

# MULTISTAGE CENTRIFUGAL PUMPS



— **Gruppo Aturia** —



## MULTISTAGE CENTRIFUGAL PUMPS

### TK - TKR - VTK - TTK series

TK-VTK-TKR-TTK are high pressure multistage pumps. Connection to the driving machine (generally an electrical motor) is through a flexible coupling.

### DESIGN

Multistage centrifugal ring section pumps with modular design. The stage elements are in series configuration and are sealed by O-rings tightened by sturdy outer tie bolts.

The supporting feet on delivery side are integrated in the delivery nozzle casing for all sizes.

For sizes up to 65-100 (included), the suction side pump feet are integrated in the first stage casing in order to allow to turn the suction nozzle in steps of 90° (left or right side or top). For larger sizes the pump feet are mounted under the suction nozzle casing, accordingly the position of the suction nozzle has to be defined when ordering.

The axial thrust is balanced by the hydraulic and dynamic balancing of each single impeller.

TK series are horizontally and between bearings mounted. PN16 Suction flange and PN40 Delivery flange. The shaft is supported by two, grease lubricated, antifriction bearings.

VTK series are vertically mounted. Suction flange PN16 and Delivery flange PN40. The shaft on the suction side is led in slide bearing lubricated by the pump liquid, on the delivery side is supported by the motor bearing. Motor and pump are connected by a stool and a rigid coupling.

TKR series are horizontally and between bearings mounted. Suction flange PN16 and Delivery flange PN64. The shaft is supported by two, oil lubricated, antifriction bearings.

Shaft sealing for TK and TKR series is achieved with soft packing and packing gland as standard. On request, mechanical seal can be mounted. Mechanical seal is standard for VTK series.

TKK high pressures series are horizontally and between bearings mounted. PN25 Suction flange and PN100 Delivery flange. Suction and Delivery nozzles are easily turned in 90° steps. Mechanical seal chamber can also accommodate API682 seals. Bearing supports are designed for heavy duty applications and with separate oil chamber.

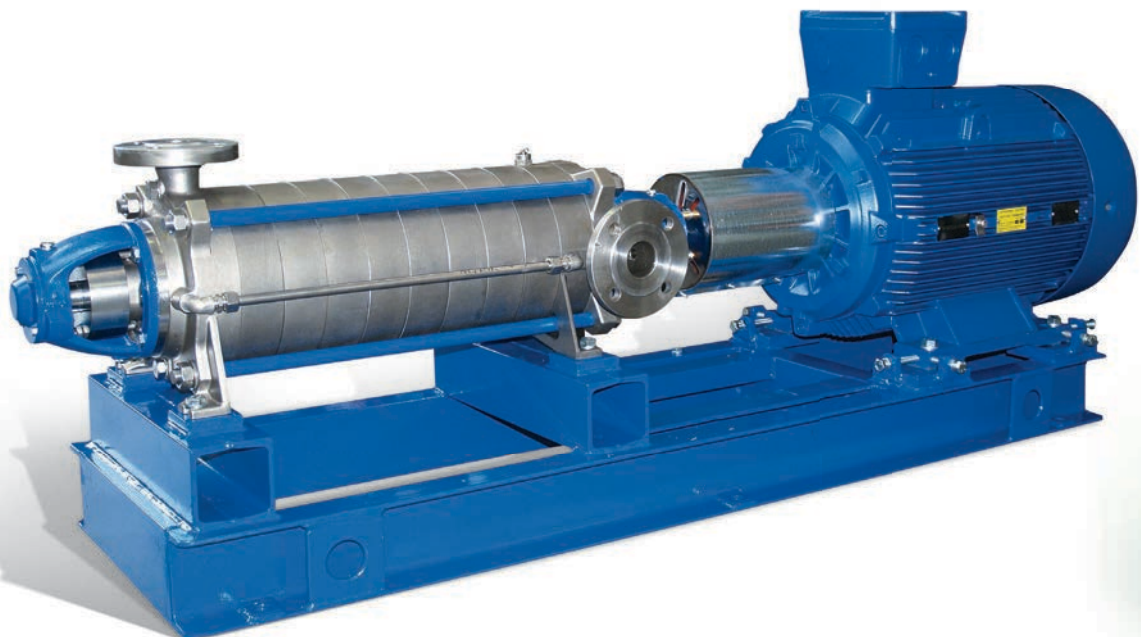
### FIELDS OF APPLICATION

TK - VTK Pumps are used for:

- Irrigation and land reclamation plants
- Water supply
- Power plants
- Hot and Cold water circulation
- Condensate transportation
- Snow gun
- Fire-Fighting equipment

TKR-TTK Pumps are used for:

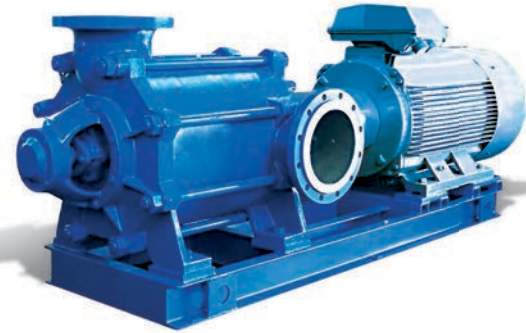
- Boiler feed
- Pressure boosting
- Osmosis and Ultra filtration



## MATERIALS

### TK / VTK SERIES

DESCRIPTION	STANDARD	OPTION
Pump Casing	Cast Iron (EN-GJL-250)	Stainless Steel (GX6CrNiMo1810) S.S. Duplex Gr.4A (GX2CrNiMo2253) S.S. Duplex Gr.5A(GX2CrNiMo2674)
Radial Impeller	Cast Iron (EN-GJL-250) Bronze (G-CuSn10)	Stainless Steel (GX6CrNiMo1810) S.S. Duplex Gr.4A (GX2CrNiMo2253) S.S. Duplex Gr.5A(GX2CrNiMo2674)
Diffuser	Cast Iron (EN-GJL-250) Bronze (G-CuSn10)	Stainless Steel (GX6CrNiMo1810) S.S. Duplex Gr.4A (GX2CrNiMo2253) S.S. Duplex Gr.5A(GX2CrNiMo2674)
Wear Rings	Bronze (G-CuSn10) for size 125-150 and higher	Bronze (G-CuSn10) Stainless Steel (AISI 316+Hardning) Stainless Steel (SAF2205 / SAF2507)
Suction Delivery Casing	Cast Iron (EN-GJL-250) (*)	Stainless Steel (GX6CrNiMo1810) S.S. Duplex Gr.4A (GX2CrNiMo2253) S.S. Duplex Gr.5A(GX2CrNiMo2674)
Shaft Sleeves	Chromium Steel (AISI 420B)	Stainless Steel (AISI 316) Stainless Steel (SAF2205 / SAF2507)
Shaft	Chromium Steel (AISI 420B)	Stainless Steel (AISI 316) Stainless Steel (SAF2205 / SAF2507)
Seal: TK VTK	Soft Packing (PTFE) Mechanical seal (Ca/Sic/EPDM)	Mechanical seal Mechanical seal (Sic/Sic/VITON)
Bearings	Grease lubricated	Oil lubricated (only TK series)



(\*) Exceeding 25 bar: Delivery Casing materials, Nodular Cast Iron or Carbon Steel

