

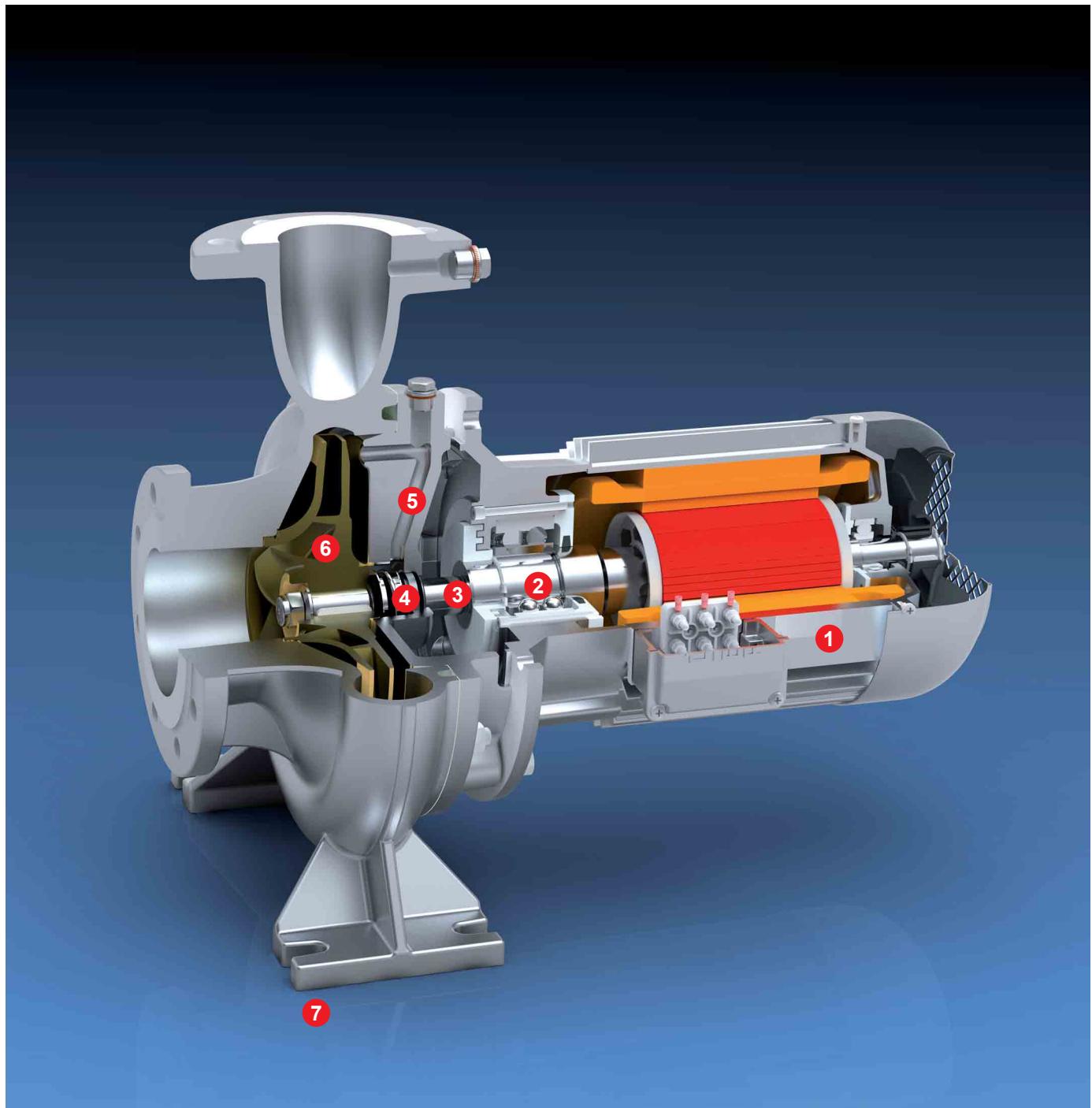


**HERBORNER**  
**PUMPE**NT**TECHNIK**

# **UNIBLOCK-GF-PM**

Energy-saving close coupled centrifugal pump





**UNIBLOCK-GF-PM benefits that ensure operational safety and cost-effectiveness in continuous operation.**

**1 Motor**

Energy-saving PM motors (permanent magnet motors) for frequency converter operation as a direct attachment (up to 30 kW) or wall attachment.

**2 Cost-effectiveness**

An extended lifetime is achieved through liberally dimensioned shafts and bearings.

**3 Motor shaft**

Rigid motor shafts made from high-alloy stainless steel for minimal deflection.

**4 Shaft sealing**

Wear-resistant mechanical seal that is adapted to the respective operating conditions.

Monitoring of mechanical seal possible using an ETS X4 to protect against dry running.

**5 By-pass channel**

For optimal flushing of mechanical seal by means of the pumped medium.

**6 Impellers**

Open and closed multi vane impellers for reliable supply output.

**7 Construction**

Cast housing bases enable the support of the pipeline and a low spatial requirement for the mounting base.

**8 Type of construction**

Easy accessibility of the inside of the pump due to process-type construction.

**9 Special configurations**

Sophisticated solutions for customer-specific problems.

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# Technical descriptions

## Use

The centrifugal pump UNIBLOCK-GF-PM in the PM motor (permanent magnet motor) version is particularly suitable for pumping clean water, cooling water, bath water, thermal brine, sea water, leaching solution, and oils.

It is used in circulating systems, swimming pools, attractions, heating and air conditioning, condensate units, water supply, water treatment, sprinkling systems, irrigation systems, washing and cleaning equipment.



## Construction

High circulation rates with minimum space requirements are achieved by means of an easy-to-install and readily serviceable compact design. Variable flange positions offer specialist consultants and construction firms optimal design possibilities. It is possible to disassemble the interchangeable module of the pump without loosening the intake connection and pressure flange from the pipework. The interchangeable module consists of a block motor, intermediate casing, impeller and mechanical seal.

## Installation

The pumps can be delivered in various installations.



Horizontal installation of the pump



Vertical installation of the pump with the motor at the top

## Impellers

Dynamically balanced impellers ensure vibration-free running and contribute significantly to the long lifetime of the pump. All multi vane impellers can reach every duty point within the set of performance curves by correcting the diameter.



Open and closed multi vane impellers for clean to slightly soiled pumped media are used.



## Range of performance

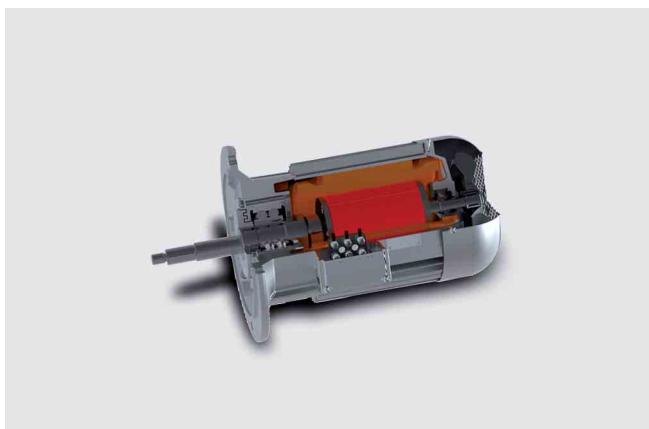
	Q [m³/h]	H [m]
1500 min⁻¹	650	60
3000 min⁻¹	270	52

### Shaft sealing

The shaft sealing on the pump side is effected in all models via a wear-resistant, maintenance-free mechanical seal that is adapted to the respective operating conditions. All motors are equipped with a special seal for splash-proofing on the pump side. Monitoring of the mechanical seal is possible using an ETS X4 to protect against dry running.

### Bearing

The pump and motor have a common shaft, which is supported by a strengthened bearing. The motors with  $1500 \text{ min}^{-1}$  (= 1500 rpm) are also equipped with a relubrication unit from 1.1 kW. In contrast to the standard motor, the pump-side rigid bearing is designed as a reinforced bearing for long life under extreme operating conditions. The high level of running accuracy of the motor shaft is achieved through the high flexural rigidity and short shaft length. This ensures vibration-free running of the mechanical shaft sealing.



### Noise

The noise emission is determined by complex influencing factors such as size, materials, operating and installation conditions. Noise emission was contained using hydraulic measures and solid construction methods as early as in the development stage. The maximum sound pressure level is generally determined by the drive motors, being caused by air, magnetic and bearing noises. Noise levels are below the permissible limit curves specified for electrical motors as defined by DIN EN 60034-9. Minimum noise emission during operation in the area of  $Q_{\text{optimal}}$  (best efficiency).

### Motor data

Surface-cooled synchronous motor with permanent excitation for frequency converter operation.

Design	IM B5
Motor connection	Manufacturer-specific
Protection type	IP 55
Speed	$1500 \text{ min}^{-1}$ $3000 \text{ min}^{-1}$
Connection	$\lambda$ 300 - 400 V
Insulation class VDE 0530	F

Motors have a PTC thermistor as standard.

### General data

- Pump colour RAL 5010 (standard)
- Media temperature range from - 5 to + 120 °C
- Ambient temperature range from - 5 to + 40 °C
- Density of the pumped medium max.  $1000 \text{ kg/m}^3$
- Viscosity of the pumped medium max.  $1 \text{ mm}^2/\text{s}$  (1 CST)
- Frequency regulation of pumps depending on the operating conditions
- Performance verification according to DIN EN ISO 9906, Class 2.

