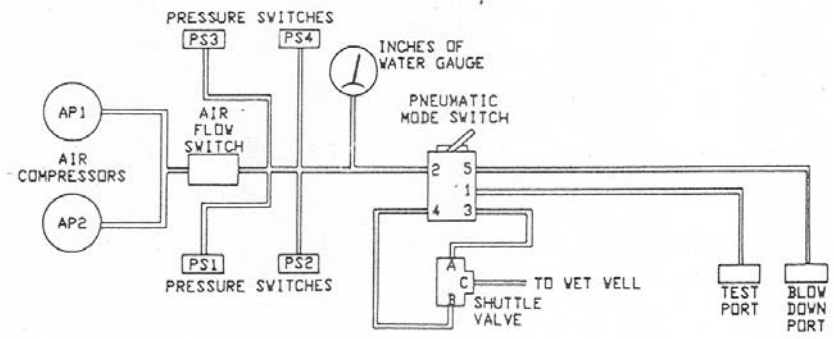
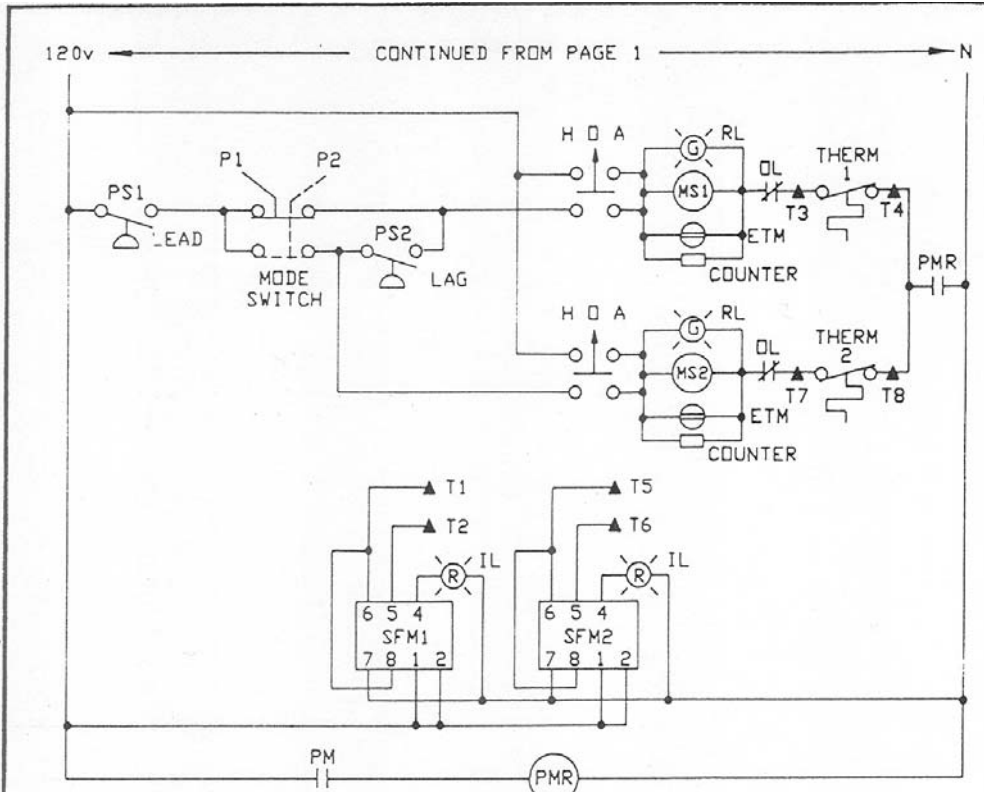


CUST: CITY OF ROCKLEDGE PROJ: L.S. #27 REHAB PUMP: S4P1000M3-4 230v, 3ph/10hp/29.4 F.L.A.	<b>UNITRON CONTROLS</b> SUBSIDIARY OF BARNEY'S PUMPS, INC. 3907 HWY 98 SOUTH LAKELAND, FLORIDA 33802 (813) 665-8500 FAX: (813) 665-2165	
	DATE: 1/3/94	BPI#: 10803
	REV. DATE:	DRAWN BY: JP
	REV. DATE:	DRAWING #: 10803
REV. DATE:	PAGE: 1 OF 3	



PNEUMATIC DIAGRAM

CUST: CITY OF ROCKLEDGE  
 PROJ: L.S. #27 REHAB  
 PUMP: S4P1000M3-4  
 230v, 3ph/10hp/29.4 F.L.A.

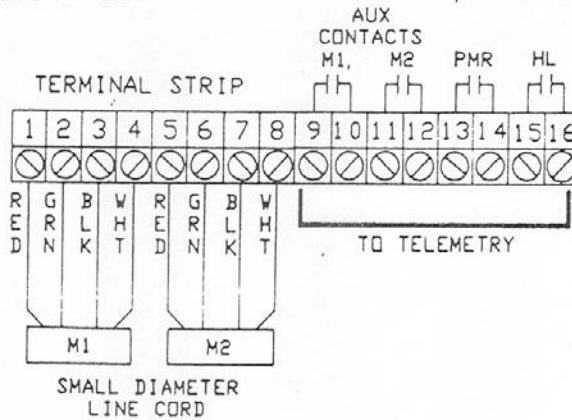
**UNITRON CONTROLS**  
 A DIVISION OF BARNEY'S PUMPS, INC  
 3907 HWY 98 SOUTH  
 LAKELAND, FLORIDA 33802  
 (813) 665-8500  
 FAX: (813) 665-2165

DATE: 1/3/95	BPI#: 10803
REV. DATE:	DRAWN BY: JP
REV. DATE:	DRAWING #: 10803A

BILL OF MATERIALS

316 55

ENC	ENCLOSURE	CUSTOM EQUIP, 48'x36'x12' SS
MCB	MAIN CIRCUIT BREAKER	SQ-D, QC3100H
ECB	EMERGENCY CIRCUIT BREAKER	SQ-D, QC3100H
PCB1,2	PUMP CIRCUIT BREAKER	SQ-D, QC3050H
CCB	CONTROL CIRCUIT BREAKER	WESTINGHOUSE, QC1010
GFICB	GFI CIRCUIT BREAKER	WESTINGHOUSE, QC1015
MS1,2	STARTER <i>Square D OIC</i>	ALLEN BRADLEY, AB509-CDD
DL	HEATER	ALLEN BRADLEY, V67
PM	PHASE MONITOR	TIMEMARK, MODEL 258B
F	FLASHER	SSAC, FS127
AL	ALARM LIGHT	INGRAM, LRXB-40
HDA	HAND OFF AUTO SWITCH	TELEMECANIQUE, XB3-BD33
ETM	ELAPSED TIME METER	ENM, T50B2
IL	INDICATING LIGHT	SQ-D, 9001 SKP-38
RL	RUN LIGHT	SQ-D, 9001 SKP-38
GFI	CONVIENENCE RECEPTACLE	LEVITON, 6599-1
PMR	PHASE MONITOR RELAY	AA ELEC, AAEKUP14A 120
R1,HL,LL	CONTROL RELAYS	AA ELEC, AAEKUP14A 120
SFM1,2	SEAL FAIL MODULE	SYRELEC, PNRU-110-60
	MODE SWITCH	TELEMECANIQUE, XB3-BD21
	AIR FLOW SWITCH	CHEMTEC, LPH-125-0A
	MAINTENANCE LIGHT	LEVITON, 9880
	MAINTENANCE LIGHT SWITCH	CARLING, 2FA53-73
	ALARM LIGHT SWITCH	CARLING, 2FA53-73
PS1-4	PRESSURE SWITCH	HONEYWELL, L408B-1149
	COUNTER	DURRANT, 4-4-41314-406-MEQ
	INCHES OF WATER GAUGE	ASHCROFT, MODEL #1000
AP1,2	AIR PUMPS	TETRA, LUFT PUMP
R2	CONTROL RELAY	AA ELEC, AAEKUP14A 120



CUST: CITY OF ROCKLEDGE  
 PRDJ:  
 PUMP: S4P1000M3-4  
 230v, 3ph/10hp/29.4 F.L.A.

**UNITRON CONTROLS**  
 A DIVISION OF BARNEY'S PUMPS, INC  
 3907 HWY 98 SOUTH  
 LAKELAND, FLORIDA 33802  
 (813) 665-8500  
 FAX: (813) 665-2165

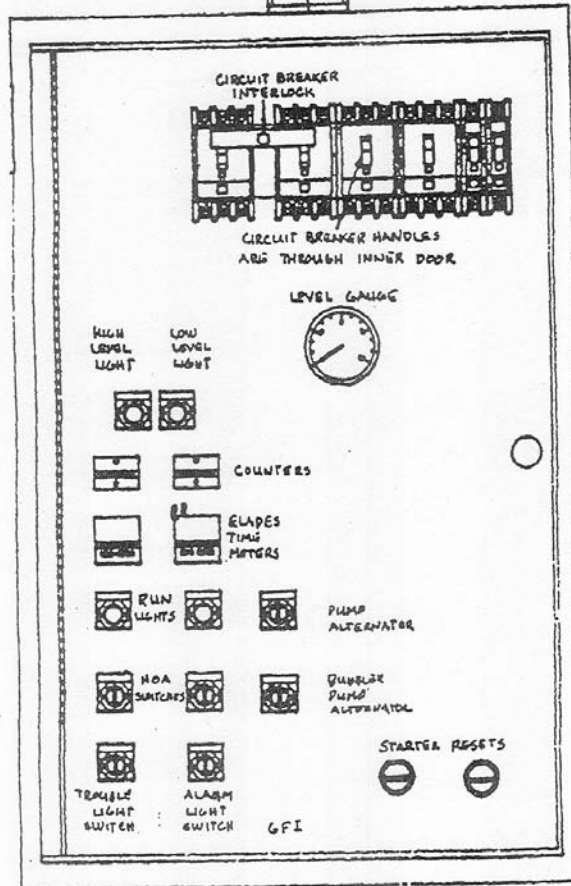
DATE:	BPI#: 10803
REV. DATE:	DRAWN BY: JP
REV. DATE:	DRAWING #: 10803B
REV. DATE:	PAGE: 3 OF 3

City of Rockledge

Panel Layout



ALARM LIGHT



INNER DOOR (1/4" LEVAN)

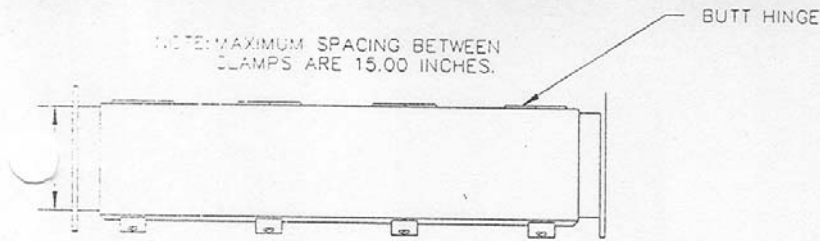
BUBBLER PUMPS TO BE LOCATED IN BOTTOM OF PANEL

P. 2

(863) 665-2165

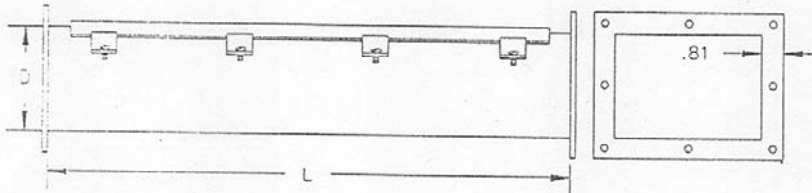
UNITRON CONTROLS

Aug 31 00 01:44p



CONSTRUCTION:  
 -CODE GAUGE TYPE 304  
 STAINLESS STEEL.  
 -11 GAUGE TYPE 304  
 STAINLESS STEEL END  
 FLANGES.  
 -SEAMS CONTINUOUSLY  
 WELDED AND GROUND  
 SMOOTH.  
 -STAINLESS STEEL BUTT  
 HINGE.  
 -SCREW CLAMPS ARE  
 QUICK AND EASY TO  
 OPERATE.  
 -OIL RESISTANT GASKET.  
 -GASKET POSITIONED  
 BETWEEN FLANGES WHEN  
 SECTIONS AND FITTINGS  
 ARE BOLTED TOGETHER.

