

INSTRUCTION MANUAL
No 001 903

HAND-OPERATED LATHE CHUCKS

READ INSTRUCTIONS!



1. SCOPE OF MANUAL

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

- 2-jaw, 3100 type scroll chucks
- 3-jaw, 3200, 3300 type self-centering standard scroll chucks
- 3-jaw, 3500 type precision self-centering scroll chucks
- 3-jaw, 3564, 3565 type super precision self-centering scroll chucks with fine adjustment
- 3-jaw 3264, 3265 type super precision self-centering scroll chucks with fine adjustment
- 4-jaw, 3600 type self-centering standard scroll chucks
- 4-jaw, 3700 type precision self-centering scroll chucks
- 6-jaw, 3864, 3865 type super precision self-centering scroll chucks with fine adjustment
- 4-jaw, 4300 type independent chucks
- 3-jaw, 4500, 4700 type self-centering and individually adjustable scroll chucks
- 4-jaw 4600, 4800 type self-centering and individually adjustable scroll chucks
- 6-jaw, 3800 type self-centering standard scroll chucks.

2. APPLICATION

Lathe chucks are purposed for holding the workpieces on lathes or grinders. They can also be used as an accessory of the index heads or other devices.

3. CONSTRUCTION OF CHUCKS

3.1. Construction of the scroll chucks

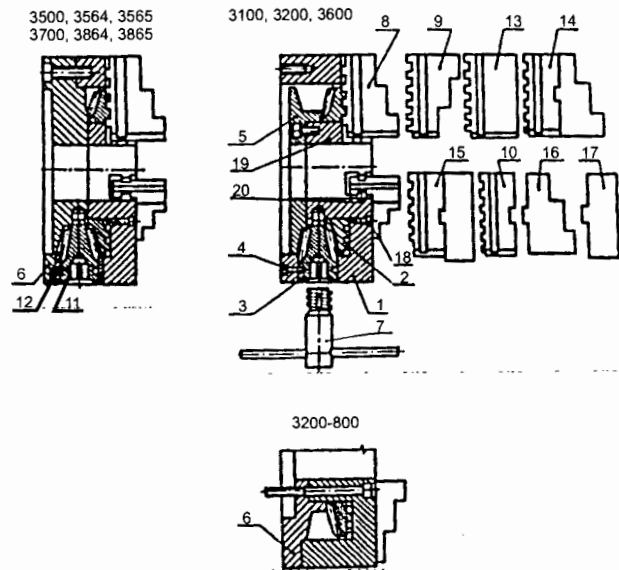


Fig. 1

- 1 - body, 2 - scroll plate, 3 - pinion, 4 - stud bolt, 5 - cover,
 6 - driver plate, 7 - wrench, 8 - outside solid jaw, 9 - inside solid jaw,
 10 - master jaw, 11 - sleeve bearing, 12 - locking half-ring, 13 - soft solid jaw,
 14 - hard sectional jaw, 15 - soft sectional jaw, 16 - hard top jaw, 17 - soft top jaw,
 18 - lubricant fitting, 19 - hub, 20 - guide

3.2. Construction of 4-jaw independent chuck

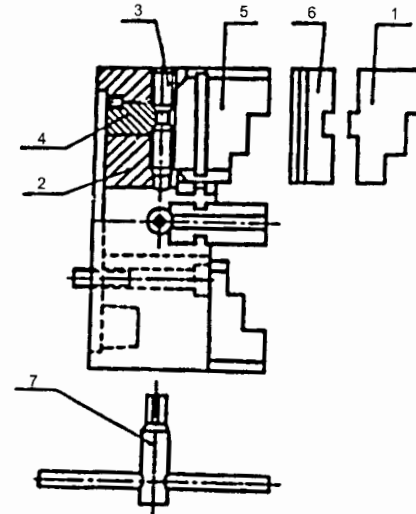


Fig. 2

- 1 - hard top jaw, 2 - body, 3 - operating screw, 4 - holder, 5 - solid jaw,
 6 - master jaw, 7 - wrench

