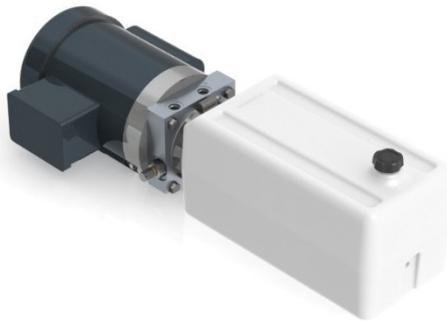


Operating Instructions & Parts Manual

<u>Grainger Model No.</u>	<u>Bucher Hydraulics Model No.</u>
36ND91	M-4504-0158
36ND92	M-4504-0159
36ND93	M-4504-0160
36ND94	M-4504-0161
36ND95	M-4504-0162
36ND96	M-4504-0163
36ND97	M-4504-0164
36ND98	M-4504-0165
36ND99	M-4504-0166

Please read the instructions carefully and always operate this equipment in a safe manner.



Unit Description:

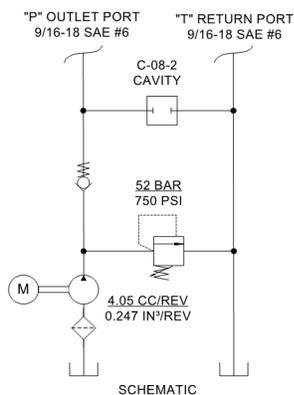
This hydraulic power unit is designed specifically to run on AC electric power. Each power unit is a custom assembly consisting of a high performance hydraulic pump, AC motor, internal relief valve, load holding check valve and reservoir. This power unit can be coupled to suit a wide variety of hydraulic actuating devices.

The pump contains hardcoated end plates for unmatched durability in demanding environments and severe duty applications.

Package Contents and Handling Instructions:

Before opening, please check for any shipping damage. The container will include (1) AC hydraulic power unit with breather cap for the reservoir. If components are missing, or if there is any visible damage, please contact the office in which you purchased this unit.

Schematic:



Content:

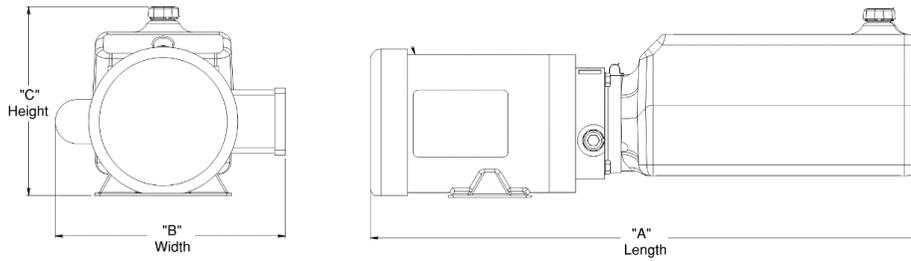
Power unit contains:

- Pump / Motor / Reservoir Unit
- Hardcoat processed internal pump
 - Fixed displacement, external tooth pump
 - Hardcoated pump ends
- Load holding check valve
- Externally Adjustable Relief Valve – adjustable range not to exceed “Maximum Operating Pressure” in Performance table
- Totally enclosed fan cooled motors
- Motors with continuous horsepower ratings
- 1.5 gallon rectangular reservoir plumbed for horizontal mount
- Dual-layered mesh inlet strainer

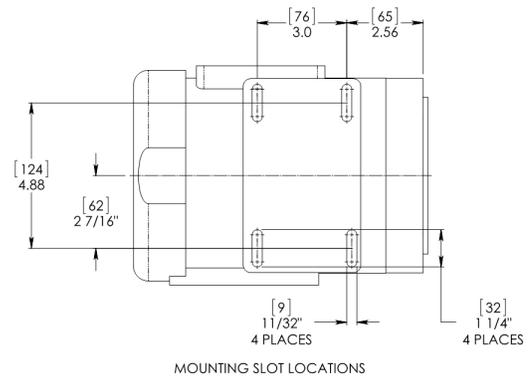
Performance:

