G.C. 8000 SERIES
DC HYDRAULIC POWER UNITS

Modular Units designed to meet your custom requirements.

Haldex

Barnes Hydraulics

The GC8000 Concept

A COMPLETE, SELF-CONTAINED, MODULAR DC POWER SYSTEM

GC8000 Series, DC hydraulic power units offer you virtually limitless choices — from a wide range of complete units assembled to your specifications, to the individual component kits which enable you to create or modify a unit to meet your exact requirements.

Three standard control valve options represent the heart of the GC8000 system, although custom valves and manifolds are available as described on page 5. Cartridge-type or subplate mounted valves are mounted directly on the power unit, providing compact, integral, multi-function control. This design also facilitates convenient field service and component replacement.

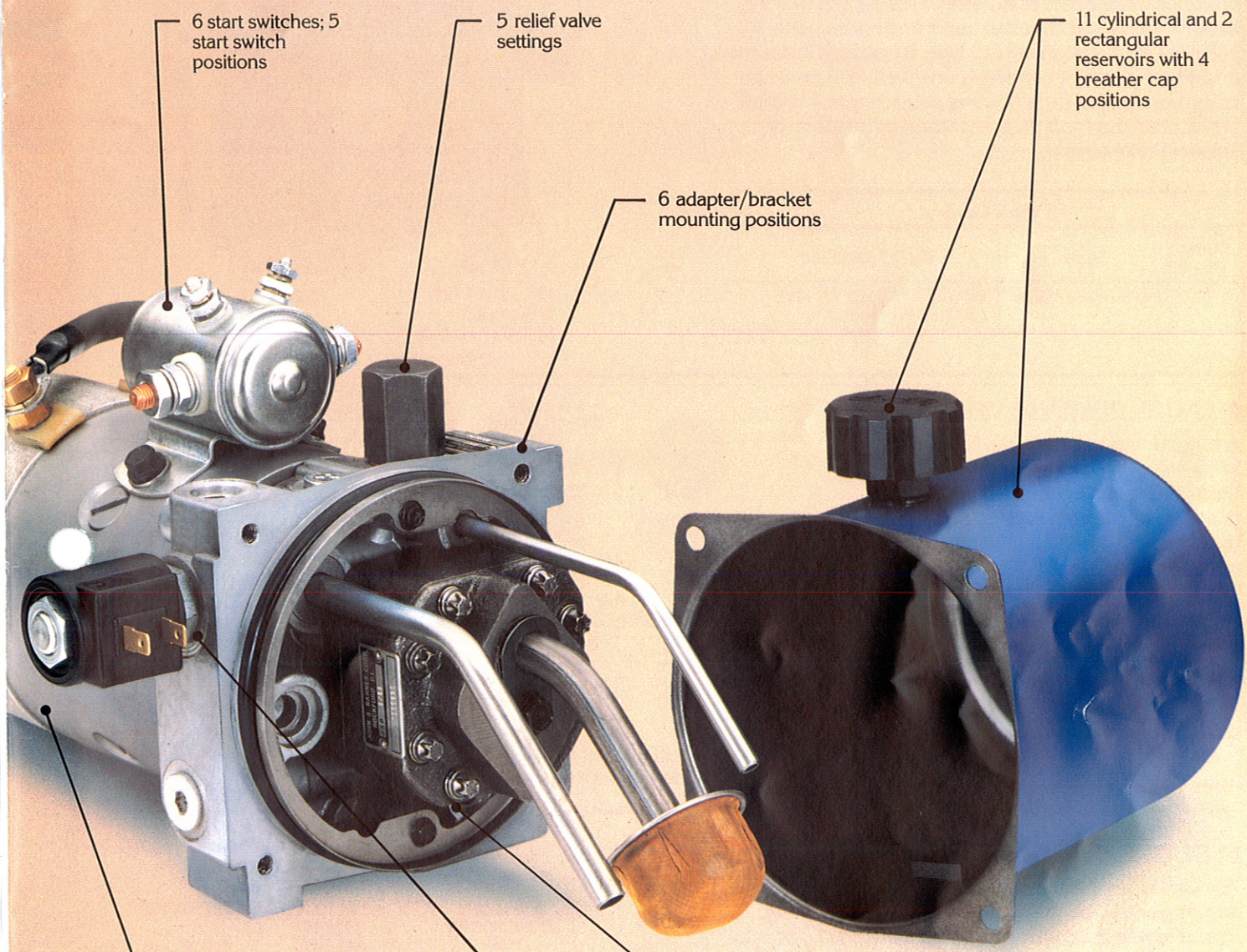
All GC8000 units and their individual components are manufactured to the most rigid specifications, providing the highest quality and reliability. The following quality and design features are standard on all GC8000 power units:

- Closed-coupled DC motors with Oldham coupling for accurate alignment.
- Hardened and ground alloy-steel gears and shafts
- Precision needle bearings
- High strength, fine grain, cast iron housings
- Spring-loaded, lip-type oil seal
- Corrosion resistant, externally mounted valves
- Cartridge-type check valve, and externally adjustable relief valve
- 100 mesh, reinforced brass inlet strainer
- 40 micron, dry-element-type breather
- Powder coated drawn steel reservoir with magnetic particle collector

This catalog describes the GC8000 system in detail. It provides useful performance and dimensional information along with an easy-to-follow ordering guide for complete systems or individual components.

If you have questions, or require technical assistance, please call us Toll Free: 800/572-7867.

SPECIFY THE POWER UNIT YOU NEED FROM A RANGE OF STANDARD OPTIONS.



4 pressure compensated flow regulators

2 mounting positions: horizontal or vertical

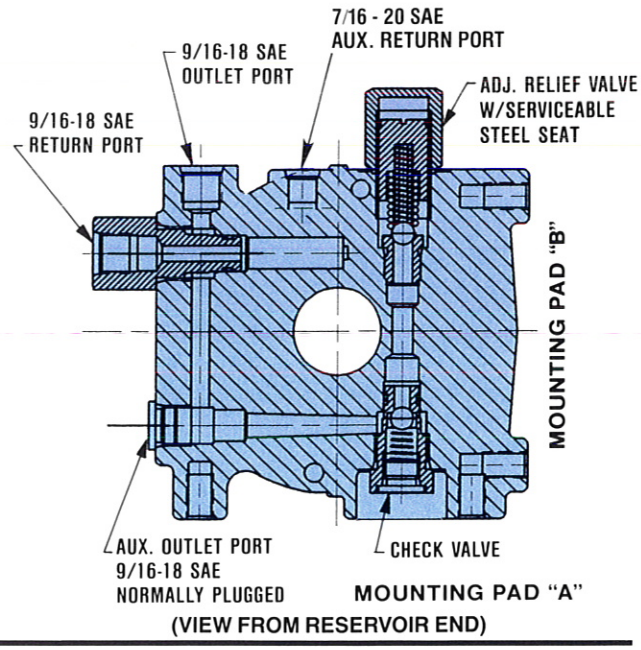
2 standard manifold options plus custom manifold options

Standard Series with Valve Options

NO RELEASE VALVE

The standard GC-8000 adapter includes a direct-acting adjustable relief valve (100-3000 psi) and load check valve. Other standard features include the return port adapter fitting and alternate outlet and return ports. All ports are SAE straight thread-type, for no leak installation, and all valves are of cartridge construction. A pressure compensated lowering flow regulator may be installed under the return port plug, manual release valve, or solenoid release valve.