3.3. Construction of 3-and 4-jaw self-centering and individually adjustable scroll chuck

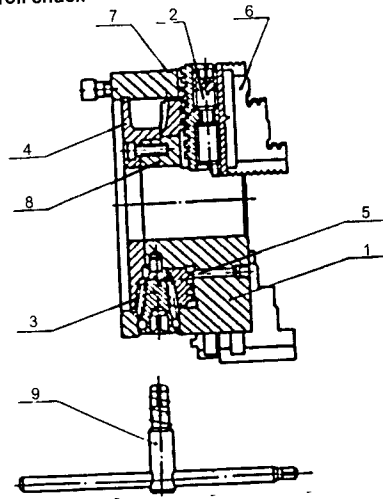


Fig. 3

1 - body, 2 - operating screw, 3 - pinion, 4 - cover, 5 - scroll plate, 6 - solid jaw, 7 - master jaw, 8 - hub, 9 - wrench

Note!
Screw (2) may only be used for moving the jaws (6) independently one to another. Rotating the pinion (3) with wrench (9) results in advancement of jaws (6) by the same stroke.

4. OPERATING DIRECTIONS

4.1. Preparation the chuck for fitting
Having the chuck removed from its package check completeness of delivery, then remove the preservative from all surfaces except the

surfaces of guides in jaws and body. Chuck seat and jaw gripping surfaces should be cleaned particularly carefully.

4.2. Fitting the chuck on the machine tool

4.2.1. Fitting 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 and ANSI B.5.9.

The chuck should be mounted on the spindle nose which accuracy conditions are presented in Fig. 4 and Table 1.

In case of chucks with 7:24 taper tighten the nut provided on the spindle nose. While fitting the chucks with 1:4 taper pay attention to make the chuck seat on conical surface and then tightened against face surface.

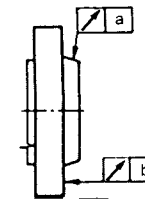


Fig. 4

Table 1

| Chuck | Index | Chuck size | | | | | | | | | | | | |
|-------|-------|------------|---------|-----|-------|------|-------|-----|-----|-----|-----|-----|------|------|
| | | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 400 | 500 | 630 | 800 | 1000 | 1250 |
| | | 85 | 110 | | 140 | | | 350 | | | | | 915 | |
| 3500 | a, b | 0,003 | | | | | 0,005 | | | | | | | |
| 3200 | | 0,003 | | | 0,005 | | | | | | | | | |
| 4300 | a | 0,003 | r 0,005 | | | 0,01 | | | | | | | | |
| | b | 0,003 | 0,005 | | | | | | | | | | | |

4.2.2. Fitting the chuck with plain back mounting

The chuck with plain back mounting is mounted on the spindle nose via adapter. These chucks are primarily intended for threaded spindle noses. Connection dimensions of adapters are given in Figs. 5 + 7 and Tables 2 + 3. Centering surfaces of the adapters should be fayed against the chuck body with the clearance the smallest possible.

Admissible runout of "A" and "B" adapter surfaces (Fig. 5 and 7) for chucks within diameters range is:

- ∅ 80 - ∅ 160 - 0,003 mm
- ∅ 200 - ∅ 800 - 0,005 mm

Note!

After having mounted the chucks of diameter exceeding 400 on the adapter, remove the transport eye screw from the chuck body.

4.2.2.1. Adapters for scroll chucks

a) ∅ 80 - 630 chucks

Table 2

| Chuck size D | D ₁ | D ₂ | d ₁ | d ₂ | h _{min} | c | N° 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 | 12,3 | 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 | |

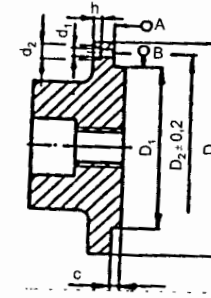


Fig. 5

b) ∅ 800 chuck

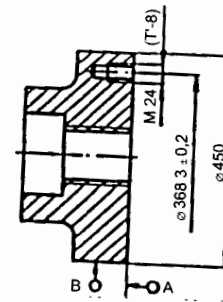


Fig. 6

Adapter for chuck mounting on threaded spindle nose.

