# COMPONENTS FOR e-PTO SYSTEMS

GO GREEN

# Bell-housings & Couplings sizing



## SOFTWARE FOR AUTOMATIC CALCULATION

The web-based software program will allow you to select the most suitable MP Filtri's Filters, in accordance with your process design requirements.

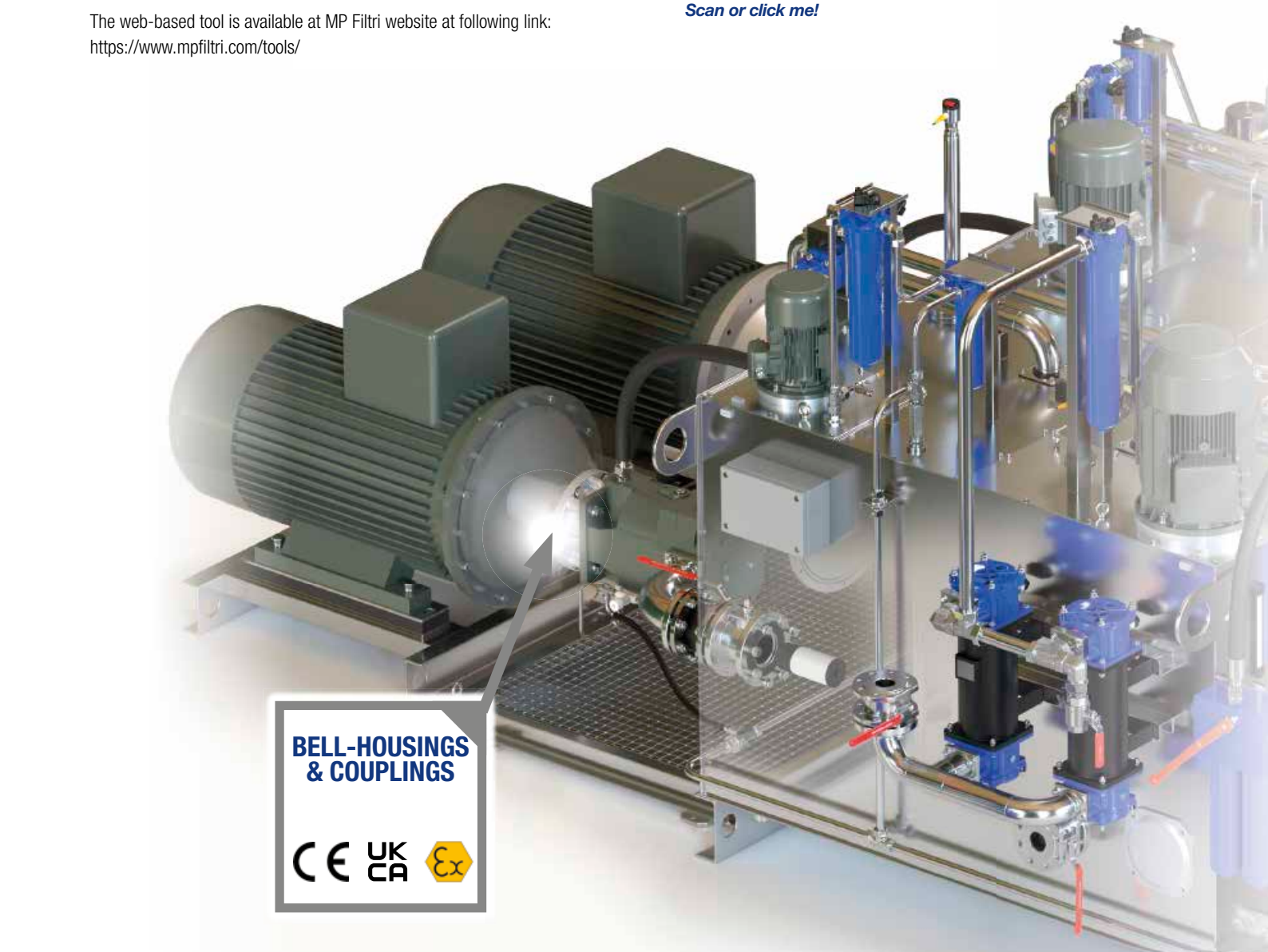
The program will automatically check your input design process prior to propose you the acceptable solutions and create an output in PDF report style format.

The MP Filtri Selection Tool software program is easy to use with a flexible fast design method and provides improved layout formats with full descriptions.

