

## Table of contents

<b>Introduction</b>	.....	2
<b>ML32</b>	Speed increaser gearbox for pumps GR.2 with European unified flange.....	4
<b>ML52</b>	Speed increaser gearbox for pumps GR.2/3 with European unified flange .....	6
<b>ML52/SAE A-B</b>	Speed increaser gearbox for pumps SAE A/B.....	8
<b>ML52/B</b>	Speed increaser gearbox with through-shaft for pumps GR.2/3 with European unified flange .....	10
<b>B-585/A</b>	Speed increaser gearbox for pumps SAE A.....	12
<b>B-585/B</b>	Speed increaser gearbox for pumps SAE B.....	14
<b>B-585/P</b>	Speed increaser gearbox for pumps GR.2 / 3.....	16
<b>B-585/U</b>	Speed increaser gearbox for universal flanges .....	18
<b>B580</b>	Speed increaser gearbox for pumps with European unified flange / SAE / ISO .....	20
<b>B600</b>	Speed increaser gearbox for pumps with European unified flange / SAE / ISO .....	22
<b>B502</b>	Splitter for pumps with European unified flange GR 2/3 - SAE A/B .....	24
<b>B582</b>	Splitter gearbox for pumps with European unified flange / SAE / ISO .....	26
<b>B602</b>	Splitter gearbox for pumps with European unified flange / SAE / ISO .....	28
<b>Flanges</b>	Flanges for speed increaser and pump drivers.....	30
<b>RD33/SAE</b>	Speed reducer gearbox SAE A.....	32
<b>RD42/SAE</b>	Speed reducer gearbox SAE A.....	34
<b>RD52/SAE A-B</b>	Speed reducer gearbox SAE A/B.....	36
<b>RD62/SAE A-B</b>	Speed reducer gearbox SAE A/B.....	38
<b>RD62/B</b>	Speed reducer gearbox with PTO for unified GR.2/3 pumps .....	40

© 2015 Brevini Fluid Power S.p.A. All rights reserved. Hydr-App, SAM Hydraulik, Aron, Brevini Hydraulics, BPE Electronics, VPS Brevini, OT Oiltechnology, logos are trademarks or are registered trademarks of Brevini Fluid Power S.p.A. or other companies of the Brevini Group in Italy and other countries.

The technical features supplied in this catalogue are non binding and no legal action can be taken against such material. Brevini Fluid Power will not be held responsible for information and specifications which may lead to error or incorrect interpretations. Given the continuous technical research aimed at improved technical features of our products, Brevini Fluid Power reserves the right to make change that are considered appropriate without any prior notice. This catalogue cannot be reproduced (in whole or in part) without the prior written consent of Brevini Fluid Power. This catalogue supersedes all previous ones.

Use of the products in this catalogue must comply with the operating limits given in the technical specifications. The type of application and operating conditions must be assessed as normal or in malfunction in order to avoid endangering the safety of people and/or items.

General terms and conditions of sale: see website [www.brevinifluidpower.com](http://www.brevinifluidpower.com).

The products shown on this catalog are parts of  line.

## GENERAL FEATURES

This catalog shows the characteristics of the gearboxes (speed increasers) ML and B series, and gearboxes (speed reducers) RD. Gearboxes are generally used for the connection of hydraulic pump with low speed tractor power take-off.

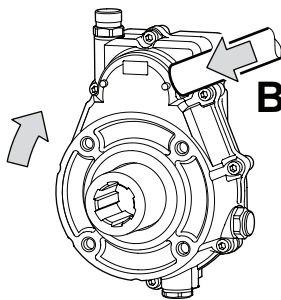
Calculation for gears was done according to UNI ISO 6336.  
Calculation for bearing was done according to ISO 281.

Operating temperature is between -20 °C to + 85 °C.

Materials used for the components of gear have been chosen according to the study of different requirements of resistance to stress and wear. In particular, the gears are made of hardened steel for high endurance. Housing and cover can be made both in aluminum alloy or cast iron, depending on the required code.

Assembly of gearbox must be performed referring to the position of the level indicator, oil drain and vent/fill plug.

Gearboxes have different attachment points that allow an integral attachment to the equipment or machine.



If it is not possible, gearboxes should be bound with a torque arm "B" (see figure). To avoid abnormal stress to the system, the torque arm "B" must be placed as close as possible to the mounting plane (PTO side) of gearbox.

