3ME

Aluminium gear motors

Technical Catalogue

E0.130.0416.02.00IM02

GEAR MOTORS

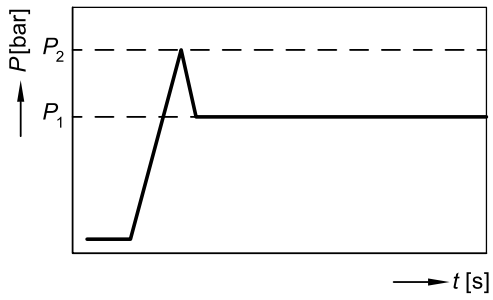
•Displacements from 2.8 cm^3/rev to 73.4 cm^3/rev *(from 0.17 cu.in./rev to 4.48 cu.in./rev).*
•Rated pressure up to 250 bar (3625psi).
•Back pressure capability up tp 120 bar (1740 psi) only in bi-directional release.
•Speed up to 4500 rpm.
•Flanges, shafts and ports for ISO, DIN and SAE standards.
•Available in uni and bi-directional version for all the sizes, displacements and configurations.
•High volumetric efficiency thanks to an innovative design and an accurate control of machining tolerances.
•Axial compensation achieved by the use of floating bushes that allow high volumetric efficiency throughout the working pressure range.
•DU bearings to ensure high pressure capability.
•12 teeth integral gear and shaft.
•Aluminium body.
•Cast iron flange and cover.
•Double shaft seals in all motor series. The one which faces the internal side in reinforced.
•Nitrile seals as standard and Viton seals in high temperature applications.
•Available with different valves and circuit configurations built-in rear cover.
•All motors are hydraulically tested after assembly to ensure the highest standard performance.

TECHNICAL DATA

- Minimum operating fluid viscosity	12 mm^2/sec
- Permitted viscosity range	12 - 800 mm^2 / sec
- Recommended viscosity range	20 - 80 mm^2 / sec
- Permitted viscosity for starting	2000 mm^2 / sec
- Fluid operating temperature range	-25 to 85 °C
- Fluid operating temperature range with FPM seals	-20 to 110°C
- Fluid operating temperature range with HNBR seals*	-30 to 110°C
- Hydraulic fluid	mineral oil

*Available on request

DEFINITION OF PRESSURES

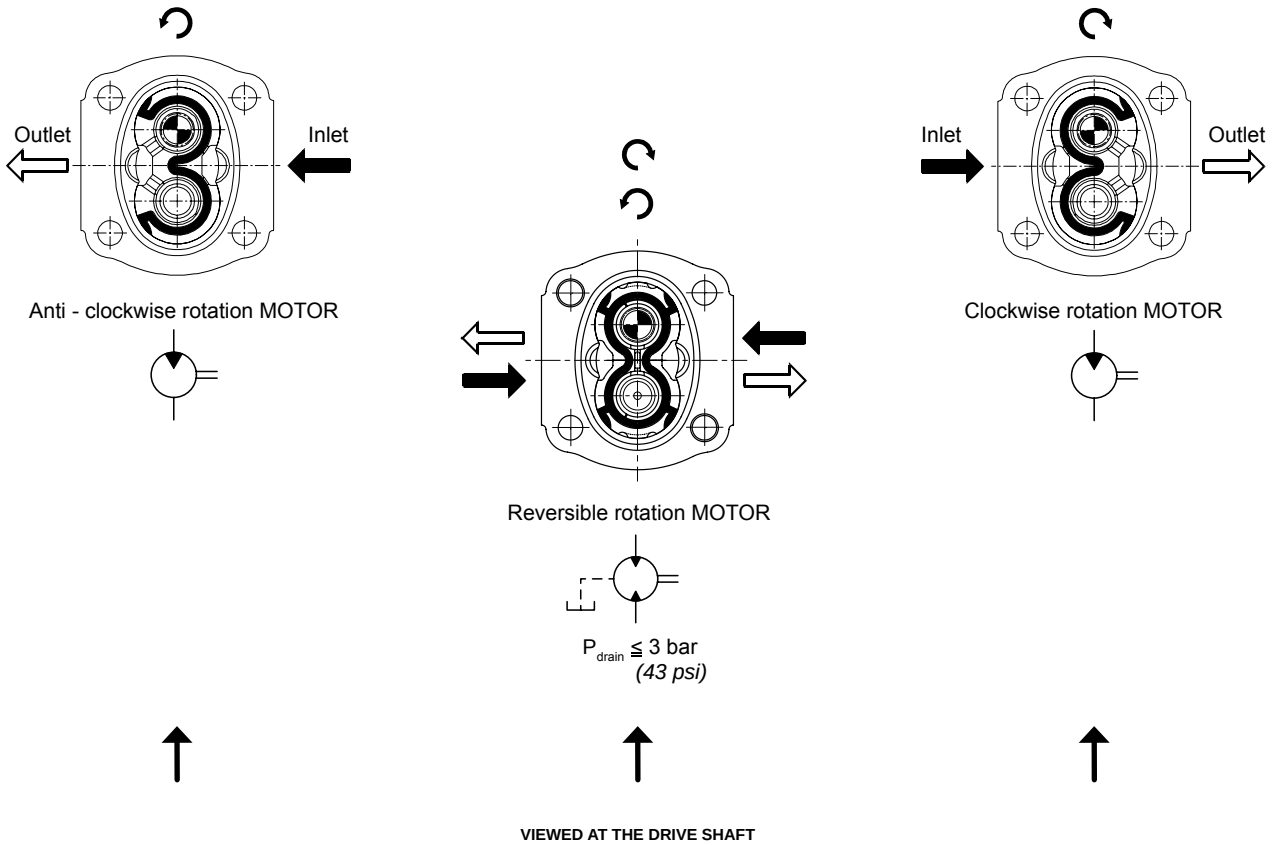


P_1 max. continuous pressure
P_2 starting pressure (depending on the application, this must be taken into consideration when setting the pressure of the hydraulic system’s pressure-relief valve).

DRIVE SHAFTS

Radial and axial loads on the shafts must be avoided since they reduce the life of the unit.
In order to avoid misalignment during the assembly with the primary engine, a connection with “Oldham” coupling (or coupling having convex toothed hub) is recommended.

ROTATION



HYDRAULIC PIPE LINE

To calculate hydraulic pipe line size, the designer can use; as an approximate guide, the following fluid speed figures:

From 6 to 10 m/sec on pressure pipe line	From *19.7* to *32.8 ft/sec* on pressure pipe line

The lowest fluid speed values in pipe lines is recommended when the operating temperature range is high and/or for continuous duty.
The highest value is recommended when the temperature difference is low and/or for intermittent duty.
In case of reversible motor allowance must be made to ensure the motor is not drained, through the case drain, when stationary.

E0.100.0416.02.00IM00

FILTRATION INDEX RECOMMENDED

Working pressure	>200 bar/2900 psi	<200 bar/2900 psi
Contamination class NAS 1638	9	10
Contamination class ISO 4406	19/18/15	20/19/16
Achieved with filter β_x=75	15 µm	25 µm

FIRE RESISTENT FLUID

Type	Description	Max pressure	Max speed (rpm)	Temperature
HFB	Oil emulsion with 40% water	130 bar/*1880 psi*	2500	3°C+65°C
HFC	Water glycol	180 bar/*2600 psi*	1500	-20°C+65°C
HFD	Phosphate esters		1750	-10°C+80°C

COMMON FORMULAS FOR MOTORS

Based on SI units

Input flow: $Q = \frac{V \cdot n}{1000 \cdot \eta_v}$ l/min

Output torque: $M = \frac{V \cdot \Delta p \cdot \eta_m}{20 \cdot \pi}$ Nm

Output power: $P = \frac{M \cdot n}{9550} = \frac{Q \cdot \Delta p \cdot \eta_t}{600}$ kW

Variables: SI units [US units]

Based on US units

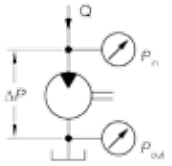
Input flow: $Q = \frac{V \cdot n}{231 \cdot \eta_v}$ [US gal/min]

Output torque: $M = \frac{V \cdot \Delta p \cdot \eta_m}{2 \cdot \pi}$ [lbf·in]

