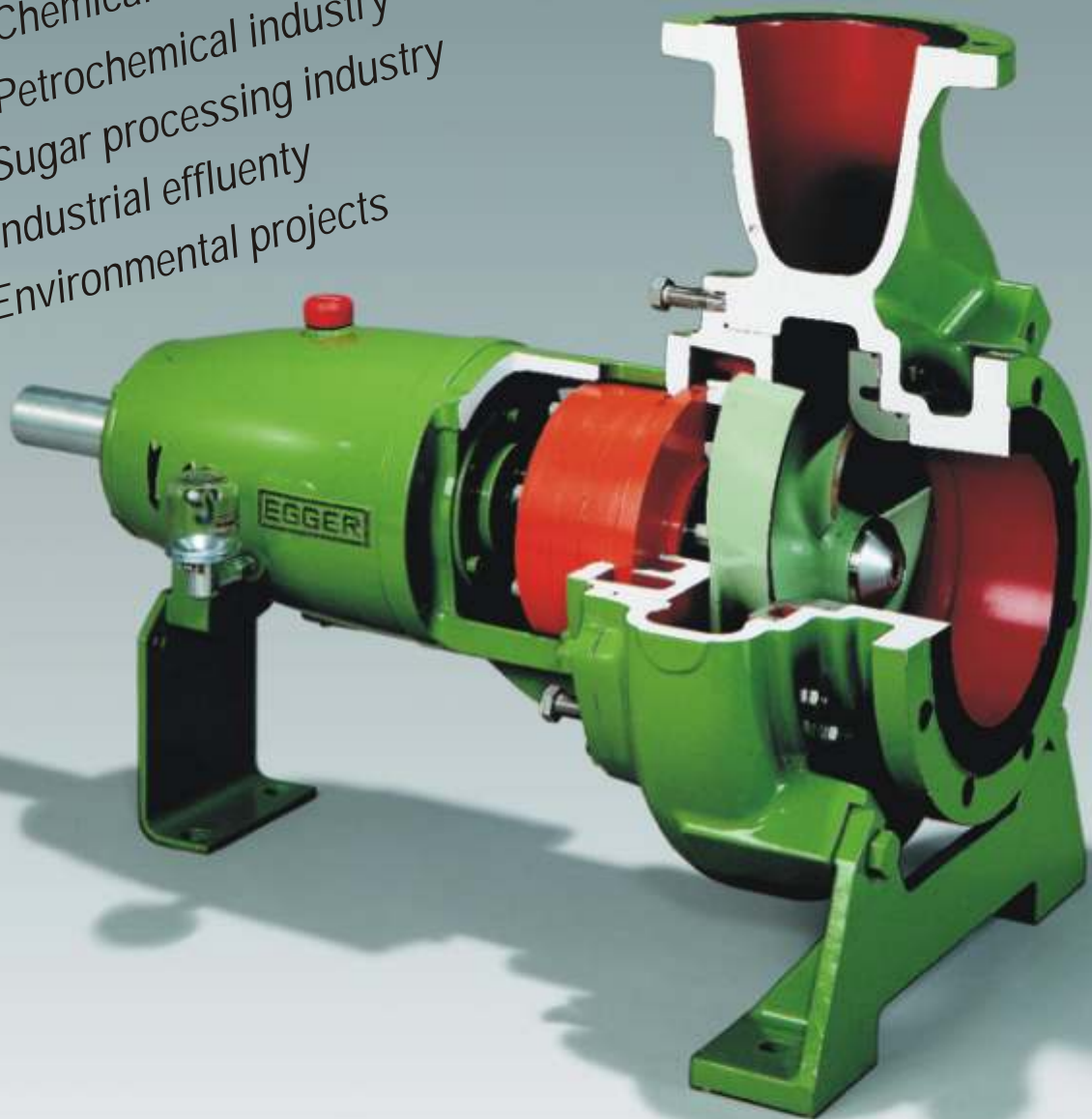




Solids Handling Pumps Series E / EO / EOS

- Pumps for the Process Industry:
- Paper and cellulose industry
 - Fibre processing industry
 - Chemical industry
 - Petrochemical industry
 - Sugar processing industry
 - Industrial effluents
 - Environmental projects



EGGER Solids handling pumps - Series E/EO/EOS

Operating parameters

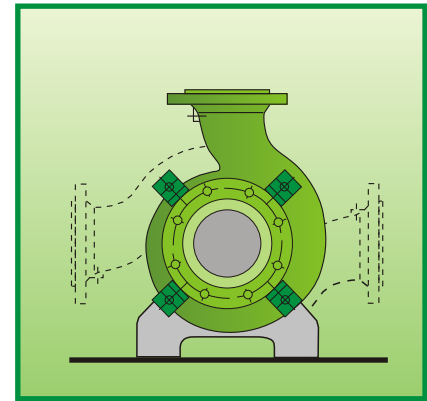
Flange sizes: DN 50-500 mm
Capacity: up to 1300 l/sec
T.D. Heads: up to 85 m
Temperature: up to 130°C
Max. operating pressure:
cast iron up to 10 bar
cast steel up to 16 bar

Shaft sealing: According to Varioseal® system (Page 7)

Spiral pump casing

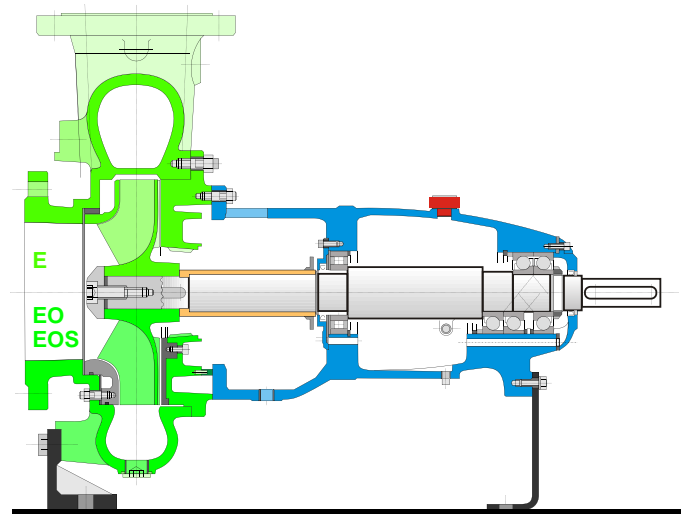
The detachable pump feet allow different positions for the pump's discharge connection. Furthermore it permits the use of one standard pump casing for all the different pump designs shown on page 5.

