

Centrifugal Pumps

Self-priming, segmental type

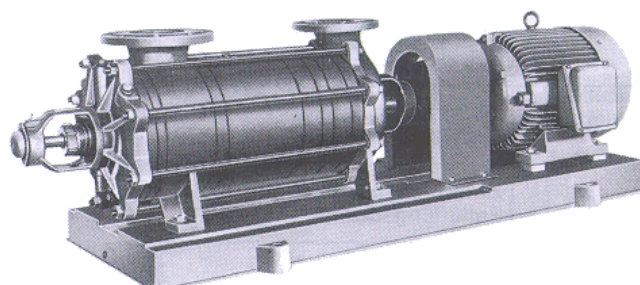
TKH 6501 . . . 15306

TLH 15101 . . . 15105



TECHNICAL DATA

Capacity:	max. 350 m³/h
Head:	max. 185 m
Speed:	max. 3600 rpm for TKH max. 1700 rpm for TLH
Temperature:	max. 60 °C for TKH max. 120 °C for TLH
Casing pressure:	max. PN 16
Shaft sealing:	stuffing box or standard mechanical seal
Flange connections:	DIN 2501 PN 10/16 SIHI-standard, resp.
Sense of rotation:	clockwise when looking at the pump from the drive end



APPLICATION

The **self-priming** centrifugal pumps of series TKH/TLH are used, when clear or turbid liquids, free from solid particles, are to be handled reliably and trouble-free.

Because of their self-priming capability and owing to the multitude of material combinations, the pumps cover a wide range of applications in such fields as:

- the supply of drinking and utility water for greater communities and large industrial plants,
- the handling of fuel in decanting stations, and large tank plants
- the construction of fire-extinguishing equipment,
- the construction of cooling plants,
- shipbuilding (ballast and stripping pumps),
- the chemical industry and the petrochemistry

DESIGN

Horizontal, segmental type centrifugal pumps with shrouded impellers and a priming stage arranged on the suction side. The priming stage runs in parallel with the first liquid stage and operates acc. to the mixed media separation principle during the priming phase and in case of big gas portions..

As result of the separation of the gas **before** entering the first impeller this is largely admitted with liquid. Finely divided gas portions can be handled without problems. If during the priming cycle, the counter pressure on the discharge side is below 0,5 bar, the pumped-away gas is discharged into the delivery pipeline. If the counter pressure is higher than 0,5 bar, then a separate gas discharging device is required.

More detailed information can be obtained from Appendix TH - KS.

The programme includes 7 pump sizes ranging from one stage to a maximum number of 9.

CONSTRUCTION

Casing pressure:

Max. casing pressures admissible, depending on the pump size and the number of stages, in bar:

TKH 6501 - 6502	10	10301 - 10304	10
TKH 6503 - 6505	16	10305 - 10308	16
TKH 8501 - 8502	10	12301 - 12304	10
TKH 8503 - 8505	16	12305 - 12307	16
TKH 8301 - 8305	10	15301 - 15304	10
TKH 8306 - 8309	10	15305 - 15306	16
TKH 6501 - 6502	16	10301 - 10304	10
TLH		15101 - 15105	16

Please note:

Casing pressure = inlet pressure + delivery head with zero flow

Position of the branches:

Series TKH 6500 to 8500:	Suction orifice showing to the left, when looking at the pump from the drive end. Discharge orifice arranged radially upwards.
Series TKH 8300 to 15300 and TLH 15100:	Suction and discharge orifices showing radially upwards.

Flanges:

The flanges are in compliance with DIN 2535/ PN 16.

Exception DN 200 (on the suction side of pump size TKH 15300) complying with DIN 2532 / PN 10 and DN 80 designed according to manufacturer's standard.

The flanges are either grooved according to DIN 2512 or drilled according to ANSI 150 for all nominal widths. Flanges according to ANSI 300 can be supplied for nominal width DN 80 and according to BS, table F for nominal widths up to DN 100.

Bearings:

Two grease-lubricated deep-groove ball bearings according to DIN 625. The first charge of grease being applied in the factory

Designation of this construction type: B·

Sense of rotation:

Clockwise when looking at the pump from the drive end.
Designation of this construction type: N

Shaft sealing:

The sealing of the shaft passage mentioned on page 2 can, according to choice, be effected by a stuffing box or a standard mechanical seal:

Shaft sealing:

Designation 001: Uncooled stuffing box, with internal flushing
Temperature range: 0 °C to 60 °C

Designation 061: Uncooled stuffing box, balanced
Temperature range: 0 °C to 60 °C

Designation 091: Uncooled stuffing box, balanced
Temperature range: 0 °C to 120 °C

Designation 135: Standard single acting mechanical seal,
uncooled, unbalanced, with internal flushing
Temperature range: 0 °C to 60 °C

Designation 136: Standard single-action mechanical seal,
uncooled, **balanced**, with internal flushing
Temperature range: 0 °C to 120 °C

Material design:

Item	COMPONENTS		Material design				
			01	02	04	32	42
1	suction cover		GG 25			G-Cu Sn 10	G-X 6 Cr Ni Mo 18 10
2	volute casing / discharge cover**		GGG 50* / GG 25**				
3	stage casing resp. venting casing		GG 25			G-Sn Bz 16	
4	stage casing resp. venting casing						
10, 11, 12, 13	stage casing						
19	plate cam						
22	central casing						
21	vane wheel impeller TKH		Rg 9 So Ms	G-X 25 Cr 14	Rg 9	G-Sn Bz verchromt	G-X 3 Cr Ni Mo Cu 26 6
30	vane wheel impeller TLH		Rg 9	-			
901 resp. 31	impeller 1rst stage		Rg 5	GG 25	Rg 5	G-Cu Sn 10	G-X 10 Cr Ni Mo 18 9
5 resp. 32	impeller, other stages		GG 25				
9 resp. 200	shaft		X 20 Cr 13			X 5 Cr Ni 18 9	X 5 Cr Ni Mo 18 10
35 resp. 241	bearing bush		lead bronze	special carbon	lead bronze	special carbon	
31 + 37 resp 400	shaft sealing	stuffing box	soft packing				
500, 600		mechanical seal	X 22 Cr Ni 17 /carbon/Viton	-			

* pump size TKH 15300 also TKH 6500 + 8500 GG 25

** For single-stage TKH-pumps and TLH 15100

Series TLH can only be supplied in material design 01.

