BISON BIAL

MADE IN POLAND

3105 ▪ 32** ▪ 3264 ▪ 3265 ▪ 35** ▪ 3564 ▪ 3565 ▪ 36** ▪ 37** 38** ▪ 3864 ▪ 3865 ▪ 43** ▪ 4505 ▪ 4705 ▪ 4605 ▪ 4805

EN INSTRUCTION MANUAL [Page 3]

The manual covers fitting, operation and maintenance of hand-operated lathe chucks.

NOTE: Carefully read the instructions before attempting to use the Workholding Chucks!

PL INSTRUKCJA OBSŁUGI [Strona 19]

Instrukcja obejmuje montaż, eksploatację i konserwację uchwytów tokarskich z mocowaniem ręcznym.

UWAGA: Przed przystąpieniem do pracy przeczytaj uważnie instrukcję!

DE BEDIENUNGSANWEISUNG [Seite 35]

Vorliegende Bedienungsanleitung umfasst Montage, Betrieb und Wartung oben genannter Drehmaschinenspannfutter mit Handeinspannung.

ANMERKUNG: Vor der Arbeit lesen Sie bitte aufmerksam die Bedienungsanleitung!

RU ИНСТРУКЦИЯ ПОЛЬЗОВАНИЯ [Страница 51]

Инструкция включает в себя монтаж, эксплуатацию и консервацию токарных патронов с ручным креплением.

ВНИМАНИЕ: Читайте инструкцию перед началом работы!

BISON®

EN Self-centering scroll chucks

PL Uchwyty samocentrujące spiralne

DE Planspiralfutter

RU Самоцетрирующие спиральные птароны

3105	32**	35**		36**	37**	38**
	3204	3504	3504-I	3604	3704	3804
	3205	3505	3505-I	3605	3705	3805
	3214	3514	3514-I	3614	3714	3806
	3215	3515	3515-I	3615	3715	3807
	3234	3534	3534-I	3634	3734	
	3235	3535	3535-I	3635	3735	
	3244	3544	3544-I	3644	3744	
	3245	3545	3545-I	3645	3745	
	3274	3574	3574-I	3674	3774	
	3275	3575	3575-I	3675	3775	

EN Self-centering chucks with fine adjustment

PL Uchwyty samocentrujące spiralne z regulowanym osadzeniem

DE Planspiralfutter mit radialer Feineinstellung

RU Самоцентрирующие патроны с точной регулировкой

3264	3265	3564	3565	3864	3865

EN Self-centering and individually adjustable scroll chucks

PL Uchwyty samocentrujące spiralne z niezależnym nastawieniem szczęk

DE Wescott-Futter

RU Патроны спиральные самоцентрирующие и с независимым перемещением кулачков

4505	4605	4705	4805

EN

Dear Customer,

On behalf of BISON-BIAL S.A. we would like to thank you for choosing our product!

We believe that the use of our products will meet your highest expectation.

Our staff will provide you with any technical information and assistance as well as help you choose the optimal products, spare parts, or accessories from the wide range of BISON-BIAL S.A. products all tailored for your specific needs.

The product you have purchased is covered with a warranty, which is part of the service we provide to our valued customers. Please take time to carefully familiarize yourself with the included warranty conditions.

Kind Regards,

BISON-BIAL S.A.

PL

Szanowny Kliencie,

W imieniu BISON-BIAL S.A. pragniemy podziękować za dokonane zakupy. Mamy nadzieję, że użytkowanie naszych wyrobów przyniesie Państwu zadowolenie i wiele satysfakcji.

Nasi pracownicy udzielą Państwu wszelkich informacji technicznych i będą służyli pomocą w doborze oprzyrządowania produkowanego przez firmę BISON-BIAL S.A.

Zakupiony przez Państwa wyrób jest objęty gwarancją, będącą jednym z elementów serwisu świadczonego naszym drogim Klientom.

Z poważaniem,

BISON-BIAL S.A.

DE

Sehr geehrte Kunde,

im Namen des Herstellers für Spannvorrichtungen und Drehfutter BISON-BIAL S.A. bedanken wir uns für den von Ihnen getätigten Kauf!

Wir hoffen, dass die Nutzung unserer Produkte Sie zufrieden stellt und Ihnen viel Freude bringen wird.

Unsere Mitarbeiter stehen Ihnen jederzeit mit allen technischen Informationen zu unseren Produkten zur Verfügung und beraten Sie gerne hinsichtlich der Auswahl von passenden Ersatzteilen und geeignetem Zubehör.

Im Rahmen unserer Serviceleistungen gewähren wir auf das von Ihnen erworbene Produkt eine Garantie. Wir bitten Sie daher, die beigefügten Garantiebedingungen aufmerksam zu lesen.

Mit freundlichen Grüßen,

BISON-BIAL S.A.

RU

Уважаемые Клиенты,

От имени BISON-BIAL S.A. хотим поблагодарить за покупку наших продуктов. Надеемся, что пользование ними даст Вам удовольствие и много удовлетворений.

Наши сотрудники дадут Вам всякие нужные технические справки а также окажут помощь при выборе оснастки, производимой фирмой BISON-BIAL S.A.

Мы предоставляем гарантию на приобретенный Вами продукт, которая является одной из частей сервисного обслуживания наших дорогих Клиентов.

С уважением,

BISON-BIAL S.A.

CONTENTS PAGE

ENGLISH

1. WORK SAFETY CONDITIONS

1. Each person using the chuck should read this manual prior to attempting to work and follow it completely.
2. In case of abnormal chuck operation or damage, stop the work immediately and notify the supervising staff.
3. Repairs and overhauls of the chuck may only be performed by suitably qualified personnel.
4. Modification of wrenches delivered by BISON-BIAL together with chuck or usage of other wrenches voids the warranty.
5. Use of wrenches which do not correctly match the square seat in the scroll chuck pinion, or screw head in independent chucks voids the warranty.
6. Usage of square seat in the pinion of scroll-chuck or the screw head in the independent chuck for removing the chuck from the spindle of the machine tool voids the warranty.
7. With the exception of the safety condition above, operators should follow local Industrial Health & Safety Regulations.

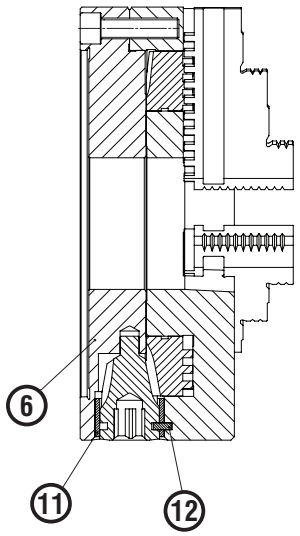
2. TECHNICAL DATA

2.1 Application

Lathe chucks are designed for holding the workpiece on lathes or grinding machines. They can also be used as an accessory from indexing units or other fixing devices.