### Determination of the average duration of the gear

The duration of the gearboxes depends on the working conditions and the torques transmitted.

In the technical specifications of each gearbox is shown a graph that allows to verify their duration (in hours) as a function of transmitted average torque.

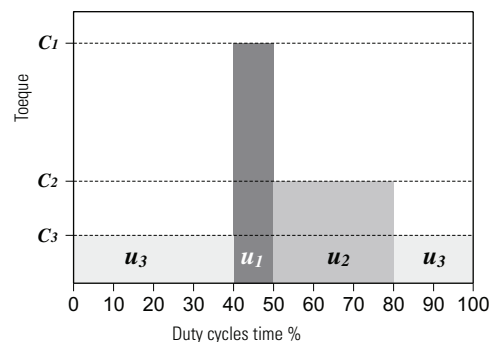
Graphs are output of standard calculations, they do not represent output of experimental tests, however they are a useful tool, as shown by experience achieved by our company in design and manufacture of gearboxes.

In the gearbox technical data table, we have 2 torque values.

**Maximum starting torque (C1)** and **maximum torque for continuous duty (C2)**.

If gearbox works with torque values that do not exceed C2, the average torque **Cm** corresponds to value C2 and duration of the gear is about 3500 hours. In mixed duty cycles, the transmitted torque can reach the limits of the maximum starting torque (C1).

A typical example of mixed duty cycle is shown in the following diagram:



- 10% of the total time (u1) - C1 torque;
- 30% of the total time (u2) - C2 torque;
- 60% of the total time (u3) - C3 torque.

In a mixed duty cycle the value of the average torque (Cm) can be calculated with a formula that takes into account the torques transmitted with different duty cycles (as required by standard).

$$C_m = \sqrt[3]{\frac{C_1^3 \cdot u_1 + C_2^3 \cdot u_2 + C_{..}^3 \cdot u_{..}}{(u_1 + u_2 + u_{..})}}$$

Where:

- Cm** = average torque (pump side);
- C1** = maximum starting torque (pump side);
- C2** = Maximum torque for continuous duty (pump side)
- C..** = .. more torque (pump side)

- u1** =% duty cycle - C1 torque
- u2** =% duty cycle - C2 torque
- u..** =% duty cycles - C.. torque

## GENERAL FEATURES

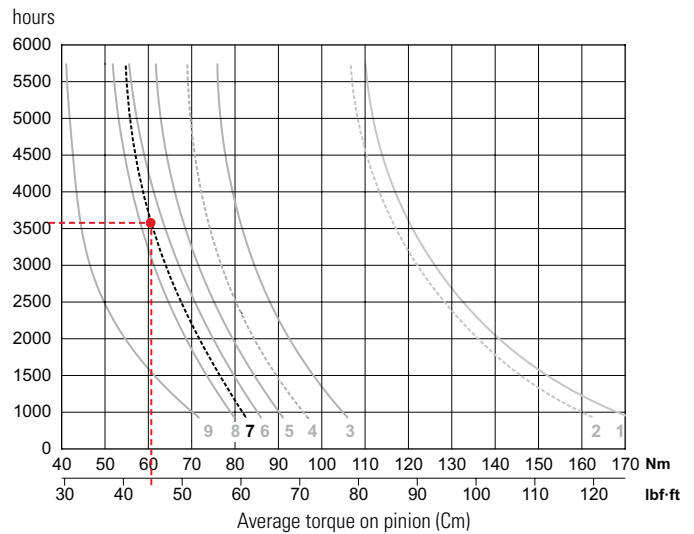
### Example of calculation of gearboxes duration:

Speed increaser ML32 - transmission ratio 1: 2.5 - rpm 1000

Operating torque::                      Duty cycles:  
**C1** = 100 Nm                              *u1* = 10%  
**C2** = 65 Nm                                *u2* = 30%  
**C3** = 40 Nm                                *u3* = 60%

$$C_m = \sqrt[3]{\frac{100^3 \cdot 10 + 65^3 \cdot 30 + 40^3 \cdot 60}{10 + 30 + 60}} = 60.4 \text{ Nm}$$

Input rpm	Output (transmission ratio)						
	1 : 1,5	1 : 2	1 : 2,5	1 : 3	1 : 3,5	1 : 3,8	
540	curve	1	3	5	6	8	8
	rpm	810	1080	1350	1680	1836	2052
1000	curve	2	4	7	—	—	—
	rpm	1500	2000	2500	—	—	—



In diagram curve number **7** has to be considered (gear ratio **1: 2.5** at **1000 rpm**). The estimated duration of the average torque of **60.4 Nm** is approximately **3600 hours**.