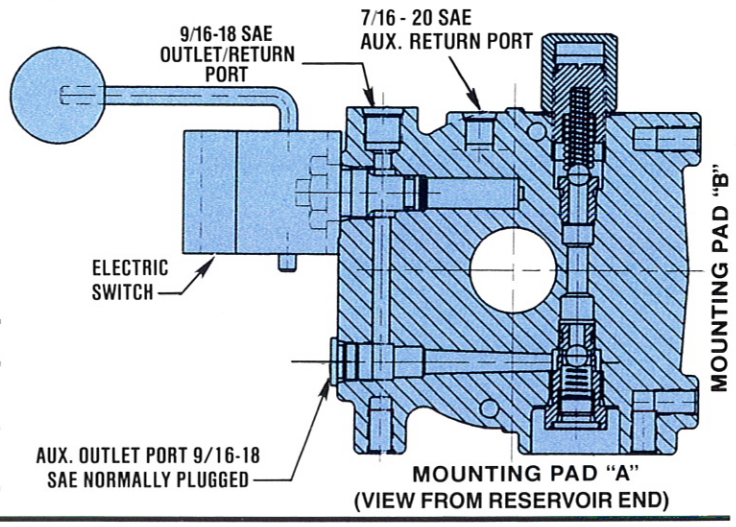
I Valve Options		
Order Code	Type	Kit(s) Required
N	No Release Valve	1300209 Adapter Kit and 1300191 Port Plug Kit



MANUAL RELEASE VALVE

A rugged manually-operated lift-hold-lower valve is offered for applications where the operator can be in close proximity to the unit. An electric power-on switch is integral to the lever assembly. The lever may be rotated to the 'up' or 'side' position relative to the mounting surface used.

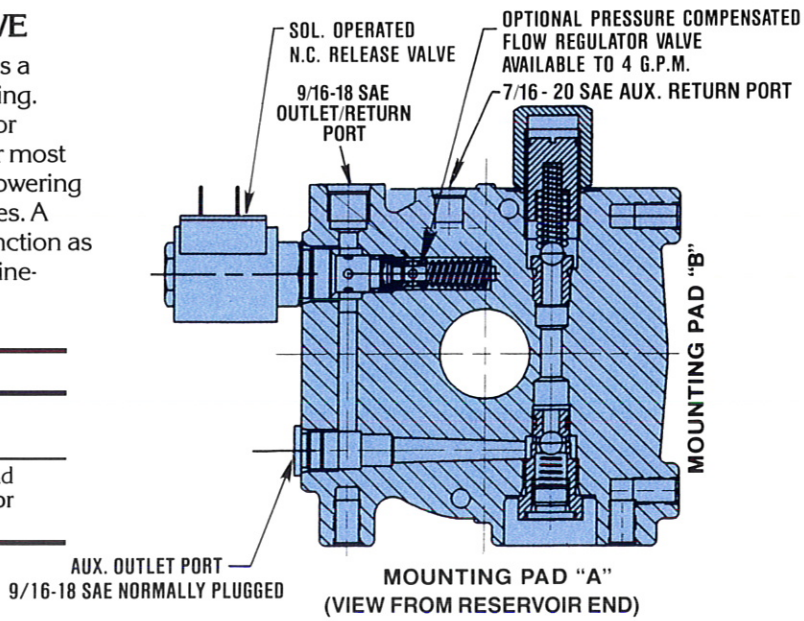
I Valve Options		
Order Code	Type	Kit(s) Required
M	Manual Release Valve	1300209 Adapter Kit and 1300192 Man. Valve Kit



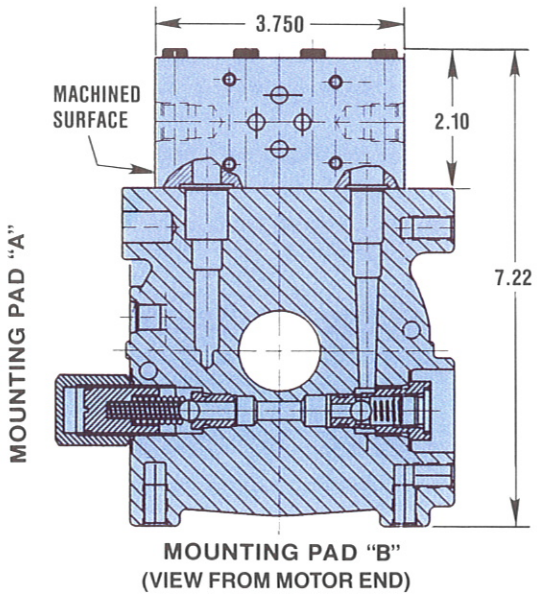
ELECTRIC SOLENOID RELEASE VALVE

The cartridge-type solenoid release valve provides a remote control means for lift-hold-lower functioning. Available with manual override and standard 12 or 24VDC coils, the solenoid cartridge is suitable for most outdoor applications. A pressure-compensated lowering flow regulator is available for 1, 2, 3, & 4 GPM rates. A normally-open cartridge can be substituted to function as a circuit unloading device for extended shaft engine-driven units.

I Valve Options		
Order Code	Type	Kit(s) Required
E	Solenoid Release Valve	1300209 Adapter Kit and 1300023 12V Valve Kit or 1300024 24V Valve Kit



"A" Series Manifold/Valve Options



MOUNTING PAD "B"
(VIEW FROM MOTOR END)

O-RING SEAL SUBPLATE MANIFOLDS FOR DO-3 VALVES

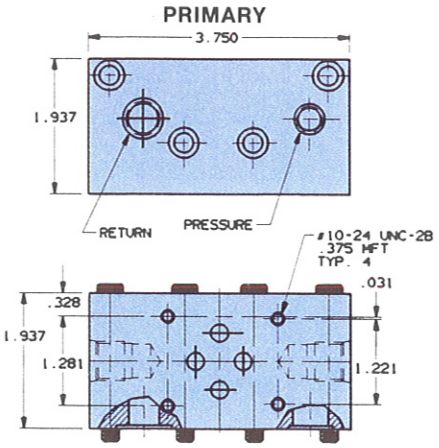
Industrial subplate-type valves and custom-designed, integrated hydraulic circuits can be mounted on GC8000 Series units through the use of the "A" type adapter, which features a machined surface with O-ring seals for direct mounting of subplate manifolds.