Because of the centerline discharge connection, all forces acting on the pipe system are transmitted evenly to the pump feet.



Description

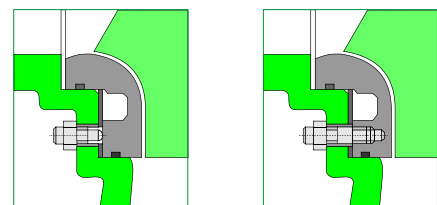
- Single stage centrifugal pump for clean and charged liquids.
- The impellers are provided with pressure relief back vanes.
- High efficiency and an excellent suction performance are the result of extensive research on our test beds, including the paper stock test rig, where the pumps were subjected to tests under simulated working conditions. (E.g. proving that there is little loss in performance between paper stock and clean water curves.)
- Arrangement E has pump casing fitted with wear ring on the suction side.
- Arrangement EO/EOS has pump casing fitted with interchangeable wear plate on suction side. (On request also on discharge side).
- Various horizontal and vertical arrangements for wet or dry-pit installation are available. For the dry-pit versions a pipe insert with handhole and cover can be supplied as an extra.
- The pump shaft is sealed and protected against the pumped liquid by a shaft sleeve.



Series E/EO/EOS

Exterior impeller clearance adjustment Types EO, EOS

Normal wear produces increased impeller clearances and reduction of efficiency. By adjusting the wear plate on the suction side, the efficiency remains constant in spite of wear.



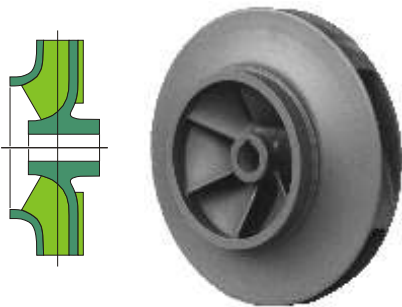
Impeller designs E / EO / EOS

The special EGGER impellers which we use today are a logical development of the original Egger impeller, Patent No. 269595, patented in 24 countries, and which was the basis on which the firm was founded.

During the past 50 years, EGGER has developed into an internationally known manufacturer of special pumps for handling charged liquids and slurries.

The EGGER centrifugal pump designs E/EO/EOS with shrouded and semi-open impellers represent the latest stage of the development of impellers for homogenous slurries. The special features of these pumps are their good efficiency, low NPSH-value, non-clogging and wear resistance, as well as being able to cope with gaseous liquids.

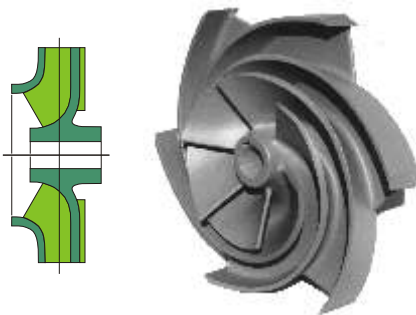
Impeller E



Shrouded impeller for clean and dirty liquids as well as low concentration of paper stock with little air content.

e.g. paper stock: up to 2 % consistency
air content: up to 5 %

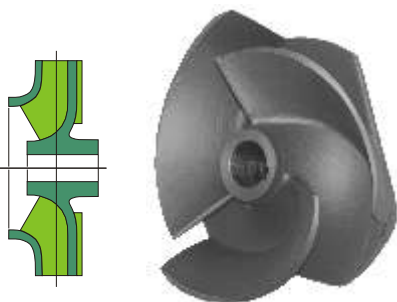
Impeller EO



Open impeller for homogenous slurries and for high concentration of paper stock with high air content.