### TKR SERIES

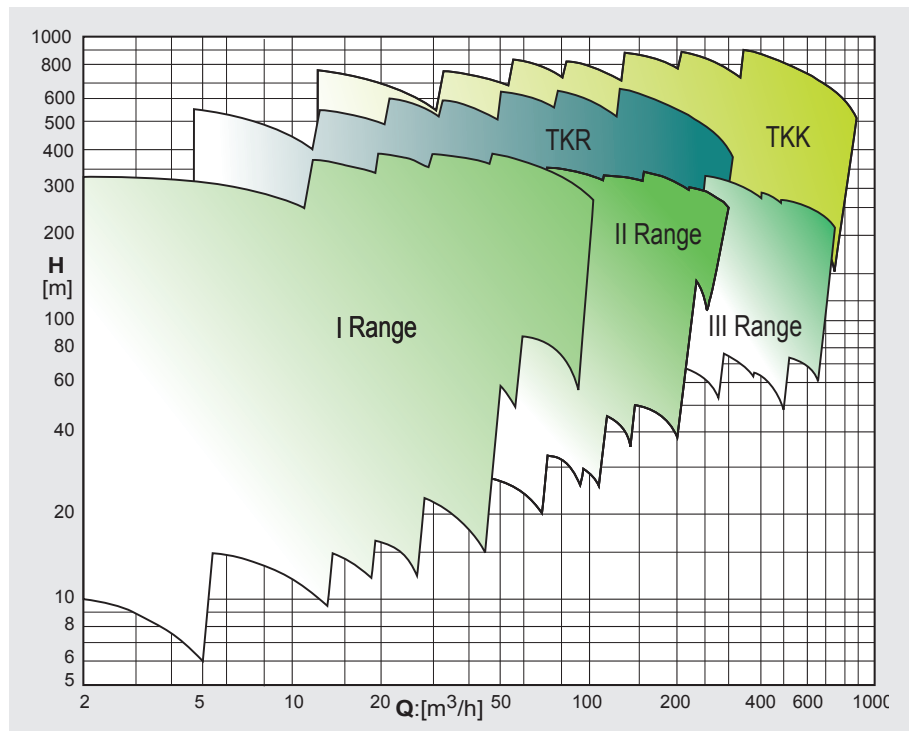
DESCRIPTION	STANDARD	OPTION
Pump Casing	Nodular Cast Iron (EN-GJS-400-15)	Stainless Steel (GX6CrNiMo1810) S.S. Duplex Gr.4A (GX2CrNiMo2253) S.S. Duplex Gr.5A(GX2CrNiMo2674)
Radial Impeller	Cast Iron (EN-GJL-250) Bronze (G-CuSn10)	Stainless Steel (GX6CrNiMo1810) S.S. Duplex Gr.4A (GX2CrNiMo2253) S.S. Duplex Gr.5A(GX2CrNiMo2674)
Diffuser	Cast Iron (EN-GJL-250)	Stainless Steel (GX6CrNiMo1810) S.S. Duplex Gr.4A (GX2CrNiMo2253) S.S. Duplex Gr.5A(GX2CrNiMo2674)
Wear Rings	Bronze (G-CuSn10)	Stainless Steel (AISI 316+Hardning) Stainless Steel (SAF2205 / SAF2507)
Suction Casing	Nodular Cast Iron (EN-GJS-400-15) Carbon Steel (GP240GH)	Stainless Steel (GX6CrNiMo1810) S.S. Duplex Gr.4A (GX2CrNiMo2253) S.S. Duplex Gr.5A(GX2CrNiMo2674)
Delivery Casing	Carbon Steel (GP240GH)	Stainless Steel (GX6CrNiMo1810) S.S. Duplex Gr.4A (GX2CrNiMo2253) S.S. Duplex Gr.5A(GX2CrNiMo2674)
Shaft Sleeves	Chromium Steel (AISI 420B)	Stainless Steel (AISI 316) Stainless Steel (SAF2205 / SAF2507)
Shaft	Chromium Steel (AISI 420B)	Stainless Steel (AISI 316) Stainless Steel (SAF2205 / SAF2507)
Seal	Soft Packing (PTFE)	Mechanical seal
Bearings	Oil lubricated	





## PERFORMANCE RANGE

2 – 4 Poles / 50 Hz



The performances included:

### I RANGE

<b>TYPE:</b> from TK-VTK 25/40 to TK-VTK 65/100
<b>CAPACITY:</b> up to 100 m <sup>3</sup> /h
<b>HEAD:</b> up to 400m

<b>WORKING PRESSURE and TEMPERATURE:</b>	Suction	Delivery	Temperature
Soft packing	12 bar	40 bar	-10°C ÷ +105°C
Standard mechanical seal (Ca/Sic/EPDM)			-10°C ÷ +120°C
Special mechanical seal (Sic/Sic/VITON)			-10°C ÷ +120°C

Maximum admissible casing pressure (suction + shut off head): 40 bar

### II RANGE

<b>TYPE:</b> from TK-VTK 80/125 to TK-VTK 125/150
<b>CAPACITY:</b> up to 300 m <sup>3</sup> /h
<b>HEAD:</b> up to 350m

<b>WORKING PRESSURE and TEMPERATURE:</b>	Suction	Delivery	Temperature
Soft packing	12 bar	40 bar	-10°C ÷ +105°C
Standard mechanical seal (Ca/Sic/EPDM)			-10°C ÷ +120°C
Special mechanical seal (Sic/Sic/VITON)			-10°C ÷ +120°C

Maximum admissible casing pressure (suction + shut off head): 40 bar; (125/150 : 30 bar)

### III RANGE

<b>TYPE:</b> from TK 150/200 to TK 250/300
<b>CAPACITY:</b> up to 800 m <sup>3</sup> /h
<b>HEAD:</b> up to 300m