Casing seal:

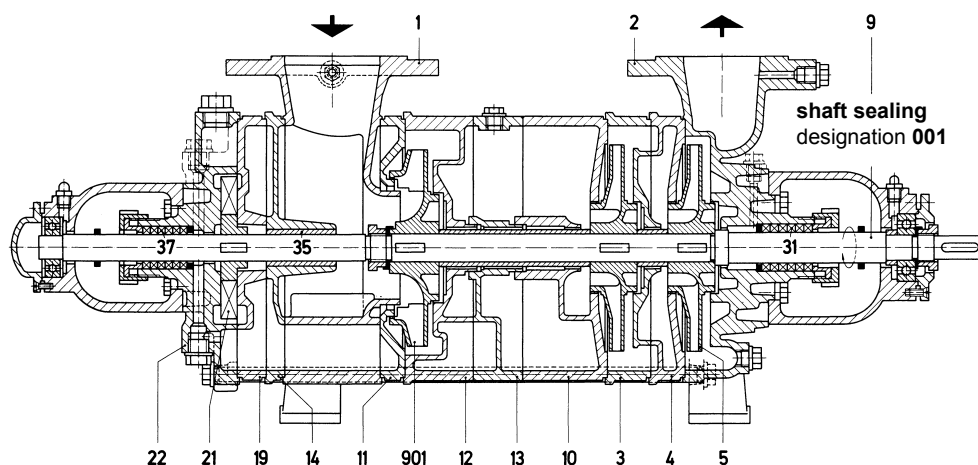
The casing seals consist of special-cardboard gaskets. Designation of this construction type: 2

Drive:

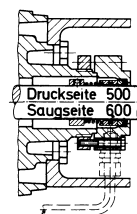
By customary electric motors, type B 3

Sectional drawing and nomenclature

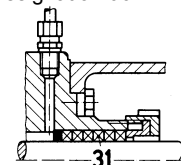
TKH 8300 ... 15300



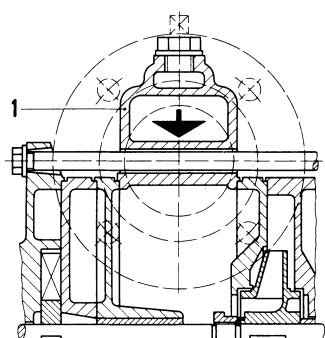
shaft sealing designation 135



shaft sealing designation 061



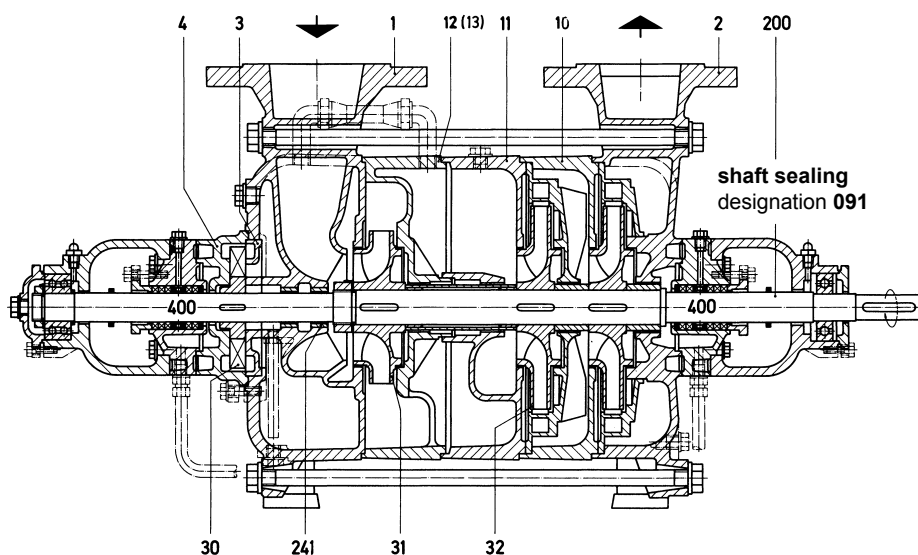
TKH 6500 ... 8500



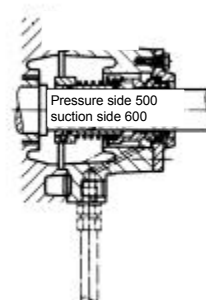
1 suction cover
2 volute casing
3, 4, 10, 11, 12, 13, 14 stage casing
5, 901 impeller
9 shaft

19 plate cam
21 vane wheel impeller
22 central casing
31, 37 stuffing box
35 bearing bush
500, 600 mechanical seal

