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銀科工業(香港)有限公司

香港荃灣沙咀道66A號豪力中心2108室

電話: (852) 2499 9168

傳真: (852) 2417 9183 8343 6887

電郵: sales@silvertech.com.hk

網址: www.silvertech.com.hk

東莞分公司：

東莞動力銀科工業配件有限公司

東莞市塘廈鎮橋龍大道23號銀科大樓

電話: (86-769) 8798 1699 8798 2699

8625 2718 (10線)

傳真: (86-769) 8798 1313 8625 2719

電郵: dgoffice@silvertech.com.hk

青島辦事處：

青島市市南區寧夏路268號商務樓B413室

電話: (86-532) 8575 5305

傳真: (86-532) 8571 5015

電郵: qdoffice@silvertech.com.hk

深圳工廠：

銀錕德傳動件制造(深圳)有限公司

成都工廠：

成都銀科同步帶輪制造有限公司

常州工廠：

常州銀科傳動件有限公司

Hong Kong Headquarters: (For Import & Export Sales)

Silvertech Industrial (H.K.) Ltd.

Rm.2108, Ho Lik Centre, 66A Sha Tsui Road, Tsuen Wan, Hong Kong.

Tel: (852) 2499 9168

Fax: (852) 2417 9183 8343 6887

Email: sales@silvertech.com.hk

Web Site: www.silvertech.com.hk

China Guangdong Branch Office: (For Domestic Sales)

Silvertech Industrial (Dong Guan) Ltd.

Silvertech Building, 23 Qiao Long Road, Tangxia, Dongguan, Guangdong, China.

Tel: (86-769) 8798 1699 8798 2699

8625 2718 (10Lines)

Fax: (86-769) 8798 1313 8625 2719

Email: dgoffice@silvertech.com.hk

China Qingdao Sales Office: (For Domestic Sales)

Rm.B413, No. 268, Ningxia Road, Qingdao, Shandong, China

Tel: (86-532) 8575 5305

Fax: (86-532) 8571 5015

Email: qdoffice@silvertech.com.hk

China Shen Zhen Factory:

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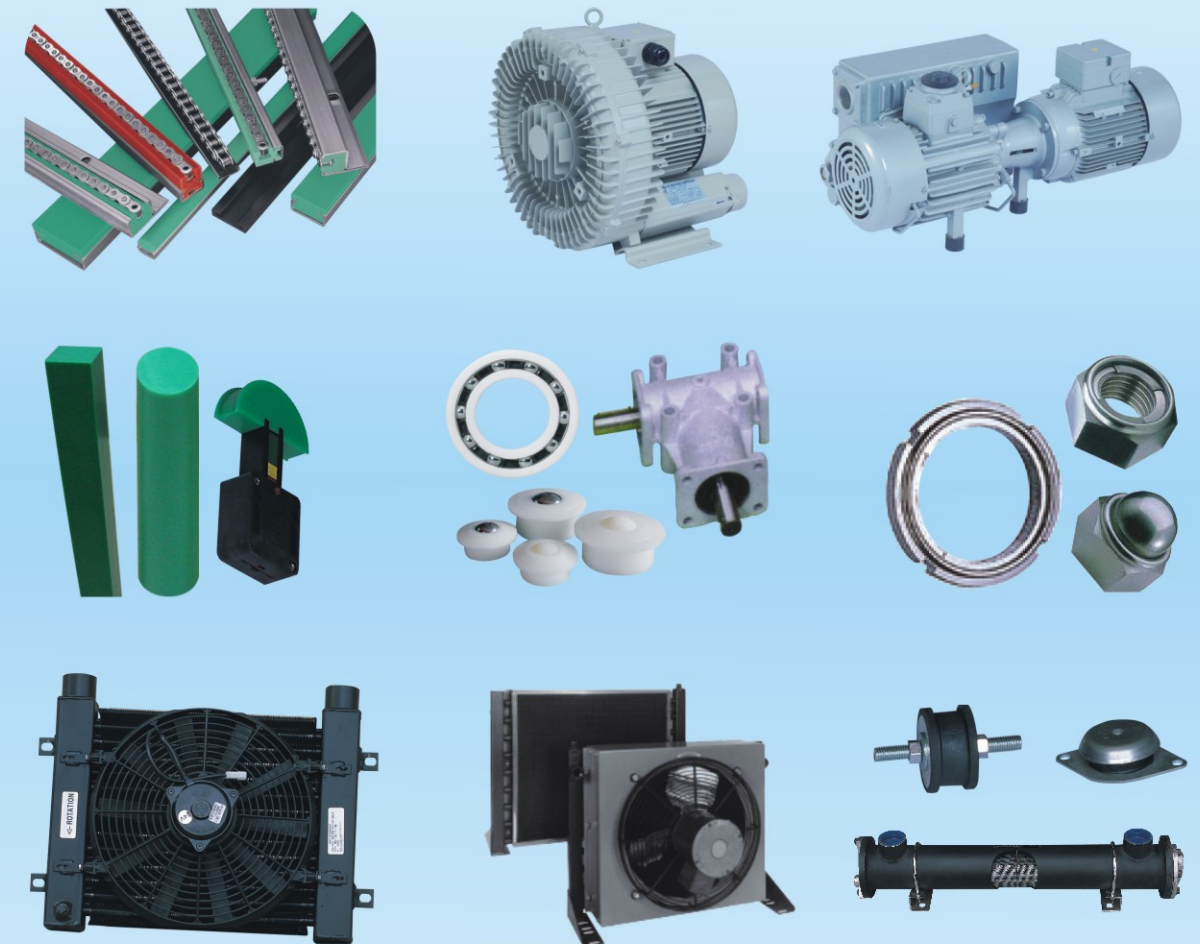
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公司簡介

銀科工業(香港)有限公司 – 成立于1992年，總部位于香港，分公司和工廠設于中國內地。公司的主要業務及經營範圍:生產 **STI** 品牌屬下的高質量工業傳動零部件，出口外銷至歐美及其它世界各國，同時也內銷至大中華地區。此外，我們還進口德國、瑞士、意大利、美國、日本和台灣等國家和地區的高科技工業產品，並且是這些世界級著名品牌的大中華區域總代理。

累積近乎二十年服務海外和大中華客戶的經驗，我們不斷的總結、不斷發展、不斷進步，因此而奠下了堅實的基礎，在海內外業界均享有優良的聲譽和知名度。銀科工業無論由:原材料採購 – 生產管理 – 質量控制 – 倉存量控制 – 銷售方式 – 技術支援 – 包裝付運 – 跟蹤到貨 – 售后服務等等，每一環節都務求做到盡善盡美，因為我們切身體會只有得到客戶的信賴才是公司發展的最大希望！

在系統化的在職培訓再加上員工對公司的歸屬感，大家分別工作于香港、東莞、深圳、青島、成都和常州，今天的銀科工業已擁有一支非常專業且盡責的團隊，為國內外工業界提供優質產品，為貼近客戶而盡我們所能！

“選銀科工業 做最好機械” 這不僅是我們的承諾，更是對客戶的責任。

About us

Silvertech Industrial (HK) Ltd was established in 1992, with its headquarter in Hong Kong, and branches as well as factories in mainland China. Our business focuses on the production of high quality power transmission parts under the brand **STI**.

Our products are very popular in the global markets, such as Europe, North American, and Greater China Area. In addition, we are the exclusive dealer in the Greater China Area for a few world-renowned high tech industrial products from Germany, Switzerland, Italy, USA, Japan and Taiwan.

We are growing stronger with almost twenty years experience of serving clients in overseas and Greater China Area. Silvertech Industrial has well developed world reputation and brand loyalty. We arm to provide perfection in our value net, such as procurement of material, production management, quality control, stock and storage, marketing, technical support, logistics, and after sale service. It is our ultimate goal to maintain the trust from our clients and continue with sustainable growth.

Our company engages in systemic on the job training and invests in corporate human resource. We have developed an extremely competent and dedicated team working in Hong Kong, Dongguan, Shenzhen, Qingdao, Chengdu, and Changzhou. We are known as the company providing the best products and service for our customers.

Our promise: **Silvertech – Your 1st choice for Industrial Products**
We take this promise as our responsibility.

