



# **PARKER CALZONI**

## **Radial Piston Motor**

### **Type MRD, MRDE, MRV, MRVE**

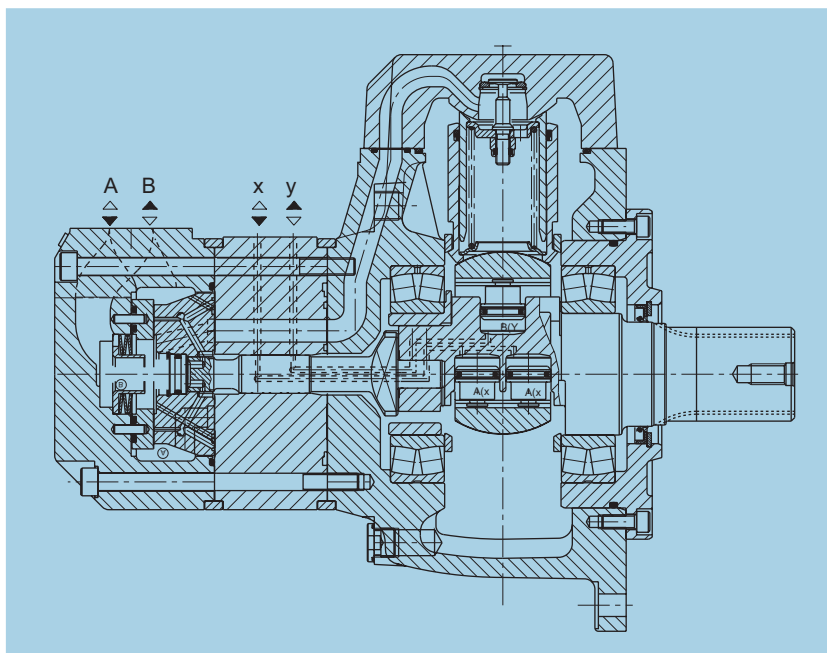


RCOe 2401/01.05



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## GENERAL CHARACTERISTICS



## CONSTRUCTION

Radial piston motor with dual displacement "MRD - MRDE" and variable displacement "MRV - MRVE"

## TYPE

MRD; MRDE; MRV; MRVE

## MOUNTING

Front flange mounting

## CONNECTION

Connection flange (See page 40)

## MOUNTING POSITION

Any (please note the installation notes on page 44)

## BEARING LIFE

See page 26

## DIRECTION OF ROTATION

Clockwise, anti-clockwise - reversible

## FLUID

HLP mineral oils to DIN 51 524 part 2; Fluid type HFB, HFC and Bio-fluids on enquiry. FPM seals are required with phosphorous acid-Ester (HFD)

## FLUID TEMPERATURE RANGE

From  $-30^{\circ}$  to  $+80^{\circ}$  °C

VISCOSITY RANGE <sup>1)</sup>

From 18 to 1000 mm<sup>2</sup>/s: Recommended operating range 30 to 50 (see fluid selection on page 8)

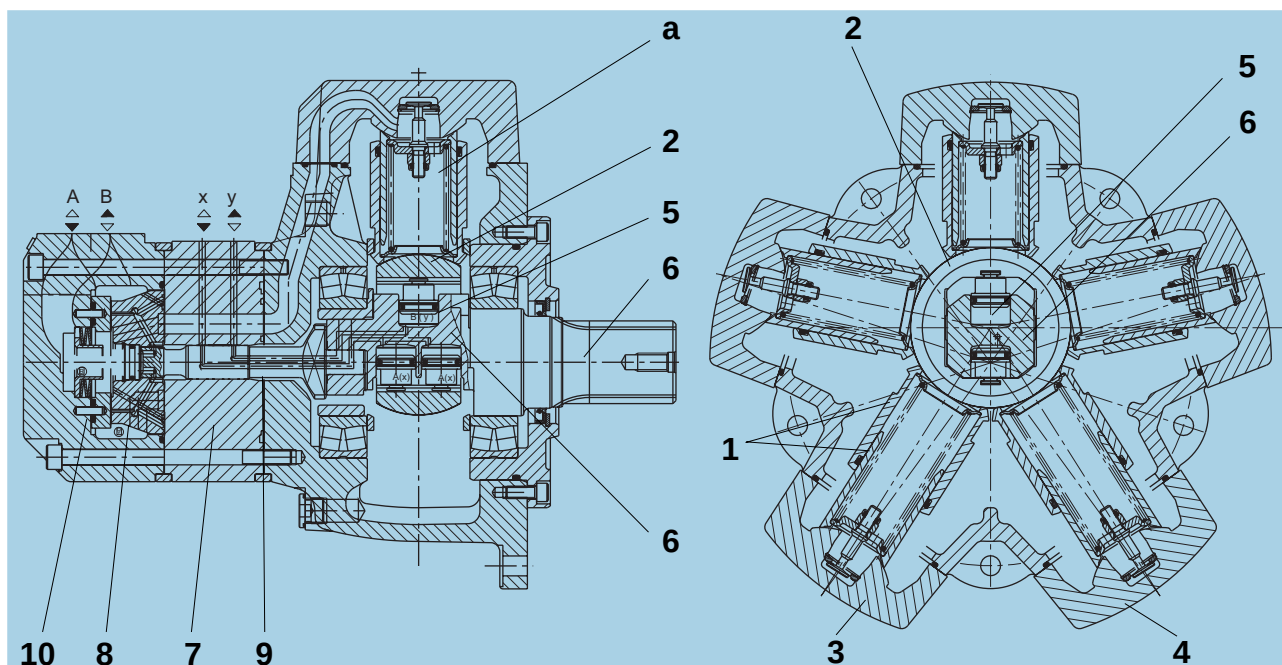
## FLUID CLEANLINESS

Maximum permissible degree of contamination of fluid NAS 1638 Class 9. We therefore recommend a filter with a minimum retention rate of  $\beta_{10} \geq 75$ .

To ensure a long life we recommend class 8 to NAS 1638.

This can be achieved with a filter, with a minimum retention rate of  $\beta_5 \geq 100$ .

1) For different valves of viscosity please contact PARKER Calzoni

**MRD-MRDE****FUNCTIONAL DESCRIPTION**

The outstanding performance of the motor is the result of an original and patented design. The principle is to transmit force to the driving shaft (2 and 6) by means of a pressurized column of oil (a) without any connecting rods, pistons, pads and pins.

This oil column is contained by a telescopic cylinder (1) with a mechanical connection at the lips at each end, which seal against the spherical surfaces (3) of the cylinder-head (4) and the spherical surface of the rotating shaft (2). These lips retain their circular cross section when stressed by the pressure so there is no alteration in the sealing geometry. The careful selection of materials and optimized design has minimized both friction and leakage. Another advantage of this design stems from the elimination of any connecting rods, the cylinder can only expand and retract linearly so there are no transverse components of the thrust. This means no oval wear on the moving parts and no side forces on the cylinder joints.

Dual displacement is accomplished by having the eccentric shaft cam free to move radially changing its eccentricity. In this way the displacement can be chosen amongst many different values.

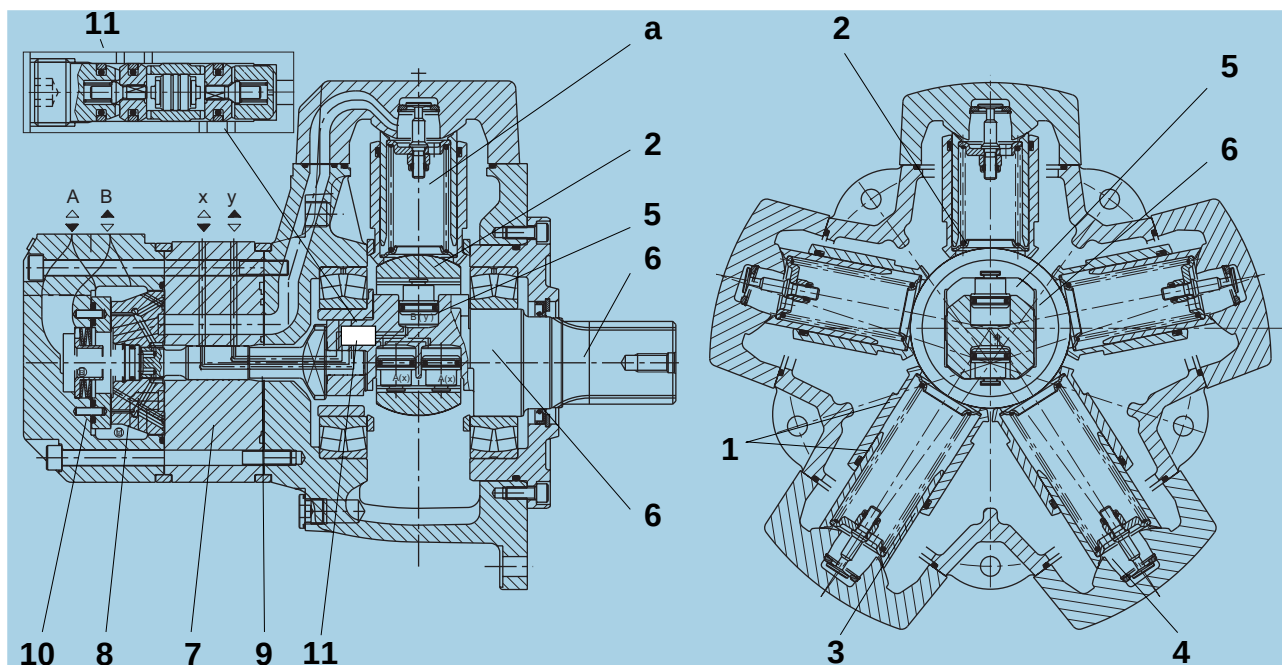
The radial motion is controlled by means of hydraulic cylinders (5) located in the drive shaft (6). The feeding of the displacement cylinders is accomplished by means of the rotating intake (7). The displacement can be changed even while rotating under full load.

**TIMING SYSTEM**

Timing is accomplished by means of a rotary valve (8) driven by the rotary valve driving shaft (9) that it is connected to the rotating eccentric shaft. The rotary valve rotates between the rotating intake (7) and the reaction ring (10) which are fixed to the rotary valve housing. This timing system is also of a patented design being pressure balanced and self-compensating for thermal expansion.

**EFFICIENCY**

The advantages of this type of timing system, combined with a revolutionary propulsion system, produces a motor with extremely high values of mechanical and volumetric efficiency. The torque output is smooth even at very low speed under high pressure, and the motor offers high performance starting under load.

**MRV-MRVE****FUNCTIONAL DESCRIPTION**

The outstanding performance of the motor is the result of an original and patented design. The principle is to transmit force to the driving shaft (2 and 6) by means of a pressurized column of oil (a) without any connecting rods, pistons, pads and pins.

This oil column is contained by a telescopic cylinder (1) with a mechanical connection at the lips at each end, which seal against the spherical surfaces (3) of the cylinder-head (4) and the spherical surface of the rotating shaft (2). These lips retain their circular cross section when stressed by the pressure so there is no alteration in the sealing geometry. The careful selection of materials and optimized design has minimized both friction and leakage. Another advantage of this design stems from the elimination of any connecting rods, the cylinder can only expand and retract linearly so there are no transverse components of the thrust. This means no oval wear on the moving parts and no side forces on the cylinder joints.

Dual displacement is accomplished by having the eccentric shaft cam free to move radially changing its eccentricity. In this way the displacement can be chosen amongst many different values.

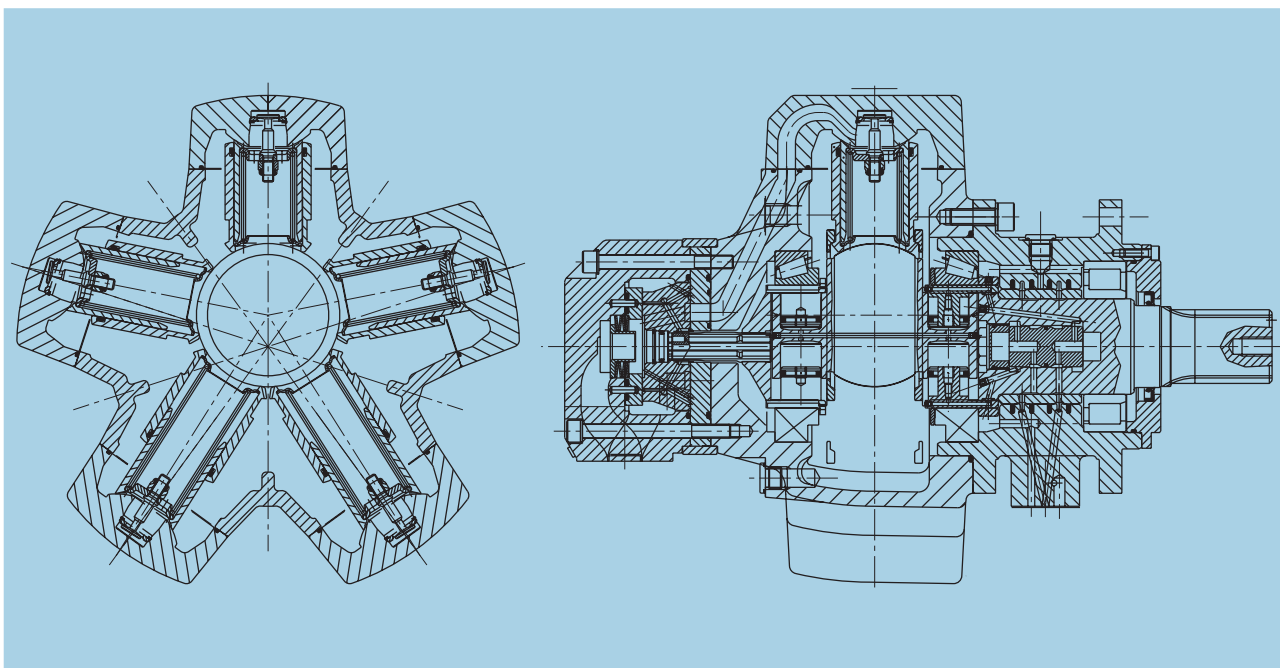
The radial motion is controlled by means of hydraulic cylinders (5) and valve (11) located in the drive shaft (6), this valve allows the step by step movement of the cylinder inside the main shaft, so it is possible to change the displacement. The feeding of the displacement cylinders is accomplished by means of the rotating intake (7). The displacement can be changed even while rotating under full load.

**TIMING SYSTEM**

Timing is accomplished by means of a rotary valve (8) driven by the rotary valve driving shaft (9) that it is connected to the rotating eccentric shaft. The rotary valve rotates between the rotating intake (7) and the reaction ring (10) which are fixed to the rotary valve housing. This timing system is also of a patented design being pressure balanced and self-compensating for thermal expansion.

**EFFICIENCY**

The advantages of this type of timing system, combined with a revolutionary propulsion system, produces a motor with extremely high values of mechanical and volumetric efficiency. The torque output is smooth even at very low speed under high pressure, and the motor offers high performance starting under load.

**MRV 450****FUNCTIONAL DESCRIPTION**

The extreme versatility of this motor is because of two simple but ingenious designs combined in one machine. The rotation of the shaft is by the same original and patented mechanism as the MR motor but, in addition, the MRV has an arrangement of internal cylinders to actually change the motor displacement, even while turning under full load. The principle of the rotation mechanism is to transmit the effort from the stator to the eccentric part of the shaft by means of a pressurized column of oil.

This oil column is contained by a telescopic cylinder with a mechanical connection only at the lips at each end which seal against the spherical surfaces of the stator and the rotor.

These lips retain their circular cross section when stressed by the pressure so there is no alteration in the sealing geometry. The particular selection of materials and optimization of design has minimized both the friction and the leakage. Another advantage of this design stems from the elimination of any connecting rods, the cylinder can only expand and retract linearly so there are no transverse components of the thrust.

This means no oval wear on the moving parts and no side forces on the cylinder joints.

A consequence of this novel design is a significant reduction in weight and overall size compared with other motors of the same basic capacity.

In the MRV motor the eccentric part of the shaft is free to move radially. The radial motion is controlled by two lateral hydraulic cylinders which are an integral part of the shaft.

As the eccentricity changes so does the stroke of the telescopic cylinders and hence the displacement.

The variation is stepless between full eccentricity (maximum displacement) and full concentricity. It is possible to insert spacers in the lateral cylinders to limit the maximum and minimum displacements and so tailor the motor to the exact requirements of any application. The facility of variable displacement can be used with hydraulic regulation valves to create a variety of control systems ex. constant pressure operation, constant power operation, two speed operation. When used with electronic regulators even more control systems are possible ex. high efficiency speed control, high efficiency ring main systems, high efficiency torque control etc.

In common with the MR range, this motor has a patented distributor valve being pressure balanced and self compensating for thermal expansion. The advantages of this type of valve coupled with a revolutionary cylinder arrangement produce a motor with extremely high values of mechanical and volumetric efficiency. The torque output is smooth even at very low speeds and the motor gives a high performance starting under load.

| Size Motor version |         | Displacement |        | Moment inertia of rotating parts | Theoretical specific torquea | Min. start. torque / Theoretical torque | Maximum Pressure |      |      |       |                                 | Speed range |          | Maximum output power |      | Weight |     |
|--------------------|---------|--------------|--------|----------------------------------|------------------------------|-----------------------------------------|------------------|------|------|-------|---------------------------------|-------------|----------|----------------------|------|--------|-----|
|                    |         |              |        |                                  |                              |                                         | input            |      |      |       |                                 | flushing    |          | flushing             |      |        |     |
|                    |         |              |        |                                  |                              |                                         | cont.            | int. | peak | A+B * | Drain                           | without     | with     | without              | with |        |     |
|                    |         |              |        |                                  |                              |                                         | V                | J    |      | %     | p                               | p           | p        | p                    | p    |        | n   |
|                    |         | cm³          |        | kg cm²                           | Nm/bar                       |                                         | bar              | bar  | bar  | bar   | bar                             | giri/min    | giri/min | kW                   | kW   | kg     |     |
| M R D              | 300     | Min.         | 152,1  | 58,50                            | 2,42                         | -                                       | 250              | 300  | 420  | 400   | 5 (15 bar with "F1" shaft seal) | 1-1000      | 1-1000   | 20                   | 35   | 56     |     |
|                    |         | Max.         | 304,1  | 65,50                            | 4,80                         | 90                                      |                  |      |      |       |                                 | 1-750       | 1-750    | 35                   | 53   |        |     |
|                    | 450     | Min.         | 225,8  | 208,40                           | 3,60                         | -                                       |                  |      |      |       |                                 | 1-850       | 1-850    | 29                   | 45   | 83     |     |
|                    |         | Max.         | 451,6  | 229,80                           | 7,20                         | 90                                      |                  |      |      |       |                                 | 1-600       | 1-600    | 46                   | 75   |        |     |
| M R V              | 450     | Min.         | 133,5  | 185,50                           | 2,11                         | -                                       |                  |      |      |       |                                 | 1-1000      | 1-1000   | 22                   | 35   | 110    |     |
|                    |         | Max.         | 451,6  | 229,80                           | 7,20                         | 90                                      |                  |      |      |       |                                 | 1-600       | 1-600    | 46                   | 75   |        |     |
| M R D              | 700     | Min.         | 237,6  | 309,67                           | 3,80                         | -                                       |                  |      |      |       |                                 | 1-750       | 1-750    | 26                   | 45   | 103    |     |
|                    |         | Max.         | 706,9  | 358,40                           | 11,30                        | 90                                      |                  |      |      |       |                                 | 1-500       | 1-500    | 65                   | 97   |        |     |
|                    | 1100    | Min.         | 381,3  | 392,67                           | 6,10                         | -                                       |                  |      |      |       |                                 | 0,5-600     | 0,5-600  | 34                   | 54   | 147    |     |
|                    |         | Max.         | 1125,8 | 451,50                           | 17,90                        | 90                                      |                  |      |      |       |                                 | 0,5-330     | 0,5-330  | 77                   | 119  |        |     |
|                    | 1800    | Min.         | 603,2  | 752,89                           | 9,6                          | -                                       |                  |      |      |       |                                 | 0,5-450     | 0,5-450  | 46                   | 69   | 209    |     |
|                    |         | Max.         | 1809,6 | 854,10                           | 28,80                        | 90                                      |                  |      |      |       |                                 | 0,5-250     | 0,5-250  | 103                  | 157  |        |     |
|                    | 2800    | Min.         | 930,7  | 2622,99                          | 14,8                         | -                                       |                  |      |      |       |                                 | 0,5-120     | 0,5-320  | 52                   | 80   | 323    |     |
|                    |         | Max.         | 2792,0 | 2975,70                          | 44,50                        | 90                                      |                  |      |      |       |                                 | 0,5-120     | 0,5-215  | 127                  | 194  |        |     |
|                    | M R V   | 4500         | Min.   | 1497,8                           | 4420,44                      | 23,9                                    |                  |      |      |       |                                 | -           | 0,5-100  | 0,5-280              | 55   | 85     | 504 |
|                    |         |              | Max.   | 4502,7                           | 5015,10                      | 71,70                                   |                  |      |      |       |                                 | 91          | 0,5-80   | 0,5-170              | 140  | 210    |     |
|                    |         | 7000         | Min.   | 2322,4                           | 10149,53                     | 36,98                                   |                  |      |      |       |                                 | -           | 0,5-100  | 0,5-210              | 82   | 125    | 796 |
|                    |         |              | Max.   | 6967,2                           | 11376,60                     | 110,94                                  |                  |      |      |       |                                 | 91          | 0,5-80   | 0,5-130              | 170  | 250    |     |
| M R D E            | 330     | Min.         | 166,2  | 58,50                            | 2,65                         | -                                       | 210              | 250  | 350  | 400   | 5 (15 bar with "F1" shaft seal) | 1-1000      | 1-1000   | 21                   | 32   | 56     |     |
|                    |         | Max.         | 332,4  | 65,50                            | 5,30                         | 90                                      |                  |      |      |       |                                 | 1-750       | 1-750    | 32                   | 49   |        |     |
|                    | 500     | Min.         | 248,9  | 208,40                           | 3,96                         | -                                       |                  |      |      |       |                                 | 1-800       | 1-800    | 26                   | 38   | 83     |     |
|                    |         | Max.         | 497,9  | 229,80                           | 7,93                         | 90                                      |                  |      |      |       |                                 | 1-600       | 1-600    | 46                   | 70   |        |     |
| M R D E            | 800     | Min.         | 270,2  | 309,67                           | 4,27                         | -                                       |                  |      |      |       |                                 | 1-750       | 1-750    | 26                   | 40   | 103    |     |
|                    |         | Max.         | 804,2  | 358,40                           | 12,81                        | 90                                      |                  |      |      |       |                                 | 1-450       | 1-450    | 65                   | 93   |        |     |
|                    | 1400    | Min.         | 463,9  | 392,67                           | 9,85                         | -                                       |                  |      |      |       |                                 | 0,5-550     | 0,5-550  | 38                   | 55   | 147    |     |
|                    |         | Max.         | 1369,5 | 451,50                           | 21,80                        | 92                                      |                  |      |      |       |                                 | 0,5-280     | 0,5-280  | 77                   | 102  |        |     |
|                    | 2100    | Min.         | 697,0  | 752,89                           | 16,65                        | -                                       |                  |      |      |       |                                 | 0,5-420     | 0,5-420  | 46                   | 72   | 226    |     |
|                    |         | Max.         | 2091,2 | 854,10                           | 33,30                        | 91                                      |                  |      |      |       |                                 | 0,5-250     | 0,5-250  | 100                  | 148  |        |     |
|                    | 3100    | Min.         | 1034,6 | 2622,99                          | 24,71                        | -                                       |                  |      |      |       |                                 | 0,5-120     | 0,5-300  | 55                   | 85   | 333    |     |
|                    |         | Max.         | 3103,7 | 2975,70                          | 49,40                        | 91                                      |                  |      |      |       |                                 | 0,5-120     | 0,5-215  | 125                  | 190  |        |     |
|                    | M R V E | 5400         | Min.   | 1800,4                           | 4420,44                      | 43,00                                   |                  |      |      |       |                                 | -           | 0,5-100  | 0,5-250              | 65   | 100    | 519 |
|                    |         |              | Max.   | 5401,2                           | 5015,10                      | 86,01                                   |                  |      |      |       |                                 | 92          | 0,5-80   | 0,5-160              | 140  | 210    |     |
|                    |         | 8200         | Min.   | 2742,1                           | 10149,53                     | 43,63                                   |                  |      |      |       |                                 | -           | 0,5-100  | 0,5-200              | 80   | 134    | 806 |
|                    |         |              | Max.   | 8226,4                           | 11376,60                     | 130,90                                  |                  |      |      |       |                                 | 91          | 0,5-90   | 0,5-120              | 170  | 250    |     |

(\*) Please consult PARKER Calzoni

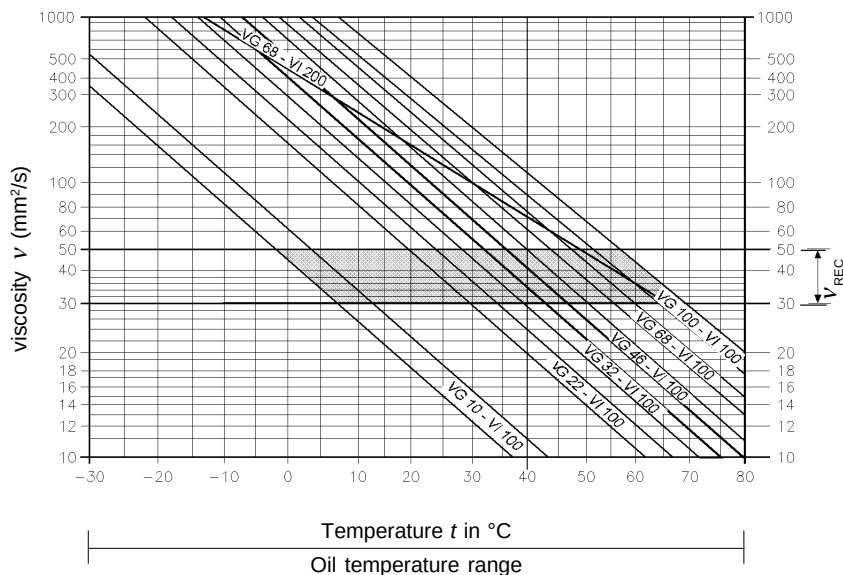


**EXAMPLE:** At a certain ambient temperature, the operating temperature in the circuit is 50°C. In the optimum operating viscosity range ( $v_{rec}$ ; shaded section), this corresponds to viscosity grades VG 46 or VG 68; VG 68 should be selected.

**IMPORTANT:** The drain oil temperature is influenced by pressure and speed and is usually higher than the circuit temperature or the tank temperature. At no point in the system, however, may the temperature be higher than 80°C.

If the optimum conditions cannot be met due to the extreme operating parameters or high ambient temperature, we always recommend flushing the motor case in order to operate within the viscosity limits.

Should it be absolutely necessary to use a viscosity beyond the recommended range, you should first contact PARKER Calzoni for confirmation.



## GENERAL NOTES

## OPERATING VISCOSITY RANGE

More detailed information regarding the choice of the fluid can be requested to PARKER Calzoni. When operating with HF pressure fluids or bio-degradable pressure fluids possible limitations of the technical data must be taken into consideration, please see information sheet TCS 85, or consult PARKER Calzoni.

The viscosity, quality and cleanliness of operating fluids are decisive factors in determining the reliability, performance and life-time of an hydraulic component. The maximum life-time and performance are achieved within the recommended viscosity range. For applications that go beyond this range, we recommend to contact .

$$v_{rec.} = \text{recommended operating viscosity } 30...50 \text{ mm}^2/\text{s}$$

This viscosity refers to the temperature of the fluid entering the motor, and at the same time to the temperature inside the motor housing (case temperature). We recommend to select the viscosity of the fluid based on the maximum operating temperature, to remain within the recommended viscosity range. To reach the value of maximum continuous power the operating viscosity should be within the recommended viscosity range of 30 - 50 cSt.

For limit conditions the following is valid:

$$v_{min.abs.} = 10 \text{ mm}^2/\text{s} \text{ in emergency, short term}$$

$$v_{min.} = 18 \text{ mm}^2/\text{s} \text{ for continuous operation at reduced performances}$$

$$v_{max.} = 1000 \text{ mm}^2/\text{s} \text{ short term upon cold start}$$

## LIMITS OF VISCOSITY RANGE

## CHOOSING THE TYPE OF FLUID ACCORDING TO THE OPERATING TEMPERATURE

The operating temperature of the motor is defined as the greater temperature between that of the incoming fluid and that of the fluid inside the motor housing (case temperature). We recommend that you choose the viscosity of the fluid based on the maximum operating temperature, to remain within the recommended viscosity range (see diagram). We recommend that the higher viscosity grade must be selected in each case.

## FILTRATION

The motor life also depends on the fluid filtration. At least it must correspond to one of the following cleanliness.

class 9 according to NAS 1638

class 6 according to SAE, ASTM, AIA

class 18/15 according to ISO/DIS 4406

In order to assure a longer life a cleanliness class 8 to NAS 1638 is recommended, achieved with a filter of  $\beta_5 = 100$ . In case the above mentioned classes can not be achieved, please consult us.