TLH 15100



shaft sealing designation 136



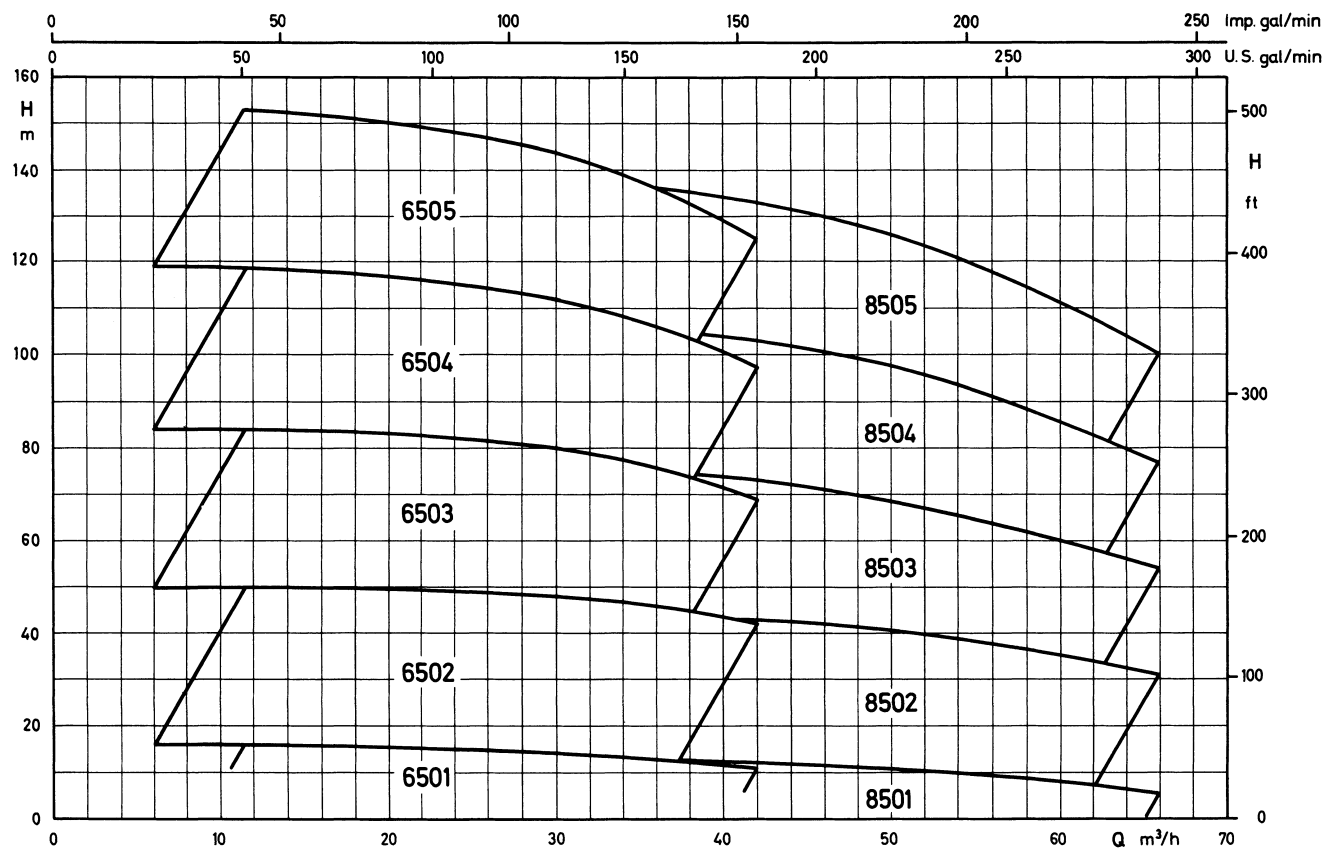
1 suction cover
2 volute casing
3 venting casing
4 venting cover

10, 11, 12, 13 stage casing
30 vane wheel impeller
31, 32 impeller
200 shaft

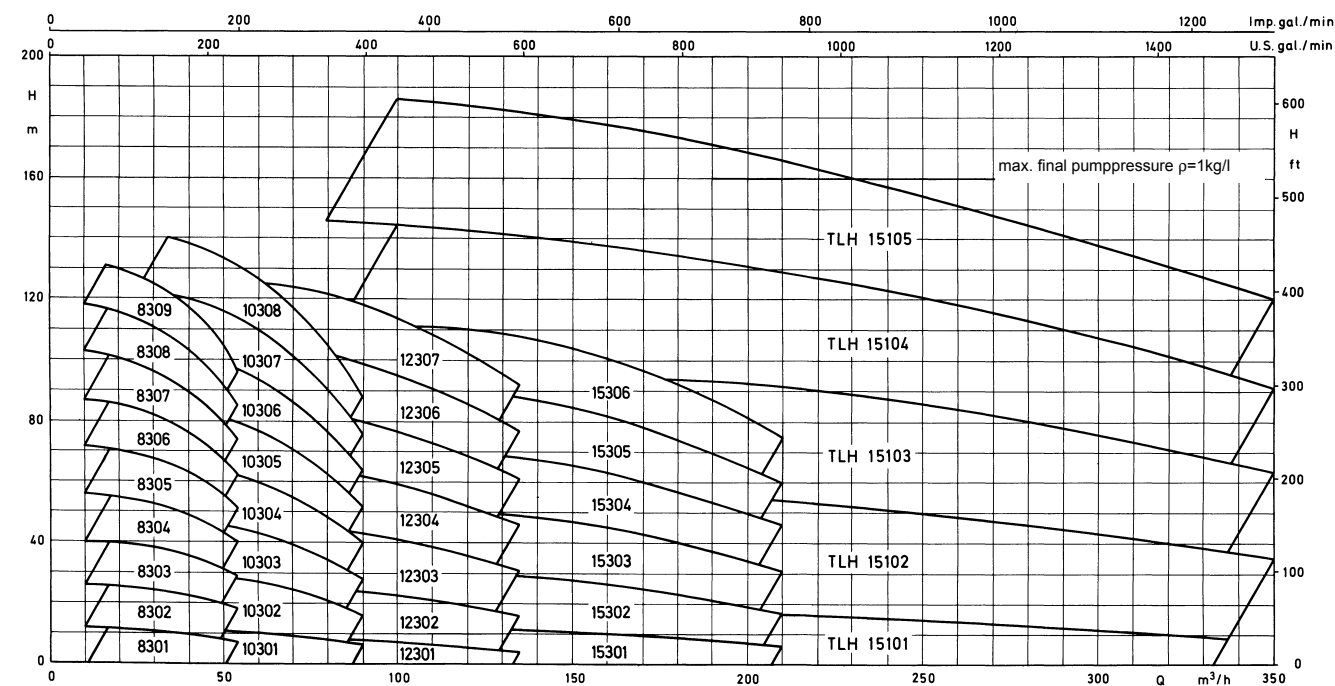
241 bearing bush
400 stuffing box
500, 600 mechanical seal

