



HEAVY DUTY PUMPS AND WATER TURBINE MFG.CO.



API PUMPS

ABOUT PETCO

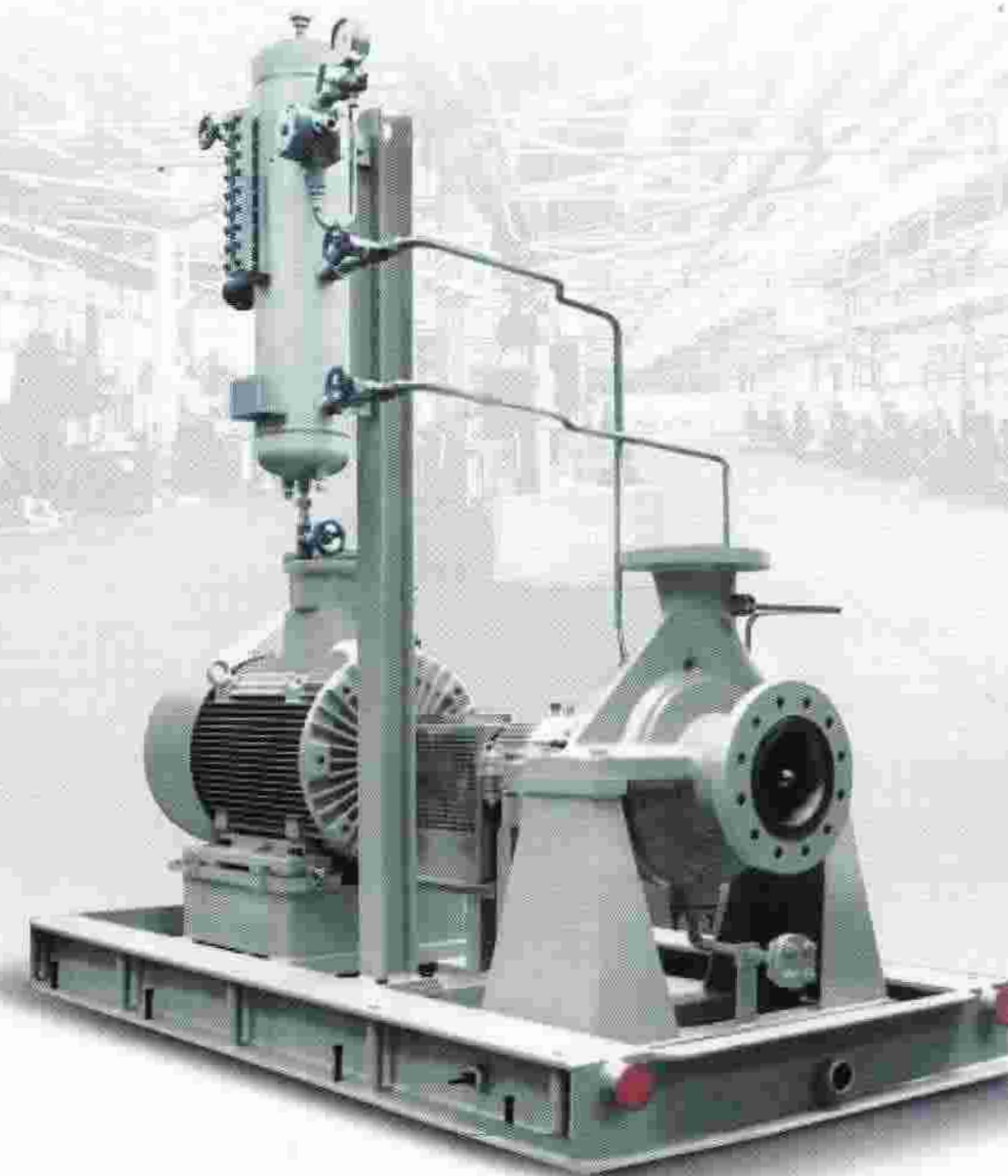
PETCO has been established in **1991** For design and manufacturing of various Types of pumps in refineries, power plants, Chemical and petrochemical plants, pump Stations, water and waste water treatment Plants and etc.

The factory is located in **TABRIZ** city in an Area of **80000 m²** and, total covered area is **20000 m²** with largest hydraulic test Facility in middle east .

HEAVY DUTY PUMPS & WATER TURBINE MFG. CO.



CP PUMPS



PETCO CP PUMPS (acc. to latest ed. of API 610 Standard):

- Horizontal centrifugal OH2 design.
 - Single stage, single suction, dynamically balanced double shrouded impeller.
 - C.W. direction of rotation viewed from coupling.
 - Single or double volute, Radial split, Centerline mounted case.
 - Different sizes in 1500rpm and 3000rpm rated speed.
 - Mechanical seal chamber dimensions in full compliance with API 682 standard.
 - 4 sizes of bearing housing cover. Equipped with constant level sight feed oilers.
- The bearing housing is equipped with replaceable labyrinth seals with internal deflector to prevent contamination by moisture, dust and other foreign matters.
- Fan cooling and fined bearing bracket. In high temperature services cooling plans acc. to annex B of API 610Ed. 10 is applicable as an option.
 - Anti friction bearings with an operating time more than 25000h with ring oil lubrication.
 - Material is compatible with the fluid and acc. to annex H of API 610 standard.
 - Standard ANSI 300# RF flanges. Other ratings are possible as an option.
 - End – Top nozzle arrangement.
 - Low shaft deflection and long life.
 - Removable wearing at case and impeller. Running clearances meet the requirements of API 610 standard.
 - Automatic self vent and socket welded flanged drain.

Performance range:

- Capacity: 5-2500 m³/hr.
- Head: 5-250 m
- Nozzle size: 1-16"

Applications:

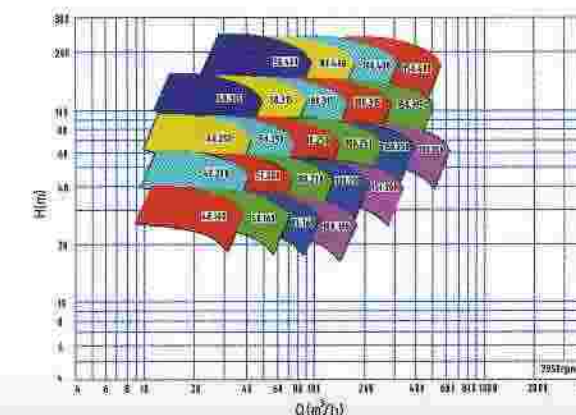
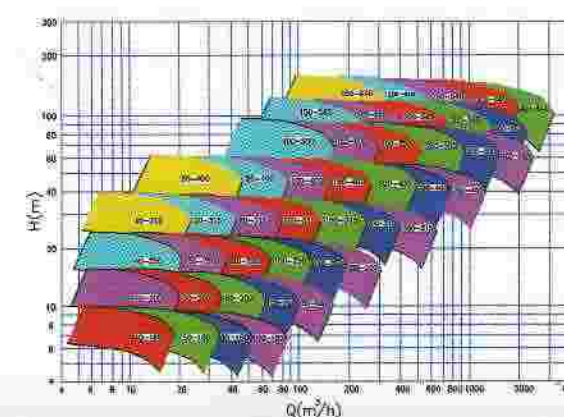
- Refineries
- Petrochemical plants
- Oil and gas fields
- Chemical industries

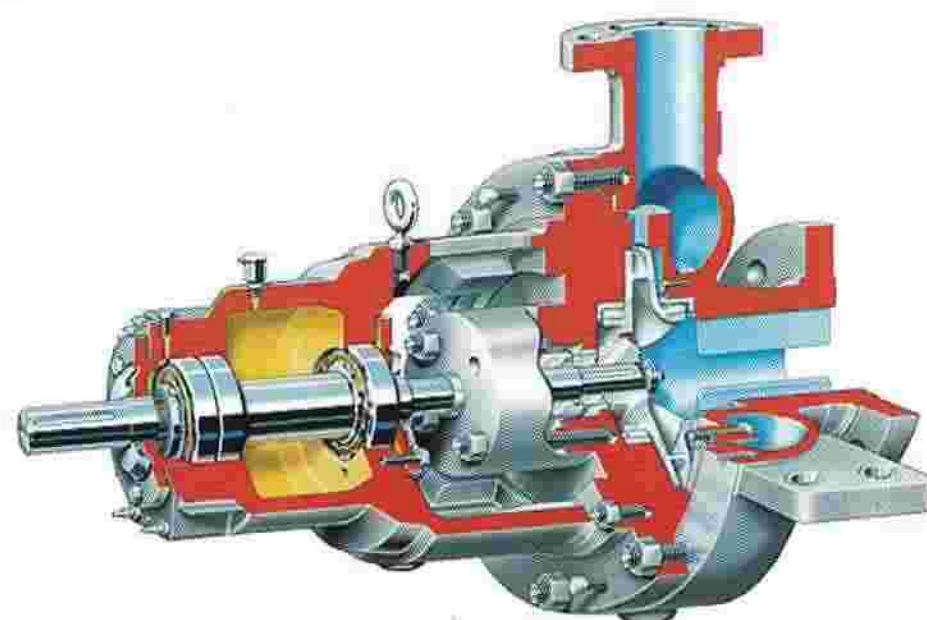


API 610 STANDARD

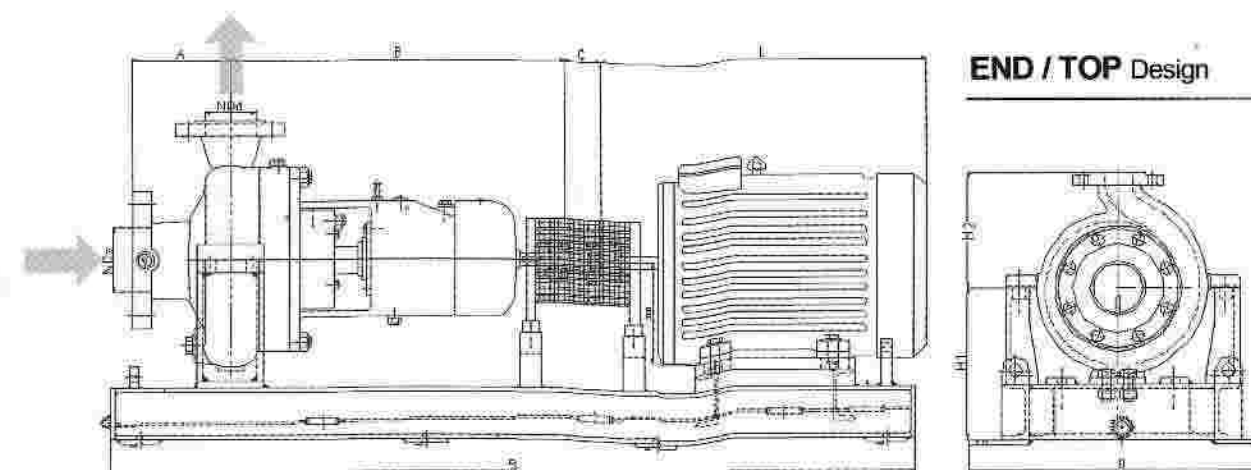


Family Diagram





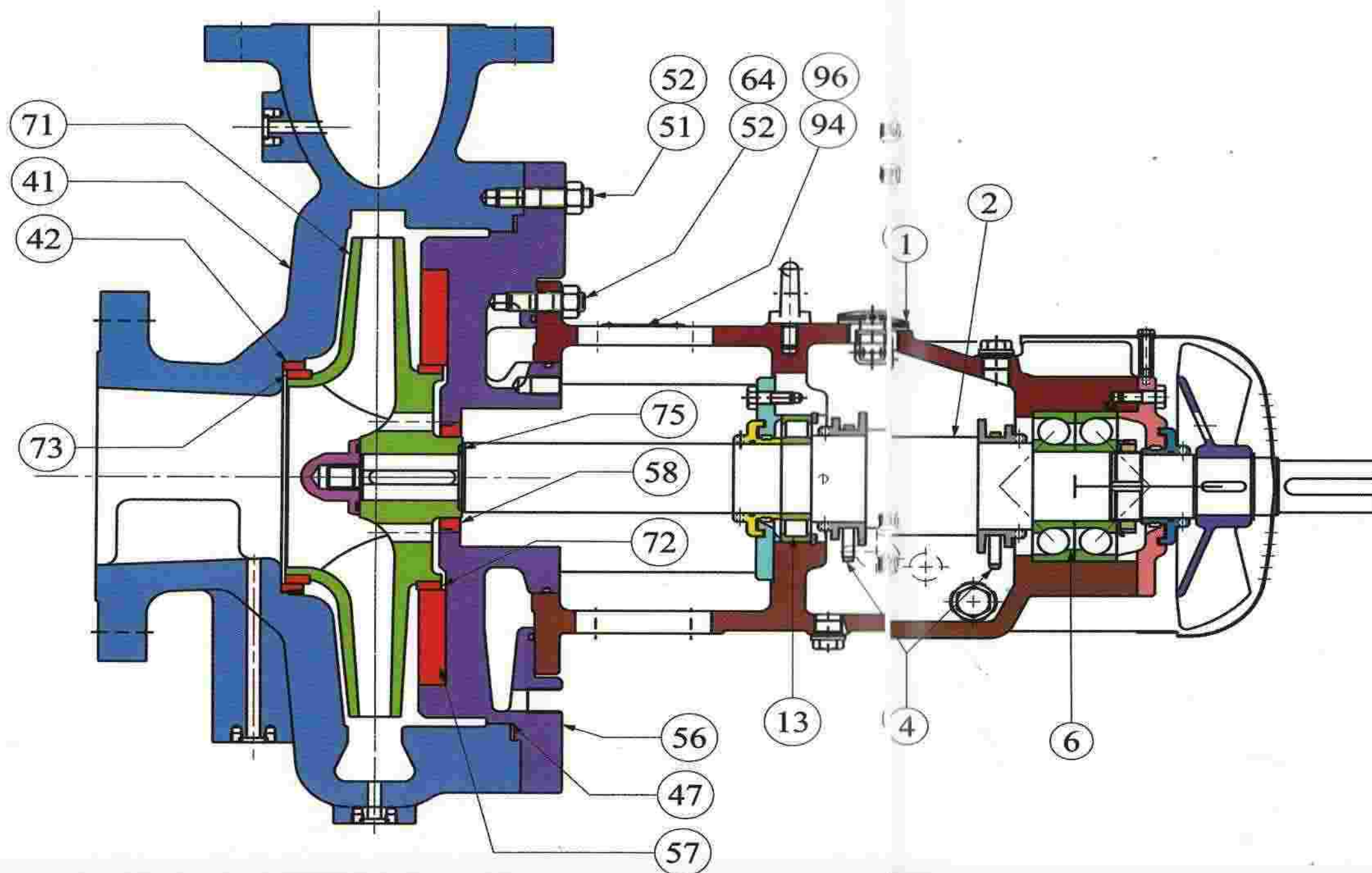
CP PUMPS



Size	DNs	DNd	A	B	H2	Size	DNs	DNd	A	B	H2
CP-25.200	50	25	109	539	200	CP-150.400	200	150	230	960	465
CP-25.250	50	25	180	637	300	CP-150.500	200	150	250	960	515
CP-25.315	50	25	180	637	300	CP-150.565	200	150	280	960	560
CP-40.160	80	40	140	635	170	CP-150.640	200	150	325	960	640
CP-40.200	80	40	145	635	210	CP-200.250	250	200	225	730	380
CP-40.250	80	40	155	635	250	CP-200.315	250	200	215	960	450
CP-40.315	80	40	180	635	320	CP-200.400	250	200	240	960	530
CP-50.160	80	50	140	630	195	CP-200.500	250	200	265	960	575
CP-50.200	80	50	150	630	210	CP-200.565	250	200	300	960	575
CP-50.250	80	50	165	630	260	CP-200.640	250	200	350	1200	675
CP-50.315	80	50	185	630	320	CP-250.315	300	250	235	960	480
CP-50.400	80	50	200	630	400	CP-250.400	300	250	255	960	565
CP-80.160	100	80	150	600	205	CP-250.500	300	250	280	1200	655
CP-80.200	100	80	150	630	240	CP-250.565	300	250	325	1200	650
CP-80.250	100	80	165	730	270	CP-250.640	300	250	370	1200	740
CP-80.315	100	80	190	720	320	CP-300.400	350	300	260	1200	605
CP-80.400	100	80	210	730	400	CP-300.500	350	300	270	1200	700
CP-100.160	150	100	150	630	220	CP-300.565	350	300	280	1200	740
CP-100.200	150	100	170	730	255	CP-300.640	350	300	395	1200	840
CP-100.250	150	100	200	730	340	CP-400.500	450	400	280	1200	745
CP-100.315	150	100	195	720	370	CP-400.565	450	400	290	1200	790
CP-100.400	150	100	220	730	415	CP-400.640	450	400	410	1200	900
CP-100.500	150	100	240	960	500						
CP-150.200	200	150	180	730	310						
CP-150.250	200	150	210	730	355						
CP-150.315	200	150	205	725	420						

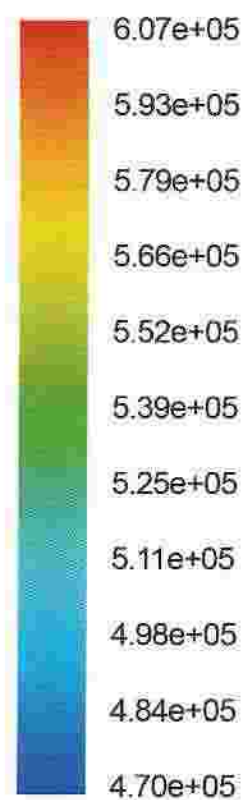
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CP PUMPS SECTIONAL