The web-based tool is available at MP Filtri website at following link:
https://www.mpfiltri.com/tools/

The related, complete user guide is available as Manual and downloadable from the "Download" section of MP Filtri website, as well as scanning the following QR code

***Scan or click me!***



# BELL-HOUSINGS & COUPLINGS SIZING

## A GUIDE TO SELECT THE CORRECT BELL-HOUSING AND DRIVE COUPLING MANUALLY

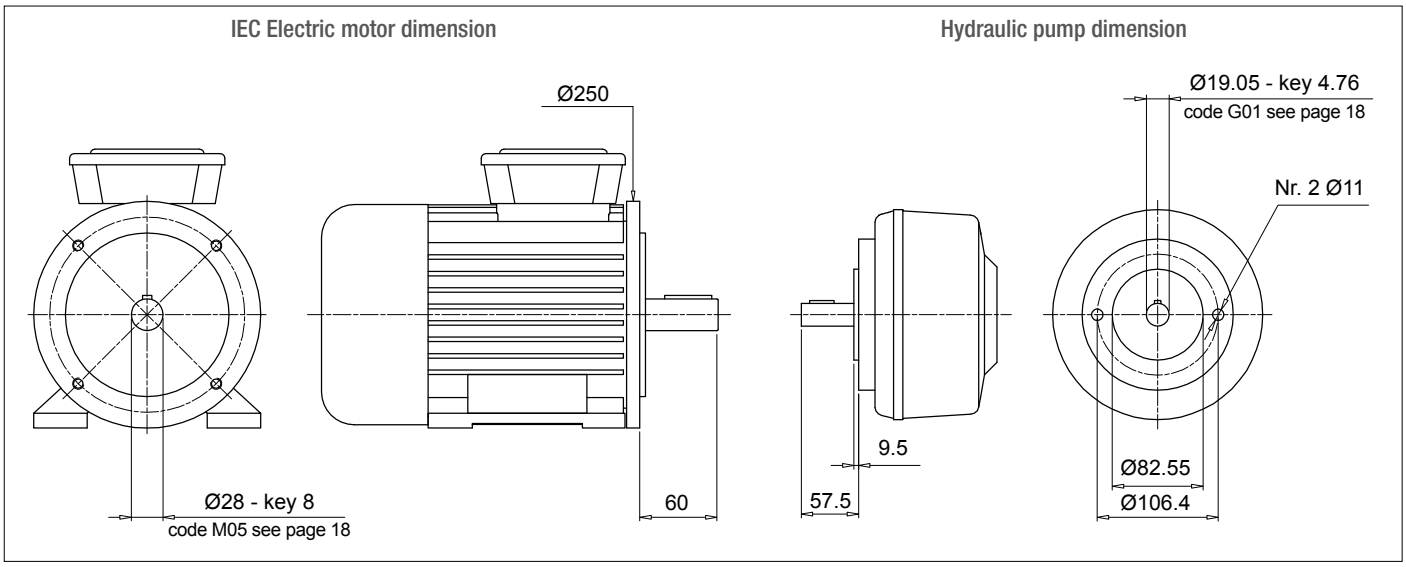
### DATA REQUIRED

- Electric motor power/motor size
- Manufacturer and pump type

### TO VERIFY:

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

*Example:*
- Electric motor 2.2 kW - size 100-112
- Atos pump code PFE31 - Shaft 1




### Bell-Housing's length calculation

- H = 60 + 18 + 57.5 = 135.5 mm (18 = Sp spider - see page 31)

- Choose type of bell-housing (LMC - LMS):
  For monobloc bell-housing LMC/LDC series see pages 75 ÷ 81
  For Low noise bell-housing LMS/LDS series see pages 81 ÷ 89
  For Multi-components 2-3 bell housing series see pages 91 ÷ 111

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

### Case A
### Solution with monobloc bell-housing series **LMC/LDC**

Pages 75 ÷ 81 for IEC Electric motor size 100-112 - LMC250

LMC 250 bell-housing with height ≥ 135.5 - LMC250AFSQ

The bell-housing code must be completed with pump drilling code (see pages 60-61).
For the specific case:
Spigot hole 82.55 - PCD 106.4 - Nr.2 holes M10 : Drilling code 060

Definitive bell-housing code **LMC250AFSQ060**

### Case B
### Solution with low noise bell-housing series **LMS/LDS**

Pages 83 ÷ 89 for IEC Electric motor size 100-112 - LMS250

LMS 250 bell-housing with height ≥ 135.5 - LMS250AFSA

The bell-housing code must be completed with pump drilling code (see pages 60-61).
For the specific case:
Spigot hole 82.55 - PCD 106.4 - Nr.2 holes M10 : Drilling code 060

