

Haldex

HE POWER PACKS



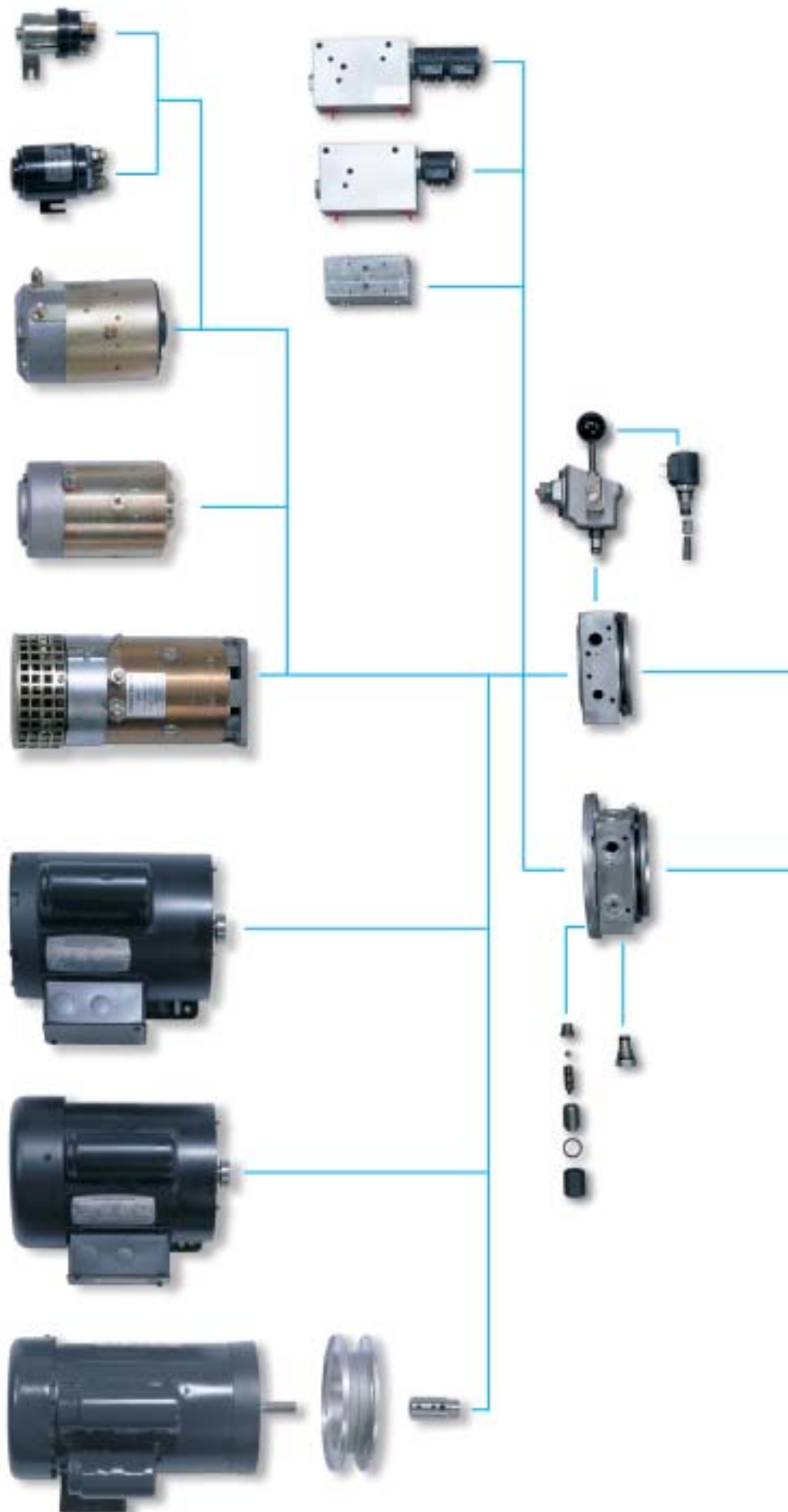
***A complete, cost-effective
and flexible system***

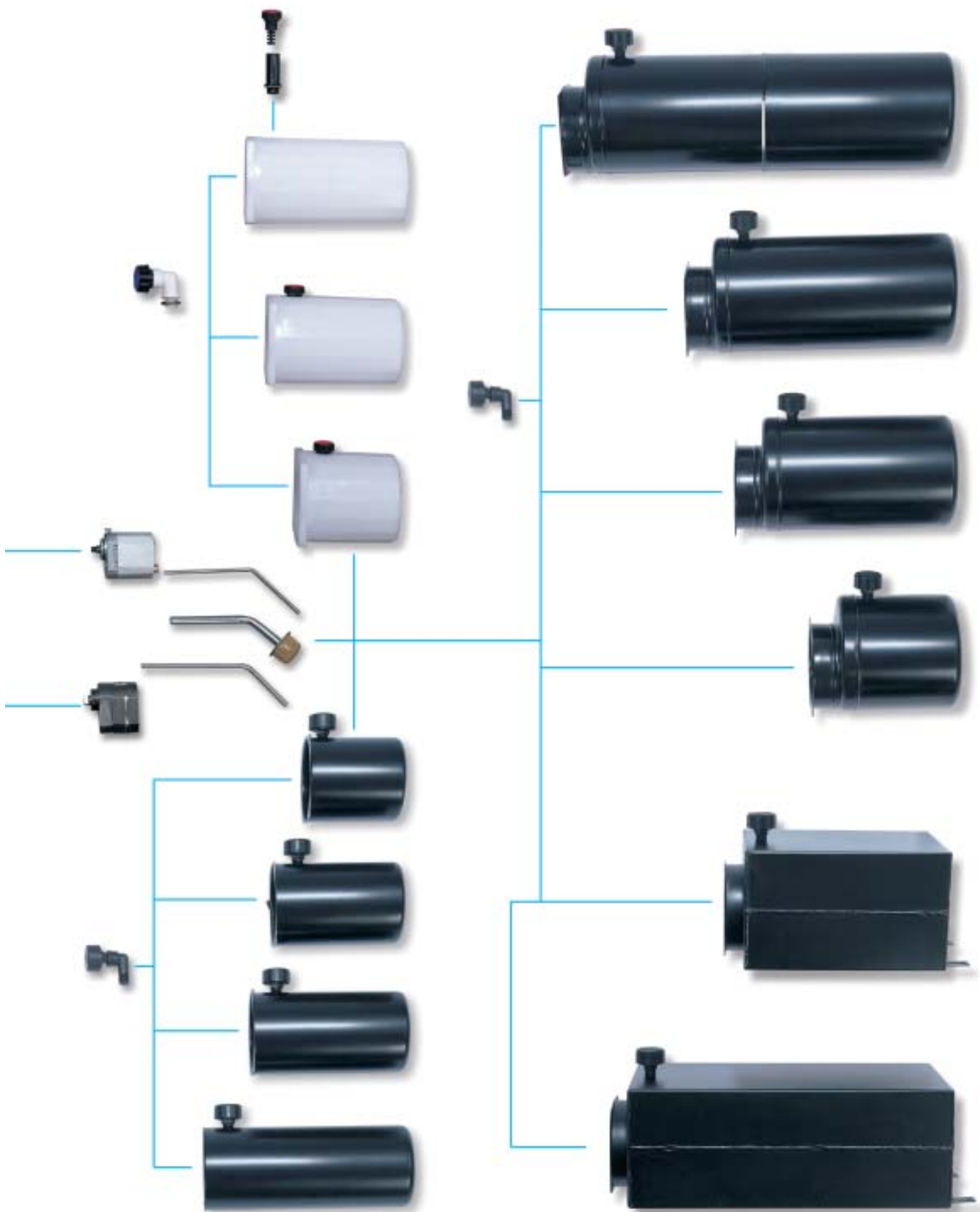
HE Power Packs allow you to build up hydraulic units simply and to your precise specifications. The system offers many advantages. It is flexible and lends itself readily to different applications.

It is very cost-effective, because you no longer need to hold complete units in stock. You build up the required unit from a small number of standard components.

Other advantages include low power consumption and low noise levels. High quality down to the finest detail ensures a long service life.

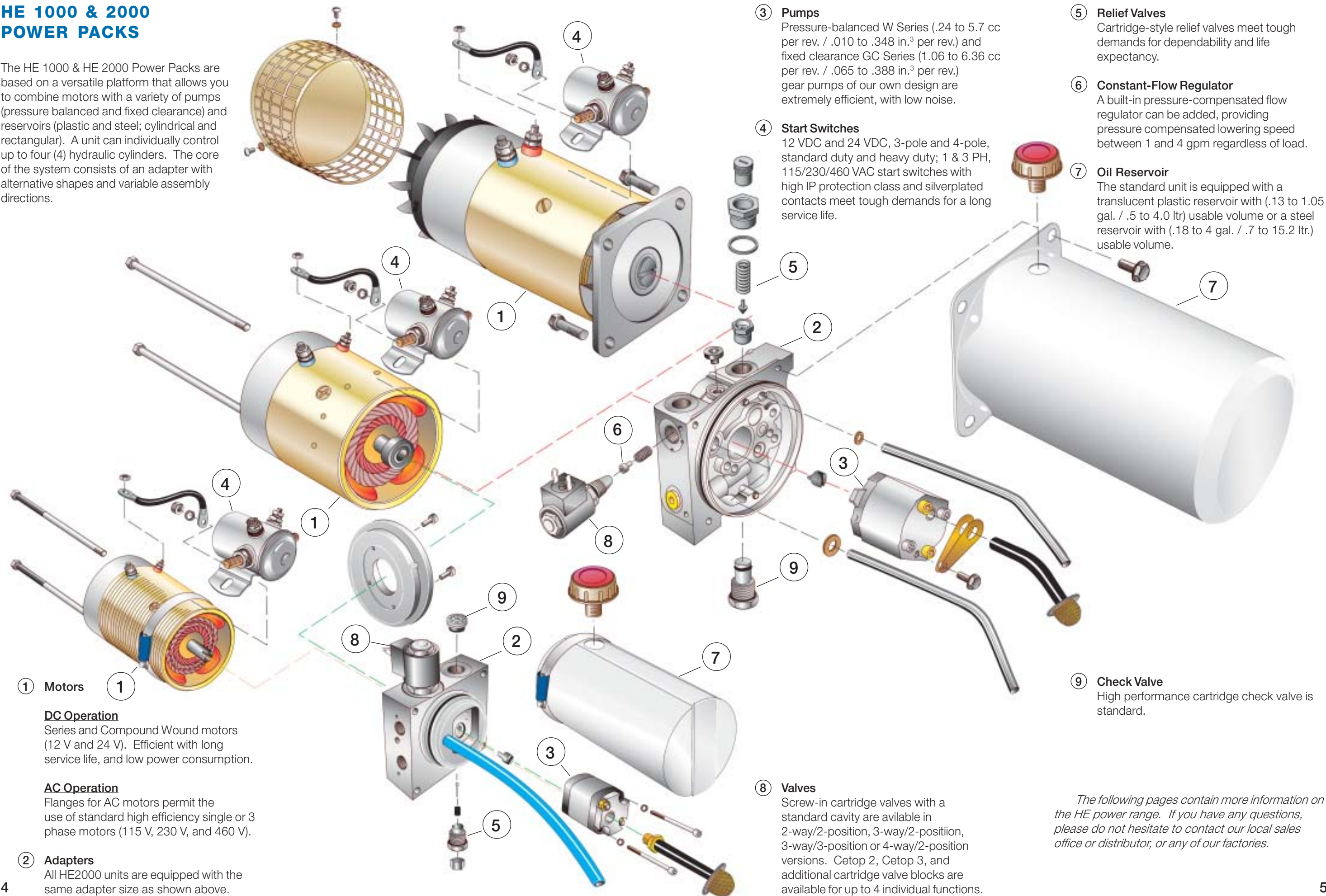
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on Page 6***





HE 1000 & 2000
POWER PACKS

The HE 1000 & HE 2000 Power Packs are based on a versatile platform that allows you to combine motors with a variety of pumps (pressure balanced and fixed clearance) and reservoirs (plastic and steel; cylindrical and rectangular). A unit can individually control up to four (4) hydraulic cylinders. The core of the system consists of an adapter with alternative shapes and variable assembly directions.



① Motors

DC Operation

Series and Compound Wound motors (12 V and 24 V). Efficient with long service life, and low power consumption.

AC Operation

Flanges for AC motors permit the use of standard high efficiency single or 3 phase motors (115 V, 230 V, and 460 V).

② Adapters

All HE2000 units are equipped with the same adapter size as shown above.

③ Pumps

Pressure-balanced W Series (.24 to 5.7 cc per rev. / .010 to .348 in.³ per rev.) and fixed clearance GC Series (1.06 to 6.36 cc per rev. / .065 to .388 in.³ per rev.) gear pumps of our own design are extremely efficient, with low noise.

④ Start Switches

12 VDC and 24 VDC, 3-pole and 4-pole, standard duty and heavy duty; 1 & 3 PH, 115/230/460 VAC start switches with high IP protection class and silverplated contacts meet tough demands for a long service life.

⑤ Relief Valves

Cartridge-style relief valves meet tough demands for dependability and life expectancy.

⑥ Constant-Flow Regulator

A built-in pressure-compensated flow regulator can be added, providing pressure compensated lowering speed between 1 and 4 gpm regardless of load.

⑦ Oil Reservoir

The standard unit is equipped with a translucent plastic reservoir with (.13 to 1.05 gal. / .5 to 4.0 ltr) usable volume or a steel reservoir with (.18 to 4 gal. / .7 to 15.2 ltr.) usable volume.

⑨ Check Valve

High performance cartridge check valve is standard.

⑧ Valves

Screw-in cartridge valves with a standard cavity are available in 2-way/2-position, 3-way/2-position, 3-way/3-position or 4-way/2-position versions. Cetop 2, Cetop 3, and additional cartridge valve blocks are available for up to 4 individual functions.

The following pages contain more information on the HE power range. If you have any questions, please do not hesitate to contact our local sales office or distributor, or any of our factories.



THE POWER OF HE

Haldex Hydraulic Systems is one of the world's leading manufacturers of hydraulic power packs. In recent years, we have focused on strategically important markets, and the result is a new series of high performance hydraulic power packs. The HE series represents a further development of the universal technical platform developed by Haldex, worldwide.

HE Power Packs are optimized for demanding applications. They are designed for use in trucks operating in harsh climates, or for heavy materials handling with long service intervals. Applications that demand high performance and superb quality. We have also prioritized customers' wishes for greater flexibility and better cost-efficiency.

The result is an extremely versatile platform, which uses standard components and can handle most of the applications the market demands. It lets you cut your stock of hydraulic components down to a minimum and radically reducing the need for specially developed components.

HE Power Packs make it easier to build short series of special applications cost efficiently.

Haldex Hydraulic Systems is a division of Haldex. Haldex is an innovator in vehicle technology supplying proprietary systems and components for trucks, cars and industrial vehicles, worldwide. With 4,100 employees and yearly sales exceeding 7 billion Swedish Kronor, Haldex is listed on the Stockholm Stock Exchange (www.haldex.com).

The company operates globally and enjoys global advantages: secure supply lines, close contact with customers on development and a universal technical platform that will always fit your product. No matter where in the world it is manufactured.

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12 VDC Single Terminal Series Wound Motor	
12 VDC Double Terminal Series Wound Motor	
24 VDC Double Terminal Series Wound Motor	
24 VDC Single Terminal Series Wound Motor	
24 VDC Double Terminal Low Speed Compound Wound Motor	
24 VDC Double Terminal Heavy Duty Compound Wound Motor	
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HE 1000 Adaptors and Valves

● HE 1000

The HE 1000 is designed for light duty applications using the 3" diameter motor, or for heavier duty applications with the 4.5" diameter motor. It's smaller envelope size, when compared to it's big brother, the HE 2000, allows further flexibility for your application.

The HE 1000 power pack can be used in a Lift-Hold-Lower circuit, a customer supplied custom valve block package or a 2-position 4-way valve circuit.

The HE 1000 adaptor includes a check valve, relief valve and most models can be equipped with a pressure compensated return flow control.

In addition to both vertical and horizontal reservoirs, the HE1000 also offers weather protection boots for the motor and start switch terminals, and a single acting pendant for remote control.

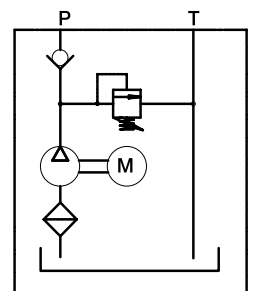
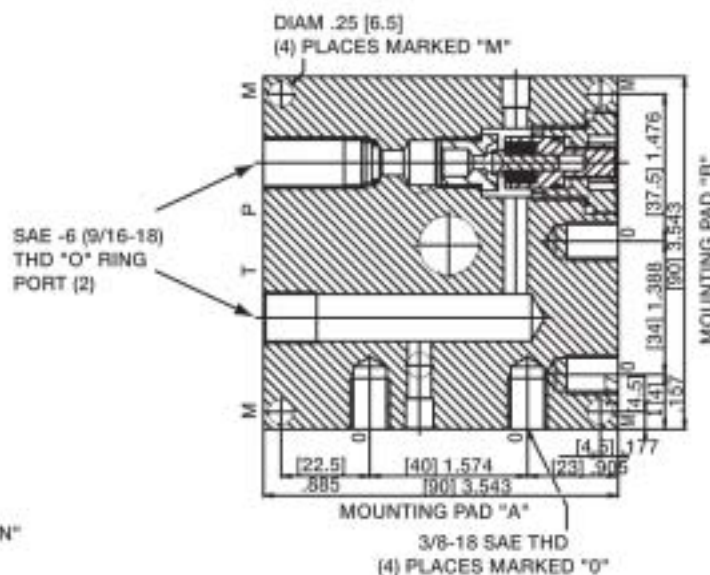
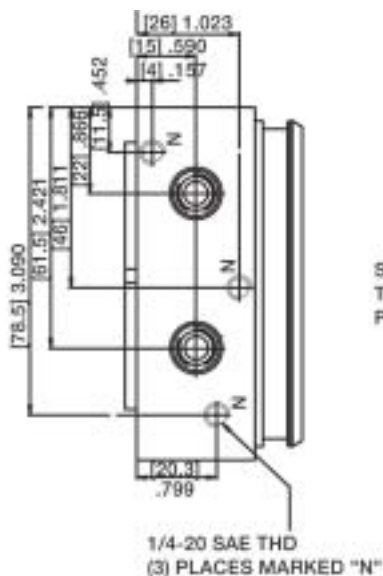
Please note that adaptors are shown from the reservoir side on the following pages.

HE 1000 Adaptors

NA000

● NA000

Adaptor prepared for pressure and return (P & T) circuit or a customer supplied custom valve block.



HE 1000 Adaptors (cont.)

NE012 & NE024 / NO012 & NO024

● NE012

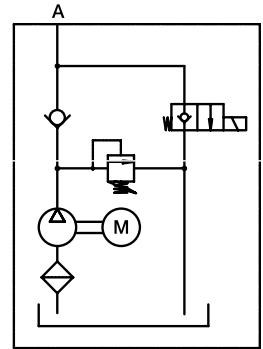
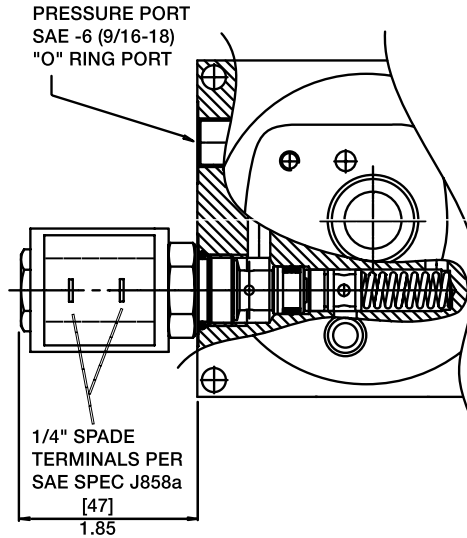
● NE024

Adaptor prepared for lift-hold-lower (LHL) applications, using 12 or 24 VDC solenoid cartridge valves.

● NO012

● NO024

Same as shown, except with integrated manual override in the solenoid cartridge valve.

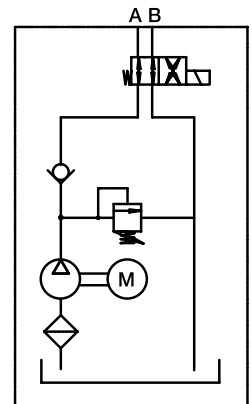
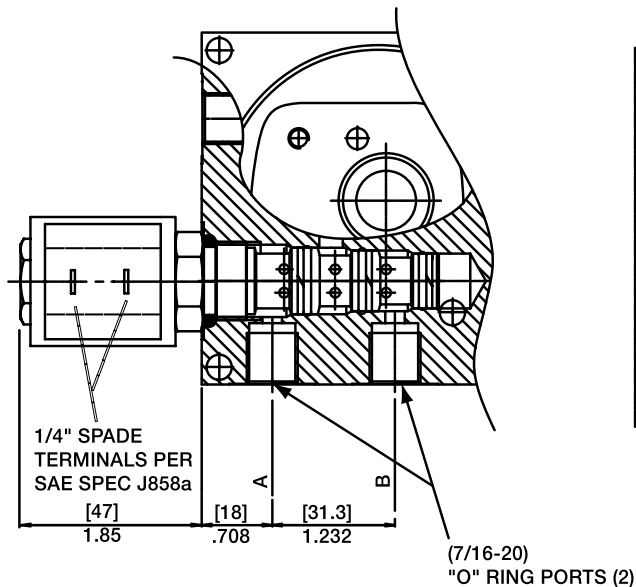


NL012 & NL024

● NL012

● NL024

Adaptor prepared for 2-position 4-way solenoid cartridge valve integrated in adapter. Adapter also tapped and machined for a customer supplied custom manifold with pilot operated checks.



HE 2000 Adapter/Circuit Options

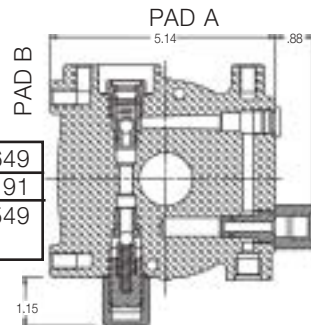
Each of the adapter options shown on the following pages provide the complete circuit indicated by the corresponding schematic. The order codes at the rear of this catalog provide the vehicle for specifying the coil voltage, flow

control settings, relief valve settings and a number of other options. The manifold adapters shown come with the manifold for the circuit indicated. All adapters, manifolds, coils, etc. are also available as stand alone kits which are easily assembled.