Performance graph

n = 2900 rpm

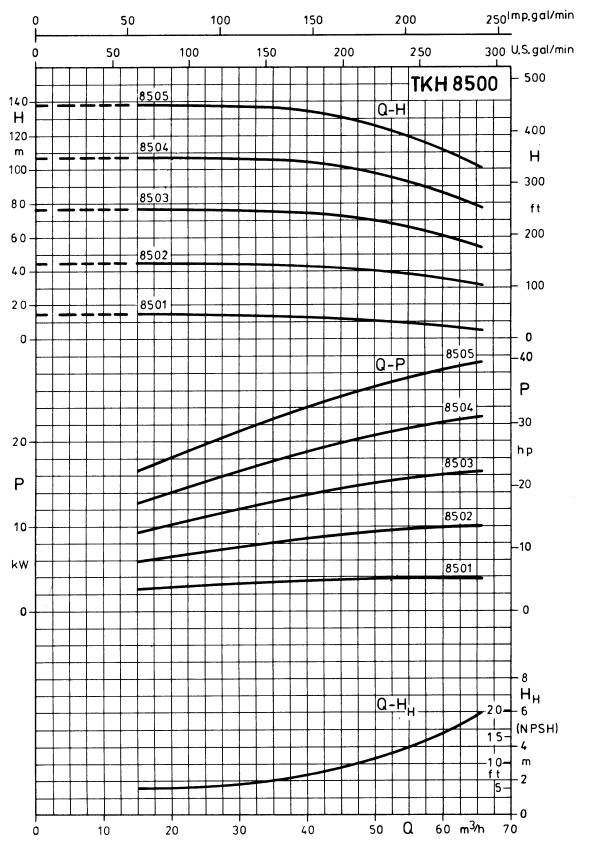
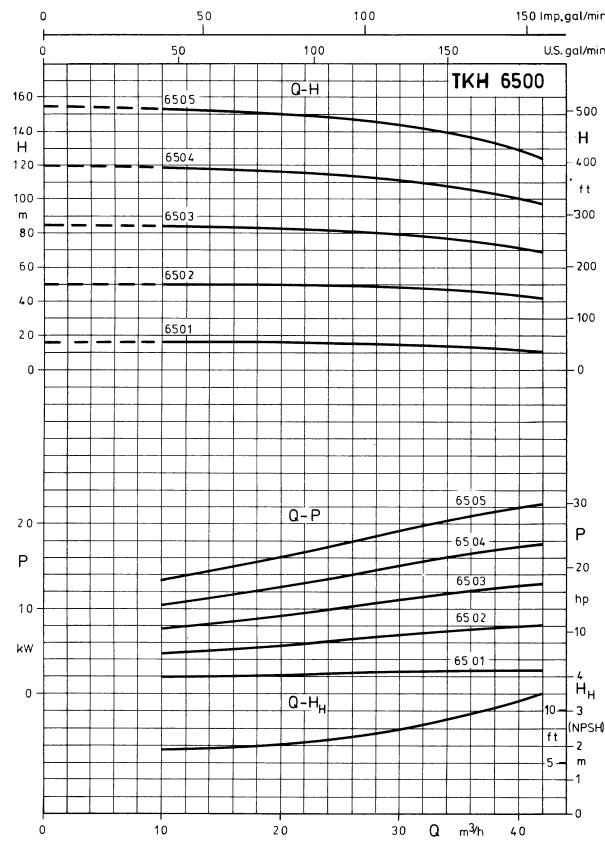


n = 1450 rpm

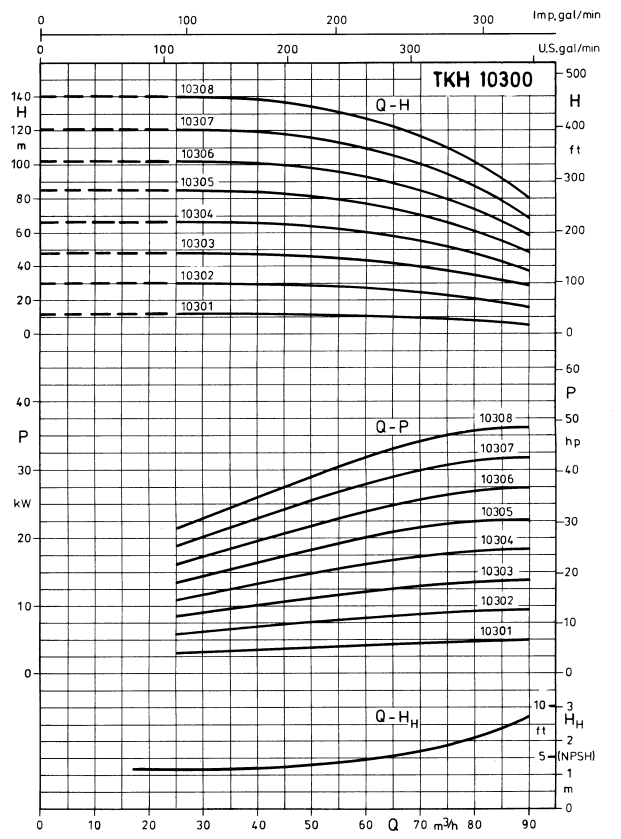
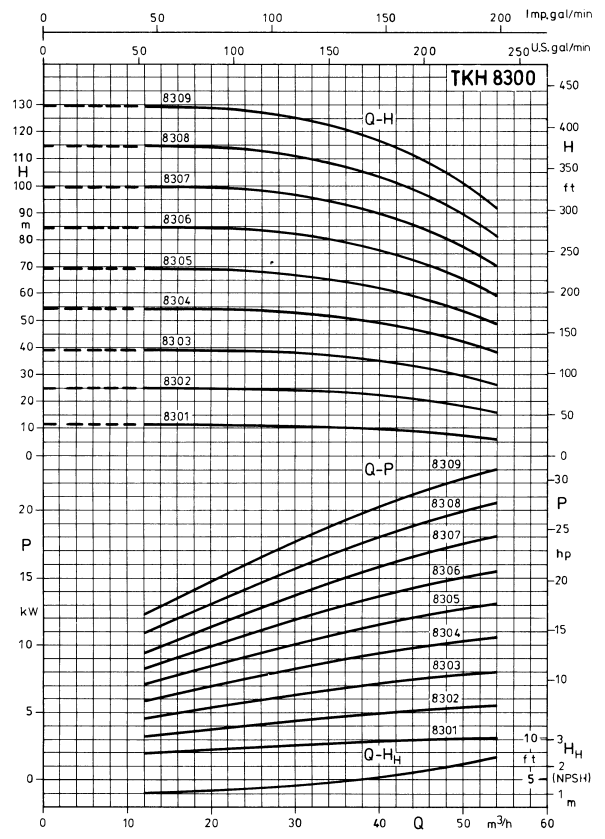


