PISTON BONDER
NF 03.400

CERTIFICATE
OPERATING MANUAL



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WARNING! Do not operate the WELDER without reading the contents of the certificate.

INTRODUCTION

This certificate, combined with the technical description and operating manual, is a document that certifies main parameters and technical characteristics of the Piston bonder NF 03.400 (hereinafter called Stand) guaranteed by the manufacturer.

The document also contains the description and mode of functioning of the Stand, operating instructions and other information necessary to ensure the full use of the technical capabilities of this device.

1 USE

The stand is designed for bonding friction lining to the lockup piston of torque converter.

The stand must be operated in closed heated facilities under the following conditions:

1.1 Air temperature from +5 to +30 °C

1.2 Relative humidity 30 to 80%

1.3 Atmospheric pressure from 84 to 106 kPa

1.4 The power supply must meet the following requirements: 220±10V, single-phase, 50±0,5 Hz.

1.5 The compressed air system must be equipped with an oil-water separator at a distance of not more than 3m from the point of stand attachment and have a constant working pressure of at least 7 kg · c/cm2.

2 SPECIFICATIONS *

№	Parameter	Value
1	Clamping force, not less, kN	Depending on pressure at regulator
2	Max diameter of lockup piston, мм	320
3	Power consumption of the heating elements, kW	6
4	Power consumption of the stand is not more than, kW	6,1
5	Dimensions, мм max.	1150x600x1800
6	Weight, not more than kg	280

*The manufacturer has the right to make design and technical changes that do not involve degradation of equipment functionality.

3 PACKAGE CONTENTS

Package contents of NF 03.400 include:

3.1 The stand NF 03.400 – 1 piece.

3.2 Certificate, operating manual – 1 piece.

3.3 Technologic indicator-regulator certificate (TRM) OVEN – 1 piece.

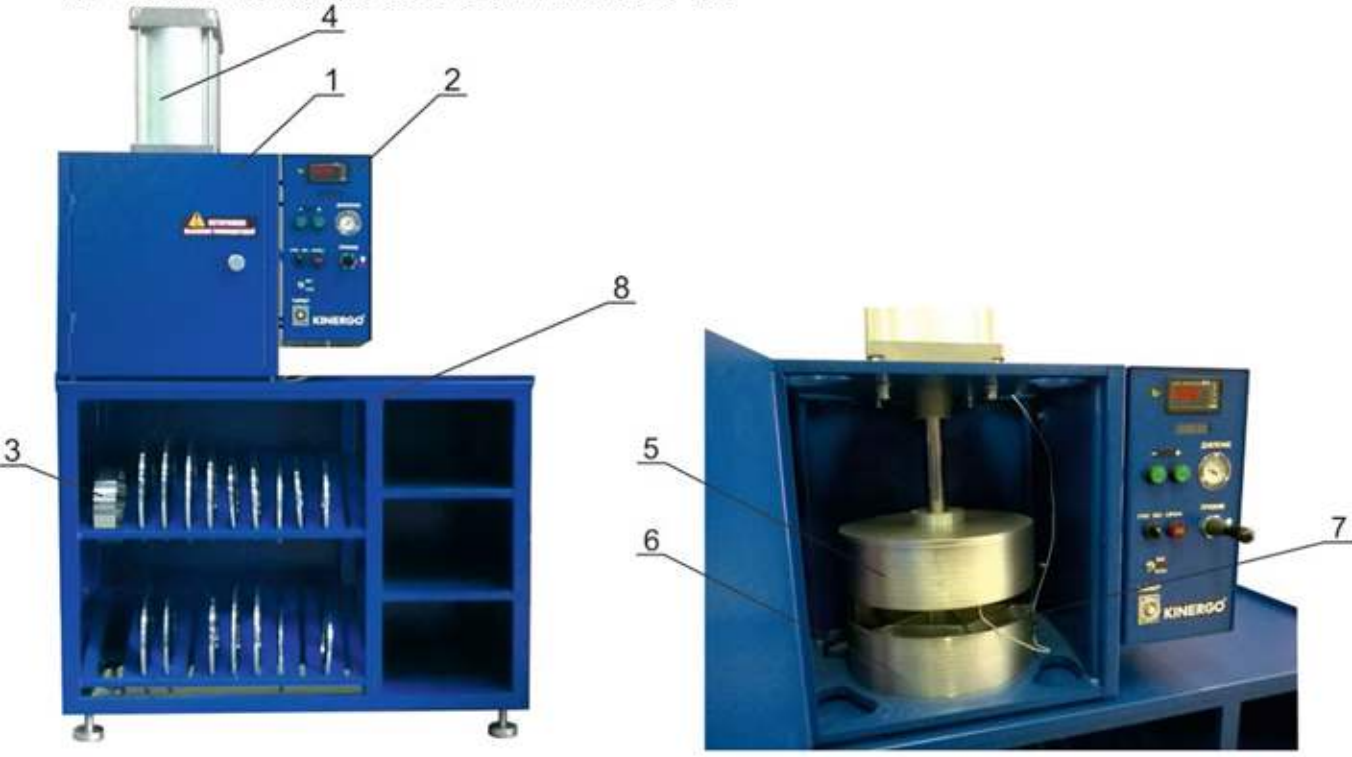
3.4 Temperature sensor (thermocouple) - 2 pcs. (3 pcs. - Depending on the configuration).