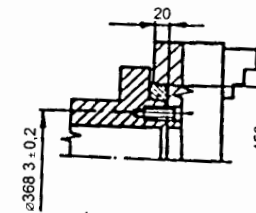


Fig. 7

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

4.2.2.2. Adapters for 4-jaw independent chucks

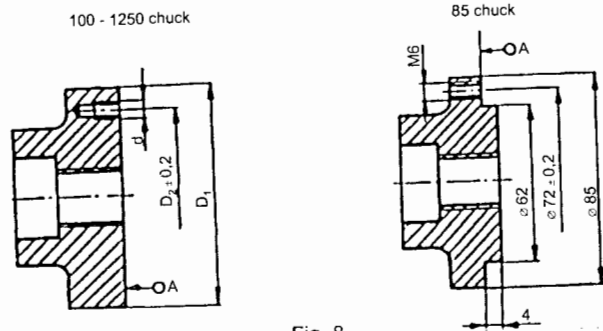


Fig. 8

Table 3

| Chuck size D | D ₁ | D ₂ | d | Number of holes d |
|--------------|----------------|----------------|-----|-------------------|
| 100 | 79,38 | 54,00 | M8 | 4 |
| 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 | |
| 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 | 8 |
| 915 | 370,00 | 330,00 | M24 | |
| 1000 | 370,00 | 330,00 | M24 | |
| 1250 | 550,00 | 500,00 | M24 | |

4.2.3. Fitting the precision chuck with fine adjustment (Fig. 9)

Mount the chuck on the adapter (1) and slightly tighten all the screws connecting the chuck and adapter (3).

In order to obtain the desired chuck setting accuracy, grip the workpiece with jaws on their entire length and fix securely. Tighten the adjusting screws (2) to the slight contact with the adapter. Place the indicator on workpiece about 60 mm from the jaws and rotate the chuck.

Determine maximum and minimum points on indicator and location of the nearest adjusting screws.

Rotate the chuck to the nearest adjusting screw of maximum indicator point and slightly unscrew it. Rotate to the oppositely located adjusting screw and screw it in by a half of the TIR error.

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

Use the ground bar stock for setting to obtain maximum accuracy.

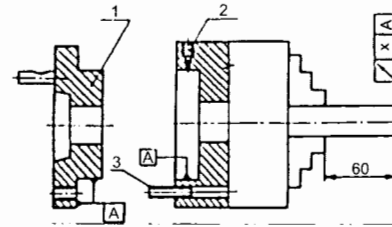


Fig. 9

4.2.4. Fitting 3264 and 3265 type standard chuck with fine adjustment (fig. 10)

Mount the chuck on adapter (1) and tighten all screws (2) connecting the chuck with the plate. Slightly loosen screws (5) connecting the chuck body and driver (3). In order to obtain the required accuracy of the chuck, grip the workpiece with jaws on their entire length and fix securely. Tighten the taper adjusting screws (4) to the slight contact with the adapter (3). Place the indicator on workpiece about 60 mm from the jaws and rotate the chuck.

Determine maximum and minimum points on indicator and location of the nearest and location of respective nearest adjusting screws.
 Rotate the chuck to the nearest adjusting screw for the location of maximum indicator point and unscrew it slightly. Rotate the chuck to the oppositely located adjusting screws and screw them in by 1/3 of TIR error. In case the location of maximum indicator point is placed in-between two adjusting screws, the chuck should be rotated to the oppositely located adjusting screw which should be screwed in by half of the TIR error.
 Repeat these steps until the required accuracy is reached and all adjusting screws are equally tightened. Having the adjustment completed tighten the screws connecting chuck and adapter.

