

These operating instructions apply for:

NTK 8 AL E	NTK 40 AL E
NTK 15 X E	NTK 40 E
NTK 16 E	NTK 55 AL E
NTK 18 AL E	NTK 55 E
NTK 25 AL E	NTK 85 E
NTK 25 E	NTK 110 E



Before use of the pneumatic linear vibrators series NTK E read this operating instruction carefully and store afterwards.

Netter GmbH does not assume liability for damage to property and persons if the product has been technically modified or if the notes and regulations of these operating instructions have not been observed.

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Scope of delivery



Check the packaging for possible shipping damage.
If the packaging is damaged check the content for completeness and possible damage. In case of damage inform the transport agent.
Check the scope of supply with the delivery note.

1 General notes

Netter pneumatic linear vibrators series NTK E comply with the regulation 94/9/EC (ATEX product directive) equipment group II and are suitable for applications in explosion endangered areas of category 2 (2G and 2D 85°C (T6)) in zones 1, 2, 21 and 22.

Furthermore, these explosion protected linear vibrators comply with the EC-machine directive 2006/42/EC.

Standards DIN EN ISO 12100-1 part 1 and part 2, EN 1127-1 and EN 13463-1 have been observed in particular.

The vibrators generate directed linear vibrations or shaking movements.

General areas of application are:

Loosening, moving, compacting, separating of bulk materials and reduction of friction.

NTK E - vibrators are used to empty bunkers, to drive conveyor troughs, screens and vibrating tables.

The use in explosion endangered areas is possible when complying with valid regulations (among others 1999/92/EEC) and the corresponding operating instructions of the operating company.

Before using these vibrators the operator must make sure that the introduction of vibration energy will not cause an explosion hazard.

The drive medium is clean (filtered), lubricated compressed air or nitrogen.






The frequency can be infinitely adjusted by means of pressure regulators or restrictors in the supply line and the amplitude by adjusting of a throttle in the exhaust line.

Weights can be attached to piston or housing to increase the working moment and thereby the amplitude. This reduces the frequency at the same time.

Special features:

- Infinitely variable
- Low air consumption
- No overrunning
- Very low noise level
- Earthing screw on housing (exception: stainless steel units)

In these operating instructions the following information and danger symbols are used.

	Notes on important processes		Warning of a danger source
	Important note on processes to be especially observed		Environmental waste disposal
	Important note on explosion protection		

2 Technical Data



Drive medium

Clean (filter $\leq 5 \mu\text{m}$, class 3) lubricated compressed air or nitrogen

Unfiltered air will cause damage to the vibrators.

Operating pressure

2 bar to 6 bar

Operating pressures must not be exceeded or fall short of.

Temperature

5°C to 60°C

The ambient temperatures must not be exceeded or fall short of.

Special designs available on request

The working moment depends on the weight of the freely oscillating part and the amplitude. Amplitude and working moment change with different weight of the freely oscillating part (e.g. by installation of an additional vibration weight SM to piston or housing). This means that the working moment can be pre-selected by choosing the freely oscillating part with the associated weight.

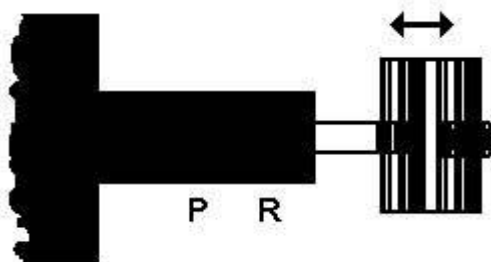
The following table lists the technical data for the freely oscillating piston (**SW 1**) as well as for the freely oscillating housing (**SW 2**), the lower value is for 2 bars, the higher value is for 6 bars.

Intermediate values can be reached by changing the pressure. On some types the weight differences of piston and housing are only very little. In such cases the data for the freely oscillating piston (**SW 1**) and the freely oscillating housing are specified with a common vibrating mass SM (**SW 3**). The designation of the vibrating mass SM is given in brackets (P+ SM 8-2; meaning piston plus vibrating mass SM 8-2).

Vibrating weights are available as accessories, see chapter 11.1.

The housing is bolted to the mass to be vibrated.

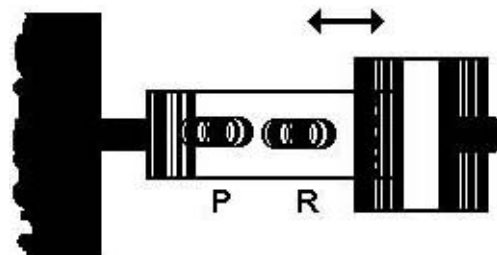
The piston oscillates freely.



Housing on mass to be vibrated
Piston with weight oscillating

Alternatively, the piston may be bolted to the mass to be vibrated.




In this case the housing oscillates.