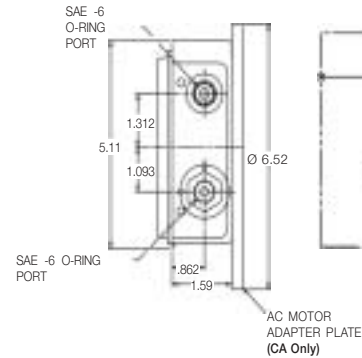
BA (DC Version) OR CA (AC Version) Adapter, P & T ports, Relief Valve & Check Valve

Adapter kit	1303649
Port Plug	1300191
AC Motor Adapter Kit (CA only)	1303549

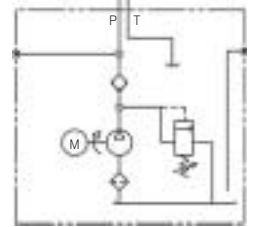
View from Reservoir End



Top View



Hydraulic Schematic

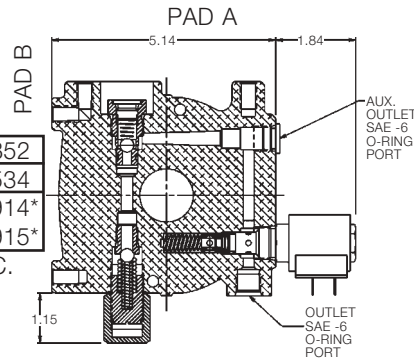


BB (DC Version) Adapter, Normally Closed Solenoid Lowering Valve

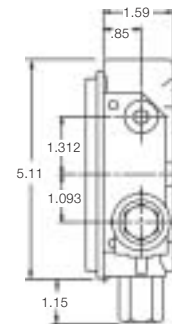
Adapter kit	1300852
Solenoid Release valve kit	1303534
BB012 12 VDC Solenoid kit	1300914*
BB024 24 VDC Solenoid kit	1300915*

* Must order (1) 12 VDC or (1) 24 VDC.

View from Reservoir End

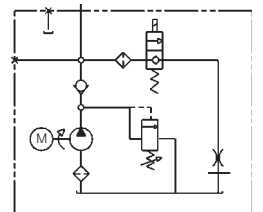


Top View



Hydraulic Schematic

Shown with optional flow control.
See Model Code V for flow control options - page 26.

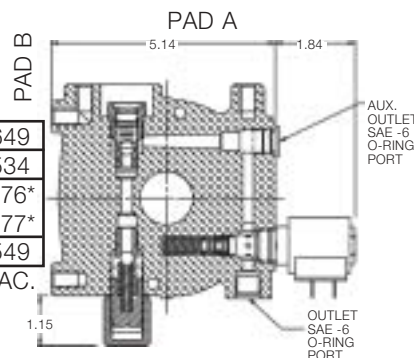


CB (AC Version) Adapter, Normally Closed Solenoid Lowering Valve

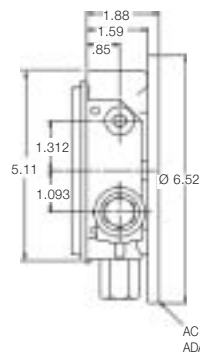
Adapter kit	1303649
Solenoid Release valve kit	1303534
CF115 110 VAC Solenoid kit	1303576*
CF230 230 VAC Solenoid kit	1303577*
AC Motor Adapter kit	1303549

* Must order (1) 115 VAC or (1) 230 VAC.

View from Reservoir End

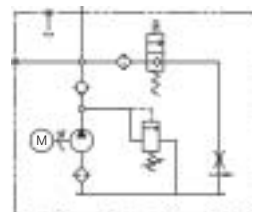


Top View



Hydraulic Schematic

Shown with optional flow control.
See Model Code V for flow control options - page 26.

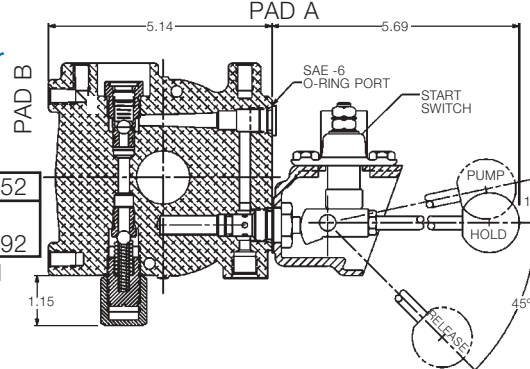


BE Manual Normally Closed Lowering Adapter with DC Contactor

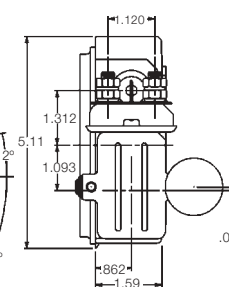
Adapter kit	1300852
Manual Release valve kit w/ pilot solenoid contactor	1300192

NOTE: Motor solenoid start switch still required.

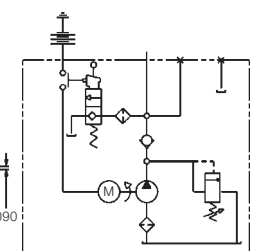
View from Reservoir End



Top View



Hydraulic Schematic



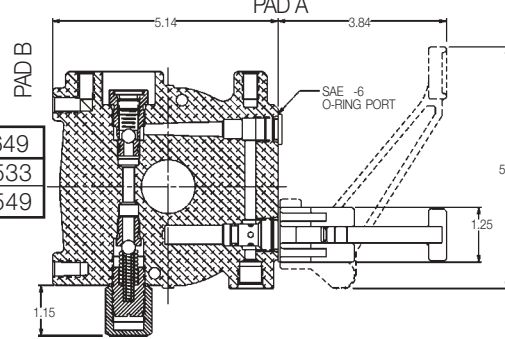
HE 2000 Adapter/Circuit Options (continued)

CE

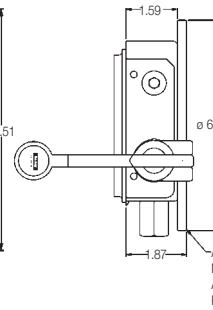
AC Manual Normally Closed
Lowering Valve Adapter

Adapter kit	1303649
Manual Release valve kit	1303533
AC Motor Adapter kit	1303549

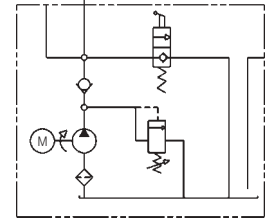
View from Reservoir End



Top View



Hydraulic Schematic



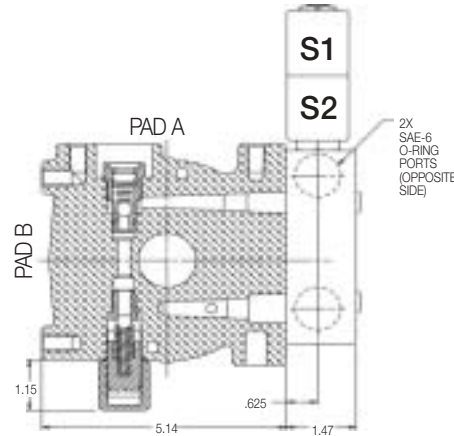
BF

Manifold Adapter w/3-position, 4-way
Valve (motor spool) (DC Version)

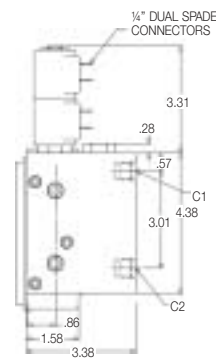
Adapter kit	1303650
Manifold kit	1300866
Motor Spool Valve	1303382
Plug (P. O. Check cavity)	1303540
BF012 12 VDC Solenoid kit	1300914*
BF024 24 VDC Solenoid kit	1300915*

* Must order (2) 12 VDC or (2) 24 VDC.

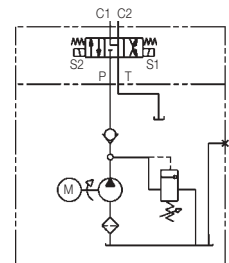
View from Reservoir End



Top View



Hydraulic Schematic



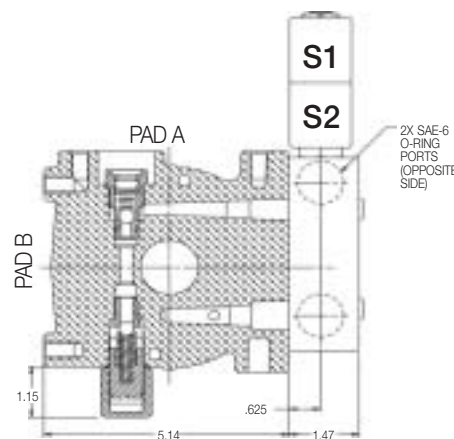
BH

Manifold Adapter w/3-position, 4-way
Valve (motor spool)
(DC Version w/Double P.O. Check)

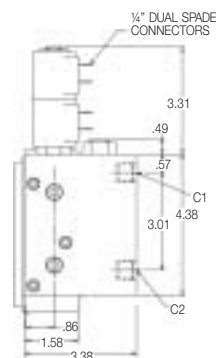
Adapter kit	1303650
Manifold kit	1300866
Motor Spool Valve	1303382
Double P. O. Check Valve	1303538
BH012 12 VDC Solenoid kit	1300914*
BH024 24 VDC Solenoid kit	1300915*

* Must order (2) 12 VDC or (2) 24 VDC.

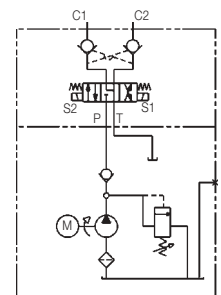
View from Reservoir End



Top View



Hydraulic Schematic



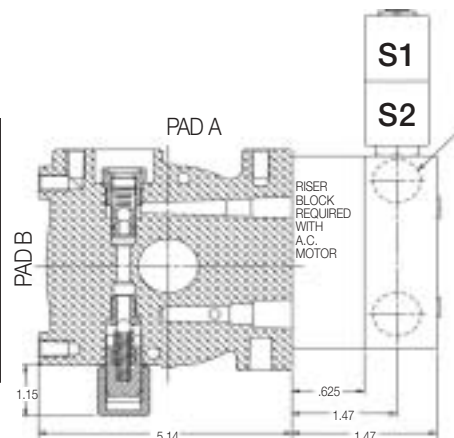
CF

Manifold Adapter w/3-position, 4-way
Valve (motor spool) (AC Version)

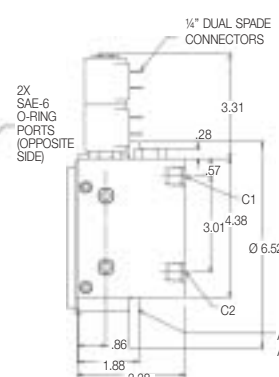
Adapter kit	1303650
Manifold kit	1300866
Motor Spool Valve	1303382
Plug (P. O. Check cavity)	1303540
CF115 115 VAC Solenoid kit	1303576*
CF230 230 VAC Solenoid Kit	1303577*
Riser block (required for AC units w/manifolds)	1300855
AC Motor Adapter kit	1303549

* Must order (2) 115 VAC or (2) 230 VAC.

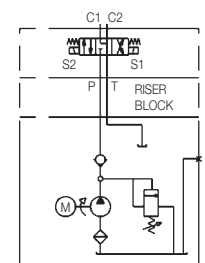
View from Reservoir End



Top View



Hydraulic Schematic



HE 2000 Adapter/Circuit Options (continued)

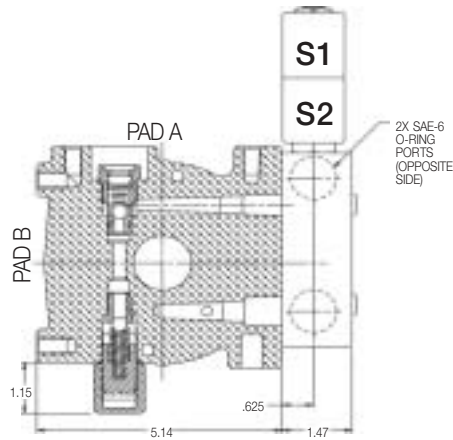
BJ

Manifold Adapter w/3-position, 4-way Valve (tandem center spool) (DC Version)

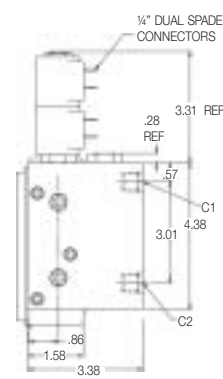
Adapter kit	1303650
Manifold kit	1300866
Tandem Center Valve	1303530
Plug (P. O. Check cavity)	1303540
BJ012 12 VDC Solenoid kit	1300914*
BJ024 24 VDC Solenoid kit	1300915*

* Must order (2) 12 VDC or (2) 24 VDC.

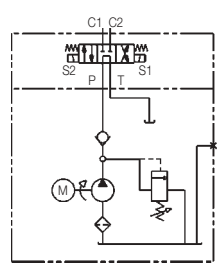
View from Reservoir End



Top View



Hydraulic Schematic



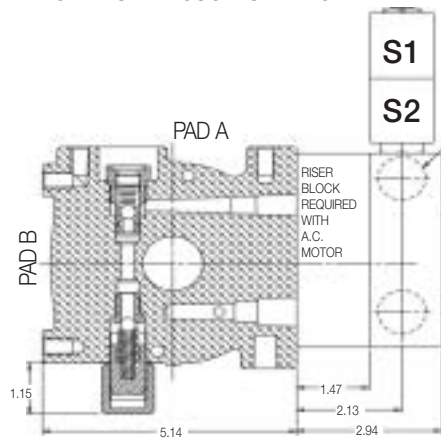
CJ

Manifold Adapter w/3-position, 4-way Valve (tandem center spool) (AC Version)

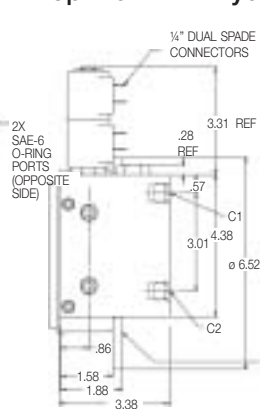
Adapter kit	1303650
Manifold kit	1300866
Tandem Center Valve	1303530
Plug (P. O. Check cavity)	1303540
CJ115 115 VAC Solenoid kit	1303576*
CJ230 230 VAC Solenoid kit	1303577*
Riser block (required for AC units w/manifolds)	1300855
AC Motor Adapter kit	1303549

* Must order (2) 115 VAC or (2) 230 VAC.

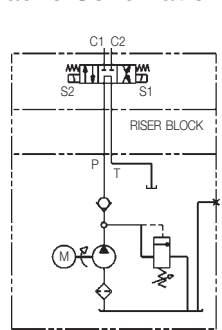
View from Reservoir End



Top View



Hydraulic Schematic



A.C. MOTOR
ADAPTOR
PLATE

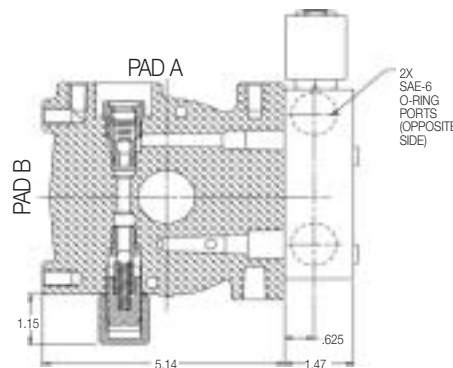
BR

Manifold Adapter w/Solenoid Operated, 2-position, 4-way Valve (DC Version)

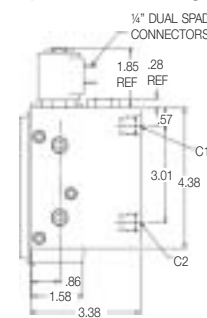
Adapter kit	1303650
Manifold kit	1300866
Normally Open Valve	1303529
Plug (P. O. Check cavity)	1303540
BR012 12 VDC Solenoid kit	1300914*
BR024 24 VDC Solenoid kit	1300915*

* Must order (1) 12 VDC or (1) 24 VDC.

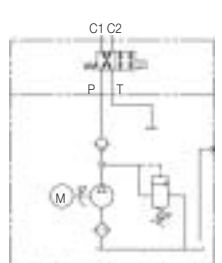
View from Reservoir End



Top View



Hydraulic Schematic



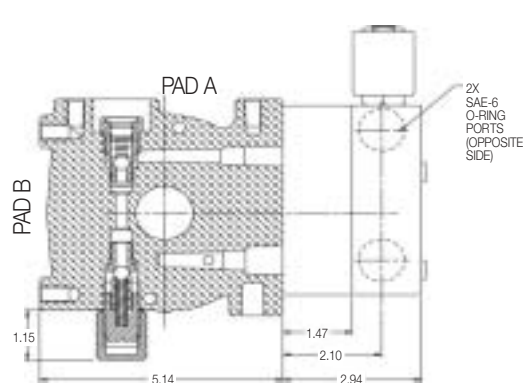
CR

Manifold Adapter w/Solenoid Operated, 2-position, 4-way Valve (AC Version)

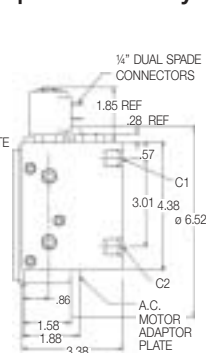
Adapter kit	1303650
Manifold kit	1300866
Normally Open Valve	1303529
Plug (P. O. Check cavity)	1303540
CR115 115 VAC Solenoid kit	1303576*
CR230 230 VAC Solenoid kit	1303577*
Riser block (required for AC units w/manifolds)	1300855
AC Motor Adapter kit	1303549

* Must order (1) 115 VAC or (1) 230 VAC.

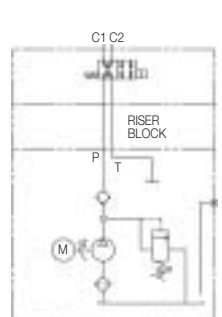
View from Reservoir End



Top View



Hydraulic Schematic



A.C. MOTOR
ADAPTOR
PLATE

HE 1000 PUMPS AND DC MOTORS

The HE series is equipped with motors for 12 or 24 VDC. These compound motors provide extremely high power output and meet tough load requirements. A thoughtful basic design and long-lasting carbon brushes cut down

on maintenance requirements. All motors are manufactured by the Hydraulic Systems Division of Haldex to ensure maximal system optimization, performance and quality.

MAKE THE OPTIMAL CHOICE OF PUMP AND MOTOR

On the following pages, you will find our range of DC motors and pumps.

Important parameters to consider in choosing the correct unit are flow in l/min, pressure in bars, and duty cycle. In some cases, allowable amp consumption is a factor too, due to restricted battery capacity.

Our curves permit easy comparison at a constant voltage measurement.

How to read the curves:

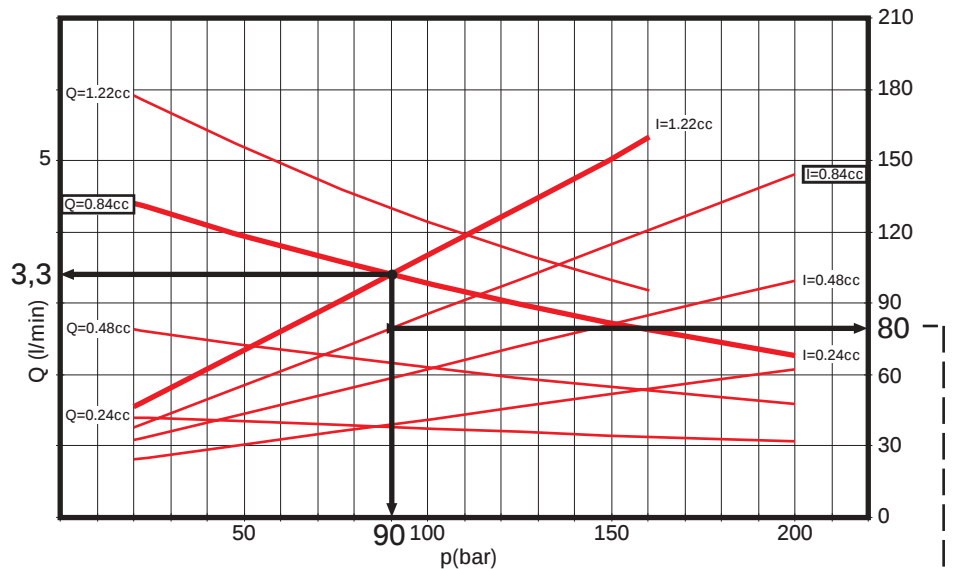
When pressure and flow are determined, the amperage can be read from the pump/motor curve. The amperage is then transferred to curve 2.

The amperage corresponds to an S2 and an S3 value. These values represent two ways of calculating duty capability.

S2 is the number of minutes a unit can operate at a certain workload before reaching the maximum allowable temperature. After this, the unit must cool down until the motor temperature is less than 2°C from the ambient temperature before the same S2 value can be applied again.

S3 is the maximum time in % per 10 minute period that a unit can work at a certain pressure/workload. For example an S3 value of 30% = 3 min. for each 10 min. period, over and over again.

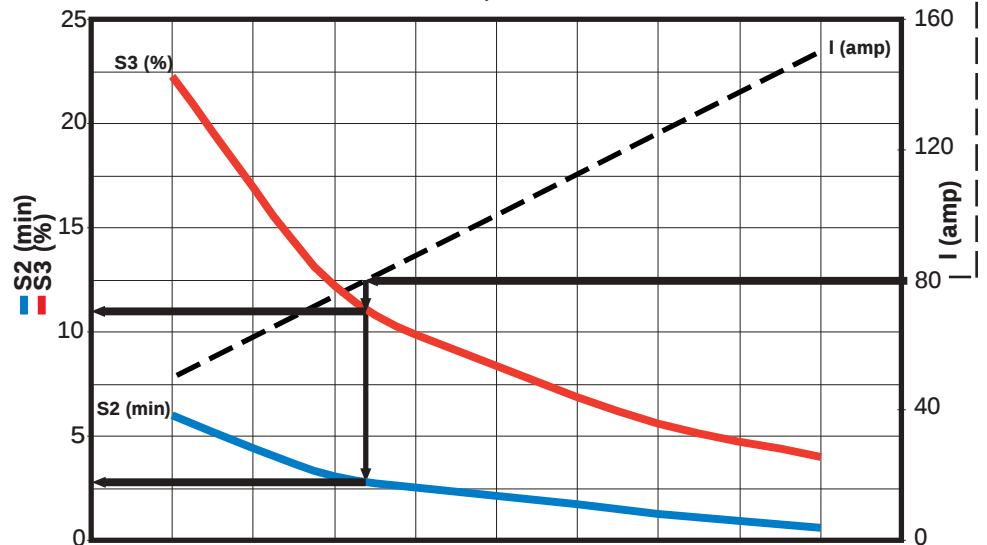
Pump motor



Example: 3,3 l/min at 90 bar and 80 amp on pump motor curve gives S2 = 3 min and S3 = 11% at corresponding motor curve.