### Lubricating oil

The types of oil, in the following table, are those suggested for the correct lubrication of the gears and are differentiated according to the temperature at which gearboxes have to work.

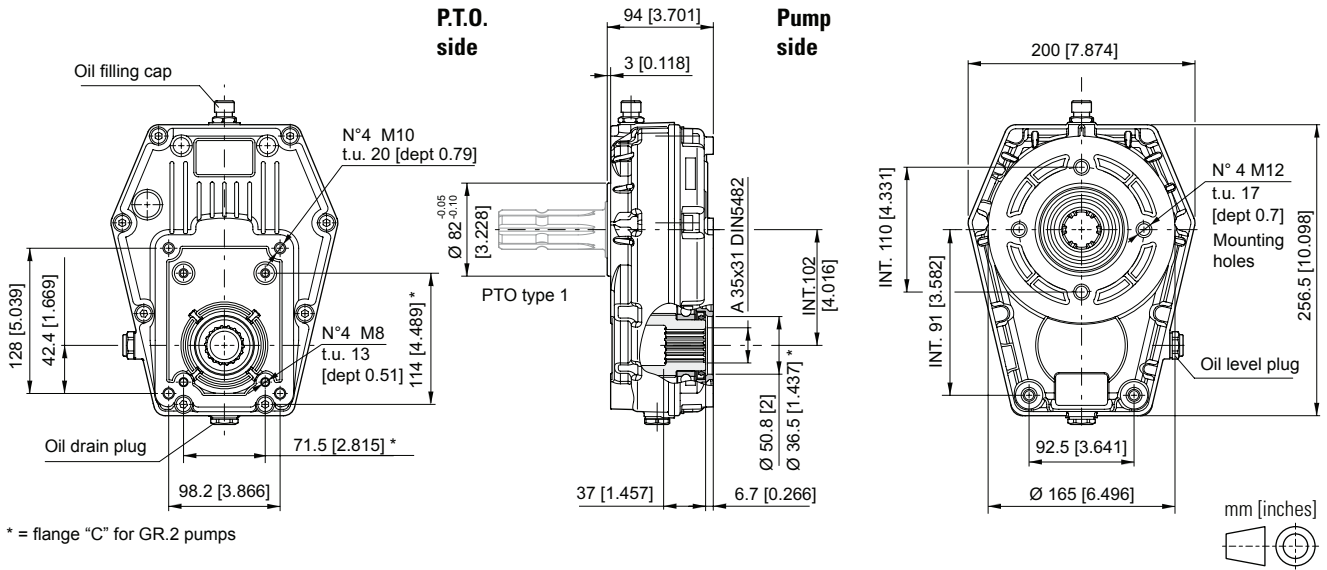
For high torque, we recommend the use of oil type "EP (extreme pressure).

For features that are outside the range of proposed values, please contact our sales department.

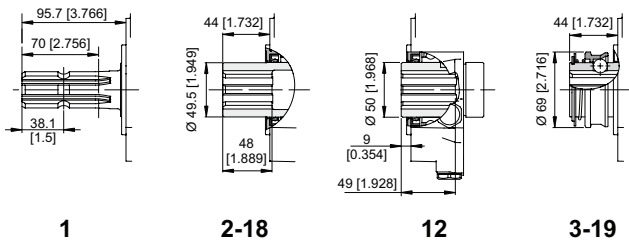
LUBRICATING OIL IN FUNCTION OF THE SEASONAL TEMPERATURE									
100	150	220	320	Industrial oils (according to ISO 3498 class CKC 220 viscosity according to ISO 3448)					
80 W	85 W	90	140	Oils for transmissions and differentials (according to SAE J 183 viscosity according to SAE J 300)					
30	40	50	60	Engine Oils (according to SAE J 308 class API GL / GL-5 second viscosity SAE J 306)					
-15	-5	+5	+15	+25	+35	+45	°C		
5	23	41	59	77	95	113	°F		

The gearboxes technical data shows the amount of oil for proper use. It is recommended to replace the lubricating oil after the first 50 hours of operation, after every 1000 hours or every 6 months.