## CASE DRAIN PRESSURE

The lower the speed and the case drain pressure, the longer the life of the shaft seal. The maximum permissible housing pressure is

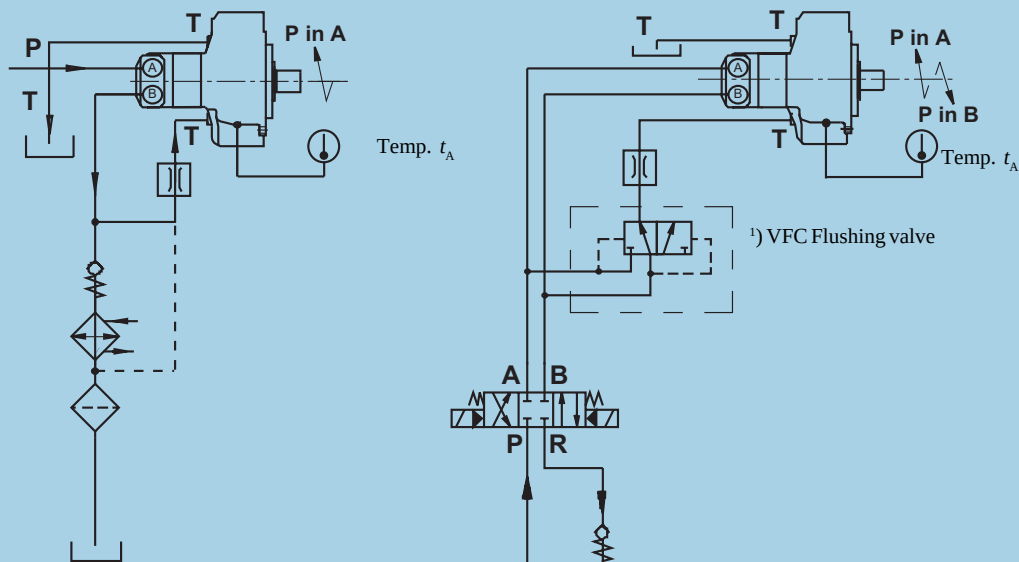
$$p_{max} = 5 \text{ bar}$$

If the case drain pressure is higher than 5 bar it is possible to use a special 15 bar shaft seal (see page 45, Seals, Code "F1").

## "FPM" SEALS

In case of operating conditions with high oil temperature or high ambient temperature, we recommend to use "FPM" seals (see page 45, Seals, Code "V1"). These "FPM" seals should be used with HFD fluids.





FLUSHING CIRCUIT  
(MONO-DIRECTIONAL ROTATION)

FLUSHING CIRCUIT  
(BI-DIRECTIONAL ROTATION)

## FLUSHING

The motor case must be flushed when the continuous operating performances of the motor are inside the "Continuous operating area with flushing" (see Operating Diagram from page 11 to page 25), in order to assure the minimum oil viscosity inside the motor case of 30 mm<sup>2</sup>/s (see page 8 - Fluid Selection). The flushing can be necessary also when the operating performances are outside the "Continuous operating area with flushing", but the system is not able to assure the minimum viscosity conditions requested by the motor as specified at page 8.

### NOTE1:

The oil temperature inside the motor case is obtainable by adding 3°C to the motor surface temperature ( $t_A$ , see figures).

### NOTE2:

With the standard shaft seal the maximum drain case pressure is 5 bar. For the selection of the restrictor, please consult us.

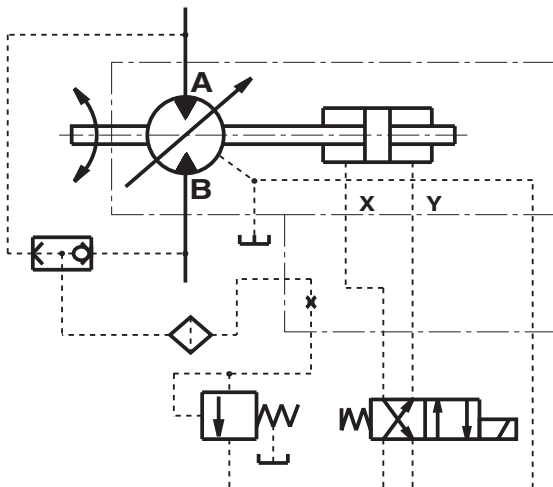
## FLOW

| TYPE                     | MOTOR VERSION                      | FLUSHING FLOW |
|--------------------------|------------------------------------|---------------|
| MRD - MRDE               | 300, 330                           | Q = 6 l/min   |
| MRD - MRDE<br>MRV        | 450, 500                           | Q = 8 l/min   |
| MRD - MRDE<br>MRV - MRVE | 700, 800, 1100, 1400               | Q = 10 l/min  |
| MRD - MRDE<br>MRV - MRVE | 1800, 2100                         | Q = 15 l/min  |
| MRD - MRDE<br>MRV - MRVE | 2800, 3100, 4500, 5400, 7000, 8200 | Q = 20 l/min  |

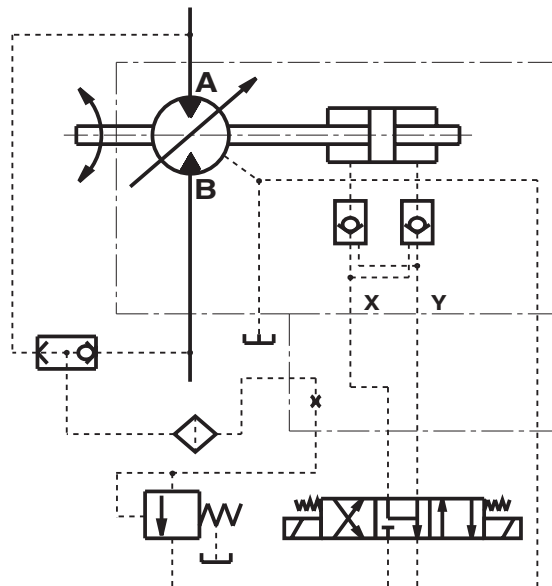
## INTERNAL PILOTING

In order to change the motor displacement, see operating diagram for requested minimum pressure.

**Internal piloting**  
Two displacement valve feded by motor pressure



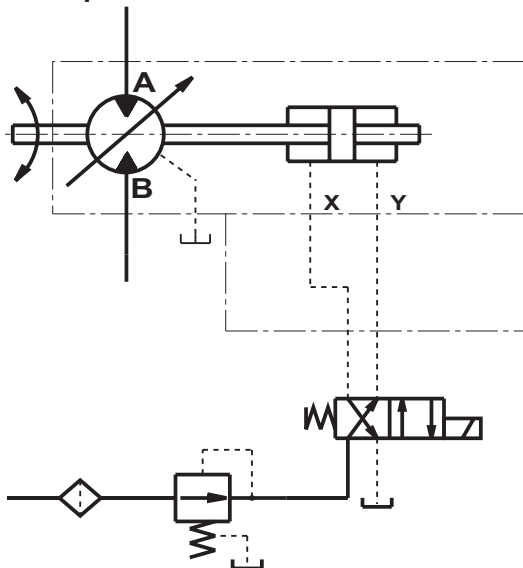
**Internal piloting**  
Solenoid operated displacement control valve feded by motor pressure



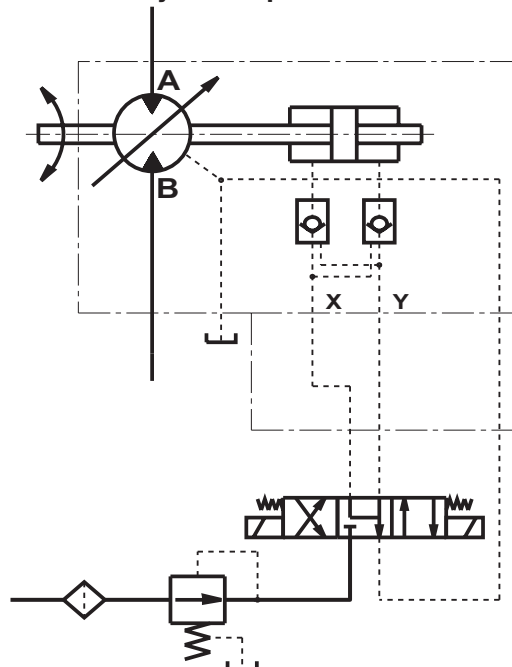
## EXTERNAL PILOTING

External piloting pressure requested is 160 bars.

**External piloting**  
Two displacement valve feded by motor pressure



**External piloting**  
Solenoid operated displacement control valve feded by motor pressure



# OPERATING DIAGRAM

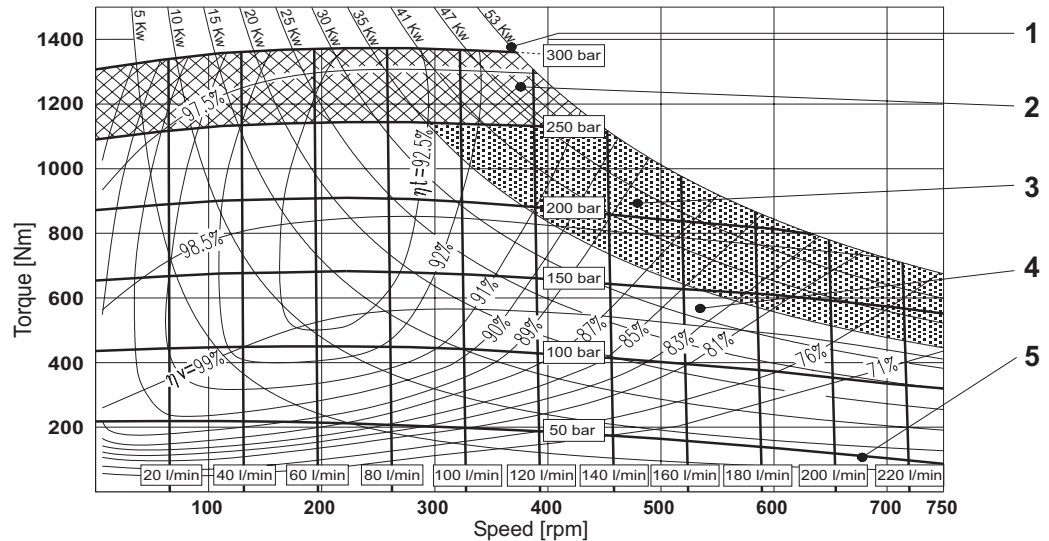
(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

## MRD 300

set to

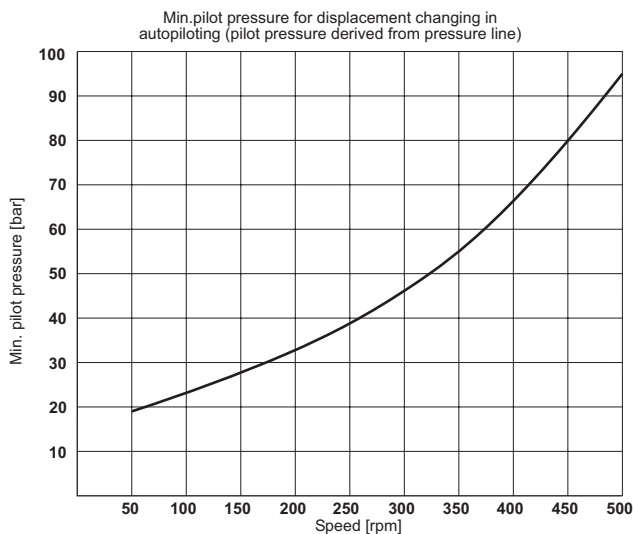
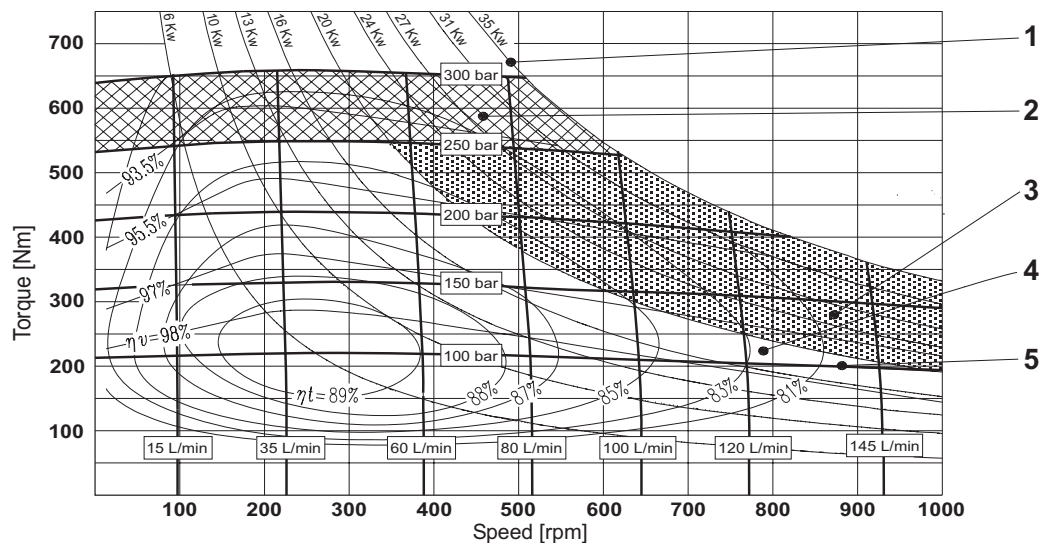
304 cm<sup>3</sup>



## MRD 300

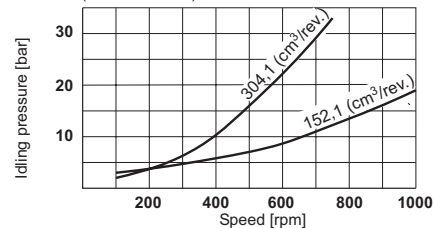
set to

152 cm<sup>3</sup>

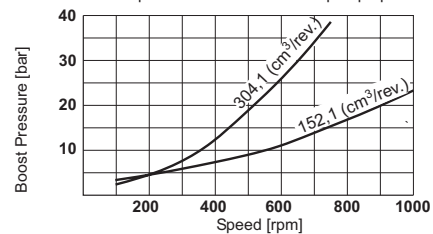


Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult PARKER Calzoni

Min. required pressure difference  $\Delta p$  with idling speed (shaft unloaded)



Min. required boost Pressure with pump operation



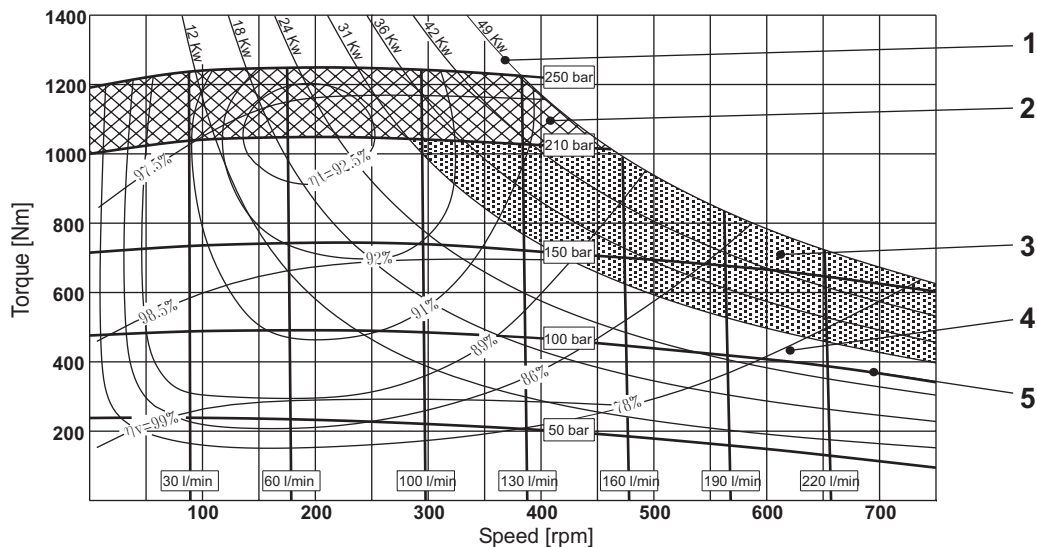
# OPERATING DIAGRAM

(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

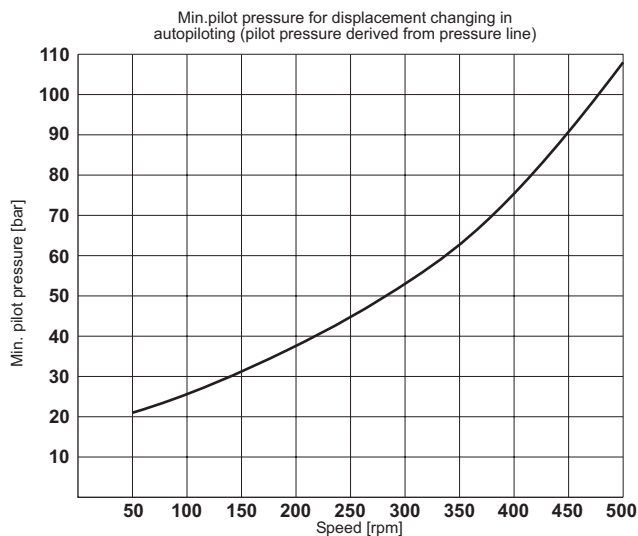
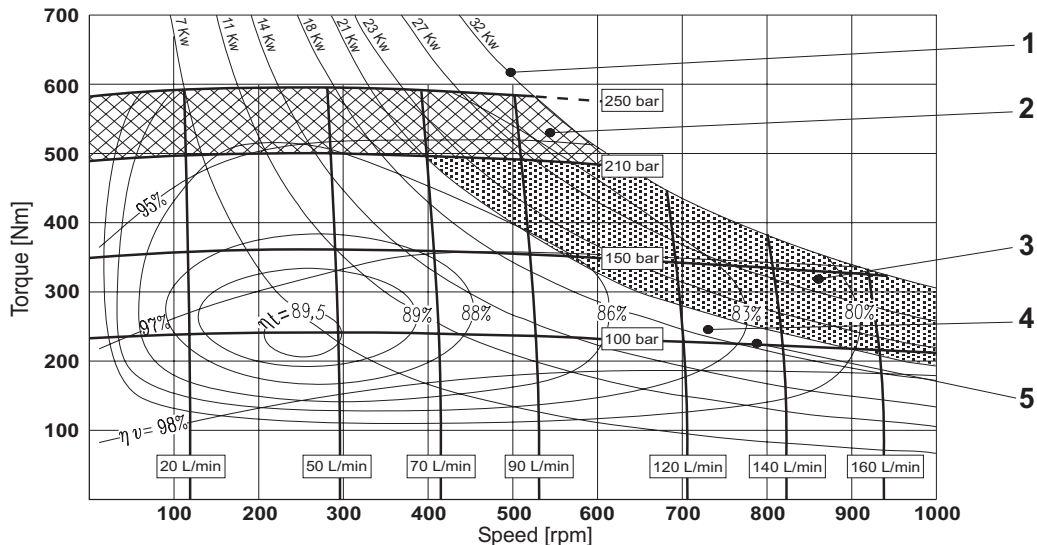
## MRDE 330

set to  
332  $\text{cm}^3$

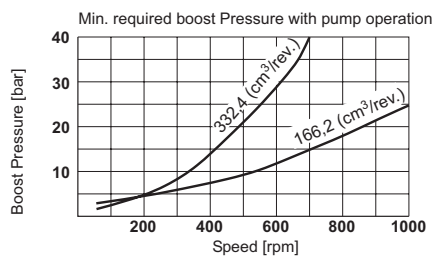
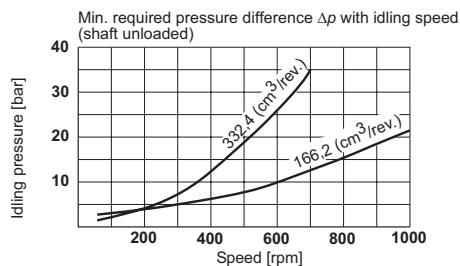


## MRDE 330

set to  
166  $\text{cm}^3$



Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult PARKER Calzoni



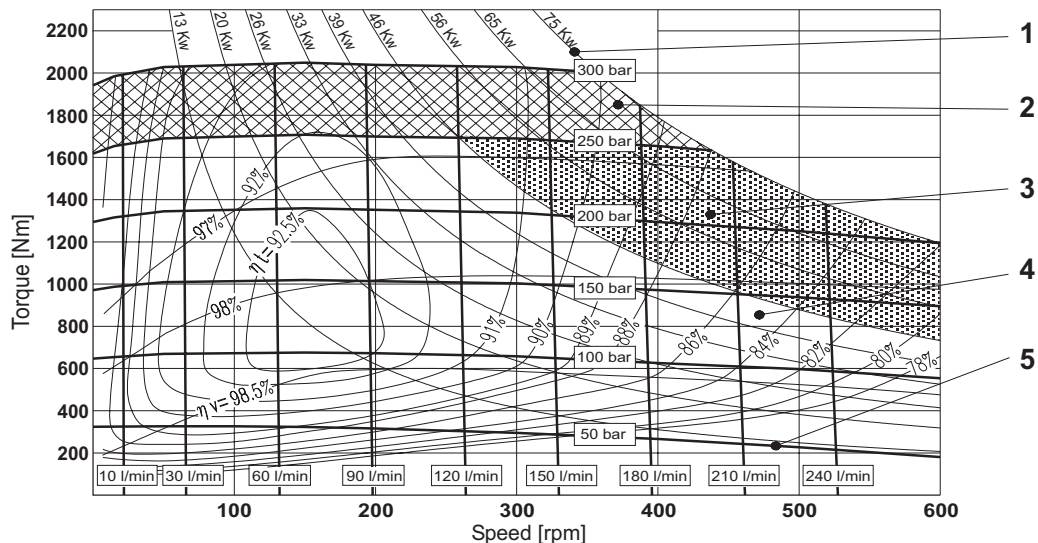
# OPERATING DIAGRAM

(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

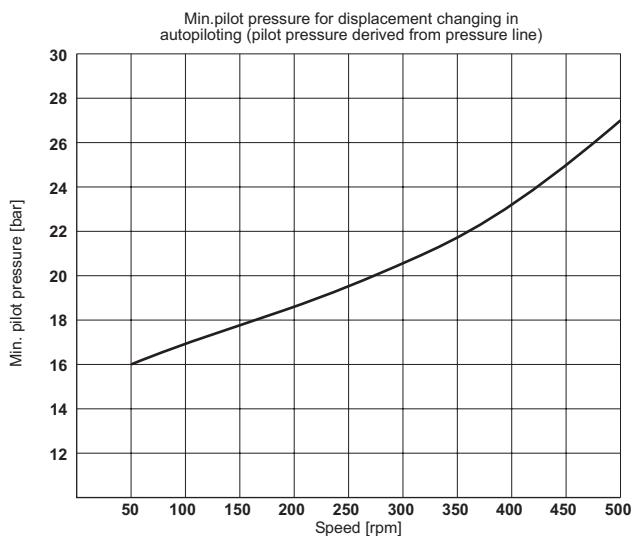
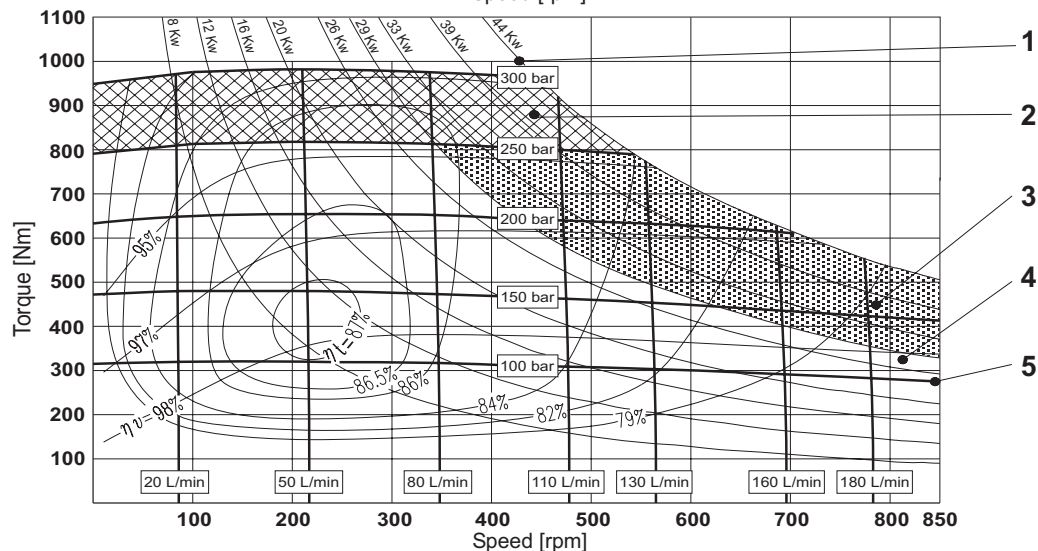
## MRD 450

set to  
452 cm<sup>3</sup>

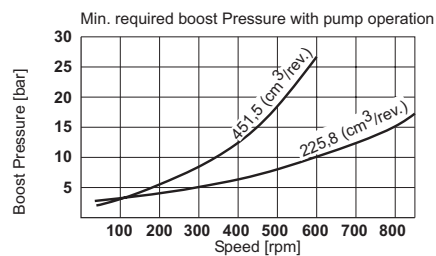
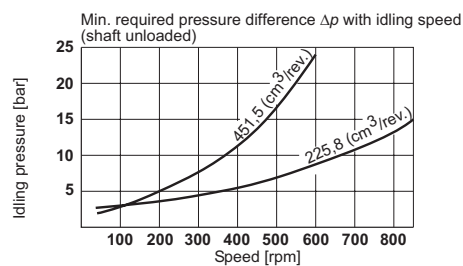


## MRD 450

set to  
226 cm<sup>3</sup>



Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult PARKER Calzonii



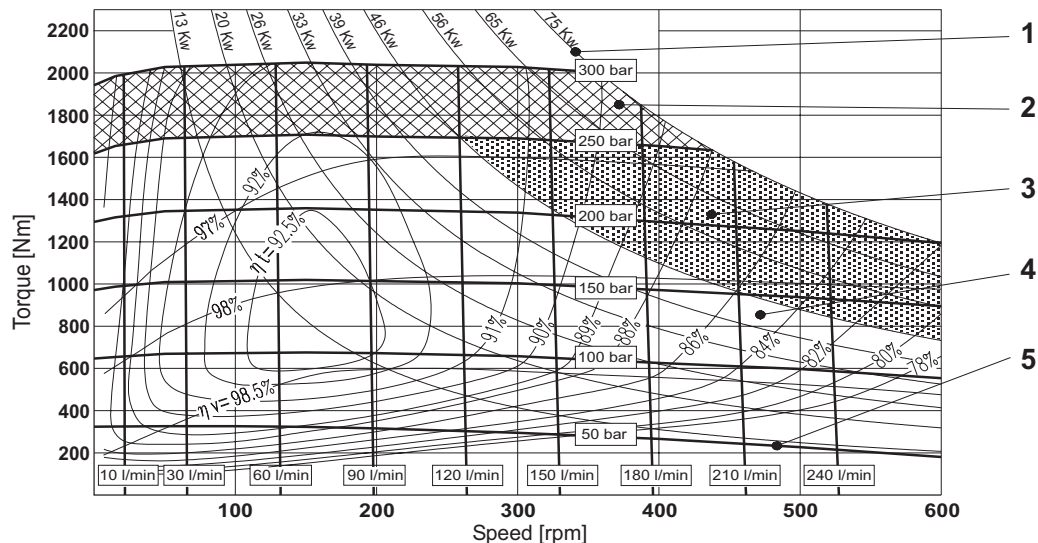
# OPERATING DIAGRAM

(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

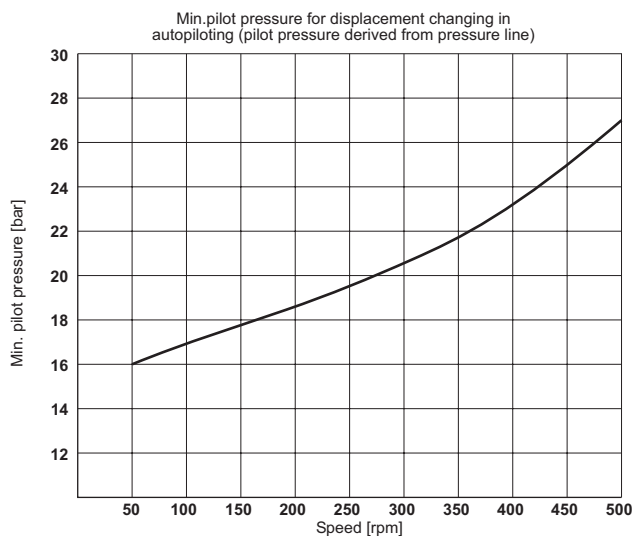
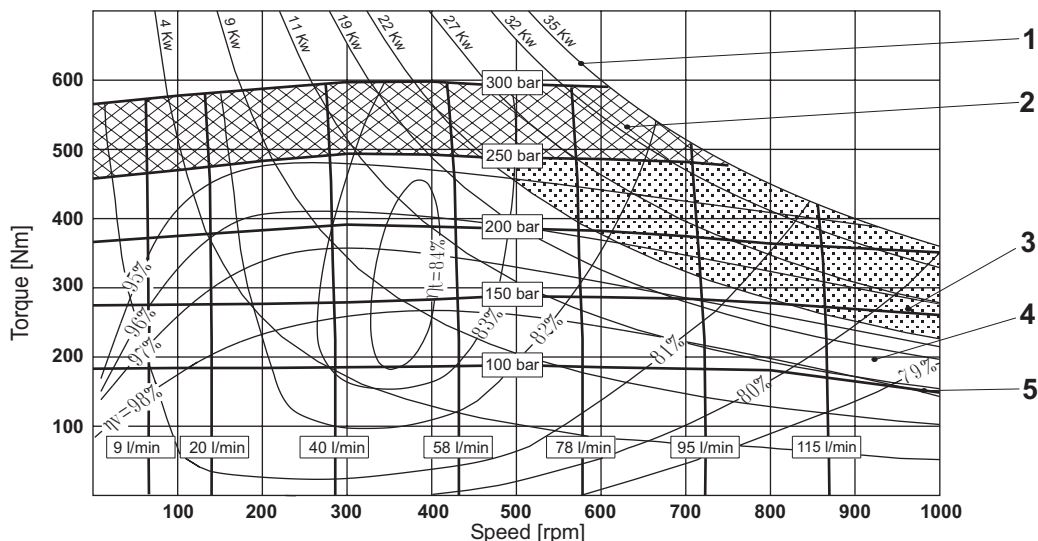
## MRV 450

set to  
452 cm<sup>3</sup>

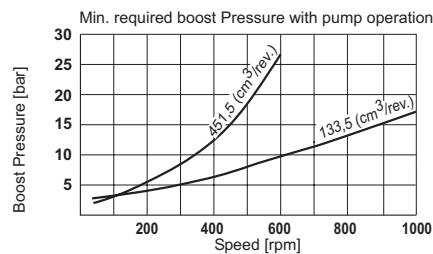
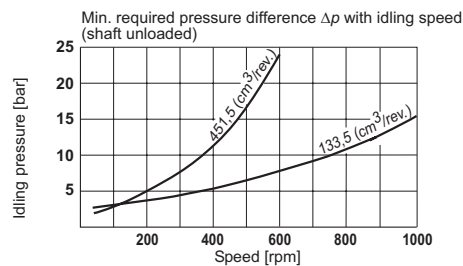