### Special configurations

- Different insulation class
- Elevated ambient temperature
- Elevated protection type
- Enhanced tropical and moisture protection
- Special materials (high-alloy cast steel, bronze) for parts coming into contact with the product
- Special paint finish
- Customer-specific solutions

### Accessories

- Frequency converter for direct installation (up to 30 kW) or wall installation
- Dry running protection for mechanical seal (ETS X4)

# Technical descriptions

## Model designation

Example:

**150-270/0554GF-PM-W1**

**Nominal diameter pressure flange DN [mm]** \_\_\_\_\_

**Design dimensions** \_\_\_\_\_

**Hydraulic version** \_\_\_\_\_

**Motor rating P<sub>2</sub> [kW]** \_\_\_\_\_

E.g.: 055 = 5.5 kW

**Speed** \_\_\_\_\_

2 = 3000 min<sup>-1</sup>

4 = 1500 min<sup>-1</sup>

**Model** \_\_\_\_\_

**Motor model** \_\_\_\_\_

PM = Permanent magnet motor

**Materials** \_\_\_\_\_

## Materials <sup>3)</sup>

<sup>1)</sup>	<b>Individual components</b>	<b>W1/1 <sup>2)</sup></b>	<b>W1/2 <sup>2)</sup></b>	<b>W2</b>	<b>W3</b>
101	Pump casing	EN-GJL-250 (EN-JL1040)	EN-GJL-250 (EN-JL1040)	EN-GJL-250 (EN-JL1040)	CuSn10-C (CC480K)
113	Intermediate casing	EN-GJL-250 (EN-JL1040)	EN-GJL-250 (EN-JL1040)	EN-GJL-250 (EN-JL1040)	CuSn10-C (CC480K)
162	Suction cover	EN-GJL-250 (EN-JL1040)	EN-GJL-250 (EN-JL1040)	EN-GJL-250 (EN-JL1040)	CuSn10-C (CC480K)
230	Impeller	EN-GJL-250 (EN-JL1040)	EN-GJL-250 (EN-JL1040)	CuAl10Fe5Ni5-C (CC333G)	CuAl10Fe5Ni5-C (CC333G)
433	Mechanical seal	SiC/SiC	Coal/chromium molybdenum steel	SiC/SiC	SiC/SiC
502	Casing wear ring	–	–	–	CuSn7Pb15-C (CC496K)
819	Motor shaft	X6CrNiMoTi17-12-2 (1.4571)	X6CrNiMoTi17-12-2 (1.4571)	X6CrNiMoTi17-12-2 (1.4571)	X6CrNiMoTi17-12-2 (1.4571)

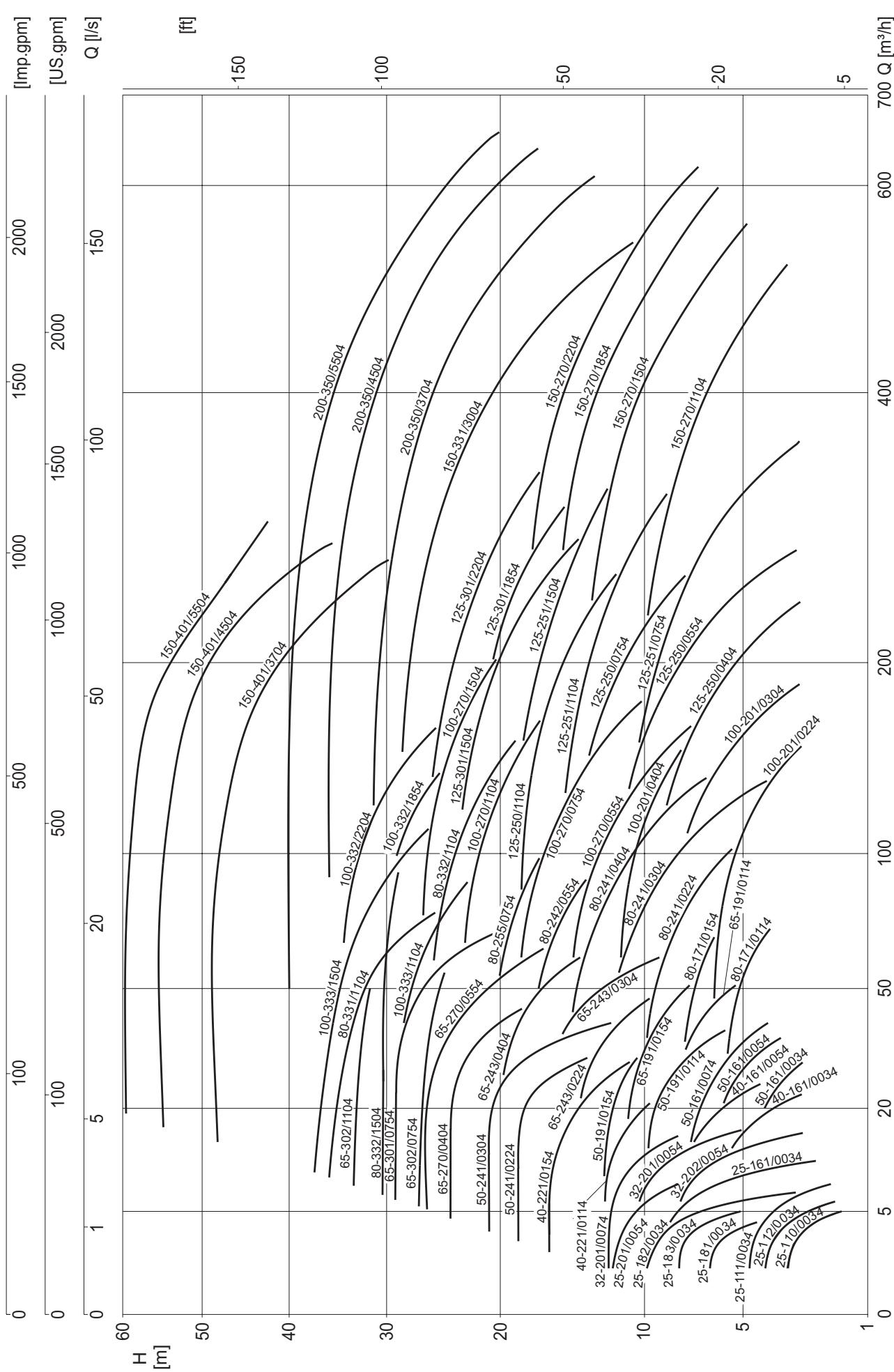
<sup>1)</sup> See exploded view (page 22)

<sup>2)</sup> On request

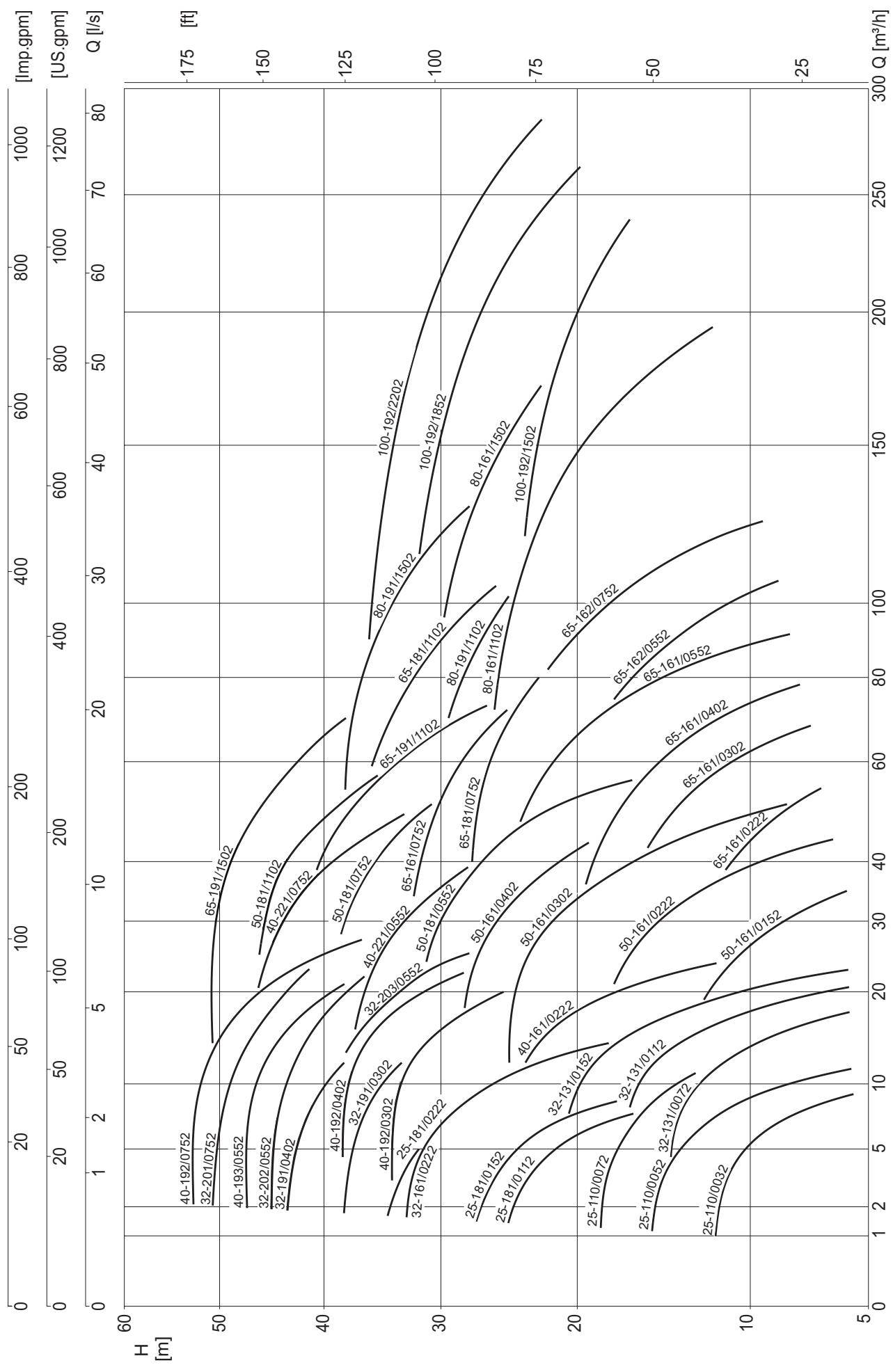
<sup>3)</sup> Other material combinations depending on operating conditions, e.g. special bronzes and stainless steels.