e.g. paper stock: up to 8 % consistency
air content: up to 15 %

Impeller EOS

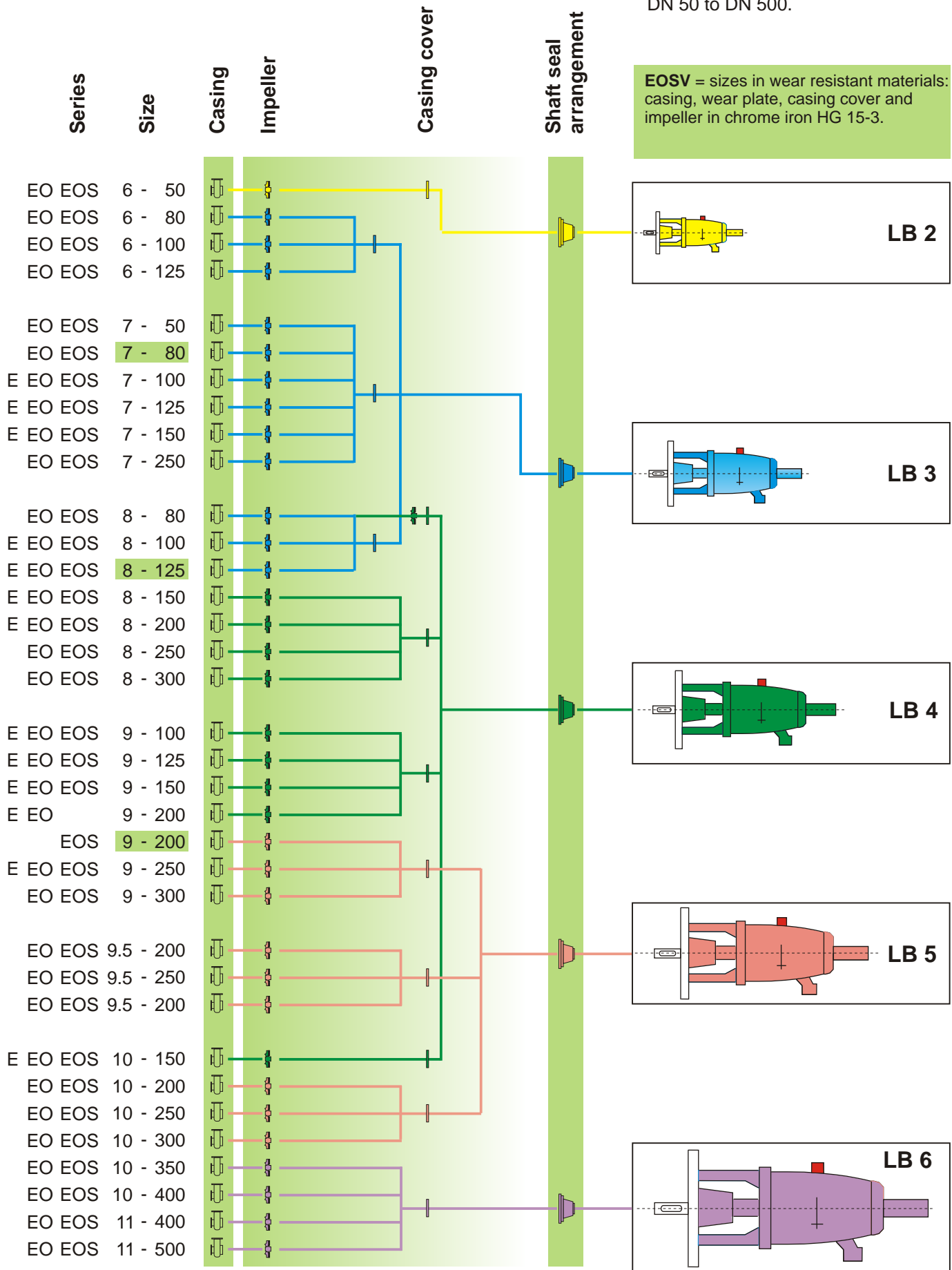


Open 3-vane impeller for dirty and abrasive slurries which may have solid and air content.

e.g. paper stock: up to 8 % consistency
air content: up to 15 %

Programme Lay-out

EGGER centrifugal pump programme series E/EO/EOS consists of 34 pump types and 5 bearing housing sizes DN 50 to DN 500.



Pump designation (example)	EO	7	-	80	H	4	
Series	EO						
Size	7						
Dia. discharge flange	80						
							Number of poles of electric motor
							Design

Summary of Designs

Description of designs:

Dry-pit design
horizontal

H

HF

Dry-pit design
Vertical

VK **VF** **V**

Wet-pit design
Vertical shaft pumps

S **F**

Cantilever pumps

SO/SOK

Wet-pit design
Submersible pumps

U (electric) **UM**

FUH (hydraulic)



Standard casing identical for all designs.

Suction and discharge flanges can comply to most international flange standards.

H = horizontal pump with bearing housing. Pump either with standard packing, mechanical seal (acc. DIN 24960), or hydrodynamic seal.

HF = horizontal close-coupled pump, impeller directly fitted to motor stubshaft. IEC standard flange-/foot motor. Can only be fitted with mechanical seals (acc. DIN 24960).

VF = vertical arrangement, pump details identical HF.

V = vertical dry-pit pump with bearing housing. Flange motor fitted on motor support with flexible coupling. Pump either with standard packing, mechanical seal (DIN 24960) or hydrodynamic seal.

VK = pump details identical V, motor however motor for safety reasons mounted on higher level. Pump/motor drive by means of cardan shaft.

S = vertical wet-pit design (pump). Motor dry mounted, shaft, bearings and intermediate couplings enclosed in intermediate pipe.

F = verticale wet-pit design (pump). Motor dry mounted, shaft, bearings and intermediate couplings enclosed in intermediate pipe. Without pit-cover, with pedestal.

SO/SOK = vertical cantilever type pump design, no bearings, bushes, or shaft seal in pumped liquid.

SOF/FOF = cantilever pump details identical SO but close-coupled pump.

U = submersible stationary pump with duckfoot-bend and pipe coupling.

UM = submersible mobile pump.

FUH = pump details similar F, driver submersible motor.

H-Series bearing housings

The horizontal E/EO/EOS pump programme uses 5 bearing housing sizes. Depending on the axial and radial loads, the bearing housings can be fitted with standard or with heavy duty bearings.

Bearing lubrication

All horizontal bearing housings have, as standard, oil lubrication for the bearings. Greased bearings can be supplied on request.

