

A guide to select the correct bell-housing and drive coupling components

DATA REQUIRED

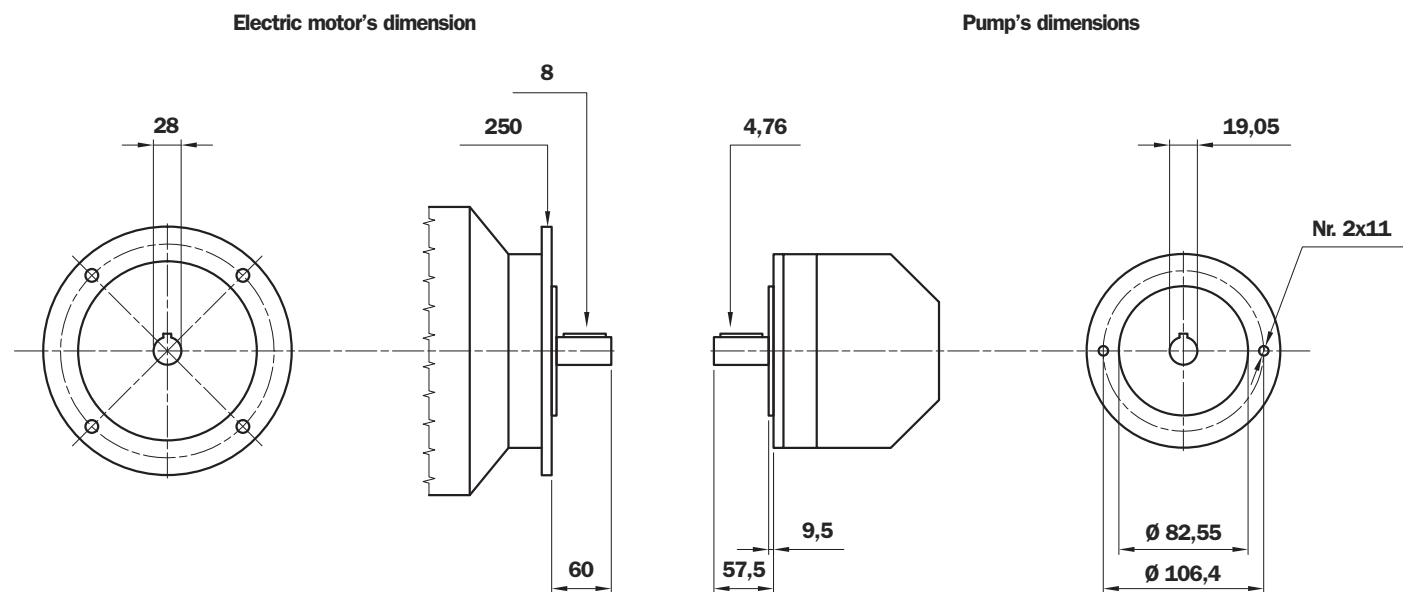
Electric motor power/motor size
 Manufacturer and pump type

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 \geq 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 $\geq 135,5$ - 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 $\geq 135,5$ - 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 length - THK Spider - THK Spigot
 $138 \text{ mm} - 60 - 18 - 9,5 = 50,5 \text{ mm}$
 - Choose the half-coupling's length on tab. 38 at page 50 $\leq 50,5 \text{ mm}$.
 - Availabe length for SGEA21= 50 mm
 - Code half-coupling code: **SGEA21G01050**

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

Nome / Petrolio / Screw pumps

AKA
AKM0320060

Pump
Manufacturer: ATOS
Pump type: PFE
Pump model: PFE31 Shaft 1

HYDRAULIC PUMP - Technical Data
L1: 57.5
d1: 19.05
Ch1: 4.76
E: 9.5
Pd: 82.55
Bd: 106
Wc: 2
F: M20

