

# Centrifugal Pumps

## Self-priming in ring-section type

**TKH 8001 ... 15006**  
**TLH 15101 ... 15105**



HALBERG™ Pumps

### Technical Data

Flow rate:	max. 350 m <sup>3</sup> /h
Head:	max. 185 m
Speed:	max. 1700 rpm
Temperature:	0 °C up to max. +120 °C
Casing pressure:	max. PN 16
Shaft seal:	Mechanical seal
Flange connection dimension:	DIN EN 1092-2 Optional: ASME B 16.5
Direction of rotation:	clockwise, when viewed from drive end
Certificate:	ATEX 94/9/EG. Ex II 2 G c T3-T5



### Application

Self-priming centrifugal pumps of the TKH/TLH range are used for pumping pure or turbid liquids containing no solid matter. Due to their self-priming ability and the possible material combinations the pumps can be used in a wide variety of applications such as:

- fuel handling in places of trans-shipment and on large tank farms
- industrial and municipal potable water and service water supply
- fire fighting equipment
- manufacture of cooling equipment
- in the shipbuilding industry as bilge and ballast pumps
- chemical and petrochemical industries

### Design

The horizontal ring-section type centrifugal pumps have closed impellers and a priming stage. The priming stage is located on the suction side parallel to the first liquid stage is used during suction operation or according to the mixture separation principle. If the liquid handled contains a lot of gas. The gas is separated and largely removed before the liquid enters the first impeller. Finally distributed quantities of gas pose no problem to pumping performance. When during suction there is 0.5 bar back-pressure on the delivery side the gas sucked is pumped into the delivery line. If the back-pressure value is higher a separate gas discharge is necessary.

### Design details

#### Casing pressure:

Permissible max. casing pressures as a function of size and number of stages in bar:

TKH 8000 - 15000	16 bar
TLH 15101 - 15105	16 bar

#### Please note:

Technical rules and safety rules.

Casing pressure = zero delivery head + pos. suction pressure

#### Nozzle position:

TKH 8000 to 15000 Suction and delivery nozzles radially and TLH 15100: upwards.

#### Flanges:

Flanges according to DIN EN 1092-2 / PN 16.  
Flange design according to ASME is possible.

#### Hydraulic:

Centrifugal hydraulic with special NPSH-impeller and gas priming stage. Gas priming stage designed to side channel or liquid ring vacuum principle.

#### Bearing:

The TKH 8000 to 15000 are equipped with a plain bearing and a deep groove ball bearing. TLH 15100 has a double-row angular contact ball bearing according to DIN 628 and a deep groove ball bearing. All deep groove ball bearings conform to DIN 625. All anti-friction bearings are grease-lubricated. Pumps are provided with the initial supply of grease.

#### Direction of rotation:

Clockwise, when viewed from drive end.

#### Shaft seal:

The shaft sealing consist of mechanical seals.

## Shaft seal in detail:

Designation 135: Roten. EBVGG. self-flushed. uncooled. unbalanced single-acting mechanical seal temperature range from 0 °C to 120 °C

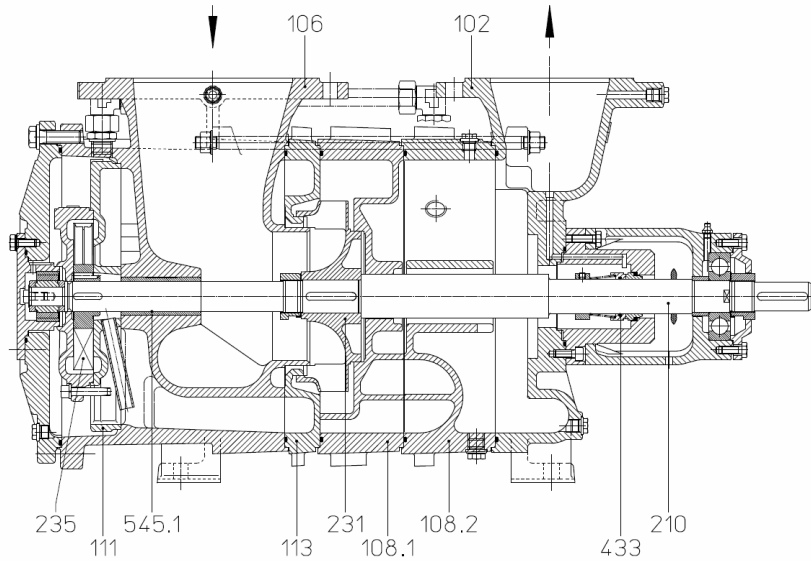
Designation 136: Roten. EBVGG. self-flushed. uncooled. balanced single-acting mechanical seal temperature range from 0 °C to 120 °C

Designation XAG: Roten. EBXGG. self-flushed. uncooled. balanced single-acting mechanical seal temperature range from 0 °C to 120 °C

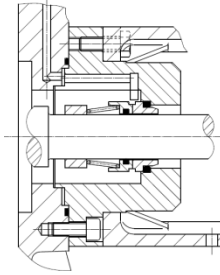
Designation X0G: Burgmann 2xM7N. BSKGG. uncooled. unbalanced double-acting mechanical seal. tandem arrangement temperature range from 0 °C to 80 °C

## Sectional drawing and list of components

### TKH 8000 ... 15000

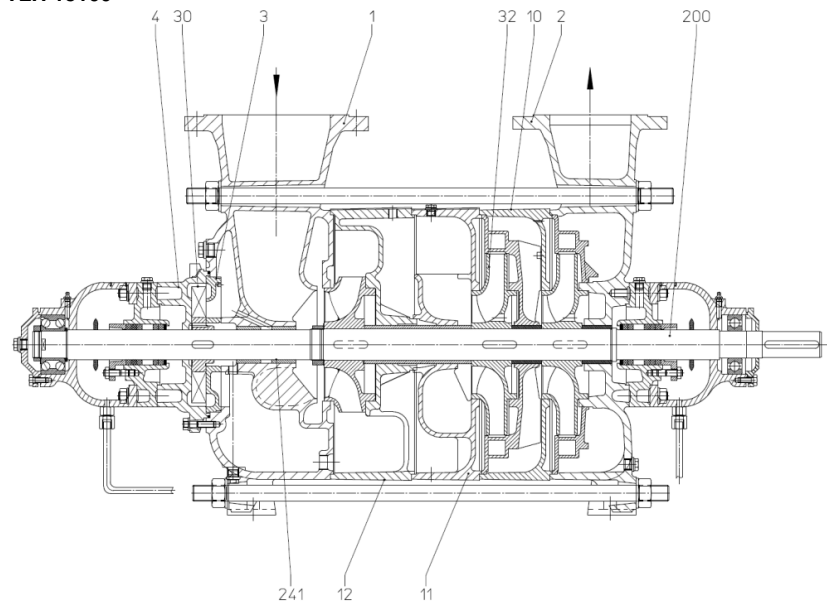


**Shaft seal**  
Designation 135

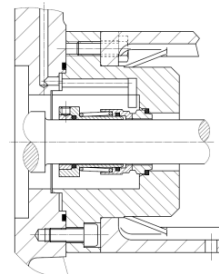


102	Volute casing	111	Priming stage	235	Side channel impeller
106	Suction casing	113	Intermediate casing	433	Mechanical seal
108.1	Stage casing	210	Shaft	545.1	Bearing bush
108.2	Stage casing	231	Impeller		

