

## Standardized Chemical Pumps

to EN 22 858/ISO 2858/ISO 5199, heatable

### Fields of Application

CPK-H pumps are used for handling liquids which must not be allowed to cool down during processing and for applications in the chemical and petrochemical industries.

### Design

Heatable, horizontal, radially split volute casing pumps in back pull-out design, in accordance with EN 22 858/ISO 2858/ISO 5199, with radial impeller, single-entry, single-stage. With heating chambers on the suction and discharge side. CPK-Hb with coolable stuffing box housing.

### Designation

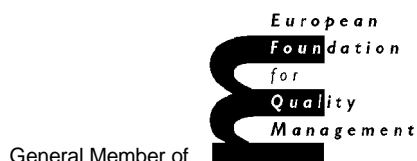
CPK - H s m 50 - 315

Type series \_\_\_\_\_  
 Heatable variant \_\_\_\_\_  
 Shaft seal not coolable (b = coolable) \_\_\_\_\_  
 Additional code \_\_\_\_\_  
 Discharge nozzle DN \_\_\_\_\_  
 Nominal impeller diameter in mm \_\_\_\_\_

Additional codes:  
 f = off-standard flange design  
 m = mechanical seal  
 x = special design

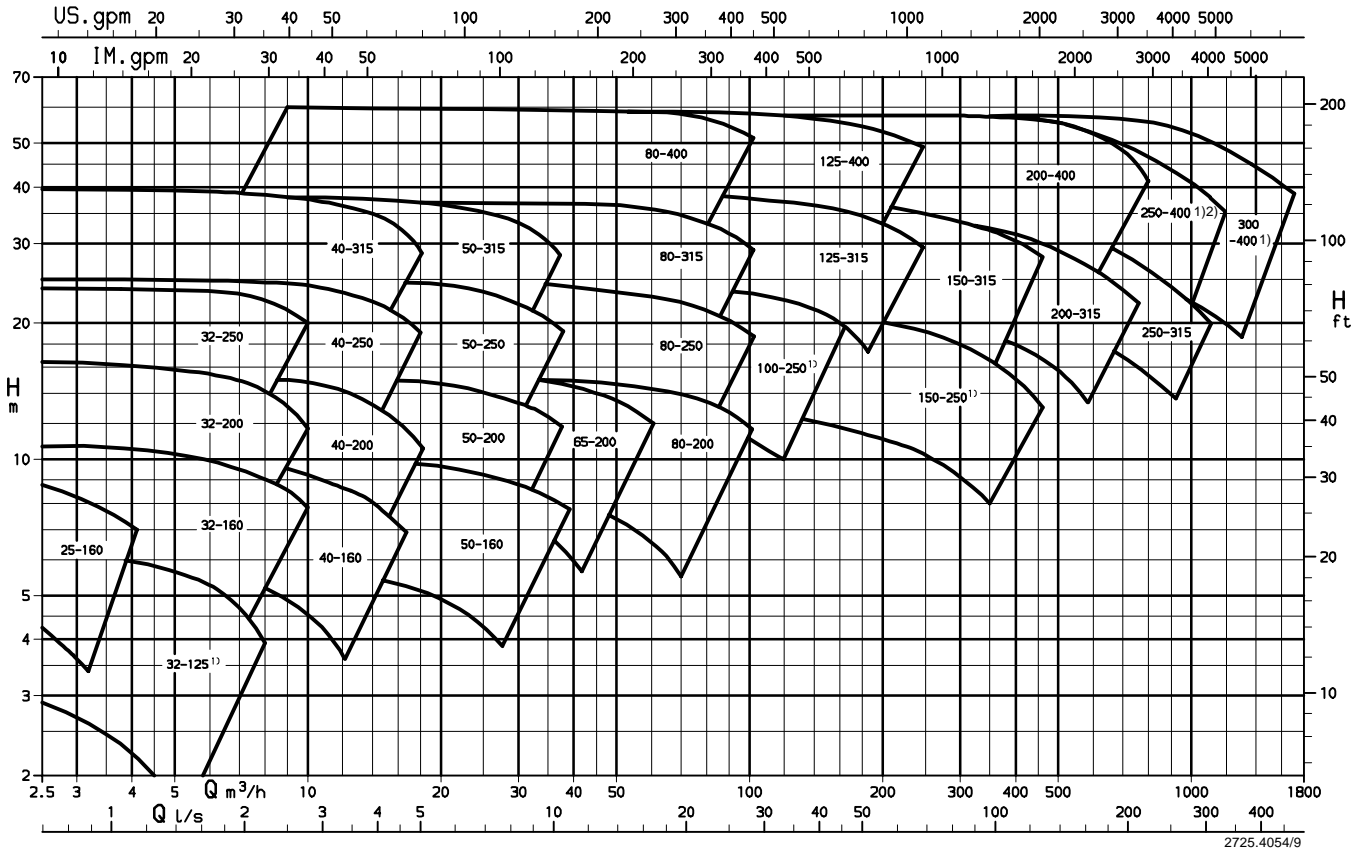
### Operating Data

Pump sizes	DN	25 to 300
Capacity	Q	up to 1600 m <sup>3</sup> /h
Discharge head	H	up to 150 m
Operating pressures p and temperatures t		
	p	up to 16 bar
	t	up to +300 °C
Heating		
	p	up to 20 bar
	t	up to +300 °C