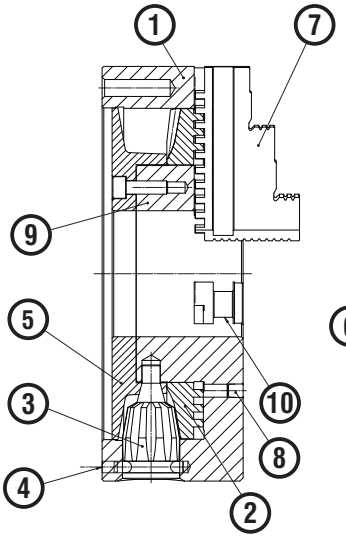
2.2 Chuck design

① - Body	⑥ - Adapter plate	⑪ - Sleeve bearing
② - Scroll plate	⑦ - Jaw	⑫ - Locking half ring
③ - Pinion	⑧ - Grease nipple	⑬ - Operating screw
④ - Stud bolt	⑨ - Body sleeve	⑭ - Holder
⑤ - Cover plate	⑩ - Jaw guide	⑮ - Master jaw



35**
3564
3565
37**
38**
3864
3865

Fig. 1



3105
32**
36**

Fig. 2

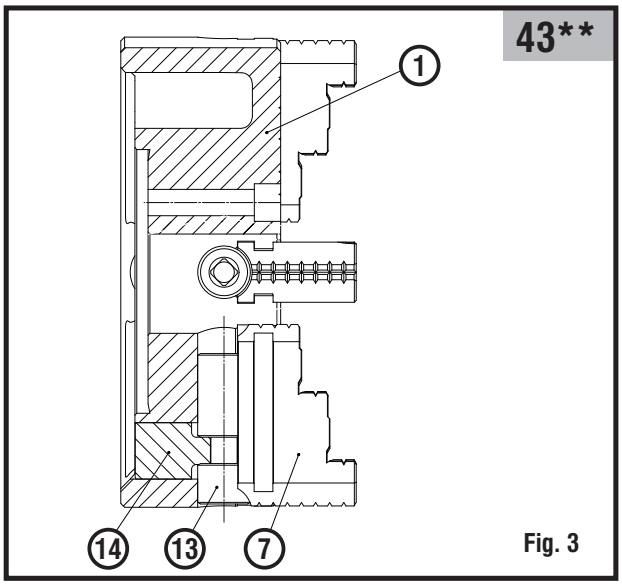


Fig. 3

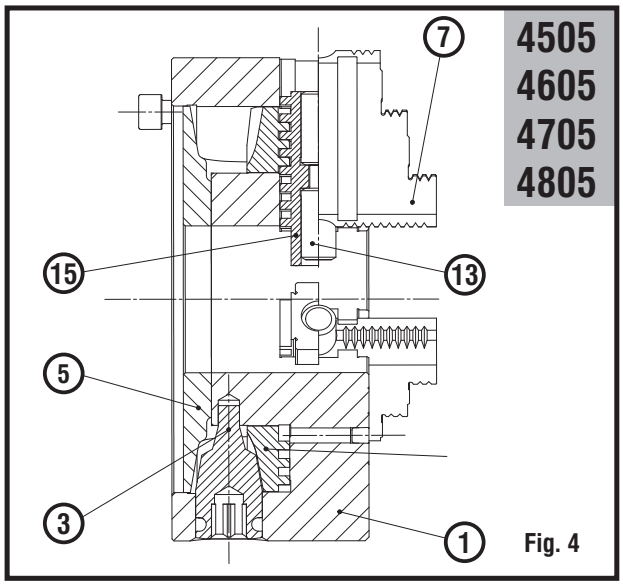


Fig. 4

NOTE: (Fig. 4) Screw (13) may only be used for moving the jaws independently to one another. Rotating the pinion (3) with wrench results in a movement of jaws (7) by the same stroke.

2.3 Installation

After removing the chuck from the carton, carefully check to ensure all parts are included in the carton (see page 15) ensuring that no parts are missing. Remove the protective coating from all surfaces except the surfaces of the guides in the jaws and the body. The chuck seat and jaw gripping surfaces should be cleaned very carefully.

Installation of the chuck with direct mounting on the spindle nose

The directions apply to chucks with mounting seats according to DIN 55026, DIN 55027, DIN 55029, ISO 702, ANSI B.5.9 and type L (long taper). The chuck should be mounted on the spindle nose. (Accuracy conditions are presented in Fig. 4 and Table 1.) In case of chucks with 7:24 taper tighten the nut provided at the spindle nose.

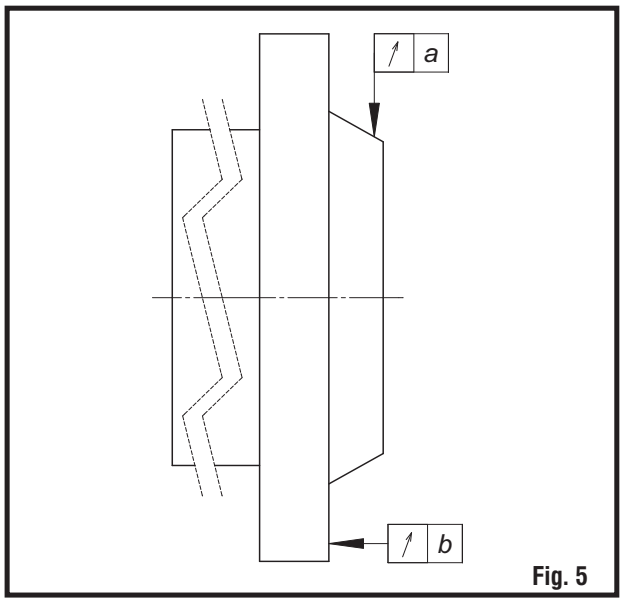


Fig. 5

Table 1

Chuck type	Indication	Chuck size											
		80 85	100 110	140 160	200	250	315 350	400	500	630	800	915 1000	1250
35**	a, b	0,003								0,005			
32**		0,003			0,005							-	
43**	a	0,003		0,005			0,01						
	b	0,003		0,005									

Installation of the chuck with plain back mounting

The chuck with plain back mounting is mounted on the spindle nose by use of an adapter. These chucks are primarily intended for threaded spindle nose. Connection dimensions of adapters are given in Fig. 9-13 and Tables 2-3.