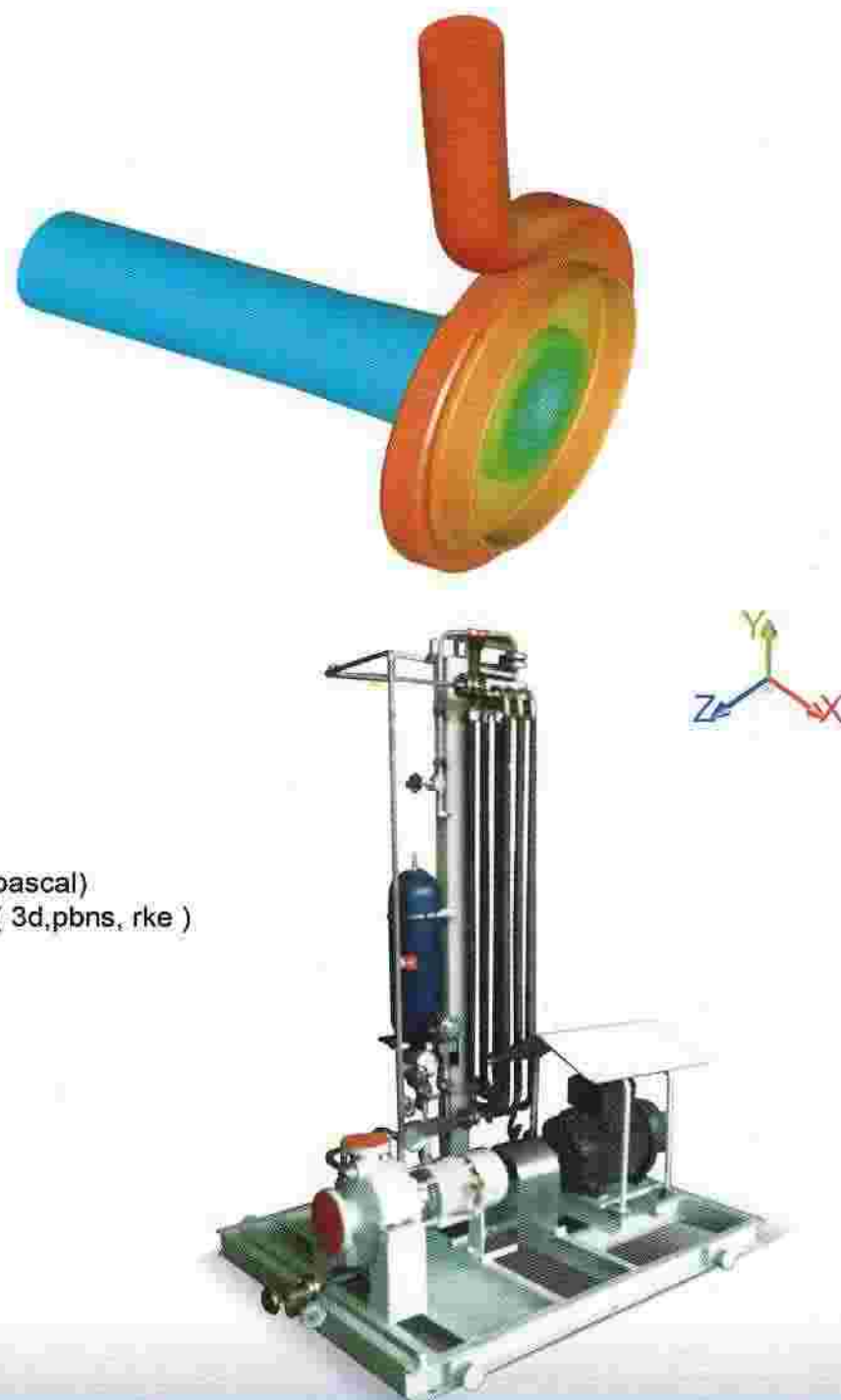


1	Bearing Bracket
2	Shaft
4	Oil Ring
6	Angular Contact Ball Bearing
13	Roller Bearing
41	Volute Casing
42	Casing Wear Ring
47	Gasket
51	Double End Stud
52	Hex Nut
53	Taper Pin
56	Delivery Cover
57	Del.Cov.WearRing
58	Del.Cov.WearRing
60	Screw Plug
64	Double End Stud
71	Impeller
72	Imp.WearRing
73	Imp.WearRing
74	Gasket
75	Gasket
76	Imp. Nut
77	Coil Insert
94	Open End Blind Rivet
96	Plaque Plate
Gr.	Name

FLUENT ANALYSIS



- Contours of Static Pressure (pascal)
- ANSYS Fluent Release 16.0 (3d,pbns, rke)



VIS PUMPS



PETCO VIS PUMPS (acc. to latest ed. of API610 standard):

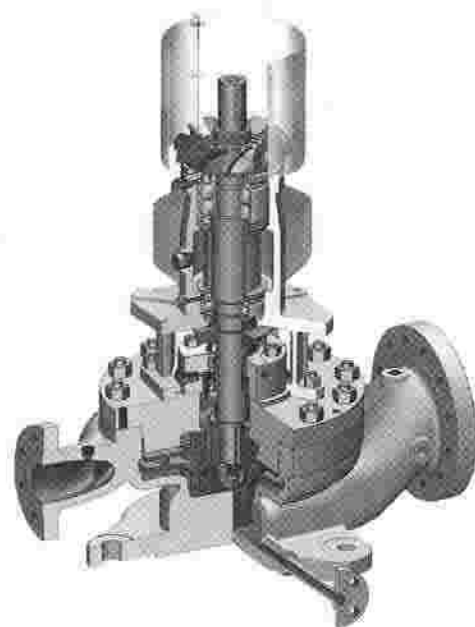
- Horizontal centrifugal OH3 design.
- Single stage, single suction impeller, dynamically balanced double shrouded impeller.
- Single or double volute, Radial split, Foot mounted case.
- Different sizes in 1500rpm and 3000 rpm rated speed.
- Mechanical seal chamber dimensions in full compliance with API682 standard.
- 4 sizes of bearing housing cover
- Anti friction bearings with an operating time more than 25000h with oil or grease lubrication.
- Material is compatible with the fluid and acc. to annex H of API610 standard.
- Standard ANSI 300# RF flanges. Other ratings are possible as an option.
- Side – Side nozzle arrangement.

Performance range:

- Capacity: 5-500 m³/hr.
- Head: 5-250 m
- Nozzle size: 1-8"

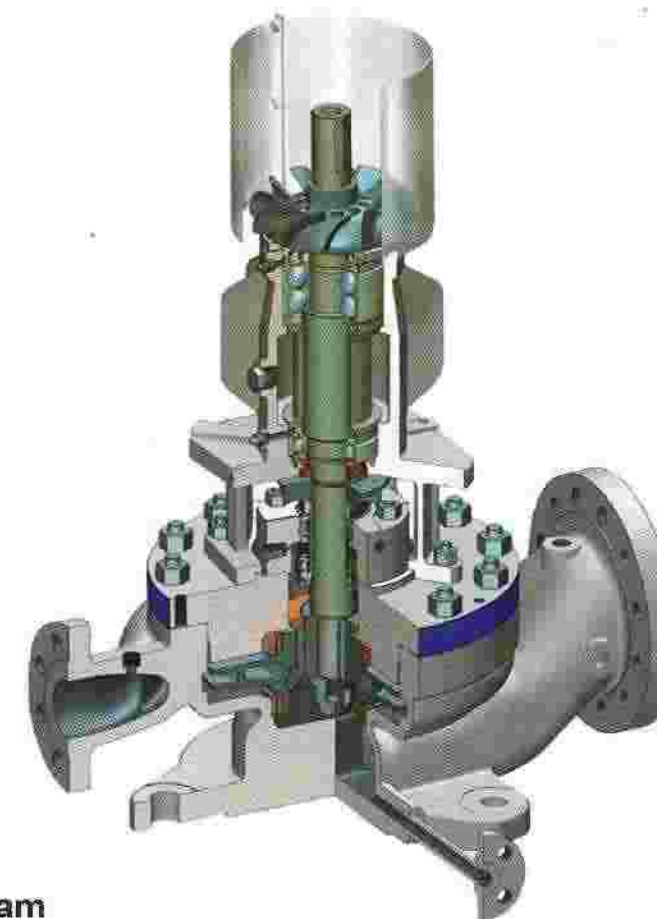
Applications:

- Refineries
- Petrochemical plants
- Petroleum distribution plants
- Chemical industries

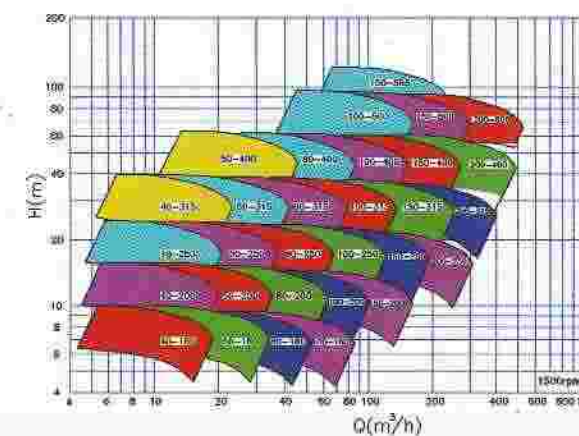


RELIABILITY ENHANCEMENT CAPABILITIES

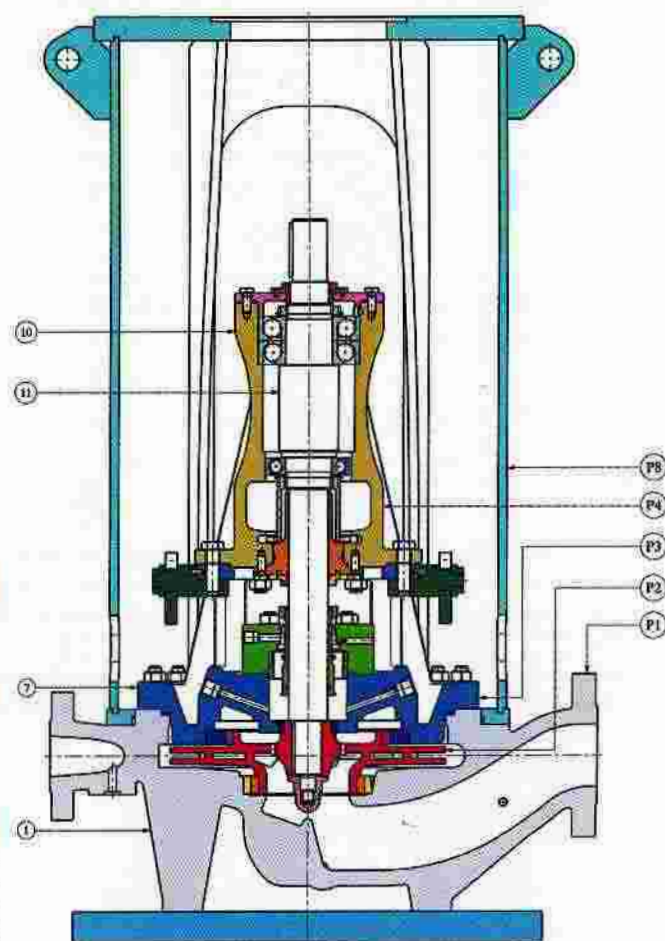
VIS PUMPS



Family Diagram



VIS PUMPS SECTIONAL



**Bill of Material: P1
Volute Casing Assembly**

Number	Definition	Quantity
1	Volute Casing	1
2	Volute Casing Wear Ring	1
3	Hexagon Socket Set Screw	3

**Bill of Material: P2
Impeller Assembly**

Number	Definition	Quantity
3	Hexagon Socket Set Screw	6
4	Impeller	1
5	Impeller Wear Ring D.S.	1
6	Impeller Wear Ring S.S.	1

**Bill of Material: P3
Stuffing Box Assembly**

Number	Definition	Quantity
5	Hexagon Socket Set Screw	6
7	Stuffing Box	1
8	Stuffing Box Building	1
9	Stuffing Box Wear Ring	1

**Bill of Material: P4
Bearing Bracket Assembly**

Number	Definition	Quantity
10	Bearing Bracket	1
11	Shaft	1
12	Angular Contact Ball Bearing	2
13	Bearing Nut Lock Washer	2
14	Bearing Nut	1
15	Deep Groove Ball Bearing	1
16	Oil Ring	1
17	Spiral Term	1
18	Parallel Key	1
19	Parallel Key	1
20	Dowel Pin	1
21	O-Ring	1
22	Bearing Cover D.S.	1
23	Hex Head Bolt	10
24	O-Ring	2
25	Deflector D.S.	1
26	Hexagon Socket Set Screw	6
27	O-Ring	1
28	Bearing Cover P.S.	1
29	Deflector P.S.	1

**Bill of Material: P5
Back Pullover Assembly**

Number	Definition	Quantity
P2	Impeller Assembly	1
P3	Stuffing Box Assembly	1
P4	Bearing Bracket Assembly	1
20	Dowel Pin	2
30	Double End Stud	4
31	Mechanical Seal	1
32	Hex Nut	10
33	Hex-Head Bolt	6
34	Spiral Term	1
35	Impeller Nut	1
36	Hexagon Socket Set Screw	3
37	Repair System Hook	2
38	Repair System Bush	2
39	Repair System Nut	2

**Bill of Material: P6
Left Repair System First Assembly**

Number	Definition	Quantity
40	Repair System Pivot Right	1
41	Repair System Pivot Bush	2

**Bill of Material: P7
Right Repair System First Assembly**

Number	Definition	Quantity
41	Repair System Pivot Bush	2
42	Repair System Pivot Left	1

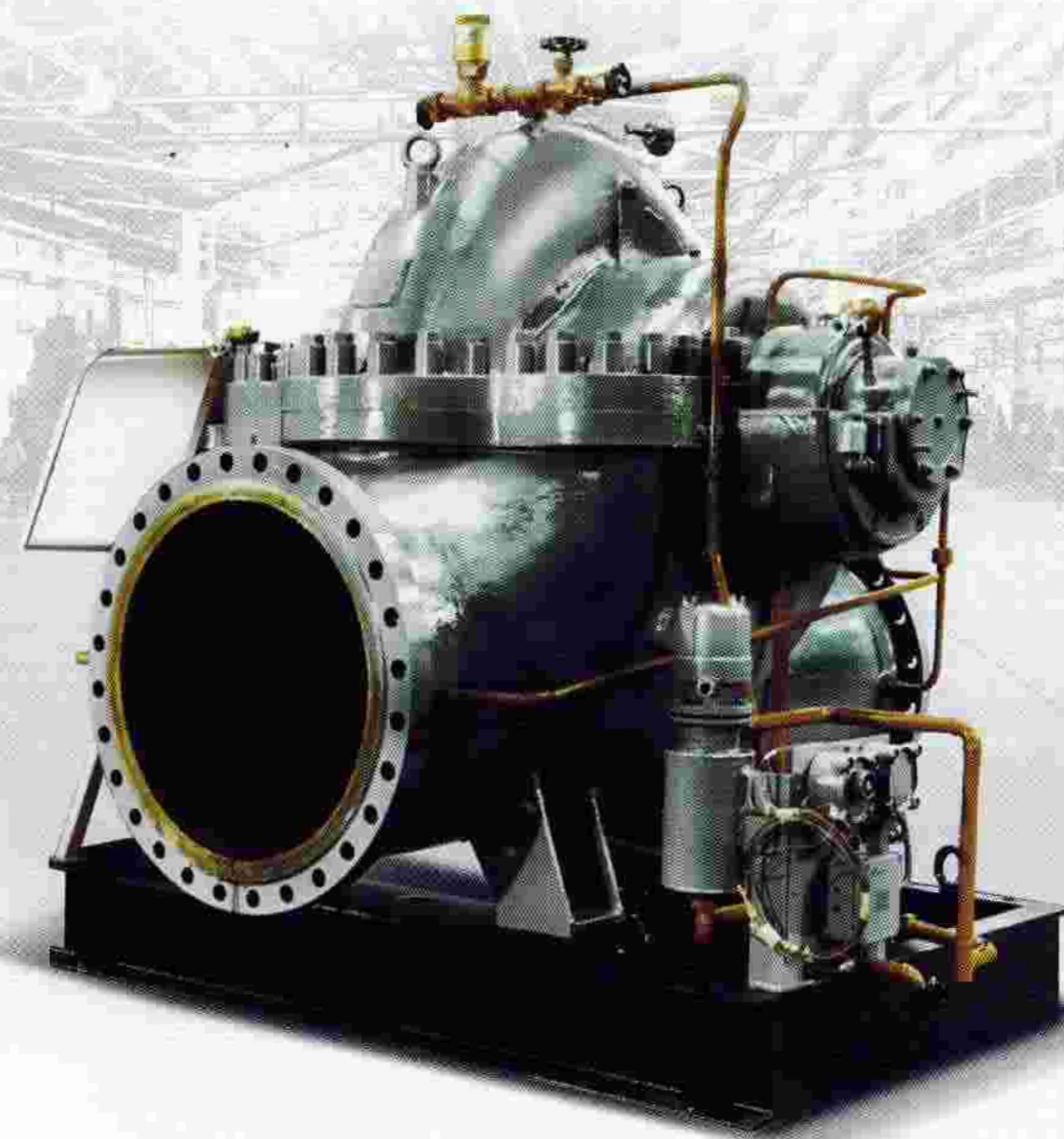
**Bill of Material: P8
Driver Spacer Assembly**

Number	Definition	Quantity
P6	Right Repair Pivot Assembly	1
P7	Left Repair Pivot Assembly	1
43	Driver Spacer Flange II	1
44	Driver Spacer Pipe	1
45	Driver Spacer Flange T	1
46	Driver Spacer Hook	2
47	Driver Spacer Stiffener	4

**Bill of Material: P9
Pump Assembly**

Number	Definition	Quantity
P1	Volute Casing Assembly	1
P5	Back Pullover Assembly	1
P6	Driver Spacer Assembly	1
32	Hex Nut	16
33	Hex-Head Bolt	4
47	Base Flange	1
48	Double End Stud	16
49	Spiral Term	1
50	Hex-Head Bolt	2
51	Hex-Head Bolt	4
52	Hex Nut	10
53	Repair System Lever	2
54	Repair System Pin	4
55	Repair System Rod	1

BS1 / BS2 PUMPS



PETCO BS1/BS2 Pumps (acc. to latest ed. of API 610 standard):

- Horizontal centrifugal BB1 design.
- Single stage, double suction, dynamically balanced double shrouded impeller (BS1).
- Two stage, single suction, dynamically balanced double shrouded impeller (BS2).
- C.W. and C.C.W. direction of rotation viewed from coupling.
- Different sizes in 1000rpm, 1500 RPM and 3000 RPM rated speed.
- Mechanical seal chamber dimensions in full compliance with API 682 standard.
- Cooling plans acc. to annex B of API 610Ed. 10 is applicable as an option.
- Anti friction bearings with an operating time more than 25000h.
- Oil, ring oil and grease lubrication methods.
- Material is compatible with the fluid and acc. to annex H of API 610 standard.
- Standard ANSI 150# RF flanges. Other ratings are possible as an option.
- SIDE - SIDE nozzle arrangement.
- Low shaft deflection and long life.
- Removable wearing at case and impeller. Running clearances meet the requirements of API 610 standard.
- Equipped with vent valve and socket welded flanged drain.

