
INSTALLATION AND MAINTENANCE MANUAL

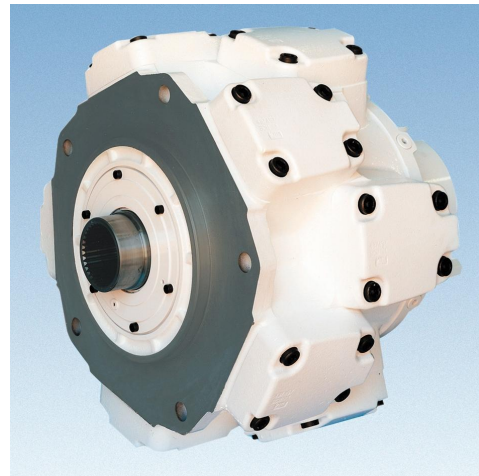
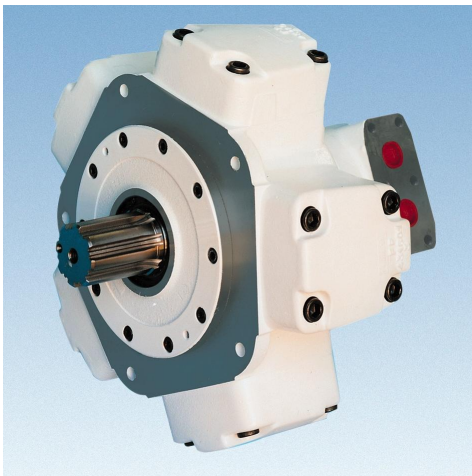
Hydraulic Motors Type

MR – MRE – MRA

MRD – MRDE – MRDA

MRV – MRVE – MRVA

MRT – MRTE – MRTF – MRTA



ATEX INCLUDED



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1 – General Information



This section must be read before consulting the rest of the documentation and before undertaking any kind of activity with the machinery.

This section is required reading for anyone assigned to interact with the machinery for all kind of purposes (transportation, installation, running, maintenance, etc.).

1.1 – Purpose of this Manual

The purpose of this manual is to inform about the general rules to be followed for the correct use of the radial piston hydraulic motors type:

1. **MR/MRE/MRA** (fixed displacement motor – single pistons row)
2. **MRT/MRTE/MRTF/MRTA** (fixed displacement motor – multiple pistons row)
3. **MRD/MRDE/MRDA** (dual displacement motor – single pistons row)
4. **MRV/MRVE/MRVA** (variable displacement motor – single pistons row)

All essential information of interest for users as well as designers are available in the “Technical Catalogue” dedicated to each above listed motor range; while in the present manual you can find the procedures to be followed for:

- Handling & Storage
- Installation
- Use and Maintenance
- Repairs and Service
- Scrapping

This manual also provides important information concerning the safety of the people assigned to the assembly, use and maintenance of the radial piston motors; consequently, it is necessary that this manual is carefully read and the indications here reported strictly followed.

In case this manual gets lost or damaged, a replacement copy can be required directly to Parker Calzoni s.r.l. by using the present manual code: RCOe2100/09/05.

1.2 – General Safety Warnings

When using industrial machinery and systems, one must be aware that moving parts (both linear and rotary), high-voltage electrical parts, any high-temperature parts, etc. may cause serious harm to people and propriety.

Those responsible for system security must ensure that:

- all improper use and operations are avoided;
- the safety devices are not removed or tampered with;
- maintenance operations are regularly performed;
- all precautions, individual protection, etc. required by safety regulations and legislation valid in the user's country are duly adopted (see EEC directives 89/686/CEE and 89/656/CEE)
- only original spares are used, especially for components that perform a safety function.

For this purpose, it is essential that:

- this documentation is filed, by a duly assigned person, in a suitable location so that to be always accessible for consultation, and always in good condition.
- only adequately trained personnel are assigned to the machinery.

The "Machine Directive" (89/392/CEE and subsequent changes) defines "OPERATOR" the person(s) assigned to install, operate, adjust, maintain, clean, repair and handle a machinery.

To better define the degree of preparation, field of operation and level of responsibility of the "OPERATORS" in this manual we define the following terms:



OPERATOR

Person who does not necessarily have a strong technical background, trained to run the machine in ordinary production regarding: start-up, stop at the end of the shift, simple maintenance operations (cleaning, etc.).



MAINTENANCE TECHNICIAN (mechanical or electrical)

Qualified Technician assigned to the more complex operations of installations, maintenance, repairs, etc. within his/her specific field of competence (mechanical or electrical.)

It is essential to make sure that the assigned operators have read and well understood the manual sections of their own competence. In particular:



the OPERATOR must consult the sections relevant to "General Information" and "Use".



The MAINTENANCE TECHNICIAN assigned to installation, maintenance, repair, etc. must consult all sections of this manual.

1.3 - Symbols

In this documentation special symbols are used to highlight in each instance possible hazardous conditions for people and/or property:

DANGER SERIOUS danger: LIFE-THREATENING to people.

WARNING People harm and product damage danger.

ATTENTION Danger of damage, even serious, to the product.



Particularly Important Technical Information: not to be neglected.



Danger of contamination.



Danger deriving from fluids under pressure.



Compulsory usage of protective goggles.



Compulsory hands protection.



Centre of gravity.



Do not store in a damp environment.



Compulsory usage of special lifting equipment.

1.4 – Notes about ATEX Standards

In this manual there are notes concerning the usage of radial piston Calzoni motors in potential explosive hazardous zones classified by the Directive 94/9/CE. These notes are identified by using the symbols below:



The information provided in correspondence of these symbols are relevant only to machinery operating in conformity to the Directive "ATEX" 94/9/CE.

The operations recalled by these symbols must be performed by qualified personnel with specific skills and competence about safety requirements in potential explosive hazardous zones.

Not to follow the indications identified by these symbols can lead to serious dangers to people and environment safety; moreover not to follow these indications can lead to the motor not to comply with the Directive requirements.

1.5 - Additional Documentation

Along with the present manual, upon request, the following additional documentation can be provided for each product:

- Exploded View
- Spare Parts List
- Overall Dimensions Drawing (the overall dimensions for each standard motor type can also be found in the "Technical Catalogue" relevant to each motor series).

Your documentation request can be addressed to Parker Calzoni s.r.l.

1.6 - Identifying the motor

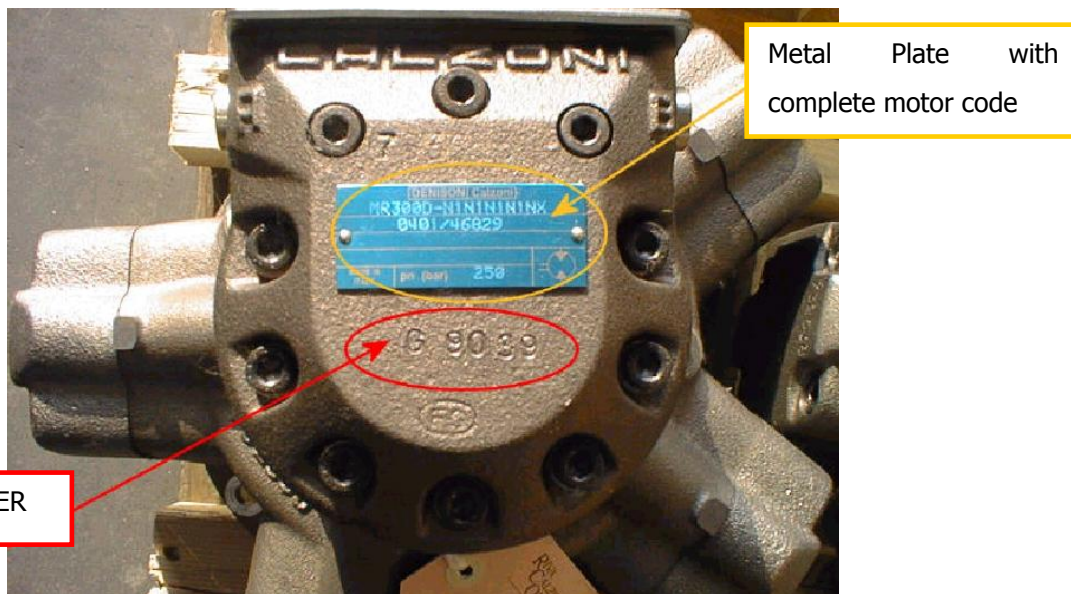
A metal plate is located on the motor rotary valve housing where you can find the complete code that describes the configuration of the unit (as per the "technical catalogue") and the maximum continuous working pressure.

In addition, a serial number is punched on the rotary valve housing of each motor; the motor serial number consists of 5 digits or one letter and 4 digits.

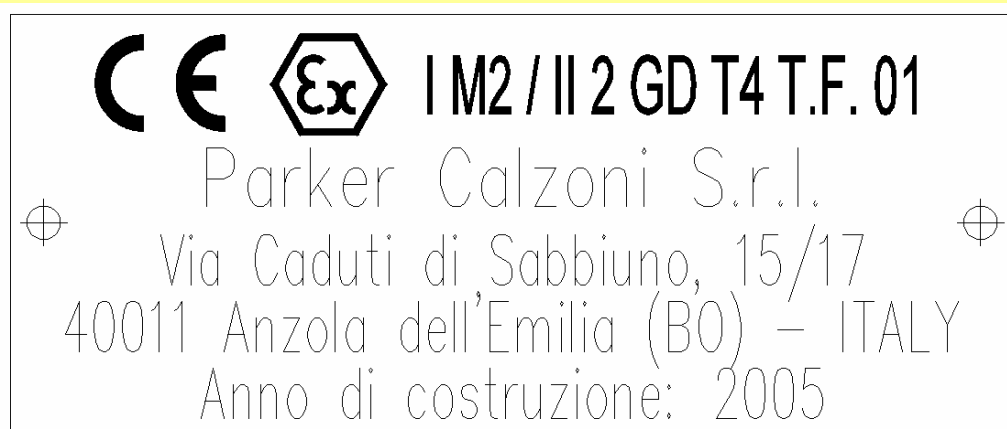


For a correct motor identification you must refer to both serial number and motor code. You must refer to these data in case of spare parts, information as well as service requests.

For motor code interpretation, pls. refer to the motor "technical catalogue".



Motors destined to operate in explosive hazardous zones classified according to Directive 94/9/CE can be recognised thanks to a special plate you can find on the motor rotary valve housing in addition to the one that indicates the motor code. The special plate is as below:



This identifying plate has to be kept in conditions so that all data on it can always be clearly read; consequently, a periodic cleaning of the plate is required.

1.7 – Technical Support Request

Any kind of technical support request has to be addressed to one of the Parker Hannifin Sales Company or directly to Parker Calzoni s.r.l. by communicating the data you can find on the motor metal plate, the motor serial number, the approximate number of service hours of the unit and the kind of failure experienced.¹

¹ Pls. See "Data collection format"

1.8 – Manufacturer Responsibility

The manufacturer declines any responsibility in case of:

- use of the product not according to the safety regulations and legislation valid in the user's country;
- use of the product in operating conditions not allowed according to the product technical documentation;
- improper installation: the instructions given in this manual are not followed or not properly followed;
- hydraulic system problems;
- modification or manumission of the product;
- operations executed by personnel not properly trained or not assigned to such a kind of operations.

The safety of the product depends upon the strict observation of the indications given in this manual; in particular, it is necessary:

- to always operate within allowed product working operating conditions²
- to always perform an accurate ordinary maintenance activity;
- to assign the inspection activity as well as maintenance activity to duly trained personnel;
- to only use original spares;
- to always use the product according to the indications you find in this manual.



The instructions of this manual are in addition and do not replace the obligations we are required to comply with in accordance to the currently valid safety regulations and legislations.

² Pls. refer to the "Technical Catalogue" of the unit in usage.

2 – Technical Information

This section is dedicated to a general introduction to the machinery. The products this manual refers to are radial piston hydraulic motors whose series are:

1. **MR/MRE/MRA** (fixed displacement motors – single pistons row)
2. **MRT/MRTE/MRTF/MRTA** (fixed displacement motors– multiple pistons row)
3. **MRD/MRDE/MRDA** (dual displacement motors – single pistons row)
4. **MRV/MRVE/MRVA** (variable displacement motors – single pistons row)

The motors are used to convert the energy generated by working fluid pressure into kinetic energy of a rotating shaft. The motor provides a torque proportional to the feeding hydraulic pressure and a speed proportional to the feeding flow rate from the system pump.

The hydraulic radial piston motors object of this manual fall into the range of “Low Speed High Torque” (LSHT) motors.

One fundamental feature of these motors is the capability to develop a very high starting torque, able to win high resistant torque and start up the system.

This information represents an initial approach to become familiar with the products object of this manual; more specific and detailed information on various topics is contained sections to follow.

2.1 – Motor Description

Parker Calzoni motors are the result of an original design aimed to obtain extremely high performances. The radial driving system consists of telescopic cylinders (1) working against the spherical eccentric cam of the rotating shaft on one side (2) and against the spherical caps (3) of the cylinder heads (4) on the other side.