### TLH 15100



**Shaft seal**  
Designation 136



1	Suction cover	10. 11. 12. 13	Intermediate piece	241	Bearing bush
2	Discharge cover	30	Side channel impeller	500	Mechanical seal
3	Venting casing	31. 32	Impeller		
4	Venting cover	200	Shaft		

## Material design:

TKH 8000 ... 15000

Item	Components	Material design	
		1B	1C
106	Suction casing	EN-JS1030-EN 1563 (0.7040)	
102	Volute casing	EN-JS1030-EN 1563 (0.7040)	
111	Priming stage	EN-JL1040 - EN 1561 (0.6025)	
114	Casing with transfer passages	EN-JL1040 - EN 1561 (0.6025)	
113	Intermediate casing	EN-JS1030-EN 1563 (0.7040)	
108.1 – 108.5	Stage casing	EN-JS1030-EN 1563 (0.7040)	
235	Side channel impeller	GX20Cr14 (1.4027.05)	CC483K-GS - EN 1982 (2.1052.01)
231	Impeller first stage	EN-JL1040 - EN 1561 (0.6025)	Bronze
230	Impeller other stages	EN-JL2030 - EN 1561 (0.6022)	
210	Shaft	1.4122+QT - EN 10088-3	
545.1	Bearing bush	Carbon / Plastic	CC496K-GS - EN 1982 (2.1182.01)
433	Mechanical seal	Please shaft seal in details	

TLH 15100

Item	Components	Material design	
		1A	1B
1	Suction cover	EN-JS1030 - EN 1563 (0.7040)	
2	Volute casing / discharge cover	EN-JS1030 - EN 1563 (0.7040)	
3	Intermediate piece or venting casing	EN-JS1030 - EN 1563 (0.7040)	
4	Intermediate piece or venting casing	EN-JL1040 - EN 1561 (0.6025)	
10. 11. 12. 13	Intermediate piece	EN-JL1040 - EN 1561 (0.6025)	
19	Port plate	EN-JL1040 - EN 1561 (0.6025)	
22	Central body	EN-JL1040 - EN 1561 (0.6025)	
30	Side channel impeller	CC483K-GS - EN 1982 (2.1052.01)	1.4027+QT - SEW 410 (G-X20Cr14)
31	Impeller first stage		
32	Impeller other stage	EN-JL1040 - EN 1561 (0.6025)	
200	Shaft	1.4122+QT - EN 10088-3	
241	Bearing bush	Lead bronze	Carbon / Plastic
500	Mechanical seal	X 22 Cr Ni17 / Carbon / Viton	

### Casing seal:

The TKH 8000 to 15000 pump range uses O-rings. The casing seal of ranges TLH 15100 consists of a special paper gasket.

### Drive / Speed:

Customary IM B 3 electric motors.

## Data regarding size

## TLH 15100

Series / Size	Hydraulic + Bearing	Shaft sealing	Material design	Casing seal
TLH 15101 to 15106	<ul style="list-style-type: none"> <li>B• two grease-lubricated deep groove ball bearings</li> <li>•N direction of rotation: clockwise. when viewed from drive end</li> </ul>	136 balanced single-acting mechanical seal	1A SG iron  1B as 1A. but without non-ferrous metal	2 Gasket

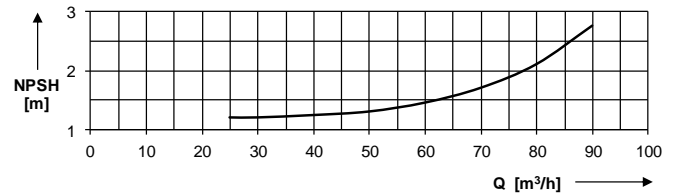
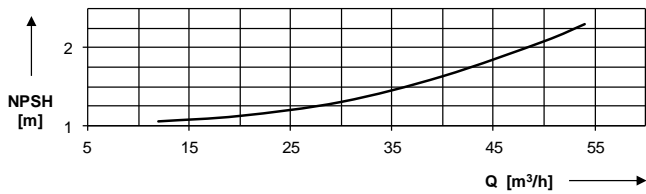
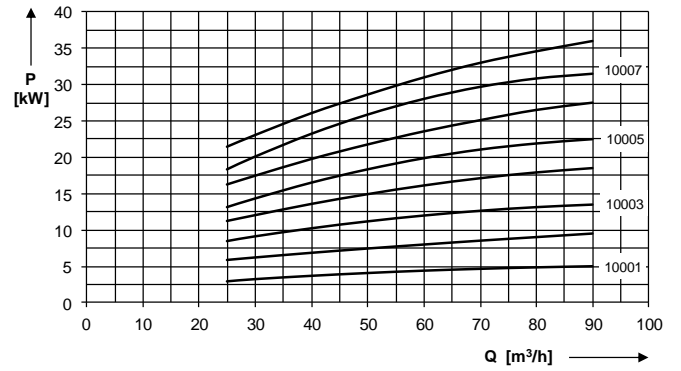
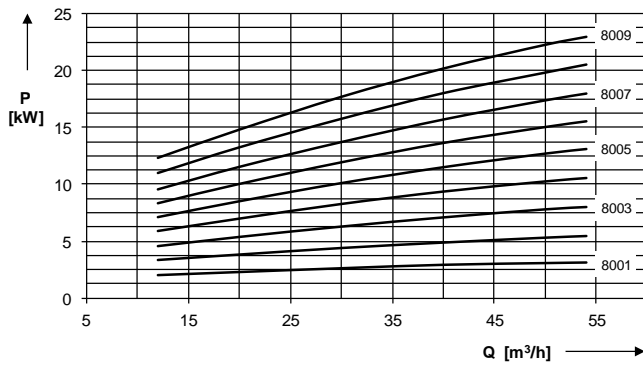
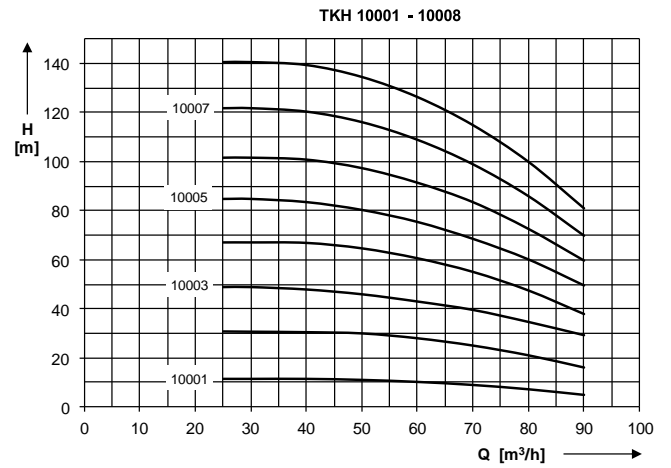
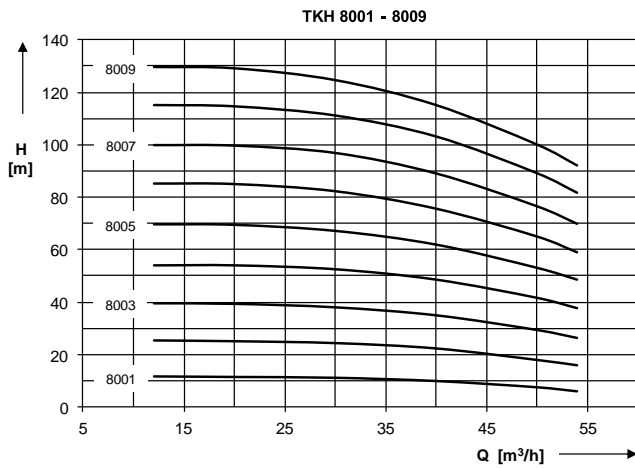
## TKH 8000 ... 15000