Performance range:

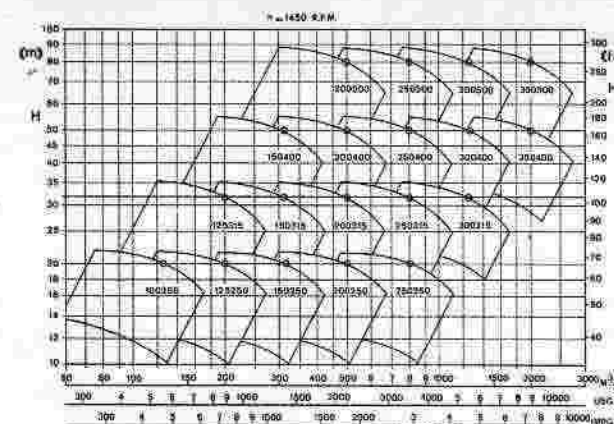
- Capacity: 50-8000m³/hr.
- Head: 15-250m
- Nozzle size: 4-30"

Applications:

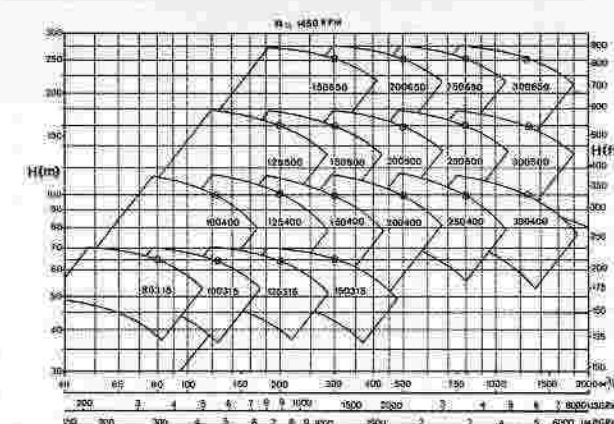
- Refineries
- Petrochemical plants
- Oil and gas fields
- Cooling and hot water systems
- Seawater handling
- Pipe lines



Family Diagram



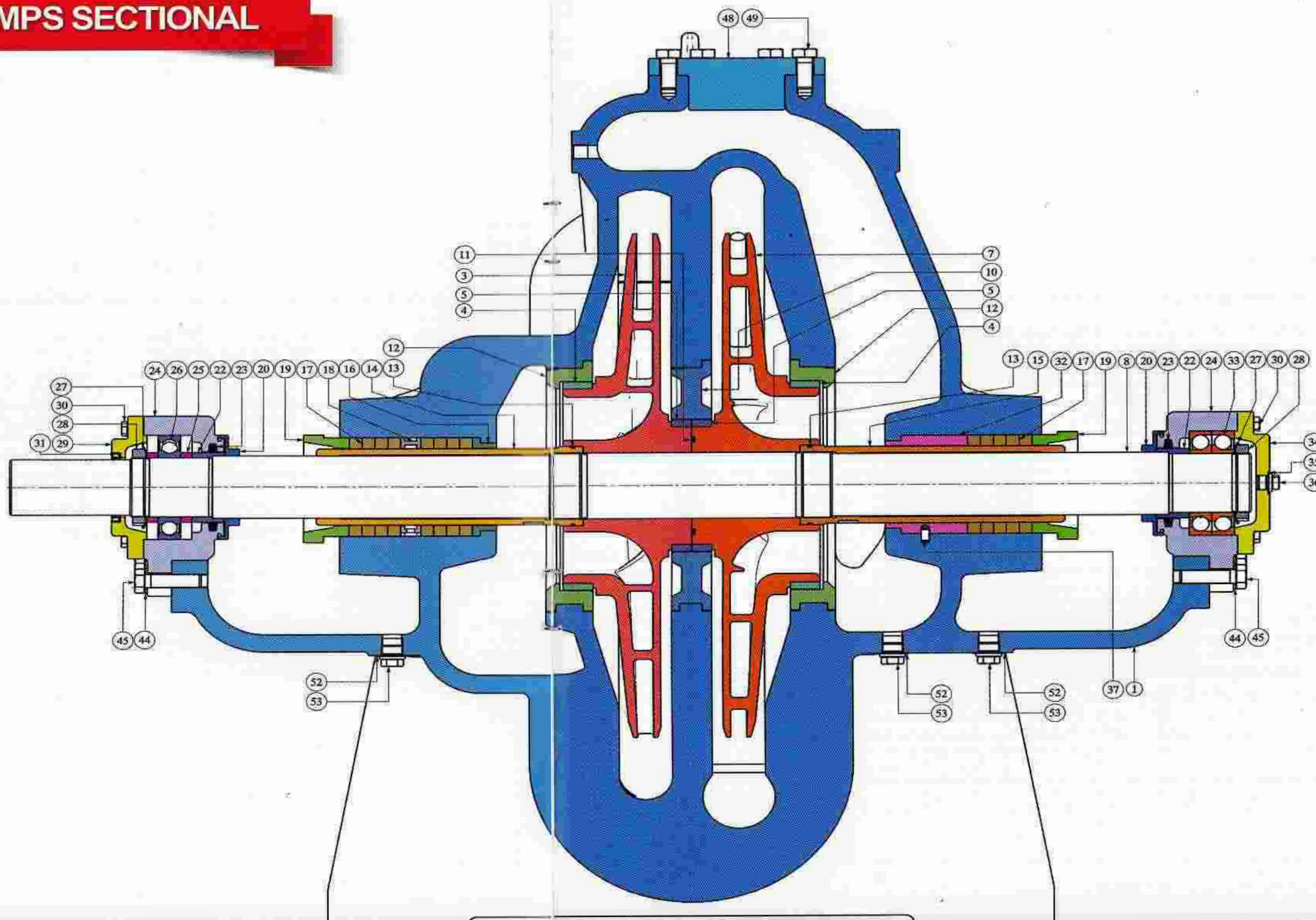
BS1 Series

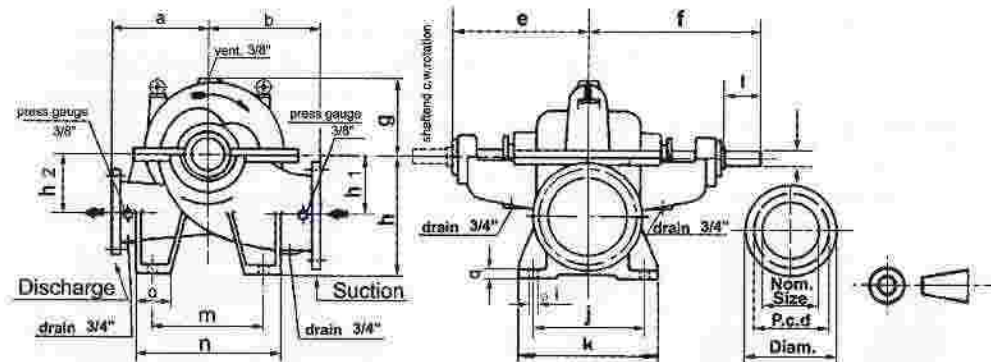


BS2 Series

BS2 PUMPS SECTIONAL

Bill of Material: P01		
Number	Description	Quantity
1	Casing half-Lower	1
2	Casing half-Upper	1
Bill of Material: P02		
Number	Description	Quantity
3	Impeller First Stage	1
4	Impeller Wear Ring S.S.	1
5	Impeller Wear Ring H.S.	1
6	Hexagon Socket Set Screw	6
Bill of Material: P03		
Number	Description	Quantity
4	Impeller Wear Ring S.S.	1
5	Impeller Wear Ring H.S.	1
6	Hexagon Socket Set Screw	6
7	Impeller Second Stage	1
Bill of Material: P04		
Number	Description	Quantity
P02	Impeller First Stage Assembly	1
P03	Impeller Second Stage Assembly	1
8	Shaft	1
9	Parallel Key	1
10	Intermediate Disc	1
11	O-Ring	1
12	Casing Wear Ring	2
13	O-Ring	2
14	Shaft Sleeve Left Thread	1
15	Shaft Sleeve Right Thread	1
16	Neck Bush S	1
17	Packing	1
18	Lantern Ring	1
19	Gland	2
20	Thrower	2
21	Hex. Socket Set Screw With Cup Point	6
22	Shoulder Ring	2
23	Felt Ring	2
24	Bearing Housing	2
25	Bearing Spacer	2
26	Deep Groove Ball Bearing	1
27	Bearing Nut Lock Washer	2
28	Bearing Nut	2
29	Bearing Cover D.S.	1
30	Hex. Head Screw	12
31	Lip Seal	1
32	Neck Bush D	1
33	Angular Contact Ball Bearing	2
34	Bearing Cover	1
35	Sealing Washer	1
36	Hex. Head Screw Plug	1
Bill of Material: P05		
Number	Description	Quantity
P04	Base Assembly	1
1	Casing half-Lower	1
2	Casing half-Upper	1
35	Sealing Washer	3
36	Hex. Head Screw Plug	3
37	Parallel Pin	1
38	Double End Stud	35
39	Taper Pin With External Thread	1
40	Hex. Nut	2
41	Washer	30
42	Hex. Dished Cap Nut	10
43	Hex. Head Screw	2
44	Washer	14
45	Hex. Head Screw	10
46	Double End Stud	4
47	Hex. Nut	4
48	Casing half-Upper Cap	1
49	Hex. Head Screw	6
50	Lifting Pin	2
51	Parallel Key - DIF 685	1
52	Sealing Washer	4
53	Hex. Head Screw Plug	6

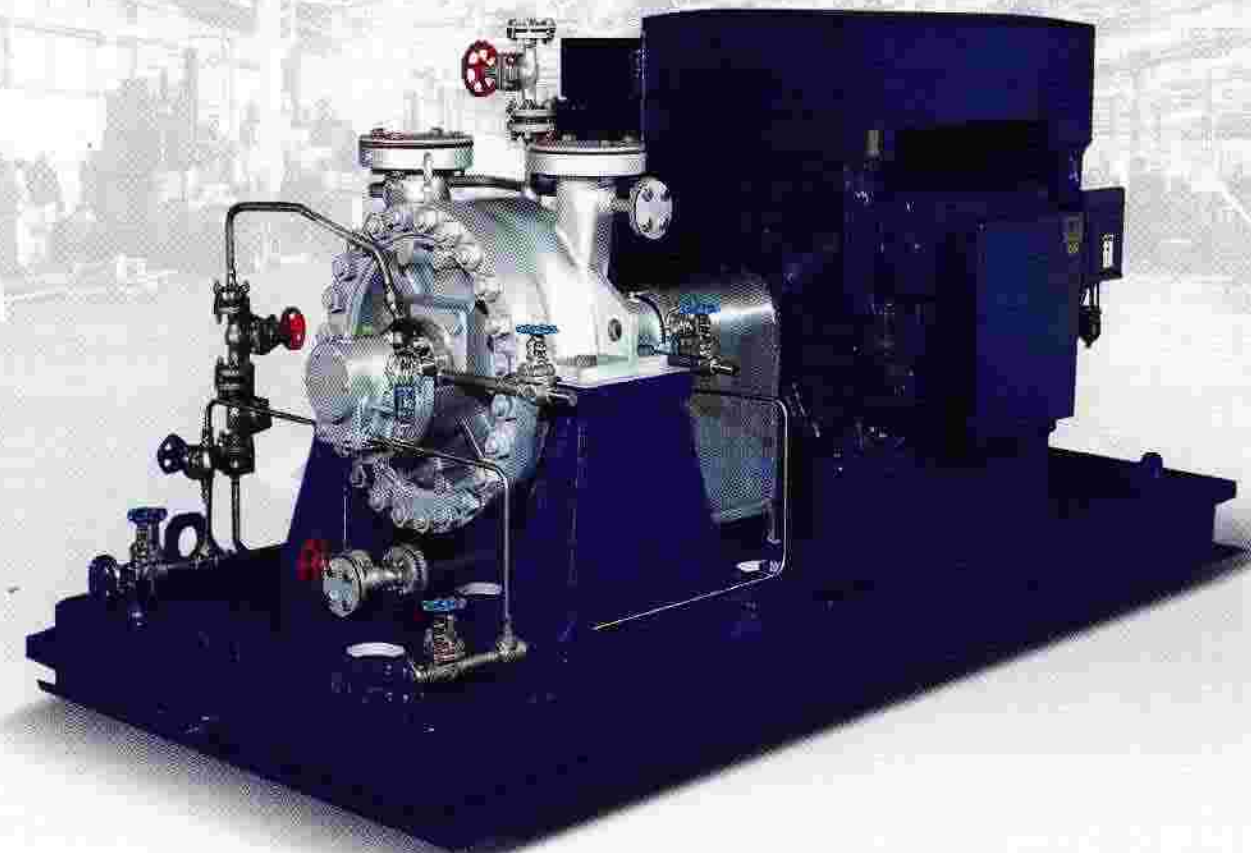




Type BSI	Dis.	Suc.	a	b	e	f	g	h	h ¹	h ²	Øi	j	k	m	n	o	q	Ød	t
1-250160	250	300	440	425	385	495	345	475	250	200	23	400	500	400	500	100	22	45	110
1-100250	100	125	275	300	385	470	200	280	150	155	23	270	325	325	400	75	22	38	80
1-125250	125	150	300	350	385	495	230	330	180	210	23	320	380	375	430	75	25	45	110
1-150250	150	200	300	400	385	495	270	375	180	210	23	375	430	375	430	75	25	45	110
1-200250	200	250	350	450	455	565	300	450	200	265	23	400	500	400	500	100	30	55	110
1-250250	250	300	450	500	525	645	275	530	275	275	27	525	650	525	650	125	27	65	120
1-300250	300	350	550	600	585	725	400	535	280	300	27	525	650	525	650	125	30	75	140
1-125315	125	150	355	395	385	495	255	330	180	200	23	375	430	375	430	90	25	45	110
1-150315	150	200	350	400	455	565	275	375	200	200	23	400	500	400	500	100	25	55	110
1-200315	200	250	400	450	525	645	320	425	200	250	27	450	550	450	550	100	27	65	120
1-250315	250	300	450	500	525	645	330	530	275	275	27	525	650	525	650	125	27	65	120
1-300315	300	350	500	600	585	725	380	585	325	360	30	580	700	580	700	125	30	75	140
1-350315	350	400	550	700	715	890	450	700	325	400	30	675	850	675	850	175	35	85	170
1-150400	150	200	400	400	455	565	320	400	225	250	23	400	500	400	500	100	25	55	110
1-200400	200	250	450	475	525	645	340	470	200	275	27	450	550	450	550	100	27	65	120
1-250400	250	300	450	500	525	645	340	530	300	300	27	525	650	525	650	125	27	65	120
1-300400	300	350	500	550	585	725	380	585	325	325	30	580	700	580	700	125	30	75	140
1-350400	350	400	550	650	715	890	450	650	325	380	30	675	850	675	850	175	35	85	170
1-400400	400	500	600	750	715	890	530	760	400	470	35	725	950	725	950	225	35	85	170
1-500400	500	600	750	900	970	1075	600	900	425	525	35	1000	1200	780	1000	225	40	100	210
1-200500	200	250	450	500	540	675	350	470	200	285	27	400	500	420	500	100	40	75	140
1-250500	250	300	500	550	585	725	400	525	250	325	27	525	650	525	650	125	30	75	140
1-300500	300	350	550	575	600	775	450	585	325	350	30	580	700	580	700	150	35	85	170
1-350500	350	400	600	675	765	965	500	675	325	385	33	675	850	675	850	175	35	100	210
1-400500	400	500	600	750	715	890	550	760	400	470	35	725	950	725	950	225	35	85	170
1-500500	500	600	650	850	825	1025	600	865	450	525	40	775	1000	775	1000	225	40	100	210
1-600500	600	700	700	950	825	1025	650	1000	500	600	40	850	1100	850	1100	250	45	100	210
1-250650	250	300	500	550	585	725	450	550	325	325	27	525	650	525	650	125	30	75	140
1-300650	300	350	650	650	600	775	520	675	325	425	33	580	700	580	700	150	35	85	170
1-350650	350	400	550	650	715	965	475	730	350	450	33	675	850	675	850	175	32	100	210
1-400650	400	500	650	800	825	1025	600	760	400	470	35	725	950	725	950	225	35	100	210
1-500650	500	600	700	850	825	1025	650	865	450	525	40	775	1000	775	1000	225	40	100	210
1-600650	600	700	700	1000	910	1125	675	1040	500	650	40	850	1100	850	1100	250	45	100	210
1-300800	300	350	800	750	755	965	620	730	325	500	33	675	850	675	850	175	35	100	210
1-350800	350	400	700	850	730	965	600	730	350	475	35	675	850	675	850	175	32	100	210
1-400800	400	500	800	825	730	930	740	775	400	475	35	565	740	900	1100	250	50	120	210
1-500800	500	600	750	950	910	1125	680	940	450	600	40	775	1000	775	1000	225	40	120	210
1-600800	600	700	750	1000	910	1160	730	1040	500	650	40	850	1100	850	1100	250	45	140	250

• All dimensions are approximately

BT2 PUMPS



PETCO BT2 Pumps (acc. to latest ed. of API 610 standard):

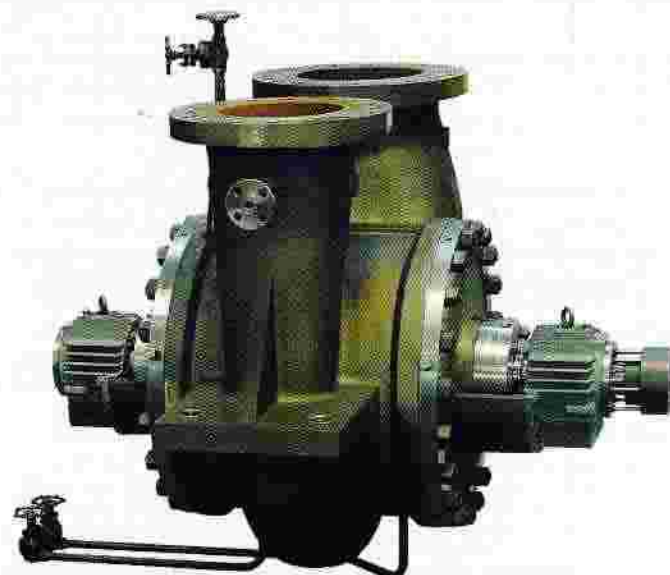
- Horizontal centrifugal BB2 design.
 - Two stages, single suction, dynamically balanced double shrouded impellers.
 - Single or double volute, Radial split, Centerline mounted case.
 - Different sizes in 3000rpm rated speed.
 - Mechanical seal chamber dimensions in full compliance with API 682 standard.
 - 3 sizes of bearing housing cover. Equipped with constant level sight feed oilers.
- The bearing housing is equipped with replaceable labyrinth seals with internal deflector to prevent contamination by moisture, dust and other foreign matters.
- Fan cooling and finned bearing bracket. In high temperature services cooling plans acc. to annex B of API 610Ed. 10 is applicable as an option.
 - Anti friction bearings with an operating time more than 25000h with ring oil lubrication.
 - Material is compatible with the fluid and acc. to annex H of API 610 standard.
 - Standard ANSI 300# RF flanges. Other ratings are possible as an option.
 - Top – Top nozzle arrangement.
 - Low shaft deflection and long life.
 - Removable wearing at case and impeller. Running clearances meet the requirements of API 610 standard.
 - Equiped with vent valve and socket welded flanged drain.

