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CAL (Cast Iron)

CAR (Stainless Steel)

End-Suction Volute Pump



CAR



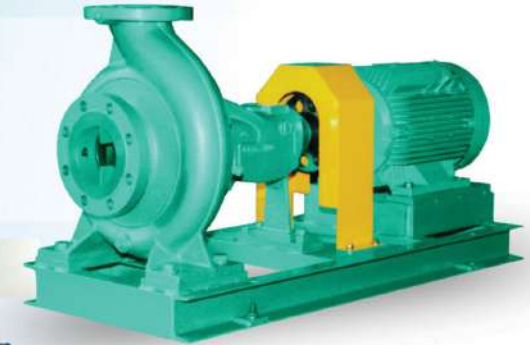
CAL

The Torishima "Eco Pumps" lead the World!

End-Suction Volute Pump (10 bar type)

CAL is of Cast Iron construction. CAR is of Stainless Steel construction.

CA series pumps are eco-friendly high-efficiency pumps based on technology from our engineered pumps.



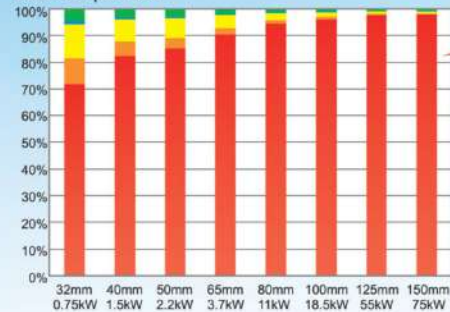
Energy Saving & Cost Reduction

Eco pumps significantly reduce the life cycle costs of pumps and CO₂ emissions because of their design (3D impeller, casing), motor (Torishima ultra high efficiency motor) and optimized specification (impeller cut).

Reduction of LCC (Life Cycle Cost)

About 90% of the pump LCC is generated from electricity cost. Increased efficiency leads to big reduction of LCC.

LCC composition



About 90% of pump LCC is electricity cost.

LCC is calculated on the basis of:
CAL size 32 to 150mm;
24hours day, 365days, 15years operation;
Operating at 60Hz-4P with normal temperature clean water;
Electricity cost of JPY10 per kWh.

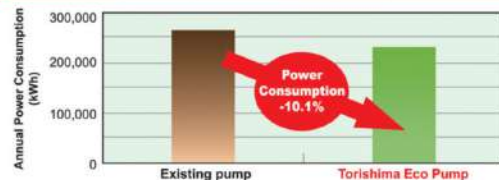
Operating cost: Electricity (red), Maintenance (orange), Spare parts (yellow)
Initial cost: Installation work (blue), Unit price (green)

Energy Saving with Eco Pumps

Cooling water pump

Annual operating hours: 8,760hours

	Existing pump spec		Torishima pump CAL125-250		Difference
	Motor capacity	30kW	30kW		
Capacity(m ³ /min)	4.7	4.7	4.7	0%	
Head(m)	26.5	27.7	26.5	-1.2m	
Pump efficiency(%)	78	81	81	+3.0%	
Shaft power(kW)	27.2	25.1	25.1	-2.1kW	
Motor efficiency(%)	91.9	94.5	94.5	+2.6%	
Power consumption(kW)	29.6	26.6	26.6	-3.0kW(-10.1%)	
Annual Power Consumption(kWh)	269,296	233,016	233,016	-26,280kWh	



Annual Saving
USD\$2,628
(= 26,280 kWh x USD 0,1)

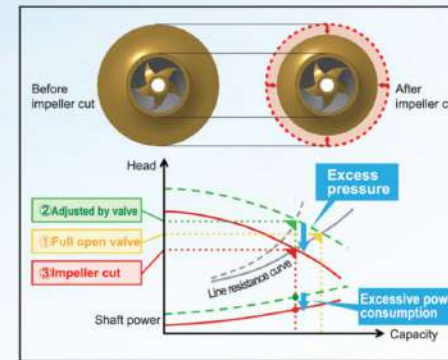
Electricity cost per kWh : USD 0,1

Annual CO₂ Reduction
11.8t-CO₂
(=26,280kWh x 0.00045t-CO₂/kWh)

Conversion factor of CO₂ emission: 0.00045 (t-CO₂/kWh) referred from Tokyo Electric Power Co., Inc, 2011

Meeting Customer's Specification (Impeller cut)

The impeller diameter can be cut to meet the customer's specification to reduce unnecessary power consumption.



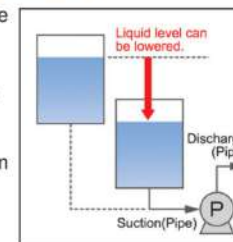
High Speed and Simplified Design

CAL/CAR are simplified with high speed and compact design, which enable to reduce the installation space.