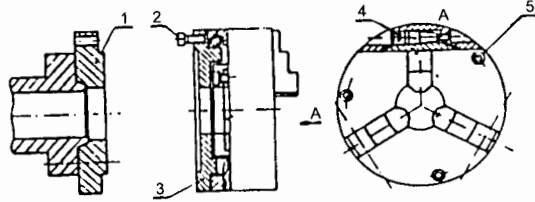


Fig. 10

4.3. Gripping ranges

4.3.1. For 3- and 4-jaw scroll chucks (Table 4, Fig. 11)

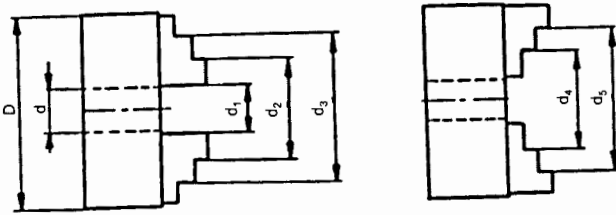


Fig. 11

Table 4

| Chuck size | 80 | 100 | 110 | 125 | 140 | 160 | 200 | 250 | 315 | 400 | 500 | 630 | 800 |
|---|----------------------|--------|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 3- and 4-jaw scroll chucks | | | | | | | | | | | | | |
| d | 15 | 20 | 27 | 32 | 40 | 42 | 55 | 76 | 103 | 136 | 190 | 252 | 320 |
| Solid jaws | d ₁ 2-27 | 3-33 | 3-33 | 3-50 | 3-64 | 4-90 | 4-90 | 5-118 | 10-131 | 10-180 | 20-235 | 30-335 | 150-482 |
| | d ₂ 22-46 | 25-56 | 25-56 | 34-74 | 42-100 | 52-135 | 62-174 | 78-200 | 85-252 | 120-335 | 140-485 | 282-814 | |
| | d ₃ 45-69 | 56-87 | 56-87 | 72-115 | 94-154 | 120-202 | 145-256 | 172-289 | 210-380 | 245-476 | 325-630 | 448-780 | |
| | d ₄ 25-50 | 32-62 | 32-62 | 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 | 98-160 | 130-200 | 160-250 | 190-315 | 230-400 | 276-500 | 345-630 | 468-800 | |
| Sectional jaws | d ₁ | 3-50 | | 3-64 | 4-90 | 5-118 | 10-131 | 10-180 | 20-235 | 30-235 | 150-482 | | |
| | d ₂ | 34-76 | | 42-97 | 50-130 | 58-165 | 66-182 | 72-228 | 120-410 | 140-590 | 252-736 | | |
| | d ₃ | 75-118 | | 88-146 | 105-190 | 125-235 | 145-265 | 165-329 | 200-485 | 210-685 | 328-812 | | |
| | d ₄ | 52-96 | | 62-121 | 72-156 | 86-197 | 103-226 | 127-294 | 110-400 | 120-570 | 240-724 | | |
| | d ₅ | 95-125 | | 115-160 | 133-200 | 160-250 | 190-315 | 230-400 | 190-500 | 200-630 | 316-800 | | |
| 6-jaw scroll chuck with fine adjustment | | | | | | | | | | | | | |
| d | 35 | | | 42 | 55 | 76 | 103 | 136 | 190 | 252 | | | |
| Solid jaws | 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 | 74-110 | | 98-154 | 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 | | | |
| Sectional 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 | 86-182 | 73-252 | 135-413 | 150-685 | | | |
| | d ₃ | 76-119 | | 92-146 | 105-190 | 150-256 | 169-353 | 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 | | | |

4.3.2. For 4-jaw independent chucks, for 3- and 4-jaw self-centering and individually adjustable scroll-chucks (Table 5, Fig. 12)

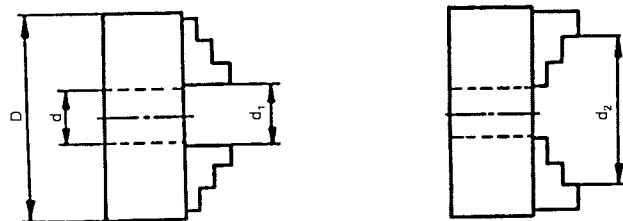


Fig. 12

Table 5

| Chuck size | 85 | 100 | 125 | 150 | 160 | 200 | 250 | 315 | 350 | 400 | 500 | 630 | 800 | 915 | 1000 | 1250 |
|------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| | mm | | | | | | | | | | | | | | | |
| d, min. | 3 | 3 | 8 | 8 | 8 | 10 | 10 | 15 | 15 | 20 | 45 | 50 | 50 | 80 | 250 | 250 |
| d, maks | 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 |