Corresponding motor

12MG32, Ø 80mm

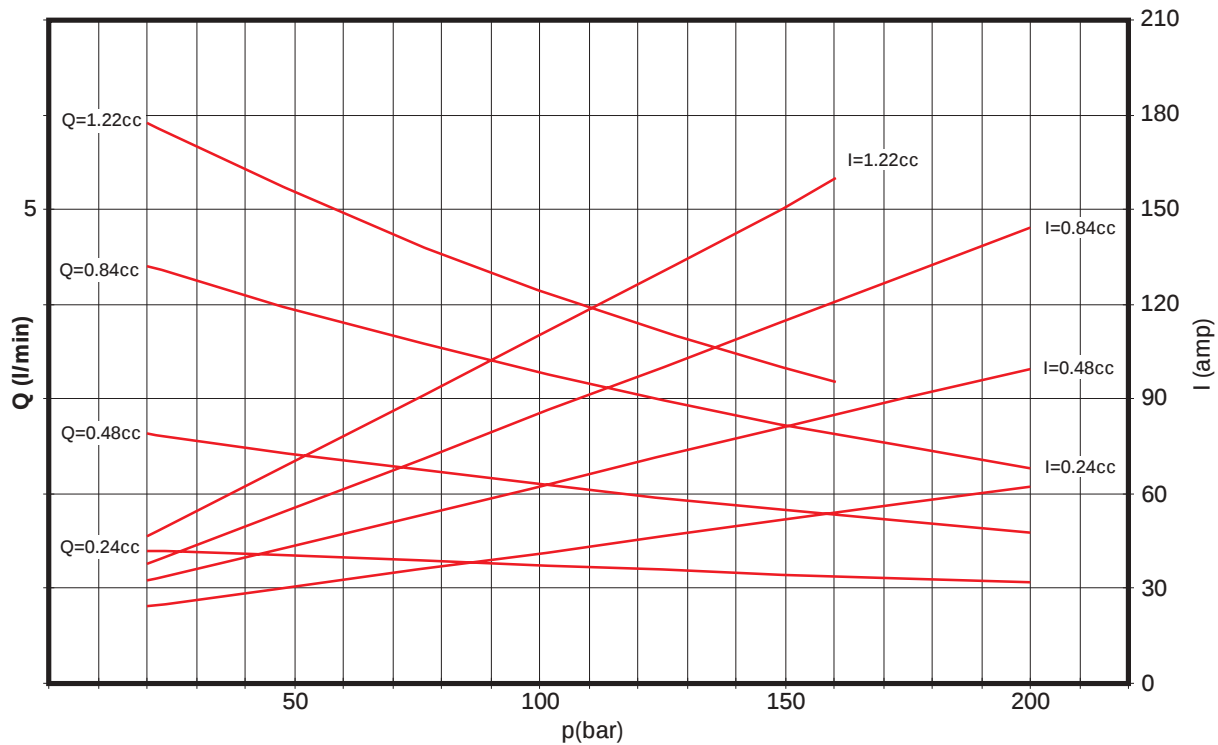


HE 1000 Performance Information

HE 1000 MG Pump/Motor w/ 12 VDC Ø 80 mm Motor

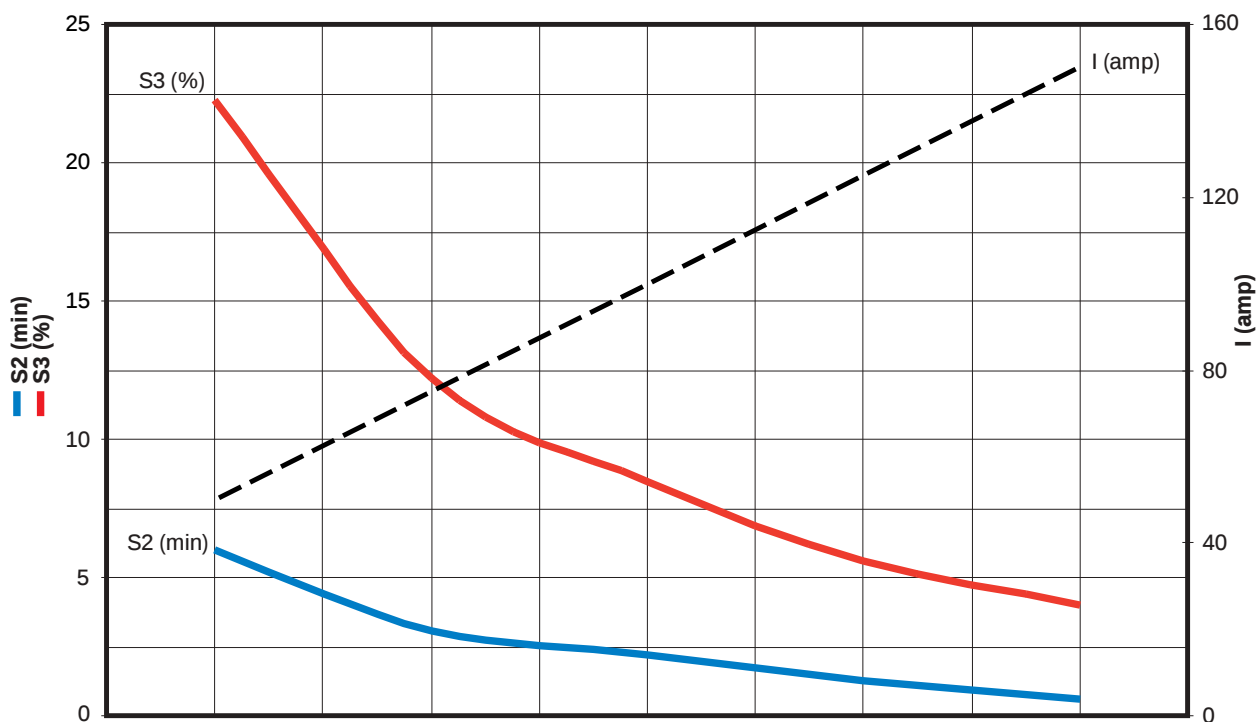
Viscosity 32 cSt at 40°C. Voltage 12 VDC constant

Code	Pump
02	0,24cc
05	0,48cc
08	0,84cc
12	1,22cc



Corresponding motor

Code	Motor
10	12MG32-HE
11	12MG32THE

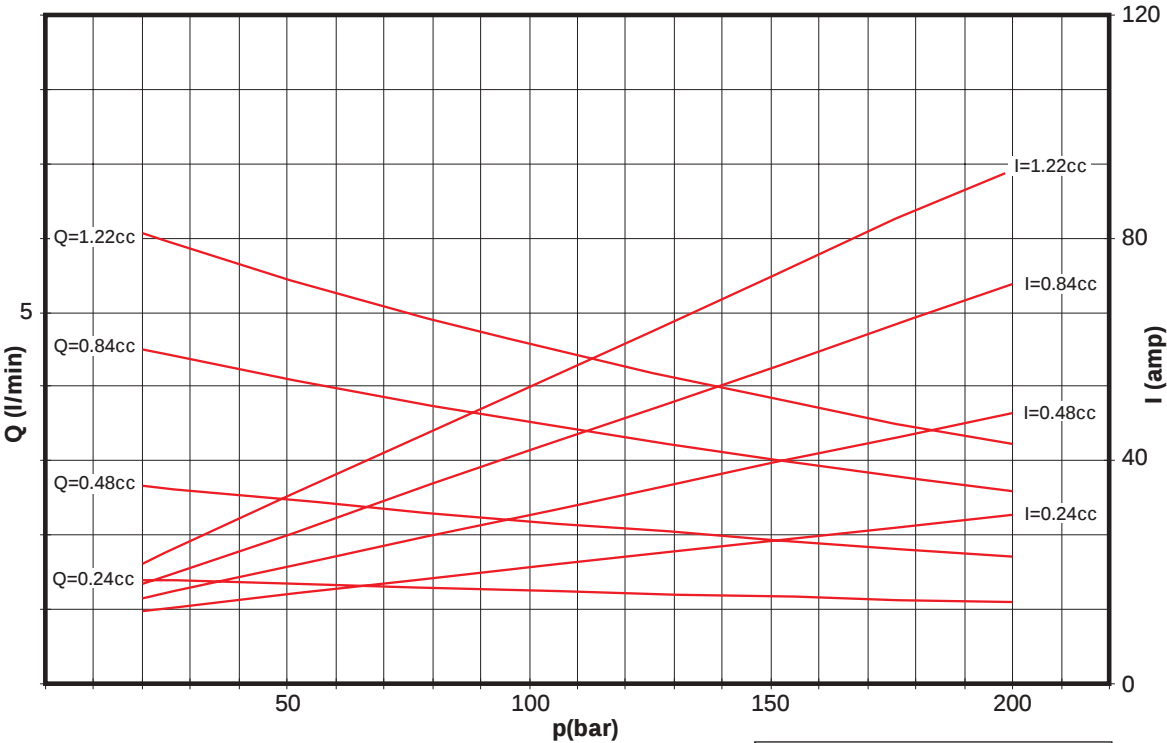


HE 1000 Performance Information

HE 1000 MG Pump/Motor w/ 24 VDC Ø 80 mm Motor

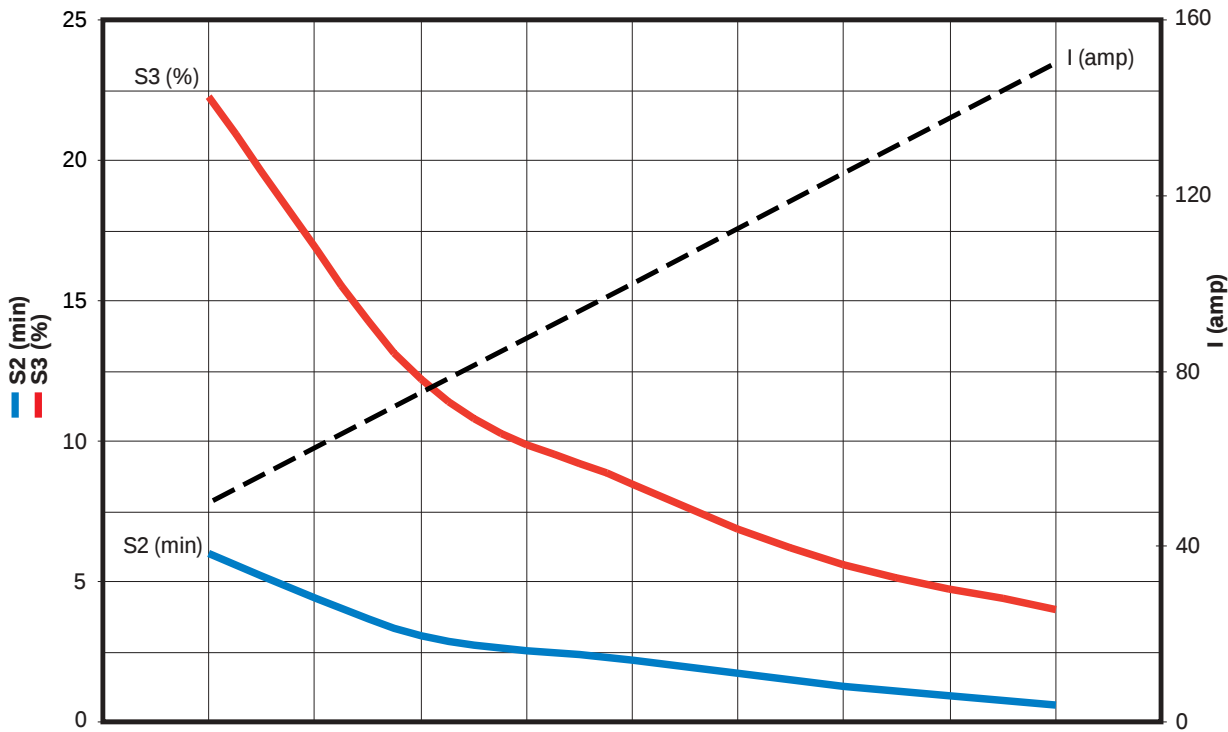
Viscosity 32 cSt at 40°C. Voltage 24 VDC constant

Code		Pump
02		0,24cc
05		0,48cc
08		0,84cc
12		1,22cc



Corresponding motor

Code		Motor
15		24MG32-HE
16		24MG32THE

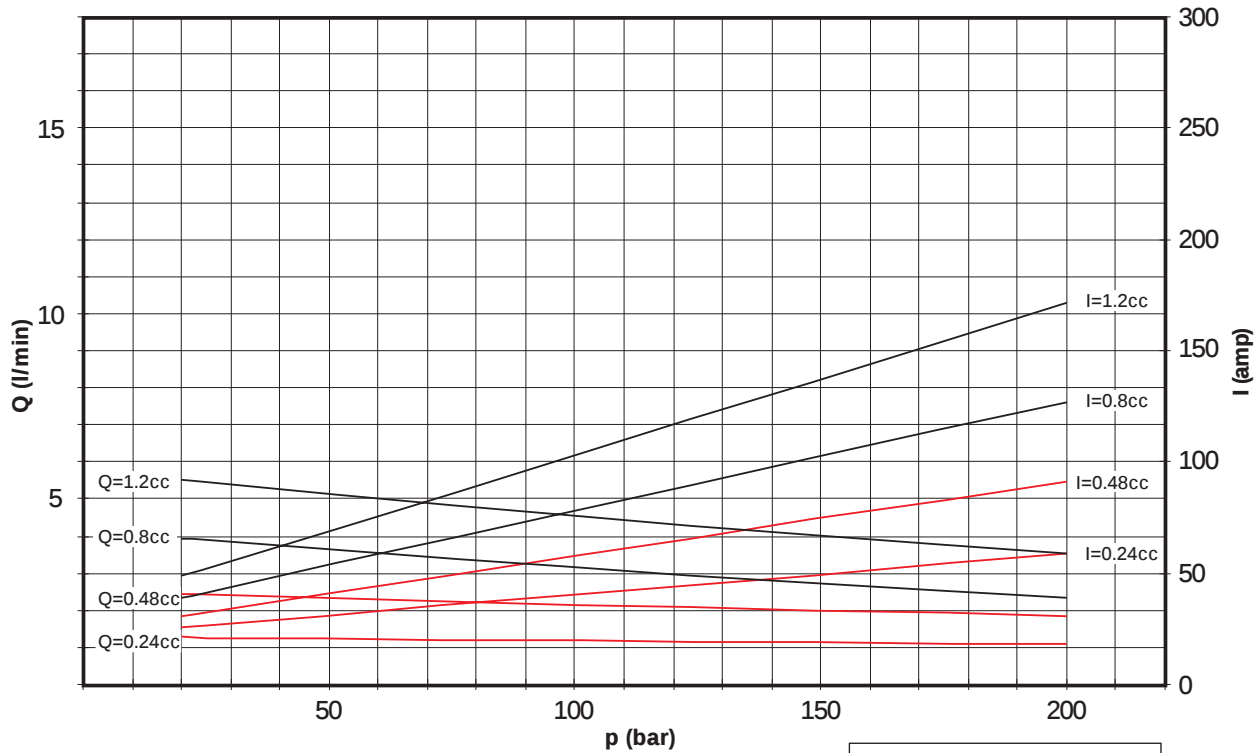


HE 1000 Performance Information

HE 1000 MD Pump/Motor w/ 12 VDC Ø 112 mm Motor

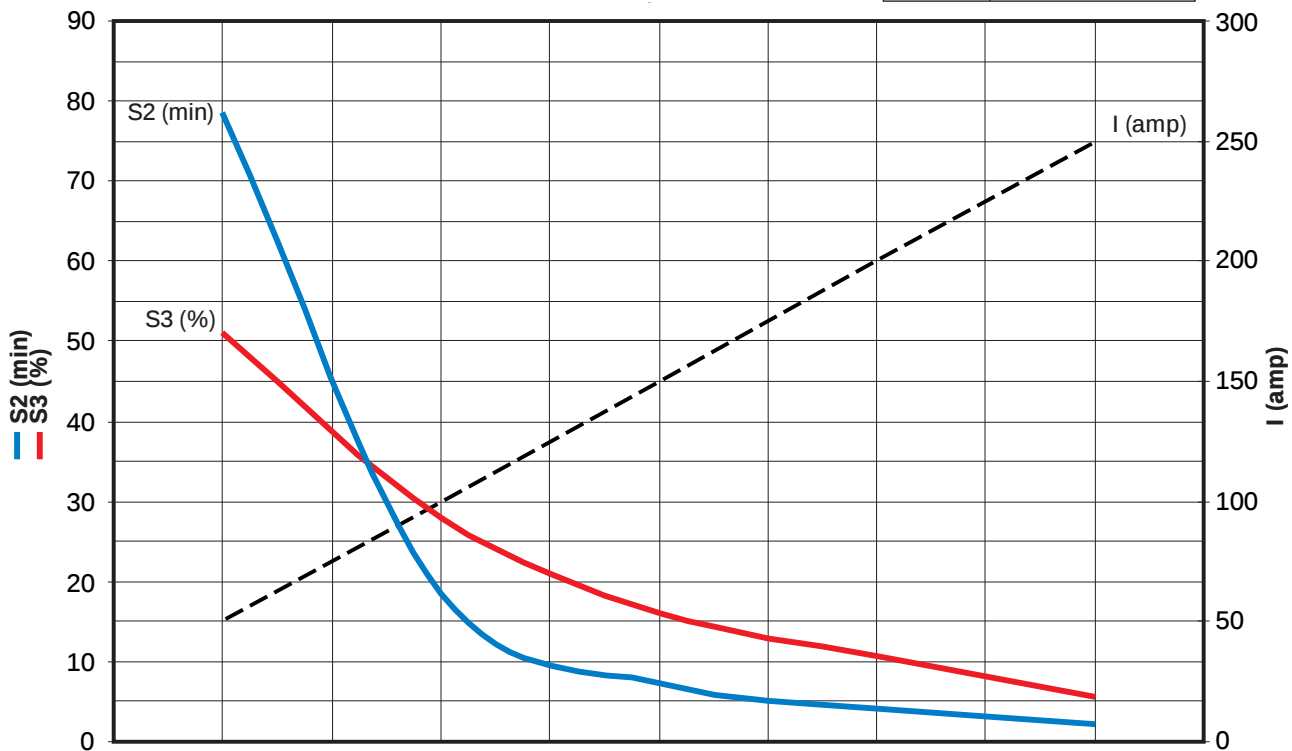
Viscosity 32 cSt at 40°C. Voltage 12 VDC constant

Code	Pump
02	0,24cc
05	0,48cc
08	0,8cc
12	1,2cc



Corresponding motor

Code	Motor
20 WA	12MD12-

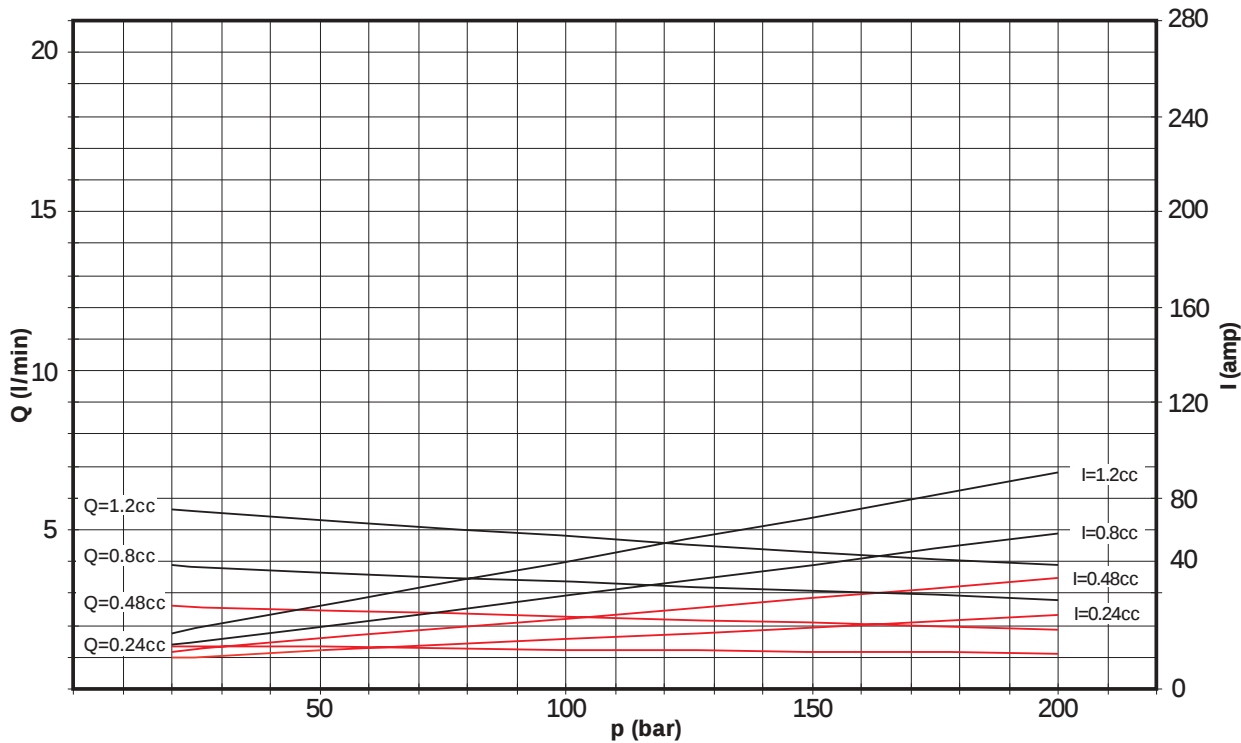


HE 1000 Performance Information

HE 1000 MD Pump/Motor w/ 24 VDC Ø 112 mm Motor

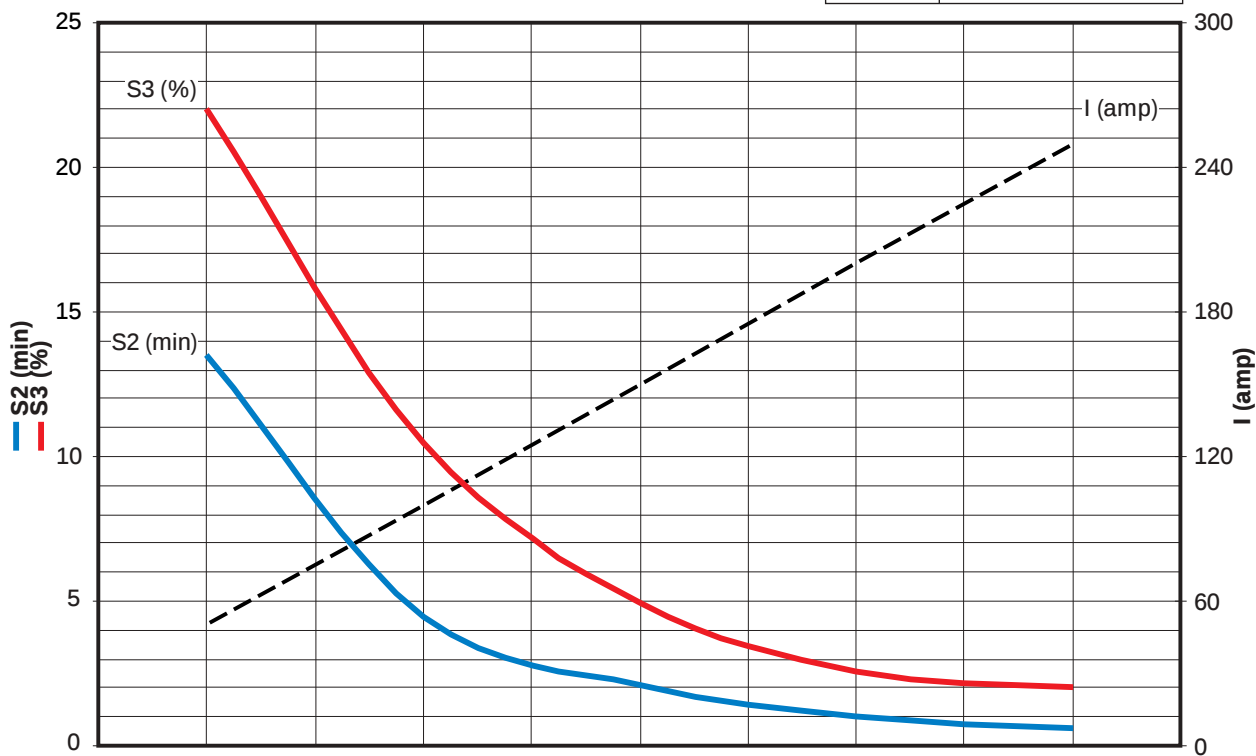
Viscosity 32 cSt at 40°C. Voltage 24 VDC constant

