

High Pressure Centrifugal Pumps**General**

WKn, WLn-Pumps are multistage centrifugal pumps in ring section design. They are usually mounted on a common base plate with a flexible coupling and driver.

Applications

For waterworks, irrigation and sprinkler installations, as boiler feed or condensate pumps, for high pressure water supply in power systems and presses, as fire pumps, for cooling water systems and hot water circulation.

Construction

The construction is horizontal, multistage, with radially split suction, discharge and stage casings. These casings are sealed by o-rings and held together by external tie bolts. The pump feet are arranged either below the pump or at the centre line according to the number of stages and the temperature.

Balancing Device

The axial hydraulic thrust in WKn pumps is balanced by means of balance holes and throttle gaps at the back shroud of each impeller. Wear rings are supplied at suction and discharge side of each impeller where applicable.

The axial thrust in WLn pumps is balanced with a balancing disk arrangement incorporated in a chamber behind the last stage impeller.

Operating Data

NB	200-350	mm
Q	750	l/s
H	500	m
t	200	°C
n	1450	rpm

Bearings

The bearings are located in two bearing housings, which are positioned at both sides of the pump. WLn pumps can be supplied with plain journal bearings with ring oil lubrication, or alternatively with roller bearings. WKn pumps are fitted with a deep groove ball bearing at the discharge end, which absorbs the residual axial thrust of the rotating assembly. The construction with heavy bearing housing is fitted with angular contact ball bearings at the discharge side in X-arrangement.

Shaft Seal

The shaft is fitted with renewable protecting sleeves in the region of the shaft seal. The uncooled packing stuffing box can be used for operating temperatures up to 105 °C; above this, a cooled packing stuffing box is used, in which a supply of cooling water ensures that the temperature is kept within safe limits. For special applications, special designs of stuffing boxes or mechanical seals can be fitted as required.

Nozzle Orientation

For arrangement "feet below the casing" the suction nozzle is radial, pointing to the right hand side or left hand side or to the top from 2 stages onwards. The discharge nozzle is generally located in the top position. Arrangement "feet in centreline" is only possible for casings of chrome steel or cast steel. In this case nozzle positions are only in top position.

Flanges

Standard construction
 DIN 2533/43, PN 16
 DIN 2535/45, PN 40
 DIN 2546, PN 63
 Special constructions of flanges according to USAS and BS and other standards are available on request.