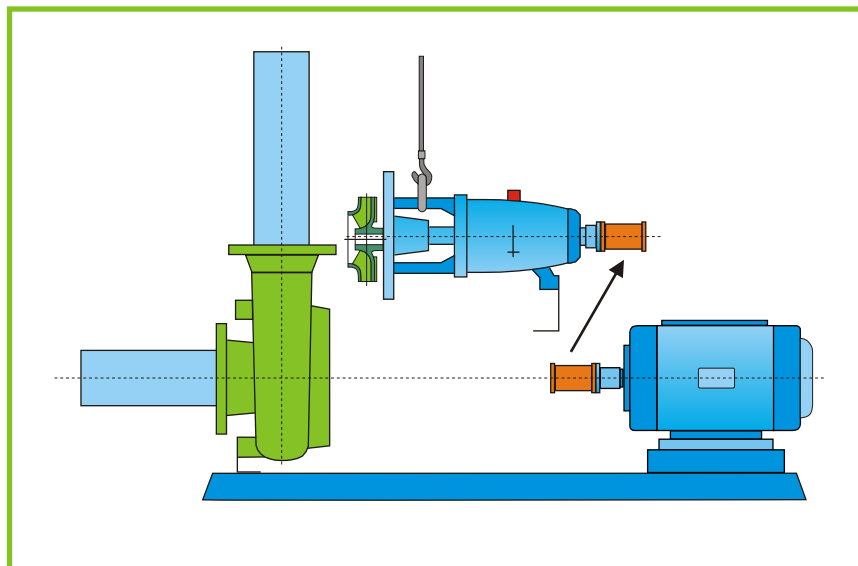
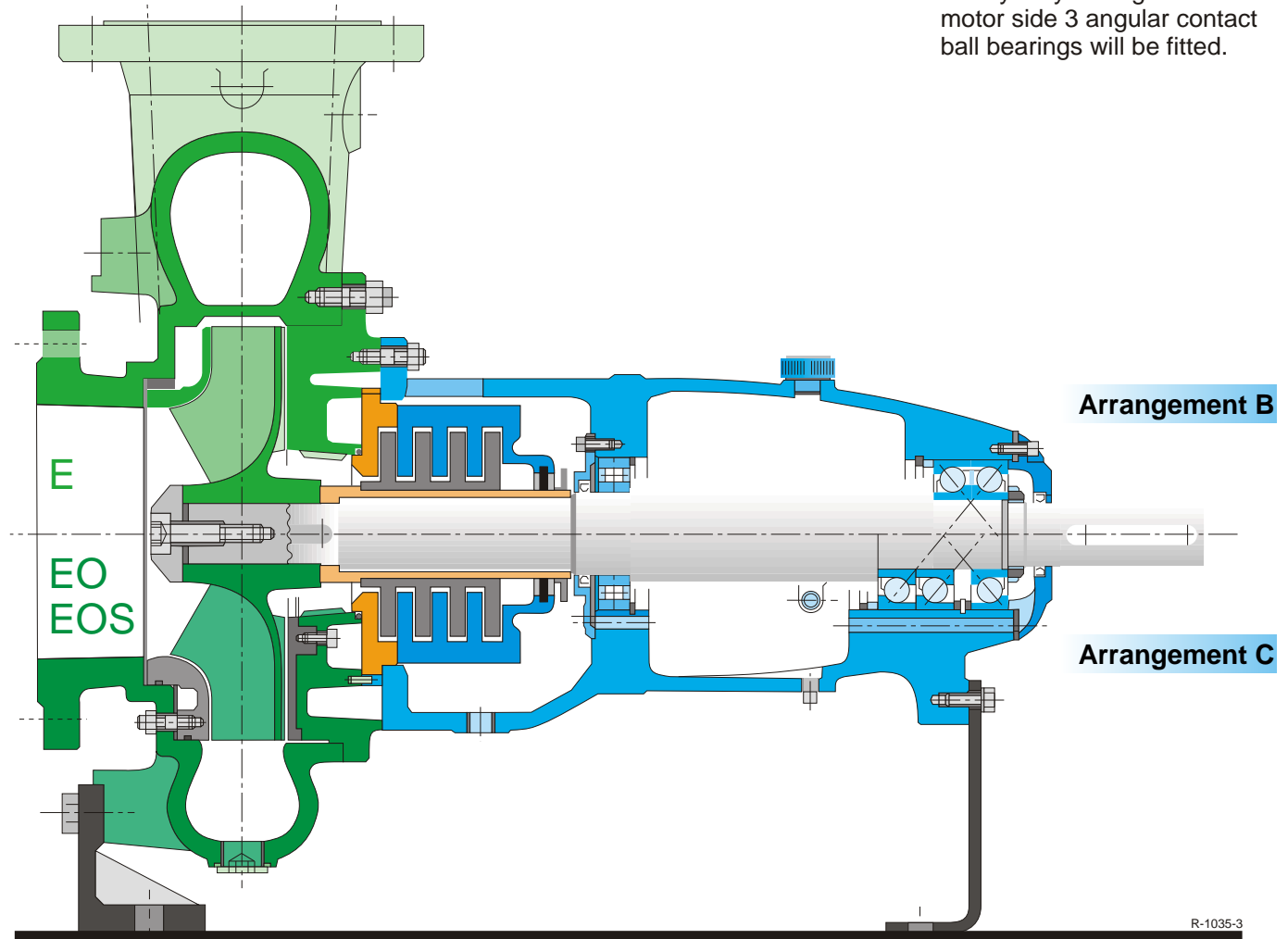
Vertical dry mounted bearing housings for design V / VK are grease lubricated.

Arrangement B

Standard arrangements with roller bearing on pump side and two angular contact ball bearings on the motor side.

Arrangement C

Heavy duty arrangement. On motor side 3 angular contact ball bearings will be fitted.



Simple construction and maintenance.

“Back pullout” feature.

Using a spacer coupling, the complete rotating assembly can be removed easily without disconnecting suction/discharge piping or the motor.

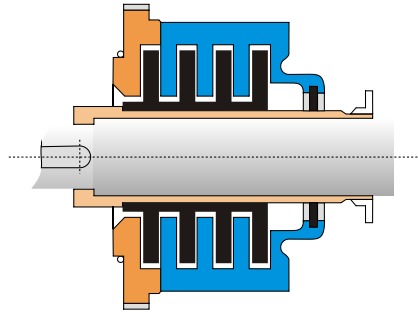
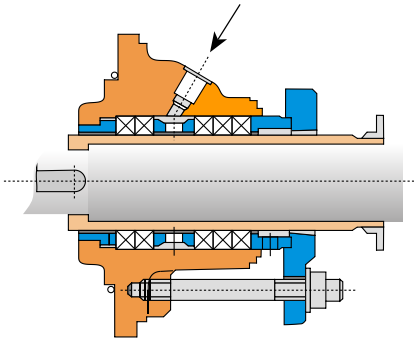
Shaft sealing system EGGER-VARIOSEAL®

Advantages

The shaft seal is designed in such a way that different seal arrangements can be fitted without modification to the pump casing cover.

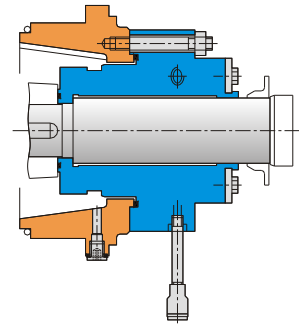
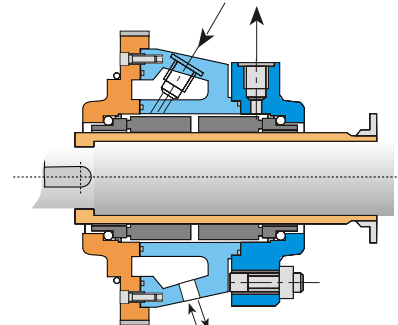
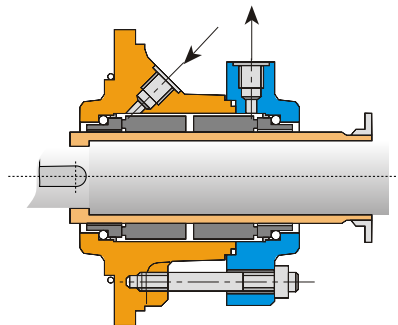
All standard elements to DIN - dimensions:
 - Stuffing boxes DIN 3780
 - Mechanical seals DIN 24960

- Wide choice of shaft sealing arrangements
- the same shaft sleeve is used for all shaft seal arrangements
- minimum number of spare elements
- easy maintenance
- the shaft is always sealed from the pumping liquid. Therefore the shaft is always in standard high tensile steel independent of the pump construction materials



All usual stuffing box arrangements possible acc. DIN 3780

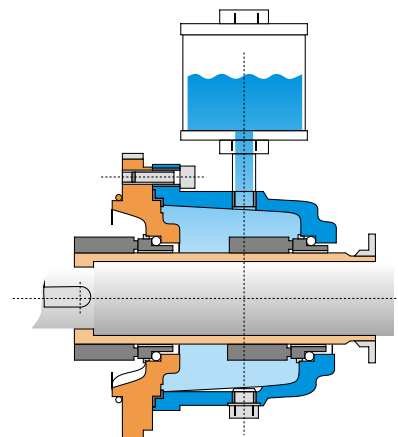
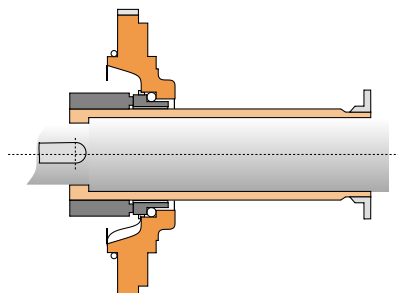
The **hydrodynamic EURO-DYN®** cartridge seal is fully integrated into the EGGER modular design programme.