公司秉承“准時、準確、高質量為客戶服務”即二准一高的質量方針，將不斷總結和提高對客戶服務的質量。



目錄 Directory

德國“梅富”牌高精度耐磨鏈條導軌.....001-098

臺灣“賀欣”牌高壓吸送風機/真空泵099-112

意大利“坡技”牌傘齒輪箱113-146

德國“SMG”耐酸碱塑料軸承147-157

日本“Fuji富士”防鬆鎖母158-176

美國“熱傳導”油冷却器177-197

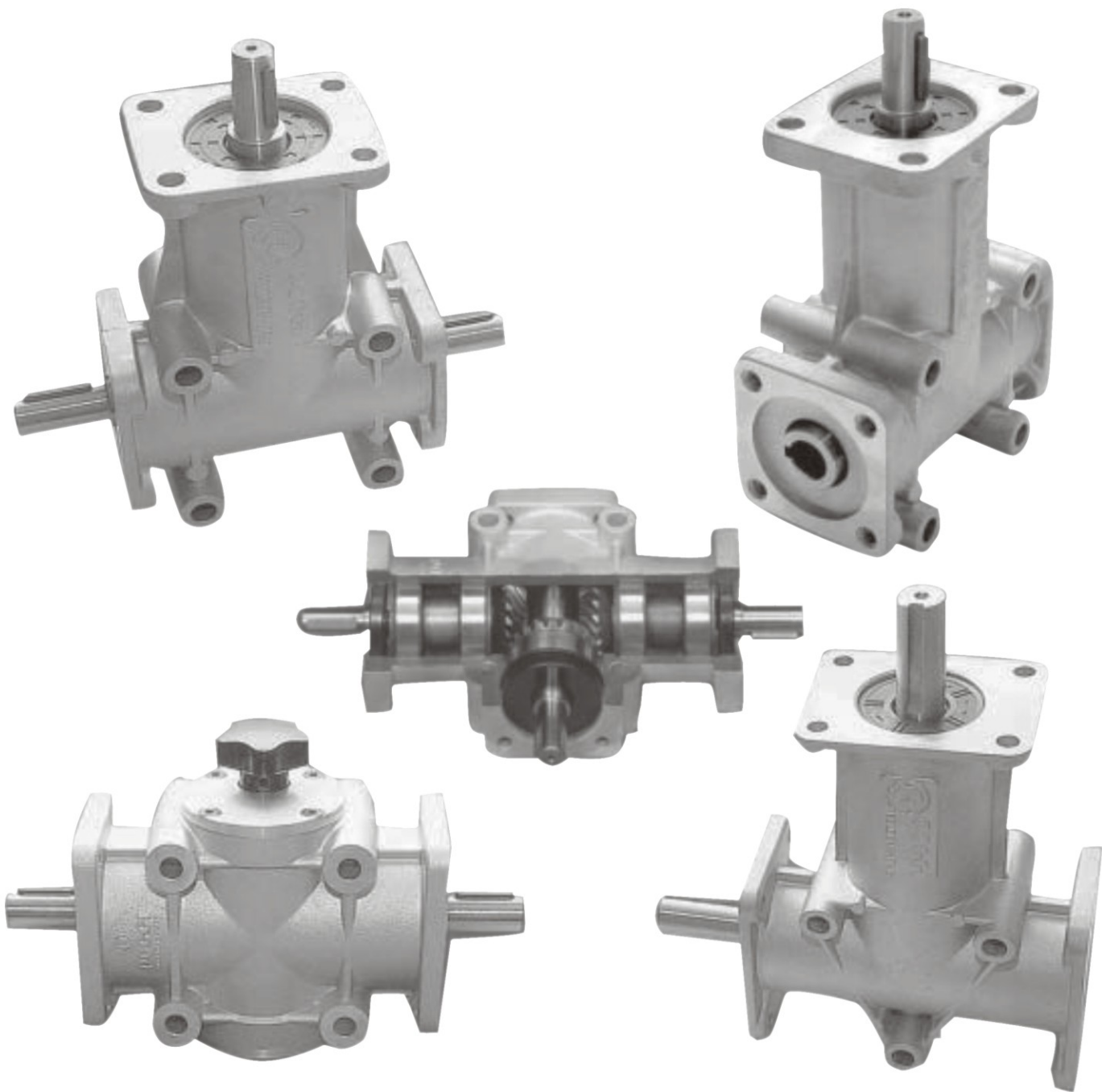
臺灣“YS和STI”系列電馬達避震腳198

東歐A/B系列電馬達避震腳199

德國“雅高”牌神奇包裝機200-201



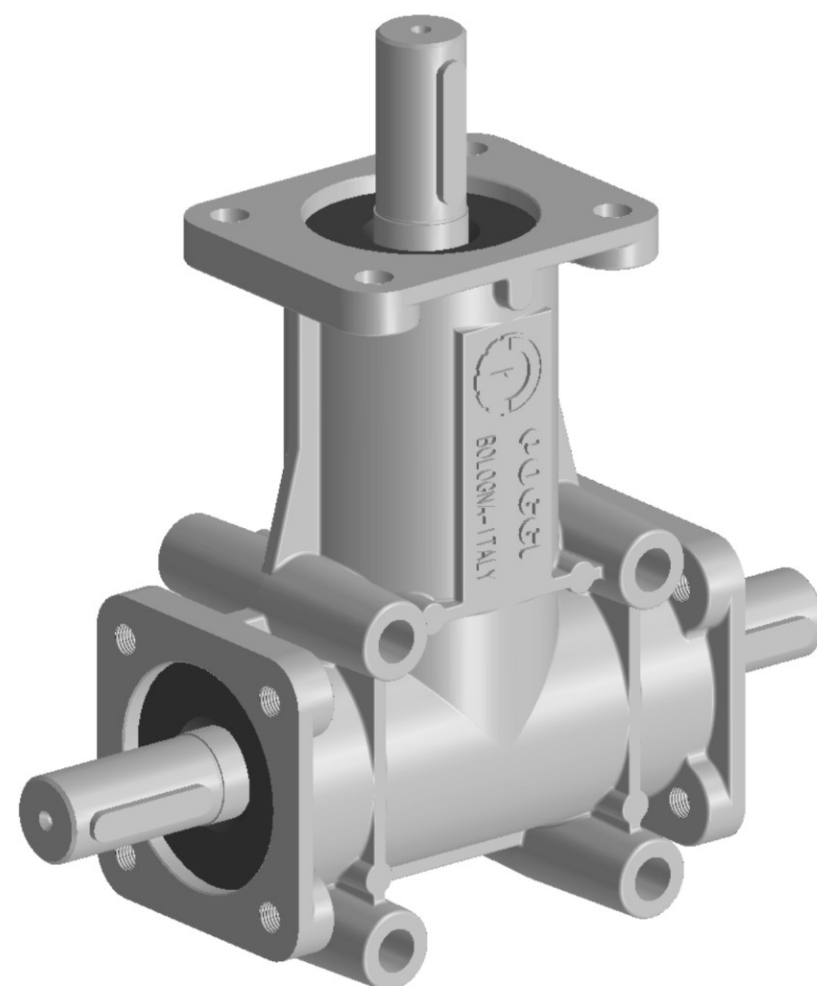
POGGI® "坡技"牌90° 傘型齒輪箱
意大利制造



目錄	頁碼
2000型90° 傘型齒輪箱的介紹 Introduction to series 2000 right angle gearboxes	115
2000型性能參數 Performances of series 2000 gearboxes	118
2000型選型指南 Selection of series 2000 gearboxes	120
2000型規格參數 Series 2000 right angle gearboxes	122
反向式傘型齒輪箱的介紹 Introduction to reversing gearboxes	131
反向式性能表 Performances of reversing gearboxes	134
反向式規格參數 Reversing gearboxes	135
4000型90° 換向傘型齒輪箱的介紹 Introduction to series 4000 right angle gearboxes	137
4000型性能參數 Performances of series 4000 gearboxes	140
4000型選型指南 Selection of series 4000 gearboxes	141
4000型規格參數 Series 4000 right angle gearboxes	143



2000型傘型齒輪箱 Series 2000 right angle gearboxes



2000型的綜合設計優點 Series 2000 general design features

轉動速度 Speed of rotation

傘齒輪箱的輸入速度(軸A)為1400rpm，可提供平均約10000小時的操作時間。傘齒輪箱的減速比率也可作加速單位，提供輸出比率1:3輸入速度500rpm，及輸出比率1:2輸入速度750rpm。所有4向及3向(輸出比率1:1以外)的傘齒輪箱，輸入軸為A(快)，輸出軸為C(快)，軸B及D則為慢。

The gearboxes are engineered for an input speed (shaft A) of 1400 rpm. This speed provides, together with the power applied, an average operating life of approx. 10000 hours.

The gearboxes with reduction ratio can be used also as speed-up units, provided that 500 rpm in input for ratio 1:3 and 750 rpm for ratio 1:2 are not exceeded.

For all 4-way and 3-way independent gearboxes having a ratio different from 1:1, the input shaft is A (fast), shaft C (fast) is in output and shafts B and D are slow.

工作溫度 Operating temperature

理想的工作溫度為

-18°C ~ +80°C (0 °F ~ 170°F)。

The permissible temperatures for trouble-free running of gearboxes should be kept within -18°C and

+80°C (0°F and 170°F).

噪音程度 Noise level

在正確安裝與控制情況下，即使在高速運行中，噪音程度都十分低。

The accurate mounting and control allow to keep a low operating noise level, even at high running speeds.

傘齒輪箱的齒距

Angular clearances

傘齒輪箱的齒距為15'~30'，如需要更高轉速或工作溫度的溫度，請與我們聯系。

The checkable angular clearance between the gear teeth is hold within 15' - 30' of arc for all stock gearboxes. Should you require gearboxes for higher speeds, for unusual operating temperatures or with reduced angular clearances, please consult us.

潤滑 Lubrication

所有型號均有注入潤滑油，2000型的傘齒輪箱所注入的為合成油，在正常情況下，並無需任何格外定時注入或更換潤滑油。

All units are factory filled with lubricant. The series 2000 gearboxes are lubricated with synthetic oil. Being life lubricated they do not require any periodical oil replenishment or change during all gearbox average lifetime.

安裝 Installation

傘齒輪箱可安裝在任何位置，唯一安裝要求是傘齒輪箱需要安裝在垂直的軸。

Thanks to the construction shape, the mounting of gearboxes is allowed in any position. The only requested caution is to advise a possible mounting with a shaft in vertical position, in order to provide the proper lubrication.



2000型的零件組合

Components of series 2000 right angle gearboxes

主體 Housing

傘齒輪箱主體由輕合金組裝而成，固定螺栓讓傘齒輪箱可安裝在任何位置。

The gearbox housing is compact and made of light alloy. The fixing flanges with threaded holes, and other guides allow the mounting in any position.

錐齒輪 Bevel gears

齒輪為格裏森系統的螺旋齒，由強化合金鋼制成，確保兩端良好的旋轉傳動。

The gears are made as a spiral toothing GLEASON system, made of alloy steel hardened and tempered. The running-in is made in both directions of rotation in order to ensure the good running in both directions of our right angle gearboxes.

