**Parker Hannifin Corporation**
Oildyne Division
5520 North Highway 169
Minneapolis, MN 55428
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# 108 SERIES POWER UNIT

# INSTALLATION & START-UP PROCEDURE

1. Mount the unit securely in a vertical position with the motor up. (Unless the unit was ordered specifically as a horizontal mount.)

2. Wire the motor using the appropriate wiring diagram on the back of this page. If your motor code is not shown, consult the factory for assistance.

3. Fill the reservoir with automatic transmission fluid or any clean hydraulic oil with a viscosity range of 150-300 SSU at 100° F. NOTE: Choose a hydraulic fluid having a viscosity index that is suitable for the climatic conditions in which the unit will be operated. Recommended operating temperature range is +20° F to +180° F. Consult the factory for special low temperature pumps.

## GENERAL START-UP INSTRUCTIONS

NOTE: The ports are marked on the casting 'UP' and 'DN'. When facing the power unit with the motor up, plug the right-hand, or 'DN' port. Jog the motor until oil flows from the left-hand, or 'UP' port. If oil does not flow from the 'UP' port, reverse the wire leads on the motor, and repeat. The pump is now primed. Connect the hose (or tubing) to the 'UP' port and tighten. Connect the other hose end to the blind end of a fully retracted hydraulic cylinder. With the hose fitting loose, operate the power unit until oil (and no air) bleeds from the fitting. Tighten the fitting. Refill the reservoir. To complete the system start-up, consult the following specific circuitry instructions appropriate for your power unit.

## SINGLE DIRECTION POWER UNITS

Follow the general start-up instructions. When using an externally mounted directional control valve (DCV), connect the tank port of the DCV to the 'DN' port of the power unit. If using an externally mounted two-way release (dump) valve, tee the valve into the pressure line and plumb the oil return line to the 'DN' port. Cycle the system a few times to ensure the air is out of the circuit.

(Over for more instructions and wiring diagrams)

## REVERSIBLE POWER UNITS

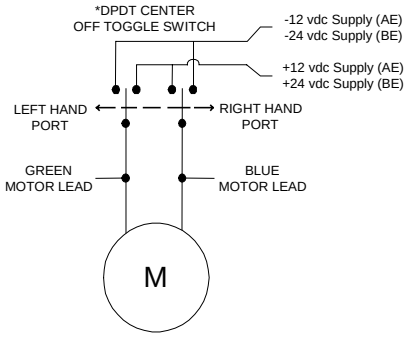
After following the general start-up instructions, run the power unit in the 'UP' port rotation (same direction as previously run). Continue until the cylinder rod is fully extended, adding only enough fluid to the reservoir to get the cylinder extended. (Adding too much oil at this point could cause the reservoir to overflow when the cylinder rod is retracted.) Remove the plug from the 'DN' port and connect one end of the second hose to it, then tighten. Jog the power unit in the 'DN' port rotation (opposite direction of earlier), until oil (with no air) flows from the loose hose end. Connect and tighten the hose end onto the rod end cylinder fitting. Operate the power unit to fully retract the cylinder. Once retracted, check the oil level in the reservoir and add as needed to maintain full capacity.

## REVERSIBLE POWER UNITS USED WITH SINGLE ACTING CYLINDERS

Follow the general start-up instructions. Operate the power unit in the same direction as earlier to extend the cylinder fully. To retract, reverse the electric motor rotation. The cylinder will retract due to the load on the rod, or due to the use of a spring return type cylinder.
NOTE: The power unit itself will not retract the cylinder. Retracting relies solely upon external forces acting on the cylinder rod, such as a spring or load.

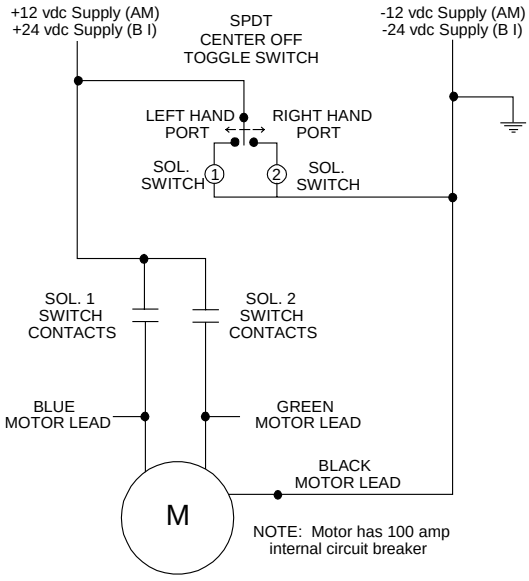
## WIRING DIAGRAMS

Wiring Diagram: AE & BE




* DPDT CENTER OFF TOGGLE SWITCH USABLE UP TO 20 AMPS

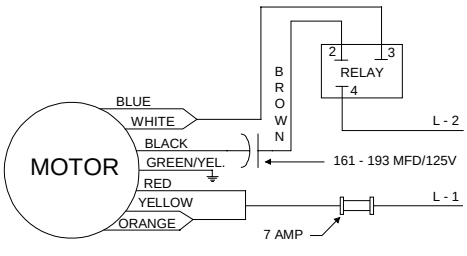
Wiring Diagram: AM & BI



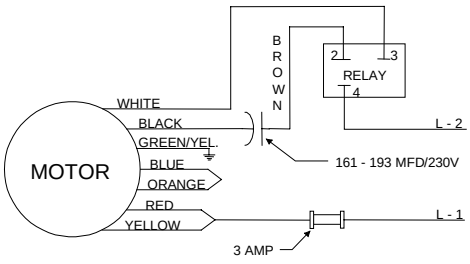

NOTE: Motor has 100 amp internal circuit breaker

Wiring Diagrams: HA & HD

Reliance Electric Motor Model KL-M330-BOL
1/3 HP, 1Ø, 115/230 VAC, 50/60 HZ.
Start Relay and Capacitor are supplied with unit.
**TO REVERSE, INTERCHANGE THE RED AND BLACK LEADS**.

