



**DICKOW
PUMPEN**



**HTM Circulation Pumps
acc. to DIN EN 733
Type NKX**

General

The new NKX pump line replaces our former heat transfer oil circulation pump type NKL s. The outer dimensions of both pump types are identical and therefore interchangeable.

The dimensions and performance range of these centrifugal pumps are according to DIN EN 733, that means range is subdivided into different pump sizes in order to achieve best efficiency for all service conditions inside the envelope.

Application

The NKX is used as a circulation pump for hot oils in industrial heating plants/units. The performance range covers capacities up to 400 m³/h and differential heads up to 90 m in 50 Hz services; and capacities up to 2500 US-gpm and differential heads up to 400 ft in 60 Hz services.

The bearing bracket with additional air cooler is specially designed to handle heat transfer oil. With this new design the application range of the pump is now extended to 350°C, without water cooling. That means the pump can now be also used in applications that earlier required double acting metal bellow seal systems. The maximum allowable operating pressure at the mechanical seal is 10 bar.

Design

The NKX are a single stage, single flow volute casing pumps in horizontal back-pull-out design with end suction and top discharge flanges. The back-pull-out design allows disassembly of the bearing bracket unit, complete with impeller, mechanical seal and cooler after removing the casing bolt nuts, without removing the volute casing from the piping system. If spacer couplings are used the drive motor can remain bolted to the base plate when removing the bearing bracket unit.

In order to extend the application range of the pump, the mechanical seal is placed in an area with lower temperature and with only minimum exchange of heat transfer agent between pump casing and mechanical seal area.

Volute casing, flange design

The radial split volute casing is cast in one piece and foot mounted on the base plate. The connection flanges can be delivered in different exe-

cutions, PN 10 or 16 according to EN 1092 or Class 150 according to ASME B16.5.

The design pressure of the casing is 16 bar @ 350 °C.

Impeller

The pumps have closed casted impellers, hydraulically balanced by throttle gap and relief bores to keep occurring axial loads to a minimum. All impellers are dynamically balanced acc. to DIN ISO 1940 part 1, at a balance grade of G 6.3, that grants a smooth and vibration free run of the pump. The impellers are arranged on the pump shaft in overhung position and are fixed by keys and shaft nuts.

Wear rings

All pumps are generally equipped with interchangeable wear rings.

Pump shaft

The pump shafts are designed to safely transmit maximum possible power of driver. Minor deflections ensure a high reliability in operation.

Standard materials:

Volute casing: EN-GJS-400-18-LT

Intermediate casing: EN-GJS-400-18-LT

Impeller: $\varnothing \leq 250 \text{ mm}$ – EN-GJL-250
 $\varnothing > 250 \text{ mm}$ – EN-GJS-400-18-LT