Model No.	Nominal Flow	Maximum Operating Pressure (PSI)	HP	Motor Phase	Hz	Voltage	RPM
36ND91	0.5 GPM	1500	1/2	1	60/50	115/230 VAC	1800
36ND92	0.5 GPM	3000	1	1	60/50	115/208-230 VAC	1800
36ND93	1.0 GPM	1500	1	1	60/50	115/208-230 VAC	1800
36ND94	1.5 GPM	1000	1	1	60/50	115/208-230 VAC	1800
36ND95	2.0 GPM	750	1	1	60/50	115/208-230 VAC	1800
36ND96	1.0 GPM	1500	1	3	60/50	230/460 VAC	1800
36ND97	2.0 GPM	750	1	3	60/50	230/460 VAC	1800
36ND98	2.0 GPM	1500	2	3	60/50	230/460 VAC	3600
36ND99	4.0 GPM	750	2	3	60/50	230/460 VAC	3600

Dimensions and Mounting Information:



Model No.	"A" Length	"B" Width	"C" Height
36ND91	26 3/32"	10 29/32"	8 15/16"
36ND92	27 3/32"	10 29/32"	8 15/16"
36ND93	27 3/32"	10 29/32"	8 15/16"
36ND94	27 3/32"	10 29/32"	8 15/16"
36ND95	27 3/32"	10 29/32"	8 15/16"
36ND96	27 3/32"	9 3/32"	8 15/16"
36ND97	27 3/32"	9 3/32"	8 15/16"
36ND98	27 3/32"	9 3/32"	8 15/16"
36ND99	27 3/32"	9 3/32"	8 15/16"



READ ALL INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO ASSEMBLE, INSTALL, OPERATE OR MAINTAIN THE PRODUCT DESCRIBED. PROTECT YOURSELF AND OTHERS BY OBSERVING ALL SAFETY INFORMATION. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE.

RETAIN INSTRUCTIONS FOR FUTURE REFERENCE.

WARNING: THIS INSTRUCTION MANUAL IS INTENDED FOR USE BY QUALIFIED INDIVIDUALS WITH A WORKING KNOWLEDGE OF HYDRAULIC AND ELECTRICAL PRINCIPLES. PROFESSIONAL INSTALLATION IS RECOMMENDED.

Assembly

All the power units are packaged fully assembled. Customer is responsible to fill the reservoir with proper level of a quality hydraulic fluid suitable for use in the intended environment.

CAUTION

Avoid dusty conditions that could clog the reservoir breather.

1. This hydraulic power unit is designed for horizontal mounting with the reservoir feet down and the reservoir breather on the top. Choose a flat, level mounting surface to bolt the reservoir feet to. See unit dimensions for reservoir base bolt pattern.

The hydraulic unit is plumbed for horizontal mounting as noted above. Mounting the unit in an inclined plane or any other position will greatly reduce available usable oil in the reservoir. This can cause the hydraulic oil to foam resulting in erratic movement of hydraulic components, and pump failure.

CAUTION

To minimize contamination problems, do not remove plastic shipping plugs from hydraulic unit until you are ready to install hoses and fittings.

2. HYDRAULIC INSTALLATION – Make sure that the work area and the hydraulic components are clean and free from dirt, lint, etc.
3. When installing, select a clean, dry, area with adequate ventilation to dissipate heat. Try to select an area near the electric power source.
4. Connect your hoses and fittings to the hydraulic actuator (hydraulic cylinder, hydraulic motor, or other device) and when ready to connect the hydraulic power unit ports, remove and discard all plastic shipping plugs from the ports of the aluminum manifold.

CAUTION

Do not use Teflon tape. This unit is equipped with SAE O-ring type ports.

Do not over-tighten fittings.

5. Remove the reservoir breather and fill the hydraulic unit reservoir with a good quality hydraulic fluid. It is recommended that hydraulic fluids have a viscosity of 100 SUS to 350 SUS when operating between 10° F and 140° F.

6. Use of a filter cart to add fluid to the reservoir is highly recommended. Do not pour hydraulic fluid directly from a pail or drum as this can result in debris entering the reservoir.
7. Re-install the breather on the reservoir.

Electrical wiring

1. When wiring the motor, follow all local electrical and safety codes as well as the National electrical and safety codes in your jurisdiction (i.e. NEC, ESA, etc) and all Occupational Safety and Health Act (OSHA) requirements, or similar.
2. For single phase motors, use 3-wire cords with 3-prong grounding type plugs.
3. For Three phase motors, use 4-wire cords with grounding type plugs
4. The use of 3-prong single phase adapters in Canada is prohibited by the Canadian Electrical Code
5. Make certain that wire size is adequate for horsepower requirements (see chart on page 2).