## MRV 450

set to  
134 cm<sup>3</sup>



Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult PARKER Calzoni





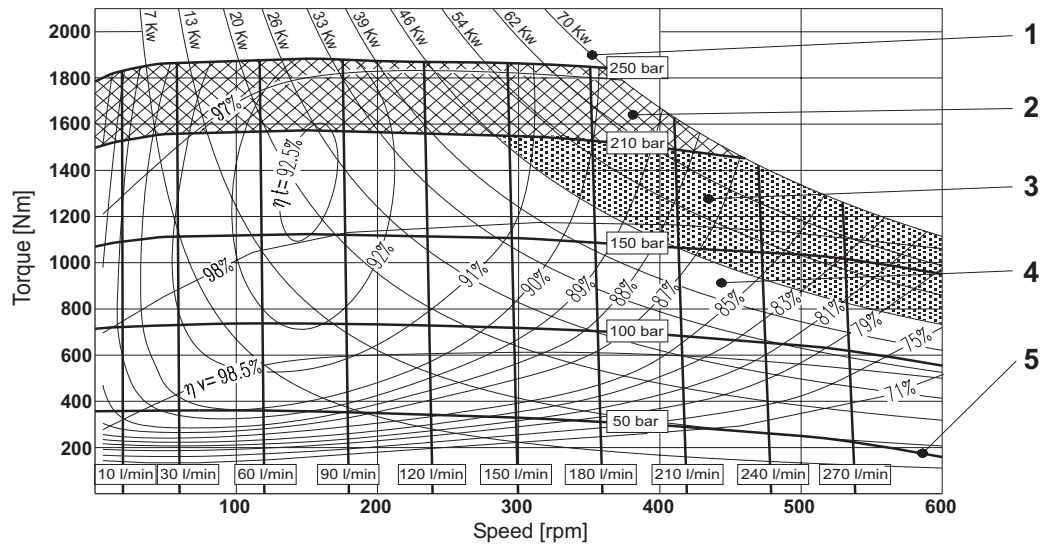
# OPERATING DIAGRAM

(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

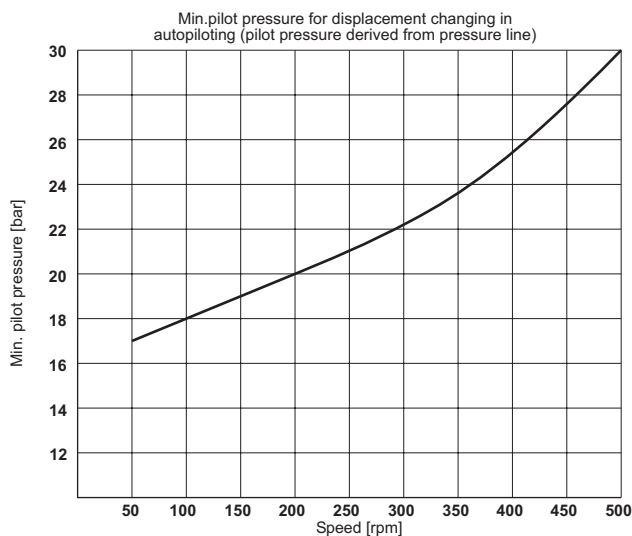
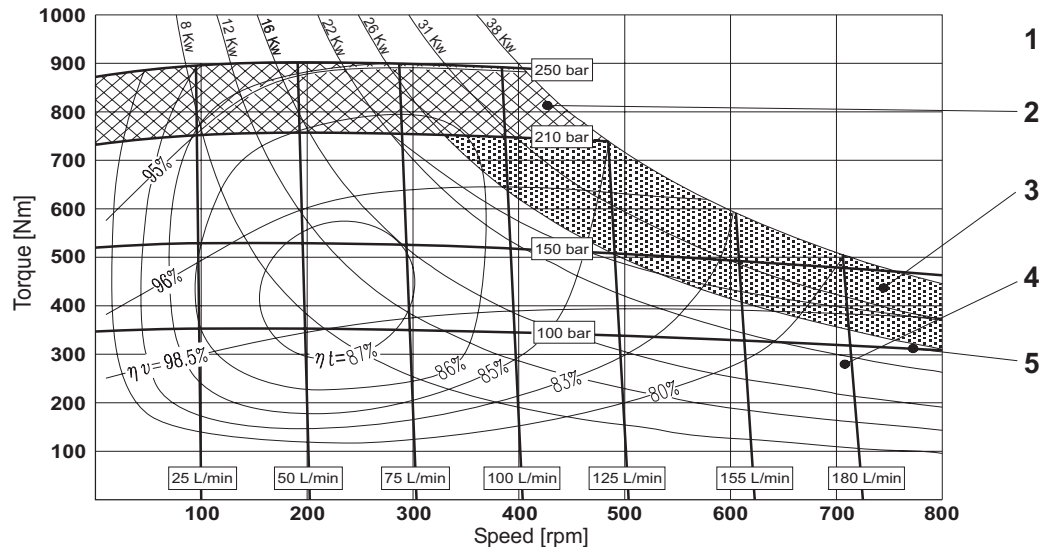
## MRDE 500

set to  
498  $\text{cm}^3$

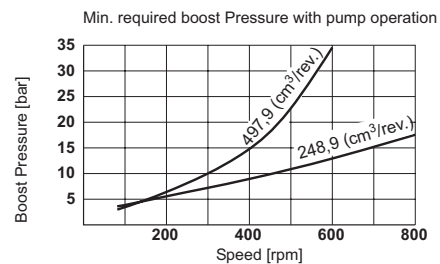
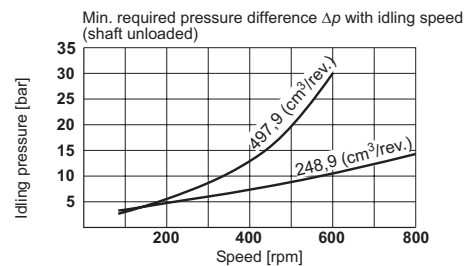


## MRDE 500

set to  
249  $\text{cm}^3$



Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult PARKER Calzoni



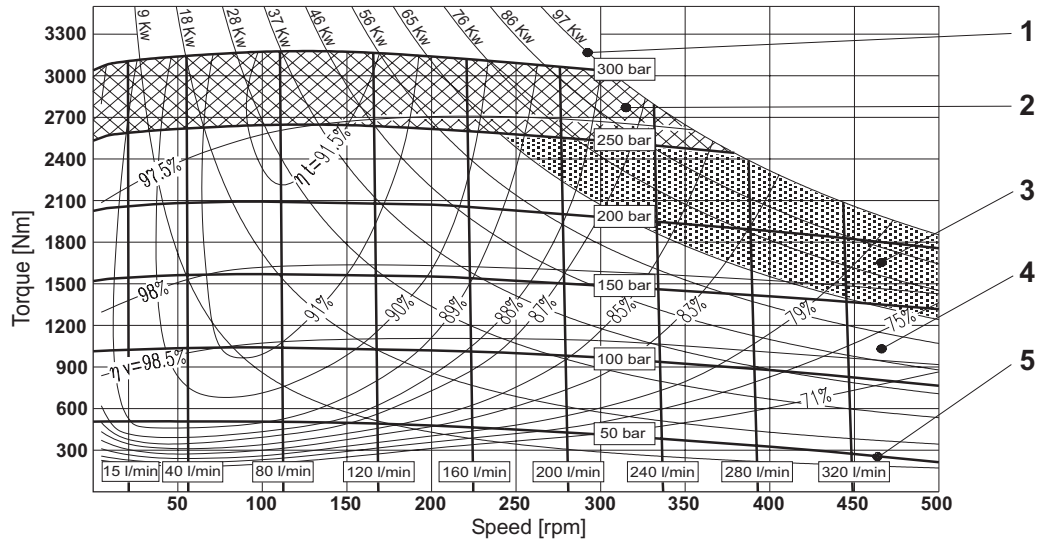
# OPERATING DIAGRAM

(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

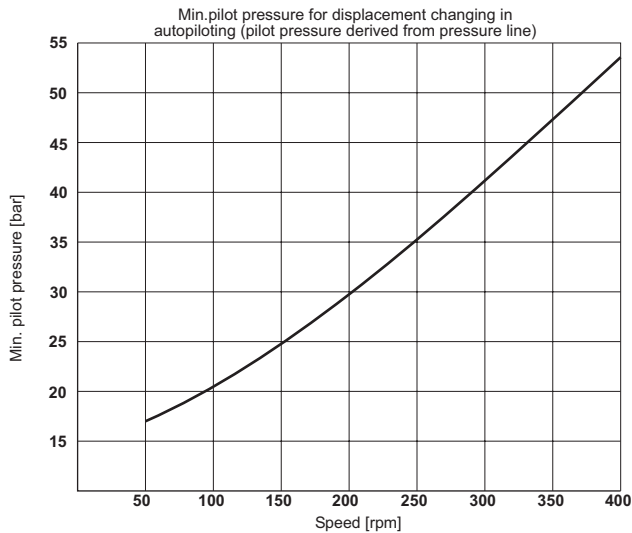
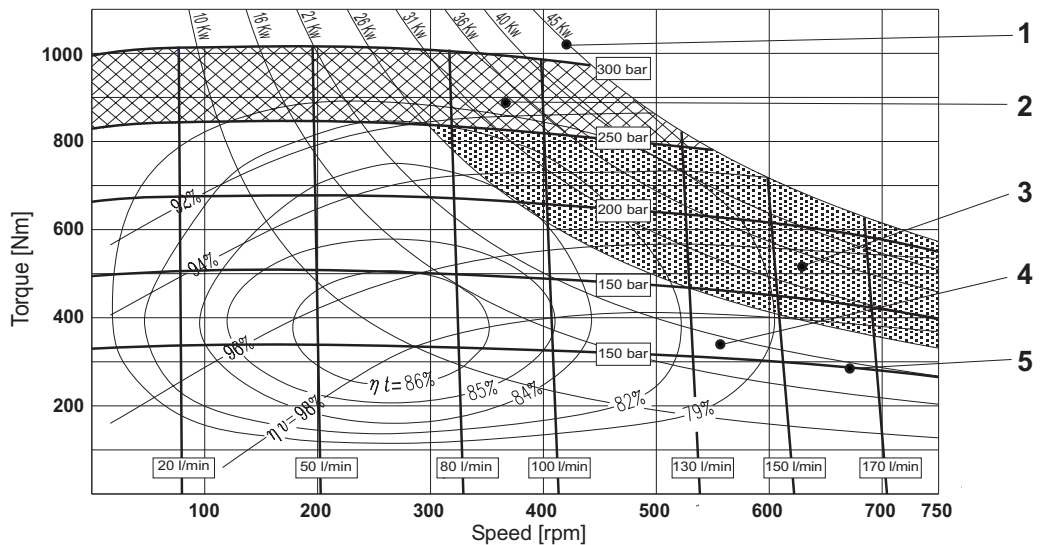
**MRD 700**  
**MRV 700**

set to  
707  $\text{cm}^3$

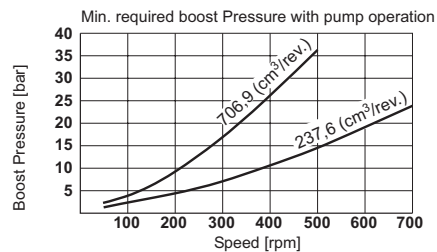
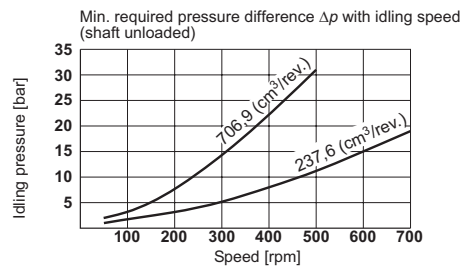


**MRD 700**  
**MRV 700**

set to  
238  $\text{cm}^3$



Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult PARKER Calzoni



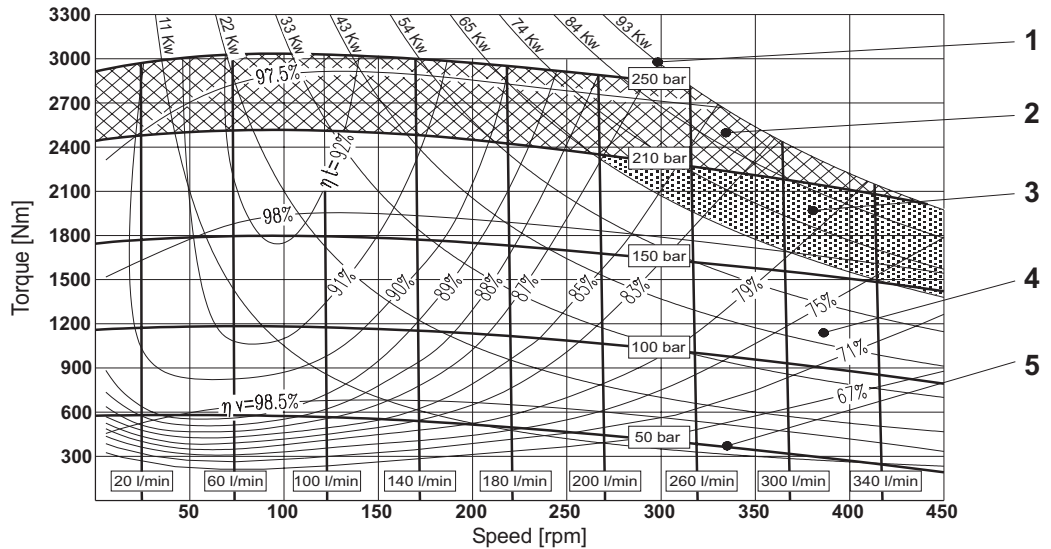
# OPERATING DIAGRAM

(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

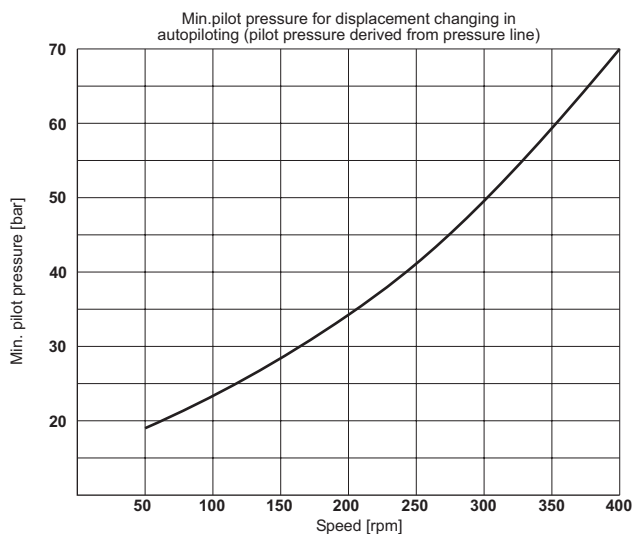
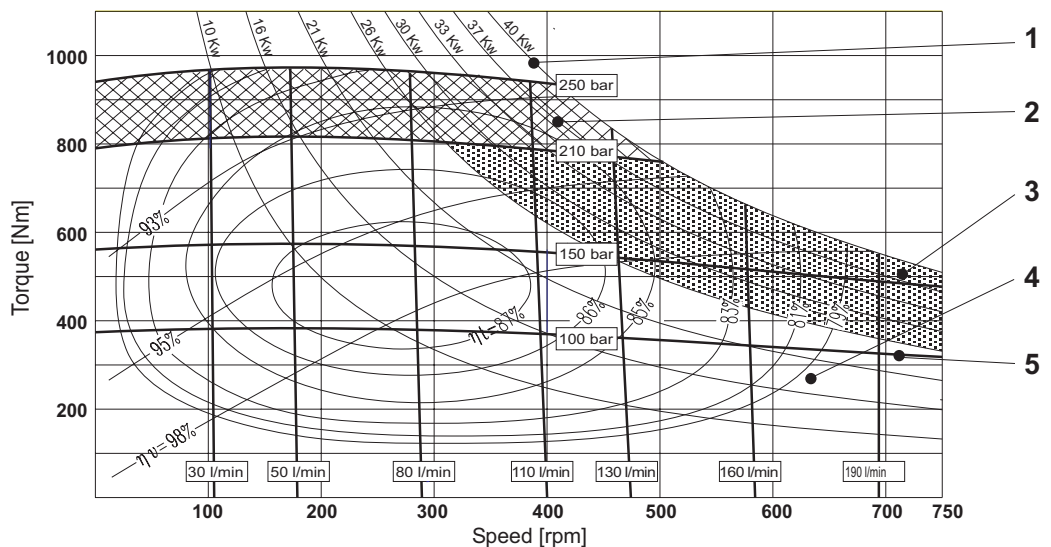
**MRDE 800**  
**MRVE 800**

set to  
804 cm<sup>3</sup>

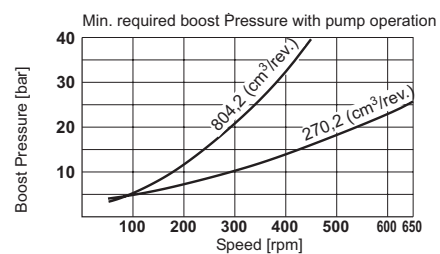
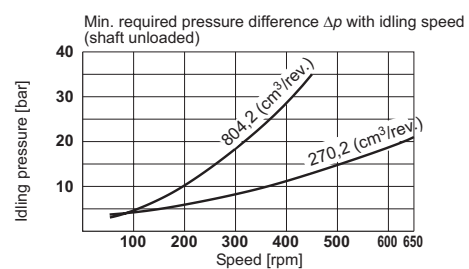


**MRDE 800**  
**MRVE 800**

set to  
270 cm<sup>3</sup>



Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult PARKER Calzoni



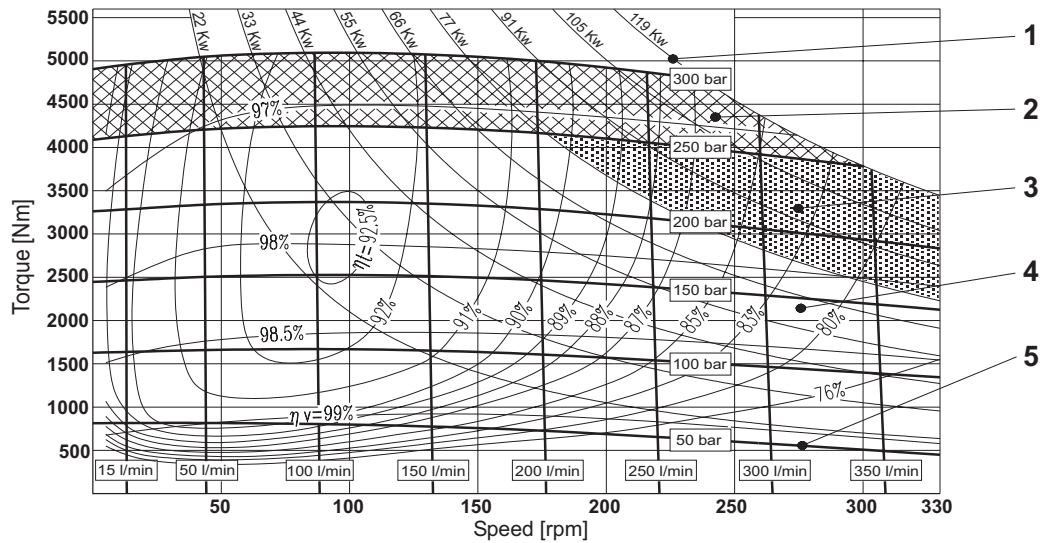
# OPERATING DIAGRAM

(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

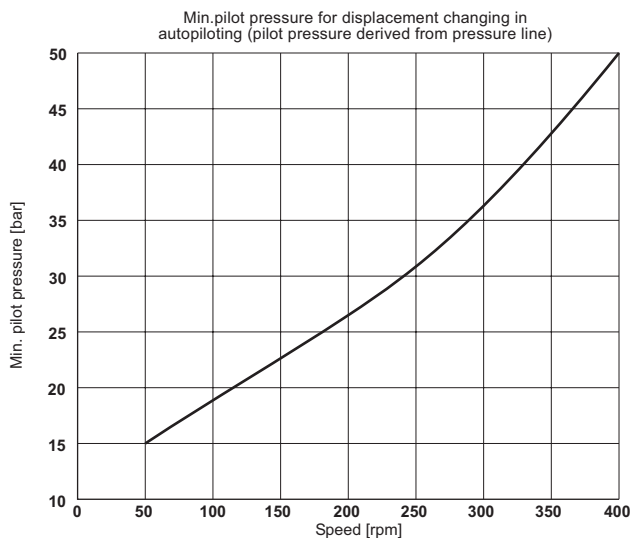
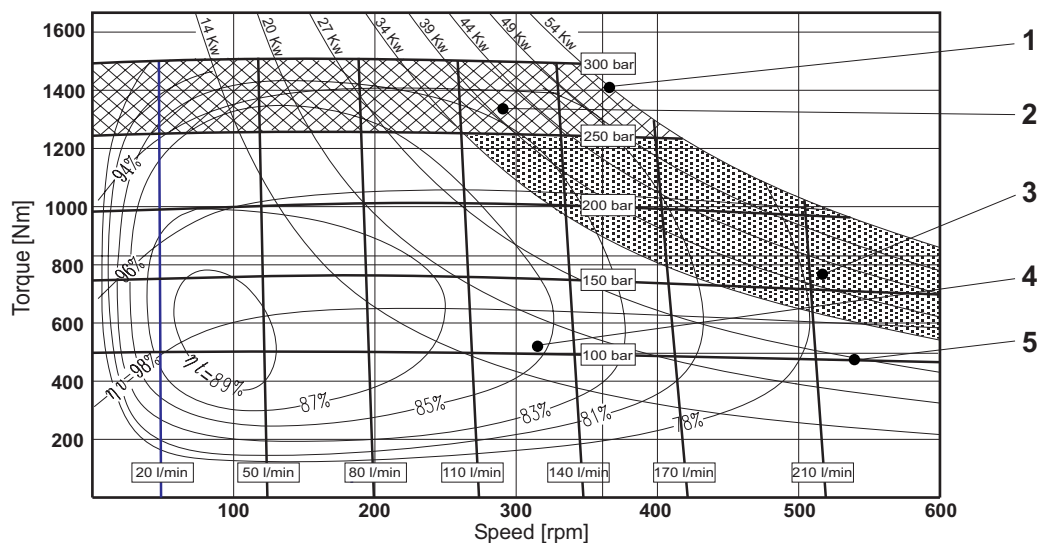
**MRD 1100**  
**MRV 1100**

set to  
1126  $\text{cm}^3$

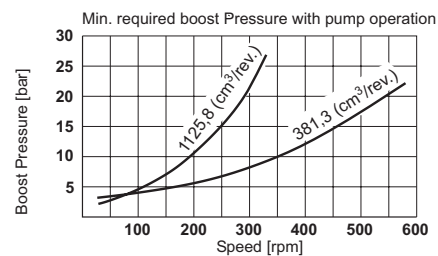
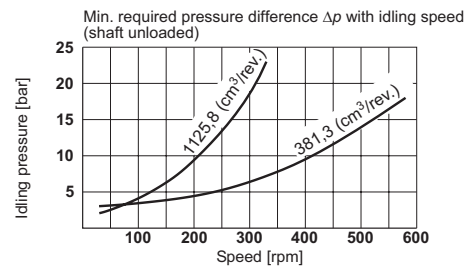


**MRD 1100**  
**MRV 1100**

set to  
381  $\text{cm}^3$



Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult PARKER Calzoni



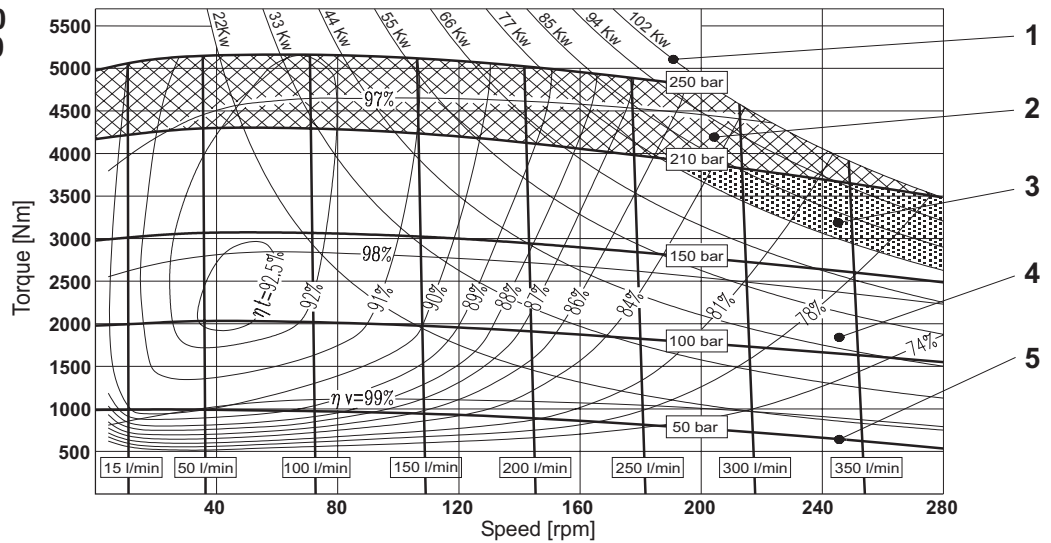
# OPERATING DIAGRAM

(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

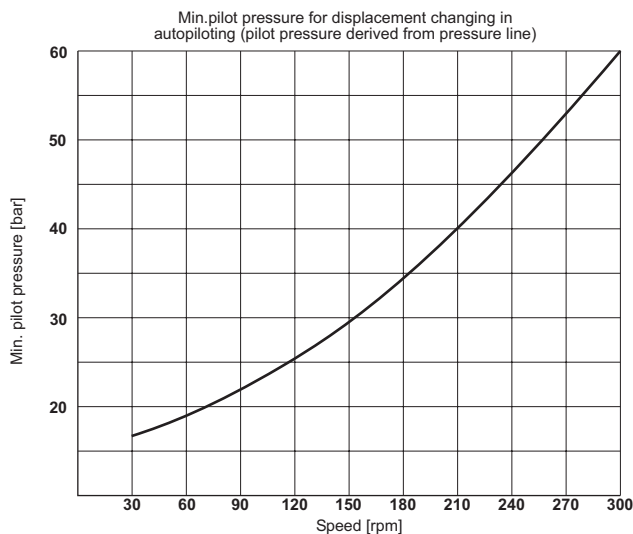
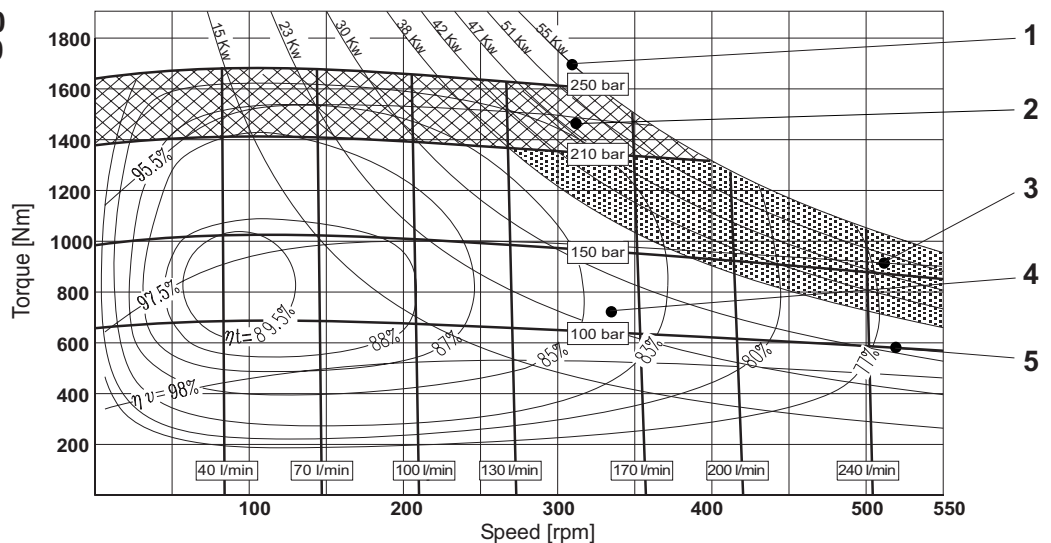
**MRDE 1400**  
**MRVE 1400**

set to  
1370  $\text{cm}^3$



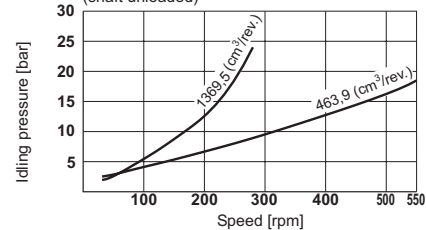
**MRDE 1400**  
**MRVE 1400**

set to  
464  $\text{cm}^3$

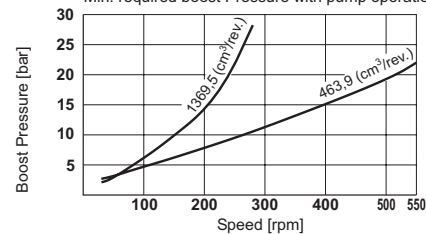


Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult PARKER Calzoni

Min. required pressure difference  $\Delta p$  with idling speed (shaft unloaded)



