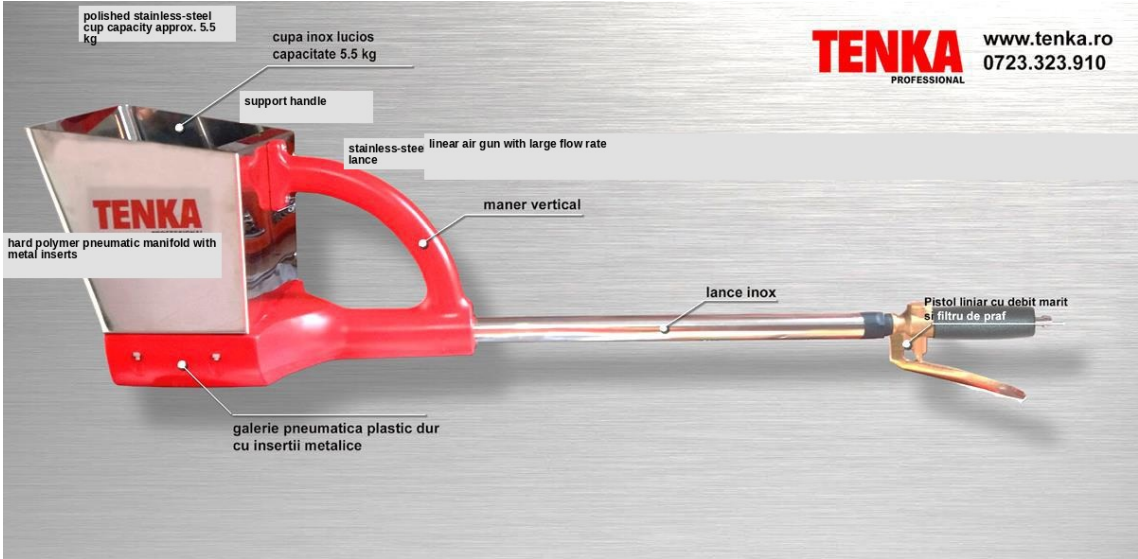


TENKA

PNEUMATIC DEVICES FOR MORTAR APPLICATION TECHNICAL USER MANUAL

Installation • operation • adjustments • cleaning • maintenance • troubleshooting



Model	Color	Hopper capacity	System
TK-31R	Red	approx. 5.5 kg	Pneumatic
TK-31N	Black	approx. 5.5 kg	Pneumatic

2020 Edition • Technical documentation for the user

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1. About the TK-31R and TK-31N models

TENKA TK-31R and TENKA TK-31N are two versions of the same pneumatic mortar application device. Their construction, operating method, hopper capacity and operating procedures are identical. The difference between the models is the color of the assembly.

Model	Identification	Difference
TK-31R	R = Red	Red housing / assembly
TK-31N	N = Black	Black housing / assembly

IMPORTANT

All instructions in this manual apply to both models. Wherever the designation "TK-31" is used, the information applies to both TK-31R and TK-31N.

2. Intended use and operating principle

TK-31 is intended for pneumatic application of mortar onto masonry and other substrates compatible with the mortar being used. The device uses compressed air exclusively to project the material from the hopper toward the work surface.

Compressed air enters through the linear air gun, passes through the metal lance and reaches the pneumatic manifold. The active nozzles create air jets that entrain the mortar positioned at the hopper openings and project it toward the substrate. Mortar is not transported through the hose: the hose carries compressed air only.

ESSENTIAL PRINCIPLE

Application quality depends simultaneously on four factors: suitable and homogeneous mortar, clean nozzles, sufficient air supply and correct configuration of the number of nozzles.