Series / Size	Hydraulic + Bearing	Shaft sealing	Material design	Casing seal
TKH 8001 to 15006	<ul style="list-style-type: none"> <li>A• a plain bearing and a deep groove ball bearing</li> <li>•A Hydraulics</li> </ul>	135 Roten. EBVGG single-acting mechanical seal. unbalanced  136 Roten. EBVGG single-acting mechanical seal. balanced  XAG Roten. EBVGG single-acting mechanical seal. balanced  X0G Burgmann. 2xM7N. BSKGG double-acting mechanical seal. tandem design	1B SG iron  1C as 1B. but without non-ferrous metal	1 O-ring

Characteristic curves

50 Hz

$\rho = 1.0 \text{ kg/dm}^3$

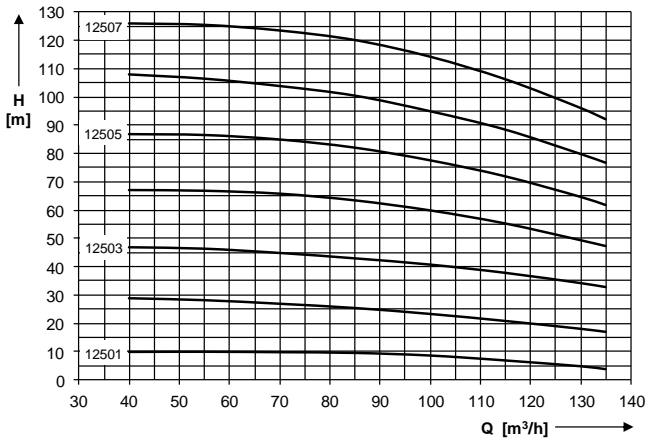


## Characteristic curves

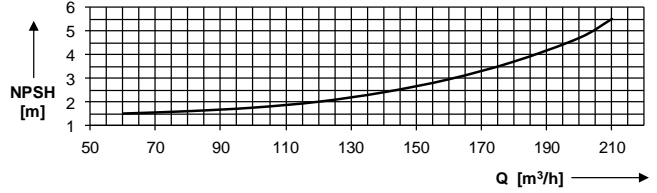
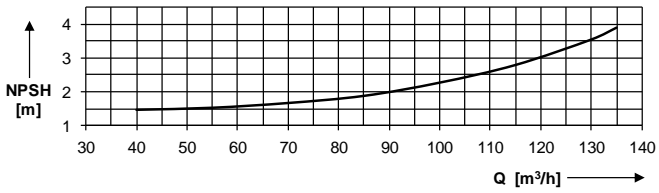
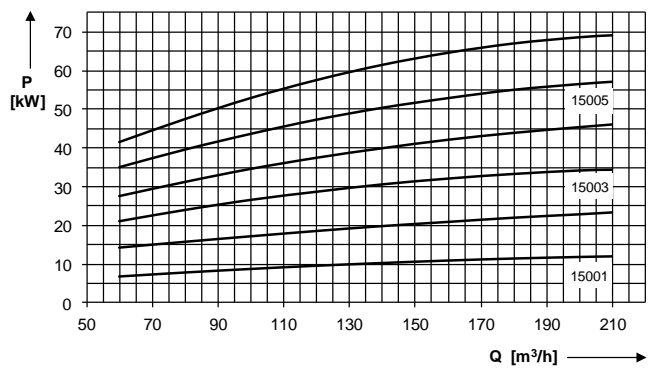
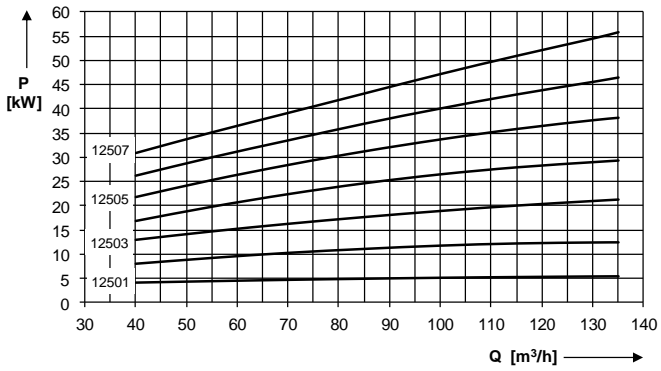
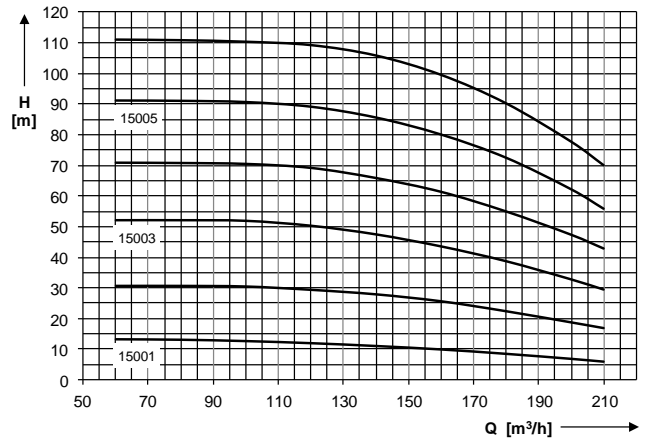
50 Hz