## Overview

1500 min<sup>-1</sup>



Technical information on the parallel connection of centrifugal pumps on request.

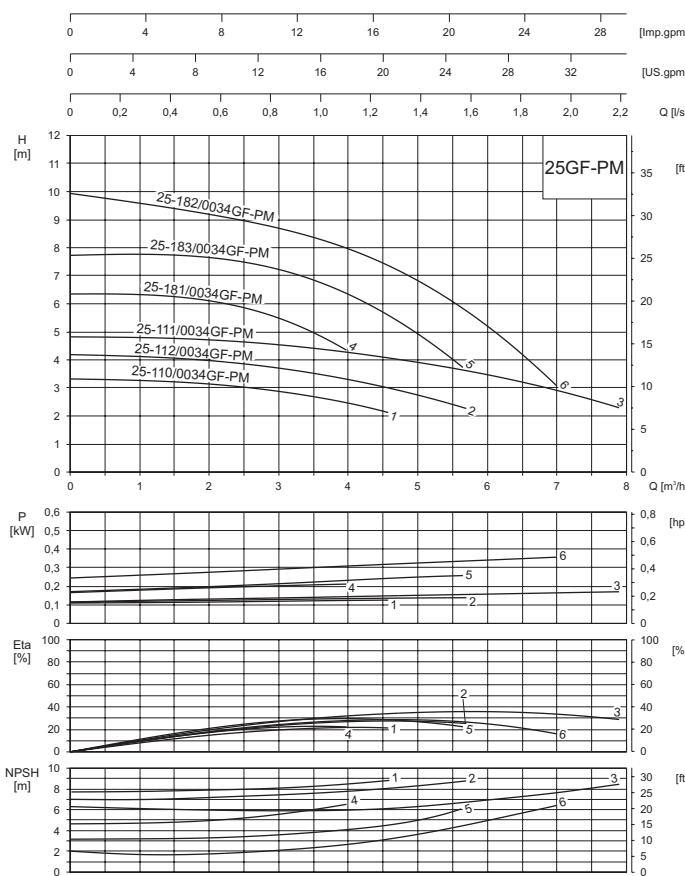


Technical information on the parallel connection of centrifugal pumps on request.