3. Equipment components

No.	Component	Function
1	Linear compressed-air gun	Controls the pneumatic supply by operating the trigger.
2	Stainless-steel metal lance	Supports the assembly and transfers air to the manifold.
3	Pneumatic manifold with metal inserts	Distributes air to the nozzles and supports the mortar discharge area.
4	Pneumatic nozzles	Generate the air jets that project the mortar.
5	Stainless-steel hopper - approx. 5.5 kg	Receives the mortar prepared for application.
6	Support handle	Allows controlled support of the weight of the device and mortar.
7	Nozzle blocking caps	Allow the device to be used with fewer active nozzles.

4. Safety rules

WARNING - COMPRESSED AIR

Never exceed 10 bar. The recommended operating pressure for the device is approximately 8-9 bar (100-110 PSI).

- Before each use, check the hose, clamps, couplings, gun, lance, manifold, nozzles and threads.
- Do not use cracked, swollen or cut hoses, or damaged fittings.
- Firmly tighten the metal clamp securing the hose to the hose barb. Use strong steel clamps or clamps made from another hard metal.
- Do not remove nozzles, caps or fittings while the system is pressurized.
- Stop the compressor and release pressure from the circuit before any intervention.
- Do not direct the jet toward people, animals, windows or fragile objects.
- Wear eye/face protection, gloves, work clothing and hearing protection when working near the compressor.
- Support the device by the dedicated handle. Do not support the entire weight of the loaded device only by the linear air gun.
- Do not store the device in water and do not leave it unnecessarily exposed to strong sunlight or high temperatures.

5. Materials and mortar preparation

TK-31 can be used with compatible mortars based on cement, sand, lime, water and, where applicable, gypsum. For proper operation, the material must have a consistency that allows it to slide into the hopper and be entrained by the air jets.

5.1 Aggregate size

An average aggregate size of approximately 2-5 mm is recommended. For mortar prepared on site, washed, relatively coarse sand in the 0-3 / 0-4 mm range is recommended. Excessively fine sand combined with fine cement can form a very sticky paste that is difficult to project.

5.2 Manual mortar and machine-applied mortar

For this type of device, mortars with behavior suitable for manual application are preferred. Some machine-applied plasters contain additives and plasticizers that make them stickier for transport through pumps and hoses; excessively sticky material may slide less easily in the TK-31 hopper.

5.3 Correct consistency

Follow the mortar manufacturer's recipe. Mix the material thoroughly and avoid both excessively dry mortar and excessive dilution. Before adding extra water to correct weak projection, check the condition of the nozzles and the air supply.

RECOMMENDATION

For pre-dosed commercial materials, follow the amount of water and mixing time stated on the packaging or in the manufacturer's technical data sheet.

6. Compressor requirements

The device requires a stable source of compressed air. Compressor capacity affects the number of nozzles that can operate simultaneously and the continuity of work.

Operating mode	Indicative configuration
Occasional / hobby work	Approx. 50 l tank, pressure up to 10 bar, indicative flow rate 250 l/min.
Professional / continuous work	Approx. 100 l tank, pressure up to 10 bar; a higher flow rate allows faster recovery between cycles.
Compressor with insufficient air reserve	Reduce the number of active nozzles from 3 to 2 or to 1, as required.

OPERATING PRESSURE

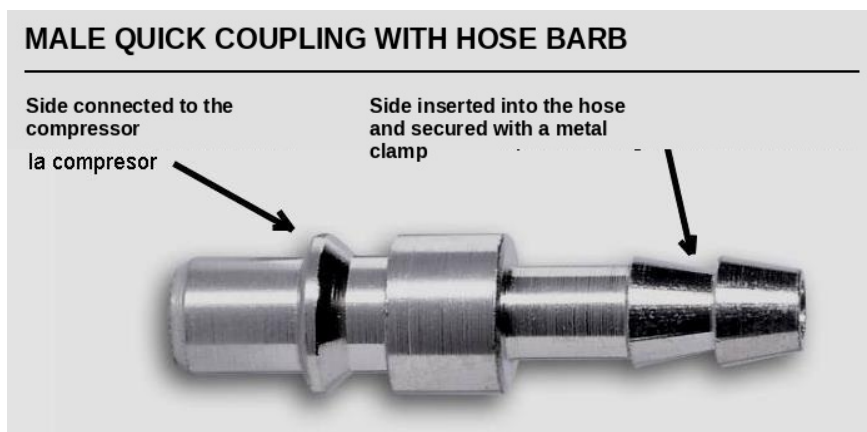
Set the system to approximately 8-9 bar. The maximum permissible pressure for the device is 10 bar. Do not attempt to compensate for an insufficient compressor by exceeding this limit.