Code	Pump
02	0,24cc
05	0,48cc
08	0,8cc
12	1,2cc



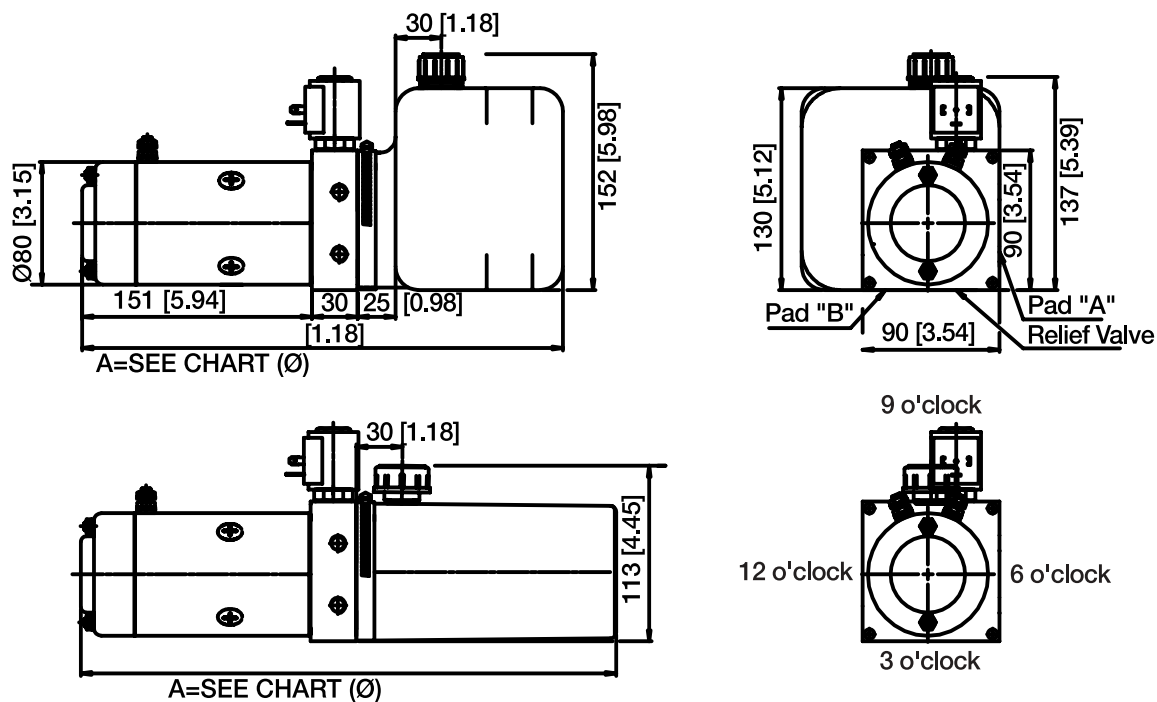
Corresponding motor

Code	Motor
25	24MD22-WA
26	24MD22TWA

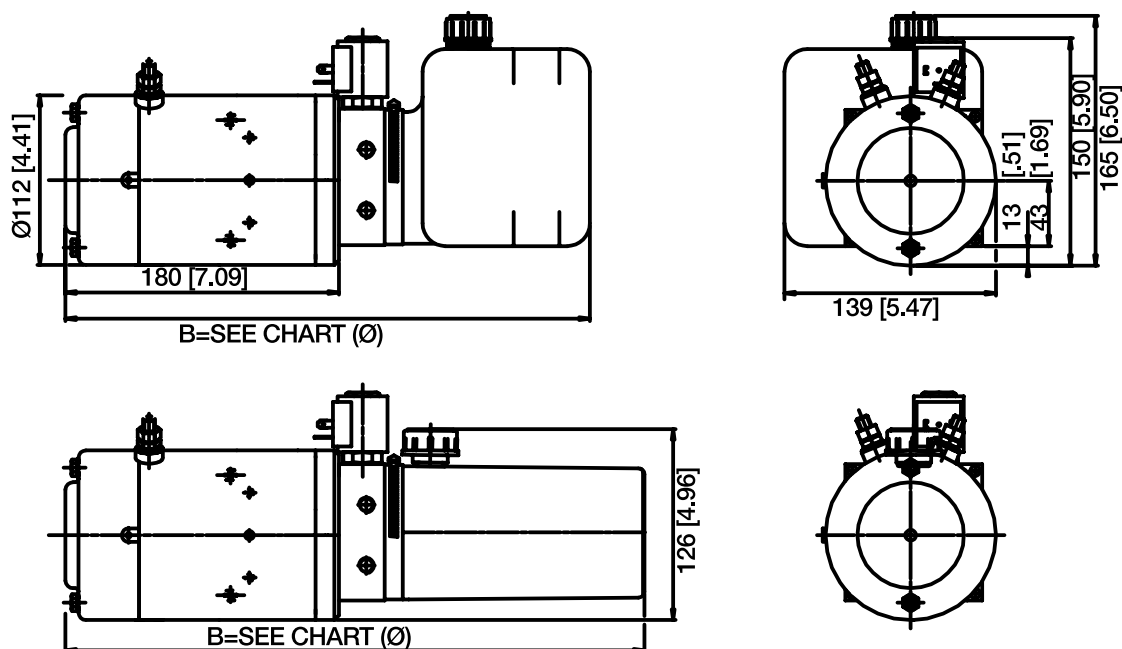


HE 1000 Power Pack Dimensions

HE 1000 w/ 12/24 VDC Ø 80 mm Motor



HE 1000 w/ 12/24 VDC Heavy Duty Ø 112 mm Motor



Reservoir		A	B	Codes	
V = Usable volume				Horizontal	Vertical
V = 0.5 L Ø	Cylindrical	353	381	AA	AB
V = 1.0 L Ø	Cylindrical	430	458	AC	AD
V = 1.5 L Ø	Rectangular	316	344	AE	AF
V = 2.0 L Ø	Rectangular	351	379	AG	AH
V = 2.5 L Ø	Rectangular	386	414	AJ	AK
V = 4.0 L Ø	Rectangular	486	514	AL	AM

HE 2000 DC Selection / Performance Information

The following pages include performance information for combinations of pumps and DC motors as well as pumps and AC motors. Pages 12-16 feature pump/DC motor performance curves. Page 28 features pump/AC motor performance curves.

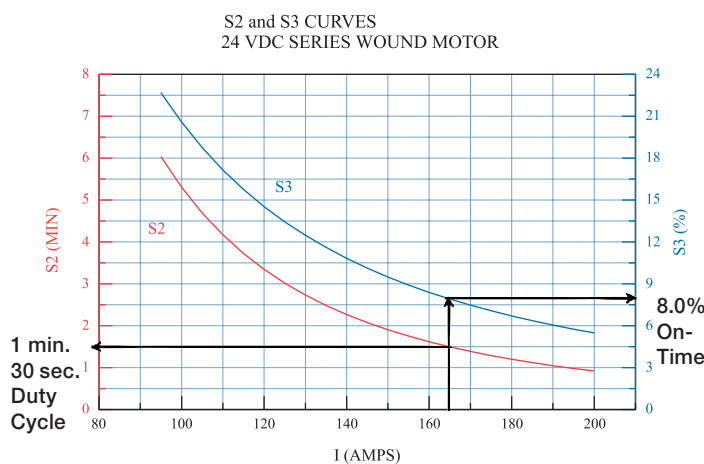
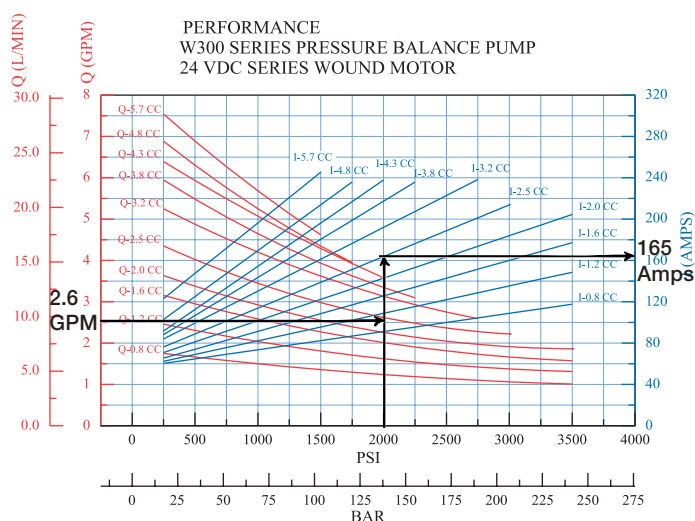
Selecting Pump and DC Motor Combinations

Refer to the appropriate “pump/motor” curve for your application voltage. Find the required flow at working pressure. Refer to the amp draw axis to determine the amp draw for the selected pump/motor combination. Note: Performance will vary depending on whether a pressure balanced or fixed clearance pump is chosen. On the “S2 (absolute continuous on-time)/S3 (percentage on-time)” curve you can determine the maximum duty cycle of your selected pump/motor combination. **Note: All S3 curves are based on a 5 minute duty cycle.**

Following is an example of determining this information:

Assuming a 2.6 GPM at 2000 PSI is required, the performance graph indicates a 2.5 cc/rev. pump is needed. The performance graph also shows a requirement of 165 amps with a W300 Pressure Balanced Pump. The S2/S3 curve at that amp draw has a S2 (absolute continuous on-time) of 1 minute, 30 sec. At that point, the motor would have to be turned off to allow cooling to ambient temperature. The motor could then be run for another 1 minute, 30 sec.

The S3 (percentage on-time) curve shows a maximum percentage on time of 8.0%, which means the motor can be operated for 24 seconds on, 276 seconds off, continuously.



Relief Valve Characteristics

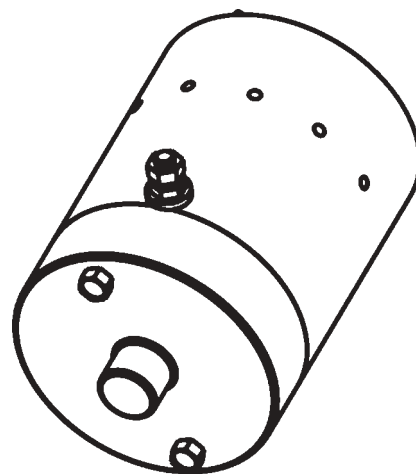
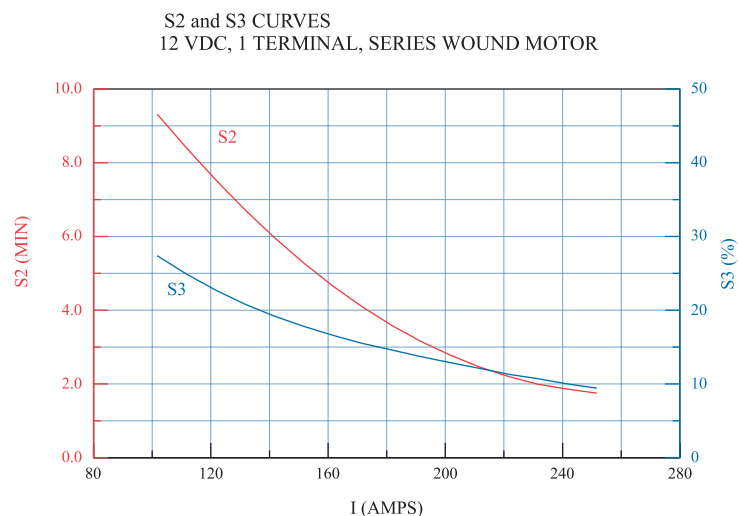
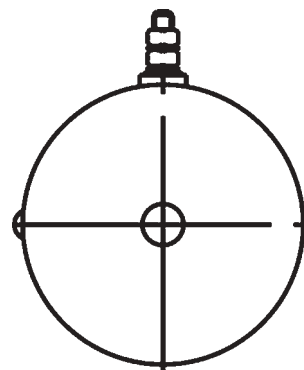
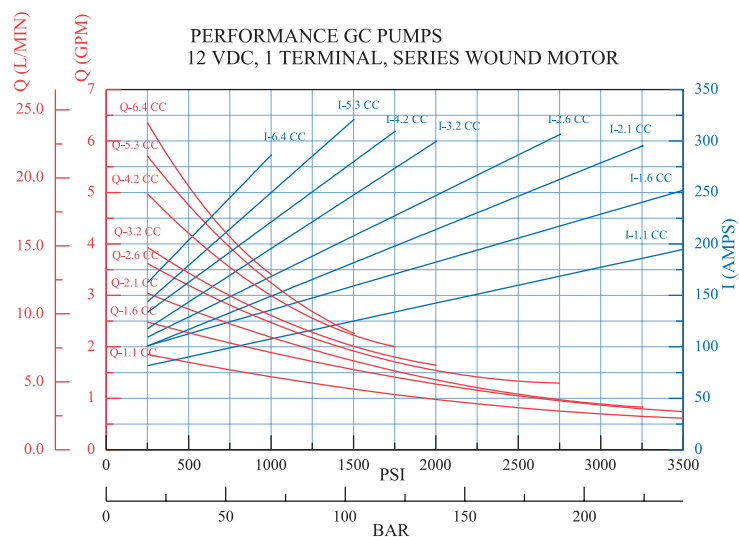
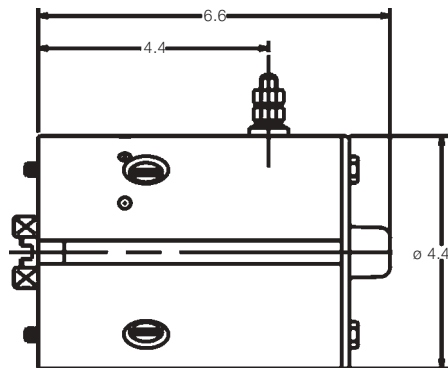
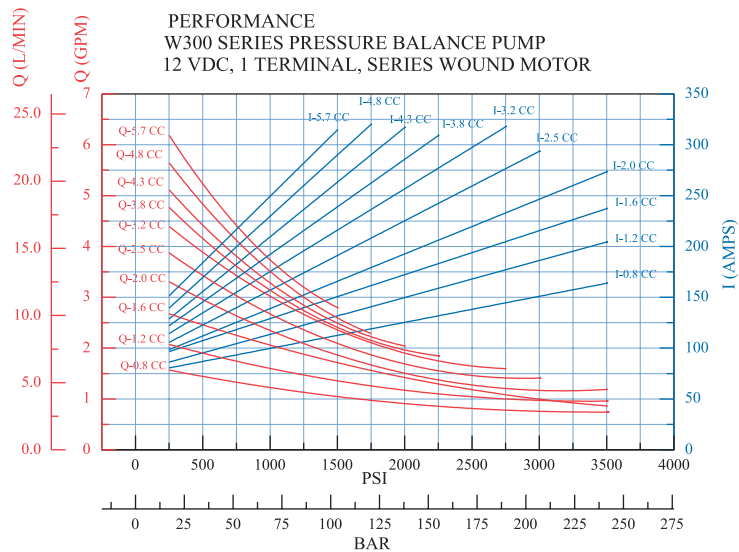
“Cracking pressure” is defined as when the relief valve begins to open and starts bypassing flow to the reservoir (defined as .25 GPM flow loss).

Relief valve cracking pressure is approximately 80% of the full bypass pressure and flow (i.e., if the relief valve pressure is to be set at 2500 PSI full bypass, then $2500 \times 0.8 = 2000$ PSI is the cracking pressure).

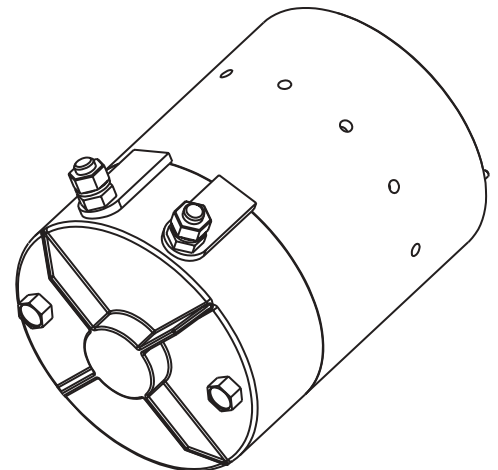
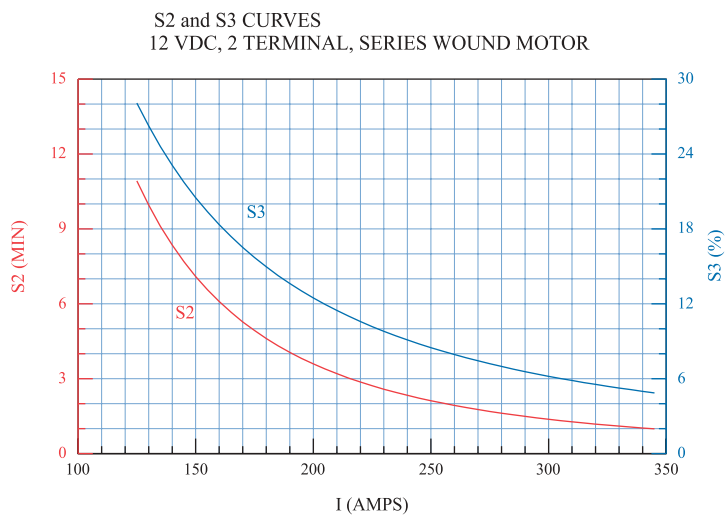
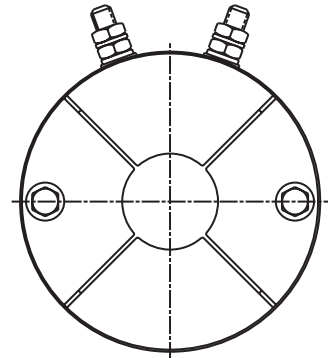
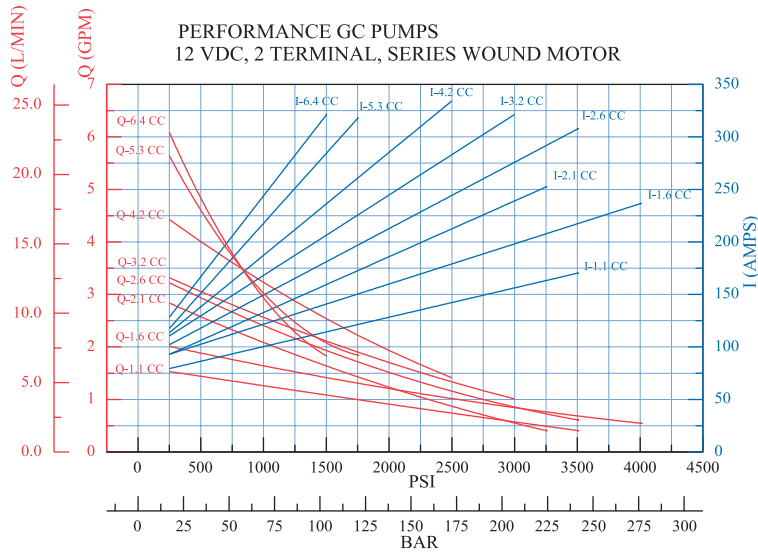
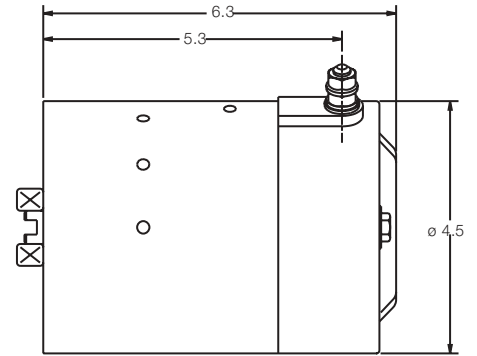
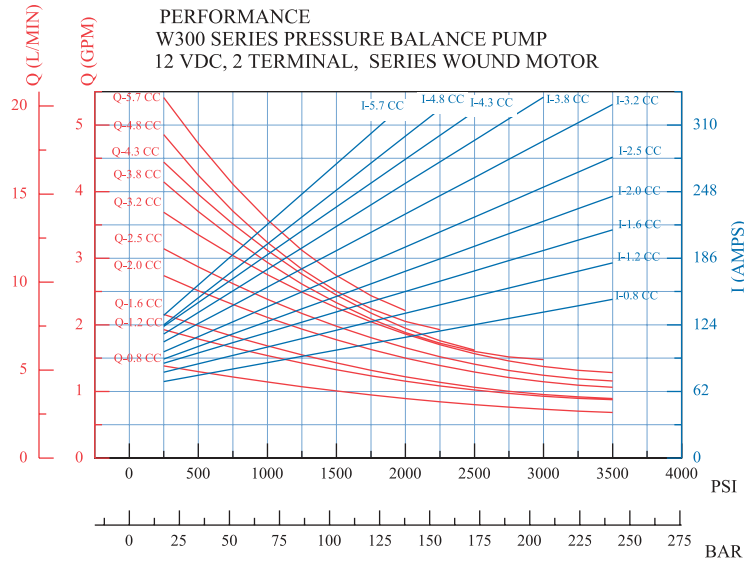
“Full bypass pressure and flow” is defined as when the relief valve is completely open and all flow is going back to the reservoir.

“Working pressure” should always be at or below the cracking pressure for maximum efficiency.