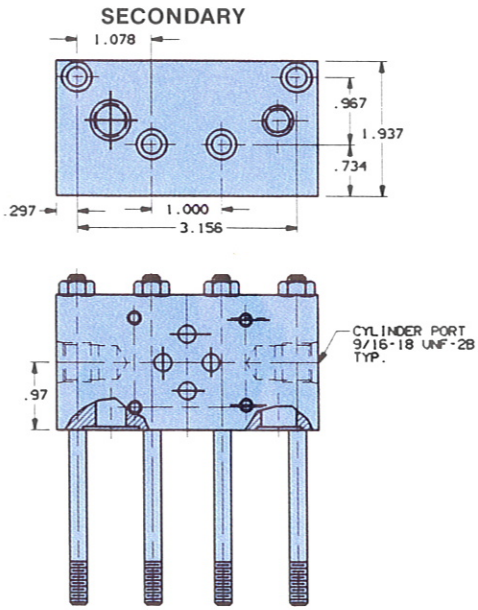
Subplate manifolds are available for parallel circuits in the NFPA DO-3 size. A secondary manifold can be stacked onto a primary manifold to perform dual functions.

CUSTOM MANIFOLD CAPABILITY

The "A" type adaptor also has the capability for direct mount custom manifold blocks incorporating cartridge type directional control valves. The top machined surface with O-ring seals on the pressure and return port can accept a variety of custom manifolds when the mounting bolt pattern shown is used.

DO-3 Mounting Pad Illustrated

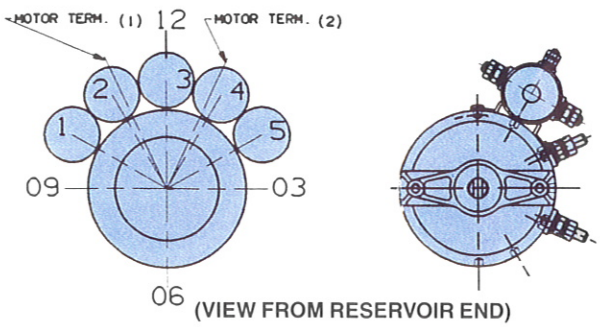




MOTOR TERMINAL AND START SWITCH LOCATION OPTIONS

The motor terminal location must first be selected. Motor terminal locations of "03", "06", "09", or "12" are available. Secondly, the motor start switch location must be determined. Start switch position of 1, 2, 3, 4, and 5 are available. Start switch positions 1-5 rotate in conjunction with the motor terminal location that has been chosen ("03", "06", "09", or "12").

Notes: The standard motor terminal location is "12" and the standard start switch position is "3".
For single terminal motors use "motor term. (1)" only for location purposes.



(VIEW FROM RESERVOIR END)

The view above shows start switch locations 1-5 as they relate to motor terminal location "12" only. An alternate example at right shows one of numerous motor terminal and start switch location possibilities that are available.

The example above shows a motor terminal location of "03" and a start switch position of "1".

Pumps/Motors Selection

SELECTING PUMP AND MOTOR COMBINATIONS

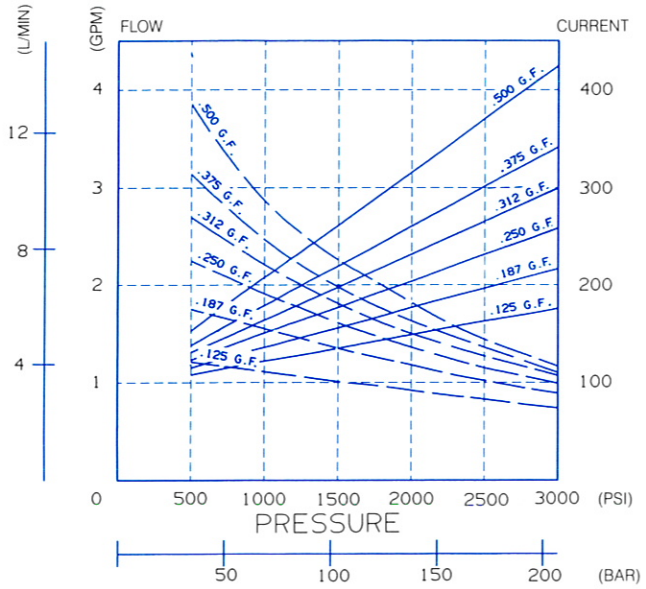
The graphs on pages 6 and 7 can be used to match motors and pumps correctly for your particular application.

First, examine the graphs below to find the required flow at working pressure for your application voltage — 12 or 24 VDC. Second, plot the current draw (amp.) of the selected pump/motor combination to either the "Allowable Percent On-Time" or "Maximum On-Time" curves on page 7.

Solid lines are for current draw and dashed lines are for flow.

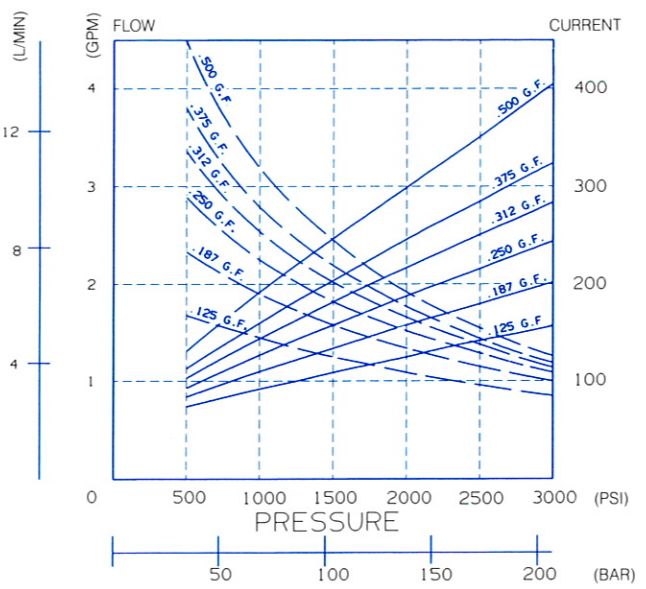
Note: Performance curves are at constant voltage using 200 SSU (43 CTS) oil.