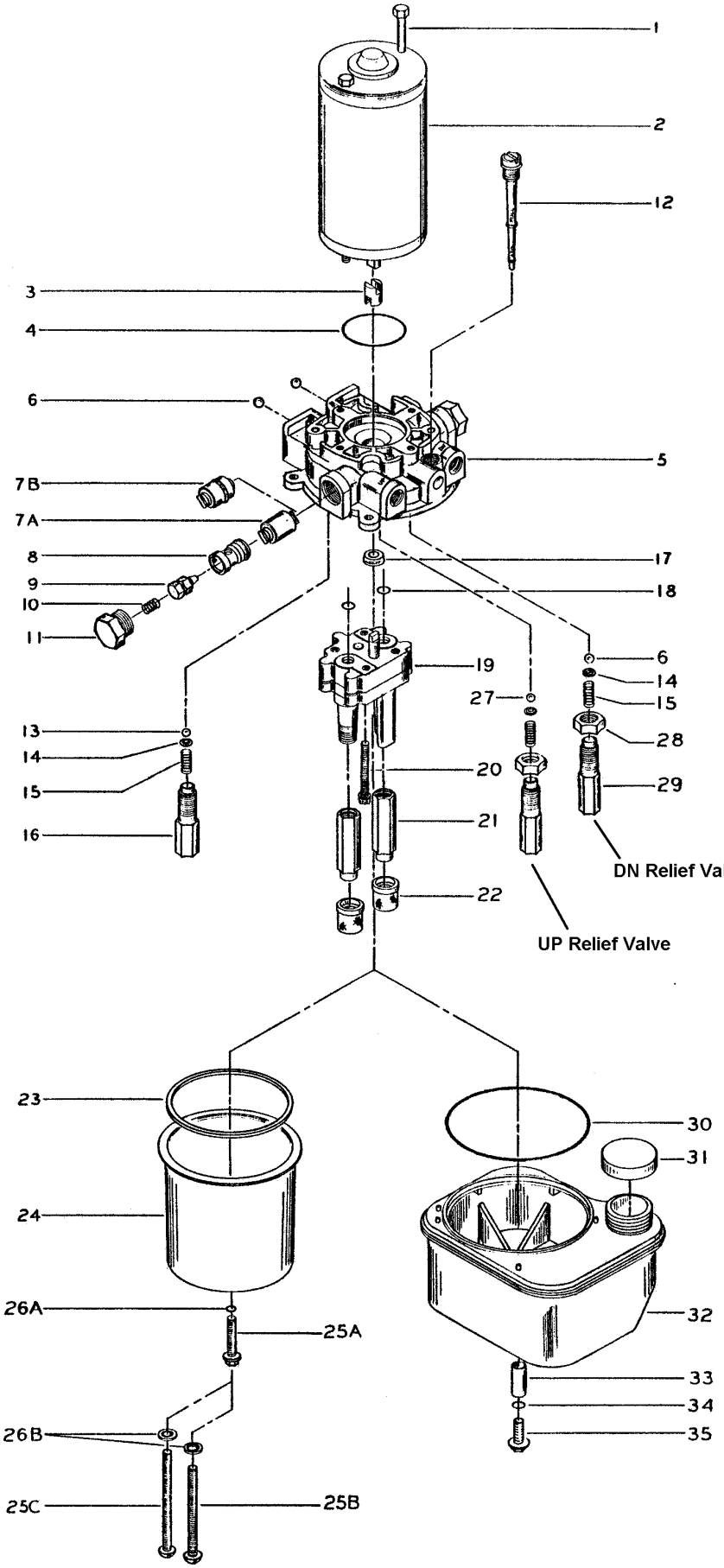



115 VOLTAGE CONNECTION




230 VOLTAGE CONNECTION

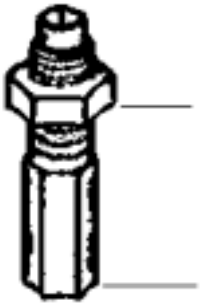
# 108 SERIES POWER UNIT RELIEF VALVE ADJUSTMENT and CLEANING INSTRUCTIONS




Note the designations in the drawing at left for the UP and DN relief valves. The UP relief valve corresponds to the UP port; the DN relief valve corresponds to the DN port. (These designations are found in the casting above each port on Item 5.

If disassembly of the relief valve is planned measure the distance between the bottom of the jam nut, Item 28, and the end of the adjusting screw, Item 29 (shown below). Make note of this dimension so upon re-assembly of the valve the measurement can serve as a guide in getting to the original setting. Do this for each relief valve being worked on.

**Pressure Setting Changes**



To adjust the relief valve loosen the jam nut, Item 28, on the applicable relief valve. Tighten the relief valve adjusting screw, Item 29 to increase the setting and loosen the adjusting screw to reduce the setting.

The approximate pressure setting changes per full turn of the adjusting screw are:

UP Side: 500 psi
DN Side: 300 psi

After the changes are made retighten the jam nut (70 in-lb max.) against the adapter, Item 5.

Follow the original bleeding and startup instructions supplied with the 108 Series Power Unit.