$\rho = 1.0 \text{ kg/dm}^3$

TKH 12501 - 12507

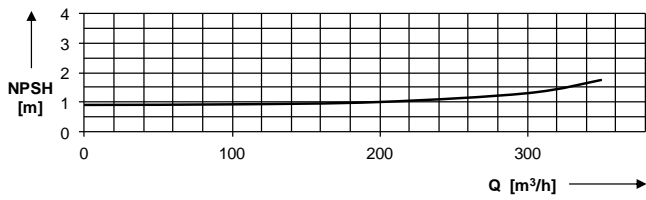
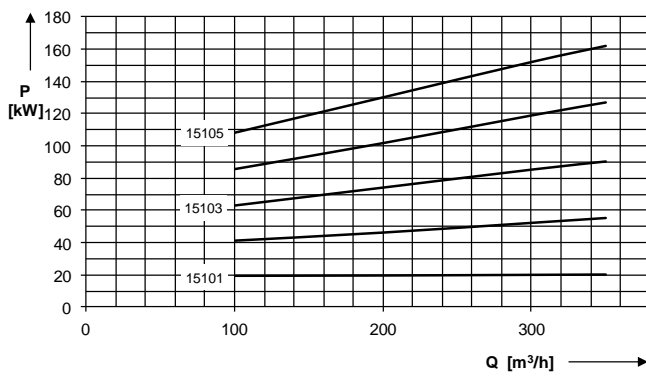
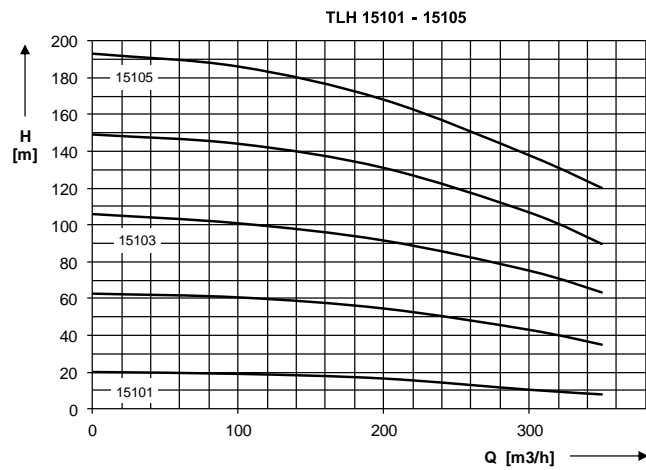


TKH 15001 - 15006



## Characteristic curves

50 Hz

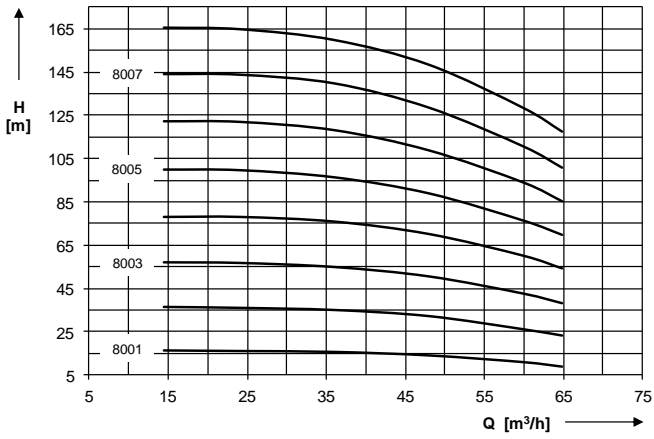
 $\rho = 1.0 \text{ kg/dm}^3$ 

## Characteristic curves

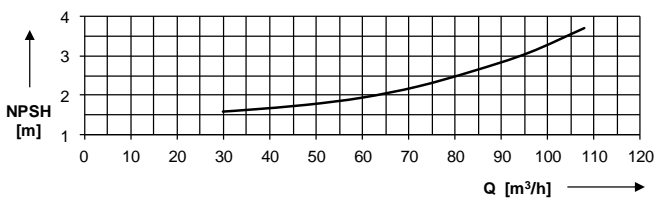
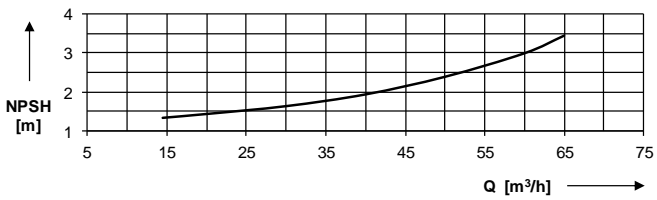
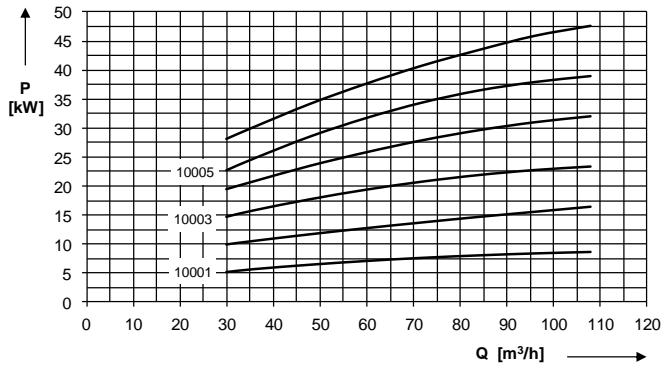
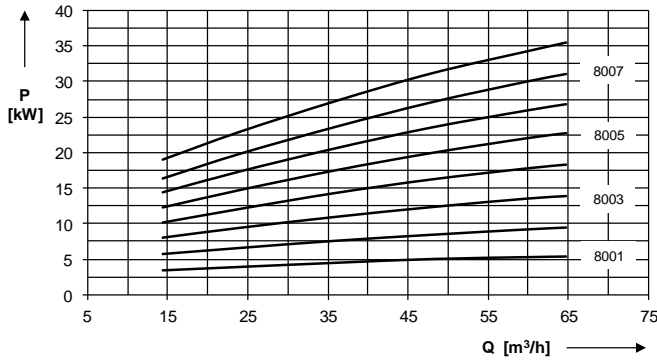
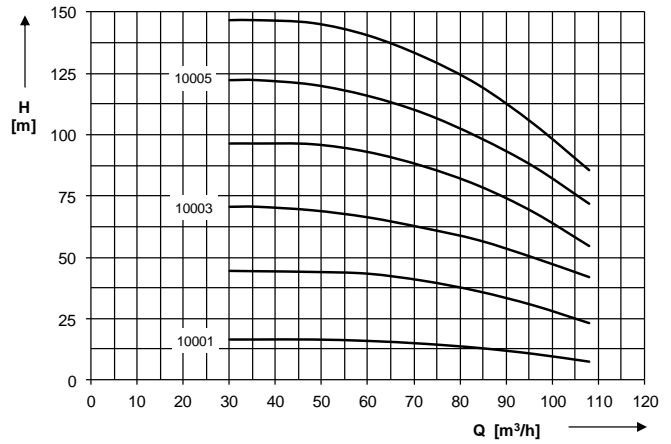
60 Hz