Pump shaft: 1.4021

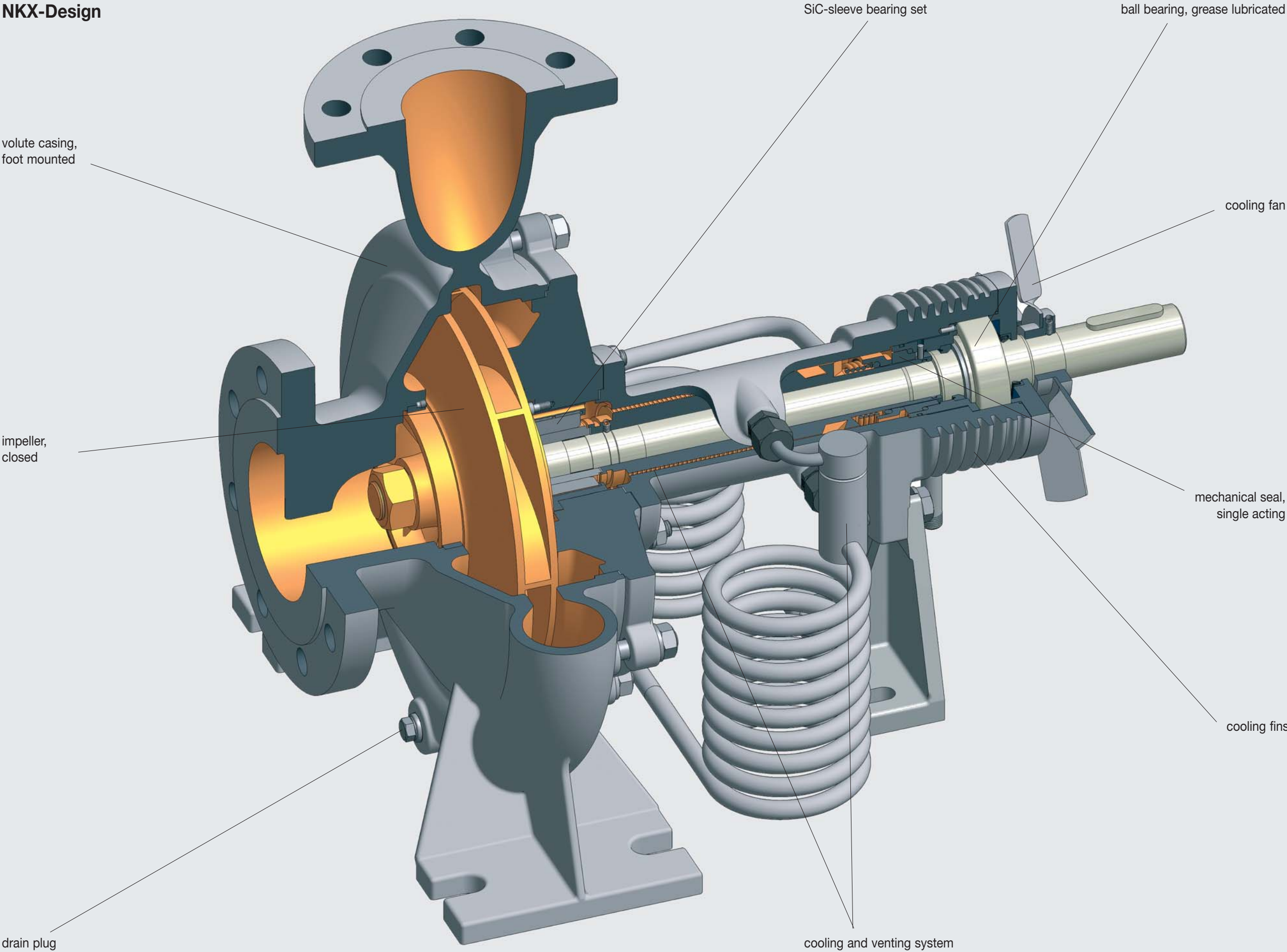
Bearing bracket: EN-GJL-250

Bearings

The installed external ball bearing is greased for life and can safely accept residual axial thrust loads of the impeller and reaches through bearing temperatures of maximum 100 °C, also under extreme conditions, a long life time. Re-greasing is not necessary.

The second bearing is a SiC sleeve bearing set behind the impeller. These sleeve bearings have proved their reliability in thousands of pumps with magnet coupling for more than three decades now. The hard SiC-material runs almost wear free.

NKX-Design

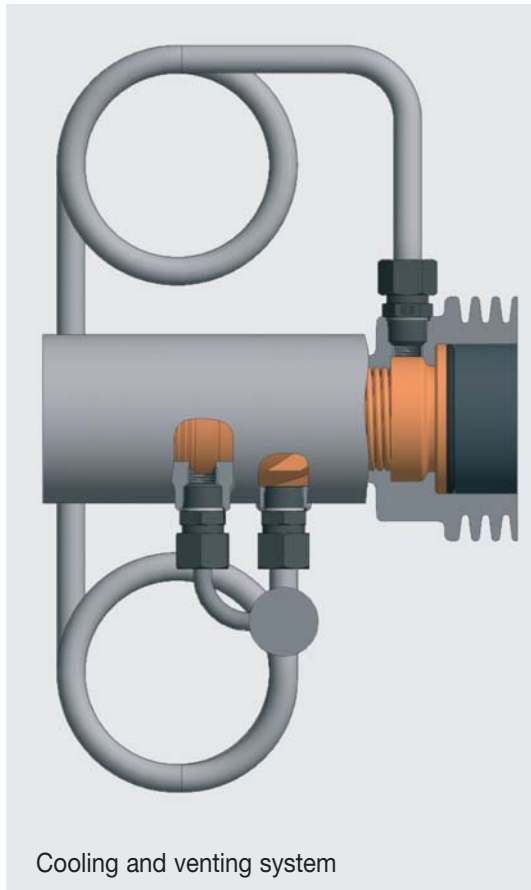


Cooling and venting system

As usual pump must be filled before start-up through the connected suction and/or discharge line. The start of the drive motor activates the internal venting mechanism. This mechanism builds up a constant pressure and therefore a permanent circulation flow around the mechanical seal in order to dissipate the frictional heat via the connected cooling coil. The coil dissipates the heat to the atmosphere, a cooling fan mounted to the pump shaft guarantees sufficient air exchange.

