panel, Right Side Access Panel, Left Side Access Panel, Compressor Access Panel, Blower Access Panel, Electric Box Hanger Bracket **Grilles** 1-7 Filter Grille, Discharge Grille, Return 2 SPLIT SYSTEM: CONDENSER BLOWER FOR MME018A 2-1 SPLIT SYSTEM: CONDENSER ASSEMBLY FOR DMC020 2-1 Blower Assembly, MME018 2-3 Capacitors Fan Speed Control Fan Motor Electrical, DMC020 2-4

Capacitor Contactor Relay

TABLE OF CONTENTS (Continued)

| SECTION | PAGE |
|---------|--------------------------------|
| | Compressor, DMC020 2-4 |
| | Compressor |
| | Switch, Pressure |
| | Coil/Piping, DMC020 2-4 |
| | Coil, Condenser, DX |
| | Filter Drier |
| | Heater Pad |
| | Receiver, Lee Temp |
| | Valve, Check |
| | Valve, Low Ambient Control |
| | Valve, Relief |
| | Valve, Solenoid |
| | Fan Assembly, DMC020 2-4 |
| | Fan Blade |
| | Fan Motor |
| | Fan Shroud |
| | |
| | |

APPENDIX A MODEL NUMBER BREAKDOWN A-1

SECTION 1

EVAPORATOR/WATER GLYCOL/CHILLED WATER 1.5 TON MME018E, MME018A, MME020WG, MME23C

- Electronic/Electrical
- Humidifier
- Reheat
- Blower
- Piping
- Coil
- Panel

.

MODELS

MMEO18E-POO/PHO/XOO/XHO MME018A-POO/PHO/XOO/XHO MME023C-POO/PHO/XOO/XHO MME020WG-POO/PHO/XOO/XHO

| FIND # | DESCRIPTION | PART NUMBER | RSP |
|--------|--|--|-----------|
| 1-1 | ALL COMPONENTS, ELECTRONICS | | |
| 1-2 | Microprocessor Printed Circuit Board | 4D13391G1 | • |
| 1-3 | Interface Printed Circuit Board | 4C13521G1 | • |
| 1-4 | Temperature and Humidity Control Printed Circuit Board | 4C13121G2 | |
| | | | 5155 B 14 |
| 1-5 | ALL COMPONENTS, ELECTRICAL PANEL | | |
| 1-6 | Capacitor, Run, 4.0 MFD 370 VAC | 1C26250P1 | |
| 1-7 | Relay, 1 Pole, 24 Volt (Main Fan, Dehumid Relays) | E03-0170 | - |
| 1-8 | Power Block, 2 Pole | 121187P1 | |
| 1-9 | Transformer, 75VA 208/230-24 50/60HZ | <u>127184P1</u> | - |
| 1-10 | Transformer, 75VA 277-24 50/60HZ | E03-0010 | • |
| 1-11 | Circuit Breaker | 1A17009P1 | - |
| 1-12 | Contactor, 2 Pole, 24 Volt Coil 25/35 Amp | E-011B | |
| | COMPLETE ASSEMBLY, CONTROL PANEL, WALL MONTED | 122136G1 | |
| 1-13 | Cover, Plastic, Front, Wall Box | 122131P1 | |
| 1-14 | Cover, Plastic, Back, Wall Box | 122132P1 | |
| 1-1-1- | Label, Membrane Keypad, Wall Box | 122135P1 | |
| 1-16 | Cable, 12 Conductor, 30 Feet | 128571P1 | |
| 1-17 | Miniature Screwdriver | 128555P1 | • |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | A constraint of the second sec | |
| | | | |
| | | | |
| | | | |

