

MC170-32
Module Case

MC170-32 INSTRUCTION MANUAL
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1.0 DESCRIPTION

1.1 GENERAL

The MC170-32 Module Case has slots for 32 plug-in modules from the Validyne MC170 Signal Conditioning System. The case contains an internal power supply which supplies regulated DC to all module positions. An optional 3 kHz carrier oscillator circuit board can be installed to provide carrier power to all module positions and related transducers. All electrical input/output connections are made to terminal headers on the rear panel. The operating power is selectable, 115 or 230 Vac. The case is equipped with a bail to raise the front for bench-top use (see the Outline Drawing in the Appendix). A rack-mounting kit is available for mounting the case in a standard 19-inch relay rack.

1.2 SIGNAL-CONDITIONING MODULES

The following MC170 Modules are readily available for use in the MC170-32:

- BA172 Dual-Channel AC/DC Buffer Amplifier
- CD173 Carrier Demodulator
- PT174 Resistance Thermometer Signal-Conditioner
- PA175 Piezoelectric Signal-Conditioner
- CA192 Carrier Demodulator and Alarm Unit
- PC202 Potentiometric Signal-Conditioner
- BA214 AC/DC Buffer Amplifier
- CD218 Dual-Channel Carrier Demodulator
- FC268 Frequency-to-Voltage Converter
- TC292 Thermouple Signal-Conditioner
- AL293 Alarm Unit
- SR302 Square-Root Converter
- BA332 Buffer Amplifier
- PA375 Piezoelectric Transducer Conditioner

The module instruction manual should be consulted for its detailed operation and adjustment. Validyne is constantly supplying these modules with customer-specified modifications; should you have such requirements, please contact the Application Engineering Department.

1.3 MODULE POSITIONING

Any module can be installed in any slot; however, the input connections on the rear panel must be in accordance with the module requirements. The input terminal wiring for each module is shown on the MC170-32 Module/Case Wiring Diagram in the Appendix.

Modules can be installed or extracted with no effect on the other modules in the case. It is recommended that this be done with the power off to eliminate any possibility of module/case connector contact erosion.

2.0 INSTALLATION AND OPERATION

2.1 PHYSICAL AND ENVIRONMENTAL

See the MC170-32 Outline Drawing in the Appendix for physical dimensions. As noted, the case is designed for bench-top operation, with a tilt bail on the bottom front, or can be rack-mounted by attaching optional rack-mount brackets to each side. Installation should be in a weather-proof area in which the ambient temperature is within 0 to 150 F with a relative humidity less than 95%, non-condensing. For best stability, installation in an area free from large temperature variations is recommended.

2.2 POWER CONNECTIONS

As noted on the MC170-32 Outline Drawing, a 3-pin IEC type AC power connector is located on the rear of the case. A nine-foot long ground-wire power cord with connectors on each end is supplied with the case when 115 Vac operation is specified on the order. An eight-foot long cord with only a case-mating connector is supplied when 230 Vac operation is specified.

The case operating voltage is selected by a removable plug located just below the power connector. This plug can be extracted by using a screwdriver at the top edge to pry it loose. This square plug has two arrows on it, one identified by 115V and the other by 230V. To select either 115 Vac or 230 Vac, insert the plug so that the proper arrow lines up with the arrow below the plug on the case. Be sure the proper fuse, as listed on the Outline Drawing, is in the plug.

The power switch is located just above the power connector on the rear panel. An LED indicator light on the right side of the front panel indicates the power on/off status. For cases without the optional carrier oscillator, this LED is activated by the DC power supply to show that it is operational. For cases with the optional carrier oscillator, this LED is activated by the carrier output to show that both the DC and carrier supplies are operational.

2.3 INPUT CONNECTIONS

A seven-pin header for each module position is located on the rear panel. The input connections to this header are dependent on the module to be installed. See the MC170-32 Module/Case Wiring Diagram in the Appendix for each module's input connections. The following mating connectors are available:

WAGO #231-107-3 Cage Clamp Type (Validyne P/N 1970-1007 for package of six)

Buchanan #SSB4L-07S Screw Cage Type (Validyne P/N 1970-2007 for package of six)

Shielded cable should be used for wiring to external transducers in order to minimize electrical noise. See the module instruction manual for such cabling recommendations.

2.4 OUTPUT CONNECTIONS

Two 40-pin headers, located at the right-hand side of the rear panel, provide terminals for the "A" and "B" signal outputs from each module position. All of the MC170 plug-in modules except the AL293 Alarm Unit have an "A" output, which is an analog signal output. These "A" outputs, along with signal ground terminals, are available at Connector J1; the terminal pin number identifies the module channel position. Many of the modules also have an additional "B" signal output; these "B" outputs are available at Connector J2, with the terminal pin number identifying the channel.