STAINLESS STEEL TYPE 4X PULL THROUGH WIREWAY



FINISH:  
 -WIREWAY ARE UN-  
 PAINTED AND HAVE A  
 NUMBER 3 SMOOTH  
 BRUSHED FINISH.

STAINLESS STEEL TYPE 4X PULL THRU WIREWAY

Enclosure Size HXDXL	List Price		Catalog Number
	Each	Weight	
4X4X12	212.40	7	S1-44P
4X4X24	271.20	12	S2-44P
4X4X36	330.00	17	S3-44P
4X4X48	388.90	21	S4-44P
4X4X60	448.00	26	S5-44P
4X4X120	742.80	52	S10-44P

FITTINGS

90L	199.00	5	S4-90P
45L	200.00	3	S4-45L
Tee	240.00	6	S4-TP
End Plate	38.83	1	S4-EPP
6" Nipple	138.00	3	S4-N6P
Box Connector	45.89	1	S4-BCP
Drop Hanger	42.00	1	S4-DHP
Bracket Hanger	27.40	1	S4-BHP

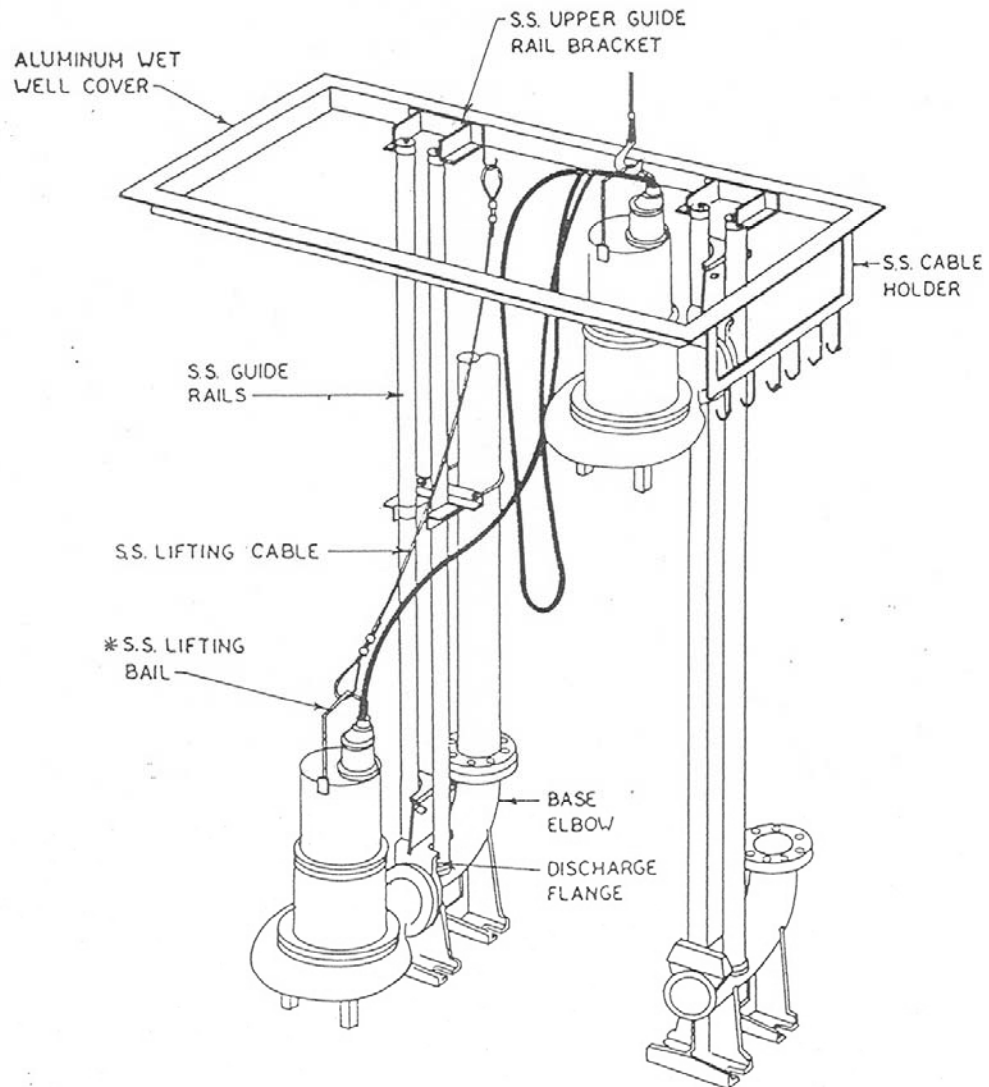
6X6X12	270.00	10	S1-66P
6X6X24	363.60	18	S2-66P
6X6X36	457.00	24	S3-66P
6X6X48	550.00	32	S4-66P
6X6X60	664.00	40	S5-66P
6X6X120	1111.00	78	S10-66P

FITTINGS

90L	244.80	8	S6-90P
45L	245.90	6	S6-45L
Tee	331.20	10	S6-TP
End Plate	42.75	3	S6-EPP
6" Nipple	186.00	5	S6-N6P
Box Connector	58.80	1	S6-BCP
Drop Hanger	57.00	2	S6-DHP
Bracket Hanger	38.18	3	S6-BHP

Note: Non-stocking items made per order:  
 Once order is placed in production, it  
 cannot be cancelled

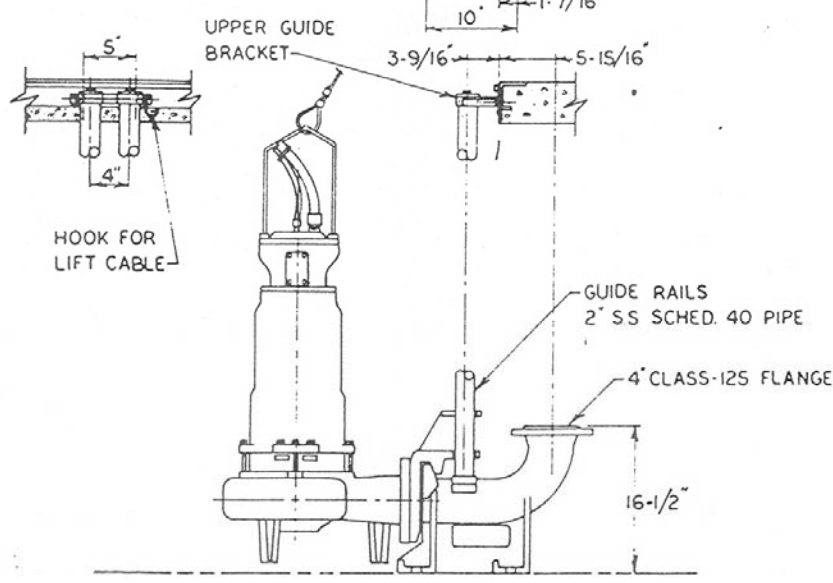
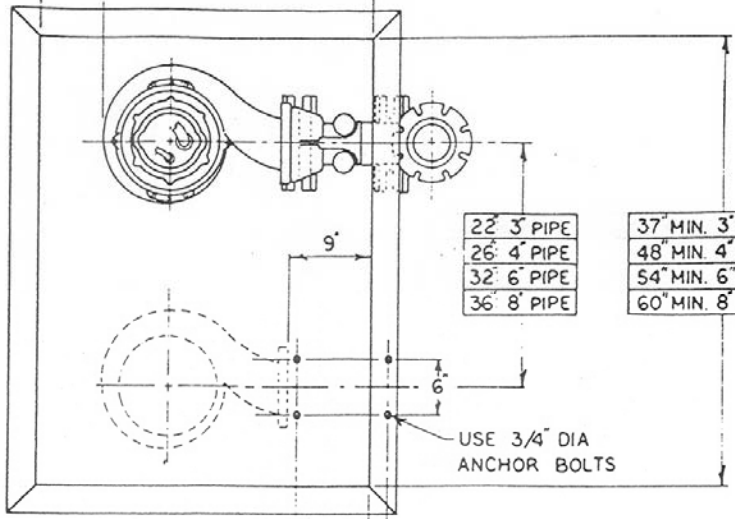
# BPIU DUPLEX RAIL SYSTEM



BARNEY'S PUMPS INC.  
P.O. BOX 8T  
LAKELAND, FL 33802

INSTALLATION DRAWING  
 BPIU RAIL SYSTEM w/  
 HYDR-O-MATIC PUMPS  
 MODELS S4 & S3HRC

24	S3HRC
30	S4HRC
30	S4N, S4NRC
30	S4M, S4MRC
36	S4L, S4LRC



REVISED 2-8-88 ✓  
 REVISED 7-23-86 ☑

BARNEY'S PUMPS INC.  
 PO BOX BT  
 LAKELAND, FL 33802

# HAZARDOUS LOCATION SEALING PRODUCTS

**Type EYA**  
Female/Female  
**Type EYAM**  
Male/Female

**Use:**  
For vertical or horizontal conduit runs.

**Features:**

- Threaded for Rigid Conduit or IMC
- Female/Female and/or Male/Female
- Tapered threads (NPT)

**Material/Finish:**  
Malleable Iron/Zinc Plated

**Optional Finish:**

- Hot Dip and/or Mechanically Galvanized.
  - 1/2" - 1 1/2" Mechanical Galvanized
  - 2" - 6" Hot Dip Galvanized
- All sizes of plugs are Mechanical Galvanized  
Contact your local representative for pricing and availability.

**Third Party Certification:**

- UL Listed: E-34997
- CSA Certified: LRS795
- Suitable for wet locations.

UL Listed using: O-Z/Gedney EYC  
sealing compound or Crouse-Hinds Chico  
compound in these fitting.

CSA Certified using any manufacturer's  
CSA certified sealing compound.