Characteristic curves

n = 2900 rpm

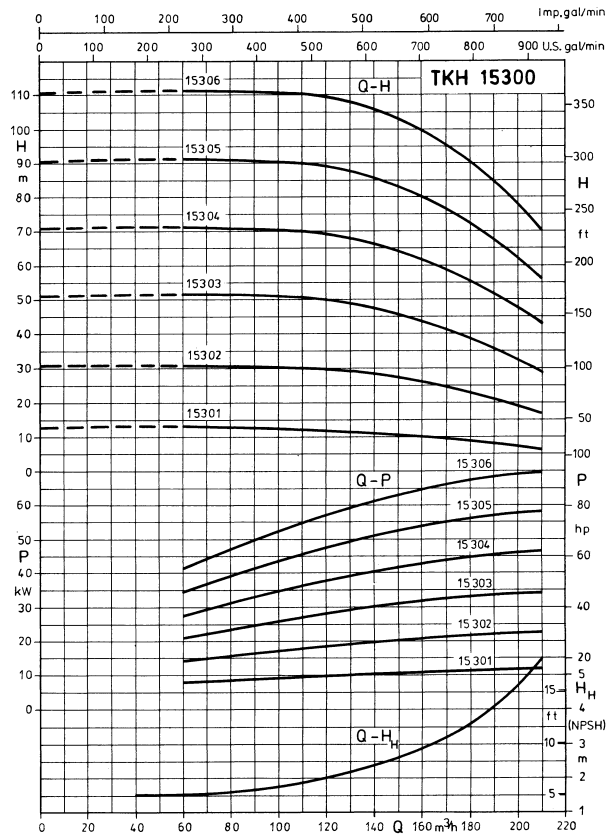
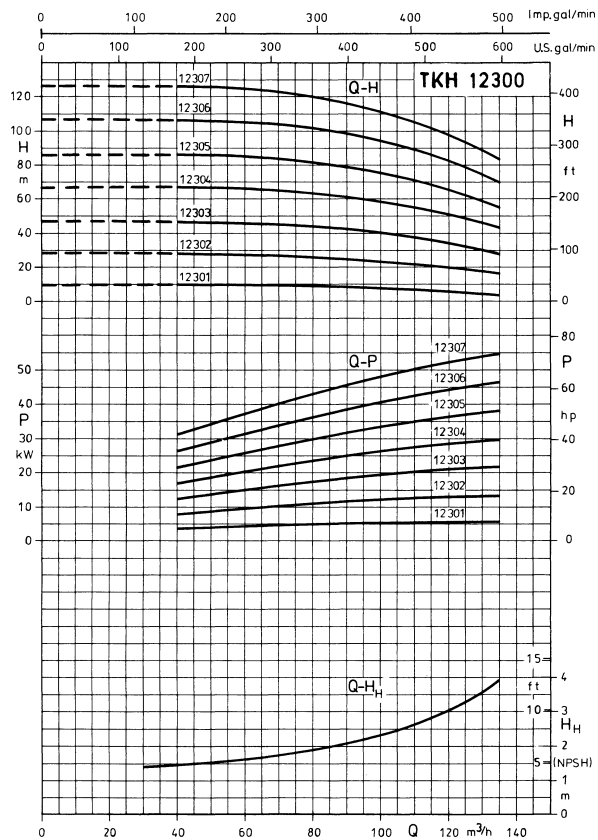


n = 1450 rpm

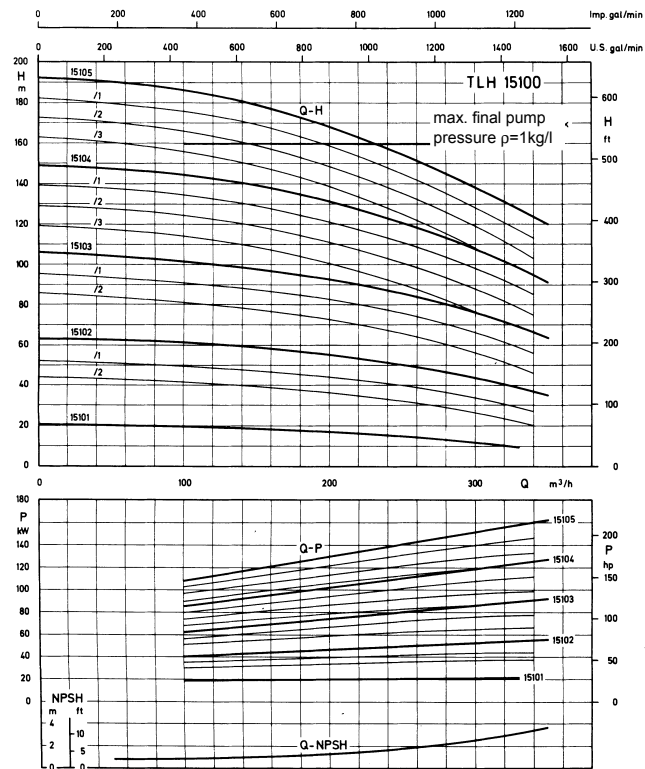


Characteristic curves

n = 1450 rpm



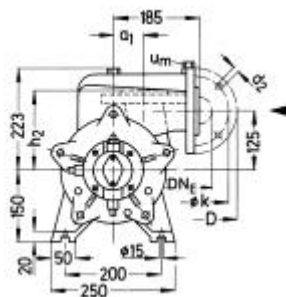
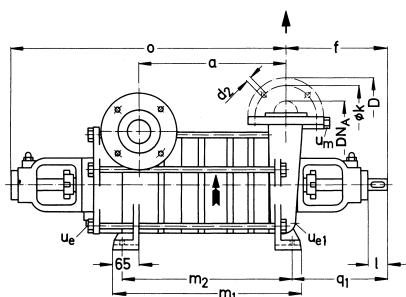
Note: Characteristics for material design 42 on request (owing to enlarged clearances).



The values are to be understood for water $\rho = 1,0 \text{ kg/l}$

Dimension table TKH

n = 2900 rpm



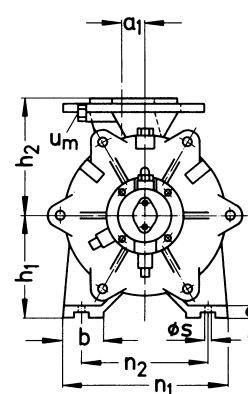
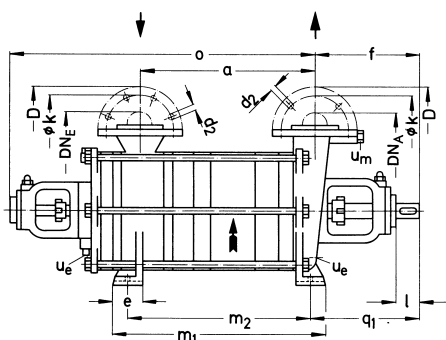
ue = connection for drainage G³/₈
 ue1 = connection for drainage G ¹/₄
 um = connection for pressure gauge G³/₈

size	DN _A	DN _E	a	a ₁	f	h ₂	m ₁	m ₂	o	q ₁	d	l	t	u
6501	80	80	215	65	224	175	314	258	534	218	22	40	24,5	6
6502	65		265	45	249	190	384	328	584	223				
6503			335				454	398	654					
6504			405				524	468	724					
6505			475		294		594	538	794	267	26	55	29	8
8501	80		235	65	224	175	334	278	554	218	22	40	24,5	6
8502			295	50	244	190	408	352	614	224				
8503			380				493	437	699					
8504			465		288		578	522	784	268	26	55	29	8
8505			550				663	607	869					