Definitive bell-housing code **LMS250AFSA060**

## Coupling selection

**Motor half-coupling** (see page 26)
For IEC Electric motor size 100/112, the half-coupling is **SGEA21M05060**

**Spider** (see page 31)
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 - see pages 18-19 for shaft 19.05 - key 4.76 - code: **G01**

Pump half-coupling length = BH length - THK Spider - THK Spigot
LMC = 138 mm - 60 - 18 - 9.5 = 50.5 mm
LMS = 148 mm - 60 - 18 - 9.5 = 60.5 mm

LMC - Choose the half-coupling's length at page 26 ≤ 50.5 mm.
LMS - Choose the half-coupling's length at page 26 ≤ 60.5 mm.
LMC - Available length for SGEA21 = 50 mm
LMS - Available length for SGEA21 = 60 mm
Half coupling for LMC: **SGEA21G01050**
Half coupling for LMS: **SGEA21G01050**

**Note:** for multi pumps we recommend to use a specific support on the base of the pump's dimensions and weight.

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

### Max admissible radial misalignment

| Half-coupling | R [mm] |
|---|---|
| **SGE * 01** | 0.5 |
| **SGE * 21** | 1.0 |
| **SGE * 31** | 1.0 |
| **SGE * 40** | 1.0 |
| **SGE * 51** | 1.5 |
| **SGE * 60** | 1.5 |
| **SGE * 80** | 2.0 |
| **SGE * 90** | 2.0 |

### Max admissible angular misalignment

| Half-coupling | ß [°] |
|---|---|
| **SGE * 01** | 1.5° |
| **SGE * 21** | |
| **SGE * 31** | |
| **SGE * 40** | |
| **SGE * 51** | |
| **SGE * 60** | |
| **SGE * 80** | |
| **SGE * 90** | |

### Max admissible angular alignment

| Half-coupling | A [mm] |
|---|---|
| **SGE * 01** | 2.0 |
| **SGE * 21** | 2.5 |
| **SGE * 31** | 3.0 |
| **SGE * 40** | 3.5 |
| **SGE * 51** | 3.5 |
| **SGE * 60** | 3.5 |
| **SGE * 80** | 4.0 |
| **SGE * 90** | 5.0 |

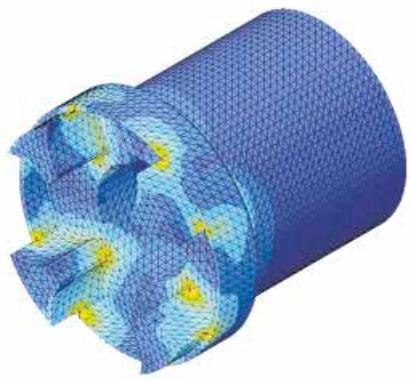
## Standard ATEX Directive 2014/34/EU and UK Regulation S.I. 2016 No. 1107 (as amended)

Half-couplings are available to use in hazardous area.
The couplings are certified according to Standard ATEX Directive 2014/34/EU and UK Regulation S.I. 2016 No. 1107 (as amended) - 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**



Drawings 3D available on website www.mpfiltri.com at section TOOLS.

## Examples verification of the coupling

Torque transmitted by electric motor:

**Mt:** 9560 x kW / rpm = Nm
**Me >** Mt x S = Nm
Where:
**Mt:** Torque transmitted by electric motor
**Me:** Torque transmitted by coupling
**kW**: Power of electric motor
**Rpm:** Revolutions per minute of electric motor
**S:** Service factor

Table 1

| | |
|---|---|
| **Small pumps, uniform load, low operating pressures**<br>e.g. rotary action machine tools - 5/8 work cycles per hour | **1.3** |
| **Small pumps, uniform load, high working pressures**<br>e.g. lifting equipment - 120-150 work cycles per hour | **1.5** |
| **Pumps, non-uniform load**<br>e.g. lifting equipment - 280-300 work cycles per hour | **1.7** |

**Example**
Electric motor, 4 pole - 4 kW
hydraulic pump, uniform load, low operating pressure
**Mt:** 9560 x 4 / 1500 = 25.45 Nm
**Me >** 25.49 x 1.3 = 33 Nm