The force is transmitted to the rotating shaft directly by means of a pressurised column of hydraulic fluid (a) without any intermediate connecting rods, pistons, pads and pins; this feature leads to high mechanical efficiency, thanks to the minimization of friction, and to the reduction of the moving parts wear.

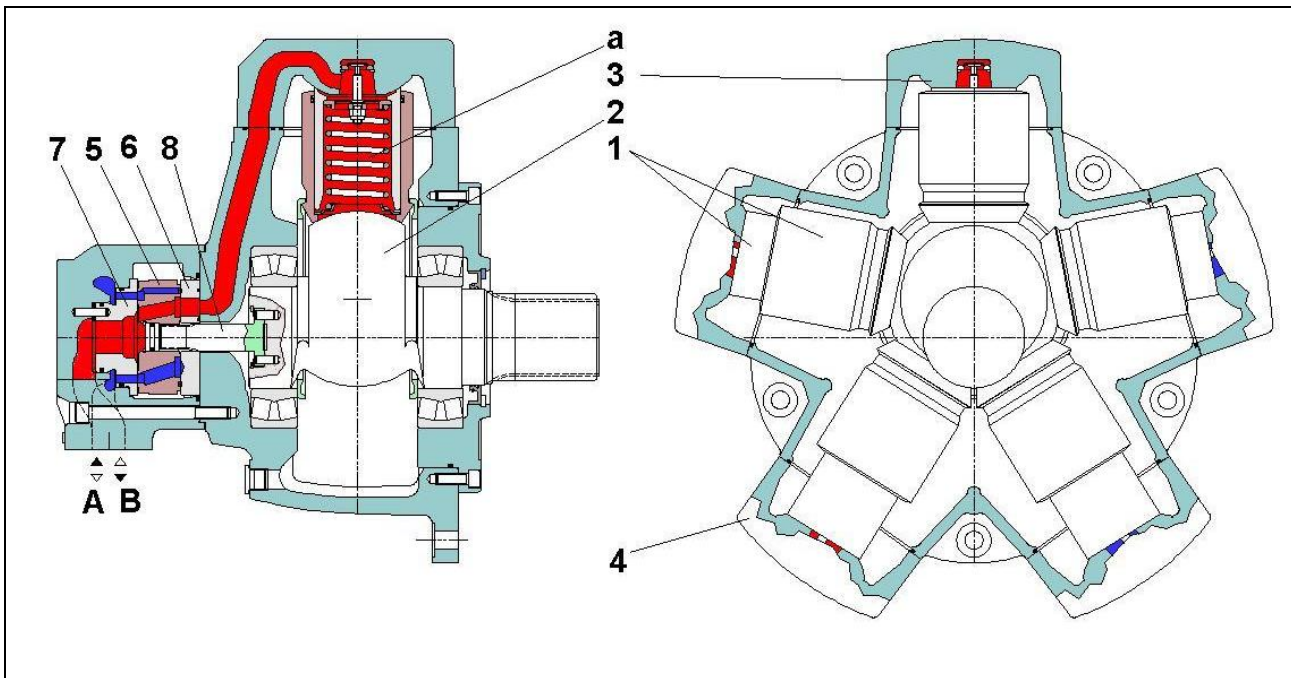
The sealing surfaces of the pistons on shaft and cylinder head caps are perfectly spherical; the sealing surfaces retain their circular cross section when stressed by pressure so that there is no alteration in the sealing geometry. The usage of dedicated coating on the motor shaft reduces the friction and prevents any kind of seizure of the motor’s internal components.

Since the force is transmitted directly toward the centre of the rotating shaft without connecting rods, there is no transverse component of the thrust (side load) which means no out of round wear of the pistons.

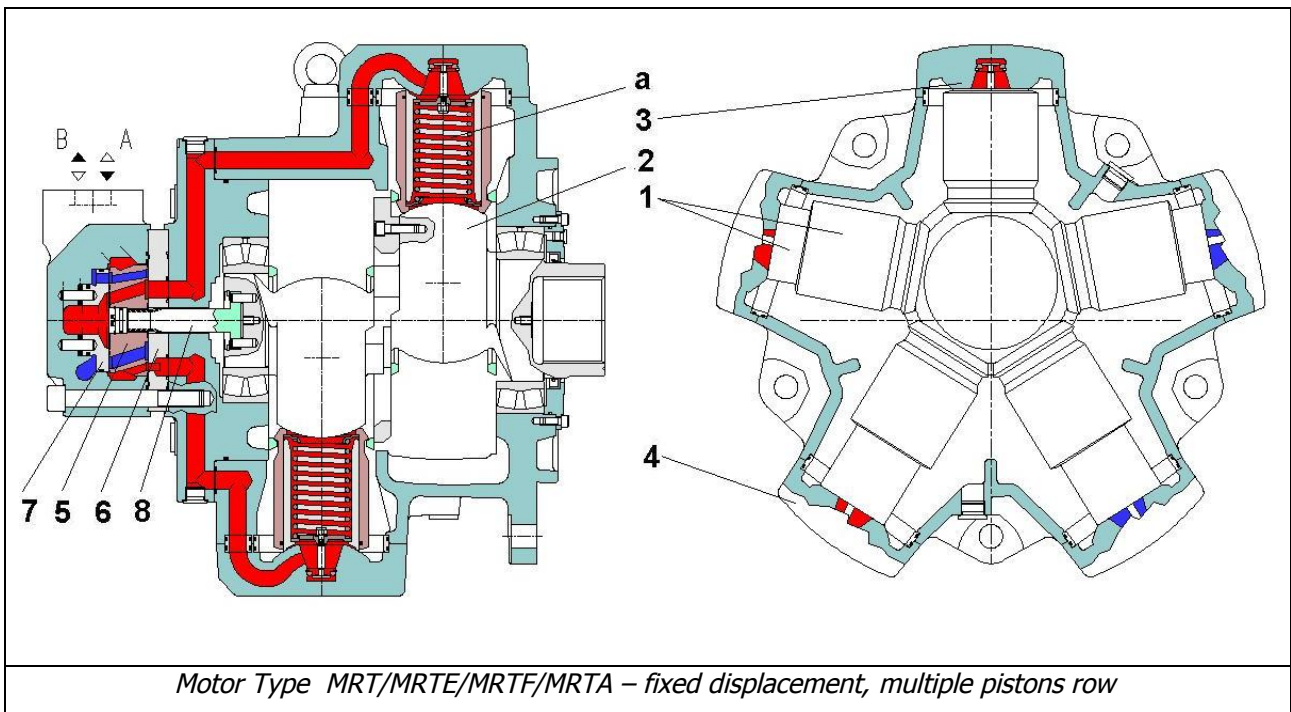
The Parker Calzoni driving system design allows the realisation of motors with limited weight and overall dimensions.

The timing system is realised by means of a frontal rotary valve (5), that rotates between two fixed plates (6-7), connected to the main rotating shaft by means of a driving shaft (8).

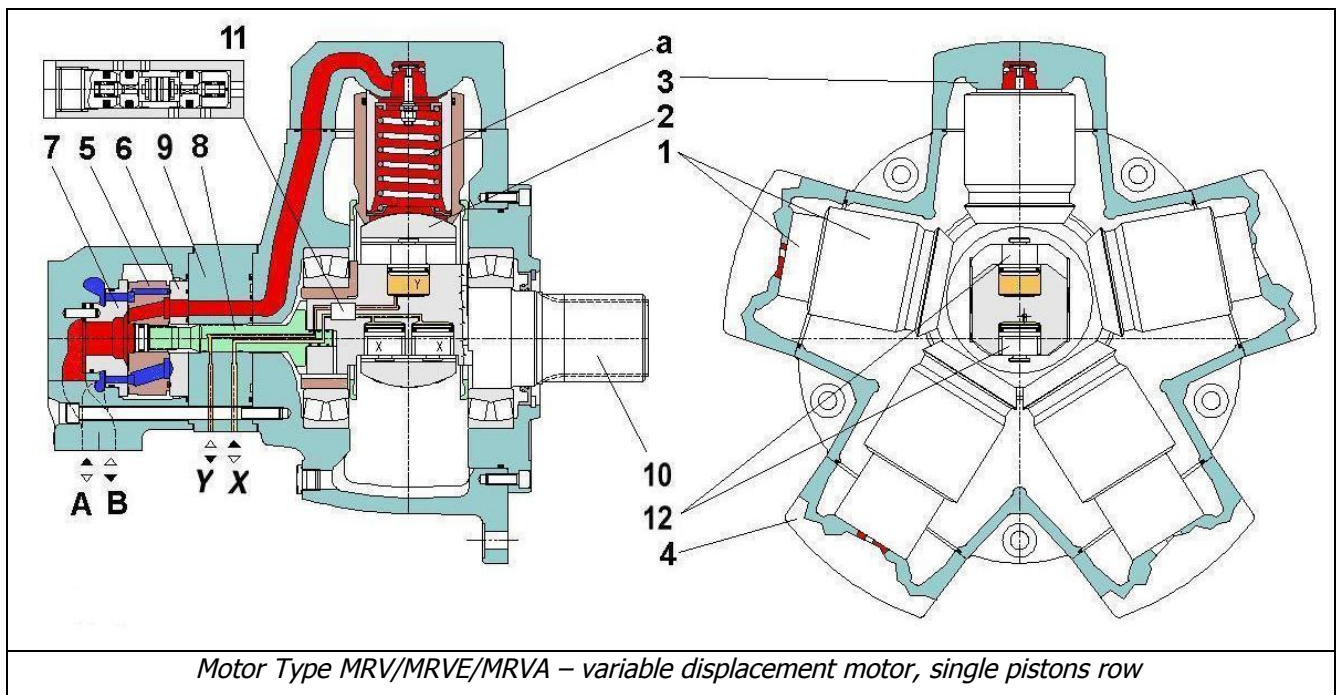
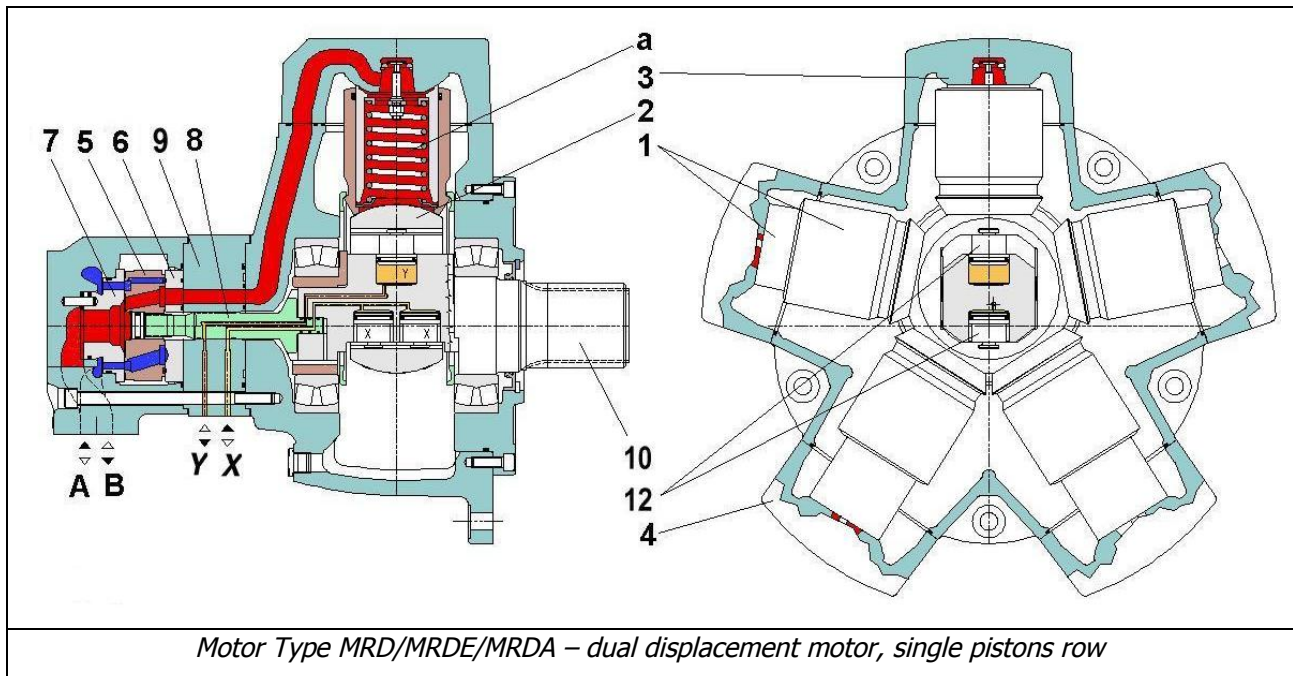
This timing system design is hydraulically balanced and self compensated for wear and temperature variation.