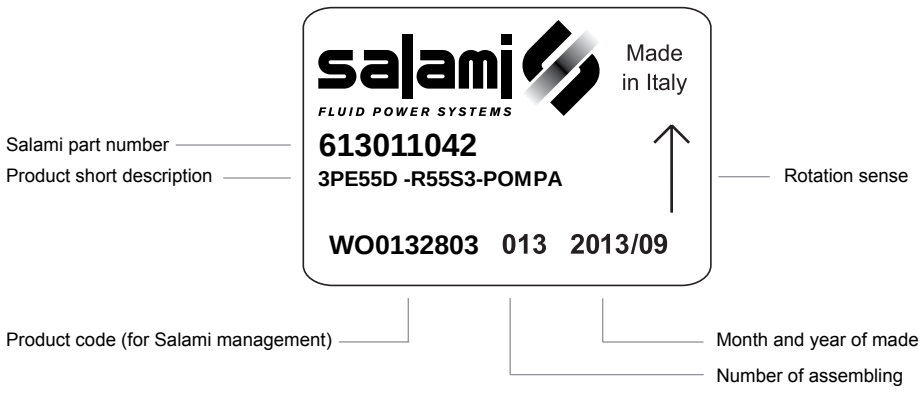
Output power: $P = \frac{M \cdot n}{63\,025} = \frac{Q \cdot \Delta p \cdot \eta_t}{1714}$ [hp]

LEGENDA

V	=	Displacement	cm³/rev [in³/rev]
P_{out}	=	Outlet pressure	bar [psi]
P_{in}	=	Inlet pressure	bar [psi]
ΔP	=	$P_{out} - P_{in}$ (system pressure)	bar [psi]
n	=	Speed	min⁻¹ (rpm)
η_v	=	Volumetric efficiency	
η_m	=	Mechanical efficiency	
η_t	=	Overall efficiency ($\eta_v \cdot \eta_m$)	



IDENTIFICATION LABEL



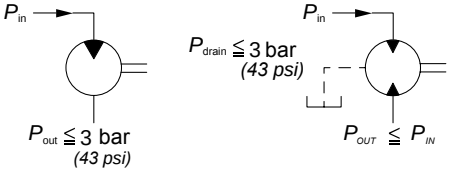
WORKING CONDITIONS

	Displacement		Max. continuous pressure P1		Max. starting pressure P2		Max. speed	Min. speed
GROUP 1.5 - E SERIES	cm³/rev	*cu.in/rev*	bar	*psi*	bar	*psi*	min⁻¹	
1.5ME - 2.8	2.8	*0.17*	250	*3625*	270	*3915*	4500	700
1.5ME - 3.5	3.5	*0.21*	250	*3625*	270	*3915*	4500	700
1.5ME - 4.1	4.1	*0.25*	250	*3625*	270	*3915*	4000	700
1.5ME - 5.2	5.2	*0.32*	230	*3335*	250	*3625*	4000	700
1.5ME - 6.2	6.2	*0.38*	230	*3335*	250	*3625*	3600	600
1.5ME - 7.6	7.6	*0.46*	200	*2900*	220	*3190*	3300	600
1.5ME - 9.3	9.3	*0.57*	180	*2610*	200	*2900*	3000	600
1.5ME - 11	11	*0.67*	170	*2465*	190	*2755*	3000	600
GROUP 2 - E SERIES	cm³/rev	*cu.in/rev*	bar	*psi*	bar	*psi*	min⁻¹	
2ME - 4.5	4.6	*0.27*	250	*3625*	280	*4060*	4000	600
2ME - 6.5	6.5	*0.4*	250	*3625*	280	*4060*	4000	600
2ME - 8.3	8.2	*0.5*	250	*3625*	280	*4060*	3600	500
2ME - 10.5*	10.6	*0.65*	250	*3625*	280	*4060*	3500	500
2ME - 11.3	11.5	*0.68*	250	*3625*	280	*4060*	3500	500
2ME - 12.5*	12.7	*0.77*	250	*3625*	280	*4060*	3400	500
2ME - 13.8	13.8	*0.84*	250	*3625*	280	*4060*	3400	500
2ME - 16	16.6	*1.01*	250	*3625*	280	*4060*	3200	450
2ME - 19	19.4	*1.15*	220	*3140*	240	*3480*	3200	450
2ME - 22.5	22.9	*1.37*	200	*2900*	220	*3140*	3000	450
2ME - 26	25.8	*1.58*	180	*2610*	200	*2900*	2850	450

*Available for quantity

GROUP 2.5 - B SERIES	cm³/rev	*cu.in/rev*	bar	*psi*	bar	*psi*	min⁻¹	
2.5MB - 16	16	*0.97*	250	*3625*	280	*4060*	3000	600
2.5MB - 19	19.3	*1.17*	250	*3625*	280	*4060*	3000	600
2.5MB - 22	22.2	*1.35*	250	*3625*	280	*4060*	3000	500
2.5MB - 25	25.2	*1.53*	250	*3625*	280	*4060*	3000	500
2.5MB - 28	27.6	*1.68*	250	*3625*	280	*4060*	3000	500
2.5MB - 32	32.4	*1.97*	230	*3330*	250	*3625*	3000	500
2.5MB - 38	38.1	*2.32*	200	*2900*	220	*3140*	2750	400
2.5MB - 44	44.2	*2.69*	170	*2465*	190	*2755*	2500	400
GROUP 3 - E SERIES	cm³/rev	*cu.in/rev*	bar	*psi*	bar	*psi*	min⁻¹	
3ME - 27	27	*1.65*	250	*3625*	280	*4060*	3000	600
3ME - 33	33.5	*2.04*	250	*3625*	280	*4060*	3000	600
3ME - 38	38.7	*2.36*	250	*3625*	280	*4060*	2750	500
3ME - 46	46.9	*2.86*	250	*3625*	270	*3915*	2750	500
3ME - 55	54.1	*3.3*	220	*3140*	240	*3480*	2500	400
3ME - 65	63.1	*3.85*	200	*2900*	220	*3140*	2500	400
3ME - 75*	73.4	*4.48*	180	*2610*	200	*2900*	2500	400

*Available for quantity



The values shown in the picture represents the standard working situation.
Max drain pressure is influenced by rotational speed of the unit.
For pressure higher than 3 bar please contact sales department.
On request available shaft seal for high P drain (20 bar).

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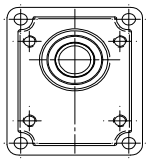
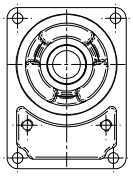
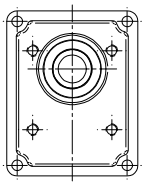
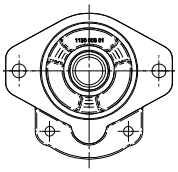
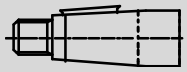
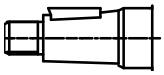
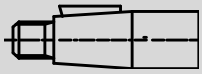
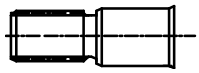
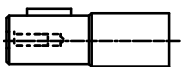
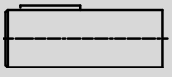
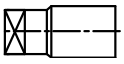
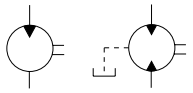
Final revised edition-April 2016

SHAFTS AND FLANGES COMBINATIONS

3ME	 CODE **P2** - European stand.	 CODE **B6** - German stand.	 CODE **P3** - European stand. for 3,5PC	 CODE **S3** - SAE B
 CODE **35** - Tapered 1:5		35B6		
 CODE **38** - Tapered 1:8	38P2			
 CODE **48** - Tapered 1:8 for 3,5PC			48P3	
 CODE **55** - SAE B 13T				55S3
 CODE **56** - SAE BB 15T				56S3
 CODE **87** - SAE B parallel				87S3
 CODE **88** - SAE BB parallel				88S3
 CODE **05** - Tang drive for electric motors		05B6		

Note: other versions available, see shafts and flanges information.