Installation of the chuck with fine adjustment type 3564, 3565, 3864 and 3865 (Fig. 6)

Mount the chuck on the adapter (1) and lightly tighten all the screws (3) connecting the chuck and adapter. In order to obtain the desired chuck setting accuracy, grip a workpiece in the jaws engaging their full face and fix securely. Tighten the adjusting screws (2) to a light contact with the adapter.

Place a dial indicator on workpiece about 60 mm from the jaws and rotate the chuck with the workpiece to determine maximum and minimum points and locations of nearest adjusting screws.

Rotate the chuck to the adjusting screw nearest to the point of the indicator maximum read-out.

Rotate to the opposite located adjusting screw and unscrew it by the half of the TIR error.

Rotate to the previous location and screw in the opposite adjusting screw.

Repeat these steps until required accuracy is reached and all the adjusting screws are equally tightened.

Having completed the adjustment tighten the screws connecting chuck and adapter. Use ground bar stock for setting to obtain maximum accuracy.

Installation of the chuck with fine adjustment 3264 and 3265 (Fig. 7)

Mount the chuck on the adapter (1) **and** tighten all screws (2) connecting the chuck with the backplate. Slightly loosen screws (5) connecting the chuck body and driver (3).

In order to obtain the required accuracy of the chuck, grip a workpiece in the jaws (engaging their full face) and fix securely.

Tighten the taper adjusting screws (4) to slight contact with the adapter (3). Place a dial indicator on workpiece about 60 mm from the jaws and rotate the chuck to determine maximum and minimum points and locations of nearest adjusting screws.

Rotate the chuck to the adjusting screw nearest to the point of the indicator maximum read-out.

Rotate to the opposite located adjusting screws and unscrew them by the 1/3 of the TIR error. Rotate to the previous location and screw in the opposite adjusting screw.

If the location of indicator maximum read-out is between two adjusting screws, the chuck should be rotated to the opposite located adjusting screws which should be unscrewed by half of the TIR error, and then screw in the opposite adjustment screw.

Repeat these steps until the required accuracy is reached and all adjusting screws are equally tightened. Having completed the adjustment tighten the screws connect the chuck and the adapter.

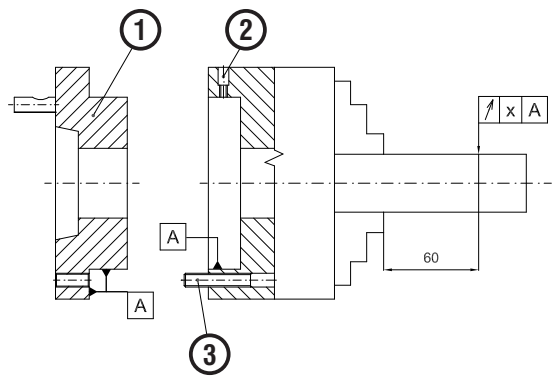


Fig. 6

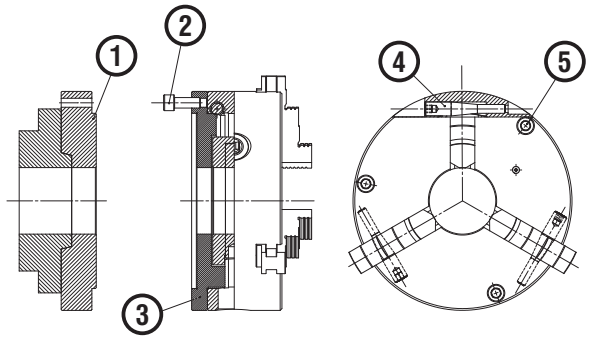


Fig. 7

2.4 Removing chucks from the spindle nose

From threaded spindle nose

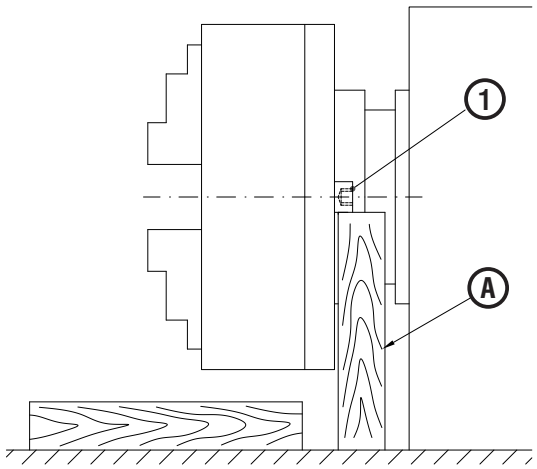


Fig. 8

Before removing the chuck from the spindle it is necessary to:

- Screw the bolt (1) into the threaded hole provided in the adapter
- Support the bolt (1) with soft metal or wooden block (A)
- Turn on the lowest reverse operating speed and loosen the adapter on its thread
- Unscrew the chuck by hand

When dismantling the chuck, put a wooden protecting board under the chuck body (B).

NOTE: Chuck should not be loosened by any sort of direct hit on the jaws.

NOTE: When removing chucks larger then Ø400mm diameter an eye-bolt should be screwed into the chuck body and a suitable hoist/crane should be used for removing the chuck from the machine tool.

From the tapered spindle noses

When removing the chuck it is necessary to:

- Secure the spindle against rotation
- Unscrew the fixing element
- Remove the chuck from the spindle nose

When removing the chuck, put a wooden protecting board under the chuck body.

2.5 Adapter plates

Centering surfaces of the adapters should be positioned against the chuck body with the smallest possible clearance. The maximum runout of „A" and „B" adapter surfaces (Fig. 8, 12 and 13) for chucks within diameters range is:

Chuck Dia. Ø80 – Ø160 = 0,003 mm

Chuck Dia. Ø200 – Ø800 = 0,005 mm

NOTE: After having mounted the chucks with diameter over 400mm on the adapter, you have to remove the transport eyebolt from the chuck body before using the chuck.