Performance range:

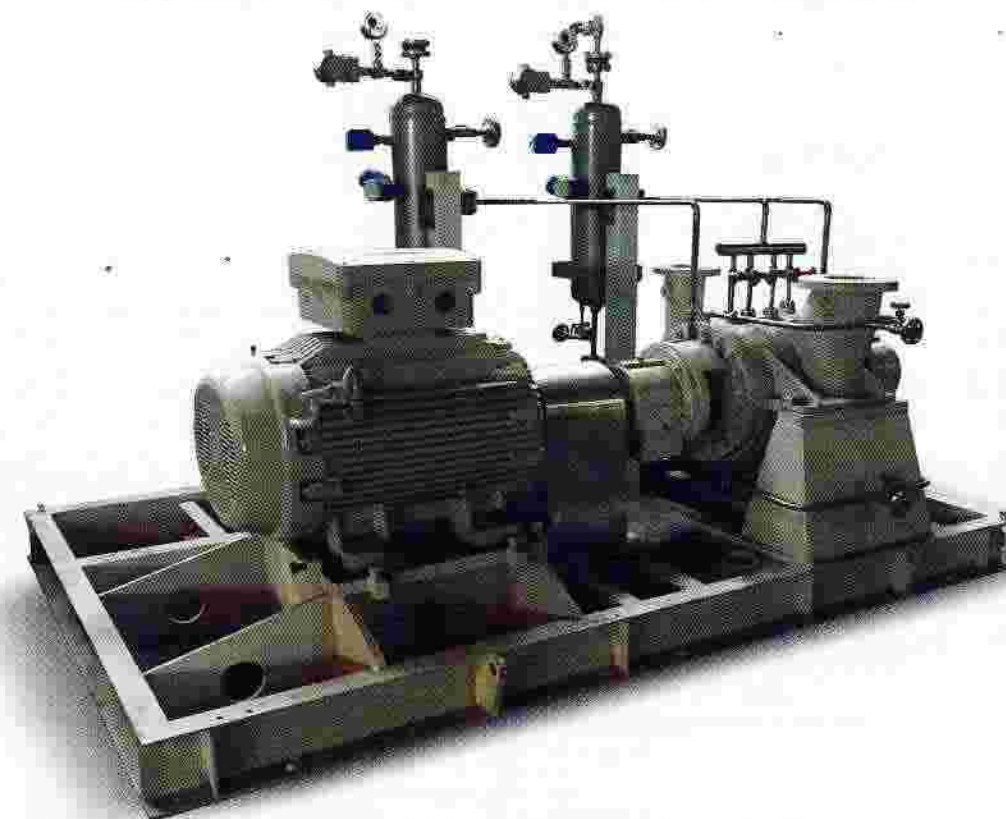
- Capacity: 10-400 m³/hr.
- Head: 100-500 m
- Nozzle size: 2-8"

Applications:

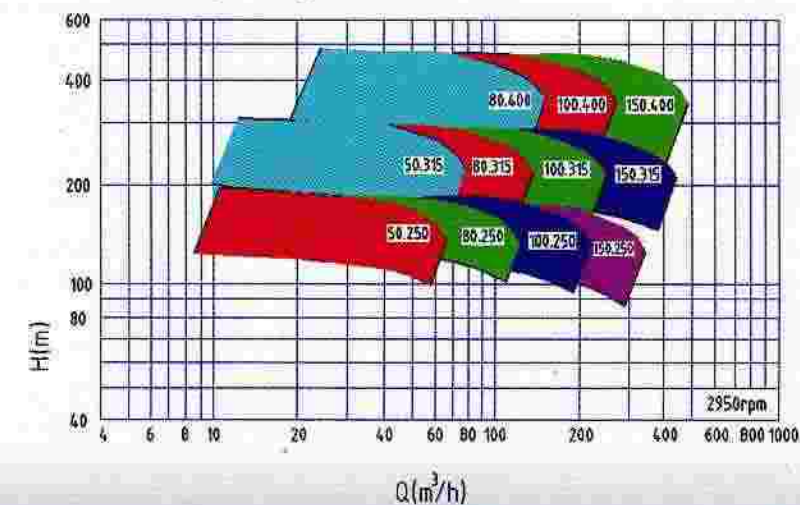
- Refineries
- Petrochemical plants
- Oil and gas fields
- Chemical industries



BT2 PUMPS

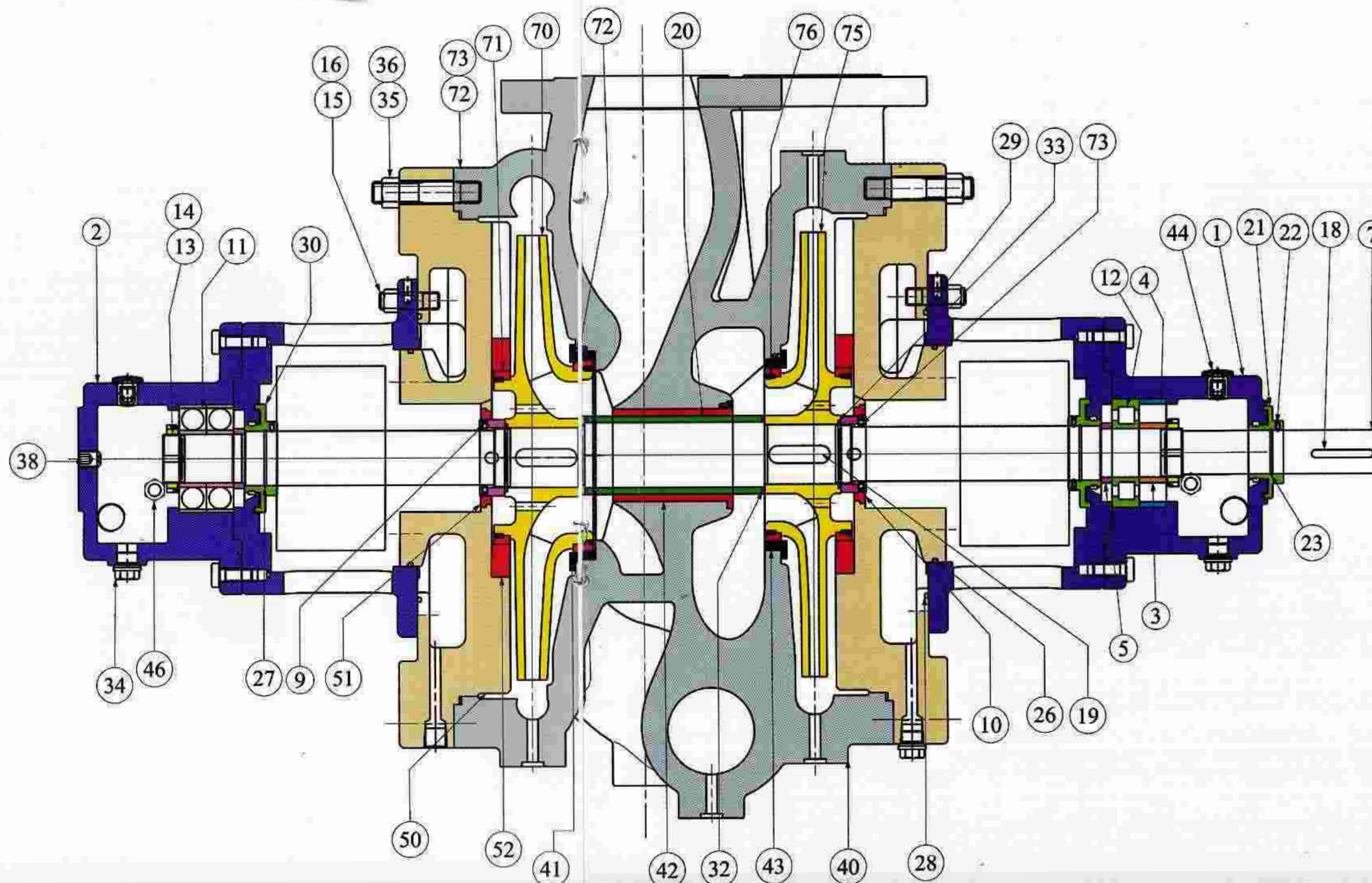


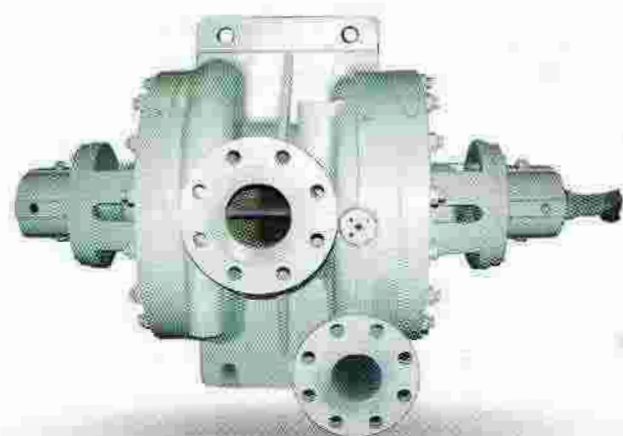
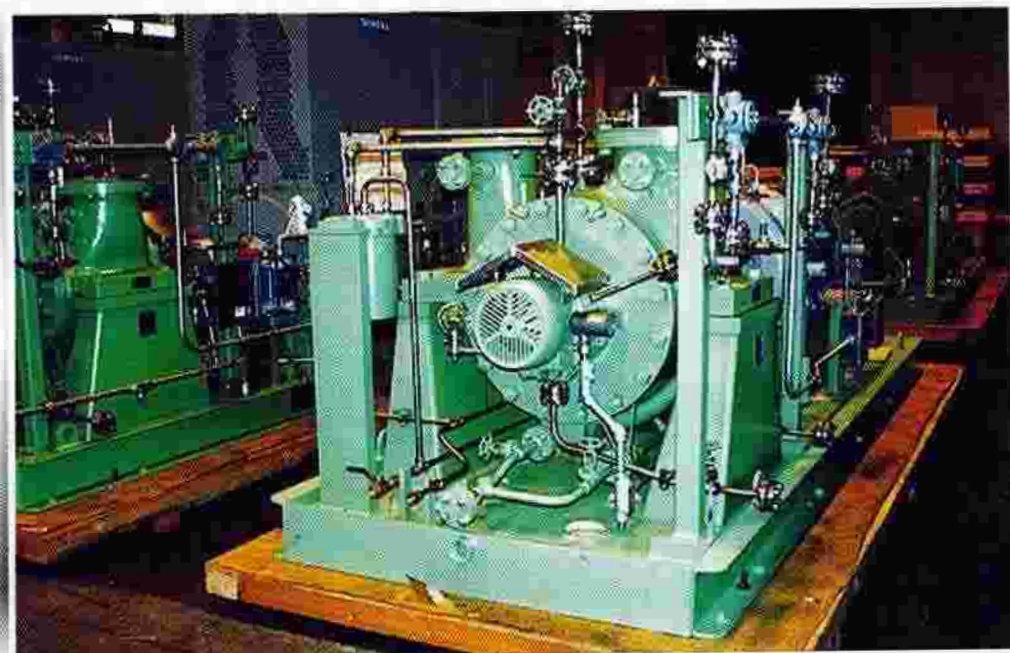
• Family Diagram



BT2 PUMPS SECTIONAL

94	Open End Blind Rivet
96	Plaque Plate
76	Imp. wear ring
73	Impeller(discharge)
73	Socket Set Screw cone point
72	Imp. wear ring
71	Imp. wear ring
70	Impeller(suction)
60	Hex Head Screw plug
52	Del. cover wear ring
51	Del. cover wear ring
50	Delivery Cover
46	Oil Gauge
44.3	Mesh
44.2	Bottom
44.1	Cover
44	Breather Ass.
43	Casing wear ring
42	Casing wear ring
41	Casing wear ring
40	Pump Casing
38	Socket Set Screw cup point
36	Hex Nut
35	Double End Stud
34	Magnetic Hex Head Screw Plug
33	Gasket
32	Gasket
30	Deflector(PS)
29	Gasket
28	O-Ring
27	O-Ring
26	O-Ring
25	O-Ring
24.3	Constant Oil Level
24.2	Elbow 90° F-F
24.1	Hexagon Reducing Nipple
23	O-Ring
22	Socket Set Screw cone point
21	Deflector(DS)
20	Impeller spacer
19	Parallel Key
18	Parallel Key
17	Hex Head Bolt
16	Hex Nut
15	Double End Stud
14	Bearing Nut Lock Washer
13	Bearing Nut
12	Cylindrical Roller Bearing
11	Angular contact ball Bearings
10	Impeller lock (DS)
9	Impeller lock (DDS)
7	Pump Shaft
6	Spacer
5	Shaft collar
4	Bearing spacer
3	Shaft collar
2	Bearing cover (ODS)
1	Bearing cover (DS)
Item	Description





CPV PUMPS



RELIABILITY FOR PUMPING TECHNOLOGY

PETCO CPV Pumps (acc. to latest ed. of API 610 standard):

- Vertical centrifugal VS4 design.
- Single stage, single suction, dynamically balanced double shrouded impeller.
- Single or double volute, Radial split Case.
- Different sizes in 1500rpm
- 4 sizes of bearing housing cover. Equipped with constant level sight
- Pumped fluid lubricated rubber radial bearings. Oil and grease lubricated thrust bearings. External source lubrication is applicable as an option.
- Material is compatible with the fluid and acc. to annex H of API 610 standard.
- Standard ANSI 150# RF flanges. Other ratings are possible as an option.
- Bottom – Side nozzle arrangement.
- Low shaft deflection and long life.
- Removable wearing at case and impeller. Running clearances meet the requirements of API 610 standard.

Performance range:

- Capacity: 5-200 m³/hr.
- Head: 5-60 m
- Nozzle size: 2"-8"

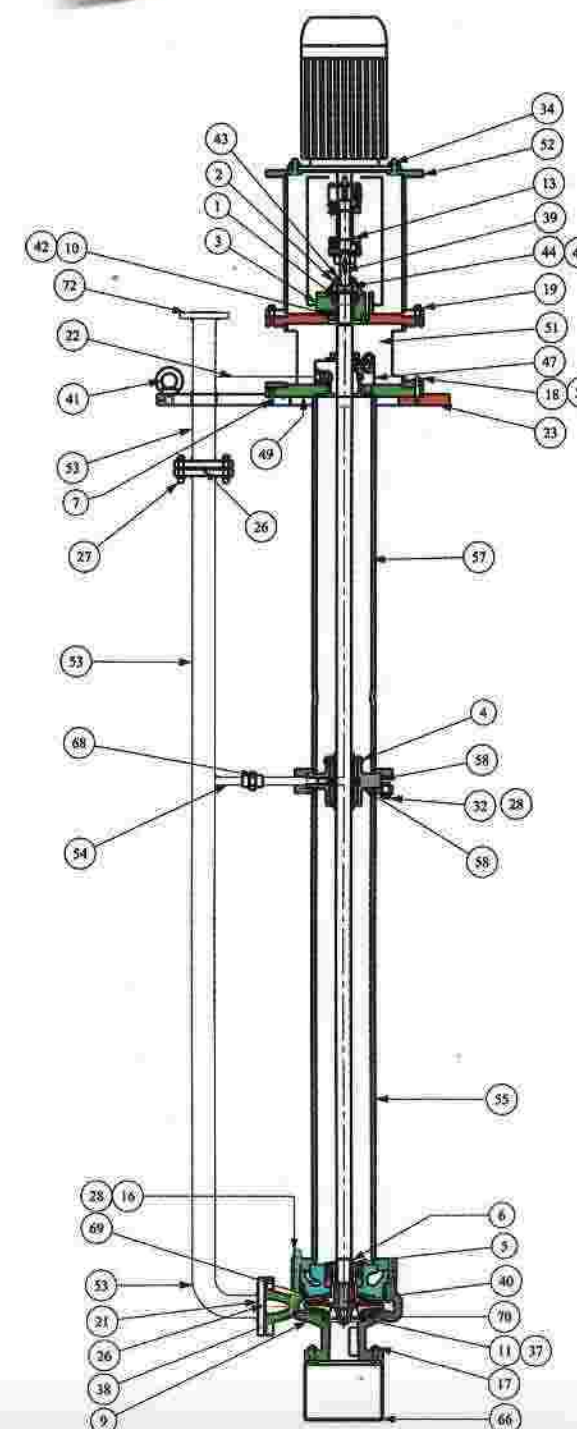
Applications:

- Refineries
- Petrochemical plants
- Water and waste water plants.
- Chemical industries
- Vessel services.