1/2" - 1" EYA/EYAM

- Class I Groups A, B, C, D
- Class II Groups E, F, G
- 1 1/2" - 2" EYAM
- Class I Group C, D
- Class II Groups E, F, G

2 1/2" - 4" EYA/EYAM

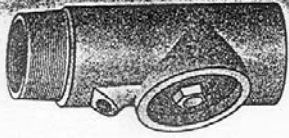
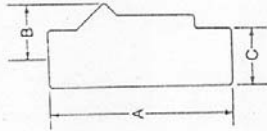
- Class I Groups B, C, D
- Class II Groups E, F, G

5" - 6" EYA/EYAM

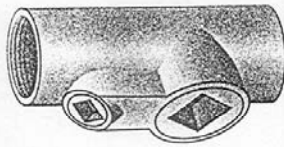
- Class I Groups C, D
- Class II Groups E, F, G

**Applicable Third Party Standards:**

- UL Standard: 886
- CSA Standard: C22.2 No. 30
- National Electrical Code: Articles 500-503
- Mil. Spec: Mil-F-28675



Type EYA-50—Type 600  
Male/Female



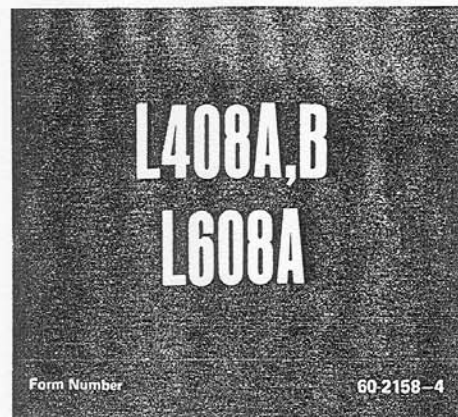
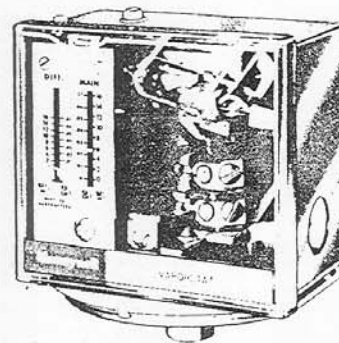
Type EYA-50—EYA 600  
Female/Female

Trade Size (inches)	Catalog Number	A	B	C	Sealing Compound Required	Approx. Net Fiber/Plug Required
1/2	EYA-50	3 3/4	1 1/4	1 1/4	3/4 oz	3/4 oz
3/4	EYA-75	3 3/4	1 1/4	1 1/4	1 1/2 oz	1 1/2 oz
1	EYA-100	4 1/4	1 1/4	1 1/4	2 1/2 oz	2 1/2 oz
1 1/4	EYA-125	5 1/4	1 1/4	2	6 oz	4 oz
1 1/2	EYA-150	5 1/4	2	2 1/4	9 oz	3/2 oz
2	EYA-200	6 1/4	2 1/4	2 1/4	15 oz	1 oz
2 1/2	EYA-250	7 1/4	2 1/4	3 1/4	1 lb 3oz	1 1/2 oz
3	EYA-300	8 1/4	3	3 1/2	1 lb 8oz	2 oz
3 1/2	EYA-350	8 1/4	3 1/4	4 1/4	3 lb 0oz	3 oz
4	EYA-400	9 1/4	3 1/4	5	4 lb 8oz	4 1/2 oz
5	EYA-500	11 1/4	7 1/4	6 1/4	11 lb 8oz	7 oz
6	EYA-600	12 1/4	8 1/4	7 1/4	18 lb 8oz	10 oz
1/2	EYAM-50	3 3/4	1 1/4	1 1/4	3/4 oz	3/4 oz
3/4	EYAM-75	3 3/4	1 1/4	1 1/4	1 1/2 oz	1 1/2 oz
1	EYAM-100	4 1/4	1 1/4	1 1/4	2 1/2 oz	2 1/2 oz
1 1/4	EYAM-125	5 1/4	1 1/4	2	6 oz	4 oz
1 1/2	EYAM-150	5 1/4	2	2 1/4	9 oz	3/2 oz
2	EYAM-200	6 1/4	2 1/4	2 1/4	15 oz	1 oz
2 1/2	EYAM-250	7 1/4	2 1/4	3 1/4	1 lb 3oz	1 1/2 oz
3	EYAM-300	8 1/4	3	3 1/2	1 lb 8oz	2 oz
3 1/2	EYAM-350	8 1/4	3 1/4	4 1/4	3 lb 0oz	3 oz
4	EYAM-400	9 1/4	3 1/4	5	4 lb 8oz	4 1/2 oz
5	EYAM-500	11 1/4	7 1/4	6 1/4	11 lb 8oz	7 oz
6	EYAM-600	12 1/4	8 1/4	7 1/4	18 lb 8oz	10 oz

# Honeywell

THE L408 AND L608 VAPORSTAT CONTROLLERS ARE LINE VOLTAGE PRESSURE CONTROLLERS THAT PROVIDE OPERATING CONTROL OR AUTOMATIC LIMIT PROTECTION FOR PRESSURE SYSTEMS OF UP TO 4 PSI [0.28 kg/cm<sup>2</sup> or 27.6 kPa].

- Primarily for use in vapor heating systems, but also may be used with liquids, air, and other noncombustible gases.
  - Stainless steel diaphragm also allows use with ammonia, oxygen, distilled water, and similar media.
  - L408A and B models have an spst switch; L408A breaks and L408B makes when pressure rises to the main scale set point.
  - L608A models have an spdt switch that breaks R-B when pressure rises to the main scale set point.
  - Dustproof, trouble-free mercury switch.
  - Maximum surge pressure of 15 psi [103.4 kPa].
  - All models have an adjustable, subtractive differential.
  - Adjustments are made by screws on top of case.
  - Scaleplates are marked in English (psi) and Metric [kg/cm<sup>2</sup>] units.
  - Case has clear plastic cover so that pressure settings and switch action can be observed.
  - Leveling indicator visible through cover.
  - Hexagonal fitting with 1/4-18 NPT internal threads for direct mounting to the 14026 Steam Trap (siphon loop), which is included.
  - Can also be surface mounted by screws through holes (knockouts) in back of case.
- J.B.  
REV. 10-78 (.06)



# SPECIFICATIONS

**IMPORTANT**

THE SPECIFICATIONS GIVEN IN THIS PUBLICATION DO NOT INCLUDE NORMAL MANUFACTURING TOLERANCES. THEREFORE, THIS UNIT MAY NOT MATCH THE LISTED SPECIFICATIONS EXACTLY. ALSO, THIS PRODUCT IS TESTED AND CALIBRATED UNDER CLOSELY CONTROLLED CONDITIONS, AND SOME MINOR DIFFERENCES IN PERFORMANCE CAN BE EXPECTED IF THOSE CONDITIONS ARE CHANGED.

MODELS: L408A,B and L608A Vaporstat Controllers. See Tables I and II below. All models include a 14026 Steam Trap (siphon loop), which is necessary for boiler installations.

TABLE I--MODELS AVAILABLE

MODEL	SWITCH TYPE	SWITCH ACTION ON PRESSURE RISE
L408A	Spst	Breaks
L408B	Spst	Makes
L608A	Spdt	Breaks R-B, makes R-W

SWITCH CONTACT RATINGS (in amperes at 50/60 Hz):

MODEL	LOAD	120V	240V	120V	240V
		AC	AC	DC	DC
L408A,B	Full Load	8.0	5.1	2.4	1.2
	Locked Rotor	48.0	30.6	24.0	12.0
	Noninductive	10.0	5.0	5.0	2.0
L608A	Full Load	8.0	5.1	2.0	1.0
	Locked Rotor	48.0	30.6	20.0	10.0
	Noninductive	10.0	5.0	8.0	4.0

TABLE II--OPERATING RANGES AVAILABLE FOR ALL MODELS

PRESSURE RANGES			MIDSCALE SUBTRACTIVE DIFFERENTIAL (ADJUSTABLE)		
ENGLISH UNITS	kg/cm <sup>2</sup>	kPa	oz/in <sup>2</sup>	kg/cm <sup>2</sup>	kPa
0 to 16 oz/in <sup>2</sup>	0 to 0.07	0 to 6.9	2 to 16	0.01 to 0.07	0.9 to 6.9
0 to 4 psi	0 to 0.28	0 to 27.6	4 to 16	0.02 to 0.07	1.7 to 6.9

(continued on page 3)

## ORDERING INFORMATION

WHEN PURCHASING REPLACEMENT AND MODERNIZATION PRODUCTS FROM YOUR TRADELINE WHOLESALE OR YOUR DISTRIBUTOR, REFER TO THE TRADELINE CATALOG OR PRICE SHEETS FOR COMPLETE ORDERING NUMBER, OR SPECIFY--

1. Order number.
2. Operating range (see Table II).
3. Replacement parts, if desired.
4. Accessories, if desired.

IF YOU HAVE ADDITIONAL QUESTIONS, NEED FURTHER INFORMATION, OR WOULD LIKE TO COMMENT ON OUR PRODUCTS OR SERVICES, PLEASE WRITE OR PHONE:

1. YOUR LOCAL HONEYWELL RESIDENTIAL DIVISION SALES OFFICE (CHECK WHITE PAGES OF PHONE DIRECTORY).
2. RESIDENTIAL DIVISION CUSTOMER SERVICE  
HONEYWELL INC., 1885 DOUGLAS DRIVE NORTH  
MINNEAPOLIS, MINNESOTA 55422 (612) 542-7500  
(IN CANADA--HONEYWELL CONTROLS LIMITED, 740 ELLESMERE ROAD, SCARBOROUGH, ONTARIO M1P 2V9)  
INTERNATIONAL SALES AND SERVICE OFFICES IN ALL PRINCIPAL CITIES OF THE WORLD.

FINISH: Gray.

**APPROVALS:**

UNDERWRITERS LABORATORIES INC. LISTED:  
File No. MP466, Vol 10; Guide No. MBPR.  
CANADIAN STANDARDS ASSOCIATION CER-  
TIFIED:  
File No. LR1620; Guide No. 400-E-0.

**REPLACEMENT PARTS:**

1. 129178 Thermoplastic Cover.
2. 14026 Steam Trap (siphon loop)—1/4 inch black iron pipe; included with all models.

**ACCESSORIES:**

1. 33312B Knurled Adjustment Knob—with setscrew; fits on main scale pressure adjusting screw.
2. 4074BJ Limit Stop Assembly—to limit set point ranges; includes 129564 Range Stop, 107194 Range Stop Screw, and 23466 Wrench.

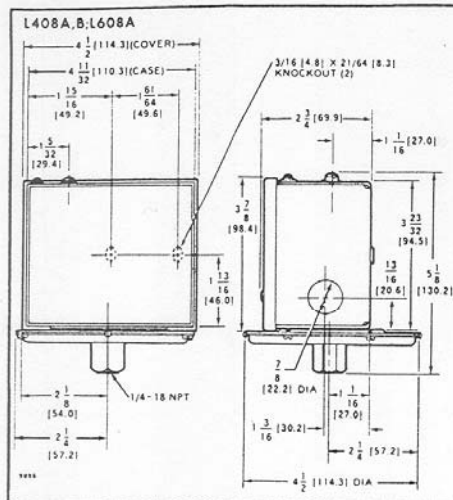


FIG. 1—MOUNTING DIMENSIONS OF THE L408A,B AND L608A VAPORSTAT CONTROLLERS, IN INCHES [MILLIMETRES IN BRACKETS].

## INSTALLATION

### CAUTION

1. Installer must be a trained, experienced service technician.
2. The installation must comply with all applicable local codes, ordinances, and regulations.
3. Disconnect power supply before beginning installation to prevent possible equipment damage or electrical shock.
4. When using the controller with a compressor, install a dampening device (such as a needle valve, header, or surge tank) to dampen pulsations which can damage the controller or reduce its life.
5. Complete all required checkout tests before leaving installation.

### IMPORTANT

1. Locate the controller where the ambient temperature will not exceed 150 F [66 C].
2. Use pipe compound sparingly to avoid clogging the hole in the pipe or diaphragm fitting.
3. Do not tighten the controller by hand by holding the case.
4. The controller must be accurately leveled for proper operation.

### LOCATION AND MOUNTING

NOTE: For most accurate operation, supplemental heat should be added to installations where the temperature falls below minus 20 F [minus 29 C]. Never locate the controller where the temperature falls below minus

35 F [minus 37 C], as mercury in the switch will freeze at this temperature.

When used with steam boilers, always mount the controller above the water line in the boiler. A steam trap (siphon loop) must always be connected between the controller and the boiler (Fig. 2) to prevent boiler scale and corrosive vapors from attacking the diaphragm. The loop on the steam trap must always be perpendicular to the face of the controller. If the loop is parallel to the controller, expansion or contraction of the loop will tip the controller and cause the switch to operate inaccurately.

The controller can be mounted (1) alongside the pressure gauge, (2) in a fitting on the boiler provided by the manufacturer, (3) at a remote location in case of excessive vibration, or (4) in a special mounting on a low water cutoff.

Make all pipe connections in accordance with approved standards. When making pipe connections, use pipe compound sparingly to seal the joints. Excess pipe compound may clog the small hole in the fitting and prevent the controller from operating properly. To avoid leaks and damage to the case, use a parallel jaw wrench on the controller's hexagonal fitting. Do not tighten the controller by hand by holding the case.