Displacements up to 4.48 cu.in./rev
Pressure up to 4350 psi



GEAR MOTORS

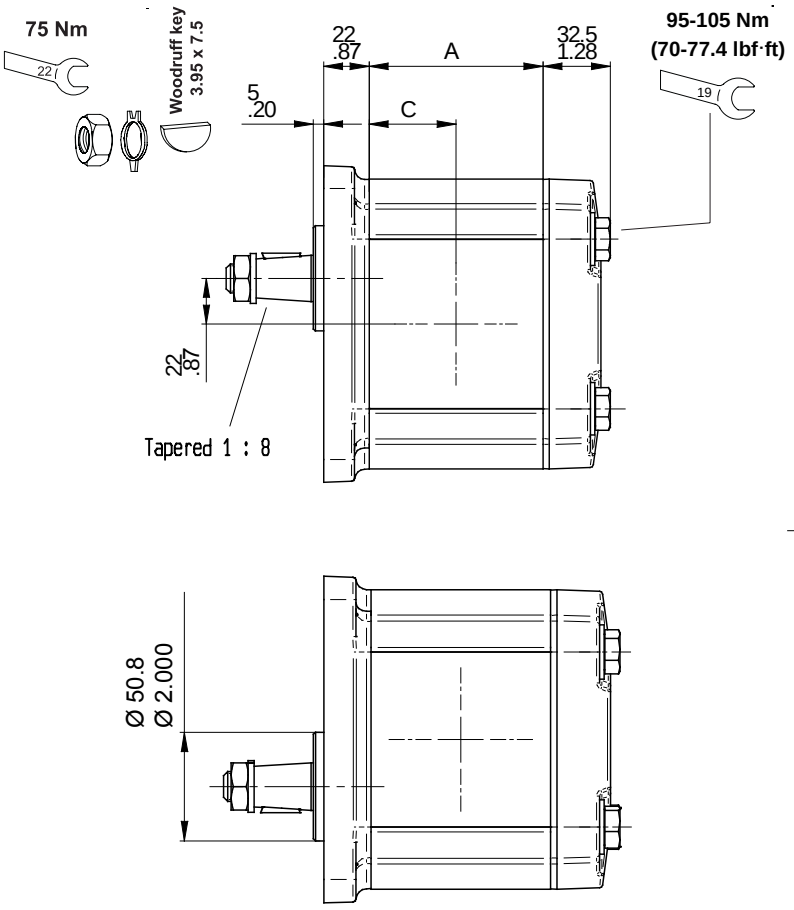
$P_{drain} \leqq 3$ bar
(43 psi)

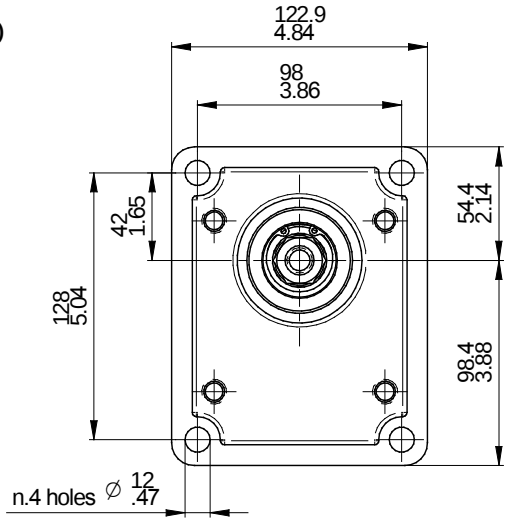
Displacements up to 73.4 cm³/rev
Pressure up to 300 bar

ASSEMBLING DIMENSIONS

Type		27	33	38	46	55	65	75*
Displacement	cm³/rev *cu.in./rev*	27 *1.65*	33.5 *2.04*	38.7 *2.36*	46.9 *2.86*	54.1 *3.3*	63.1 *3.85*	73.4 *4.48*
Dimension A	mm *in*	79 *3.11*	84 *3.31*	88 *3.46*	104 *4.09*	110 *4.33*	117 *4.61*	124 *4.88*
Dimension C	mm *in*	39.5 *1.56*	42 *1.65*	44 *1.73*	52 *2.05*	55 *2.17*	58.5 *2.30*	62 *2.44*
Weight	kg *lbs*	8.9 *19.6*	9.1 *20.1*	9.4 *20.6*	10.1 *22.3*	10.5 *23*	10.8 *23.8*	11.2 *24.6*

*Displacement 75 is special release, please contact sales department.





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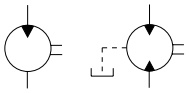
Displacements up to 4.48 cu.in./rev
Pressure up to 4350 psi



GEAR MOTORS

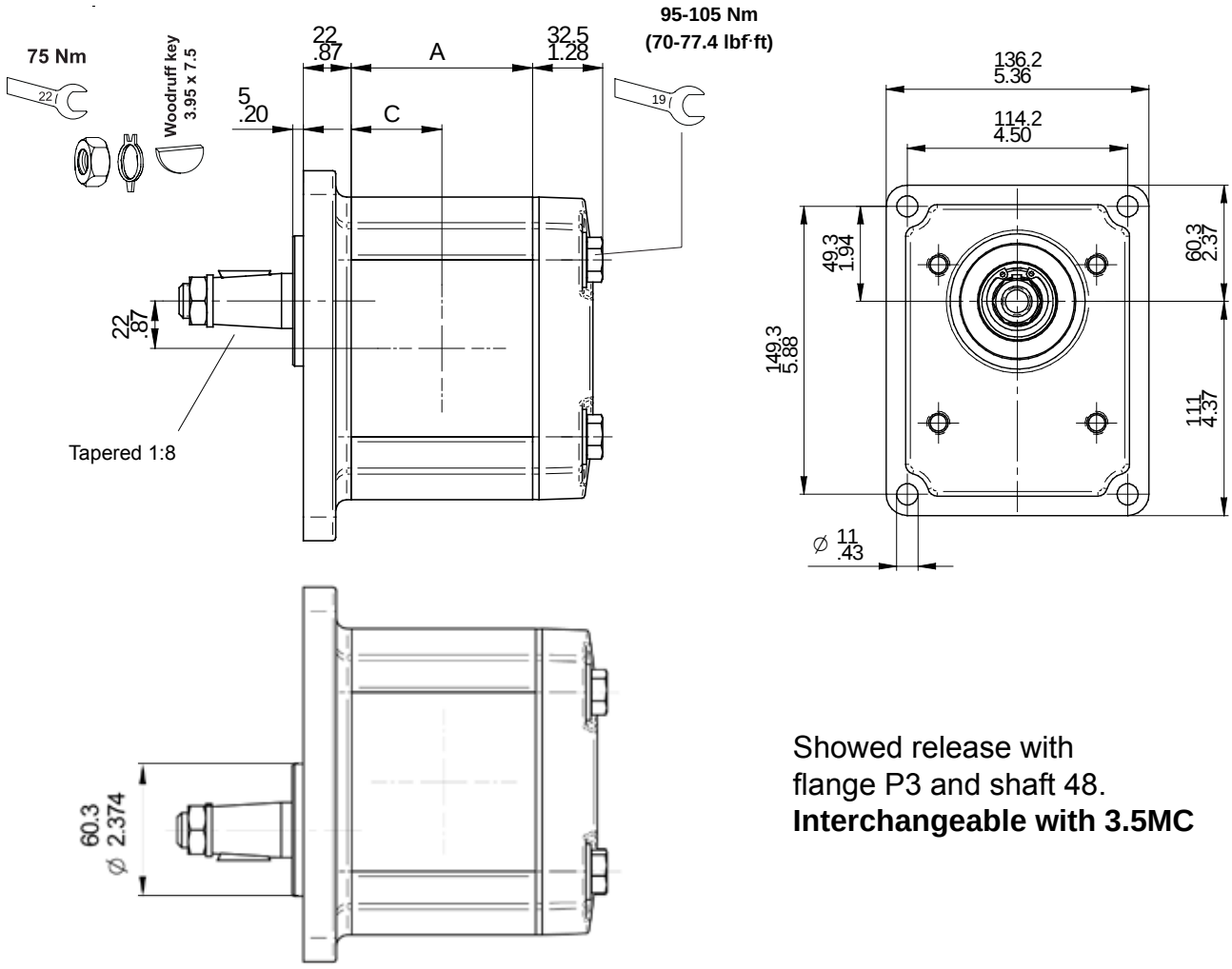
$P_{drain} \leqq 3$ bar
(43 psi)

Displacements up to 73.4 cm³/rev
Pressure up to 300 bar

ASSEMBLING DIMENSIONS

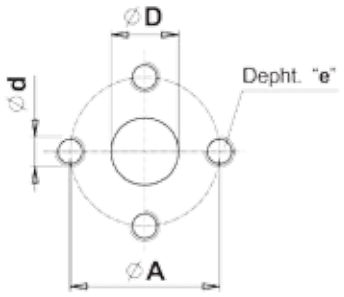
Type		46	55	65	75*
Displacement	cm³/rev cu.in./rev	46.9 *2.86*	54.1 *3.3*	63.1 *3.85*	73.4 *4.48*
Dimension A	mm in	104 *4.09*	110 *4.33*	117 *4.61*	124 *4.88*
Dimension C	mm in	52 *2.05*	55 *2.17*	58.5 *2.30*	62 *2.44*
Weight	kg lbs	10.1 *22.3*	10.5 *23*	10.8 *23.8*	11.2 *24.6*

*Displacements 75 are special release, please contact sales department.