Performance for HE 2000 12 VDC Single Terminal Series Wound Motor, P/N 1300027

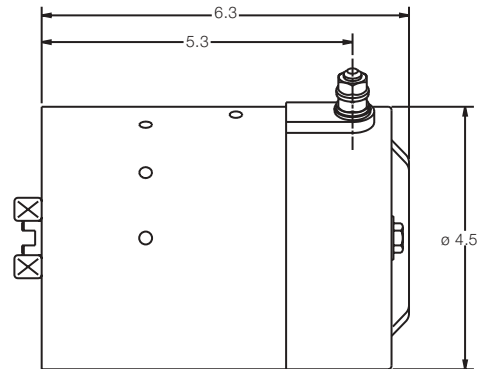
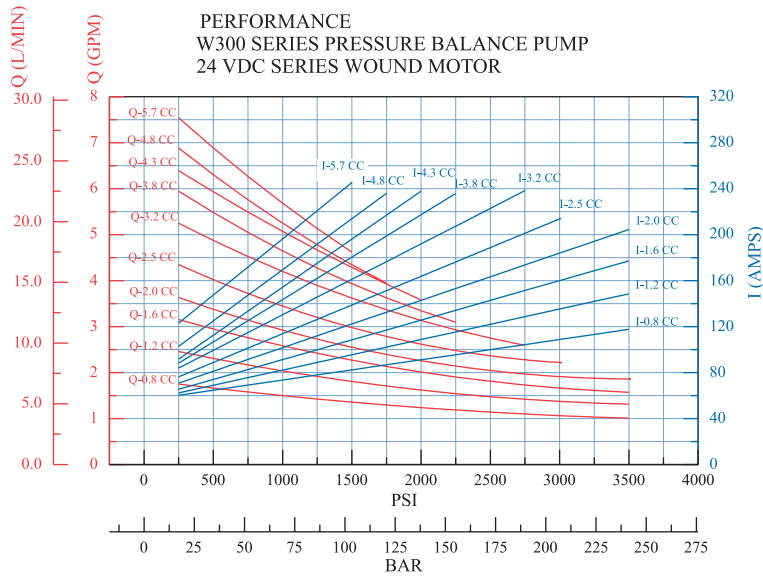


Performance for HE 2000 12 VDC Double Terminal Series Wound Motor, P/N 1300618

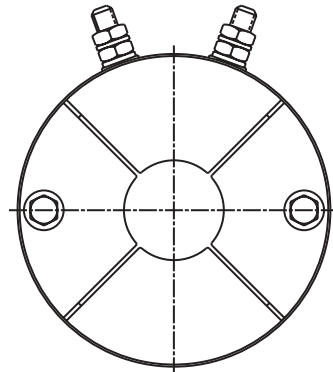
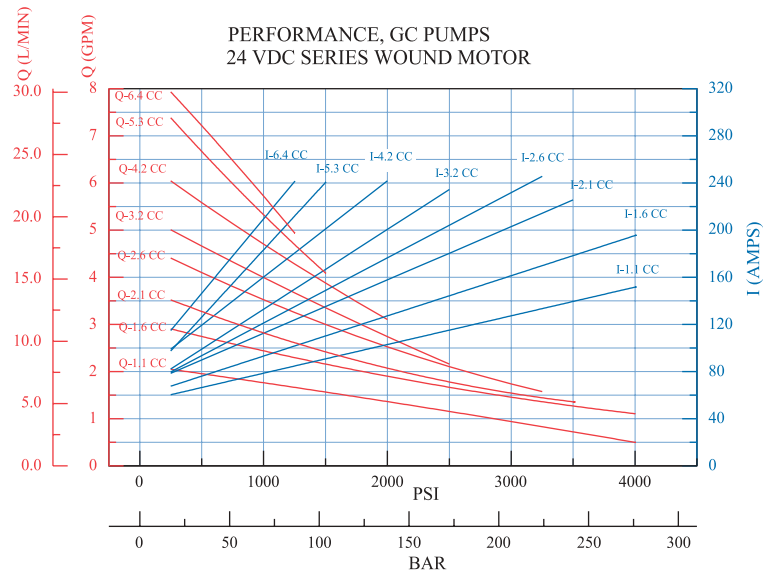


Note: Motor damage may result from operation outside the curve parameters as shown above.

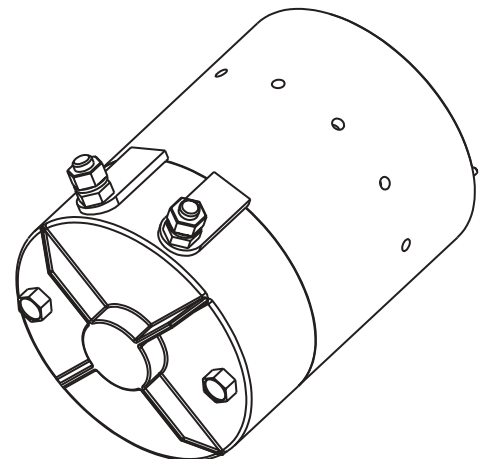
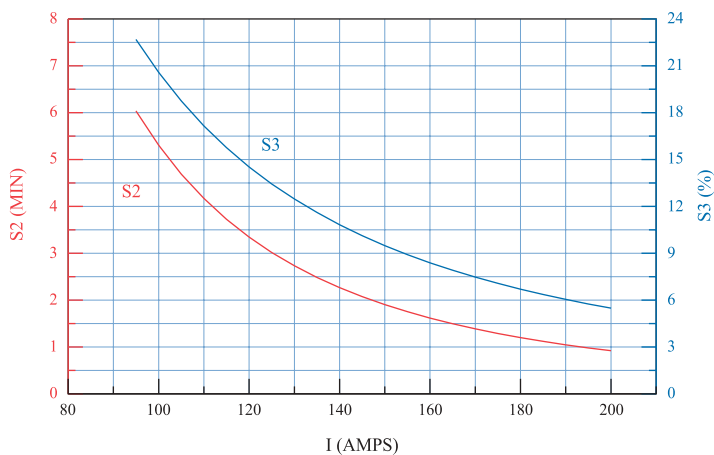
Performance for HE 2000 24 VDC Double Terminal (P/N 1300619) and Single Terminal (P/N 1300912) Series Wound Motors



NOTE:
1300912 IS THE SAME AS A
1300619 WITH A GROUND STRAP
ON EITHER MOTOR TERMINAL.

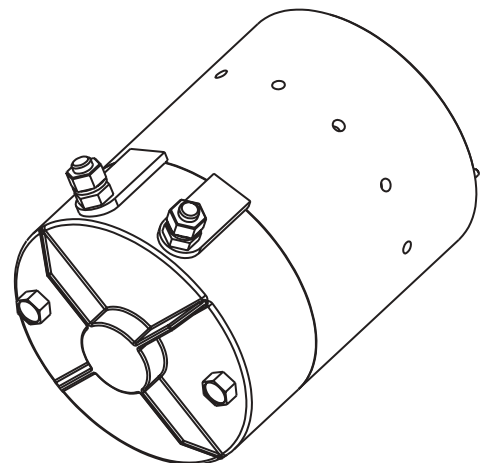
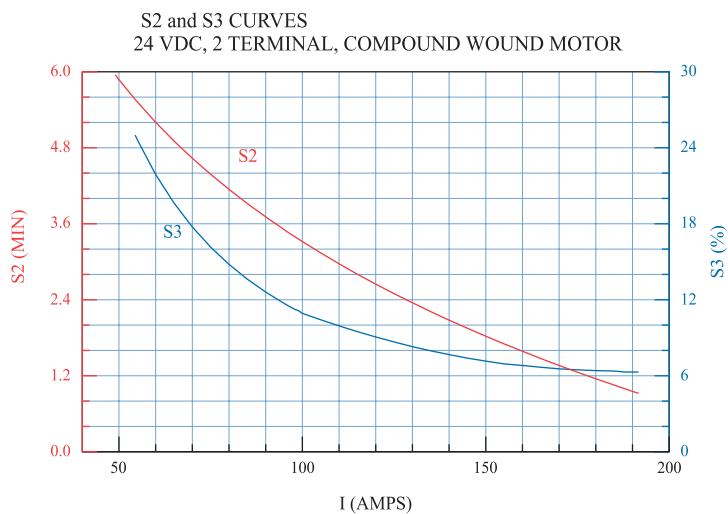
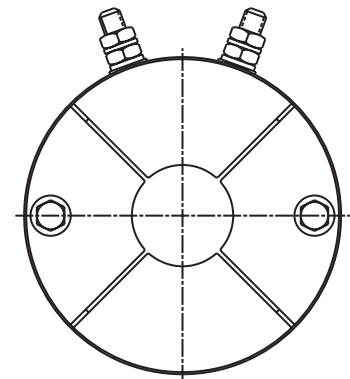
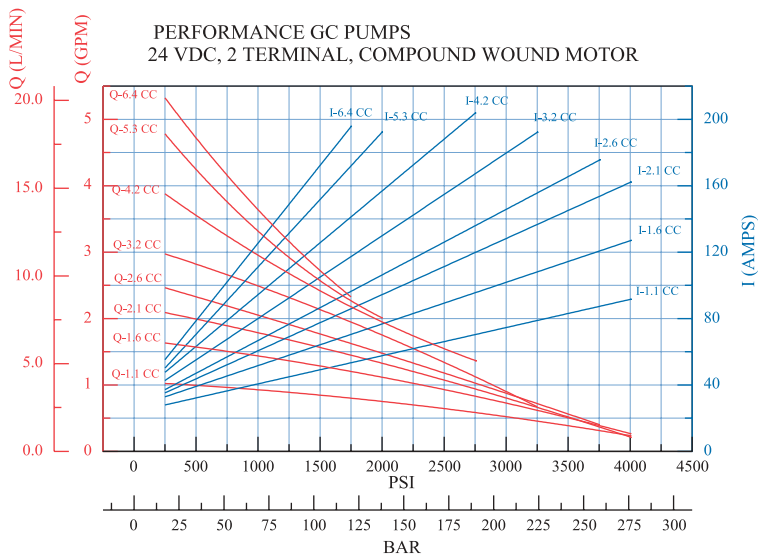
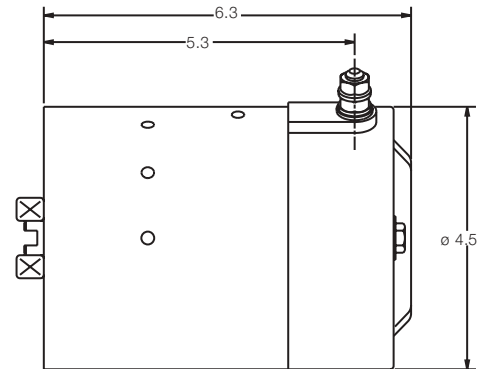
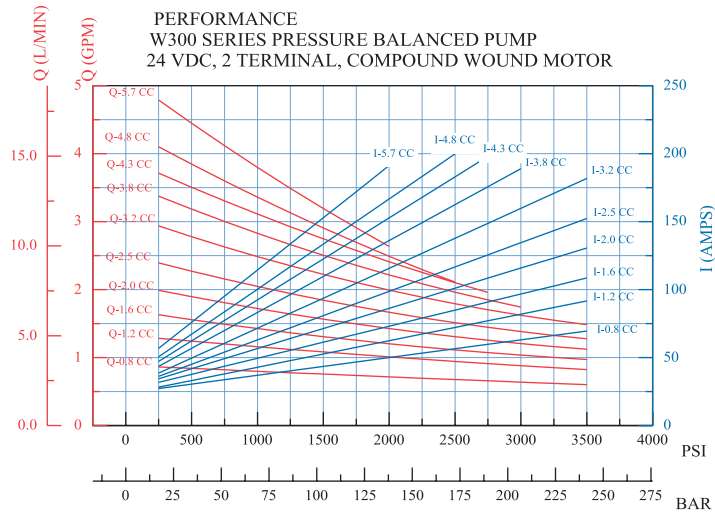


S2 and S3 CURVES
24 VDC SERIES WOUND MOTOR



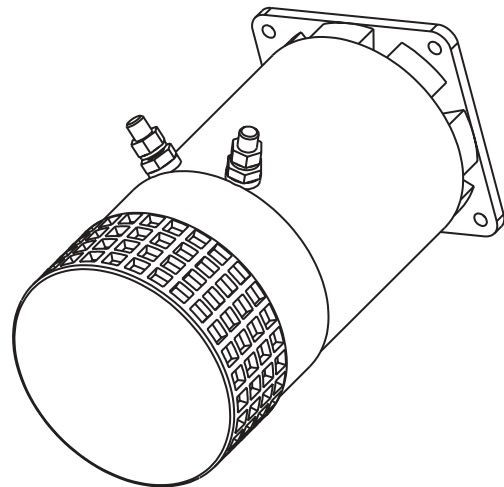
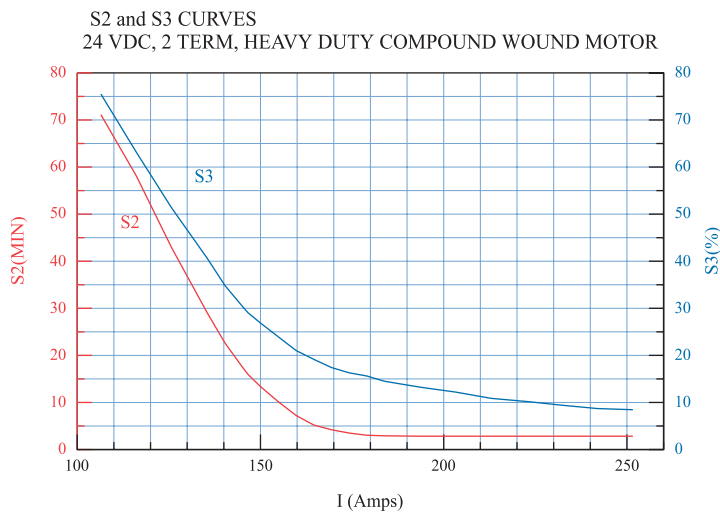
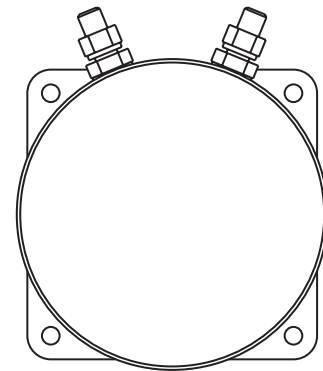
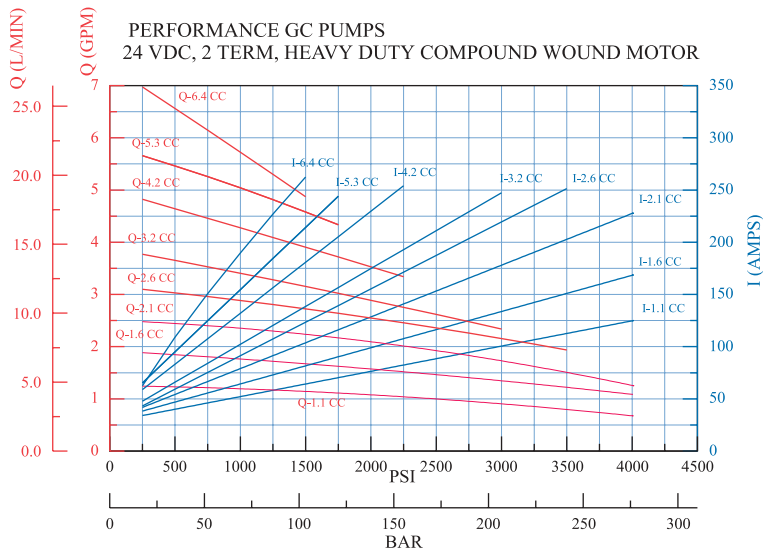
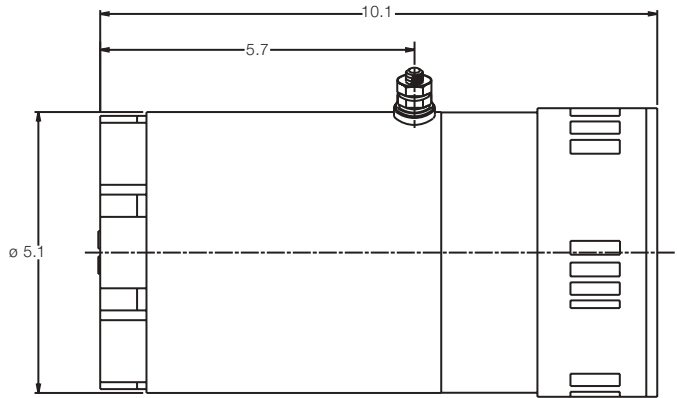
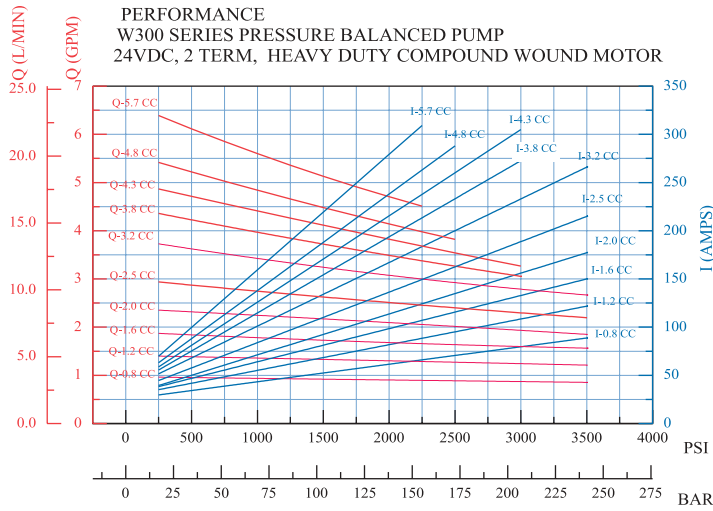
Note: Motor damage may result from operation outside the curve parameters as shown above.

Performance for HE 2000 24 VDC Double Terminal Low Speed Compound Wound Motor, P/N 1300913



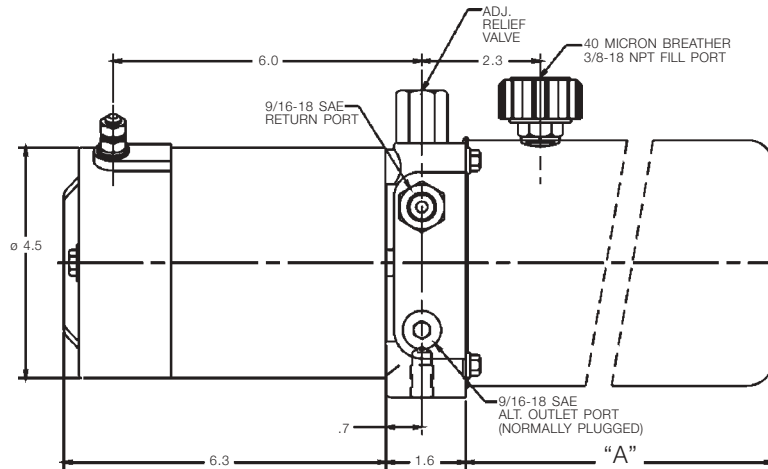
Note: Motor damage may result from operation outside the curve parameters as shown above.

Performance for HE 2000 24 VDC Double Terminal Heavy Duty Compound Wound Motor, P/N 1303551



HE 2000 DC Power Pack Dimensions

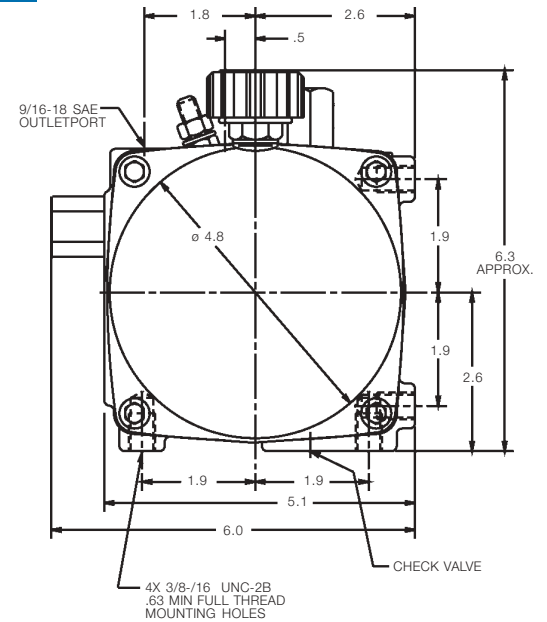
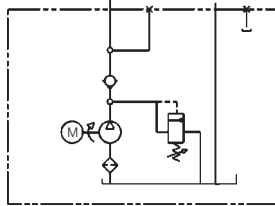
Power Pack with 4.8 Inch Cylindrical Reservoir



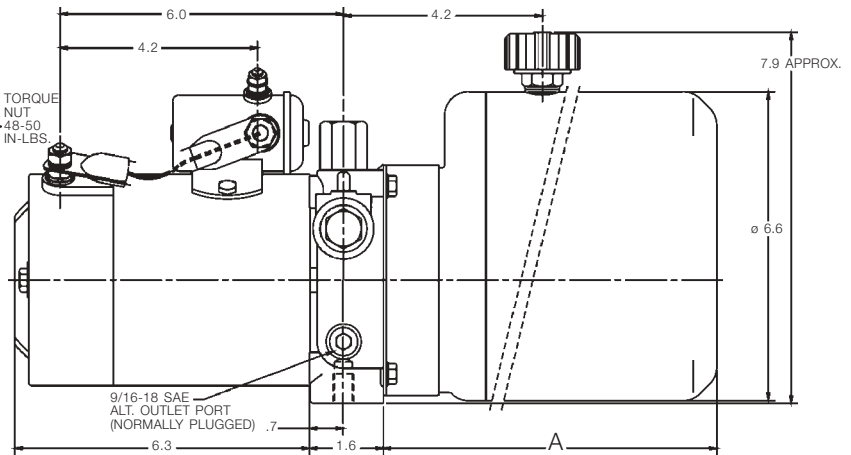
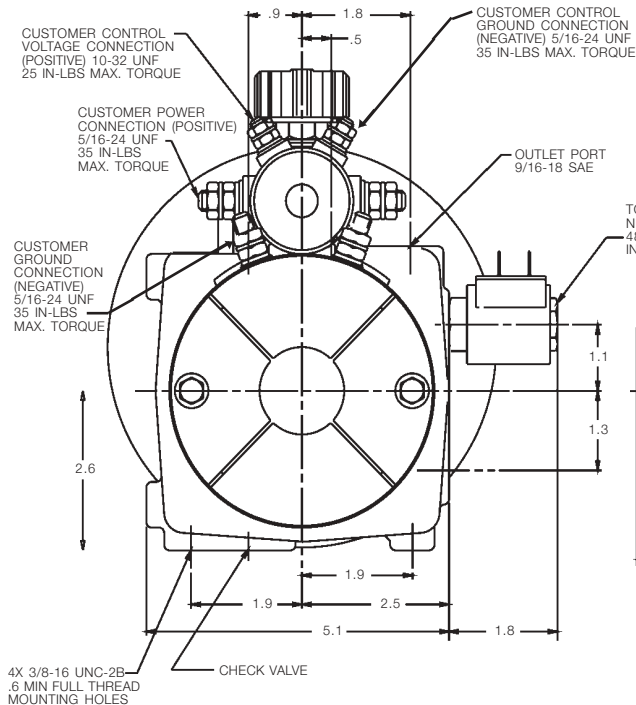
CAPACITY / TYPE	"A" (INCHES)
1.0 QT. CYLINDRICAL	5.6
1.5 QT. CYLINDRICAL	7.5
2.0 QT. CYLINDRICAL	9.0
3.0 QT. CYLINDRICAL	12.0

INSTALLATION NOTES: Motors, center adapters and reservoirs may be rotated in many combinations of 90 degree increments for maximum flexibility.

See Model Code XI for Tube Options - page 39.



Power Pack with 6.6 Inch Single Piece Cylindrical Reservoir

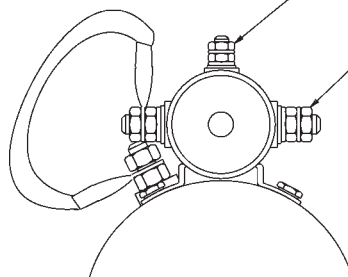


CAPACITY	"A"
1.0 GAL. (3.9 L.)	8.34 IN. (212 MM)
1.5 GAL. (5.7 L.)	12.6 IN. (320 MM)
2.0 GAL. (7.6 L.)	15.3 IN. (390 MM)
3.0 GAL. (11.3 L.)	22.3 IN. (566 MM)

See Model Code XI for Tube Options - page 39.