Flange connection sizes acc. to DIN 2501 PN 16						
DN _{A,E}	65	80	100	125	150	200
D	185	200	235	250	285	340
k	145	160	190	210	240	295
d ₂ x num.	18 x 4	18 x 4*	18 x 8	18 x 8	22 x 8	22 x 8

* according to standard for pump size 8404, 8505, 8308 and 8309 = 8 bores

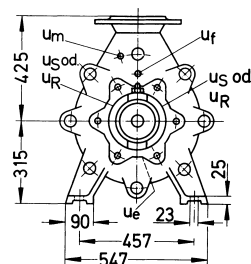
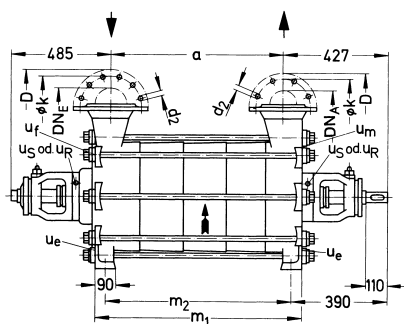
n = 1450 rpm



ue = connection for drainage G³/₈
 ue1 = connection for pressure gauge G³/₈

size	DN _A	DN _E	a	a ₁	b	c	e	f	h ₁	h ₂	m ₁	m ₂	n ₁	n ₂	o	q ₁	s	d	l	t	u
8301	80	100	250	-	50	20	65	249	180	200	344	288	250	200	585	243	15	26	55	29	8
8302			337	50				282			427	371			672	280					
8303			417								507	451			752						
8304			497								587	531			832						
8305			577								667	611			912						
8306			657								747	691			992						
8307			737								827	771			1072						
8308			817					319			907	851			1150	317		32	70	35,5	10
8309			897								987	931			1230						
10301	100	125	266	-	70			252	200	220	360	310	340	270	614	240		26	55	29	8
10302			338	30				275			423	373			686	272					
10303			423								508	458			771						
10304			508								593	543			856						
10305			593					297			678	628			940	294		32	70	35,5	10
10306			678								763	713			1025						
10307			763								848	798			1110						
10308			848								933	883			1195						
12301	125	150	360	-				289	212	240	454	404			737	275					
12302			462	40				308			542	492			839	308					
12303			577								657	607			954						
12304			692								772	722			1069						
12305			807					346			887	837			1182	346		36		39,5	
12306			922								1002	952			1297						
12307			1037								1117	1067			1412						
15301	150	200	443	-	80	25	80	328	235	275	550	490	400	320	873	321	18				
15302			573	55							675	615			1003						
15303			723								825	765			1153						
15304			873								975	915			1303						
15305			1023					358			1125	1065			1453	356		42	80	45,5	12
15306			1173								1275	1215			1603						

Dimension table TLH



u_e = connection for drainage G $\frac{3}{8}$

u_f = connection for filling G $\frac{3}{4}$

u_m = connection for pressure gauge G $\frac{1}{2}$

u_R = connection for flushing liquid G $\frac{3}{8}$

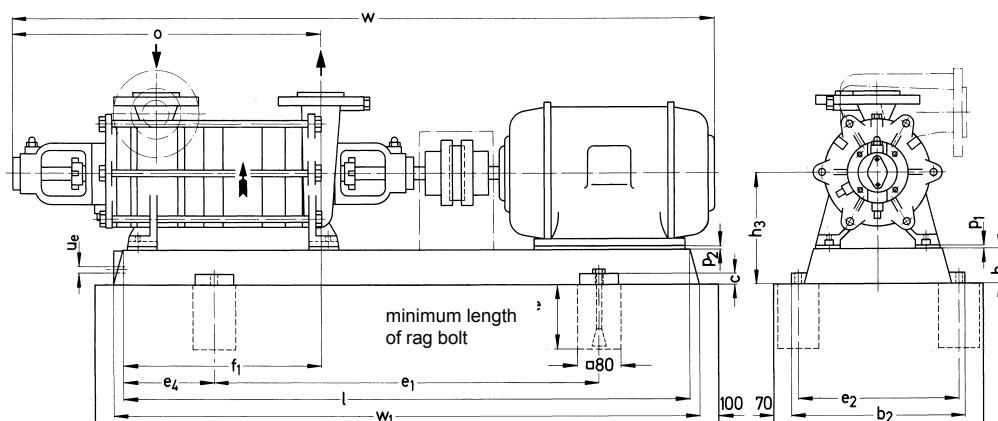
u_s = connection for buffer liquid G $\frac{3}{8}$

size	DN _A	DN _E	a	m ₁	m ₂
15101	150	200	365	541	445
15102			450	626	530
15103			580	756	660
15104			710	886	790
15105			840	1016	920

Flange connection size acc. to DIN 2501 PN 16		
DN _{A,E}	150	200
D	285	340
k	240	295
d ₂ x num.	22 x 8	22 x 8

Foundation plan TKH

n = 2900 rpm



TKH 6501 ... 8505 suction orifice showing to the left, when looking at the pump from the drive end.

TKH 8301 ... 15306 suction and discharge orifices showing radially upwards.