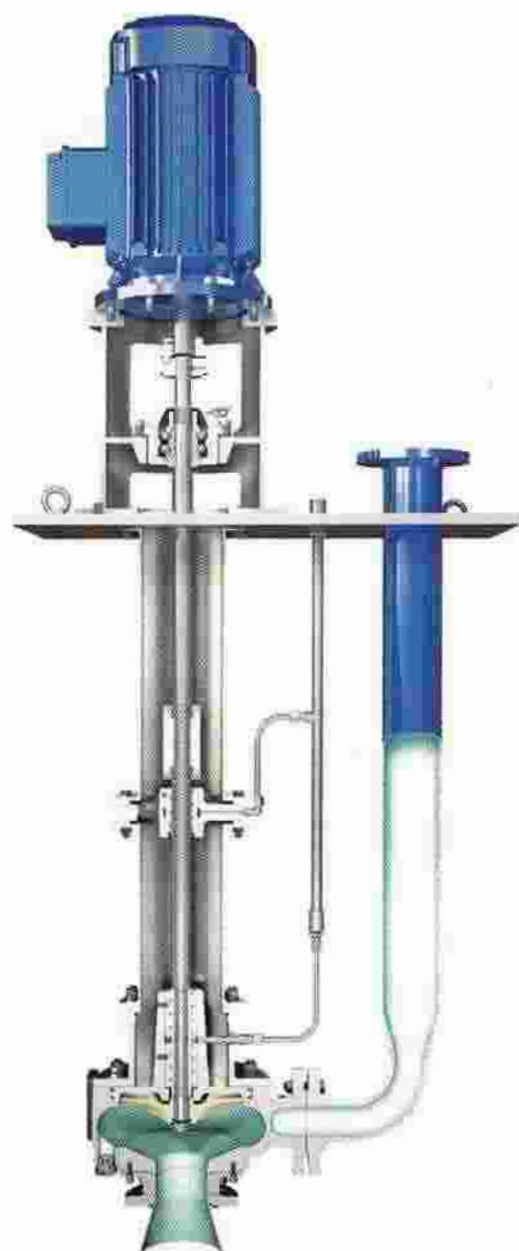
LONG LIFE AND SAFETY

CPV PUMPS SECTIONAL

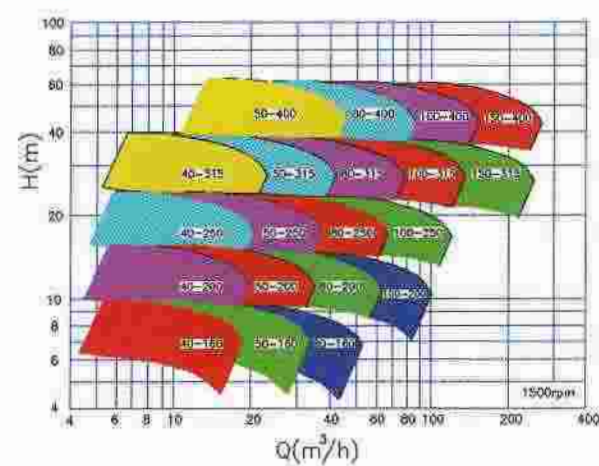


GR.	Qty	Description
72	1	Flange DN40 Class150#
71	1	Wear Ring Imp.
70	1	Casing Wear Ring
66	1	Strainer Ass.
65	1	Shaft Sleeve
64	1	Shaft
58	1	Retainer
37	1	Pipe Column Ass. Upper
53	1	Pipe Column Ass. Lower
53	1	Pipe
52	1	Pedstal Driver Upper Ass
51	1	Pedstal Driver Lower Ass
45	1	Lock Washer
44	1	Lock Nut
43	1	Lip Seal
42	2	Lip Seal
41	2	Lifting Eyebolt
40	1	Key Imp.
39	1	Key
38	1	Impeller
37	1	Imp. Nut
34	4	Hex-Head Bolt
32	8	Hex-Head Bolt
27	8	Hex Nut
23	1	Frame
21	3	Flange
19	8	Double End Stud
18	10	Double End Stud
17	4	Double End Stud
16	8	Double End Stud
15	1	Delivery Cover
13	1	Coupling TSK0013
11	1	Coil Insert
9	1	Casing
6	1	Bush
5	1	Bush
4	1	Bearing Line Shaft
3	1	Bearing Housing
2	1	Bearing Cover
1	1	Ball Bearing
GR.	Qty	Description

CPV PUMPS



• Family Diagram



VDLA PUMPS



VDLA PUMPS

Acc. to VS1 type of API 610 Standard (Latest ed.)

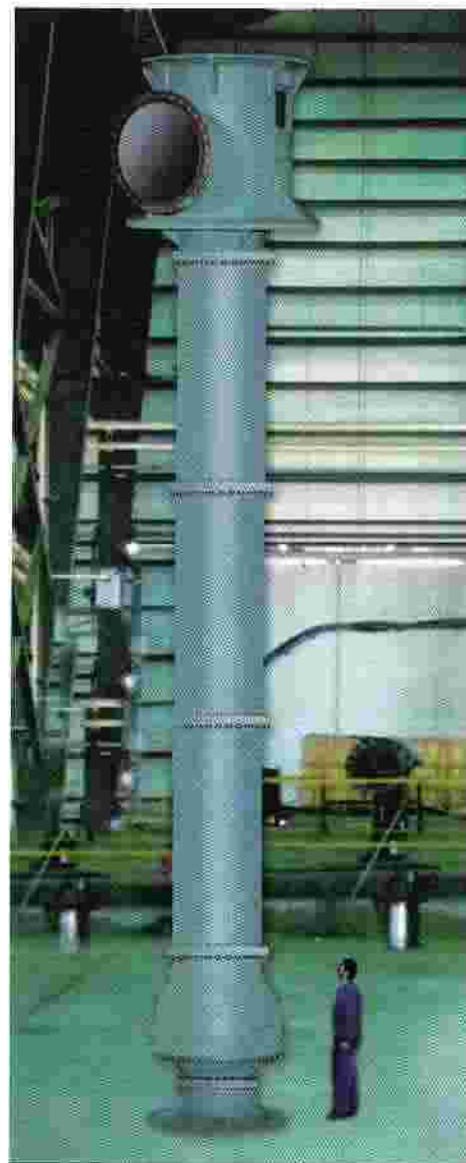
- Vertical turbine casing.
- Sigle/multi stage closed impeller in VDL and HVCPR Serie.
- Propeller type in VPL serie.
- Bellmouth suction in bottom and flanged discharge inside of above floor.
- Medium lubricated radial bearings/grease lubricated anti friction ball trust bearing.
- Packed gland shaft seal.
- Minimum shaft deflection.

Operating Data:

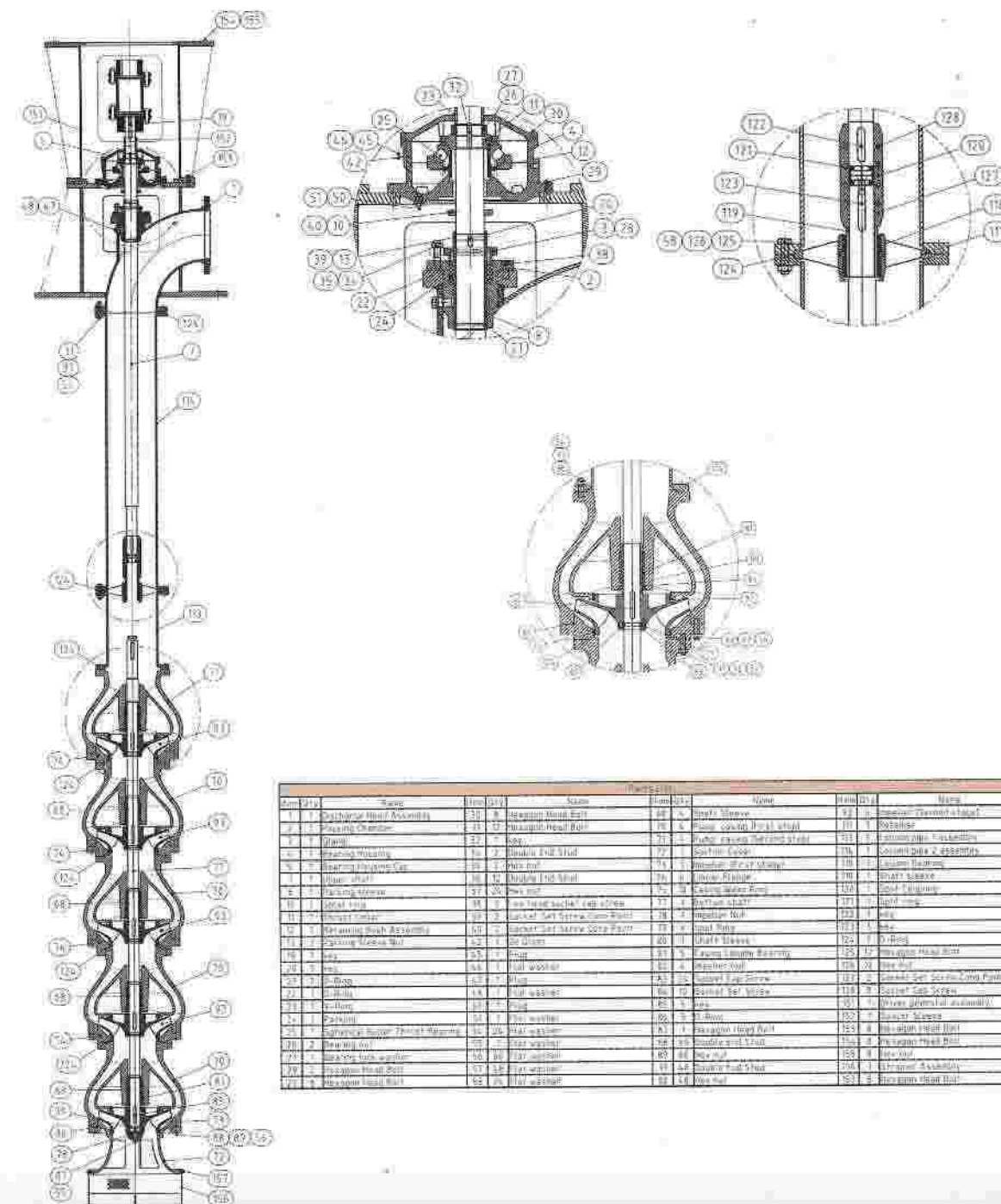
- Capacity: up to 20000 m³/h
- Total head: up to 200 m

Applications:

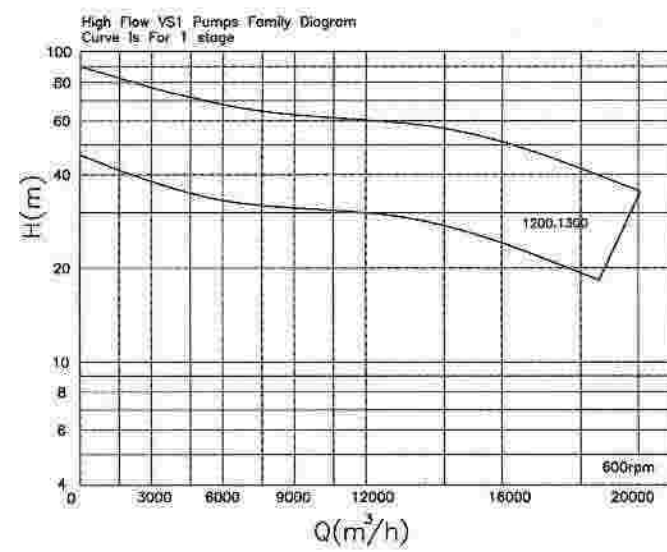
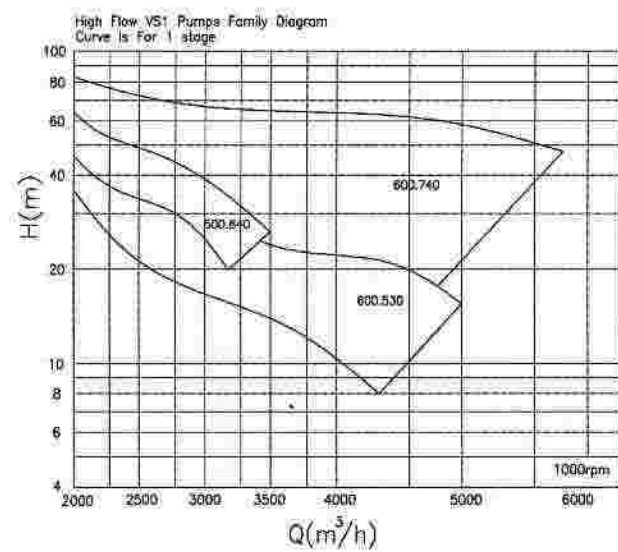
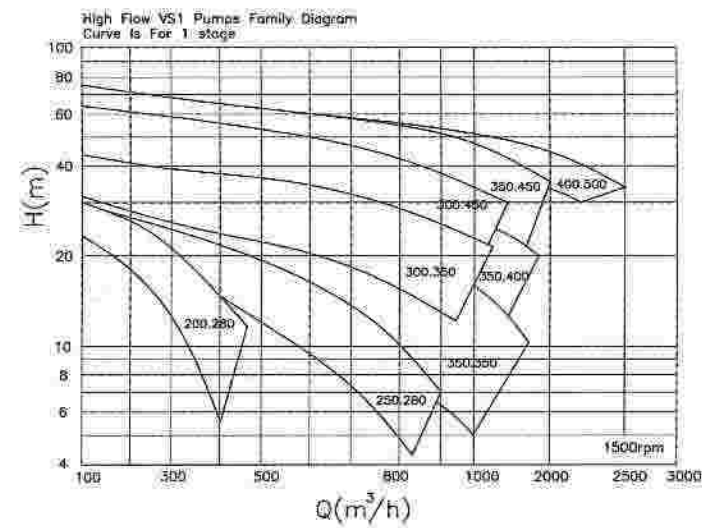
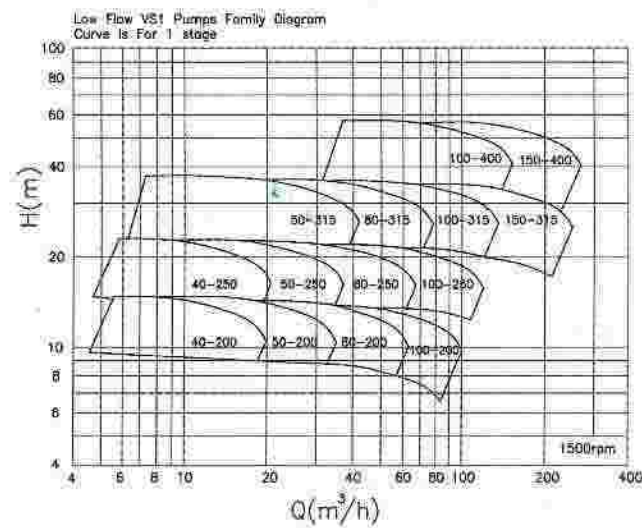
- Water industries.
- Water supply systems
- Cooling water intake systems.
- Sea water intake systems.