Electric Motor
N. Pole: 2P
Type: M3-B5
Size: 100-112
Sec: 3-4
Isp: 4-5,44

ELECTRIC MOTOR - Technical Data
L1: 60
H1: 28
Pkg: 250
Ch1: 8

Coupling material
 Aluminum
 Cast iron
 Allow alternative material

Result
Coupling: M21 - 21066
Drilling Pump: 5000
Pump Shaft: G01
Motor Shaft: M20

Result
Monobloc Bellhousing:
Modular Bellhousing:
Silenced Bellhousing:

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

Modular Bellhousing: OK
Silenced Bellhousing: OK

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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

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	β (°)
SGE * 01	
SGE * 21	
SGE * 31	
SGE * 40	1,5°
SGE * 51	
SGE * 60	
SGE * 80	
SGE * 90	

Max admissible angular misalignment

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

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:

Mt: $9560 \times \text{kW} / \text{rpm} = \text{Nm}$

Me > $\text{Mt} \times \text{S} = \text{Nm}$

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

Small pumps, uniform load, low operating pressures e.g. rotary action machine tools - 5/8 work cycles per hour	1.3
Small pumps, uniform load, high working pressures e.g. lifting equipment - 120-150 work cycles per hour	1.5
Pumps, non-uniform load 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: $9560 \times 4 / 1500 = 25.45 \text{ Nm}$

Me > $25.49 \times 1.3 = 33 \text{ Nm}$

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 following formulas and tables:

TABLE 2

Half-coupling type	External diameter mm	Nominal torque Me - Nm	Maximum transmissible torque Me - Nm	
ALUMINIUM	SGEA01	43	15	20
	SGEA21	68	160	190
	SGEA31	85	340	380
	SGEA51	109,5	550	620
CAST IRON	SGEG01	40	20	30
	SGEG30	80	400	450
	SGEG40	95	550	620
	SGEG60	120	760	850
	SGEG80	160	2200	2500
	SGEG90	200	5500	6100
STEEL	SGES40	95	550	620
	SGES60	120	760	850
	SGES80	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

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

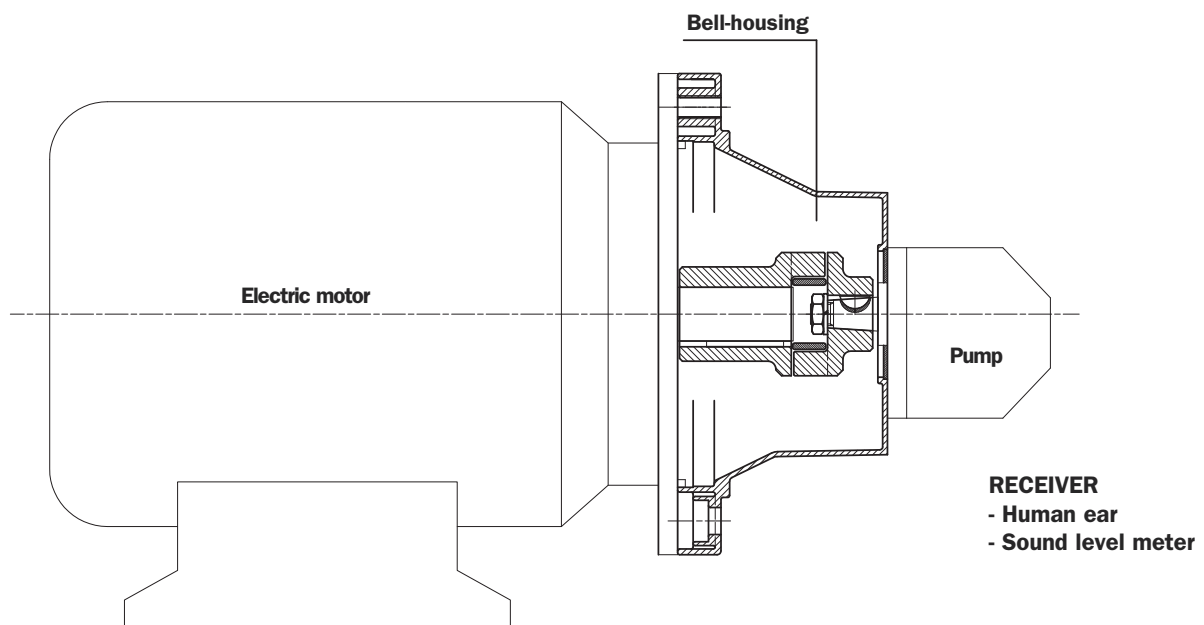
From a health and hygiene standpoint, noise can be defined as an unpleasant and undesirable sound, or an unpleasant and annoying or intolerable auditory sensation (noise being any sound phenomena that may be accompanied by sensations of disturbance and pain). By definition, acoustic phenomena are oscillatory 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