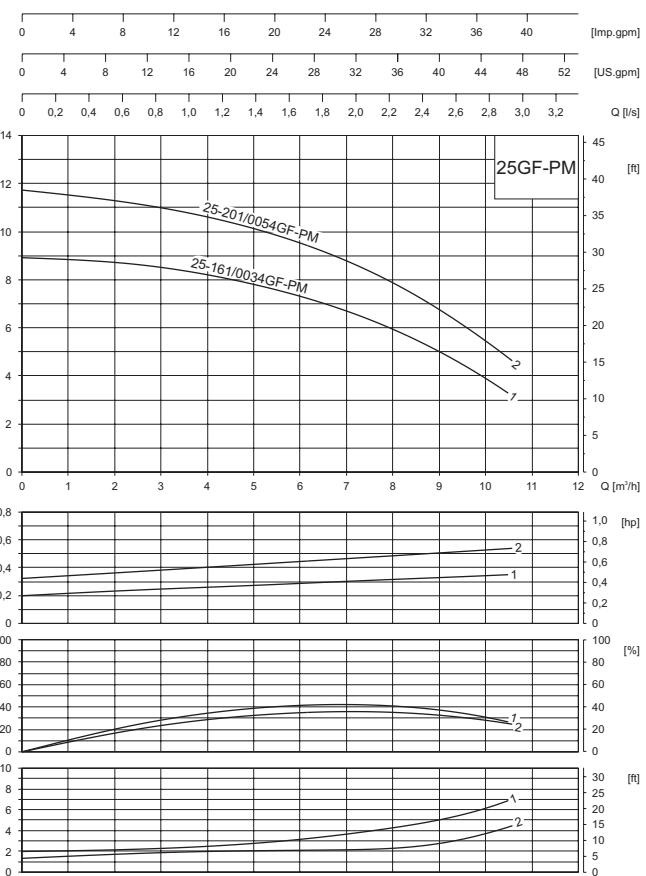
# Characteristic curves

**1500 min<sup>-1</sup>**

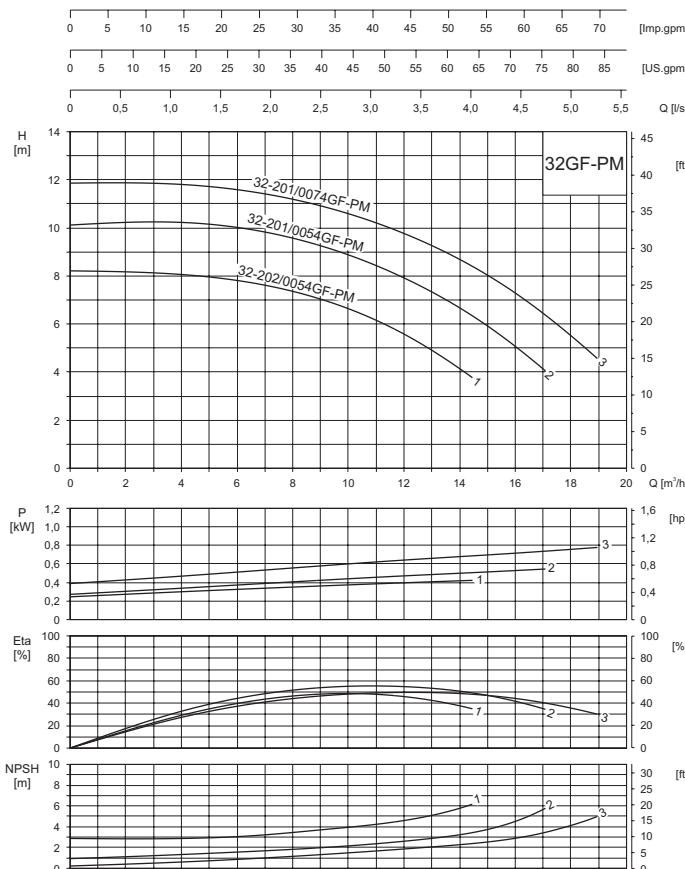
## DN 25



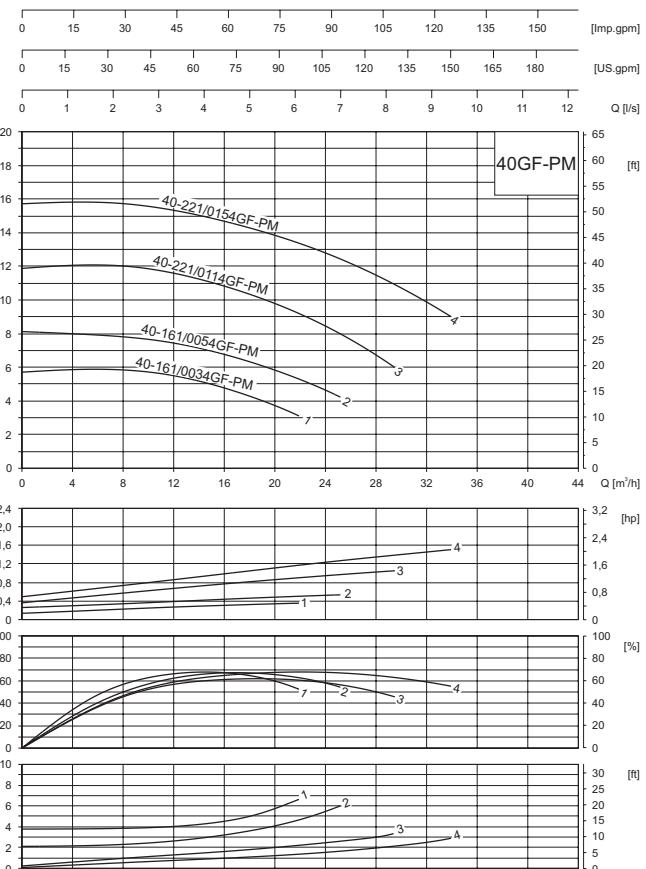
## DN 25



## DN 32



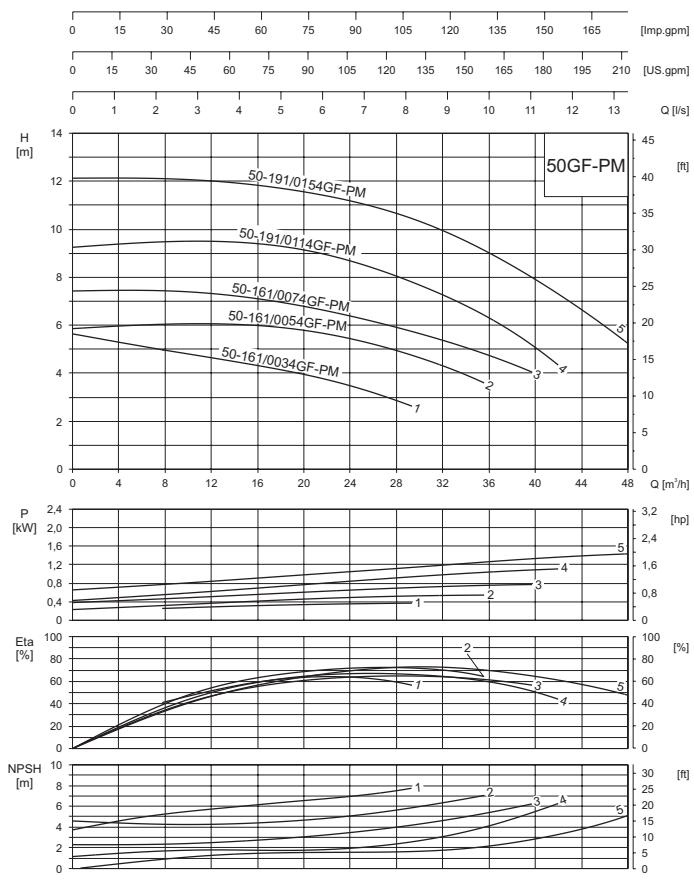
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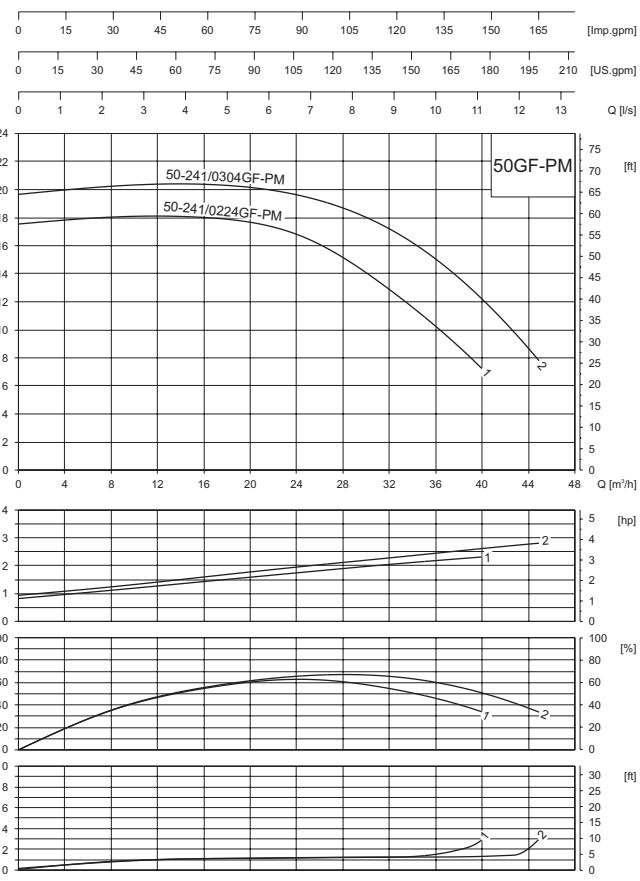
**1500 min<sup>-1</sup>**

## Characteristic curves

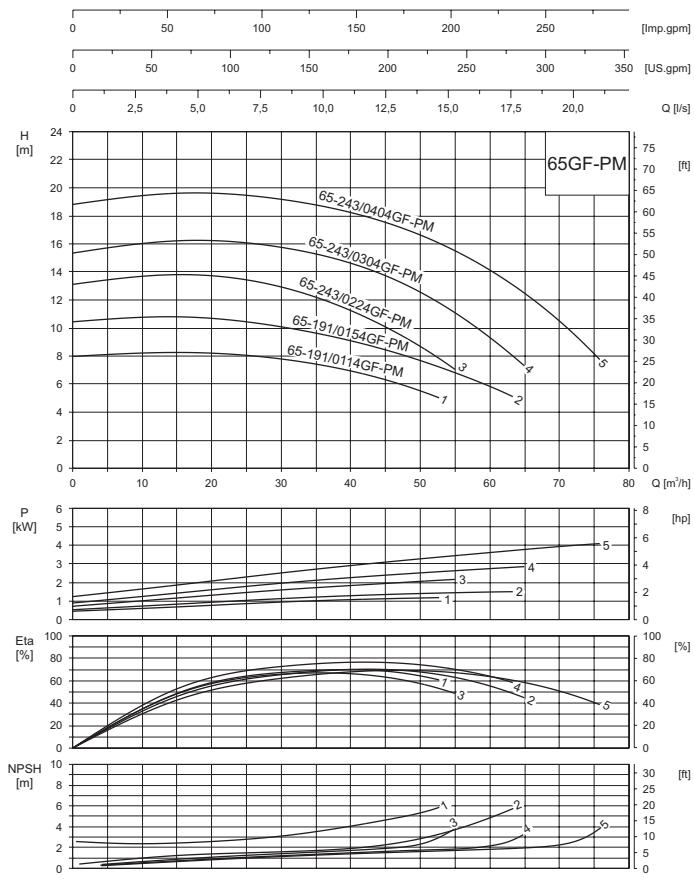
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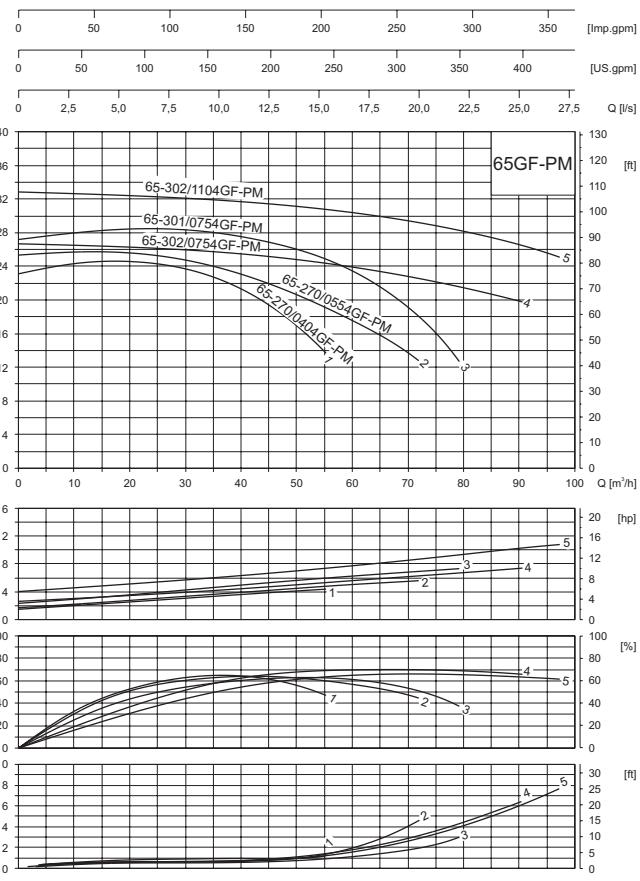
### DN 50



### DN 65



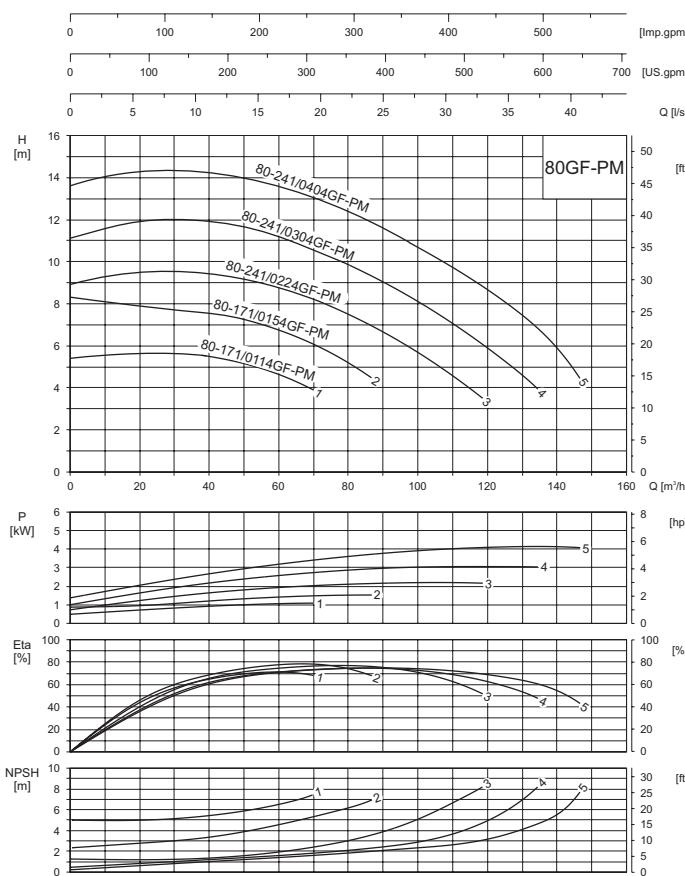
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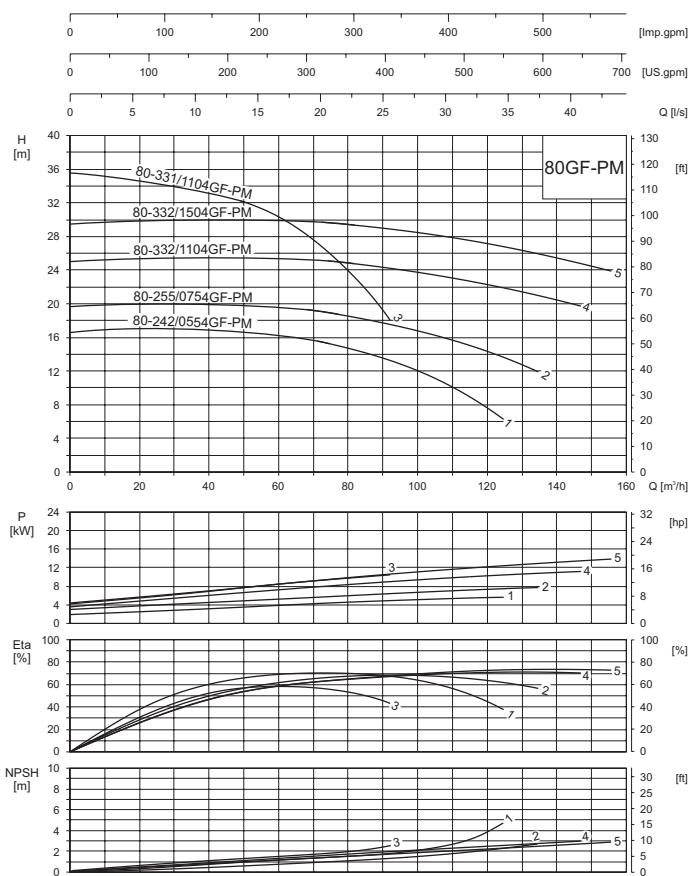
# Characteristic curves