Motor Type MR/MRE/MRA – fixed displacement, single pistons row



Motor Type MRT/MRTE/MRTF/MRTA – fixed displacement, multiple pistons row



For the motor type MRD/MRDE/MRDA the change of displacement is accomplished by having the eccentric cam (2) free to radial move: the radial movement of the eccentric cam is controlled by means of hydraulic cylinders (12) located inside the shaft. It is possible to choose maximum and minimum displacement values within the maximum range allowed by means of spacers. The piloting cylinders are operated by means of a rotating intake (9). Motor displacement can be changed during the motor operation, from maximum displacement to minimum displacement, as well as from minimum displacement to maximum displacement with no need to stop the motor operation.

The eccentric cam radial move in the variable motors type MRV/MRVE/MRVA is controlled by means of a counter check valve (11) located inside the rotating shaft. This valve pilots the movement of the displacement change system cylinders (12): with this solution it is possible to obtain whatever value of displacement within the maximum range allowed by means of a continuous variation of the position of the eccentric cam (2).





The usage of Parker Calzoni motors is made very flexible by means of electronic and hydraulic regulation circuits; moreover, these solutions lead to efficiency increase and performances improvement of the machine the motors are installed on.

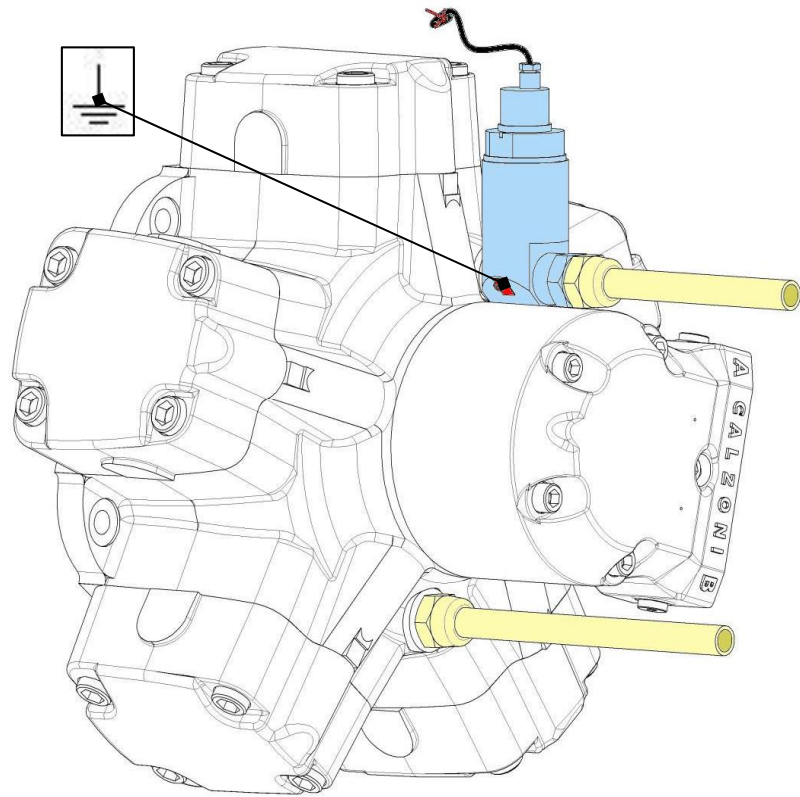
Thanks to these design peculiarities, Parker Calzoni motors grant high mechanical and volumetric efficiency values, even at very low speed and high operating pressure, as well as in starting torque condition; these performances do not worsen during the motor service life, granting the reliability for which this motor brand is well known.

According to the application's request, the motor can be provided in different configurations. To widen the motors' flexibility PARKER CALZONI provides a series of accessories and options (for all information concerning the technical and dimensions characteristics pls. refer to the correspondent "technical catalogue").

2.2 – Conformity to standards

Parker Calzoni motors can be provided in conformity to the essential safety requirements according to the Directive ATEX 94/9/CE as per the specifications here below:

 	<p>The motors, if destined to operate in potential explosive hazardous atmosphere, are designed and realised in conformity to the Safety Essential Requirements (RES) of Annex II of Directive "ATEX" 94/9/CE. The Directive provides the following classification:</p> <ul style="list-style-type: none"> • Group II, category 2, operation in gaseous and dusty environment zone 1 and 21; • Group II, category 3, operation in gaseous and dusty environment zone 2 e 22; • Group I, category M2, operation inside mines; • Maximum surface temperature: class of temperature T4
<p>SAFETY SPECIFICATIONS FOR MOTORS IN CONFORMITY TO DIRECTIVE 94/9/CE</p> <ul style="list-style-type: none"> • the motor must be connected to ground by means of the dedicated threaded hole identified by  means of the symbol () – pls. refer to the picture here below; • only mineral oil with in flammability degree higher than 185°C can be used; • motor seals must be in VITON®; • motor must be always flushed in whatever operating condition (pls. refer to the section "Flushing"); • the motor must be equipped with a system to detect the oil level inside the motor case: motor case must be always full of oil (pls. refer to the section "Flushing"); • no creeping metal elements external to the motor are allowed; • plastic parts that might accumulate electrostatic charges are not allowed; their presence is accepted if shielded. • for installations in zones 21 and 22 the user has to adopt a scheduled periodic cleaning plan of the machinery surface and recesses so that to prevent more than 5 mm thickness dusts deposits. 	
<p>Before servicing motors that operate in potential explosive hazardous atmosphere, the assigned personnel must deactivate the inlet feeding putting the motor in "out of service" condition; attention has to be paid to any situation that might lead to the undesired re start up of the motor or to the undesired and not predicted movement of motor's parts.</p>	
<p>All additional environmental safety regulations must be undertaken (i.e. degassing process & residual dust cleaning process of the atmosphere)</p>	
<p>It is forbidden to use a motor not designed and realised in conformity to the dedicated standards in potential explosive hazardous zones or where the usage of anti-deflagration components is required.</p>	



2.3 – Operating Fluids

The viscosity, quality and cleanliness of the operating fluid are decisive factors in determining the reliability, performances and life time of a hydraulic component.

2.3.1 – Working viscosity range

The motor maximum life time and performances are achieved within the recommended viscosity range. For applications exceeding this range we recommend that you contact Parker Calzoni s.r.l.

- $V_{rec.}$ = recommended operating viscosity 30...50 mm²/s

This viscosity is referred at the same time to the temperature of the fluid entering the motor and to the temperature of the fluid inside the motor housing (case temperature).

2.3.2 – Extreme Conditions

The following limitations are applied:

- $V_{min.abs.}$ = 10 mm²/s for instants in case of emergency, with a maximum case fluid temperature of 80°C
- $V_{min.}$ = 18 mm²/s with reduced torque and maximum supplied power performances
- $V_{max.}$ = 1000 mm²/s during "cold" start up

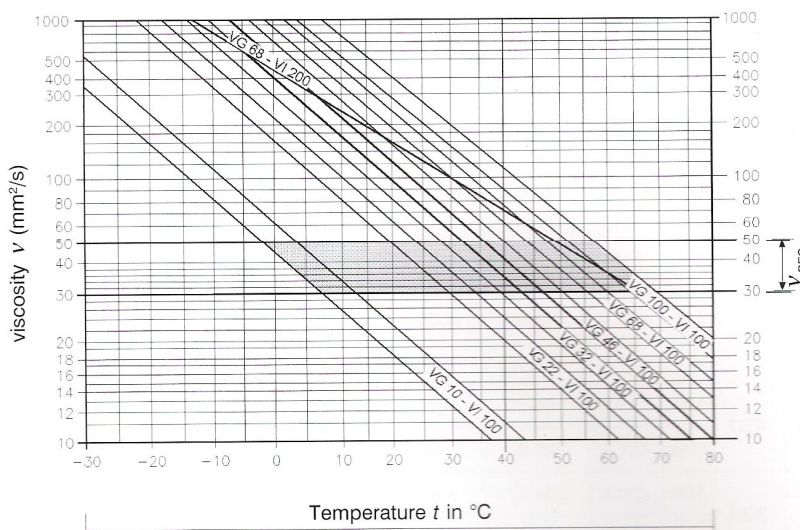
2.3.3 – Choosing the type of fluid according to the operating temperature

The motor operating temperature is defined as the higher between that of the inlet feeding fluid entering the motor and that of the fluid inside the motor case (case temperature).

WARNING

Temperature must never exceed 80°C anywhere in the system.

It is recommended that you choose the viscosity of the fluid based on the maximum operating temperature so that to make the motor operate within the recommended viscosity range.



If these viscosity requirements cannot be met due to extreme operating parameters or high environment temperature, motor case flushing is strictly recommended in order to operate within the viscosity limits. Should it be absolutely necessary to use a viscosity exceeding the recommended range, pls. first contact Parker Calzoni s.r.l.

2.3.4 – Types of fluids allowed

HLP oils according to standard DIN 51 524 part 2 (with wear-proof, oxidation-proof and corrosion-proof additives) and part 3 (with a high viscosity index, suitable for applications subject to broad operating temperature variations) are recommended.

The use of water-based fluids is allowed only with motors specifically designed; the motor performances get reduced according to the class the oil belongs to: HFA, HFB or HFC (pls. contact Parker Calzoni s.r.l. about the usage of motors on water based fluids).

The use of synthetic fluids (type HFD) is allowed with motors supplied with seals in FPM material (pls. contact Parker Calzoni s.r.l. about the usage of motors on synthetic fluids).

Seals in FPM material are necessary for HFD/U fluids only if expressly indicated by the fluid manufacturer.

The use of synthetic fluids (typo HFD) does not imply any motor performances reduction.

Three families of biodegradable fluids are currently available in the market:

1. Vegetable-based fluids HETG
2. Polyglycol-based synthetic fluids HEPG
3. Ester-based synthetic fluids HEE

At the present time very little practical experience and information has been gathered with regard to the possible performances and aging characteristics of the various fluids belonging to the HETG class. In case of working pressure exceeding 200 bar, the generation of sludge is a side effect of the use of a fluid belonging to this class. As a consequence the fluid has to be frequently monitored and an operating temperature below 45°C is recommended.

HEPG fluids have excellent working characteristics thanks to their usual high viscosity.

For information concerning HEE fluids you can refer to the operating parameters of the HLP oils.


WARNING



AS FOR MINERAL BASED FLUIDS, BIODEGRADABLE FLUIDS MUST BE DISPOSED OF IN ACCORDANCE TO CURRENT REGULATIONS.



It is compulsory to use only oils whose inflammable degree is higher than 185°C in case the motor is destined to be used in potential explosive hazardous atmosphere (Directive "ATEX" 94/9/CE).

FLAMMABLE AND SELF-EXTINGUISHING FLUIDS					
Fluid characteristics					
<i>Class</i>	<i>Type of fluid</i>			<i>Water content (% in weight)</i>	
HFA	Oil-water emulsion			95 – 98	
HFB	Water-oil emulsion			>40	
HFC	Water-based solution (mostly with glycol)			35 – 55	
HFD	Synthetic fluids (water free)			0 – 0.1	
HFD/R	Fluid based on phosphorous esters				
HFD/S	Fluid based on chlorinated hydrocarbons				
HFD/T	Fluid based on phosphorous esters & chlorinated hydrocarbons				
HFD/U	Other compositions				
Motor application limitations					
<i>Class</i>	<i>Pressure (bar) (% nom. pressure)</i>	<i>Speed (r.p.m.) (% max. speed)</i>	<i>Power (kW) (% max. power)</i>	<i>Temperature (°C)</i>	
				Maximum	Ideal
HFA	50	50	25	50	40
HFB	80	80	60	60	45
HFC	60	60	30	60	45
HFD	100	100	100	80	50
	Note: For HFD/U fluids FPM seals must be used only if required by the fluid manufacturer.				

2.3.5 – Fluid filtration

To ensure a smooth and reliable motor operation, the fluid must comply with to one of the following filtration classes:

1. class 9 according to NAS 1638
2. class 6 according to SAE, ASTM, AIA
3. class 20/17/16 according to ISO 4406:1999



To ensure a long motor life time class 8 according to NAS 1638 is recommended: it is attainable by using $\beta_x = 100$ filtration quotient.

In case the above listed filtration classes cannot be respected, pls. contact Parker Calzoni s.r.l.

2.3.6 – Mixing different oils

Mixing oils of different brands or different oils of the same brand may lead to the formation of sediment and sludge. Consequently a rapid, irreversible deterioration of the system is induced.