7. Hose, clamps and quick couplings

Use a pressure-resistant hose with an internal diameter of 8 mm. A minimum length of 15 m allows the compressor to be positioned away from the operator and reduces direct exposure to noise.

7.1 Connection to the compressor

Compressors are commonly equipped with a female quick coupling. To connect the hose, a compatible male quick coupling with a hose barb is required.



Male quick coupling with hose barb

7.2 Direct connection

The hose can be fixed directly to the TENKA gun hose barb using a strong metal clamp. Check that it is securely tightened before pressurizing.



Figure 3. Direct connection configuration

7.3 Modular connection

For easier transport and assembly, a short hose section of approximately 20 cm may remain attached to the device, while the long hose can be connected through a female-male quick-coupling set.



Figure 4. Modular configuration with short hose section and quick couplings

8. Preparation before work

- 1 Visually inspect the device and check for cracks, deformation or loose parts.
- 2 Check the hose along its entire length and inspect the condition of the couplings.
- 3 Connect the hose correctly and firmly tighten the metal clamp.
- 4 Select the operating configuration: 1, 2 or 3 active nozzles.
- 5 Check that the active nozzles are clean and that unused positions are correctly covered with the blocking caps.
- 6 Prepare and thoroughly mix the mortar.
- 7 Rinse / wet the hopper before the first load to help the material slide.
- 8 Start the compressor and set the operating pressure to approximately 8-9 bar, without exceeding 10 bar.
- 9 Perform a test in a controlled area and check that the jets are uniform.

ON FIRST USE

Air can carry dust or particles from a new hose. If one nozzle has reduced flow, clean that channel separately according to Chapter 12.

9. Applying the bonding / spray coat

To prepare the substrate, it is recommended to first apply a bonding / spray coat using a single active nozzle. The other two positions are blocked using the caps provided for this purpose.

Use normal mortar or, if required for the application, mortar moderately diluted with approximately 5% water. Do not use plain "cement slurry". The air jet should break up the mortar and form a fine spray that adheres to and penetrates the irregularities of the substrate.



Figure 5. Example of applying the bonding / spray coat

- 10 Block two positions and leave only one nozzle active.
- 11 Load the hopper with correctly prepared mortar.
- 12 Support the device by the handle and point it toward the work area.
- 13 Operate the trigger and move the device evenly.
- 14 Aim for a distributed spray coat, not a liquid film.
- 15 Proceed with the main coat only after the substrate has been properly prepared and in accordance with the application technology of the mortar used.

10. Applying the main mortar coat

After preparing the substrate, the mortar can be applied with 2 or 3 active nozzles, depending on compressor capacity, material consistency and work rate.

- 16 Configure 2 or 3 active nozzles.
- 17 Wet the hopper and load homogeneous mortar free of foreign objects or lumps.
- 18 Support the device by the handle and maintain control of the assembly throughout spraying.
- 19 Operate the trigger and move the device at a constant rate to distribute the material evenly.
- 20 If the jet becomes weaker, first check the nozzles and compressor capacity.
- 21 If the air source cannot support three nozzles, work with two nozzles.
- 22 Rinse the hopper periodically; as a working reference, approximately every 10-12 loads.

DO NOT INCREASE PRESSURE ABOVE THE LIMIT

If three nozzles consume more air than the compressor can supply, reduce the number of active nozzles. Do not exceed 10 bar in an attempt to obtain stronger projection.

