



Owner's instructions
PLEASE READ CAREFULLY



**240 & 415 volt AC
Hydraulic power packs**

Operation and Maintenance

AC Motors

All standard Stone AC Power Packs are supplied with a CMG motor rated EXE, IP55. Operation and maintenance instructions are valid for standard motors. For all other motors please contact PT Hydraulics or the motor manufacturer CMG Australia.

Source AC motor operation and maintenance: product catalogue SGC motor, CMG Motors Australia

AC Motor Installation

All AC motors must be installed in such a manner as to ensure the air intake is not obstructed. CMG motors are totally enclosed fan cooled. Cooling air flows from the non-drive-end to the drive end. When installed care should be taken not to impede the air flow into the motor cowl. As a guide minimum distance as shown should be adopted.

Motor Frame	Dimension BL (mm)
71-100	15
112-132	30
160-180	40
200-280	50
315-355	65

AC Motor Electrical Connection



PT Hydraulics recommends that a qualified electrician connects AC Power Packs

Ensure all electrical connections are solid and continuous. Check motor starter and overloads for correct rating and trip setting. All circuit breakers, HRC fuses or protective devices associated with the motor must be rated to suit motor running current and starting characteristics.

- Never use an ungrounded power supply with the system.
- The pump must be compatible with existing line voltage.
- Disconnect the pump from the power supply when performing maintenance or repair on the unit.
- All electrical work must be done by a qualified electrician.

AC Motor Initial Start Up

Prior to initial start up, the following steps must be taken:

- Insulation resistance test. On machines up to 600 volt, the minimum value should be 1MΩ.
- Thermistors if fitted should be checked for continuity with a multimeter and never mega tested.
- Ensure supply voltage and frequency corresponds to the motor nameplate ratings.
- Measure stator resistance and record in log book.

AC Motor Operation

Standard motors fitted to your power unit are designed for:

1. 415 Volt, 3 phase, 50 Hertz supply or
2. 220 Volt, 1 phase, 50 hertz supply

For operation conditions other than stated above please contact PT Hydraulics.

7. Ensure plant log book records commissioning data and compare maintenance data with original

Preparing your power pack for Operation

After you have correctly connected the power pack to a suitable power supply, the unit must next be filled with a suitable grade of hydraulic oil. (SHELL Tellus 32 or equivalent)

As part of the installation process, the hydraulic system to which your power pack is installed must be bled of all air.

To correctly bleed your hydraulic system it is necessary to “crack” the supply line to the hydraulic actuator and briefly operate the power pack until all air is expelled from the supply line and a clear stream of oil flows out.

Oil should be bled in to a suitable receptacle to prevent environmental hazards.

Once a continuous stream of fluid is present without evidence of air, the supply line should be tightened and the power pack switched off.

All hydraulic service procedures should be carried out in a safe manner. Ensure all loads are sufficiently supported by a mechanical means to prevent personal injury or death.

Once all of the hydraulic actuators have been bled of air they should be fully retracted and the level of oil in the reservoir should be checked and topped up if necessary.

Your power pack has a relief valve that has not been set to any specific setting. It is important to ensure that the relief valve is adjusted in accordance with your system requirements.

(See over leaf)

Each unit is fitted with a RED relief valve spring (item 12) as standard (unless specifically ordered otherwise).

Your power pack comes with additional springs for different pressure ranges. The table specifies the spring range for each coloured spring.

It is strongly recommended that adjustment procedures outlined in this instruction are carried out by a suitably qualified hydraulic technician.

SPRING COLOUR	PRESSURE RANGE	
BLUE	500 -1000 PSI	34.5 - 69 BAR
GREEN	1000 - 2000 PSI	69 - 138 BAR
RED	2000 – 3000 PSI	138 - 207 BAR
BLACK	3000 – 4000 PSI	207 - 276 BAR

Oil Levels:

Prior to each operation, the oil level in the reservoir should be checked and topped up if necessary.

If regular top ups of the oil are required, there may be a system problem where oil is leaking from the hydraulic circuit. Check each hose connection, all actuator seals and reservoir seal to identify the source of the leak and rectify immediately.

Filters:

Each unit is fitted with a filtered filler breather (item 17) to help prevent the ingress of foreign particles in to the oil system. Over time the breather can become clogged and should be replaced regularly. The breather should be inspected regularly for clogging and replaced as necessary.