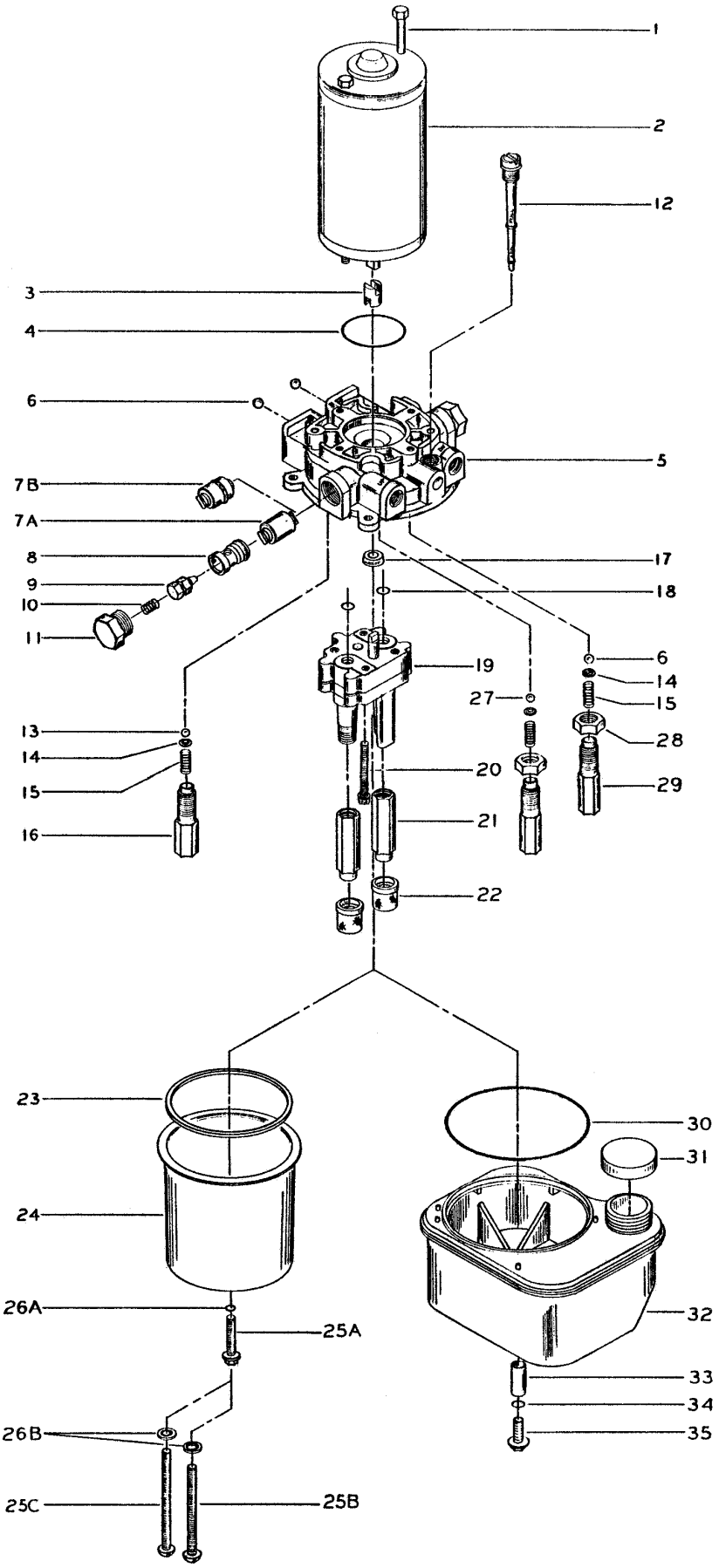
**Relief Valve Cleaning**

Follow the measuring instructions given above. Loosen the jam nut, Item 28. Unscrew the adjusting screw, Item 29, completely taking care to catch all internal relief valve components. Flush the relief valve seat (the cavity in the 108 Series adapter, Item 5, into which the adjusting screw goes) to remove any contamination. Examine the relief valve ball, Item 6, and clean as needed. Reassemble all relief valve components as shown in the diagram at left. Tighten the adjusting screw and jam nut to achieve the earlier recorded measurement. Repeat for second relief valve.

Follow the original bleeding and startup instructions supplied with the 108 Series Power Unit.

# 108 SERIES POWER UNIT

## Reversible Locking, Vertical Mount shown




### GENERIC EXPLODED VIEW AND PARTS LIST

| ITEM # | PART # | DESCRIPTION | QUANT |
|---|---|---|---|
| 1 | * | Motor Mounting Stud | 2 |
| 2 | * | Motor | 1 |
| 3 | 361183 | Coupling | 1 |
| 4 | 405673 | O-Ring (132-70) | 1 |
| 5 | * | Adapter | 1 |
| 6 | 401065 | 1/4 Steel Ball | 3 |
| 7A | 361181 | Spool (Use with .327 rev. pump) | 1 |
| 7B | 774022 | Spool (Use with .100, .190 & .250 rev. pumps and all sgl. dir. pumps, includes #404581 O-ring 013-70) | 1 |
| 8 | 773763 | Check Valve Body (Includes #406484 O-ring 014-90) | 2 |
| 9 | 773776 | Poppet Assembly | 2 |
| 10 | 410462 | Spring | 2 |
| 11 | 773764 | Hex Plug Retainer | 2 |
| 12 | 773762 | Dipstick (With "A" & "B" reservoirs only, includes #407328 O-ring 012-90) | |
| 13 | 411167 | 3/16 Vespel Ball | 2 |
| 14 | 411173 | Eyelet | 4 |
| 15 | 411170 | Spring | 4 |
| 16 | ** | Thermal Relief Adjusting Screw | 2 |
| 17 | 410512 | Shaft Seal | 1 |
| 18 | 405387 | O-ring 009-70 | 2 |
| 19 | * | Basic Pump | 1 |
| 20A | 410465 | #10-32 UNF x 1 5/16" Torx Hd. (Use with .100 & .190 pumps) | 2 |
| 20B | 410601 | #10-32 UNF x 1 7/16" Torx Hd. (Use with .250 and .327 pumps) | 2 |
| 21 | 362136 | Suction Tube Extension (Use only with "B" reservoir) | 2 |
| 22 | 410521 | Filter | 2 |
| 23 | 410578 | Reservoir Seal | 1 |
| 24A | 411477 | Reservoir "A" (28 cu. in.) | 1 |
| 24B | 410541 | Reservoir "B" (46 cu. in.) | 1 |
| 25A | 411355 | #10-32 x 1 Hex Hd. Screw (Use with "A" reservoir) | 1 |
| 25B | 409715 | #10-32 UNC x 2 1/2" Sl. Rd. Hd. (Use with "B" reservoir & .327 pump) | 1 |
| 25C | 411796 | #10-32 UNC x 2 3/4" Sl. Rd. Hd. (Use with "B" reservoir & .100, .190 & .250 pumps) | 1 |
| 26A | 409815 | O-ring 007-90 (Use with "A" reservoir) | 1 |
| 26B | 359071 | Thread Seal (Use with "B" reservoir) | 1 |
| 27 | 401072 | 3/16 Steel Ball | 1 |
| 28 | 410288 | 7/16-20 Hex Jam Nut | 2 |
| 29 | ** | Relief Valve Adjusting Screw | 2 |
| 30 | 411237 | Reservoir Seal, O-ring 238-70 | 1 |
| 31 | 411175 | Reservoir Cap | 1 |
| 32 | 363220 | Reservoir "C" | 1 |
| 33A | 363235 | Spacer (Use with .100 pump) | 1 |
| 33B | 363236 | Spacer (Use with .190 pump) | 1 |
| 33C | 364030 | Spacer (Use with .250 pump) | 1 |
| 34 | 410245 | O-ring (108-70) | 1 |
| 35A | 411392 | #10-32 Hex Hd. Self Tapping (For use with .327 pump) | 1 |
| 35B | 411355 | #10-32 Hex Hd. Self Tapping (For use with .100, .190 & .250 pumps) | 1 |

634412 Seal Kit (Single Direction & Reversible)

* Please Specify Code Description Of The Power Unit When Ordering These Items.

** Please Specify Relief Valve Settings When Ordering These Items.

Oildyne

# *108 Series Hydraulic Power Units*

***Pressures to 241 bar (3500 psi)***
***Flows to 2.8 lpm ($^{3}/_{4}$ gpm)***


# Typical applications

**Positioning**
- Hydraulic door operators
- Conveyor belt tensioners
- Medical chairs, beds, and equipment

**Recreational Vehicles**
- Leveling
- Slideouts
- Tent Trailers

**Clamping**
- Tool fixtures and jigs
- Hydraulic brakes
- Crimping tools
- Arbor presses
- Truck restraints

**Cycling**
- Garbage compactors
- Valve operators
- Press controls
- Packing equipment
- Indexing tables

**Lifting**
- Handicap lifts
- Scissor lift tables
- Pallet movers

# 108 Series Self-contained Hydraulic Power Units

Our compact 108 Series power units let you put the power where you need it. They're completely self-contained with an AC or DC motor, gear pump, reservoir, internal valving, load hold checks and relief valves.