$\rho = 1.0 \text{ kg/dm}^3$

TKH 8001 - 8008



TKH 10001 - 10006

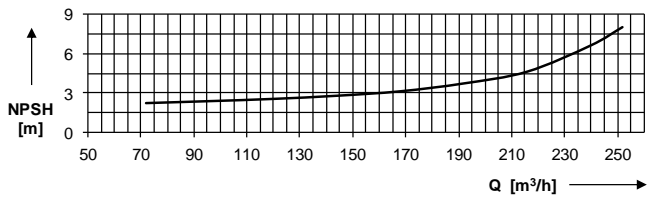
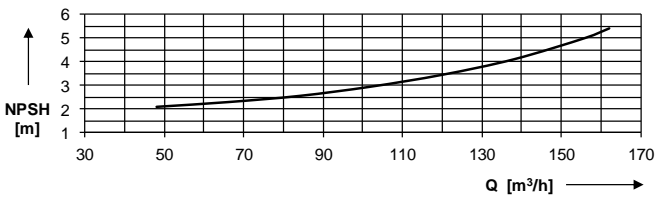
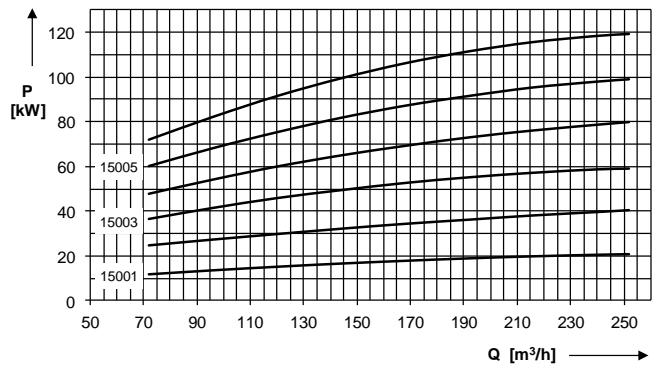
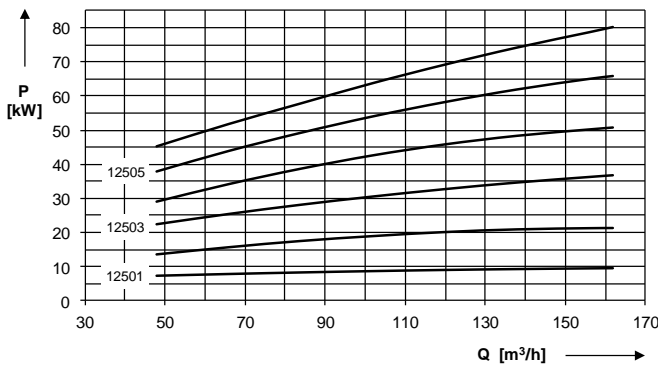
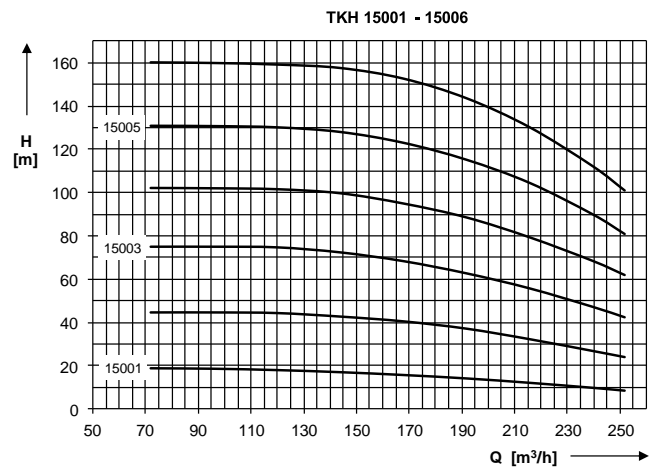
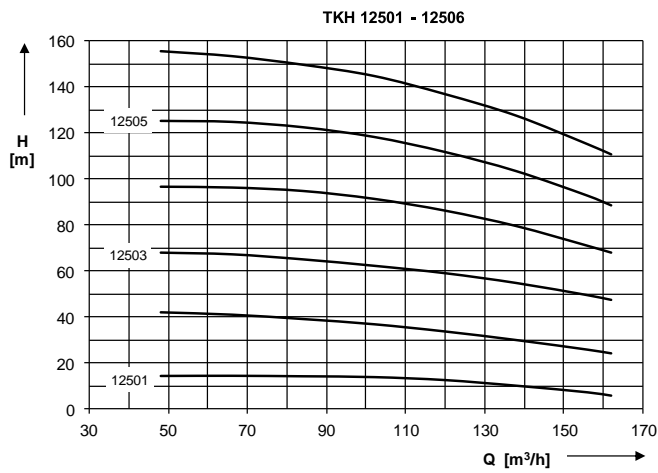