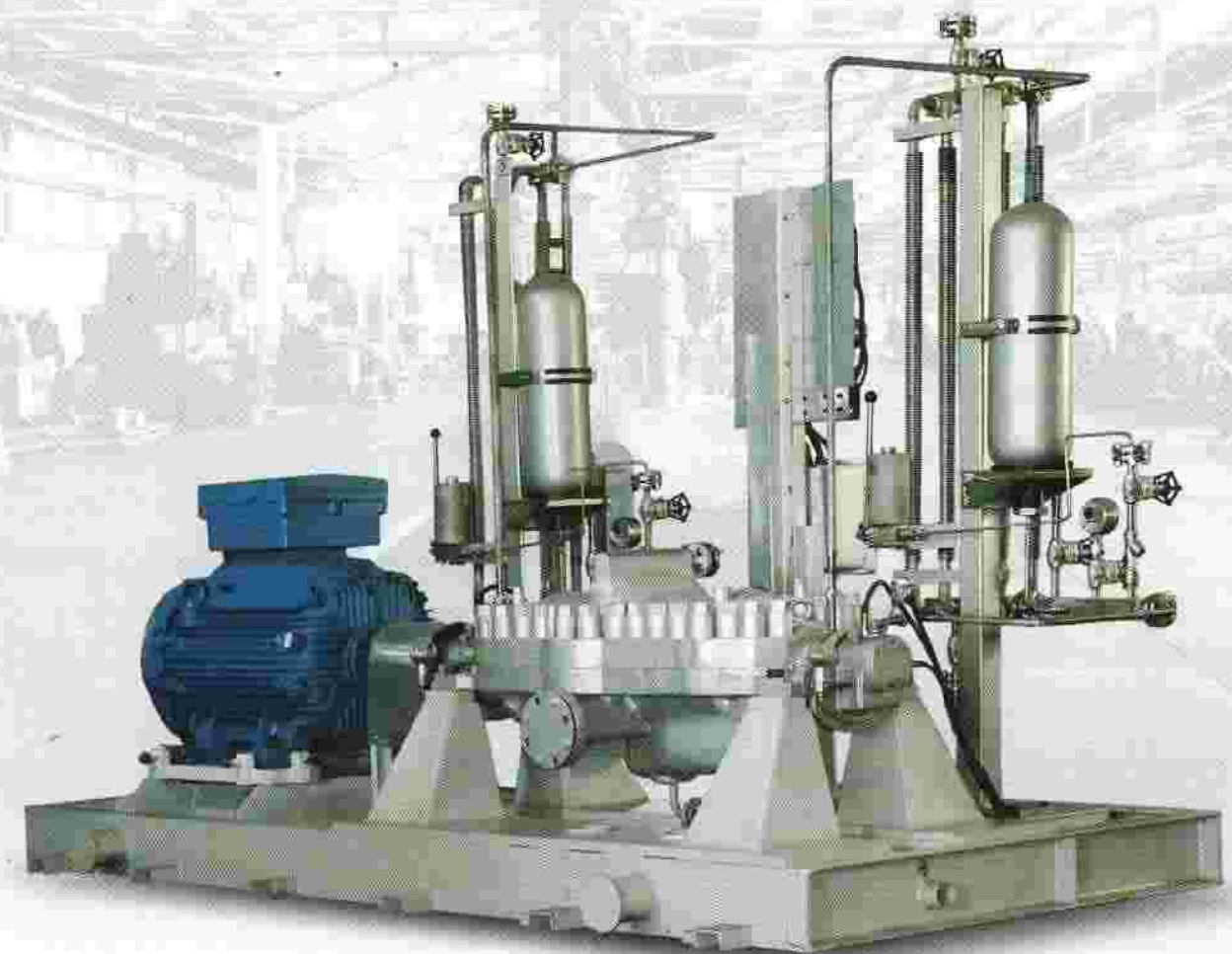
VDLA PUMPS SECTIONAL



Family Diagram



BS3 PUMPS



PETCO BS3 Pumps (acc. to latest ed. of API 610 standard):

Characteristic Data :

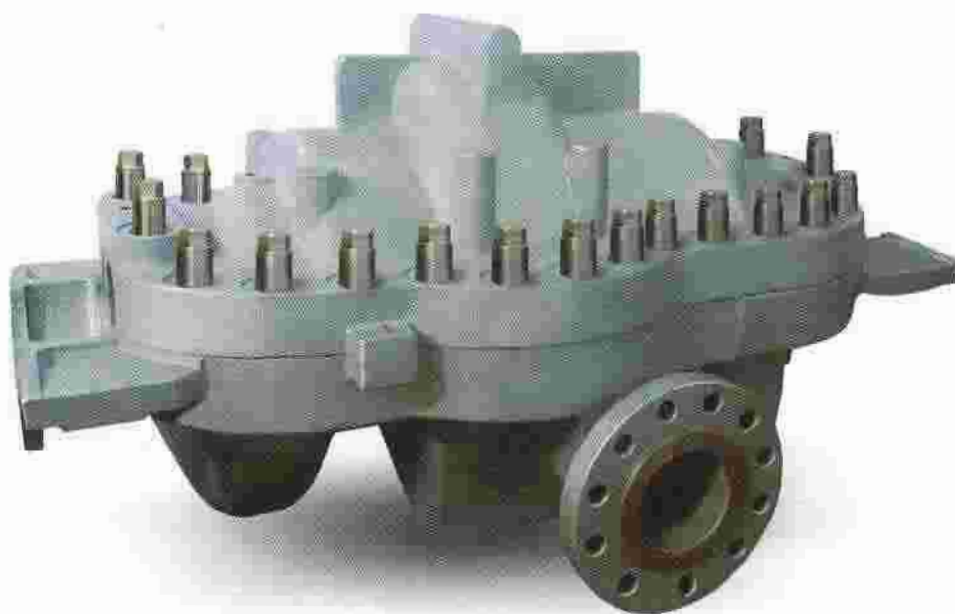
- API 610 Latest Edition (BB3 Type)
- Axially Split, Horizontal Multi-Stage Centrifugal Pump
- Centerline / Near Centerline Mounted
- Double Volute Casing
- Single Suction, Enclosed Impeller.
- Thrust Compensation By Opposed Impeller Groups
- Side-Side Nozzle Arrangement
- Materials of Construction as API 610
- Ring Oil Lubrication. Other Methods of Lubrication Available
- Replaceable Wear Rings For Casing And Impeller
- Sleeve / Tilt Pad Bearings Design Available
- Fan / Water Cooling Available

Applications :

- Refineries
- Petrochemical plants
- Oil fields
- Chemical plants
- Power plants
- Desalination plants
- Boiler feed water pumps

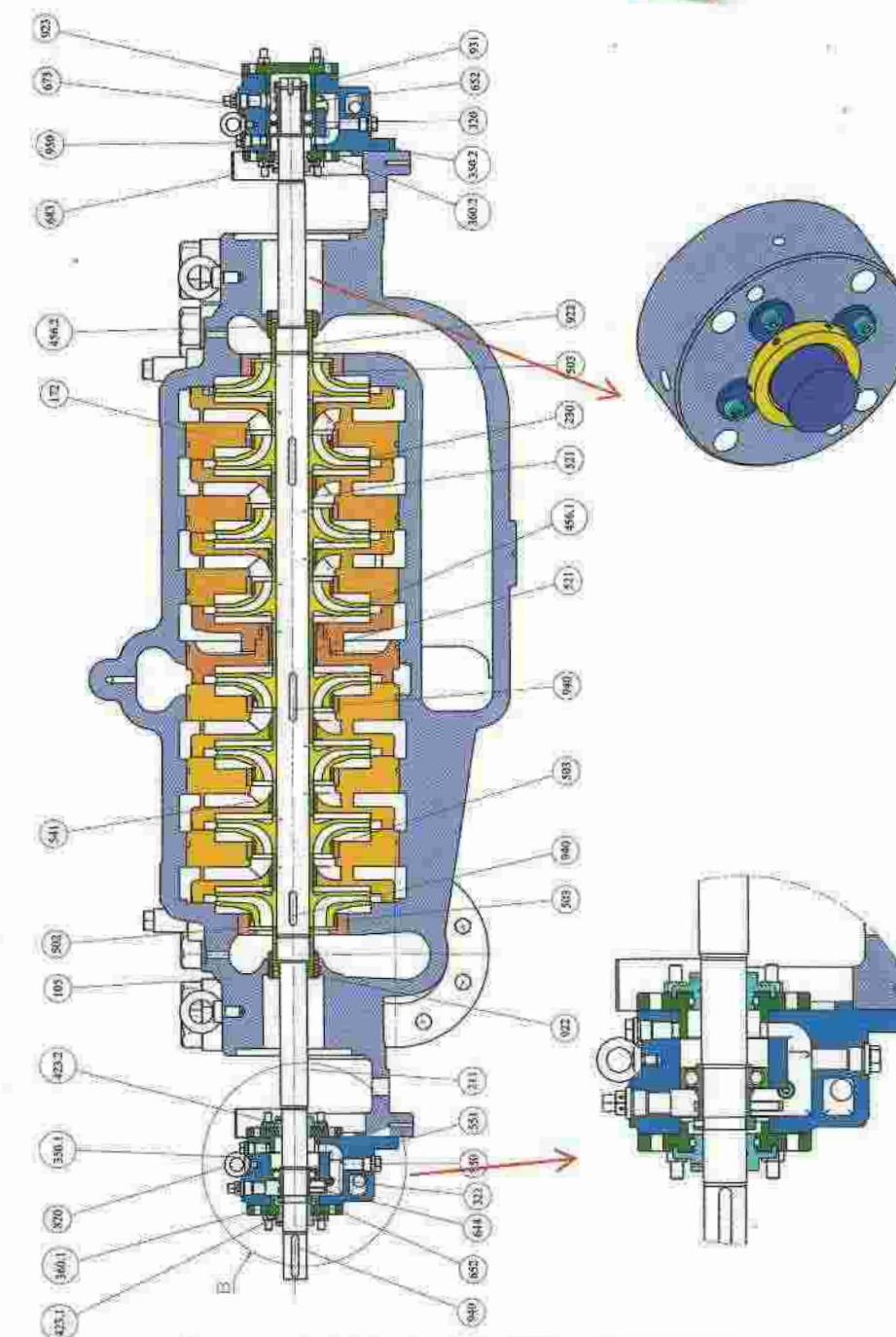
Performance Data :

- Capacity: 10 - 500 m³/hr.
- Head: 100 - 1000 m
- Temperature: to 250°C
- Discharge size: 1 1/2" to 14"



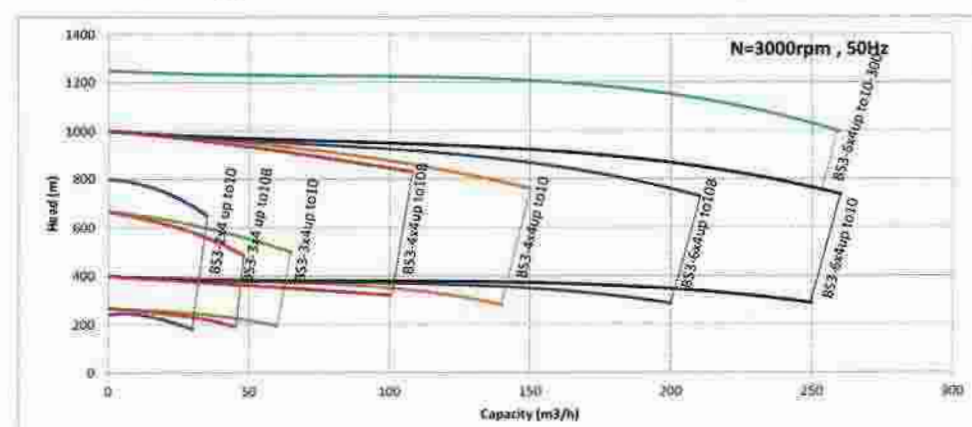
BS3 PUMPS SECTIONAL

Item	Name
105	Casing
172	Diffuser
211	Main shaft
230	Impeller
320	Ball Bearing
321	Radial ball bearing
350.1	Bearing housing (DS)
350.2	Bearing housing (NDS)
360.1	Bearing cover (DS)
360.2	Bearing cover (PS)
423.1	Deflector (DS)
423.2	Deflector (PS)
456.1	Diffuser wear ring
456.2	Stuffing box bushing
502	Casing wear ring
503	Impeller wear ring
521	Interstage sleeve
541	Diffuser wear ring
551	Disc spacer
638	Constant level oiler
642	Oil level sight glass
644	Lubricating ring
652	Lubricating sleeve
673	Vent filter
683	Cap
820	Eye bolt
922	Impeller nut
923	Bearing nut
931	Lockwasher
940	Fitting key
950	Plug



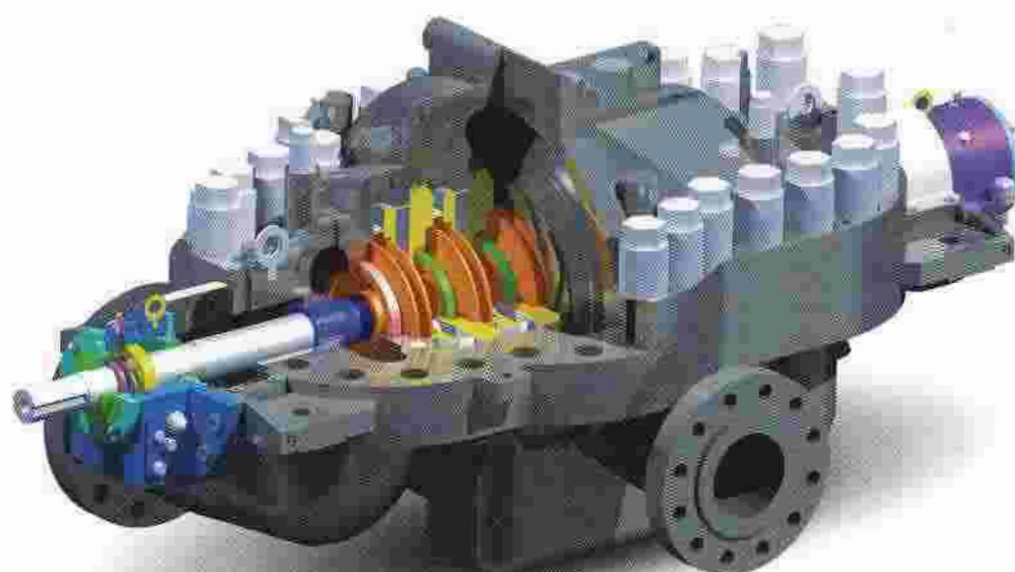
BS3 PUMPS

• Family Diagram



• NOTE:

For other ranges of BS3 pumps, design and manufacturing as per customer request is possible



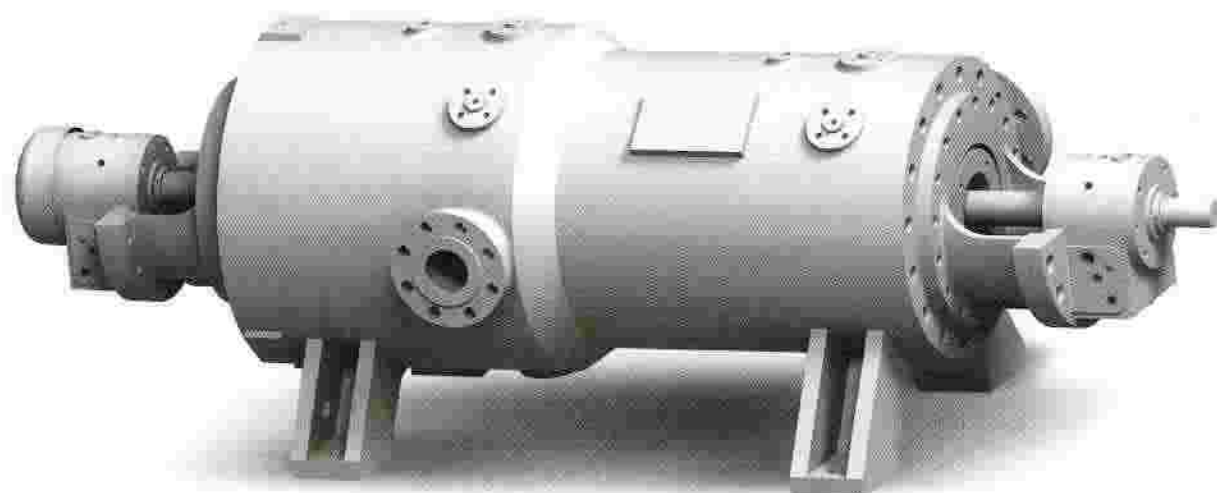
BT5 PUMPS



BT5 PUMPS

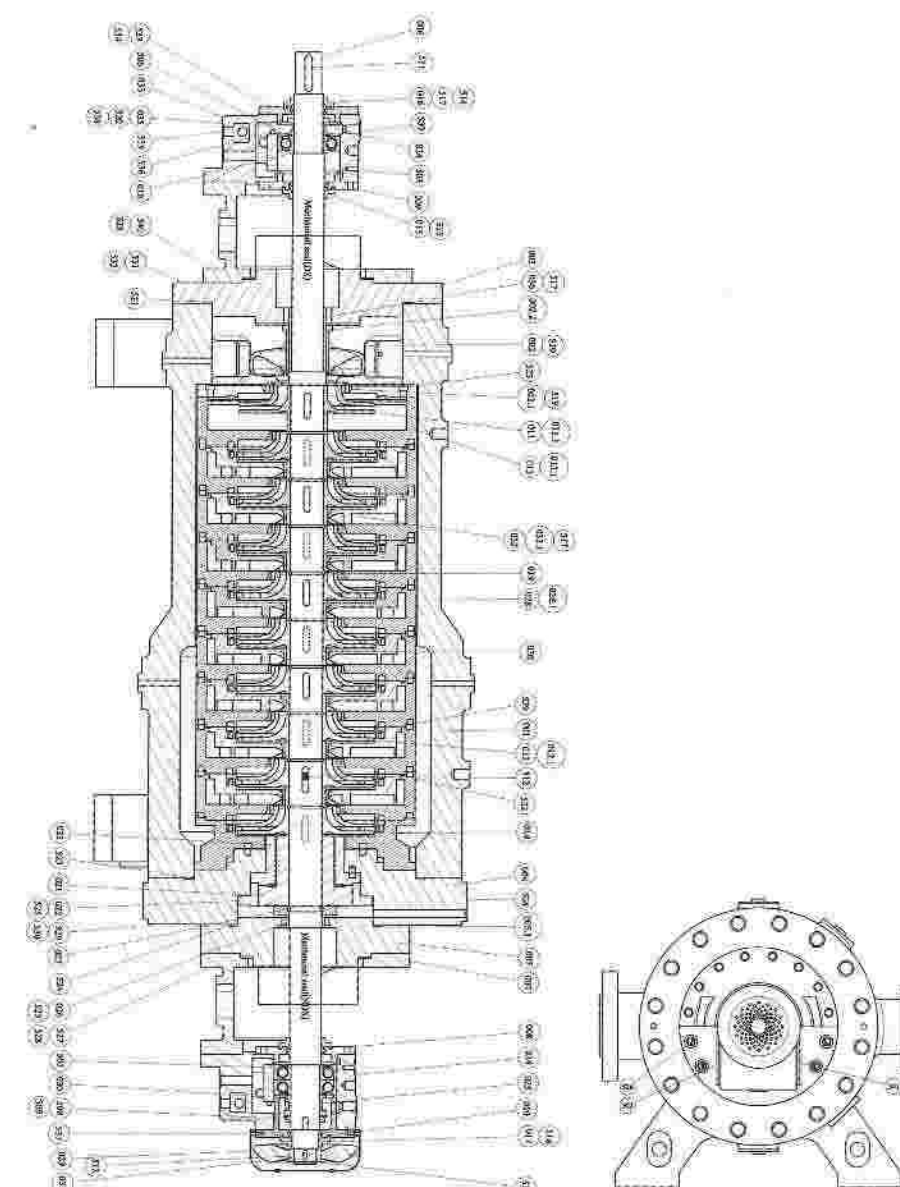
Description:

- Horizontal centrifugal barrel type pumps acc. to BB5 type as per API 610 standard (Latest Ed.)
- Multi stage , single suction impeller
- Double casing
- Radially split
- Between bearing
- Top – Top or Side- Side or Top- Side nozzle arrangements