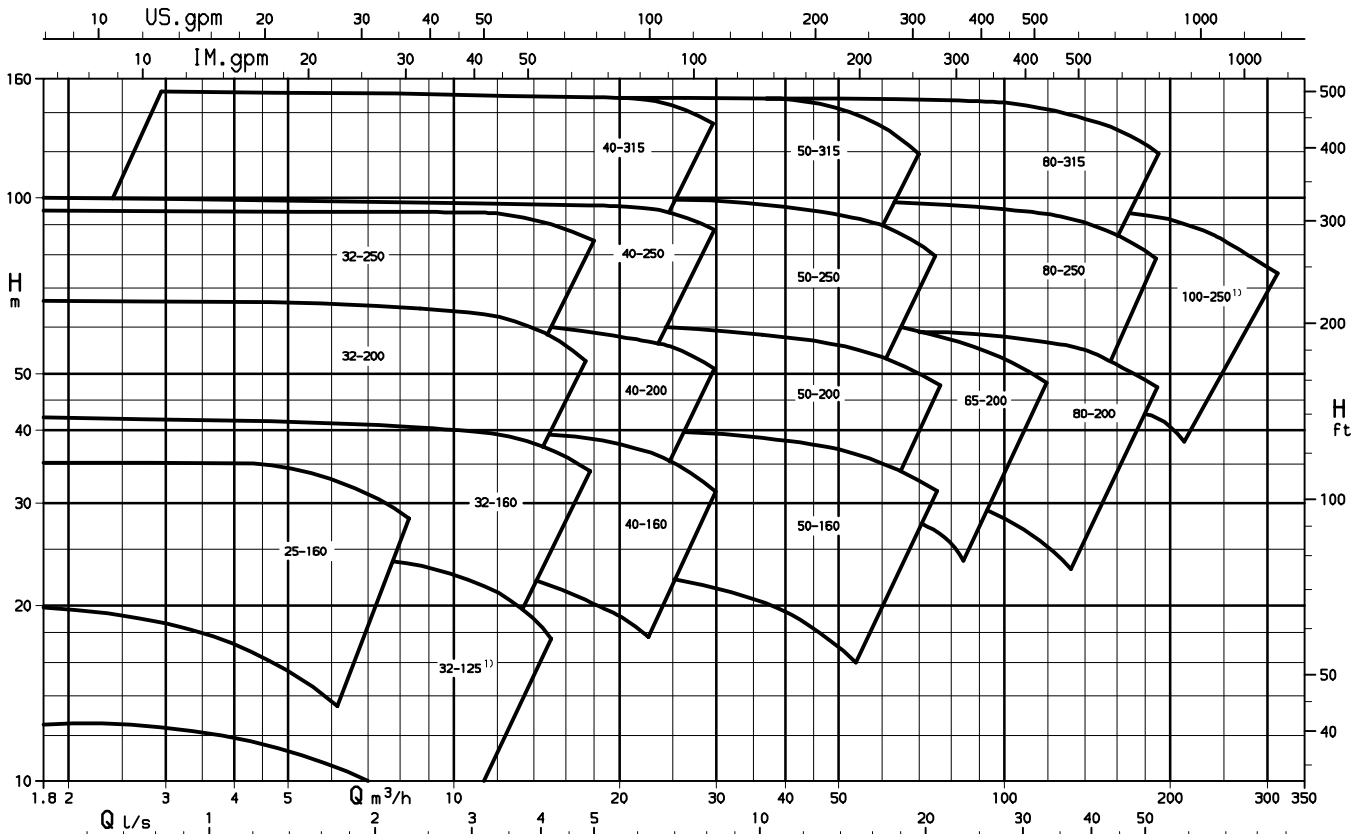
Selection Charts

n = 1450 1/min



2725.4054/9

n = 2900 1/min

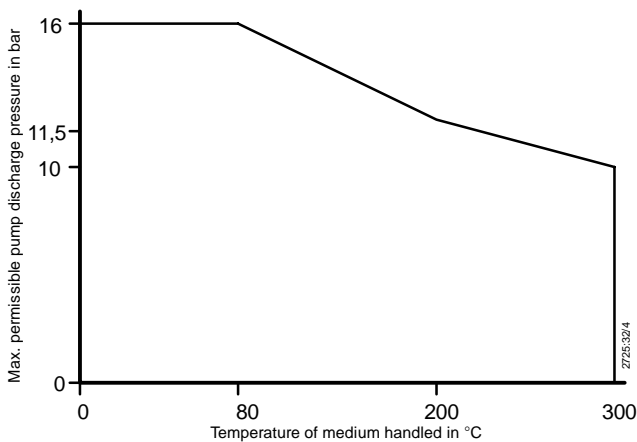


2725.4052/5

1) CPK-Hb not available in this size  
2) Contact KSB

## Pressure and Temperature Limits

### a) Where no special regulations apply



### b) Where special regulations apply

Where special regulations apply, contact the manufacturer for the application limits both for operating and heating conditions, indicating the acceptance specification.

### c) For heating

#### CPK-Hb:

If heated by

**hot water or saturated steam:**  $t_{\max}$  210 °C,  $p_{\max}$  20 bar<sup>4)</sup>

**thermal oil:**  $t_{\max}$  300 °C,  $p_{\max}$  6 bar

#### CPK-Hs:

Design	Heated by			
	Hot water/ saturated steam		Thermal oil	
	$t_{\max}$	$p_{\max}$	$t_{\max}$	$p_{\max}$
Lantern (344) JL1040 <sup>1)</sup> O-ring (412.01)- material EPR	183 °C	10 bar	--	--
Lantern (344) JS1025 <sup>2)</sup> O-ring (412.01)- material PTFE/alloyed steel	250 °C	20 bar <sup>4)</sup>	300 °C	6 bar
Welded casing cover	300 °C	20 bar <sup>4)</sup>	300 °C	6 bar

4) except for pump sizes 250-315, 80-400 and 200-400:  
 $p_{\max}$  = 12 bar, for higher pressures please contact KSB.

### d) Pressure and temperature limits for shaft seals

The application limits of shaft seals depend on the circumferential speed, the material and the medium handled. They have to be checked in each individual case on the basis of the manufacturer's documentation, taking into account the actual operating conditions.

