

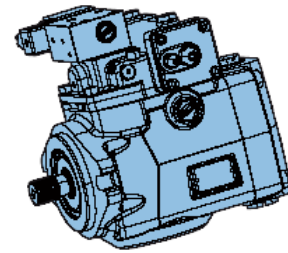
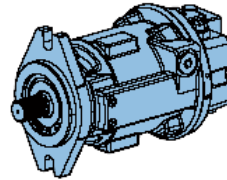


# M MOTORS



## MV. HYDRAULIC MOTORS.

### OVERVIEW



MV2

MV3

|                                  |                       |  |                             |                              |
|----------------------------------|-----------------------|--|-----------------------------|------------------------------|
| <b>Displacement</b>              | Maximum               | cm <sup>3</sup> /rev [in <sup>3</sup> /rev.] | From 35 [2.14] to 53 [3.23] | From 55 [3.36] to 65 [3.973] |
|                                  | Minimum               | cm <sup>3</sup> /rev [in <sup>3</sup> /rev.] | From 17 [1.04] to 41 [2.50] | 25 [1.53]                    |
| <b>Speed</b>                     | at max. displacement  | rpm  | 3 200                       |                              |
|                                  | at mini. displacement | rpm  | 4 200                       |                              |
| <b>Output torque</b>             |                       | N.m [lbf.in]                                 | 211 [1868]                  | 256 [2266]                   |
| <b>Max. pressure</b>             | Continuous            | bar [PSI]                                    | 250 [3 626]                 |                              |
|                                  | Peak                  | bar [PSI]                                    | 350 [5 076]                 |                              |
| <b>Case pressure</b>             | Continuous            | bar [PSI]                                    | 1,5 [21,7]                  |                              |
|                                  | Maximum (cold start)  | bar [PSI]                                    | 2,5 [36.2]                  |                              |
| <b>Mounting flange and shaft</b> |                       |  | SAE B                       |                              |
| <b>Mass</b>                      |                       | kg [lb]                                      | 19 [42]                     | 30 [66]                      |

\* minimal displacement is determined by max. acceptable speed (4200 rpm)

The MV motors are 2 displacement axial pistons swashplate design. They can be used for close or open loop circuits. The MV motors provide a torque according to the differential pressure between A and B ports. Their speed of rotation is function of input flow and motor displacement.

The displacement is obtained by number of pistons, piston diameter and angle of swash plate.

The MV motors are available with hydraulic or electrical two position control.

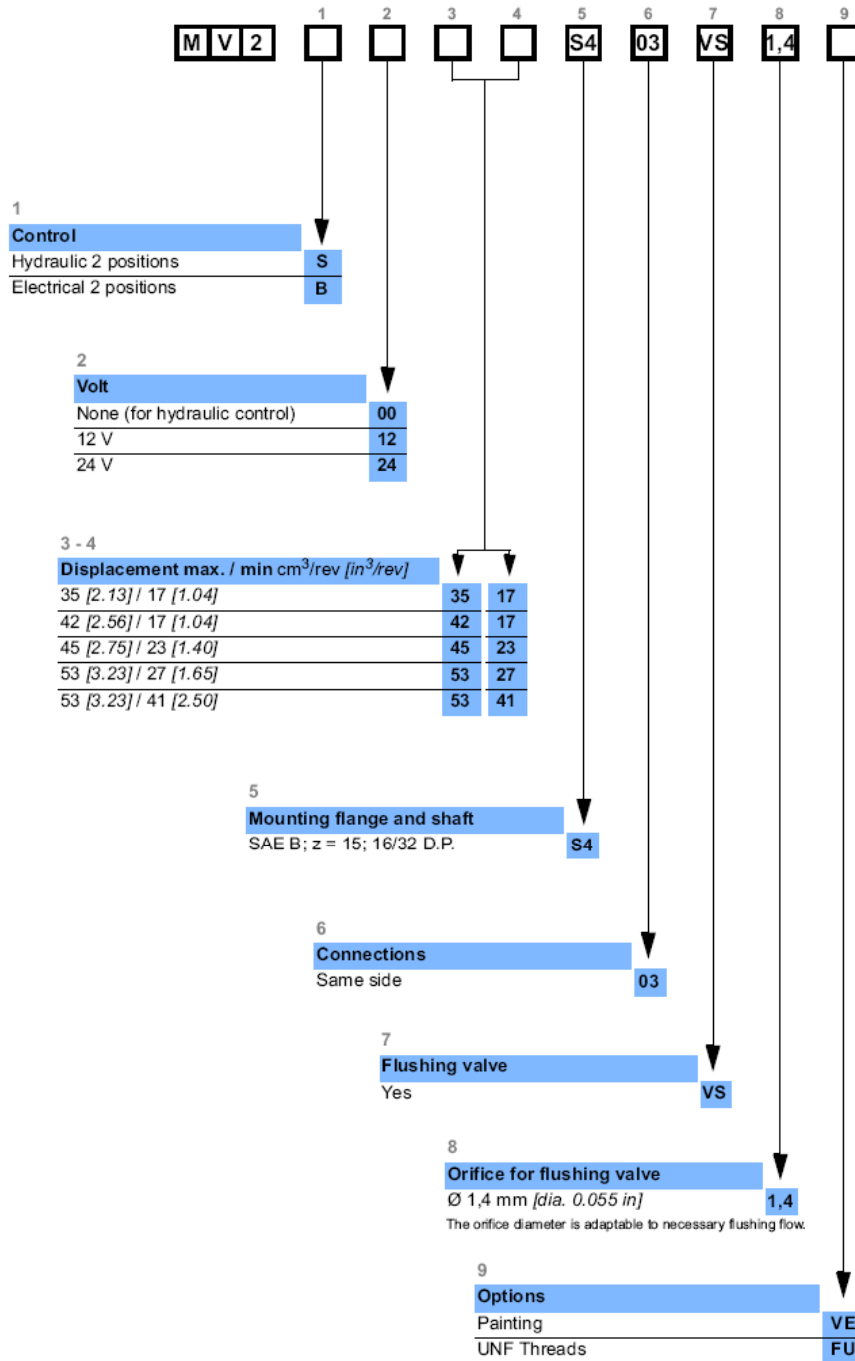
The MV motors can be equipped with flushing valve to reduce the oil temperature in the circuit.