Double mechanical seal acc. DIN 24960 (L_{1K}), back-to-back with external sealing liquid.

Double mechanical seal acc. DIN 24960 (L_{1K}), back-to-back with external sealing liquid. Seal casing with cooling or heating jacket.

Special arrangements are possible (e.g. mech. seals with stationary springs). Flushing connections are provided for.



Single mechanical seal acc. DIN 24960 (L_{1K}), (without sealing liquid)

Double mechanical seal acc. DIN 24960 (L_{1K}), in tandem (with pressureless internal sealing liquid)

Bearing housing (LB)	Shaft sleeve Ø (mm)	Stuffing box insert Inside (mm)	Packing ring Ø (mm)
2	35	51	8
3	48	68	10
4	65	90	12.5
5	90	122	16
6	130	170	20

Material - Standard Assembly

Item	GG	GGG	GG GGG -1.4408	1.4408	HG 15-3
Casing	GG25	GGG50	GG 25 GGG 50	1.4408	HG 15-3
Impeller	GG20	GGG50	1.4408	1.4408	HG 15-3
Casing cover	GG20	GG20	GG20	1.4408	HG 15-3
Wear disc	GG20	GG20	1.4408	1.4408	GG20
Shaft	Ck45	Ck45	Ck45	Ck45	Ck45
Shaft sleeve	GGK-FP	GGK-FP	1.4435	1.4408	GGK-FP+ Eut. 12 496

Material qualities used

GG

Cast iron according to DIN 1691

Tensile strength: GG25 = 250 N/mm²
GG20 = 200 N/mm²
Brinell hardness: GG25 = 180 - 240
GG20 = 170 - 210

GGG 40/50

Nodular cast iron acc. DIN 1693

BS 2789: 1973 / ASTM A 536-80
Tensile strength: 400 - 500 N/mm²
Brinell hardness: 130 - 180

1.4408

Stainless steel acc. to DIN mat. No. 1.4408

BS 3100: 1976 316 C 16 / AISI 316
Analysis: 18-20 % Cr; 10-12 % Ni; 2,0-3,0 % Mo;
max. 0.07 % C; 1.5 % Mn; 1.5 % Si; 0.03 % S; 0.45 % P.
Tensile strength: 440 - 640 N/mm²
Brinell hardness: 130-200
Good weldability

GGK - FP

Special fine grain chilled iron

Mat. structure ferritic/perlitic
Tensile strength: 250 N/mm²
Brinell hardness: 160-220

HG 15.3

Abrasion resisting alloyed cast iron acc. to

DIN 0.9635, nomination G-X300 CrMo 15 3

Analysis: 2.7 % C; 0.6 % Si; 0.5 % Mn;

15.0 % Cr; 0.7 % Ni; 2.8 % Mo.

Tensile strength: 500 - 800 N/mm²
Brinell hardness: 55-65 HRC (600-830 HV)

Service temperatures
for standard materials
upto 130°C.

Higher temperatures
and other materials
on request

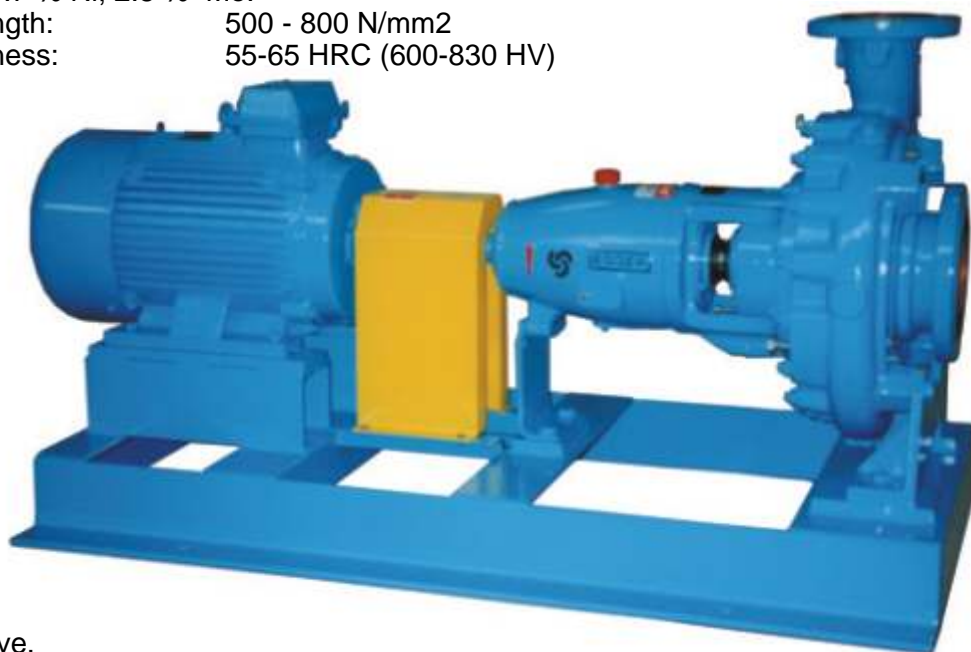
**Coupling guards are
available which comply
to latest international
safety standard.**

E/EO/EOS Pump

with base-plate for direct drive.



E/EO/EOS Pump
with V-belt drive.



Pump applications

Due to optimum impeller design, difficult media can be handled without problems.

Paper industry

Application in all sections of the pulp preparation plant and at the paper machine for handling: waste paper and wood pulp, cellulose, rag pulp, bagasse, kaolin, etc., as well as abrasive and corrosive waste waters.