## Materials

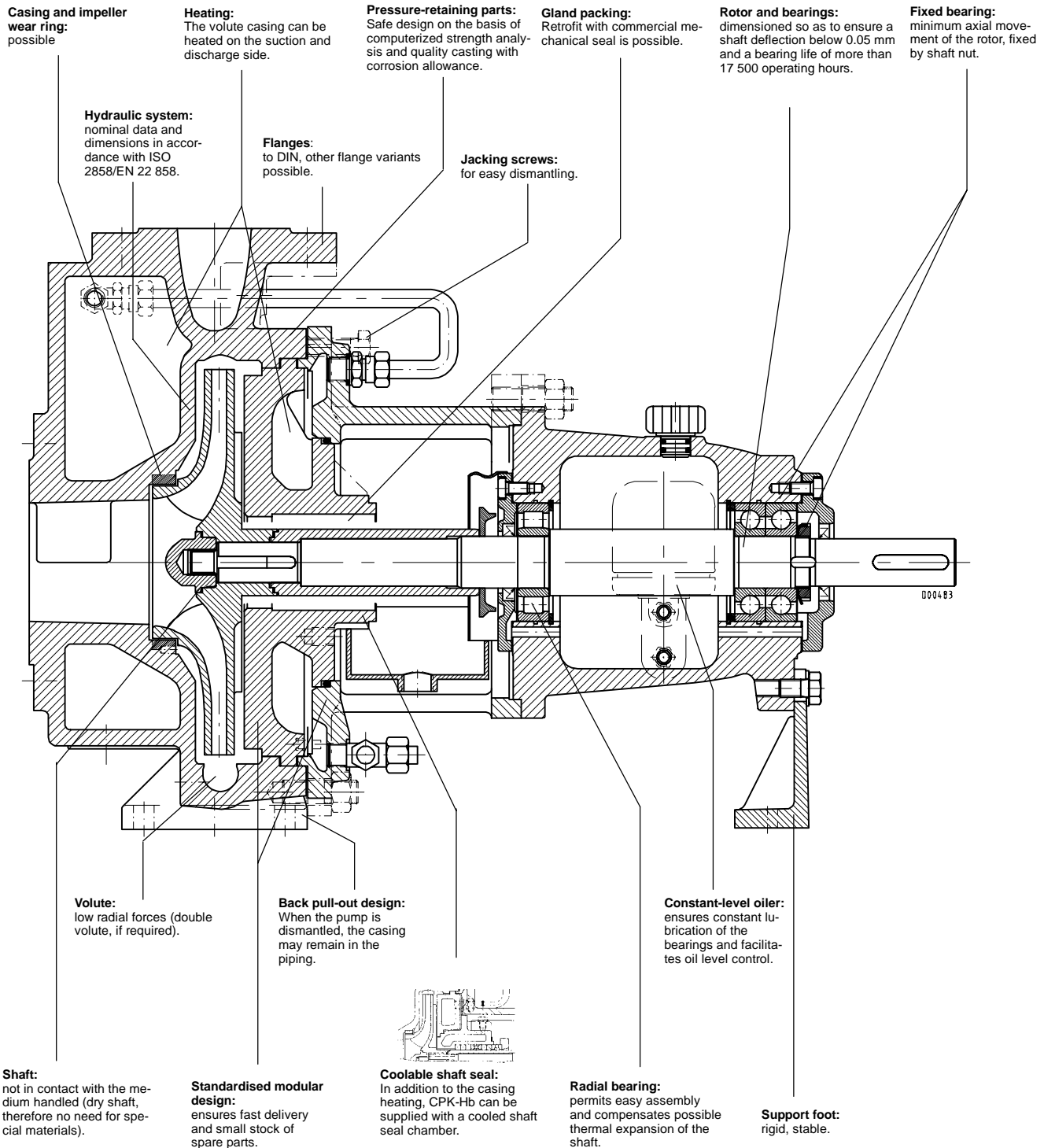
Description	Material C
Volute casing	1.4408
Casing cover	1.4408
Casing cover with heating chamber	1.4408
Shaft <sup>3)</sup>	C45+N
Impeller	1.4408
Bearing bracket	JL1040 <sup>1)</sup>
Bearing bracket lantern	JL1040 <sup>1)</sup>
Stuffing box housing	1.4408
Shaft protecting sleeve	1.4571
Impeller nut	1.4571

1) GJL-250 to EN 1561

2) GJS-400-18-LT to EN 1563

3) T > 250 °C: 1.7709+QT/S

## Benefits at a Glance



## Technical Data

		Pump sizes																												
		Units	25-160	32-125 (1)	32-160	32-200	40-160	40-200	50-160	50-200	32-250	40-250	40-315	50-250	50-315	65-200	80-200	80-250	80-315	80-400	100-250 (1)	125-315	125-400	150-250 (1)	150-315	200-315	200-400 (1)	250-315	250-400 (1)	300-400 (1)
Bearing bracket	standard		P02as						P03s						P04s						P05s			P06s	P08s					
Impeller	impeller outlet width	mm	6	8	7	7	9	7	15	12	6	7	8	10	8	16	22	17	14	11	23	26	20	46	38	50	40	73	63	68
	impeller inlet dia.	mm	45	52	52	52	65	65	82	82	52	65	65	84	84	96	114	114	129	118	129	154	154	180	190	222	222	270	294	294
	max. impeller dia.	mm	see individual characteristic curve																											
	min. impeller dia.	mm	see individual characteristic curve																											
Shaft dia.	in the stuffing box housing	mm	25						32						42						54			65	80					
	at the bearings																													
	pump end	mm	35						35						55						65			65	80					
	motor end	mm	35						35						55						65			75	95					
	at the coupling	mm	24						32						42						48			60	75					
Shaft protecting sleeve	packing	mm	35						45						55						70			80	100					
	mechanical seal	mm	depending on the make																											
Bearings	pump end	Nr.	NU 307						NU 307						NU 311						NU 313			NU 413	NU 416					
	motor end	Nr.	2 x 7307 BUA						2 x 7307 BUA						2 x 7311 BUA						2 x 7313 BUA			2x7315 BUA	2x7319 BUA					
Gland packing	bore dia.	mm	51						65						75						95			105	132					
	length	mm	53						64						64						79			79	102					
	packing dimensions	mm	8 x 8						10 x 10						10 x 10						12,5 x 12,5			12,5 x 12,5	16 x 16					
	number of packing rings	pcs.	4 (6)						4 (6)						4 (6)						4 (6)			4 (6)	4 (6)					
	lantern ring width	mm	16						20						20						25			25	32					
	clearance for removal	mm	67						79						77						88			88	108					
Shaft deflection			The shaft deflection according to ISO 5199 is respected with max. 0.05 mm at the shaft seal																											
Pressure limits	max. oper. pressure	bar	see temperature and pressure limits																											
	max. test pressure	bar	1.5 times the max. permissible pump discharge pressure																											
Temp. limit	max. temp. of med. handled	°C	see temperature and pressure limits																											
Drive	P/n value		0,009						0,021						0,05						0,11			0,2	0,42					
	max. drive rating																													
	at n = 1450 1/min	kW	13						30						72						160			290	610					
	n = 1750 1/min	kW	16						37						87						192			350	735					
	n = 2900 1/min	kW	26						60						144						-			-	-					
n = 3500 1/min	kW	31						74						175						-			-	-						