**CONTENT**

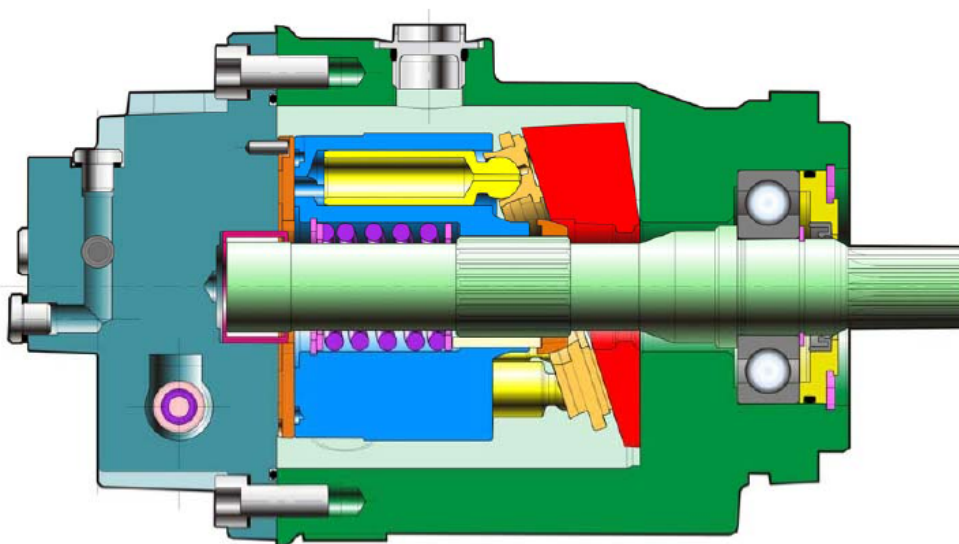
|                             |           |                      |
|-----------------------------|-----------|----------------------|
| <b>MOTOR MV2</b>            | <b>4</b>  | Motor MV2            |
| Model Code                  | 4         |                      |
| Characteristics             | 5         |                      |
| Options                     | 9         |                      |
| <hr/>                       |           |                      |
| <b>MOTOR MV3</b>            | <b>10</b> | Motor MV3            |
| Model Code                  | 10        |                      |
| Characteristics             | 11        |                      |
| Options                     | 16        |                      |
| <hr/>                       |           |                      |
| <b>OPERATING PARAMETERS</b> | <b>18</b> | Operating parameters |
| Operating parameters        | 18        |                      |

## MODEL CODE



it is possible to combine several options.  
Consult your Poclair Hydraulics application  
engineer for more information.

## CHARACTERISTICS

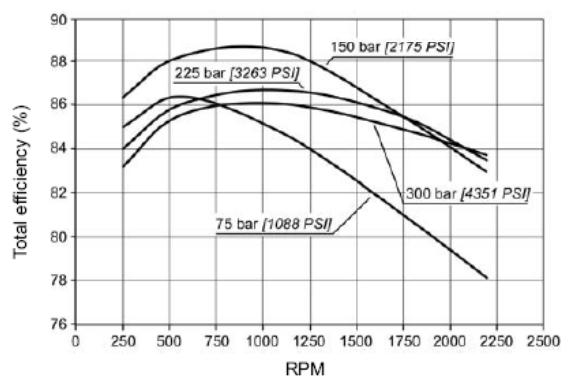


|                             |  |                             |
|-----------------------------|--|-----------------------------|
| Max. displacement*          | cm <sup>3</sup> /rev [in <sup>3</sup> /rev.] | From 35 [2.14] to 53 [3.23] |
| Mini. displacement*         | cm <sup>3</sup> /rev [in <sup>3</sup> /rev.] | From 17 [1.04] to 41 [2.50] |
| Speed at max. displacement  | rpm  | 3 200                       |
| Speed at mini. displacement | rpm  | 4 200                       |
| Output torque               | N.m [lbf.in]                                 | 211 [1868]                  |
| Max.continuous pressure     | bar [PSI]                                    | 250 [3 626]                 |
| Max. peak pressure          | bar [PSI]                                    | 350 [5 076]                 |
| Mounting flange and shaft   |  | SAE B                       |
| Mass                        | kg [lb]                                      | 19 [42]                     |

The maximal and minimal displacements are determined from angle of swashplate and can not be subsequently changed. If the motor is installed in an open loop, be careful to provide a backpressure (return line) of 10 bar [145 PSI].