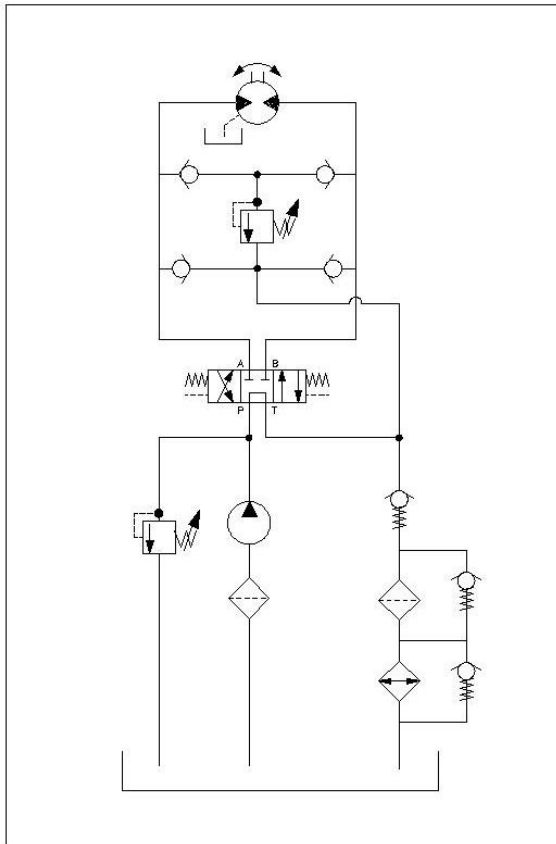
2.4 – Pump Operation: boost pressure requirements

In case the motor is used as a pump or driven by the load (even for short time) it is necessary to ensure an adequate boost pressure to the inlet line.

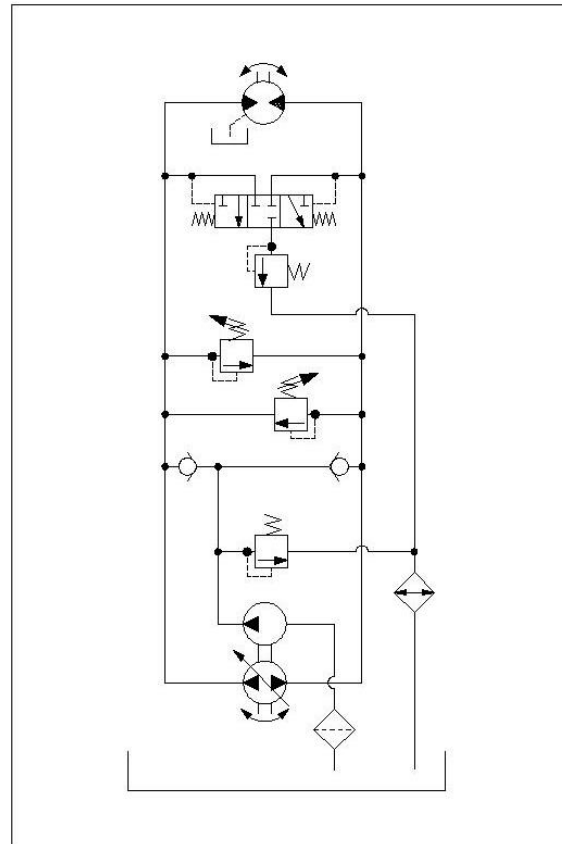
The diagrams relevant to the minimum boost pressure required by the motor when working as a pump can be found in the “Technical Catalogue” of the series the motor belongs to.



The hydraulic circuit has to be built so that to protect the motor from insufficient boosts pressure. The two circuits below are just general examples to how to solve the problem.



Open Loop Circuit



Closed Loop Circuit

3 – HANDLING AND STORAGE

This section contains the instructions essential to operators for packing removal and motors handling. The information of this section is intended for Qualified Technical personnel (Mechanical and Electrical Maintenance Technicians) with adequate skills to work appropriately and safely with lifting equipment, harnesses, lift trucks, bridge cranes, etc.

DANGER

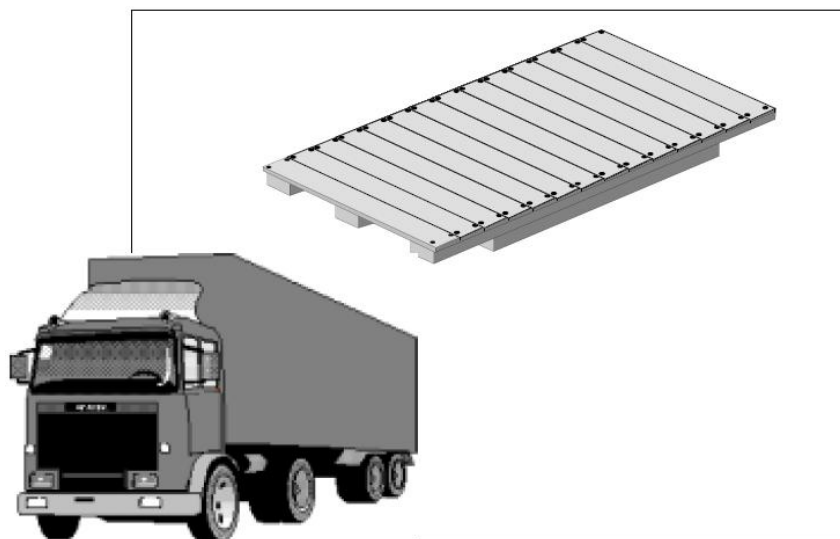
Only Qualified Technical Personnel, trained in the specific field of intervention, should perform lifting, handling and placement activities as well as execute mechanical, hydraulic and electrical connections.

3.1 – Supply Conditions

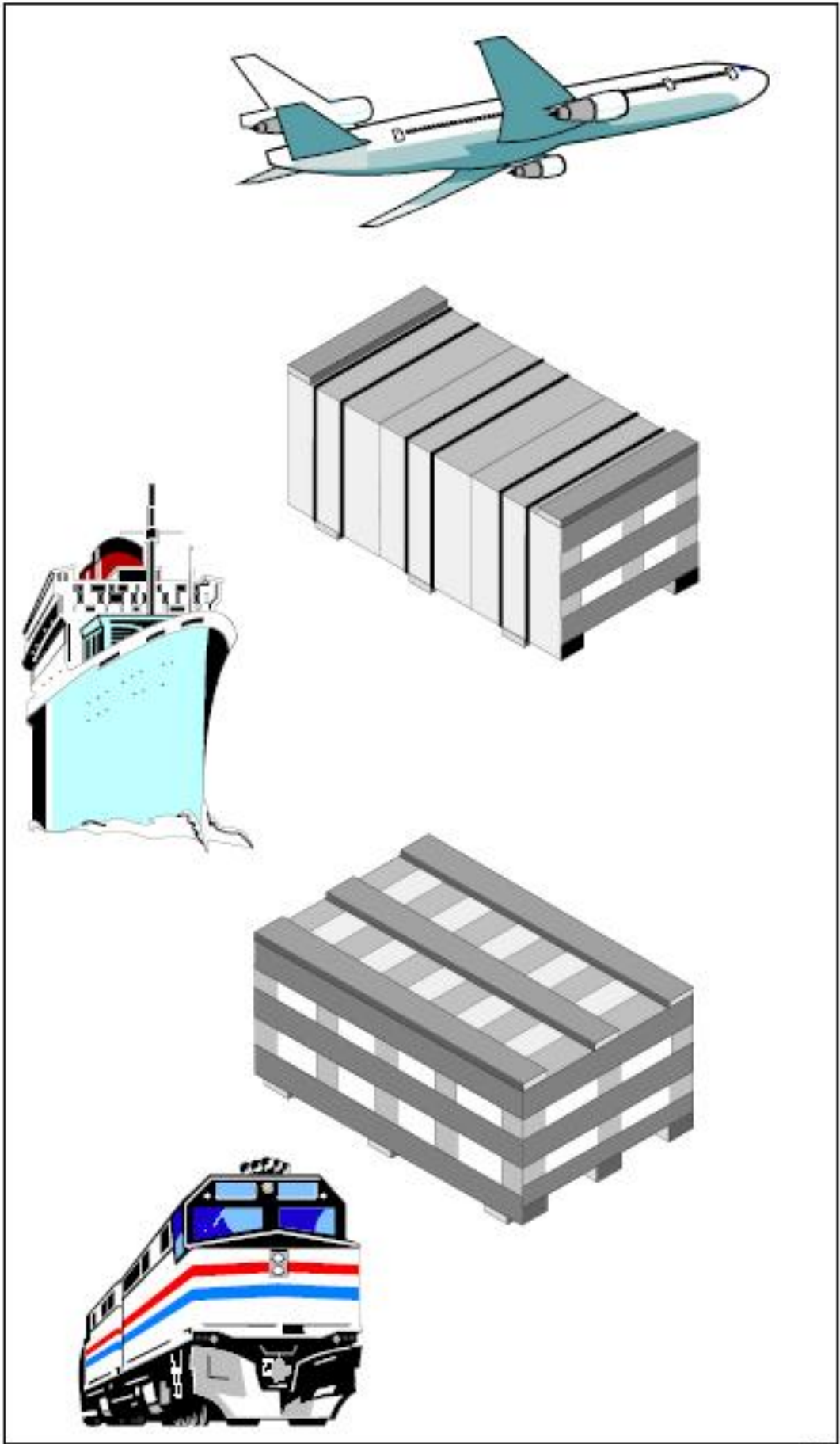
The motors are supplied in the following conditions:

- for shipments within Italy, motors are packed and fixed to skids (pallets);
- for international shipments, motors are packed in dedicated cardboard or wooden crates, according to the type of shipment (truck, ocean freight, air freight) and to specific customers' requests;
- all parts of the motor are protected by a layer of anti rust coating, while delicate external parts (pipe connection flange, drain holes, output shaft) are equipped with a special protection cover;
- motors to be shipped by ocean freight are placed inside dedicated humidity absorber plastic bags;
- motors might be painted according to specific customers' requests. The coupling surfaces are not painted;
- motors are supplied with empty motor case; the motor internal components are protected by the layer of oil residual from the test performed before delivery;
- all motors before shipment are tested according to Parker Calzoni s.r.l. internal functional test procedures.

Shipment on
wooden skids



Shipment in
cardboard or
wooden
crates.



3.2 - Transportation

During transportation better to treat motors as delicate goods so that to avoid collisions that might cause the damage of the packing as well as of the content.

DANGER

When transporting the motors in-house, the utmost care is recommended while manoeuvring the vehicle as well a low speed is suggested so that to avoid collisions and jerks that can damage the output shaft or other delicate parts.

3.3 - Storage



It is strongly recommended to avoid storing the motors outdoor, in excessively damp sites or positioned directly on the ground.

Motors can be stored in a warehouse, in the same conditions it was supplied, for no longer than 3 months.

Should the motors be stored of a longer period or should they be stored in a damp site, their motor cases have to be filled in with filtered hydraulic oil (pls. refer to "Operating Fluids" section) by using one of the two drain holes; drain holes have then to be duly plugged.

The oil used to fill in the motor case has possibly to be the same that will be used in the system the motor will operate on, so that to avoid risks of mixing different fluids (pls. refer to "Operating Fluids" section).

ATTENTION

The motors may be seriously damaged if they are stored at critical temperatures before installation. Do not expose the motors to temperatures below -30°C or higher than 80°C; these two temperature values must be considered the absolute lower and upper extremes.

3.4 – Packing Removal

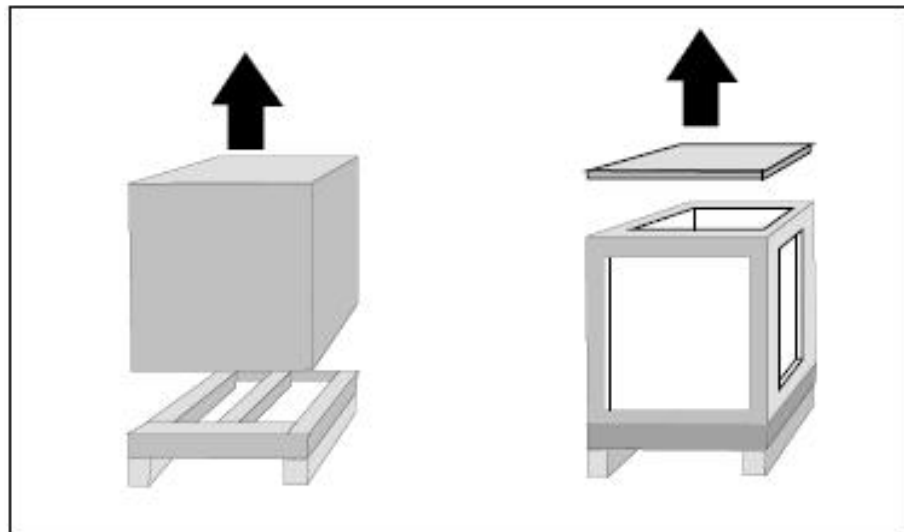
3.5

As illustrated in the previous section, the motor is simply packed on a wooden skid or on a skid with cardboard or wooden crate. The wooden crate must be opened with order, starting from the cover, then removing the side panels and finally taking out the end panels.

WARNING

The parts the crates consist of must be made harmless for people; thus, before storing them dangerous parts must be removed; dangerous parts are: wooden pins, screws, nails, sharply pointed to edged parts, etc.

Packing removal
procedure



ATTENTION

Operators assigned to handle and remove the packing must adopt individual protection devices (gloves, helmet, and safety shoes) and respect the general safety regulations required by EEC directives and legislations valid in the user's country.