Motor and pump unit



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.

Table of summary MODUL 2/3

	5.5 - 7.5 kW	11 - 22	30	37 - 45	55 - 90	110 - 200	250 - 400
	7.5 - 10.2 Hp	15 - 30 Hp	40.80 Hp	50.32 - 61.2 Hp	75 - 125 Hp	150 - 272 Hp	340 - 544 Hp
	Size 225 - D.450	Size 160/180 D.350	Size 200 - D.350	Size 225 - D.450	Size 250/280 D.550	Size 315 - D.660	Size 355/400 D.800
MODUL 2	<p>AR*</p> <p>BMT300 BMT350</p> <p>FR1*</p> <p>Kit of assembly KVG5 (Q.ty 1) + Kit of assembly KVG1 (Q.ty 1)</p>						
	<p>AD*</p> <p>BMT350 BMT400 BMT450</p> <p>FP5 FP6 FP7</p> <p>Kit of assembly KVG5/7 (Q.ty 2)</p>						
MODUL 3	<p>BMT550 BMT660 BMT800</p> <p>FP6 FP7 (BAD800 ONLY FP7)</p> <p>Kit of assembly KVG6/7 (Q.ty 1)</p>						
	5.5 - 7.5 kW	11 - 22	30	37 - 45	55 - 90	110 - 200	250 - 400
7.5 - 10.2 Hp	15 - 30 Hp	40.80 Hp	50.32 - 61.2 Hp	75 - 125 Hp	150 - 272 Hp	340 - 544 Hp	
Size 225 - D.450	Size 160/180 D.350	Size 200 - D.350	Size 225 - D.450	Size 250/280 D.550	Size 315 - D.660	Size 355/400 D.800	