11. Configuration with 1, 2 or 3 nozzles

Configuration	Recommended use	Effect
1 nozzle	Bonding / spray coat; difficult materials; compressor with limited reserve	Concentrates the air flow at a single point.
2 nozzles	General application when the compressor cannot comfortably support 3 nozzles	Compromise between working width and air consumption.
3 nozzles	Fast application of the main coat with sufficient air supply	Greater working width and productivity.

11.1 Installing the blocking caps

- 23 Stop the compressor and completely release pressure from the circuit.
- 24 Unscrew the nozzle that is to be disabled.
- 25 Insert the blocking cap from the outside so that it covers both the mortar opening and the channel corresponding to the nozzle.
- 26 Secure the cap without overtightening.
- 27 Repeat for the second position if working with one nozzle.
- 28 Check the assembly before pressurizing.

Figure 6. Pneumatic nozzle area

Pneumatic nozzle area during application

12. Cleaning the nozzles and pneumatic manifold

A partially or completely blocked nozzle reduces projection force at the corresponding opening and can cause mortar to fall instead of being projected firmly onto the masonry.

12.1 Purging a channel

- 29 Stop the air supply and release the pressure.
- 30 Remove only one nozzle.
- 31 Point the device in a safe direction, with no people or objects in front of the channel.
- 32 Restore the air supply in a controlled manner and allow the channel to purge for approximately 30 seconds.
- 33 Stop the compressor again and release the pressure.
- 34 Reinstall the nozzle.
- 35 Repeat separately for each channel that requires cleaning.

WARNING

Nozzles may be removed and reinstalled only when there is no pressure in the circuit. Air purging must be performed only after hands and tools have been removed from the discharge area.



Figure 7. Cleaning the pneumatic manifold channels

13. Cleaning after use and storage

Immediate cleaning after work is essential. Hardened mortar can block the openings, clog the nozzles and make threaded components difficult to remove.

- 36 Completely empty any mortar remaining in the hopper.
- 37 Stop the compressor and depressurize the circuit.
- 38 Rinse the device thoroughly under running water. Simply filling the hopper with water and pressing the trigger does not replace complete washing.
- 39 Remove deposits from the hopper, openings and nozzle area.
- 40 Check that the nozzles are clear.
- 41 Allow the water to drain completely.
- 42 Store the device with the nozzles pointing downward so that water or suspensions accidentally entering the manifold can drain out.
- 43 Do not store the device in water and avoid prolonged exposure to strong sunlight.

DURING WORK

Periodically rinse the hopper in a container of water, approximately every 10-12 loads, to limit deposits and mortar hardening.

14. Output and work organization

Output depends on the mortar, coat thickness, compressor capacity, number of active nozzles, surface geometry, material supply, operator experience and the time required for auxiliary operations.

Working reference	Indicative value
Theoretical coverage capacity	Up to approx. 55 m ² /h for a coat of approx. 2 cm, under favorable conditions.
Applying the bonding / spray coat	Can be performed very quickly with one nozzle on prepared surfaces.
Site application	Daily productivity varies significantly depending on the team, material and leveling operations.

For good productivity, prepare mortar in a continuous flow, keep the hose free from kinks, immediately clean any nozzle with reduced flow and adapt the number of nozzles to the compressor's actual capacity.

15. Troubleshooting

Symptom	Probable cause	Remedy
Mortar does not descend from the hopper even though air is present	Mortar too dry / incorrect recipe / insufficient material flowability	Check the recipe and mixing. Follow the recommended binder dosage and water quantity.
The device projects weakly and some mortar falls	One or more nozzles are blocked	Clean the nozzles and purge the channels separately.
The device projects weakly with all nozzles	Insufficient compressor or leaks in the circuit	Check pressure, hose and couplings; reduce the number of active nozzles.
Material is very sticky	Sand too fine or mortar contains additives/plasticizers unsuitable for the application	Test mortar suitable for manual application; if necessary, work with fewer nozzles.
Uneven jets on first use	Dust or particles carried from the hose/lance	Purge each channel for approximately 30 seconds.
Hose tends to slip off the hose barb	Clamp insufficiently tightened or unsuitable	Stop and depressurize; install and tighten a strong metal clamp.
Gun / joint is excessively stressed	The weight of the device is supported only by the gun	Always use the support handle.