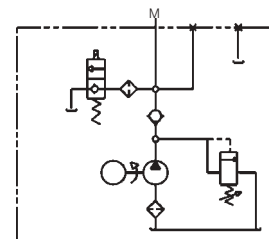
NOTE:

FOR SINGLE TERMINAL MOTORS, GROUNDING OCCURS WHEN THE UNIT IS BOLTED TO THE VEHICLE.



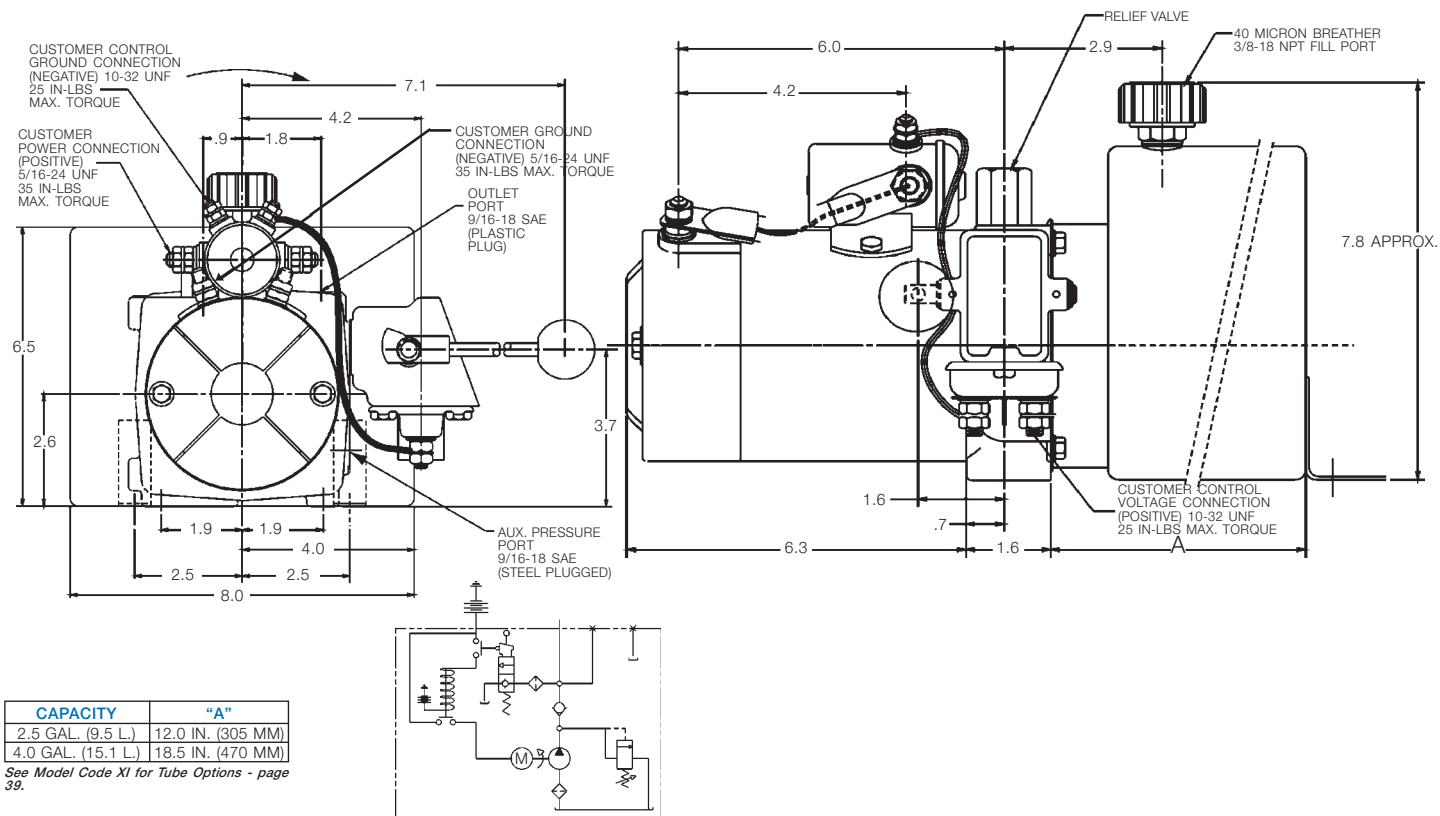
CUSTOMERS CONTROL VOLTAGE CONNECTION (POSITIVE) #10-32 UNF 25 IN-LBS MAX. TORQUE

CUSTOMERS POWER CONNECTION (POSITIVE) 5/16-24 UNF 35 IN-LBS MAX. TORQUE



HE 2000 DC Power Pack Dimensions (continued)

Power Pack with Rectangular Reservoir



HE 2000 Pump and AC Motor Selection / Combinations

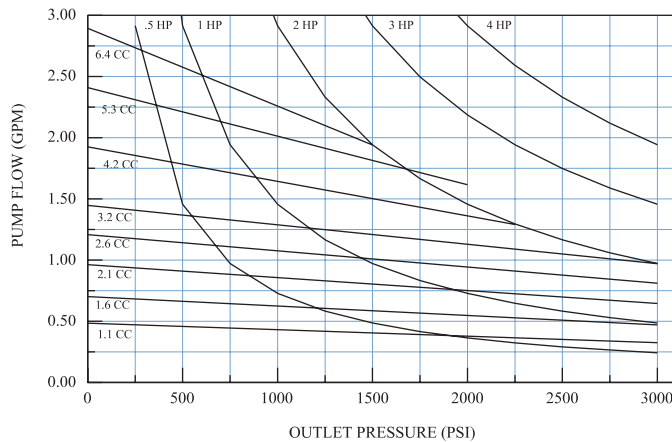
The following charts and curves provide all the information required to specify a pump and AC motor for the HE 2000. The nominal rated horsepower for TENV motors is based on a 30 minute duty cycle. The nominal rated horsepower for TEFC motors is based on continuous duty. For 50 Hz operation, pump flow and horsepower shown below need to be derated by approximately 20%.

Model Code	Catalog P/N	HP	Phase	Hz	Voltage	Encl.	RPM	60 Hertz Ratings										Dimensions		
								HP 5 min. Rated	HP 15 min. Rated	HP 30 min. Rated	Line Voltage	Low Voltage	Max. cc/rev. Starting at 2500 psi Low Voltage	Pullup Torque at Line Voltage Ft.-lbs.	Breakdown Torque at Line Voltage Ft.-lbs.	5 Min. Duty HP Nominal Amp Draw				
								L	H	K										
60	1300916	.5	three	50/60	208-230/460	TENV	1425/1725	1	0.75	0.5	230	188	1.6	6.2	9.0	3.5 A @ 230 V	5.8	6.8	4.0	
62	1300918	1	three	50/60	208-230/460	TENV	2850/3450	2.5	1.8	1	230	188	1.6	6.4	6.7	8.4 A @ 230 V	5.8	6.8	4.0	
63	1300919	1	three	50/60	208-230/460	TEFC*	2850/3450	2.5	1.8	1	230	188	1.6	6.4	6.7	8.4 A @ 230 V	7.5	7.3	4.0	
64	1300920	1	single	60	115/208-230	TENV	3450	2.5	1.8	1	115	99	1.6	5.7	6.9	28.6 A @ 115V	7.8	8.8	4.3	
65	1300921	1	single	50/60	115/208-230	TEFC*	2850/3450	2.5	1.8	1	115	99	1.6	5.1	6.0	28.6 A @ 115V	9.5	8.8	4.3	
66	1300922	1	three	50/60	208-230/460	TENV	1425/1725	3	2	1	230	188	3.2	12.3	17.1	8.4 A @ 230 V	6.8	6.8	5.0	
67	1300923	1	single	60	115/208-230	TENV	1725	2	1.5	1	115	99	3.2	9.1	10.8	8.5 A @ 230 V	9.3	9.0	5.8	
68	1300924	2	single	60	115/208-230	TENV	3450	4	3	2	115	99	2.1	7.4	7.7	27 A @115 V	9.8	8.8	6.2	
69	1300925	2	single	50/60	115/208-230	TEFC*	2850/3450	3	2.5	2	115	99	2.1	5.4	8.0	30.2 A @ 115V	11.0	8.8	5.8	
70	1300926	2	three	50/60	208-230/460	TENV	1425/1725	4	3.5	2	230	188	6.4	24.0	26.5	5.7 A @ 230V	8.8	6.8	5.3	
71	1300927	2	single	60	115/208-230	TENV	1725	3	2.5	2	115	99	4.8	17	19	35 A @ 115 V	9.8	8.6	6.3	
72	1300928	3	three	50/60	208-230/460	TENV	2850/3450	4.9	3.8	3	230	188	3.2	12.6	14.6	13.7 A @ 230 V	6.8	6.8	3.3	
73	1300929	3	three	50/60	208-230/460	TEFC*	2850/3450	4.9	3.8	3	230	188	3.2	12.6	14.6	13.7 A @ 230 V	9.5	6.8	4.3	
74	1300930	2.5	single	50/60	208-230	TENV	2850/3450	3.5	3	2.5	230	188	3.7	9.3	10.7	20.1 A @ 230 V	9.8	9.1	6.2	

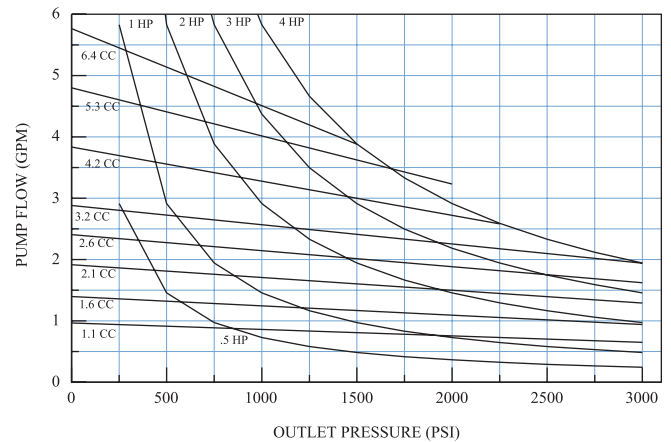
* NOTE: For TEFC motors the 30 minute rated horsepower is a continuous rating.

The curves below demonstrate the relationship between flow and pressure to determine horsepower required. Once horsepower required is determined, refer to the above chart to determine the appropriate motor for the required duty cycle.

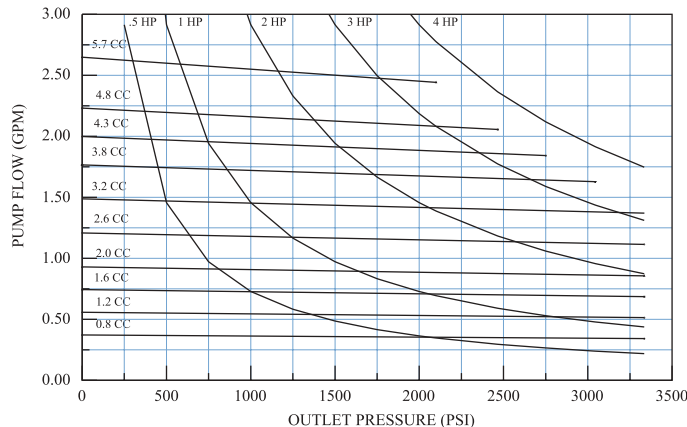
PERFORMANCE - GC SERIES PUMPS
1725 RPM - 60 Hz - 200 SUS FLUID



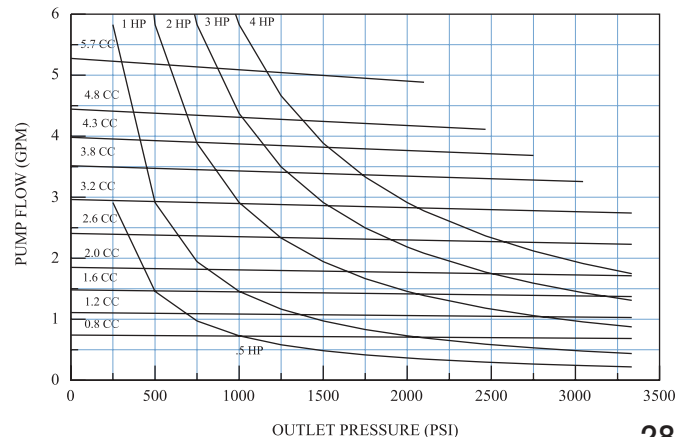
PERFORMANCE - GC SERIES PUMPS
3450 RPM - 60 Hz - 200 SUS FLUID



PERFORMANCE - W300 SERIES PUMPS
1725 RPM - 60 Hz - 200 SUS FLUID

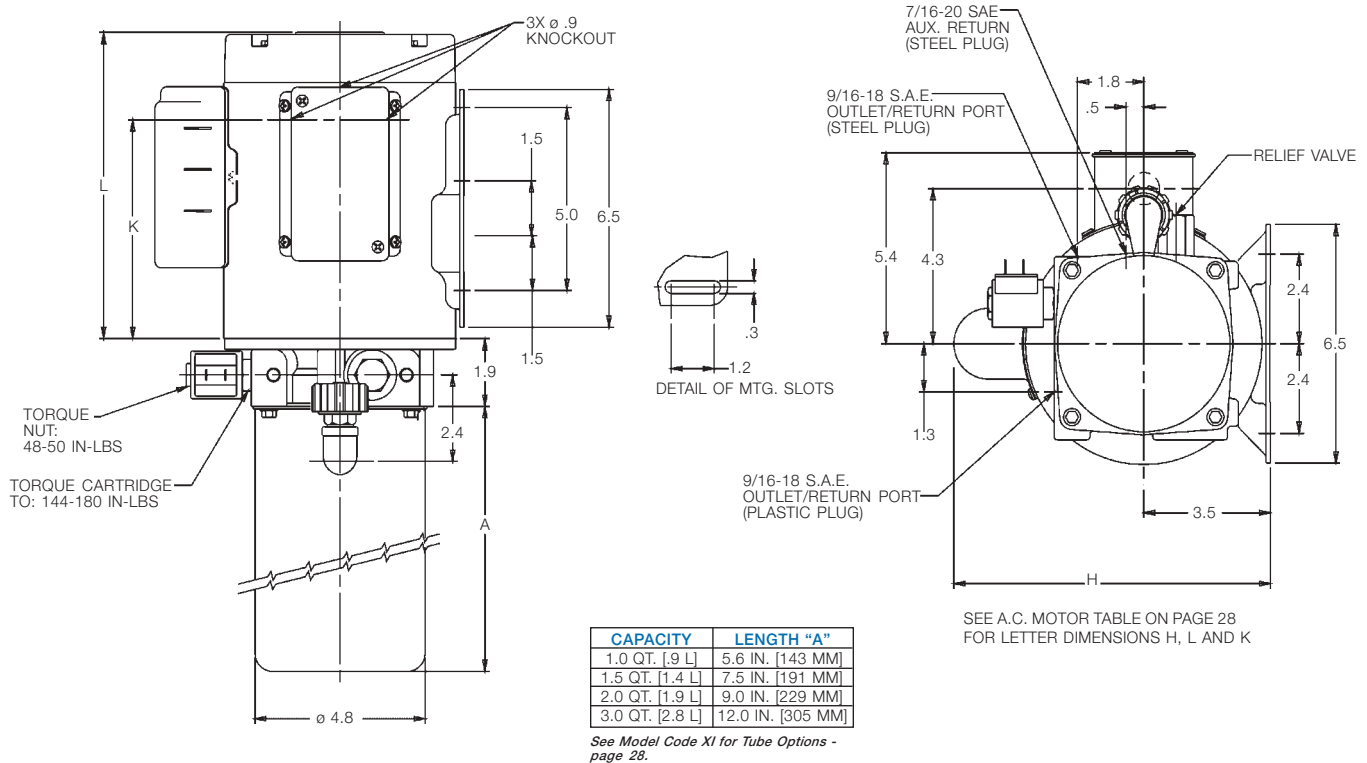


PERFORMANCE - W300 SERIES PUMPS
3450 RPM - 60 Hz - 200 SUS FLUID

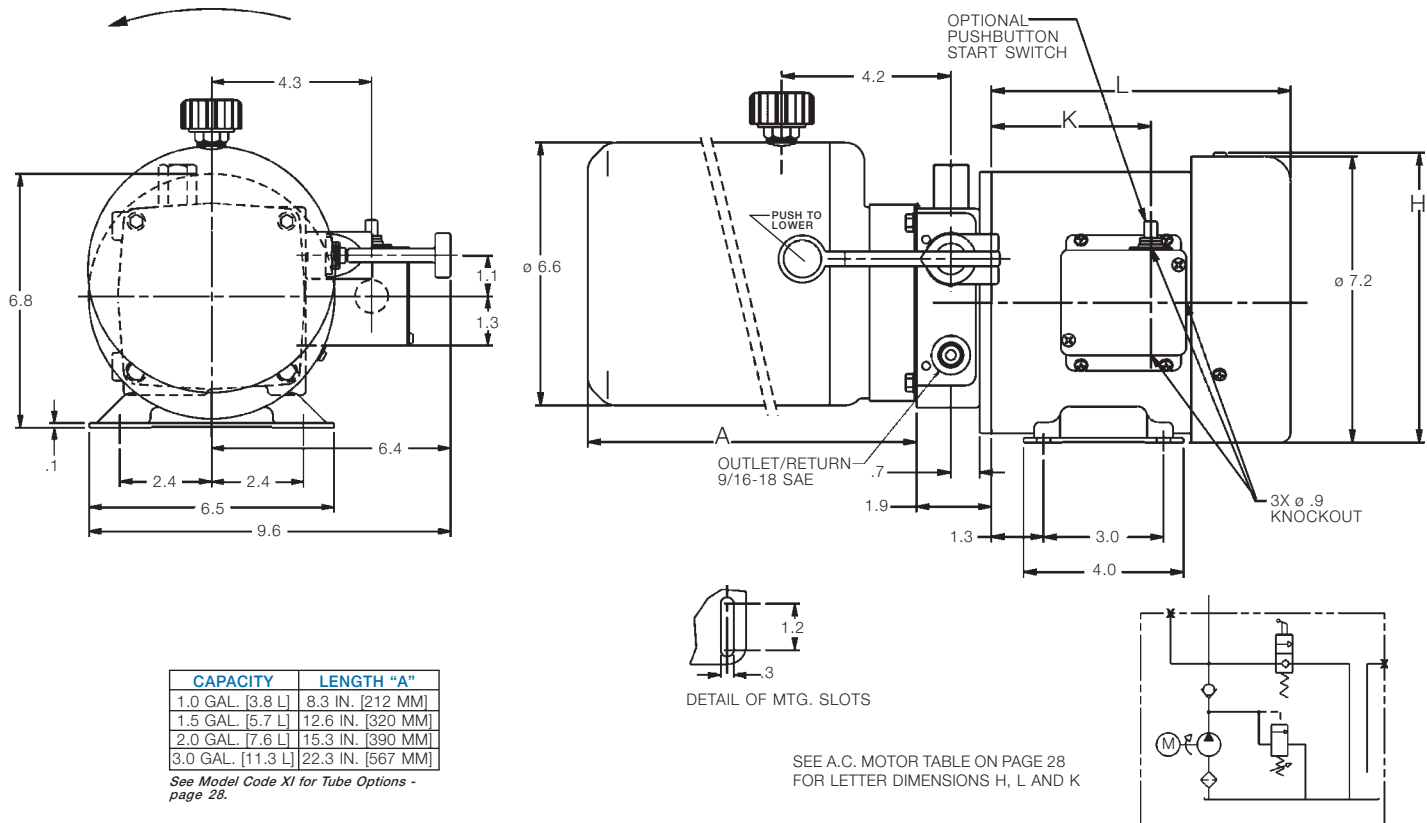


HE 2000 AC Power Pack Dimensions

Power Pack with 4.8 Inch Cylindrical Reservoir

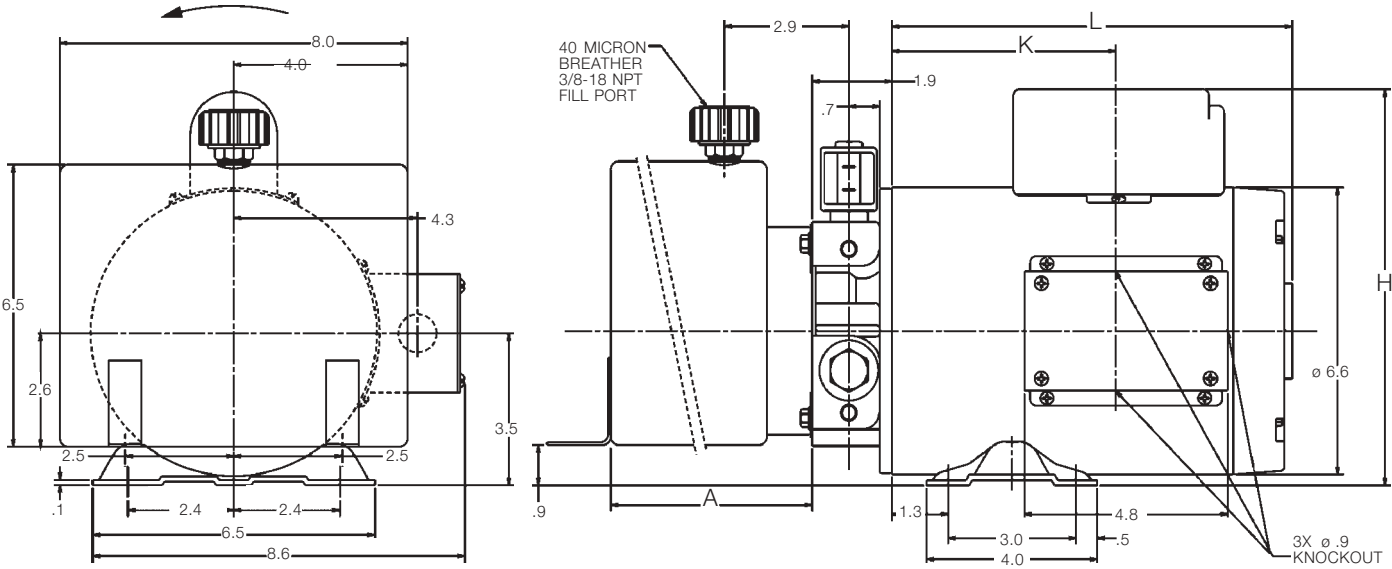


Power Pack with 6.6 Inch Single Piece Cylindrical Reservoir



HE 2000 AC Power Pack Dimensions (continued)

Power Pack with Rectangular Reservoir



CAPACITY	LENGTH "A"
2.5 GAL. [9.5 L]	12 IN. [305 MM]
4.0 GAL. [15.1 L]	18.5 IN. [470 MM]

See Model Code XI for Tube Options - page 28.