4.4. Removing chucks from the spindle noses

4.4.1. From threaded spindle noses

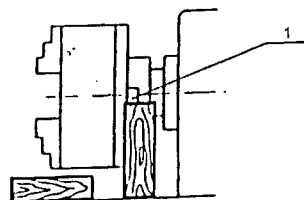


Fig. 13

During removing the chuck its necessary:

- screw the bolt (1) into threaded hole provided in the adapter,
- support the bolt with soft metal or wooden block,
- turn on the lowest reverse operating speed and loosen the adapter on its thread,
- unscrew the chuck by hand.

During the unscrewing, put under the chuck a wooden protecting board.

Note:

1. Chuck should not be unscrewed by directly hitting the jaws.
2. During removing the chucks larger then $\varnothing 400$ an eye-screw should be screwed into the chuck body and suitable hoisting crane should be employed for removing the chuck from the machine tool.

4.4.2. From the tapered spindle noses

During removing the chuck its necessary to:

- secure the spindle against rotation
- screw in the fixing element
- remove the chuck from the spindle nose.

During the removing put under the chuck a wooden protecting board.

4.5. Chuck maintenance

4.5.1. Recommended greases

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 | Toothings of scroll and toothed wheel |

Another grease brands can be used providing their properties are not worse than of these given in Table 6.

4.5.2. 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 thread in case of independently set jaws) and lubricate them with greases according to Table 6, item 4.5.1.

In case of particularly heavy operating conditions of scroll chucks it is recommended to lubricate them additionally with machine oil type "16" through the lubricating nipple located on the chuck body face, at least after every 8 working hours.

Note! Cleaning the chuck with the compressed air is inadmissible

4.6. Surveys of the scroll chucks

Depending on needs, however at least once a year the chuck should be removed from the spindle and disassembled. Thoroughly clean and inspect all parts. Replace damaged parts. Lubricate all working surfaces according to directions contained in Table 6, item 4.5, and reassemble the chuck.

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

The survey should be performed at least every 6 months and minor decrease of the jaw gripping force should be taken into consideration.

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

Example: jaw No. 1 should be inserted in the guide No. 1.

4.7. General directions

4.7.1. In the scroll chucks it is recommended to grip the workpieces on these gripping jaw surfaces which location that ensure the scroll being in mesh with the jaw.

4.7.2. In 4-jaw independent chucks it is recommended to grip on these gripping surfaces which location in relation with screws ensures greatest possible number of working thread turns.

4.7.3. When assembling the sectional jaws be sure to remove the clearance in the jointing lock, by moving the top jaw outside to the master jaw.

4.7.4. The workpiece being gripped should be facing against face surfaces of jaws.

4.7.5. Longer workpieces should be machined with steady.

4.7.6. In case of heavily performance of the chuck, the jaws should be disassembled, problem found and fixed.

4.7.7. Hammering of jaws as well as using the extension pipe for fixing wrench is inadmissible.

4.8. Admissible operating parameters for scroll chucks

4.8.1. Jaw clamping force

Table 7

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

Clamping forces given in the Table 7 are being obtained with the jaws lubricated according to the directions contained under item 4.5.1.