Low NPSH and a Wide Application Range

Low NPSH performance enables lower suction level which reduces plant construction cost.

CAL/CAR can handle liquid temperatures from -40 to +350°C (heat medium) and various liquid types.



Maintenance & Operation

Mechanical Seal as Standard Part

Maintenance free.

No leakage from seal parts allows cleanliness around pumps.



Standard mechanical seal (rubber bellows seal) is easy to install and does not damage shaft, thus does not require shaft sleeve.

	Mechanical seal	Gland packing
Leakage	0 cc/min	15 cc/min
5-year leakage	0 £	39,420 £
Cost amount	USD\$ 0	USD\$ 138*

* In case of using tap water
- Industrial Water : USD\$ 17,74 (USD\$ 0,45/m³)
- Tap Water : USD\$ 138 (USD\$ 3,5/m³)
- Pure Water : USD\$ 591,000 (USD\$ 151)

39,420£ leakage from using gland packing for 5 years equals to about 197 bathtubs (200£ home bathtub)

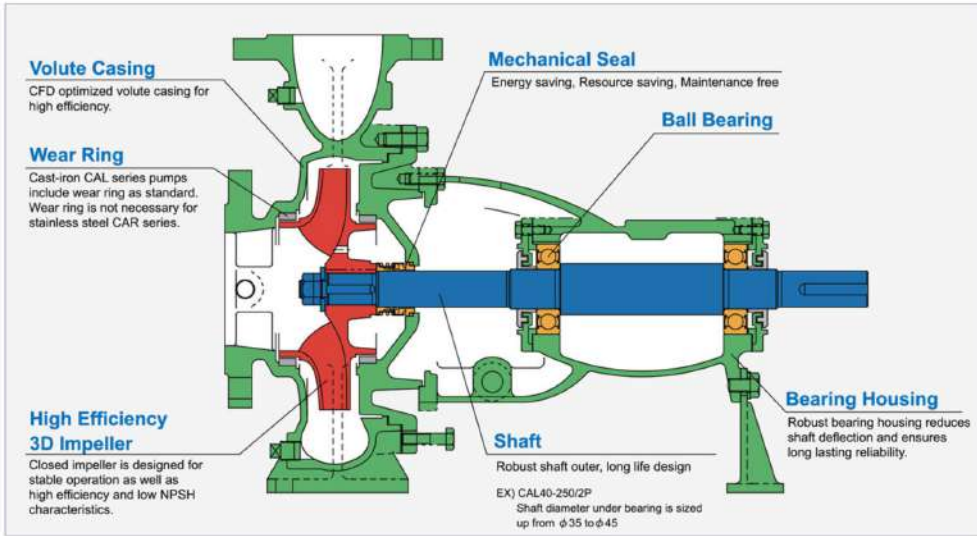


Safe Operation with Precision Bearing Design

Stable Operation

The stable pump performance facilitates valve control and parallel operation.

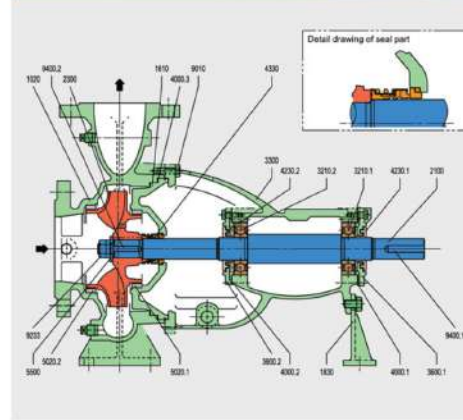
Design Features



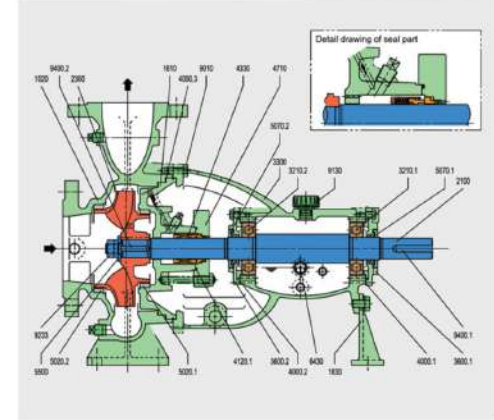
Pump Sectional Drawing

The basic structure is same between CAL and CAR for parts interchangeability. CAR, which is made from stainless, does not require case wear ring. Due to adopting build to order method, various combination with pump material, seal and bearing is available according to liquids kinds and temperature.