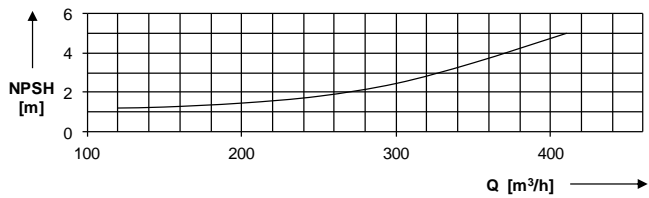
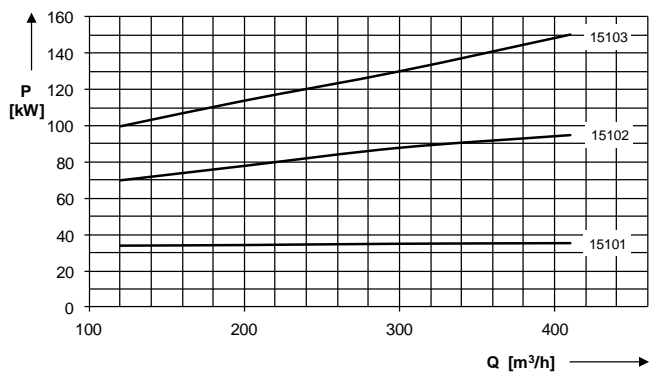
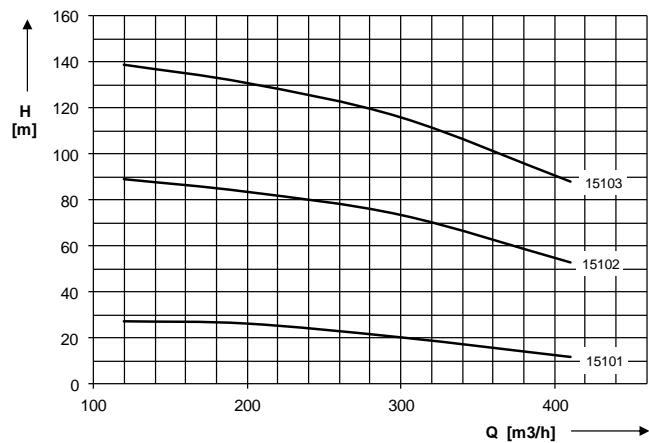
Characteristic curves

60 Hz

$\rho = 1.0 \text{ kg/dm}^3$

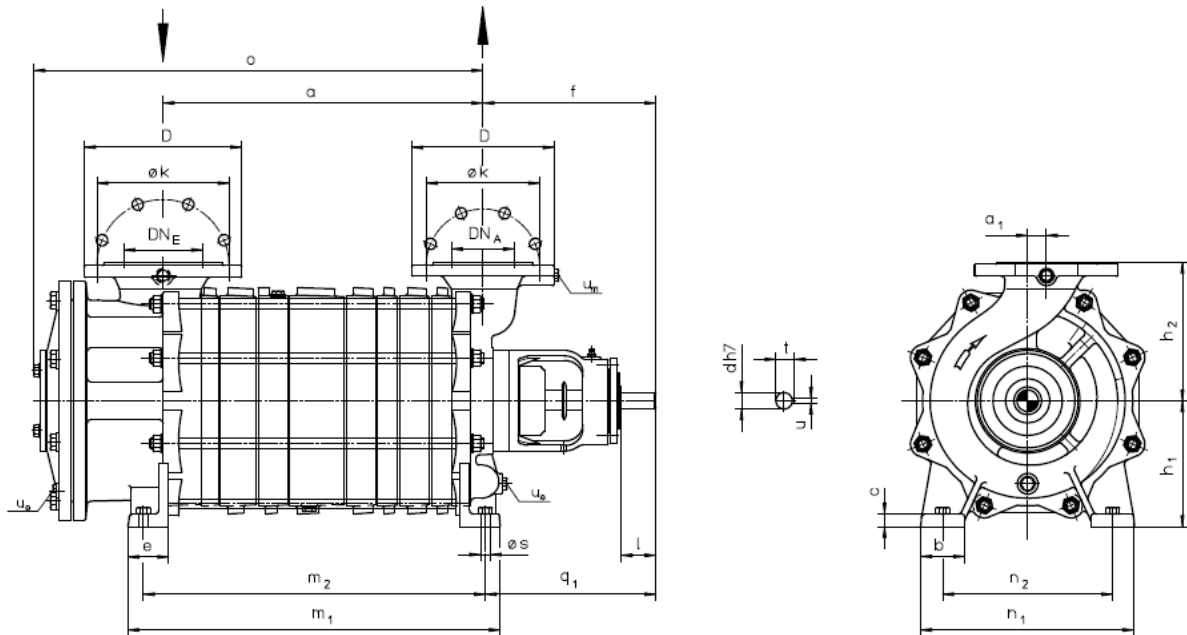


TLH 15101 - 15103



## Dimension table

TKH

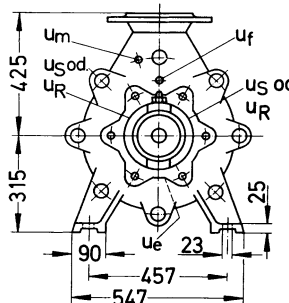
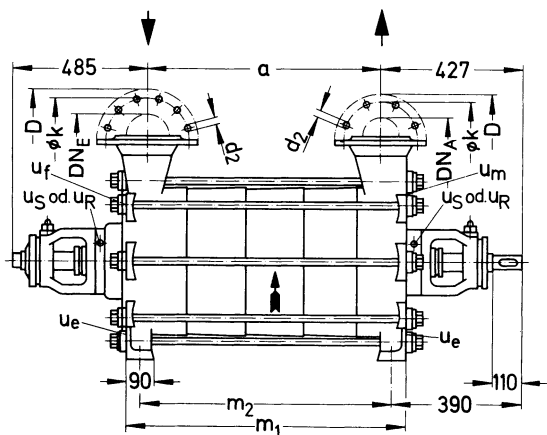
 $u_e$  = drain connection G<sup>3/8</sup> $u_m$  = pressure gauge connection G<sup>3/8</sup>