Min. required boost Pressure with pump operation





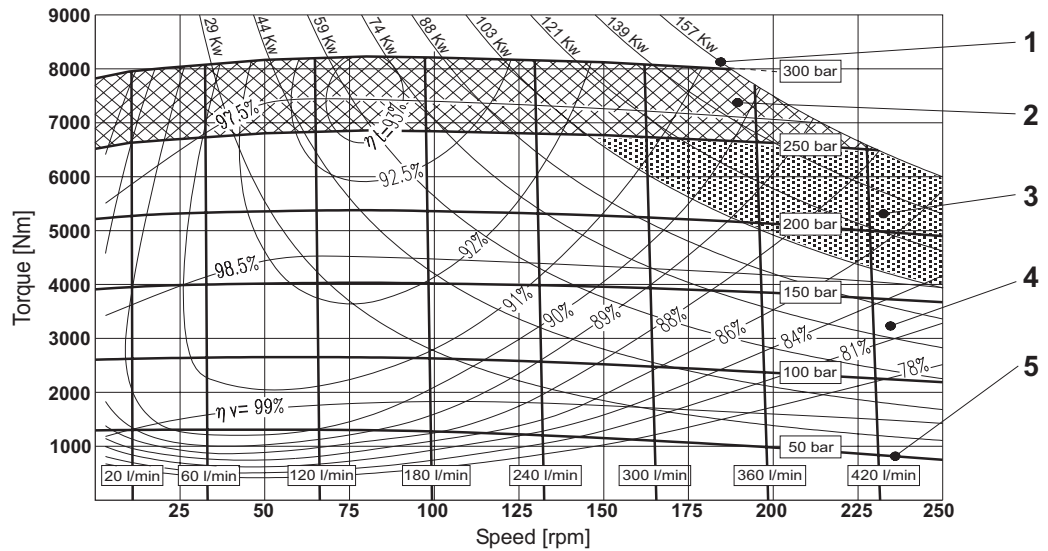
# OPERATING DIAGRAM

(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

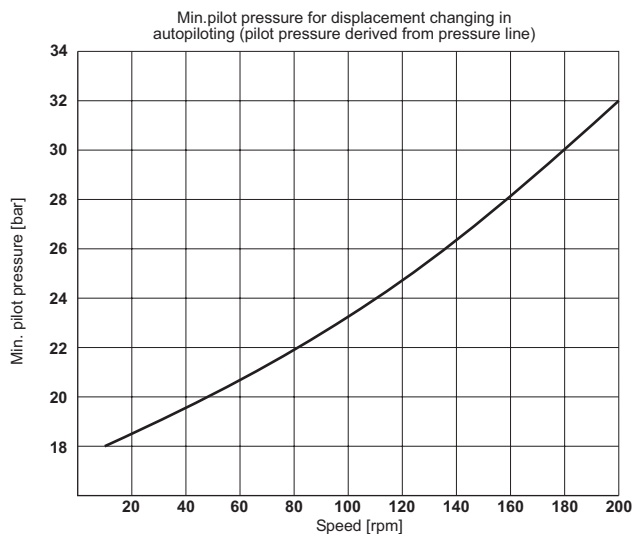
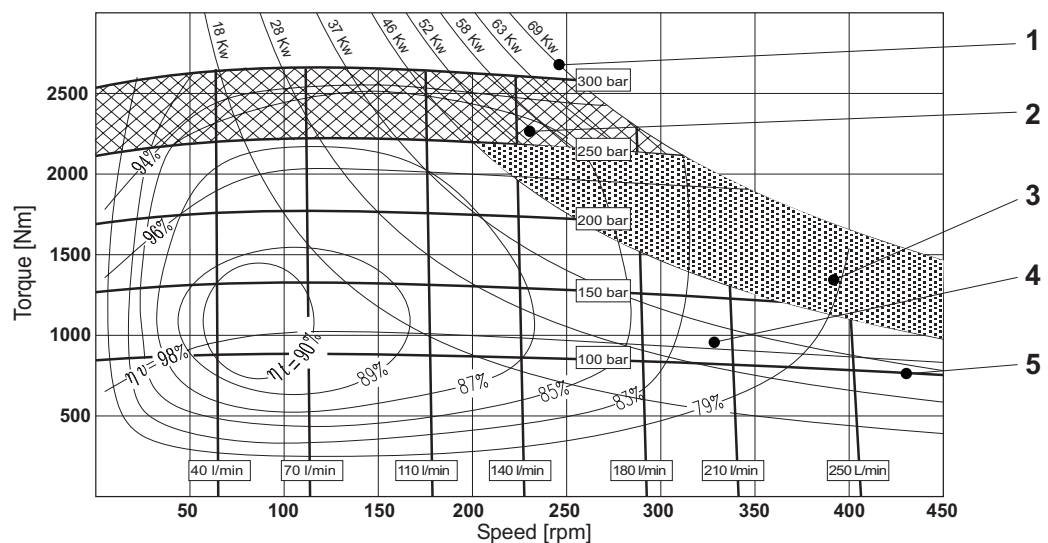
**MRD 1800**  
**MRV 1800**

set to  
1810  $\text{cm}^3$

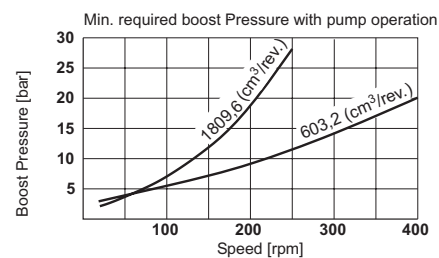
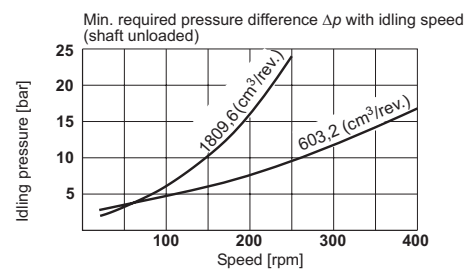


**MRD 1800**  
**MRV 1800**

set to  
603  $\text{cm}^3$



Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult DENISON Calzoni



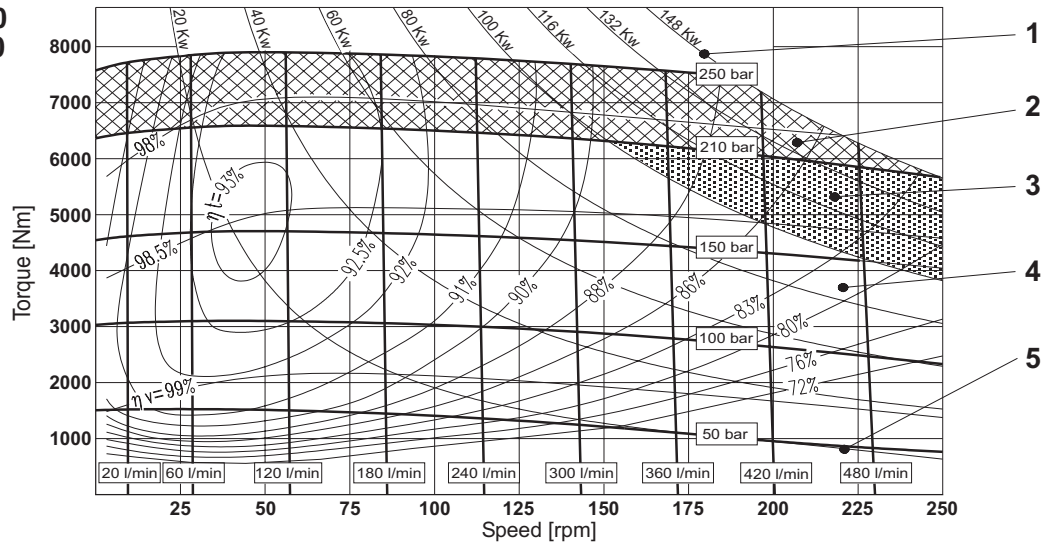
# OPERATING DIAGRAM

(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

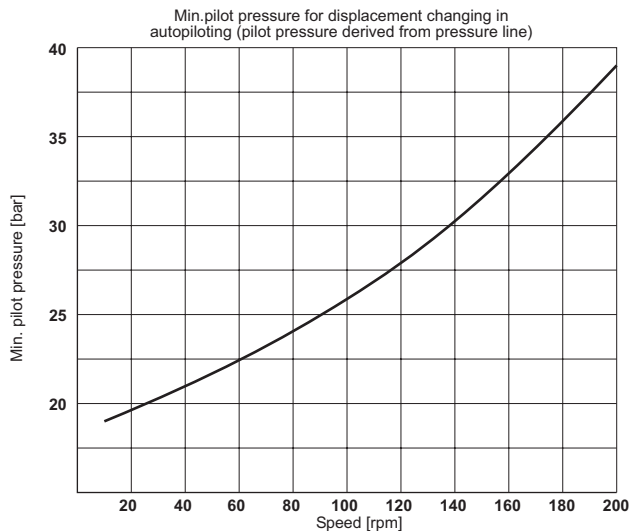
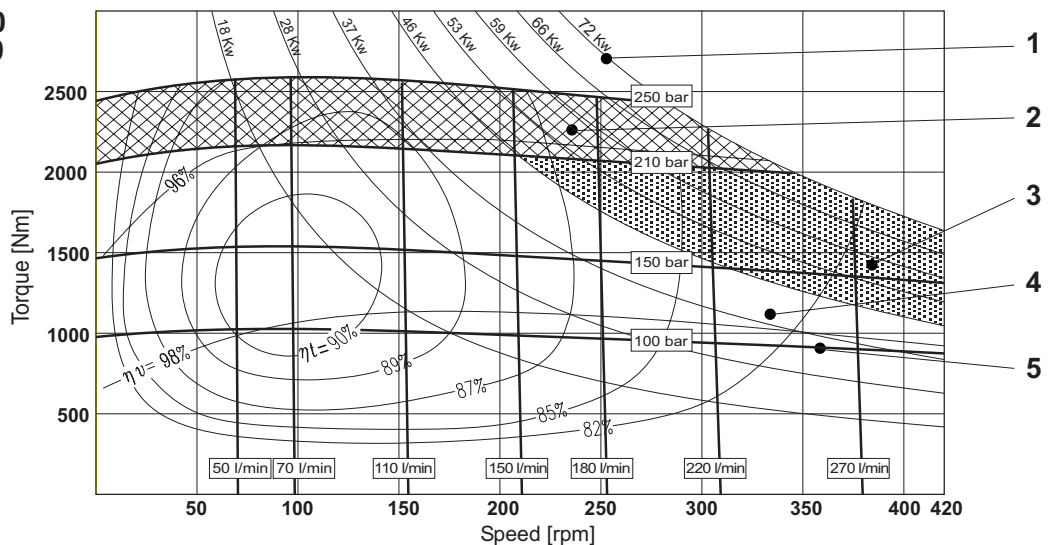
**MRDE 2100**  
**MRVE 2100**

set to  
2091  $\text{cm}^3$

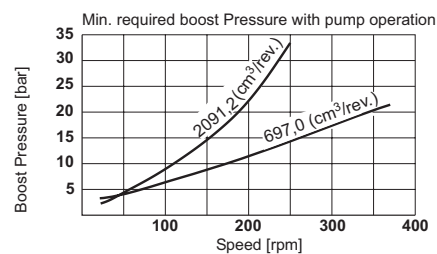
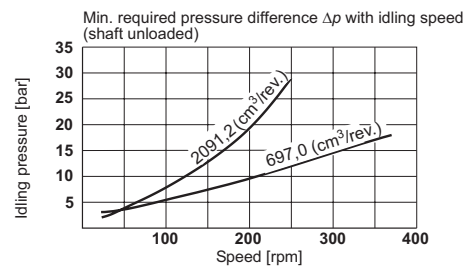


**MRDE 2100**  
**MRVE 2100**

set to  
697  $\text{cm}^3$



Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult PARKER Calzoni





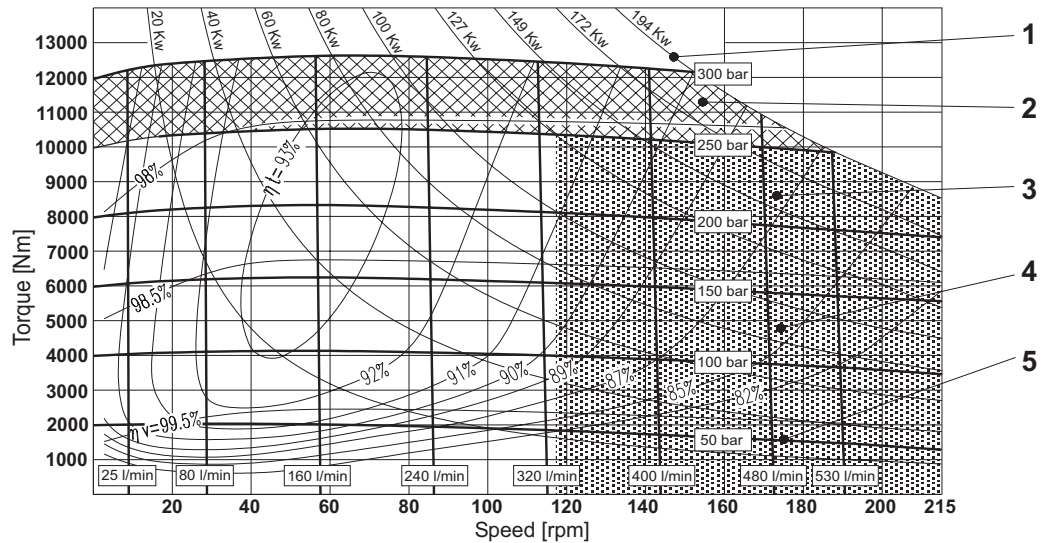
# OPERATING DIAGRAM

(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

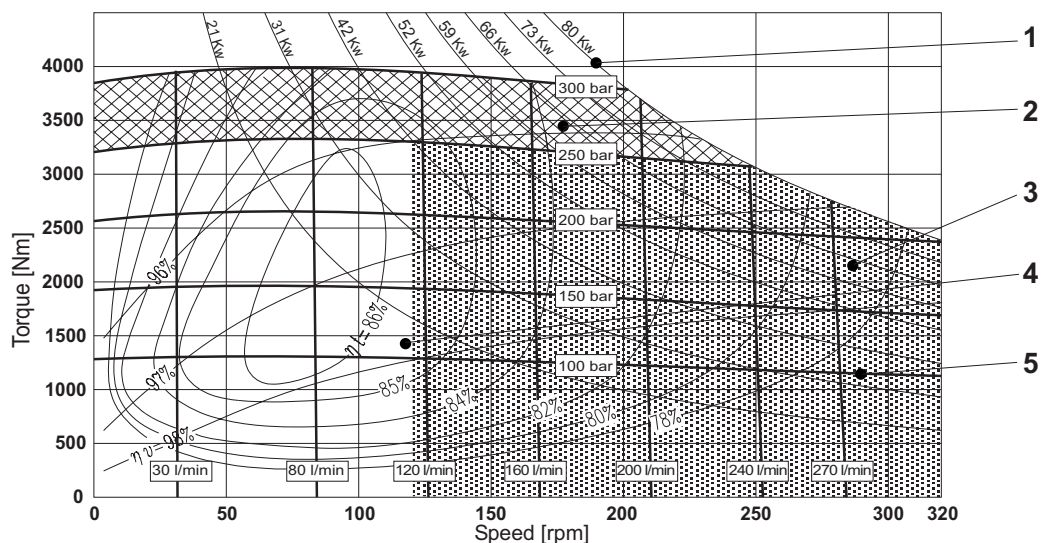
**MRD 2800**  
**MRV 2800**

set to  
2792 cm<sup>3</sup>

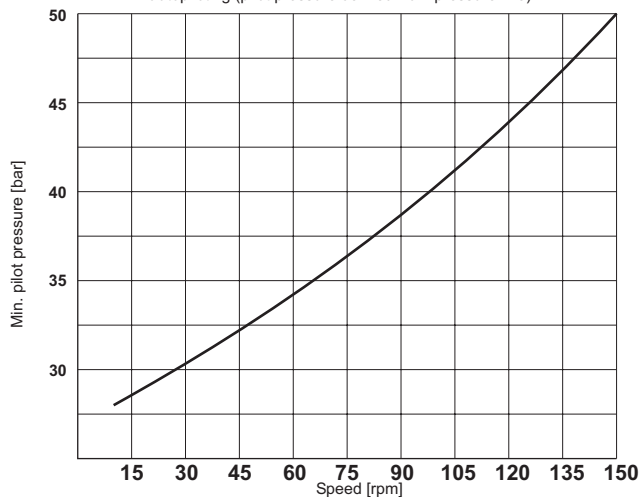


**MRD 2800**  
**MRV 2800**

set to  
931 cm<sup>3</sup>

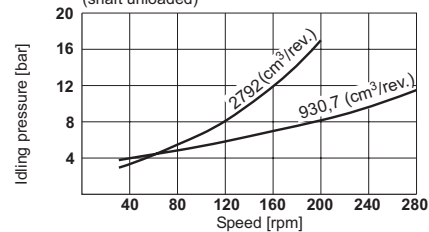


Min. pilot pressure for displacement changing in  
autopiloting (pilot pressure derived from pressure line)

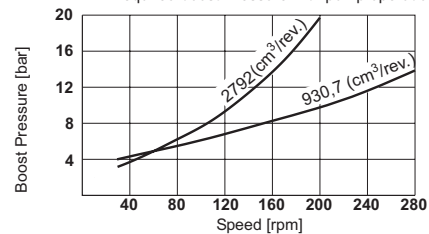


Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult PARKER Calzoni

Min. required pressure difference  $\Delta p$  with idling speed  
(shaft unloaded)



Min. required boost Pressure with pump operation



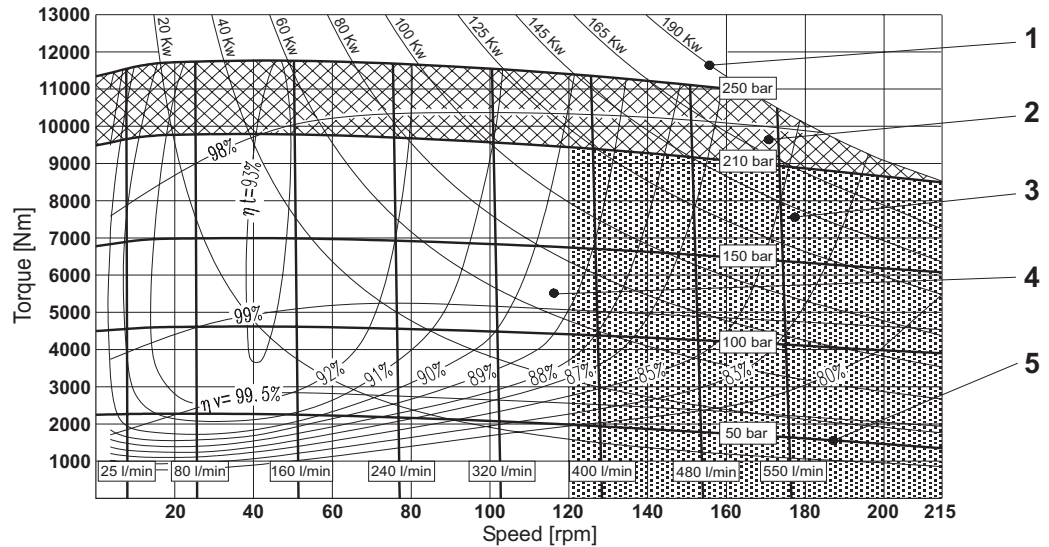
# OPERATING DIAGRAM

(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

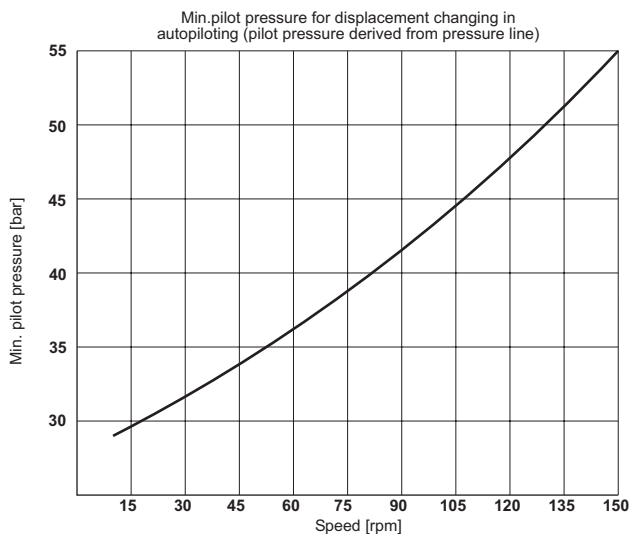
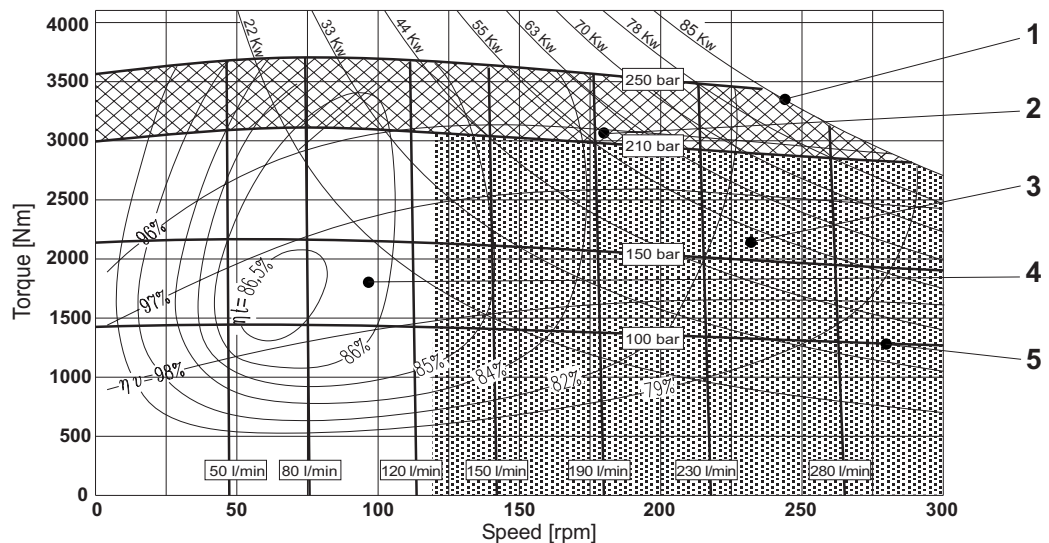
**MRDE 3100**  
**MRVE 3100**

set to  
3104 cm<sup>3</sup>

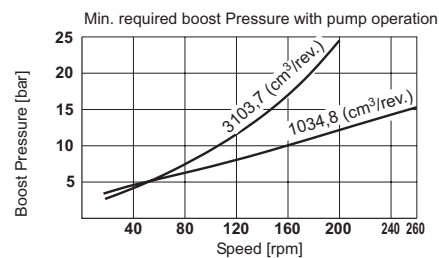
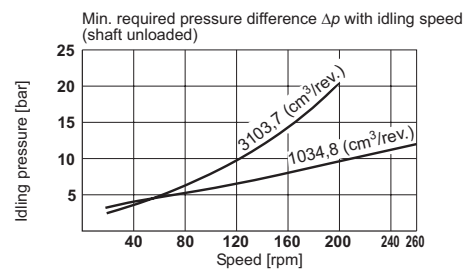


**MRDE 3100**  
**MRVE 3100**

set to  
1035 cm<sup>3</sup>



Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult PARKER Calzoni



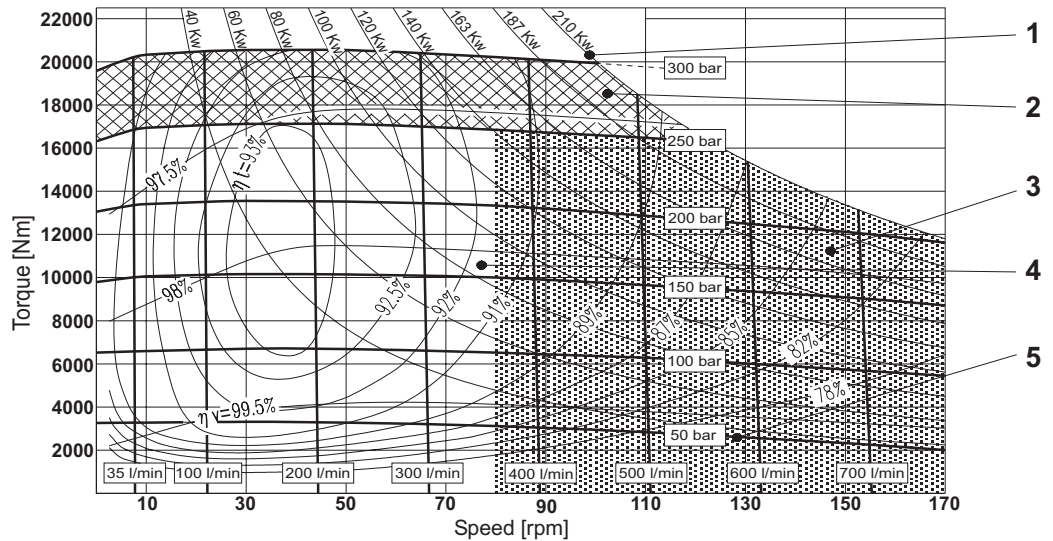
# OPERATING DIAGRAM

(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

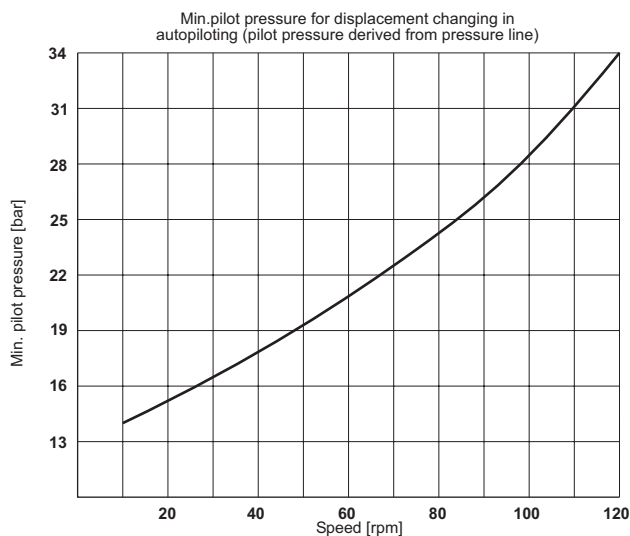
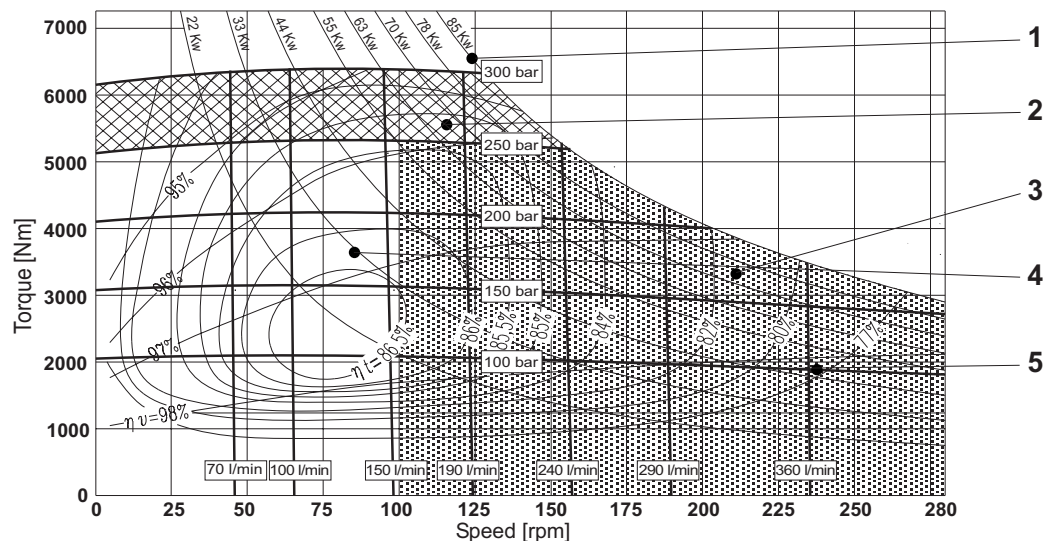
**MRD 4500**  
**MRV 4500**

set to  
4502 cm<sup>3</sup>

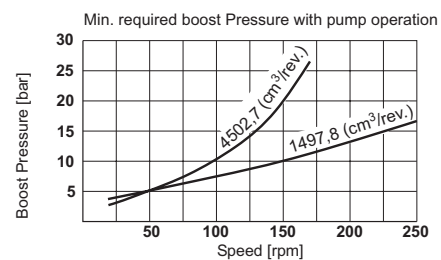
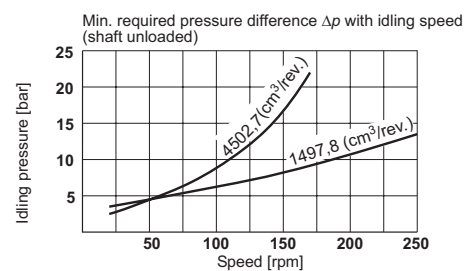


