DATA REQUIRED

Electric motor power/motor size
Manufacturer and pump type

TO VERIFY:

1 - Pump and motor shaft dimensions (see page 69)
2 - Shaft and flange pump (see pump data sheet)

Example:
- Electric motor 2 kW - 4 poles - Motor size 110/112
- Atos pump code PFE31 - Shaft 1

Bell-Housing’s length calculation

- $H = 60 + 18 + 57.5 = 135.5$ mm ($18 = $Sp$ spider$ - see page 49)
- Choose type of bell-housing (LMC - LMS)
  - For LMC see tab. 3 at page 11
  - For LMS see tab. 21 at page 32
  - For MODUL 2/3 see at page 36

Note: The length of bell-housing must be ≥ than the length calculated (135.5 mm)

Case A - solution with LMC bell-housing

Tab. 3 at page 11 - for electric motor 2kW LMC 250
LMC 250 bell-housing with height ≥ 135.5 - LMC250AFSQ

- The bell-housing code must be completed with drilling pump code (see tab. 34 at page 47)
  For the specific case $C = 101.6$ - Nr. 2 holes M10: Code drilling 070
- Definitive bell-housing code LMC250AFSQ070

Case B - solution with LMS bell-housing

Tab. 21 at page 32 - for electric motor 2kW LMS 250
LMS 250 bell-housing with height ≥ 135.5 - LMS250AFSQ

- The bell-housing code must be completed with drilling pump code (see tab. 34 at page 47)
  For the specific case $C = 101.6$ - Nr. 2 holes M10: Code for. 070
- Definitive bell-housing code LMS250AFSQ070
Choose coupling

- **Motor half-coupling** (see tab. 37 at page 50)
  - For electric motor GR 100/112, the half-coupling is **SGEA21M05060**

- **Spider** (see tab. 35 - 36 at page 49)
  - For SGEA21, EGE2 - EGE2RR
    (choose spider material on the base of the application, oil, temperature and cycle machine, etc.)

- **Pump half-coupling**
  - Choose the drilling code tab. 43 - 44 at page 53 for shaft 19.05 - Ch. 4.76 - code: **G01**
  - Half-coupling length = L BH lenght – THK Spider – THK Spigot
    138 mm - 60 - 18 - 9,5= 50,5 mm
  - Choose the half-coupling’s length on tab. 38 at page 50 ≤ 50,5 mm.
  - Available length for SGEA21= 50 mm
  - Code half-coupling code: **SGEA21G01050**

Software for automatic calculation available on the web site
www.mpfiltr.com - tools - software

Pump half-coupling with grub screw
For other solution please contact technical department

Note: For multi pumps we recommend to use a specific support on the base of the pump’s dimensions and weight.
Half-coupling SGE*** series

The half-couplings series SGE*** allow secure transmission between the electric motor and the driven side; they are able to absorb shocks and vibration, in addition to compensating radial misalignment, angular and axial. The assembly of the couplings can be horizontal/vertical, withstanding vibration and load reversals.

The complete range of couplings are extrapolated from the on-line software, with a length equal than the shaft on which must be mounted and they are completed with grub screw for fixing located on the key.

Available for cylindrical shaft with metric and imperial dimensions as well for splined shafts as per specification DIN, ISO and SAE.

Admissible misalignment radial, angular and axial

<table>
<thead>
<tr>
<th>Max admissible radial misalignment</th>
<th>Max admissible angular misalignment</th>
<th>Max admissible angular misalignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half coupling</td>
<td>R (mm)</td>
<td>Half coupling</td>
</tr>
<tr>
<td>SGE * 01</td>
<td>0,5</td>
<td>SGE * 01</td>
</tr>
<tr>
<td>SGE * 21</td>
<td>1,0</td>
<td>SGE * 21</td>
</tr>
<tr>
<td>SGE * 31</td>
<td>1,0</td>
<td>SGE * 31</td>
</tr>
<tr>
<td>SGE * 40</td>
<td>1,0</td>
<td>SGE * 40</td>
</tr>
<tr>
<td>SGE * 51</td>
<td>1,5</td>
<td>SGE * 51</td>
</tr>
<tr>
<td>SGE * 60</td>
<td>1,5</td>
<td>SGE * 60</td>
</tr>
<tr>
<td>SGE * 80</td>
<td>2,0</td>
<td>SGE * 80</td>
</tr>
<tr>
<td>SGE * 90</td>
<td>2,0</td>
<td>SGE * 90</td>
</tr>
</tbody>
</table>