軸心 Shafts

除2000, 2002及輸出通心軸型2012及2028的軸心由強化鋼制成外，其他型號的軸心均由強化合金鋼制成。

Shafts are made of alloy steel hardened, tempered and grounded. Exceptions are the shafts of types 2000, 2002 and the output hollow shafts of types 2012 and 2028 made of hardened and tempered steel.

軸承 Bearings

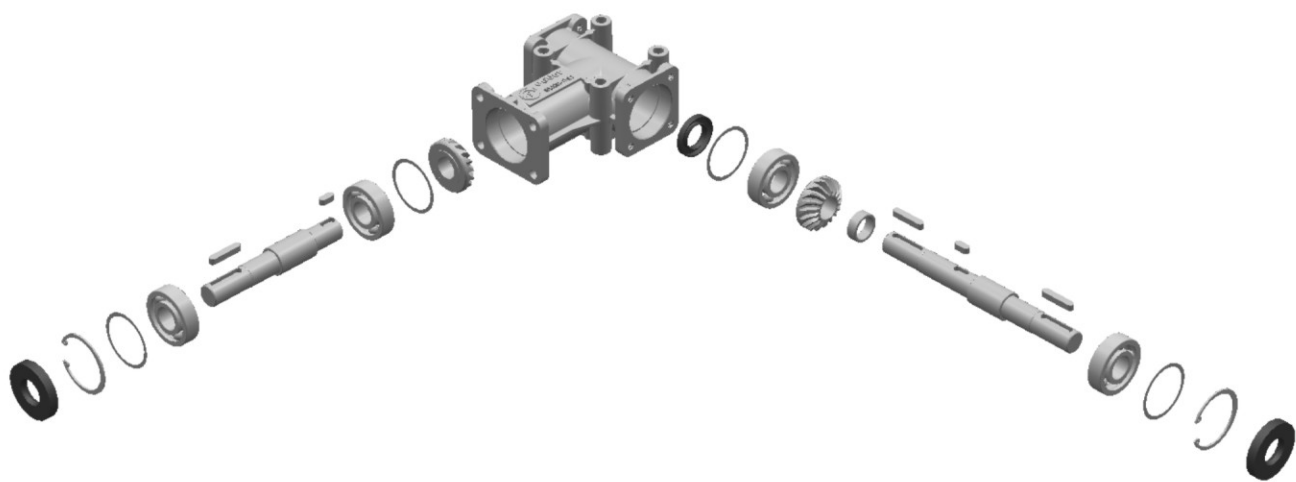
所使用的軸承均為品牌最好的高品質滾珠軸承。

All shafts are rotating on generously sized and high quality ball bearings of first class brands.

油封 Oil seals

如有需要，我們可以提供特殊油封，例如VITON®品牌的防高溫油封。

For special applications, on request we can supply gearboxes with special oil seals, like for example VITON® seals for high temperatures.



2000型性能參數

Performances of series 2000 gearboxes

型號 Article	輸出比率 Ratio	1400rpm時入力軸 A最大功率 Shaft A max. input power at 1400 rpm		各出力軸心 最大扭矩(Nm) Max. torque for each output shaft in Nm		
		kW	HP	B	C	D
2000	1 : 1	0,42	0,58	0,30	-	-
	1 : 2	0,10	0,14	1,5	-	-
2002	1 : 1	0,42	0,58	1,5	1,5	-
	1 : 2	0,10	0,14	0,8	0,8	-
2006	1 : 1	1,83	2,50	4,5	4,5	4,5
	1 : 2	0,50	0,68	2,5	2,5	2,5
	1 : 3	0,25	0,34	1,7	1,7	1,7
2007	1 : 1	1,83	2,50	9,0	4,5	-
	1 : 2	0,50	0,68	5,0	2,5	-
	1 : 3	0,25	0,34	3,5	1,7	-
2008	1 : 1	1,83	2,50	6,5	6,5	-
	1 : 2	0,50	0,68	3,5	3,5	-
	1 : 3	0,25	0,34	2,5	2,5	-
2011	1 : 1	1,83	2,50	13,0	-	-
	1 : 2	0,50	0,68	7,0	-	-
	1 : 3	0,25	0,34	5,0	-	-
2012	1 : 1	1,83	2,50	13,0	-	-
	1 : 2	0,50	0,68	7,0	-	-
	1 : 3	0,25	0,34	5,0	-	-
2025	1 : 1	7,35	10,00	35,0	18,0	-
	1 : 2	2,94	4,00	28,0	14,0	-
	1 : 3	1,47	2,00	18,9	9,0	-

1 kgm = 9,8 Nm

型號 Article	輸出比率 Ratio	1400rpm時入力軸 A最大功率 Shaft A max. input power at 1400 rpm		各出力軸心 最大扭矩(Nm) Max. torque for each output shaft in Nm		
		kW	HP	B	C	D
2026	1 : 1	7,35	10,00	18,0	18,0	18,0
	1 : 2	2,94	4,00	14,0	14,0	14,0
	1 : 3	1,47	2,00	9,0	9,0	9,0
2027	1 : 1	7,35	10,00	16,6	16,6	16,6
2028	1 : 1	5,50	7,50	38,0	-	-
	1 : 2	1,83	2,50	25,0	-	-
	1 : 3	0,91	1,25	18,0	-	-
2030	1 : 1	5,50	7,50	38,0	-	-
	1 : 2	1,83	2,50	25,0	-	-
	1 : 3	0,91	1,25	18,0	-	-
2031	1 : 1	5,50	7,50	19,0	19,0	-
	1 : 2	1,83	2,50	12,5	12,5	-
	1 : 3	0,91	1,25	9,0	9,0	-
2032	1 : 1	7,35	10,00	50,0	-	-
	1 : 2	2,94	4,00	40,0	-	-
	1 : 3	1,47	2,00	28,0	-	-
2033	1 : 1	7,35	10,00	25,0	25,0	-
	1 : 2	2,94	4,00	20,0	20,0	-
	1 : 3	1,47	2,00	14,0	14,0	-



2000型潤滑要求

Lubrication of series 2000 right angle gearboxes

2000型傘齒輪箱的潤滑油內容
Lubricant contents of series 2000 right angle gearboxes

Article	g	Article	g
2000	20	2026	150
2002	20	2027	155
2006	100	2028	120
2007	100	2030	135
2008	75	2031	135
2011	75	2032	135
2012	75	2033	135
2025	150		

傘齒輪箱內的潤滑油為AGIP BLASIA S150型，也可更換為以下型號的潤滑油。
The oil contained into right angle gearboxes is type AGIP BLASIA S150 but it can be replaced by one of those as listed in the table below.

如有需要注油或更換潤滑油，我們建議更換一個全新的傘齒輪箱。
In case of need to add or change the oil, we recommend to replace it completely.

建議潤滑油：
Table of recommended oils

生產商 Manufacturer	AGIP	BP	ESSO	GULF	MOBIL	SHELL
潤滑油型號 Oil type	BLASIA S150	ENERGOL SGR 150	SPARTAN SEP 150	SYNTETIC GEAR LUBRICANT	GLYGOYLE 22	TIVELA WA



2000型選型指南

Selection of series 2000 gearboxes

傘齒輪箱選型基本參數
Basic parameters for gearboxes selection.

所有特殊應用下的工作條件都需被確定，以便選擇適當的型號。
All actual working conditions for each specific application must be determined for correct selection.

Data given			
P = Motor power P=馬達功率(kW)	(kW)	n1 = Speed of input shaft A n1=入力軸 A 的轉速(Rpm)	(Rpm)
Pc = Design power Pc=設計功率(kW)	(kW)	n2 = Speed of output shaft n2=出力軸凡的轉速(Rpm)	(Rpm)
Mt2 =Output shaft torque Mt2-出力軸扭力(Nm)	(Nm)	Fs = Service factor Fs=操作因素	

Service factors Fs 操作因素Fs

Load type 負載類型	Hours per day duty 每天操作時數			
	< 3	3 ÷ <8	8 ÷ <12	12 ÷ > 4
Uniform 一致程度	0,80	0,90	1,00	1,25
Light shocks 微震動	0,90	1,00	1,25	1,50
Heavy shocks 強震動	1,00	1,50	1,60	1,80

Example
P = 1,1 kW
n1 = 1400 rpm
n2 = 700 rpm
Fs = 1,5 (5 hours per day duty with heavy pulsating loads)

Calculation of design power by the following formula:

Pc = P · Fs = 1,1 · 1,5 = 1,65 kW



2000型選型指南
Selection of series 2000 gearboxes

出力軸扭力計算方程式：
Calculation of output shaft torque by the following formula:

$$Mt_2 = 9550 \cdot \frac{P_c}{n_2} = 9550 \cdot \frac{1,65}{700} = 22,5 \text{ Nm}$$

At this stage, consulting the performance table, the choice must be for a gearbox having a max. output shaft equal to or higher than the torque just calculated; in our case, the most suitable gearbox is type 2030, having a max. output torque of 25 Nm.