**Half-coupling SGEA21 meets the above requirement.**

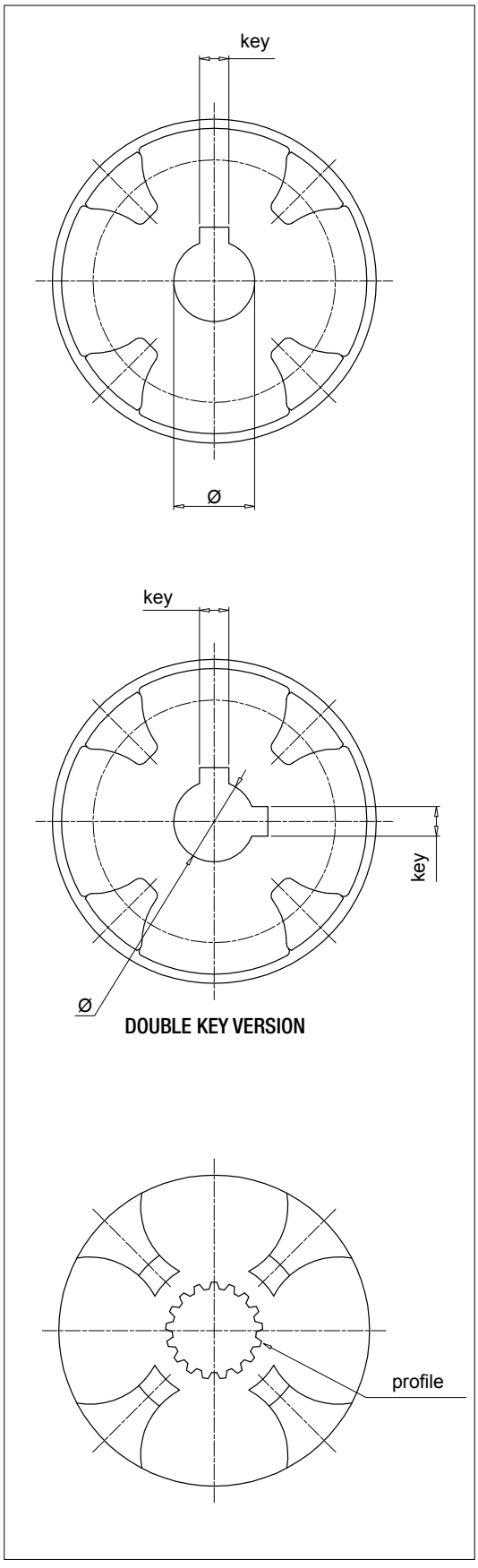
Select the half-coupling of the calculated size from the motor half-couplings table.
**Note:** When selecting the coupling, remember that for pumps with splined shaft, only cast iron couplings of the SGEG series can be used.

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

Table 2

| Half-coupling type | | External diameter [mm] | Nominal torque Me - Nm | Maximum transmissible torque Me - Nm | |
|---|---|---|---|---|---|
| | ROTAFIT | | | | |
| **SGEA01** | **SGEK01** | 44 | 10 | 20 | |
| **SGEA21** | **SGEK21** | 70 | 95 | 190 | |
| **SGEA31** | **SGEK31** | 85 | 190 | 380 | |
| **SGEA51** | **SGEK51** | 109.5 | 310 | 620 | **ALUMINIUM** |
| **SGEG01** | | 40 | 10 | 20 | |
| **SGEG30** | | 80 | 190 | 380 | |
| **SGEG40** | **SGEK40** | 95 | 310 | 620 | |
| **SGEG60** | **SGEK60** | 120 | 430 | 860 | |
| **SGEG80** | **SGEK80** | 160 | 1250 | 2500 | |
| **SGEG90** | | 200 | 5500 | 6100 | **CAST IRON** |
| **SGES40** | | 95 | 310 | 620 | |
| **SGES60** | | 120 | 430 | 860 | |
| **SGES80** | | 180 | 1250 | 2500 | **STEEL** |

Nominal and maximum torque values are referred to couplings assembled with standard flexible spiders of the **EGE**** series (see page 31).
Where higher torques are to be transmitted, use flexible spiders of the **EGE**RR** series (see page 31).