* - relates to type 3100 chucks

4.8.2. Admissible revolutions

Table 8

| Chuck type | Admissible operating parameters | Chuck nominal size D (mm) | | | | | | | | | | |
|------------|---------------------------------|---------------------------|------------|------|------------|------|------|------------|------|------|------|------|
| | | 80 | 100 110 | 125 | 160 140 | 200 | 250 | 315 350 | 400 | 500 | 630 | 800 |
| 3500 | 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 |
| 3700 | 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 |
| 3100* | Pz' (daN) | 30 | 60 | 80 | 100 | 120 | 160 | 180 | 240 | 300 | 320 | 500 |
| 3200 | n' max (rpm) | 4000 | 3500 | 3200 | 3000 | 2500 | 2000 | 1500 | 1000 | 700 | 500 | 300 |
| 3600* | Pz'' (daN) | 80 | 150 | 200 | 250 | 350 | 400 | 500 | 600 | 700 | 900 | 1400 |
| | n'' max (rpm) | 1700 | 1600 | 1500 | 1400 | 1200 | 1100 | 700 | 400 | 300 | 250 | 250 |
| 3560 | n max (rpm) | - | 4200 | 3800 | 3500 | 3100 | 2700 | 2200 | 1800 | 1400 | 1000 | - |
| 3860 | n max (rpm) | - | - | 3000 | 2500 | 2200 | 1900 | 1500 | 1300 | 900 | 500 | - |
| 3800 | n max (rpm) | - | - | - | - | - | - | - | - | - | - | 250 |

Pz - cutting force
n - admissible revolutions
Pz, n - precision machining
Pz', n' - medium - precision machining
Pz'', n'' - rough machining

* - for chucks type 3100, 3600, the values of Pz' and Pz'' should be decreased by 50%

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

Values of admissible revolutions presented in Table 8 relate to Pz value determined for the workpieces of symmetrical shape and under continuous turning.

In case of 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 decreased accordingly.

4.8.3. Conditions of clamping the workpieces

Admissible weight of the workpieces.

Admissible chuck load coming from the weight of the gripped workpieces depends on many factors such as machining parameters, and particularly the way of clamping the workpieces in the chuck.

To simplify the approach to this problem i.e. without including the effects of cutting 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, acc. to Table 9 and Fig. 14.

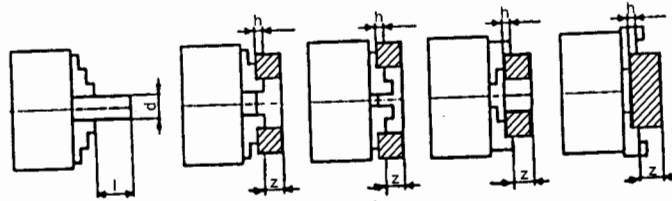


Fig. 14

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

where: 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, acc. to Table 10.

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

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

c) with the workpiece supported by means of centers or clamped in two chucks, acc. to Table 11

| Chuck size | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 400 | 500 | 630 | 800 | 915 | 1000 | 1250 |
|------------|----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-------|-------|
| | 85 | 110 | 140 | | | | 350 | | | | | | | |
| P in kgs | 40 | 60 | 100 | 150 | 250 | 500 | 1000 | 2500 | 4000 | 6000 | 8000 | 9000 | 11000 | 12500 |

where: P - load per chuck

The presented admissible weights of workpieces should be regarded as reference data only. The variety of chucking and machining methods makes the explicit stating of such values impossible. This is because during machining a lot of special cases occur for which the presented data has to be suitably corrected.

However, it should be possible for the user who has these approximate data to determine in most cases a safe and suitable working conditions.

4.9. Admissible operating speeds for 4-jaw independent chucks

For finishing machining and workpieces symmetrically clamped in the chuck, admissible operating speeds are given in Table 12.

Table 12

| Chuck size | | | | | | | | | | | | |
|-------------------------------------|------|------|------|------|------|------|------|-----|-----|-----|------|------|
| 85 | 100 | 125 | 160 | 200 | 250 | 315 | 400 | 500 | 630 | 800 | 1000 | 1250 |
| n _m (rpm) cast iron body | | | | | | | | | | | | |
| - | - | - | - | 1800 | 1500 | 1200 | 800 | 500 | 400 | 300 | 150 | 100 |
| n _m (rpm) steel body | | | | | | | | | | | | |
| 4000 | 3800 | 3500 | 3200 | 2500 | 2000 | 1500 | 1100 | 700 | 550 | 450 | 200 | 150 |

For rough machining shown rpm values should be decreased accordingly.

4.10. Admissible operating speeds for 3- and 4-jaw self-centering and individually adjustable scroll chucks, 4500, 4600, 4700 type are given in Table 13 (for cases of symmetrical clamping)

Table 13

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

4.11. Admissible weight of the workpieces

Similarly as in case of scroll chucks, the admissible weights of workpieces depends on many factors, mainly machining parameters.