### Motor performances

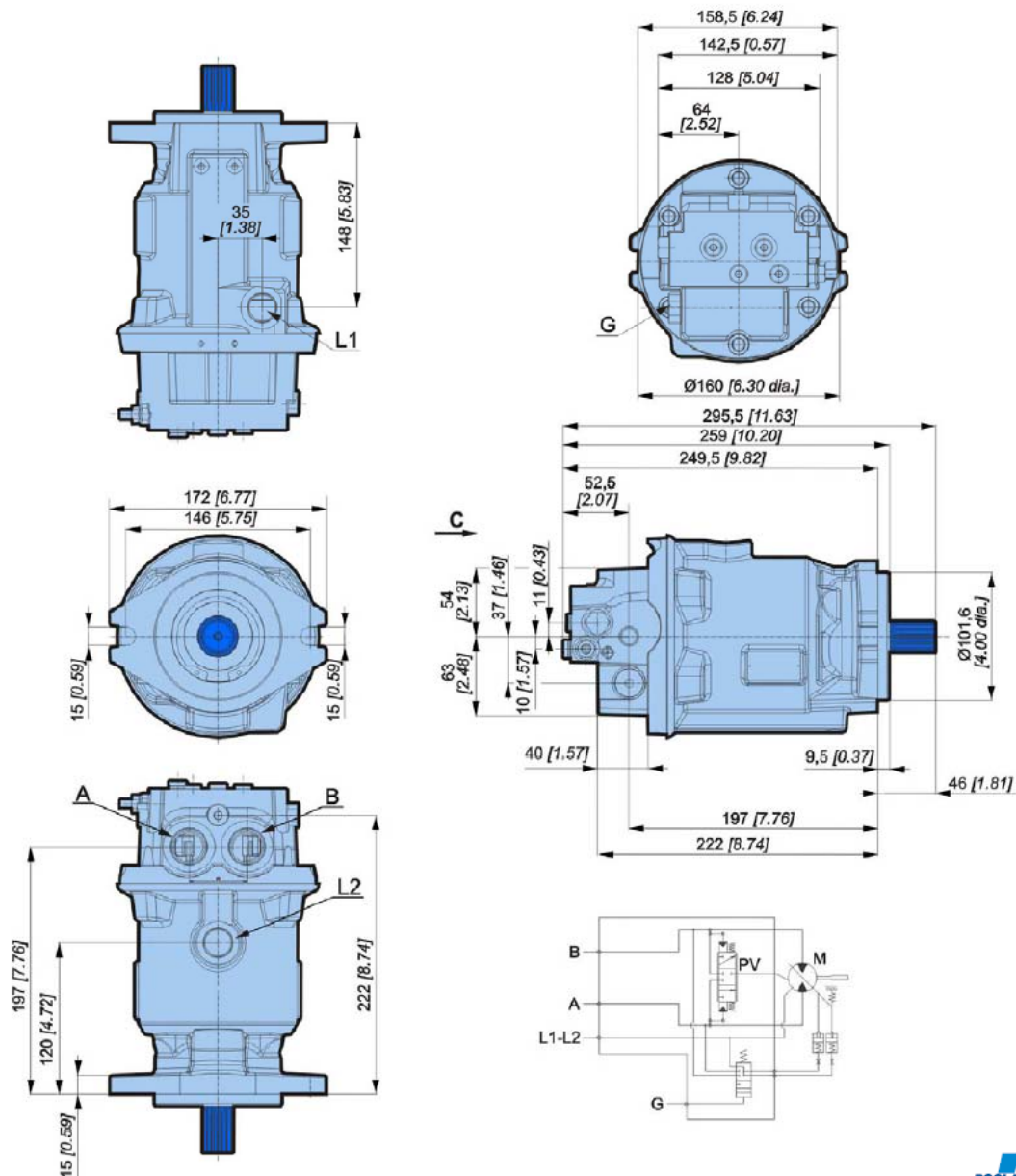
Total efficiency at 45 cm<sup>3</sup>/rev [2.75 in<sup>3</sup>/rev.] and 50°C [122°F].



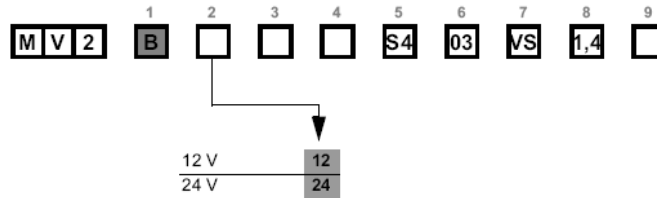
### Hydraulic control (two positions)

M
V
2
1
S
2
00
3
4
5
S4
6
03
7
VS
8
1,4
9

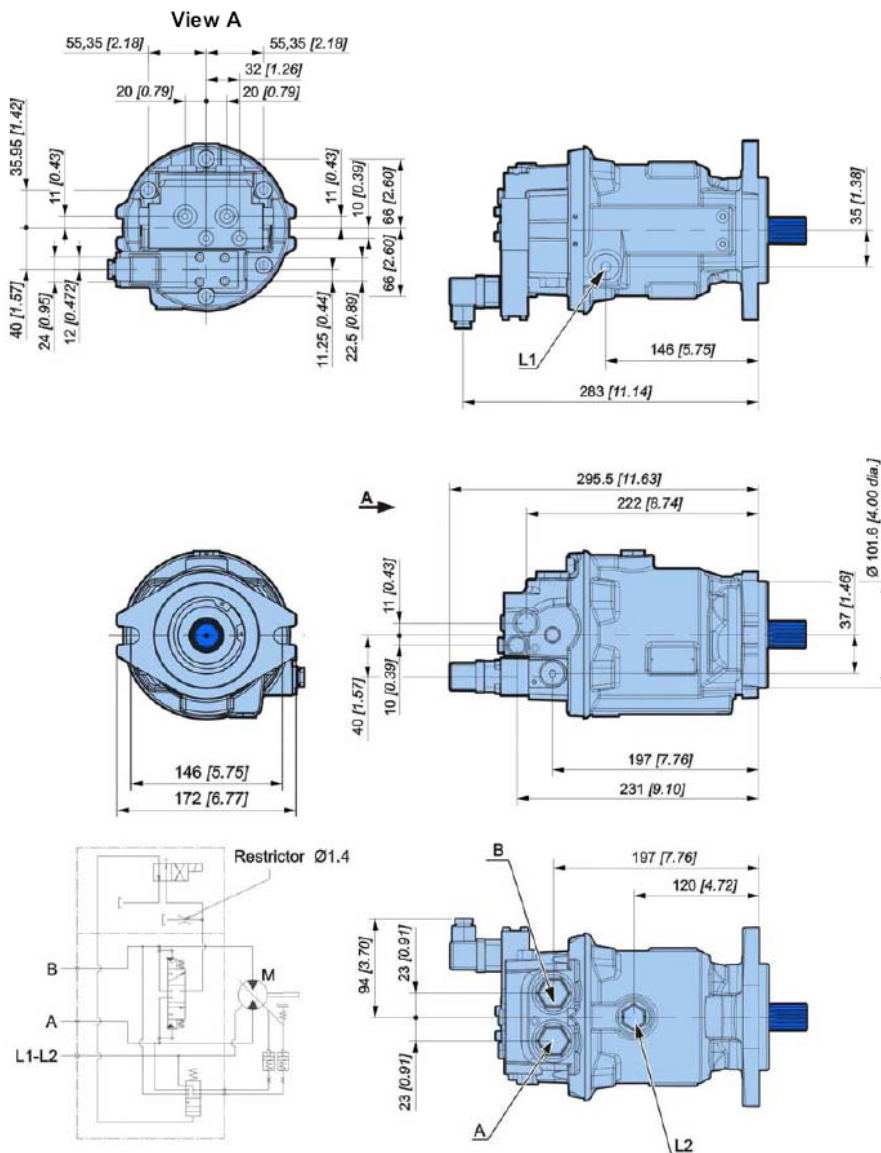
The displacement is modified by feeding an input pressure into the port G (minimal required pressure is 10 bar [145 PSi]). Motor without pressure is at max. displacement.