Showed release with
flange P3 and shaft 48.
Interchangeable with 3.5MC

FLANGED AND THREADED PORTS



code P

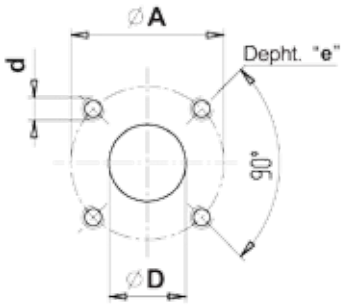
Flanged ports
european standard

UNI-DIRECTIONAL MOTORS

TYPE	OUTLET				INLET			
	Ø D	Ø A	d	e	Ø D	Ø A	d	e
From 27 to 55	27 *(1.06”)*	51 *(2.01”)*	M10	16 *(0.63”)*	16 *(0.63”)*	40 *(1.57”)*	M8	16 *(0.63”)*
From 65 to 75	33 *(1.3”)*	62 *(2.44”)*	M12		21 *(0.83”)*	51 *(2.01”)*	M10	

BI-DIRECTIONAL MOTORS

TYPE	OUTLET				INLET			
	Ø D	Ø A	d	e	Ø D	Ø A	d	e
27	19 *(0.75”)*	40 *(1.57”)*	M8	16 *(0.63”)*	19 *(0.75”)*	40 *(1.57”)*	M8	16 *(0.63”)*
From 33 to 75	27 *(1.06”)*	51 *(2.01”)*	M10		27 *(1.06”)*	51 *(2.01”)*	M10	

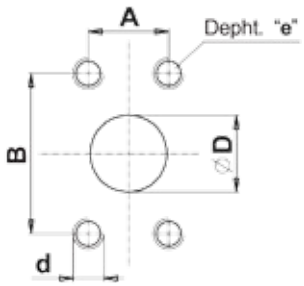


code B

Flanged ports
german standard

UNI-DIRECTIONAL MOTORS

TYPE	OUTLET				INLET			
	Ø D	Ø A	d	e	Ø D	Ø A	d	e
From 27 to 75	27 *(1.06”)*	55 *(2.17”)*	M8	13 *(0.51”)*	19 *(0.75”)*	55 *(2.17”)*	M8	13 *(0.51”)*



code W

Flanged ports
SAE J518
METRIC THREAD

UNI-DIRECTIONAL MOTORS

TYPE	OUTLET					INLET				
	ØD	B	A	d	e	ØD	B	A	d	e
From 27 to 38	26 *(1.02”)*	52.4 *(2.06”)*	26.2 *(1.03”)*	M10	18 *(0.71”)*	19 *(0.75”)*	47.6 *(1.87”)*	22.2 *(0.87”)*	M10	18 *(0.71”)*
From 46 to 75	32 *(1.26”)*	58.7 *(2.31”)*	30.2 *(1.19”)*			26 *(1.02”)*	52.4 *(2.06”)*	26.2 *(1.03”)*		

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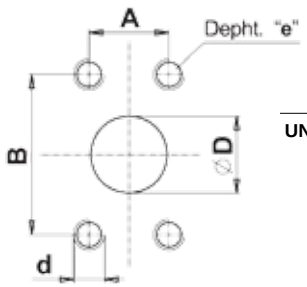
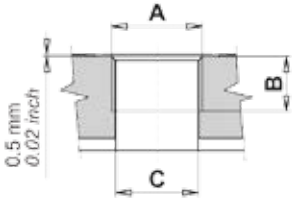


code S

Flanged ports
SAE J518
AMERICAN STANDARD
THREAD

UNI-DIRECTIONAL MOTORS

TYPE	OUTLET					INLET				
	ØD	B	A	d	e	ØD	B	A	d	e
From 27 to 38	26 *(1.02”)*	52.4 *(2.06”)*	26.2 *(1.03”)*	3/8 16 UNC	18 *(0.71”)*	19 *(0.75”)*	47.6 *(1.87”)*	22.2 *(0.87”)*	3/8 16 UNC	18 *(0.71”)*
From 46 to 75	32 *(1.26”)*	58.7 *(2.31”)*	30.2 *(1.19”)*	7/16 14 UNC		26 *(1.02”)*	52.4 *(2.06”)*	26.2 *(1.03”)*		



code G

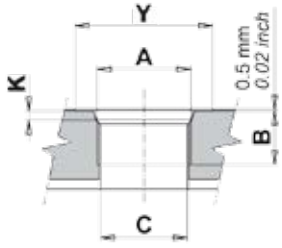
Threaded ports
GAS (BSPP)

UNI-DIRECTIONAL MOTORS

TYPE	OUTLET			INLET		
	A	B	C	A	B	C
From 27 to 38	G1	22 *(0.86”)*	27 *(1.06”)*	G1	22 *(0.86”)*	27 *(1.06”)*
From 46 to 75	G1 1/4	24 *(0.94”)*	32.5 *(1.28”)*			

BI-DIRECTIONAL MOTORS

TYPE	OUTLET			INLET		
	A	B	C	A	B	C
From 27 to 75	G1	22 *(0.86”)*	30.5 *(1.20”)*	G1	22 *(0.87”)*	30.5 *(1.20”)*



code R

Threaded ports
SAE (ODT)

UNI-DIRECTIONAL MOTORS

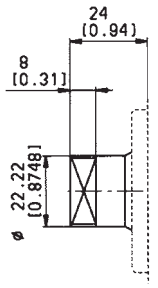
TYPE	OUTLET					INLET				
	A	B	C	Y	K	A	B	C	Y	K
From 27 to 38	1-5/16-12 UN (SAE 16)	19 *(0.75”)*	25 *(0.98”)*	49 *(1.93”)*	3.3 *(0.12”)*	1-1/16-12 UN (SAE 12)	19 *(0.75”)*	21 *(0.83”)*	41 *(1.16”)*	3.3 *(0.13”)*
From 46 to 75	1-5/8-12 UN (SAE 20)		27 *(1.06”)*	58 *(2.28”)*		1-5/16-12 UN (SAE 16)		25 *(0.98”)*	49 *(1.93”)*	

BI-DIRECTIONAL MOTORS

TYPE	OUTLET					INLET				
	A	B	C	Y	K	A	B	C	Y	K
From 27 to 38	1-1/16-12 UN (SAE 12)	19 *(0.75”)*	21 *(0.83”)*	41 *(1.61”)*	3.3 *(0.12”)*	1-1/16-12 UN (SAE 12)	19 *(0.75”)*	21 *(0.83”)*	41 *(1.61”)*	3.3 *(0.13”)*
From 46 to 75	1-5/16-12 UN (SAE 16)		25 *(0.98”)*	49 *(1.93”)*		1-5/16-12 UN (SAE 16)		25 *(0.98”)*	49 *(1.93”)*	

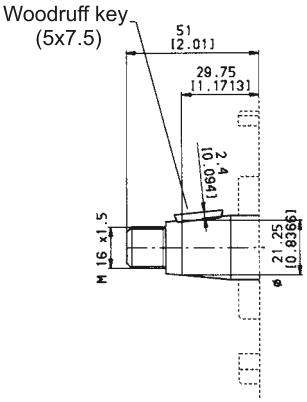
E0.130.0416.02.00IM**03**

DRIVE SHAFTS



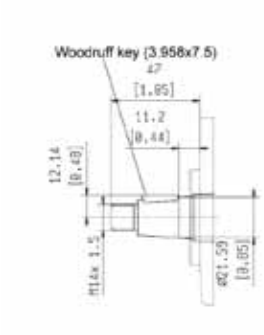
code 05 Max torque 180 Nm (1590 lbf in)