Piston on mass to be vibrated
Housing with weight oscillating

Type		Weight [kg]	Air consumption [l/min]	Frequency [oscil./min]	Centrifugal force [N]	Working moment [cmkg]
NTK 8 AL (P+SM 8-2)	SW 1	0,030	8 - 33	2.180 – 3.600	12 - 43	0,049 - 0,061
	SW 3	0,088	5 - 26	1.320 – 2.160	12 - 49	0,126 - 0,192
NTK 15 X (P+SM 16-2)	SW 1	0,13	18 - 85	1.820 – 2.700	40 - 96	0,22 - 0,24
	SW 3	0,67	16 - 60	870 – 1.260	52 - 113	1,26 - 1,30
NTK 16	SW 1	0,15	17 - 70	1.900 – 2.700	43 - 96	0,21 - 0,24
	SW 2	1,34	9 - 43	670 - 990	49 - 178	2,47 - 3,30
NTK 18 AL	SW 1	0,21	21 - 63	1.560 – 2.640	60 - 206	0,45 - 0,54
	SW 2	0,53	14 - 57	1.000 – 1.580	87 - 236	1,58 - 1,73
NTK 25 AL (P+SM 25-3)	SW 1	0,425	40 - 160	1.390 – 2.750	121 - 522	1,14 - 1,26
	SW 3	1,675	32 - 141	750 – 1.320	188 - 529	6,11 - 5,54
NTK 25	SW 1	0,47	56 - 180	1.585 – 2.200	82 - 398	0,60 - 1,50
	SW 2	3,10	44 - 115	635 - 900	111 - 622	5,0 - 14,0
NTK 40 AL* (P+SM 25-3)	SW 1	1,28	80 - 390	1.400 – 2.000	206 - 657	2,00 - 3,00
	SW 3	2,55	70 - 360	980 - 1480	255 - 785	4,80 - 9,70
NTK 40	SW 1	1,29	80 - 390	1.400 – 2.000	206 - 657	2,00 - 3,00
	SW 2	4,20	65 - 315	750 – 1.050	334 - 893	10,3 - 14,8
NTK 55 AL	SW 1	2,10	140 – 717	1.600 – 2.500	451 – 1.305	3,20 – 3,80
	SW 3	3,42	133 - 706	1.200 – 1.900	550 – 1.619	6,90 – 8,20
NTK 55 (HF) (NF)	SW 1	2,10	105 - 449	2.220 – 3.300	592 – 1.744	2,19 – 2,92
	SW 2	5,60	120 - 492	880 – 1.460	834 – 2.433	17,2 - 20,8
NTK 85 (NF)	SW 1	5,20	301 - 900	1.800 – 2.650	706 – 1.530	4,0 - 4,0
	SW 2	11,30	210 - 865	985 – 1.560	1.177 – 3.198	22,0 - 24,0
NTK 110	SW 1	8,00	345 - 920	2.130 – 3.000	1.550 – 2.737	6,2 - 5,5
	SW 2	16,60	330 - 880	1.330 – 2.050	1.687 – 4.807	17,4 - 20,9

These technical data are reference values and may vary in dependence on the application, further data on request.

 NetterVibration Germany, 55252 Mainz-Kastel Tel.: +49 6134 2901-0		
 II 2 G D 85°C (T6)	⇔ Temperature class (G)	
Max. surface temp. (D) ⇔ Type designation ⇔ Serial number ⇔	Type <input type="text"/> 5°C ≤ t_a ≤ 60°C No. <input type="text"/> Year <input type="text"/>	⇔ Min.-Max. ambient temp. ⇔ Year of manufacturing
	Doc. No. NV 2003 007 X	⇔ Documentation No.

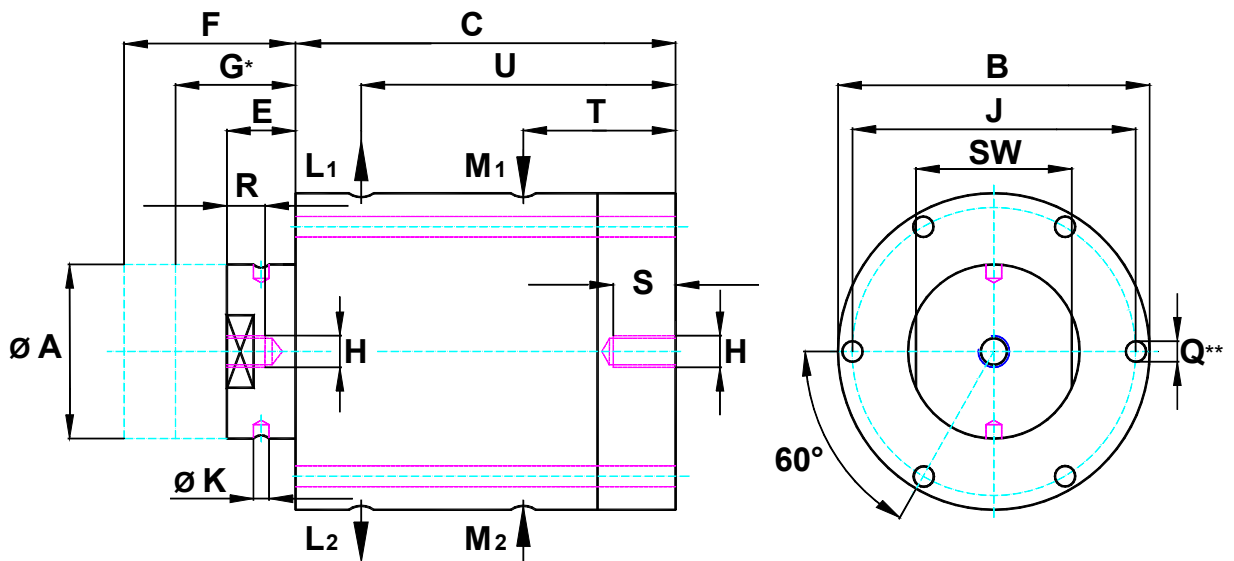
Noise level:

Depending on the type of NTK (with silencer) and an air pressure of 6 bar the noise level is about 78-80 dB(A), it is less with lower air pressure.

Duration of operation:

Long operating periods change the performance data due to wear.

Dimensions [mm]

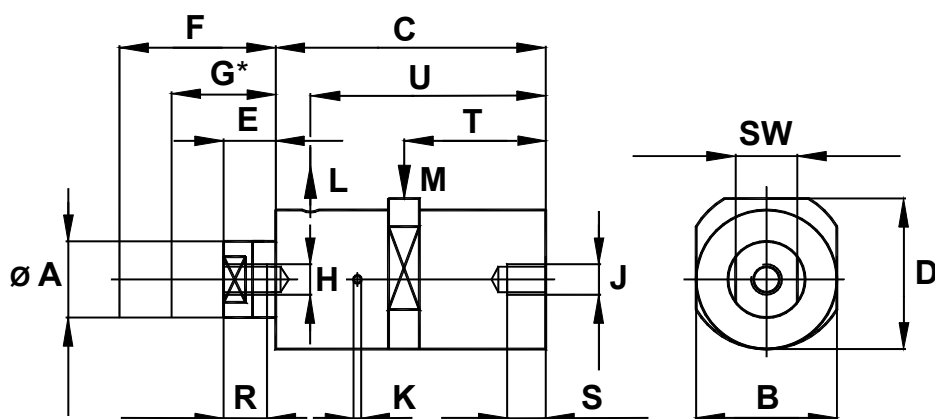


Type	A	B	C	E	F	G*	H	J	K	L	M	Q**	R	S	T	U	SW
NTK 15 x E	15	50	114	9	32	23,5	M 10	—	—	G 1/8	G 1/8	—	20	10	55	99	13
NTK 16 E	16	49	111	5	38	21,5	M 10	—	—	G 1/8	G 1/8	—	21	10	57	96	14
NTK 18 AL E	18	49	116	8	42	25,0	M 10	—	—	G 1/8	G 1/8	—	21	10	62	101	16
NTK 25 E	25	64	138	9	52	30,5	M 16	—	—	G 1/4	G 1/4	—	25	10	73	121	22
NTK 40 E	40	84	140	12	54	33,0	M 16	—	—	G 3/8	G 1/4	—	40	15	73	123	32
NTK 55NF E	55	110	125	17	55	37,0	M 20	96	—	G 3/8	G 3/8	4x8,5	40	30	60	108	46
NTK 55HF E	55	110	115	27	55	37,0	M 20	96	—	G 3/8	G 3/8	4x8,5	40	30	50	98	46
NTK 85NF E	85	160	122	20	55	32,5	M 20	143	12,8	2 x G 3/8	G 3/8	6x10,5	40	20	57	105	—
NTK 85HF E	85	160	112	30	55	32,5	M 20	143	12,8	2 x G 3/8	G 3/8	6x10,5	40	20	47	95	—
NTK 110 E	110	200	122	22	55	38,5	M 20	182	12,8	2 x G 1/2	2 x G 3/8	8x12,5	40	25	57	105	—

*Central position of vibration

**additional fastening possibilities on NTK 55 E

***optionally M₁ or M₂



Type	A	B	C	D	E	F	G*	H	J	K	L	M	R	S	T	U	SW
NTK 8 AL E	8	22	91	22	5	32	18,5	M 5	M 6	—	M 5	M 5	15	9	47,0	76,5	7
NTK 25 AL E	25	50	138	54	7	52	29,5	M 16	M 16	—	G 1/4	G 1/4	25	18	72,0	120,5	22
NTK 40 AL E	40	73	140	79	12	57	34,5	M 16	M 16	8	G 3/8	G 1/4	25	20	73,0	122,5	32
NTK 55 AL E	55	98	133	109	20	57,5	38,5	M 20	M 20	10	G 3/8	G 3/8	40	35	66,0	115,0	46

*Central position of vibration

3 Design and function

The vibration is generated by a freely oscillating, automatically reversing piston.

Both masses, the piston on one side and the housing with the attached mass on the other side, thereby vibrate against each other relatively to their total weights.