3.5 Adapters - 15 pieces. (quantity may vary depending on the package).

3.6 Table – 1 piece.

4 FUNCTIONAL DESIGN

4.1 General view of the stand shown in Picture 4.1.



Pic.4.1 – General view of the stand

1 – frame
2 – control panel
3 – adapter kit
4 – air-operated cylinder
5 – upper heating element
6 – lower heating element
7 – temperature sensor (thermocouple)
8 – table

4.2 Description of control panel

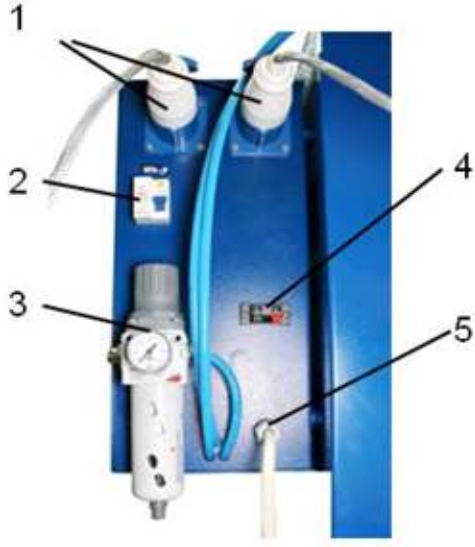
Control panel is located on the right side with respect to an operator.
General view of the front of the control panel is shown in Picture 4.2.



Pic.4.2 – Front of control panel

1 regulator-indicator with digital temperature display
2 – button to increase the intensity of heat "+"
3 – button to decrease the intensity of heat "-"
4 – power off
5 – pressure gauge of pneumatic cylinder
6 – display of heating elements control unit
7 – control knob of pneumatic cylinder
8 – LED indicator of alarm
9 – alarm mute toggle
10 – alarm on timer

General view of the rear panel of the controller is shown in Picture 4.3.



Pic.4.3. Rear of control panel.

1 – Socket for connecting the heating element
2 – automatic circuit breaker
3 – filter/regulator of maximum pressure of pneumatic cylinder
4 – connector for the temperature sensor (thermocouple)
5 – total power cord

The principle of operation of the stand is based on the infrared thermal radiation, capable of penetrating deep enough into ferrous metals, thereby providing uniform heating, regardless of integrity of heating elements. Source of radiation in this stand are lamps with a larger impact of thermal energy in the infrared range. Managing power module, designed by KINERGO company, using modern components and driven by microcontroller with software - stipulates reliability and ease of use of this piston bonder.

Bonding process takes about 5 to 20 minutes and consists of the following steps:

— Preparation of surfaces to be bonded;
— Selection of adapter size for clamping the friction lining to bonding surface;
— installation and clamping of items to be bonded;
— mode selection and bonding process;
— removing items from the stand;
— quality control.