1) CPK-Hb is not available in this size

### Pump Size/Bearing Bracket Combination

Discharge nozzle DN/ pump sizes	Nominal impeller dia.						Bearing bracket
	125	160	200	250	315	400	
25		⊗					P02as
32	⊗ <sup>4)</sup>	⊗	⊗	⊗			P03s
40		x	x	⊗	⊗		
50		x	⊗	⊗	⊗		
65			⊗				P04s
80			⊗	⊗ <sup>1)</sup>	⊗ <sup>2)</sup>	⊗ <sup>3)</sup>	
100				⊗ <sup>1)4)</sup>			
125					⊗ <sup>3)</sup>	⊗ <sup>3)</sup>	P05s
150					⊗ <sup>3)4)</sup>		
200					⊗ <sup>3)</sup>	⊗ <sup>1)3)4)</sup>	
250					⊗ <sup>1)3)</sup>	⊗ <sup>1)3)4)5)</sup>	P06s
300						⊗ <sup>1)3)4)</sup>	P08s

⊗ also available with centreline support feet

- 1) casing with double volute
- 2) double volute possible
- 3) max. speed n = 1750 1/min
- 4) CPK-Hb is not available in this size
- 5) on request

### Balancing System

Axial thrust is balanced by means of back vanes.

### Shaft Seal

CPK-Hs

The standard CPK-Hs is supplied with gland packing or single-acting mechanical seal. For other mechanical seal variants consult KSB.

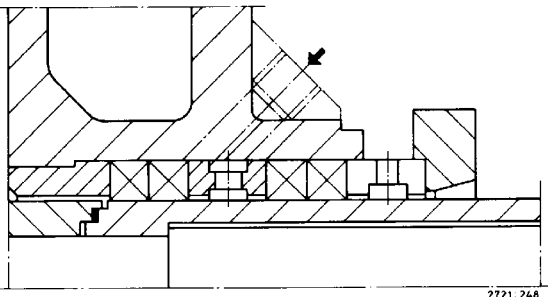
CPK-Hb

CPK-Hb is supplied with gland packing or double-acting mechanical seal.

Mechanical seals standardised acc. to EN 12756 of various makes are preferred (design L<sub>1K</sub>).

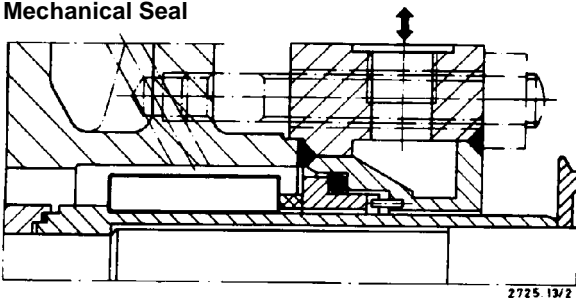
Piping acc. to API is possible.

### Gland Packing

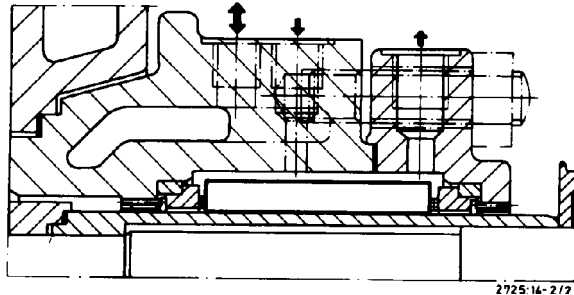


Gland packing (CPK-Hs)

### Mechanical Seal



Single-acting mechanical seal for CPK-Hs with heated sealing cover.



Intensively cooled, double-acting mechanical seal for CPK-Hb with sealing liquid supply.

### Mechanical Seals Used

Design	Make	Type
Single-acting	Burgmann	H7N
	Pacific	600
	Crane	59 U 209
Double-acting b.t.b.	Burgmann	M7N/M7N <sup>6)</sup>
	Pacific	600/600 <sup>6)</sup>
	Crane	59U/59U <sup>6)</sup>

6) pumping screw possible

### Acceptance Tests / Guarantees

- **Materials tests**  
Test report 2.2 on request
- **Product tests**  
Inspection certificate 3.1, on request, for:  
pressure test of complete pump as per EN 10204
- **Hydraulic tests**

Each pump is subjected to a performance test run, and its duty point is guaranteed according to DIN 1944/III.