12 VDC STANDARD DUTY



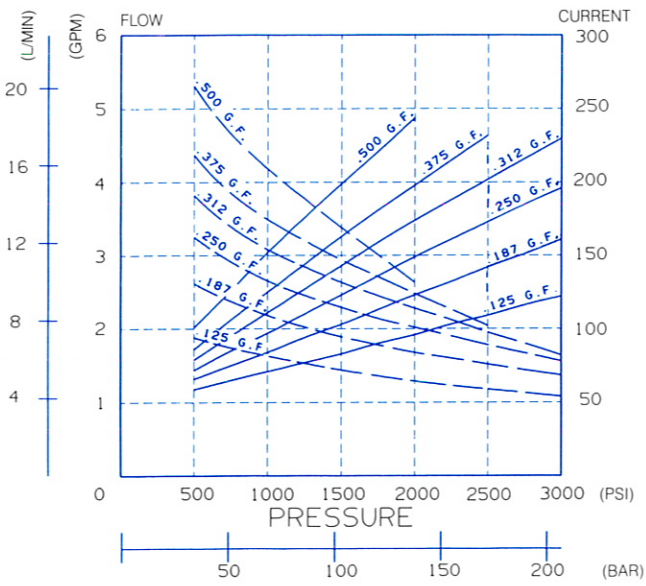
MOTOR OPTION "01"

12 VDC MEDIUM DUTY



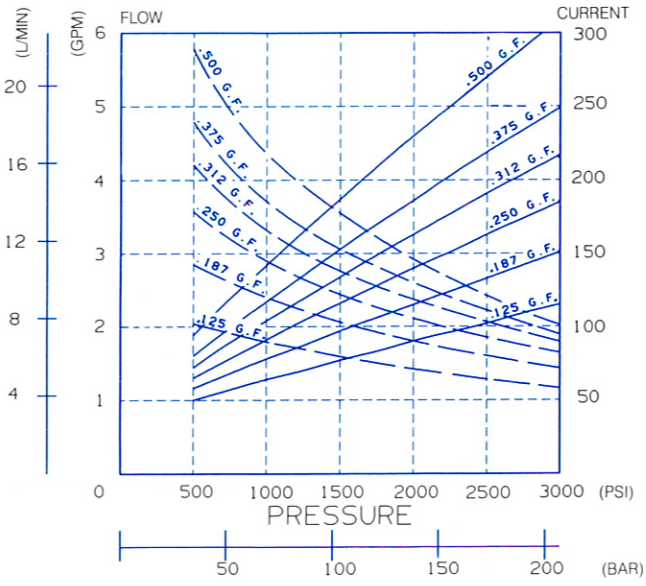
MOTOR OPTIONS "20" and "30"

24 VDC STANDARD DUTY



MOTOR OPTION "60"

24 VDC MEDIUM DUTY



MOTOR OPTIONS "40" and "50"

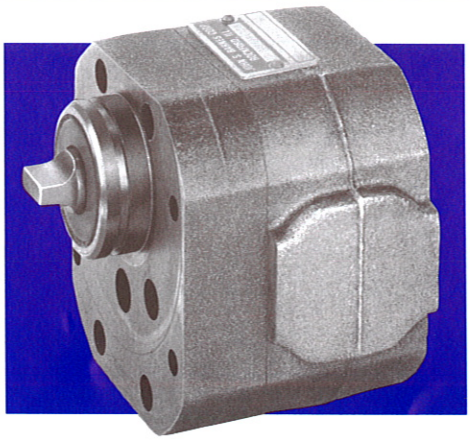
———— = CURRENT DRAW — — — — — = FLOW

PUMPS

Heavy-duty pumps are available in six gear sizes for flows to 6 GPM. Each pump is pre-tested under load. Gears and gear pockets are pre-machined to tolerance, not "worn-in" which may cause surface damage, reduction of efficiency, and contamination of systems.

Gear sizes range from .125" to .500" with cu. in. displacements from .065" to .258". Maximum continuous pressures to 3000 PSI; maximum intermittent pressures to 4000 PSI.

All pumps are clockwise rotation.

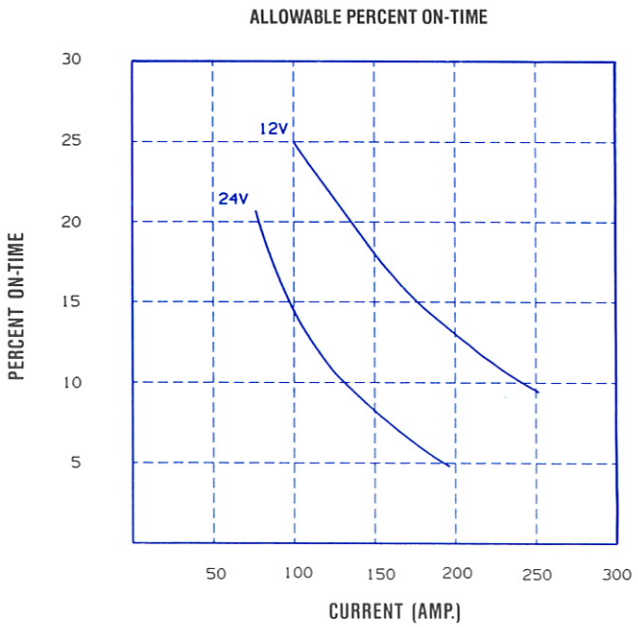


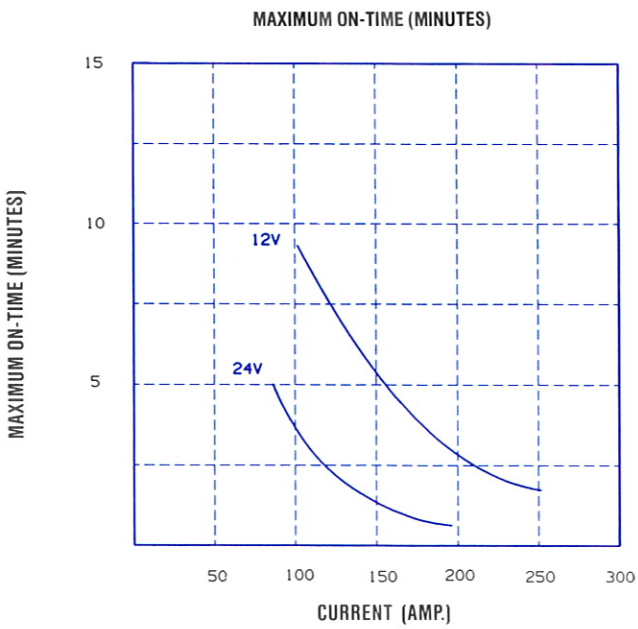
MOTOR DUTY CYCLE CURVES

The curves below relate maximum on-time and percent on-time to motor current for the available motors. "Duty cycle" refers to the length of time the motor can be run at a specific current (amp.) before it must be turned off and allowed to cool.