The constant venting of the mechanical seal chamber respectively the evacuation of gaseous low-boiling hydrocarbon components is done via an integrated gas separator immediately after the inlet into the cooling coil. The separated gas is transported through an internal pumping ring inside of the bearing bracket towards the volute casing. The sleeve bearing located directly behind the impeller has a top venting bore that feeds the gas into the rear chamber of the volute casing. The normal pumping flow absorbs the gas and carries it away.

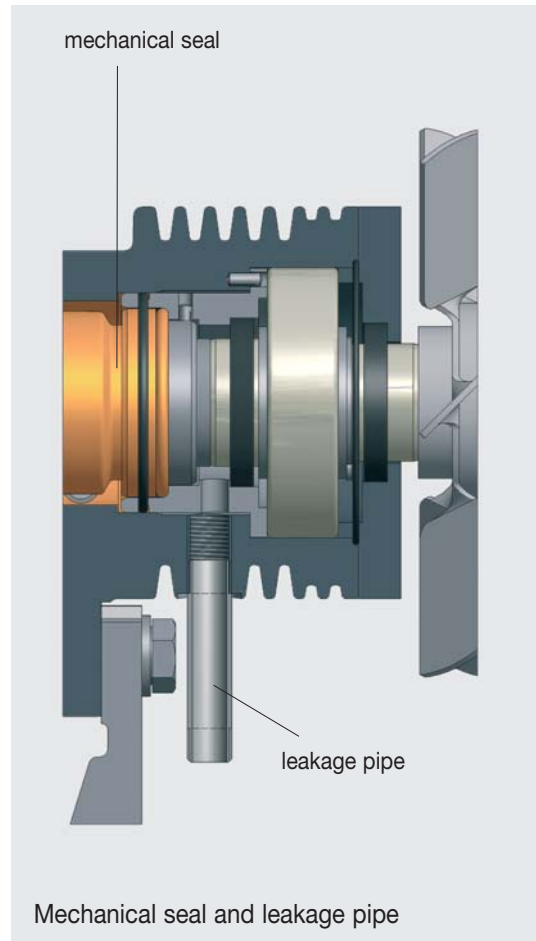
Patent for the integrated cooling and venting system is pending.