Normative ATEX 94/9/CE

Half-couplings SGE*** series are available to use in hazardous area. The couplings are certified according to ATEX 94/9/CE (ATEX 95). Category certified 2G - area 1 and 2. Other information available on our web site “www.mpfiltri.com”.

MP Filtri couplings are developed with:

CAD 3D

FEM (calculation)

Drawings 3D available on website www.mpfiltri.com at section TOOLS/2D-3D COMPONENTS
The half-couplings SGE*** series are in conformity to normative DIN 740/2. The max torque to transmit is always less than the max torque that the coupling can transmit.

**Examples verification of the coupling**

**Torque transmitted by electric motor:**

\[
\begin{align*}
Mt & : 9560 \times kW / rpm = \text{Nm} \\
Me > & : Mt \times S = \text{Nm}
\end{align*}
\]

Where:

- **Mt**: Torque transmitted by electric motor
- **Me**: Torque transmitted by coupling (see table 14)
- **kW**: Power of electric motor
- **Rpm**: Revolutions per minute of electric motor
- **S**: Service factor (see table 14)

### TABLE 1

<table>
<thead>
<tr>
<th>Small pumps, uniform load, low operating pressures</th>
<th>1.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>e.g. rotary action machine tools - 5/8 work cycles per hour</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Small pumps, uniform load, high working pressures</th>
<th>1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>e.g. lifting equipment - 120-150 work cycles per hour</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pumps, non-uniform load</th>
<th>1.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>e.g. lifting equipment - 280-300 work cycles per hour</td>
<td></td>
</tr>
</tbody>
</table>

**Example**

Electric motor, 4 pole - 4 kW

Hydraulic pump, uniform load, low operating pressure

\[
\begin{align*}
Mt & : 9560 \times 4 / 1500 = 25.45 \text{Nm} \\
Me > & : 25.49 \times 1.3 = 33 \text{Nm}
\end{align*}
\]

Half-coupling SGEA21 meets the above requirement.

Select the half-coupling of the calculated size from the motor half-couplings table.

**Note:** When selecting the coupling, remember that for pumps with splined shaft, only cast iron couplings of the SGE series can be used.

Determine the size of the coupling according to the type of installation and application envisaged, on the basis of the following formulas and tables:

### TABLE 2

<table>
<thead>
<tr>
<th>Half-coupling type</th>
<th>External diameter mm</th>
<th>Nominal torque Me - Nm</th>
<th>Maximum transmissible torque Me - Nm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ALUMINIUM</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SGEA01</td>
<td>43</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>SGEA21</td>
<td>68</td>
<td>160</td>
<td>190</td>
</tr>
<tr>
<td>SGEA31</td>
<td>85</td>
<td>340</td>
<td>380</td>
</tr>
<tr>
<td>SGEA51</td>
<td>109,5</td>
<td>550</td>
<td>620</td>
</tr>
</tbody>
</table>

| **CAST IRON**      |                      |                         |                                      |
| SGE01              | 40                   | 20                      | 30                                   |
| SGE30              | 80                   | 400                     | 450                                  |
| SGE40              | 95                   | 550                     | 620                                  |
| SGE60              | 120                  | 760                     | 850                                  |
| SGE80              | 160                  | 2200                    | 2500                                 |
| SGE90              | 200                  | 5500                    | 6100                                 |

| **STEEL**          |                      |                         |                                      |
| SGE40              | 95                   | 550                     | 620                                  |
| SGE60              | 120                  | 760                     | 850                                  |
| SGE80              | 160                  | 2200                    | 2500                                 |

Nominal and maximum torque values are referred to couplings assembled with standard flexible spiders of the EGE** series (see page 49).