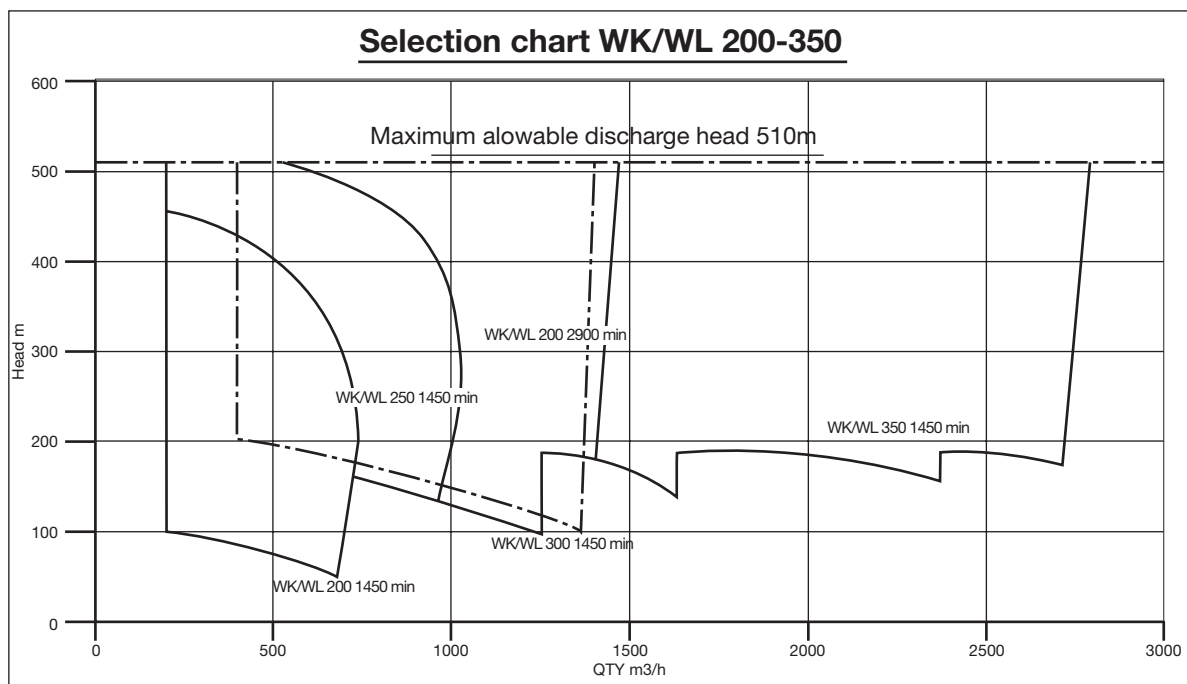
Drive

The drive is generally a direct coupled electric motor, using a flexible coupling. The suction end is the drive end, and the direction of rotation is clockwise. A stub shaft can be fitted at the discharge end (in this case the direction of rotation is anti-clockwise) or the pump can be fitted with a stub shaft at each end.

Materials

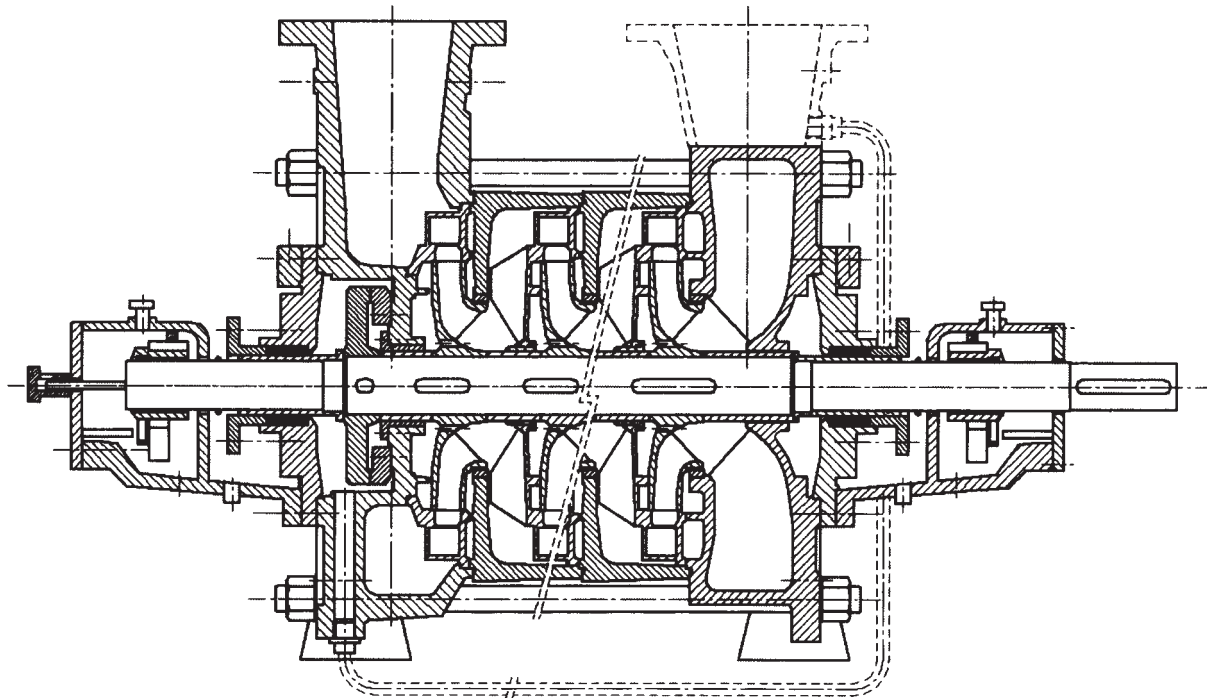
The following materials are used for standard material combinations:

Suction, discharge and stage casing	Cast Iron / Cast Steel	Cast Chrome Steel
Impellers and diffusers	Cast iron / Bronze	Cast Chrome Steel
Shaft	Hi- tensile carbon steel	Chrome Steel
Shaft protecting sleeve	Cast iron, Bronze	Cast Chrome Steel
Casing wear rings, spacer sleeves	Cast iron, Bronze	Ni alloyed Cast Iron
Balancing disc	Cast iron, Bronze	Chrome steel
Balancing counter disc	Cast iron	Chrome steel
Tie bolts	Alloyed steel	Alloyed steel

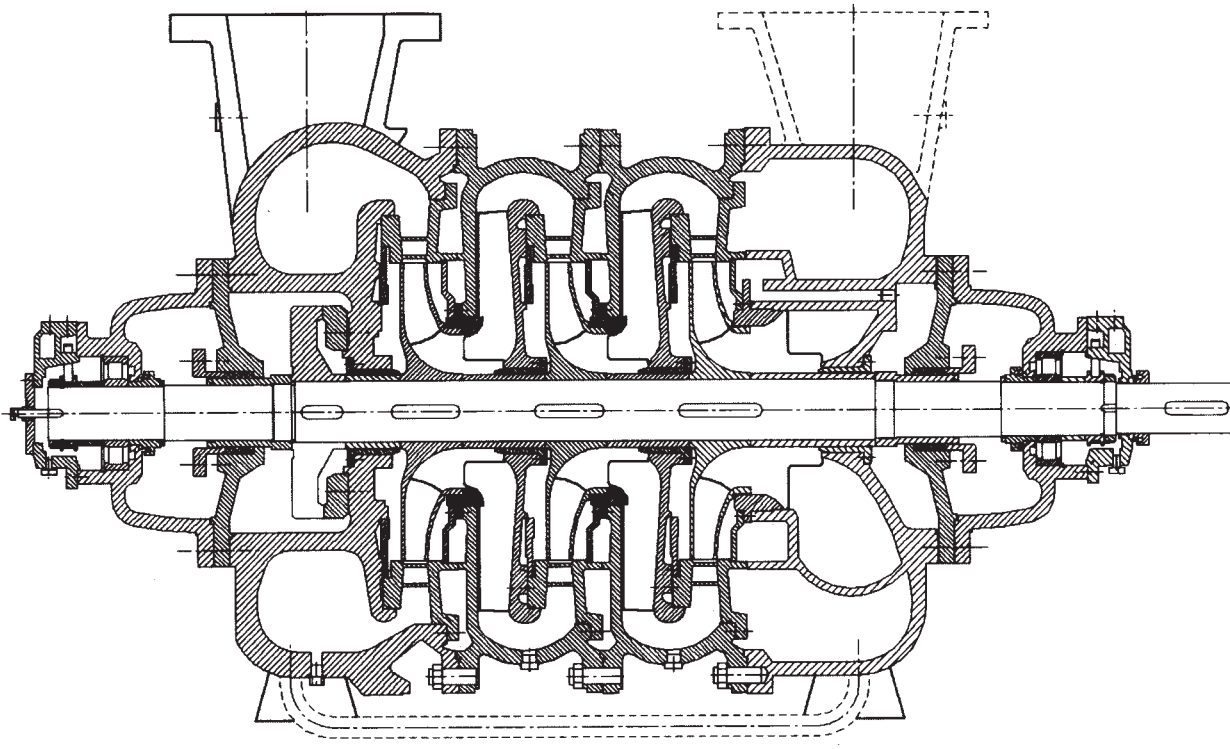


Typical Pump Sections

WLn 200, 250 & 350



WLn 300



Typical Pump Designs

WLn Pumps

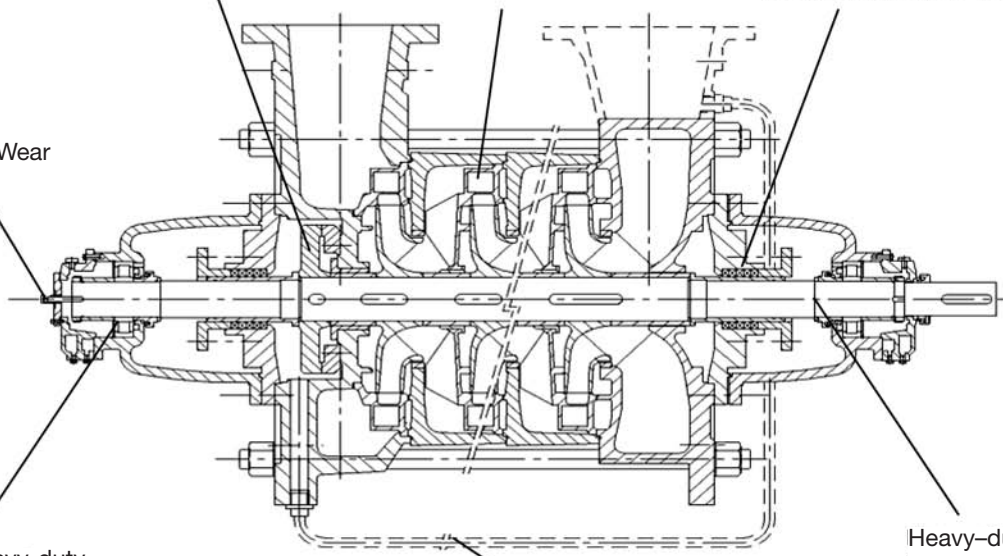
A disc and counter disc arrangement balances the hydraulic axial thrust

Impeller diffuser combination for best efficiency