The following acceptance tests may be performed and certified at extra charge:

Test run DIN 1944/III	5 measuring points
Test run DIN 1944/II	5 measuring points (see individual curve)
NPSH test	1 measuring point

Guarantees are given within the scope of the valid delivery conditions.

### Forces and Moments

CPK-H pumps are designed for handling forces and moments in accordance with ISO 5199.

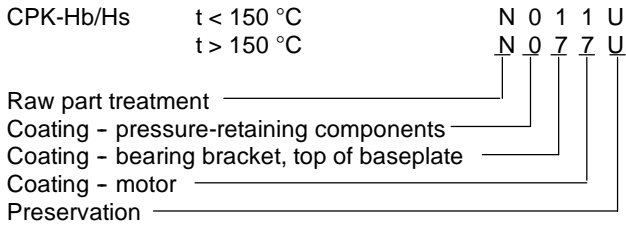
### Documentation

Printed documentation adapted to CE requirements

- sectional drawing with list of components
- drawing of shaft seal
- installation plan / dimensions table
- operating instructions

## Coating and Preservation

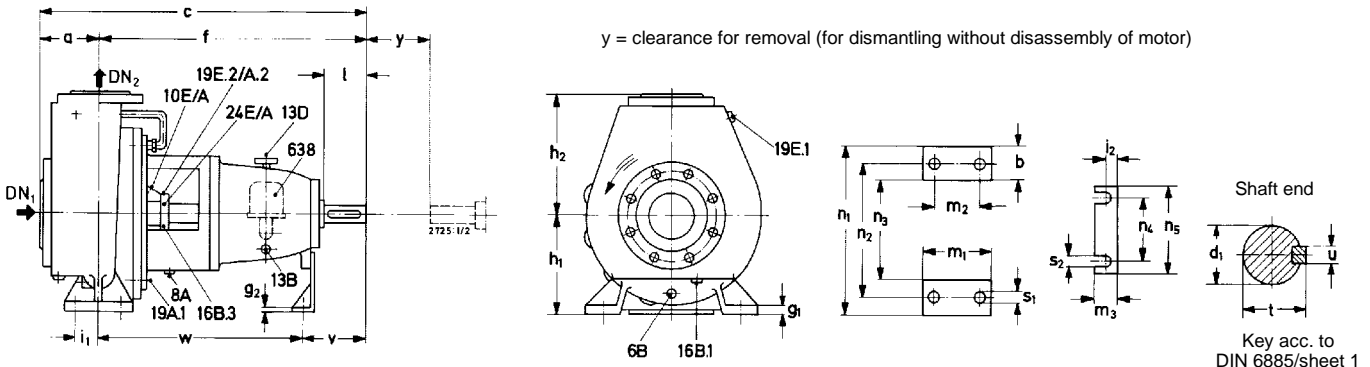
(acc. to AN 1865)



- N = reaction primer, wetted parts without finish coating
- 0 = without top coat
- 1 = synthetic resin varnish RAL 5002 - ultramarine blue
- 7 = heat-resisting paint RAL 9007 - aluminium grey
- U = untreated

## Recommended Spare Parts Stock for Two Years' Operation to DIN 24 296

Part No.	Description	Number of pumps (incl. standby pumps)						
		2	3	4	5	6+7	8+9	10 and more
		Quantity of spare parts						
210	Shaft	1	1	1	2	2	2	20 %
230	Impeller	1	1	1	2	2	2	20 %
320.02	Angular contact ball bearing (set)	1	1	2	2	2	3	25 %
322.01	Cylindrical roller bearing	1	1	2	2	2	3	25 %
433	Mechanical seal, complete	1	1	2	2	2	3	25 %
	or							
	spring-loaded ring	2	3	4	5	6	7	90 %
	seat ring	2	3	4	5	6	7	90 %
	secondary seal at spring-loaded ring	2	3	4	5	7	9	100 %
	secondary seal at seat ring	2	3	4	5	7	9	100 %
	spring (set)	1	1	1	1	2	2	20 %
456.01	Neck bush	1	1	2	2	2	3	30 %
461.01	Gland packing (set)	4	4	6	6	6	8	100 %
502.01	Casing wear ring	2	2	2	3	3	4	50 %
524.01	Shaft protecting sleeve	2	2	2	3	3	4	50 %
---	Gaskets for pump casing (set)	4	6	8	8	9	12	150 %
---	Torque transmission elements (coupling, set)	1	1	2	2	3	4	30 %