About individual protection devices the European Community has issued the directives 89/686/CEE and 89/656/CEE.



Once the packing has been completely removed, if the motor has been partially or fully subject to a corrosion-proof treatment, it is necessary to clean the treated parts thoroughly so that to eliminate the anti-oxidant: this operation has to be performed by using cloths dampened into solvent.

Materials used as packing material like boards, wooden walls, and waterproof covers can be stored and successively re-used as loose material.

In no case may they be disposed in the environment; in particular do not burn waterproof covers. They must be disposed in an authorized site for differentiated waste disposal.



Parker Calzoni s.r.l. does not hold any responsibility for the improper use of packing material as well as for successive handling of the motor.

3.5 – Contents Control

Check carefully that the received material complies with the shipping documents and has not been damaged during the transportation. Notify immediately any discrepancies or damages. For any kind of assistance request or communication concerning a motor, the user must inform about the unit complete model code (information reported on the motor metal plate) and serial number.

3.6 - Handling

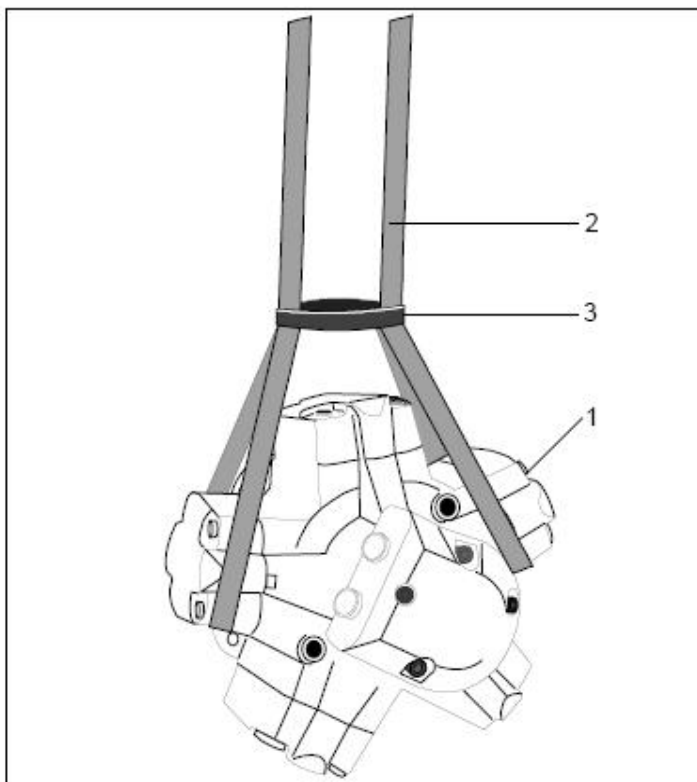
For motors handling during assembly and disassembly from the application, the following procedures are recommended.

3.6.1 – Handling of Motor Types *MR – MRE – MRA / MRD – MRDE – MRDA / MRV – MRVE – MRVA*

Lifting by means of Nylon belt

Harness the motor (1) by means of a Nylon belt (2) as shown here below

Lifting with a
Nylon belt +
metal ring



DANGER

The belt size must be chosen according to the motor weight (motors' weight can be found in the relevant "technical catalogue").



Use a metal ring (3) to "throttle" the belt (2), adjusting the height of the metal ring before tensioning the cable.

Lifting by means of a dedicated lifting tool

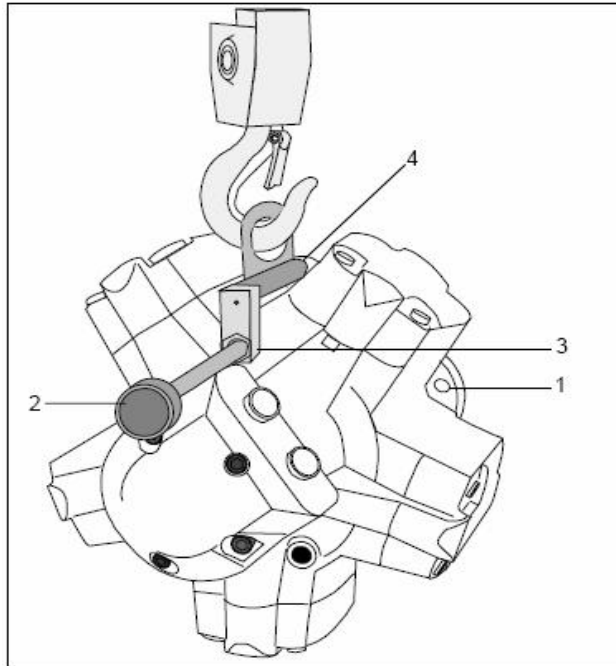


Connect the motor (1) to the dedicated lifting tool (2), as shown in the following picture, and handle the motor by using an adequate lifting system. The dedicated lifting tool can be supplied by Parker Calzoni s.r.l. upon request. The tool (2) must be connected to one of the two drain ports (3) and to one fixing hole (4) of the front flange.



A different type of tool is supplied for each family of motors.

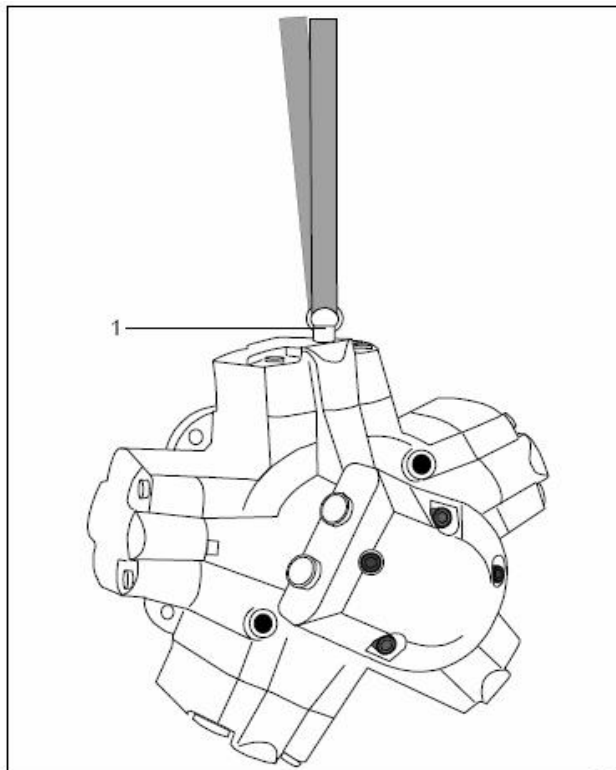
Lifting with
dedicated tool.



Lifting by means of eyebolt

For some types of applications, as shown in the following picture, upon request of the customer it is possible to provide motors with dedicated eyebolt holes (1) on one or more cylinder heads.

Lifting by means
of eyebolt



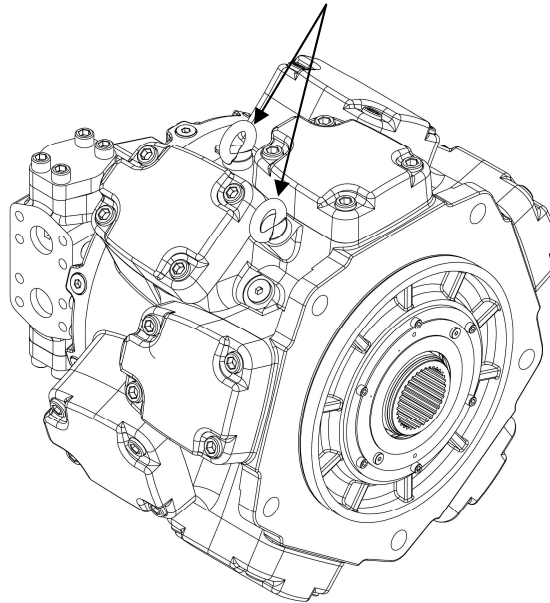


For motor types MR 6500 - MR 7000 - MRE 8200 2 holes for each cylinder head are foreseen.

3.6.2 – Handling of Motor Types MRT – MRTE – MTF – MRTA

The motor types MRT – MRTE – MRTF – MRTA belonging to class P (displacement from 7100 cm³ to 8200 cm³) foresee two eyebolt holes on the motor case for lifting purposes. During lifting, the motor weight has to be distributed on both eyebolts.

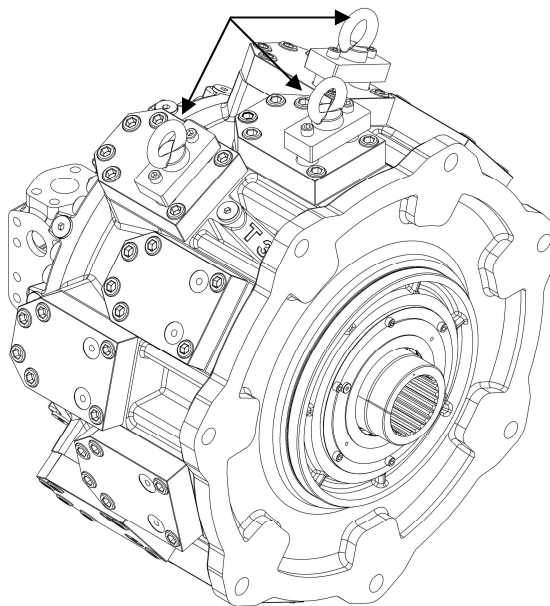
Lifting by means
of eyebolt



The motor types MRT – MRTE – MRTF – MRTA belonging to class Q (displacement from 14000 cm³ to 23000 cm³) are equipped with three lifting tools on three cylinder heads as per the picture here below.

During lifting, the motor weight has to be distributed on all the three tools.

Lifting by means
of eyebolt



4 - Installation

This section is intended for personnel (MECHANICAL MAINTENANCE TECHNICIAN) assigned to install the motor on the machine or system for which the unit has been purchased. Therefore the importance of this section is emphasised since the optimum operation of the group machine/system – motor is the consequence of the correct assembly of the parts; the correct installation will limit the sources of danger for people working near to the structure.

4.1 – Applying the Motor to the System

Manufacture the assembly flange on the machine/system where the motor has to be installed: the relevant surface has to be perfectly smooth, completely de-greased and non-deforming.

The motor must be assembled by using bolts whose size must be selected based on fixing holes dimensions: appropriate lock washers must be used. The tightening torque must be proportional to the momentum generated by the motor: if necessary, the 70% of the bolt yield load can be reached (pls. refer to the table here below). Use fixing bolts belonging to resistance class 8.8 or higher.

MAXIMUM TIGHTENING TORQUE FOR MOTOR FIXING BOLTS					
MOTOR TYPE	MOTOR CLASS	BOLT NOMINAL DIAMETER (mm)	MAX. MOMENTUM (daNm)		
			Class 8.8	Class 10.9	Class 12.9
MR	A	M08	2.48	3.50	4.18
MR / MRE	B	M10	4.97	7.00	8.37
	C	M10	4.97	7.00	8.37
MR / MRE / MRA MRD / MRDE / MRDA	D	M10	4.97	7.00	8.37
MR / MRE / MRA MRD / MRDE / MRDA MRV / MRVE / MRVA	E	M12	8.46	11.90	14.30
MR / MRE / MRA MRD / MRDE / MRDA MRV / MRVE / MRVA	F	M12	8.46	11.90	14.30
	G	M14	13.46	18.92	22.70
	H	M16	20.40	28.80	34.60
	I	M18	28.40	40.00	48.00
	L	M22	53.00	74.50	90.00
	M	M24	70.00	98.00	117.00
MRT / MRTE / MRTF / MRTA	P	M30	130.00	182.00	217.00
MRT / MRTE / MRTF	Q	M33	153.00	215.00	256.00

In case a rigid coupling is used it is necessary to verify the perfect alignment between the motor output shaft and the machine shaft; the fitment between motor shaft and application's driven shaft must be executed so that no radial or axial pre-load is generated: these extra loads reduce the bearings expected lifetime.

The motor can be assembled horizontally or vertically, with output shaft facing up or output shaft facing down; in any case there are no special rules to be followed about the positioning of the main hose connections (inlet and outlet lines), while special rules have to be followed for the drain line connections.

During installation, place first the motor against the machine assembly flange and then insert and tighten the fixing bolts.

ATTENTION

NB: motor positioning obtained as a result of the fixing bolts tightening process might generate axial and radial loads on the motor shaft that will lead to bearings lifetime reduction.

4.2 – Hydraulic Connections

4.2.1 – Main Inlet Hoses Connections

In standard configuration, the motor has two ports on the rotary valve housing which may be both inlet or outlet ports depending on the application, and 6 threaded holes.



Remove the plastic plugs from the inlet ports before connecting the hoses.

Standard Parker Calzoni threaded holes or SAE flanges (pls. refer to the “Technical Catalogue”) are supplied upon request: these flanges have grooves for the sealing gaskets (O-Rings).

In case the application foresees rigid pipes, they must be made in drawn, polished steel and must be connected to the flange by means of cutting-ring fittings (such as ERMETO).