## Parallel shaft - Metric Dimensions

| Ø [mm] | key [mm] | Code |
|---|---|---|
| 12 | 4 | **C00** |
| 15 | 5 | **C01** |
| 16 | 4 | **C02** |
| 16 | 5 | **C03** |
| 17 | 5 | **C04** |
| 18 | 6 | **C05** |
| 20 | 5 | **C06** |
| 19 | 5 | **C07** |
| 30 | 10 | **C08** |
| 20 | 6 | **C09** |
| 16 | 5 | **C10** |
| 15 | 4 | **C11** |
| 22 | 6 | **D00** |
| 24 | 6 | **D01** |
| 25 | 8 | **D02** |
| 30 | 8 | **D03** |
| 32 | 10 | **D04** |
| 35 | 10 | **D05** |
| 40 | 12 | **D06** |
| 45 | 14 | **D07** |
| 50 | 14 | **D08** |
| 70 | 20 | **D09** |
| 22 | 8 | **D10** |
| 52 | 16 | **D20** |
| 8 | 3 | **E00** |
| 10 | 3 | **E01** |
| 22 | 5 | **E02** |
| 32 | 8 | **E03** |
| 35 | 8 | **E04** |
| 82 | 22 | **E05** |
| 25 | 7 | **E06** |
| 63 | 18 | **E07** |
| 9 | 3 | **M00** |
| 11 | 4 | **M01** |
| 14 | 5 | **M02** |
| 19 | 6 | **M03** |
| 24 | 8 | **M04** |
| 28 | 8 | **M05** |
| 38 | 10 | **M06** |
| 42 | 12 | **M07** |
| 48 | 14 | **M08** |
| 55 | 16 | **M09** |
| 60 | 18 | **M10** |
| 65 | 18 | **M11** |
| 75 | 20 | **M12** |
| 80 | 22 | **M13** |
| 90 | 25 | **M14** |
| 95 | 25 | **M15** |
| 100 | 28 | **M16** |
| 110 | 28 | **M17** |
| 85 | 22 | **M18** |

## Parallel shaft - Imperial Dimensions

| Ø | | key | | Code |
|---|---|---|---|---|
| [inch] | [mm] | [inch] | [mm] | |
| 7/16” | 11.11 | 1/8” | 3.18 | **G00** |
| 3/4” | 19.05 | 3/16” | 4.76 | **G01** |
| 7/8” | 22.22 | 3/16” | 4.76 | **G02** |
| 7/8” | 22.22 | 1/4” | 6.35 | **G03** |
| 1” | 25.4 | 3/16” | 4.76 | **G04** |
| 1” | 25.40 | 1/4” | 6.35 | **G05** |
| 1 1/4” | 31.75 | 1/4” | 6.35 | **G06** |
| 1 1/4” | 31.75 | 5/16” | 7.94 | **G07** |
| 1 3/8” | 34.94 | 5/16” | 7.94 | **G08** |
| 1 1/2” | 38.1 | 3/8” | 9.52 | **G09** |
| 1 5/8” | 41.27 | 3/8” | 9.52 | **H00** |
| 1 3/4” | 44.45 | 7/16” | 11.11 | **H01** |
| 2” | 50.8 | 1/2” | 12.7 | **H02** |
| 2 11/32” | 53.94 | 1/2” | 12.7 | **H03** |
| 3/4” | 19.02 | 1/8” | 3.17 | **H04** |
| 1” | 25.4 | 3/16” | 4.76 | **H05** |
| 5/8” | 15.87 | 3/16” | 4.76 | **H06** |
| 17/32” | 13.45 | 1/8” | 3.18 | **H07** |
| 11/16” | 17.46 | 3/16” | 4.76 | **H08** |
| 1/2” | 12.7 | 1/8” | 3.18 | **H09** |
| 5/8” | 15.87 | 5/32” | 3.97 | **L00** |
| 7/8” | 22.22 | 5/32” | 4 | **L01** |
| 11/8” | 28.58 | 1/4” | 6.35 | **L02** |
| 3/4” | 19.05 | 1/4” | 6.35 | **L03** |
| 1 7/8” | 47.63 | 1/2” | 12.7 | **L04** |
| 3 3/8” | 85.73 | 7/8” | 22.23 | **L05** |
| 2 3/8” | 60.33 | 5/8” | 15.88 | **L06** |
| 2 3/8” | 60.33 | 1/2” | 12.7 | **L07** |
| 2 7/8” | 73.03 | 3/4” | 19.05 | **L08** |
| 3 5/8” | 92.07 | 7/8” | 22.22 | **L09** |
| 1 5/8” | 41.6 | 15/32” | 12 | **L10** |
| 1 1/8” | 28.58 | 5/16” | 7.94 | **L15** |

## Parallel shaft - Double Key

| Ø [mm] | key [mm] | Code |
|---|---|---|
| 16.00 | 4.00<br>5.00 | **C02***2H** |
| 20.00 | 5.00<br>6.00 | **C06***2M** |
| 19.00 | 5.00<br>6.00 | **C07***2L** |
| 24.00 | 6.00<br>8.00 | **D01***2N** |
| 30.00 | 8.00<br>10.00 | **D03***2P** |
| 22.22 | 4.76<br>6.35 | **G02***2E** |
| 25.40 | 6.35<br>4.76 | **G04***2F** |
| 31.75 | 6.35<br>7.94 | **G06***2G** |