**MRD 4500**  
**MRV 4500**

set to  
1498 cm<sup>3</sup>



Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult PARKER Calzoni



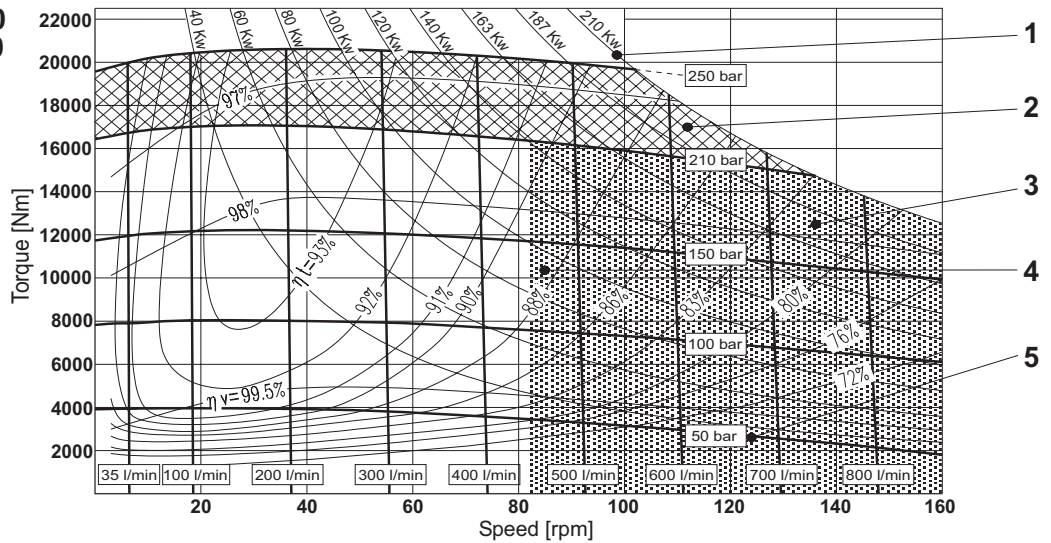
# OPERATING DIAGRAM

(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

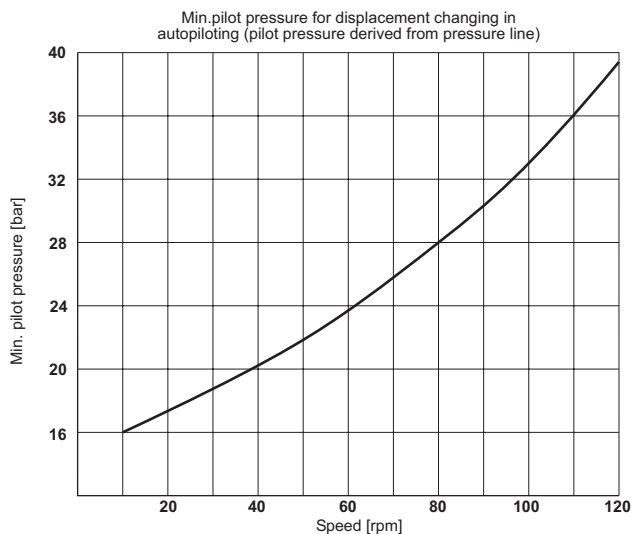
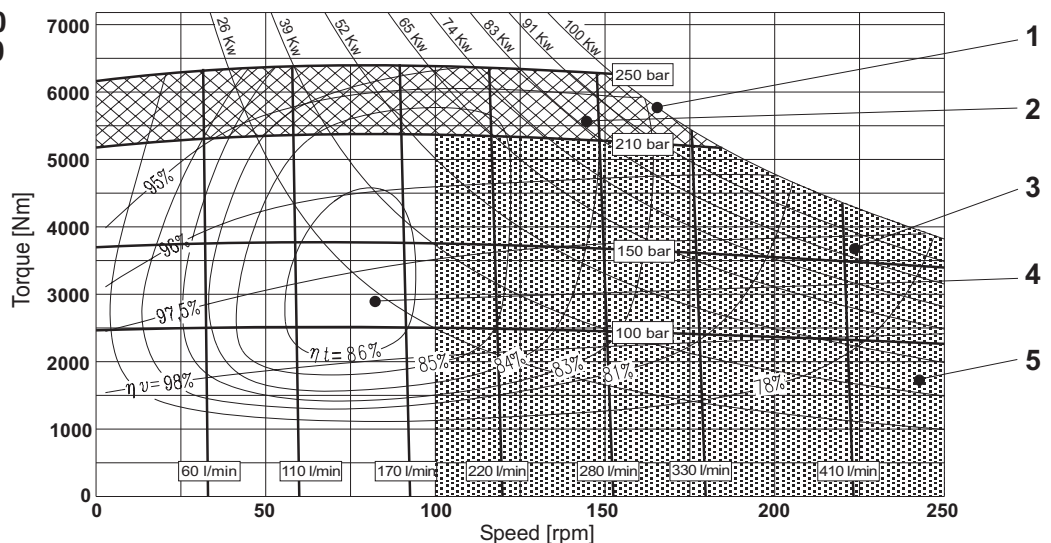
**MRDE 5400**  
**MRVE 5400**

set to  
5401  $\text{cm}^3$

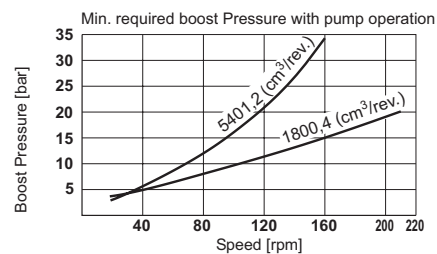
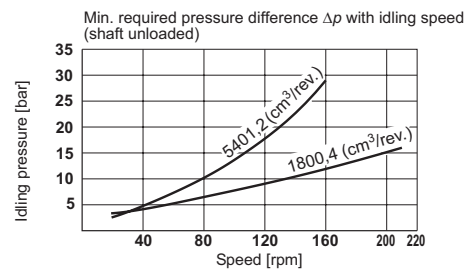


**MRDE 5400**  
**MRVE 5400**

set to  
1800  $\text{cm}^3$



Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult PARKER Calzoni



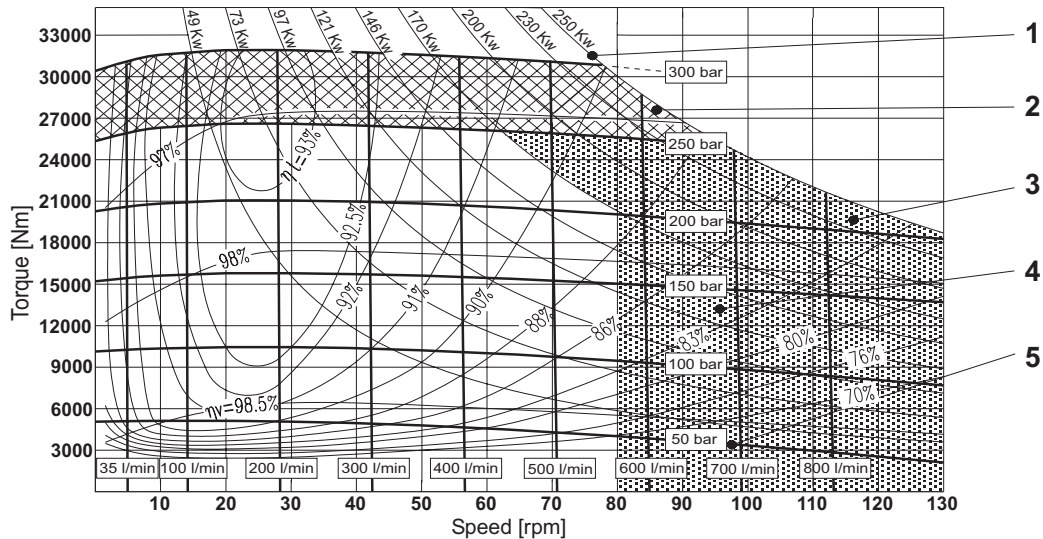
# OPERATING DIAGRAM

(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

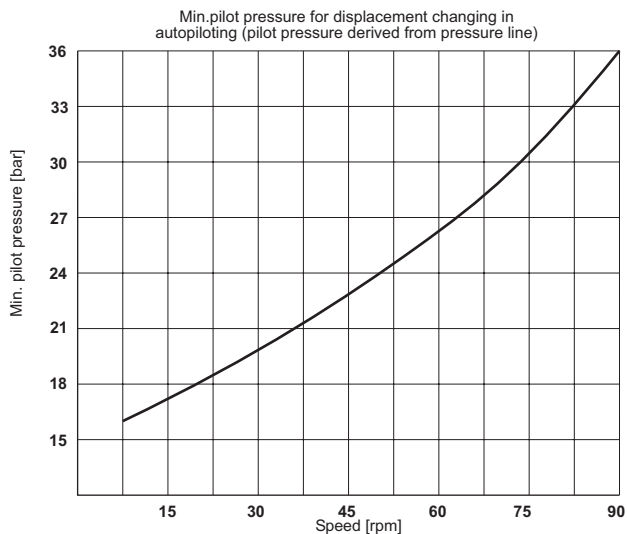
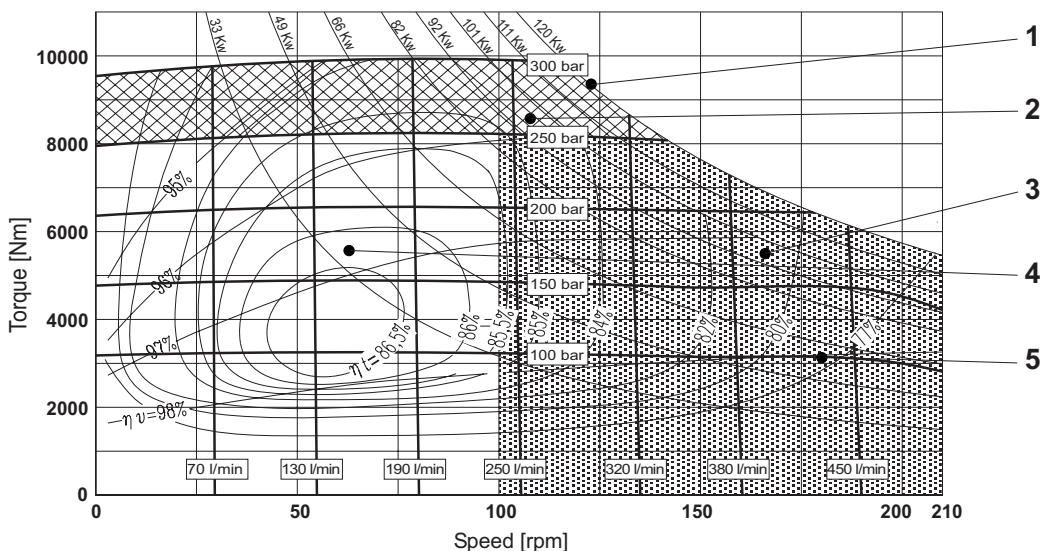
**MRD 7000**  
**MRV 7000**

set to  
6967  $\text{cm}^3$



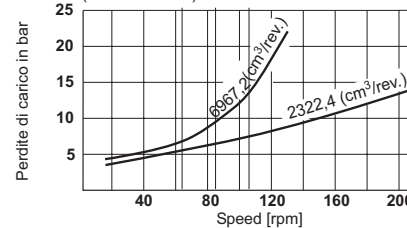
**MRD 7000**  
**MRV 7000**

set to  
2322  $\text{cm}^3$

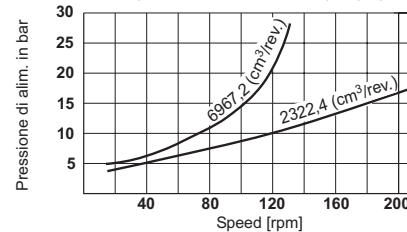


Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult PARKER Calzoni

Min. required pressure difference  $\Delta p$  with idling speed (shaft unloaded)



Min. required boost Pressure with pump operation





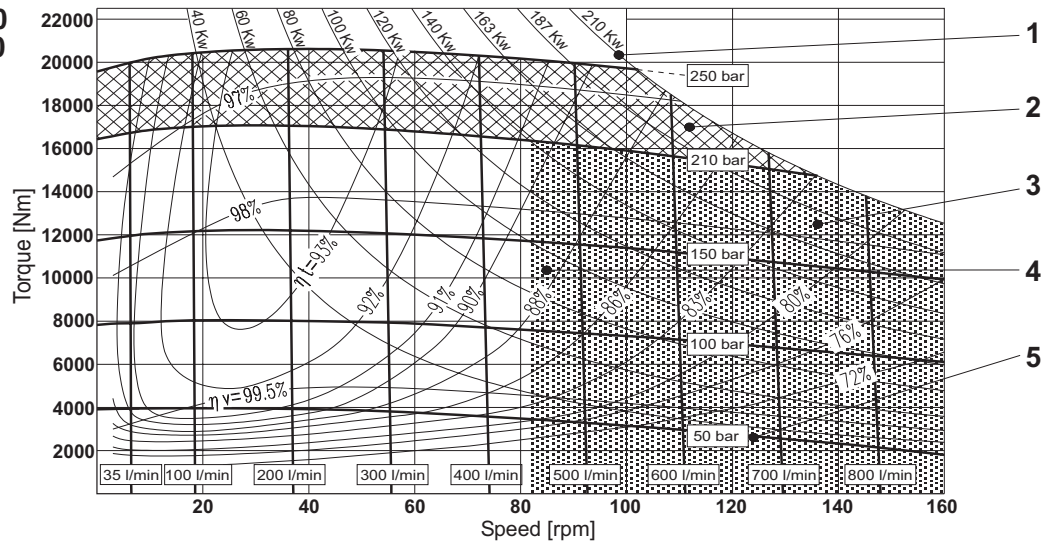
# OPERATING DIAGRAM

(average values) measured at  $V = 36 \text{ mm}^2/\text{s}$ ;  $t = 45^\circ \text{ C}$ ;  $p_{\text{outlet}} = 0 \text{ bar}$

- 1 Output power
- 2 Intermittent operating area
- 3 Continuous operating area with flushing
- 4 Continuous operating area
- 5 Inlet pressure
- $\eta_t$  Total efficiency
- $\eta_v$  Volumetric efficiency

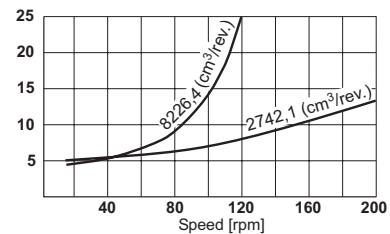
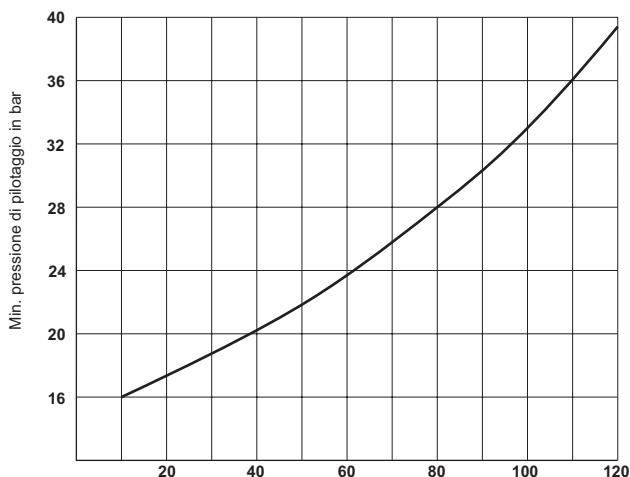
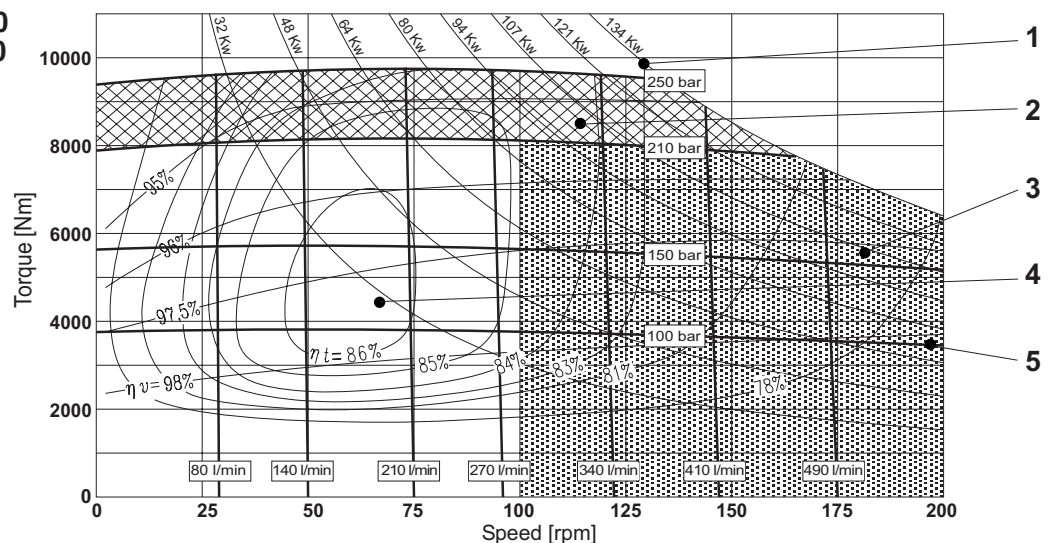
**MRDE 8200**  
**MRVE 8200**

set to  
8226  $\text{cm}^3$

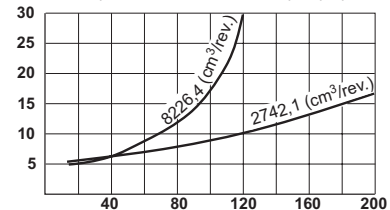


**MRDE 8200**  
**MRVE 8200**

set to  
2742  $\text{cm}^3$



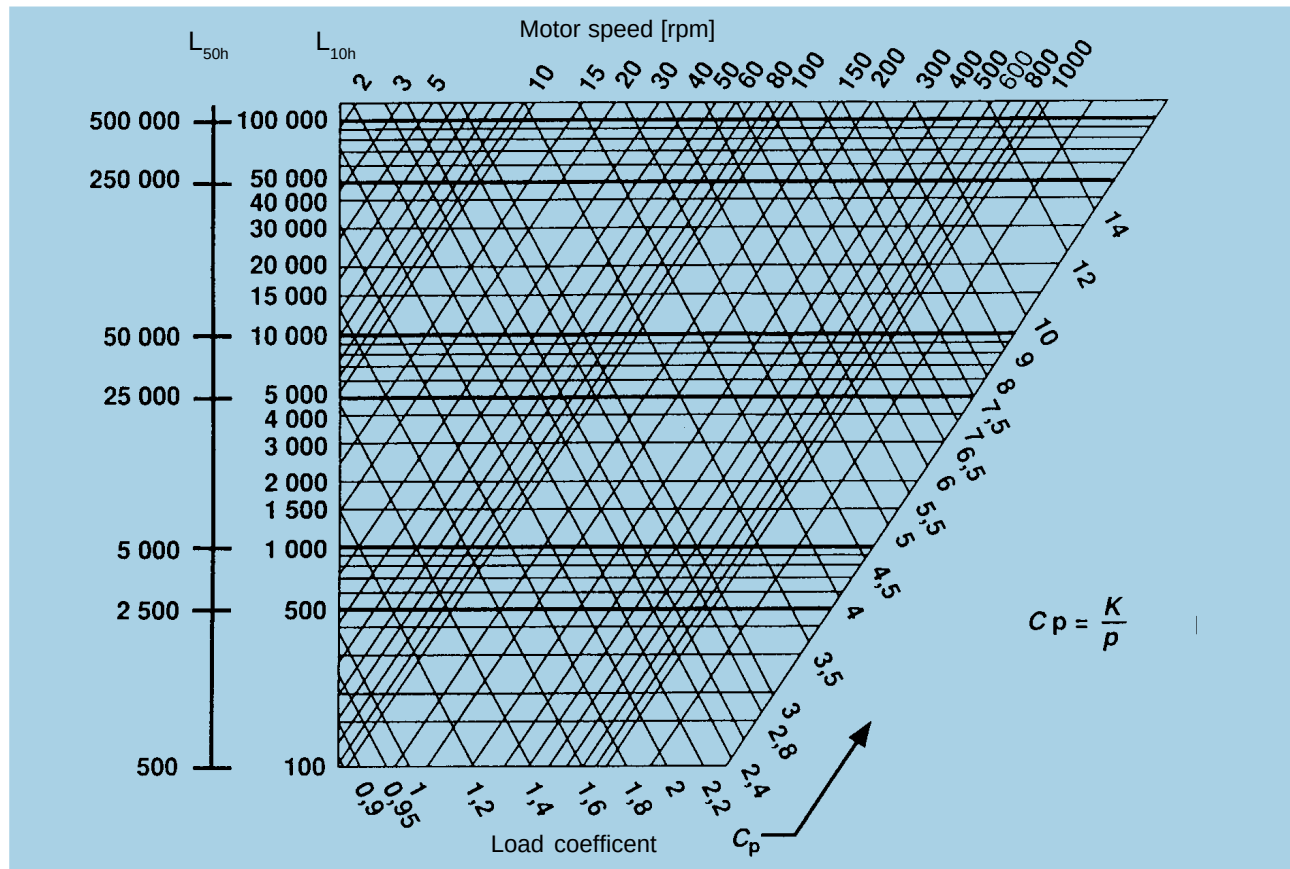
Min. required boost Pressure with pump operation



Valid for back pressure up to 50 bar, drain pressure up to 5 bar.  
For other working conditions please consult PARKER Calzoni



## BEARING LIFE

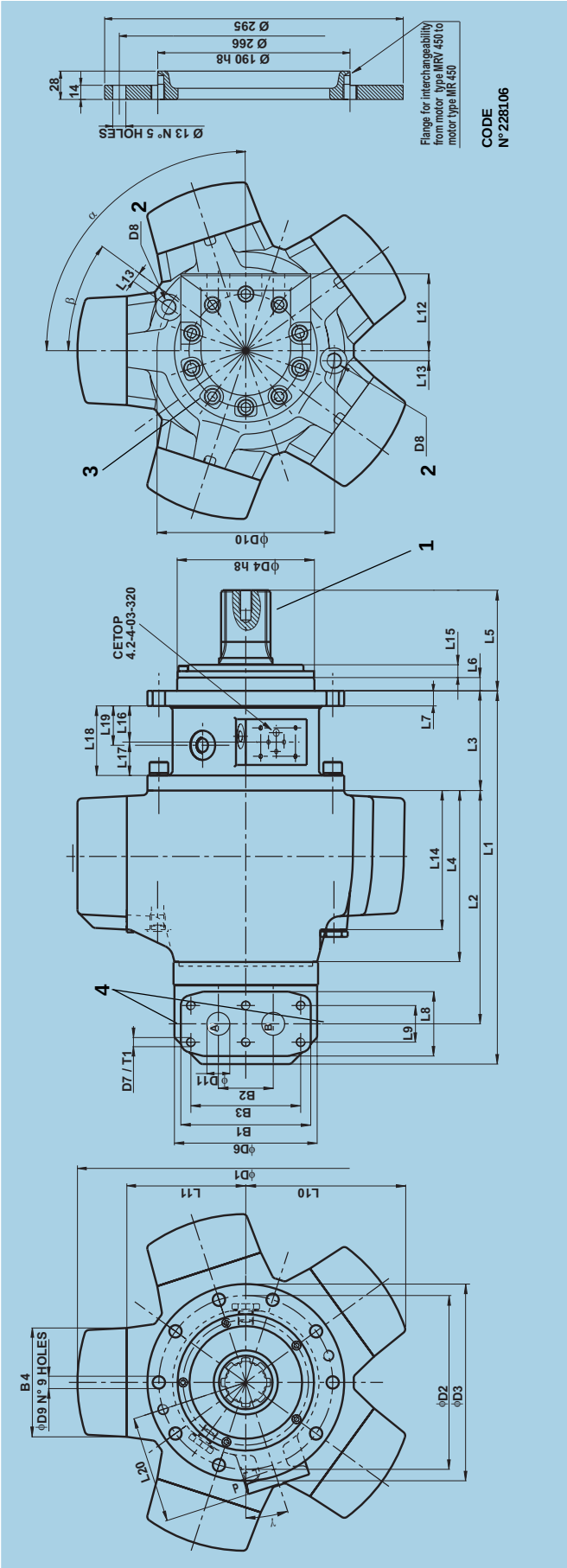


$C_p$  = Load coefficient  
 $K$  = Service life coefficient for standard bearing  
 $p$  = operating pressure in bar

$L_{10h}$  is the theoretically service life value normally reached or exceeded by the 90% of the bearings.