**1500 min<sup>-1</sup>**

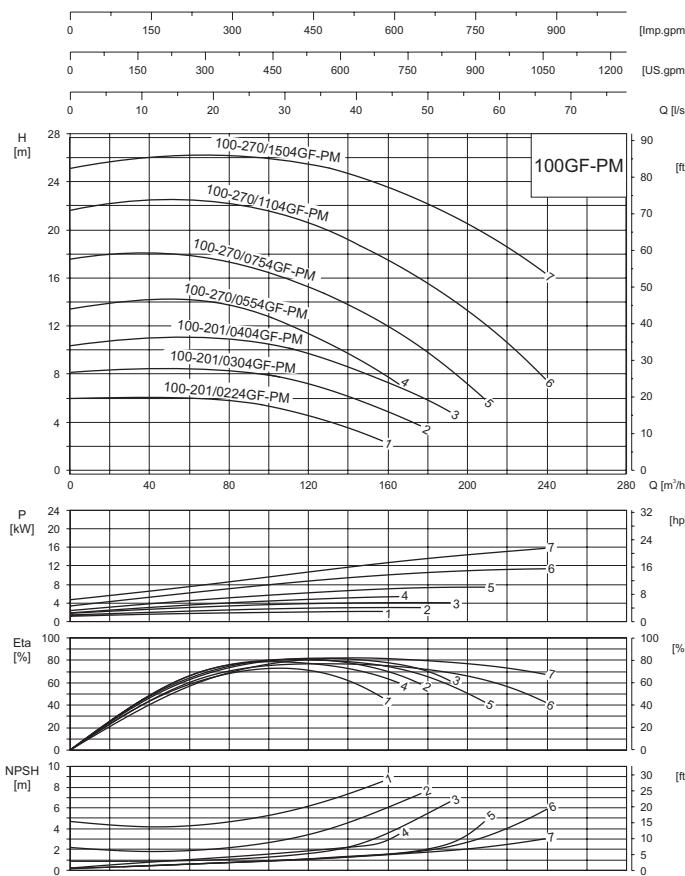
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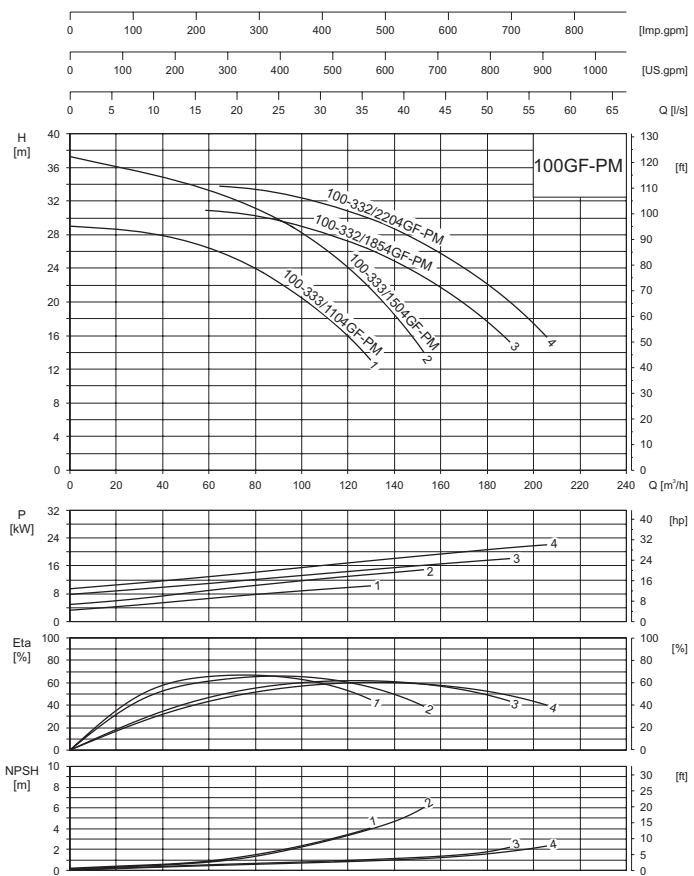
## DN 80



## DN 100

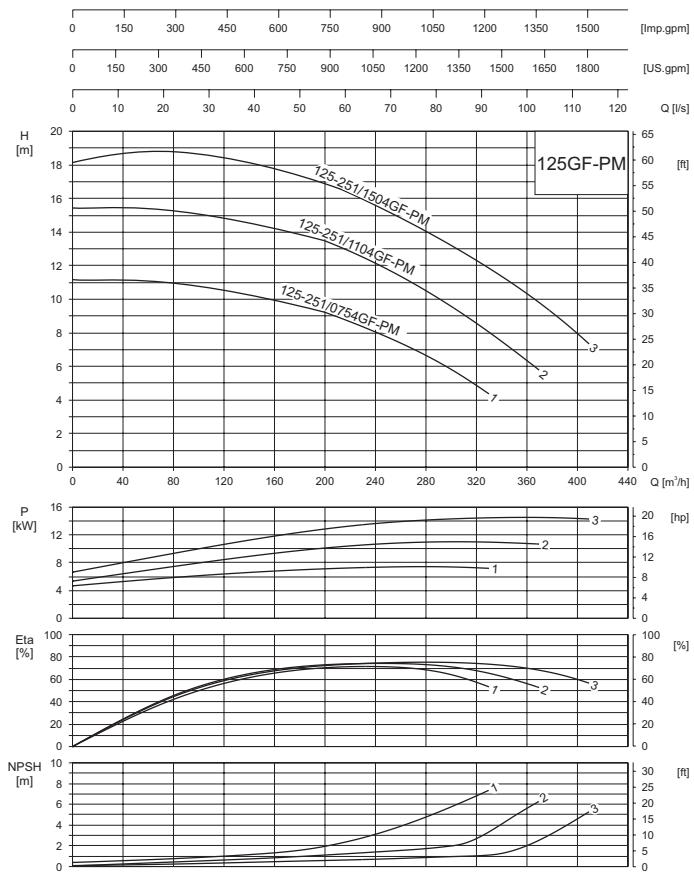


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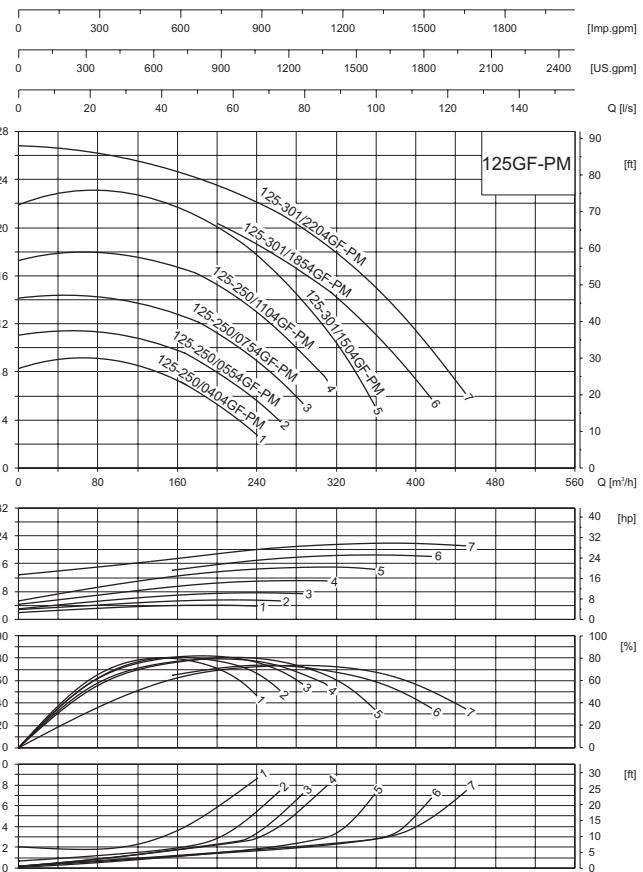