### LEVELING

A vaporstat controller must be accurately leveled for proper operation. It is level when the leveling indicator (Fig. 9) hangs freely with its pointer directly over the index mark inside on the back of the case. Level the controller by carefully bending the steam trap (siphon loop).

### MOUNTING ALONGSIDE A PRESSURE GAUGE

To mount the controller *alongside* a pressure gauge (Fig. 2), remove the gauge. In its place, install a steam trap (siphon loop) with a tee on top. Using elbows and pipe nipples, mount the controller and pressure gauge on the ends of the tee. Level the controller after installation.

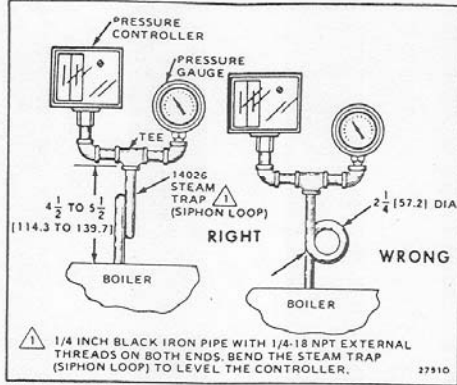


FIG. 2—RIGHT AND WRONG MOUNTING OF A STEAM TRAP (SIPHON LOOP), WITH APPROXIMATE DIMENSIONS IN INCHES [MILLIMETRES IN BRACKETS].

### MOUNTING ON A BOILER

If it is not convenient to mount the controller alongside the pressure gauge, install a steam trap (siphon loop) in the fitting provided by the boiler manufacturer. If there is no fitting, mount the steam trap at a location recommended by the boiler manufacturer. Screw the controller directly to the steam trap, and level the controller.

### MOUNTING AT A REMOTE LOCATION

If there is *excessive vibration* at the boiler which may adversely affect the operation of the controller, the controller should be mounted *at a remote location*. All piping from the boiler must be suitable and solidly mounted. The piping must be properly pitched to drain all condensation back to the boiler. A steam trap (siphon loop) must be mounted between the remote piping and the controller. Level the controller after installation.

### WIRING

- All wiring must comply with applicable electrical codes, ordinances, and regulations. Use NEC Class 1 (line voltage) wiring.
- For normal installations, use moisture-resistant No. 14 wire suitable for at least 167 F [75 C] if you are using the controller with a flame safeguard primary control, or at least 194 F [90 C] if you are using it with a programming control.
- For high temperature installations, use moisture-resistant No. 14 wire, selected for a temperature rating above the maximum operating temperature.
- Disconnect the power supply before beginning wiring to prevent electrical shock and equipment damage.

5. All models have a terminal block inside the cover (Fig. 3) and a 7/8 inch [22.2 mm] hole in one side for 1/2 inch conduit, cable, or wires. Remove the front cover by loosening the screw at the bottom of the main scale.

6. Refer to Figs. 4-7 for typical hookups. Follow the burner or boiler manufacturer's wiring diagram if provided.

7. Make sure the loads do not exceed the Switch Contact Ratings in the SPECIFICATIONS section.

8. Replace the front cover when wiring is completed.

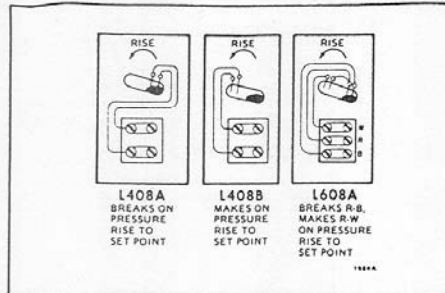


FIG. 3—L408A,B AND L608A TERMINAL BLOCKS AND INTERNAL SCHEMATICS.

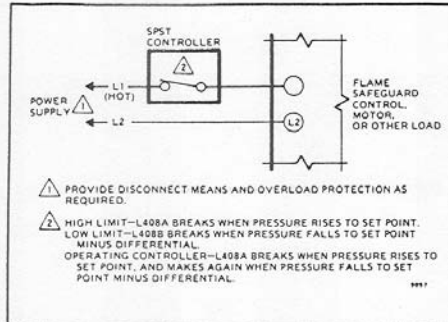


FIG. 4—L408 USED AS A LIMIT OR AS AN OPERATING CONTROLLER.

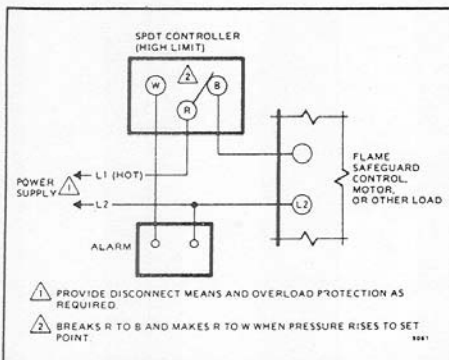


FIG. 5—L608A USED AS A HIGH LIMIT, WITH AN ALARM CIRCUIT.

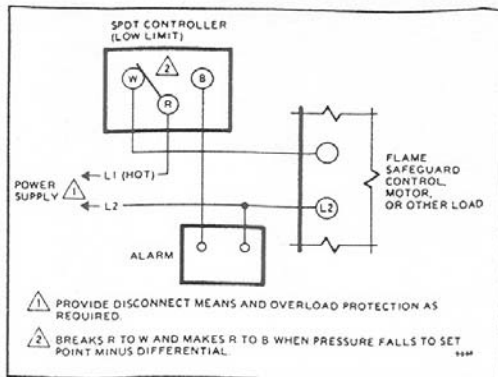


FIG. 6—L608A USED AS A LOW LIMIT, WITH AN ALARM CIRCUIT.

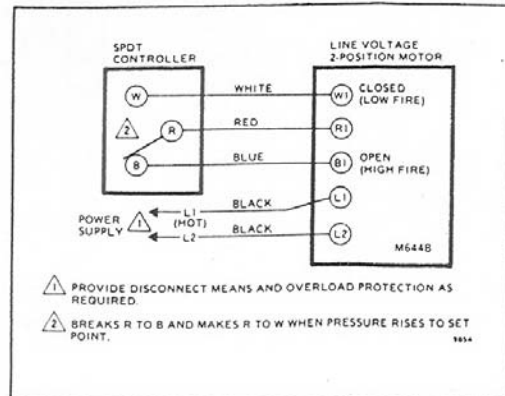


FIG. 7—L608A CONTROLLING AN M644B MOTOR.

## SETTING AND CHECKOUT

### SETTING

In all models, the differential is subtractive from the main scale set point. The upper operating point is determined by the main scale set point, while the lower operating point is determined by the main scale setting less the differential setting. Operating points are shown in Fig. 8.

Adjust the *main scale set point* for the desired operating pressure by turning the *main scale adjusting screw* (Fig. 9) on the top of the case until the main scale setting indicator is at the desired value. Adjust the *differential setting* by turning the *differential adjusting screw* (Fig. 9) until the differential setting indicator is at the desired value. The scaleplates are marked in psi and kg/cm<sup>2</sup>.

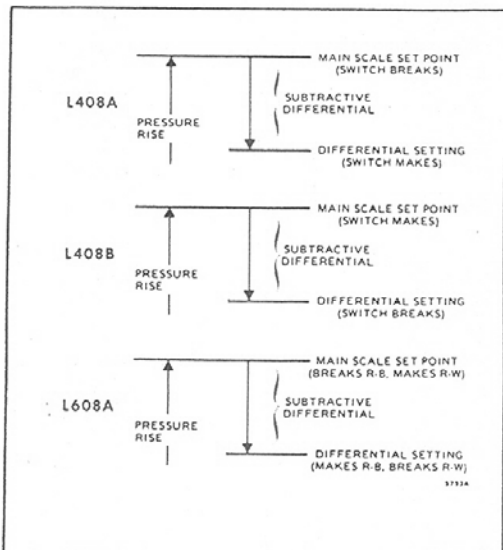


FIG. 8—L408A,B AND L608A OPERATING POINTS.

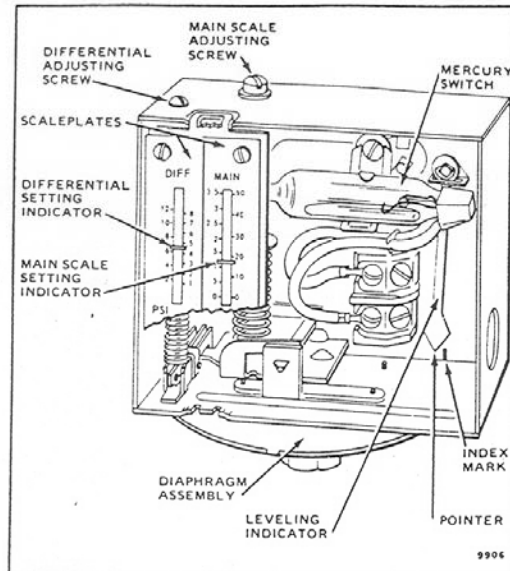


FIG. 9—SETTING A VAPORSTAT CONTROLLER.

### CHECKOUT

After the controller has been installed, wired, and set, it should be tested with the system in operation. First allow the system to stabilize. Then observe the operation of the controller while raising and lowering its set point. Pressure should increase when the set point is raised and decrease when the set point is lowered.

Also check the make and break points of the controller. If they do not agree with a separate, accurately calibrated, pressure gauge, a slight adjustment of the scaleplate(s) may be necessary.

Use accurate pressure testing equipment when checking out the controller. Do not rely on inexpensive gauges. The controllers are carefully calibrated at the factory.

### BOILER INSTALLATION

If the controller is being used on a boiler installation, test it as follows:

1. Note the boiler pressure by checking the boiler pressure gauge. (To perform this test properly, the boiler should have a pressure reading near the middle of the controller's main scale range.)

2. Turn the main scale adjusting screw (Fig. 9) until the main scale setting indicator on the controller corresponds to the boiler pressure gauge reading.

3. The L408A should break the control circuit automatically when the boiler pressure gauge reading equals or slightly exceeds the controller setting.

The L408B should make the circuit under the same circumstances.

The L608A should make the R-W circuit and break the R-B circuit under the same circumstances.

4. If the controller is operating properly, turn the main scale adjusting screw (Fig. 9) until the main scale setting indicator is at the desired set point.

### IF A CONTROLLER SEEMS TO OPERATE IMPROPERLY

If the controller is suspected of operating improperly, it may be checked further as follows (Fig. 10):

1. Disconnect all power to the controller, loosen the cover screw, and remove the cover.

2. Disconnect the wires from the controller.

3. Connect an ohmmeter between the switch terminals.

4. Lower the set point of the controller (simulating a pressure increase) through a range greater than the differential. The switch should either make or break, depending on the model of the controller. (An L408A should break, an L408B should make, and an L608A should break R-B and make R-W.) If it makes, the ohmmeter will read zero; if it breaks, the ohmmeter will read infinity.

5. Raise the set point of the controller (simulating a pressure decrease) through a range greater than the differential. The switch should break or make, just the opposite of its action in step 4.

6. An approximation of the differential can be made by observing the change in set point required for a resistance change from zero to infinity.

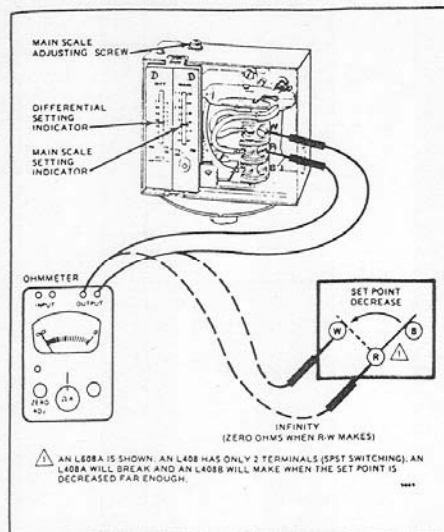


FIG. 10—CHECKING A VAPORSTAT CONTROLLER.