Adapters for scroll chucks Ø80-630

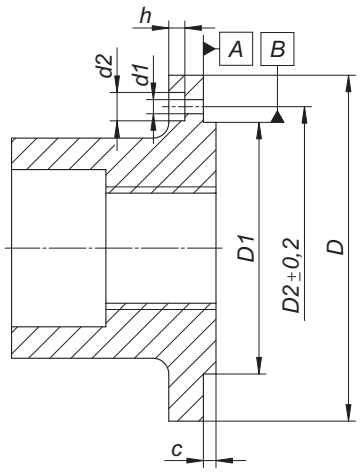


Fig. 9

Table 2

Chuck size	D_1	D_2	d_1	d_2	h_{min}	c	Number of holes
80	56	67	6,4	10,4	6,2	2,5	3
100	70	83	8,4	13,5	8,3	2,5	
110	80	95	8,4	13,5	8,3	3,5	
125	95	108	8,4	13,5	8,3	3,5	
140	105	120	8,4	13,5	8,3	3,5	
160	125	140	10,5	16,5	10,3	3,5	6
200	160	176	10,5	16,5	10,3	3,5	
250	200	224	13,0	19,0	12,3	4,5	
315	260	286	17,0	25,0	16,5	4,5	
400	330	362	17,0	25,0	16,5	4,5	
500	420	458	17,0	25,0	16,5	4,5	
630	545	586	17,0	25,0	16,5	6,5	

Adapters for scroll chucks Ø800

Example of chuck mounting on the threaded spindle nose.

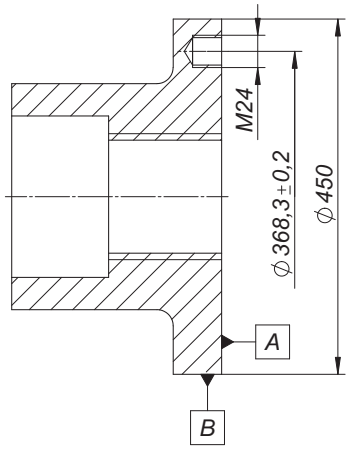


Fig. 10

Example of chuck mounting on the spindle nose with 1:4 taper, A1 version, taper size = 20.

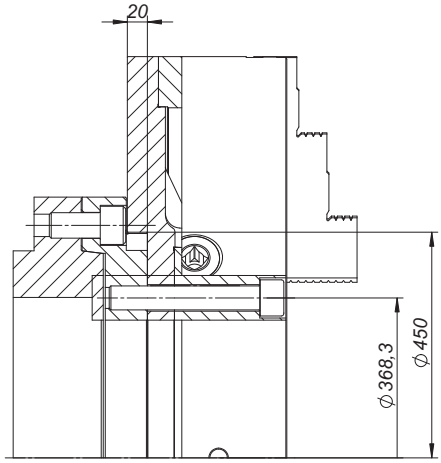


Fig. 11

Adapters for independent chucks

Ø100 ÷ Ø1250 mm chuck

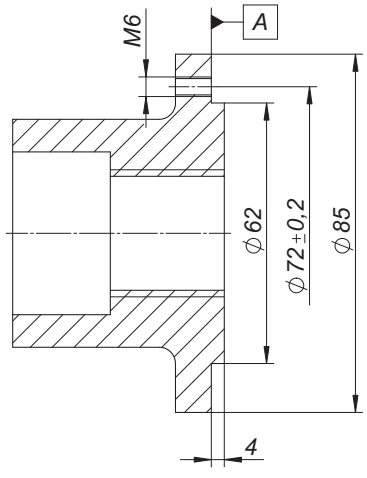


Fig. 12

Ø85 mm chuck

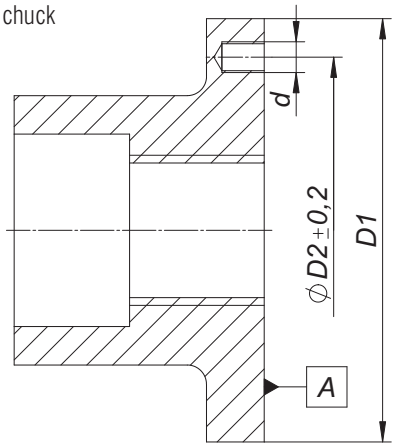


Fig. 13

Table 3

Chuck size	D_1	D_2	d	Number of holes
100	79,38	54,00	M8	
125	69,85	54,00	M8	
160	82,55	69,85	M10	
200	110,00	82,60	M10	
250	150,00	104,80	M12	
315	175,00	133,40	M16	4
350	175,00	133,40	M16	
400	200,00	171,40	M16	
500	270,00	235,00	M20	
630	270,00	235,00	M20	
800	380,00	330,20	M24	
915	370,00	330,00	M24	
1000	370,00	330,00	M24	8
1250	550,00	500,00	M24	

2.6 Gripping ranges

Gripping ranges for self-centering scroll chucks (Fig. 14, Table 4)