Tang drive for electric motors



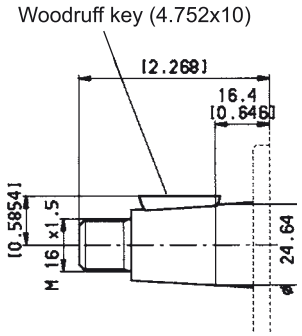
code 35 Max torque 260 Nm (2300 lbf in)

European tapered 1:5



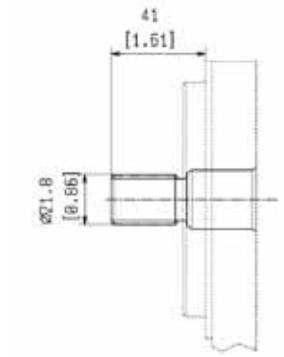
code 38 Max torque 250 Nm (2213 lbf in)

European tapered 1:8



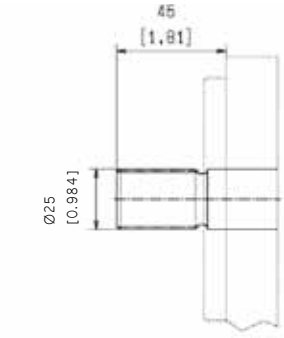
code 48 Max torque 350 Nm (3100 lbf in)

European tapered 1:8 for 3.5PC



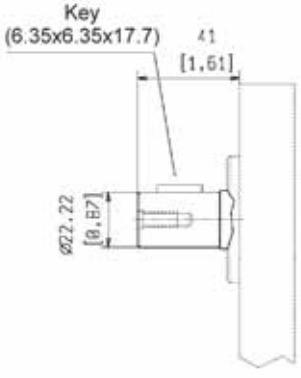
code 55 Max torque 330 Nm (2921 lbf in)

SAE B 13T-16/32DP Ansi B92 1a 1976



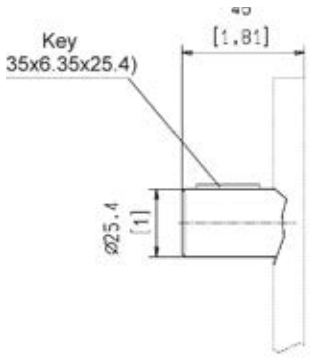
code 56 Max torque 480 Nm (4250 lbf in)

SAE BB 15T-16/32DP Ansi B92 1a 1976



code 87 Max torque 220 Nm (1950 lbf in)

SAE B Parallel

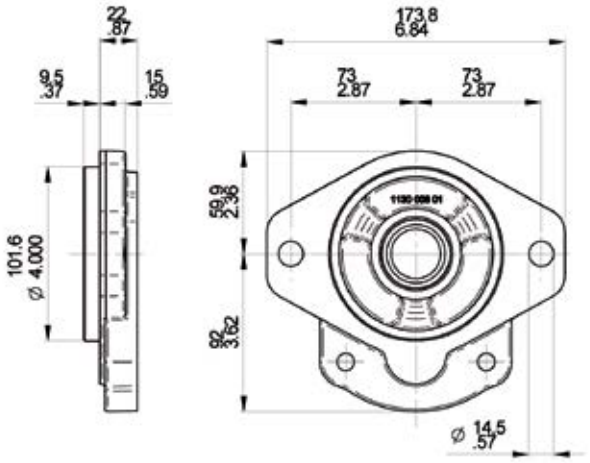


code 88 Max torque 320 Nm (2830 lbf in)

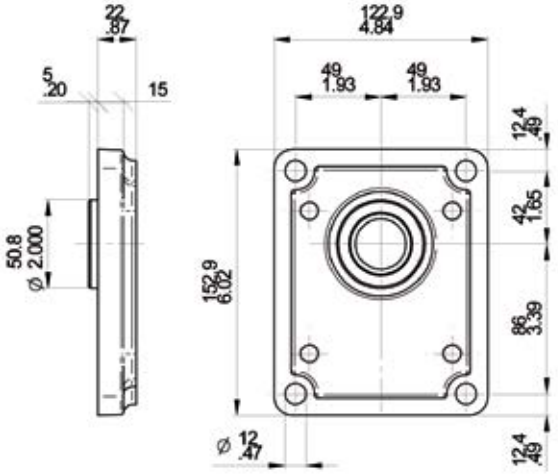
SAE BB Parallel

E0.130.0416.02.00IM03

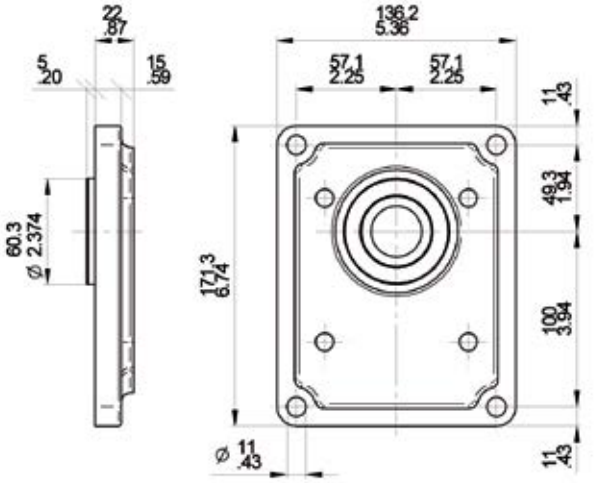
MOUNTING FLANGES



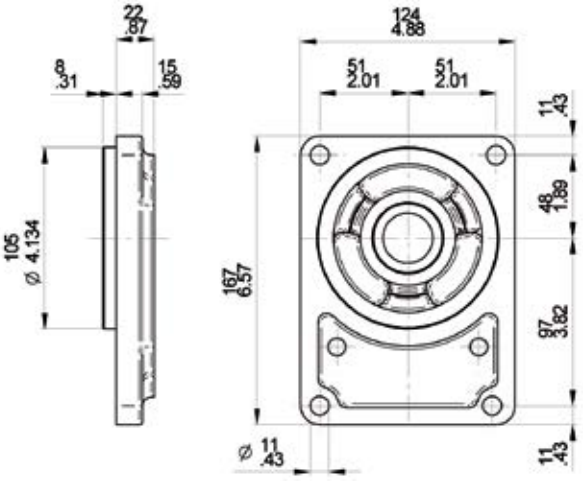
S3	SAE B
With shaft code 55-56-87-88	



P2	European standard
With shaft code 38	



P3	European standard
With shaft code 48	



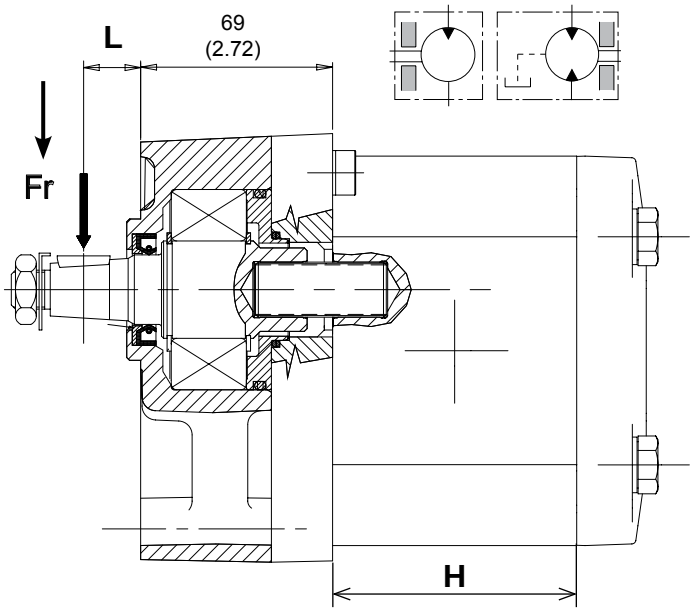
B6	German standard
With shaft code 05-35	

OUTRIGGER BEARING

The following diagrams show radial load capability of the bearing.
Calculation according to ISO 281 at 10 cSt.