<b>WORKING PRESSURE and TEMPERATURE:</b>	Suction	Delivery	Temperature
Soft packing	12 bar	25 bar	-10°C ÷ +105°C
Standard mechanical seal (Ca/Sic/EPDM)			-10°C ÷ +120°C
Special mechanical seal (Sic/Sic/VITON)			-10°C ÷ +120°C

Maximum admissible casing pressure (suction + shut off head): 30 bar

### TKR RANGE

<b>TYPE:</b> from TKR 32/50 to TKR 125/150
<b>CAPACITY:</b> up to 500 m <sup>3</sup> /h
<b>HEAD:</b> up to 600m

<b>WORKING PRESSURE and TEMPERATURE:</b>	Suction	Delivery	Temperature
Soft packing	12 bar	64 bar	-10°C ÷ +105°C
Standard mechanical seal (Ca/Sic/EPDM)			-10°C ÷ +120°C
Special mechanical seal (Sic/Sic/VITON)			-10°C ÷ +140°C

Maximum admissible casing pressure (suction + shut off head): 64 bar

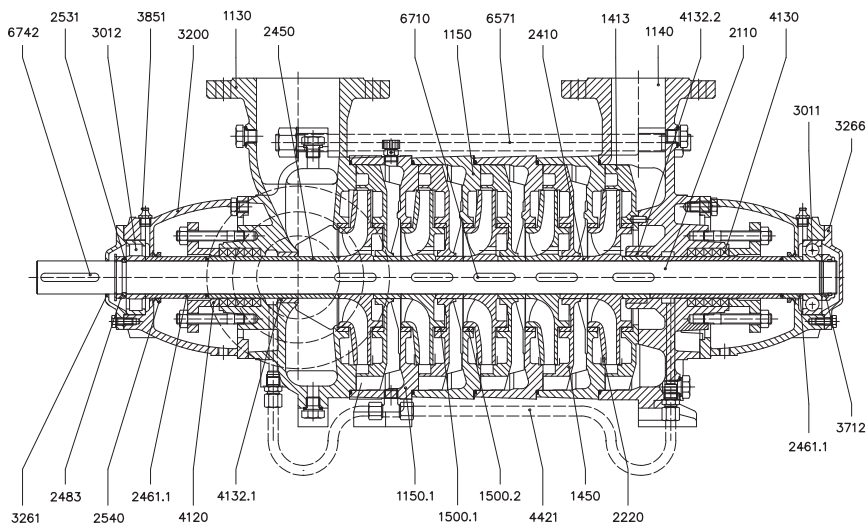
### TKK RANGE

<b>TYPE:</b> from TKK 40/65 to TKK 200/250
<b>CAPACITY:</b> up to 900 m <sup>3</sup> /h
<b>HEAD:</b> up to 900m

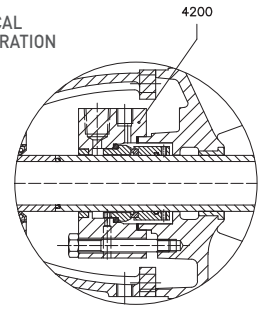
<b>WORKING PRESSURE and TEMPERATURE:</b>	Suction	Delivery	Temperature
Mechanical seal (Ca/Sic/EPDM)	25 bar	100 bar	+160°C