ELECTRONICS/ELECTRICAL

PAGE 1 - 3

1.5 Ton

444

MMEO18E-POO/PHO MME018A-POO/PHO MME023C-POO/PHO MME020WG-POO/PHO

HUMIDIFIERS

| FIND # | DESCRIPTION | PART NUMBER | RSP |
|--------|--|--|-------------|
| | ALL COMPONENTS, ELECTRICAL PANEL, HUMIDIFIER | | |
| 1-1 | Relay, Control, 1 Pole, 24 Volt | E03-0170 | • |
| 1-2 | Relay, Capacity HIGH/LOW 1 Pole, 24 Volt | E03-0170 | |
| 1-3 | Circuit Breaker, 3.0 Amp | 1C19584P1 | |
| 1-4 | Circuit Breaker, 4.5 Amp | 1C19584P2 | |
| 1-5 | Manual Drain Switch | 1A19592P1 | |
| | | | |
| 1-6 | COMPLETE ASSEMBLY, HUMIDIFIER/REHEAT | | |
| | HUMIDIFIER/REHEAT 208/230V, MME018/MME020 | 127308G1 | |
| | HUMIDIFIER/REHEAT 277V, MME018/MME020 | 127308G2 | 1 |
| | HUMIDIFIER/REHEAT 208/230V, MME023 | 127308G3 | |
| | HUMIDIFIER/REHEAT 277V, MME023 | 127308G4 | |
| 1-7 | Valve, Flo Regulator | 1C19585P1 | |
| 1-8 | Valve, Solenoid | 1C19657P1 | |
| 1-9 | Sleeve, Compression 1/4" | P-057A | |
| 1-10 | Nut, Compression 1/4" | P-058A | |
| 1-11 | Elbow, Brass 1/4 COM x 1/4 MPT | P15-0250 | |
| 1-12 | Tubing, PVC 3/80Dx1/4ID | 1A18222P1 | |
| 1-13 | Reducer 1/4" TO 1/8" | 1A19660P1 | |
| 1-14 | Connector, Nylon 3/8 Tube x 3/8MPT | 1A19661P1 | 1 |
| 1-15 | Elbow, 1/2 Tube x 3/8MPT | 1A19662P1 | |
| 1-16 | Tee, Nylon 3/8 Tube x 1/4MPT | 1A19664P1 | |
| 1-17 | Adapter Block Skinner Valve | 1A19704P1 | |
| 1-18 | Connector, Nylon 3/8 Tube x 1/4MPT | 1A19749P1 | |
| 1-19 | Capillary Tube | 1C19702G1 | ji godine i |
| 1-20 | Humidifier Fill Plate | 1C19732P1 | |
| 1-21 | Humidifier Bottle Assy | 1D16378P42 | |
| 1-22 | Clamp, Hose 1-1/4"SS | 124216P1 | |
| 1-23 | Hose, Steam 7/8"ID 10PSI | 12421011 124220P1 | |
| 1-24 | Tube, Norprene 3/8"OD x 1/4"ID | 12422011 124222P1 | |
| 1-25 | Support, Tube 1/4"OD P-Propylene | 124224P1 | |
| 1-26 | Tee, Nylon M-Run 3/8 Tube x 1/4MPT | 127166P1 | |
| 1-27 | Humidifier Housing | 127300G1 | |
| 1-28 | Tube, Humidifier Drain | 127305P1 | |
| 1-29 | Tube, Humidifier Fill | 127306P1 | |
| 1-30 | Manifold, Steam | 127407G1 | |
| | | 12/40/01 | |
| | | | |
| 1900 | | All states of the second secon | |

.