The Module/Case Wiring Diagram in the Appendix shows the outputs for each module by the notation "A" or "A/B" under the input terminal identification for each module. "A" indicates A output only; A/B indicates both A and B outputs. Check the module instruction manual for full descriptions of the module outputs.

A signal ground terminal for test use is located at the bottom left hand side of the rear panel, and a signal ground test jack is located on the right front of the module case. These ground terminals can be used as the ground reference for both input and output signals.

A flat ribbon cable with 40-pin connectors on each end can be used to interconnect the MC171-32 A outputs to the input of a DA380 Digital Data Acquisition System. This is listed below.

The following mating connectors are available from Validyne:

- 40-pin Crimp Type Contacts and Housing - AMP #86016-2 and 1-87835-4 (Validyne P/N 11401)
- 40-pin Flat Ribbon Cable Type - AMP #499956-B (Validyne P/N 1900-0040)
- Interface Cable, A Output to DA380 Input, Flat Ribbon with 40-pin Connectors (Validyne P/N 11439)

2.5 OPERATION

After the input/output connections have been made, the modules installed, and AC operating power applied via the power switch on the rear panel, no operational checks are necessary if the Power On LED indicator light on the front right hand side of the front panel is lit. This shows that the internal power supplies are functional.

See the instruction manuals for the installed modules for module adjustment, calibration, and operational procedures.

3.0 MAINTENANCE AND REPAIR

3.1 PERIODIC MAINTENANCE

As the MC170-32 Module Case is basically a holding fixture which supplies operating power and provides input/output connections for the signal-conditioning modules installed therein, it requires no specific maintenance routine except for an occasional inspection for accumulated dust and dirt. If periodic maintenance is desired, the following procedures are recommended:

Dust and Dirt: Remove all modules and inspect the interior of the module space for dust, dirt, and damaged circuit-board connectors at the rear of the module slots. Dust and dirt can be removed by wiping, brushing, or air jet. Do not freely spray liquid cleaning solutions into the case. The frequency for this procedure must be determined by the cleanliness conditions in the area; the dirtier the place, the more often the procedure, and vice versa.

Electrical Connections: Check to see that all input/output connections on the rear panel are properly mated; this should be done whenever the case is moved about, as in the cleaning procedure above. It is a good idea to clean off any accumulated dirt at this time.

Modules: Check the signal-conditioning modules for accumulated dust and dirt, and clean as necessary. Check the printed circuit terminals at the end of the circuit board for any damage or wear.

3.2 POWER SUPPLIES

As shown in Figure 3-2, the MC170-32 power supplies are located under the top of the module case. The DC power supply consists of two circuit boards, and the optional 5 Vrms 3 kHz carrier supply consists of one board. These are identified in Figure 3-2 and their interconnections shown in the DC Power Supply Schematic in the Appendix.

For access to the power supplies, remove the top row of screws on both sides of the module case and lift off the top cover. This also exposes the printed circuit board connectors at the rear of the module slots. If operating voltage checks are desired, they can easily be made by measuring the DC and carrier voltages at any module connector, as these operating voltages are bussed to the same terminals on all module positions. These terminal identifications are, with No. 1 & 2 at the top:

+15 Vdc:	Terminal	7 or 8,	referred to ground
Ground:	"	9 or 10	
-15 Vdc:	"	11 or 12,	referred to ground
2.5 Vrms:	Terminals	1 or 2,	referred to ground
2.5 Vrms:	"	3 or 4,	" " "

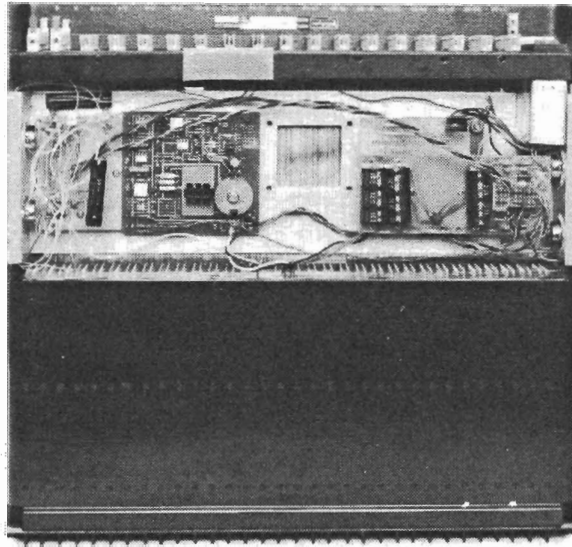


FIGURE 3-2, MC170-32 POWER SUPPLIES (CASE TOP REMOVED)

3.3 INSTALLATION OF CARRIER POWER SUPPLY

The MC170-32 can be ordered with the optional 5 Vrms 3 kHz supply factory-installed, or this power supply can be installed later by the customer. As the case is already internally wired to distribute carrier power to all module positions, installation of this power supply board requires no additional wiring.