Your Stone power pack is also fitted with a suction strainer (item 9) which is mounted to the intake of the hydraulic pump and is located inside of the oil reservoir.

The suction filter helps prevent ingress of harmful material entering the hydraulic circuit through the pump intake which can cause damage to the power pack or other hydraulic components.

The suction filter should be replaced as part of a regular maintenance routine.

AC Motor Number of Starts per Hour

The number of starts per hour is dependant on the inertia of the driven load and the load torque demand. A guide to generally acceptable starts per hour is listed as per table.

Frame	Starts per hour			
	2 pole	4 pole	6 pole	8 pole
71	-	40	-	-
80	20	40	40	-
90	16	30	40	-
100	16	30	40	40
112	16	30	40	40
132	10	20	25	25
160	10	20	25	25
180	8	15	20	20
200	6	12	12	12
225	5	10	10	10
250	4	8	8	8
280	3	6	6	6
315	3	4	4	4

AC Motor Permitted Starting Time

In respect to the temperature rise of the motor, starting time should not exceed the time indicated in the following table. Motor must be allowed to be cooled prior to each start.

Frame	Start method	Maximum starting time (sec)			
		2 pole	4 pole	6 pole	8 pole
71	D.O.L	-	26	-	-
80	D.O.L	15	26	40	-
90	D.O.L	10	15	25	-
100	D.O.L	12	13	18	40
112	D.O.L	10	10	18	35
132	D.O.L	14	12	12	25
160-355	D.O.L	15	15	20	20
160-355	Star-delta	45	45	60	60

AC Motor Maintenance

The following maintenance instructions apply to stone AC Power Packs supplied with PT Hydraulics standard supplied AC motor from CMG Australia.

1. Ensure air intake space is not unobstructed
2. On a weekly basis use an air hose to ensure all airways are clear and free of dust
3. Do not wash the motor down unless it is IP66 rated
4. On a quarterly basis:
 - Check motor terminals for tightness and contact
 - If terminal lug/lugs are discoloured, re-terminate
 - Check operation of starting equipment, ensuring all terminations are tight
 - Check mechanical operation of thermal overload
 - Check mechanical operation of thermistor relay (if fitted)
 - Check operation of space heaters (if fitted)
5. On a six month basis:
 - Check stator resistance (compare to original and enter in log book)
 - Check supply voltage at motor terminals.
 - Check bearings for noise/overheating
6. On a an annual basis in addition to 4 and 5:
 - RE-grease bearings
 - Strip motor down and clean thoroughly
 - Check bearings for wear/damage – replace as necessary
 - Check all machine bolts for signs of fatigue/damage – replace as necessary
 - After re-assembly check and record:
 - Full load Current
 - Full load Voltage
 - Full load Speed
 - Ensure cooling fan is operational

Introduction

Congratulations on the purchase of your new SPX Stone power pack!

Your Stone power pack is designed to give a long trouble free service life with just a few minor maintenance checks at regular intervals.

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

For more technical problem solving, please consult a qualified hydraulic technician.

Power pack Layout

Depending on the type of power pack you may have, there are a number of differences that may be obvious between your power pack and the unit shown below.

All power packs have some common features and a quick review of your pack should help you better understand what each component is.

The electric motor is coupled to the pump via the endhead. The endhead provides oil flow direction through galleries inside the endhead. The endhead also houses the various valve options that are available for SPX Stone power packs.

There are three basic types of power packs that SPX Stone offer.

1. Single acting
2. Double acting
3. Remote valve

Fig 1.1 shows a basic **single acting** power pack which has a solenoid lower valve (item 3) to lower the load under gravity.

Fig 1.2 shows the manual lowering valve that fits in place of the solenoid operated version (item 3).

The **double acting** version (not shown) has a special adaptor plate that mounts the double acting valve to the endhead. It does not have a solenoid lowering valve (item 3)

The **remote valve** version looks similar to the unit in Fig 1.1 however it does not have a solenoid lowering valve (item 3).

The remote valve unit also utilises the return port (see Fig 2.1).