Dimensions in mm, dimensional tolerances admissible (baseplates) for castings acc. to DIN1686/GTB 17, for welded parts acc. to DIN 8570 B

size	motor		base plate 271 ... 100	coup- ling	weight		b ₂	c	e ₁	e ₂	e ₄	f ₁	h	h ₃	l	o	p ₁	p ₂	w*	w ₁	u _e	rag bolt DIN 529
6501	112 M	4,0	303	A 25	pump kg	unit kg	390	25	600	350	150	322	65	215	900	534	-	38	1144	920	G1/2	M 16 x 200
6502	160 M	11,0	0110.00.385	A 63	78	279	490	36	740	440	190	362	110	270	1120	584	10	-	1467	-	-	M 20 x 200
6503	160 M	15,0	436		86	279	540	30	840	490	205	462	80	240	1250	654			1537	1270	G1/2	
6504	160 L	18,5			95	312						472				724			1651			
	180 M	22,0		A 100	95	335											30		1678			
6505	180 M	22,0	0110.00.487		115	369	610	40	940	550	230	562	100	280	1400	794			1793	-	-	M 24 x 250
	200 L	30,0	538	A 160	115	504	660	35	1060	600	270	622		300	1600		50		1891		G1/2	
8501	112 M	4,0	303	A 25	70	150	390	25	600	350	150	342	65	215	900	554	-	38	1164	920	-	M 16 x 200
8502	160 M	11,0	0110.00.385	A 63	80	281	490	36	740	440	190	382	110	270	1120	614	10	-	1492	-	-	M 20 x 200
8503	160 L	18,5	436		92	309	540	30	840	490	205	467	80	240	1250	699			1621	1270	G1/2	
8504	180 M	22,0	0110.00.487	A 100	105	359	610	40	940	550	230	562	100	280	1400	784	30		1777	-	-	M24 x 250
	200 L	30,0	538	A 160	105	495	660	35	1060	600	270	632		300	1600		50		1875	1620	G1/2	
8505	200 L	30,0			125	515						667				869			1960			

n = 1450 rpm

size	motor		base plate 271 ... 100	coup- ling	weight		b ₂	c	e ₁	e ₂	e ₄	f ₁	h	h ₃	l	o	p ₁	p ₂	w*	w ₁	u _e	rag bolt DIN 529
8301	112 M	4,0	303	A 63	90	173	390	25	600	350	150	332	65	245	900	585	-	68	1220	920	G1/2	M 16 x 200
8302	132 M	7,5	0110.00.385		110	243	490	36	740	440	190	429	110	290	1120	672			1461	-	-	M 20 x 200
8304	160 M	11,0	436	A 100	125	324	540	30	840	490	205	489	80	260	1250	752		20	1668	1270	G1/2	
8305	160 M	11,0	0110.00.487		140	353	610	40	940	550	230	609	100	280	1400	832			1748	-	-	M 24 x 250
8306	160 L	15,0			155	429	660	35	1060	600	270	729			1600	912			1872	1620	G1/2	
8307	180 M	18,5	538	A 160	175	469						759				992			1979			
8308	180 M	18,5			190	484						799				1072			2059			
	180 L	22,0	9110.187.01		210	540	540	-	1070	480	400	924	160	340	1870	1150			2212	-	-	M 16 x 200
8309	180 L	22,0			230	560										1230			2292			
	200 L	30,0		A 250	230	641								360			20		2352			

Foundation plan TKH

n = 1450 rpm

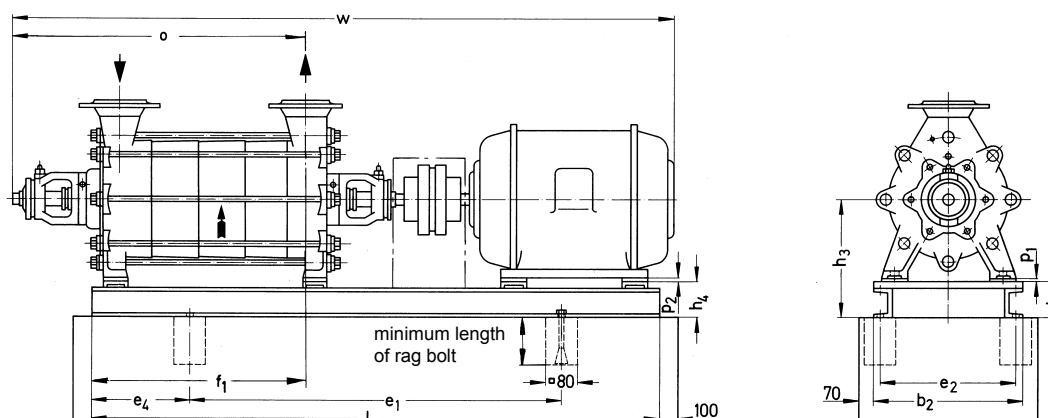
size	motor		base plate 271. 100	coup- ling	weight		b ₂	c	e ₁	e ₂	e ₄	f ₁	h	h ₃	l	o	p ₁	p ₂	w*	w ₁	u _e	rag bolt
	size	kW			pump kg	unit kg																DIN 529
10301	132 S	5,5	344	A 63	115	233	450	30	660	400	170	368	80	280	1000	614	-	68	1335	1020	R1/2	M 20 x 200
10302	160 M	11,0	436	A 100	135	334	540		840	490	205	450			1250	686		40	1595	1270		
10302	160 L	15,0	0110.00.487		155	389	610	40	940	550	230	545	100	300	1400	771			1724	-	-	M 24 x 250
10304	180 M	18,5		A 160	170	425					590					856		20	1836			
10305	180 L	22,0	538		195	510	660	35	1060	600	270	705			1600	940			1980	1620	R1/2	
	200 L	30,0		A 250	195	589					675							-	2040			
10306	200 L	30,0	9110.187.01		220	630	540	-	1070	480	400	905	160	360	1870	1025			2125	-	-	M 16 x 200
10307	225 S	37,0			240	699					910			385		1110	25		2220			
10308	225 S	37,0			260	739					905					1195			2305			
12301	132 M	7,5	0110.00.385	A 63	150	315	490	36	740	440	190	430	110	322	1120	737	-	80	1533	-		M 20 x 200
12302	160 L	15,0	0110.00.487	A 100	185	420	610	40	940	550	230	552	100	312	1400	839		52	1825			M 24 x 250
	180 L	22,0	538	A 160	210	526	660	35	1060	600	270	687			1600	954		32	2005	1620	R1/2	
12303	200 L	30,0		A 250	210	605					667							12	2065			
	200 L	30,0	9110.187.01		240	651	540	-	1070	480	400	907	160	372	1870	1069			2180	-	-	M 16 x 200
12304	225 S	37,0			240	719					857			385		1182	13	-	2190			
	225 S	37,0			270	749					872								2341			
12305	225 M	45,0		PKZ 20	270	812													2366			
	225 M	45,0	9110.220.05		300	862	640		1400	580		1087	180/	392	2200	1297	-	7	2481			M 20 x 200
12306	250 M	55,0			300	943							160	410			18	-	2589			
	250 M	55,0			330	973					1112					1412			2704			
12307	280 S	75,0		PKD 25	330	1168								440			48		2842			
15301	160 L	15,0	0110.00.487	A 100	220	456	610	40	870	550	230	543	100	335	1400	837	-	75	1879	-	-	M 24 x 250
15302	180 L	22,0	538	A 160	260	576	660	35	1060	600	270	678			1600	1003		55	2074	1620	R1/2	
	200 L	30,0		A 250	260	656					568							35	2134			
15303	225 S	37,0	9110.178.03		290	748	550	-	980	490	400	793	160/1 80**	413	1780	1153	10	-	2294	-	-	M 16 x 200
15304	225 M	45,0	9110.220.05	PKZ 20	330	891	640		1400	580		1098	180**	415	2200	1303	-	20	2469			M 20 x 200
	250 M	55,0			330	973							160					5	2577			
15305	250 M	55,0			380	1023						1108				1453			2757			
15305	280 S	75,0	9110.239.01	PKD 25	380	1212	650		1590	590		1243	205**	440	2390		-		2895			
15306	280 S	75,0			420	1252						1253	160		1603				3045			