******* = coupling length

## SAE Bore - ANS.B.92.1-1970

| Profile | Nr. of Th | Code |
|---|---|---|
| 17 th 8/16 | 17 | **PD01** |
| 14 th 12/24 | 14 | **PD02** |
| 16 th 12/24 | 16 | **PD03** |
| 17 th 12/24 | 17 | **PD04** |
| 9 th 16/32 | 9 | **PD05** |
| 11 th 16/32 | 11 | **PD06** |
| 12 th 16/32 | 12 | **PD07** |
| 13 th 16/32 | 13 | **PD08** |
| 15 th 16/32 | 15 | **PD09** |
| 21 th 16/32 | 21 | **PD10** |
| 23 th 16/32 | 23 | **PD11** |
| 27 th 16/32 | 27 | **PD12** |
| 40 th 16/32 | 40 | **PD13** |
| 20 th 24/48 | 20 | **PD14** |
| 21 th 24/48 | 21 | **PD15** |
| 23 th 24/48 | 23 | **PD16** |
| 25 th 24/48 | 25 | **PD17** |
| 26 th 24/48 | 26 | **PD18** |
| 27 th 12/48 | 27 | **PD19** |
| 28 th 24/48 | 28 | **PD20** |
| 29 th 24/48 | 29 | **PD21** |
| 32 th 24/48 | 32 | **PD22** |
| 21 th 32/64 | 21 | **PD23** |
| 30 th 32/64 | 30 | **PD24** |
| 33 th 32/64 | 33 | **PD25** |
| 23 th 40/80 | 23 | **PD26** |
| 36 th 48/96 | 36 | **PD27** |
| 41 th 48/96 | 41 | **PD28** |
| 47 th 48/96 | 47 | **PD29** |
| 13 th 8/16 | 13 | **PD30** |
| 15 th 8/16 | 15 | **PD31** |
| 14 th 16/32 | 14 | **PD32** |
| 40 th 16/32 | 40 | **PD33** |
| 33 th 16/32 | 33 | **PD34** |
| 9 th 20/40 | 9 | **PD35** |
| 10 th 16/32 | 10 | **PD36** |
| 25 th 20/40 | 25 | **PD37** |

## Splined bore as per standard DIN5480

| Profile | Nr. of Th | Code |
|---|---|---|
| W18 x 1.25 x 13 | 13 | **PA01** |
| W20 x 1.25 x 14 | 14 | **PA02** |
| W25 x 1.25 x 18 | 18 | **PA03** |
| W28 x 1.25 x 21 | 21 | **PA04** |
| W32 x 1.25 x 24 | 24 | **PA05** |
| W38 x 1.25 x 29 | 29 | **PA06** |
| W30 x 2 x 14 | 14 | **PA07** |
| W32 x 2 x 14 | 14 | **PA08** |
| W35 x 2 x 16 | 16 | **PA09** |
| W37 x 2 x 17 | 17 | **PA10** |
| W38 x 2 x 18 | 18 | **PA11** |
| W40 x 2 x 18 | 18 | **PA12** |
| W42 x 2 x 20 | 20 | **PA13** |
| W45 x 2 x 21 | 21 | **PA14** |
| W50 x 2 x 24 | 24 | **PA15** |
| W55 x 2 x 26 | 26 | **PA16** |
| W60 x 2 x 28 | 28 | **PA17** |
| W70 x 2 x 34 | 34 | **PA18** |
| W80 x 2 x 38 | 38 | **PA19** |
| W60 x 3 x 18 | 18 | **PA20** |
| W70 x 3 x 22 | 22 | **PA21** |
| W75 x 3 x 24 | 24 | **PA22** |
| W90 x 3 x 28 | 28 | **PA23** |
| W105 x 3 x 34 | 34 | **PA24** |
| W80 x 3 x 25 | 25 | **PA25** |
| W50 x 1.25 x 38 | 38 | **PA26** |
| W62 x 1.25 x 48 | 48 | **PA27** |
| W40 x 1.5 x 25 | 25 | **PA28** |
| W32 x 1.5 x 20 | 20 | **PA29** |
| W40 x 1.25 x 30 | 30 | **PA30** |

## Splined bore as per standard DIN5481

| Profile | Nr. of Th | Code |
|---|---|---|
| 8 x 10 | 28 | **PC01** |
| 10 x 12 | 30 | **PC02** |
| 12 x 14 | 31 | **PC03** |
| 15 x 17 | 32 | **PC04** |
| 17 x 20 | 33 | **PC05** |
| 21 x 24 | 34 | **PC06** |
| 26 x 30 | 35 | **PC07** |
| 30 x 34 | 36 | **PC08** |
| 60 x 65 | 41 | **PC09** |