MODELS

MMEO18E-PHO/XHO MME018A-PHO/XHO MME023C-PHO/XHO MME020WG-PHO/XHO

| | | | REHEAT | |
|--------|---|--|----------|--|
| FIND # | DESCRIPTION | PART NUMBER | RSP | |
| | ALL COMPONENTS, ELECTRICAL PANEL, REHEAT | | | |
| 1-18 | Contactor, 2 Pole, 24V | E-011A | • | |
| 1-19 | Safety Switch, Thermal 120F | R15-0070 | | |
| 1-20 | COMPLETE ASSEMBLY, HUMIDIFIER/REHEAT | | | |
| | HUMIDIFIER/REHEAT 208/230V, MME018/MME020 | 127308G1 | | |
| | HUMIDIFIER/REHEAT 277V, MME018/MME020 | 127308G2 | 1.191.12 | |
| | HUMIDIFIER/REHEAT 230V, MME023 | 127308G3 | | |
| | HUMIDIFIER/REHEAT 277V, MME023 | 127308G4 | | |
| 1-21 | Heater, Fin-Tube (240V, 4.5 KW) | 1D19572P2 | ▲ | |
| 1-22 | Heater, Fin-Tube (277V, 4.5 KW) | 1D19571P3 | • | |
| 1-23 | Retainer, Reheat Element | 127035P1 | | |
| 1-24 | Plate, Mounting, Reheat Element | 127015P1 | 10.110.5 | |
| | | A strain of the | | |
| | | | | |
| | | | | |
| | | A construction of the second s | | |
| | | Antiplete | | |
| | | Scawar Sc | | |
| | | Analysis and a second second second second second second second s | | |
| | | | | |
| | | | | |
| | | Merrors of Provide and Array and Ar | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

•

REHEAT

(08-91)

MMEO18E-POO/PHO MME018A-POO/PHO MME023C-POO/PHO MME020WG-POO/PHO

PIPING/COIL/COMPRESSOR

| FIND # | DESCRIPTION | PART NUMBER | RSP |
|--------|---|-------------|-----------|
| | ALL COMPONENTS, PIPING | | 8 |
| 1-1 | Solenoid Valve Assembly | 127403G1 | |
| 1-2 | Expansion Valve, 3/8 x 1/2 x 1/80DF | 127168P1 | 4 |
| 1-3 | Solenoid Valve, 1/4"IDS-3/80DS | 127169P1 | |
| 1-4 | Distributor | 127192P1 | |
| 1-5 | Water Reg Valve-3/8"-2-Way (MME020WG MODELS ONLY) | 127170P1 | |
| 1-6 | Valve, Chill Water 1/2" 2-Way | 127585P1 | 4 |
| 1-7 | Liquid Indicator (Sight Glass) 3/8"ODF | P-3870 | |
| 1-8 | Filter/Drier 3/8"0DF-1/20DM | 127185P1 | • |
| 1-9 | Freezestat | 1A19716P1 | • |
| | | | 1 - 1 - 2 |
| | ALL COMPONENTS COIL | | |
| 1-10 | Evaporator Coil, Dx, 2-Circuit | 127155P1 | |
| 1-11 | Evaporator Coil, Cw, 4-Circuit 127/57Pl | 125157P1 | |
| 1-13 | Condenser, Coil (MME018A MODELS ONLY) | 127156P1 | |
| 1-14 | Condenser, Plate (MME020WG MODELS ONLY) | 127159P1 | |
| 1-15 | Liquid Level Switch (High Water Float) | 1A18660P1 | |
| | | | |
| 1-16 | COMPLETE ASSEMBLY, DRAIN PAN | 127042G1 | |
| 1-17 | Coupling Half-SS-304 1/2 IPS | P-4040 | |
| 1-18 | Drain Pan | 127014P1 | |
| 1-19 | Ell 1/2" 90 | P-5300 | |
| | | 1 0000 | |
| | ALL COMPONENTS, COMPRESSOR | | |
| 1-20 | Compressor, Hermetric 208/230-1-60 | 127150P1 | |
| 1-21 | Compressor, Hermetric 277-1-60 (463019) | 127165P1 | |
| 1-22 | Pressure Switch, Hi-Cutout-360PSI | P15-0080 | 4 |
| 1-23 | Compressor Mounting Plate | 127007P1 | |
| 1-24 | Isolator, Rubber | 1A19640P1 | 11000 |
| 1-25 | Capacitor, Terminal Boot | B-1450 | |
| 1-26 | Capacitor, Mounting Bracket | B15-0120 | 1000000 |
| 1-27 | Capacitor, 25 MF 370 VAC (208-230 Volt) | C03-005A | • |
| 1-28 | Capacitor, 25 MF 440 VAC (277 Volt) | C03-008A | |
| | <u> </u> | 000 0001 | |
| | | | |
| | | | |
| | | | |
| AU MA | | | |
| | | | |
| | | | |