# SECTIONAL DRAWINGS

## TK SERIES

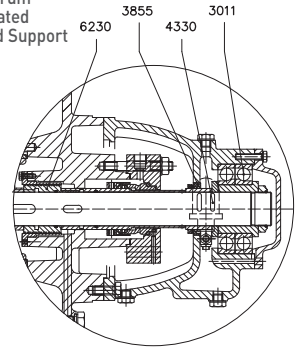


MECHANICAL SEAL CONFIGURATION

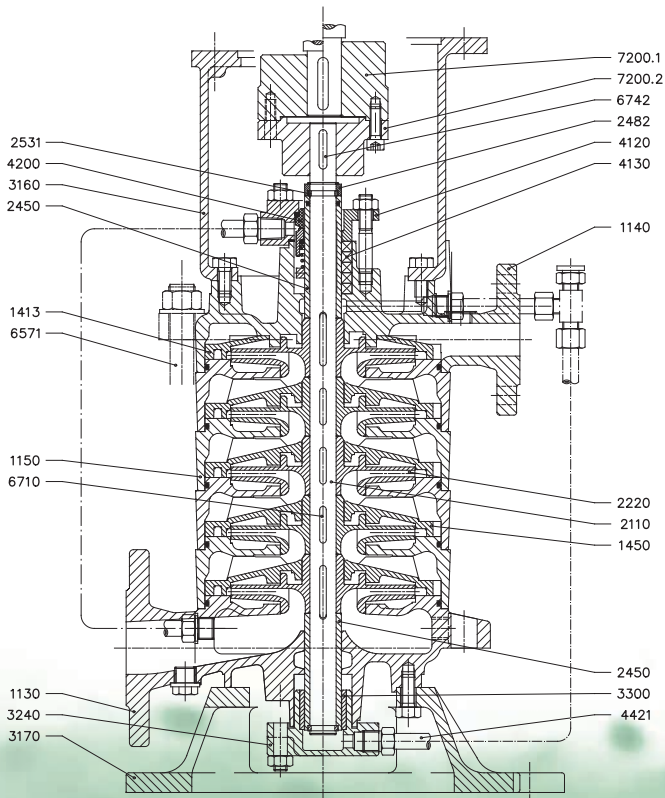


TKR CONFIGURATION

- Balance Drum
- Oil Lubricated Reinforced Support



## VTK SERIES



POS.	PARTS NAME	POS.	PARTS NAME
1130	Suction casing	3240 (5)	Bearing carrier
1140	Delivery casing	3261	Bearing cover suction side
1150	Stage casing	3266	Bearing cover delivery side
1150.1 (3)	First stage casing	3300 (5)	Bearing bush
1413	Diffuser last stage	3712	Thrust bearing nut
1450	Diffuser	3851	Grease cup
1500.1 (1)	Casing wear ring, suction side	3855 (4)	Constant level oil
1500.2 (1)	Casing wear ring, delivery side	4120	Packing gland
2110	Pump shaft	4130	Packing seal
2220	Impeller	4130	Packing seal delivery side
2410 (1)	Impeller spacer sleeve	4132.1 (1)	Neck bush suction side
2450	Spacer sleeve, suction side	4132.2 (1-2)	Neck bush delivery side
2461.1/2	Bearing spacer sleeve	4200	Mechanical seal
2483	Locating sleeve	4330 (4)	Labirint ting
2531	Retaining ring split	4421	Shaft seal pipe
2540	Trower	6230 (4)	Balance drum
3011	Thrust ball bearing	6571	Tie bolt
3012	Radial roller bearing	6710	Impeller key
3160 (5)	Motor stool	6742	Coupling key
3170 (5)	Pump stool	7200.1	Half couplin g
3200	Bearing housing	7200.2	Half coupling