### CAUTION

Do not put the system into service until you have satisfactorily completed all applicable tests described in this Checkout section, in the Checkout section of the applicable instruction sheet for the flame safeguard control, and any others required by the burner and boiler manufacturers.

## SERVICE INFORMATION

### CALIBRATION

The controller was carefully calibrated during manufacture and should not require recalibration. Most calibration errors are caused by improper leveling. The controller should be level if the pointer on the leveling indicator is directly over the index mark (Fig. 9). In some cases, the leveling indicator may not be accurate enough. The pointer may be over the index mark, but the controller still may not be operating within the tolerance of its scale setting. In this case, carefully bend the steam trap

(siphon loop) until the controller switches properly.

### MAINTENANCE

The cover of the controller should be in place at all times to protect the internal components from dirt, dust, and physical damage. Routine maintenance should consist of occasional inspection and blowing or brushing away any accumulated dirt and dust. To ensure proper functioning of the controller at all times, an operational check of the entire system should be performed during routine maintenance checks.

Dear Customer,

We welcome your comments and suggestions for improving this publication. Your assistance is greatly appreciated and will enable us to provide better technical information for you.

Please send your comments and suggestions to:

Honeywell Inc.  
Honeywell Plaza  
Minneapolis, Minnesota 55408  
ATTN: Publications Supervisor MN12-3247

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PRINTED IN U.S.A.

Type 1000, 2071A  
Commercial Gauges



**Product Specifications**

Ashcroft Model Number: 1000, 2071A

Size: 4 1/2"  
Case: 1000 - Black painted steel  
2071A - Aluminum with black flange, painted black

Ring: 1000 - Black painted steel, friction fit  
2071A - Chrome plated steel, friction fit

Window: Glass

Dial: Black figures on white background, steel

Pointer: 1000 - Black, Aluminum  
2071A - Adjustable, Black, Aluminum

Bourdon Tube: 1000 - Bronze  
2071A - Bronze, soldered, siphon required for steam service

Movement: Patented spring suspended with polyester segment

Socket: Brass

Connection: 1/4" NPT lower

Ranges: 1000 - Vacuum - 600 psi and compound  
2071A - 30 psi - 400 psi

Accuracy: 1000 - ASME B40.1, Grade B, ± 3-2-3%  
2071A - ASME B40.1, Grade A, ± 2-1-2%

**Optional Features**

Case  
• Case color (other than black)

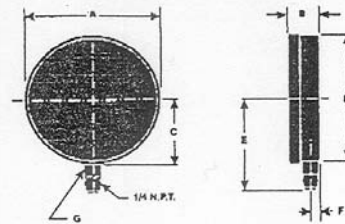
Window  
• Plastic

Pointer  
• Adjustable (Type 1000)

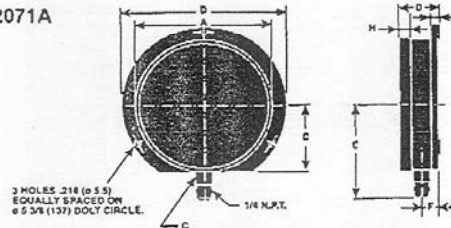
Socket  
• Nickel Plated  
• Throttle plugs - .007", .013", .020", .031", .063" orifices

Others  
• Customized dials  
• Chrome ring (Type 1000)  
• Black ring (Type 2071A)  
• Non-standard ranges  
• Special calibration on application

T-1000



T-2071A



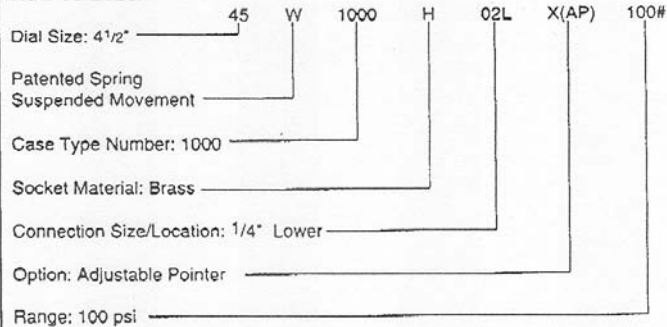
T-1000

SIZE TYPE	A	B	C	D	E	F	G	WEIGHT
4 1/2"	4 3/4 (121)	1 1/8 (29)	2 11/32 (60)	4 11/16 (119)	3 3/8 (86)	1 1/32 (9)	8 7/16 (14)	12 oz.

T-2071A

SIZE TYPE	A	B	C	D	E	F	G	H	I	WEIGHT
4 1/2"	4 3/4 (121)	1 13/32 (36)	2 3/8 (60)	5 13/16 (148)	3 3/8 (86)	15/32 (12)	9/16 (14)	27/64 (11)	1/4 (8)	18 oz.

**How To Order**



**Instrument Division Customer Service Locations and Telephone Numbers**

**Domestic Headquarters**

**Berea, Kentucky**  
Commercial Instrument Plant  
Harrison Road  
Berea, KY 40403  
Tel: (606) 986-9333  
FAX: 1-800-28-BEREA

**International Headquarters**

**Stratford, Connecticut**  
250 East Main Street  
Stratford, CT 06497  
Tel: (203) 378-8291  
FAX: (203) 385-0357

**Sales Offices**

**Chicago, Illinois**  
400 W. Lake Street  
Suite 310  
Roseville, IL 60172-3392  
Tel: (708) 980-9030  
FAX: (708) 980-9440

**Houston, Texas**  
3838 North Sam Houston  
Parkway East  
Suite 120  
Houston, TX 77062  
Tel: (713) 590-1092  
FAX: (713) 590-7100

**Los Angeles, California**

3549 East Spring Street  
Long Beach, CA 90808  
Tel: (310) 595-4691  
FAX: (310) 427-0537

**Philadelphia, Pennsylvania**

Computer Road and Maryland Ave.  
Suite A-8  
Willow Grove, PA 19090  
Tel: (215) 657-2686  
FAX: (215) 657-7962

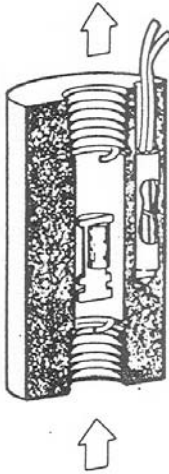


# NONADJUSTABLE FLOW MONITORS

AUTOMATIC PROTECTION • HIGH DEPENDABILITY • SUPER SENSITIVE • CORROSION RESISTANT

DESIGNED FOR LONG LIFE

## LPH SERIES



 UL Recognized  
File No. E 75356

Materials	Weight	Maximum Working Pressure	Wetted Parts
Acrylic	4 oz.	100 PSI	Acrylic, 316ss Epoxy
Brass	8 oz.	1500 PSI	Brass, 316ss Epoxy
316ss	8 oz.	3000 PSI	316ss Epoxy

FLOW SETTINGS AVAILABLE BETWEEN:

MODEL	AIR		WATER		PORT
	Minimum	Maximum	Minimum	Maximum	
LPH-125	50	2,500	1	35	1/8
LPH-250	350	24,000	7	760	1/8
LPH-357	3,000	45,300	70	2,200	1/4


## FS SERIES

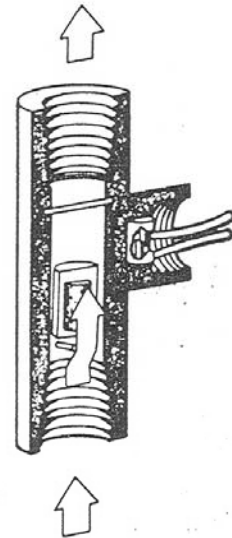
Materials	Maximum Working Pressure	Wetted Parts
PVC	PSIG	PVC, Epoxy Titanium
Brass	250 PSIG	Brass, Epoxy, Titanium
316ss	500 PSIG	316ss, Epoxy Titanium

FLOW SETTINGS

WATER IN GALLONS PER MINUTE

FS-50		FS-75		FS-1	
PVC	BRASS or 316ss	PVC	BRASS or 316ss	PVC	BRASS or 316ss
0.15	0.25	0.20	0.50	0.25	2.00
0.25	0.50	0.50	1.00	0.75	2.50
0.50	1.00	0.75	2.00	1.00	3.00
0.75	1.50	1.00	3.00	2.00	4.00
1.00	2.00	1.50	4.00	3.00	6.00
1.25	2.50	2.00	5.75	4.00	8.50

 Some Models UL Recognized  
File No. E 75356



**CHEM-TEC EQUIPMENT CO.**

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CHEM TEC

CALL FOR YOUR NET PRICE

# Hour Meters

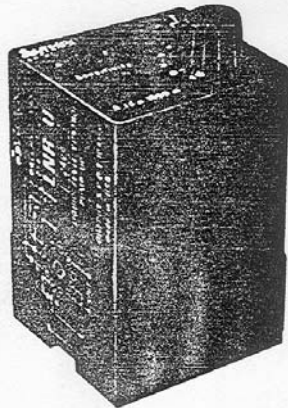


	DESCRIPTION	DISPLAY	VOLTAGE	MOUNT	PART NO.	LIST PRICE
	<b>T32 Hour Meter</b> <i>Non-reset AC/DC quartz.</i>	99999 99	230 AC	Panel	T32BL711D	B \$23.00
			115 AC	with	T32BL72D	
			24 AC	snap	T32BL74D	
			24 DC	in	T32BL75D	
			12 DC	bracket	T32BL712D	38.00
			6 DC		T32BL710D	
	<b>T33 Hour Meter</b> <i>Mini DC quartz.</i>	99999.99	24 DC	Panel	T338M75DC	B 29.00
			12 DC	with	T338M712DC	
			5 DC	spring	T338M733DC	
			12-28 DC	clip	T338M741D	
	<b>T33 Hour Meter</b> <i>Mini DC quartz.</i>	99999.99	24 DC	PCB	T33EA75DC	B 29.00
			12 DC		T33EA712DC	
			5 DC		T33EA733DC	
			12-28 DC		T33EA741D	
	<b>T34 Hour Meter</b> <i>Push-button reset AC/DC</i>	9999.99	230 AC	Panel	T34BJ611D	B 49.00
			115 AC		T34BJ62D	
			24 AC		T34BJ64D	
			24 DC	with	T34BJ65D	
			12 DC		T34BJ612D	75.00
			6 DC		T34BJ610D	
<b>New!</b> 	<b>T40 DC Hour Meter</b> <i>With Quartz Timing</i>	99999.9	4-40 DC	Panel	T40A39	A 25.00
			10-80 DC	with	T40A45	
				spring		
				clip		
			4-40 DC	3-Hole	T40B39	
			10-80 DC	Flange	T40B45	
<b>New!</b> 	<b>T50 AC Hour Meter</b> <i>With Quartz Timing and Dual Frequency Capability (50/60Hz)</i>	99999.9	230 AC	Panel	T50A1	A 25.00
			115 AC	with	T50A2	
			24 AC	spring	T50A4	
				clip		
			230 AC	3-Hole	T50B1	
			115 AC	Flange	T50B2	
			24 AC		T50B4	

**3 YEAR WARRANTY**

1-800-237-8274

— OVER —



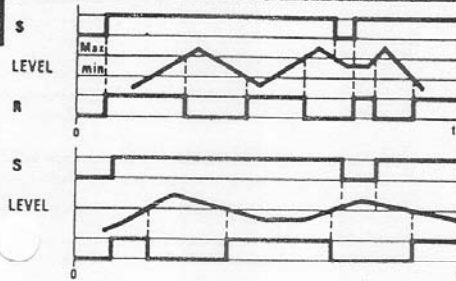
# NRU SERIES

## Liquid Level Control

### Pump Up

UL-E87133 CSA-LR56339

- LED Relay Indicator
- Three Mounting Styles
- Pump Up Control
- 4.7K  $\Omega$  to 100K  $\Omega$  Sensitivity
- 10 Amp SPDT Relay



Control of conductive liquids (tap water, sea water, sewage, chemical solutions, coffee, ice cream, etc.).