NOTE: Voltage drop increases with the length of power cord. Larger wire diameter may be required.

6. Motor nameplate voltage must be available at the motor when it is operating under load. Avoid voltage drop by using adequate wire size.
7. **DOUBLE CHECK ROTATION** Motor rotation is clockwise facing fan end of motor (which means the motor is wired to turn counter clockwise when facing the shaft of the motor).
8. **On start-up, ensure an open flow path** for the hydraulic circuit and jog the motor to ensure correct rotation and to prime the pump to ensure adequate lubrication. After the correct motor rotation is confirmed and the fluid is moving freely, motor may be operated at full speed.

CAUTION

Never run the system without adequate levels of hydraulic fluid in the reservoir. New installations will require additional fluid to fill the lines, cylinders etc. so check the reservoir fluid levels frequently during initial operation to ensure the fluid level does not go below the minimum level on the sight gauge.

9. Keep all electrical lines as short as practical.
10. Never exceed the maximum operating pressure.

11. Do not over-tighten fittings, bolts, etc., as this can damage the units.
12. Provide adequate cooling for the hydraulic oil so as not to allow oil and/or component damage due to excessive temperatures. Excessively high operating temperatures will be hazardous and may cause property damage and/or personal injury.

WARNING

REPLACE OR REPAIR DAMAGED OR WORN POWER CORDS IMMEDIATELY.

WARNING

DO NOT OPERATE UNITS WITHOUT PROPER GROUNDING.

WARNING

DO NOT RUN THE HYDRAULIC UNIT DRY AS THIS WILL CAUSE SEVERE PUMP DAMAGE.

Prior to Operation

1. Double check all hydraulic and electric connections.
2. Confirm that reservoir is filled with hydraulic fluid.
3. Put all equipment guards in place
4. Clear all persons from work area
5. Check for loose tools, equipment, or anything that might interfere with operation of equipment.

Operation

1. Start Up – When initially starting unit up, be sure to jog the unit (intermittently run unit) several times. This will prime the pump and fill the hydraulic lines.

CAUTION

Check motor fan rotation again at this time to avoid damaging pump or pump shaft seal.

WARNING

IF MOTOR IS TURNING IN THE WRONG ROTATION, SHUT OFF ELECTRICAL POWER BEFORE ATTEMPTING TO CHECK OUT MOTOR WIRING.

WARNING

Do not overfill the reservoir as foaming of the oil may occur.