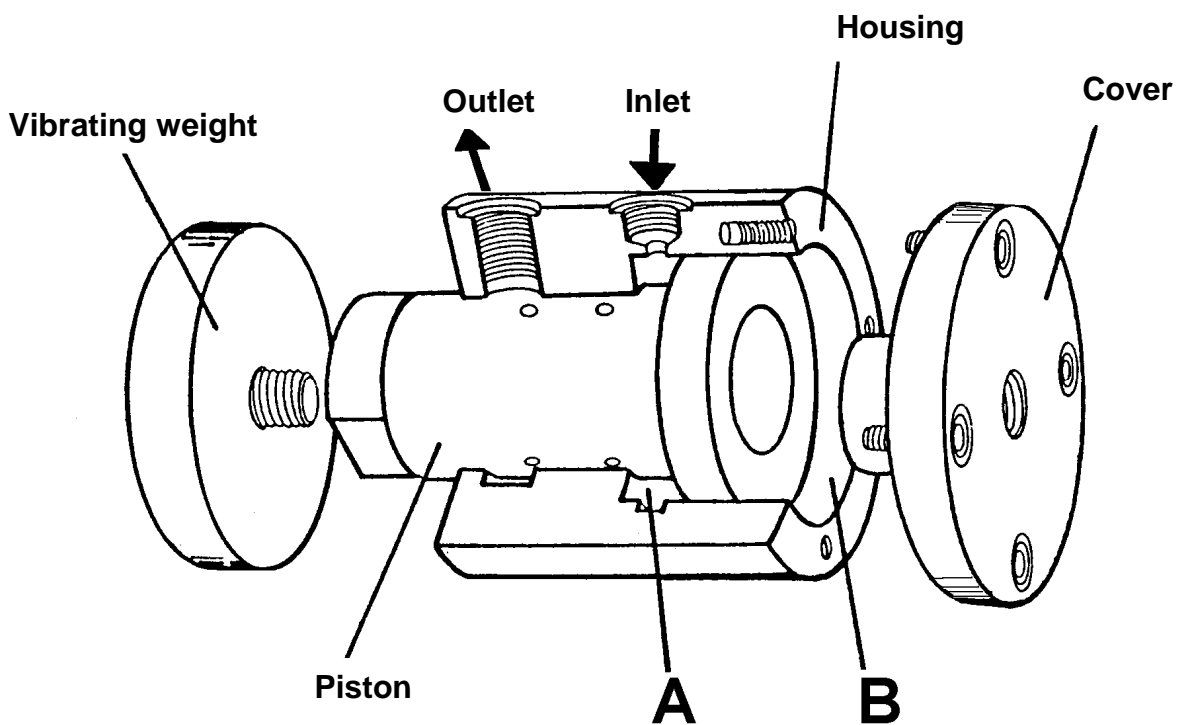
If a higher amplitude of the vibrating mass is required, a larger oscillating weight simply has to be bolted to the piston.

As measure to maintain the mass to be vibrated at a low level, the mass may (in case of steel housings) be connected to the piston, allowing the housing to oscillate freely, if necessary even with an additional vibrating weight.

Chamber **A** is always filled with compressed air, while chamber **B** is alternately charged and relieved through the control bores. Since the pressurized area at **B** is twice the size of the area at **A**, the piston is pressed outwards.

During ventilation of **B** this process is reversed.

Since the piston is reversed before it reaches the stop, the only noise is caused by the exhaust air, which is dampened by a silencer.



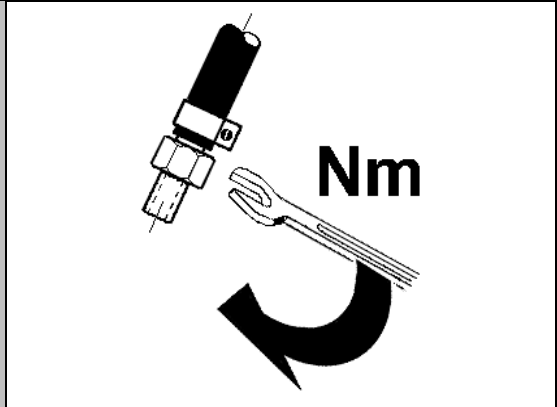
4 Safety



NTK E vibrators are manufactured according to the current EC-regulations. Before using these vibrators the operator must make sure that the introduction of vibration energy will not cause an explosion hazard. Installation and operation of the vibrators must be in compliance with the directives of ATEX for operation in explosion endangered environments and the established accident prevention regulations.



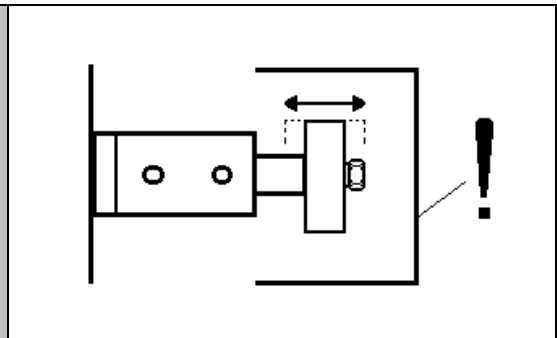
NTK E vibrators work with compressed air. Make sure that the compressed air supply is switched off during installation. Disconnect the supply lines before starting other work on the vibrators and on the supply lines. Before starting operation all hoses must be tightly connected. A hose under pressure coming loose can cause severe injury.