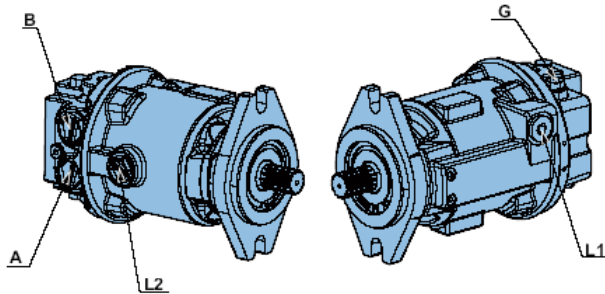
**Electrical control (two positions)**



The motor is at maximal displacement if there is no current. The pressure to change the displacement comes from an internal line. There is no need of external line.



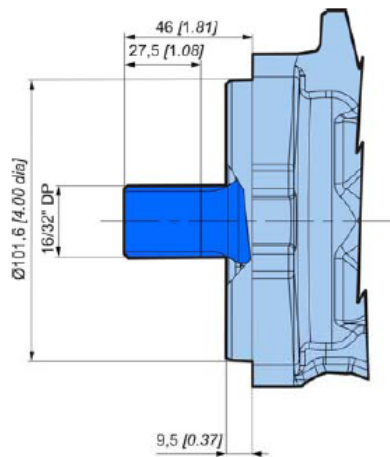
## Connections



| Port  | Function                    | ISO 1179-1 (standard) |
|-------|-----------------------------|-----------------------|
| A-B   | Pressure                    | 3/4" - BSPP           |
| L1/L2 | Drain                       | 1/2" - BSPP           |
| G     | External hydraulic shifting | 1/4" - BSPP           |

## Mounting flange and shaft

15 teeth  
Max torque: 360 N.m [3186 in.lbf]



Splined ANSI B92.1a-1976  
Pitch 16/32" DP  
Pressure angle 30°  
Tolerance class: 5