* Motor-type IP 54, dimensions dependent on motor make.

** Dimensions of the base plate: pump side/motor side.

Foundation plan TLH

n = 1450 rpm



Dimensions in mm

size	motor		base frame 9110.	coup- ling PK	weight		b ₂	e ₁	e ₂	e ₄	f ₁	h	h ₃	h ₃	l	o	p ₁	p ₂	w*	rag bolt DIN 529					
	size	kW			pump kg	Aggr. kg																			
15101	180 L	22	150.12	Z 15	389	714	670	800	610	350	508	160	475	295	1500	850	-	-	2020	M 16 x 200					
15102	250 M	55	170.43	Z 20	459	1080		900		400	568		500	250	1700	935	25	-	2308						
/1	225 M	45				1000							-	2200											
/2	225 S	37		Z 17		943							-	2175											
15103	280 M	90	195.18	D 25	514	1411		1150		500	703			195	1950	1065			2627	M 20 x 200					
/1	280 S	75				1332													2676						
/1	280 M	90				1411													2627						
/2	250 M	55		1137		2438																			
/2	280 S	75		D25		1332		30		2576															
15104	280 M	90		208.04				569		1466			1080		500	828					2080	1195			-
	315 S	110	220.07	1613	720		1200		660	843		160				2200	2825								
	315 M1	132	1703													2876									
/1	280 M	90	208.04	1466	670		1080		610	828		195	2080		2757										
/1	315 S	110	220.07	1613	720		1200		660	843		160	2200		2825										
/2	280 M	90	208.04	1466	670		1080		610	828		195	2080		2757										
/2	315 S	110	220.07	1613	720		1200		660	843		160	2200		2825										
/3	280 S	75	208.04	1386	670		1080		610	828		195	2080		2706										
/3	280 M	90		1466											2757										
15105	315 M1	132	230.05		624		1753		720	1300		660			953		160	2300		1325					3006
	315 M2	160					1848																		3006
/1	315 S	110					1663																		2955
/1	315 M1	132				1753	3006																		
/1	315 M2	160				1848	3006																		
/2	315 S	110				1663	2955																		
/2	315 M1	132				1753	3006																		
/3	315 S	110				1663	2955																		

* Motor-type IP 54, dimensions dependent on motor make.

Data regarding the pump size - order notes

Series + size	Bearings and sense of rotation	Shaft sealing	Material design	Casing joint
	·B two grease-lubricated deep-groove ball bearing ·N sense of rotation: clockwise when looking at the pump from the motor	001 uncooled stuffing box 061 uncooled stuffing box, balanced 091 uncooled stuffing box, balanced 135 standard mechanical seal 136 standard mechanical seal, balanced	01 standard design grey cast iron 02 free from nonferrous metal 04 as 02, but impellers of gun metal (Rg 5) 32 main parts of cast tin bronze 42 main parts of Cr Ni Mo steel castings	2 gaskets
TKH 6501-04 6505 6501+02 8501-03 8504+05 8501+02 8301-07 8301-03 8301-04 8302+03 8308+09 8301-04 10301-04 10302+03 10301-03 10305-08 10301-04 12301-04 12302+03 12301-03 12305-07 12301-04 15301-04 15302+03 15301-03 15305+06 15301-04	BN	001 061 135 001 061 135 001 001 001 001 061 135 001 001 061 135 001 001 061 135 001 001 061 135 001 001 061 135	01 01 01 01 01 01 01 04 02 32, 42 01 01 01 04, 32, 42 02 01 01 01 04, 32, 42 02 01 01 04 02 01 01	2
TLH 15101 15102 15103 15104 15105		alternatively 091 136	01	

design	designation	Motor selection table					
		motor n = 2900 rpm			motor n = 1450 rpm		
		kW	size	designation	kW	size	designation
pump with free shaft end	01	4	112 M	MA	4	112 M	MB
pump with coupling, motor side rough-drilled	04	11	160 M	SA	7,5	132 M	PB
as above, but pump mounted on base plate	05	15	160 M	TA	11	160 M	SB
as above, but with motor and coupling guard	e.g. TA	18,5	160 L	UA	15	160 L	UB
e.g. three-phase A.C. motor of 15 kW		22	180 M	VA	18,5	180 M	VB
(50 Hz, 380 V), for 2900 rpm		30	200 L	XA	22	180 L	WB
					30	200 L	XB
					37	225 S	ZB
					45	225 M	AB
					55	250 M	BB
					75	280 S	CB
					90	280 M	DB
					110	315 S	EB
					132	315 M1	FB
					160	315 M2	GB

Example for ordering:

The pump size TKH 6503 BN 001 02 2 with coupling rough-drilled on the motor side has the complete order No.:

TKH- 6503 BN 001.01.2 04

The pump size TKH 6503 BN 001 01 2 as a complete unit with 15 kW three-phase A.C. motor of 2900 rpm, has the complete order No.:

TKH- 6503 BN 001.01.2 TA

On delivery, the point (·) in the forth place of the type designation is replaced by a letter in the factory.

If the motor to be provided is specified, the coupling can be finish-drilled on the side of the motor and a coupling guard as well as the suitable shims to compensate for the height difference between the shaft centerlines of motor and pump can be supplied.

Any changes in the interest of technical development are reserved.

Sterling SIHI GmbH

Lindenstraße 170, D-25524 Itzehoe, Germany, Telephone +49 (0) 48 21 / 7 71 - 01, Fax +49 (0) 48 21 / 7 71-274