## Splined bore as per standard DIN5482

| Profile | Nr. of Th | Code |
|---|---|---|
| A15 x 12 | 8 | **PB01** |
| A17 x 14 | 9 | **PB02** |
| A18 x 15 | 10 | **PB03** |
| A20 x 17 | 12 | **PB04** |
| A22 x 19 | 13 | **PB05** |
| A25 x 22 | 14 | **PB06** |
| A28 x 25 | 15 | **PB07** |
| A30 x 27 | 16 | **PB08** |
| A32 x 28 | 17 | **PB09** |
| A35 x 31 | 18 | **PB10** |
| A38 x 34 | 19 | **PB11** |
| A40 x 36 | 20 | **PB12** |
| A42 x 38 | 21 | **PB13** |
| A45 x 41 | 22 | **PB14** |
| A48 x 44 | 23 | **PB15** |
| A50 x 45 | 24 | **PB16** |
| A52 x 47 | 25 | **PB17** |
| A55 x 50 | 26 | **PB18** |
| A58 x 53 | 27 | **PB19** |
| A60 x 55 | 28 | **PB20** |
| A62 x 57 | 29 | **PB21** |
| A65 x 60 | 30 | **PB22** |
| A68 x 62 | 31 | **PB23** |
| A70 x 64 | 32 | **PB24** |
| A72 x 66 | 33 | **PB25** |
| A75 x 69 | 34 | **PB26** |
| A78 x 72 | 35 | **PB27** |
| A80 x 74 | 36 | **PB28** |
| A82 x 76 | 37 | **PB29** |
| A85 x 79 | 38 | **PB30** |
| A88 x 82 | 39 | **PB31** |
| A90 x 84 | 40 | **PB32** |
| A92 x 86 | 41 | **PB33** |
| A95 x 89 | 42 | **PB34** |
| A98 x 92 | 43 | **PB35** |
| A100 x 94 | 44 | **PB36** |

FOCUS ON

**e-PTO CONCEPT**

Designed to power the onboard hydraulic systems of heavy vehicles, such as waste collection vehicles and cranes, the e-PTO uses the electric energy of a Banke e-PTO instead of traditional diesel. This innovation represents a significant step towards sustainability and energy efficiency in the industrial vehicle sector.

One of the main advantages of the e-PTO is its quiet operation and zero $CO_2$ emissions. This system allows for up to a 50% reduction in the energy consumed by onboard hydraulic systems.

The e-PTO system consists of:
- **Aluminum lantern**: customizable based on the pump mounted by the manufacturer
- **Steel half-coupling**: engine side with integrated shaft, ensuring robustness and reliability
- **Polyurethane elastic insert**: for a flexible and durable connection
- **Pump side half-coupling**: customizable based on the mounted pump
- **Hydraulic pump**: chosen by the manufacturer for equipment movement
- **Intelligent electronic control system**: manages the entire process to ensure efficiency and reliability.

**Versatile Applications**

The e-PTO is particularly suitable for vehicle outfitters who build:
- Loader cranes
- Refrigerated vehicles
- Cement mixers
- Urban distribution vehicles
- Dumper
- Aircraft Tug
- Sweeper machines.

## Technical data

Couplings - Solutions for e-PTO

**Half-couplings materials**

SGES: Steel C40

**Spider materials**

EGE**RR series: in polyurethane Laripur - 92 Shore A - LPR202-95A - red colour

**Compatibility with fluids**
- Mineral oils types HH-HL-HM-HR-HV, to ISO 6743/4 standard
- Water based emulsions types HFAE-HFAS, to ISO 6743/4 standard
- Water glycol type HFC, to ISO 6743/4 standard: ask for anodized version