Cooling and venting system

Mechanical seal

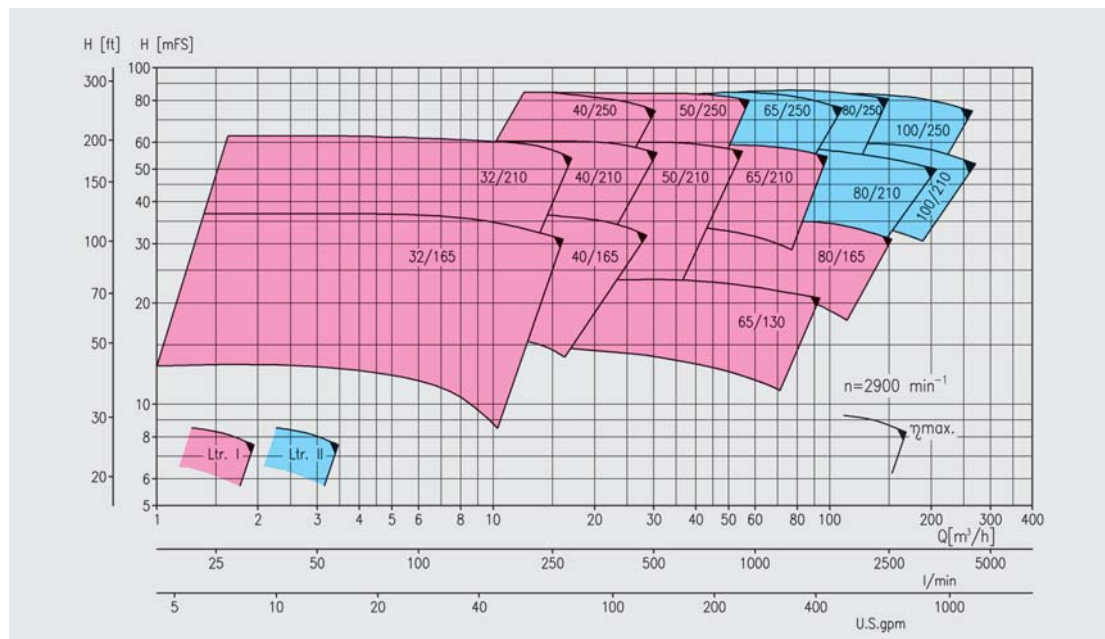
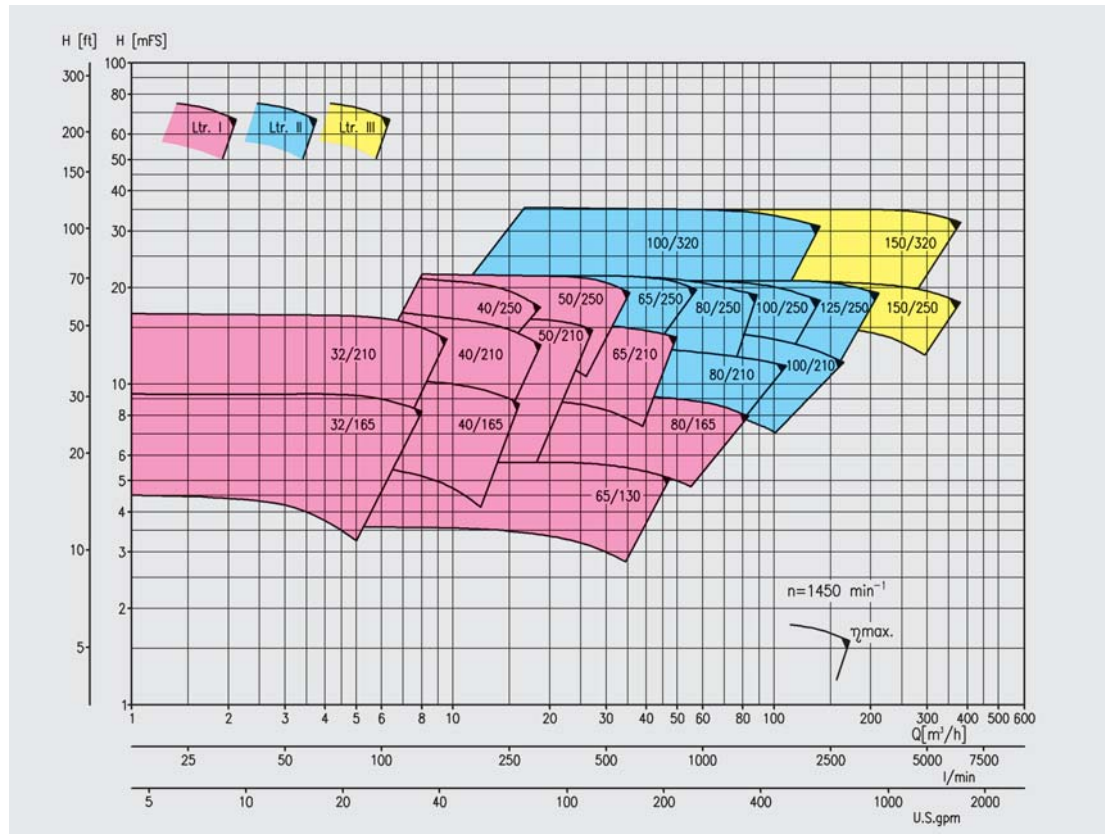
The sealing to the atmosphere is done by a single acting O-ring mechanical seal. In case of seal damage the leakage of the seal is guided away from the seal through a connected leakage pipe. This arrangement prevents damage of the ball bearing by hot leaking oil.



Advantages of the new NKX-pump design

- Compared to all major competitors products the mechanical seal chamber does not require manual, external filling and venting.
The pump is self-venting!
- Since no filling and venting is required there is no need to collect and dispose any spilled oil. As an additional benefit no operating personal may be harmed or injured during venting of the hot pump.
- Even at high mechanical seal temperatures the danger of oil carbon deposits is greatly minimized through the lack of oxygen.
- The cooling coil allows operation of the pump up to 3500 rpm.

Performance range



Performance curves of the individual pump sizes, also for 1750 / 3500 rpm, are available on request.