Two stuffing box designs are available which allows the pump to operate at temperatures of up to 140 °C

Shaft position indicator for verification of Balance Disc Wear

NU type heavy-duty cylindrical roller bearings with oil lubrication (Sleeve bearings optional)



Balance pipe from balance chamber to suction casing

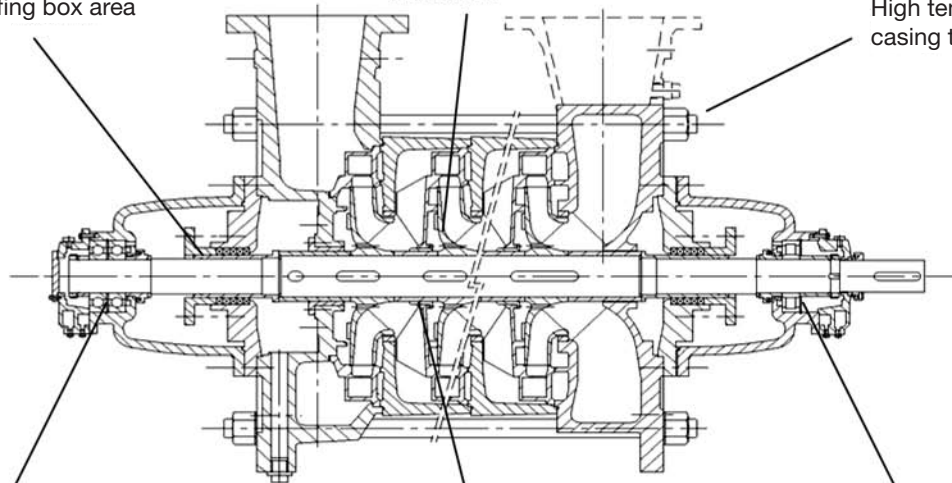
Heavy-duty shaft available in different materials

WKn Pumps

Renewable shaft protecting sleeves in stuffing box area

Balance holes provided in the impeller for balancing of hydraulic axial thrust

High tensile casing tie bolts



Matched angular contact ball bearings with oil bath lubrication

Renewable shaft sleeves and stage bushes in diffuser throttle gaps

NU type heavy-duty cylindrical roller bearing