We recommend not to use welded pipes; should it be necessary to use them, they must be internally cleaned thoroughly around the welds using both mechanical means and chemical pickling so that to prevent welding residue from entering the oil circuit.

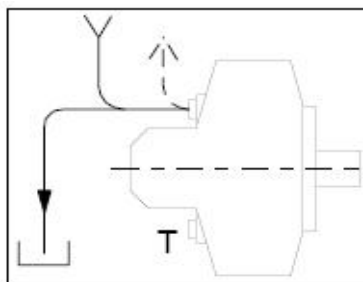
Steel pipes must be chemically pickled and then neutralised and flushed when they show traces of oxidation or in any case they are not perfectly clean.

4.2.2 – Drain Line Connections

The motor drain line must be connected directly to tank (without filter) by means of an \varnothing 1/2" or \varnothing 3/8" size pipe, not too long and without unnecessary bends and bottlenecks. Pressure inside the motor case must not exceed 5 bars to prevent damaging the shaft seal or 15 bar if the motor is equipped with a high pressure shaft seal.

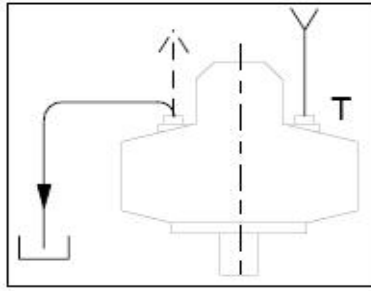
In order to avoid the motor case emptying, the drain line connection must be executed according to the following instructions:

Horizontal
Installation



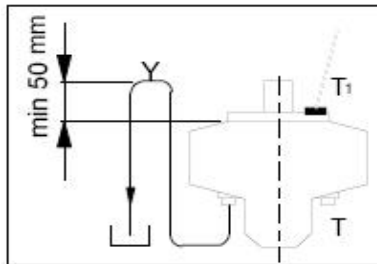
Use the drain port located in the highest position to ensure the perfect lubrication of the two motor bearings.

Vertical
Installation with
output shaft
downward



Any drain port can be used.

Vertical
Installation with
output shaft
upward.



Use one of the two drain ports and make sure that, before reaching tank, the pipe gets above the motor installation flange level, so that the two bearings lubrication is ensured. On request, the motor can be supplied with an optional purge (T1) on the front cover.

4.3 - Flushing

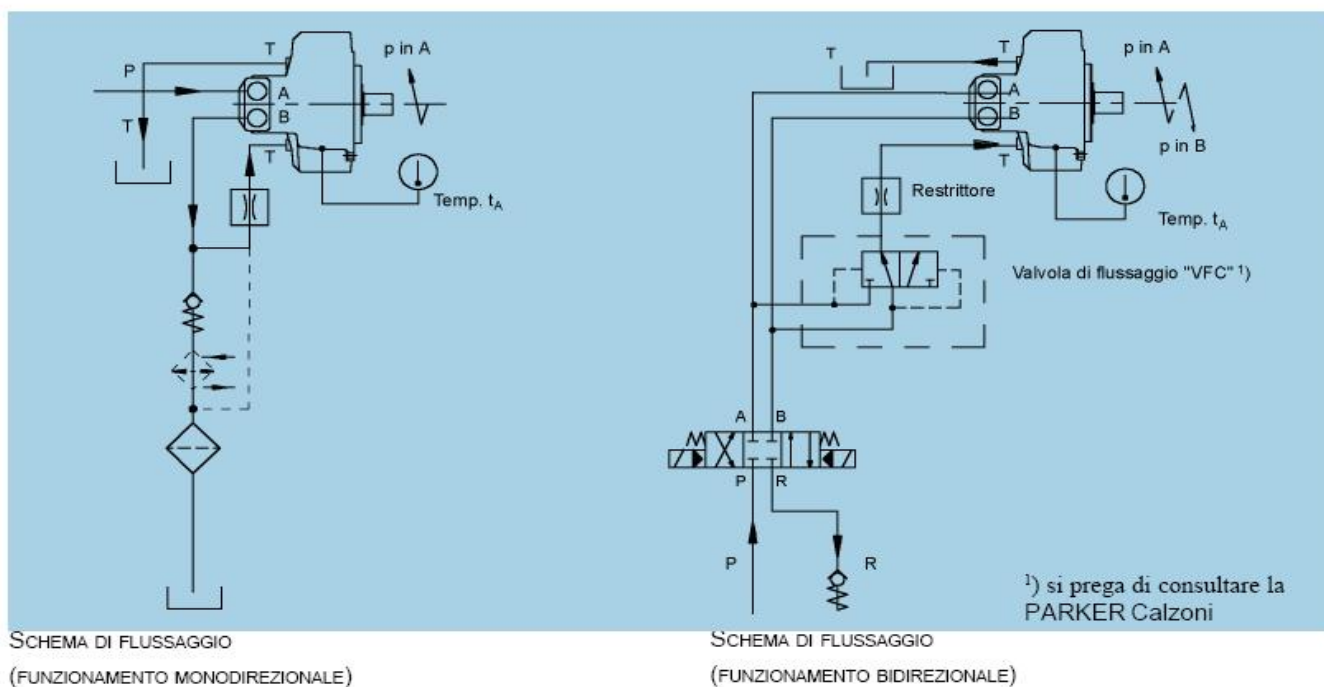
Case flushing is compulsory when the motor has to continuously operate in the "Continuous operating area with flushing" (pls. refer to the operating diagrams in the "Technical Catalogue" the motor type belongs to), in order to ensure a minimum oil viscosity inside the motor case of 30 mm²/s.

Flushing may also be necessary out of the "Continuous operating area with flushing" when the system is unable to ensure the minimum recommended viscosity level.



The oil temperature inside the motor case may be determined with excellent approximation by measuring the motor case surface temperature t_A and adding 3°C to it.

Here below there are flushing circuits that foresee the usage of flushing oil taken from the outlet line motor to tank (external flushing).



In case the motor is requested to operate in bi-directional function, it is necessary to use a valve to perform the connection between the outlet line and the motor case (flushing valve type "VFC").

ATTENTION

To measure the motor case leakage it is essential to disconnect the flushing system.

ATTENTION

For all motor types the maximum allowed case pressure is 5 bar; in case higher case pressure is required by the application, pls. contact Parker Calzoni s.r.l.

ATTENTION

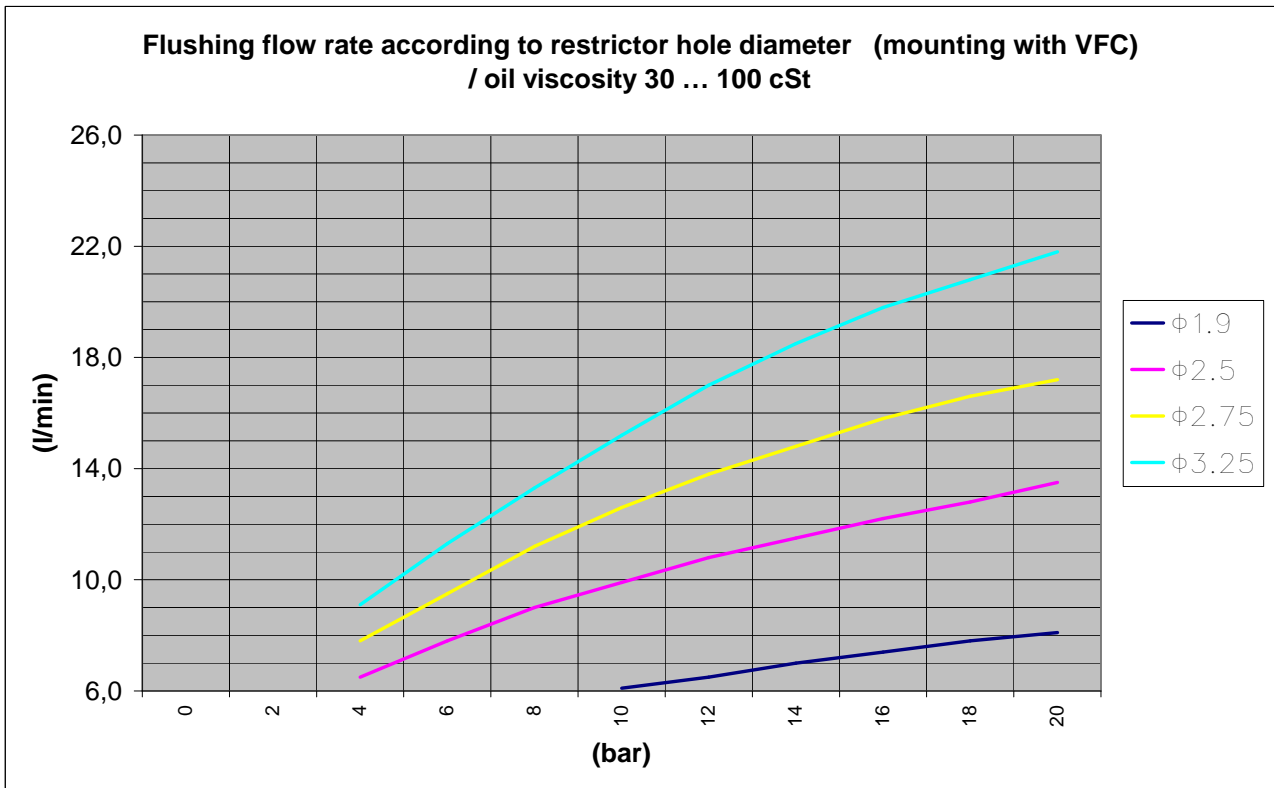
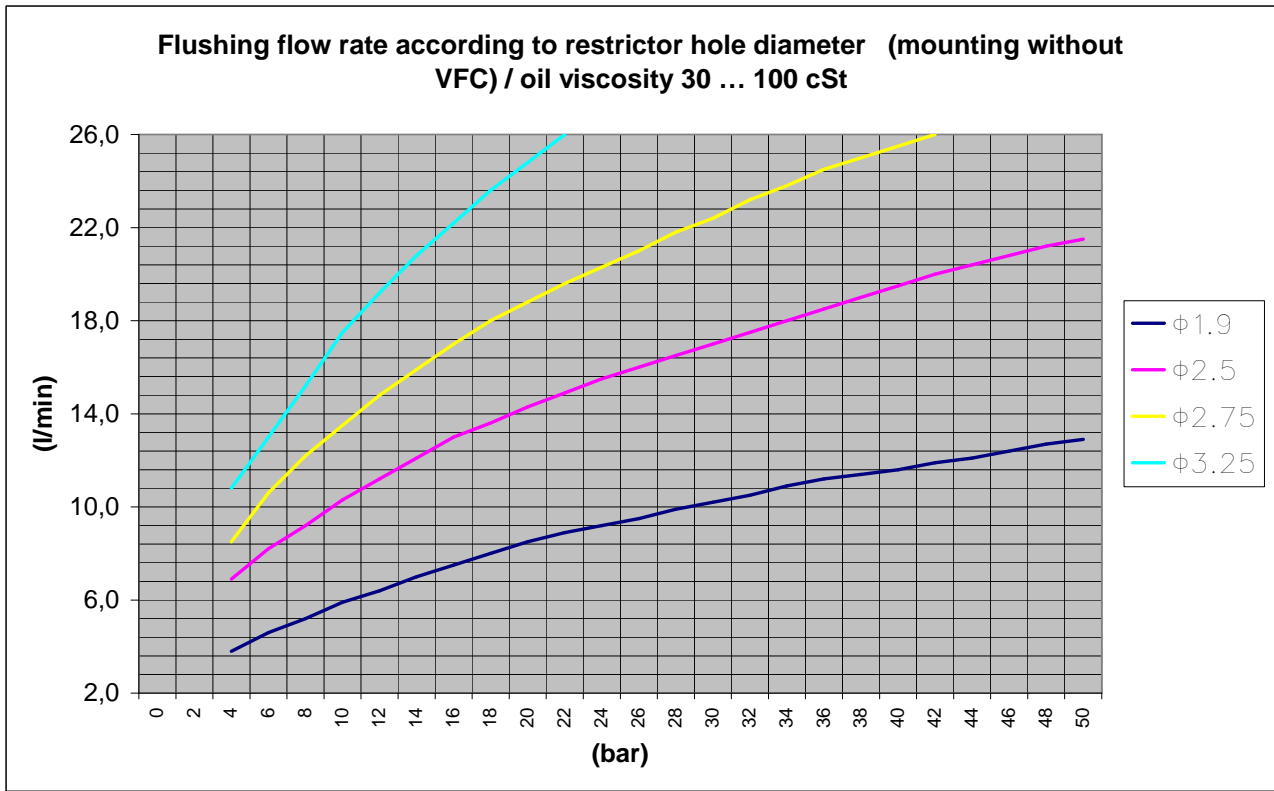
In order to avoid the case emptying, the flushing return line to tank must be positioned by following the same instructions provided for the drain line (pls. refer to "Drain Line Connection").