## Characteristic curves

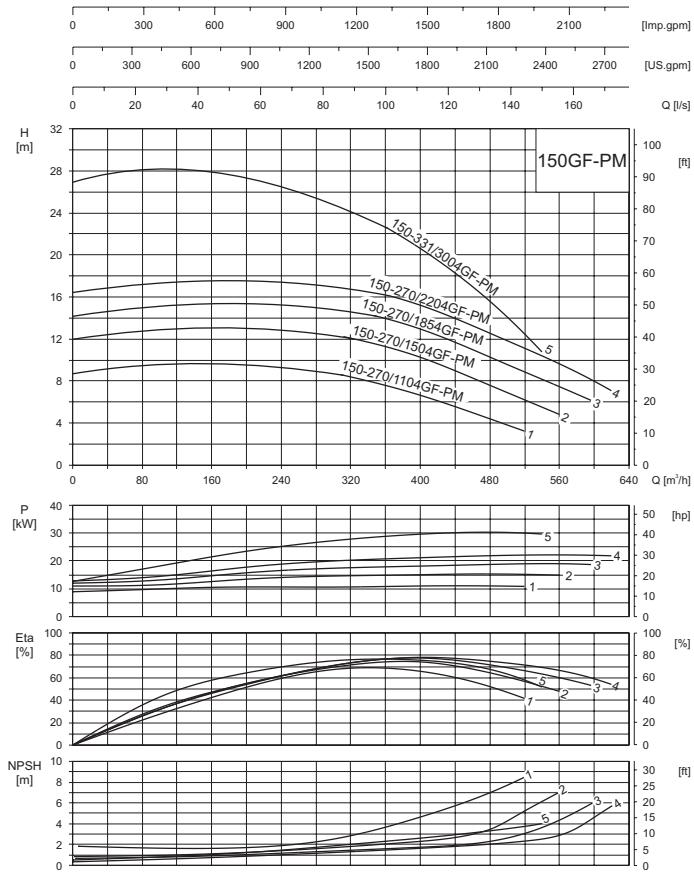
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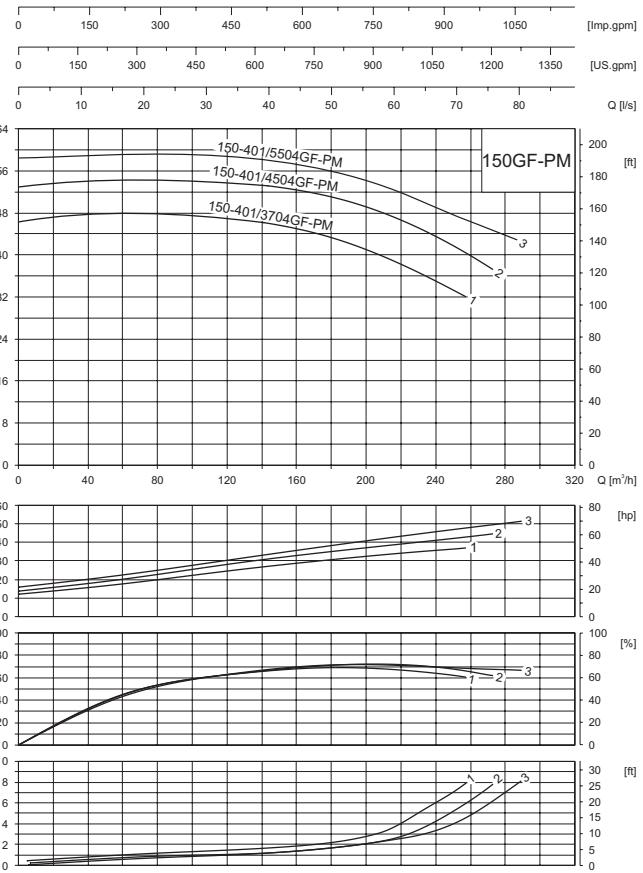
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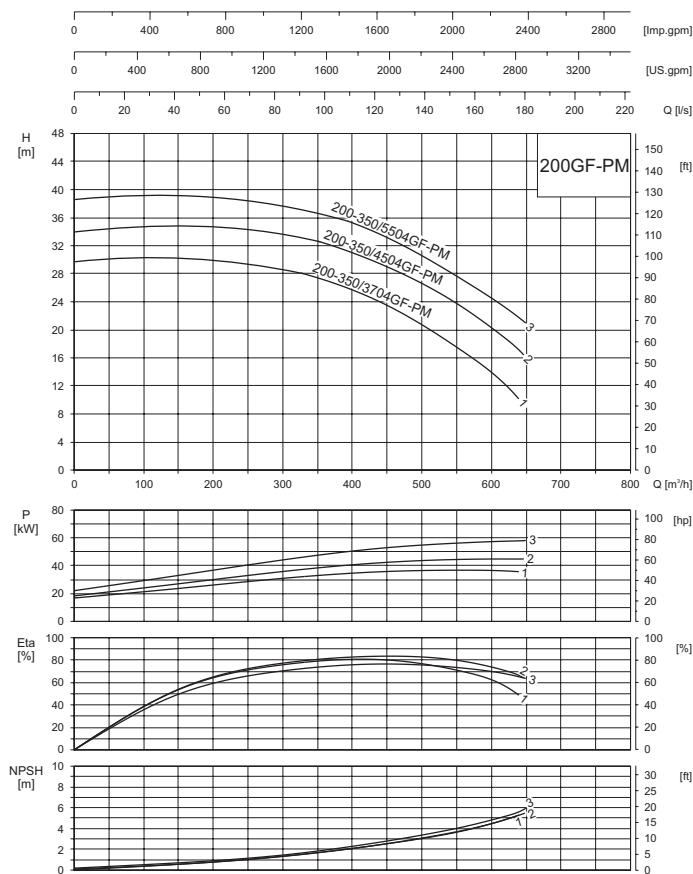