The relay is energized when the level falls below the low level probe. It de-energizes when the high level probe is reached. The NRU will also control a single level. In this case, a single probe is used and the relay operates when the probe is not immersed.

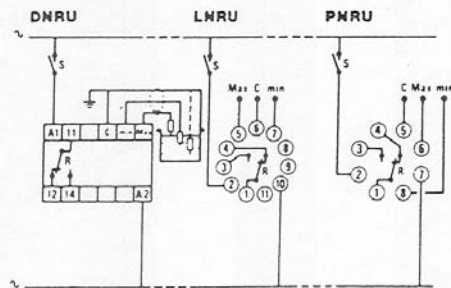
In either case, a common electrode is needed if the container is non-conductive.

#### SPECIFICATIONS:

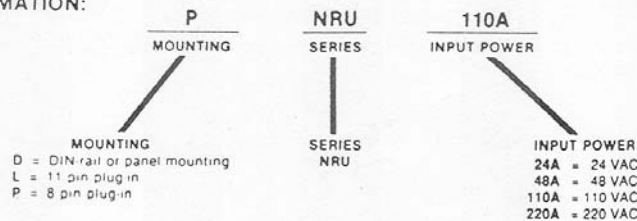
Input Power	24 48 110 220 VAC, $\pm 15\%$ , (50/60 Hz)
Maximum Power Consumption	24 VAC 1.5 VA 48 VAC 1.7 VA 110 VAC 2 VA 220 VAC 2 VA
Output	SPDT Relay
Contact Material	Ag Cdo
Maximum Loading	10A AC resistive      8A DC resistive
Maximum Switching Voltage	250 VAC                      80 VDC
Maximum Power Rating	2500 VA                      80 W
Electrical Life	2 $\times 10^6$ at 2200 VA resistive load
Mechanical Life	3 $\times 10^6$ operations
Probe Isolation	Switching contact: 2000 VA Electrodes: 2000 VAC
Probe Sensitivity	4.7K $\Omega$ to 100K $\Omega$
Probe Voltage	24 VAC 60 Hz
Probe Current	2mA Max
Operating Temperature	+14°F to +140°F    -10°C to +60°C
Weight	7oz 200 grams

Note: The cable for probes (max 300ft) should be run in separate conduit. A shielded cable is recommended.

#### WIRING DIAGRAM

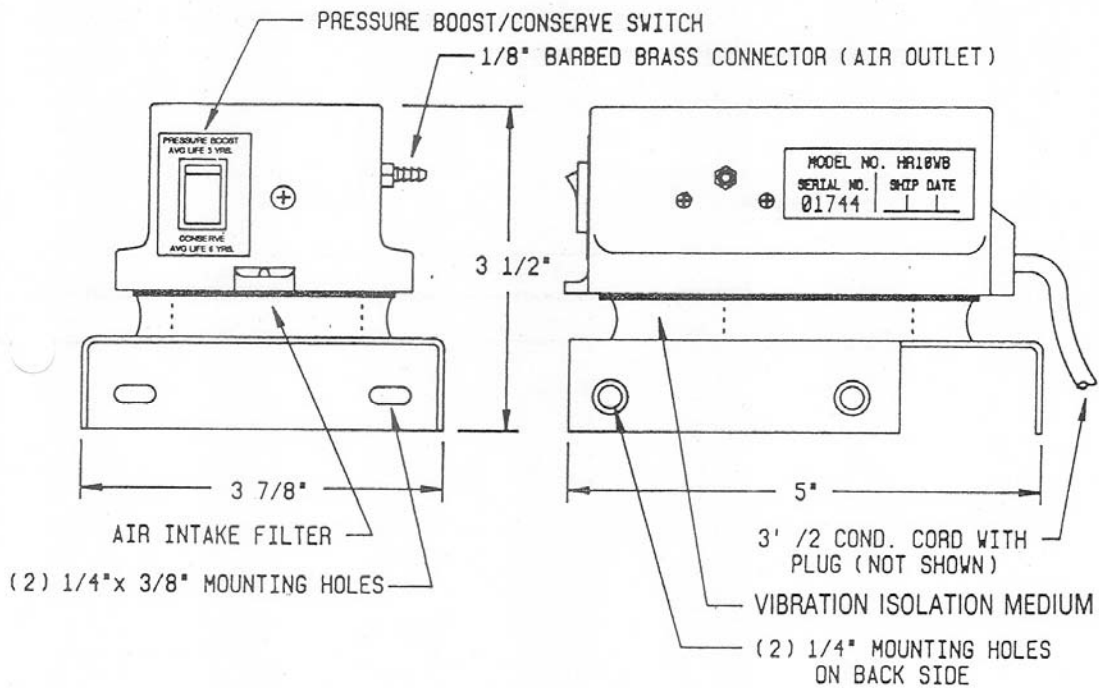


#### ORDERING INFORMATION:



**INGRAM**  
PRODUCTS, INC.

(4) HIGH RELIABILITY AIR COMPRESSOR  
(MODEL HR 10WB)



- Designed specifically for use in control panels for liquid level bubbler systems with a level control range of 0 to 10 feet.
- Pressure boost/consERVE switch allows dual air output settings.
  - Conserve (Normal Setting) produces a six year average life.
  - Pressure boost setting produces a three year average life.
- Three replacement air intake filters are included.
- Two year warranty.
- 120 VAC, 60Hz, 5W.
- Furnished with two way, corrosion resistant, gold iridite aluminum mounting bracket.
- The .016" fixed orifice choke reduces air flow (see graphs), provides artificial back-pressure, reduces pulsations, and extends the life of the air compressor.

6000 Phillips Parkway, North Jacksonville, Florida 32256 • (904) 268-5252 • FAX (904) 268-1794

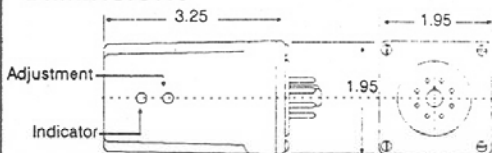
# Model 258 3-PHASE POWER MONITOR

- Detects phase loss, low voltage, phase reversal and phase unbalance
- 60 Hz and 50 Hz models
- Automatic or optional manual reset

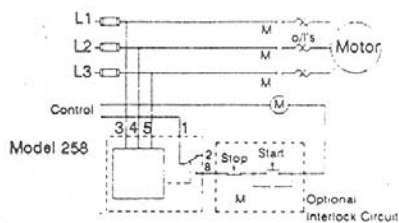
## DESCRIPTION

The Model 258 continuously monitors 3-phase power lines for abnormal conditions. When properly adjusted, the Model 258 will detect phase loss on a loaded motor even when regenerated voltage is present. The device consists of a solid-state voltage and phase-angle sensing circuit driving an electromechanical relay. When correct voltage and phase rotation are applied, the internal relay will energize. A fault condition will de-energize the relay; when the fault is corrected the 258 will automatically reset (a manual reset version is available). The 258 does not require a neutral connection and can be used with Wye or Delta systems. Four versions cover 120vac, 208/240vac and 480vac, 60 Hz, and 380vac, 50 Hz. Adjustment ranges are sufficiently wide to allow for proper adjustment to existing conditions. A failure indicator is provided to aid in adjustment and system troubleshooting. Special voltage and frequency ranges are available.

## DIMENSIONS



## TYPICAL APPLICATION



## SPECIFICATIONS

Model No.	B258B	258B	A258B	EX258B
Nominal AC Voltage (phase-to-phase)	120vac	208/240vac	480vac	380vac
Adjustment Range	85-120vac	160-250vac	380-480vac	300-380vac
Frequency	60 Hz	60 Hz	60 Hz	50 Hz
Power consumption	25 W/ph.	50 W/ph.	1.5 W/ph.	1.25 W/ph.
Transient protection	2500 VRMS for 10ms			
Repeat Accuracy (fixed conditions)	± 0.1% of set point			
Response Time	50 milliseconds			
Reset Time	.05 seconds			
Reset Type	Automatic (optional manual reset)			
Dead Band	2%			
Output Contacts	SPDT			
Contact Rating	Resistive:	15A at 150VAC 10A at 240 VAC 15A at 28VDC		
	Inductive:	4A at 120VAC 2A at 240VAC		
	Pilot Duty:	480VA at 240VAC		
	Tungsten lamp operation:	800W on N.O. contacts 240W on N.C. contacts		
Expected Relay Life	Mechanical:	50,000,000 operations		
	Electrical:	100,000 at rated load		
Operating Temperature	-40° to 55° C			
Humidity Tolerance	97% w/o condensation			
Case Material	ABS plastic			
Mounting	8-pin socket (order separately)			
Weight	5 oz.			
Agency approval	Recognized / CSA certified components (to meet UL Model A258B & EX258B must be used with TM #51X120 socket) Auto Reset Versions			

## ORDERING INFORMATION

Model No. 258  
 Voltage Code: B = 120VAC, None = 208/240VAC, A = 480VAC, EX = 380VAC  
 Adjust.: Blank = Auto, A = Fact. set, M = Manual  
 Reset: Blank = Auto, B = screwdriver



11440 East Pine Street  
 Tulsa, Oklahoma 74116  
 Tel: (918) 438-1220  
 FAX: (918) 437-7594

TITLE 3-PHASE POWER MONITOR  
 MODEL 258

Dimensions are in inches unless otherwise specified. Drawings show no power applied.

© 1989 Time Mark Corp.

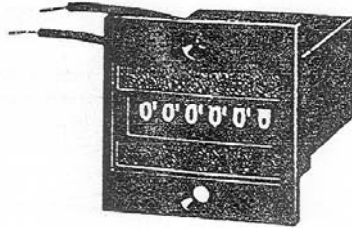
FORM 87A123 12/89



Eaton Corporation  
Automation Products Division

901 South 12th Street  
Watertown, Wisconsin 53094  
Phone: 414/261-4070 • TWX: 910-260-3713

## Installation Instructions for Miniature Electric Counters



The Durant Miniature Electric Series are high quality, low priced counters designed to operate accurately at speeds up to 1000 counts per minute. Power requirement is 3 watts DC, 3.5 watts AC, 8.5 watts for electric reset coil, and all counters in the series will operate at  $\pm 10\%$  of their rated voltage.

### COUNTING

A minimum count pulse of 30 milliseconds is required for AC or DC operation. There is no maximum count pulse, and COUNT COILS may be left "on" indefinitely without damage. As long as the counter is energized, the figures on the unit wheel will remain halfway between counts. (Do not reset at this time). When the counter is de-energized, the count will be completed. Since this is a moderately high speed counter series, it is important that the count pulse be free of switch bounce or chatter, or extra counts may be registered.

### ELECTRIC RESET MODELS

Electric reset counters require a reset pulse width of 300 ms. RESET COILS ARE NOT CONTINUOUS DUTY RATED. Duty cycle is 50%, and maximum energized time is 5 minutes.

### INSTALLATION

For best results, the counters should be mounted on a rigid base or panel in a clean, dry location. **IMPORTANT: WHEN INSTALLING BOTTOM MOUNT COUNTER, THE MAXIMUM PENETRATION OF THE MOUNTING SCREWS INTO THE COUNTER FRAME MUST NOT EXCEED 3/32".** Interior parts of the counter will be damaged if the screws penetrate further.

The miniature electric counters are not affected by reasonable amounts of shock or vibration, and "jolting" the counters will not produce unwanted counts. The counters are made of corrosion resistant materials throughout. Electrical connections should be made in accordance with all applicable requirements of electrical codes.