Motors base

BMC series

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

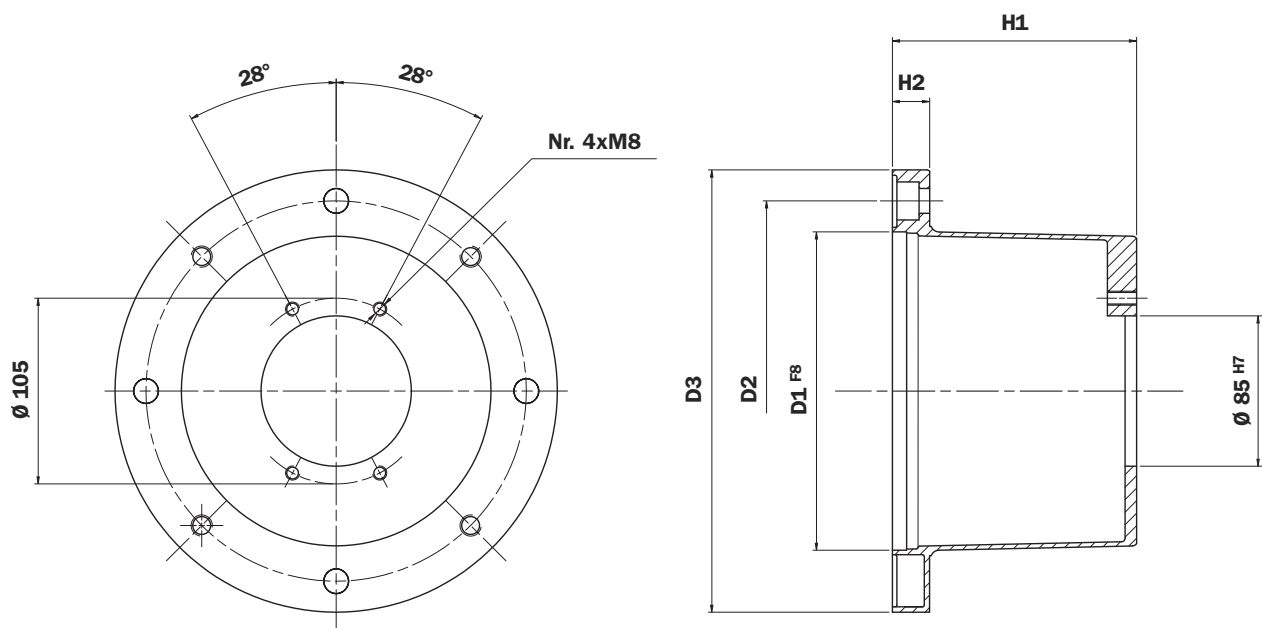


TABLE 6

Electric motor, 4-pole, 1500 rpm				Dimensions of BMC motor base							
Frame size	kW	Hp	Shaft	Motor base code	Foot bracket code	D1	D2	D3	H1	H2	Weight (kg)
80	0.53-0.75	0.75-1	19x40	BMC200A1001	PDM A 200	130	165	200	100	18	0,75
90	1.1-1.5	1.5-2	24x50	BMC200A1251	PDM A 200	130	165	200	125	18	0,95
100-112	2.2-4	3-12.5	28x60	BMC250A1141	PDM A 250	180	215	250	114	19	1,60
				BMC250A1361	PDM A 250	180	215	250	136	19	1,60
132	5.5-7.5	7.5-12.5	38x80	BMC300A1551	PDM A 300	230	265	300	155	23	3,30