Taking the flushing oil from the motor return line allows the simplification of the hydraulic system; however it is possible to use an external flushing flow rate source, by means of a dedicated pump.

In the table here below, it is possible to find the recommended flushing flow rate (l/min) according to the motor size.

FLUSHING FLOW RATE SELECTION				
MOTOR TYPE	CLASS	DISPLACEMENT (cm³)		FLOW RATE (litre / minute)
		FROM	TO	
MR	A	33	57	5
MR / MRE	B	73	110	5
	C	125	190	6
MR / MRE / MRA MRD / MRDE / MRDA	D	200	400	6
MR / MRE / MRA MRD / MRDE / MRDA MRV / MRVE / MRVA	E	350	500	8
MR / MRE / MRA MRD / MRDE / MRDA MRV / MRVE / MRVA	F	600	800	10
	G	1100	1600	10
	H	1600	2100	15
	I	2400	3500	20
	L	3600	5400	20
	M	6500	8200	20
MRT / MRTE / MRTF / MRTA	P	7100	10800	23
MRT / MRTE / MRTF	Q	14000	23000	

In order to get the correct flushing flow rate, according to the return line pressure, a drilled grain with the appropriate diameter holes dimension has to be used. The holes diameter can be chosen by using the diagrams here below, in accordance to the pressure difference upstream and downstream of the grain; it has to be taken into account that the maximum case pressure cannot exceed 5 bars if the motor is equipped with a standard shaft seal.



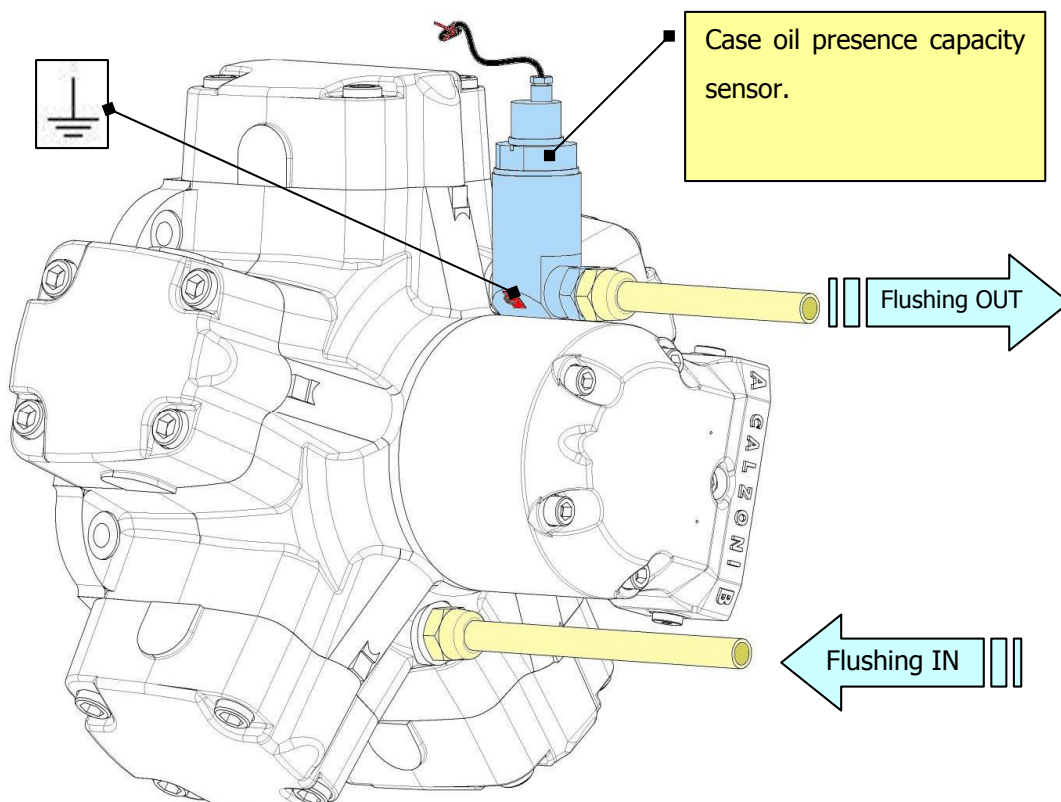
Motor case must be flushed (independently on the motor operating conditions) **in case of operation in potential explosive hazardous zones**, to ensure an adequate lubrication of the parts subject to continuous metal to metal contacts and avoid the local and superficial increase of temperature.

The motors (pls. see picture below) in conformity to the directive "ATEX" 94/9/CE must be equipped with a **case oil presence capacity sensor**; the sensor itself must be realised in conformity to the directive "ATEX" 94/9/CE. The sensor must be installed on the flushing return line ("flushing OUT").

In case the motor is installed horizontally, the sensor must be located in a higher position with respect to the shaft seal, as shown in the picture below; in case of vertical installation it is necessary to follow the indications reported in the "Drain Connections" section.

The electrical signal provided by the sensor must be used to interrupt the motor feeding if there is no more oil inside the case.

NB: for information concerning the sensor electrical connections, it is necessary to refer to the sensor technical documentation provided along with the motor.



4.4 – Displacement change connections for motor types MRD/MRDE/MRDA – MRV/MRVE/MRVA

On the motor rotating intake there is a CETOP 4.2-4-03-320 port for displacement change connections.

In case the motor operates in mono directional function, the piloting pressure necessary to perform the displacement change can be directly derived from the inlet working pressure line by means of one of 1/4" BSP pressure gauges ports located on the rotary valve housing.

Both hoses and rigid pipes can be used; however all instructions as per the "Main Inlet Hoses Connections" section must be followed.

If required by the customer, motors can be provided with a built in self piloting system.

The maximum piloting pressure corresponds to the motor maximum continuous working pressure.

For any detailed technical information on the matter, pls. refer to the MRD/MRDE/MRDA – MRV/MRVE/MRVA technical catalogue.

5 - Use

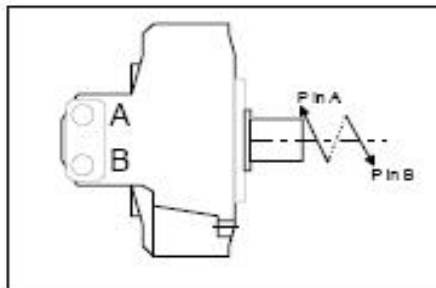
The purpose of this section is to indicate the necessary procedures to perform the motor start up. The information of this section is intended for qualified technical personnel in charge of the machine maintenance as well as for the machine operator.

5.1 – Pre start up controls.

Before performing the first motor start up, the following points have to be checked:

- Make sure the motor hydraulic connections are so to make the motor rotate in the desired direction.
For motors with standard direction of rotation:
 - Clockwise rotation (viewed facing the output shaft) with inlet pressure in the A port (pls. see picture below)
 - Counter-clockwise rotation (viewed facing the output shaft) with inlet pressure in the B port (pls. see picture below)

Motor direction of rotation



- Select the hydraulic fluid according to the recommendations specified in the "Operating Fluids" section.
- Check the main inlet & outlet lines, drain line and displacement change line (only for motor types MRD/MRDE/MRDA – MRV/MRVE/MRVA) connections as specified in the "Hydraulic Connections" section.
- A motor case flushing system, as per the recommendations specified in the "Flushing" section, has to be implemented if the motor has to continuously work in the "Continuous Working Area with Flushing" (pls. refer to the operative diagrams of the technical catalogues) or in case the system cannot ensure the recommended viscosity level.
- Make sure that all couplings and plugs are completely tightened to prevent leakage.

5.2 – Motor Case Oil Filling



All motors are supplied without lubricating oil. Before start up, the motor case must be filled in by using the same hydraulic oil used to operate the motor.

The two case drain holes are both plugged one with a metal plug and the other one with a plastic plug.

To fill in the motor case it is necessary:

- to place the motor in its working position, making sure to close the lower case drain hole by means of the metal plug;
- use the upper case drain hole to fill in the motor case, by using the same hydraulic oil used in the system, up to the level required to ensure the perfect lubrication of the bearings.

ATTENTION

Oil must be pre-filtered (pls. refer to the "Operating Fluids" section).

In the table below pls. find the volume of oil necessary to fill in the case according to the motor size:

MOTOR CASE VOLUME OF OIL				
MOTOR TYPE	CLASS	DISPLACEMENT (cm ³)		VOLUME OF OIL (litre)
		FROM	TO	
MR	A	33	57	1.0
MR / MRE	B	73	110	1.5
	C	125	190	1.7
MR / MRE / MRA MRD / MRDE / MRDA	D	200	390	2.0
MR / MRE / MRA MRD / MRDE / MRDA MRV / MRVE / MRVA	E	350	500	2.8
MR / MRE / MRA MRD / MRDE / MRDA MRV / MRVE / MRVA	F	600	800	3.3
	G	1100	1600	6.0
	H	1600	2400	9.5
	I	2400	3500	13.0
	L	3600	6000	19.0
	M	6500	8200	27.0
MRT / MRTE / MRTF / MRTA	P	7100	12000	37.0
MRT / MRTE / MRTF	Q	14000	23000	95.0



Motor case fill in control for motor usage in potential explosive hazardous atmosphere (Directive "ATEX" 94/9/CE).

It is compulsory to design the system so that not to allow the motor operation if the case is not full of oil; lack of oil in the motor case may be either due to incorrect installation (i.e.: motor case not filled in with oil) or motor failure (i.e. shaft seal failure). For this reason the motors built in conformity to the "Directive ATEX 94/9/CE" are equipped with case oil presence sensor (sensor also built in conformity to the directive)³.

5.3 – Start Up

During and immediately after the motor start up, any hydraulic system must be closely and frequently checked.

The motor does not require any special breaking-in, but all residual impurities in the system must be eliminated by running the motor at low speed and with no load applied, granting the minimum necessary inlet pressure

After a brief period in service, the system filters should be cleaned. This operation will also lead to the purge of air from the motor cylinders; air inside the motor cylinders is the reason of the possible noise at the start up of the motor. In case of the motor types MRD/MRDE/MRDA – MRV/MRVE/MRVA it is recommended to change displacement several times in order to purge air from the displacement piloting system cylinders.

In case after this initial breaking-in phase the system filters are very dirty, it is recommended to repeat the operation; however this fact does not imply that the prescribed system cleaning procedures have not been followed.




It is better to follow the above instructions each time the motor or any other part of the system is dismantled.

When running idle (no load applied), make sure the motor pressure, temperature and noise level are sufficiently low. High pressure, temperature or noise level in idle operation might be symptoms of unforeseen operating conditions.

³ Pls. see the "Flushing" section

5.4 – “Check list” for usage in presence of explosive hazardous atmosphere (Directive “ATEX” 94/9/CE)

In addition to the standard controls listed in the previous sections, in case the motor is destined to be used in explosive hazardous atmosphere, the maintenance operator must check that:

- the motor has the plate ensuring the its comply to the Directive “ATEX” 94/9/CE (pls. refer to the “Identifying the product” section)
- the motor is connected to ground by means of the dedicated threaded hole identified by means of the symbol ();
- mineral oil with inflammable degree higher than 185°C is used (pls. refer to the “Type of used fluids” section);
- motor is always flushed in whatever operating condition (pls. refer to the section “Flushing”);
- the motor is equipped with a system to detect the oil level inside the motor case: motor case must be always full of oil (pls. refer to the section “Flushing”);
- there are no creeping metal elements external to the motor;
- there are no plastic parts that might accumulate electrostatic; or they are shielded.
- for installations in zones 21 and 22 the user has adopted a scheduled periodic cleaning plan of the machinery surface and recesses so that to prevent more than 5 mm thickness dusts deposits.

6 - Maintenance

The scope of this section is to indicate the necessary operations for a correct maintenance of the motor to grant long lasting performances and reliability.

The information of this section is intended for all qualified technical personnel assigned to the maintenance of the machine; a part of this section is also of interest for the machine operator.



It is compulsory to use anti sparking safety tools in case the maintenance activity has to be performed in explosive hazardous atmosphere.

6.1 – Hydraulic system periodic maintenance

The periodic maintenance activity the system must be subject to, on a regular basis and according to the type of application, must include the listed below controls.

- Verify the possible presence of leakage in the complete hydraulic system; in case leakage is present:
 - tighten the fixing screws by means of a wrench, specially if high or frequent change of direction of application of the load characterise the application;
 - replace failed or exhausted seals.
- Inspect and keep clean all system's filters (air, oil and magnetic).
 - Replace the dirty filters;
 - Inspect the tank and check the possible presence of water or humidity.
- During system's function, it is necessary to:
 - Verify that pressure and temperature of the operating fluid are those initially determined.
- Check the characteristics of the used hydraulic fluid.
- Check that the hydraulic system does not get contaminated by external agents.



Always keep in mind that in a clean hydraulic system it is easier to determine the presence of leakage as well as find out failure's reasons.

- It is recommended to collect in a dedicated file data and findings of the periodic as well as extraordinary maintenance intervention.