The 108 Series models are designed for intermittent service and come in four standard pump sizes which produce flows of .0098, .0187, .0246, and .0321 cubic inches per revolution. Locking check valves are available in all models. Performance will vary with the type of fluid used. Several hydraulic circuits are available.

108 Series units are available with single- or bi-directional rotation. Single units are commonly used to charge accumulators, power one-direction hydraulic motors and cylinders, provide pilot flow to servo valves, pressurize lube systems and supply multi-function circuits with external valving.

Bi-directional, reversible units operate double-acting cylinders and two-way motors.

We'd like to work with you on your special hydraulic applications. Our people know small hydraulics. We know how to design them, how to make them and how to apply them. Therefore, we can offer you a practical, economical solution to your fluid power problems.

Oildyne has pioneered top quality, compact hydraulic components since 1955. We can provide standard products or custom design high pressure, space saving solutions to your specific needs.



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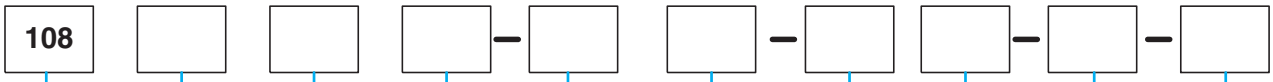
# Standard Product Ordering Code




**108 POWER UNIT**
- includes relief valve(s)

**MOTOR CODE**
**AE** 12 vdc Permanent Magnet
**AM** 12 vdc Series Wound
**BE** 24 vdc Permanent Magnet
**BI** 24 vdc Series Wound
**HA** 115 vac, 1 phase, Open
**HD** 230 vac, 1 phase, Open
**IA** 36 vdc Permanent Magnet

**PUMP TYPE**
**S** Standard
**C** Cold Temp

**PUMP SIZE**
**10** .0098 CIPR
**19** .0187 CIPR
**25** .0249 CIPR
**32** .0321 CIPR

**RESERVOIR**
**A** 26 cu. in. (13 cu. in. usable)
**B** 46 cu. in. (23 cu. in. usable)
**C** 46 cu. in. (26 cu. in. usable)
**D** Alternate orientation version of C
**F** 122 cu. in. (82 cu. in. usable)
**G** 69 cu. in. (46 cu. in. usable)
**H** 1/2 gallon usable
**I** 1 gallon usable
**J** 1-1/2 gallon usable
**P** 1/4 gal. usable (plastic)
**Q** 1/2 gal. usable (plastic)
**R** 1 gal. usable (plastic)
**S** 3/4 gal. usable (plastic)

**NOTES: C and D reservoirs are available as Vertical Mount ONLY. A reservoir with pump 32 is available ONLY as vertical mount.**

**CIRCUIT TYPE**
**NN** Single direction
**WW** Single direction with check
**RR** Reversible
**LL** Reversible locking
**RB** Reversible with Back Pressure
**LB** Reversible locking with Back Pressure

**Each Solenoid Valve option below includes the WW circuit:**
**S1** 12 vdc, Normally Closed
**S2** 24 vdc, Normally Closed
**S3** 120 vac, Normally Closed
**S4** 240 vac, Normally Closed
**S5** 12 vdc, Normally Open
**S6** 24 vdc, Normally Open
**S7** 120 vac, Normally Open
**S8** 240 vac, Normally Open

**PORTS**
**1** 7/16-20 (SAE -4)
**2** 7/16-24 (Inv. Flare)
**3** 1/8" Pipe (NPSF)
**4** 1/8" Pipe (BSPP)

**MOUNTING**
**V** Vertical (motor up)
**H** Horizontal

**UP RV SETTING**
(Left Hand Port)
In multiples of 100 psi
**Examples**
**04** = 400 psi
**12** = 1200 psi
**29** = 2900 psi

**DN RV SETTING**
(Right Hand Port)
Use **00** for Single Dir.
In multiples of 100 psi
**Examples**
**04** = 400 psi
**12** = 1200 psi
**29** = 2900 psi

**ORDERING CODE INSTRUCTIONS**

Select the model code needed based on catalog information. All boxes above must be filled in before Oildyne can process the order. If the power unit is a single direction unit use '00' for the DN (Right Hand) relief valve box.

## Hydraulic Fluid

ATF, OD18, or other clean hydraulic oil with a viscosity of 150 to 300 SUS at 38°C (100°F) is acceptable. If another type of fluid is needed, please consult the factory.

## Temperature Range

Normal operating range is +20°F to +140°F. Please review your application with the factory for uses below -7°C and over +60°C (+20°F and over +140°F).

ALL DATA SUBJECT TO CHANGE WITHOUT NOTICE
FOR POWER UNIT CONFIGURATIONS OTHER THAN THOSE SHOWN PLEASE CONSULT OILDYNE.



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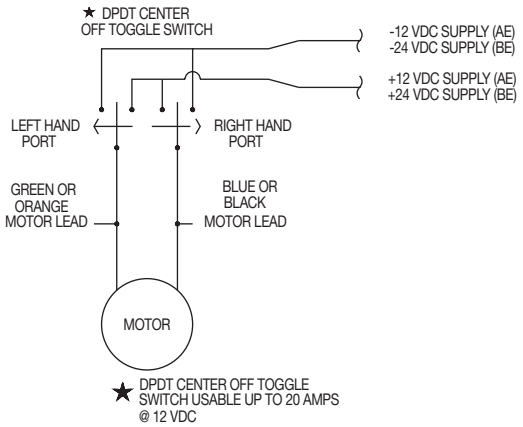
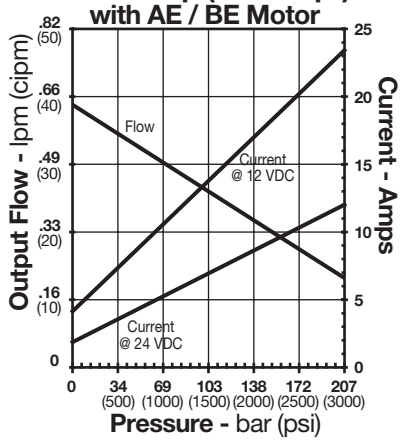
# 12/24 V DC Permanent Magnet Motor • Code AE • BE