SEE A.C. MOTOR TABLE ON PAGE 28 FOR LETTER DIMENSIONS H, L AND K

DETAIL OF MTG. SLOT

HE 1000 Technical Information

	Symbols	SI-units	Equations	Common units	Equations
Flow	Q	m ³ /s	$Q = v \times A$	l/min	$Q = 0,06 \times v \times A$
Operating pressure	p	Pa	$p = \frac{F}{A}$	bar	$p = \frac{F}{0,1 \times A}$
Internal diameter, hydraulic cylinder	d	m		mm	
Area of hydraulic cylinder	A	m ²	$A = \frac{\pi \times d^2}{4}$	mm ²	$A = \frac{\pi \times d^2}{4}$
Piston force	F	N		N	
Piston speed	v	m/s		m/s	
Power requirement for AC motor	Pe	kW	$Pe = p \times Q$	kW	$Pe = \frac{p \times Q}{611}$

Max pressure p₁ 230 bar
Intermittent p₂ 255 bar

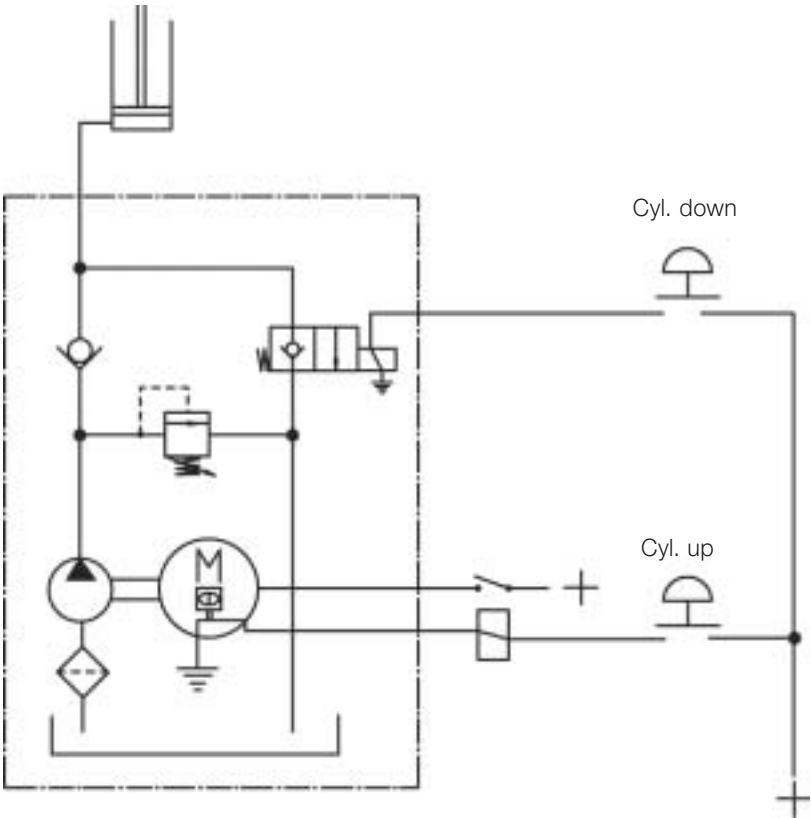
Allowable fluids HL or HLP hydraulic oils according to DIN 51524.
Biogradable fluids eg. Statoil Bio Pa.
Before using other types of fluids, contact factory.

Recomended viscosity 40-16mm²/s.
Permissible cold start viscosity is 2000mm²/s.
Contact factory before using fluids outside this range.

Temperature min -25°C, max +80°C.

Fluid cleanliness We recommend a cleanliness according to IS4406/1986 Code 18/14 or better to achieve optimal performance and lifetime.

When operating outside these limits, see recommendations in "Allowable fluids".



HE 2000 Installation / Technical Information

FLUIDS

Most premium grade petroleum based fluids can be used. Optimum operating viscosity range is 16 - 63 cSt (80 - 288 SSU).

Minimum recommended viscosity is 12 cSt (66 SSU).

Maximum recommended viscosity is 800 cSt (3600 SSU).

Permissible cold start viscosity is 2000 cSt (9000 SSU). Contact factory before using fluids outside this range.

TEMPERATURES

Minimum recommended temperature is -25°C (-13°F).

Maximum recommended temperature is +80°C (+175°F).

FLUID CLEANLINESS

We recommend a cleanliness according to IS4406/1986 Code 18/14 or better to achieve optimal performance and lifetime.

When operating outside these limits, see recommendations in "FLUIDS".

Technical Information, Formulas and Symbols

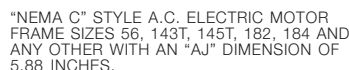
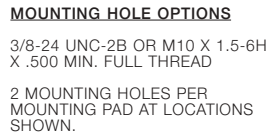
Description	Symbols	English		Metric	
		Units	Equations	Units	Equations
Flow	Q	gal/min	$Q = v \times A$	l/min	$Q = 0.06 \times v \times A$
Operating Pressure	p	psi	$p = \frac{F}{A}$	bar	$p = \frac{F}{0.1 \times A}$
Internal diameter, hydraulic cylinder	d	in		mm	
Area of hydraulic cylinder	A	in ²	$A = \frac{\pi \times d^2}{4}$	mm ²	$A = \frac{\pi \times d^2}{4}$
Piston force	F	LB	$F = p \times A$	N	$F = p \times A \times 0.1$
Piston speed	v	in/s	$v = \frac{Q}{A}$	m/s	$v = \frac{Q \times 16.67}{A}$

Supplemental Bolt Kits for Stock

Description	Kit #
Bolt Kit (AC Riser block + D03)	1300857
Bolt Kit (AC Riser block + 2 - D03's)	1300858
Bolt Kit (AC Riser block + Manifold +D03) or (AC Riser block + 2 Manifolds) or (3 Manifolds) or (2 Manifolds + D03)	1300859
Bolt Kit (Manifold)	1300860
Bolt Kit (2 D03's)	1300861
Bolt Kit (3 D03's)	1300862
Bolt Kit (AC Riser block + Manifold) or (2 Manifolds) or (Manifold + D03)	1300863
Bolt Kit (Manifold + 2 D03's)	1300864
Bolt Kit (D03)	1300865

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 flexible coupling and 4-hole flange adapter with a 1.780" pilot hole and NEMA C face on the other end.

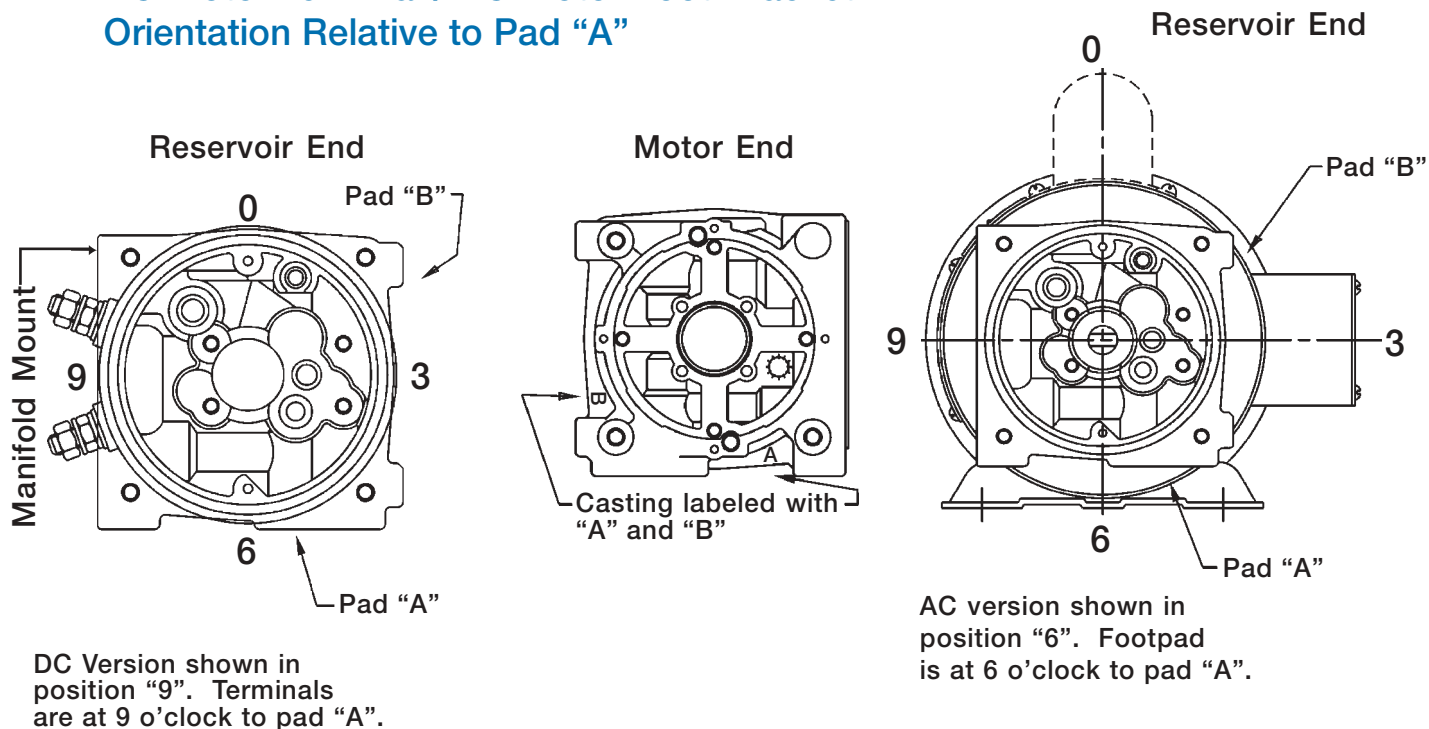
Maximum OHL at center of shaft extension	150 lbs.
Maximum inward thrust	75 lbs.
Maximum outward thrust	50 lbs.
Maximum speed	5000 RPM
Maximum input horsepower	3 HP



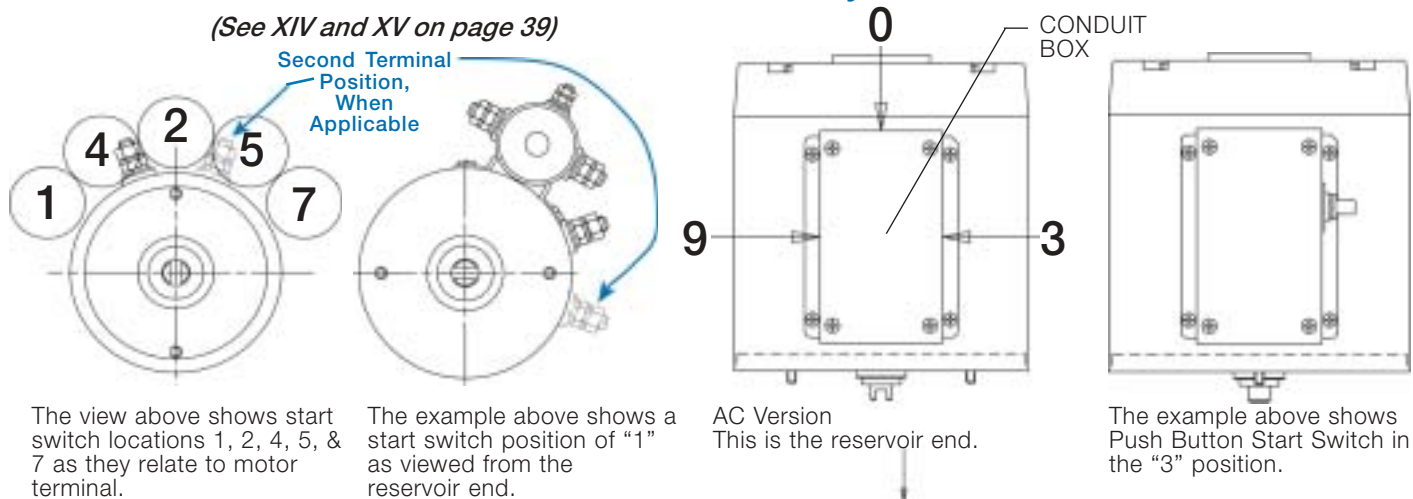
NOTE: Contact factory for continuous pressures less than 250 PSI.

HE 2000 Orientation Page

VIII: DC Motor Terminal / AC Motor Foot Bracket Orientation Relative to Pad "A"



X: DC - Start Switch Orientation Relative to Terminals AC - Push Button Start Switch or Accessory Location on Conduit Box



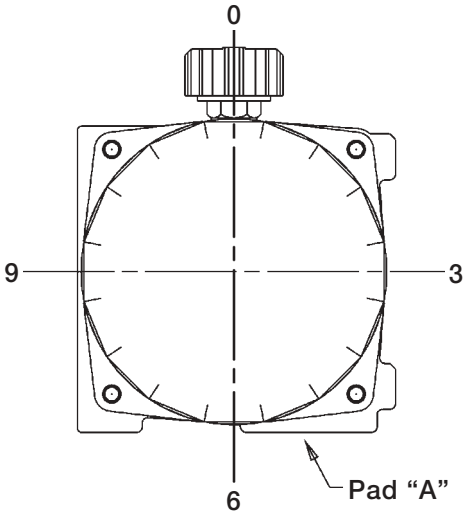
NOTE: When a manifold is added to the adapter, start switch location is critical in reference to the motor terminals. The chart shown below shows the "approved" locations. Interference will occur in any other position.

Motor Terminal Location	Start Switch Approved Location
3	1, 4, 2, 5, 7
6	1, 4, 2
9	None
12	2, 4, 7

DC - Location relative to pad "A" viewing from reservoir end		AC - Location relative to reservoir end	
Model Code	DC Version	Model Code	AC Version
1	= 10 O'Clock (motor terminals)	0	= 12 o'clock w/reservoir end down
4	= 11 O'Clock (motor terminals)	3	= 3 o'clock w/reservoir end down
2	= 12 O'Clock (motor terminals)	9	= 9 o'clock w/reservoir end down
5	= 1 O'Clock (motor terminals)		
7	= 2 O'Clock (motor terminals)		
A = no switch or push button			

Orientation Page (cont.)

XII: Breather Orientation Relative to Pad “A” (Reservoir End View)



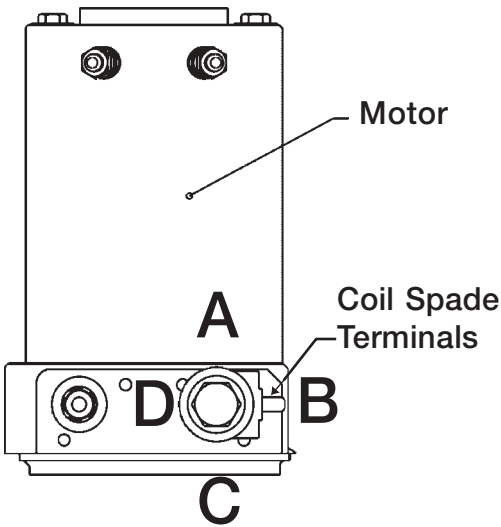
Model Code

0	= 12 o'clock
3	= 3 o'clock
6	= 6 o'clock
9	= 9 o'clock

Shown:
0 = 12 o'clock
to pad “A”

XIII: Coil Termination (Spade Terminal or Wire Leads) Relative to Motor for Solenoid Acting Release Valves

Note: The “Model Code” chart shown below applies to both “Coil Termination” and “Lever Orientation”. Either “Coil Termination” or “Lever Orientation” must be selected for Option XIII, not both.



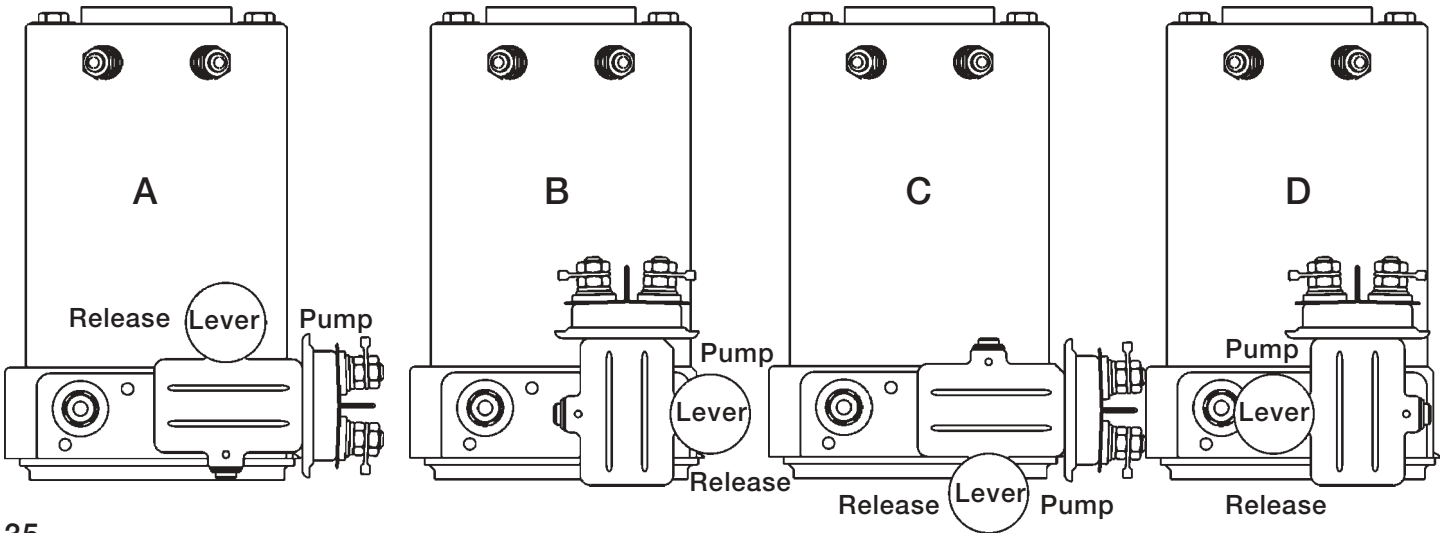
Model Code

A	= 12 o'clock = Toward Motor
B	= 3 o'clock = Away from Center
C	= 6 o'clock = Toward Reservoir
D	= 9 o'clock = Toward Center
N	= None

The example above shows the coil spade terminal at the “B” position.

XIII: Lever Orientation Relative to Motor for Manual Release Valves

Location relative
to motor viewing
from top of coil or
top of manual
release switch box



Only Haldex offers this extensive range of pumps, hydraulic motors, power packs 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).

D Series Hydraulic Pumps

Compact, external gear pumps for use in pumping fluids with lubricating qualities. Suitable for use in a wide variety of applications, including agricultural, construction, transmission charge and lube, and diesel fuel transfer. Displacements from .232 cu. in. to 1.395 cu. in. (3.8 - 22.9 cc) per revolution. Pressures to 3,000 psi (207 bar).

H Series Hydraulic Pumps

Cast iron, external gear pumps for use in pumping fluids with lubricating qualities. Designed to provide reliable, long-life service under rugged conditions. Suitable for use in a wide variety of applications, including agricultural, construction, transmission charge and lube, and diesel fuel transfer. Displacements from 0.60 cu. in. to 2.40 cu. in. (9.8 - 39.4 cc) per revolution. Pressures to 3,000 psi (207 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 .183 to 3.05 cu. in. (3 to 50 cc) per revolution. Other features include SAE, ISO and DIN shafts, flanges and ports; integrated valves and multiple pump configurations.

G20-LS/G-30LS 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 1.41 to 9.82 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 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 to 9.82 cu. in. (23 to 161 cc).
- G20 / G30 two section flow dividers. Displacements from 1.41 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 2,000 psi (136 Bar).

GC-9500 AC Hydraulic Power Units

AC power units offering the ultimate in design versatility and ordering flexibility. It can be ordered completely assembled or in kits. Standard options include: motors (1/2-5 hp, TEFC, open, and drip-proof); 4 reservoirs (5, 10, 15 and 20 gal.); and pumps (pressure balanced and high/low with flows to 28 gpm and pressures to 3500 psi).

HE 1000 & HE 2000 AC & DC Hydraulic Power Packs

Self-contained modular power systems in fully assembled or kit form; wide range of standard or high efficiency pumps, motors, switches, mounts, valves, and reservoirs. Custom options also available. Pressures to 4,000 psi (276 Bar). Flows from 0.20 to 7.0 GPM.

Hydraulic Motors

Available in the GC, W and G20 Series in unidirectional and birotational configurations. Motors available with modular valve, bearing, seal and shaft options for maximum flexibility. Displacements from 0.065 to 5.30 cu. in. (1.06 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). Flows from 5 to 28 GPM.

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 0.065 to 0.813 cu. in. (1.0 to 13.32 cc) per revolution. Pressures to 4,500 psi (306 Bar).

Call us for more information

For application assistance or detailed literature on any Haldex product line, call us toll-free: **1-800-572-7867**. Visit our web site: <http://www.hbus.haldex.com>
E-mail us: sales.usro@haldex.com



HE 1000 Power Packs Order Code

To order a complete power pack, simply work through the options below, creating a model number as shown in the example. All location positions are viewed from the reservoir end.