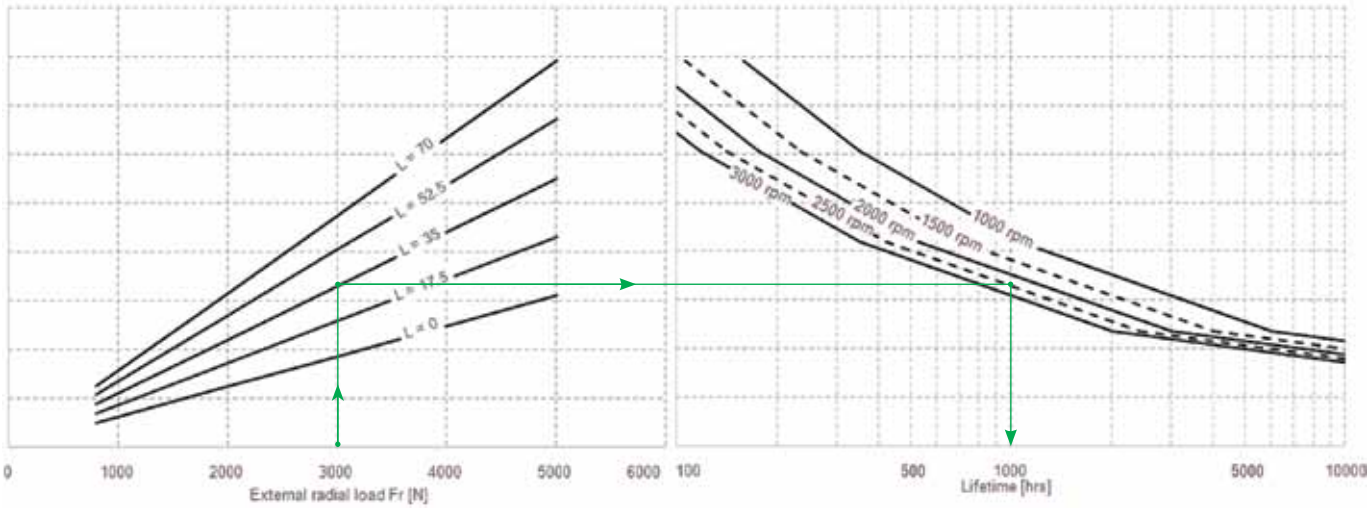
TYPE	H
27	79 (3.11")
33	84 (3.31")
38	88 (3.46")
46	104 (4.09")
55	110 (4.33")
65	117 (4.61")

L=Distance between mounting flange and radial force point of application.