MODELS

1.5 Ton

MMEO18E-PHO/XHO MME018A-PHO/XHO MME023C-PHO/XHO MME020WG-PHO/XHO

| FIND # | DESCRIPTION | PART NUMBER | RSP |
|--------------------|--|----------------------|-------------------|
| 1-1 | COMPLETE ASSEMBLY, BLOWER | | |
| | BLOWER ASSEMBLY, 208/230V | 127177G1 | |
| | BLOWER ASSEMBLY, 277V | 127177G2 | |
| 1-2 | Blower Wheel and Housing | B03-0060 | |
| 1-3 | Main Fan, 1/5HP 208/230-1-60Hz 2 Speed | 127161P1 | |
| 1-4 | Main Fan, 1/5HP 277-1-60Hz 2 Speed | 127162P1 | |
| 1-5 | Base Pan | 127011P1 | 1990 |
| 1-6 | Bracket, Bottom Blower | 127012P1 | 1 |
| 10 | | | |
| 1-7 | COMPLETE ASSEMBLY, GRILLE | 127049G1 | |
| 1-8 | Filter 1" 20.0 x 20.0 25% | A03-0010 | • |
| 1-9 | Grill Return, Lanced 2x2 Filter, 1 Way | 127160P1 | |
| 1-10 | Grill, Discharge, Lanced 2x2 Filter, 3 Way | 127160P2 | |
| 1-10 | Offit, Discharge, Danced 2x2 Thier, 5 Way | | |
| 1-11 | ALL COMPONENTS, PANELS | | |
| 1-11 | Panel, Right Side Access | 127001P1 | |
| 1-12 | Panel, Left Side Access | 127002P1 | |
| 1-15 | Panel, Compressor Access | 127003P1 | |
| 1-15 | Panel, Blower Access | 127004P1 | |
| | Panel, Electric Box | 127008P1 | |
| 1-17 | | 127010P1 | |
| 1-18 | Angle, Mounting, Electric Box | 12701011 127006P1 | |
| 1-19 | Cover, Top | 1C19591P1 | |
| 1-20 | Bracket, Hanger | 1A19733P1 | |
| 1-21 | Bracket, Hanging Hardware, Rubber Viberation Absorbers | <u> </u> | 10000 |
| Contraction of the | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | a states a |
| | | | |
| 11.000 | | | <u> </u> |
| CONTRACTOR OF | | | |
| | | | |
| | | | |
| | | | |
| | | | <u>a (1999)</u> |
| <u></u> | | | |
| 10110100 | | | 1.5.0.23.5.0.26.5 |
| | | | |

BLOWER/PANELS/GRILLE

.

SECTION 2

SPLIT SYSTEM: CONDENSER BLOWER FOR MME018A SPLIT SYSTEM: CONDENSER ASSEMBLY FOR DMC020A

- Electrical
- Blower
- Compressor
- Piping
- Coil
- Condenser Blower
- Fan Assembly

\$

1

\$

,

SPLIT SYSTEM: CONDENSER BLOWER

| FIND # | DESCRIPTION | PART NUMBER | RSP |
|--------|----------------------------------|-------------|-----|
| | ALL COMPONENTS, CONDENSER BLOWER | | |
| 1-1 | Motor, 1/4HP 208/230 Volt | 127163P1 | |
| 1-2 | Motor, 1/4HP 277 Volt | 127164P1 | |
| 1-3 | Capacitor, Run, 7.5MFD 370VAC | 127186P1 | • |
| 1-4 | Fan Speed Control, Single Sensor | 1C25446P1 | 4 |
| 1-5 | Capacitor Mounting Bracket | C03-0130 | |
| 1-6 | Blower Support Bracket | 1C19572P1 | |
| 1-7 | Fan Speed Access Panel | 127017P1 | |
| 1-8 | Fan Speed Control Box | 127025P1 | |
| 1-9 | Formed Duct Angle | 127028P1 | |
| 1-10 | Condenser Blower Outlet | 127022P1 | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