### MAINTENANCE

The Miniature Electric Series counters are made with a minimum of moving parts, and maintenance is not required. The covers are adhesive bonded in place, and no attempt should be made to remove them. Removal of cover voids counter warranty.

### CAUTION

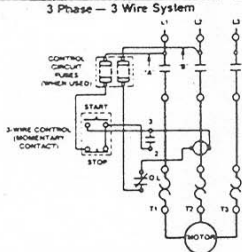
Avoid connecting AC (rectified) counters in parallel with highly inductive relays, solenoids, motors, etc. The high voltage transients produced by these devices may affect the proper functioning of the counter. If such transients exceed 400 volts suitable surge protection or separate contacts should be used.



41346-900-02

BULLETIN 509, SIZE \_\_\_\_\_, NEMA Type \_\_\_\_\_  
Magnetic Motor Controller

Cat. No. \_\_\_\_\_ Series \_\_\_\_\_



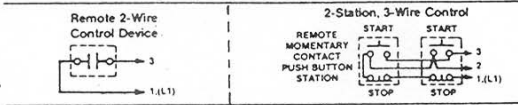
SEPARATE CONTROL CIRCUIT

If the controller coil is to operate on a voltage other than line voltage, check coil rating for compatibility and change coil if necessary. Disconnect wires "A" and "B" from lines L1 and L2. Connect wires "A" and "B" to the separate control source. Refer to the National Electrical Code for control circuit disconnection requirements.

NOTE: Additional control circuit overcurrent protection may be required. Refer to the National Electrical Code.

The current rating of the control circuit conductors furnished with this device is 15 Amp (Sizes 0 thru 3) or 20 Amp (Size 4).

Maintain this equipment in accordance with guidelines of NFPA-70B, Electrical Equipment Maintenance.



ACCESSORY KITS

Auxiliary Contacts		Catalog No. 595-A
Single Circuit (1 N.O.)		Catalog No. 595-B
Single Circuit (1 N.C.)		Catalog No. 595-BL
Single Circuit (1 N.C. Late Break)		Catalog No. 595-AA
Double Circuit (2 N.O.)		Catalog No. 595-BB
Double Circuit (2 N.C.)		Catalog No. 595-AB
Double Circuit (1 N.O.-1 N.C.)		
Auxiliary Contact for Bulletin 592 Overload Relay		
Sizes 0, 1 & 2 (N.O.)		Catalog No. 595-A02
Sizes 3 & 4 (N.O. or N.C.)		Catalog No. 595-A34
Control Circuit Fusing Kit (Single Pole) - Controller or Panel Mounted		Catalog No. 599-FR04
NOTE: Each kit occupies the space of one double circuit auxiliary contact block when controller mounted.		
Surge Suppressor		Catalog No. 599-K04
(120 Volt AC Max.)		Catalog No. 599-KA04
(240 Volt AC Max.)		Catalog No. 599-DM-3 5
Device Markers (50 Markers)		
Tie Point Terminal		Catalog No. 599-TP02
Sizes 0, 1 & 2		Catalog No. 599-TP34
Sizes 3 & 4		
Top Wiring Terminal Kit (3 Terminals)		Catalog No. 599-TW01
Size 0 & 1		Catalog No. 599-TW2
Size 2		Catalog No. 599-TW3
Size 3		Catalog No. 599-TW4
Size 4		

- [1] Auxiliary mounted on right side of overload relay provides N.O. contact function. When mounted on left side, it serves as renewal part for N.C. contact function.
- [2] For use on a circuit capable of delivering no more than 200,000 RMS symmetrical amperes, 600 Volts maximum.
- [3] To complete catalog number, insert in this position the desired numeric symbol (0 through 9) or one of the following letters: A, B, C, D, E, F, H, L, M, P, R, S, T, U, or W.
- [4] For open type controller only.

40050-502-01 (G)  
Printed in U.S.A.



TABLE 152

Heater Type No.	Full Load Amps
W50	8.56
W51	9.40
W52	10.4
W53	11.5
W54	12.5
W55	13.8
W56	15.1
W57	16.3
W58	17.7
W59	19.1
W60	21.1
W61	23.2
W62	25.7
W63	28.5
W64	30.5
W65	33.0
W66	35.5
W67	38.5
W68	41.5
W69	45.0

Bulletin 509, Size 2, 3 Phase, Heater Element Selection Table for controllers with Bulletin 592 3-Pole Overload Relay.

WARNING: If burnout of an overload relay heater element occurs, the heater element must be replaced to provide continued protection against fire and shock hazard.

AVERTISSEMENT: Si un élément chauffant du relais de protection contre les surcharges est brûlé, cet élément doit être remplacé afin de fournir une protection continue contre les dangers d'incendie et de chocs.

IMPORTANT: When ordering heater elements for this controller, always specify the desired "Heater Type No."

MOTORS RATED FOR CONTINUOUS DUTY WITH MARKED SERVICE FACTOR NOT LESS THAN 1.15 OR MARKED TEMPERATURE RISE NOT OVER 40°C. Select the "Heater Type No." with the listed "Full Load Amps." nearest the full load current value shown on the motor nameplate when the ambient temperature at the controller and the motor is the same. If the ambient temperature at the controller is higher than at the motor and the nameplate full load current is between the values listed, select the "Heater Type No." with the higher value [1]. If the ambient temperature at the controller is lower than at the motor and the nameplate full load current is between the values listed, select the "Heater Type No." with the lower value [2].

[2] When temperature difference exceeds 10°C (18°F), consult local Allen-Bradley Office.

ALL OTHER MOTORS RATED FOR CONTINUOUS DUTY (INCLUDES MOTORS WITH MARKED SERVICE FACTOR OF 1.0). Select the "Heater Type No." one rating smaller than determined by the above rules. This will provide protection at current levels 10% lower than indicated above.

MOTORS RATED FOR INTERMITTENT DUTY: Consult local Allen-Bradley Office.

The rating of the relay at 40°C is 115% of the "Full Load Amps." listed for the "Heater Type No."

Select the motor branch circuit overcurrent protection in accordance with the National Electrical Code.

RENEWAL PARTS LIST

- Overload Relay without Normally Open Auxiliary Contact (Less Elements) . . . . . Part No. 40185-800-01
- Auxiliary Contact for Overload Relay (Normally Open) . . . . . Catalog No. 595-A02
- Single Pole Contact Kit, Part No. 40420-322-51
- Operating Coil . . . . . (Specify number and Rating on Coil Label)

When ordering, specify Catalog Number and Series Letter of the device.

40050-502-02 (D)  
Printed in U.S.A.



# MOLDED CASE CIRCUIT BREAKERS

## QUICKLAG<sup>®</sup> Miniature Circuit Breakers

### Cable-In/Cable-Out



**Quicklag<sup>®</sup> Circuit Breakers**  
**Cable-in/Cable-out Type**  
 Type QC: 10-100 Amps, 10,000 AIC  
 Type QCHW: 15-100 Amps, 22,000 AIC  
 Type QHCX: 15-100 Amps, 42,000 AIC

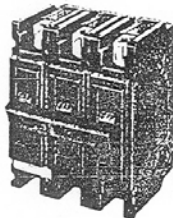
**Quicklag<sup>®</sup> Mark 75<sup>®</sup>**  
**Cable-in/Cable-out Type**  
 Type QHCW: 15-30 Amps, 65,000 AIC



Quicklag<sup>®</sup> Type QC  
1-Pole



Quicklag<sup>®</sup> Type QC  
2-Pole



Quicklag<sup>®</sup> Type QC  
3-Pole

Selling Policy 25-000  
 Special Application Breakers, page 65  
 Accessories, Modifications, page 66  
 Terminal Data, page 67  
 Interrupting Capacities, page 31  
 Technical Data 29-120  
 Application Data 29-160  
 Shipping Data, page 67  
 Discount Symbol CB-1

Continuous Ampere Rating 40 C	1 Pole		2 Poles				3 Poles	
	120/240 Volts Ac		120/240 Volts Ac		240 Volts Ac		240 Volts Ac	
	Catalog Number	List Price	Catalog Number	List Price	Catalog Number	List Price	Catalog Number	List Price
<b>Quicklag<sup>®</sup> Type: QC 10,000 Ampere I.C. Thermal Magnetic Breakers</b>								
10	QC1010	\$19.60	QC2010	\$ 43.10	QC2010H	\$112.00	QC3010H	\$139.00
15	QC10150	19.60	QC2015	43.10	QC2015H	112.00	QC3015H	139.00
20	QC10200	19.60	QC2020	43.10	QC2020H	112.00	QC3020H	139.00
25	QC1025	19.60	QC2025	43.10	QC2025H	112.00	QC3025H	139.00
30	QC1030	19.60	QC2030	43.10	QC2030H	112.00	QC3030H	139.00
35	QC1035	19.60	QC2035	43.10	QC2035H	112.00	QC3035H	139.00
40	QC1040	19.60	QC2040	43.10	QC2040H	112.00	QC3040H	139.00
45	QC1045	19.60	QC2045	43.10	QC2045H	112.00	QC3045H	139.00
50	QC1050	19.60	QC2050	43.10	QC2050H	112.00	QC3050H	139.00
55	QC1055	19.60	QC2055	43.10	QC2055H	112.00	QC3055H	139.00
60	QC1060	19.60	QC2060	43.10	QC2060H	112.00	QC3060H	139.00
70	QC1070	38.40	QC2070	81.00	QC2070H	149.00	QC3070H	173.00
80	.....	.....	QC2080	112.00	QC2080H	172.00	QC3080H	197.00
90	.....	.....	QC2090	112.00	QC2090H	172.00	QC3090H	197.00
100	QC1100	65.00	QC2100	112.00	QC2100H	172.00	QC3100H	197.00
<b>Quicklag<sup>®</sup> Type: QCHW 22,000 Ampere I.C. Thermal Magnetic Breakers</b>								
15	QCHW10150	38.90	QCHW2015	83.00	QCHW2015H	154.00	QCHW3015H	209.00
20	QCHW10200	38.90	QCHW2020	83.00	QCHW2020H	154.00	QCHW3020H	209.00
25	QCHW1025	38.90	QCHW2025	83.00	QCHW2025H	154.00	QCHW3025H	209.00
30	QCHW1030	38.90	QCHW2030	83.00	QCHW2030H	154.00	QCHW3030H	209.00
35	QCHW1035	38.90	QCHW2035	83.00	QCHW2035H	154.00	QCHW3035H	209.00
40	QCHW1040	38.90	QCHW2040	83.00	QCHW2040H	154.00	QCHW3040H	209.00
45	QCHW1045	38.90	QCHW2045	83.00	QCHW2045H	154.00	QCHW3045H	209.00
50	QCHW1050	38.90	QCHW2050	83.00	QCHW2050H	154.00	QCHW3050H	209.00
55	QCHW1055	38.90	QCHW2055	83.00	QCHW2055H	154.00	QCHW3055H	209.00
60	QCHW1060	38.90	QCHW2060	83.00	QCHW2060H	154.00	QCHW3060H	209.00
70	QCHW1070	51.00	QCHW2070	123.00	QCHW2070H	191.00	QCHW3070H	250.00
80	.....	.....	QCHW2080	181.00	QCHW2080H	232.00	QCHW3080H	302.00
90	.....	.....	QCHW2090	181.00	QCHW2090H	232.00	QCHW3090H	302.00
100	.....	.....	QCHW2100	181.00	QCHW2100H	232.00	QCHW3100H	302.00
<b>Quicklag<sup>®</sup> Type: QHCX 42,000 Ampere I.C. Thermal Magnetic Breakers</b>								
15	QHCX10150	55.00	QHCX2015	99.00	.....	.....	QHCX3015H	198.00
20	QHCX10200	55.00	QHCX2020	99.00	.....	.....	QHCX3020H	198.00
25	QHCX1025	55.00	QHCX2025	99.00	.....	.....	QHCX3025H	198.00
30	QHCX1030	55.00	QHCX2030	99.00	.....	.....	QHCX3030H	198.00
35	QHCX1035	55.00	QHCX2035	99.00	.....	.....	QHCX3035H	198.00
40	QHCX1040	55.00	QHCX2040	99.00	.....	.....	QHCX3040H	198.00
45	QHCX1045	55.00	QHCX2045	99.00	.....	.....	QHCX3045H	198.00
50	QHCX1050	55.00	QHCX2050	99.00	.....	.....	QHCX3050H	198.00
55	QHCX1055	55.00	QHCX2055	99.00	.....	.....	QHCX3055H	198.00
60	QHCX1060	55.00	QHCX2060	99.00	.....	.....	QHCX3060H	198.00
70	QHCX1070	89.00	QHCX2070	212.00	.....	.....	QHCX3070H	300.00
80	.....	.....	QHCX2080	212.00	.....	.....	QHCX3080H	423.00
90	.....	.....	QHCX2090	212.00	.....	.....	QHCX3090H	423.00
100	.....	.....	QHCX2100	212.00	.....	.....	QHCX3100H	423.00
<b>Quicklag<sup>®</sup> Mark 75<sup>®</sup> Type: QHCW 65,000 Ampere I.C. Thermal Magnetic Breakers</b>								
15	QHCW10150	63.00	QHCW2015	145.00	.....	.....	QHCW3015H	252.00
20	QHCW10200	63.00	QHCW2020	145.00	.....	.....	QHCW3020H	252.00
25	QHCW1025	63.00	QHCW2025	145.00	.....	.....	.....	.....
30	QHCW1030	63.00	QHCW2030	145.00	.....	.....	.....	.....