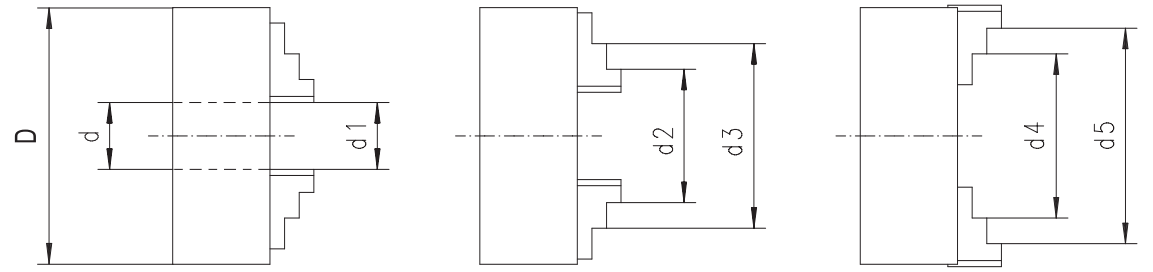


Fig. 14

Table 4

Chuck size D		80	100	110	125	140	160	200	250	315	400	500	630	800	1000
3- and 4-jaw scroll chucks															
Solid jaws	d	15	20	27	32	40	42	55	76	103	136	190	252	320	460
	d_1	2-27	3-33	3-33	3-50	3-50	3-64	4-90	5-118	10-131	10-180	20-235	30-335	150-482	-
	d_2	22-46	25-56	25-56	34-74	34-74	42-100	52-135	62-174	78-200	85-200	120-335	160-465	282-614	-
	d_3	45-69	56-87	56-87	72-115	72-115	94-154	120-202	145-256	172-299	210-380	245-476	325-630	448-780	-
	d_4	25-50	32-62	32-62	39-83	39-83	50-107	60-145	77-188	90-215	103-272	140-357	180-487	302-634	-
	d_5	48-71	62-83	62-83	80-125	80-125	98-160	130-200	160-250	190-315	230-400	276-500	345-630	468-800	-
2-piece jaws	d_1	-	-	-	3-50	-	3-64	4-90	5-118	10-131	10-180	20-235	30-335	150-482	250-600
	d_2	-	-	-	34-76	-	42-97	50-130	58-165	65-182	72-228	120-410	140-590	252-736	350-1080
	d_3	-	-	-	75-118	-	88-146	105-190	125-235	145-265	165-329	200-485	210-665	328-812	430-1150
	d_4	-	-	-	52-96	-	62-121	72-156	86-197	103-226	127-294	110-400	120-570	240-724	425-1070
	d_5	-	-	-	95-125	-	115-160	133-200	160-250	190-315	230-400	190-500	200-630	316-800	500-1150
6-jaw scroll chucks															
Solid jaws	d	-	-	-	35	-	42	55	76	103	136	190	252	-	-
	d_1	-	-	-	6-43	-	8-64	8-90	12-118	12-131	15-202	30-235	40-335	-	-
	d_2	-	-	-	34-68	-	47-100	55-135	68-174	82-200	95-280	132-335	175-467	-	-
	d_3	-	-	-	74-100	-	68-154	121-202	150-256	178-299	213-400	270-474	340-630	-	-
	d_4	-	-	-	42-78	-	52-107	64-145	82-188	95-215	140-308	152-361	192-487	-	-
	d_5	-	-	-	83-120	-	102-160	132-200	165-250	192-315	232-400	291-500	358-630	-	-
2-piece jaws	d_1	-	-	-	6-43	-	8-64	8-90	12-118	12-131	15-202	30-235	40-335	-	-
	d_2	-	-	-	33-70	-	45-97	52-130	68-174	68-182	73-252	135-413	150-585	-	-
	d_3	-	-	-	76-119	-	92-146	109-190	150-256	150-265	169-353	210-489	220-661	-	-
	d_4	-	-	-	50-87	-	67-121	74-156	82-188	108-226	132-296	121-402	132-555	-	-
	d_5	-	-	-	94-125	-	118-160	134-200	164-250	153-315	236-400	197-478	210-630	-	-

Gripping ranges for independent chucks and self-centering individually adjustable scroll-chucks (Fig. 15, Table 5)

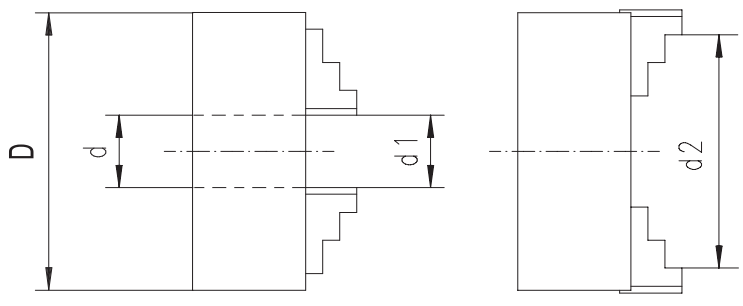


Fig. 15

Table 5

Chuck size D	85	100	125	150	160	200	250	315	350	400	500	630	800	915	1000	1250
d_1 min	3	3	8	8	8	10	10	15	15	20	45	50	50	80	250	250
d_2 min	85	100	125	150	160	200	250	315	350	400	500	630	800	915	1000	1250
d	25	25	26	42	42	45	60	75	75	95	120	155	195	190	190	190

2.7 Operation

General directions

1. For scroll chucks it is recommended to grip workpieces by selecting jaw faces which are the closest match to the size of the workpiece.
2. With a 4-jaw independent chucks it is recommended to grip by using jaw types which locate screws to give the best possible jaw positioning for the workpiece.
3. When assembling 2-piece reversible jaws: To reduce the “play” at the tenon and slot joint of the jaws, take the top jaws off the chuck and then clamp jaws together using screws.
4. The workpiece being gripped should align to jaw faces as much as possible.
5. Longer workpieces should be machined with an appropriate steady.
6. If the jaw movement appears stiff or more difficult than usual; disassemble to to investigate the problem, remedy the fault and rebuild the jaws.
7. DO NOT use any form of hammering force for fixing the jaws!
8. DO NOT use any extension pipe to lengthen the fixing wrench to exert more force!

Maintenance procedure

It is recommended, at least once a week, to remove the jaws from the chuck body; clean the working surfaces (guides, teeth, and threads in the case of independently set jaws) and lubricate them with grease according to Table 6.

In the case of heavy operating conditions of scroll chucks it is recommended to lubricate them with machine oil type „16” through the lubricating nipple located on the chuck body face, every 8 hours.

NOTE: DO NOT clean the chuck with compressed air as it is extremely dangerous and can send fragments into eyes and skin at high speed.

Table 6

Item	Grease brand	Lubrication area
1	GLEITMO - 805	Jaw and body guides, jaw teeth, scroll, body hub, feed screws for the chucks with independent jaw setting
2	Machine grease 2	Toothing of scroll and toothed wheel

An inspection should be performed at least every 6 months and any minor reduction of the jaw gripping force should be taken into consideration.

At least once a year the chuck should be removed from the spindle and disassembled. Thoroughly clean and inspect all parts. Replace all worn out and damaged parts. Lubricate all working surfaces according to directions contained in Table 6 and reassemble the chuck.

In case of a shortage of grease (item 1, Table 6) or equivalent, it is permitted to lubricate all the working surfaces with the machine grease type 2.

NOTE: Jaws and guides in the scroll-chuck bodies are marked with sequential numbers. When assembling the chuck, jaws must be screwed into the guides marked with the same number.

Example: Jaw no. 1 must be inserted in the guide no. 1.

2.8 Clamping force

Jaw clamping force

Clamping forces in Table 7 are with the jaws lubricated according to the directions contained under item 2.7.

Table 7

Chuck size	80	100 110	125 140	160	200	250	315	400	500	630	800	1000
Wrench torque (Nm)	35	50	75	120	160	180	200	280	360	460	500	500
Total jaw force (daN)	1000	1700	2400	3100 2400*	3700 2900*	4600 3600*	5500 4400*	6500 4900*	7200	8000	9000	11500

* relates to type 3105 chucks

2.9 Admissible revolutions

Admissible revolutions of the chuck depend on many factors, such as cutting parameters, weight of the workpiece and its balance or type of machining (interrupted or continuous turning) etc.

Admissible revolutions for self-centering scroll chucks (Table 8)

Values of admissible revolutions presented in Table 8 relate to „Pz" values determined for workpieces of symmetrical shape and under continuous turning.
In case of a change of any condition, the value of admissible revolutions should be revised. For example, in case of increasing of „Pz" value or any of the other parameters, admissible operating speeds should be reduced accordingly.