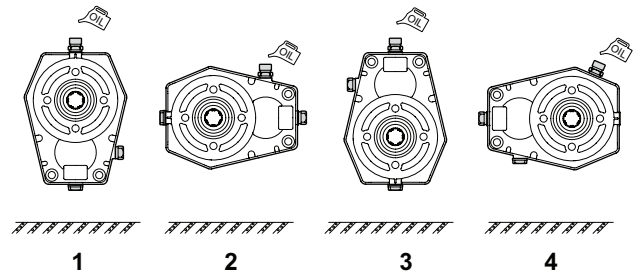
## SPEED INCREASER GEARBOX FOR PUMPS GR.2/3 WITH EUROPEAN UNIFIED FLANGE



### P.T.O.



### Mounting positions



### ORDERING CODE

ML52 - \*\* -1/ \*\*\* - \* - \*

**ML52** = Speed increaser (aluminium body)

#### P.T.O.

- 1** = Male 1" 3/8 DIN 9611
- 2** = Female 1" 3/8 DIN 9611
- 3** = Female 1" 3/8 DIN 9611 + tightening
- 12** = Female 1" 3/8 DIN 9611 short
- 18** = Female z21 - 16/32 DIN 9611
- 19** = Female z21 - 16/32 DIN 9611 + tightening

Coupling for pump to be required to our sales department.

#### Flange

Omit for pumps GR.3  
**C** = predisposition for pumps GR.2 - GR.3  
**S** = SAE A - see page 30  
**T** = SAE B - see page 30

#### Mounting positions

**1 / 2 / 3 / 4**

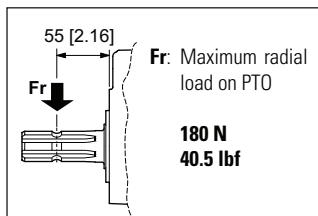
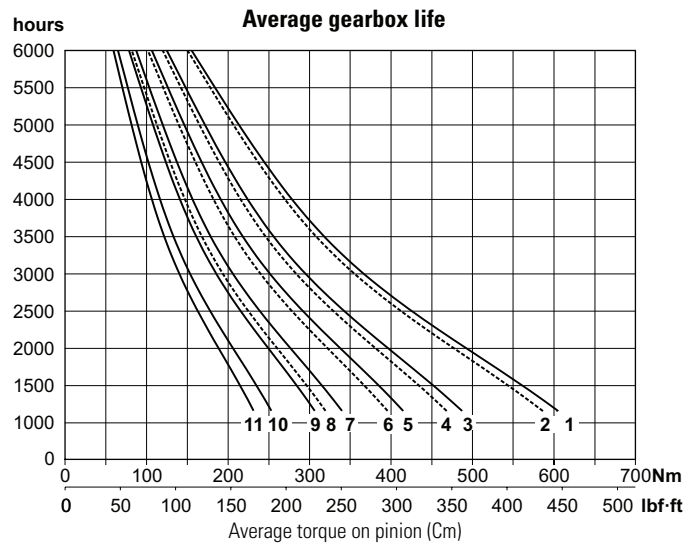
#### Transmission ratio

- 1** = 1 : 1.0
- 1,5** = 1 : 1.5
- 2** = 1 : 2.0
- 2,6** = 1 : 2.6
- 3** = 1 : 3.0
- 3,4** = 1 : 3.4
- 3,8** = 1 : 3.8

## TECHNICAL DATA

Transmission ratio	Maximum torque Nm [lbf-ft]				Weight kg [lb]
	540 rpm		1000 rpm		
	C1*	C2*	C1*	C2*	
<b>1 : 1.0</b>	604 [445]	318 [235]	585 [431]	308 [227]	9 [19.8]
<b>1 : 1.5</b>	486 [358]	256 [189]	467 [344]	246 [181]	8,4 [18.5]
<b>1 : 2.0</b>	414 [305]	218 [161]	395 [291]	208 [153]	8 [17.6]
<b>1 : 2.6</b>	339 [250]	178 [131]	319 [235]	168 [124]	7,9 [17.4]
<b>1 : 3.0</b>	306 [226]	161 [119]	—	—	7,7 [17]
<b>1 : 3.4</b>	253 [187]	133 [98]	—	—	8,1 [17.9]
<b>1 : 3.8</b>	231 [170]	122 [89]	—	—	8,1 [17.9]