Where higher torques are to be transmitted, use flexible spiders of the EGE**RR series (see page 49).
Noise is a particularly pervasive problem so much so that there have been statutory regulations in place now for some years, designed to limit harmful occupational exposure. Many of the machines used in industry today are equipped with oil-hydraulic systems, which happen to be a major source of noise.

1. Theory and definition of noise

From a health and hygiene standpoint, noise can be defined as an unpleasant and undesirable sound, or an unpleasant and annoying or intolerable auditory sensation (noise being any sound phenomena that may be accompanied by sensations of disturbance and pain). By definition, acoustic phenomena are oscillatory in character, propagated in a flexible medium and causing pressure variations at the points, and the areas adjacent to those points, through which they pass.

2. Sound

Technically considered, certain elements must be present simultaneously for acoustic phenomena to occur:

- Sound source
- Transmission medium
- Receiver

The electric motor and the pump, together with the drive coupling, are the SOURCE OF THE NOISE. The Bell-housing is the noise transmission medium. Depending on whether the monobloc bell-housing is a rigid or low noise type, there will be variations in the flexible properties of the transmission medium.

The acoustic phenomena are dissimilar in the two cases, given the differences in pressure variation and particle displacement.
Assembly of motor and pump unit

As mentioned in the presentation, low noise bell-housing will help to attenuate the transmission of vibrations and the emission of noise generated by the system. Self-evidently, however, the mere adoption of a low noise bell-housing will achieve little unless the motor and pump are correctly installed on the machine, or on the tank of the hydraulic power unit.

• Should be followed in order to achieve best possible results and correct installation:

1. Motor and pump unit mounted horizontally on oil tank lid
   • The suction pipe attached to the pump must be rigid, and fitted using a resilient bulkhead flange of the FTA series, which helps to cushion the vibrations propagated between the pipe and the tank lid. If pipes need to be bent, the radius of curvature must be at least 3 times the pipe diameter. Do not use elbow fittings, as these will significantly increase pressure losses.
   • The pressure pipeline of the pump must be flexible, and long enough to include bends with the minimum radius of curvature recommended by the manufacturer for the specified operating pressure.
   • The return pipeline running from the service to the filter must be flexible. Where oil is returned directly to the tank of the hydraulic power unit through a rigid pipe, it is advisable to use a resilient bulkhead flange of the FTR series, which helps to cushion the vibrations propagated between the pipe and the tank lid.
   • Anti-vibration devices (resilient mounts or damping rods) must be located under the feet of the electric motor or the PDM foot brackets, depending on the mounting position of the motor.
   • The lids of hydraulic oil tanks must be sturdy enough to support the load they carry.

2. Motor and pump unit mounted horizontally on machine
   • As a matter of good practice, the oil tank and motor-pump unit should be mounted on a single supporting frame of strength sufficient to support the load.
   • If the hydraulic system is fitted with a side-mounted filter, the suction pipeline to the pump must be flexible, and long enough to include bends with the minimum radius of curvature recommended by the manufacturer.
   • If the suction filter is not side mounted, the pipeline should be rigid and installed in conjunction with a compensating coupling.
   • The pressure pipeline of the pump must be flexible, and long enough to include bends with the minimum radius of curvature recommended by the manufacturer for the specified operating pressure.
   • The return pipeline running from the service to the filter must be flexible. Where oil is returned directly to the tank of the hydraulic power unit through a rigid pipe, it is advisable to use a resilient bulkhead flange of the FTR series, which helps to cushion the vibrations propagated between the pipe and the tank lid.
   • Anti-vibration devices (resilient mounts or damping rods) must be located under the feet of the electric motor or the PDM foot brackets, depending on the mounting position of the motor.

Note: The above guidelines are indicative only, and subordinate to the solutions adopted ultimately by design engineers.