Assembly kit code (motor base + flange): **KVG1**

For dimension see page 55

- For pump flange codes, see page 17

Motor base for installation of auxiliary flange FP5

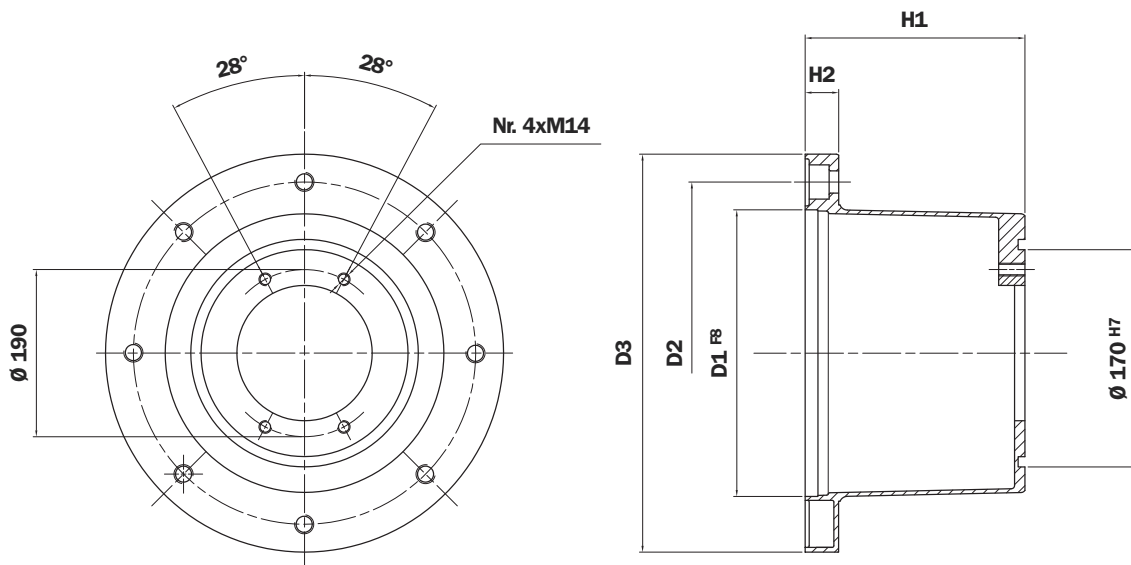


TABLE 7

Electric motor, 4-pole, 1500 rpm				Dimensions of BMC motor base							
Frame size	kW	Hp	Shaft	Motor base code	Foot bracket code	D1	D2	D3	H1	H2	Weight (kg)
132	5.5-7.5	7.5-12.5	38x80	BMC300A1555	PDM A 300	230	265	300	155	23	3,30
				BMC300A1705	PDM A 300	230	265	300	170	23	
160	11-15	15-20	42x110	BMC350A1945	PDM A 350	250	300	350	194	31	4,90
180	18.5-22	25-30	48x110								

Assembly kit code (motor base + flange): **KVG5**

- For pump flange codes, see page 17

For dimension see page 55

Motor base for installation of auxiliary flange FP6

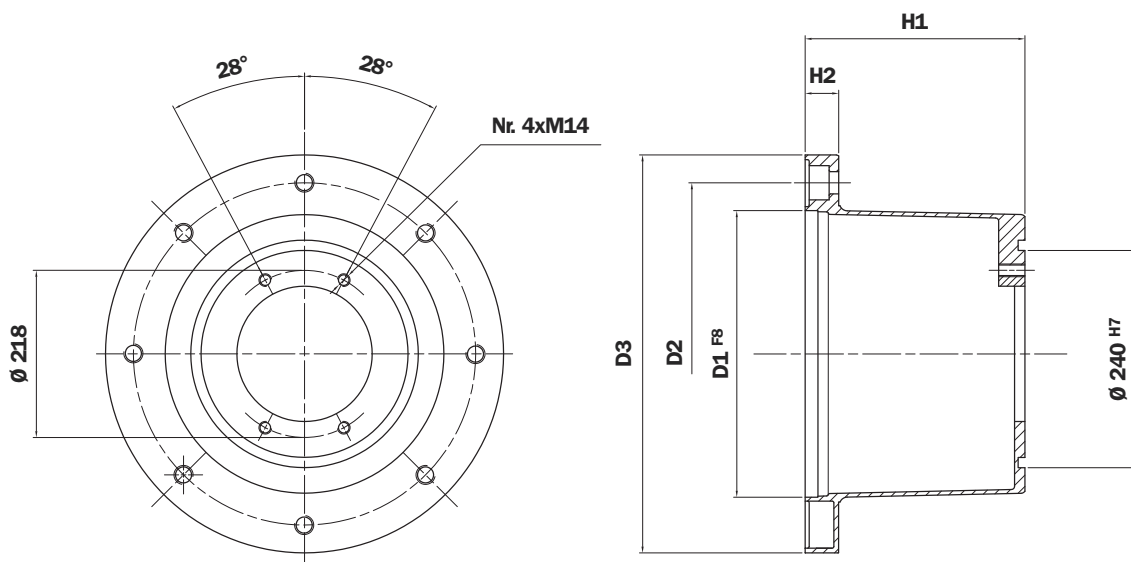


TABLE 8

Electric motor, 4-pole, 1500 rpm				Dimensions of BMC motor base							
Frame size	kW	Hp	Shaft	Motor base code	Foot bracket code	D1	D2	D3	H1	H2	Weight (kg)
160	11-15	15-20	42x110	BMC350A1946	PDM A 350	250	300	350	194	31	4,90
180	18.5-22	25-30	48x110								
200	30	40	55x140	BMC400A2016	/	300	350	400	201	31	6,90