Standard Seal: Mechanical seal
Bearing: Grease lubrication



Option Seal: Mechanical seal + Water cooling
Bearing: Oil lubrication



Parts Interchangeability

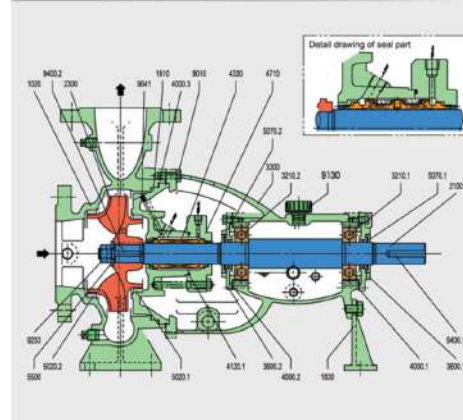
2P type Same color and number in the same parts indicate interchangeability.

Parts Pump type	Casing	Casing Cover	Bearing Housing	Shaft	Mechanical Seal
32-125	1				
40-125	2	1			
65-125	3				
32-160	4				
40-160	5	2	1	1	1
50-160	6				
32-200	7				
40-200	8	3			
50-200	9				
80-160	10	4	2	2	
80-200	11	5			
32-250	12				2
40-250	13	6	3	3	
50-250	14				
80-250	15	7			

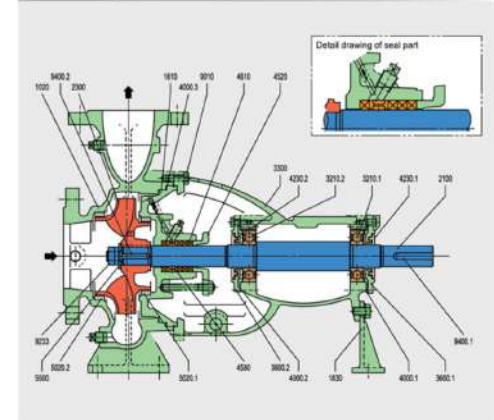
4P type Same color and number in the same parts indicate interchangeability.

Parts Pump type	Casing	Casing Cover	Bearing Housing	Shaft	Mechanical Seal
32-125	1				
40-125	2	1			
65-125	3				
32-160	4				
40-160	5	2	1	1	1
50-160	6				
65-150	7				
32-200	8				
40-200	9	3			
50-200	10				
65-190	11				
80-150	12	4			
80-190	13	5			
100-190	14				
32-250	15				
40-250	16	6			
50-250	17				
65-240	18				
80-240	19	7	2	2	2
100-245	20				
100-250	21				
50-315	22				
65-310	23	8			
80-320	24				
100-320	25	9			
150-190	26		3	3	3
125-240	27	10			
125-250	28				
200-240	29				
200-250	30	11	4	4	
125-310	31	12			
125-315	32	13	3	3	
80-400	33	14	4	4	
100-400	34	15	5	5	4
125-400					
150-310					
150-315					
150-390					
150-400					

Option Seal: Double mechanical seal
Bearing: Oil lubrication



Option Seal: Gland packing
Bearing: Grease lubrication



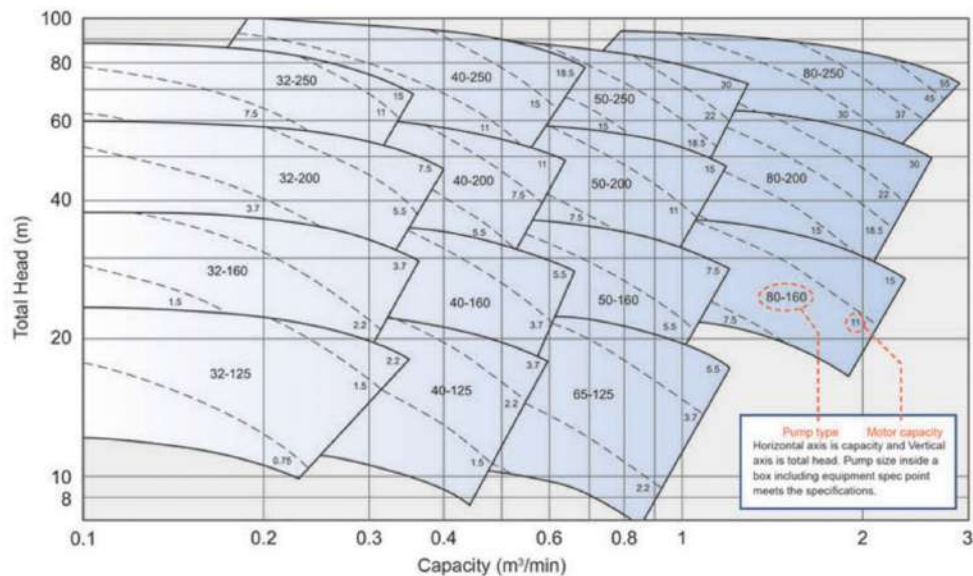
Parts number	Parts name	Parts number	Parts name	Parts number	Parts name	Parts number	Parts name
1020	Volute casing	3600.2	Bearing cover	4580	Lantern ring	9010	Hex. bolt
1610	Casing cover	4000.1	Flat gasket	4610	Gland packing	9041	Nock
1830	Support foot	4000.2	Flat gasket	4710	Seal cover	9130	Plug
2100	Shaft	4000.3	Flat gasket	5020.1	Casing wear ring	9233	Lock nut
2300	Impeller	4120.1	O-ring	5020.2	Casing wear ring	9400.1	Key
3210.1	Deep groove ball bearing	4230.1	Labyrinth ring	5070.1	Deflector	9400.2	Key
3210.2	Deep groove ball bearing	4230.2	Mechanical seal	5070.2	Deflector		
3300	Bearing housing	4330	Shaft box gland	5500	Bearing housing		
3600.1	Bearing cover	4520		6430	Oil gauge		