**Motor Type: AE and BE**
For intermittent duty cycles.

## Wiring Diagram: AE • BE



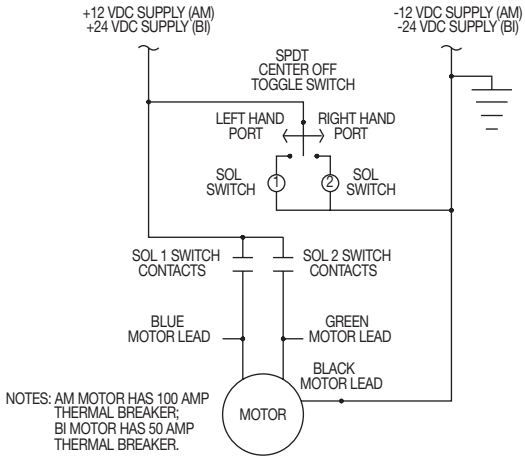

## .100 Pump (.0098 cipr) with AE / BE Motor



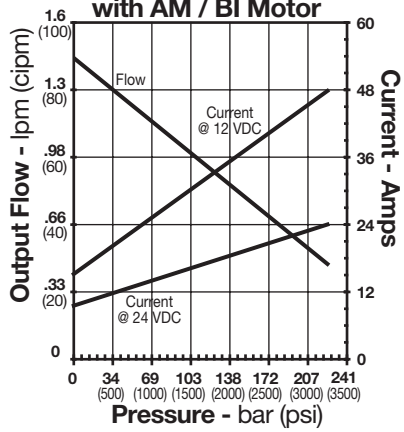

# 12/24 V DC Series Wound Motor • Code AM • BI

**Motor Type: AM and BI**
For intermittent duty cycles.

## Wiring Diagram: AM • BI



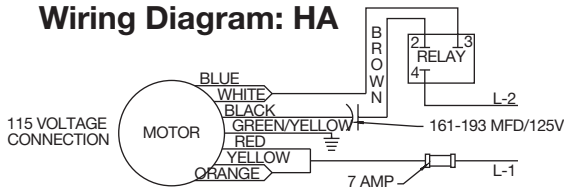

## .100 Pump (.0098 cipr) with AM / BI Motor




# 115/230 V AC Capacitor Start Motor • Code HA • HD

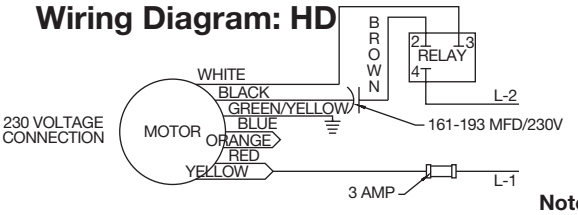
**Motor Type: HA and HD**
Dual voltage 1/3 HP, 60/50 hz, 3450/2850 rpm, intermittent duty, single phase, open frame. Capacitor and relay included.

## Wiring Diagram: HA

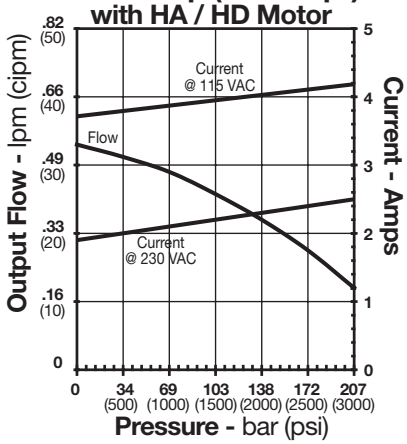



TO REVERSE, INTERCHANGE RED AND BLACK LEADS

## Wiring Diagram: HD




## .100 Pump (.0098 cipr) with HA / HD Motor




**Note:** 50 hz performance is 83% of curves shown.



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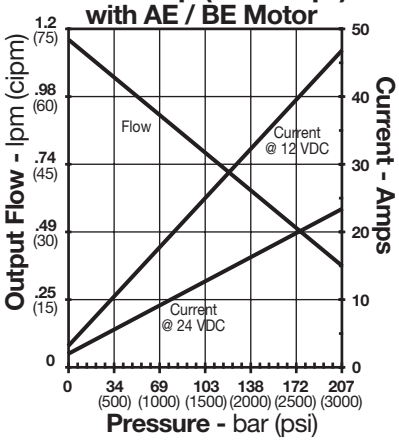
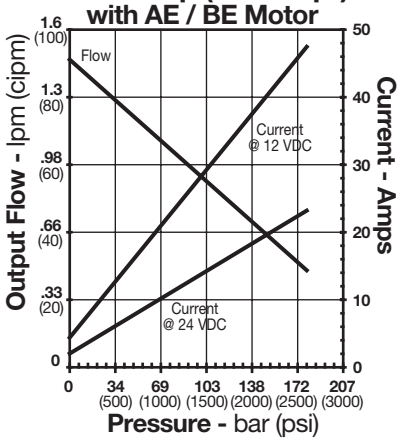
Performance data based on ATF @ 21°C ( 70°F)

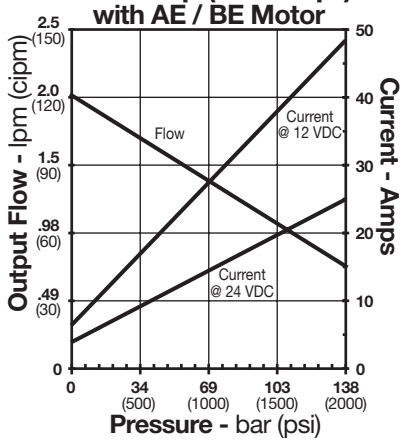
### .190 Pump (.0187 cipr) with AE / BE Motor