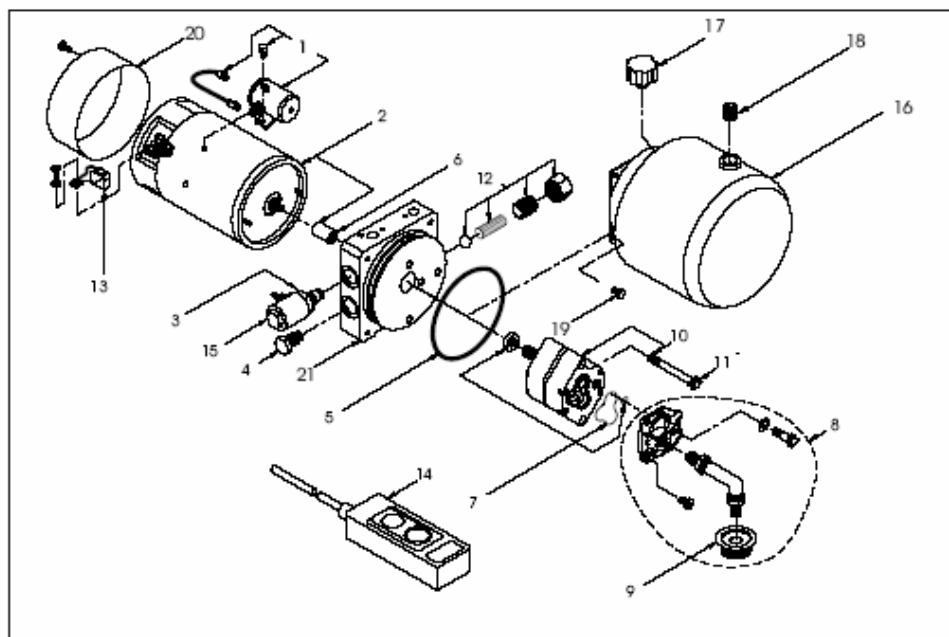


Fig 1.1 Power pack exploded view

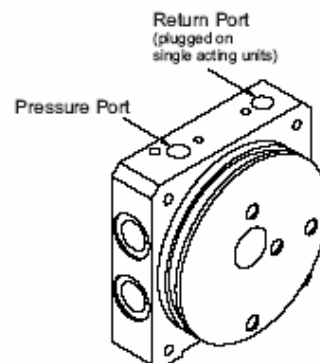


Fig 2.1 Service ports

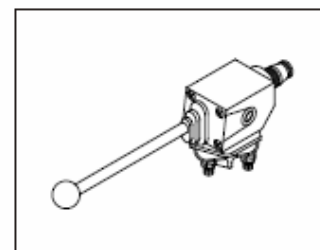


Fig 1.2 Manual Lowering valve

Item	Description	QTY	Item	Description	QTY
1	Solenoid starter assembly	1	14	Electric pendant control (Optional)	1
2	DC Motor	1	15	Solenoid coil	1
3	Solenoid lowering valve	1	16	Oil reservoir	1
4	Check cartridge	1	17	Filler breather	1
5	Reservoir O-ring	1	18	Alternate breather plug	1
6	Coupling	1	19	Tank fastening screw	4
7	Pump O-ring kit	1	20	Motor cover	1
8	Inlet plumbing kit	1	21	Endhead	1
9	Suction strainer	1			
10	Pump assembly	1			
11	Pump mounting bolt	2			
12	Adjustable relief valve assembly	1			
13	Motor brush	2			



DO NOT PRESSURE WASH THE HYDRAULIC POWER PAC

Troubleshooting

If for any reason you are experiencing some difficulty with your SPX Stone power pack, check the following table for possible causes of the problem. If you cannot rectify any issue with these simple check procedures return the power pack to the point of purchase for inspection.

Symptom	Possible cause	Remedy
Motor will not run	Faulty electrical connections	Check all electrical connections in accordance with instructions
	Insufficient battery power	Charge or replace battery
	Faulty starter solenoid	Replace starter solenoid
	Faulty motor	Replace motor
Motor starts but load will not move	Faulty electrical connections	Check all valves' electrical connections (if fitted with electric operated valves)
	Faulty valve solenoid	Replace valve solenoid
	Faulty valve	Replace valve
	Insufficient oil	Check oil and replenish if necessary
	Faulty pump coupling	Return to service centre
Load moves but stops prematurely	Insufficient oil	Check oil and replenish if necessary
	Faulty electrical connections	Check all valves electrical connections (if fitted with electric operated valves)
	Incorrect orientation of suction filter	Reposition suction filter
Erratic movement of actuators	System not bled properly	Bleed system
	Faulty electrical connections	Check all electrical connections in accordance with instructions