1.5 Ton

PAGE 2 - 3

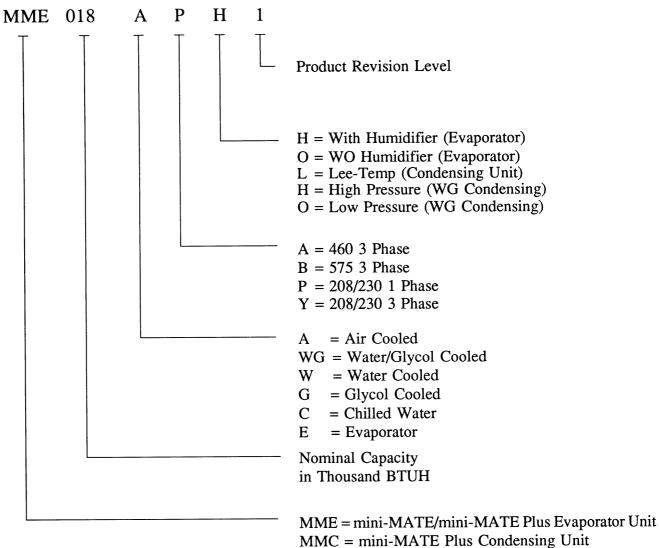
DMC020-PLL

| SPLIT SYSTEM: CON | DENSER ASSEMBLY |
|-------------------|-----------------|
|-------------------|-----------------|

| 1-11Contactor, 2 Pole1-12Capacitor, 5.0 MI1-13Bracket, Capacitor1-14Capacitor, Start,1-15Bracket, Capacitor1-16Capacitor, 40 MF1-17Bracket, Capacitor | DESCRIPTION | PART NUMBER | RSP |
|--|--|--|-----|
| 1-11Contactor, 2 Pole1-12Capacitor, 5.0 MI1-13Bracket, Capacitor1-14Capacitor, Start,1-15Bracket, Capacitor1-16Capacitor, 40 MF1-17Bracket, Capacitor | TS, ELECTRICAL PANEL CONDENSER | | |
| 1-12Capacitor, 5.0 MI1-13Bracket, Capacitor1-14Capacitor, Start,1-15Bracket, Capacitor1-16Capacitor, 40 MF1-17Bracket, Capacitor | 24 Volt 25/35 Amp | E-011B | • |
| 1-14Capacitor, Start,1-15Bracket, Capacito1-16Capacitor, 40 MF1-17Bracket, Capacito | | B-1220 | • |
| 1-14Capacitor, Start,1-15Bracket, Capacitor1-16Capacitor, 40 MF1-17Bracket, Capacitor | r Mounting | C03-0130 | |
| 1-16Capacitor, 40 MF1-17Bracket, Capacitor | 88-100 MF 250 VAC | C15-0050 | |
| 1-16Capacitor, 40 MF1-17Bracket, Capacitor | r Mounting | \$67-0010 | |
| 1-17 Bracket, Capacito | 370 VAC | 1A19538P1 | |
| | | 1A19542P1 | |
| 1-18 Potential Relay | | 1B21249P1 | |
| | rs, compressor | | |
| | netric 208/230-1-60 | 1D21114P1 | |
| 1-20 Pressure Switch | 360 PSI | 1C21139P1 | 4 |
| ALL COMPONEN | | | |
| 1-21 Coil, Dx, Conden | | 1D21107P1 | |
| 1-22 Lee Temp Receiv | er | 1C21264P1 | |
| 1-23 Heater Pad, Recei | | 1C21138P2 | • |
| 1-24 Relief Valve 400 | PSI 1/4" NPT | 123900P1 | 4 |
| | ntrol Valve Assembly | 121256G2 | |
| 1-26 Valve, Low Am | bient Control | 1C21207P1 | • |
| 1-27 Valve, Check 3 | /8" | 1A21208P1 | • |
| 1-28 Filter Drier 1/4" | | 1C21132P1 | |
| | oid Valve 3/8" 208/240 Volt | 126630P1 | • |
| 1-30 Sight Glass 1/4" | | 1A21133P1 | |
| 1-31 COMPLETE ASS | EMBLY, FAN | | |
| 1-32 Fan Motor 1/5 | HP 208/230-1-60 | 1D21121P1 | |
| 1-33 Fan Blade | | 1D21119P1 | • |
| 1-34 Fan Shroud | | 1D21136P2 | • |
| | | | |
| Alacción Alacción< | | | |
| | Markata Markata | | |
| Antonio Marco Mar | And the second s | | |
| A Sector | | MUMUNI MU | |
| | | | |
| | | | |