50 % of the bearings reach the value  $L_{50h} = 5$  times  $L_{10h}$ .

| MOTOR TYPE | K    | MOTOR TYPE | K    | MOTOR TYPE | K   |
|------------|------|------------|------|------------|-----|
| MRD 300    | 1120 | MRDE 1400  | 840  | MRV 4500   | 880 |
| MRDE 330   | 1000 | MRVE 1400  | 840  | MRDE 5400  | 730 |
| MRD 450    | 1340 | MRD 1800   | 920  | MRVE 5400  | 730 |
| MRV 450    | 1340 | MRV 1800   | 920  | MRD 7000   | 880 |
| MRDE 500   | 1215 | MRDE 2100  | 800  | MRV 7000   | 880 |
| MRD 700    | 1080 | MRVE 2100  | 800  | MRDE 8200  | 680 |
| MRV 700    | 1080 | MRD 2800   | 1020 | MRVE 8200  | 680 |
| MRDE 800   | 950  | MRV 2800   | 1020 |            |     |
| MRVE 800   | 950  | MRDE 3100  | 920  |            |     |
| MRD 1100   | 1020 | MRVE 3100  | 920  |            |     |
| MRV 1100   | 1020 | MRD 4500   | 880  |            |     |



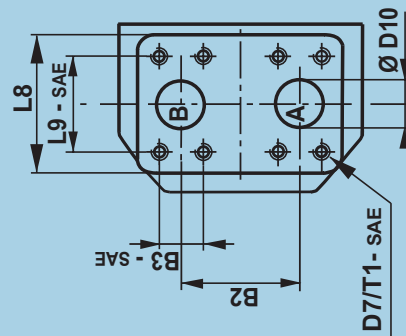
- 1 Splined shaft with flank contact  
(for dimension see page 30)  
Ordering code "N1"  
(for further shaft ends see page 30 - 31)
- 2 Case drain port  
BSP threads to ISO 228/1
- 3 On request the port flange can be  
rotated by 36°
- 4 Port 1/4" BSP threads to ISO 228/1  
for pressure reading.

| MOTOR TYPE | L1  | L2  | L3  | L4  | L5  | L6   | L7   | L8   | L9 | L10   | L11 | L12 | L13 | L14 | L15 | L16  | L17  | L18 | L19 | L20 |
|------------|-----|-----|-----|-----|-----|------|------|------|----|-------|-----|-----|-----|-----|-----|------|------|-----|-----|-----|
| MRV 450    | 408 | 255 | 109 | 187 | 110 | 14,5 | 16,5 | 70,4 | 40 | 174,5 | 130 | 84  | 11  | 152 | 14  | 39,5 | 36,5 | 76  | 43  | 117 |

| MOTOR TYPE | B1  | B2 | B3  | B4  | Ø D1 | Ø D2 | Ø D3 | Ø D4,* | Ø D5 | Ø D6 | Ø D7 | T1 | D8    | D9   | Ø D10 | Ø D11 | Ø D12 | α   | β   | γ   |
|------------|-----|----|-----|-----|------|------|------|--------|------|------|------|----|-------|------|-------|-------|-------|-----|-----|-----|
| MRV 450    | 142 | 60 | 120 | 119 | 368  | 190  | 215  | 150    | -    | 156  | M10  | 18 | G 3/8 | 13,5 | 194   | 25    | G 1/4 | 90° | 36° | 18° |

| Dir. of Rotation<br>(Viewed on shaft end) | Port inlet | ordering code<br>(see page47) |
|-------------------------------------------|------------|-------------------------------|
| clockwise                                 | A          | "N"                           |
| anti-clockwise                            | B          |                               |
| clockwise                                 | B          | "S"                           |
| anti-clockwise                            | A          |                               |

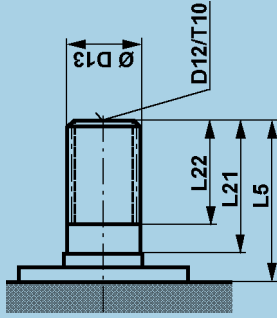
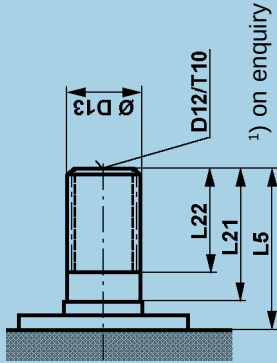
- 1** Splined shaft with flank contact (for dimension see page 32)  
Ordering code "N1"  
(for further shaft ends see page 32 - 33)
- 2** Case drain port BSP threads to ISO 228/1
- 3** On request the port flange can be rotated by 72°  
(For MRD 300, MRDE 330, MRD 450, MRDE 500,  
MRD 700, MRDE 800 can be rotated by 36°)  
For standard position see angle  $\alpha$ .
- 4** Port 1/4" BSP threads to ISO 228/1 for pressure reading.



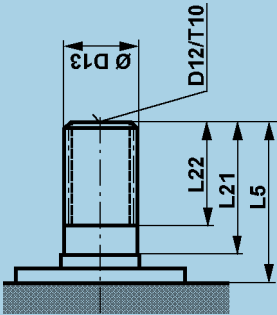
| MOTOR TYPE                                            | L1    | L2    | L3    | L4    | L5  | L6 | L7 | L8   | L9 | L9 - SAE | L10   | L11 | L12 | L13 | L14 | L15 | L16 |
|-------------------------------------------------------|-------|-------|-------|-------|-----|----|----|------|----|----------|-------|-----|-----|-----|-----|-----|-----|
| <b>MRD 300</b><br>MRDE 330                            | 363   | 282   | 244   | 173   | 81  | 15 | 16 | 54   | 34 | -        | 153,5 | 119 | 72  | 7,5 | 70  | 65  | 65  |
| <b>MRD 450</b><br>MRDE 500                            | 426   | 329   | 285   | 202   | 97  | 15 | 18 | 70,4 | 40 | -        | 174,5 | 130 | 84  | 9,5 | 79  | 70  | 78  |
| <b>MRD 700</b><br>MRDE 800<br>MRV 700<br>MRVE 800     | 450   | 349   | 305   | 222   | 101 | 15 | 20 | 70,4 | 40 | -        | 192   | 143 | 84  | 8   | 79  | 70  | 78  |
| <b>MRD 1100</b><br>MRDE 1400<br>MRV 1100<br>MRVE 1400 | 518   | 401   | 353   | 235   | 117 | 20 | 22 | 82   | 50 | -        | 223   | 165 | 105 | 9   | 88  | 75  | 88  |
| <b>MRD 1800</b><br>MRDE 2100<br>MRV 1800<br>MRVE 2100 | 566   | 434   | 386   | 268   | 132 | 21 | 24 | 82   | 50 | -        | 264   | 197 | 105 | 11  | 88  | 75  | 88  |
| <b>MRD 2800</b><br>MRDE 3100<br>MRV 2800<br>MRVE 3100 | 679   | 526   | 452   | 317   | 153 | 24 | 26 | 98   | 62 | 79,4     | 303   | 221 | 123 | 15  | 108 | 84  | 108 |
| <b>MRD 4500</b><br>MRDE 5400<br>MRV 4500<br>MRVE 5400 | 759,5 | 549,5 | 478,5 | 340,5 | 210 | 34 | 28 | 98   | 68 | 96,82    | 359,5 | 255 | 140 | 19  | 108 | 84  | 108 |
| <b>MRD 7000</b><br>MRDE 8200<br>MRV 7000<br>MRVE 8200 | 854   | 624   | 555   | 417   | 230 | 37 | 30 | 98   | 68 | 96,82    | 407,3 | 272 | 140 | 21  | 108 | 84  | 108 |

| MOTOR TYPE                                            | B1  | B2  | B3  | B3 - SAE | B4  | Ø D1 | Ø D2 | Ø D3  | Ø D4 <sub>h8</sub> *      | Ø D5 | Ø D6 | D7-T1  | D7-T1 SAE | D8    | D9 | Ø D10 | Ø D11 | Ø D12 | α    | β   | γ   |
|-------------------------------------------------------|-----|-----|-----|----------|-----|------|------|-------|---------------------------|------|------|--------|-----------|-------|----|-------|-------|-------|------|-----|-----|
| <b>MRD 300</b><br>MRDE 330                            | 120 | 50  | 100 | -        | 100 | 328  | 232  | 256   | 175                       | 90   | 129  | M8-15  | -         | G 3/8 | 11 | 162   | 20    | G 1/4 | 90°  | 36° | 0°  |
| <b>MRD 450</b><br>MRDE 500                            | 142 | 60  | 120 | -        | 119 | 368  | 266  | 296   | 190                       | 96   | 156  | M10-18 | -         | G 3/8 | 13 | 194   | 25    | G 1/4 | 90°  | 36° | 0°  |
| <b>MRD 700</b><br>MRDE 800<br>MRV 700<br>MRVE 800     | 142 | 60  | 120 | -        | 133 | 405  | 290  | 320   | 220                       | 102  | 156  | M10-18 | -         | G 3/8 | 13 | 207   | 25    | G 1/4 | 90°  | 36° | 0°  |
| <b>MRD 1100</b><br>MRDE 1400<br>MRV 1100<br>MRVE 1400 | 162 | 73  | 136 | -        | 148 | 470  | 330  | 367   | 250                       | 120  | 172  | M12-21 | -         | G 1/2 | 15 | 228   | 31    | G 1/4 | 104° | 36° | 14° |
| <b>MRD 1800</b><br>MRDE 2100<br>MRV 1800<br>MRVE 2100 | 162 | 73  | 136 | -        | 168 | 558  | 380  | 423   | 290                       | 148  | 172  | M12-21 | -         | G 1/2 | 17 | 266   | 31    | G 1/4 | 90°  | 36° | 14° |
| <b>MRD 2800</b><br>MRDE 3100<br>MRV 2800<br>MRVE 3100 | 208 | 86  | 180 | 36,5     | 190 | 642  | 440  | 494   | 335                       | 140  | 215  | M14-28 | M16-28    | G 1/2 | 19 | 314   | 37    | G 1/4 | 90°  | 36° | 18° |
| <b>MRD 4500</b><br>MRDE 5400<br>MRV 4500<br>MRVE 5400 | 230 | 116 | 200 | 44,45    | 240 | 766  | 540  | 597   | 400<br>D4 <sub>h7</sub> * | -    | 215  | M16-28 | M20-28    | G 1/2 | 23 | 380   | 38    | G 1/4 | 108° | 36° | 18° |
| <b>MRD 7000</b><br>MRDE 8200<br>MRV 7000<br>MRVE 8200 | 230 | 116 | 200 | 44,45    | 264 | 864  | 600  | 658,6 | 450<br>D4 <sub>h7</sub> * | 190  | 215  | M16-28 | M20-28    | G 1/2 | 25 | 450   | 38    | G 1/4 | 108° | 36° | 18° |

Code D 1 - DIN 5480

Code B 1 - BS 3550 - <sup>1)</sup>

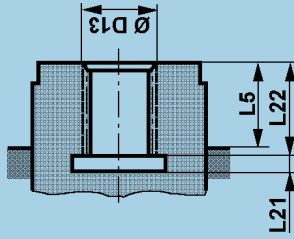
Code N 1 (Standard)



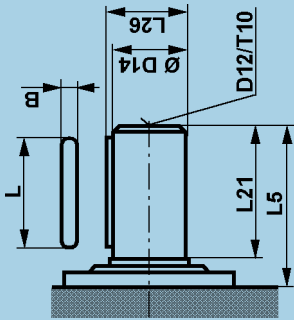
| Version                                        | N   |     |      |     |     |             | B   |     |       |     |     |          | D   |     |      |     |     |              |
|------------------------------------------------|-----|-----|------|-----|-----|-------------|-----|-----|-------|-----|-----|----------|-----|-----|------|-----|-----|--------------|
|                                                | L5  | L21 | L22  | D12 | T10 | ØD13        | L5  | L21 | L22   | D12 | T10 | ØD13     | L5  | L21 | L22  | D12 | T10 | ØD13         |
| MRD 300<br>MRDE 330                            | 81  | 60  | 46   | M12 | 25  | B8x42x48    | 81  | 60  | 45    | M12 | 25  | 12/24-21 | 81  | 60  | 46   | M12 | 25  | W48x2x22-8e  |
| MRD 450<br>MRDE 500                            | 97  | 74  | 56,5 | M12 | 25  | B8x46x54    | 97  | 74  | 61    | M12 | 25  | 8/16-17  | 97  | 74  | 60   | M12 | 25  | W55x3x17-8e  |
| MRV 450                                        | 110 | 74  | 56,5 | M14 | 22  | B8x52x60    | -   | -   | -     | -   | -   | -        | 110 | 74  | 56,5 | M14 | 22  | W55x3x17-8e  |
| MRD 700<br>MRDE 800<br>MRV 700<br>MRVE 800     | 101 | 78  | 62   | M12 | 25  | B8x52x60    | 101 | 78  | 62    | M12 | 25  | 8/16-17  | 101 | 78  | 62   | M12 | 25  | W60x3x18-8e  |
| MRD 1100<br>MRDE 1400<br>MRV 1100<br>MRVE 1400 | 117 | 88  | 69   | M12 | 25  | B8x62x72    | 117 | 88  | 67    | M12 | 25  | 6/12-14  | 117 | 88  | 72   | M12 | 25  | W70x3x22-8e  |
| MRD 1800<br>MRDE 2100<br>MRV 1800<br>MRVE 2100 | 132 | 100 | 79   | M12 | 25  | B10x72x82   | 132 | 100 | 76    | M12 | 25  | 6/12-20  | 132 | 100 | 80   | M12 | 25  | W80x3x25-8e  |
| MRD 2800<br>MRDE 3100<br>MRV 2800<br>MRVE 3100 | 153 | 120 | 99   | M12 | 25  | B10x82x92   | 153 | 120 | 76    | M12 | 25  | 6/12-20  | 153 | 120 | 100  | M12 | 25  | W90x4x21-8e  |
| MRD 4500<br>MRDE 5400<br>MRV 4500<br>MRVE 5400 | 210 | 173 | 144  | M12 | 25  | B10x102x112 | 210 | 173 | 142,5 | M12 | 25  | 6/12-20  | 210 | 173 | 144  | M12 | 25  | W110x4x26-8e |
| MRD 7000<br>MRDE 8200<br>MRV 7000<br>MRVE 8200 | 230 | 188 | 150  | M12 | 25  | B10x112x125 | 230 | 188 | 153   | M12 | 25  | 6/12-26  | 230 | 188 | 153  | M12 | 25  | W120x4x28-8e |

NOTE: the threaded holes (D12/T10) for the shaft versions "N1", "B1" and "D1" must be considered as service holes. In case the holes dimensions required by the application are different from the ones listed here above, please contact PARKER Calzoni.

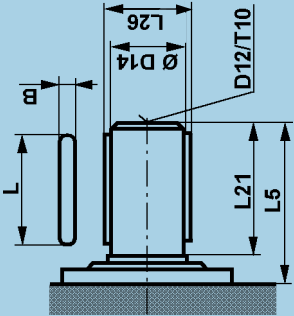
Code F 1 - DIN 5480



Code P 1



Code P 1 \*\*



Only MRD 7000, MRV 7000,  
MRDE 8200, MRVE 8200

| Version                                                                                                                                                                                                                                                                          |    | F   |     |                  |     | P   |           |     |     |        |              |                               | NOTE<br>For higher values of the torque to be transmitted, please consult PARKER Calzoni |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|------------------|-----|-----|-----------|-----|-----|--------|--------------|-------------------------------|------------------------------------------------------------------------------------------|
| Type                                                                                                                                                                                                                                                                             | L5 | L21 | L22 | ØD13<br>DIN 5480 | L5  | L21 | L26       | D12 | T10 | ØD14   | Key<br>L x B | Transmitted<br>torque<br>(Nm) |                                                                                          |
| MRD 300<br>MRDE 330                                                                                                                                                                                                                                                              | 27 | 5   | 36  | N40x2x18-9H      | 81  | 60  | 53.5      | M12 | 25  | 50 k6  | 56 x 14      | 897                           |                                                                                          |
| MRD 450<br>MRDE 500                                                                                                                                                                                                                                                              | 28 | 5   | 38  | N47x2x22-9H      | 97  | 74  | 59        | M12 | 25  | 55 k6  | 70 x 16      | 1413                          |                                                                                          |
| MRV 450                                                                                                                                                                                                                                                                          | 33 | 5   | 38  | N47x2x22-9H      | 110 | 74  | 59        | M14 | 25  | 55 k6  | 70 x 16      | 1413                          |                                                                                          |
| MRD 700<br>MRDE 800<br>MRV 700<br>MRVE 800                                                                                                                                                                                                                                       | 28 | 5   | 44  | N55x3x17-9H      | 101 | 78  | 64        | M12 | 25  | 60 k6  | 70 x 18      | 2030                          |                                                                                          |
| MRD 1100<br>MRDE1400<br>MRV 1100<br>MRVE1400                                                                                                                                                                                                                                     | 38 | 8   | 50  | N65x3x20-9H      | 117 | 88  | 76,5      | M12 | 25  | 70 k6  | 80 x 20      | 2690                          |                                                                                          |
| MRD 1800<br>MRDE 2100<br>MRV 1800<br>MRVE 2100                                                                                                                                                                                                                                   | 47 | 8   | 57  | N75x3x24-9H      | 132 | 100 | 85        | M12 | 25  | 80 k6  | 90 x 22      | 4020                          |                                                                                          |
| MRD 2800<br>MRDE 3100<br>MRV 2800<br>MRVE 3100                                                                                                                                                                                                                                   | 48 | 8   | 62  | N85x3x27-9H      | 153 | 120 | 95        | M12 | 25  | 90 k6  | 110 x 25     | 6207                          |                                                                                          |
| MRD 4500<br>MRDE 5400<br>MRV 4500<br>MRVE 5400                                                                                                                                                                                                                                   | 50 | 14  | 68  | N100x3x32-9H     | 210 | 173 | 116       | M12 | 25  | 110 k6 | 160 x 28     | 10757                         |                                                                                          |
| MRD 7000<br>MRDE 8200<br>MRV 7000<br>MRVE 8200                                                                                                                                                                                                                                   | 50 | 14  | 76  | N110x3x35-9H     | 230 | 188 | 138<br>** | M12 | 25  | 124 k6 | N°2 180 x 32 | 28270                         |                                                                                          |
| NOTE: the threaded holes (D12/T10) for the shaft versions "P1" must be considered as service holes. In case the holes dimensions required by the application are different from the ones listed here above, please contact PARKER Calzoni.<br>**This dimension includes two keys |    |     |     |                  |     |     |           |     |     |        |              |                               |                                                                                          |

**NOTE**

For higher values of the torque to  
be transmitted, please consult  
PARKER Calzoni

NOTE: the threaded holes (D12/T10) for the shaft versions "P1" must be considered as service holes. In case the holes dimensions required by the application are different from the ones listed here above, please contact PARKER Calzoni.  
\*\*This dimension includes two keys

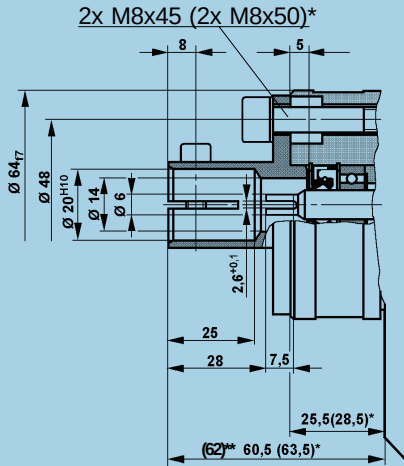


# MECHANICAL TACHOMETER DRIVE

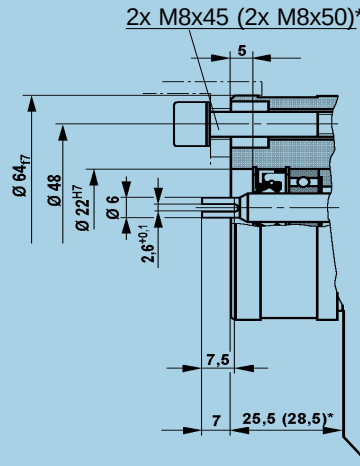
# TACHOGENERATOR DRIVE

# ENCODER DRIVE

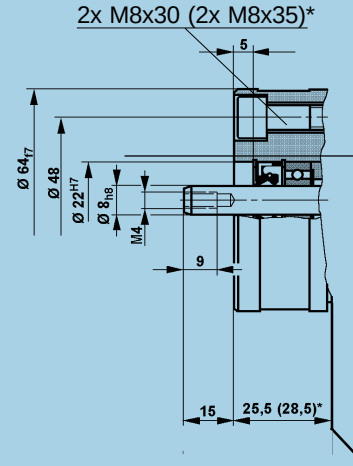
Code "C1"



Code "T1"

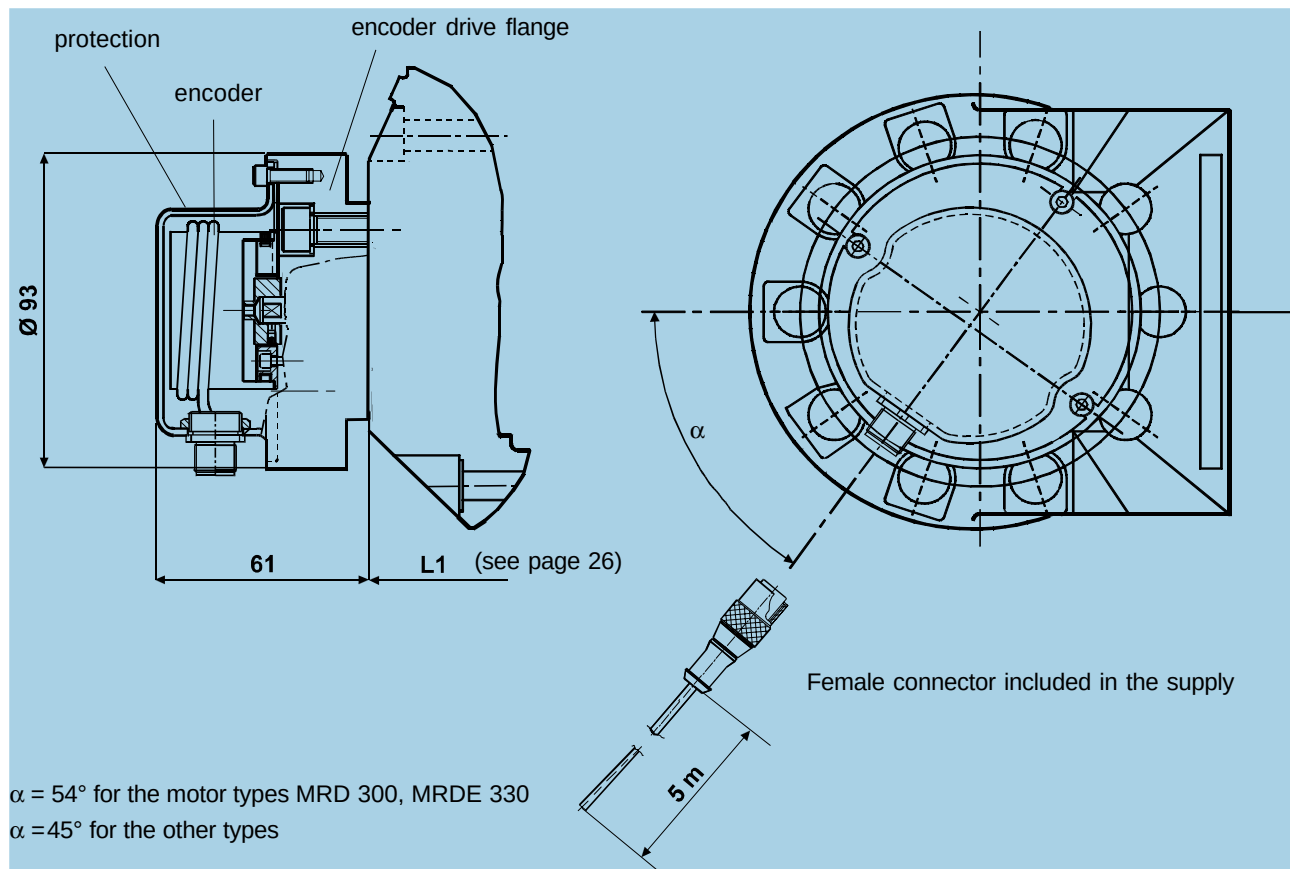


Code "Q1"



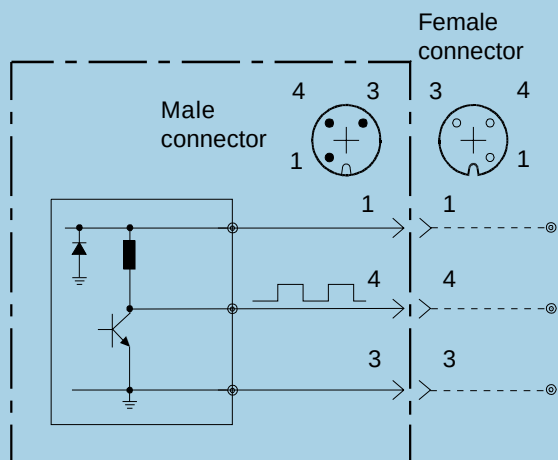
( ) \* Motor MRD 300, MRDE 330

# INCREMENTAL ENCODER DIMENSIONS

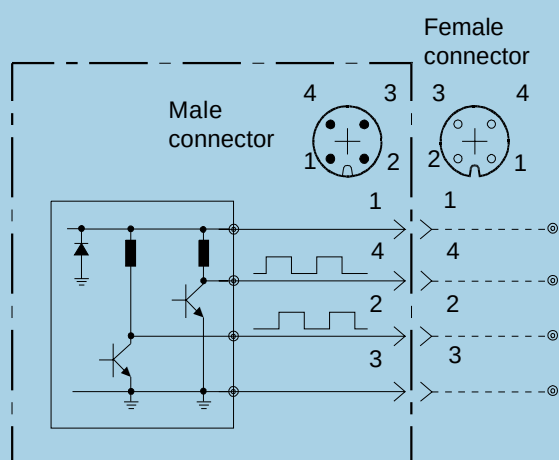


## INCREMENTAL ENCODER CONNECTION DIAGRAMS

### Monodirectional



### Bidirectional



### Color wires and function

| <b>1</b> | <b>Brown</b> | Power Supply (8 to 24 Vdc)          |
|----------|--------------|-------------------------------------|
| <b>2</b> | <b>White</b> | Output B phase (MAX 10 mA - 24 Vcc) |
| <b>3</b> | <b>Blue</b>  | Power Supply (0 Vdc)                |
| <b>4</b> | <b>Black</b> | Output A phase (MAX 10 mA - 24 Vcc) |

## INCREMENTAL ENCODER TECHNICAL DATA

|                              |                                                         |
|------------------------------|---------------------------------------------------------|
| Encoder type:                | ELCIS mod. 478                                          |
| Supply voltage:              | 8 to 24 Vcc                                             |
| Current consumption:         | 120 mA max                                              |
| Current output:              | 10 mA max                                               |
| Output signal:               | A phase- MONODIRECTIONAL<br>A and B phase BIDIRECTIONAL |
| Response frequency:          | 100 KHz max                                             |
| Number of pulses:            | 500 (others on request - max 2540)                      |
| Slew speed:                  | Always compatible with maximum motor speed              |
| Operating temperature range: | from 0 to 70 °C                                         |
| Storage temperature range:   | from -30 to +85 °C                                      |
| Ball bearing life:           | 1.5x10 <sup>9</sup> rpm                                 |
| Weighth:                     | 100 gr                                                  |
| Protection degree:           | IP 67 (with protection and connector assembled)         |

### Connectors:

|                 |                      |        |
|-----------------|----------------------|--------|
| MONODIRECTIONAL | RSF3/0.5 M (Lumberg) | male   |
|                 | RKT3-06/5m (Lumberg) | female |
| BIDIRECTIONAL   | RSF4/0.5 M (Lumberg) | male   |
|                 | RKT4-07/5m (Lumberg) | female |

Note: Female connectors cable length equal to 5 m.

## RCE

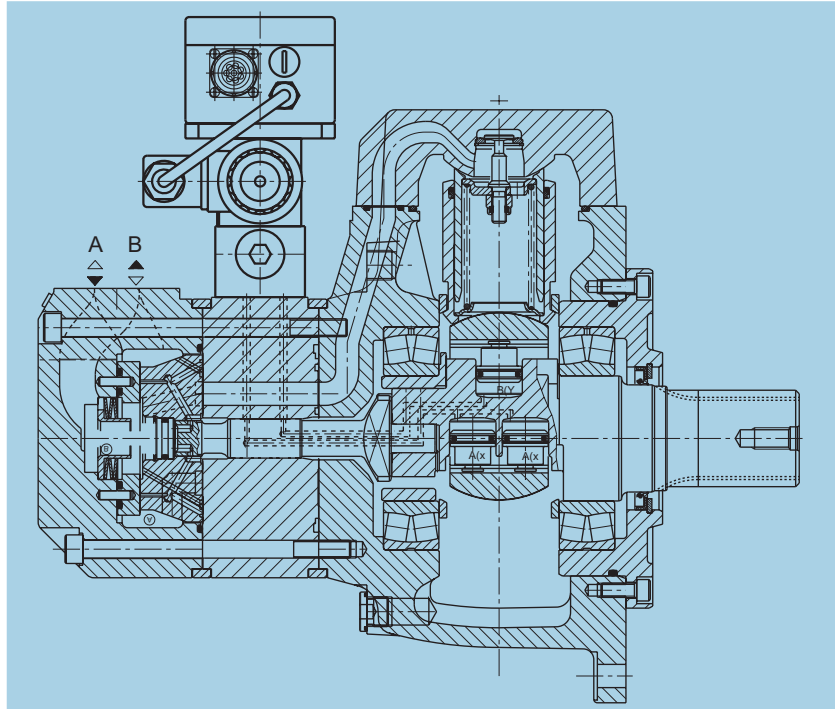
### USING GENERALITIES

The electronic regulator type RCE is designed to be mounted on board of the motors type "MRV/MRVE", to control their displacement in relation to a reference value of:

- displacement
- pressure
- speed

The RCE regulator is of the bi-directional ON-OFF type, with successive integratory pulses. It is mounted directly on a 4 way, 3 position solenoid valve (CETOP size 6) which pilots the displacement variation of the motor.

The power supply is 24 V DC or 24 V AC rectified.