Simplifying the problem, the following cases of clamping workpieces may be accepted:

a) with the workpiece unsupported in jaws and with all the teeth of the jaws in mesh with the scroll plate, acc. to Table 14.

Table 14

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

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

b) with the workpiece supported by means of centers or clamped in two chucks, acc. to Table 15.

Table 15

| D | 85 | 100 | 125 | 160 | 200 | 250 | 315 | 400 | 500 | 630 | 800 | 915 | 1000 | 1250 |
|----------|----|-----|-----|-----|-----|------|------|------|------|------|------|------|-------|-------|
| P in kgs | 15 | 50 | 150 | 250 | 600 | 1000 | 1500 | 3000 | 4500 | 6500 | 8500 | 9500 | 11500 | 13000 |

where: P - maximum load per chuck

Aforementioned data should be considered as directional ones. Variety of cases of workpieces clamping and sorts of machining does not allow for these data to be universally determined, since many particular cases arise during operation for which these data should be adjusted in view of correct processing and work safety.

5. LIST OF SPARE PARTS

5.1. For scroll chucks

Table 16

| Part No. Acc. to Fig. | Part name | No. of pcs per chuck | | | |
|-----------------------|--------------------|----------------------|-------|-------|-------|
| | | 2-jaw | 3-jaw | 4-jaw | 6-jaw |
| 2 | Scroll plate | 1 | 1 | 1 | 1 |
| 3* | Pinion | 2 | 3 | 2 | 3 |
| 4* | Stud-bolt | 2 | 3 | 2 | - |
| 7 | Wrench | 1 | 1 | 1 | 1 |
| 8 | Outside solid jaw | - | 3 | 4 | 6 |
| 9 | Inside solid jaw | - | 3 | 4 | 6 |
| 10 | Master jaw | 2 | 3 | 4 | 6 |
| 16 | Hard top jaw | - | 3 | 4 | 6 |
| 17 | Soft top jaw | 2 | 3 | 4 | 6 |
| 13 | Soft solid jaw | - | 3 | 4 | 6 |
| 11** | Sleeve bearing | - | 3 | 4 | 6 |
| 12** | Locking half-ring | - | 3 | 4 | 6 |
| 14 | Sectional hard jaw | - | 3 | 4 | 6 |
| 15 | Sectional soft jaw | 2 | 3 | 4 | 6 |

* for Ø80 chuck 1 pcs of each only

** for chuck 3500, 3700, 3800 type

5.2. For 4-jaw independent chucks

Table 17

| No. of part acc. to Fig. 2 | Part name | No. of pcs per chuck |
|----------------------------|-----------------|----------------------|
| 3 | Operating screw | 4 |
| 4 | Holder | 4 |
| 5 | Solid jaw | 4 |
| 6 | Master jaw | 4 |
| 1 | Hard top jaw | 4 |
| 7 | Wrench | 1 |

5.3. For 3- and 4-jaw self-centering and individually adjusted scroll chucks, 4500, 4600, 4700 and 4800 type.

Table 18

| No. of part acc. to Fig. 3 | Part name | No. of pcs per chuck | |
|----------------------------|-----------------|----------------------|------------|
| | | 4500, 4700 | 4600, 4800 |
| 2 | Operating screw | 3 | 4 |
| 5 | Scroll plate | 1 | 1 |
| 6 | Solid jaw | 3 | 4 |
| 7 | Master jaw | 3 | 4 |
| 9 | Wrench | 1 | 1 |

Note! When ordering spares for the chuck being operated be sure to specify chuck serial No. and year of manufacture, No. of part and part name and the quantity.

6. WORK SAFETY CONDITIONS

- Each person operating the chuck should become familiar with this manual prior to attempting to work and follow it strictly.
- In case of abnormal chuck operation or its damage, stop the work immediately and notify the supervising staff.
- Repairs and overhauls of the chuck may only be performed by suitably qualified personnel.
- Modification of wrenches delivered by the manufacturer together with chuck or usage of another wrenches is forbidden.