ALLOWABLE PERCENT ON-TIME is based on a percentage of a 5 minute or shorter duty cycle. For example, on the percent on-time curve, the 24 VDC motors at a current draw of 130 amps are capable of 10% on-time. The motor could be run for 30 seconds, then must be turned off and allowed to cool for 4-1/2 minutes. This duty cycle (30 seconds on, 4-1/2 minutes off) can then be repeated continuously. This ratio of 10% on-time to 90% off-time applies to any duty cycle of 5 minutes or less (e.g. in a duty cycle of 2-1/2 minutes, the motor could be run for up to 15 seconds, and must be turned off for at least 2 minutes 15 seconds).

MAXIMUM ON-TIME is the absolute maximum continuous operating time at a specific current draw (amp.). For example, on the maximum on-time-curve, the 12 VDC motors at a current draw of approximately 155 amps could be run for 5 minutes continuously. The motor should then be turned off and allowed to cool to ambient temperature. Having reached ambient temperature, the motor can again be run for 5 minutes. This run/cooling cycle can be continuously repeated.





Notes: The thermal characteristics of percent on-time and maximum on-time of the standard duty and medium duty motors are identical. The medium duty motors are UL listed and do offer extended brush life over the standard duty motors.

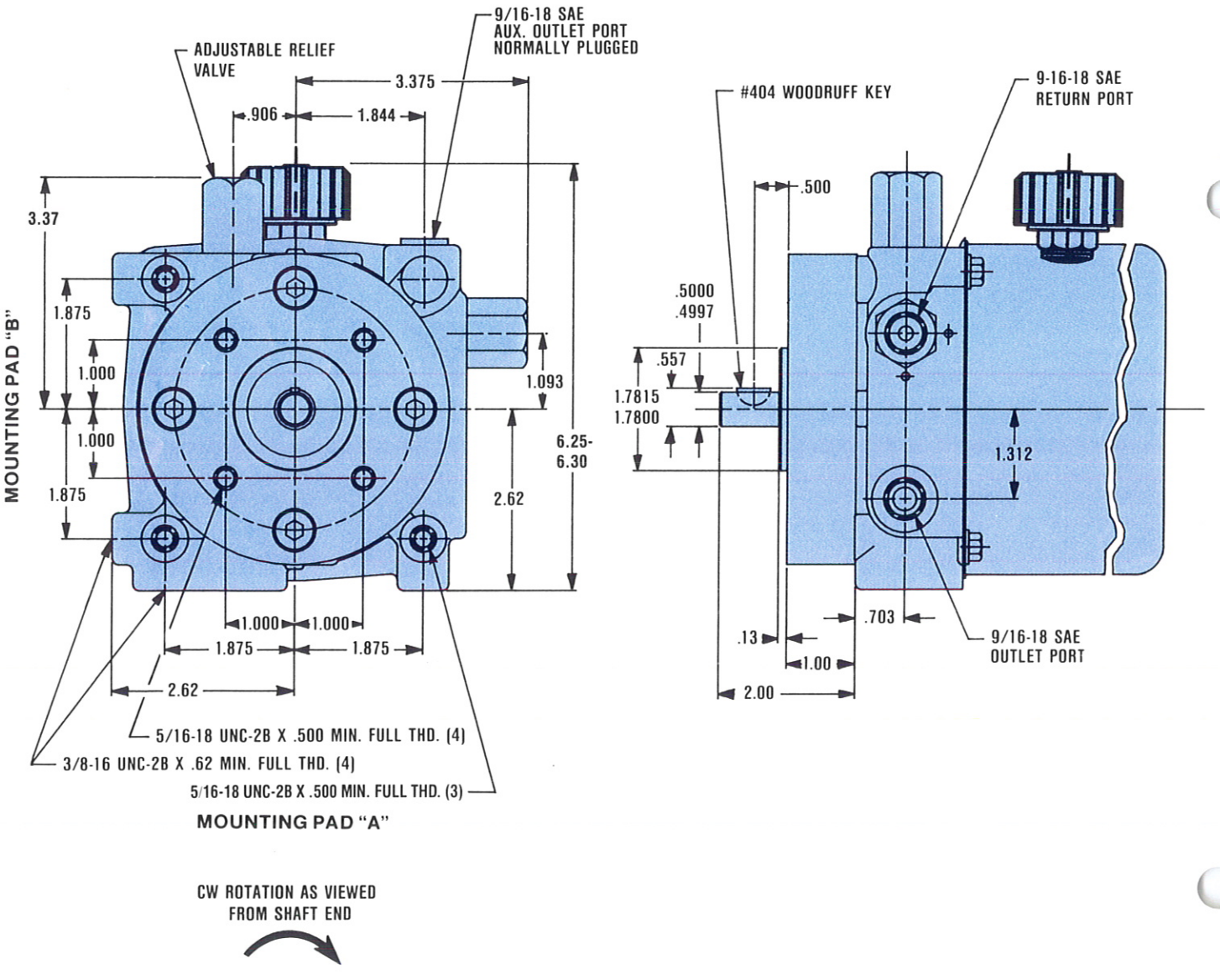
Motor damage may result from operation outside the curve parameters as shown above.

Extended Shaft Drive

The Extended Shaft Drive option allows for replacement of the electric motor drive with a drive of the designer's choice. By allowing for drive shaft side loading with double ball bearing support, the adapter may be used for pulley or belt drives, direct engine drives, or fluid motor drives. In addition, the extended shaft adapter feature enables the designer to adapt to larger electric motors, either DC or AC, 48 frame and larger. Installations of larger motors require a flex coupling and 4-hole flange adapter with a 1.780" pilot hole and NEMA C face on the other end.

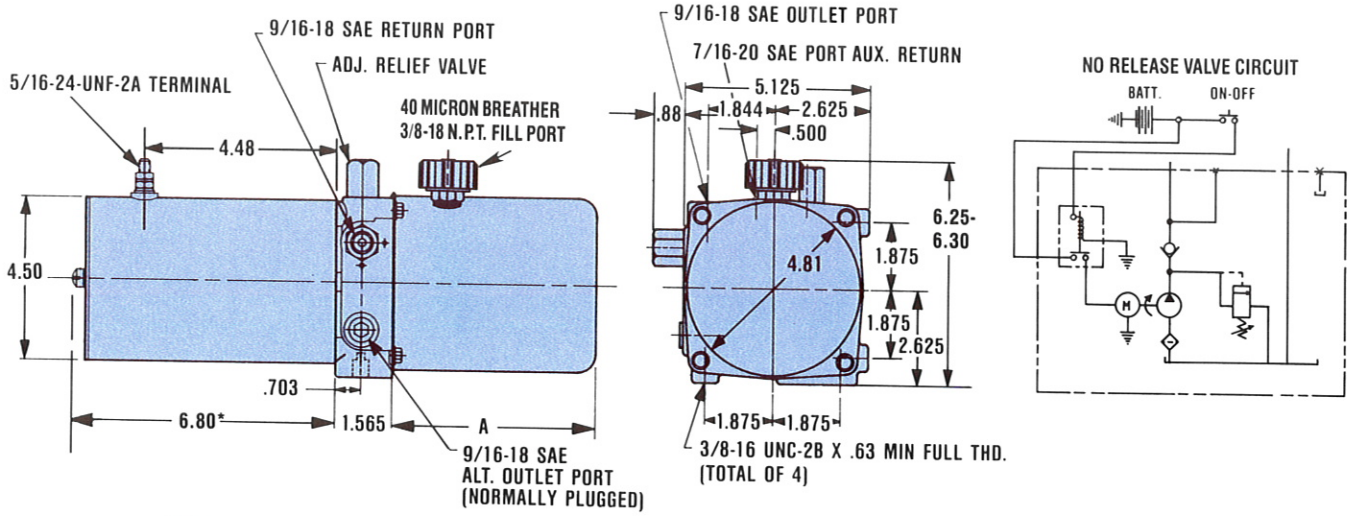
SPECIFICATIONS:

Maximum OHL at center of shaft extension	150 lbs.
Maximum inward thrust	75 lbs.
Maximum outward thrust	50 lbs.
Maximum Speed	5000 RPM
Maximum Input Horsepower	3 HP.



Typical Power Units

POWER UNIT WITH 4.8 INCH CYLINDRICAL RESERVOIR

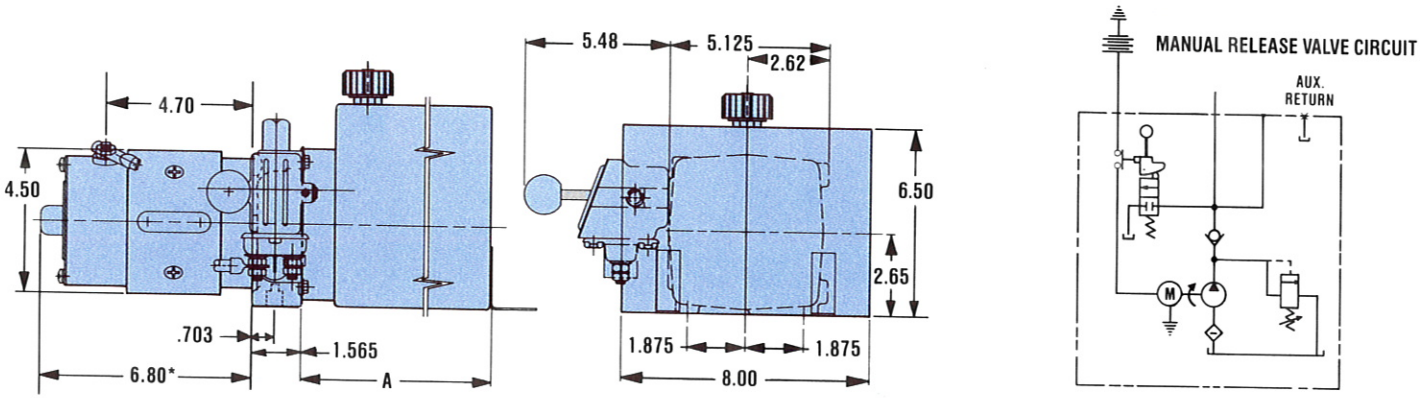


Capacity/Type	Length (A) Inches
1 Qt. Cylinder	5.6
1.5 Qt. Cylinder	7.5
2 Qt. Cylinder	9.0
3 Qt. Cylinder	12.0

Installation Notes: Motors, Center Adapters, and Reservoirs may be rotated in many combinations of 90 degree increments for maximum flexibility. An elbow fitting may be installed to point the filler/breather in the 'up' position for vertical mount installations. Electric start switches may be mounted on the DC motor, or in remote location.

*Motor length will vary. Shown is approx. 7.50".

POWER UNIT WITH RECTANGULAR RESERVOIR



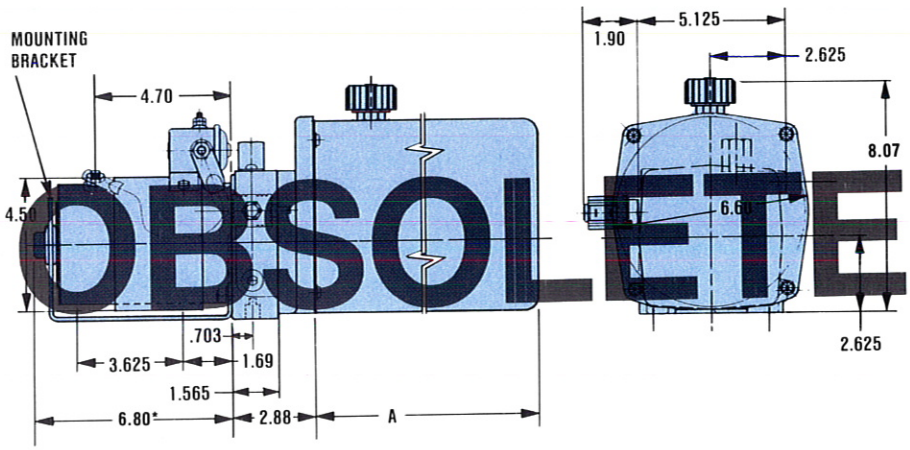
Capacity/Type	Length (A) Inches
2.5 Gal. Rectangular	12
4.0 Gal. Rectangular	18.5

Installation Notes: Rectangular Reservoirs feature a standard mounting bracket on the end of the reservoir. This bracket usually eliminates the need for a motor mount bracket in all but severe vibration applications.

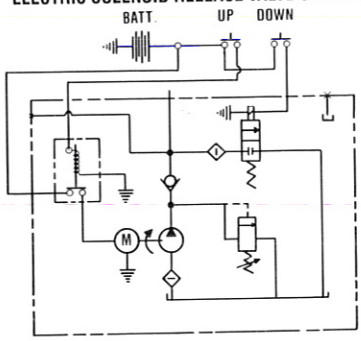
*Motor length will vary. Shown is approx. 7.50".

Typical Power Units

POWER UNIT WITH 6.6 INCH CYLINDRICAL RESERVOIR



ELECTRIC SOLENOID RELEASE VALVE CIRCUIT

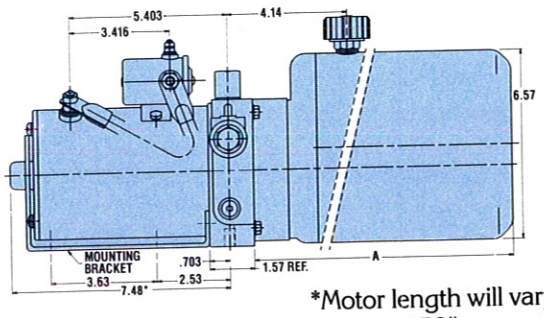


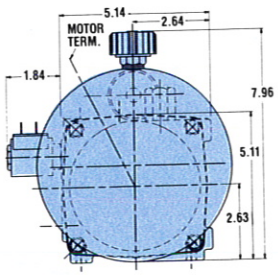
Capacity/Type	Length (A) Inches
1 Gal. Cylinder	7.0
1.5 Gal. Cylinder	11.3
2 Gal. Cylinder	14.0
3 Gal. Cylinder	21.0

Installation Notes: Valve options are installed at 9 O'Clock with Pad 'A' Down as illustrated. With Pad "B" Down, valves and manifolds would be in the 'up' position at 12 O'Clock. Units shown on mounting pad "A".