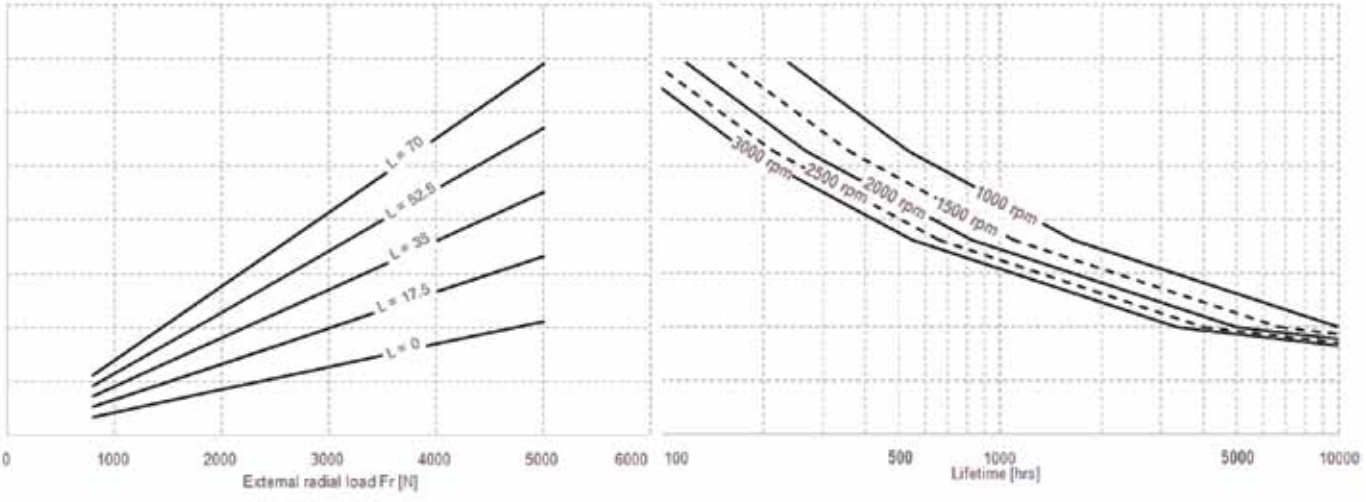


Example:
Fr = 3000 N
L = 35
Speed = 2500 rpm
→ Expected life: 1000 hrs

For Code CP

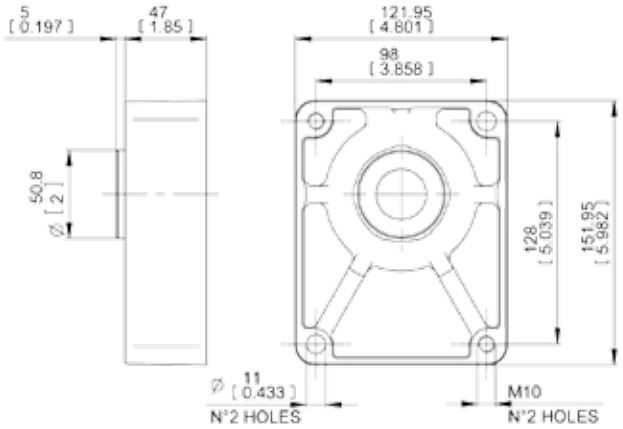


For Code CSB

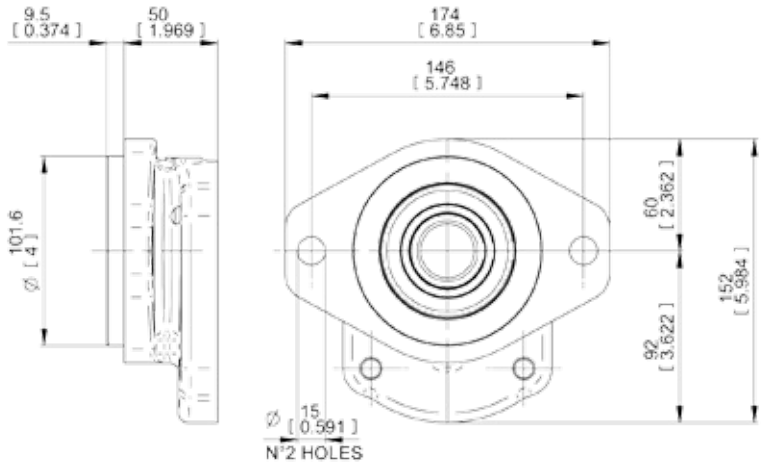


E0.130.0416.02.00IM03

MOUNTING FLANGES WITH OUTRIGGER BEARING SUPPORT

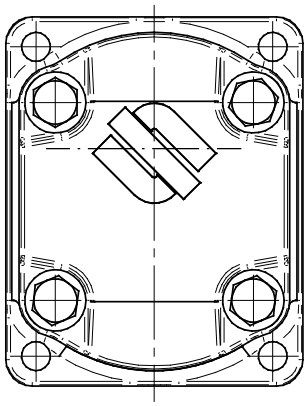


CP	**European standard** Ø50.8 mm
With shaft code 38	

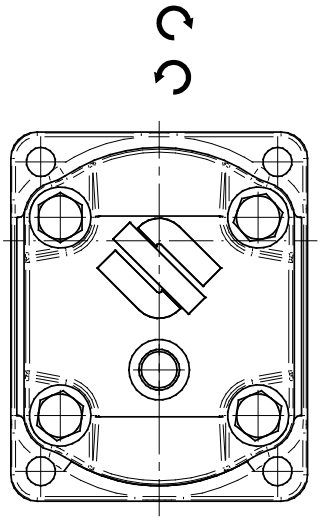


CSB	**SAE B**
With shaft code 55-56-87-88	

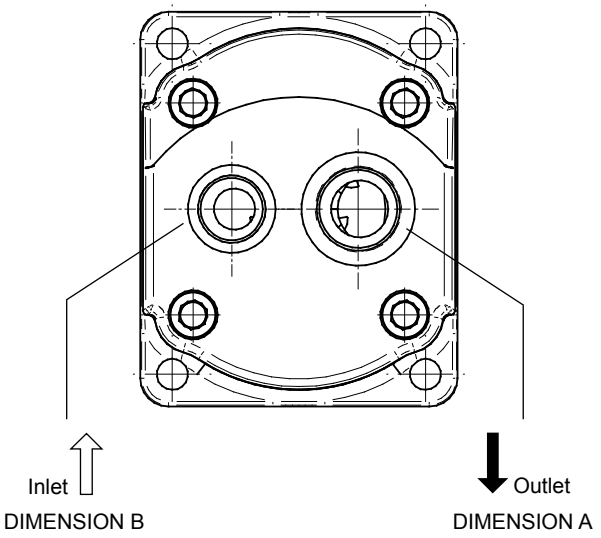
REAR COVERS

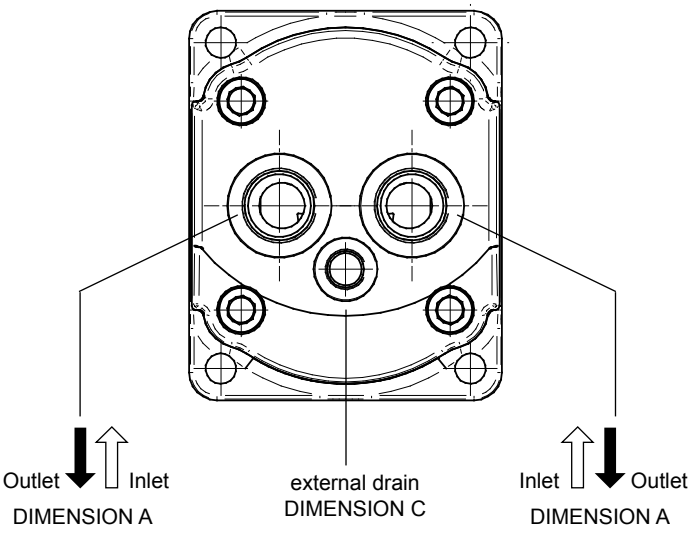


Standard rear cover
for unidirectional motors



Standard rear cover
for reversible motors, with external drain C.
For the dimension C please see the table here below





E0.130.0416.02.00IM**03**

code 1

UNIDIRECTIONAL MOTORS

A	B
G1	G3/4
1-5/16-12 UN-2B (SAE16)	1-1/16-12 UN-2B (SAE12)

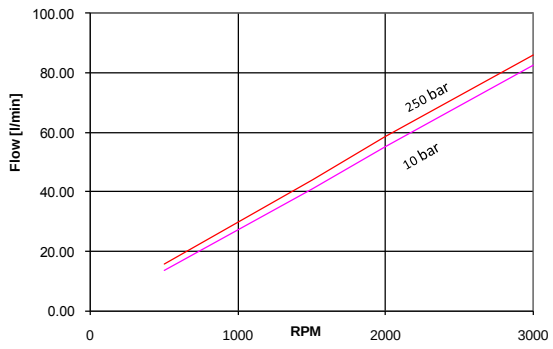
BIDIRECTIONAL MOTORS

A	C
G3/4	G3/8
1-1/16-12 UN-2B (SAE12)	9/16-18 UN-2B (SAE6)

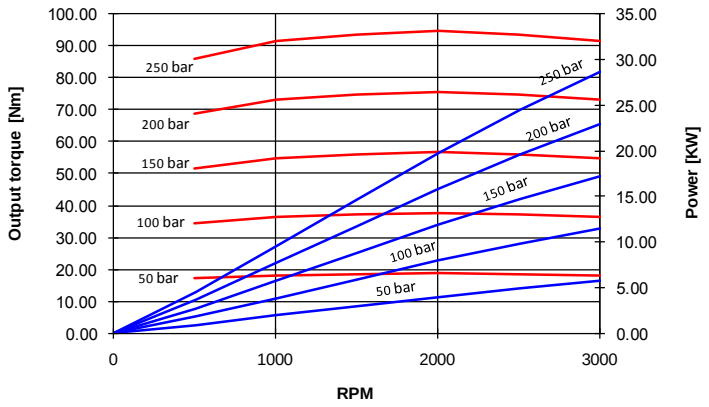
PERFORMANCE CURVES

Performance curves carried out with oil viscosity at 21 cSt and oil temperature at 50°C