The vibrator as well as parts of the structure may come loose because of vibration. Falling parts can cause damage to persons and material. Only the supplied lock washers must be used. Screw connections must be checked and, if necessary, retightened after 1 hour of operation and then at regular intervals (normally every month). In critical installation situations the unit must be secured with a safety rope.



NTK E vibrators are equipped with moving parts which can cause injury, e.g. bruises or pinching. Direct touching of a vibrating part must be prevented by the customer by appropriate design measures, e.g. by protection cap. These additionally protect the piston rod against deposits of dust.



Silencer: NTK E vibrators must strictly be operated with silencer.



Technical changes to the equipment may affect the characteristics of the linear vibrators or even damage the units and cause the rejection of any warranty claims.
The non-compliance with these operating instructions also leads to the rejection of any claims.



Permissible operating conditions:

Drive medium
Clean (filter $\leq 5 \mu\text{m}$, class 3) lubricated compressed air or nitrogen
Unfiltered air will cause damage to the vibrators.

Operating pressure
2 bar to 6 bar
Operating pressures must not be exceeded or fall short of

Temperature
5°C to 60°C
The ambient temperatures must not be exceeded or fall short of.

Special designs available on request



Declaration of conformity in compliance with ATEX Directive 94/9/EC

We herewith confirm that the pneumatic linear vibrators

Series NTK E

are in compliance with the following regulations:

**94/9/EG
2006/42/EG**

Used harmonised standards:

**DIN EN ISO 12100-1:2004-04
DIN EN ISO 12100-2:2004-04
DIN EN 1127-1:2008-02
DIN EN 13463-1:2009-07**

The sign X placed after the certificate number indicates that the equipment is subject to special conditions for safe use specified in the enclosure to this certificate.

The marking of the pneumatic linear vibrators includes additionally:

 II 2 G D 85°C (T6) or 200°C (T3) (according version)

NetterVibration

i.A. A. Werkmann
(quality manager)



Annex to declaration of conformity NTK E

Description:

The pneumatic piston vibrators series NTK E produce linear vibrations. The vibration is caused by a freely swinging self-steering piston. Both masses, the piston on one side which may be equipped with an additional weights, and the housing with the attached mass on the other side, vibrate against each other relatively to their total weights.

The body may be of electrographic plastic, hard-coated aluminium, cast iron or stainless steel depending on the type of NTK whereas the pistons are made of bronze. The drive medium can be either clean (filtered), lubricated compressed air or nitrogen.

Markings:

Netter Vibration, address...
type: ... (according version)
 $5^{\circ}\text{C} \leq T_{a.} \leq 60^{\circ}\text{C}$
serial number
year

 II 2 G D 85°C (T6) or 200°C (T3) (according version)
documentation number: NV 2003 007 X

Technical documentation:

No. NV 2003 007

Special conditions for safe use:

- The pneumatic piston vibrator has moving parts. The direct contact with the moving parts has to be avoided by constructional means on site.
- In dust areas the piston vibrator may only be operated with adequate dust protection.
- The end user must make sure that the lined-up lubricator works properly.
- For synchronous operation a Netter synchronous line is necessary.
The temperature class increases to 200°C (T3).

NetterVibration

i.A. A. Werkmann
(quality manager)



In explosion endangered atmospheres the socket head cap screws for base plate and cover on NTK E vibrators must not be loosened.



NTK E vibrators must not operate in dust environments without dust protection.



Connection to ground via the earthing connection and the mounting surface is mandatory.

On stainless steel units earthing is accomplished directly via the mounting surface, which requires that electric transition via this surface is assured (clean mounting surface without paint finish).



Compressed air supply and discharge lines (hoses) must be suitable for applications in explosion endangered rooms (electrically conductive, anti-static).

5 Transport and Storage



Check the packing for possible shipping damage.

If damage to the packing is found check the content for completeness and possible damage. In case of damage inform the transport agent.

The units are packed ready for installation. The name plate is attached to the vibrator.

If not specified, attachments (grommet, silencer) will be supplied loosely.

Special transport conditions are not specified.

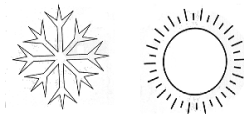
The units should be stored in a dry and clean environment.

Units with steel housing must be oiled before being returned to the stores (spray machine oil in air inlet and outlet and move the piston several times by hand in and out).

On new units the piston may be blocked by paint. In this case turn the piston slightly to loosen it.