## DN 150



## DN 150

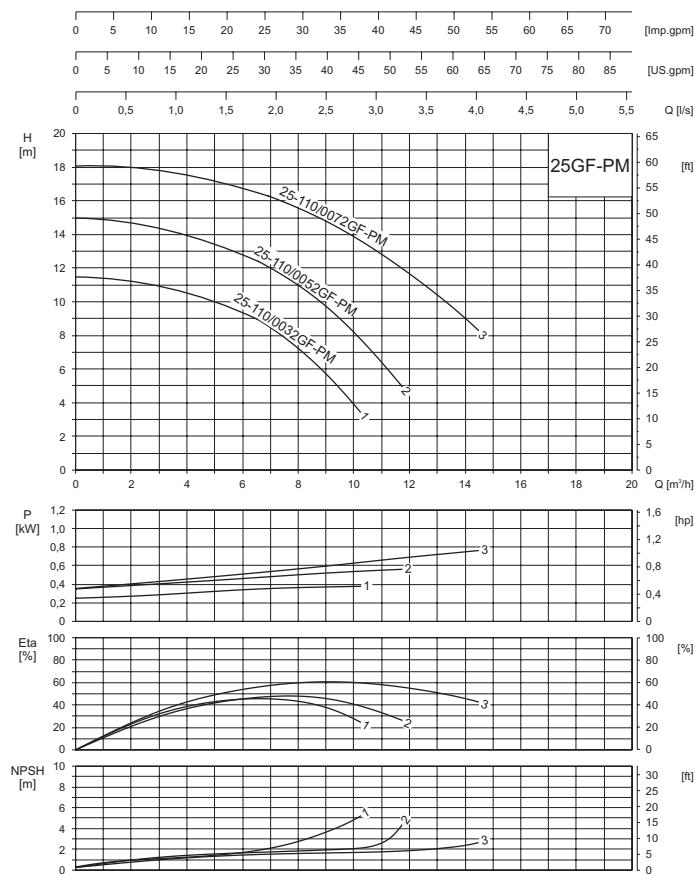


**DN 200**

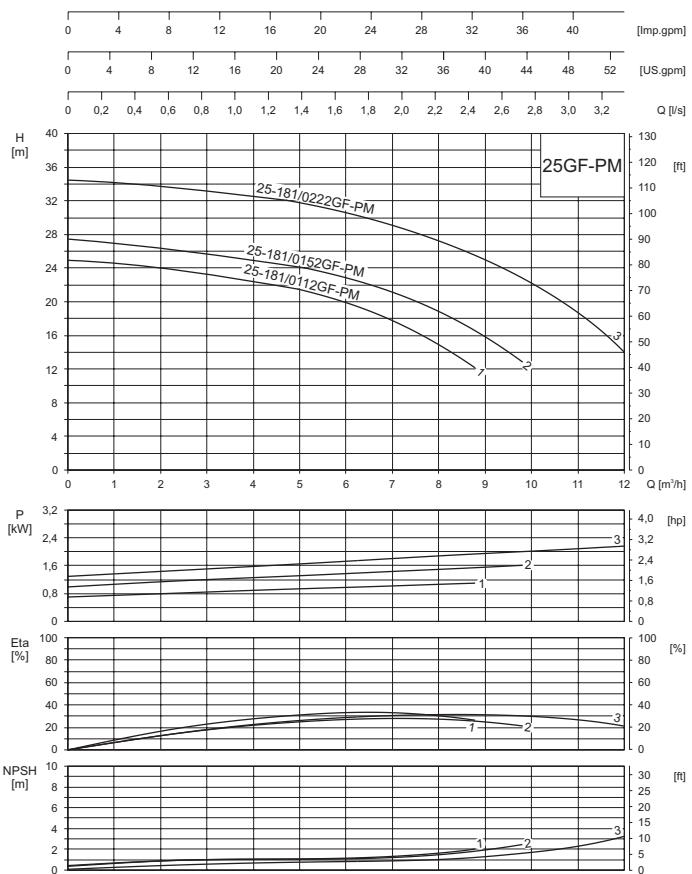
**3000 min<sup>-1</sup>**

## Characteristic curves

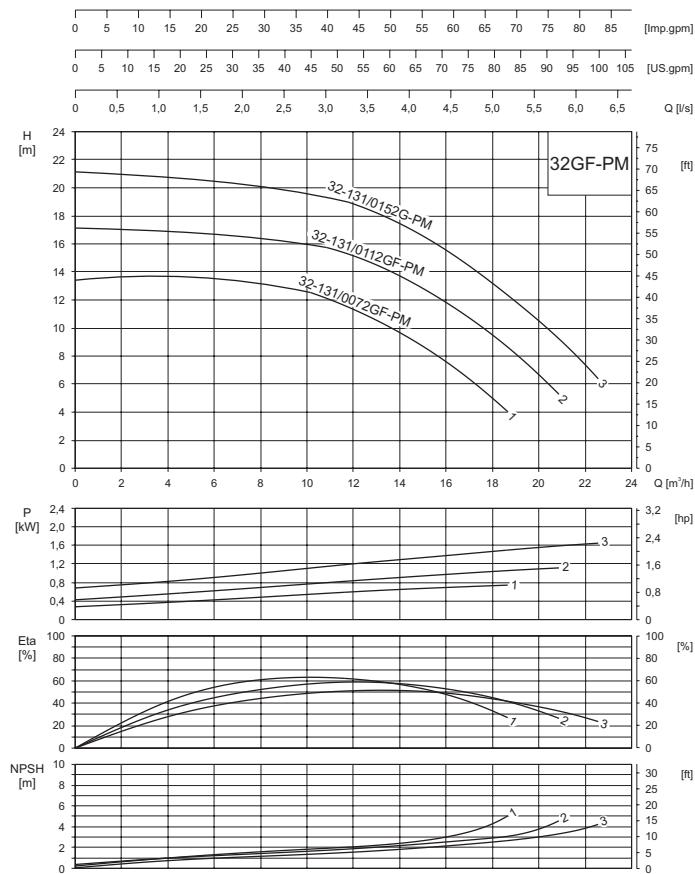
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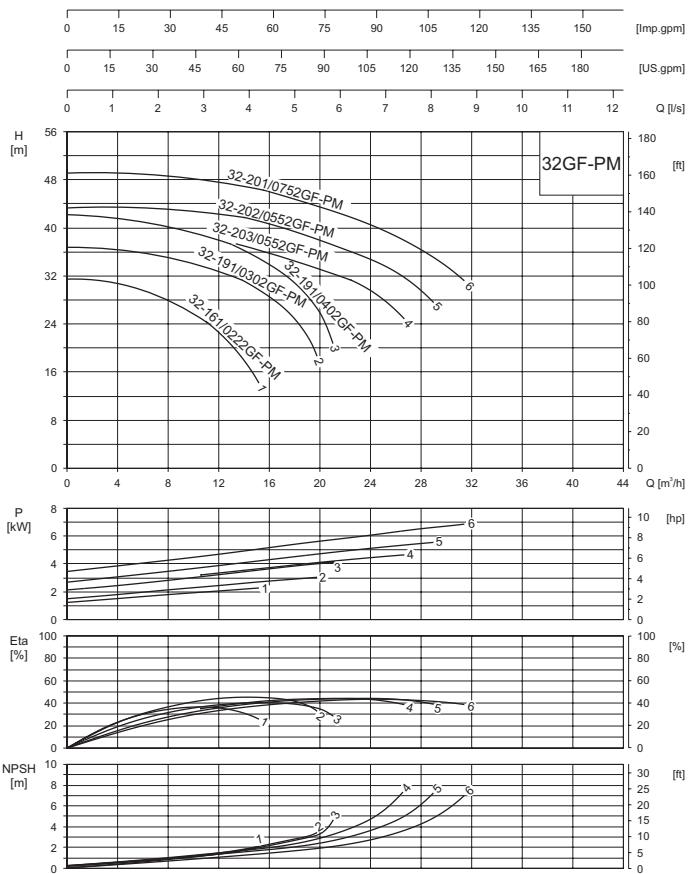
### DN 25



### DN 32



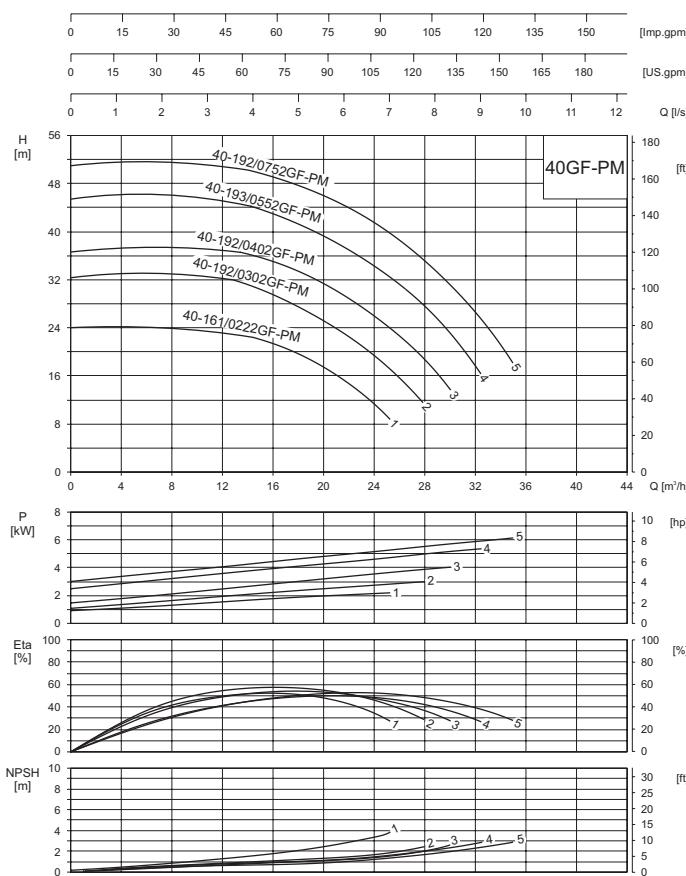
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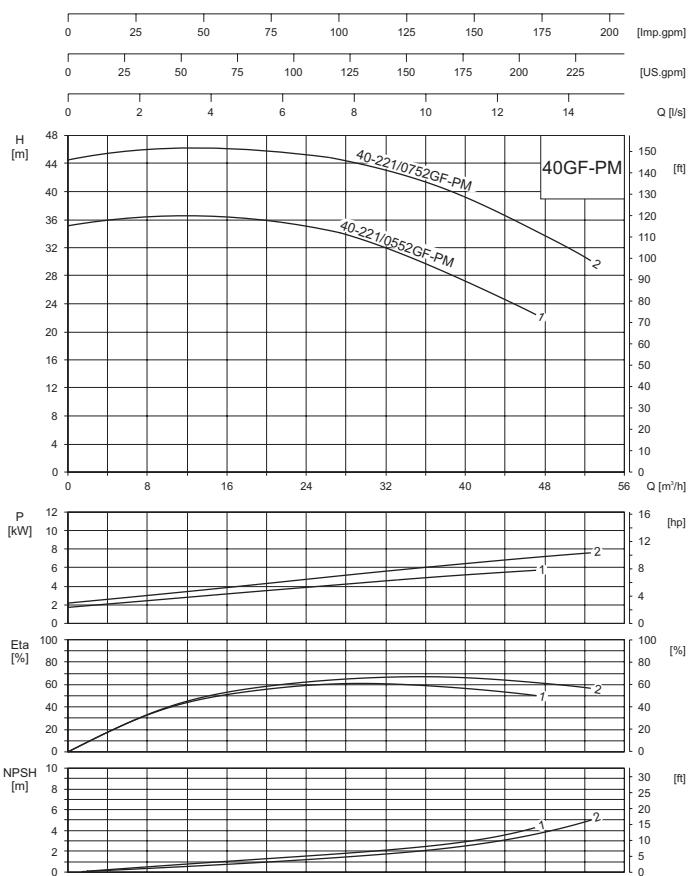
# Characteristic curves