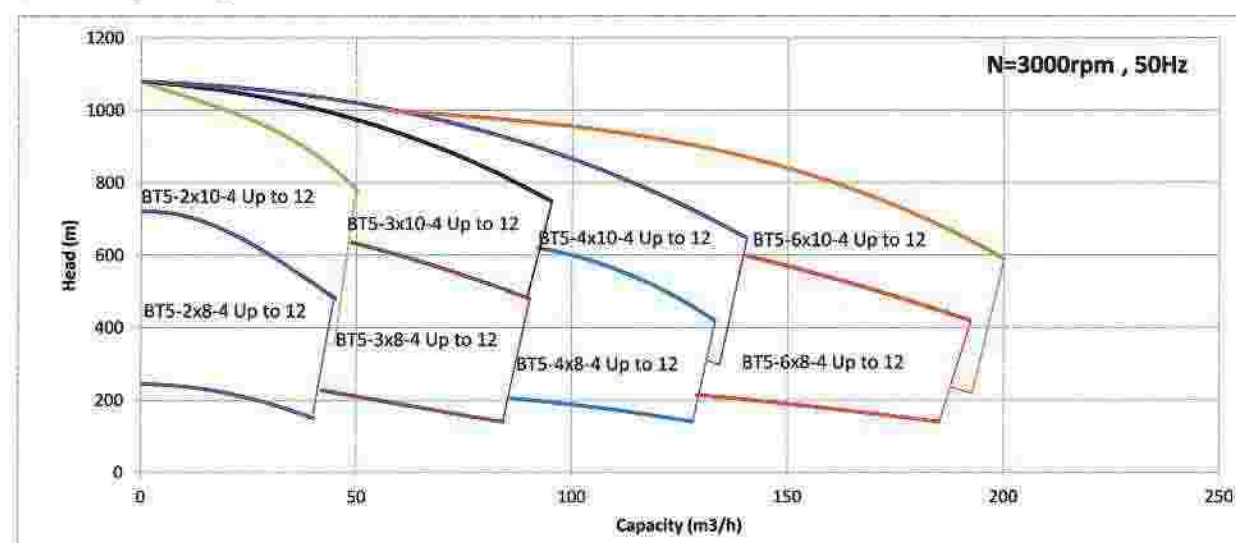
BT5 PUMPS SECTIONAL

Item	Qty	Description	Sub-Item	Note
001	1	Impeller	2300010	
002	1	Section piece	2300020	TC-2300031
003.1	1	Section piece wear Ring1	2300030	TC-2300032
003.2	1	Section piece Wear Ring2	2300030	TC-2300032
004	1	Section delivery cover	2300040	
005	1	Discharge Delivery cover	2300050	
006.1	1	Discharge Shafting Box	2300060	
006.2	1	Throttle Ring	2300060	TC-2300031
007	1	Man shaft	2300070	
008	2	Spacer	2300080	
009	2	Bushing cover PS	2300090	
010	1	Bushing cover PS	2300100	
011	2	Bushing cover ND3	2300110	
012	1	First Stage Impeller	2300120	
013.1	1	First Stage Impeller Wear Ring	2300130	TC-2300031
013.2	1	Impeller	2300130	
014.1	1	Impeller Wear Ring	2300140	TC-2300032
014.2	1	First Stage Diffuser cover	2300140	
015.1	1	First Stage Diffuser cover Wear Ring	2300150	TC-2300031
015.2	1	Diffuser	2300150	
016	1	Diffuser PS	2300160	
017	1	Diffuser DS	2300170	
018	1	Diffuser ND3	2300180	
019	1	Heating Spacer	2300190	
020	1	Split Ring	2300200	
021	1	Heating Spacer	2300210	
022	1	Balance Sleeve	2300220	
023	1	Balance cover	2300230	
024	1	Balance Bush	2300240	
025	1	Flange Flt	2300250	
026	1	Flange Flt	2300260	
027	1	Lock Nut	2300270	
028	1	Retainer Split Ring	2300280	
029	1	Diffuser Cover	2300290	
030.1	1	Diffuser Cover Wear Ring	2300300	TC-2300031
030.2	1	Ventilator	2300300	
031	1	Diffuser	2300310	
032	1	Ventilator Cap	2300320	
033	1	Diffuser	2300330	
034.1	1	Diffuser Wear Ring	2300340	TC-2300032
034.2	1	Bearing Housing (DS)	2300340	Model No.2300340
035	1	Bearing Housing (ND3)	2300350	Model No.2300350
036	1	Cooling Cover	2300360	
037	1	Section piece	2300370	
038	1	Impeller	2300380	
039	1	Concent level plate	2300390	
040	1	Oil level sight glass	2300400	
041	1	Dyn Bolt	2300410	
042	1	Eye Bolt	2300420	
043	1	Deep Groove Ball Bearing	2300430	
044	1	Angular Contact Ball Bearing	2300440	
045	1	Bearing Nut	2300450	
046	1	Bearing Lock Washer	2300460	
047	1	Clutch	2300470	
048	1	Parallel Key	2300480	
049	1	Parallel Key	2300490	
050	1	Parallel Key	2300500	
051	1	O-Ring	2300510	
052	1	O-Ring	2300520	
053	1	O-Ring	2300530	
054	1	Socket Set Screw Cone Point	2300540	
055	1	Socket Set Screw Cone Point	2300550	
056	1	Socket Set Screw Cone Point	2300560	
057	1	Gasket	2300570	
058	1	Gasket	2300580	
059	1	Gasket	2300590	
060	1	Gasket	2300600	
061	1	Gasket	2300610	
062	1	Hex Socket Head Screw	2300620	
063	1	Hex Socket Head Screw	2300630	
064	1	Double End Stud	2300640	
065	1	Hex Nut	2300650	
066	1	Double End Stud	2300660	
067	1	Hex Nut	2300670	
068	1	Double End Stud	2300680	
069	1	Hex Nut	2300690	
070	1	Double End Stud	2300700	
071	1	Hex Nut	2300710	
072	1	Double End Stud	2300720	
073	1	Hex Nut	2300730	
074	1	Double End Stud	2300740	
075	1	Hex Nut	2300750	
076	1	Double End Stud	2300760	
077	1	Hex Nut	2300770	
078	1	Double End Stud	2300780	
079	1	Hex Nut	2300790	
080	1	Double End Stud	2300800	
081	1	Hex Nut	2300810	
082	1	Double End Stud	2300820	
083	1	Hex Nut	2300830	
084	1	Double End Stud	2300840	
085	1	Hex Nut	2300850	
086	1	Double End Stud	2300860	
087	1	Hex Nut	2300870	
088	1	Double End Stud	2300880	
089	1	Hex Nut	2300890	
090	1	Double End Stud	2300900	
091	1	Hex Nut	2300910	
092	1	Double End Stud	2300920	
093	1	Hex Nut	2300930	
094	1	Double End Stud	2300940	
095	1	Hex Nut	2300950	
096	1	Double End Stud	2300960	
097	1	Hex Nut	2300970	
098	1	Double End Stud	2300980	
099	1	Hex Nut	2300990	
100	1	Double End Stud	2301000	



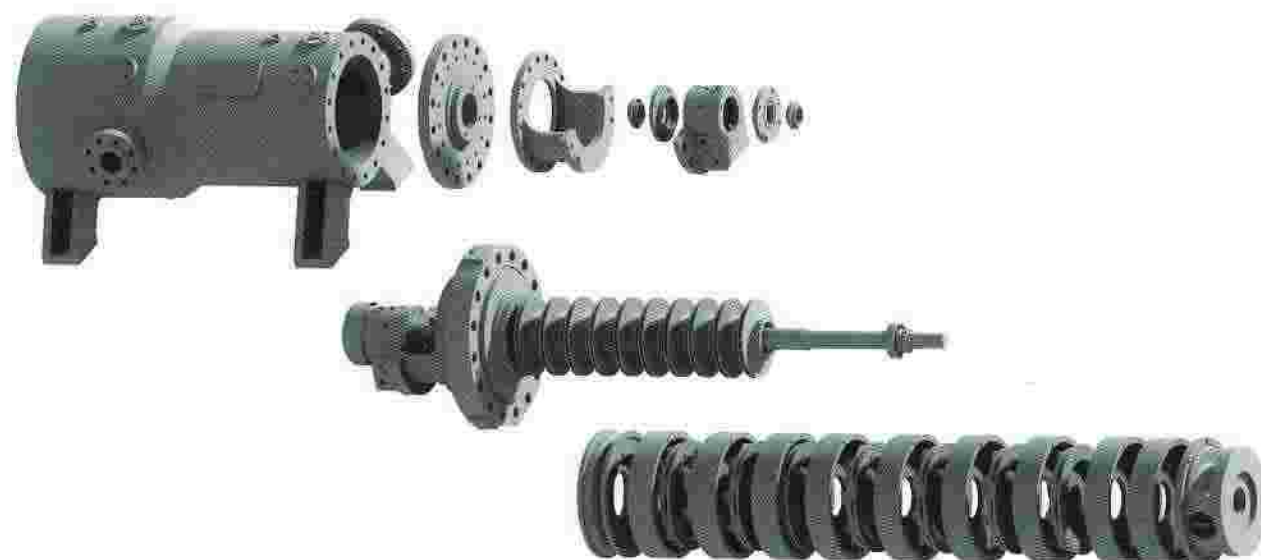
BT5 PUMPS

Family Diagram



NOTE:

For other ranges of BT5 pumps, design and manufacturing as per customer request is possible



VLTP / CTP PUMPS



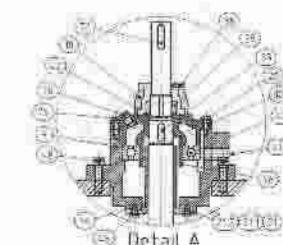
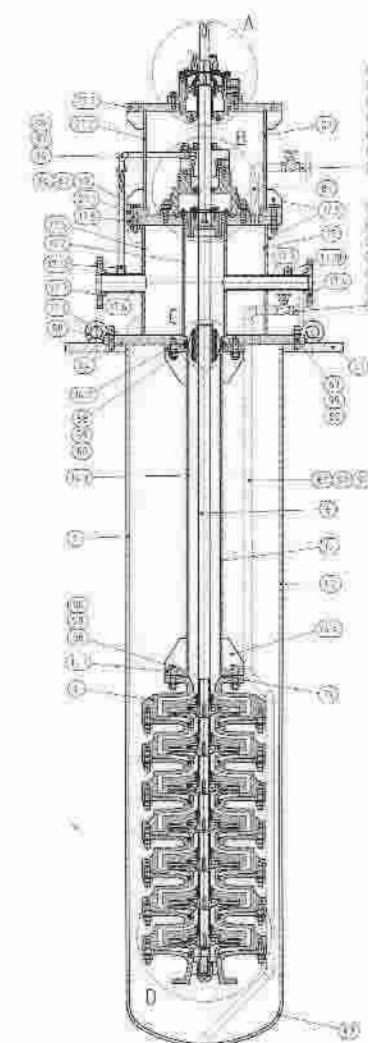
VLTP / CTP PUMPS

Acc. to VS6 type as per API 610 standard (Latest Ed.)

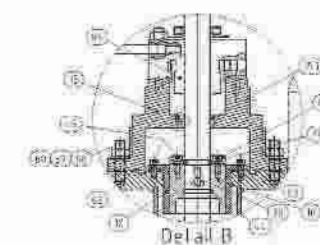
- Vertical arrangement
- Barrel type pumps
- Single or multistage
- Single suction impellers
- Suction and discharge nozzle in-line



VLTP / CTP PUMPS SECTIONAL

[illegible]

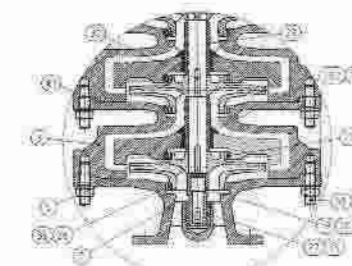
[Detail](#)



Detail 1



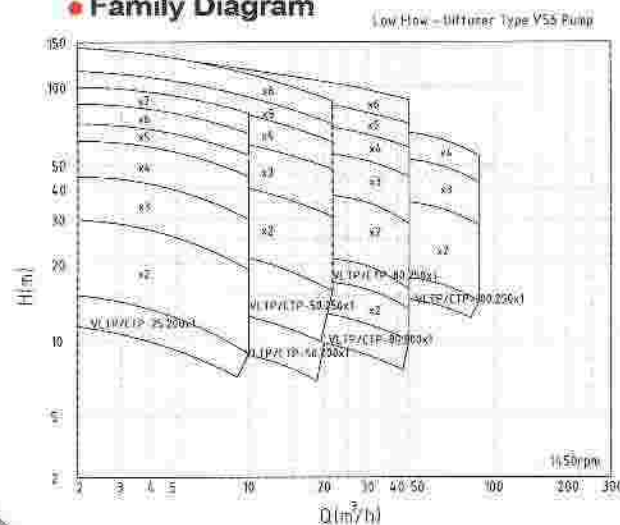
Detail



Total 1

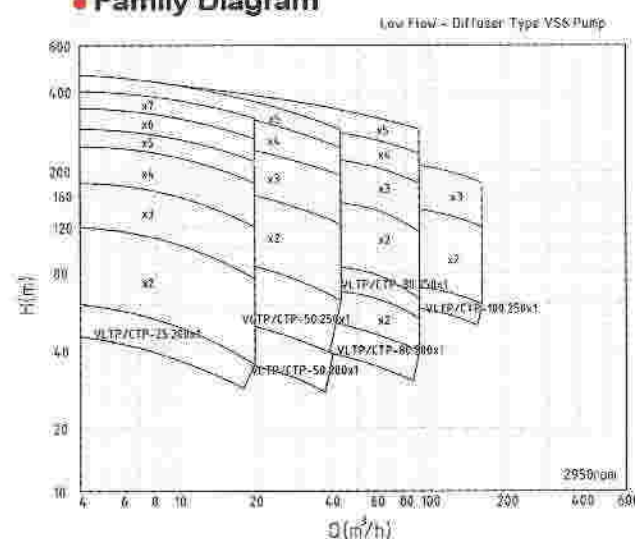
VLTP / CTP PUMPS

Family Diagram



NOTE:
For other ranges of VLTP / CTP pumps, design and manufacturing as per customer request is possible

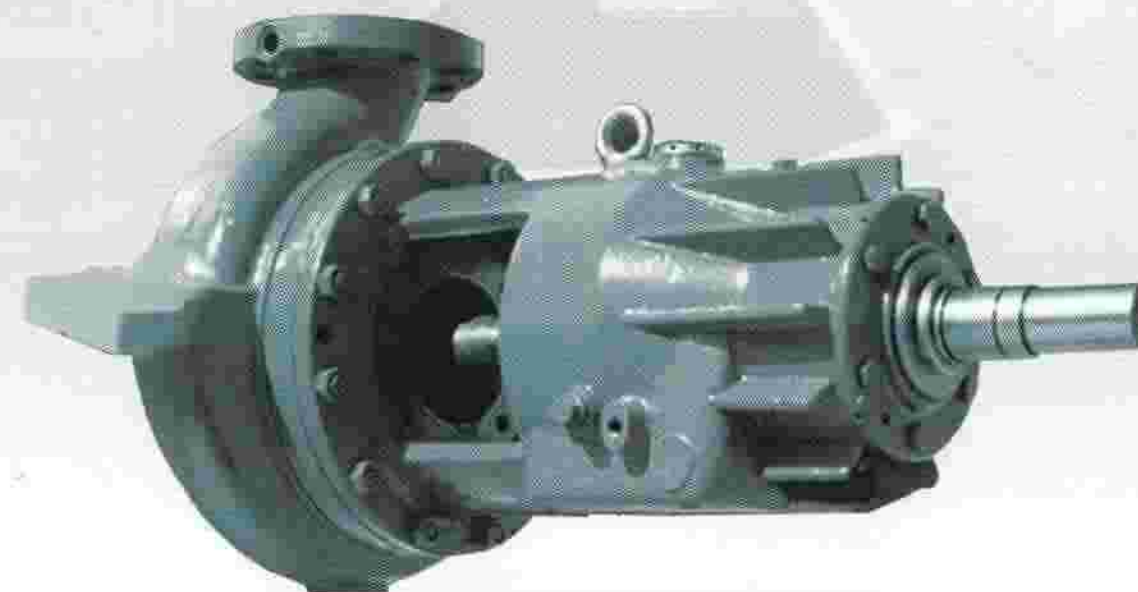
Family Diagram



NOTE:
For other ranges of VLTP / CTP pumps, design and manufacturing as per customer request is possible

APPENDIX

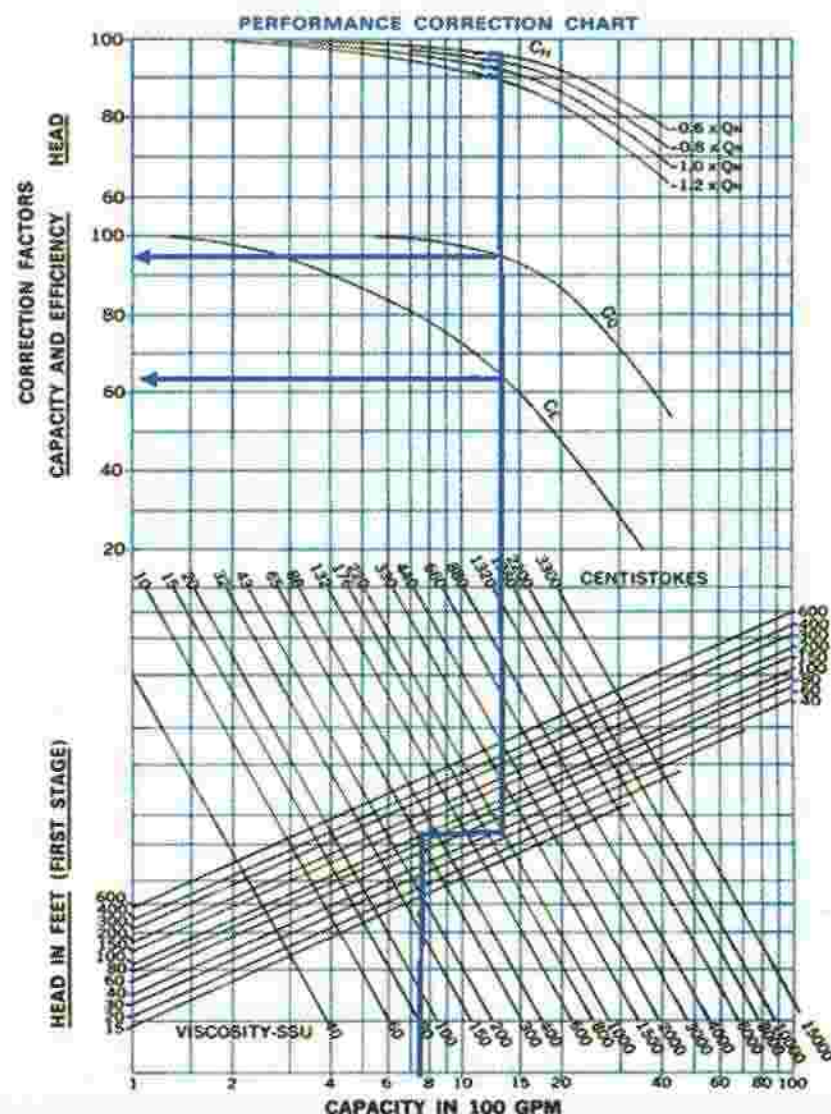
- Guide line pump selection for viscous fluids.
- Material class selection guidance.