根據各個數據，所選的型號的最大出力軸扭力須等于或大于所計算出的數值，最適用的型號為2030型，最大輸出扭力為 25 Nm。

軸心負載
Shaft loading capacity

型號 Article	懸吊負荷 Overhung load (kg)	重力負荷 Thrust load (kg)
2000 2002	10	2
2006 2007	25	5
2008 2011	25	5
2012	25	5

型號 Article	懸吊負荷 Overhung load (kg)	重力負荷 Thrust load (kg)
2025 2026 2027	50	10
2028	40	8
2030 2031	40	8
2032 2033	80	16



2-way right angle gearbox

2000

Weight

kg 0,500

		D. 1	D. 2
Ratio	Disp.	Item number	Designation
1 : 1	1	182000111	2000 R 1 : 1 D1
1 : 1	2	182000112	2000 R 1 : 1 D2
1 : 2	1	182000121	2000 R 1 : 2 D1
1 : 2	2	182000122	2000 R 1 : 2 D2

3-way right angle gearbox

2002

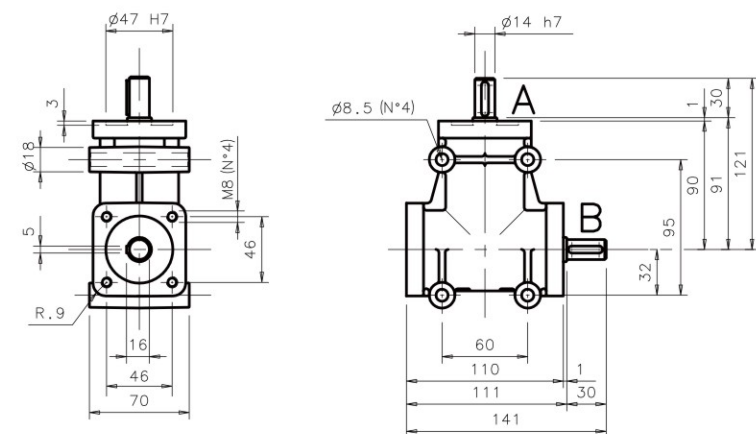
Weight

kg 0,500

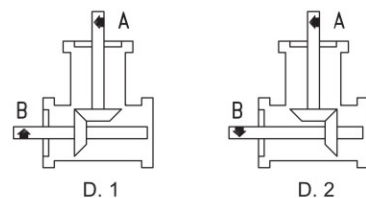
		D. 1/2	
Ratio	Disp.	Item number	Designation
1 : 1	1/2	182002111	2002 R 1 : 1 D1/2
1 : 2	1/2	182002121	2002 R 1 : 2 D1/2



2011



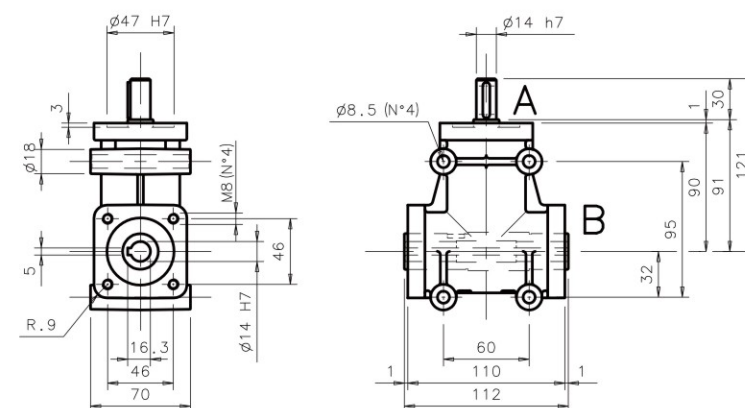
Weight	kg 2,000
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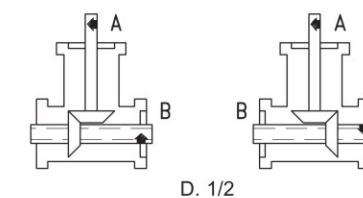
Ratio	Disp.	Item number	Designation
1 : 1	1	182011111	2011 R 1 : 1 D1
1 : 1	2	182011112	2011 R 1 : 1 D2
1 : 2	1	182011121	2011 R 1 : 2 D1
1 : 2	2	182011122	2011 R 1 : 2 D2
1 : 3	1	182011131	2011 R 1 : 3 D1
1 : 3	2	182011132	2011 R 1 : 3 D2



2012



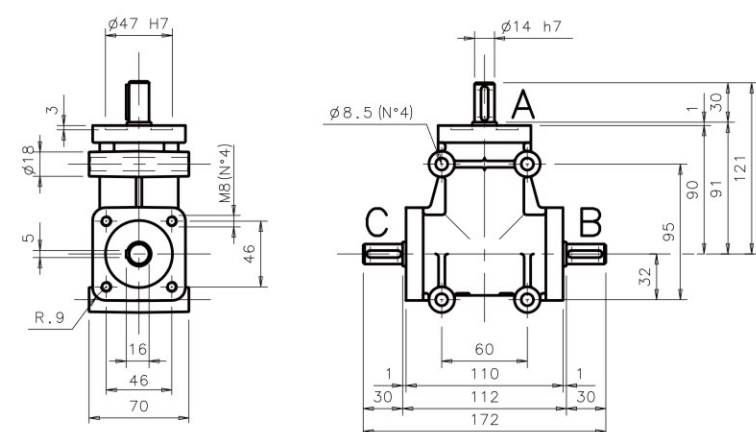
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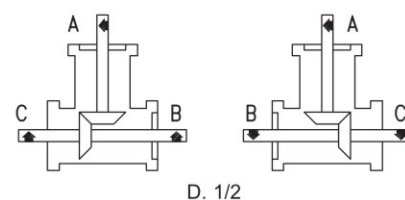
Ratio	Disp.	Item number	Designation
1 : 1	1/2	182012111	2012 R 1 : 1 D1/2
1 : 2	1/2	182012121	2012 R 1 : 2 D1/2
1 : 3	1/2	182012131	2012 R 1 : 3 D1/2



2008



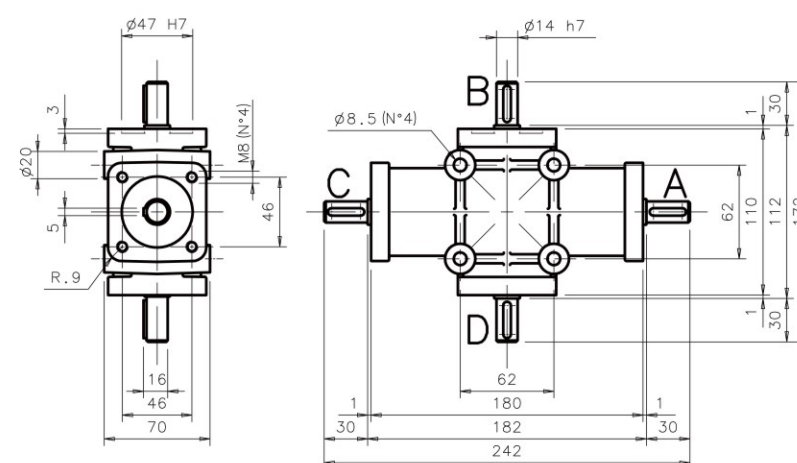
Weight	kg 2,000
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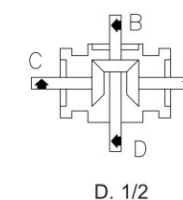
Ratio	Disp.	Item number	Designation
1 : 1	1/2	182008111	2008 R 1 : 1 D1/2
1 : 2	1/2	182008121	2008 R 1 : 2 D1/2
1 : 3	1/2	182008131	2008 R 1 : 3 D1/2



2006



Weight	kg 3,250
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Ratio	Disp.	Item number	Designation
1 : 1	1/2	182006111	2006 R 1 : 1 D1/2
1 : 2	1/2	182006121	2006 R 1 : 2 D1/2
1 : 3	1/2	182006131	2006 R 1 : 3 D1/2



3-way independent shafts right angle gearbox **2007**

Technical drawing of the 3-way independent shafts right angle gearbox 2007. The front view shows a square housing with a central input shaft and three output shafts. Dimensions include: input shaft diameter $\phi 47$ H7, output shaft diameter $\phi 14$ h7, housing width 70, and total height 141. The side view shows the housing depth 242 and output shaft spacing 180. A weight box indicates **kg 3,250**.

D. 1		D. 2	
Ratio	Disp.	Item number	Designation
1 : 1	1	182007111	2007 R 1 : 1 D1
1 : 1	2	182007112	2007 R 1 : 1 D2
1 : 2	1	182007121	2007 R 1 : 2 D1
1 : 2	2	182007122	2007 R 1 : 2 D2
1 : 3	1	182007131	2007 R 1 : 3 D1
1 : 3	2	182007132	2007 R 1 : 3 D2



2-way right angle gearbox **2030**

Technical drawing of the 2-way right angle gearbox 2030. The front view shows a square housing with a central input shaft and two output shafts. Dimensions include: input shaft diameter $\phi 62$ H7, output shaft diameter $\phi 19$ h7, housing width 86, and total height 181. The side view shows the housing depth 191 and output shaft spacing 150. A weight box indicates **kg 4,400**.

D. 1		D. 2	
Ratio	Disp.	Item number	Designation
1 : 1	1	182030111	2030 R 1 : 1 D1
1 : 1	2	182030112	2030 R 1 : 1 D2
1 : 2	1	182030121	2030 R 1 : 2 D1
1 : 2	2	182030122	2030 R 1 : 2 D2
1 : 3	1	182030131	2030 R 1 : 3 D1
1 : 3	2	182030132	2030 R 1 : 3 D2

3-way right angle gearbox **2031**

Technical drawing of the 3-way right angle gearbox 2031. The front view shows a square housing with a central input shaft and three output shafts. Dimensions include: input shaft diameter $\phi 62$ H7, output shaft diameter $\phi 19$ h7, housing width 86, and total height 181. The side view shows the housing depth 232 and output shaft spacing 152. A weight box indicates **kg 4,400**.