*Motor length will vary. Shown is approx. 7.50".

POWER UNIT WITH 6.6 INCH SINGLE PIECE CYLINDRICAL RESERVOIR





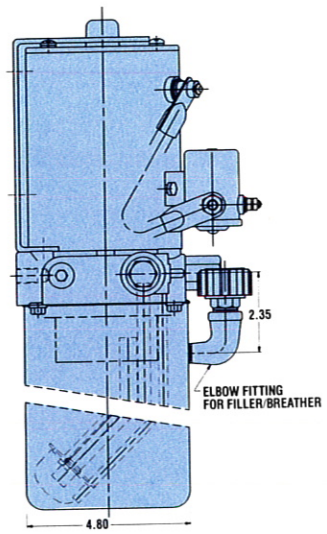
*Motor length will vary. Shown is approx. 7.50".

Capacity/Type	Length (A) Inches
1 Gal. Single Piece	8.34
1.5 Gal. Single Piece	12.59
2.0 Gal. Single Piece	15.34
3.0 Gal. Single Piece	22.34

The single piece reservoir options eliminate the "step-up" adaptor which is used on the standard 1, 1.5 and 2 gallon reservoirs. Due to the elimination of the "step-up" adaptor, the single piece reservoir kits offer significant cost savings.

Note: The single piece reservoir options do increase overall power unit length by approximately 1 inch (.90").

VERTICAL MOUNT UNITS



For "Reservoir Down" vertical mounting, please specify vertical elbow Kit No. 1300626.

How to Order GC8000 Series Units

GC8000 Series DC Units can be ordered as completely assembled units, or in kit form for on-site assembly and installation. To order complete units, simply work through the options in tables I to XV, creating an assembly number as shown in the example. To order in kit form, specify the kit numbers as shown in the ordering tables.

Note: Locating positions in tables VII, IX, X, XI, and XII are as viewed from reservoir end.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	Order Code Fields
GC8000	N	06	C	0	20	D	A	E	09	3	A	09	0	—	—	Example
GC8000																Your Options

I Valve Options

Order Code	Type	Kit(s) Required
N	No Release Valve	1300209 Adapter Kit 1300191 Port Plug Kit
M	Manual Release Valve	1300209 Adapter Kit 1300192 Man. Valve Kit
E	Solenoid Release Valve	1300209 Adapter Kit 1300023 12V Valve Kit or 1300024 24V Valve Kit
O	Manual Override Electrical Release Valve	1300209 Adapter Kit 1300783 12V Valve Kit or 1300784 24V Valve Kit
A	For Subplate Manifolds ("A" Series)	1300846 Adapter Kit
	GC-8001 Options	
C	Cartridge Directional Valve	1300743 Adapter Kit
D	D03 Valve Direct Mount	1300744 Adapter Kit

II Heavy Duty Gear Pump

Order Code	Type	Kit No.
04	.125 Gear, .065 cu. in. Displ.	1300174
06	.187 Gear, .097 cu. in. Displ.	1300176
08	.250 Gear, .129 cu. in. Displ.	1300171
10	.312 Gear, .161 cu. in. Displ.	1300625
12	.375 Gear, .194 cu. in. Displ.	1300169
16	.500 Gear, .258 cu. in. Displ.	1300172

III Relief Valve

Order Code	Preset Pressure	Kit No.
A	500 psi	1300116
B	1000 psi	1300116
C	1500 psi	1300021
D	2000 psi	1300021
E	2500 psi	1300021

Note: Relief Valves are Field Adjustable from 100 to 3000 psi. Contact factory for settings above 2500 psi.

IV Pressure Compensated Flow Regulator

Order Code	Type	Kit No.
0	No Valve	—
1	1 GPM Valve	1300036
2	2 GPM Valve	1300022
3	3 GPM Valve	1300035
4	4 GPM Valve	1300034

Note: Not Available with Options C, D and A in Section I.

V Motor or Extended Shaft Drive

Order Code	Type	Kit No.
01	12VDC, Single Terminal, Standard Duty	1300027
20	12VDC, Double Terminal, Medium Duty	1300618
30	12VDC, Double Terminal, Medium Duty with Foot Mounting Bracket Attached	1300623
40	24VDC, Double Terminal, Medium Duty	1300619
50	24VDC, Double Terminal, Medium Duty with Foot Mounting Bracket Attached	1300624
60	24VDC, Single Terminal, Standard Duty	1303173
7*	Ground Strap for Motor See Note Below	1300620
06	Extended Shaft Adapter Drive	1300335
08	GC8001 Extended Shaft Adapter Drive	1300849

*Required to change Medium Duty Double Terminal Motors to Single Terminal. Substitute a "7" for the "0" in options 20, 30, 40 or 50.

VI Reservoir

Order Code	Type	Description	Kit No.
A	4.8" Dia. Cylindrical	1 Qt. Capacity	1300134
B		1.5 Qt. Capacity	1300135
C		2 Qt. Capacity	1300028
D		3 Qt. Capacity	1300039
L	6.6" Dia. Single Piece Cylindrical	1 Gal. Capacity	1303176
M		1.5 Gal. Capacity	1303177
N		2 Gal. Capacity	1303178
O		3 Gal. Capacity	1300850
H	Rectangular	2.5 Gal. Capacity	1300125
J		4.0 Gal. Capacity	1300284

Note: Suction and Return Line Parts Included

VII Adapter Mounting Position

Order Code	Type	Kit No.
A	Standard Mount, Pad 'A' Down. Valves & Manifolds at 9 O'Clock (Side)	None
B	Optional Mount, Pad 'B' Down. Valves & Manifolds at 12 O'Clock (Up)	None
C	Same as A except Bracket on Pad 'A' side	Motor Option 1 or 60 1300118 Bracket Kit
D	Same as B except Bracket on Pad 'B' side	Motor Option 1 or 60 1300118 Bracket Kit
E	Same as A except Bracket on Pad 'A' side	Motor Options 30 or 50
F	Same as B except Bracket on Pad 'B' side	Motor Options 30 or 50

VIII Motor Start Switch

Order Code	Type	Description	Kit No.
A	Case (Internal) Negative Grounded	12 VDC, 3 Pole*	1300029
B		24 VDC, 3 Pole*	1300106
C	Externally "Battery" Positive Grounded	12 VDC, 3 Pole	1300101
D		24 VDC, 3 Pole	1300103
E	Non-Grounded (UL Required)	12 VDC, 4 Pole+	1300194
F		24 VDC, 4 Pole+	1300030
G	No Start Switch Required		None

*Recommended for most Single Terminal Motors
+Recommended for most Double Terminal Motors.