Example of Order Code Structure: HE1-NE024-05-150-C-15-AD-0-C-2-AA-0-A-00-00

Code HE 1	HE 1000 Adaptor Size HE 1000 adaptor	
NA000	HE 1000 Coil Voltage+ Valve Type Adaptor Kit for P & T Ports or Block Mounted Valves	HE 1000 Kit No. 1303653
NE012 Or NE024 And	Valve Kit (12VDC Lift-Hold-Lower Solenoid Release Valve) Valve Kit (24VDC Lift-Hold-Lower Solenoid Release Valve) Adaptor Kit (Lift-Hold-Lower Circuit)	1300023 1300024 1303654
NL012 Or NL024 And	2-Position, 4-Way Valve Kit w/12VDC Coil 2-Position, 4-Way Valve Kit w/24VDC Coil Adaptor Kit (2-Position, 4-Way Valve)	1303655 1303656 1303657
NO012 Or NO024 And	Valve Kit (12VDC Lift-Hold-Lower Solenoid Release Valve w/Manual Override) Valve Kit (24VDC Lift-Hold-Lower Solenoid Release Valve w/Manual Override) Adaptor Kit (Lift-Hold-Lower Circuit)	1300783 1300784 1303654
Code 02 05 08 12 15 17 20	HE 1000 Pump 0.015 in ³ (0.24 cm ³) 0.029 in ³ (0.48 cm ³) 0.051 in ³ (0.84 cm ³) 0.074 in ³ (1.22 cm ³) 0.100 in ³ (1.50 cm ³) 0.900 in ³ (1.75 cm ³) 0.122 in ³ (2.00 cm ³)	HE 1000 Kit No. 1303431 1303432 1303433 1303434 1303580 1303581 1303582
Code ***	HE 1000 Relief Valve Setting 50-250 bar, eg 150 bar	HE 1000 Kit No. 1303525
Code A C D E F	HE 1000 Flow Control Valve None .53 gpm (2 l/min) .79 gpm (3 l/min) 1.0 gpm (4 l/min) 1.3 gpm (5 l/min)	HE 1000 Kit No. 1303446 1303447 1303448 1303449
Code 10 15 82 84 80	HE 1000 Motor 12 VDC, 2 Terminal, 3" Motor (80 mm) 24 VDC, 2 Terminal, 3" Motor (80 mm) 12 VDC, 2 Terminal, 4.5" Motor (112 mm)† 24 VDC, 2 Terminal, 4.5" Motor (112 mm)† 12 VDC, 1 Terminal, 4.5" Motor (112 mm)†	HE 1000 Kit No. 1303454 1303456 1300618 1300619 1300027
†	Requires Motor Mounting Kit (Skanes #40599-00)	1303658

Code AA AB AC AD AE AF AG AH AJ AK AL AM	HE 1000 Reservoir .13 gal. (0.5 l) usable, horizontal, plastic .13 gal. (0.5 l) usable, vertical, plastic .26 gal. (1.0 l) usable, horizontal, plastic .26 gal. (1.0 l) usable, vertical, plastic .40 gal. (1.5 l) usable, horizontal, plastic .40 gal. (1.5 l) usable, vertical, plastic .53 gal. (2.0 l) usable, horizontal, plastic .53 gal. (2.0 l) usable, vertical, plastic .66 gal. (2.5 l) usable, horizontal, plastic .66 gal. (2.5 l) usable, vertical, plastic 1.0 gal. (4.0 l) usable, horizontal, plastic 1.0 gal. (4.0 l) usable, vertical, plastic	HE 1000 Kit No. 1303484 1303485 1303486 1303487 1303488 1303489 1303490 1303491 1303492 1303493 1303494 1303495
Code 0 3 6 9	HE 1000 Motor Terminal Position Terminals at 12 o'clock to pad "A" Terminals at 3 o'clock to pad "A" Terminals at 6 o'clock to pad "A" Terminals at 9 o'clock to pad "A"	
Code A B C D	HE 1000 Start Switch None 12V, 4 Pole (2 Terminal Motors) 24V, 4 Pole (2 Terminal Motors) 12V, 3 Pole (1 Terminal Motor)	HE 1000 Kit No. 1300937 1300938 1300939
Code 2 1 4 5 7	HE 1000 Start Switch Position 12 o'clock to motor terminals 10 o'clock to motor terminals 11 o'clock to motor terminals 1 o'clock to motor terminals 2 o'clock to motor terminals	
Code AA	HE 1000 Tube Kit Tube kit included in reservoir kit	
Code 0 1 3 4 6 7 9 5	HE 1000 Breather Position 12 o'clock to pad "A" 1:30 to pad "A" 3 o'clock to pad "A" 4:30 to pad "A" 6 o'clock to pad "A" 7:30 to pad "A" 9 o'clock to pad "A" 10:30 to pad "A"	
Code A B C D	HE 1000 Coil Terminals Position on Solenoid Valve (as viewed from side) 12 o'clock (towards motor) 3 o'clock (towards reservoir) 6 o'clock (towards pad "A") 9 o'clock (away from pad "A")	
Code 00 26	HE 1000 Accessory 1 No accessories Single Acting Pendant	HE 1000 Kit No. 1303569
Code 00 10	HE 1000 Accessory 2 No accessories Boots	HE 1000 Kit No. 1303554

HE 2000 Power Packs Order Code

To order a complete power pack, simply work through the options below, creating a model number as shown in the example.

STANDARD POWER PACK																
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI
	ADAPTER SIZE	ADAPTOR OPTIONS	PUMP TYPE/SIZE	RELIEF VALVE SETTING	FLOW CONTROL VALVE	MOTOR	RESERVOIR	MOTOR POSITION	START SWITCH	START SWITCH POSITION	TUBE KIT	BREATHER POSITION	COIL / LEVER POSITION	ACCESSORY	ACCESSORY	DESIGN SERIES
EXAMPLE	HE2	BH012	26	150	E	82	AF	6	H	2	KC	0	N	00	00	A3
Your Options	HE2				*** DO NOT LEAVE ANY BLANK FIELDS ***											A3

THE HE 2000 POWER PACK EXAMPLE SHOWN ABOVE consists of a 3-position / 4-way valve, dual pilot-operated check valves, a 2.6 cc/rev. pressure-balanced pump, a 12 volt two terminal DC motor with start switch, and a 1.3 quart plastic reservoir. The relief valve has been set at 150 BAR (2175 PSI) and the power pack has a 1 gallon per minute (GPM) / 4 liter per minute (LPM) flow control valve incorporated into the return line circuit. The power pack is intended to be mounted in a vertical position with the motor terminals and breather cap opposite to PAD A.

I. ADAPTER SIZE

HE2 = HE 2000

Pick a valve type and corresponding coil voltage, if applicable.

VALVE TYPE		KIT #		+ COIL VOLTAGE		KIT #
BA	Adapter, P & T Ports, Relief Valve & Check Valve	Adapter	1303649	BA000		
		Port Plug	1300191			
CA	Adapter, P & T Ports, Relief Valve & Check Valve	Adapter	1303649	CA000		
		Port Plug	1300191			
		AC Motor Adapter	1303549			
BB	Solenoid Lowering Adapter	Adapter	1303649	BB012*	12 Volt DC	1300914
		Solenoid Release Valve	1303534	BB024*	24 Volt DC	1300915
CB	Solenoid Lowering Adapter	Adapter	1303649	CB115*	115 Volt AC	1303576
		Solenoid Release Valve	1303534	CB230*	230 Volt AC	1303577
		AC Motor Adapter	1303549	CB012*	12 Volt DC	1300914
				CB024*	24 Volt DC	1300915
BE	Manual Lowering Adapter w/DC Contactor	Adapter	1303649	BE000		
		Manual Release Valve w/Pilot Contactor	1300192			
CE	AC Manual Lowering Valve Adapter	Adapter	1303649	CE000		
		Manual Release Valve	1303533			
		AC Motor Adapter	1303549			
Motor Spool (DC Version, AC Version and DC Version w/Double P.O. Check)						
BF	Manifold Adapter w/3-Pos. 4-Way Valve (Motor Spool) DC Version	Adapter	1303650	BF012+	12 Volt DC	1300914
		Manifold	1300866	BF024+	24 Volt DC	1300915
		Motor Spool Valve	1303382			
		Cavity Plug	1303540			
BH	Manifold Adapter w/3-Pos. 4-Way Valve (Motor Spool) DC Version w/Double P.O.	Adapter	1303650	BH012+	12 Volt DC	1300914
		Manifold	1300866	BH024+	24 Volt DC	1300915
		Motor Spool Valve	1303382			
		Double P.O. Check	1303538			
CF	Manifold Adapter w/3-Pos. 4-Way Valve (Motor Spool) AC Version	Adapter	1303650	CF115+	115 Volt AC	1303576
		Manifold	1300866	CF230+	230 Volt AC	1303577
		Motor Spool Valve	1303382	CF012+	12 Volt DC	1300914
		Cavity Plug	1303540	CF024+	24 Volt DC	1300915
		Riser Block	1300855			
		AC Motor Adapter	1303549			
Tandem Center Spool (DC and AC Versions)						
BJ	Manifold Adapter w/3-Pos. 4-Way Valve (Tandem Center Spool) DC Version	Adapter	1303650	BJ012+	12 Volt DC	1300914
		Manifold	1300866	BJ024+	24 Volt DC	1300915
		Tandem Center Valve	1303530			
		Cavity Plug	1303540			
CJ	Manifold Adapter w/3-Pos. 4-Way Valve (Tandem Center Spool) AC Version	Adapter	1303650	CJ115+	115 Volt AC	1303576
		Manifold	1300866	CJ230+	230 Volt AC	1303577
		Tandem Center Valve	1303530	CJ012+	12 Volt DC	1300914
		Cavity Plug	1303540	CJ024+	24 Volt DC	1300915
		Riser Block	1300855			
		AC Motor Adapter	1303549			
Solenoid Operated, 2-Position, 4-Way Normally Open Valve (DC and AC Versions)						
BR	Manifold Adapter w/Sol. Operated, 2-Pos., 4-Way Valve DC Version	Adapter	1303650	BR012*	12 Volt DC	1300914
		Manifold	1300866	BR024*	24 Volt DC	1300915
		Normally Open Valve	1303529			
		Cavity Plug	1303540			
CR	Manifold Adapter w/Sol. Operated, 2-Pos., 4-Way Valve AC Version	Adapter	1303650	CR115*	115 Volt AC	1303576
		Manifold	1300866	CR230*	230 Volt AC	1303577
		Normally Open Valve	1303529	CR012*	12 Volt DC	1300914
		Cavity Plug	1303540	CR024*	24 Volt DC	1300915
		Riser Block	1300855			
		AC Motor Adapter	1303549			
BS	Manifold Adapter w/Sol. Operated, 2-Pos., 4-Way Valve DC Version w/P.O. Check	Adapter	1303650	BS012*	12 Volt DC	1300914
		Manifold	1300866	BS024*	24 Volt DC	1300915
		Normally Open Valve	1303529			
		Single P.O. Check	1303539			
Single D03 Valve Manifold (DC and AC Versions) / Double D03 Valve Manifold (AC Version Only)						
DA	Manifold Adapter w/ Single D03 Valve Manifold DC Version	Adapter	1303650	DA000		
		D03 Manifold	1300854			
		Bolts	1300865			
DB	Manifold Adapter w/ Single D03 Valve Manifold AC Version	Adapter	1303650	DB000		
		D03 Manifold	1300854			
		Bolts	1300857			
		Riser Block	1300855			
		AC Motor Adapter	1303549			
DC	Manifold Adapter w/ Double D03 Valve Manifold AC Version Only	Adapter	1303650	DC000		
		D03	1300854			
		Manifolds (2)	(2)			
		Bolts	1300858			
		Riser Block	1300855			
		AC Motor Adapter	1303549			
DM	Manifold Adapter (DC Version)	Adapter	1303650	DM000		
AM	Manifold Adapter (AC Version)	Adapter	1303650	AM000		
		AC Motor Adapter	1303549			

HE 2000 Power Packs Order Code (continued)

RESERVOIR		
		Kit #
AA	0.7 LTR (1 QT) STEEL	1300897
AB	1.2 LTR (1.5 QT) STEEL	1300898
AC	1.9 LTR (2 QT) STEEL	1300899
AD	2.9 LTR (3 QT) STEEL	1300900
AE	0.76 LTR (.8 QT) PLASTIC*	1300901
AF	1.2 LTR (1.3 QT) PLASTIC*	1300902
AG	1.6 LTR (1.7 QT) PLASTIC*	1300903
AJ	3.8 LTR (1 GAL) STEEL	1300904
AK	5.7 LTR (1.5 GAL) STEEL	1300905
AL	7.6 LTR (2 GAL) STEEL	1300906
AM	11.4 LTR (3 GAL) STEEL	1300907
AN	9.5 LTR (2.5 GAL) STEEL, RECTANGULAR	1300908
AP	15.2 LTR (4 GAL) STEEL, RECTANGULAR	1300909

* Maximum allowable fluid temperature for plastic reservoirs is 175°F (79°C).

MOTOR TERMINAL POSITION	
A	No Motor
0	12 O'Clock
3	3 O'Clock
6	6 O'Clock
9	9 O'Clock

NOTE: Location relative to Pad "A" as viewed from reservoir end.

START SWITCH		Kit #
A	None	N/A
H	12 VDC - UL RECOGNIZED, 4-POLE	1300937
J	24 VDC - UL RECOGNIZED, 4-POLE	1300938
K	12 VDC, 3-POLE	1300939
L	24 VDC, 3-POLE	1300940
M	12 V, HEAVY DUTY, 4-POLE	1300941
N	24 V, HEAVY DUTY, 4-POLE	1300942
P	1 PH, 115 VAC (only for motors: 64, 65, 67, 68, 69 & 71)	1303546
Q	1 PH, 230 VAC (only for motors: 64, 65, 67, 68, 69 & 71)	1303545
R	1 PH, 230 VAC (only for motor: 74)	1303544
S	3 PH, 230 VAC (only for motors: 60, 62, 63, 66, 70, 72 & 73)	1303548
T	3 PH, 460 VAC (only for motors: 60, 62, 63, 66, 70, 72 & 73)	1303547

START SWITCH POSITION	
A	No Switch or Push Button
DC Units (Relative to Motor Terminals)	
1	10 O'Clock
2	12 O'Clock
4	11 O'Clock
5	1 O'Clock
7	2 O'Clock
AC Units Push Button (Reservoir End Down-Pad "A")	
0	12 O'Clock
3	3 O'Clock
9	9 O'Clock

TUBE KITS							
Order Code	LTR	QTS	MOUNT	SERIES	PAD "A"	Kit #	Material
AB	0.7	1	Horizontal	GC	Down	1300867	Steel
BB	0.7	1	Horizontal	GC/W	@ 9:00	1300868	Steel
CB	0.7	1	Horizontal	W	Down	1300943	Steel
DB	0.7	1	Vertical	GC	N/A	1300875	Steel
EB	0.7	1	Vertical	W	N/A	1300953	Steel
FB	0.76	.8	Horizontal	GC	Down	1300961	Plastic
GB	0.76	.8	Horizontal	GC/W	@ 9:00	1300963	Plastic
HB	0.76	.8	Horizontal	W	Down	1300962	Plastic
JB	0.76	.8	Vertical	GC	N/A	1300973	Plastic
KB	0.76	.8	Vertical	W	N/A	1300974	Plastic
Order Code	LTR	QTS	MOUNT	SERIES	PAD "A"	Kit #	Material
AC	1.2	1.5	Horizontal	GC	Down	1300867	Steel
BC	1.2	1.5	Horizontal	GC/W	@ 9:00	1300868	Steel
CC	1.2	1.5	Horizontal	W	Down	1300943	Steel
DC	1.2	1.5	Vertical	GC	N/A	1300876	Steel
EC	1.2	1.5	Vertical	W	N/A	1300954	Steel
FC	1.2	1.3	Horizontal	GC	Down	1300961	Plastic
GC	1.2	1.3	Horizontal	GC/W	@ 9:00	1300963	Plastic
HC	1.2	1.3	Horizontal	W	Down	1300962	Plastic
JC	1.2	1.3	Vertical	GC	N/A	1300975	Plastic
KC	1.2	1.3	Vertical	W	N/A	1300976	Plastic
Order Code	LTR	QTS	MOUNT	SERIES	PAD "A"	Kit #	Material
AD	1.9	2	Horizontal	GC	Down	1300867	Steel
BD	1.9	2	Horizontal	GC/W	@ 9:00	1300868	Steel
CD	1.9	2	Horizontal	W	Down	1300943	Steel
DD	1.9	2	Vertical	GC	N/A	1300877	Steel
ED	1.9	2	Vertical	W	N/A	1300891	Steel
FD	1.6	1.7	Horizontal	GC	Down	1300961	Plastic
GD	1.6	1.7	Horizontal	GC/W	@ 9:00	1300963	Plastic
HD	1.6	1.7	Horizontal	W	Down	1300962	Plastic
JD	1.6	1.7	Vertical	GC	N/A	1300977	Plastic
KD	1.6	1.7	Vertical	W	N/A	1300978	Plastic

TUBE KIT OPTIONS CONTINUED AT THE TOP OF THE NEXT COLUMN.

TUBE KITS							
Order Code	LTR	QTS	MOUNT	SERIES	PAD "A"	Kit #	Material
AE	2.9	3	Horizontal	GC	Down	1300873	Steel
BE	2.9	3	Horizontal	GC/W	@ 9:00	1300874	Steel
CE	2.9	3	Horizontal	W	Down	1300946	Steel
DE	2.9	3	Vertical	GC	N/A	1300878	Steel
EE	2.9	3	Vertical	W	N/A	1300878	Steel
Order Code	LTR	GAL	MOUNT	SERIES	PAD "A"	Kit #	Material
AF	3.8	1	Horizontal	GC	Down	1300867	Steel
BF	3.8	1	Horizontal	GC/W	@ 9:00	1300868	Steel
CF	3.8	1	Horizontal	W	Down	1300943	Steel
DF	3.8	1	Vertical	GC	N/A	1300891	Steel
EF	3.8	1	Vertical	W	N/A	1300957	Steel
Order Code	LTR	GAL	MOUNT	SERIES	PAD "A"	Kit #	Material
AG	5.7	1.5	Horizontal	GC	Down	1300873	Steel
BG	5.7	1.5	Horizontal	GC/W	@ 9:00	1300874	Steel
CG	5.7	1.5	Horizontal	W	Down	1300946	Steel
DG	5.7	1.5	Vertical	GC	N/A	1300892	Steel
EG	5.7	1.5	Vertical	W	N/A	1300958	Steel
Order Code	LTR	GAL	MOUNT	SERIES	PAD "A"	Kit #	Material
AH	7.6	2	Horizontal	GC	Down	1300873	Steel
BH	7.6	2	Horizontal	GC/W	@ 9:00	1300874	Steel
CH	7.6	2	Horizontal	W	Down	1300946	Steel
DH	7.6	2	Vertical	GC	N/A	1300891	Steel
EH	7.6	2	Vertical	W	N/A	1300959	Steel
Order Code	LTR	GAL	MOUNT	SERIES	PAD "A"	Kit #	Material
AJ	11.4	3	Horizontal	GC	Down	1300873	Steel
BJ	11.4	3	Horizontal	GC/W	@ 9:00	1300874	Steel
CJ	11.4	3	Horizontal	W	Down	1300946	Steel
DJ	11.4	3	Vertical	GC	N/A	1300894	Steel
EJ	11.4	3	Vertical	W	N/A	1300960	Steel
Order Code	LTR	GAL	MOUNT	SERIES	PAD "A"	Kit #	Type
AK	9.5	2.5	Horizontal	GC	Down	1300873	Rectangle
BK	9.5	2.5	Horizontal	GC/W	@ 9:00	1300874	Rectangle
CK	9.5	2.5	Horizontal	W	Down	1300946	Rectangle
Order Code	LTR	GAL	MOUNT	SERIES	PAD "A"	Kit #	Type
AL	15.2	4	Horizontal	GC	Down	1300873	Rectangle
BL	15.2	4	Horizontal	GC/W	@ 9:00	1300874	Rectangle
CL	15.2	4	Horizontal	W	Down	1300946	Rectangle

BREATHER POSITION	
0	12 O'Clock
3	3 O'Clock
6	6 O'Clock
9	9 O'Clock

NOTE: Location relative to Pad "A" as viewed from reservoir face.

COIL TERM./LEVER POSITION	
A	12 O'Clock = Toward Motor
B	3 O'Clock = Away from Center
C	6 O'Clock = Toward Reservoir
D	9 O'Clock = Toward Center
N	None

NOTE: Location relative to motor as viewed from top of coil or top of manual release switch box.

ACCESSORY (Maximum of 2 can be specified.)		
00	No Accessories	N/A
10	DC - Rubber Terminal Boots (Qty of 4)	1303553
11	AC - Plain Pigtail (Exits box from orientation "3")	1303554
12	AC - Plain Pigtail (Exits box from orientation "0")	1303554
13	AC - Plain Pigtail (Exits box from orientation "9")	1303554
14	AC - Pigtail w/115 VAC Male Wall Plug (Exits box from orientation "3")	1303557
15	AC - Pigtail w/115 VAC Male Wall Plug (Exits box from orientation "0")	1303557
16	AC - Pigtail w/115 VAC Male Wall Plug (Exits box from orientation "9")	1303557
17	AC - Pigtail w/115 VAC Male Twist Lock Plug (Exits box from orientation "3")	1303560
18	AC - Pigtail w/115 VAC Male Twist Lock Plug (Exits box from orientation "0")	1303560
19	AC - Pigtail w/115 VAC Male Twist Lock Plug (Exits box from orientation "9")	1303560
20	AC - Pigtail w/115 VAC Male/Female Twist Lock Plug (Exits box from orientation "3")	1303563
21	AC - Pigtail w/115 VAC Male/Female Twist Lock Plug (Exits box from orientation "0")	1303563
22	AC - Pigtail w/115 VAC Male/Female Twist Lock Plug (Exits box from orientation "9")	1303563
23	AC - Single Acting Pendant (Exits box from orientation "3")	1303566
24	AC - Single Acting Pendant (Exits box from orientation "0")	1303566
25	AC - Single Acting Pendant (Exits box from orientation "9")	1303566
26	DC - Single Acting Pendant	1303569
27	DC - Double Acting Pendant	1303570

NOTE: "Box" refers to conduit box. See page 20 for conduit box locations.

DESIGN SERIES	
A	Major Change to form, fit or function
3	Minor Design Change

Note: Design Series is assigned by the factory at the current level.

TOOLS AVAILABLE:	W300 Stud Driver	1303583
	Relief Valve Seat Installation Socket	1303584

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PRODUCT RANGE

He Power Packs

12/24/48 VDC 0.8 – 3.5 kW and
0.75 – 3 kW AC modular power
packs

Pressure Switches

5 - 350 bar, connecting/
disconnecting

He Classic Power Packs

12/24/48 VDC modular
powerpacks in weatherproof
boxes

W300 Hydraulic pumps

0.8 – 5.7 cc/section 230 bar

W600 Hydraulic pumps

4 – 12 cc/section 276 bar

WM600 Hydraulic motors

4 – 12 cc/section 276 bar

W900 Hydraulic pumps

5 – 31 cc/section 276 bar

WM900 Hydraulic motors

5 – 31 cc/section 276 bar

WQ900 The quiet pump

5 – 23 cc/section 230 bar

W1500 Hydraulic pumps

19 – 50 cc/section 276 bar

WM1500 Hydraulic motors

19 – 50 cc/section 276 bar

G25 Hydraulic pumps

23 – 87 cc/section 250 bar

GM25 Hydraulic motors

23 – 87 cc/section 250 bar

GPA Internal Gear pumps

1.7 – 63 cc/section 100 bar

GC Hydraulic pumps / fluid motors

1.06 – 11.65 cc/section 276 bar

II-Stage Hydraulic pumps

4.2 – 22.8 cc/section 276 bar

Rotary Flow Dividers

3.8 – 13.3 cc/section 300 bar

D Hydraulic pumps

3.8 – 22.9 cc/section 207 bar

H Hydraulic pumps

9.8 – 39.4 cc/section 207 bar

G20/G30 Hydraulic pumps

23 – 161 cc/section 276 bar

GM20/GM30 Hydraulic motors

23 – 161 cc/section 276 bar

G20/G30 (LS) Hydraulic pumps

23 – 161 cc/section 276 bar

Transmission pumps

Fuel pumps

www.hbus.haldex.com



Haldex Hydraulics Corp.

2222 15th Street
ROCKFORD, IL 61104
USA
Tel: +1-815 398 4400
Fax: +1-815 398 5977
E-mail: sales.usro@haldex.com

Haldex Hydraulics Corp.

214 James Farm Road
STATESVILLE, NC 28625
USA
Tel: +1-704 873 2587
Fax: +1-704 878 0530
E-mail: sales.usst@haldex.com

Haldex Hydraulics AB

Box 95
SE-280 40 SK. FAGERHULT
Sweden
Tel: +46-433 32400
Fax: +46-433 30546
E-mail: sales@hbse.haldex.com

Haldex Hydraulics AB

Box 511
SE-195 25 MÅRSTA
Sweden
Tel: +46-8 591 288 50
Fax: +46-8 591 288 60
E-mail: sales@hbse.haldex.com

Haldex Hydraulics GmbH

Postfach 1507
D-95014 HOF
Germany
Tel: +49-9281 895-0
Fax: +49-9281 87133
E-mail: sales@hbde.haldex.com



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