Assembly kit code (motor base + flange): **KVG6**

- For pump flange codes, see page 17

For dimension see page 55

Pump flange

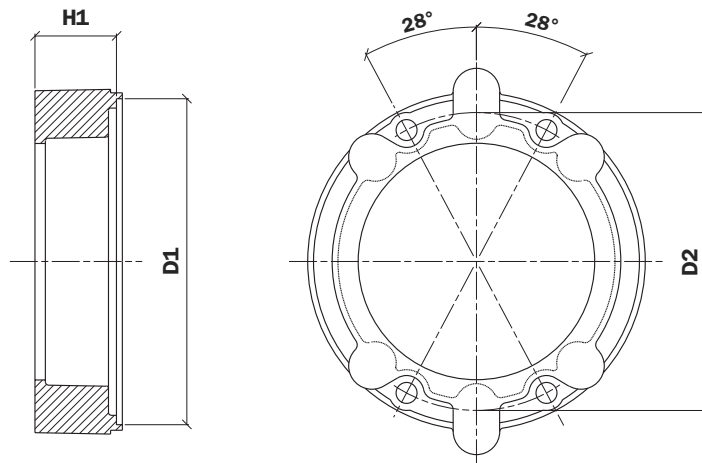


TABLE 10

Code	Flange			Assembly kit	Possible pump interfaces	Weight (kg)
	H1	D1	D2			
FR1023***	23	85	105	KVG1	S024 S025 D042 S061 S063 S083 S023 S070 S071 S072 S075 S125 S154	0,25
FR1025***	25				S021 S026 S068 S069 S080 S082 S115 S237	0,30
FR1033***	33				S021 S023 S026 S027 S070 S071 S072 S074 S080 S082 F260	0,80
FR1035***	35				S060 S063 S065	0,90
FR1040***	40				S098 S227	1,10
FR1079***	79				S031 S116	1,30

Complete the order designation with the pump interface code: Ex. **FP5026S023**

TABLE 11

Code	Flange			Assembly kit	Possible pump interfaces	Weight (kg)
	H1	D1	D2			
FP5026***	26	190	170	KVG5	S023-S024-S025-S033-D042-S063-S070-S072-S075-S154-S254	1,00
FP5032***	32				S024-S031-S158-S096-S125	1,10
FP5035***	35				S021-S023-S024-S025-S026-S031-S059-S060-S068-S072-S074-S075-S083-S097-S106-S125-S131-S138	0,90
FP5045***	45				S021-S024-S025-S026-S060-S068-S070-S071-S072-S074-S075-S106-S125-S141	0,90
FP5056***	56				S021-S026-S072	1,61
FP5063***	63				S021-S025-S068-S070-S079-S138-S141	1,70
FP5064***	64				S024-S025-S059-S093-S099-S100-S104	1,70
FP5091***	91				S025-S031-S033-S100-S113-S115-S116-S267	2,20
FP6032***	32	240	218	KVG6	S021-S035-S081-S082	1,80
FP6045***	45				S021-S025-S026-S027-S069-S070-S075-S077-S080-S081-S082-S125-S198-S207-S215-S253	2,10
FP6058***	58				S024-S025-S026-S027-S038-S077-S078-S079-S080-S081-S082-S207-S215-S237	2,40
FP6070***	70				S080-S270	3,00
FP6082***	82				S038-S080-S081-S116-S141-S198-S215	3,30
FP6086***	86				S021-S026-S027-S077-S078-S090-S092-S166-S091-S114-S132-S198-S200	3,40
FP6101***	101				S027-S035-S113-S115-S132-S148-S176-S228	4,20
FP6110***	110				S080-S111	5,50
FP7052***	52	288	258	KVG7	S028-S092-S108-S112-S133-S192	4,10
FP7066***	66				S090-S092-S166	4,75
FP7069***	69				S108-S143-S148-S158-S192-S19-S201-S204-S281-S282-S288	4,90
FP7086***	86				S022-S027-S028-S091-S092-S108-S112-S117-S166-S184-S192-S201-S228-S300	5,20
FP7111***	111				S028-S091-S112-S117-S144-S145-S184	6,30
FP7124***	124				S190-S211	7,50