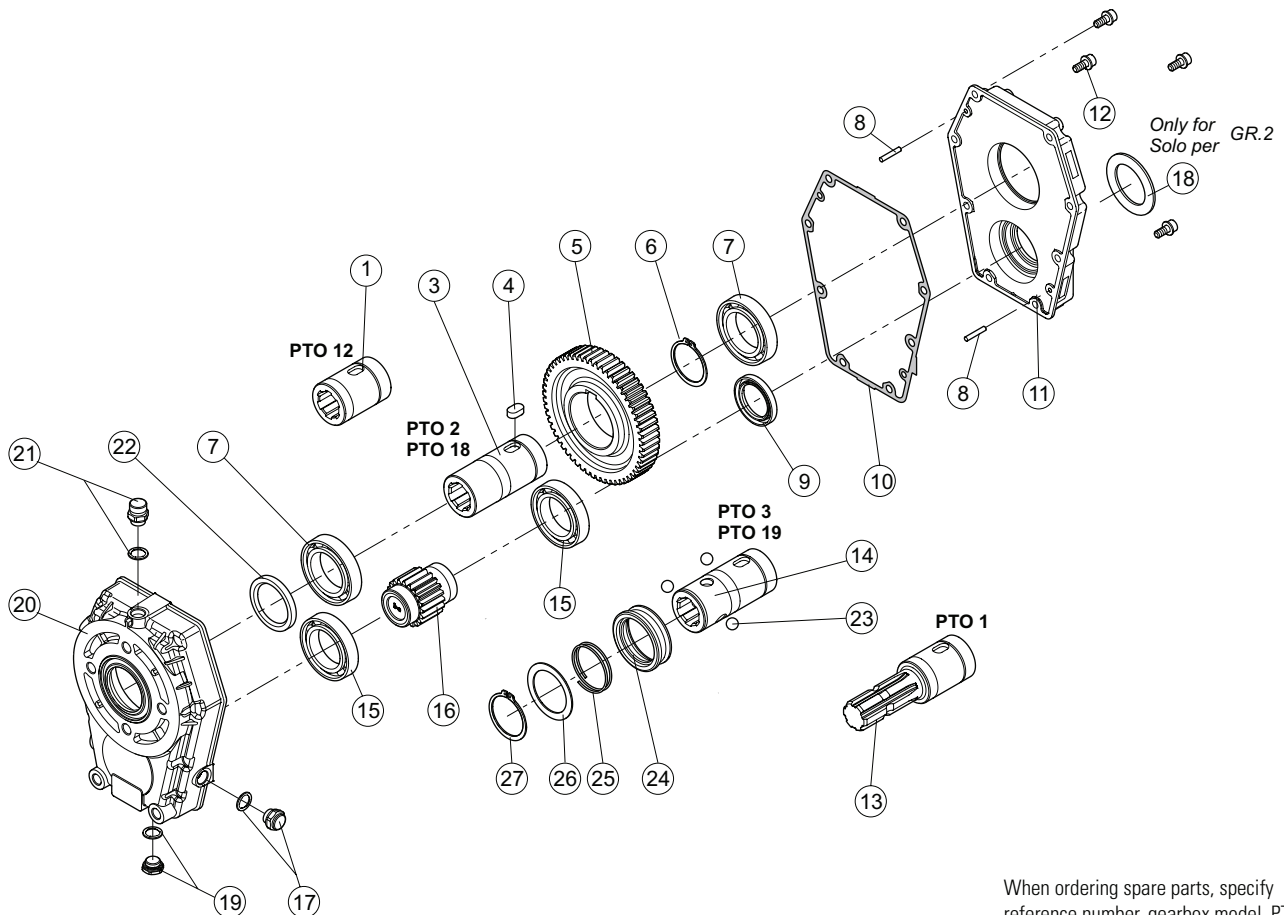
\* Maximum torque on pump;  
C1= maximum starting torque; C2= maximum torque for continuous duty.



Mounting positions	Oil liters [US gallon]
<b>1</b>	0.34 [0.09]
<b>2</b>	0.80 [0.21]
<b>3</b>	0.52 [0.14]
<b>4</b>	0.75 [0.20]

Input rpm	Output (transmission ratio)						
	1 : 1.0	1 : 1.5	1 : 2.0	1 : 2.6	1 : 3.0	1 : 3.4	1 : 3.8
<b>540</b>	curve	1	3	5	7	9	11
	rpm	540	810	1080	1408	1620	1836
<b>1000</b>	curve	2	4	6	8	—	—
	rpm	1000	1500	2000	2607	—	—

## SPARE PARTS



When ordering spare parts, specify reference number, gearbox model, PTO type and transmission ratio.