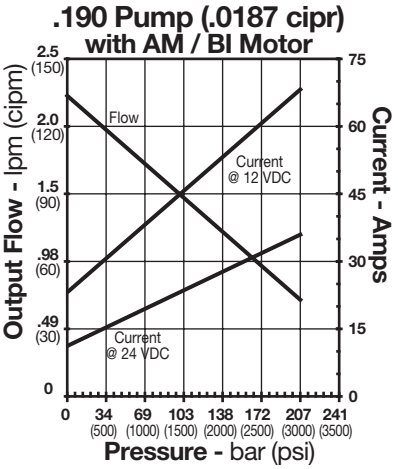

### .250 Pump (.0246 cipr) with AE / BE Motor



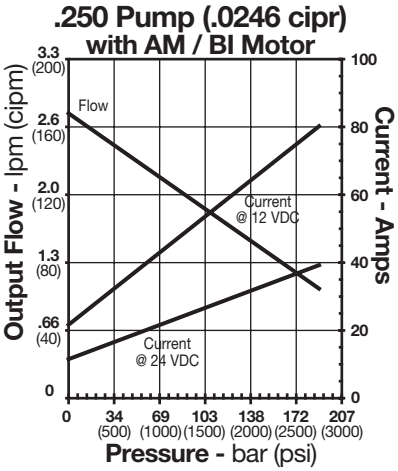

### .327 Pump (.0321 cipr) with AE / BE Motor



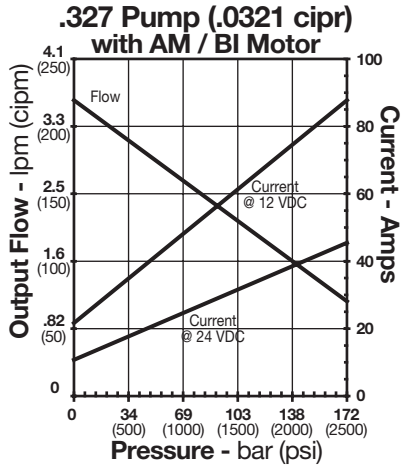

### .190 Pump (.0187 cipr) with AM / BI Motor



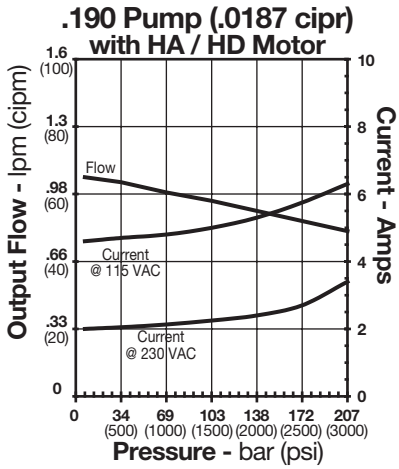

### .250 Pump (.0246 cipr) with AM / BI Motor



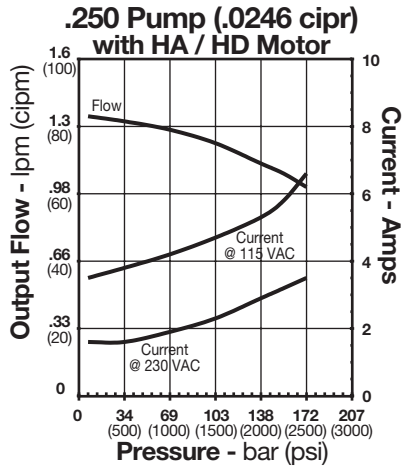

### .327 Pump (.0321 cipr) with AM / BI Motor



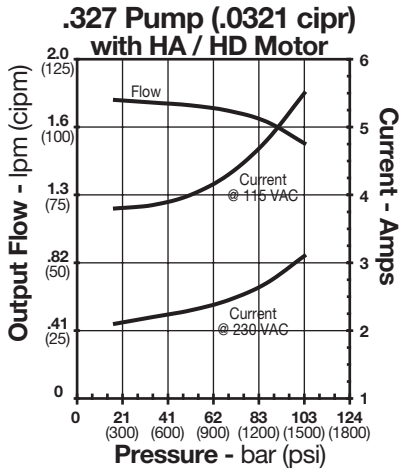

### .190 Pump (.0187 cipr) with HA / HD Motor




### .250 Pump (.0246 cipr) with HA / HD Motor




### .327 Pump (.0321 cipr) with HA / HD Motor




**Note:** Performance data is for reference only.



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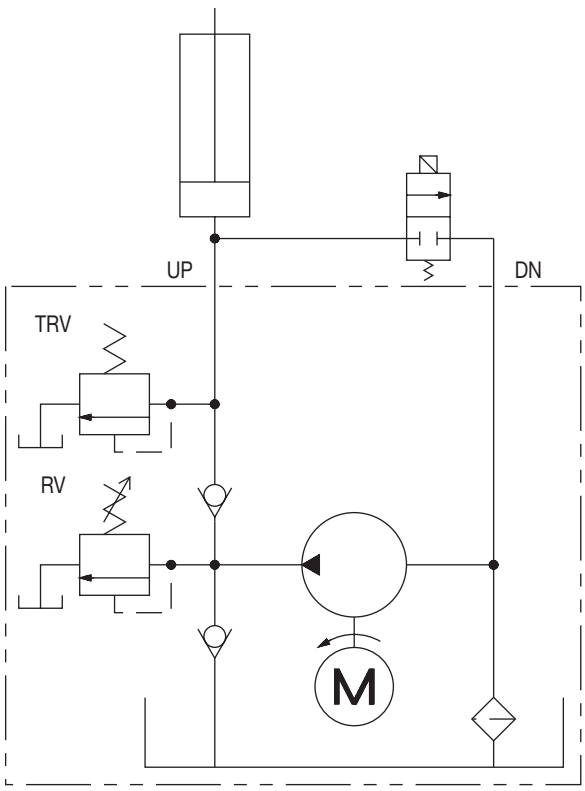
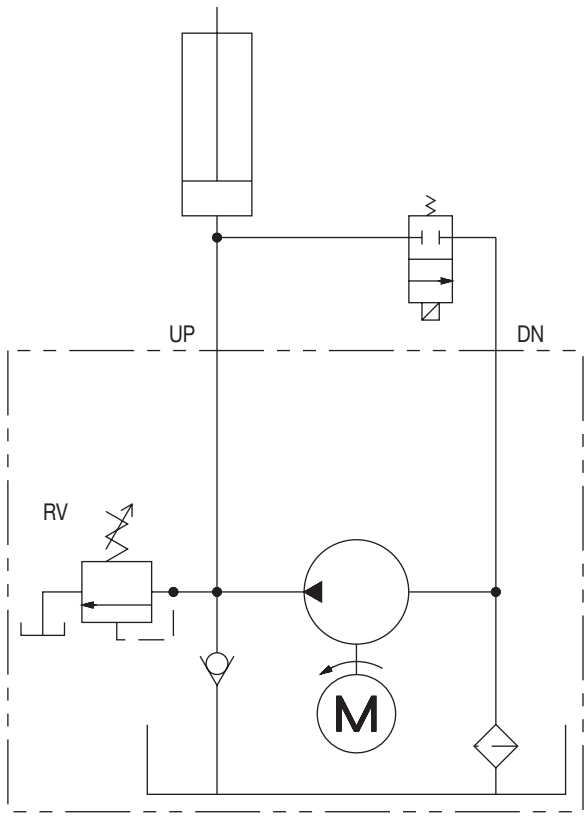
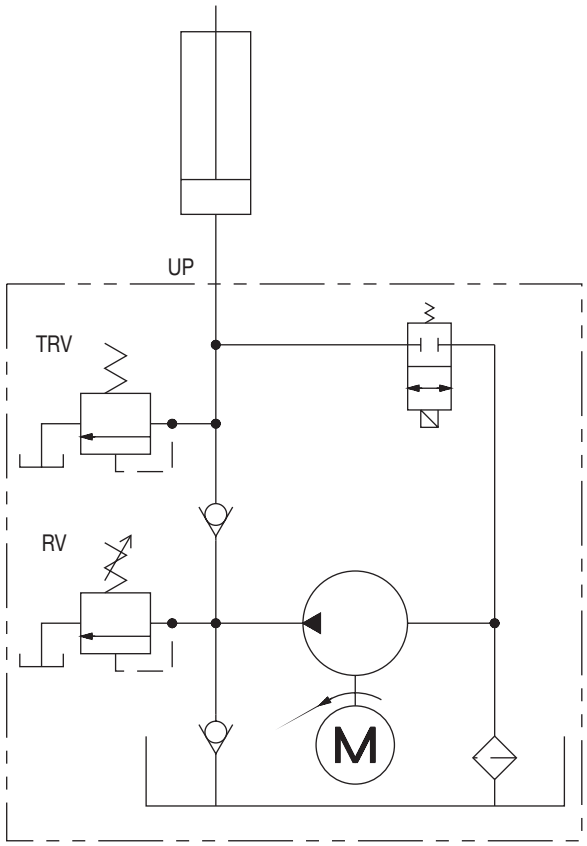