In conclusion: For best results, in any event, the motor-and-pump unit should be incorporated into the hydraulic system in such a way that no one component is rigidly associated with another, resulting in the propagation of vibration, and consequently noise.
### MODUL 2

<table>
<thead>
<tr>
<th>5.5 - 7.5 kW</th>
<th>7.5 - 10.2 Hp</th>
<th>11 - 22</th>
<th>30</th>
<th>37 - 45</th>
<th>55 - 90</th>
<th>110 - 200</th>
<th>250 - 400</th>
</tr>
</thead>
</table>

- Kit of assembly KVG5 (Q.ty 1) + Kit of assembly KVG1 (Q.ty 1)

**Diagram:**
- AR*
- BMT300
- BMT350
- Ø 190
- Ø 85
- FR1*
- Ø 190
- Ø 288

### MODUL 3

<table>
<thead>
<tr>
<th>5.5 - 7.5 kW</th>
<th>7.5 - 10.2 Hp</th>
<th>11 - 22</th>
<th>30</th>
<th>37 - 45</th>
<th>55 - 90</th>
<th>110 - 200</th>
<th>250 - 400</th>
</tr>
</thead>
</table>

- Kit of assembly KVG6/7 (Q.ty 2)

**Diagram:**
- AD*
- BMT350
- BMT400
- BMT450
- Ø 190
- Ø 288
- Ø 140
- Ø 288
- FP5
- FP6
- FP7

**Diagram:**
- Ø 288
- BMT550
- BMT660
- BMT800
- FP6
- FP7
- BAD800
- ONLY FP7

- Kit of assembly KVG6/7 (Q.ty 1)
The motors base of the BMC series are derived from standard LMC monobloc bell-housings, and used as bases to which flanges of the FR/FP5/FP6 series can be fitted either to increase the height of the bell-housing or to allow machining of the pump interface, not possible with a standard monobloc housing.

### Motor base for installation of auxiliary flange FR1

**TABLE 6**

<table>
<thead>
<tr>
<th>Electric motor, 4-pole, 1500 rpm</th>
<th>Motor base code</th>
<th>Dimensions of BMC motor base</th>
<th>Foot bracket code</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>H1</th>
<th>H2</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame size kW Hz Shaft</td>
<td>BMC200A1001</td>
<td>D1 130 165 200 100 18</td>
<td>PDM A 200</td>
<td>0.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80 0.53-0.75 0.75-1 19x40</td>
<td>BMC200A1251</td>
<td>D1 130 165 200 125 18</td>
<td>PDM A 200</td>
<td>0.95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90 1.1-1.5 1.5-2 24x50</td>
<td>BMC250A1141</td>
<td>D1 180 215 250 114 19</td>
<td>PDM A 250</td>
<td>1.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100-112 2.2-4 3-12.5 28x60</td>
<td>BMC250A1361</td>
<td>D1 180 215 250 136 19</td>
<td>PDM A 250</td>
<td>1.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>132 5.5-7.5 7.5-12.5 38x80</td>
<td>BMC300A1551</td>
<td>D1 230 265 300 155 23</td>
<td>PDM A 300</td>
<td>3.30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Assembly kit code (motor base + flange): KVG1

- For pump flange codes, see page 17
Motor base for installation of auxiliary flange FP5

Assembly kit code (motor base + flange): KVG5
• For pump flange codes, see page 17

**TABLE 7**

<table>
<thead>
<tr>
<th>Electric motor, 4-pole, 1500 rpm</th>
<th>Dimensions of BMC motor base</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frame size kW Hp Shaft</strong></td>
<td><strong>Motor base code</strong></td>
</tr>
<tr>
<td>132 5.5-7.5 7.5-12.5 38x80</td>
<td>BMC300A1555 BMC300A1705</td>
</tr>
</tbody>
</table>

**Motor base for installation of auxiliary flange FP6**

Assembly kit code (motor base + flange): KVG6
• For pump flange codes, see page 17

**TABLE 8**

<table>
<thead>
<tr>
<th>Electric motor, 4-pole, 1500 rpm</th>
<th>Dimensions of BMC motor base</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frame size kW Hp Shaft</strong></td>
<td><strong>Motor base code</strong></td>
</tr>
<tr>
<td>180 18.5-22 25-30 48x110</td>
<td></td>
</tr>
</tbody>
</table>
Motor base for installation of auxiliary flange FP7

Assembly kit code (base module + flange): KVG7

- For pump flange codes, see page 17
Complete the order designation with the pump interface code: Ex. FR5026S023