## OPTIONS

### Painting



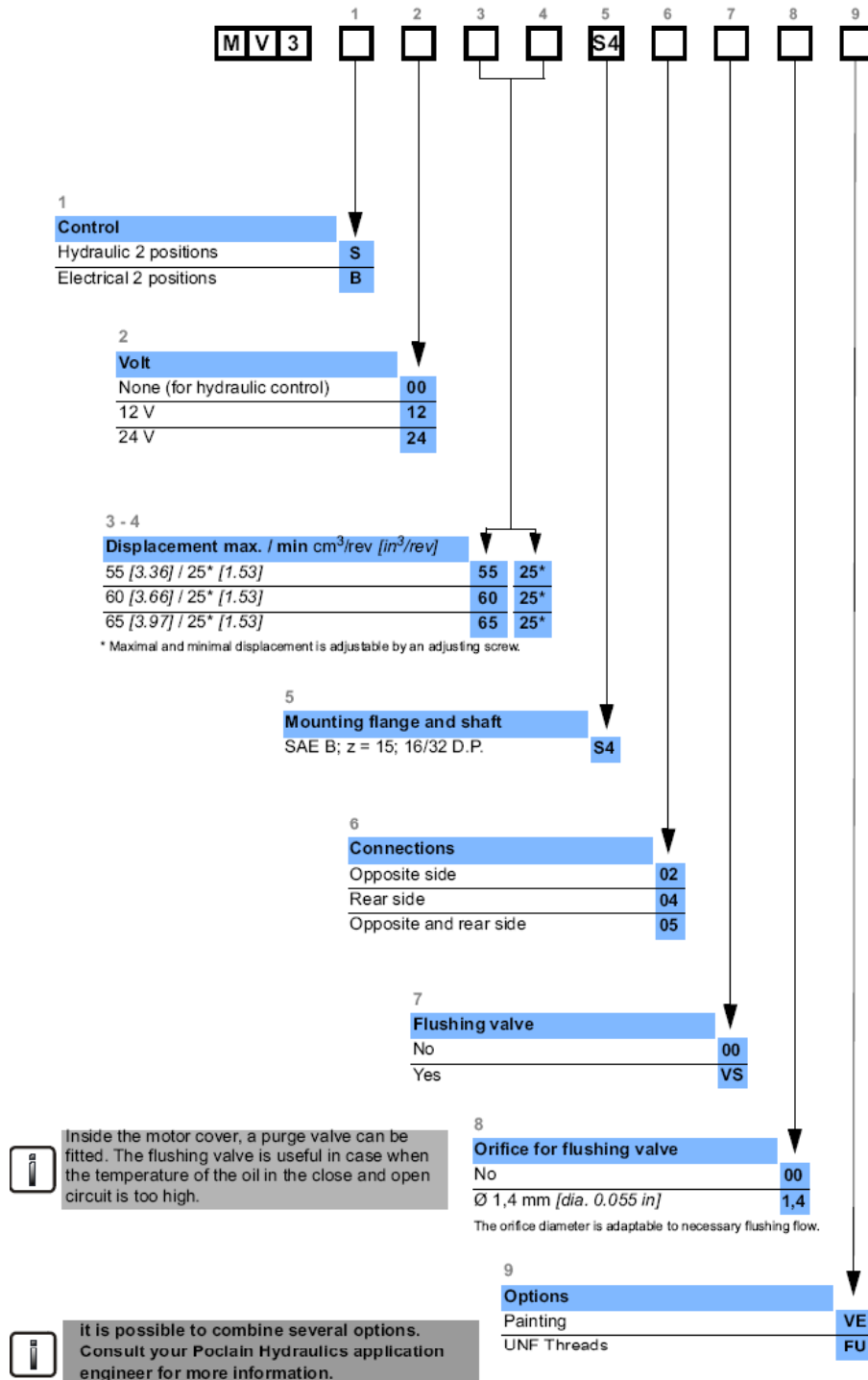
The standard colour is black RAL 9005

### UNF threads

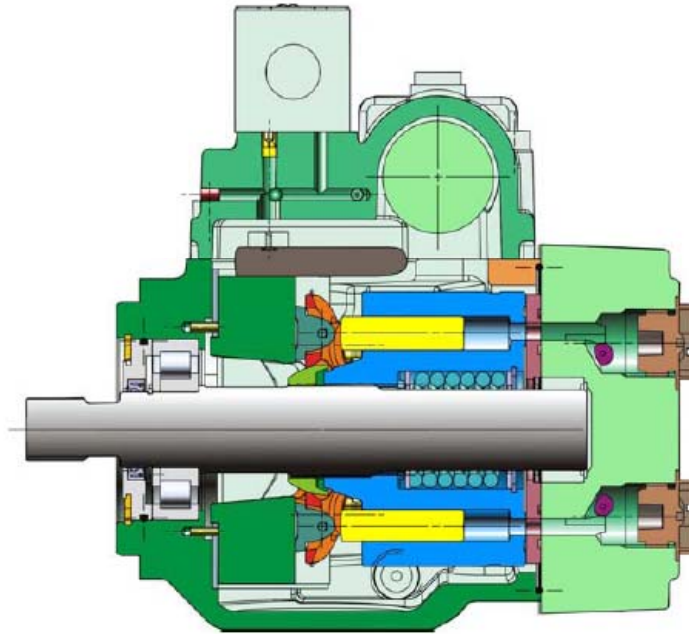


| Port  | Function                    | ISO 11926-1 (option FU) |
|-------|-----------------------------|-------------------------|
| A-B   | Pressure                    | 1" 1/16 - 12 UNF        |
| L1/L2 | Drain                       | 7/8" - 14 UNF           |
| G     | External hydraulic shifting | 7/16" - 20 UNF          |

## MODEL CODE



## CHARACTERISTICS



|                                    |  |                              |
|------------------------------------|--|------------------------------|
| <b>Max. displacement*</b>          | cm <sup>3</sup> /rev [in <sup>3</sup> /rev.] | From 55 [3.36] to 65 [3.973] |
| <b>Mini. displacement**</b>        | cm <sup>3</sup> /rev [in <sup>3</sup> /rev.] | 25 [1.53]                    |
| <b>Speed at max. displacement</b>  | rpm  | 3 200                        |
| <b>Speed at mini. displacement</b> | rpm  | 4 200                        |
| <b>Output torque</b>               | N.m [lbf.in]                                 | 256 [2266]                   |
| <b>Max. continuous pressure</b>    | bar [PSI]                                    | 250 [3 626]                  |
| <b>Max. peak pressure</b>          | bar [PSI]                                    | 350 [5 076]                  |
| <b>Mounting flange and shaft</b>   |  | SAE B                        |
| <b>Mass</b>                        | kg [lb]                                      | 30 [66]                      |