5. SAFETY PRECAUTIONS

When working with the stand general requirements of technical operation of electrical equipment and electrical appliances must be complied.

Body of the stand must be grounded.

Observe safety precautions when working with heating elements.

6. MAKEREADY AND WORKING ARRANGEMENTS

Attention! Only an operator with sufficient skills and knowledge of the process of this type of work can work with this stand.

Every day before work check the following: grounding, connection of pneumatics, electrical connections, correct connection of temperature sensor (observe polarity), operation of heating elements and instrumentation, make a trial turn-on.

6.1 Preparation of the surfaces to be bonded.

6.1.1 Worn friction lining must be removed from the surface of piston.

6.1.2 Perform surface preparation for bonding new lining, providing a surface roughness of about Ra 6,3.

6.1.3 Deoil bonding surfaces.

6.1.4 It is recommended to set a new lining on the prepared surface of lockup piston, fixing it evenly with cyanoacrylate adhesive around the circle in three or four points.

6.2 Select an adapter for the lockup piston with the new friction lining, so that the plane of the clamping surface completely overlaps the surface of friction material (Picture 6.1).

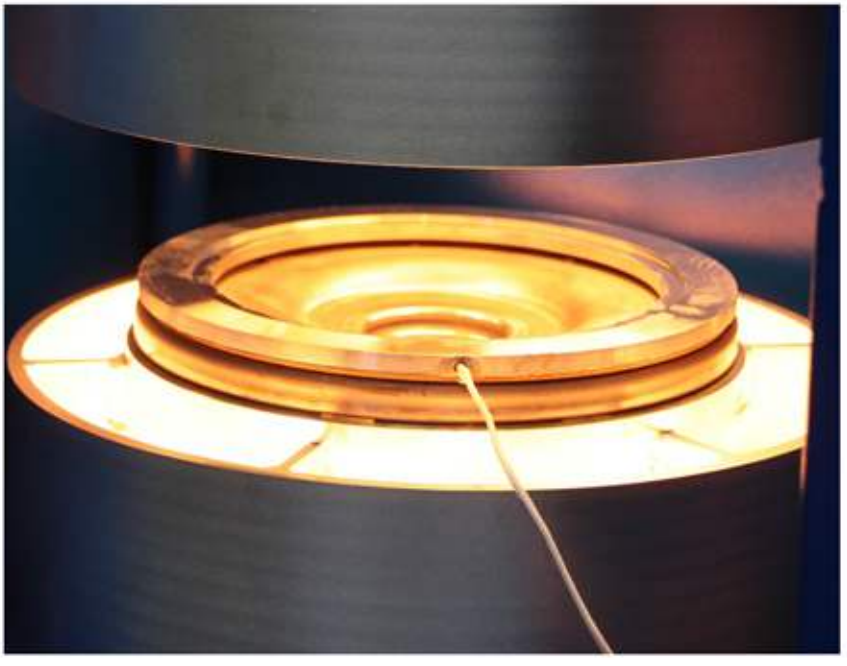


Pic 6.1

Pay attention to any structural baffles of lockup plate that can rest on the adapter without providing proper clamping of the friction lining. In this case, the adapter must be replaced with a suitable one.

6.3 Put assembled package in the center on the lower heating element with adapter upward (Picture 6.2).

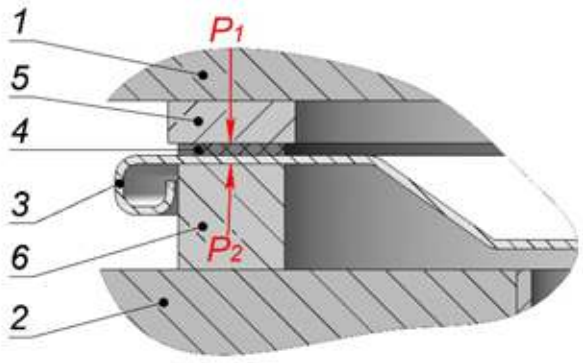
Note the uniform contact of the adapter or piston to frames of the heating element.