**Dimensions**  
**CPK-Hs**


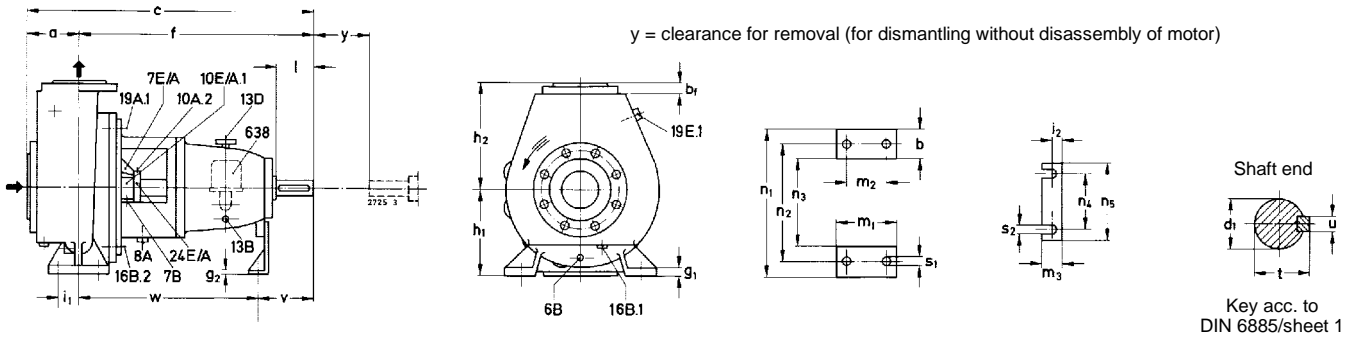
Dimensions in mm

Pump size	Bearing bracket	Pump dimensions														
		DN <sub>1</sub>	DN <sub>2</sub>	a	b	c	f	g <sub>1</sub>	g <sub>2</sub>	h <sub>1</sub>	h <sub>2</sub>	m <sub>1</sub>	m <sub>3</sub>	n <sub>1</sub>	n <sub>3</sub>	n <sub>5</sub>
25-160	P 02 as	40	25	80	50	465	385	14	4	132	160	100	48	240	140	160
32-125	P 02 as	50	32	80	50	465	385	12	4	112	140	100	48	190	90	160
32-160	P 02 as	50	32	80	50	465	385	14	4	132	160	100	48	240	140	160
32-200	P 02 as	50	32	80	50	465	385	14	4	160	180	100	48	240	140	160
32-250	P 03 s	50	32	100	65	600	500	16	4	180	225	125	48	320	190	160
40-160	P 02 as	65	40	80	50	465	385	14	4	132	160	100	48	240	140	160
40-200	P 02 as	65	40	100	50	485	385	14	4	160	180	100	48	265	165	160
40-250	P 03 s	65	40	100	65	600	500	16	4	180	225	125	48	320	190	160
40-315	P 03 s	65	40	125	65	625	500	18	6	200	250	125	48	345	215	160
50-160	P 02 as	80	50	100	50	485	385	14	4	160	180	100	48	265	165	160
50-200	P 02 as	80	50	100	50	485	385	14	4	160	200	100	48	265	165	160
50-250	P 03 s	80	50	125	65	625	500	16	4	180	225	125	48	320	190	160
50-315	P 03 s	80	50	125	65	625	500	18	6	225	280	125	48	345	215	160
65-200	P 03 s	100	65	100	65	600	500	16	4	180	225	125	48	320	190	160
80-200	P 03 s	125	80	125	65	625	500	16	4	180	250	125	48	345	215	160
80-250	P 03 s	125	80	125	80	625	500	18	6	225	280	160	48	400	240	160
80-315	P 04 s	125	80	125	80	655	530	18	6	250	315	160	48	400	240	160
80-400	P 04 s	125	80	125	80	655	530	20	6	280	355	160	48	435	275	160
100-250	P 04 s	125	100	140	80	670	530	18	6	225	280	160	48	400	240	160
125-315	P 04 s	150	125	140	100	670	530	20	6	280	355	200	48	500	300	160
125-400	P 04 s	150	125	140	100	670	530	20	6	315	400	200	48	500	300	160
150-250	P 04 s	200	150	160	100	690	530	20	6	280	375	200	48	500	300	160
150-315	P 05 s	200	150	160	100	830	670	22	12	315	400	200	60	550	350	200
200-315	P 05 s	250	200	200	110	870	670	22	12	355	450	200	60	550	350	200
200-400	P 05 s	250	200	180	100	850	670	22	12	355	500	200	60	550	350	200
250-315	P 05 s	300	250	250	130	920	670	26	12	400	560	260	60	690	430	200
250-400	P 06 s	300	250	200	130	920	720	26	12	425	600	260	60	800	540	200
300-400	P 08s s	350	300	300	180	1200	900	32	12	500	630	360	60	900	540	200

Pump size	Shaft end					Foundation bolts										
	d <sub>1</sub> Øk <sub>6</sub>	l	t	u	y	i <sub>1</sub>	i <sub>2</sub>	m <sub>2</sub>	n <sub>2</sub>	n <sub>4</sub>	s <sub>1</sub>	s <sub>2</sub>	v	w		
25-160	24	50	27	8	100	35	20	70	190	110	14	14	100	285		
32-125	24	50	27	8	100	35	20	70	140	110	14	14	100	285		
32-160	24	50	27	8	100	35	20	70	190	110	14	14	100	285		
32-200	24	50	27	8	100	35	20	70	190	110	14	14	100	285		
32-250	32	80	35	10	100	47,5	20	95	250	110	14	14	130	370		
40-160	24	50	27	8	100	35	20	70	190	110	14	14	100	285		
40-200	24	50	27	8	100	35	20	70	212	110	14	14	100	285		
40-250	32	80	35	10	100	47,5	20	95	250	110	14	14	130	370		
40-315	32	80	35	10	100	47,5	20	95	280	110	14	14	130	370		
50-160	24	50	27	8	100	35	20	70	212	110	14	14	100	285		
50-200	24	50	27	8	100	35	20	70	212	110	14	14	100	285		
50-250	32	80	35	10	100	47,5	20	95	250	110	14	14	130	370		
50-315	32	80	35	10	100	47,5	20	95	280	110	14	14	130	370		
65-200	32	80	35	10	140	47,5	20	95	250	110	14	14	130	370		
80-200	32	80	35	10	140	47,5	20	95	280	110	14	14	130	370		
80-250	32	80	35	10	140	60	20	120	315	110	18	14	130	370		
80-315	42	110	45	12	140	60	20	120	315	110	18	14	160	370		
80-400	42	110	45	12	140	60	20	120	355	110	18	14	160	370		
100-250	42	110	45	12	140	60	20	120	315	110	18	14	160	370		
125-315	42	110	45	12	140	75	20	150	400	110	23	14	160	370		
125-400	42	110	45	12	140	75	20	150	400	110	23	14	160	370		
150-250	42	110	45	12	180	75	20	150	400	110	23	14	160	370		
150-315	48	110	51	14	180	75	39	150	450	140	23	18	170	500		
200-315	48	110	51	14	180	75	39	150	450	140	23	18	170	500		
200-400	48	110	51	14	180	75	39	150	450	140	23	18	170	500		
250-315	48	110	51	14	180	95	39	190	560	140	28	18	170	500		
250-400	60 <sup>1)</sup>	140	64	18	180	95	39	190	670	140	28	18	205	515		
300-400	75 <sup>1)</sup>	150	79,5	20	250	125	39	250	750	140	28	18	220	680		