Table 8

Chuck type	Admissible operating parameters	Chuck size D (mm)											
		80	100 110	125	140 160	200	250	315 350	400	500	630	800	1000
35** 37**	Pz (DaN)	10	15	20	25	30	40	50	60	70	80	-	
	n max (RPM)	6000	5200	4800	4500	4000	3500	2800	2000	1200	1000	-	
	Pz' (DaN)	30	60	80	100	120	160	180	240	300	320	500	
	n' max (RPM)	4200	3800	3500	3200	2800	2500	2000	1300	1000	700	500	
	Pz" (DaN)	80	150	200	250	350	400	500	600	700	900	1400	
	n" max (RPM)	1900	1700	1600	1500	1200	1000	800	500	400	300	250	
3105 [1] 32** 36** [1]	Pz'(DaN)	30	60	80	100	120	160	180	240	300	320	500	700
	n' max (RPM)	4000	3500	3200	3000	2500	2000	1500	1000	700	500	300	300
	Pz" (DaN)	80	150	200	250	350	400	500	600	700	900	1400	1650
	n" max (RPM)	1700	1600	1500	1400	1200	1100	700	400	300	250	250	250
3565	n max (RPM)	-	4200	3800	3500	3100	2700	2200	1800	1400	1000	-	
3865	n max (RPM)	-	-	3000	2500	2200	1900	1500	1300	900	500	-	
38**	n max (RPM)	-	-	-	-	-	-	-	-	-	-	250	-

Pz - cutting force
n - admissible revolutions
Pz, n - precision machining
Pz', n' - medium-precision machining
Pz", n" - rough machining
[1] - for chucks type 3105, 36**, the values of Pz' and Pz'' should be decreased by 50%

Admissible revolutions for independent chucks (Table 9)

For finishing machining and workpieces symmetrically clamped in the chuck, admissible operating speeds are given in Table 9. For rough machining shown, RPM values should be reduced accordingly.

Table 9

Chuck size												
85	100	125	160	200	250	315 350	400	500	630	800	915 1000	1250
n_{max} (RPM) cast iron body												
-	-	-	-	1800	1500	1200	800	500	400	300	150	100
n_{max} (RPM) steel body												
4000	3800	3500	3200	2500	2000	1500	1100	700	550	450	200	150

Admissible revolutions for self-centering and individually adjustable scroll chucks (Table 10)

For finishing machining and workpieces symmetrically clamped in the chuck, admissible operating speeds are given in Table 10.

Table 10

Chuck type	Chuck size					
	200	250	315	400	500	630
	n (RPM)					
4505	2500	2000	1500	1000	500	350
4605	2000	1300	1500	1000	500	350
4705	3000	2500	2000	1500	1000	750
4805	2500	2000	1700	1500	1000	750

2.10 Admissible weight of the workpieces

Admissible chuck load based on the weight of the gripped workpieces depends on many factors; such as machining parameters, particularly the way of clamping the workpieces in the chuck.
The admissible weights of workpieces should be considered as reference data only. The variety of chucking and machining methods makes the accuracy of such values impossible.
During machining a lot of special conditions occur for which the data has to be corrected by an experienced operator. However, it should be possible for the user who has the approximate data to determine safe and suitable working conditions.

Admissible weight of the workpieces for self-centering scroll chucks

To simplify the approach to this problem without including the effects of cutting/turning forces and inertia forces of spinning workpieces onto chuck load; the following guide should help to determine the maximum weights of the workpieces loading the chuck.

a) With the workpiece unsupported in outside jaws and with all the teeth of the jaws in mesh with the scroll plate, see Table 11 and Fig. 16

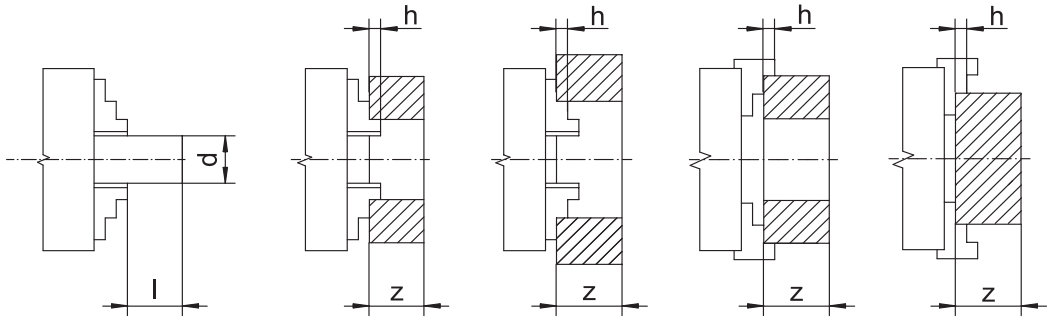


Fig. 16

Table 11

Chuck size (mm)	80 85	100 110	125 140	160	200	250	315 350	400	500	630	800	915	1000	1250
l	1,2 d						1,5 d			1 d		0,5 d		
Weight (kg)	0,6	1	2	3	6	10	20	40	90	150	400	500	600	700

l - max. length of the workpiece projection outside the jaws
d - diameter of the workpiece being clamped in the jaws

b) With the workpiece unsupported in inside jaws and with all the teeth of the jaws in mesh with the scroll plate, see Table 12

Table 12

Chuck size (mm)	80 85	100 110	125 140	160	200	250	315 350	400	500	630	800	915	1000	1250
z	4 x h													
Weight (kg)	1,5	2,5	4	7	15	25	40	70	130	240	400	550	700	850

z - max. length of the workpiece projection outside the jaws
h - height of jaw step

c) With the workpiece supported by revolving center or clamped in two chucks, see Table 13

Table 13

Chuck size (mm)	80 85	100 110	125 140	160	200	250	315 350	400	500	630	800	915	1000	1250
Weight (kg)	40	60	100	150	250	500	1000	2500	4000	6000	8000	9000	11000	12500

Admissible weight of the workpieces for independent chucks

The following method cases of clamping workpieces are acceptable:

a) With the workpiece unsupported in the jaws and with all the teeth of the jaws in mesh with the scroll plate, see Table 14

Table 14

D	85	100	125	160	200	250	315	400	500	630	800	915	1000	1250
z	4 x h													
Weight (kg)	1,5	2,5	4	7	15	25	40	70	130	140	400	550	700	850

z - max. length of the workpiece projection outside the jaws
h - height of the jaw step

b) With the workpiece supported by the revolving center or clamped in two chucks, see Table 15