D. 1/2			
Ratio	Disp.	Item number	Designation
1 : 1	1/2	182031111	2031 R 1 : 1 D1/2
1 : 2	1/2	182031121	2031 R 1 : 2 D1/2
1 : 3	1/2	182031131	2031 R 1 : 3 D1/2



3-way independent shafts right angle gearbox **2025**

Weight	kg 5,250
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Ratio	Disp.	Item number	Designation
1 : 1	1	182025111	2025 R 1 : 1 D1
1 : 1	2	182025112	2025 R 1 : 1 D2
1 : 2	1	182025121	2025 R 1 : 2 D1
1 : 2	2	182025122	2025 R 1 : 2 D2
1 : 3	1	182025131	2025 R 1 : 3 D1
1 : 3	2	182025132	2025 R 1 : 3 D2



4-way independent shafts right angle gearbox **2027**

Weight	kg 6,100
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Ratio	Disp.	Item number	Designation
1 : 1	1/2	182027111	2027 R 1 : 1 D1/2

4-way right angle gearbox **2026**

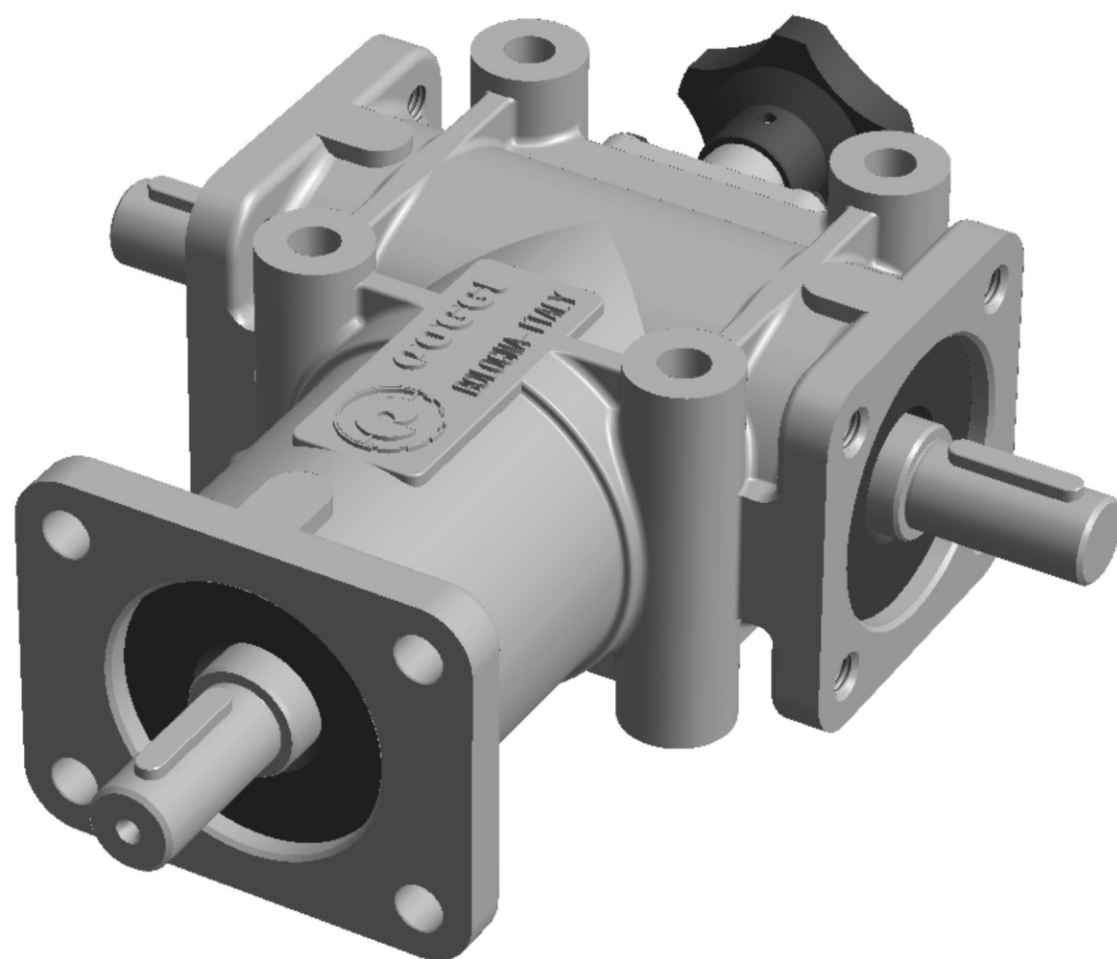
Weight	kg 5,350
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Ratio	Disp.	Item number	Designation
1 : 1	1/2	182026111	2026 R 1 : 1 D1/2
1 : 2	1/2	182026121	2026 R 1 : 2 D1/2
1 : 3	1/2	182026131*	2026 R 1 : 3 D1/2

* A richiesta - On request - Auf Anfrage - Sur demande - Bajo consulta.



反向式傘型齒輪箱 Reversing gearboxes



反向式綜合設計優點 Reversing gearboxes general design features

反向式傘齒輪箱提供反方向式輸出軸心轉動，傘齒輪箱的輸入速度(軸A)為1400rpm，可提供平均約10000小時的操作時間。主體內，三組齒輪會以不同位置聯接在一起：

The reversing gearboxes offer the same basic design features as the range of right angle gearboxes, with the additional facility for reversing the output shaft rotation.

The reversing gearboxes are engineered for an input speed (shaft A) of 1400 rpm. This speed provides, together with the power applied, an average operating life of approx. 10.000 hours.

Inside the housing, a group of three bevel gears is mounted, together with a three positions control knob:

中心位置：空轉出力軸

- CENTRAL POSITION: idle output shaft

左方位置：同一方向轉動

- LEFT POSITION: rotation in one direction

右方位置：反方向轉動

- RIGHT POSITION: rotation in the opposite direction

反向轉動需在軸停頓時才可產生(特別是出力軸)。如軸在轉動時，反向轉動祇可在重量較低或轉速不超過2000rpm下產生。

Reversing must be made when shafts are standstill (especially the output shaft).

Rotation reversing when shafts are in motion can be made only in case of very low masses and with shafts speed rotation not exceeding 200 rpm.

工作溫度 Operating temperature

理想的工作溫度為

-18°C ~ +80°C (0 °F ~ 170°F)。

The permissible temperatures for trouble-free running of reversing gearboxes should be kept within - 18 °C and + 80 °C (0 °F and 170 °F).

噪音程度 Noise level

在正確安裝與控制情況下，即使在高速運行中，噪音程度都十分低。

The accurate mounting and control of our reversing gearboxes allow to keep a low operating noise level, even at high running speeds.

潤滑 Lubrication

所有型號的傘齒輪箱均注入合成潤滑油，在正常情況下，並無需任何格外定時注入或更換潤滑油。

All reversing gearboxes are factory filled with lubricant. Being life lubricated, they do not require any periodical oil replenishment or change during all reversing gearbox average lifetime.

安裝 Installation

傘齒輪箱可安裝在任何位置，唯一安裝要求是傘齒輪箱需要安裝在垂直的軸。

Thanks to the construction shape, the mounting of reversing gearboxes is allowed in any position. The only requested caution is to advise a possible mounting with a shaft in vertical position, in order to verify the proper lubrication.

在安裝時，反向式傘齒輪箱需與入力軸在同一位置，以確保可以在自動轉向的情況下正常使用。

The mounting of bevel gears in phase, grants to all our reversing gearboxes the motion reversal with the input shaft always in the same position.

This ensures that our reversing gearboxes can be used even in applications where it is necessary to reverse the motion automatically.



反向式零件組合
Components of reversing gearboxes

主體 Housing

傘齒輪箱主體由輕合金組裝而成，固定螺栓讓傘齒輪箱可安裝在任何位置。
The reversing gearboxes housing is compact and made of light alloy. The fixing flanges with threaded holes and other guides allow the mounting in any position.

錐齒輪 Triple bevel gears

齒輪為格裏森系統的螺旋齒，由強化合金鋼製成，確保兩端良好的旋轉傳動。
The gears are made as a spiral toothing GLEASON system, made of alloy steel hardened and tempered. The running-in is made in both directions of rotation in order to ensure the good running of our reversing gearboxes in both directions.