Cellulose industry

Semi-chemical pulp, sulphite/sulphate pulp, black liquor, wood chips, defibration pulp, digester drainage and waste waters.



Fibre industry

Fibre cement slurry, leather fibres, rockwool, glass fibres, textile fibres, suspensions, nitro cellulose and fibrous waste waters.

Textile industry

Artificial and natural fibres, suspensions and fibrous waste waters.



Automobile industry

Phosphate sludges, passivating liquids, degreasing solutions, electrostatic paints, aqueous lacquers and lacquer sludges.

Sugar industry

Clear, press and dirty water, screened and unscreened juices in all concentrations, milk of lime and other liquids.

Chemical industry

Crystal suspensions, filter slurries, polystyrene beads in water, caustic soda solutions up to 50 %, hot brine, washing powder slurries, zinc slurry, milk of lime and pigment suspensions.

Petrochemical industry

Hydrocarbons, slops, catalytic sludge, carbonated drilling sludge.



Environmental engineering

Corrosive, abrasive, charged as well as clean liquids.

Municipal and industrial waste water treatment plants

Pre-screened waste waters and sludges.



Power stations

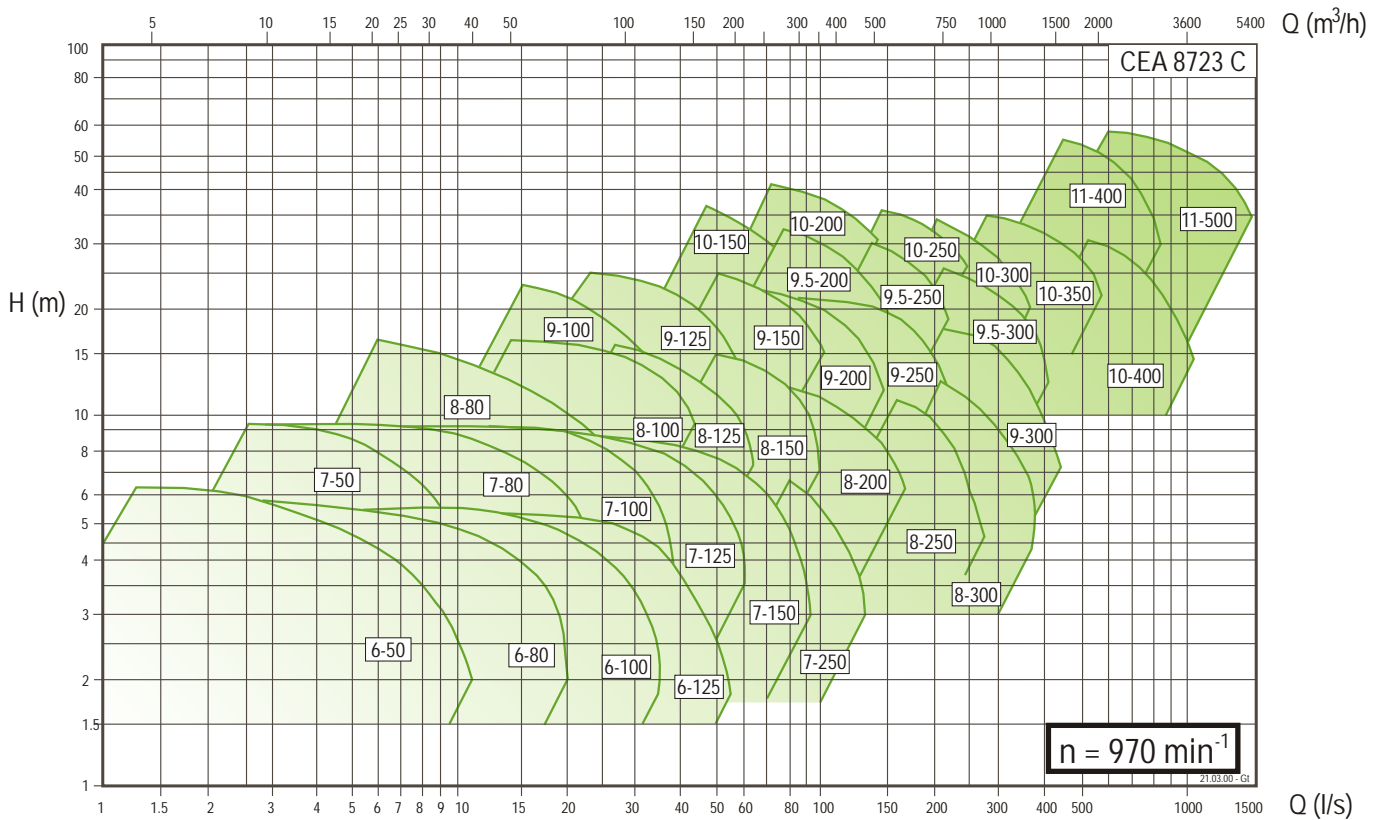
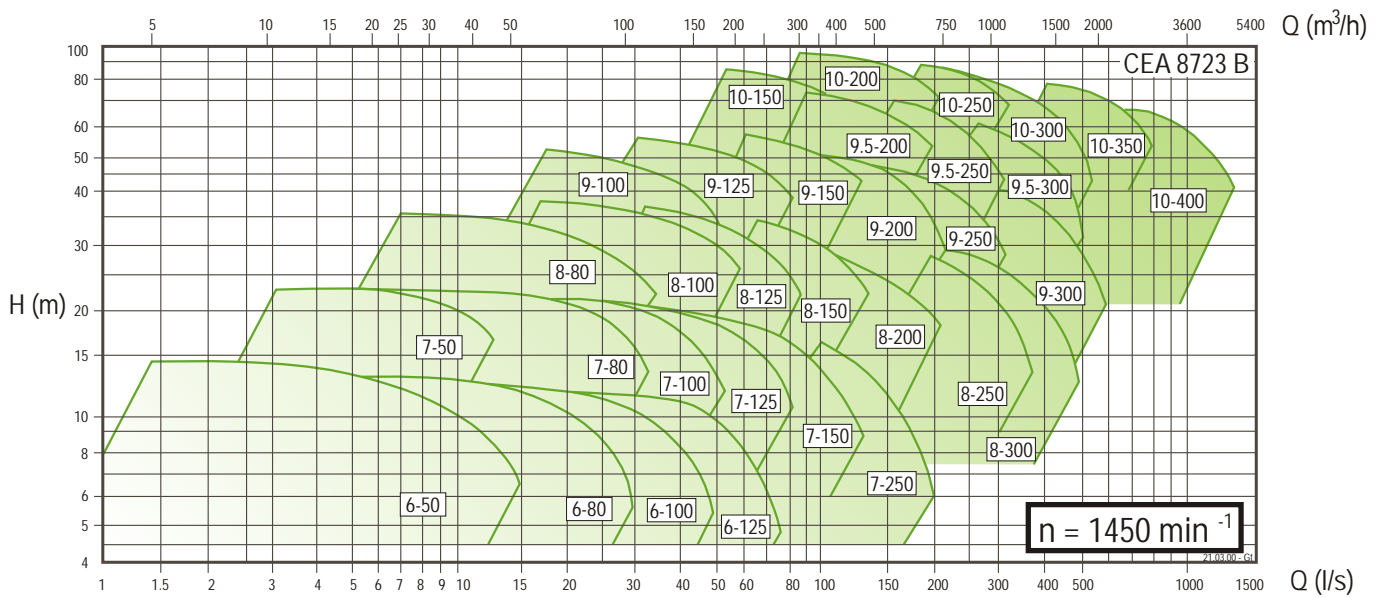
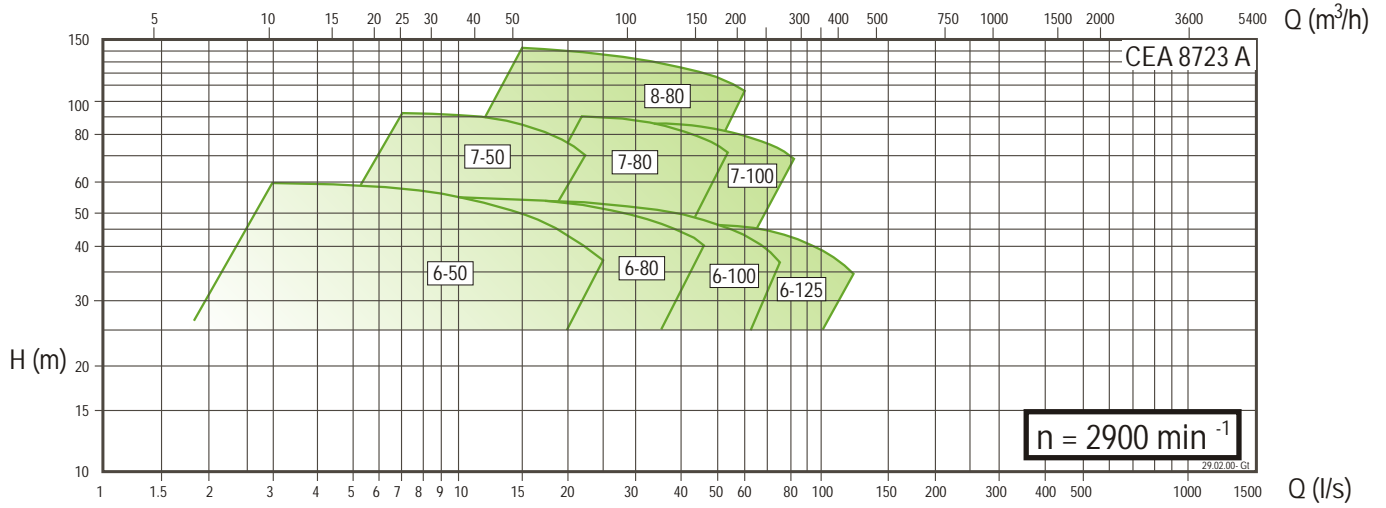
Dust filter sludges, lime suspensions and milk of lime.