Table 15

Chuck size (mm)	85	100	125	160	200	250	315	400	500	630	800	915	1000	1250
Weight (kg)	15	50	150	250	600	1000	1500	3000	4500	6500	8500	9500	11500	13000

2.11 Permissible centering accuracy values

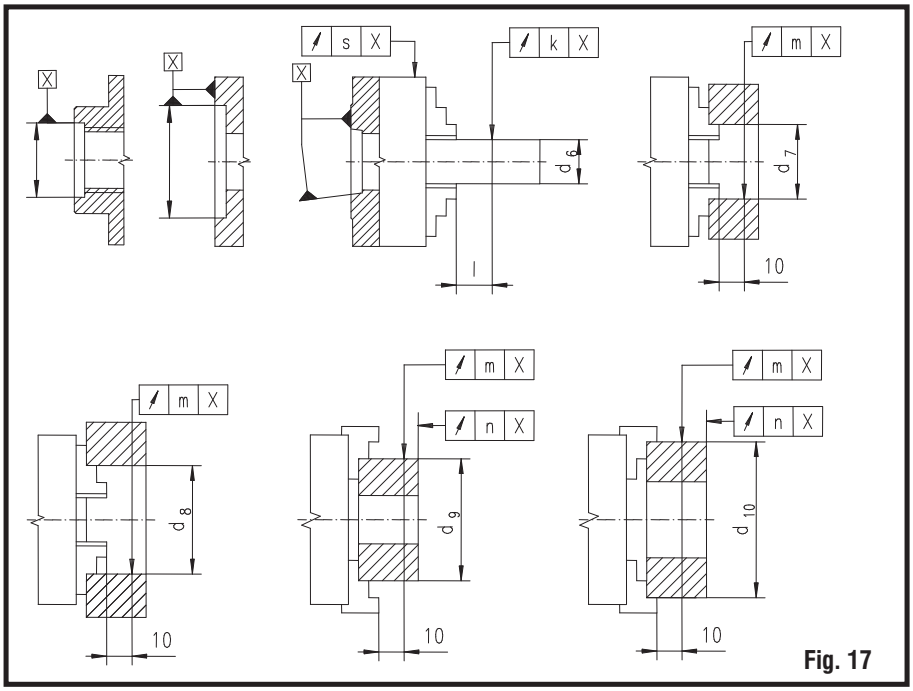


Fig. 17

Table 16

3274	
Chuck size D	80 85
l	40
d_6	10
	14
d_7	40
d_8	60
d_9	35
d_{10}	80
k	0,04
m	0,075
n	0,04

Table 16

32** - 36**												
Chuck size D	80 85	100 110	125 140	160	200	250	315	400	500	630	800	1000
l	40	40	60	60	80	80	120	120	160	160	160	160
d_6	10	10	18	18	30	30	53	53	75	75	160	250
	-	14	25	30	40	53	75	100	100	125	200	315
	14	18	30	40	53	75	100	125	125	160	-	400
d_7	40	40	50	50	80	80	125	125	200	200	325	500
d_8	60	75	100	135	162	200	252	282	282	325	400	630
d_9	35	50	62	88	96	150	210	250	300	400	400	500
d_{10} solid jaws	63	80	100	100	160	160	250	250	400	400	400	-
d_{10} 2-piece jaws	-	-	120	150	185	225	300	350	400	400	400	630
k	0,030		0,030		0,040		0,050	0,060	0,100		0,150	
m	0,025		0,035		0,045		0,055	0,065	0,100		0,150	
n	0,015		0,020		0,025		0,030	0,030	0,050		0,060	
s	0,020		0,030		0,040		0,050	0,060	0,100		0,150	

Table 17

35** - 37**												
Chuck size D		**80**	**100**	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**
l		40	40	60	60	80	80	120	120	160	160	160	160
d_6		10	10	18	18	30	30	53	53	75	75	160	250
		-	14	25	30	40	53	75	100	100	125	200	315
		14	18	30	40	53	75	100	125	125	160	-	400
d_7		40	40	50	50	80	80	125	125	200	200	325	500
d_8		60	75	100	135	162	200	252	282	282	325	400	630
d_9		35	50	62	88	96	150	210	250	300	400	400	500
d_{10} solid jaws		63	80	100	100	160	160	250	250	400	400	400	500
d_{10} 2-piece jaws		-	-	120	150	185	225	300	350	400	400	400	630
k s	Class I	0,010		0,015		0,020		0,025	0,030	0,050	0,070	-	-
	Class II	0,020		0,030		0,040		0,050	0,060	0,100	0,100	0,150	0,150
m	Class I	0,013		0,018		0,023		0,028	0,033	0,055	0,075	-	-
	Class II	0,025		0,035		0,045		0,055	0,065	0,100	0,100	0,150	0,150
n	Class I	0,008		0,010		0,013		0,015	0,015	0,030	0,050	-	-
	Class II	0,015		0,020		0,025		0,030	0,030	0,050	0,050	0,060	0,060

3. INCLUDED IN CARTON

Table 18

	3105	**3204 3214 3234 3244 3274 3504 3514 3534 3544 3574 3504-I 3514-I 3534-I 3544-I 3574-I**	**3205 3215 3235 3245 3275 3505 3515 3535 3545 3575 3505-I 3515-I 3535-I 3545-I 3575-I**	**3604 3614 3634 3644 3674**	**3605 3615 3635 3645 3675**	**3704 3714 3734 3744 3774**	**3705 3715 3735 3745 3775**	**3804 3806**	**3805 3807**
Chuck	•	•	•	•	•	•	•	•	•
Hard outside solid jaws (sets)		•		•		•		•	
Hard inside solid jaws (sets)		•		•		•		•	
Hard 2-piece reversible jaws (sets)			•		•		•		•
Soft 2-piece jaws (set)	•								
Mounting screws	•	•	•	•	•	•	•	•	•
Wrench	•	•	•	•	•	•	•	•	•
Instruction manual	•	•	•	•	•	•	•	•	•
Quality certificate	•	•	•	•	•	•	•	•	•

Table 19

	3264	3265	3564	3565	3864	3865
Chuck	•	•	•	•	•	•
Hard outside solid jaws (sets)	•		•		•	
Hard inside solid jaws (sets)	•		•		•	
Hard 2-piece reversible jaws (sets)		•		•		•
Mounting screws	•	•	•	•	•	•
Wrench	•	•	•	•	•	•
Instruction manual	•	•	•	•	•	•
Quality certificate	•	•	•	•	•	•

Table 20

	4505	4605	4705	4805
Chuck	•	•	•	•
Hard solid jaws (sets)	•	•	•	•
Hard master jaws (sets)	•	•	•	•
Mounting screws	•	•	•	•
Wrench	•	•	•	•
Instruction manual	•	•	•	•
Quality certificate	•	•	•	•

4. LIST OF SPARE PARTS

NOTE: When ordering spare parts for the chuck being used, be sure to specify chuck serial number, year of manufacture,, part number, product name and quantity needed.