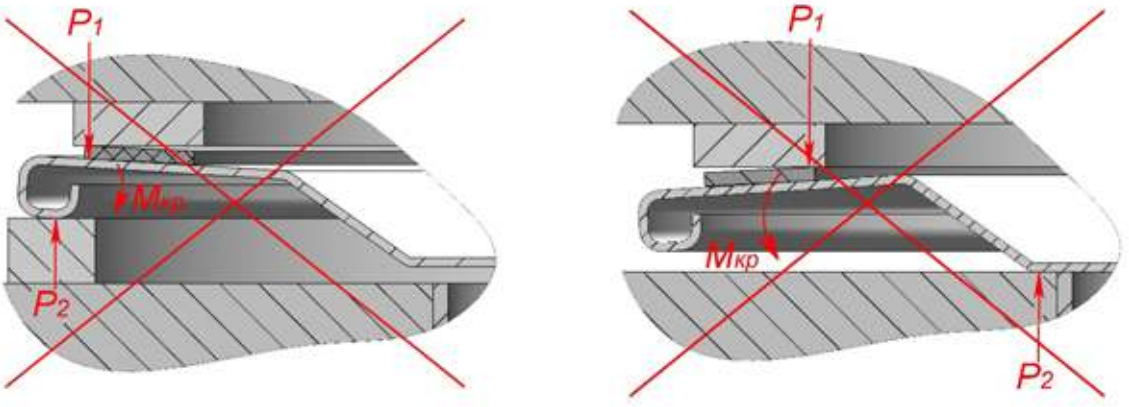
Pic.6.2

If the bottom of the lockup piston has a complex shape, it is necessary to select adapter for the lower surface to avoid deformation of the piston when it is pressed (Picture 6.3).

Right



Wrong



Pic.6.3

1 – upper heating element
2 – lower heating element
3 – lockup piston
4 – friction lining
5 – upper adapter
6 – lower adapter

6.4 Set in the bonding place a temperature sensor (thermocouple) so that its work zone be in a safe contact with the object of heating (lockup piston) and is not exposed to direct optical emission. Observe caution in dealing with thermocouple, do not resort to frequent and excessive bend of wire, it can destroy the insulation and shorten the life of the sensor. During work look after its entirety, if the wires became bare and touch each other, welded connection of the working area of the thermocouple is broken and temperature sensor readings will be wrong! In this case, it must be replaced.

6.5 Lower the upper heating element 5 with handle 7 (Picture 4.2) by moving it downward and hold it down until the required pressing is achieved, while controlling the pressure on the gauge.

6.6 Use switch 4 (Picture 4.2) to turn on the electrical power of the stand.

6.7 Use buttons 2 and 3 to set the heating intensity as a percentage of the maximum possible ratio, controlling the display readings 6 (Picture 4.2).

6.8 Set the desired temperature on the indicator-regulator 1 (Picture 4.2), according to the attached instruction manual, at which the heating elements will be turned off automatically.

6.9 Simultaneously press buttons 2 and 3 to turn on heating elements.

During heating control the temperature in adhesion zone by readings on indicator-regulator 1 (Picture 4.2), which takes readings from the temperature sensor.

For reliable bonding of friction lining to steel base it is necessary to hold the piston under pressure at a given temperature by the time interval which is determined in accordance with the glue polymerization timetable and ranges from 3 to 16 minutes.

Note: The hold time at a given temperature in this version of the stand is controlled by the operator manually. For the convenience of monitoring time the stand is equipped with sound-and-light alarm with timer 10 (Picture 4.2).

6.10 Upon completion of the bonding process turn the heater off by simultaneously pushing two buttons 2 and 3 (Picture 4.2).