- Usage of wrenches which are not correctly matching the square seat in the scroll chuck pinion or screw head in the independent chucks is forbidden.
- 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 is forbidden.
- Turning on the machine tool with the wrench engaged in the chuck is forbidden.
- Except above requirements, operator should follow local industrial work safety rules.

7. ADDITIONAL INFORMATIONS

Radial runout of the control arbours being clamped in the chuck with the complete of spare jaws should not exceed values given in Table 19, otherwise these jaws should be reground at site.

Table 19

| MAXIMUM VALUES OF CONTROL ARBORS RUN-OUT* | | | | |
|---|-------|---------------------------|---|------------------|
| Chuck nominal size | | The jaws fitted in bodies | | |
| | | of new chucks | | of used chucks** |
| | | of precision type class I | of precision type class II and standard | |
| over | up to | | | |
| - | 100 | 0,045 | 0,080 | 0,100 |
| 100 | 160 | 0,060 | 0,090 | 0,100 |
| 160 | 250 | 0,070 | 0,100 | 0,150 |
| 250 | 315 | 0,090 | 0,120 | 0,150 |
| 315 | 400 | 0,100 | 0,150 | 0,200 |
| 400 | 500 | 0,120 | 0,180 | 0,250 |
| 500 | 630 | - | 0,180 | 0,250 |
| 630 | - | - | 0,220 | 0,300 |
| 800 | - | - | 0,280 | 0,380 |

*) The presented values should be regarded as approximate

**) The runout value in used chuck depends on its components wear. In case the runout value in used chuck exceed the ones given in Table 19, its further operation is not recommended.

FINAL REMARKS

Wilful changes in chuck construction are forbidden.
Master and top jaws which are not completed-up by manufacturer may turn to be of minimum lower clamping diameters in the range of workmanship tolerances.
Use the lubricants recommended in this manual.
Use only original accessories and spare parts.
Please observe to instructions included in this manual.
Failing to observe to this manual may cause the chuck damages.

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001 903 N

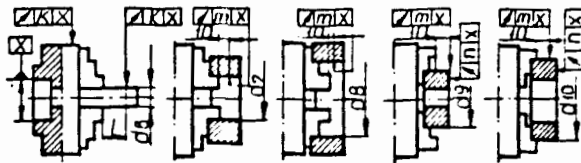
SPANNFUTTER MIT HANDEINSPANNUNG

LESEN SIE DIE ANWEISUNG!

DREHBANKFUTTER
LATHE CHUCK

PRÜFSCHEIN
INSPECTION CARD

| Typ | NO |
|------|-----------|
| 3284 | |
| 3285 | 5 1/2 x 8 |



| Permissible Centring Accuracy Values | | | | | | | |
|--------------------------------------|------------|-------|--------|-------|-------|---------|-----|
| Nominal value | 100 | 125 | 160 | 200 | 250 | 315 | |
| | 4° | 5° | 6 1/4° | 8° | 10° | 12 1/2° | |
| d ₆ | 10 | 18 | 18 | 30 | 30 | 53 | |
| | 14 | 25 | 30 | 40 | 53 | 75 | |
| | 18 | 30 | 40 | 53 | 75 | 100 | |
| L | 40 | 60 | 60 | 80 | 80 | 120 | |
| d ₇ | 40 | 50 | 50 | 80 | 80 | 125 | |
| d ₈ | 75 | 100 | 135 | 162 | 200 | 252 | |
| d ₉ | 50 | 62 | 88 | 96 | 150 | 210 | |
| d ₁₀ | solid jaws | 80 | 100 | 100 | 160 | 160 | 250 |
| | split jaws | - | 120 | 150 | 185 | 225 | 300 |
| k | 0.05 | 0.05 | 0.05 | 0.05 | 0.08 | 0.08 | |
| m | 0.075 | 0.075 | 0.075 | 0.075 | 0.075 | 0.075 | |
| n | 0.04 | 0.04 | 0.04 | 0.04 | 0.07 | 0.07 | |

Chuck NO 2907

Date 2002-03-19 Supervisor