CAL (Cast Iron) Selection Range Charts

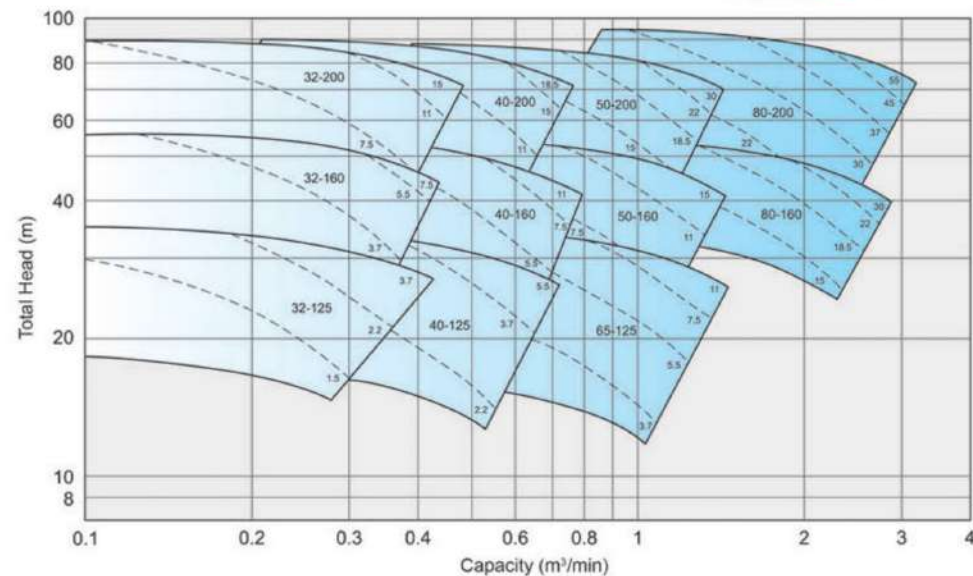
6P is also available. Please ask our sales representative for details.



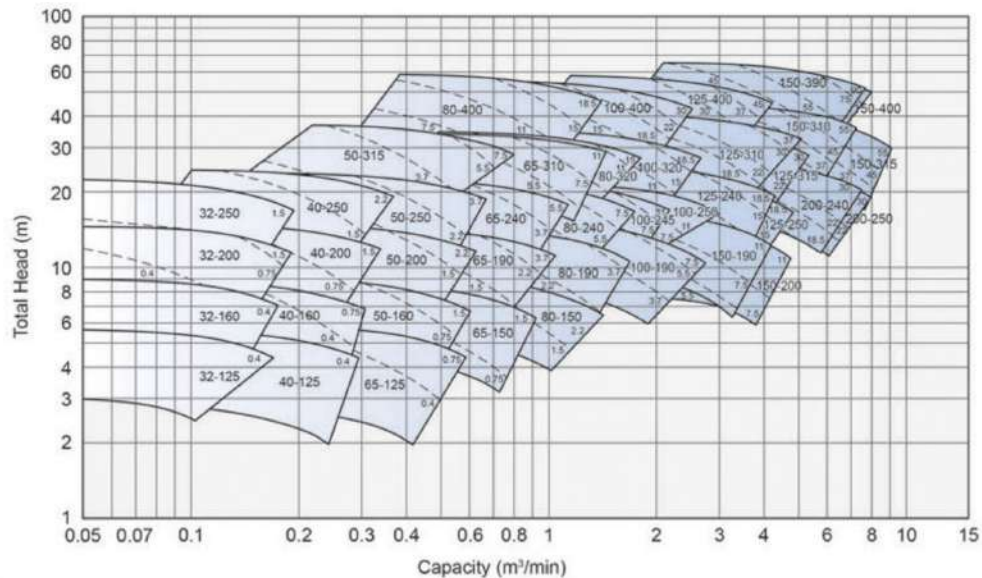
■ 50Hz-2P (3000min⁻¹)



■ 60Hz-2P (3600min⁻¹)



■ 50Hz-4P (1500min⁻¹)



■ 60Hz-4P (1800min⁻¹)