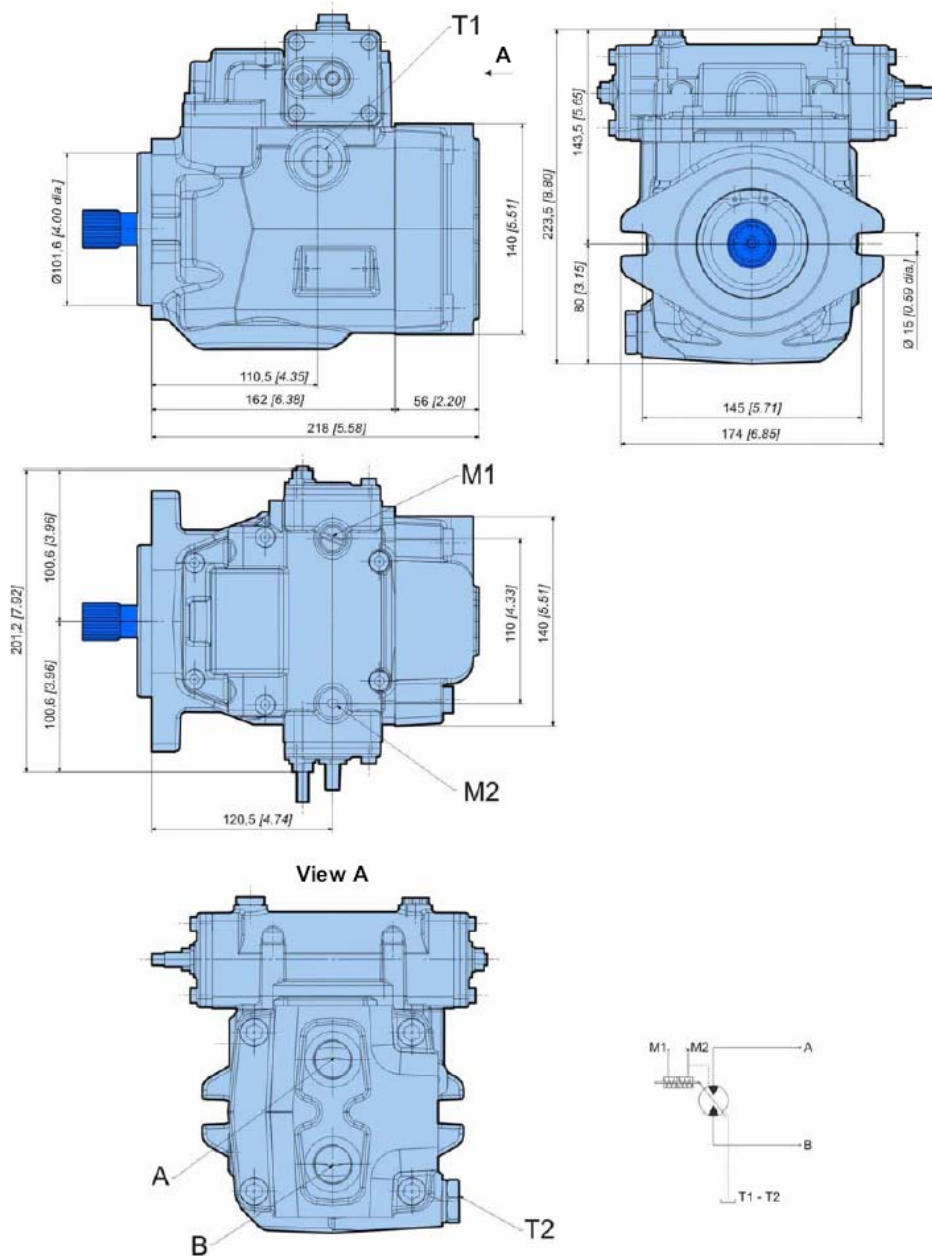
\* The maximal displacement can be reduced with the screw of max. displacement limiter.

\*\* The minimal displacement can be adjusted with the screw of mini. displacement limiter. Taking care that the max. speed is 4200 RPM. If the motor is installed in an open loop circuit, make sure that the back pressure is 10 bar [145 PSI].

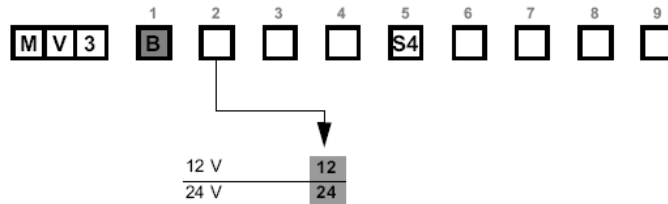
Hydraulic control (two positions)



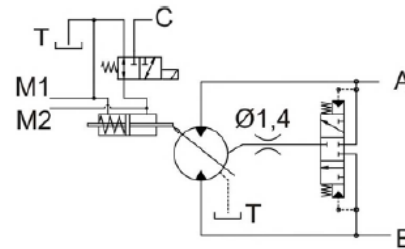
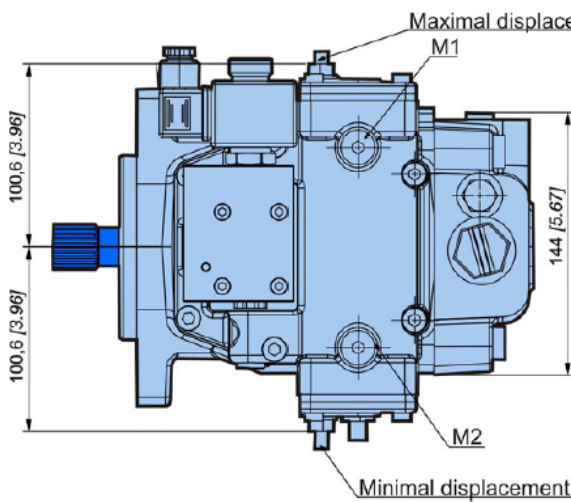
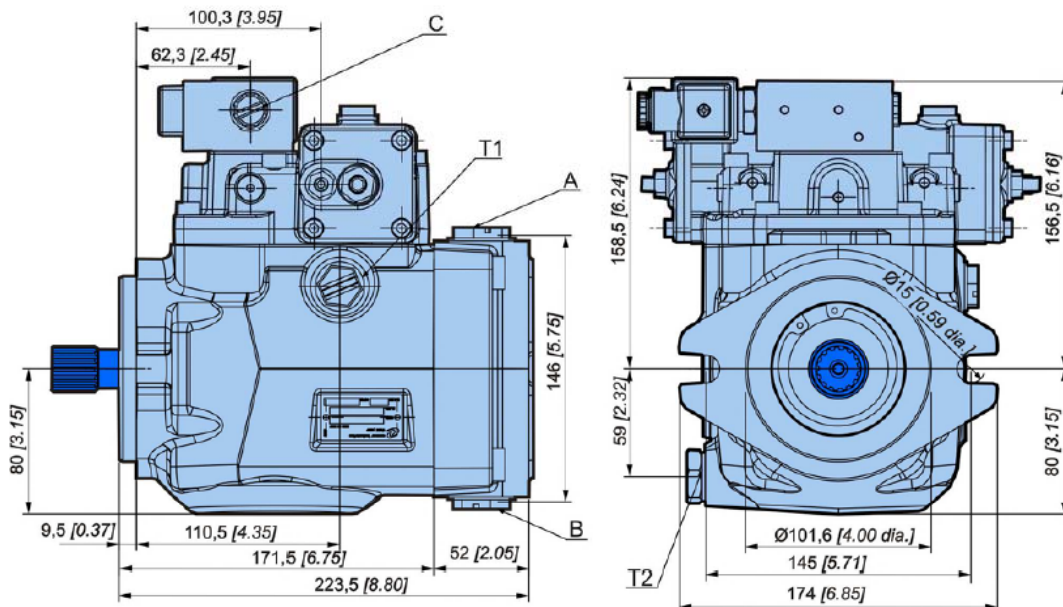
The displacement is modified by feeding an input pressure into the port M1 (minimal required pressure is 15 bar [210 PSI]). Motor with no pressure is at max. displacement.