List of spare parts for self-centering scroll chucks

Table 21

Part name	No. of pcs per chuck			
	2-jaw	3-jaw	4-jaw	6-jaw
Scroll plate	1	1	1	1
Pinion	2	3	2	3
Stud-bolt	2	3	2	-
Wrench	1	1	1	1
Hard inside solid jaw	-	3	4	6
Hard outside solid jaw	-	3	4	6
Master jaw	2	3	4	6
Hard top jaw	-	3	4	6
Soft top jaw	2	3	4	6
Soft solid jaw	-	3	4	6
Sleeve bearing*	-	3	4	6
Locking half ring**	-	3	4	6
Hard 2-piece jaw	-	3	4	6
Soft 2-piece jaw	2	3	4	6

* for Ø80 chuck 1 pcs of each only

** for chuck 35**, 37**, 38** type

List of spare parts for independent chucks

Table 22

Part name	No. of pcs per chuck
Operating screw	4
Holder	4
Solid jaw	4
Master jaw	4
Hard top jaw	4
Wrench	1

List of spare parts for self-centering and individually adjusted scroll chucks

Table 23

Part name	No. of pcs per chuck	
	4505, 4705	4605, 4805
Operating screw	3	4
Scroll plate	1	1
Solid jaw	3	4
Master jaw	3	4
Wrench	1	1

5. GENERAL TERMS AND CONDITIONS OF WARRANTY

The product you have purchased is covered with a warranty, which is part of the service we provide to our dear Customers. Please take time to carefully familiarize yourself with the warranty conditions listed below:

1. BISON-BIAL S.A. guarantees a smooth operation of the purchased product in the period of 12 months from the date of purchase. If the purchased product has been successfully registered on the Internet website www.bison-bial.com the warranty period may be prolonged up to 24 months from the date of purchase.
2. The warranty covers defects resulting from causes inherent in the sold product.
3. The Buyer may take advantage of the rights arising from this Warranty on the following conditions:
   1) Presenting the proof of purchase
   2) Submitting the faulty product.
4. The Warranty covers only products assembled and used in accordance with the Manual.
5. Should a fault become evident in the warranty period the Customer is asked to:
   1) Notify BISON-BIAL S.A. by completing the special form provided on the internet website of BISON-BIAL S.A. in the tab "Complaints", subject to the provisions of point 18 of the General Warranty Conditions, or
   2) Notify BISON-BIAL S.A. in writing via mail, fax or email sent to the following email address: qualitycontrol@bison-bial.com.
6. The Buyer is obliged to include in the complaint notification the type and size of the purchased product and its serial number, describe the defect of the product or how the damage occurred. The notification must be attached with the invoice under which the product was purchased.
7. Before submitting the product to BISON-BIAL S.A. the Buyer is obliged to clean, preserve, and secure the product against damage and destruction that may occur during transport. This also applies to cases when the product is submitted to BISON-BIAL S.A. through third parties.
8. The notified complaint will be processed under the condition of returning the product in its original packaging with its complete equipment and all the documents (Manual and Quality Certificate).
9. The notified complaint will be processed within 30 days from the date of submitting the product to BISON-BIAL S.A. However, should there be a need to conduct necessary tests or expert's studies, or should it be impossible to correct the notified defects for reasons beyond the control of BISON-BIAL S.A. other than the ones indicated above, the aforementioned period shall be extended by the time necessary to correct the defects.
10. If the Buyer's complaint, as referred to in point 9 of the General Warranty Conditions, is classified as reasonable, BISON-BIAL S.A. shall correct the defect within 21 days from the date on which the complaint was recognized as reasonable, subject to the provisions of point 11 of the General Warranty Conditions. The time of correcting the defect may be prolonged should it be impossible to correct the recognised defect for reasons beyond the control of BISON-BIAL S.A.
11. The Buyer is entitled to have the product replaced with a new one if:
    1) There have been five in-warranty repairs done during the Warranty Period of BISON-BIAL S.A.;
    2) It is impossible to correct the defect;
    3) BISON-BIAL S.A. does not correct the defect within the time limit specified in point 10 of the General Warranty Conditions,

    subject to the provisions of point 13 of the General Warranty Conditions.
12. BISON-BIAL S.A. shall replace the product with a new one or provide the Buyer with a refund within a period agreed on with the Buyer; but not longer than 90 days from the date on which one of the conditions specified in point 11 of this General Warranty Conditions occurred.
13. Rights arising from the Warranty may be lost should the following conditions occur:
    1) Improper use of the products, use of the products not in compliance with their purpose, instalment and exploitation as well as a maintenance not compliant with the principles included in the Manual.
    2) The product has been repaired at an unauthorised service point;
    3) The Buyer has had arbitrary changes made to the construction of the product or had the product modified;
    4) The product has been used with non-original spare parts or equipment other than the original one.
    5) Use of consumables – lubricants or oils – other than the ones recommended in the Manual to BISON-BIAL S.A. products.

14. Should the notified complaint on a defect appear groundless, BISON-BIAL S.A. has the right to charge the Buyer with the costs of return and delivery of the product, as well as with the costs of the control tests.
15. BISON-BIAL S.A. shall not be held responsible for the consequences of the use of its products in ways incompatible with their purpose, the use of its products after modifications and contrary to the provisions included in the Manual.
16. The court competent to solve any disputes arising in relation to the sale of the products is the court of competent venue for BISON-BIAL S.A.
17. The fact that the Buyer has exercised his warranty rights does not result in the transfer of the ownership of the product to BISON-BIAL S.A.
18. The warranty on the product sold does not exclude, limit or suspend any rights of the Buyer that result from the nonconformity of goods with the contract as referred to in the Act of 27th July 2002 on special conditions of consumer selling and on amending the Civil Code (Dziennik Ustaw [Journal of Laws] No. 141, item 1176 as amended).
19. The provisions of this Rules and Regulations regulating the rights or obligations of the Customer in a manner contrary to or inconsistent with the rights of consumers arising from the generally applicable laws or adversely affecting consumers' interest do not apply to consumers. This applies in particular to point 16 of the General Warranty Conditions.