INPUT FLOW

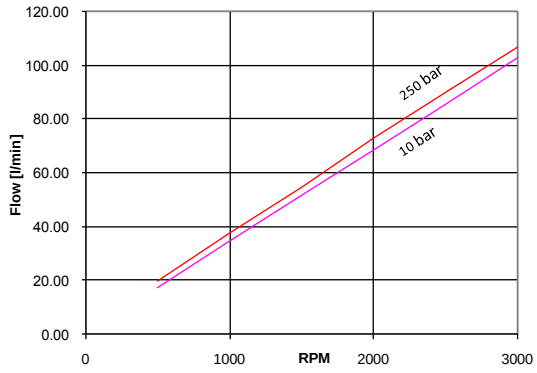


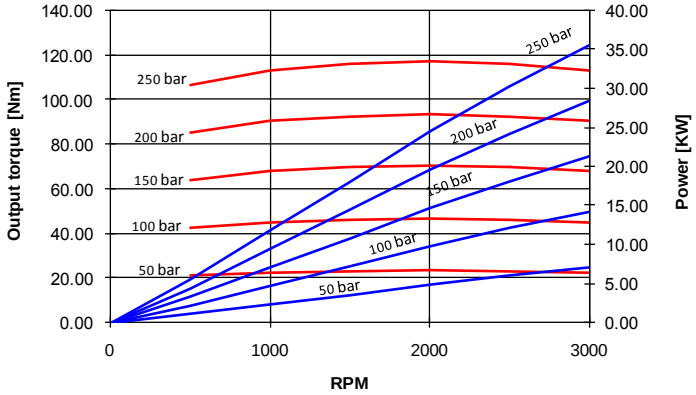
Output torque / Power



3ME - 27

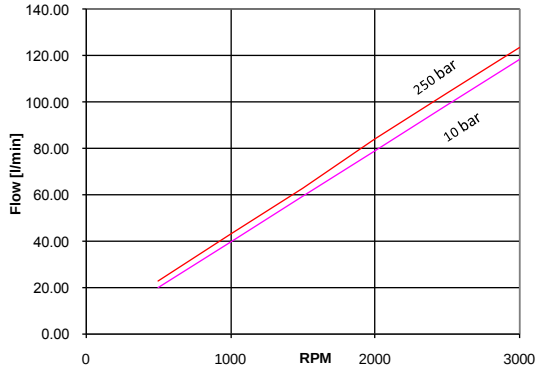
Output torque / Power

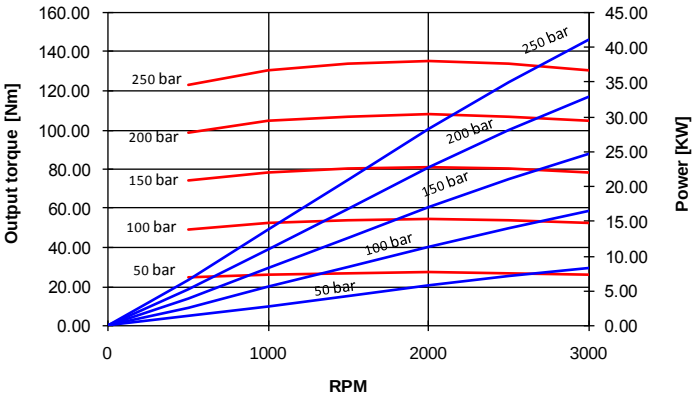




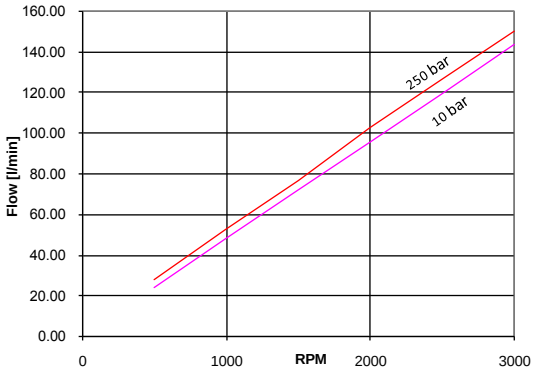
3ME - 33

Output torque / Power

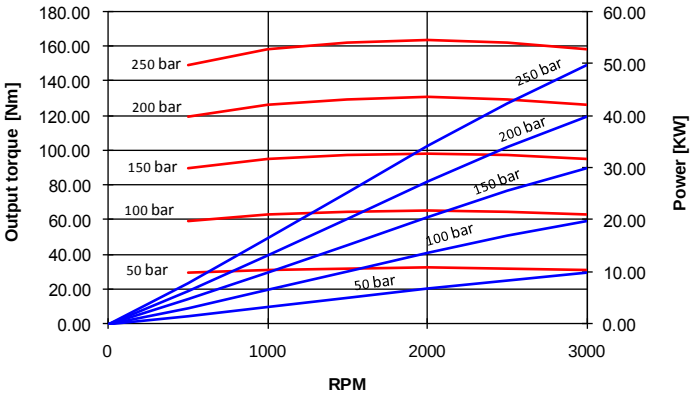




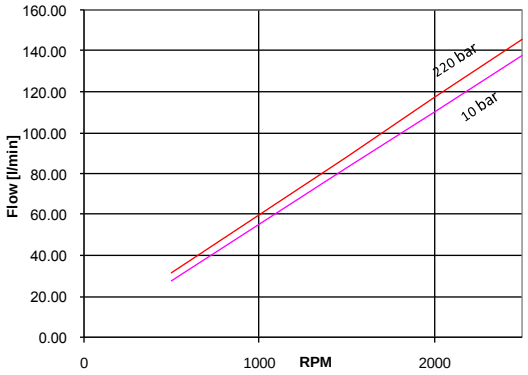
3ME - 38



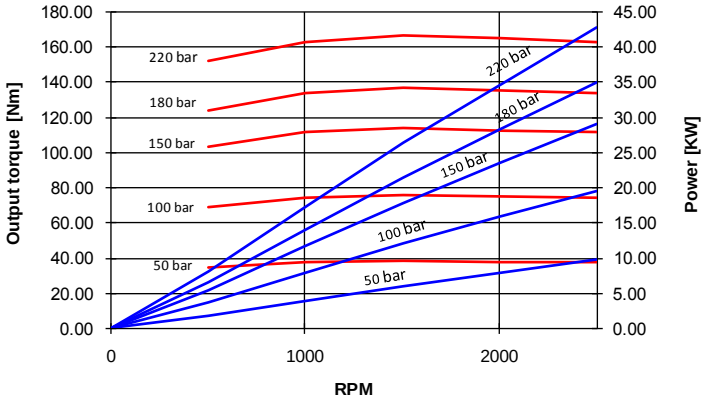
Output torque / Power



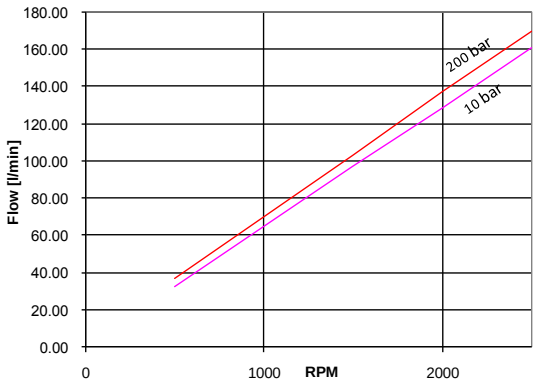
3ME - 46



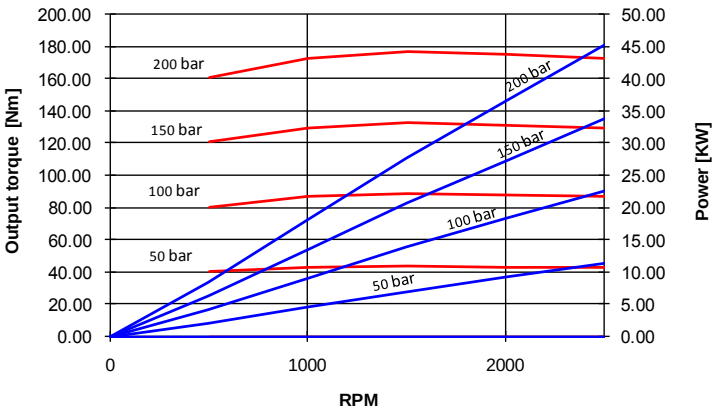
Output torque / Power



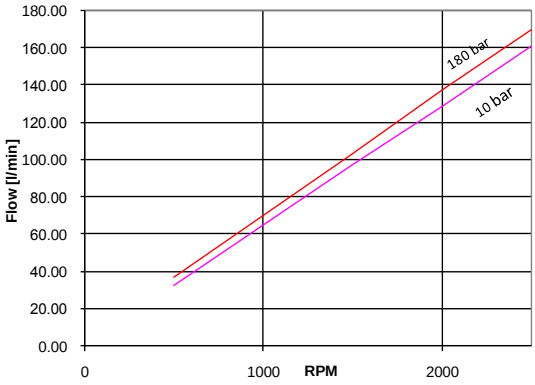
3ME - 55



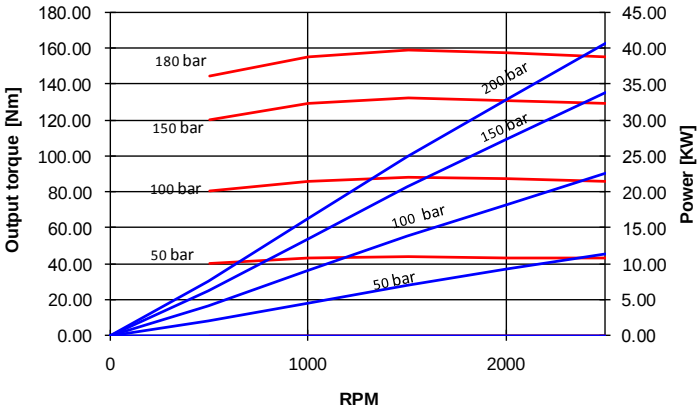
Output torque / Power



3ME - 65



Output torque / Power



3ME - 75

SINGLE MOTORS

3ME	A	B	-	C	D	E	-	F	-	G	-	H
	46	D	-	R	56	S3	-	V	-	1	-	CP

TYPE	A DISPLACEMENTS	
21	20.6 cm³/rev.	*1.26 cu.in/rev.*
27	27 cm³/rev.	*1.65 cu.in/rev.*
33	33.5 cm³/rev.	*2.04 cu.in/rev.*
38	38.7 cm³/rev.	*2.36 cu.in/rev.*
46	46.9 cm³/rev.	*2.86 cu.in/rev.*
55	54.1 cm³/rev.	*3.3 cu.in/rev.*
65	63.1 cm³/rev.	*3.85 cu.in/rev.*
75	73.4 cm³/rev.	*4.48 cu.in/rev.*

ROTATION (page 124)	CODES B
Clockwise	D
Anti-clockwise	S
Reversible	R

PORTS (page 188)	CODES C
Flanged ports european standard	P
Flanged ports german standard	B
Threaded ports GAS (BSPP)	G
Threaded ports SAE (ODT)	R
Flanged ports SAE J518 AMERICAN STANDARD THREAD	S
Flanged ports SAE J518 METRIC THREAD	W

DRIVE SHAFT (page 190)	CODES D
Tang drive for electric motors	05
European Tapered 1:5	35
European Tapered 1:8	38
European Tapered 1:8	48
SAE B splined 13T	55
SAE BB splined 15T	56
SAE B parallel	87
SAE BB parallel	88

H OUTRIGGER BEARING (page 192)	CODES
European standard	CP
German standard	CSB

G PORTS POSITION	CODE
Lateral ports standard	
Rear ports (page)	1

F SEAL	CODE
Buna standard	
Viton	V

E MOUNTING FLANGES (page 191)	CODES
SAE B 2 Bolts	S3
European standard Ø50.8	P2
European standard Ø60.3	P3
German standard Ø105	B6

Order example 3ME 46D, ports SAE (R), drive shaft (56), mounting flange (S3)
3ME46D-R56S3

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