Dimensions in mm

Size	DN <sub>A</sub>	DN <sub>E</sub>	a	a <sub>1</sub>	b	c	e	f	h <sub>1</sub>	h <sub>2</sub>	m <sub>1</sub>	m <sub>2</sub>	n <sub>1</sub>	n <sub>2</sub>	o	q <sub>1</sub>	s	d	l	t	u
08001	80	100	247	30	50	20	65	282	180	200	337	281	250	200	450	280	15	26	55	29	8
08002			427								371	530									
08003			507								451	610									
08004			587								531	690									
08005			667								611	770									
08006			747								691	850									
08007			827								771	930									
08008			907								851	1010									
08009			987								931	1090									
10001	100	125	248	30	70	20	65	275	200	220	333	283	340	270	459	294	15	26	55	29	8
10002			423								373	544									
10003			508								458	629									
10004			593								543	714									
10005			678								628	799									
10006			763								713	884									
10007			848								798	969									
10008			933								883	1054									
12501	125	150	342	40	70	20	65	308	212	240	422	372	400	320	567	346	15	32	70	35.5	10
12502			542								492	682									
12503			657								607	797									
12504			772								722	912									
12505			887								837	1027									
12506			1002								952	1142									
12507			1117								1067	1257									
15001	150	200	423	55	80	25	80	328	235	275	252	465	400	320	679	326	18	36	80	45.5	12
15002			675								615	829									
15003			825								765	979									
15004			975								915	1129									
15005			1125								1065	1279									
15006			1275								1215	1429									

Dimension table

TLH



u<sub>e</sub> = drain connection G 3/8  
 u<sub>f</sub> = filling connection G 3/4

u<sub>m</sub> = pressure gauge connection G 1/2  
 u<sub>R</sub> = flushing liquid connection G 3/8

u<sub>s</sub> = sealing liquid connection G 3/8

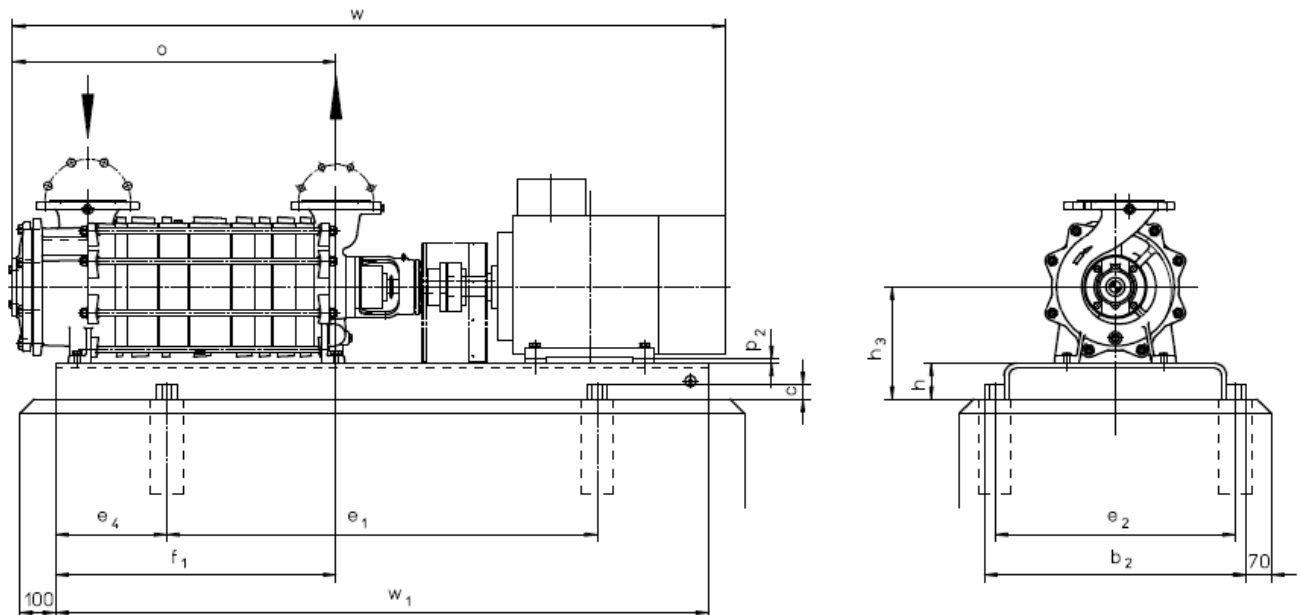
Dimensions in mm

size	DN <sub>A</sub>	DN <sub>E</sub>	a	m <sub>1</sub>	m <sub>2</sub>
15101	150	200	365	541	445
15102			450	626	530
15103			580	756	660
15104			710	886	790
15105			840	1016	920

Flange connection dimensions acc. to DIN EN 1092-2		
DN <sub>A,E</sub>	150	200
D	285	340
k	240	295
d <sub>2</sub> x no.	23 x 8	23 x 8

## Foundation plan

TKH



Dimension in mm

Size	Motor Size	kW	Pump **kg	Set kg	Base plate	Coupling	b <sub>2</sub>	c	e <sub>1</sub>	e <sub>2</sub>	e <sub>4</sub>	f <sub>1</sub>	h	h <sub>3</sub>	o	p <sub>2</sub>	w*	w <sub>1</sub>	Stone bolt EN ISO 898-1	
8001	112 M	4	155	200	S344	BDS 76	450	30	660	400	180	341	80	180	439	68	1120	1000	4x FM20X 250	
8002	132 M	7.5	176	240	S385	BDS 88	490	36	740	440	200	431		260	530	48	1275	1140		
8003	132 M	7.5	197	274	S436		540	30	840	490	215	1055		610	48	1350	1270			
8004	160 M	11	218	326	S487	BDS 103	610	35	940	550	240	581	100	280	689	20	1565	1400	4x FM24X 400	
8005	160 L	15	239	333	S388		540	40	1060	490	270	671			751		769	1645		1600
8006	160 L	15	260	354								849			1725					
8007	180 M	18.5	281	387	S389	BDS 118	540	40	1200	300	831	911		929	1935	1800				
8008	180 L	22	302	408							1009	2015								
8009	200 L	30	323	525	S610	BDS 135	740		700	690		991		305	1089	5	2145	2000		6x FM24X 400
10001	132 S	5.5	174	231,2	S434	BDS 88	540	40	660	490	170	338	100	280	453	68	1196	1000	4x FM20X 250	
10002	160 M	11	200	270,2	S436	BDS 103	540	30	840	490	215	433	80	543	0	1412	1250	4x FM24X 400		
10003	160 L	15	226	310	S387		510		940	456	230	518	110	310	628	0	1550		1400	
10004	180 M	18.5	252	348	S388	BDS 118	540	40	1060	490	270	603	100	713	20	1715	1600			
10005	180 L	22	278	374								688		798		1800				
10006	200 L	30	304	467	S609	BDS 135	730	40	1200	670	310	773		305	883	5	1935	1800		
10007	200 L	30	330	493								858		968	2020					
10008	225 S	37	356	558	S610	BDS 135	740		700	690	300	943		330	1053		2165	2000	6x FM24X 400	
12501	132 M	7.5	223	231	S436	BDS 88	540	30	840	490	215	432		80	292	561	80	1330	1250	4x FM24X 400
12502	160 L	15	254	269	S487	BDS 103	610	35	940	550	240	552	100	312	681	52	1585	1400		
12503	180 L	22	286	308	S538	BDS 118	660		1060	600	280	667			796	32	1825	1600		
12504	200 L	30	317	347	S609	BDS 135	730	40	1200	670	310	782		332	911	12	1995	1800		
12505	225 M	45	348,5	394	S610		740		700		700	690	300		897	1026	7	2175	2000	
12506	225 M	45	380	425	-	BDS 152		740	40	750	690	370	1012		1141		2290	2100		
12507	250 M	55	412	467	S612		750				750	690	370	1127	355	1256	5	2500	2240	6x FM24X 400
15001	160 L	15	328	343	S487	BDS 103	610	35	940	550	240	545	100	335	679	75	1615	1340	4x FM24X 400	
15002	180 L	22	371	393	S538	BDS 118	660		1060	600	280	670	160	829	55	1885	1620			
15003	225 S	37	414	451	-	BDS 135	550	-	1050	490		820		395	979	5	2115	1850		
15004	250 M	55	457	512		BDS 152	640			1250	580	400		970	415		1129		2390	2050
15005	250 M	55	500	555			700			700	580		1125	1279			2540	2200		
15006	280 S	75	543	618		BDS 194	650		850	590		1275	445	1429		2720	2500	6x FM24X 400		