**Electrical control (two positions)**



The motor is at maximal displacement if there is no current. The pressure to change the displacement comes from an external line at the port C.

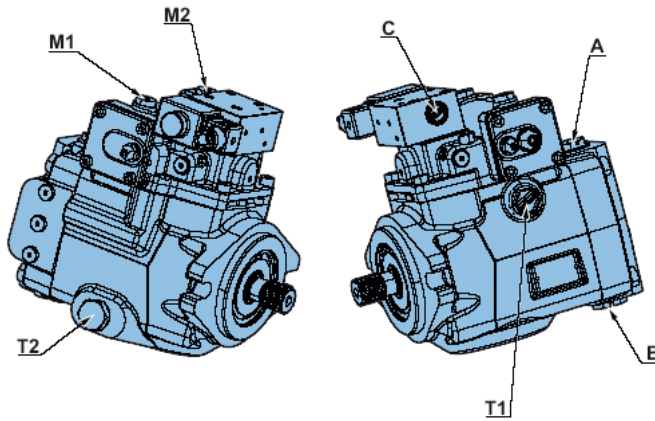


**Connections**

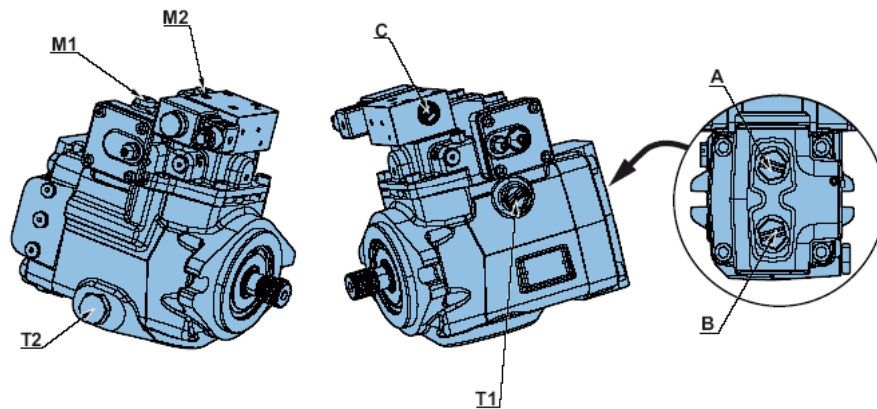


| Port  | Function                      | ISO 1179-1 (standard) |
|-------|-------------------------------|-----------------------|
| A-B   | Services                      | 3/4"                  |
| M1/M2 | Servo control pilot           | 1/4"                  |
| T1/T2 | Drain                         | 1/2"                  |
| C     | Variable displacement control | 1/4"                  |

**02 Opposite side**



**04 Rear side**



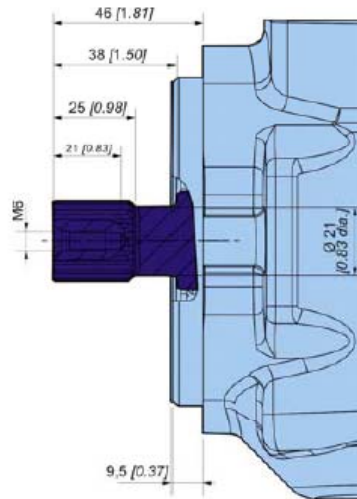
**05 Opposite and rear sides**



### Mounting flange and shaft



15 teeth  
Max torque: 360 N.m [3186 in.lbf]



Splined ANSI B92.1a-1976  
Pitch 16/32" DP  
Pressure angle 30°  
Tolerance class: 5

## OPTIONS

### Painting



The standard colour is black RAL 9005

### UNF threads



| Port  | Function                      | ISO 11926-1 (option FU) |
|-------|-------------------------------|-------------------------|
| A-B   | Services                      | 1 1/6 UNF               |
| M1/M2 | Servo control pilot           | 1/2 20 UNF              |
| T1/T2 | Drain                         | 7/8 UNF                 |
| C     | Variable displacement control | G 1/4                   |



## OPERATING PARAMETERS

### Poclairn Hydraulics recommendations for fluid



Poclairn hydraulics recommends the use of hydraulic fluids defined by the ISO 12380 and ISO 6743-4 standards. For temperate climates, the following types are recommended.