• Viscous Fluids

The performance of centrifugal pumps is affected when pumping viscous liquids. A dramatic increase in Brake Horsepower and a reduction of Flow and Head occurs. To determine the effects of pumping viscous fluids using a centrifugal pump use the Performance Correction Chart below:

CH = Head Correction
CQ = Flow Correction.
CE = Efficiency Correction.



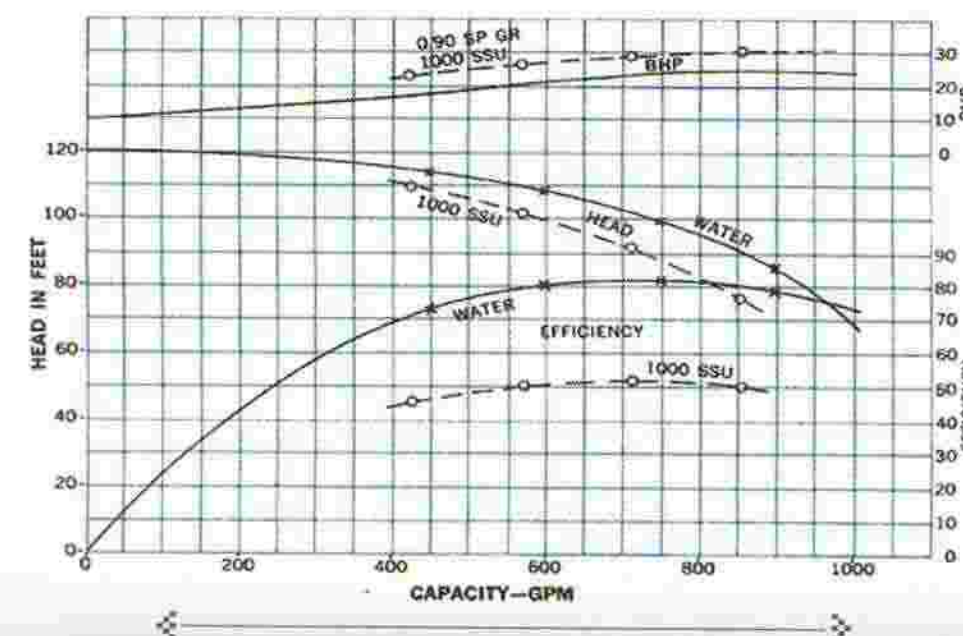
EXAMPLE

To determine the affects of pumping a 1,000 SSU viscous hydrocarbon liquid with a specific gravity of 0.9 using a pump with known water performance characteristics we find that:

CALCULATIONS				
WATER CAPACITY(GPM)	450	600	750	900
WATER HEAD (FT)	114	108	100	86
WATER EFFICIENCY	72.5%	80%	82%	79.5%
HORSEPOWER(BHPR)	16.1	18.4	20.8	22.1
SPECIFIC GRAVITY	.90	.90	.90	.90
VISCOSITY	1,000SSU	1,000SSU	1,000SSU	1,000SSU
CQ (FLOW CORRECTION)	0.95	0.95	0.95	0.95
CH (HEAD CORRECTION)	0.96	0.94	0.92	0.89
CE (EFFICIENCY CORRECTION)	0.635	0.635	0.635	0.635
VISCOUS CAPACITY(GPM)	427	570	712	855
VISCOUS HEAD(FT)	109.5	101.5	92	76.5
VISCOUS EFFICIENCY	46%	50.8%	52.1%	50.5%
VISCOUS HORSEPOWER	23.1	25.9	28.6	29.4

These calculations can be plotted on a performance curve as follows:

PERFORMANCE CURVE



API STANDARD 610/ISO 13709

Materials class selection guidance

Table G.1 – Materials class selection guidance

Service	Temperature range		Pressure range	Materials class	Ref. note
	°C	(°F)			
Fresh water, condensate, cooling tower water	< 100	< 212	All	I-1 or I-2	
Boiling water and process water	< 120	< 250	All	I-1 or I-2	a
	120 to 175	250 to 350	All	S-5	a
	> 175	> 350	All	S-6, C-6	a
Boiler feed water	> 95	> 200	All	C-6	
	> 95	> 200	All	S-6	
Boiler circulator	> 95	> 200	All	C-6	
Foul water, reflux drum water, water draw, and hydrocarbons containing these waters, including reflux streams	< 175	< 350	All	S-3 or S-6	b
	> 175	> 350	All	C-6	
Propane, butane, liquefied petroleum gas, ammonia, ethylene, low temperature services (minimum metal temperature)	230	< 450	All	S-1	
	> -46	> -50	All	S-1(LCB)	h
	> -73	> -100	All	S-1(LC2)	h
	> -100	> -150	All	S-1(LC3)	h, i
	> -196	> -320	All	A-7 or A-8	h, i
Diesel oil; gasoline; naphtha; kerosene; gas oils; light, medium and heavy lubricating oils; fuel oil; residuum; crude oil; asphalt; synthetic crude bottoms	< 230	< 450	All	S-1	
	230 to 370	450 to 700	All	S-6	b, c
	> 370	> 700	All	C-6	b
Non-corrosive hydrocarbons, e.g. catalytic reformat, isomaxate, desulfurized oils	230 to 370	450 to 700	All	S-4	c
Xylene, toluene, acetone, benzene, furfural, MEK, cumene	< 230	< 450	All	S-1	
Sodium carbonate	< 175	< 350	All	I-1	
Caustic (sodium hydroxide), concentration <20 %	< 100	< 212	All	S-1	d
	> 100	> 200	All	—	e
Seawater	< 95	< 200	All	—	f
Sour water	< 260	< 470	All	D-1	
Produced water, formation water and brine	All	All	All	D-1 or D-2	f
Sulfur (liquid state)	All	All	All	S-1	
FCC slurry	< 370	< 700	All	C-6	
Potassium carbonate	< 175	< 350	All	C-6	
	< 370	< 700	All	A-8	

API STANDARD 610/ISO 13709

Table G.1 (Continued)	Temperature range		Pressure range	Materials class	Ref. note
	°C	(°F)			
MEA, DEA, TEA stock solutions	< 120	< 250	All	S-1	
DEA, TEA-lean solutions	< 120	< 250	All	S-1 or S-8	d, g
MEA-lean solution (CO ₂ only)	80 to 150	175 to 300	All	S-9	d
MEA-lean solution (CO ₂ and H ₂ S)	80 to 150	175 to 300	All	S-8	d, g
MEA-, DEA-, TEA-, rich solutions	< 80	175	All	S-1 or S-8	d
Sulfuric acid concentration > 85 %	< 38	< 100	All	S-1	b
	< 230	< 450	All	A-8	b
Hydrofluoric acid concentration > 96 %	< 38	< 100	All	S-9	b
The materials for pump parts for each material class are given in Annex H. Specific materials recommendations should be obtained for services not clearly identified by the service descriptions listed in this table. Cast iron casings, where recommended for chemical services, are for non-hazardous locations only. Steel casings (5.12.1.6) should be used for pumps in services located near process plants or in any location where released vapour from a failure could create a hazardous situation or where pumps could be subjected to hydraulic shock, for example, in loading services. ^a Oxygen content and buffering of water should be considered in material selection. ^b The corrosiveness of foul waters, hydrocarbons over 230 °C (450 °F), acids, and acid sludges may vary widely. Material recommendations should be obtained for each service. The material class indicated above is satisfactory for many of these services, but shall be verified. S-8 materials may also be considered for operating temperatures below 95 °C (200 °F). ^c If product corrosivity is low, Class S-4 materials may be used for services at 231 °C to 370 °C (451 °F to 700 °F). Specific material recommendations should be obtained in each instance. ^d All welds shall be stress-relieved. ^e UNS N08007 or Ni-Cu alloy pump material should be used. ^f For seawater, produced water, formation water and brine services, the purchaser and the vendor should agree on the construction materials that best suit the intended use. ^g The vendor shall consider the effects of differential material expansion between casing and rotor and confirm suitability if operating temperatures are to exceed 95 °C (200 °F). ^h Materials selected for low temperature services shall meet the requirements of 5.12.4 and 5.12.1.6. Casting alloy ASTM A 352, Grades LCB, LC2 & LC3 is shown only for reference. Use equivalent materials for wrought alloys. ⁱ Material alloys based on aluminium, bronze, aluminium bronze and nickel, may also be considered for temperatures as low as -196 °C (-320 °F).					

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Table H.1 – Material classes for pump parts

PART	Full compliance materials ^b	Material classes and abbreviations													
		I-1	I-2	S-1	S-3	S-4	S-5	S-6	S-8 ¹	S-9 ¹	C-6	A-7	A-8	D-1 ¹	D-2 ¹
		CI ^a	CI	STL	STL	STL	STL	STL	STL	STL	12 % CHR	AUS	316 AUS	Duplex	Super Duplex
		CI	BRZ	CI	NI-RESIST	STL	STL	12 % CHR	316 AUS	NI-Cu Alloy	12 % CHR	AUS ^{c, d}	316 AUS ^d	Duplex	Super Duplex
Pressure casing	Yes	Cast iron	Cast iron	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	12 % CHR	AUS	316 AUS	Duplex	Super Duplex
Inner case parts (bowls, diffusers, diaphragms)	No	Cast iron	Bronze	Cast iron	NI-Resist	Cast iron	Carbon steel	12 % CHR	316 AUS	NI-Cu Alloy	12 % CHR	AUS	316 AUS	Duplex	Super Duplex
Impeller	Yes	Cast iron	Bronze	Cast iron	NI-Resist	Carbon steel	Carbon steel	12 % CHR	316 AUS	NI-Cu Alloy	12 % CHR	AUS	316 AUS	Duplex	Super Duplex
Case wear rings ^k	No	Cast iron	Bronze	Cast iron	NI-Resist	Cast iron	12 % CHR Hardened	12 % CHR Hardened	Hard-faced 316 AUS ^e	NI-Cu Alloy	12 % CHR Hardened	Hard-faced AUS ^e	Hard-faced 316 AUS ^e	Hard-faced Duplex ^e	Hard-faced Super Duplex ^e
Impeller wear rings ^k	No	Cast iron	Bronze	Cast iron	NI-Resist	Cast iron	12 % CHR Hardened	12 % CHR Hardened	Hard-faced 316 AUS ^e	NI-Cu Alloy	12 % CHR Hardened	Hard-faced AUS ^e	Hard-faced 316 AUS ^e	Hard-faced Duplex ^e	Hard-faced Super Duplex ^e
Shaft ^d	Yes	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	AISI 4140	AISI 4140 ^f	316 AUS	NI-Cu Alloy	12 % CHR	AUS	316 AUS	Duplex	Super Duplex
Throat bushings ^k	No	Cast iron	Bronze	Cast iron	NI-Resist	Cast iron	12 % CHR Hardened	12 % CHR Hardened	316 AUS	NI-Cu Alloy	12 % CHR Hardened	AUS	316 AUS	Duplex	Super Duplex
Interstage sleeves ^k	No	Cast iron	Bronze	Cast iron	NI-Resist	Cast iron	12 % CHR Hardened	12 % CHR Hardened	Hard-faced 316 AUS ^e	NI-Cu Alloy	12 % CHR Hardened	Hard-faced AUS ^e	Hard-faced 316 AUS ^e	Hard-faced Duplex ^e	Hard-faced Super Duplex ^e
Interstage bushings ^k	No	Cast iron	Bronze	Cast iron	NI-Resist	Cast iron	12 % CHR Hardened	12 % CHR Hardened	Hard-faced 316 AUS ^e	NI-Cu Alloy	12 % CHR Hardened	Hard-faced AUS ^e	Hard-faced 316 AUS ^e	Hard-faced Duplex ^e	Hard-faced Super Duplex ^e
Case and gland studs	Yes	Carbon steel	Carbon steel	AISI 4140 steel	AISI 4140 Steel	AISI 4140 Steel	AISI 4140 Steel	AISI 4140 Steel	AISI 4140 Steel	NI-Cu Alloy Hardened ¹	AISI 4140 Steel	AISI 4140 Steel	AISI 4140 Steel	Duplex ¹	Super Duplex ¹
Case gasket	No	AUS, Spiral wound ^g	AUS, Spiral wound ^g	AUS, Spiral wound ^g	AUS, Spiral wound ^g	AUS, Spiral wound ^g	AUS, Spiral wound ^g	AUS, Spiral wound ^g	316 AUS Spiral wound ^g	NI-Cu Alloy, Spiral wound, PTFE filled ^g	AUS, Spiral wound ^g	AUS, Spiral wound ^g	316 AUS Spiral wound ^g	Duplex SS Spiral wound ^g	Duplex SS Spiral wound ^g

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Table H.1 (Continued)

PART	Full compliance materials ^b	Material classes and abbreviations													
		I-1	I-2	S-1	S-3	S-4	S-5	S-6	S-8 ¹	S-9 ¹	C-6	A-7	A-8	D-1 ¹	D-2 ¹
		CI ^a	CI	STL	STL	STL	STL	STL	STL	STL	12 % CHR	AUS	316 AUS	Duplex	Super Duplex
		CI	BRZ	CI	NI-RESIST	STL	STL	12 % CHR	316 AUS	NI-Cu Alloy	12 % CHR	AUS ^{c, d}	316 AUS ^d	Duplex	Super Duplex
Discharge head/suction can	Yes	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	AUS	AUS	316 AUS	Duplex	Super Duplex
Column / bowl shaft bushings	No	Nitrile butadiene ^h	Bronze	Filled carbon	Nitrile butadiene ^h	Filled carbon	Filled carbon	Filled carbon	Filled carbon	Filled carbon	Filled carbon	Filled carbon	Filled carbon	Filled carbon	Filled carbon
Wetted fasteners (bolts)	Yes	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	316 AUS	316 AUS	316 AUS	NI-Cu Alloy	316 AUS	316 AUS	316 AUS	Duplex	Super Duplex

^a The abbreviations in this upper part of the second row indicate the case material; the abbreviations in the lower part of the second row indicate trim material. Abbreviations are as follows: BRZ = bronze, STL = steel, 12 % CHR = 12 % chromium, AUS = austenitic stainless steel, CI = cast iron, 316 AUS = Type 316 austenitic stainless steel.

^b See 5.12.1.4.

^c Austenitic stainless steels include ISO Types 683-13-10/19 (AISI Standard Types 302, 303, 304, 316, 321, and 347).

^d For vertically suspended pumps with shafts exposed to liquid and running in bushings, the standard shaft material is 12 % chrome, except for Classes S-8, A-7, A-8, and D-1. The standard shaft material for cantilever pumps (Type V55) is AISI 4140 where the service liquid allows (see Annex G, Table G.1).

^e Unless otherwise specified, the need for hard-facing and the specific hard-facing material for each application is determined by the vendor and described in the proposal. Alternatives to hard-facing may include opening running clearances (5.7.4) or the use of non-galling materials or non-metallic materials, depending on the corrosiveness of the pumped liquid.

^f For Class S-6, the standard shaft material for boiler feed service and for liquid temperatures above 175 °C (350 °F) is 12 % chrome (see Annex G, Table G.1).

^g If pumps with axially split casings are furnished, a sheet gasket suitable for the service is acceptable. Spiral-wound gaskets should contain a filler material suitable for the service. Gaskets other than spiral wound, may be proposed and furnished if proven suitable for service and specifically approved by the purchaser.

^h Alternative materials may be substituted for liquid temperatures greater than 45 °C (110 °F) or for other special services.

ⁱ Unless otherwise specified, AISI 4140 steel may be used for non-wetted case and gland studs.

^j Some applications may require alloy grades higher than the Duplex materials given in Table H.2.

^k "Super Duplex" material grades with pitting resistance equivalency (PRE) values greater than 40 may be necessary.

PRE = $\%C_{eq} + (3 \times \% \text{ molybdenum}) + (2 \times \% \text{ copper}) + (2 \times \% \text{ tungsten}) + (16 \times \% \text{ nitrogen})$

$\%C_{eq} = [\% \text{ chromium} - (14.5 \times \% \text{ carbon})] + (3.3 \times \% \text{ molybdenum}) + (2 \times \% \text{ copper}) + (2 \times \% \text{ tungsten}) + (16 \times \% \text{ nitrogen})$

Note that alternative materials such as "super austenitic" may also be considered.

^l Non-metallic wear part materials, proven to be compatible with the specified process fluid, may be proposed within the applicable limits shown in Table H.4. Also see 5.7.4 c).

^m The vendor shall consider the effects of differential material expansion between casing and rotor and confirm suitability if operating temperatures are to exceed 95 °C (200 °F).



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