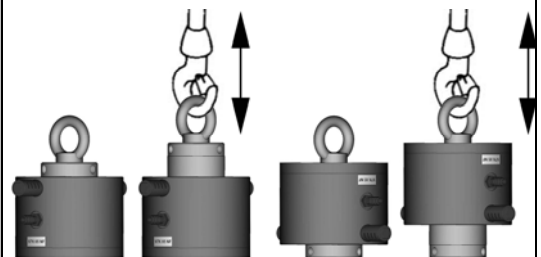


The storage temperature may be between -40°C and $+150^{\circ}\text{C}$. (This does not apply for operating temperature, compare with **chapter 4 "Safety - Permissible Operating Conditions"**).



A suitable lifting equipment has to be used for the transport of the vibrators NTK 85 E and NTK 110 E. Please screw an eyebolt in the piston or in the housing to lift the vibrator (thread M 20). The lifting and lowering has to be executed cautiously, as the piston moves out of the housing or retracts from the housing.

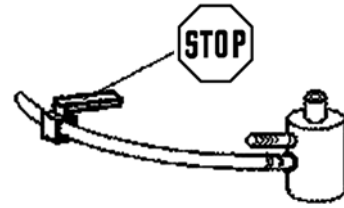
Take care when lifting or lowering!



6 Installation



During installation please comply strictly with the safety regulations in chapter 4 and the accident prevention instructions! Make sure that the compressed air supply is switched off during installation or when working on vibrator and supply lines.



The thoroughly chosen installation position must ensure that any impact contact between NTK E vibrator (aluminium housing) and corroded steel components is ruled out.

Installing the vibrator

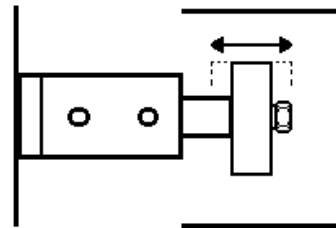


The mounting surfaces must be absolutely level ($\pm 0.1\text{mm}$ flatness fault), so that the vibrator has full area contact and warping of the housing is avoided when tightening the fastening screws.

Up to size NTK 40 E the units can be bolted on by their housing or their piston, as required by the application.

For types NTK 55 E and higher the housing has bores for fastening (see page 11).

In case of horizontal mounting the weight of the freely oscillating part must not heavier than $SW_{\text{Fed.}}$ - refer to the following table.



Type	$SW_{\text{max.}}$ [kg]
NTK 8 AL E	0,15
NTK 15 X E	0,70
NTK 16 E	2,00
NTK 18 AL E	1,50
NTK 25 AL E	2,00
NTK 25 E	3,50

Type	$SW_{\text{max.}}$ [kg]
NTK 40 AL E	3,5
NTK 40 E	5,0
NTK 55 AL E	6,5
NTK 55 E NF	9,5
NTK 85 E NF	18,0
NTK 110 E	20,0



In explosion endangered atmospheres the socket head cap screws for base plate and cover on NTK E vibrators must not be loosened.

Connection to ground via the earthing connection and the mounting surface is mandatory.

On stainless steel units earthing is accomplished directly via the mounting surface, which requires that electric transition via this surface is assured (clean mounting surface without paint finish).



The screw connections must solely be secured using the supplied lock washers.



In critical installation situations the unit must be secured with a safety rope.



The tightening torques can be taken from the following table. Higher tightening torques may cause fracture of screws or tearing of threads. Inadequate screw connections may cause loosening of units by vibration. This can cause damage to persons and material!



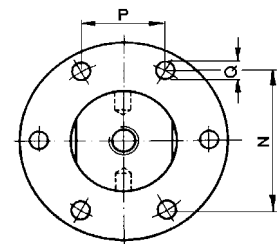
Recommended mean tightening torques for screws of quality 8.8 used on NTK-housings and pistons (screws as delivered, not additionally greased or oiled):

Type	Thread*	Tightening torque
NTK 8 AL E	M 6 (Housing)	8,5 Nm
NTK 8 AL E	M 5 (Piston)	5,9 Nm
NTK 15 X E	M 10	18 Nm
NTK 16 E	M 10	40 Nm
NTK 18 AL E	M 10	40 Nm
NTK 25 E	M 16	95 Nm
NTK 25 AL E	M 16	95 Nm
NTK 40 E	M 16	180 Nm
NTK 40 AL E	M 16	180 Nm
NTK 55 E	M 20	345 Nm
NTK 55 AL E	M 20	345 Nm
NTK 85 E	M 20	400 Nm
NTK 110 E	M 20	430 Nm

*use total length of thread



For units NTK 55 E, NTK 85 E and NTK 110 E use at least 4 of the bores in the housing to mount the housing to the vibrating mass. For these screws the following tightening torques are specified:



Type	Thread	Tightening torque
NTK 55 E	M 8	25 Nm
NTK 85 E	M 10	51 Nm
NTK 110 E	M 12	87 Nm

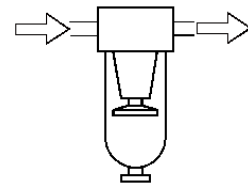


Retightening:

Screw connections must be checked and, if necessary, retightened after 1 hour of operation (after initial start-up) and then at regular intervals (normally every month).



