MOTOR INSTALLATION AND APPLICATION

GENERAL

The following information is for general guidance only and it is recommended that individual applications are discussed with ROTARY POWER.
Always examine the motor externally to check that damage has not occurred in transit, ensure that the areas around the protective plugs are clean and remove all protective coatings. Do not remove protective plugs from main ports and drain connections until system flushing is complete and immediate connection into the system is to be made.

CASE MOUNTING

Provision is made for locating the motor by means of a spigot diameter on the motor crankcase. The unit should be mounted on a flat, machined face. The mounting surface pilot diameter should be machined to the nominal spigot diameter +0.0 to +0.05mm. Clearance should be made for the fillet radius between the motor spigot and mounting face. Fixing is by either five or ten mounting bolts, depending on motor size. All fixing holes provided should be utilised, and normally, matching clearance holes in the mounting bracket are satisfactory. If heavy or frequent torque reversals are anticipated, one or more of the attachment holes should be reamed in conjunction with the mounting bracket and fitted bolts used. For special models, please contact ROTARY POWER for instruction.

SHAFT DETAILS C1, C1 High Power, C2

Two standard forms of output shaft are offered on the SMA range. The first being cylindrical shaft with parallel key, the second being a B S. involute side fit splined shaft. For details of these or possible special shafts please contact ROTARY POWER. Motor drives should be designed to eliminate unnecessary axial and radial loads and thus prolong bearing life. A keyed shaft is recommended for a flexible coupling output connection and a spline shaft where the driven shaft is rigidly connected to the motor. Alignment of the two shafts should be maintained within 0.05 mm TIR.
Splined shaft motors should be assembled using molybdenum grease, or preferably, in an oil bath . On keyed shaft motors operating in applications where the pressures are high, where the motor is subjected to reverse loadings or where the motor is subjected to shock loads; the adaptor, gear pinion, etc. should be shrunk onto the shaft to provide an interference fit. Note: hammering or pressing components onto the shaft will damage the crankshaft bearings.

SHAFT DETAILS B1

This motor type is supplied with cylindrical shaft and parallel key. The connection should be an interference shrink fit or clamped. In applications where the driven load is constrained by any other means other than a single drive motor, ROTARY POWER should be consulted. Note: hammering or pressing components onto the shaft will damage the crankshaft bearings.

SHAFT DETAILS E1, E1 high power

Provision is made for locating the motor shaft by means of a spigot diameter on the motor shaft or port block, if fitted. The unit should be mounted on a flat, machined face. The mounting surface pilot diameter should be machined to the nominal spigot diameter +0.0 to +0.075mm. Clearance should be made for the fillet radius between the motor spigot and mounting face.
Fixing is by a number of mounting bolts. All fixing holes provided should be utilised, and normally, matching clearance holes in the mounting bracket are satisfactory. Fixing bolts should be tightened to the recommended torque settings shown on the relevant installation drawing. If heavy or frequent torque reversals are anticipated, one or more of the attachment holes should be reamed in conjunction with the mounting bracket and fitted bolts used. For special models, please contact ROTARY POWER for instruction. In applications where the driven load is constrained by any other means other than a single drive motor, ROTARY POWER should be consulted.

CASE DRAINS

Rotating shaft motors are provided with two or more main drain ports located in the main crankcase. Rotating case motors are supplied with either one or two drain ports. The drain port that is to be used should be installed in the highest possible position. The bore size of the drain line should be big enough to minimise case pressure and under all conditions, within the maximum value given in the relevant technical data section. Leakage rate values can be obtained from ROTARY POWER and must be considered together with any other requirements dictated by the application. High crankcase pressures will affect shaft seal life and minimum boost pressure requirements for correct motor operation.
For shaft up applications, an optional top vent must be used & for shaft down applications an optional distributor end vent port must be used, together with the main drain port, which itself must be looped up to the level of the top or distributor end vent to prevent siphoning.

RADIAL LOADS

SMA motors will accept high radial and external loads. For individual motor information, or to discuss your application requirements, please contact ROTARY POWER.

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FLUSHING FLOW

A case warming flow may be required if temperature differentials of 30°C are envisaged between motor temperature and bulk oil temperature. The flow rate required depends upon the amount of the temperature difference, the motor size and the motor running speeds under these conditions, please contact ROTARY POWER.

FREEWHEELING

True freewheel running is achieved under normal circumstances by isolating the motor main ports from the pressure supply and connecting them direct to tank. Additionally a case pressure needs to be developed by adding flow to the motor case, and creating a back pressure (nominally 2 bar above any remaining main port pressures) in the drain line. This retracts and holds the pistons in their respective bores and provides internal lubrication to hydrostatic bearings. It is possible to engage and disengage freewheel whilst SMA motors are rotating. However due to the potentially high flow rates that may be required, the high risk of pump cavitation damage and excessive motor case pressures, it is recommended where possible to engage and disengage freewheel whilst SMA motors are stationary.
Recirculating freewheel is also possible by connecting the main ports together and applying a boost pressure to them. If this condition is to occur for long periods, it is recommended that a purge system is also incorporated. For required circuit details etc., contact ROTARY POWER.

FLUIDS

SMA motors will run on a wide variety of hydraulic fluids. As a general guide derating factors are as set out below:

Fluid type	% of max. catalogue speed rating	% of max. catalogue pressure rating
HF-A High water base	66	50
HF-B Water in oil	75	60
HF-C Water glycol	50	50
HF-D Phosphate ester*	100	100
HF-E Synthetic ester	100	100

* NOTE: Viton seals must be specified. Also contact ROTARY POWER if high speed running is to be part of the duty cycle.
Contact ROTARY POWER if any other special fluid is to be used.

OUT OF BALANCE FORCES

The orbiting motion of the cylinder block in rotating shaft motors creates out of balance forces as the motor rotates. This rarely has a detectable effect, but for applications where speed is very high, or where the machine mass is very low, it may be beneficial to install a calculated amount of counterbalance.

SEALING

All standard motors are fitted with nitrile sealing systems compatible with mineral hydraulic oils and capable of operating up to 8 bar case pressure. Please refer to the options section for further details, or contact ROTARY POWER.