(08-91)

MODEL NUMBER BREAKDOWN



DMC = Outdoor Condensing Unit

•

•

.

To assure your manual is up to date, record the date you receive each update across from the appropriate number (UPDATE #1....DATE RECEIVED : <u>8 - 4 - 92</u>)

| UPDATE #1 DATE RECEIVED : |
|----------------------------|
| UPDATE #2 DATE RECEIVED : |
| UPDATE #3 DATE RECEIVED : |
| UPDATE #4 DATE RECEIVED : |
| UPDATE #5 DATE RECEIVED : |
| UPDATE #6 DATE RECEIVED : |
| UPDATE #7 DATE RECEIVED : |
| UPDATE #8 DATE RECEIVED : |
| UPDATE #9 DATE RECEIVED : |
| UPDATE #10 DATE RECEIVED : |
| UPDATE #11 DATE RECEIVED : |
| UPDATE #12 DATE RECEIVED : |
| UPDATE #13 DATE RECEIVED : |
| UPDATE #14 DATE RECEIVED : |
| UPDATE #15 DATE RECEIVED : |
| UPDATE #16 DATE RECEIVED : |
| UPDATE #17 |
| UPDATE #18 DATE RECEIVED : |
| UPDATE #19 |
| UPDATE #20 |
| UPDATE #21 DATE RECEIVED : |
| UPDATE #22 DATE RECEIVED : |
| UPDATE #23 DATE RECEIVED : |
| UPDATE #24 DATE RECEIVED : |
| |

READER COMMENT FORM

This manual is a part of a library that serves as a source for suppliers and users of Liebert equipment. The authors have taken every precaution to ensure accuracy and completeness of the manual. Use this form to communicate your views about the publication. Your input is voluntary, but it is appreciated.

Mail comments to the address below. All comments are sent to the author's department for review and action, if any is deemed appropriate. Comments may be written in your own language. English is not required.

> Liebert Corporation Customer Services & Support Division 250 East Wilson Bridge Road Suite 100, CS&S Documentation Support Group Worthington, OH 43085 614-841-6400

Liebert Corporation may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation whatever. You may, of course, continue to use the information you supply.

| Check | if you wish a reply to your comments. |
|-----------|---------------------------------------|
| Name: | |
| Addres | S: |
| Occupa | ntion: |
| Comments: | |
| | |
| | |
| | |
| | |
| | |

READER COMMENT FORM

This manual is a part of a library that serves as a source for suppliers and users of Liebert equipment. The authors have taken every precaution to ensure accuracy and completeness of the manual. Use this form to communicate your views about the publication. Your input is voluntary, but it is appreciated.

Mail comments to the address below. All comments are sent to the author's department for review and action, if any is deemed appropriate. Comments may be written in your own language. English is not required.

> Liebert Corporation Customer Services & Support Division 250 East Wilson Bridge Road Suite 100, CS&S Documentation Support Group Worthington, OH 43085 614-841-6400

Liebert Corporation may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation whatever. You may, of course, continue to use the information you supply.

| Check i | f you wish a reply to your comments. |
|-----------|--------------------------------------|
| Name: | |
| Address | |
| | |
| Occupa | tion: |
| | |
| Comments: | |
| | |
| | |
| | |
| | |
| | |
| | |

, `