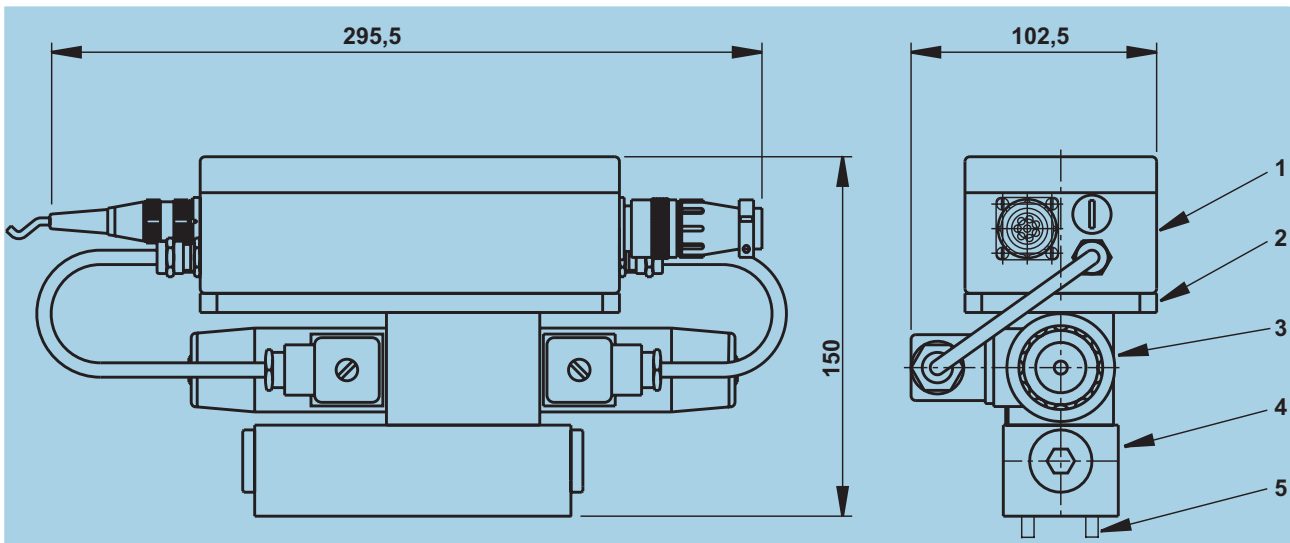
### TECHNICAL DATA

|                                                        |                                                        |
|--------------------------------------------------------|--------------------------------------------------------|
| Supply Voltage:                                        | 24 Vcc $\pm$ 10% rectified (Vmax. peak 35 V)           |
| Max power needed:                                      | 35 W (60 W if you use the solenoid output: SOLENOID C) |
| Referenced voltage:                                    | 0 - 10 Vcc (range 2 - 10 Vcc)                          |
| Displacement output signal:                            | 2 - 10 Vcc                                             |
| Pressure - speed output signal:                        | 0 - 10 Vcc                                             |
| Regulation and speed aptitude pulse command:           | 12 - 24 Vcc (opto-insulated input)                     |
| Galvanic insulation between power and control circuits |                                                        |
| Reversal of input polarity protection                  |                                                        |
| Output power with self proofed MOSFET                  |                                                        |
| IP 64 protection                                       |                                                        |
| Complying with standard CEE                            |                                                        |

### DIMENSION and Data

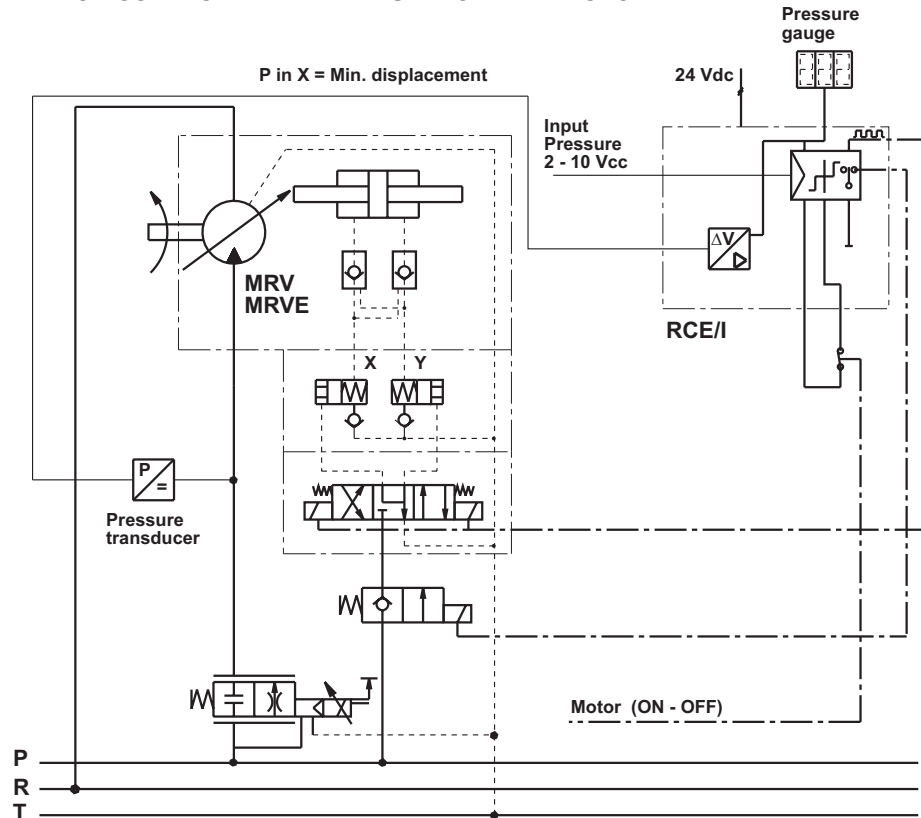
1 Electronic unit RCE/I-20  
3 PARKER DENISON valve  
5 House case fixing screw

2 Middle plate  
4 Double metering valve VDD



## RCE

## CIRCUIT FOR VARIABLE DISPLACEMENT MOTOR



## DESCRIPTION

The circuits of the regulator are powered through a DC/DC converter having 15 V DC output, so to obtain a total galvanic separation from the 24 V DC power lines. The input reference signal to the regulator has been set in the range 2,10 V DC, as for the output of the regulated values (displacement, pressure, speed). Three internal led show the command condition (+ or -). The pilot oil is dosed at each pulse by a specific dual metering valve type "VDD", fitted beneath the solenoid valve. In relation to the parameter that it is wished to keep under control by acting on the motor displacement, the RCE/I regulator can allow 3 different regulation modes.

## CONSTANT DISPLACEMENT MODE

The hydraulic motor is equipped with an inductive (TEC) displacement transducer powered by the regulator, which statically reads and saves the current displacement position at each motor revolution.

Through special built-in valves, the motor keeps the set displacement position constant. Due to an intrinsic feature of radial-piston motors, the tendency under load is to move toward maximum displacement.

Thus the function of the regulator is to restore the original setting with an external voltage reference (range 2,10 V DC from min. displ. to max displacement).

The precision of the actual displacement value is approximately + 2,3% over the rated value set.

For remote reading of the displacement a 2,10 V DC output signal is provided, almost linear in the range of the motor displacement variation.

To quickly change from one value to another of the set displacement, a special opto-insulated input circuit may be activated in transitory mode with a 24 V DC signal.

To enable the regulator only when the motor is running, it is necessary to activate a special opto-insulated input circuit with a 24 V DC signal simultaneously with the start command; an internal trimmer allows a short enabling delay to be inserted if desired.

The regulator is normally set to perform stable adjustments up to a minimum speed of 60 r.p.m.

For lower speeds, to approximately 6 r.p.m., it is necessary to use an internal multiple-turn trimmer to modify the pause length between the control pulses.

The pause length must be greater than the time required by the motor to complete one turn, this is to permit the displacement position read by the transducer at each shaft revolution to be updated in the memory.

## CONSTANT WORKING PRESSURE MODE

When the motor is used in systems equipped with hydraulic accumulators and the torque required by the motor may vary in relation to the process characteristics, the displacement is controlled in relation to the working pressure set for the motor, so that the working pressure remains constant as the required torque varies.

The constant pressure regulation can be achieved for torque variations within the displacement variation ratio allowed by the motor.

The hydraulic circuit that feed the motor must include a pressure transducer that may be powered by the regulator itself with a voltage of 15 V DC and a signal output of 0,10 V DC or 4,20 mA. The hydraulic motor is equipped with built-in valves, to maintain the displacement, as well as with the displacement transducer if it is wished to read the actual displacement during torque changes (by processing the displacement signal together with the pressure and speed signals, it is possible to determine the torque and absorbed power). The pressure setting is achieved by means of an external signal in the range 0,10 V DC (2, 10 V DC); the 10 V value must correspond to the full scale value (10 V or 20 mA) of the pressure transducer. The min. acceptable reference value is 2 V DC. During the startup transitory, the regulator remains disabled for an adjustable period of time (internal trimmer).

Also in this case the regulator is enable with a 24 V DC input signal.

Even with frequent start-stop cycles, the regulator can change the motor displacement to adapt it to the average pressure value saved during the running cycle.

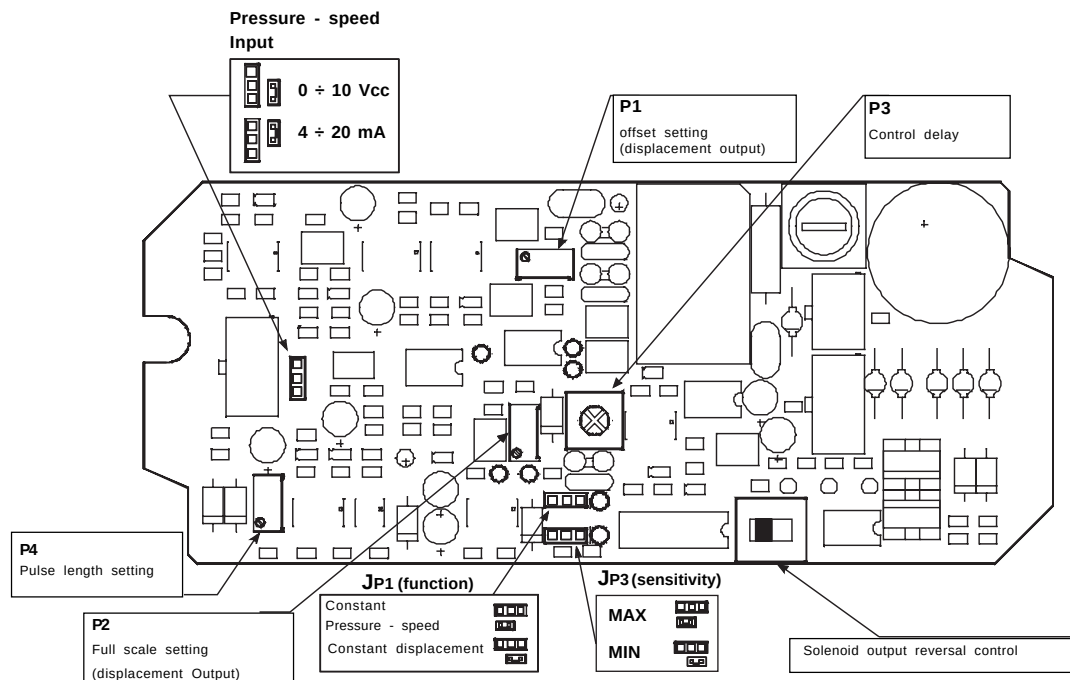
The saved pressure signal can be read remotely, again in the range 0,10 V DC. A third 24 V DC power output is available on the regulator to simultaneously energize a 2-way solenoid valve of the type with a conical diaphragm, which intercepts the pilot oilupstream the 4-way solenoid valve.

## CONSTANT SPEED MODE

If multi-stage fixed displacement pumps are used to drive the motor, in certain conditions it is necessary to drain off the excess delivery in relation to the set motor speed.

In order to avoid this dissipation, it is possible to use a variable-displacement motor which would absorb the excess delivery by adjusting its displacement. The regulator in this case accents the speed signal and compares it to the reference value; when the motor speed exceeds the set value, the regulator increases the displacement until the excess delivery provided by the pump is absorbed; at the same time, the working pressure is proportionally reduced, to the advantage of the life of the components of the system (pump, motor, etc.).

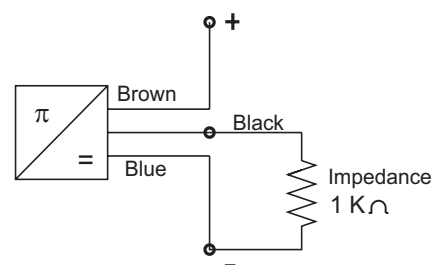
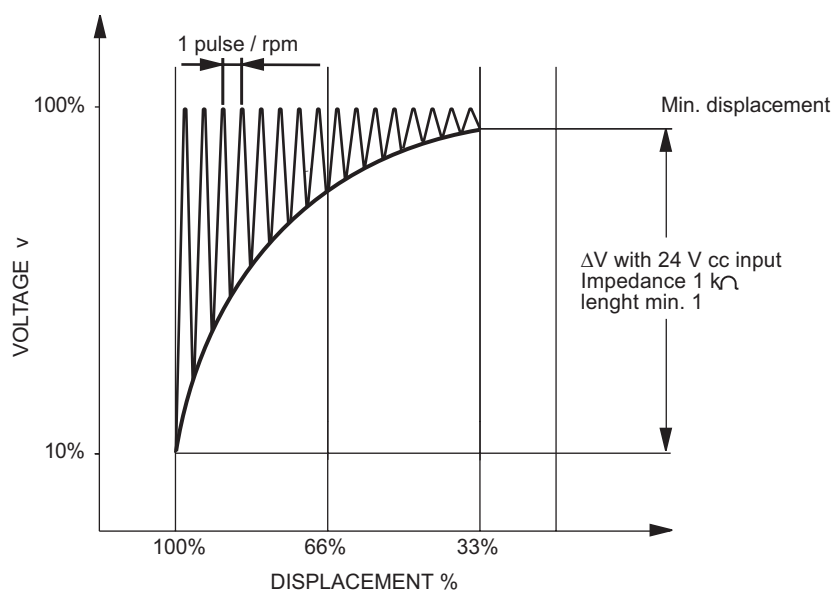
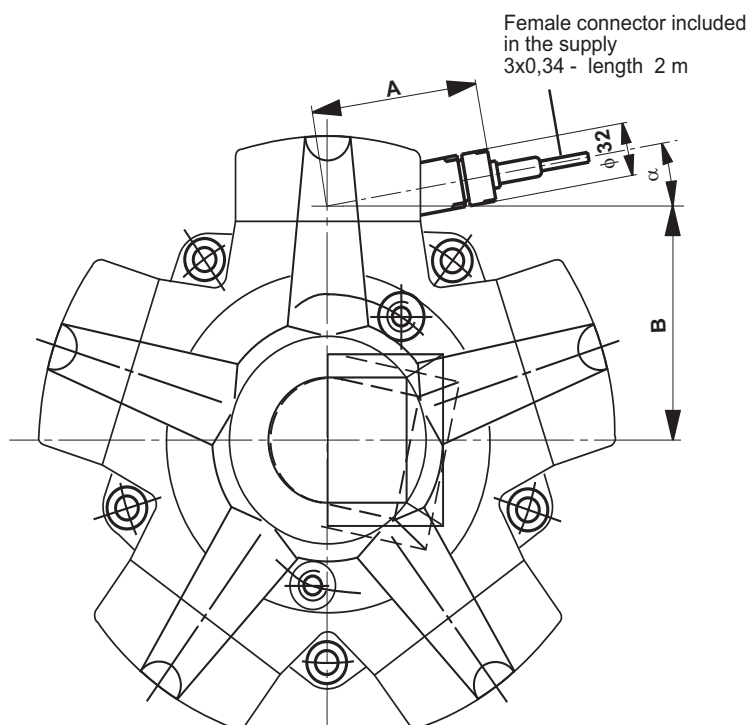
This provides a simple speed regulating system without energy dissipation, since the circuit includes neither flow regulator valves nor drainage valves. The speed signal saved is also available as output signal for remote reading, again in the field of 0,10 V DC; this signal may be useful for detecting the maximum speed reached when the motor running cycle is very short (< 2sec). Here again, the regulation is enable by activating the special 24 V DC input circuit; the command may be delayed by the time the motor needs to accelerate in order to reach the rated speed. If it is wished to switch quickly the speed from one value to another, a special input may be activated with a 24 V DC signal in transitory mode. The precision attainable through this system varies: it is approximately  $\pm 2\%$  on the fullscale value with the motor at maximum displacement; at minimum displacement the precision is slightly lower.



ELECTRONIC DISPLACEMENT  
TRANSDUCER

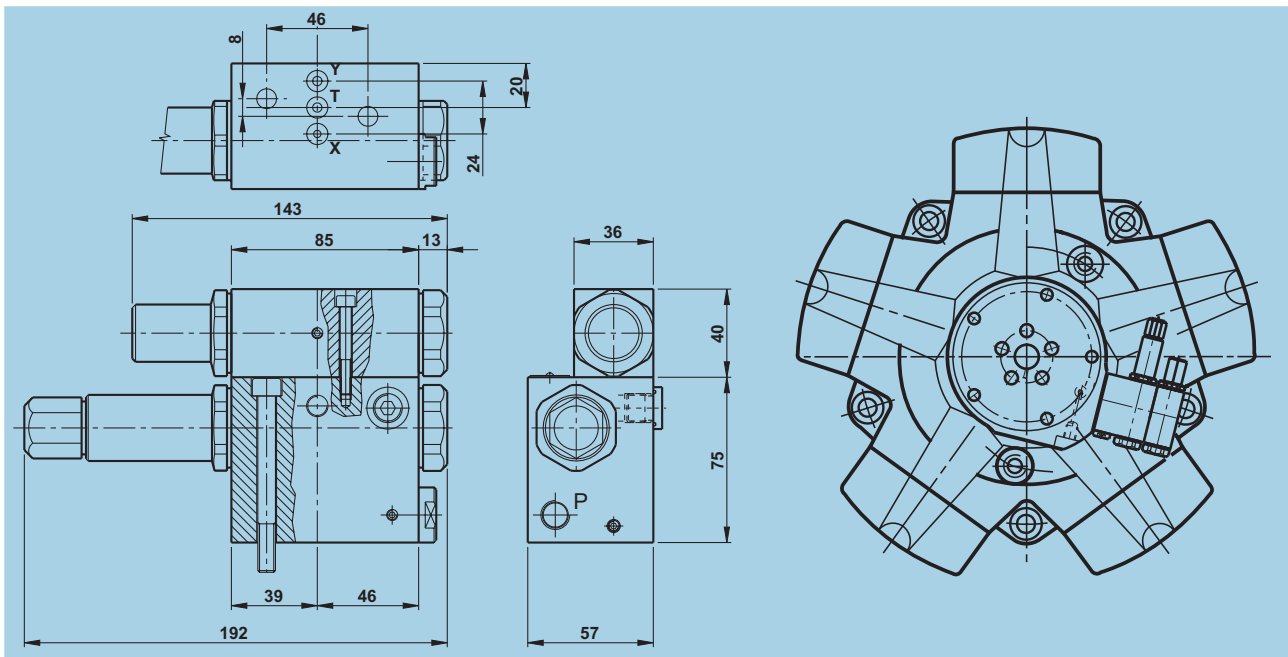
## DIMENSIONS

| MOTOR TYPE                   | A     | B     | $\alpha$ |
|------------------------------|-------|-------|----------|
| <b>MRV 450</b>               | 108   | 135,6 | 12° 30'  |
| <b>MRV 700</b><br>MRVE 800   | 115,3 | 147,8 | 12°      |
| <b>MRV 1100</b><br>MRVE 1400 | 124,6 | 179   | 5°       |
| <b>MRV 1800</b><br>MRVE 2100 | 132,3 | 210   | 5°       |
| <b>MRV 2800</b><br>MRVE 3100 | 141,2 | 237,5 | 5°       |
| <b>MRV 4500</b><br>MRVE 5400 | 155,8 | 266   | 7°       |
| <b>MRV 7000</b><br>MRVE 8200 | 200   | 262   | 6° 30'   |

ELECTRONIC DISPLACEMENT  
TRANSDUCER  
TECHNICAL DATA

|                             |                                |
|-----------------------------|--------------------------------|
| Max cont. pressure:         | 2,5 bar                        |
| Supply voltage:             | 18 - 24 Vdc - stab. $\pm$ 0,5% |
| Current consumption:        | 10 mA                          |
| Output current:             | 1 - 6 mA                       |
| Working temperature range:  | da 0 a 60°C                    |
| Load impedance:             | 1 K $\Omega$                   |
| Reading displacement range: | 1:3                            |
| protection degree:          | IP 68                          |
| Precision F.S.              | $\pm$ 1%                       |



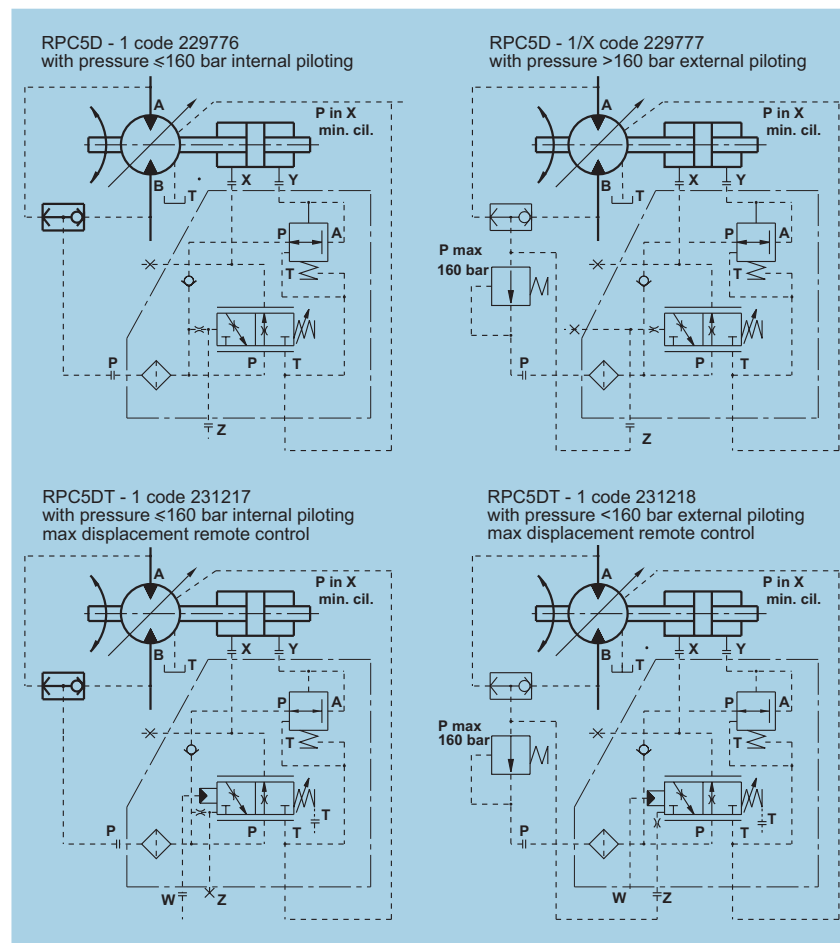


## RPC

### FUNCTIONAL DESCRIPTION

The RPC hydraulic regulator keeps the motor working at a constant pressure while supplying a variable torque. The pressure value can be set in the range from 50 to 250 bar

### BASIC CIRCUITS

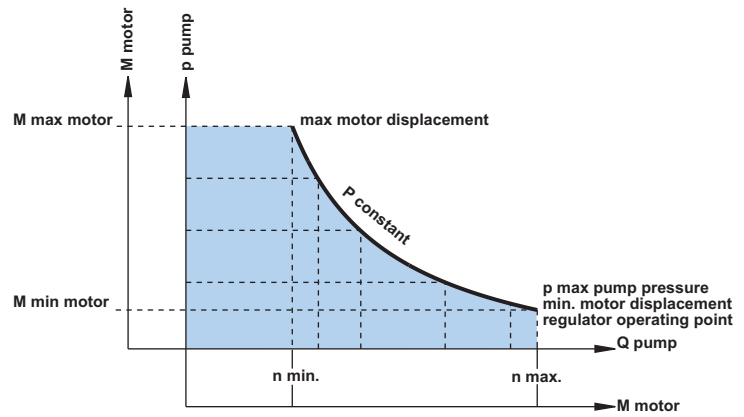


## RPC

### USING GENERALITIES

A variable torque and speed, constant power system can be obtained by using the MRD-MRDE motor provided with the RPC constant pressure regulator along with a fixed displacement pump.

### REGULATION SCHEME

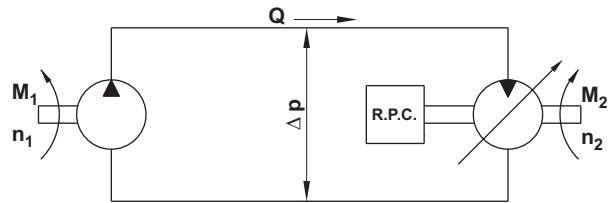


### HYDRAULIC CIRCUIT

RPC = motor constant pressure regulator

$$P = Q \times p \text{ max} = \text{constant}$$

$$M_1 \times n_1 = M_2 \times n_2 = \text{constant}$$

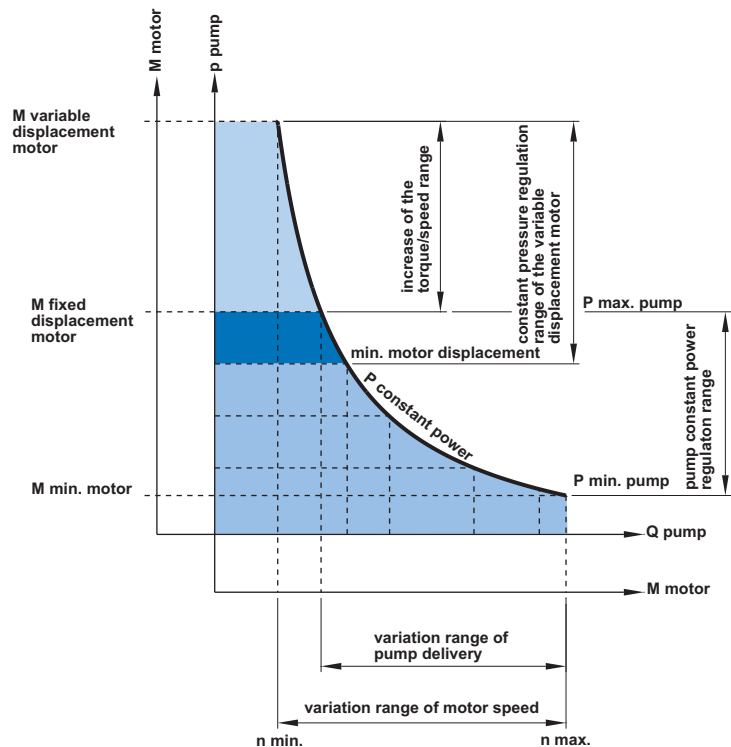


## RPC

### USING GENERALITIES

By replacing the fixed displacement pump with a variable one provided with a constant regulator, it is possible to obtain an enlargement of the torque and speed regulation range to constant power.