軸心 Shafts

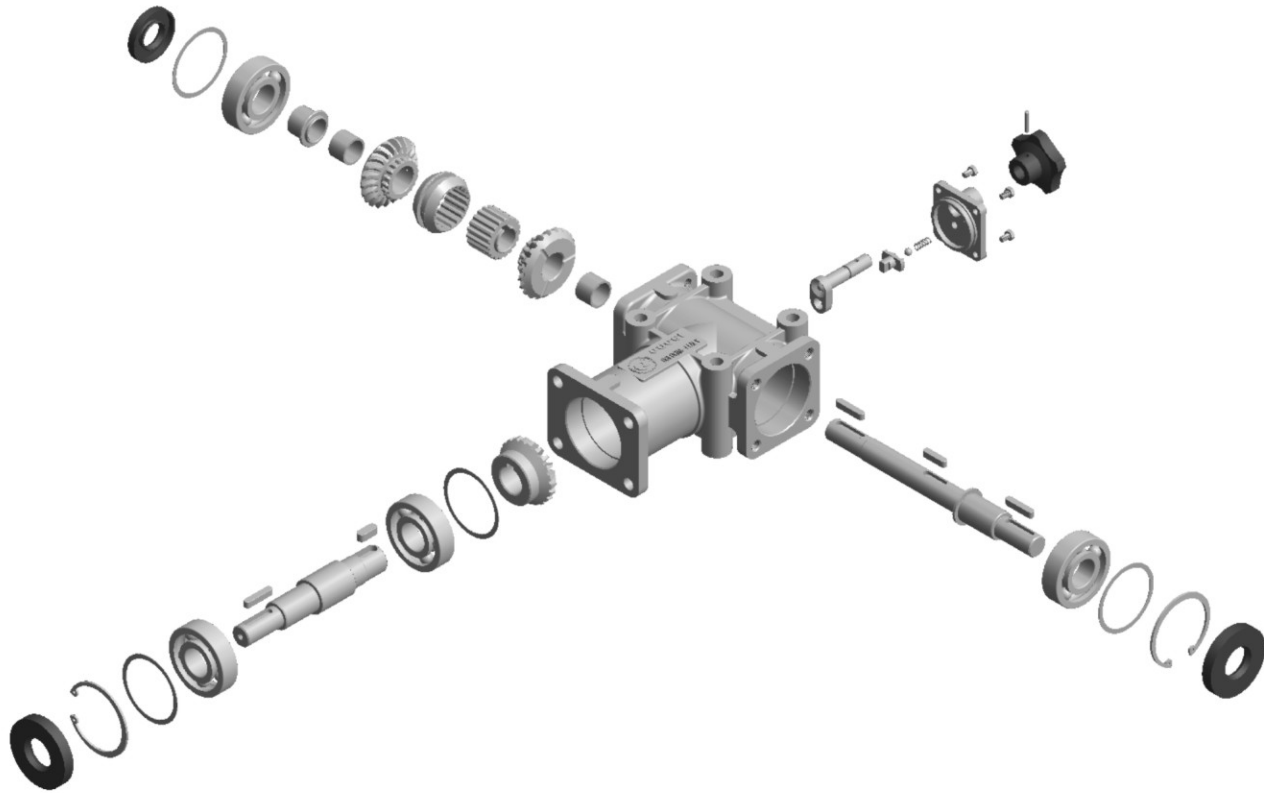
軸心均由強化合金鋼製成。
Shafts are made of alloy steel hardened, tempered and grounded.

軸承 Bearings

所使用的軸承均為品牌最好的高品質滾珠軸承。
All reversing gearboxes shafts are rotating on generously sized and high quality ball bearings of first class brands.

油封 Oil seals

如有需要，我們可以提供特殊油封，例如VITON品牌的防高溫油封。
For special applications, on request we can supply reversing gearboxes with special oil seals, like for example VITON® seals for high temperatures.



反向式性能表
Performances of reversing gearboxes

型號 Article	1400rpm時入 力軸 A 最大功率 Shaft A max. input power at 1400 rpm		各出力軸心 最大扭矩(Nm) Max. torque for each output shaft in Nm	
	kW	HP	B	C
2019	2,25	3	1.55	-
2020	2,25	3	1.55	-
2023	2,25	3	0.755	0.755

1 kgm = 9,8 Nm

反向式潤滑要求
Lubrication of reversing gearboxes

反向式傘齒輪箱的潤滑油內容
Lubricant contents of reversing gearboxes

Articolo - Article - Typ - Article - Artículo	g
2019	120
2020	130
2023	120

傘齒輪箱內的潤滑油為AGIP BLASIA S150型，也可更換為以下型號的潤滑油。
如有需要注油或更換潤滑油，我們建議更換一個全新的傘齒輪箱。
The oil contained into reversing gearboxes is type AGIP BLASIA S150 but it can be replaced by one of those as listed in the table below.
In case of need to add or change the oil, we recommend to replace it completely.

建議潤滑油：
Table of recommended oils

生產商 Manufacturer	AGIP	BP	ESSO	GULF	MOBIL	SHELL
潤滑油型號 Oil type	BLASIA S150	ENERGOL SGR 150	SPARTAN SEP 150	SYNTHETIC GEAR LUBRICANT	GLYGOYLE 22	TIVELA WA



2-ways reversing gearboxes with shafts at 90° **2019**

Technical drawing of the 2019 gearbox showing front, side, and top views with dimensions. Key dimensions include: shaft diameter $\phi 19$ h7, input/output shaft diameter $\phi 10.5$ (N°4), mounting flange diameter $\phi 62$ H7, and overall dimensions 191x181x141mm.

Weight	kg 5,400
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Ratio	Item number	Designation
1 : 1	182019	2019



3-ways reversing gearboxes with shafts at 90° **2023**

Technical drawing of the 2023 gearbox showing front, side, and top views with dimensions. Key dimensions include: shaft diameter $\phi 19$ h7, input/output shaft diameter $\phi 10.5$ (N°4), mounting flange diameter $\phi 62$ H7, and overall dimensions 232x181x141mm.

Weight	kg 5,500
--------	----------

Ratio	Item number	Designation
1 : 1	182023	2023

2-ways reversing gearboxes with shafts at 180° **2020**

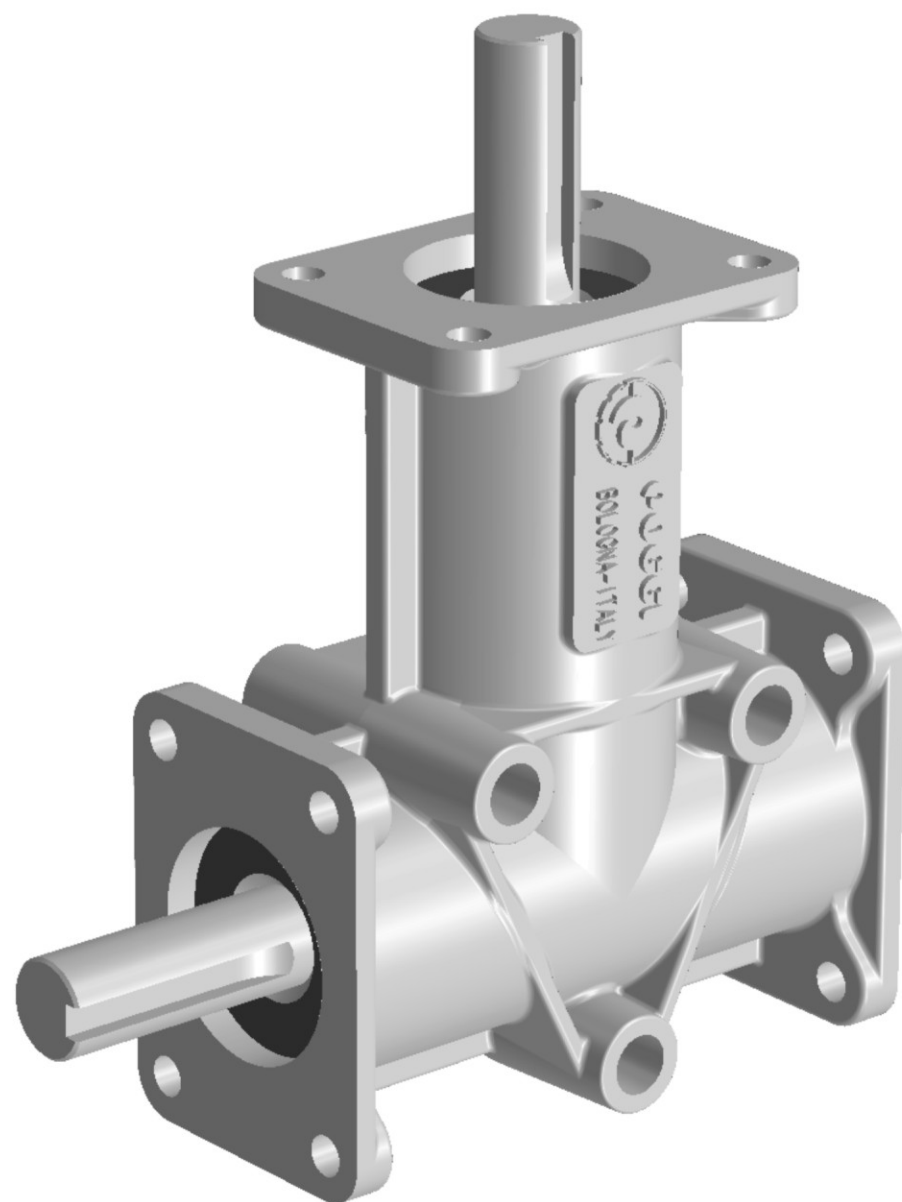
Technical drawing of the 2020 gearbox showing front, side, and top views with dimensions. Key dimensions include: shaft diameter $\phi 19$ h7, input/output shaft diameter $\phi 11$ (N°4), mounting flange diameter $\phi 62$ H7, and overall dimensions 264x184x92mm.

Weight	kg 5,100
--------	----------

Ratio	Item number	Designation
1 : 1	182020	2020



4000型90° 換向傘型齒輪箱 Series 4000 right angle gearboxes



4000型綜合設計優點 Series 4000 general design features

轉動速度 Speed of rotation

傘齒輪箱的輸入速度(軸A)為1400 rpm, 可提供平均約10000小時的操作時間。傘齒輪箱的減速比率也可作加速單位, 提供輸出比率1:2輸入速度750rpm。

The gearboxes are engineered for an input speed (shaft A) of 1400 rpm. This speed provides, together with the power applied, an average operating life of approx. 10000 hours.

The gearboxes with reduction ratio can also be used as speed-up units, provided that 750 rpm in input for ratio 1:2 are not exceeded.

工作溫度 Operating temperature

理想的工作溫度為 $-18^{\circ}\text{C} \sim +80^{\circ}\text{C}$ ($0^{\circ}\text{F} \sim 170^{\circ}\text{F}$)。

The permissible temperatures for trouble-free running of gearboxes should be kept within -18°C and $+80^{\circ}\text{C}$ (0°F and 170°F).