Steel industry

Plant water, industrial effluents, scale water, scale sludge, gas and dust filter sludges and foundry sludge.

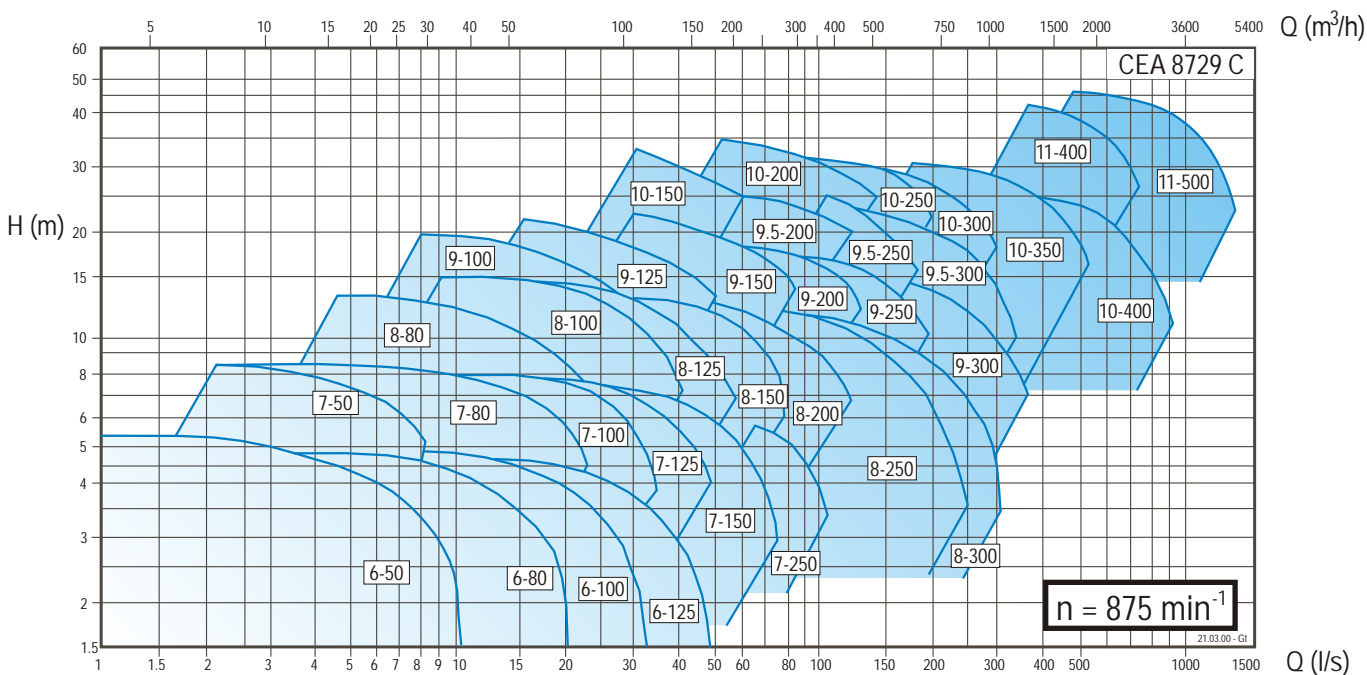
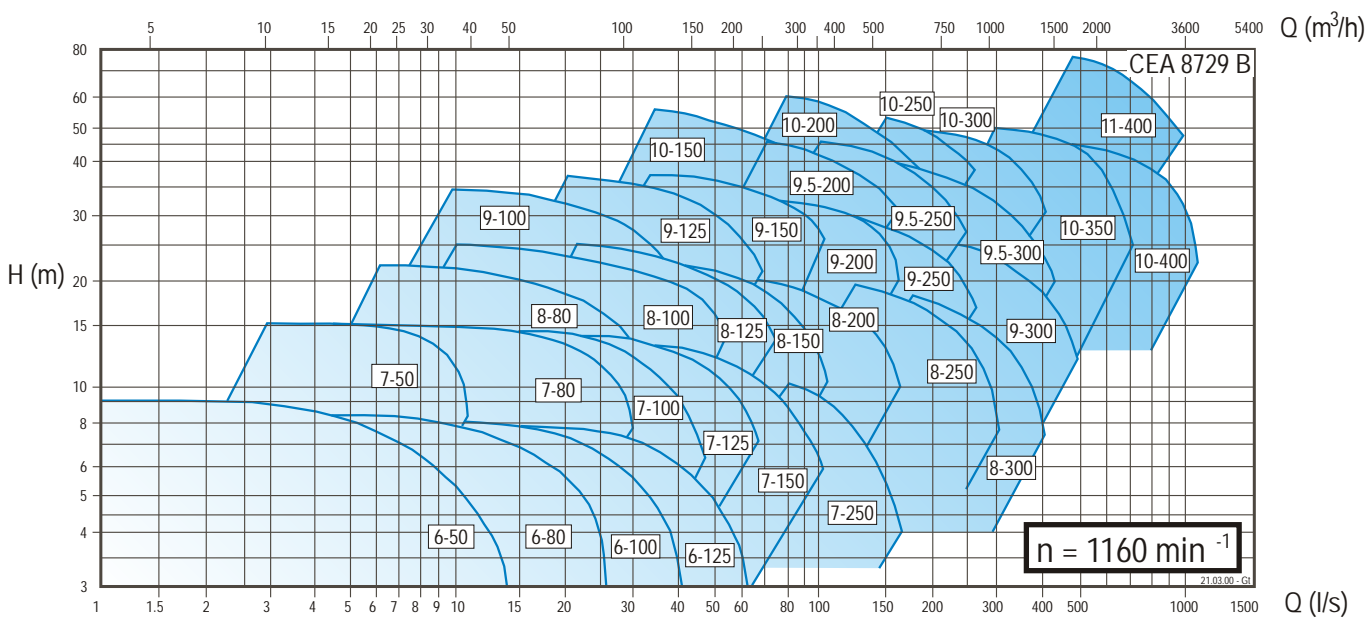
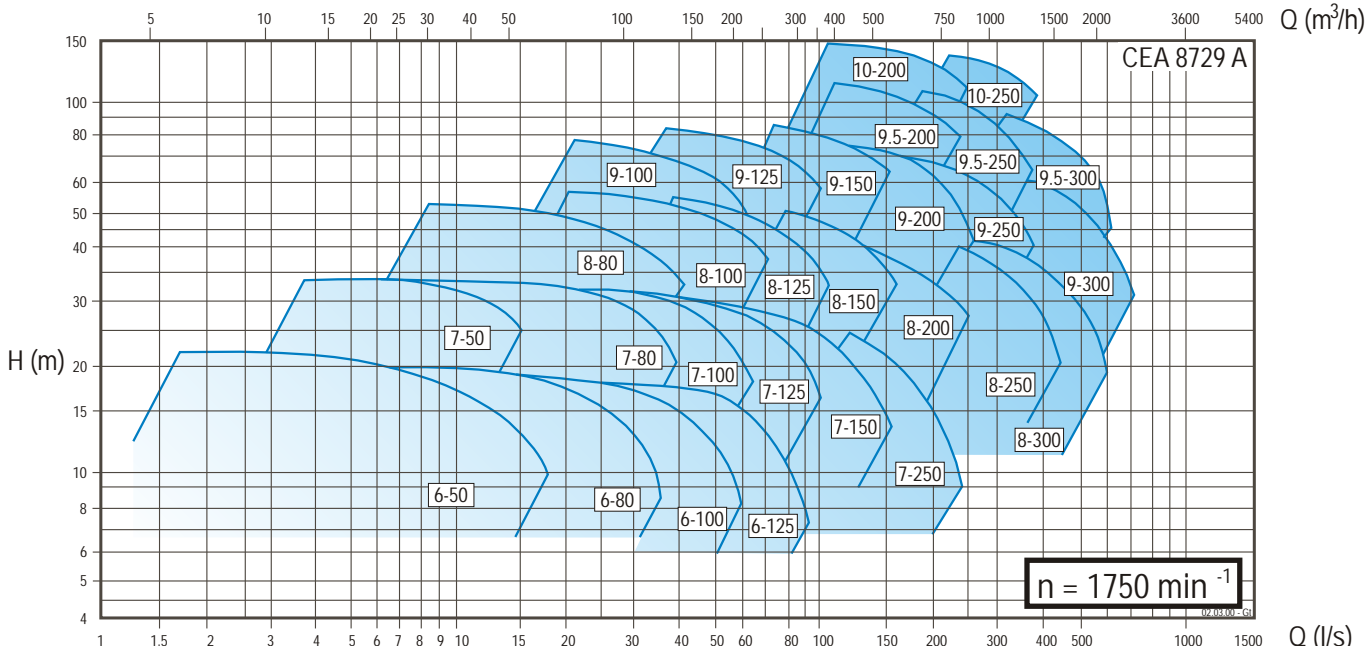
Series E / EO / EOS Performance Curves

50 Hz



Series E / EO / EOS Performance Curves

60 Hz



1 m = 0.1 bar = 3.28 ft - 1 m³ = 220 Imp.Gal. = 264 U.S. Gal.

EGGER centrifugal pumps type EOS in a sewage treatment station



Subject to modifications