"WW" CIRCUIT




"NN" CIRCUIT




"S*" CIRCUIT

# Thermal Relief Valves—Why?

The thermal relief valve's (TRV) purpose is to allow a bleed off of built up pressure due to thermal expansion of the fluid or to act as a (limited) shock load protection, should a cylinder in the system get bumped.

The thermal relief valve is included in circuits using a pilot operated check valve. The single direction units get one; the reversing units get two. It is located between the check valve and the 108 Series pump outlet port. It is a fixed relief valve with a pressure setting approximately 100-140 bar (1500-2000 psi) above the system relief valve pressure.



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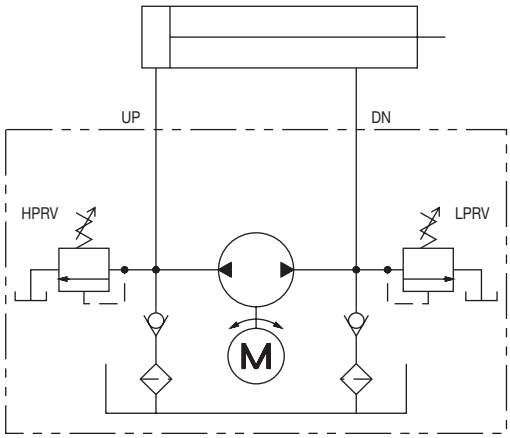
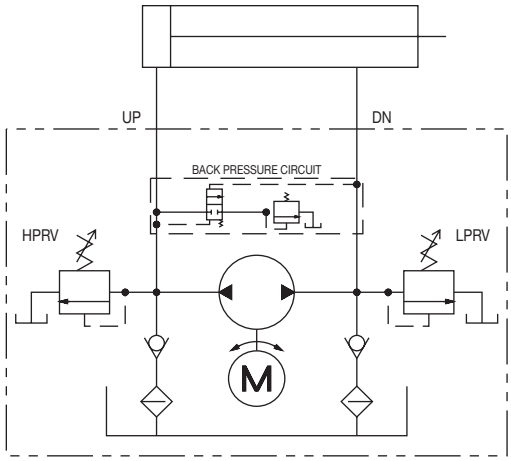
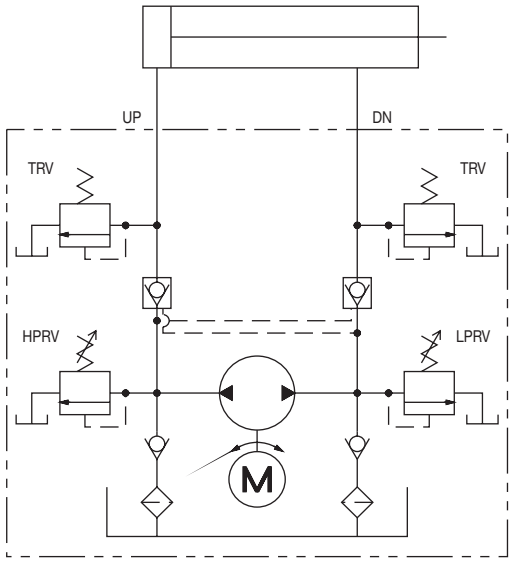


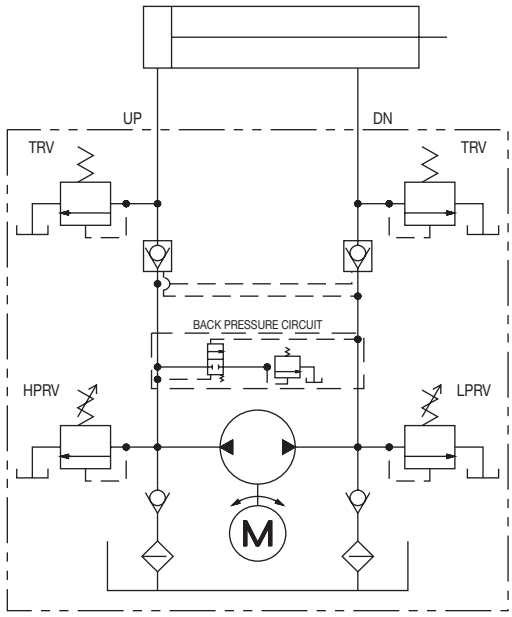
"RR" CIRCUIT



"RB" CIRCUIT



"LL" CIRCUIT



"LB" CIRCUIT

# Back Pressure Circuits—Why?

The basic reversible circuit is essentially a closed loop. The oil returning from the system is fed back into the pump inlet. When a cylinder is being retracted more oil is being returned to the power unit than is leaving it due to the rod volume. This results in the DN side relief valve cracking open allowing the rod volume of oil to go back to the tank. The larger the rod volume the more open the relief valve will be. In many applications this is not a problem. However, if work is being done on the retract stroke, or if a pressure switch is used to signal the cylinder is fully retracted, the back pressure circuit is required. This circuit allows the rod volume of oil to return to the reservoir through a special shuttle spool, before it reaches the pump. Full relief valve pressure is then available to retract the cylinder, also preventing a pressure switch from tripping before the full retract position is achieved.