噪音程度 Noise level

在正確安裝與控制情況下, 即使在高速運行中, 噪音程度都十分低。

High accuracy assembly ensures low operating noise levels, even at high running speeds.

傘齒輪箱的齒距 Angular clearances

傘齒輪箱的齒距為 $15' \sim 30'$, 如需要更高轉速或工作溫度的溫度, 請與我們聯繫。

Angular clearances between gears are hold within $15'$ and $30'$. In case of need for gearboxes for higher speeds or unusual operating temperatures, please consult us.

潤滑 Lubrication

所有型號均有注入潤滑油, 4000型的傘齒輪箱所注入的為合成油, 在正常情況下, 並無需任何格外定時注入或更換潤滑油。

All units are factory filled with lubricant. The series 4000 gearboxes are lubricated with synthetic oil. Being life lubricated they do not require any periodical oil replenishment or change during all gearbox average lifetime.

安裝 Installation

傘齒輪箱可安裝在任何位置, 唯一安裝要求是傘齒輪箱需要安裝在垂直的軸。

Thanks to the construction shape, the mounting of gearboxes is allowed in any position. The only requested caution is to advise a possible mounting with a shaft in vertical position, in order to provide the proper lubrication.



4000型零件組合

Components of Series 4000 right angle gearboxes

主體 Housing

傘齒輪箱主體由輕合金組裝而成，固定螺栓讓傘齒輪箱可安裝在任何位置。

The gearbox housing is compact and made of light alloy. The fixing flanges with threaded holes, and other guides allow the mounting in any position.

錐齒輪 Bevel gears

齒輪為格裏森系統的螺旋齒，由強化合金鋼製成，確保兩端良好的旋轉傳動。

The gears are made as a spiral toothing GLEASON system, made of alloy steel hardened and tempered. The running-in is made in both directions of rotation in order to ensure the good running in both directions of our right angle gearboxes.

軸心 Shafts

除有減速比率的入力軸心 A 由強化合金鋼製成外，其他軸心均由強化鋼製成。

Shafts are made of hardened and tempered steel. Exceptions are gearboxes with reduction ratio, where input shafts (shaft A) are made of alloy steel hardened, tempered and ground.

軸承 Bearings

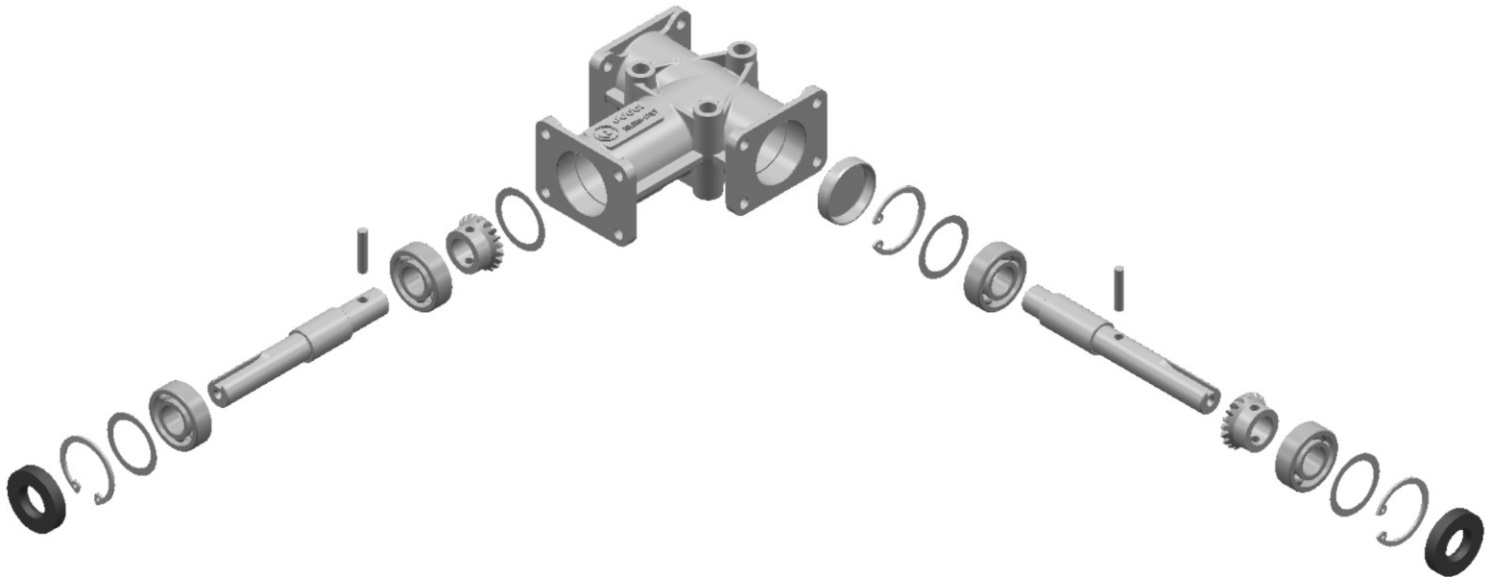
所使用的軸承均為品牌最好的高品質滾珠軸承。

All shafts are rotating on generously sized and high quality ball bearings of first class brands.

油封 Oil seals

如有需要，我們可以提供特殊油封，例如VITON品牌的防高溫油封。

For special applications, on request we can supply reversing gearboxes with special oil seals, like for example VITON® seals for high temperatures.



4000型性能表

Performances of series 4000 gearboxes

型號 Article	輸出比率 Ratio	1400rpm時入力軸 A 最大功率 Shaft A max. input power at 1400 rpm		各出力軸心 最大扭矩(Nm) Max. torque for each output shaft in Nm	
		kW	HP	B	C
4000	1 : 1	0,37	0,50	2,4	-
	1 : 2	0,15	0,20	2,0	-
4002	1 : 1	0,37	0,50	1,2	1,2
	1 : 2	0,15	0,20	1,0	1,0
4008	1 : 1	1,30	1,75	4,4	4,4
	1 : 2	0,50	0,70	3,4	3,4
4011	1 : 1	1,30	1,75	8,8	-
	1 : 2	0,50	0,70	6,8	-

1 kgm = 9,8 Nm

型號 Article	輸出比率 Ratio	1400rpm時入力軸 A 最大功率 Shaft A max. input power at 1400 rpm		各出力軸心 最大扭矩(Nm) Max. torque for each output shaft in Nm	
		kW	HP	B	C
4030	1 : 1	4,00	5,50	27,2	-
	1 : 2	1,50	2,00	20,0	-
4031	1 : 1	4,00	5,50	13,6	13,6
	1 : 2	1,50	2,00	10,0	10,0
4032	1 : 1	6,50	8,80	44,0	-
	1 : 2	3,00	4,08	40,9	-
4033	1 : 1	6,50	8,80	22,0	22,0
	1 : 2	3,00	4,08	20,4	20,4

4000型潤滑要求

Lubrication of Series 4000 right angle gearboxes

4000型傘齒輪箱的潤滑油內容
Lubricant contents of series 4000 right angle gearboxes

Articolo - Article - Typ - Article - Artículo	g
4000	30
4002	30
4008	60
4011	60

de la remplacer complètement.

Articolo - Article - Typ - Article - Artículo	g
4030	100
4031	100
4032	130
4033	130

傘齒輪箱內的潤滑油為AGIP BLASIA S150型，也可更換為以下型號的潤滑油。
The oil contained into right angle gearboxes is type AGIP BLASIA S150 but it can be replaced by one of those as listed in the table below.

如有需要注油或更換潤滑油，我們建議更換一個全新的傘齒輪箱。
In case of need to add or change the oil, we recommend to replace it completely.

Table of recommended oils

生產商 Manufacturer	AGIP	BP	ESSO	GULF	MOBIL	SHELL
潤滑油型號 Oil type	BLASIA S150	ENERGOL SGR 150	SPARTAN SEP 150	SYNTHETIC GEAR LUBRICANT	GLYGOYLE 22	TIVELA WA



4000型選型指南
Selection of series 4000 gearboxes

傘齒輪箱選型基本參數
Basic parameters for gearboxes selection.

所有特殊應用下的工作條件都需被確定，以便選擇適當的型號。
All actual working conditions for each specific application must be determined for correct selection.

Dati - Data given - Gegeben - Données - Datos			
P = Motor power P=馬達功率(kW)		(kW)	
Pc = Design power Pc=設計功率(kW)		(kW)	
Mt2 =Output shaft torque Mt2=出力軸扭力(Nm)		(Nm)	
n1 = Speed of input shaft A n1=入力軸 A 的轉速(Rpm)		(Rpm)	
n2 = Speed of output shaft n2=出力軸凡的轉速(Rpm)		(Rpm)	
Fs = Service factor Fs=操作因素			

Service factors Fs 操作因素Fs

Load type 負載類型	Hours per day duty 每天操作時數			
	< 3	3 ÷ < 8	8 ÷ <12	12 ÷ 14
Uniform 一致程度	0,70	0,90	1,00	1,30
Light shocks 微震動	0,90	1,00	1,30	1,80
Heavy shocks 強震動	1,30	1,60	1,80	2,30

Example

P = 2,21 kW
n1 = 1400 rpm
n2 = 1400 rpm
Fs = 1,6 (5 hours per day duty,
with heavy pulsating loads)

Calculation of design power by
the following formula:

$P_c = P \cdot F_s = 2,21 \cdot 1,6 = 3,54 \text{ kW}$



4000型選型指南
Selection of series 4000 gearboxes

出力軸扭力計算方程式：
Calculation of output shaft torque by the following formula:

$M_{t2} = 9550 \cdot \frac{P_c}{n_2} = 9550 \cdot \frac{3,54}{1400} = 24,1 \text{ Nm}$

At this stage, consulting the per-formance table, the choice must be for a gearbox having a max. output shaft equal to or higher than the torque just calculated; in our case, the most suitable gearbox is type 4030, having a max. output torque of 27,2 Nm.