 1) d<sub>1</sub>Øn<sub>6</sub>



**CPK-Hb**


Dimensions in mm

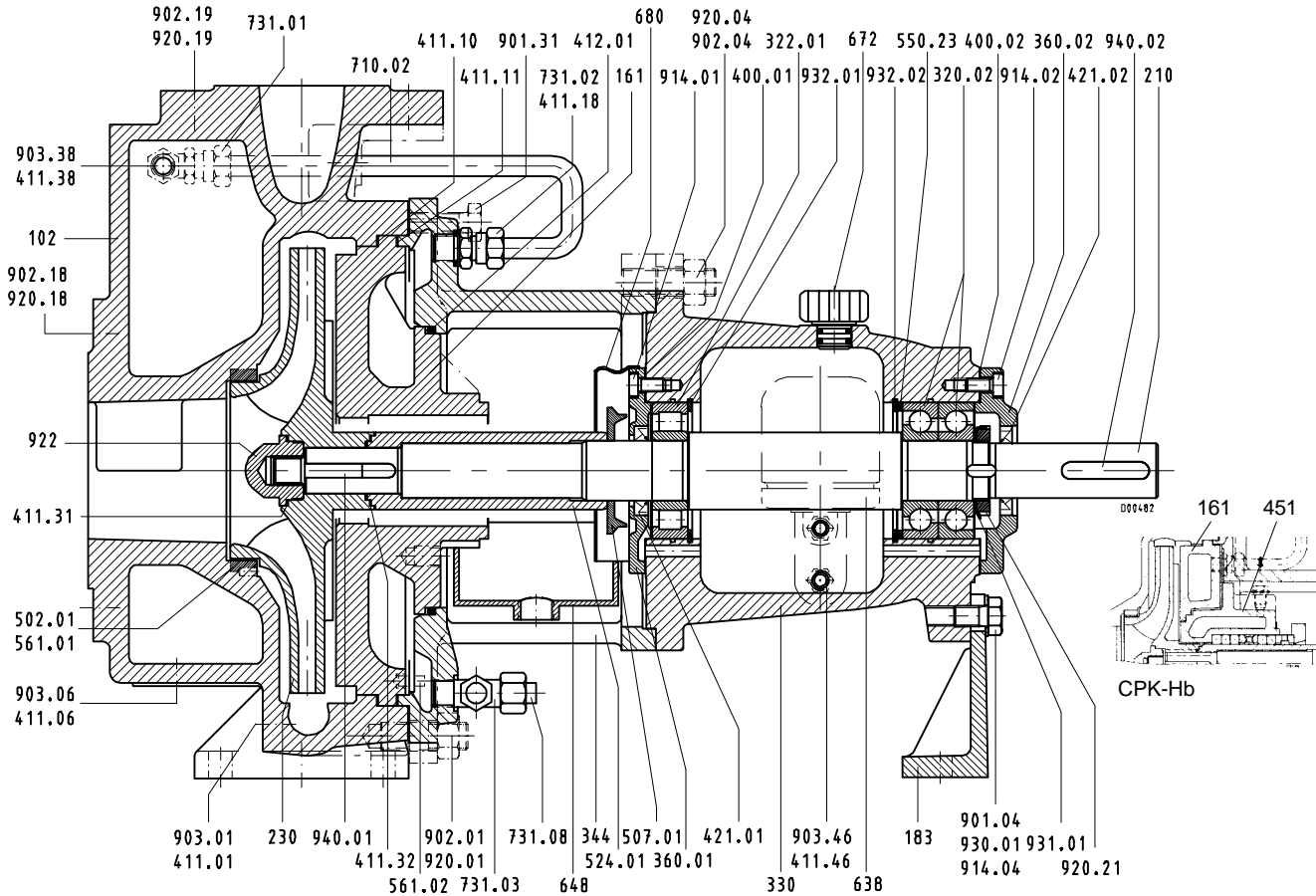
Pump size	Bearing bracket	Pump dimensions														
		DN <sub>1</sub>	DN <sub>2</sub>	a	b	c	f	g <sub>1</sub>	g <sub>2</sub>	h <sub>1</sub>	h <sub>2</sub>	m <sub>1</sub>	m <sub>3</sub>	n <sub>1</sub>	n <sub>3</sub>	n <sub>5</sub>
25-160	P 02	40	25	80	50	465	385	14	4	132	160	100	48	240	140	160
32-160	P 02	50	32	80	50	465	385	14	4	132	160	100	48	240	140	160
32-200	P 02	50	32	80	50	465	385	14	4	160	180	100	48	240	140	160
32-250	P 03	50	32	100	65	600	500	16	4	180	225	125	48	320	190	160
40-160	P 02	65	40	80	50	465	385	14	4	132	160	100	48	240	140	160
40-200	P 02	65	40	100	50	485	385	14	4	160	180	100	48	265	165	160
40-250	P 03	65	40	100	65	600	500	16	4	180	225	125	48	320	190	160
40-315	P 03	65	40	125	65	625	500	18	6	200	250	125	48	345	215	160
50-160	P 02	80	50	100	50	485	385	14	4	160	180	100	48	265	165	160
50-200	P 02	80	50	100	50	485	385	14	4	160	200	100	48	265	165	160
50-250	P 03	80	50	125	65	625	500	16	4	180	225	125	48	320	190	160
50-315	P 03	80	50	125	65	625	500	18	6	225	280	125	48	345	215	160
65-200	P 03	100	65	100	65	600	500	16	4	180	225	125	48	320	190	160
80-200	P 03	125	80	125	65	625	500	16	4	180	250	125	48	345	215	160
80-250	P 03	125	80	125	80	625	500	18	6	225	280	160	48	400	240	160
80-315	P 04	125	80	125	80	655	530	18	6	250	315	160	48	400	240	160
80-400	P 04	125	80	125	80	655	530	20	6	280	355	160	48	435	275	160
125-315	P 04	150	125	140	100	670	530	20	6	280	355	200	48	500	300	160
125-400	P 04	150	125	140	100	670	530	20	6	315	400	200	48	500	300	160
150-315	P 05	200	150	160	100	830	670	22	12	315	400	200	60	550	350	200
200-315	P 05	250	200	200	110	870	670	22	12	355	450	200	60	550	350	200
250-315	P 05	300	250	250	130	920	670	26	12	400	560	260	60	690	430	200