When using compressed air as drive medium, it must be clean (filtered). Unfiltered air leads to excessive wear, clogging of the silencer and complete damage of the vibrator (seizure of piston). The compressed air supply must be reliably fastened.



≤ 5 µm
filter recommended



In case of dusty environments NTK E vibrators must not be operated without any dust protection. During operation the permissible temperature range must not be exceeded, see chapter 4, "Safety".

Air supply line:

The pressure loss increases with the hose length.

The following recommendations refer to hose lengths of max. 3 m to the next bigger hose cross section. For longer supply lines we recommend bigger cross sections.

Air discharge line:

If the exhaust air is discharged the discharge hose must have a bigger nominal width than the air supply hose, in order to prevent throttling of the vibrator. This would otherwise reduce the amplitude.



Compressed air supply and discharge lines (hoses) must be suitable for applications in explosion endangered rooms (electrically conductive, anti-static).

Minimum cross-sections for valves and hoses:

Type	Connection threads	Hose size	3/2-way valve
NTK 8 AL E	M 5	NW 4	M 5 oder G 1/8, NW 2
NTK 15 X E	G 1/8	NW 4	G 1/8, NW 4
NTK 16 E	G 1/8	NW 6	G 1/8, NW 4
NTK 18 AL E	G 1/8	NW 6	G 1/8, NW 4
NTK 25 E	G 1/4	NW 6	G 1/4, NW 6
NTK 25 AL E	G 1/4	NW 6	G 1/4, NW 6
NTK 40 E	G 1/4	NW 6 - 9	G 1/4, NW 6-7
NTK 40 AL E	G 1/4	NW 6 - 9	G 1/4, NW 6-7
NTK 55 E	G 3/8	NW 9 - 12	G 3/8-G1/2, NW 9-12
NTK 55 AL E	G 3/8	NW 9 - 12	G 3/8-G1/2, NW 9-12
NTK 85 E	G 3/8	NW 12	G 1/2, NW 12
NTK 110 E	G 3/8	NW 12	G 1/2, NW 12



For the air supply do not use fittings with threads longer than specified (e.g. no tubes with male thread). The housing may thereby be deformed – the piston will seize.

Make sure that no Teflon tape will enter into the unit. This would cause seizure. The first two windings of the thread should remain free!

The base plate must have uniform contact. Otherwise the housing may warp and the unit will not start.

Checklist for installation

- 1) Install the unit. Secure the fastening screws with the enclosed washers, connect the earthing.
- 2) Consider the expected operating temperature.
- 3) Install service unit (filter, lubricator, regulator), valve, supply line, silencer.
- 4) If necessary (dust, risk of pinching) install a dust protection.
- 5) If required mount an additional weight (vibrating weight) to piston or housing.
- 6) Are fastening screws secured with the supplied lock washers? Check!
Has the unit been secured against falling down?

7 Start-up / Operation

Start-up of the vibrators can be performed immediately after the correct installation.

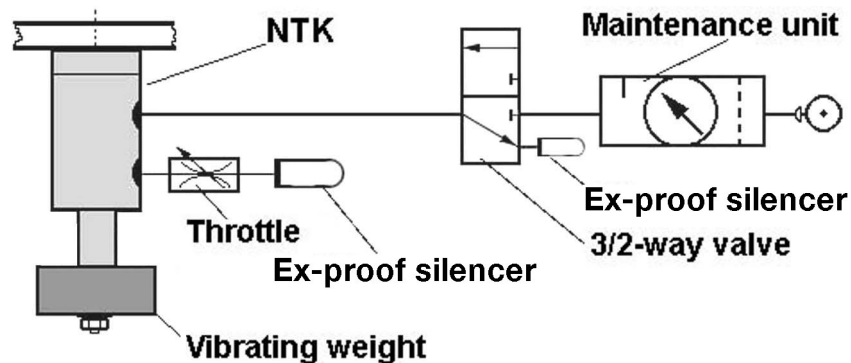
The frequency can be adjusted or regulated with the pressure regulator on the service unit. Use a 3/2-way valve!

The amplitude can be regulated with a throttle installed in the exhaust air outlet.

Attention: Reduced cross-sections (observe NW) already throttle.

Standard installation

Special plans on request



Lubricated compressed air is specified for the NTK E:

Use acid-free and resin-free pneumatic oil, ISO-viscosity class according to DIN 51519, VG 5 to VG 15.

NTK 8 AL E to	
NTK 25 E	1-2 drops/min
NTK 40 E to	
NTK 55 E	2-3 drops/min
NTK 85 E to	
NTK 110 E	3-4 drops/min



ATTENTION:

Adjust number of drops while unit is running.

Only after the adjustment and correct function of the mist lubricator the unit is ready for operation.

Choosing the amplitude:

Amplitude and frequency will change depending on the weight attached to the piston. Lighter or no weight = higher frequency, smaller amplitude. Heavier weight = bigger amplitude, lower frequency.

Regulating the amplitude:

The amplitude can be regulated by throttling the exhaust air (installation of a throttle in the discharge port).

With this the centrifugal force can be reduced. The frequency remains almost constant.