6.11 Raise the top heating element with the knob 7 on control panel.

6.12 Remove lockup piston with caution.

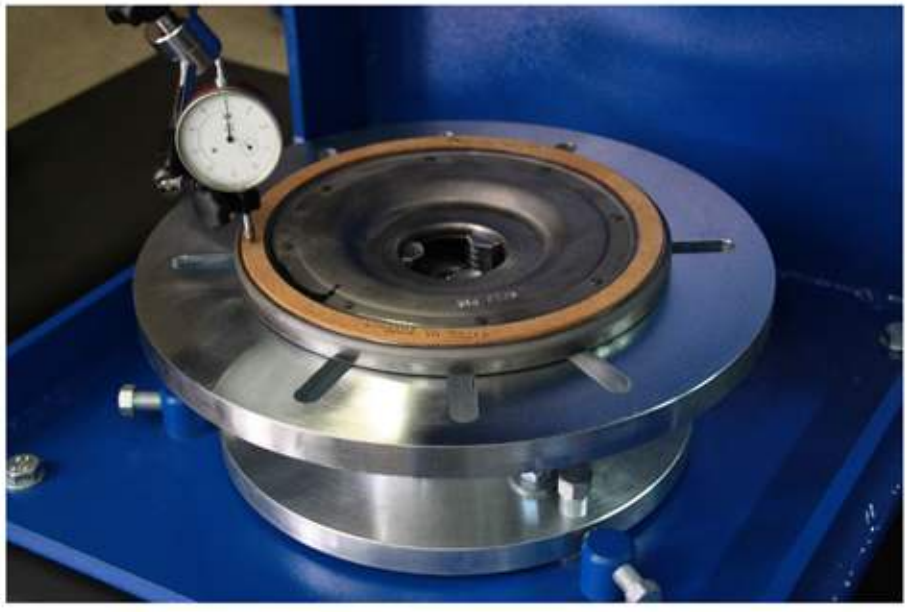
CAUTION! Heaters and lockup piston temperature reaches 200 ° C.
Touching them may result in burns!

6.13 Turns off the stand with switch 4 (Picture 4.2) if all prepared lockup pistons are bonded.

6.14 Make an external inspection of bonded friction lining for the overheating or low-quality clamp.

WARNING ! If friction lining was not fully adhered or adhesive gripe happened only in areas - do not try to bond it again, a repeat pressing and heating will not give a proper result, because during the initial heating irreversible polymerization of adhesive occurred. The whole process of preparation and bonding must be repeated with new friction lining.

After cooling of bonded piston (10-15 minutes), check it for flatness on the welder turntable or lathe faceplate with the indicator (Picture 6.4).



Pic.6.4

In case of excessive undulation of friction lining its surface, thickness permitting, must be processed by the lathe.

7. STORAGE AND SHIPMENT PRECAUTIONS

7.1 Conditions of transportation must meet the conditions 5 in accordance with all-Union State Standard 15150-69 at temperature of -25 to +55 ° C in compliance with the safeguards against the snatching and vibrations.

7.2 The Stand should be transported in closed transport of any kind. Railway wagons, containers, and truck bodies used to transport devices must not have any trace of cement, coal, chemicals, etc.

7.3 Storage conditions must comply with conditions 1 according to all-Union State Standard 15150-69. There must be no dust, acid and alkali fumes, aggressive gases and other substances that may cause corrosion.

8. WARRANTY

8.1. The manufacturer guarantees compliance of the stand with all the requirements and the technical characteristics specified in this certificate if the relevant conditions of usage, transportation and storage are met.

8.2. The warranty does not apply to:

— product without the certificate, logos or serial number;
— natural wear;
— damage caused by using the product for purposes beyond its purpose;
— paint products
— defects caused by mechanical damage, improper or careless operation;
— damage caused by unauthorized changes to the product design or its components;

8.3. The warranty period of operation of the stand is 12 months from the date of delivery to the Customer.

8.4. Seller diagnose the cause of a fault on the basis of images or video, provided by the Buyer. If this is not possible, the customer comes to the Seller for warranty inspection and repair of the goods. The Customer shall bear the costs associated with the arrival of a specialist for repair or shipment of defective parts or assemblies.

8.5. The buyer cannot claim compensation for any incidental, indirect or consequential costs, such as lost profits or revenue, other commercial loss, inconvenience caused by equipment failure etc.

8.6. In the case of warranty replacement of parts or assemblies warranty for replacement item is 90 days or until the end of the initial term (12 months from the date of delivery to the Customer) whichever is longer.

M2K

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