⊙ Switching duty rated for 120 volt Ac fluorescent light applications only.  
 ⊙ All products UL and CSA listed  
 ⊙ All products 10-100A are HACR rated



# MOLDED CASE CIRCUIT BREAKERS

81

Type: CA, CAH, HCA 225 Ampere

## Type CA, CAH and HCA Circuit Breakers

2 and 3 Poles, 240 Volts AC  
 Non-Interchangeable Trip  
 Type CA: 100-225 Amps, 10,000 AIC  
 Type CAH: 100-225 Amps, 22,000 AIC  
 Type HCA: 100-225 Amps, 42,000 AIC



Type CA  
3-Pole

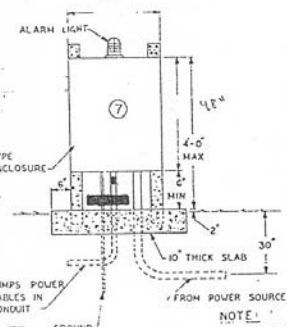
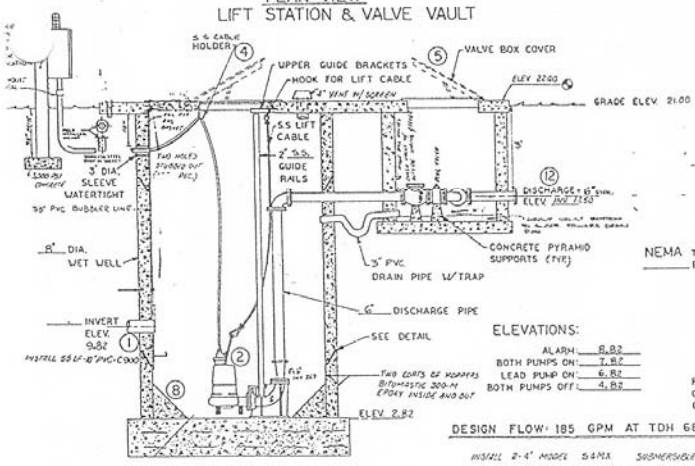
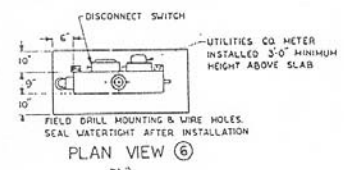
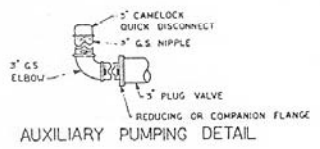
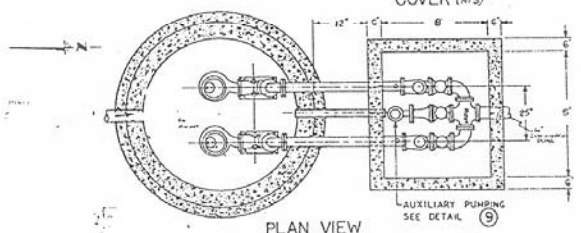
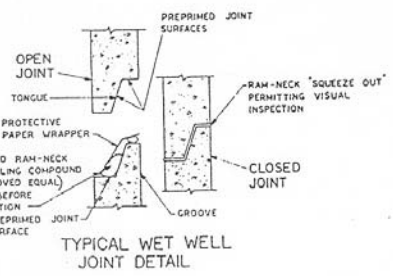
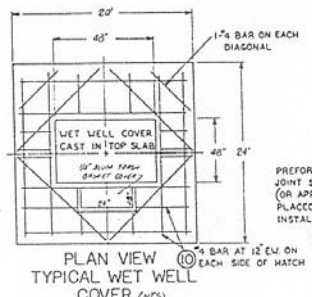
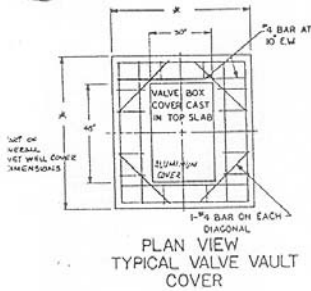
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 Technical Data 29-120  
 Application Data 29-160  
 Shipping Data, page 67  
 Discount Symbol CB-1

Continuous Ampere Rating <sup>100</sup> 40°C	Breaker Shipped With							
	Line and Load Terminal Installed		Load Terminals Only Installed		Line Terminals Only Installed		No Terminals Installed	
	Catalog Number	List Price	Catalog Number	List Price	Catalog Number	List Price	Catalog Number	List Price
<b>Type: CA 10,000 Ampere I.C. Thermal Magnetic Breakers</b>								
<b>2-Poles, 240 Volts AC</b>								
100	CA2100	\$ 244	CA2100X	\$ 232	CA2100Y	\$ 232	CA2100W	\$ 232
125	CA2125	244	CA2125X	232	CA2125Y	232	CA2125W	232
150	CA2150	244	CA2150X	232	CA2150Y	232	CA2150W	232
175	CA2175	244	CA2175X	232	CA2175Y	232	CA2175W	232
200	CA2200	244	CA2200X	232	CA2200Y	232	CA2200W	232
225	CA2225	244	CA2225X	232	CA2225Y	232	CA2225W	232
225 MCS							CA2225WK	200
<b>3-Poles, 240 Volts AC</b>								
100	CA3100	625	CA3100X	607	CA3100Y	607	CA3100W	607
125	CA3125	625	CA3125X	607	CA3125Y	607	CA3125W	607
150	CA3150	625	CA3150X	607	CA3150Y	607	CA3150W	607
175	CA3175	625	CA3175X	607	CA3175Y	607	CA3175W	607
200	CA3200	625	CA3200X	607	CA3200Y	607	CA3200W	607
225	CA3225	625	CA3225X	607	CA3225Y	607	CA3225W	607
225 MCS							CA3225WK	557
<b>Type: CAH 22,000 Ampere I.C. Thermal Magnetic Breakers</b>								
<b>2-Poles, 240 Volts AC</b>								
100	CAH2100	565	CAH2100X	553	CAH2100Y	553	CAH2100W	553
125	CAH2125	565	CAH2125X	553	CAH2125Y	553	CAH2125W	553
150	CAH2150	565	CAH2150X	553	CAH2150Y	553	CAH2150W	553
175	CAH2175	565	CAH2175X	553	CAH2175Y	553	CAH2175W	553
200	CAH2200	565	CAH2200X	553	CAH2200Y	553	CAH2200W	553
225	CAH2225	565	CAH2225X	553	CAH2225Y	553	CAH2225W	553
<b>3-Poles, 240 Volts AC</b>								
100	CAH3100	885	CAH3100X	867	CAH3100Y	867	CAH3100W	867
125	CAH3125	885	CAH3125X	867	CAH3125Y	867	CAH3125W	867
150	CAH3150	885	CAH3150X	867	CAH3150Y	867	CAH3150W	867
175	CAH3175	885	CAH3175X	867	CAH3175Y	867	CAH3175W	867
200	CAH3200	885	CAH3200X	867	CAH3200Y	867	CAH3200W	867
225	CAH3225	885	CAH3225X	867	CAH3225Y	867	CAH3225W	867
<b>Type: HCA 42,000 Ampere I.C. Thermal Magnetic Breakers</b>								
<b>2-Poles, 240 Volts AC</b>								
100	HCA2100	797	HCA2100X	785	HCA2100Y	785	HCA2100W	785
125	HCA2125	797	HCA2125X	785	HCA2125Y	785	HCA2125W	785
150	HCA2150	797	HCA2150X	785	HCA2150Y	785	HCA2150W	785
175	HCA2175	797	HCA2175X	785	HCA2175Y	785	HCA2175W	785
200	HCA2200	797	HCA2200X	785	HCA2200Y	785	HCA2200W	785
225	HCA2225	797	HCA2225X	785	HCA2225Y	785	HCA2225W	785
<b>3-Poles, 240 Volts AC</b>								
100	HCA3100	1142	HCA3100X	1124	HCA3100Y	1124	HCA3100W	1124
125	HCA3125	1142	HCA3125X	1124	HCA3125Y	1124	HCA3125W	1124
150	HCA3150	1142	HCA3150X	1124	HCA3150Y	1124	HCA3150W	1124
175	HCA3175	1142	HCA3175X	1124	HCA3175Y	1124	HCA3175W	1124
200	HCA3200	1142	HCA3200X	1124	HCA3200Y	1124	HCA3200W	1124
225	HCA3225	1142	HCA3225X	1124	HCA3225Y	1124	HCA3225W	1124

Description	Catalog Number	List Price Each
Handle Locks Non-padlockable	CA23NPL	\$ 5.90
Handle Locks Padlockable	CA23PL CA23LOCK	76.00/10 178.00/10
Mounting Hardware Base mounting hardware - 2 pole	CA28HW	5.30
Base mounting hardware - 3 pole	CA38HW	8.00
Mounting Bracket - 2 pole	CA2MB	9.40
Mounting Bracket - 3 pole	CA3MB	10.60
Terminals #3 to 300MCM	TA225CA2	6.00

Description	Catalog Suffix	List Price Adder
Shunt Trip	S1 to S16	\$180.00
Auxiliary Switch	A1 to A16	61.00
Special Calibration (50 C)	V	20%
Freeze Testing	H	30%
Moisture/Fungus Treatment	F	52.00

Electrical Components Division  
 February 1993



ELEVATIONS:

ALARM	8.82
BOTH PUMPS ON	7.82
LEAD PUMP ON	6.82
BOTH PUMPS OFF	4.82

DESIGN FLOW: 185 GPM AT TDH 68 FT.

INSTALL 2-4" MODEL 54MX SUBMERSIBLE PUMPS  
BY HYDRA-MATIC, 15 BHP, 93" IMP DWN 1150-RWH  
MFG SAIDS 3/16" SHRED OR EQUIV. APPROVED.

NOTE:  
ALL SHOP DRAWINGS SHALL BE  
APPROVED BY THE CITY OF ROCKLEDGE  
AND THE ENGINEER PRIOR TO  
ORDERING MATERIALS.