- HM 46 or HM 68 for fixed installations.
- HV 46 or HV 68 for mobile installations.
- HEES 46 for mobile installations.

These specifications correspond to category 91H of the CETOP standard, parts 1, 2 and 3 of the DIN 51524 standard, and grades VG32, VG 46 and VG68 of the ISO 6743-4 standards.



It is also possible to use ATF, HD, HFB, HFC or HFD type hydraulic fluid upon Poclairn Hydraulics specific approval of the components' operating conditions.

Standardized designations for the fluids

- **HM** : Mineral fluids having specific antioxidant, anticorrosion and antiwear properties (HLP equivalent to DIN 51524 parts 1 and 2).
- **HV** : HM mineral fluids providing improved temperature and viscosity properties (DIN 51524 part 3).
- **HEES** : Biodegradable fluids based on organic esters.



It is also possible to use a fluid that meets the biodegradability criteria and is compatible in the event of accidental food contact. The BIOHYDRAN FG 46 fluid designed by the company Total has undergone testing of its properties and performance on our test benches. Since this type of fluid has not yet been categorized, it is the responsibility of machine manufacturers to validate its compatibility with all of the components used in order to guarantee that the intended functions will be fulfilled and this for the desired life time of all equipment items.



For biodegradable fluids, consult your Poclairn Hydraulics' application engineer



During operation, the temperature of the oil must be between 0°C [32°F] and 80°C [176°F]; the minimum and maximum temperatures may be exceeded momentarily by ± 20°C [± 68°F] for a duration of less than 30 minutes. For all applications outside these limits, please consult with your Poclairn Hydraulics' application engineer.

### Fluid and filtration

The contaminating particles suspended in the hydraulic fluid cause the hydraulic mechanisms moving part wear. On hydraulic pumps, these parts operate with very small dimensional tolerances. In order to reach the part life, it is recommended to use a filter that maintains the hydraulic fluid contamination class at a max. of:

9 according to NAS 1638  
20/18/15 according to ISO 4406:1999

According to the type of application decided for the pump, it is necessary to use filtration elements with a filtration ratio of:

$\beta_{20 \text{ to } 30} \geq 100$

Making sure that this ratio does not worsen together with the increasing of the filter cartridge differential pressure.

If these values cannot be observed, the component life will consequently be reduced and it is recommended to contact the Poclairn Hydraulics Customer Service.

#### Filters on charge circuit

Filters on the charge circuit (F0-F2) are designed without by-pass. The max. pressure drop on the filtration part must not exceed 2 bar [29 PSI] (3 bar [43.5 PSI] in case of cold starting) at pump full rating. To monitor the pressure drop, it is recommended to use the clogging indicator on the filtration element (F2 option). Contact your Poclairn Hydraulics Application engineer, each time the pump is not charged by its internal charge pump.

Filters on charge circuit are mounted on the pump special support.

#### Filters assembling

The suction filter is mounted on the suction line. Check that the pressure before the charge pump is 0.8 bar abs. [11.6 PSI abs.], measured on the pump suction port (0.5 bar [7.2 PSI] for cold starting).



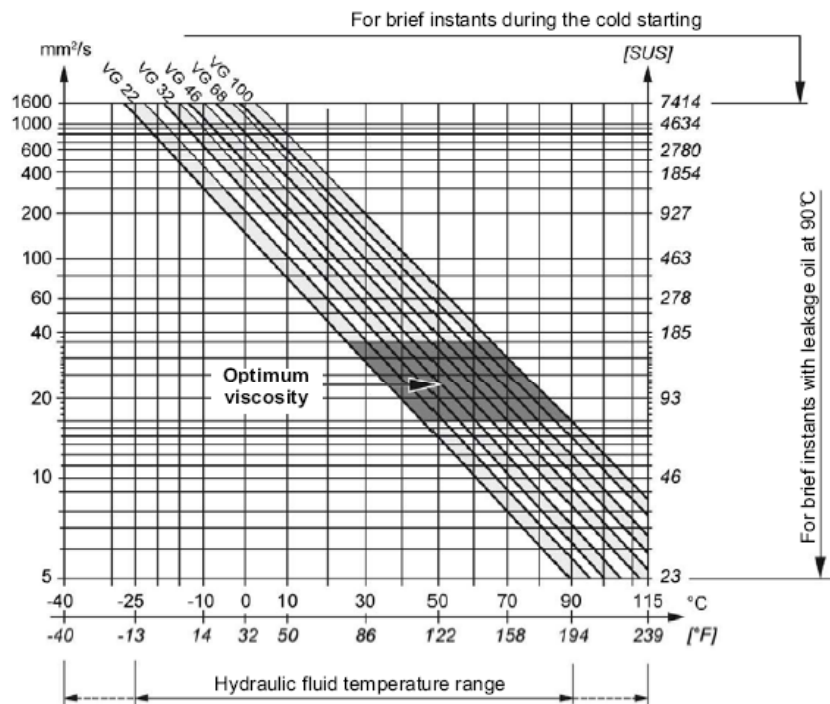
## Viscosity range

For both max. efficiency and life of the unit, the operative viscosity should be chosen within the optimum range of:  
 $\sqrt{\text{opt}}$  = optimum operating viscosity from 16 to 36  $\text{mm}^2/\text{s}$  [from 74.1 to 166.8 SUS] referred to the closed loop temperature.

**Working conditions:** the following limits of viscosity apply

$\sqrt{\text{min}}$  = 5  $\text{mm}^2/\text{s}$  [23 SUS] short-duration at a max. permissible leakage oil temperature of 90°C [194°F]

$\sqrt{\text{max}}$  = 1000  $\text{mm}^2/\text{s}$  [4 634 SUS] short-duration, on cold start.



Ensure fluid temperature and viscosity limits are concurrently satisfied.