Recommended uses:

- In systems where work is being done on the retract stroke
- Where a pressure switch is used to signal the full retract position
- In systems requiring a faster retract than extend speed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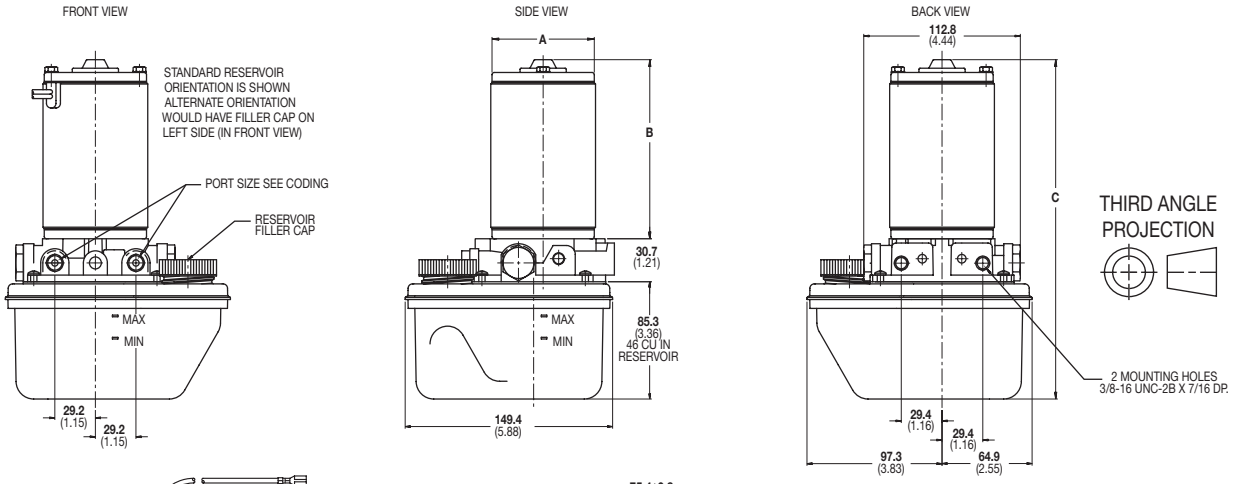
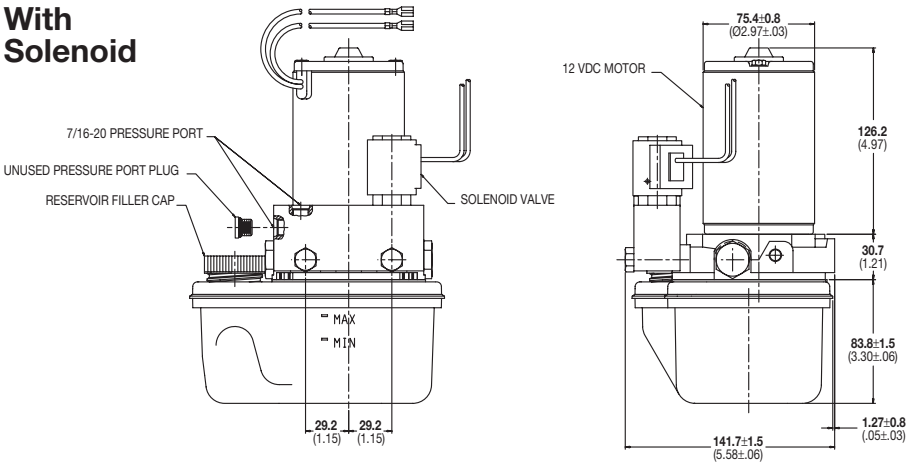
# Overall Dimensions




## With Solenoid

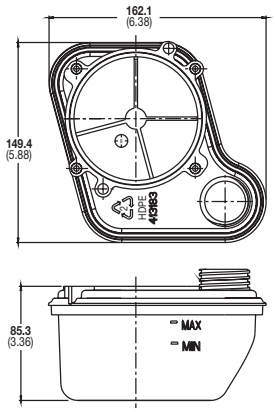



| Motor Dimensions ±.1.3 (±.050) | A | B | C |
|---|---|---|---|
| AE/BE | **75.4** (2.97) | **126.2** (4.97) | **241.3** (9.50) |
| AM/BI | **95.8** (3.77) | **151.4** (5.96) | **266.4** (10.49) |
| IA | **75.4** (2.97) | **128.8** (5.07) | **244.1** (9.61) |
| HA/HD | **100.1** (3.94) | **161.0** (6.34) | **276.4** (10.88) |

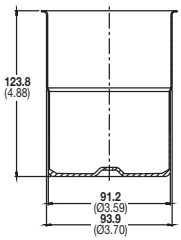
**Note:** All dimensions in **mm** (inches).

# Reservoir Dimensions

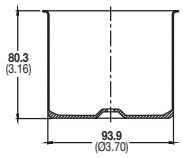
Note: refer to page 17 for information on the P, Q, R and S reservoirs.



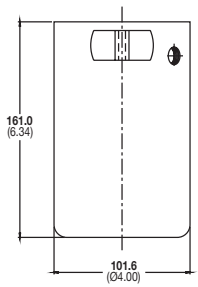

"C" RESERVOIR
46 CU. IN. (26 CU. IN. USABLE)
HIGH DENSITY POLYETHYLENE WITH UV ADDITIVE STD.
(754 CC: 426 CC USABLE)



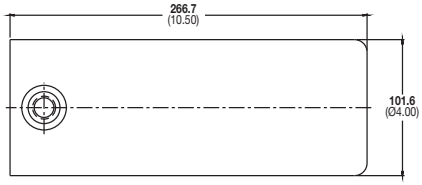

"B" RESERVOIR
46 CU. IN. (23 CU. IN. USABLE) ALUMINUM
(754 CC: 377 CC USABLE)



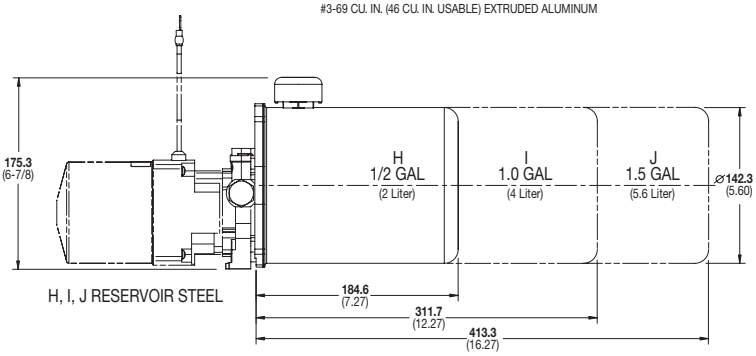

"A" RESERVOIR
28 CU. IN. (13 CU. IN. USABLE) ALUMINUM
(459 CC: 213 CC USABLE)




"G" RESERVOIR
#3-69 CU. IN. (46 CU. IN. USABLE) EXTRUDED ALUMINUM




"F" RESERVOIR
122 CU. IN. (82 CU. IN. USABLE) STEEL
(2000 CC: 1344 CC USABLE)




H, I, J RESERVOIR STEEL



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