(1) Only for pumps, ≥125-150

(2) Only for pumps, 80-125 and 100-150

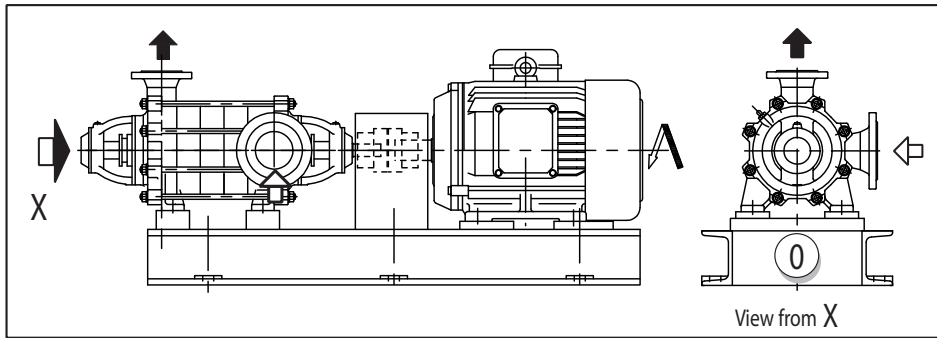
(3) Only for pumps, ≤ 65-100

(4) Only for pumps, TKR Pumps

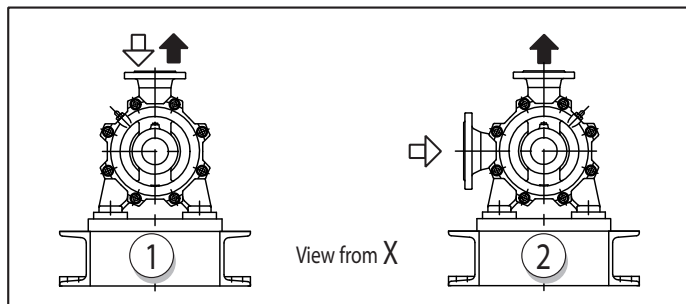
(5) Only for VTK pumps

# INSTALLATIONS TYPE

## TK – TKR HORIZONTAL INSTALLATION

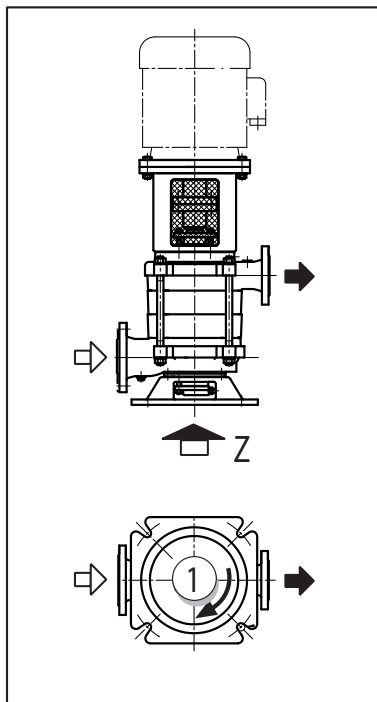


Standard

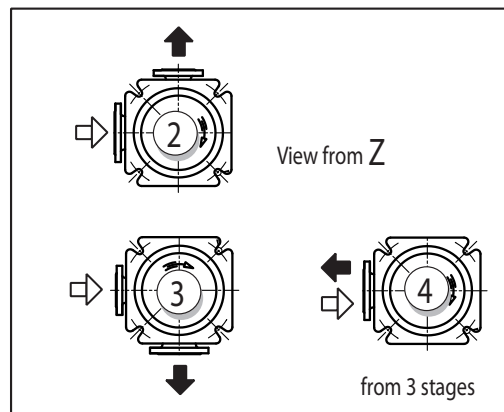


On Request

## VTK VERTICAL INSTALLATION



Standard



On Request

## SPECIAL EXECUTIONS

### IN TANK

#### TKV VERTICAL PUMP

TKV pumps are vertical, centrifugal multistage pumps connected to the drive (generally an electric motor) by flexible coupling.

Alignment and drive of line shaft is ensured by bush bearing located in pump casing and by the column pipe joints.

Pressure seal at shaft connection is ensured by packing seal.

The impeller is a centrifugal type.

The pump is composed of:

- Pump casing
- Column pipe
- Thrust bearing housing
- Motor stool

Applications:

- Water Distribution
- Underground Service
- Lube Oil Systems

### IN BARREL

#### TKVB VERTICAL PUMP

TKVB pumps are canned centrifugal multistage vertical pumps.

Vertical axis alignment is ensured by special smooth bearings in the pump, in the support and in the guides interposed on connection pipe.

Axial and radial thrusts are borne respectively by two bearing balls 3010 placed in the support housing.

Coupling between pump and motor is created through two half-couplings joined by a spacer.

Shaft sealing is created through mechanical member.

The set is composed of:

- Pump casing
- Connection column
- Casing
- Motor stool
- Barrel containing pump casing

Applications:

- LPG Transfer
- Volatile Chemicals
- Condensate Systems

### POWER & PROCESS

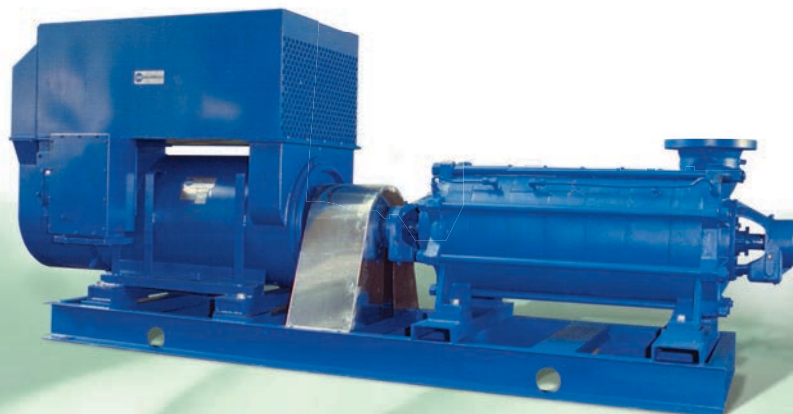
#### TKRC HORIZONTAL MULTISTAGE PUMP

TKRC pumps are centrifugal multistage pumps for high pressures.

Coupling to the drive, generally an electric motor, is ensured by a flexible joint.

Applications:

- Steam boiler power plants
- Thermal energy generating systems
- District heating systems





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