根據各個數據，所選的型號的最大出力軸扭力須等于或大于所計算出的數值，最適用的型號為4030型，最大輸出扭力為27,2Nm。

軸心負載
Shaft loading capacity

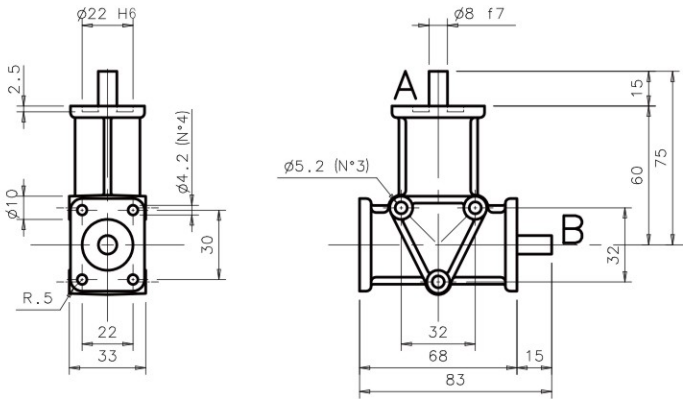
型號 Article	懸吊負荷 Overhung load (kg)	推力負荷 Thrust load (kg)
4000 4002	21	11
4008 4011	41	20

型號 Article	懸吊負荷 Overhung load (kg)	推力負荷 Thrust load (kg)
4030 4031	76	43
4032 4033	88	49

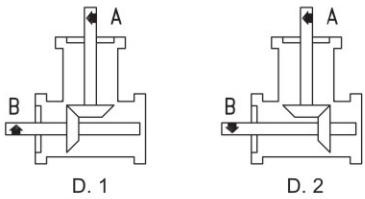


2-way right angle gearbox

4000



Weight	kg 0,300
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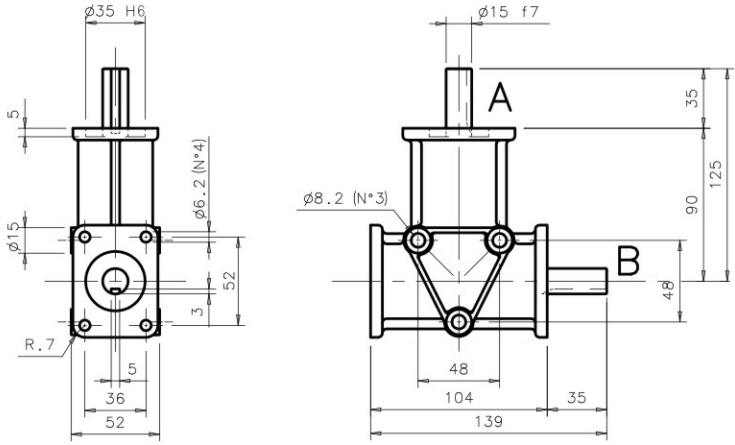


Ratio	Disp.	Item number	Designation
1 : 1	1	184000111	4000 R 1 : 1 D1
1 : 1	2	184000112	4000 R 1 : 1 D2
1 : 2	1	184000121	4000 R 1 : 2 D1
1 : 2	2	184000122	4000 R 1 : 2 D2

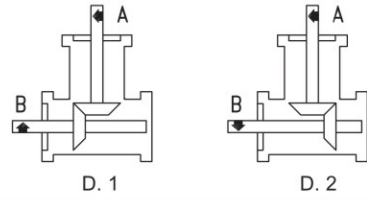


2-way right angle gearbox

4011



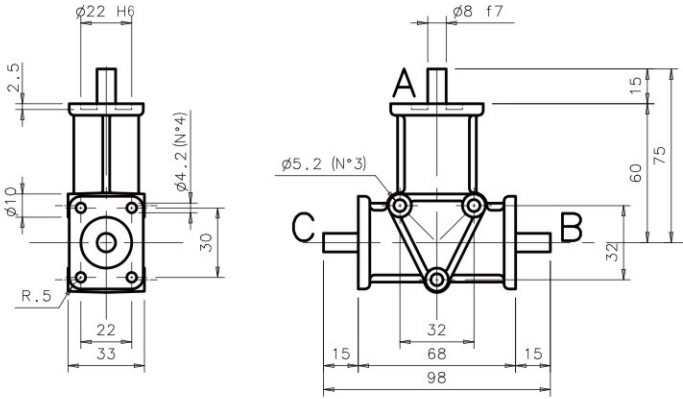
Weight	kg 1,200
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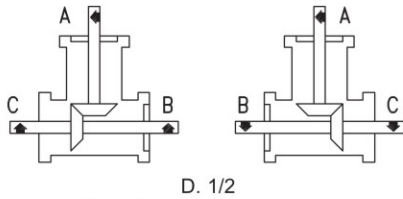
Ratio	Disp.	Item number	Designation
1 : 1	1	184011111	4011 R 1 : 1 D1
1 : 1	2	184011112	4011 R 1 : 1 D2
1 : 2	1	184011121	4011 R 1 : 2 D1
1 : 2	2	184011122	4011 R 1 : 2 D2

3-way right angle gearbox

4002



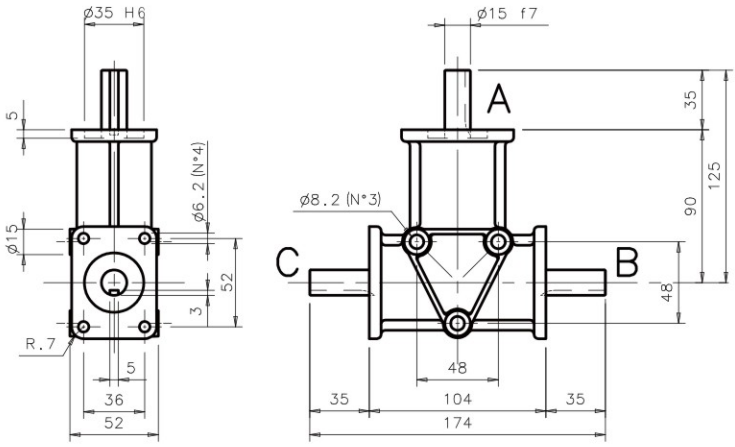
Weight	kg 0,300
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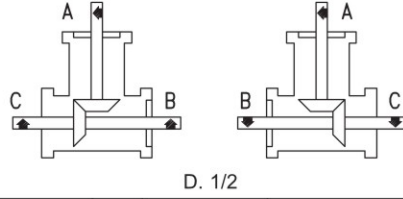
Ratio	Disp.	Item number	Designation
1 : 1	1/2	184002111	4002 R 1 : 1 D1/2
1 : 2	1/2	184002121	4002 R 1 : 2 D1/2

3-way right angle gearbox

4008



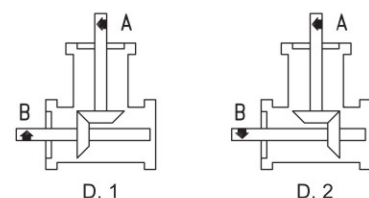
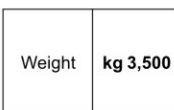
Weight	kg 1,200
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Ratio	Disp.	Item number	Designation
1 : 1	1/2	184008111	4008 R 1 : 1 D1/2
1 : 2	1/2	184008121	4008 R 1 : 2 D1/2



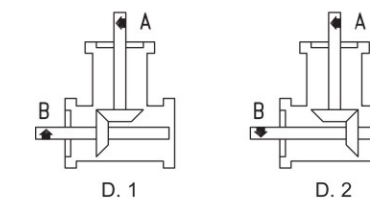
4030



Ratio	Disp.	Item number	Designation
1 : 1	1	184030111	4030 R 1 : 1 D1
1 : 1	2	184030112	4030 R 1 : 1 D2
1 : 2	1	184030121	4030 R 1 : 2 D1
1 : 2	2	184030122	4030 R 1 : 2 D2

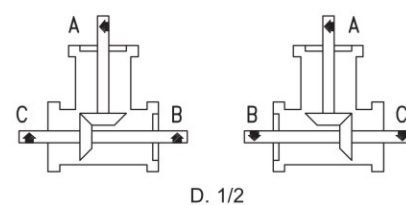
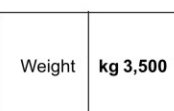


4032



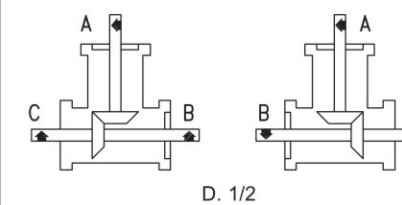
Ratio	Disp.	Item number	Designation
1 : 1	1	184032111	4032 R 1 : 1 D
1 : 1	2	184032112	4032 R 1 : 1 D
1 : 2	1	184032121	4032 R 1 : 2 D
1 : 2	2	184032122	4032 R 1 : 2 D

4031



Ratio	Disp.	Item number	Designation
1 : 1	1/2	184031111	4031 R 1 : 1 D1/2
1 : 2	1/2	184031121	4031 R 1 : 2 D1/2

4033



Ratio	Disp.	Item number	Designation
1 : 1	1/2	184033111	4033 R 1 : 1 D1
1 : 2	1/2	184033121	4033 R 1 : 2 D1