**Temperature**

Spider polyurethane resin: from -30 °C to +120 °C

**Note**

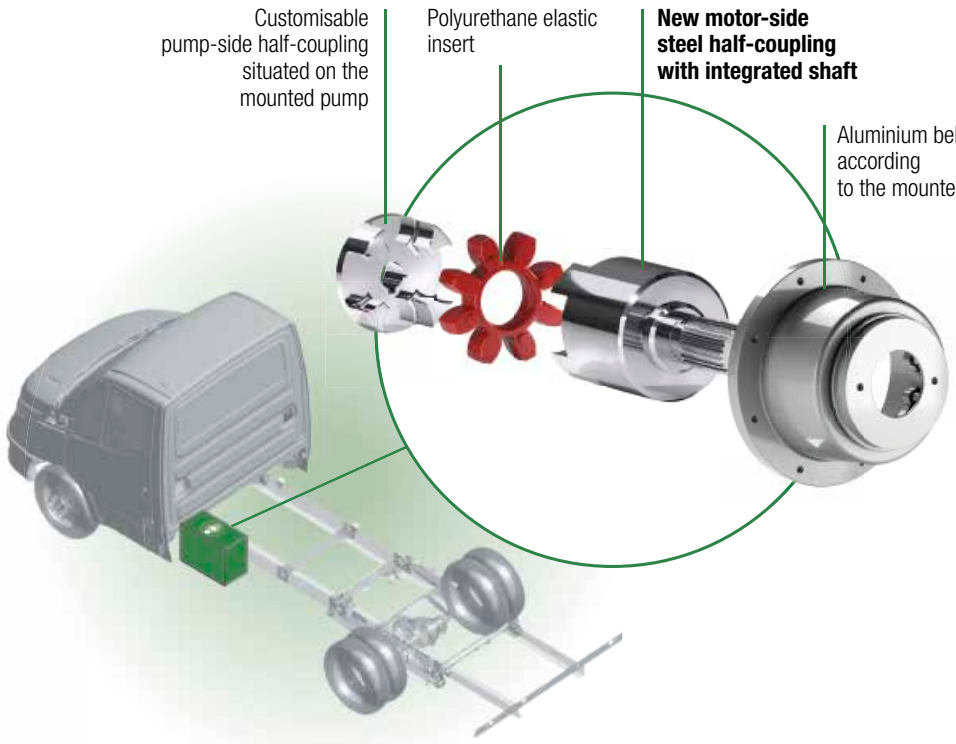
For temperatures outside this range, contact MP Filtri Technical and Sales Department

**Ordering code**

Motor half-coupling code: **SGES21ISO4156**

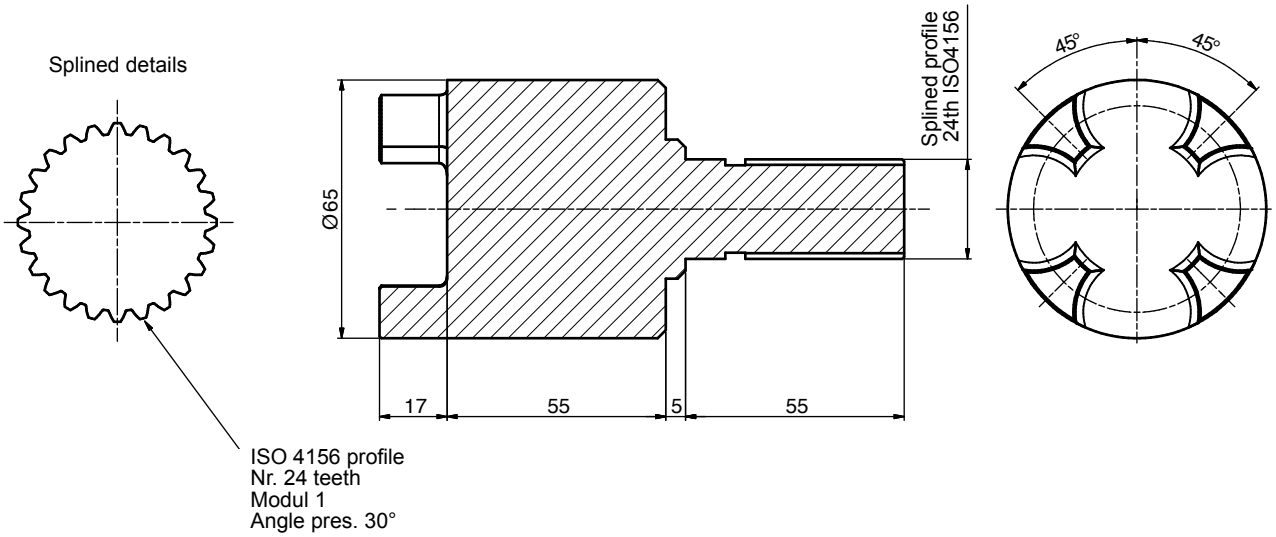
## MP Filtri solution for e-PTO

**The MP Filtri solution includes**




e-PTO Brochure

## Dimensions




**Notes:**
Please contact the Technical Department to discuss possible combinations between the electric motor installed on the machine and the pump mounted on the vehicle.