Regulating the frequency:

The frequency can be reduced by reducing the air pressure at the inlet port of the NTK E.

This also reduces the centrifugal force. The amplitude remains almost constant.

Checklist for commissioning:

- 1) Check all hose connections before opening the compressed air supply.
- 2) Adjust the desired frequency on the pressure regulator.
- 3) Adjust the desired amplitude by throttling the exhaust air.
- 4) Adjust the lubricator.



Fastening screws and compressed air supply lines must be retightened or checked after 1 operating hour.

8 Maintenance / Repair



When servicing the unit please observe the safety regulations in chapter 4.

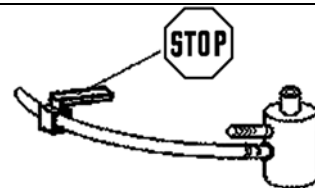


Retightening:

Screw connections must be checked and, if necessary, retightened and secured with Loctite after 1 hour of operation (after initial start-up) and then at regular intervals (normally every month). The specified torque must thereby be observed (see chapter 6).



Before starting inspection and service work shut off the compressed air supply and secure it against unintended activation!



Lubricator:

With a lubricator connected in series make sure that the lubricator works as specified (content diminishing? number of drops/h?). Top up oil.

Filter: Empty the filter when required, clean the filter insert (wash out).

Cleaning:

All NTK E vibrators can be externally cleaned with water, as long as the exhaust air is discharged through a hose or the exhaust opening is closed. Water must not enter through the silencer into the piston chamber.

Contamination:

Especially contaminated air can cause a deposit of dirt or dust which brakes the vibrator.

If this is noticed (power drop or even standstill) the unit must be opened and cleaned inside. The dirt film must be cleaned off with an oiled cloth from the inside of the housing and from the piston. Further notes can be found in chapter 9 „Troubleshooting“.

The maintenance intervals mainly depend on the purity of the drive medium.



The following maintenance work must be regularly performed by an authorized specialist:

- a) Inspection of screw connections
- b) Inspection of earthing connection
- c) Inspection of supply lines
- d) Inspection of silencers

Further maintenance and repair work, e.g. maintenance must solely be carried out by *NetterVibration* .

When servicing the unit please observe the safety regulations in chapter 4.

9 Troubleshooting

Fault	possible cause	Remedy
No starting	Connection mixed up.	See illustration in chapt. 3 „Design and Working Principle“, inlet on cover side, outlet on piston side.
	Air supply	Check if pressure is sufficient? Check valve. It must be a 3/2 way valve which vents the supply line to the vibrator in stop position.
	Cover loose.	A leaking cover will cause standstill. Tighten the screws.
	Line cross-sections	Observe minimum cross-sections, see specifications under „Installation“
	Line between valve and NTK E too long	Causes slow starting and possible standstill of piston in middle position. If necessary install a pilot-controlled 3/2-way valve in front of the vibrator
	Exhaust air excessively restricted	Open the restrictor further. Clean the silencer.
Rattling	Piston braked in middle position.	Make sure that the piston can oscillate freely. It must not be positioned in middle position by external influences.
	Screws loose.	Check screws on piston and housing.
Power drop	No lubrication.	Check function of lubricator if lubricated compressed air is specified.
	Unit soiled.	Dismantle, remove dirt film.
	Wear	Check unit and piston for visible wear.
	Design	Check size of unit. Has the size been chosen correctly?
	Pressure too low.	Check the pressure at the inlet of the unit (!) during operation. If necessary increase the pressure.

10 Spare Parts

When ordering spare parts you should always provide the following details:

1. Type of unit
2. Description and position of the spare part
3. Required quantity



Please note: Piston and housing are matched to each other and can only be delivered together.

11 Appendix

11.1 Accessories

The following accessories are available for the linear vibrators NTK E (on request):

Description	Remark
Vibrating weight SM	for all units in various sizes
Hose material and fittings	For supply and discharge of compressed air in various qualities and dimensions.
3/2-way valves	For electric, pneumatic and manual control
Throttle valves	For amplitude control, manually adjustable or pneumatically controllable (for remote control)
Service units	Filter, regulator, lubricator or filter + regulator
Timer	Electric or pneumatic for interval operation
Brackets	For quick displacement of vibrators on containers
Special designs:	NTK vibrators are available for extreme temperatures, completely made out of stainless steel for use in aggressive environments, for highest frequency ranges (HF-versions) as well as in shorter lengths. Information on request.

11.2 Disposal

Depending on the material, the parts must be disposed of according to regulations.

Material specifications:

All parts of these vibrators are suitable for recycling

- Piston: ⇒ Bronze
- Housing, covers: ⇒ Grey cast iron, steel or aluminium
- Screws: ⇒ Steel



All units can be disposed off through Netter GmbH.
The valid waste disposal prices are available on request.

11.3 Enclosures

Enclosure(s):

Declaration of conformity
Spare parts list



Further information available on request:

Brochure no. 24 (NTK)
Notes for the design of small conveyor troughs with NTK vibrators and many more