IX Motor Terminal Orientation

Order Code	Type	Kit(s) Req'd
03	At 3 O'Clock to Pad A	None
06	At 6 O'Clock to Pad A	None
09	At 9 O'Clock to Pad A	None
12*	At 12 O'Clock to Pad A	None

*Standard location is 12 O'Clock.

X Start Switch Position

Order Code	Type	Kit(s) Req'd
0	No Start Switch	None
1	See chart on page 5 for position locations.	None
2		None
3		None
4		None
5		None

Start switch locations are relative to the motor terminal location (03, 06, 09, 12) selected. Standard location is "3".

XI Mounting Position

Order Code	Type	Kit No.
A	Horizontal	None
B	Vertical (Elbow Fitting)	1300626

XII Breather Position

Order Code	Type	Kit(s) Req'd
03	At 3 O'Clock to Pad A	None
06	At 6 O'Clock to Pad A	None
09	At 9 O'Clock to Pad A	None
12*	At 12 O'Clock to Pad A	None

*Standard location is 12 O'Clock.

XIII Manifold

Order Code	Type	Kit No.
0	None	None
1	D03 Primary Manifold	1300847*
2	D03 Secondary Manifold	1300848*

*Must use Order Code "A" for Subplate Manifolds under Section I Valve Options.

GC-8001 Options

XIV GC-8001 Cartridge Directional Control Valves

Order Code	Type	Kit No.
A	2-position, 4-way Cartridge Valve	1300729
B	3-position, 4-way Cartridge Valve, Tandem Center	1300785
C	3-position, 4-way Cartridge Valve, Open Center	1300786
F	Pilot-operated Check Valve, C1	1300727
G	Pilot-operated Check Valve, C2	1300728
H	Double Pilot-operated Check Valve	1300763

Note: To order a unit with both cartridge and pilot-operated check valves, put both order codes in field no. XIV. Must use adapter option "C" in Section 1.

* XV GC-8001 DC Valve Coil

Order Code	Type	Kit No.
1	12 VDC	1300740
2	24 VDC	1300741

*One coil is required for 2-position, 4-way valve. Two coils are required for 3-position, 4-way cartridge valves. Contact factory for other coil voltages.

XVI GC8000 Accessories

Order Code	Type	Kit No.
A	Electric cord set for remote raise and lower	1300651

Note: The electric cord set can only be used with the solenoid release valve option. Option "E", Section I.

Only Haldex Barnes offers this extensive range of pumps, hydraulic motors, power units and flow dividers worldwide.

GC Series Hydraulic Pumps

Compact cast iron gear pumps with a wide variety of integrated options provide custom systems capability and high-efficiency performance. Displacements from 0.065 to 0.711 cu. in. (1.066 to 11.65 cc) per revolution. Pressures to 4,000 psi (275 Bar).

W Series Gear Pumps

Highly efficient pumps feature 4,000 psi continuous operation, speed range from 500 to 4,000 rpm, low noise operation and overall efficiency greater than 90%. Displacements from .05 to 3.05 cu. in. (.8 to 50 cc) per revolution. Other features include SAE, ISO and DIN shafts, flanges and ports; integrated valves and multiple pump configurations.

G20-LS/G30-LS Load Sense Variable Discharge Gear Pumps

Offers the horsepower conservation of a load sense system and the low cost reliability of a gear pump. Featuring cast iron construction and 4,000 psi continuous operation for severe-duty applications. Displacements from 1.4 to 9.8 cu. in. (23 to 161 cc).

G20 & G30 Series Gear Pumps

Rugged cast iron pumps offer high performance for severe-duty applications. Available in single, multiple and through-drive versions. Displacements from 1.41 to 9.82 cu. in. (23 to 161 cc) per revolution. Pressures to 4,000 psi (275 Bar) continuous.

G20/G30 Specialty Products

- G20-DM Pump/Motor Series, G20 series pump with direct mount motor options. Motor options—7.5 HP, 10 HP, and 15 HP and displacements from 1.41 to 2.94 cu. in. (23 cc to 48 cc) for pump/motor units. Integral manifold options also available.
- G20/G30 PTO Pump Series. Specifically designed pump options and features for PTO (power take off) applications. Displacements from 1.41 cu. in. to 9.82 cu. in. (23 cc to 161 cc).
- G20/G30 two section flow dividers. Displacements from 1.41 cu. in. to 9.82 cu. in. (23 to 161 cc) per section. Pressures to 4,000 psi continuous (275 Bar).

Gerotor Pumps

High-efficiency, low-maintenance design with quiet operation and uniform flow. Extremely tolerant of contamination. Displacements from 0.05 to 8.29 cu. in. (0.8 to 135.8 cc) per revolution. Pressures to 1,000 psi (68.9 Bar).

AC Hydraulic Power Systems

AC power units ranging from heavy-duty modular units with a wide variety of pump, motor, manifold and reservoir options to compact, quiet units for low-flow, low-noise applications. Available fully assembled or in kit form. Pressures to 4,000 psi (275 Bar).

DC Hydraulic Power Units

Self-contained modular power systems in fully assembled or component form; wide range of standard pumps, motors, switches, mounts, valves, and reservoir plus custom options. Pressures to 4,000 psi (275 Bar).

Hydraulic Motors

Available in the GC and W Series in unidirectional and birotational configurations. Motors available with modular valve, bearing, seal and shaft options for maximum flexibility. Displacements from 0.05 to 5.30 cu. in. (.8 to 87.0 cc) per revolution. Pressures to 4,000 psi (275 Bar).

Two-Stage Hydraulic Pumps

External gear pumps designed for high-speed positioning coupled with maximum working pressure. High-pressure displacements from 0.258 to 1.395 cu. in. (4.23 to 22.86 cc) per revolution. Pressures to 4,000 psi (275 Bar).

Rotary Flow Dividers

Rotary-gear units up to four sections for synchronized operation of multiple cylinders or motors, proportional division of output or intensified flow. Single-section displacements from 0.232 to 0.813 cu. in. (3.8 to 13.32 cc) per revolution. Pressures to 4,500 psi (306 Bar).

For more information, application assistance or detailed literature on any Haldex Barnes product line, call Toll Free 1-800-572-7867 or visit our website at http://www.hbus.haldex.com

Haldex Group

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Performance & Safety in Vehicles

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