### REGULATION SCHEME

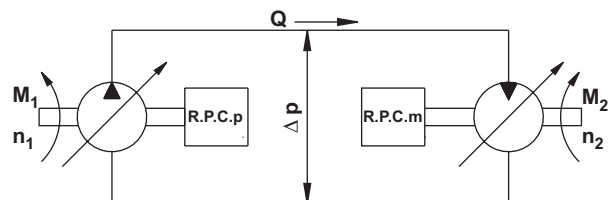


### HYDRAULIC CIRCUIT

RPCp = pump constant power regulator

RPCm = motor constant pressure regulator

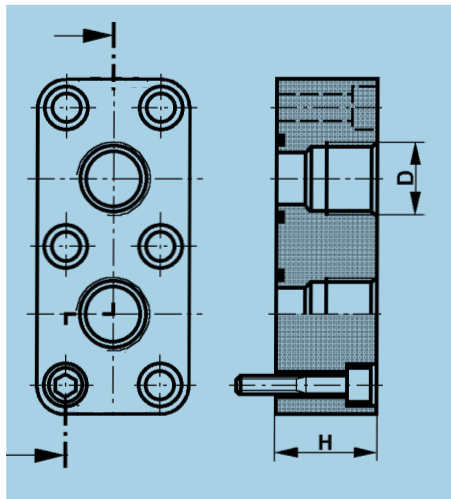
$$P = M_1 \times n_1 = M_2 \times n_2 = \text{constant}$$



# STANDARD CONNECTION FLANGE

Code "C1"

Flange is supplied complete with screws and seals.



| MRD - MRDE<br>MRV - MRVE   | D       | H  | ORDERING<br>CODE<br>NBR | ORDERING<br>CODE<br>FPM |
|----------------------------|---------|----|-------------------------|-------------------------|
| 300 - 330                  | G 3/4   | 36 | 262 098                 | 229 394                 |
| 450 - 500<br>700 - 800     | G 1 1/4 | 40 | 262 089                 | 229 395                 |
| 1100 - 1400<br>1800 - 2100 | G 1 1/2 | 45 | 262 093                 | 229 396                 |
| 2800 - 3100                | G 1 1/2 | 60 | 264 572                 | 229 397                 |
| 4500 - 5400<br>7000 - 8200 | G 2     | 60 | 272 724                 | 229 398                 |

BSP threads to ISO 228/1

Permitted up to 6000 PSI

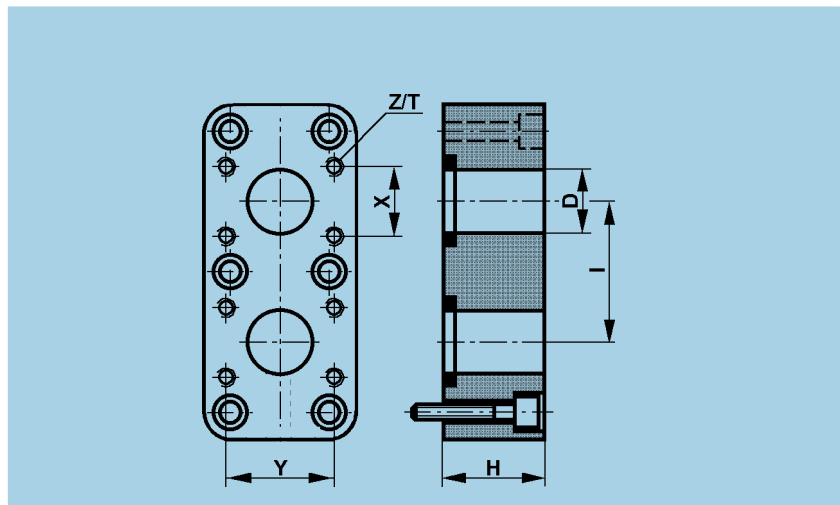
# SAE CONNECTION FLANGE

Code "S1"

Code "T1"

Code "G1"

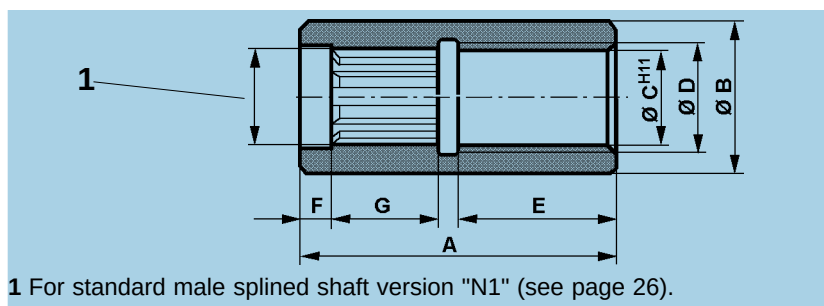
Code "L1"



Flange is supplied complete with screws and seals. FPM seals enquiry.

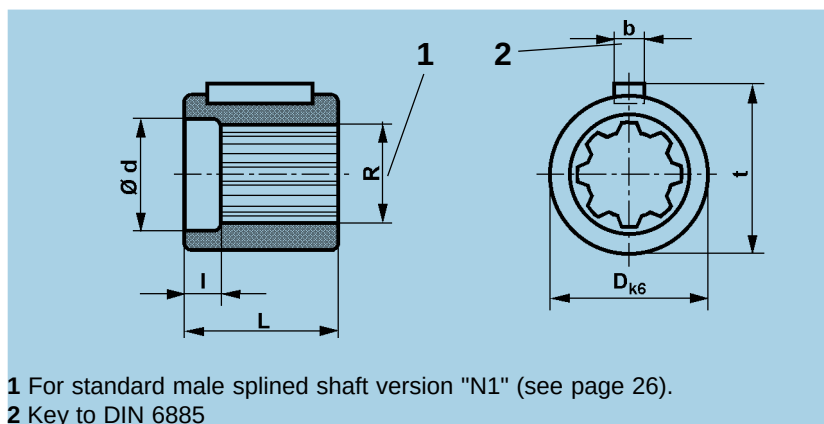
| MRD - MRDE<br>MRV - MRVE   | SAE<br>PSI | D      |    | H  | I    | X     | Y     | METRIC |                         | UNC       |    |                         |
|----------------------------|------------|--------|----|----|------|-------|-------|--------|-------------------------|-----------|----|-------------------------|
|                            |            | "      | mm |    |      |       |       | Z/T    | ORDERING<br>CODE<br>NBR | Z         | T  | ORDERING<br>CODE<br>NBR |
| 300 - 330                  | 5000       | 3/4"   | 19 | 36 | 55   | 22,2  | 47,6  | M10/25 | 277 295                 | 3/8"- 16  | 25 | 223 335                 |
| 450 - 500<br>700 - 800     | 5000       | 1"     | 25 | 40 | 60   | 26,2  | 52,4  | M10/25 | 277 297                 | 3/8"- 16  | 25 | 223 336                 |
| 1100 - 1400<br>1800 - 2100 | 4000       | 1 1/4" | 31 | 45 | 75   | 30,2  | 58,7  | M10/25 | 277 299                 | 7/16"- 14 | 30 | 223 337                 |
|                            | 6000       | 1"     | 25 | 45 | 71   | 27,8  | 57,15 | M12/22 | 230 166                 | 7/16"- 14 | 30 | 342 092                 |
| 2800 - 3100                | 3000       | 1 1/2" | 37 | 60 | 86   | 35,7  | 69,8  | M12/30 | 277 301                 | 1/2"- 13  | 30 | 223 338                 |
|                            | 6000       | 1 1/2" | 37 | 60 | 97,5 | 36,5  | 79,4  | M16/30 | 230 168                 | 5/8"- 11  | 35 | 349068                  |
| 4500 - 5400<br>7000 - 8200 | 3000       | 2"     | 50 | 60 | 112  | 42,9  | 77,8  | M12/30 | 277 303                 | 1/2"- 13  | 30 | 223 339                 |
|                            | 6000       | 2"     | 50 | 60 | 116  | 44,45 | 96,82 | M20/35 | 230 170                 | 3/4"- 10  | 38 | 342 547                 |

## COUPLINGS



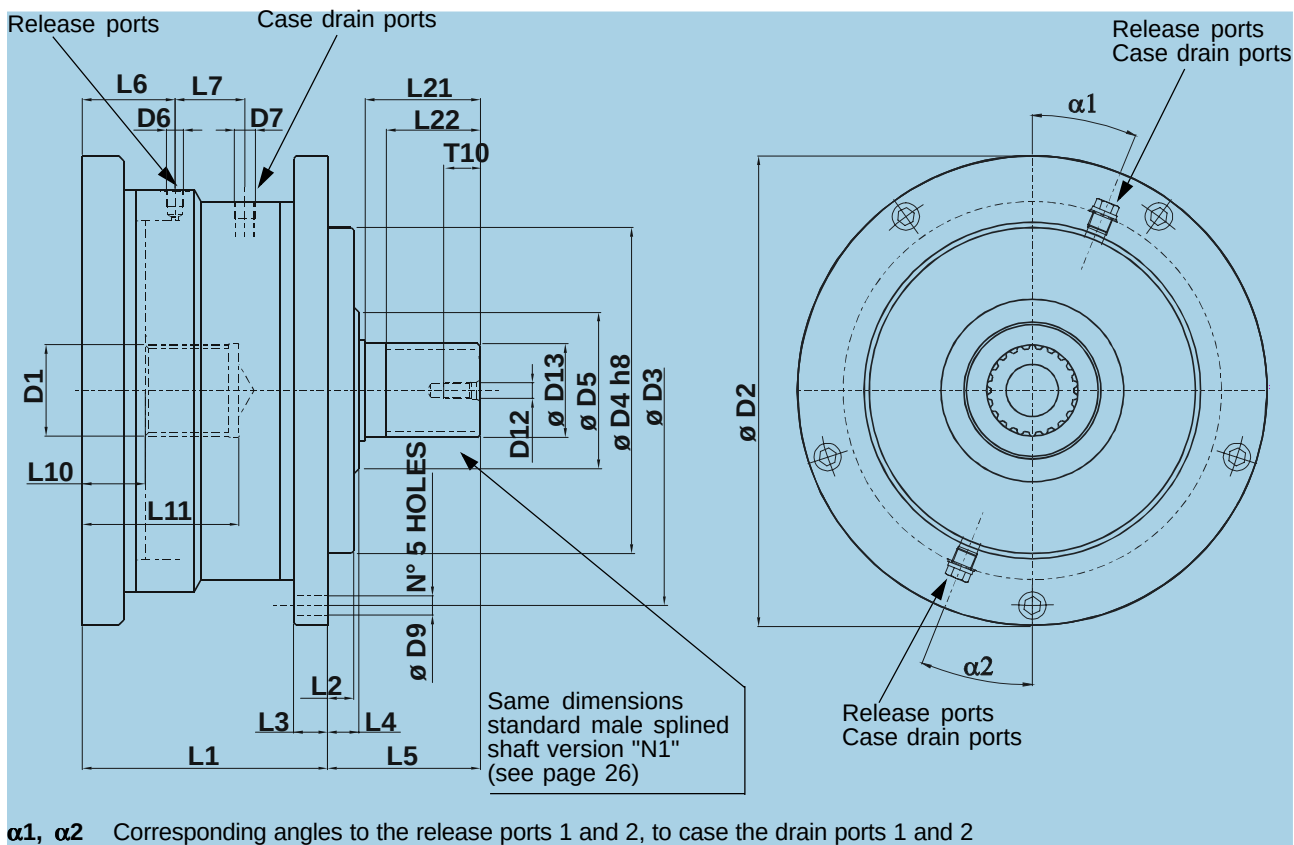
| MRD - MRDE<br>MRV - MRVE | ORDERING<br>CODE | A   | B   | C <sup>H11</sup> | D    | E    | F    | G    |
|--------------------------|------------------|-----|-----|------------------|------|------|------|------|
| <b>300 - 330</b>         | 465 202          | 135 | 71  | 49               | 60   | 64   | 15   | 45   |
| <b>450 - 500</b>         | 465 201          | 155 | 80  | 55               | 68   | 68   | 18,5 | 55,5 |
| <b>700 - 800</b>         | 465 200          | 171 | 90  | 61               | 75   | 80   | 19   | 59   |
| <b>1100 - 1400</b>       | 464 785          | 186 | 106 | 73               | 88,5 | 85,5 | 20   | 65,5 |
| <b>1800 - 2100</b>       | 465199           | 224 | 118 | 83               | 98   | 107  | 22   | 78   |
| <b>2800 - 3100</b>       | 465 198          | 265 | 132 | 93               | 112  | 127  | 23   | 97   |
| <b>4500 - 5400</b>       | 474 692          | 355 | 150 | 113              | 126  | 165  | 30   | 140  |
| <b>7000 - 8200</b>       | 422 544          | 390 | 195 | 126              | 140  | 185  | 38   | 147  |

## ADAPTERS WITH KEY



| MRD - MRDE<br>MRV - MRVE | ORDERING<br>CODE | R           | d     | I    | D <sub>k6</sub> | L   | b  | t     | KEY<br>DIN 6885 |
|--------------------------|------------------|-------------|-------|------|-----------------|-----|----|-------|-----------------|
| <b>300 - 330</b>         | 271 118          | A8x42x48    | 48,3  | 15   | 70              | 60  | 14 | 73,5  | 14x9x56         |
| <b>450 - 500</b>         | 271 119          | A8x46x54    | 54,3  | 18,5 | 80              | 75  | 16 | 84    | 16x10x70        |
| <b>700 - 800</b>         | 271 120          | A8x52x60    | 60,3  | 19   | 90              | 80  | 18 | 94    | 18x11x70        |
| <b>1100 - 1400</b>       | 271 121          | A8x62x72    | 72,3  | 20   | 105             | 98  | 20 | 109,5 | 20x12x90        |
| <b>1800 - 2100</b>       | 271 122          | A10x72x82   | 82,3  | 22   | 118             | 118 | 22 | 123   | 22x14x110       |
| <b>2800 - 3100</b>       | 271 123          | A10x82x92   | 92,3  | 23   | 130             | 148 | 25 | 135   | 25x14x140       |
| <b>4500 - 5400</b>       | 272 719          | A10x102x112 | 112,3 | 30   | 160             | 188 | 28 | 166   | 28x16x180       |
| <b>7000 - 8200</b>       | 223 476          | A10x112x125 | 126,6 | 38   | 185             | 188 | 45 | 195   | 45x25x180       |

| BRAKE TYPE                             | B 300     | B 450     | B 700     | B 1100      | B 1800      | B 2800      |
|----------------------------------------|-----------|-----------|-----------|-------------|-------------|-------------|
| MOTOR TYPE<br>MRD - MRDE<br>MRV - MRVE | 300 - 330 | 450 - 500 | 700 - 800 | 1100 - 1400 | 1800 - 2100 | 2800 - 3100 |



α1, α2 Corresponding angles to the release ports 1 and 2, to case the drain ports 1 and 2

| BRAKE TYPE | L1  | L2 | L3 | L4 | L5  | L6   | L7   | L10  | L11 | L21 | L22  | D1                                      | D2  | D3  | D4 <sub>h8</sub> | D5  | D6    | D7    | D9   | D12 | D13                                      | T10 | α1     | α2     |
|------------|-----|----|----|----|-----|------|------|------|-----|-----|------|-----------------------------------------|-----|-----|------------------|-----|-------|-------|------|-----|------------------------------------------|-----|--------|--------|
| B 300      | 136 | -  | 25 | 15 | 81  | 42   | 39,5 | 21   | 86  | 60  | 46   | see page 32<br>compatible<br>code N1 D1 | 256 | 232 | 175              | -   | G1/4" | G3/8" | 10,5 | M12 | see page 32 - 33<br>code<br>N1 - D1 - F1 | 28  | 22°30' | 22°30' |
| B 450      | 147 | -  | 27 | 15 | 97  | 49,5 | 36   | 24   | 100 | 74  | 56,5 |                                         | 296 | 266 | 190              | -   | G1/4" | G3/8" | 13,5 | M12 |                                          | 28  | 22°30' | 22°30' |
| B 700      | 172 | -  | 28 | 15 | 101 | 55   | 46   | 25   | 105 | 78  | 62   |                                         | 320 | 290 | 220              | -   | G1/4" | G3/8" | 13,5 | M12 |                                          | 28  | 22°30' | 22°30' |
| B 1100     | 188 | 20 | 26 | 24 | 117 | 71   | 53,5 | 48   | 120 | 88  | 72   |                                         | 360 | 330 | 250              | 120 | G1/4" | G1/2" | 15   | M12 |                                          | 28  | 0°     | 0°     |
| B 1800     | 216 | -  | 28 | 21 | 132 | 63,5 | 58,5 | 34   | 135 | 100 | 79   |                                         | 423 | 380 | 290              | -   | G1/4" | G1/2" | 17,5 | M12 |                                          | 28  | 22°30' | 22°30' |
| B 2800     | 263 | -  | 30 | 24 | 153 | 87   | 67   | 42,5 | 165 | 120 | 99   |                                         | 494 | 440 | 335              | -   | G1/4" | G1/2" | 19   | M12 |                                          | 28  | 22°30' | 22°30' |

## TECHNICAL DATA

(For operation outside these parameters, please consult **PARKER Calzoni**)

| CHARACTERISTICS                     |                  |            |            |            |              |              |              |
|-------------------------------------|------------------|------------|------------|------------|--------------|--------------|--------------|
|                                     |                  | B 300      | B 450      | B 700      | B 1100       | B 1800       | B 2800       |
| STATIC BRAKING TORQUE               | Nm               | 1800       | 2650       | 4000       | 6200         | 11400        | 17100        |
| DYNAMIC BRAKING TORQUE              | Nm               | 1200       | 1450       | 2200       | 4200         | 6250         | 12000        |
| RELEASE PRESSURE                    | bar              | 28         | 27         | 27         | 27           | 30           | 30           |
| MAX. OPERATING PRESSURE             | bar              | 420        | 420        | 420        | 420          | 420          | 420          |
| MOMENT OF INERTIA OF ROTATING PARTS | Kgm <sup>2</sup> | 0,0062     | 0,029      | 0,043      | 0,061        | 0,20         | 0,27         |
| WEIGHT                              | Kg               | 39         | 54         | 74         | 100          | 158          | 262          |
| MOTOR TYPE MRD - MRDE -MRV - MRVE   |                  | 300<br>330 | 450<br>500 | 700<br>800 | 1100<br>1400 | 1800<br>2100 | 2800<br>3100 |

## CODE

Example: BRAKE - B 450 N1 N1 V1 \*\*

1. BRAKE - B 450 N1 N1 V1 \*\*

## BRAKE TYPE

|               |                          |
|---------------|--------------------------|
| <b>B 300</b>  | Brake for motor size "D" |
| <b>B 450</b>  | Brake for motor size "E" |
| <b>B 700</b>  | Brake for motor size "F" |
| <b>B 1100</b> | Brake for motor size "G" |
| <b>B 1800</b> | Brake for motor size "H" |
| <b>B 2800</b> | Brake for motor size "I" |

2. BRAKE - B 450 N1 N1 V1 \*\*

## OUTPUT SHAFT

|                                        |                                      |
|----------------------------------------|--------------------------------------|
| <b>N1</b>                              | Spline ex DIN 5463 (see page30)      |
| <b>D1 *</b>                            | Spline DIN 5480 (see page 30)        |
| <b>F1 *</b>                            | Female spline DIN 5480 (see page 31) |
| <b>* please contact PARKER Calzoni</b> |                                      |

3. BRAKE - B 450 N1 N1 V1 \*\*

## INPUT SHAFT

|           |                                              |
|-----------|----------------------------------------------|
| <b>N1</b> | Hollow shaft for motor type N1 (see page 30) |
| <b>D1</b> | Hollow shaft for motor type D1 (see page 30) |

4. BRAKE - B 450 N1 N1 V1 \*\*

## SEALS

|                                        |                           |
|----------------------------------------|---------------------------|
| <b>N1</b>                              | NBR: mineral oil          |
| <b>V1 *</b>                            | FPM seals                 |
| <b>U1</b>                              | No shaft seal (for brake) |
| <b>* please contact PARKER Calzoni</b> |                           |

5. BRAKE - B 450 N1 N1 V1 \*\*

## SPECIAL

|           |                                  |
|-----------|----------------------------------|
| <b>**</b> | Space reserved to PARKER Calzoni |
|-----------|----------------------------------|



## Mounting

Any mounting position

- Note the position of the case drain port (see below)

Install the motor properly

- Mounting surface must be flat and resistant to bending

Min. tensile strength of mounting screws to DIN 267 Part 3 class 10.9

- Note the prescribed fastening torque

## Pipes, pipe connections

Use suitable screws!

- Depending on type of motor use either threaded or flange connection

Choose pipes and hoses suitable for the installation

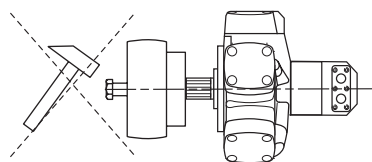
- Please note manufacturing data!

Before operation fill with hydraulic fluid

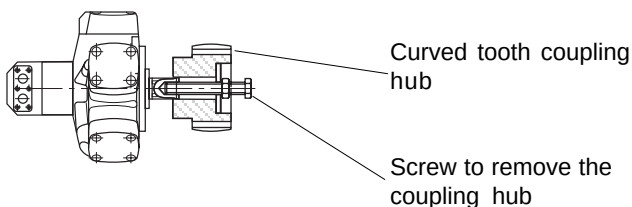
- Use the prescribed filter!

**NOTE:** Two of the mounting screws must be precisely located/fitted if operation is started and stopped frequently or if high reversible frequencies exist.

## Coupling



- Mounting with screws
- Use threaded bore in the drive shaft
- Take apart with extractor



Curved tooth coupling hub

Screw to remove the coupling hub

## DRAIN AND FLUSHING LINK INSTALLATION EXAMPLES

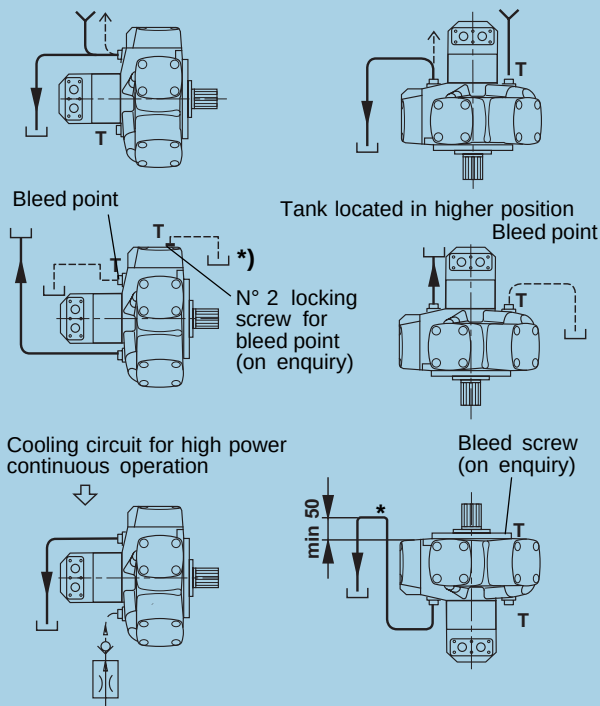
**Note:** Position the case drain pipe, so that the motor **cannot** run empty.

T = Seal  
Y = Motor housing feeding line  
← = Bleed

### Installation instructions for motors of the series "MRD - MRDE - MRV - MRVE"

Low pressure case drain returns to tank.

(release to bleed)

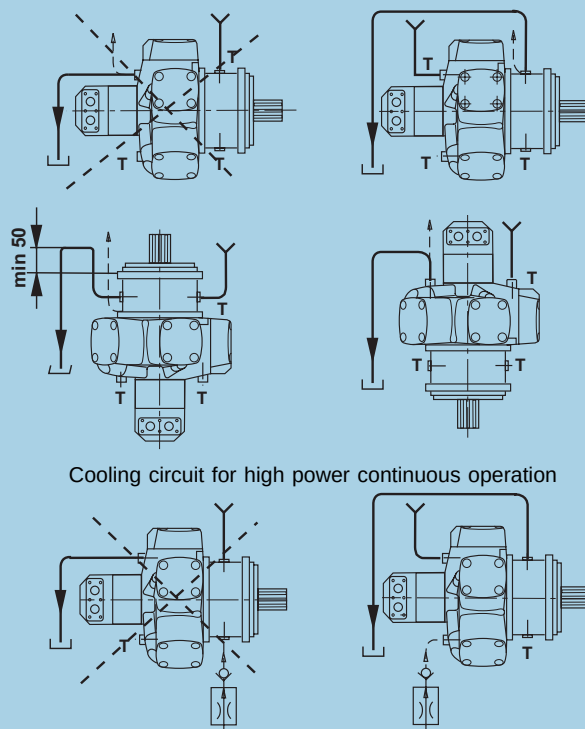


Flushing  $p_{max} = 5 \text{ bar}$

\*) Special designs for applications, where the equipment needs to be filled with oil. (e.g. in a salty atmosphere)

### Installation instructions for motors of the series "MRD - MRDE - MRV - MRVE with brakes"

Low pressure case drain returns to tank.



Flushing  $p_{max} = 5 \text{ bar}$

Motors without shaft seal used with brake

## CODE

1. MRD 700 F 240 N1 M1 F1 N1 N \*\*

## SERIES

2. MRD 700 F 240 N1 M1 F1 N1 N \*\*

## SIZE &amp; DISPLACEMENT

3. MRD 700 F 240 N1 M1 F1 N1 N \*\*

## SHAFT

4. MRD 700 F 240 N1 M1 F1 N1 N \*\*

## SPEED SENSOR OPTION

5. MRD 700 F 240 N1 M1 F1 N1 N \*\*

## SEALS

6. MRD 700 F 240 N1 M1 F1 N1 N \*\*

## CONNECTION FLANGE

7. MRD 700 F 240 N1 M1 F1 N1 N \*\*

## ROTATION

8. MRD 700 F 240 N1 M1 F1 N1 N \*\*

## SPECIAL

Example: MRD 700 F 240 N1 M1 F1 N1 N \*\*

|             |                                  |
|-------------|----------------------------------|
| <b>MRD</b>  | standard 250 bar max. continuous |
| <b>MRDE</b> | expanded 210 bar max. continuous |
| <b>MRV</b>  | standard 250 bar max. continuous |
| <b>MRVE</b> | expanded 210 bar max. continuous |

| <b>D</b> | codice | <b>MRD</b><br>300 D 150   | <b>MRDE</b><br>330 D 165   |                           |        |                            |        |
|----------|--------|---------------------------|----------------------------|---------------------------|--------|----------------------------|--------|
|          | Cm³    | 304,1                     | 152,1                      | 332,4                     | 166,2  |                            |        |
| <b>E</b> | codice | <b>MRD</b><br>450 E 225   | <b>MRDE</b><br>500 E 250   | <b>MRV</b><br>450 E 133   |        |                            |        |
|          | Cm³    | 451,6                     | 225,8                      | 497,9                     | 248,9  | 451,6                      | 133,5  |
| <b>F</b> | codice | <b>MRD</b><br>700 F 240   | <b>MRDE</b><br>800 F 270   | <b>MRV</b><br>700 F 240   |        | <b>MRVE</b><br>800 F 270   |        |
|          | Cm³    | 706,9                     | 237,6                      | 804,2                     | 270,2  | 706,9                      | 237,6  |
| <b>G</b> | codice | <b>MRD</b><br>1100 G 380  | <b>MRDE</b><br>1400 G 470  | <b>MRV</b><br>1100 G 380  |        | <b>MRVE</b><br>1400 G 470  |        |
|          | Cm³    | 1125,8                    | 381,3                      | 1369,5                    | 463,9  | 1125,8                     | 381,3  |
| <b>H</b> | codice | <b>MRD</b><br>1800 H 600  | <b>MRDE</b><br>2100 H 700  | <b>MRV</b><br>1800 H 600  |        | <b>MRVE</b><br>2100 H 700  |        |
|          | Cm³    | 1809,6                    | 603,2                      | 2091,2                    | 697,0  | 1809,6                     | 603,2  |
| <b>I</b> | codice | <b>MRD</b><br>2800 I 930  | <b>MRDE</b><br>3100 I 1030 | <b>MRV</b><br>2800 I 930  |        | <b>MRVE</b><br>3100 I 1030 |        |
|          | Cm³    | 2792,0                    | 930,7                      | 3103,7                    | 1034,6 | 2792,0                     | 930,7  |
| <b>L</b> | codice | <b>MRD</b><br>4500 L 1500 | <b>MRDE</b><br>5400 L 1800 | <b>MRV</b><br>4500 L 1500 |        | <b>MRVE</b><br>5400 L 1800 |        |
|          | Cm³    | 4502,7                    | 1497,8                     | 5401,2                    | 1800,4 | 4502,7                     | 1497,8 |
| <b>M</b> | codice | <b>MRD</b><br>7000 M 2320 | <b>MRDE</b><br>8200 M 2750 | <b>MRV</b><br>7000 M 2320 |        | <b>MRVE</b><br>8200 M 2750 |        |
|          | Cm³    | 6967,2                    | 2322,4                     | 8226,4                    | 2742,1 | 6967,2                     | 2322,4 |

|           |                                      |
|-----------|--------------------------------------|
| <b>N1</b> | spline ex DIN 5463 (see page 32)     |
| <b>D1</b> | spline DIN 5480 ((see page 32)       |
| <b>F1</b> | female spline DIN 5480 (see page 33) |
| <b>P1</b> | shaft with key (see page 33)         |
| <b>B1</b> | spline B.S. 3550 (see page 32)       |

|           |                                           |                 |
|-----------|-------------------------------------------|-----------------|
| <b>N1</b> | none                                      |                 |
| <b>Q1</b> | encoder drive (see page 34)               |                 |
| <b>C1</b> | mechanical tachometer drive (see page 34) |                 |
| <b>T1</b> | tachogenerator drive (see page 34)        |                 |
| <b>M1</b> | incremental Elcis encoder                 | Uni-directional |
| <b>B1</b> | ( 500 pulse/rev) (see page 34)            | Bi-directional  |

|           |                           |
|-----------|---------------------------|
| <b>N1</b> | NBR mineral oil           |
| <b>F1</b> | NBR, 15 bar shaft seal    |
| <b>V1</b> | FPM seals                 |
| <b>U1</b> | no shaft seal (for brake) |

|           |                                       |
|-----------|---------------------------------------|
| <b>N1</b> | none                                  |
| <b>C1</b> | standard PARKER Calzoni (see page 42) |
| <b>S1</b> | standard SAE metric (see page 42)     |
| <b>T1</b> | standard SAE UNC (see page 42)        |
| <b>G1</b> | SAE 6000 psi metric (see page 42)     |
| <b>L1</b> | SAE 6000 psi UNC (see page 42)        |

|          |                                                     |
|----------|-----------------------------------------------------|
| <b>N</b> | standard rotation (CW: inlet in A, CCW: inlet in B) |
| <b>S</b> | reversed rotation (CW: inlet in B, CCW: inlet in A) |

|           |                                  |
|-----------|----------------------------------|
| <b>**</b> | space reserved to PARKER Calzoni |
|-----------|----------------------------------|



FOR INFORMATION ABOUT SALES AND SERVICE LOCATIONS PLEASE CONTACT:

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[www.denisonhydraulics.com](http://www.denisonhydraulics.com)



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