6.2 – Motor Maintenance

In order to keep the motor in perfect efficiency condition, it is necessary to observe a minimum maintenance activity as described in the chapters here below.

6.2.1 – Filters Cleaning Process

The system filters must be changed after the first 200 working hours.

The subsequent filters' replacement or cleaning has to be performed every 3 months or 500 operating hours, whatever one is the first to occur (in case a filter cleanliness level indicator is present, as soon as the signal of locking is received).

6.2.2 – Operating Fluid Change

The periodic scheduling of oil replacement is based on the working condition of the motor, of the environmental conditions and of the quantity of oil in the system.

As indicated in the "Hydraulic System Maintenance", it is recommended to perform a periodic analysis of the operating oil in order to determine its characteristics (viscosity, oxidation, filtration level, etc.).

For other operating fluids, it is compulsory to follow the relevant manufacturer's instructions.

6.2.3 - Viscosity

Verify that the viscosity level is within the recommended values as indicated in the "Operating Fluids" section.

6.2.4 - Oxidation

Mineral oil gets oxidized proportionally to the usage degree and operating temperature. The oil oxidation gets evident because of its change of colour, bad smell, acidity increase and because of the generation of sludge inside the tank.

In case symptoms of this kind are detected, the system oil must be immediately changed.

6.2.5 – Water Presence

The presence of water inside the oil can be determined by taking oil samples from the bed of the tank: oil floats on water, so, if present, water tends to stay on the tank's bed.

If its presence is determined, water must be regularly purged.

ATTENTION

Presence of water in the hydraulic system can severely damage the motor.

6.2.6 – Degree of contamination

A high degree of contamination of the operating oil causes a severe wear of all hydraulic components: for this reason, the cause of the contamination must be identified and eliminated.

This analysis might also help in better optimising the schedules for the oil replacement. In any case, the oil changes have to be performed at least every 12 months.

ATTENTION

In order to avoid mixing of different oils, when replacing the operating fluid, it is necessary to empty all the machinery and pipes, clean them carefully and clean the tank.

It is important to perform the complete oil replacement also inside the case of the motor: motor case must be totally emptied.

6.3 - Emptying

In order to complete empty the motor, it is necessary to:

- unscrew the plug (1) (pls. see the picture below) from the drain port;
- let the fluid get out from the case.

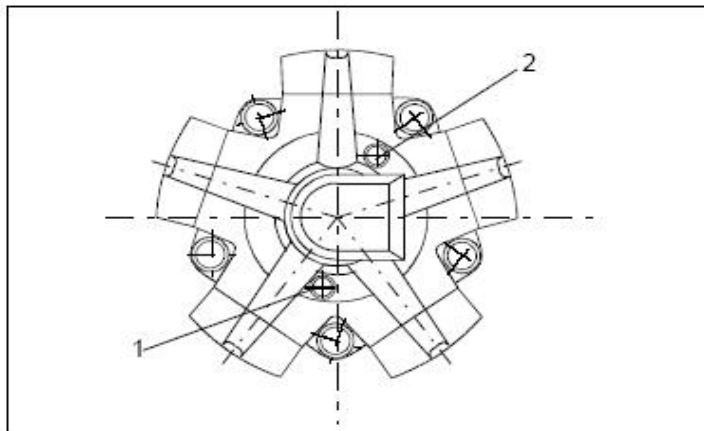


In order to facilitate the operation, we suggest that also the second drain port is opened (2)

When the operation is completer:

- plug the first drain port (1), and the second one (2) if opened.

Emptying motor
case process



Once the motor case is emptied, the operating fluid has to be gathered and consigned to an authorised collector.

IT IS FORBIDDEN TO THROW ANY OPERATING OIL INTO THE SEWAGE!

7 – Repair and Service

The scope of this section is to provide technical support in case of failure during operation and list the main service centre in the world. One chapter is also dedicated to the general warranty conditions reserved by Parker Calzoni. The information of this section is intended for qualified technical personnel assigned to the MAINTENANCE of the motor.

7.1 – General Information

In case a service or repair intervention on motors is required, it has to be performed by an authorized Parker Calzoni s.r.l. service centre or directly by Parker Calzoni s.r.l.

The motor repair includes all motors internal components inspection with respect to the original Parker Calzoni original drawings and technical specifications.

When sending a motor back to Parker Calzoni or to an authorized service centre, it is important to inform about:

- complete motor code
- serial number
- service working hours
- experienced failure
- type of application
- working conditions (cycle, pressure, speed, etc.)
- oil type and working temperature
- filtration degree

7.2 - Malfunctions: Trouble-shooting

The scope of this section is to provide the necessary trouble-shooting information and identify the actions to undertake in order to solve the problem.

Malfunction	Possible Cause	Actions to be undertaken
The motor does not run	<ol style="list-style-type: none"> 1. Mechanical transmission block. 2. The motor does not generate enough torque because the operating pressure is too low. 3. The electric motor does not supply enough power. 4. Piloting pressure is too low (<u>dual & variable displacement motors only</u>). 5. Piloting system failure (<u>dual & variable displacement motors only</u>). 	<ol style="list-style-type: none"> 1. Check system pressure. In case the system pressure exceeds the relief valve pressure set, remove the load from the transmission. 2. Check the system pressure level and, if necessary, correct the pressure limiting valve set value. 3. Check the hydraulic schematic. 4. Increase the piloting pressure up to the required value (pls. refer to

		<p>“Displacement Change connections for motor types MRD/MRDE/MRDA – MRV/MRVE/MRVA” or refer to Parker Calzoni Service Centre).</p> <p>5. Pls. contact Parker Calzoni Service Centre.</p>
The motor rotates in the wrong direction	1. The hydraulic inlet & outlet A & B connections are reversed.	1. Correct the connections.
Motor rotation is not smooth	<p>1. Pressure and/or flow rate .fluctuations of the hydraulic system.</p> <p>2. Displacement fluctuations (<u>variable displacement motors only</u>).</p>	<p>1. Research the reason by analysing the hydraulic circuit or the mechanical transmission.</p> <p>2. Check the hydraulic system that feeds the motor displacement control function or inspect the motor piloting system (if so, pls. refer to Parker Calzoni service centre).</p>
Noise	<p>1. Timing system still breaking in.</p> <p>2. Too low boost pressure.</p> <p>3. Residual air inside the motor driving system.</p> <p>4. Resonance phenomena generated by pipes or the rest of the system.</p> <p>5. Bearings.</p>	<p>1. After the first few operating hours, the noise (squeaking) generated by the contact surfaces of the timing system disappears.</p> <p>2. Set the boost pressure value as described in the “Pump Operation: Boost Pressure” section.</p> <p>3. After the first few operating hours, the air present in the motor driving system will be mixed with the fluid and purged out.</p> <p>4. Optimise size and type of hydraulic pipe connections to the motor. For information and support, pls. contact Parker Calzoni.</p> <p>5. When operating idle, the bearings noise can be heard; the noise disappears as soon as load is applied to the motor shaft.</p> <p>5.1. For bearings end of life pls. contact Parker Calzoni Service Centre.</p>

External Leakage	<ol style="list-style-type: none"> 1. Oil sweating between motor components (i.e.. between motor case and cylinder head because of oil residues and anti rust fluid). 2. Porosity in foundry parts. 3. Shaft seal leakage. 	<ol style="list-style-type: none"> 1. Clean carefully the motor and verify if the leakage is still present. 2. Pls. contact Parker Calzoni Service Centre. 3. Pls. contact Parker Calzoni Service Centre.
Reversed displacement piloting function (<u>only for variable displacement motors</u>)	<ol style="list-style-type: none"> 1. Incorrect displacement piloting system (reversed piloting function). 	<ol style="list-style-type: none"> 1. Re-set properly the displacement piloting function.

In case the above proposed solutions do not solve the problem, or in case of doubts as well as for malfunctions not listed in the above table, pls. refer to Parker Calzoni service centre.

Many motor failures have as immediate consequence an abrupt and important drain leakage increase both in terms of flow rate and impurities present in the fluid.

DANGER

If the motor case is flushed, before performing the drain leakage check, pls. remember to exclude the flushing system first.

7.3 – Warranty Conditions

- Parker Calzoni guarantee the motors for failures due to material defect and erroneous machining for 12 months after the unit installation; the period of 12 months is evaluated considering the motor running 8 hours per day.
- For repaired motors the warranty period is reduced to 6 months.
- For units used in a multiple shifts working condition, the warranty period is reduced proportionally (i.e. the motor works for two shifts of 8 hours per day, the warranty period is reduced to 6 months).
- Anyhow, the warranty period ends after 18 months from the consignment of the motor to the end user customer.
- The examination of the warranty claim by Parker Calzoni is based upon the assumption the customer has fulfilled all the contract duties.
- For the examination of a warranty claim Parker Calzoni need to check the complete motor. Any kind of service operation performed by the customer on a unit object of warranty claim (i.e. disassembly of the motor components) causes the warranty loss.

- From the warranty arises for Parker Calzoni the duty of repairing a unit, replacing it or part of it according to what Parker Calzoni decide it is the most effective solution. Parker Calzoni decision is unquestionable.
- All the costs, of any kind, deriving from the disassembly of the unit object of the warranty claim, from the transport of the repaired or replaced unit from Parker Calzoni to the customer's residence and from the re-assembly of the unit itself, are at customer's charge.
- For the motor components already repaired or replaced free of charge, the warranty is automatically extended, till a maximum period of 3 months after the consignment to the end user customer.
- Parker Calzoni do not accept warranty claims for failures provoked by the negligence or incompetence of the customer; Parker Calzoni do not accept warranty claims for failures caused by running the motor in operating conditions different from the ones recommended by Parker Calzoni technical documentation and instructions.
- If the warranty claim is not accepted by Parker Calzoni, Parker Calzoni will submit the customer a regular reparation estimated cost; in case the customer does not confirm it, Parker Calzoni will return the material and charge the customer with the relevant transportation expenses.

8 - Scrapping

The purpose of this section is to provide instructions and suggestions for properly scrapping the motor. The information in this section is intended for all qualified technical personnel responsible for motor maintenance.

8.1 – Shut-down and dismantling

8.1.1 – Safety Warnings

- The machine must be dismantled and scrapped by qualified personnel familiar with safety regulations related to the type of intervention to be executed.
- During disassembly, the operator must wear the most appropriate protective gear, based on the type of residual or intrinsic hazard involved in the dismantling process. The operator must also make sure that the motor parts to be removed have not an excessive weight and can be lifted individually by an operator (maximum 25 kg are allowed); moreover the operator must pay attention to the fact that there is no risk of a weight that follows down.

8.1.2 - Instructions

The motors belonging to the MR-MRE-MRA/MRD-MRDE-MRDA/MRV-MRVE-MRVA/MRT-MRTE-MRTA range are made in the following materials:

- Ferrous material
- Plastic/Rubber material (gaskets)
- Operating Fluid

Ferrous Material

The motor must be dismantled appropriately in order to separate the different materials it consists of. All materials must be scrapped at an authorised demolition centres.

DANGER

Make sure that all motor parts to be lifted individually by the operator (maximum 25 kg) and that there is no risk of a weight following down

Plastic/Rubber Material (gaskets)

The sealing rings (O-rings) in the motor are the only components made of plastic/rubber material.

Operating Fluid



Collect the fluid from the motor following the procedure described in Section "Emptying".



The collected fluid must be sent to authorised disposal centres.

IT IS STRICTLY FORBIDDEN TO DISPOSE USED OIL THROUGH THE SEWAGE SYSTEM!

9 – Data Collection Format

		
Data collection format		
Motor code		
Serial Number		
Application	<input type="checkbox"/> - industrial <input type="checkbox"/> - mobile <input type="checkbox"/> - other (pls. specify:)	
Operating Environment	<input type="checkbox"/> - marine <input type="checkbox"/> - mine <input type="checkbox"/> - foundry <input type="checkbox"/> - ATEX certification request <input type="checkbox"/> - other (pls. specify:.....)	
Motor assembly position	<input type="checkbox"/> - horizontal <input type="checkbox"/> - vertical with output shaft upward <input type="checkbox"/> - vertical with output shaft downward <input type="checkbox"/> - other (pls. specify:)	
Operating Fluid	<input type="checkbox"/> - mineral oil ISO VG ... <input type="checkbox"/> - water based fluid type HFA <input type="checkbox"/> - water based fluid type HFB <input type="checkbox"/> - water based fluid type HFC <input type="checkbox"/> - water based fluid type HFD <input type="checkbox"/> - Biodegradable fluid type <input type="checkbox"/> - other (pls. specify:)	
Max. Operating Pressure (bar)		
Max. Operating Speed (rpm)		
Max. Working Power (kW)		
Max. Operating Temperature (°C)		
Number of Service hours		
Motor is flushed	<input type="checkbox"/> - yes (..... l/min) <input type="checkbox"/> - no	
Failure / Malfunction description		
Notes		

10 - Contacts

For any kind of information concerning sales and service:

Parker Calzoni S.r.l.

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CALZONI

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