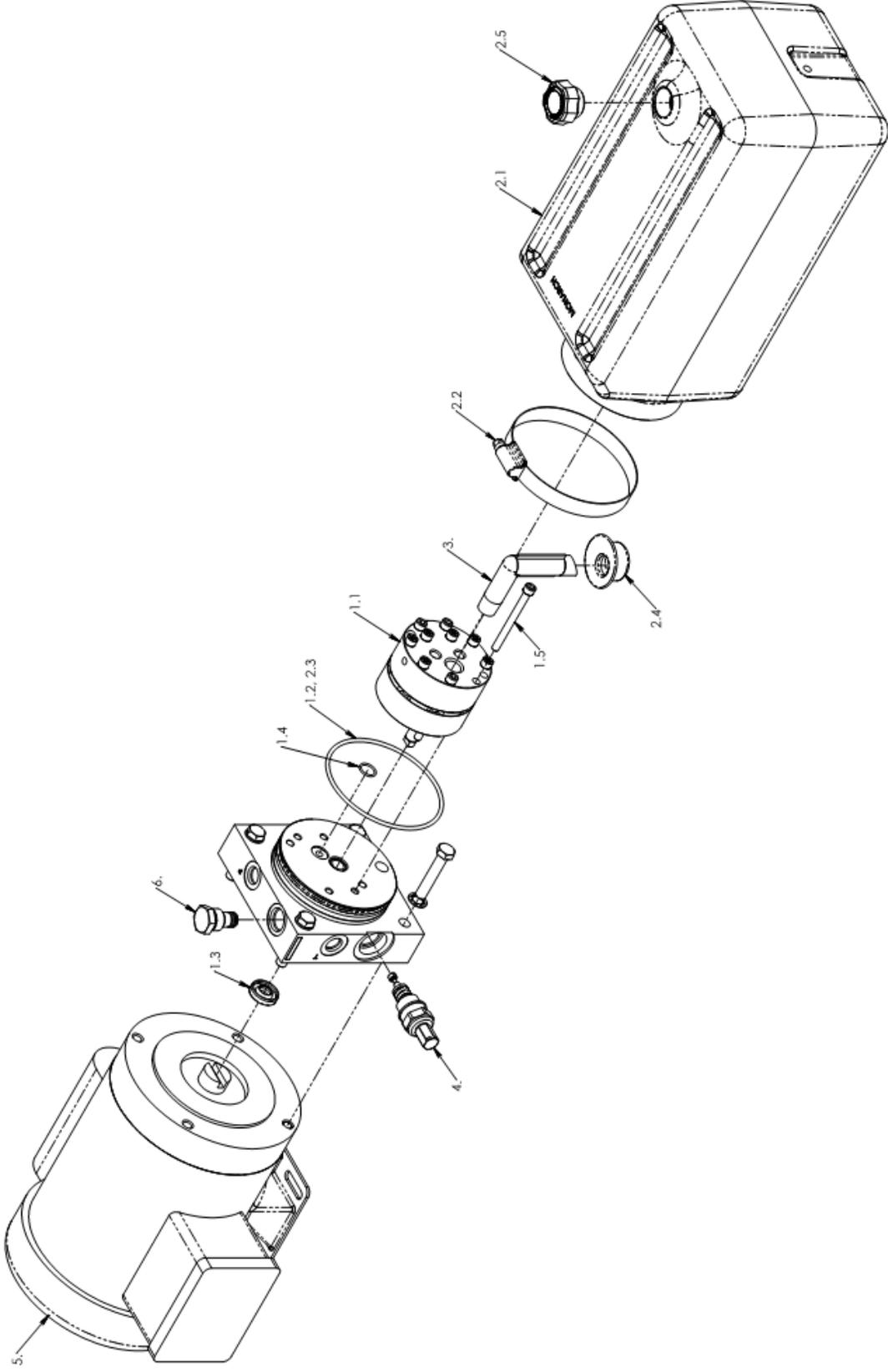
Maintenance

1. Keep the reservoir filled to the proper level with hydraulic fluid. Use a good quality hydraulic fluid that is suitable for use in the intended environment.
2. Check the reservoir fluid level on a regular basis and use new, filtered hydraulic fluid when adding fluid. Most pump/fluid motor failures, valve malfunctions, and short unit life can be traced directly or indirectly to dirt or other foreign materials (water, chips, lint, etc.) entering or already in the hydraulic system.
3. Make a frequent inspection of hydraulic fluid and change if contaminated.
4. Regularly inspect hydraulic hoses and fittings for wear or leakage.
5. Keep the unit and surrounding area clear of dirt and foreign materials.
6. Keep electrical connections clean.

Troubleshooting Chart:

Symptom	Possible cause(s)	Corrective action
Motor won't start	<ol style="list-style-type: none"> 1. Loose connection 2. Circuit breaker tripped 3. Voltage drop 4. Seized pump 	<ol style="list-style-type: none"> 1. Check wiring 2. Reset circuit breaker 3. Use heavier gauge wire 4. Replace pump
Will not pump oil (Motor runs but cylinder does not move, or moves slowly)	<ol style="list-style-type: none"> 1. No oil in reservoir 2. Motor rotation incorrect 3. Oil level low 4. Relief valve is held open 5. Suction strainer is clogged 6. Hydraulic cylinder (or motor etc.) seals are cut or worn out. 7. Reservoir breather is dirty or clogged. 	<ol style="list-style-type: none"> 1. Check oil level, refill 2. Rewire 3. Add oil as needed 4. Flush relief valve 5. Clean suction strainer 6. Replace or repair cylinder (or motor etc.) 7. Clean reservoir breather and reinstall
Pump motor unit is noisy	<ol style="list-style-type: none"> 1. Low oil level 2. Air in system 3. Suction strainer or inlet filter is clogged 	<ol style="list-style-type: none"> 1. Add oil as needed 2. Bleed air from highest fitting in system by loosening fitting very slightly and operating unit until bubbling of air stops, then tighten 3. Clean suction strainer or inlet filter
Unit does not develop full pressure	<ol style="list-style-type: none"> 1. System relief valve set too low, or leaking 2. Pump worn out 3. Air in system 4. Oil temperature is too high 	<ol style="list-style-type: none"> 1. Check system relief valve for proper setting 2. Replace the pump 3. Bleed air from systems 4. Let oil cool below 140 °F