To install this carrier oscillator board, remove the top cover of the module case. Mount this board in the location shown in Figure 3-2. See the DC Power Supply Schematic, Appendix, for connections to this board.

- 3.3.1 Connect the two-terminal plug soldered to terminals 1 and 3 of channel 17 onto the two-pin header at E15 on the carrier board.
- 3.3.2 Connect the plug carrying red, violet, and black/white wires from E16 on the carrier board to the 4-pin header at E5 on the 15 Vdc board.
- 3.3.3 Disconnect the two-pin plug from the E3 header on the 15 Vdc board and reconnect it to the E14 header on the carrier board; this connects the front-panel LED power indicator to the carrier output.

Carrier operation can be checked by measuring the 5 Vrms 3 kHz voltage now available between terminals 1/2 and 3/4 at any module connector.

3.4 SERVICE ACCESSORIES

The following accessories are available to aid in servicing the MC170-32 System:

- Module Extractor - Clamps to front of module to aid in removing module from case
P/N 2130-5000
- Blank Module - Blank module circuit board with plated contacts for PC connector in module slot; ideal for special circuits
P/N 8579
- Module Extender - Plug-in module with 18-inch cable and PC connector; extends internal module connections to outside of case; useful for making internal module adjustments with power applied
P/N 8609

3.5 REPLACEMENT PARTS:

The following parts are available for replacement purposes:

- P/N 11930 15 Vdc Regulator Circuit Board Assembly
- P/N 11938-1 5V/3A Regulator Circuit Board Assembly
- P/N 11924 Carrier Oscillator Circuit Board Assembly
- P/N 2975-7501 Power Cord, 115 Vac
- P/N 11849 Power Cord, 230 Vac

3.6 REPAIR

The MC170-32 Module Case is covered by the standard Validyne product warranty included in the front of this manual. Should repair become necessary because of damage or malfunction, we recommend that the unit be returned to Validyne for prompt inspection and repair. See the warranty for return instructions.

Equipment returned for repair should be shipped with shipping charges prepaid to:

VALIDYNE ENGINEERING CORPORATION
8626 WILBUR AVENUE
NORTHRIDGE, CA 91324

ATTN: CUSTOMER SERVICE

WARRANTY

VALIDYNE ENGINEERING CORPORATION warrants equipment of its own manufacture to be free from defects in material and workmanship under normal conditions of use and service.

VALIDYNE will repair or replace any component found to be defective on its return to VALIDYNE within the time specified below:

1. Pressure Transducers and Pressure Transmitters (including transducers supplied as part of Digital Manometer Systems) within three (3) years of its original purchase.
2. Electronic products (Transducer indicator, carrier demodulators, plug-in signal conditioners, module cases, etc.) within one (1) year of its original purchase.

Buyer is requested to secure authorization of VALIDYNE, and to describe defect prior to return of equipment under warranty. Shipment to VALIDYNE shall be at Buyer's expense, with return at VALIDYNE's expense. NON-VERIFIED problems or malfunctions whether warranty or not are subject to an \$80.00 evaluation charge.

The warranty carries no liability, either expressed or implied, beyond our obligation to repair or replace, at VALIDYNE's option the unit which carries the warranty to the original purchaser. Prices, specifications and designs subject to change without notice. This warranty is void if the product is subjected to misuse, accident, neglect or improper application, installation or operation.

REPAIR POLICY

Units returned to VALIDYNE for repair which are not under warranty will be subject to the following conditions.

1. A description of the problem or malfunction shall accompany the unit returned for repair, or be communicated to VALIDYNE prior to shipment. Otherwise there will be a minimum evaluation and/or calibration charge of \$80.00.
2. Unit will be repaired automatically if charge is less than 65% of current list price unless other specific instructions are received. Above 65% VALIDYNE will request authorization by buyer.
3. If quotation is required before proceeding with repairs unit should be accompanied by paper so stating, or information communicated to VALIDYNE prior to shipment.
4. Buyer is to secure authorization and shipping method from VALIDYNE prior to return of equipment or shipment will be rejected. (Applies to Canada only)

REPAIR WARRANTY

Warranty coverage on repairs is 90 days on work done, or to the end of the original warranty period, whichever is longest.