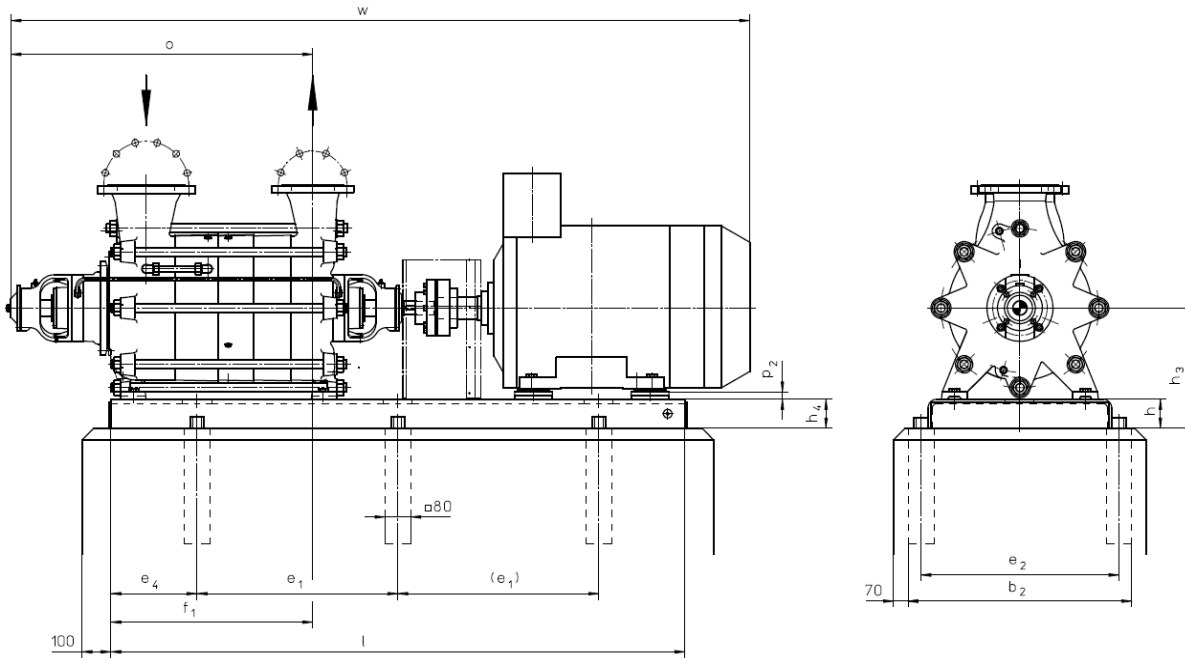
60Hz on request

\* Motor - system of protection IP 54, dimensions depend on make of motor.

\*\* Base frame dimensions pump side / motor side

Foundation plan

TLH



Dimension in mm

Size	Motor Size	Motor kW	Pump kg	Weight Set kg	b <sub>2</sub>	e <sub>1</sub>	e <sub>2</sub>	e <sub>4</sub>	f <sub>1</sub>	h	h <sub>3</sub>	h <sub>3</sub>	l	o	p <sub>1</sub>	p <sub>2</sub>	w*	Stone-bolt DIN 529				
15101	180 L	22	389	714	800	900	610	350	508	160	475	295	1500	850	-	-	2020	M 16 x 200				
15102	250 M	55	1080	500							250	1700	935	25	2308							
/1	225 M	45	459	1000							568	2200										
/2	225 S	37	943	2175																		
15103	280 M	90	514	1411	670	1150	610	400	703	160	475	195	1950	1065	30	2438	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		1332	2576																	
	280 M	90		1466	2757																	
15104	315 S	110	1613	720	1200	660	610	828	843	160	475	160	2200	1195	-	2825	2876	M 20 x 200				
	/1	280 M	90														1466		828	195	2080	2757
	/1	315 S	110														1613		843	160	2200	2825
/2	280 M	90	1466	670	1080	610	828	828	195	2080	2757	2825	2706									
/2	315 S	110	1613	720	1200	660	610	843	160	2200	2825	2757	2706									
/3	280 S	75	1386	670	1080	610	500	828	828	160	475	195	2080	-	-	2757	3006	M 20 x 200				
/3	280 M	90	1466														2757					
15105	315 M1	132	624	1753	720	1300	660	953	953	160	475	160	2300	1325	-	-	3006	M 20 x 200				
	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 - system of protection IP 54, dimensions depend on make of motor.

## Additional innovative solutions from SIHI

### SIHI<sup>detect</sup>



### Condition based monitoring

#### **Detect wear before damage occurs**

- + Cavitation and process turbulence
- + Simple to connect
- + LED display
- + Available Ex
- + All rotating machinery
- + DCS integration and continual monitoring

Noise and Vibration analysis allows this compact device to diagnose the (often hidden) symptoms of longer term damage even before vibration occurs.