Pump size	Shaft end					Foundation bolts									
	d <sub>1</sub> Øk <sub>6</sub>	l	t	u	y	i <sub>1</sub>	i <sub>2</sub>	m <sub>2</sub>	n <sub>2</sub>	n <sub>4</sub>	s <sub>1</sub>	s <sub>2</sub>	v	w	
25-160	24	50	27	8	100	35	20	70	190	110	14	14	100	285	
32-160	24	50	27	8	100	35	20	70	190	110	14	14	100	285	
32-200	24	50	27	8	100	35	20	70	190	110	14	14	100	285	
32-250	32	80	35	10	100	47,5	20	95	250	110	14	14	130	370	
40-160	24	50	27	8	100	35	20	70	190	110	14	14	100	285	
40-200	24	50	27	8	100	35	20	70	212	110	14	14	100	285	
40-250	32	80	35	10	100	47,5	20	95	250	110	14	14	130	370	
40-315	32	80	35	10	100	47,5	20	95	280	110	14	14	130	370	
50-160	24	50	27	8	100	35	20	70	212	110	14	14	100	285	
50-200	24	50	27	8	100	35	20	70	212	110	14	14	100	285	
50-250	32	80	35	10	100	47,5	20	95	250	110	14	14	130	370	
50-315	32	80	35	10	100	47,5	20	95	280	110	14	14	130	370	
65-200	32	80	35	10	140	47,5	20	95	250	110	14	14	130	370	
80-200	32	80	35	10	140	47,5	20	95	280	110	14	14	130	370	
80-250	32	80	35	10	140	60	20	120	315	110	18	14	130	370	
80-315	42	110	45	12	140	60	20	120	315	110	18	14	160	370	
80-400	42	110	45	12	140	60	20	120	355	110	18	14	160	370	
125-315	42	110	45	12	140	75	20	150	400	110	23	14	160	370	
125-400	42	110	45	12	140	75	20	150	400	110	23	14	160	370	
150-315	48	110	51	14	180	75	39	150	450	140	23	18	170	500	
200-315	48	110	51	14	180	75	39	150	450	140	23	18	170	500	
250-315	48	110	51	14	180	95	39	190	560	140	28	18	170	500	

**Flange variants CPK-Hs and -Hb**

DIN 2501, PN 16

# General Drawing

**CPK-Hs**


When ordering spare parts please always specify:  
the type series, pump size, works No. (stamped on the name plate and on the suction nozzle flange), motor No. (serial No.), year of manufacture, quantity required, part No., part designation, material, medium handled, sectional drawing No. and mode of dispatch.

Part No.	Designation	Scope of supply
102	Volute casing	with joint ring 411.01/.06/.10/.18/.38, casing wear ring 502.01, grooved pin 561.01, pipe union 731.01, stud 902.01/.18/.19, screwed plug 903.01/.06/.38, hex. nut 920.01/.18/.19
161	Casing cover	with joint ring 411.11/.16 <sup>1)</sup> /.17 <sup>1)</sup> , O-ring 412.01, disc 550.01 <sup>1)2)</sup> , grooved pin 561.02, pipe union 731.03/.08, stud 902.02 <sup>1)</sup> , screwed plug 903.16 <sup>1)2)</sup> /.17 <sup>1)2)</sup> , hex. nut 920.02 <sup>1)</sup>
183	Support foot	with hex. head bolt 901.04 <sup>3)</sup> , spring washer 930.01
210	Shaft	with nut 920.21, lockwasher 931.01, key 940.01/.02
230	Impeller	with joint ring 411.32
320.02	Angular contact ball bearing	
322.01	Radial roller bearing	
330	Bearing bracket	with gasket 400.01/.02, joint ring 411.46, venting device 672, screwed plug 903.46, bearing cover 360.01/.02, radial shaft seal ring 421.01/.02, disc 550.23, constantlevel oiler 638, socket head cap screw 914.01/.02, circlip 932.01/.02
330	Bearing bracket complete	with gasket 400.01/.02, radial shaft seal ring 421.01/.02, socket head cap screw 914.01/.02
344	Bearing bracket lantern	with pipe union 731.01/.02, stud 902.04, hex. head bolt 901.31, hex. nut 920.04
360.01/.02	Bearing cover	with gasket 400.01/.02, radial shaft seal ring 421.01/.02, socket head cap screw 914.01/.02
421.01/.02	Radial shaft seal ring	
452.01 <sup>1)2)</sup>	Gland	
454.01 <sup>1)2)</sup>	Stuffing box ring	
456.01 <sup>1)2)</sup>	Neck bush	
458.01 <sup>1)2)</sup>	Lantern ring	
461.01 <sup>1)2)</sup>	Gland packing	
463.01 <sup>1)2)</sup>	Drip plate	
502.01	Casing wear ring	
507.01	Thrower	
524.01	Shaft protecting sleeve	with joint ring 411.32
638	Constant-level oiler	
648	Drip pan	
680	Guard	
710.02	Pipe	with pipe union 713.01/.02, joint ring 411.18/.32
922	Impeller nut	with joint ring 411.31

1) not illustrated  
2) not required for mechanical seal variant  
3) on bearing bracket P 02a/as cheese head screw 914.04