16. Indicative mortar recipes

The recipes below are expressed as parts of material by volume. They are indicative formulas for traditional mortars. For pre-dosed commercial materials, always follow the manufacturer's technical data sheet.

Grade	Mortar type	Cement	Fat lime (paste)	Sand	Indicative use
M4T	Lime	-	1	3.25	Interior plastering without moisture
M10T	Lime-cement	1	2	8	Exterior plastering on walls without profiles
M10T	Lime-cement	1	1.5	7	Interior plastering in damp environments
M25T	Cement-lime	1	1.5	6.5	Exterior and interior plastering
M50T	Cement-lime	1	1	4	Heavily stressed plastering, including damp environments
M100T	Cement	1	0	3	Mortar with high cement content

CHECK BEFORE APPLICATION

Regardless of the recipe, test a small quantity. The mortar must slide into the hopper, be projected uniformly and be compatible with the substrate and the requirements of the work.

17. Inspection and preventive maintenance

Element	What to check	Action
Hopper	Deposits, deformation, cleanliness	Wash after each use; do not allow mortar to harden.
Nozzles	Blockage, thread, visible wear	Clean; install without overtightening.
Pneumatic manifold	Uneven flow, impurities	Purge the channels according to the procedure.
Gun / trigger	Free movement, joint	Do not use if damaged or if abnormal play is present.
Lance	Deformation and joints	Check before work.
Hose	Cracks, swelling, cuts	Replace if damaged.
Clamps and couplings	Tightness and locking	Tighten / replace as required.
Blocking caps	Condition and fastening	Keep clean and install correctly.

18. Quick operating checklist

18.1 Before starting

- The device is clean and has no visible damage.
- The nozzles are clean.
- The 1 / 2 / 3 nozzle configuration has been selected correctly.
- Blocking caps are installed where required.
- The 8 mm internal-diameter hose is in good condition.
- The clamp is metal and firmly tightened.
- The couplings are correctly locked.
- The mortar is homogeneous and suitable for the application.
- Pressure is set to approx. 8-9 bar and cannot exceed 10 bar.
- The operator is wearing protective equipment.

18.2 During work

- Support the device by the handle.
- Monitor the uniformity of the jets.
- If projection weakens, check the nozzles and air supply.
- Rinse the hopper periodically.
- Do not work on the nozzles while the system is pressurized.

18.3 At the end of work

- Empty the remaining mortar.
- Stop the compressor and release the pressure.
- Wash the device completely under running water.
- Clean the nozzles and openings.
- Allow the water to drain.
- Store the device with the nozzles pointing downward, in a dry place protected from strong sunlight.

19. Essential technical data

Characteristic	TK-31R	TK-31N
Operating principle	Pneumatic	Pneumatic
Color	Red	Black
Hopper capacity	approx. 5.5 kg	approx. 5.5 kg
Number of nozzle positions	3	3
Operating configurations	1 / 2 / 3 active nozzles	1 / 2 / 3 active nozzles
Recommended operating pressure	approx. 8-9 bar	approx. 8-9 bar
Maximum pressure	10 bar	10 bar
Recommended hose internal diameter	8 mm	8 mm
Recommended hose length	minimum 15 m	minimum 15 m
Hopper material	Stainless steel	Stainless steel
Lance	Metal / stainless steel	Metal / stainless steel

TENKA TK-31R / TK-31N

Following the mortar recipe, keeping the nozzles clean and supplying the correct amount of air are the main conditions for consistent operation and for maximizing the service life of the equipment.