Exploded View:



Parts List:

No.	Description	36ND91	36ND92	36ND93	36ND94	36ND95
1.*	P ASSY,MOD,DC,BRGS BLEED RESV	500246312171150	500246312171150	500246312171270	500246312171380	500246312171510
1.1	P ASSY,QM,MDLR,DC,BRGS BLD RSV	500216312171150	500216312171150	500216312171270	500216312171380	500216312171510
1.2	O-RING,3.75 X 4.00 X 0.13 -240	500205302352	500205302352	500205302352	500205302352	500205302352
1.3	SEAL,SHAFT,HEAVY DUTY(B&M SER)	500207002159	500207002159	500207002159	500207002159	500207002159
1.4	O-RING,0.50 X 0.63 X 0.06 -014	500205300120	500205300120	500205300120	500205300120	500205300120
1.5	SCREW,SHC,1/4-20,BLK OX	500206907819	500206907819	500206907818	500206907818	500206907837
2.*	PARTS KIT,RESV,PLSTC,6.75X6.75	500205523786	500205523786	500205523786	500205523786	500205523786
2.1	RESV,PLASTIC,6.7X6.7X15,H/MT	500206414168	500206414168	500206414168	500206414168	500206414168
2.2	CLAMP,HOSE,WORM GEAR,RSV,M-SER	500201707900	500201707900	500201707900	500201707900	500201707900
2.3	O-RING,3.75 X 4.00 X 0.13 -240	500205302352	500205302352	500205302352	500205302352	500205302352
2.4	FILTER,SCREEN M-SERIES SUCT.	500203201134	500203201134	500203201134	500203201134	500203201134
2.5	PLUG,RESEV,BREATHER-FILLER	500205901143	500205901143	500205901143	500205901143	500205901143
3.	TUBE,SUCT 90,H/MT,M-400,3/8NPT	500208301791	500208301791	500208301791	500208301791	500208301791
4.	VALV MAX.SPEC.-ROT	200787402710	200787402710	200787402710	200787402780	200787402780
5.	MOTOR,AC	50020502371605	50020502371705	50020502371705	50020502371705	50020502371705
6.	PLUG,VALVE CAVITY,SAE #8,IND O	500205913124	500205913124	500205913124	500205913124	500205913124

No.	Description	36ND96	36ND97	36ND98	36ND99
1.*	P ASSY,MOD,DC,BRGS BLEED RESV	500246312171270	500246312171510	500246312171270	500246312171510
1.1	P ASSY,QM,MDLR,DC,BRGS BLD RSV	500216312171270	500216312171510	500216312171270	500216312171510
1.2	O-RING,3.75 X 4.00 X 0.13 -240	500205302352	500205302352	500205302352	500205302352
1.3	SEAL,SHAFT,HEAVY DUTY(B&M SER)	500207002159	500207002159	500207002159	500207002159
1.4	O-RING,0.50 X 0.63 X 0.06 -014	500205300120	500205300120	500205300120	500205300120
1.5	SCREW,SHC,1/4-20,BLK OX	500206907818	500206907837	500206907818	500206907818
2.*	PARTS KIT,RESV,PLSTC,6.75X6.75	500205523786	500205523786	500205523786	500205523786
2.1	RESV,PLASTIC,6.7X6.7X15,H/MT	500206414168	500206414168	500206414168	500206414168
2.2	CLAMP,HOSE,WORM GEAR,RSV,M-SER	500201707900	500201707900	500201707900	500201707900
2.3	O-RING,3.75 X 4.00 X 0.13 -240	500205302352	500205302352	500205302352	500205302352
2.4	FILTER,SCREEN M-SERIES SUCT.	500203201134	500203201134	500203201134	500203201134
2.5	PLUG,RESEV,BREATHER-FILLER	500205901143	500205901143	500205901143	500205901143
3.	TUBE,SUCT 90,H/MT,M-400,3/8NPT	500208301791	500208301791	500208301791	500208301791
4.	VALV MAX.SPEC.-ROT	200787402710	200787402780	200787402710	200787402780
5.	MOTOR,AC	50020502371805	50020502371805	50020502371905	50020502371905
6.	PLUG,VALVE CAVITY,SAE #8,IND O	500205913124	500205913124	500205913124	500205913124

***KITS CONTAIN ALL SUBCOMPONENTS LISTED BELOW EACH KIT NUMBER**