**3000 min<sup>-1</sup>**

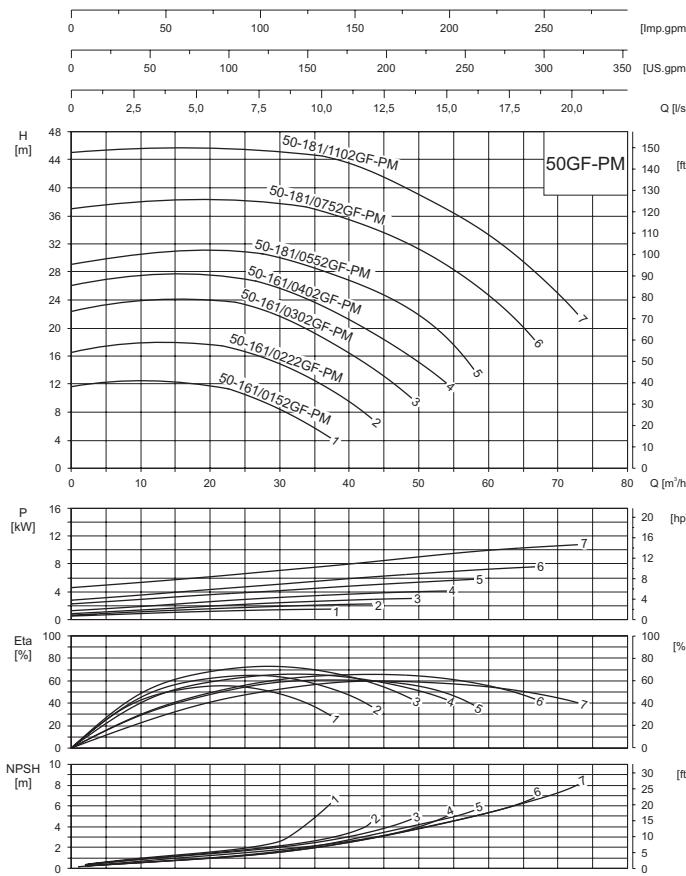
## DN 40



## DN 40



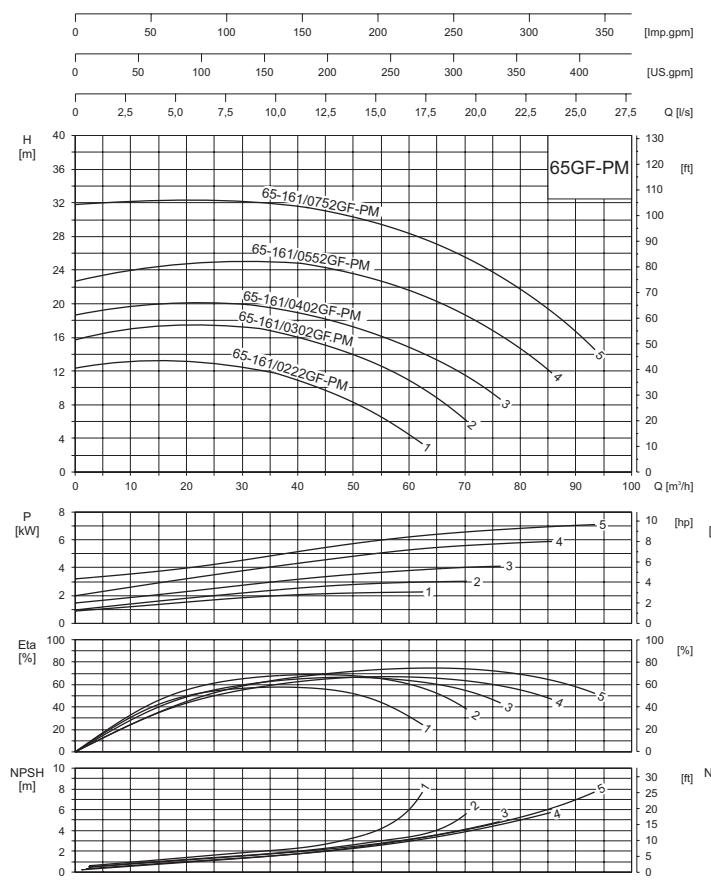
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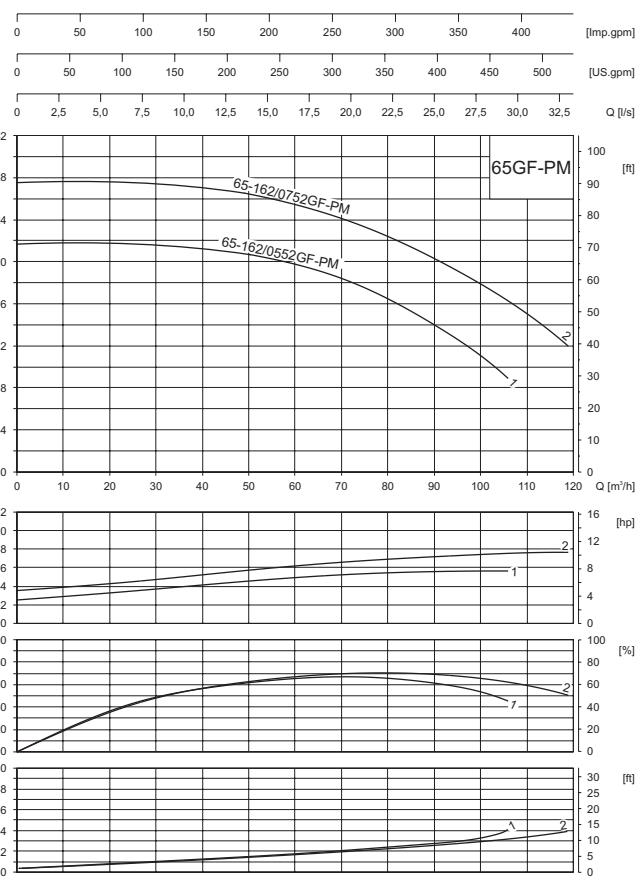
**3000 min<sup>-1</sup>**

## Characteristic curves

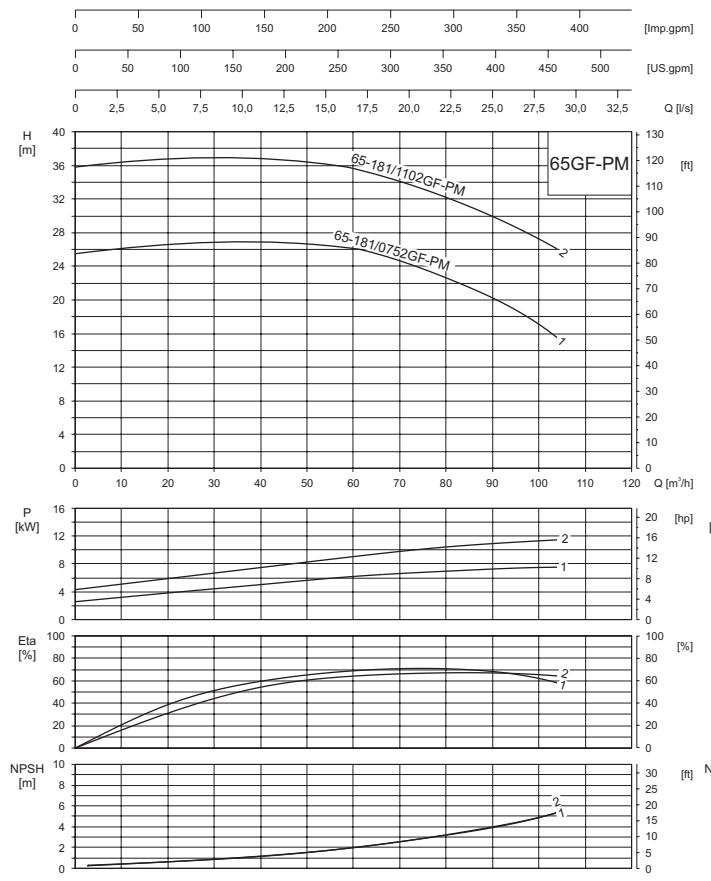
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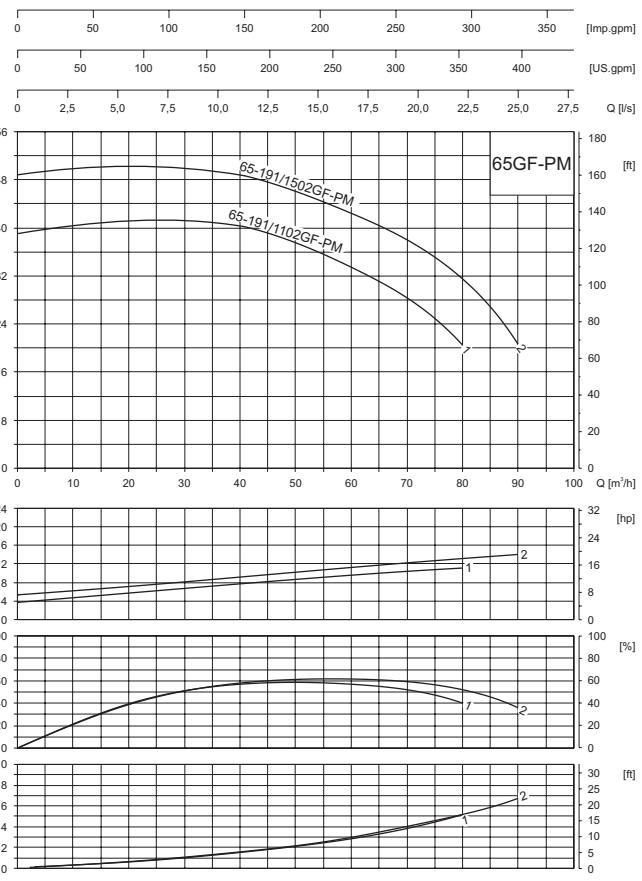
### DN 65



### DN 65



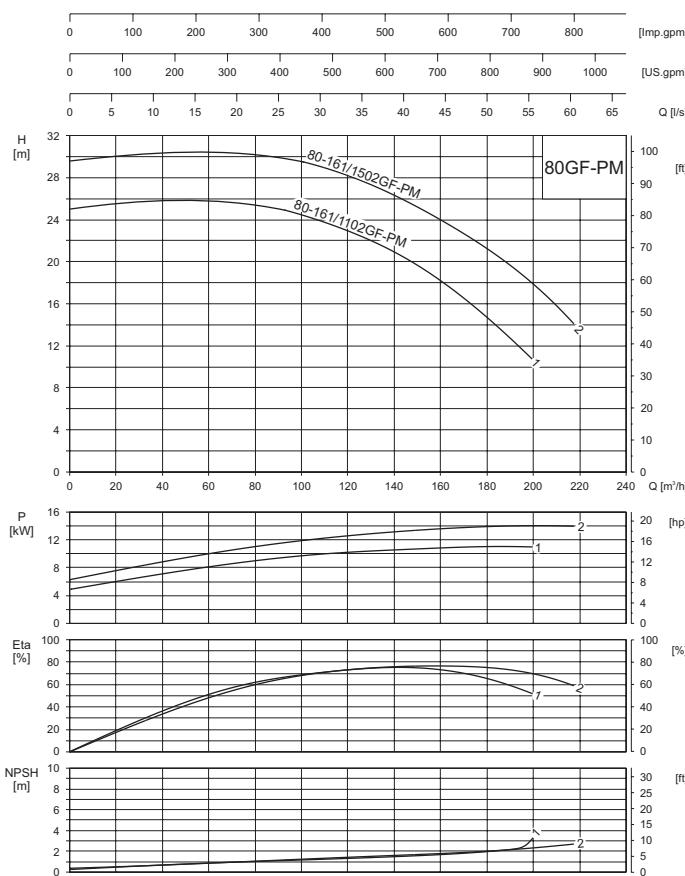
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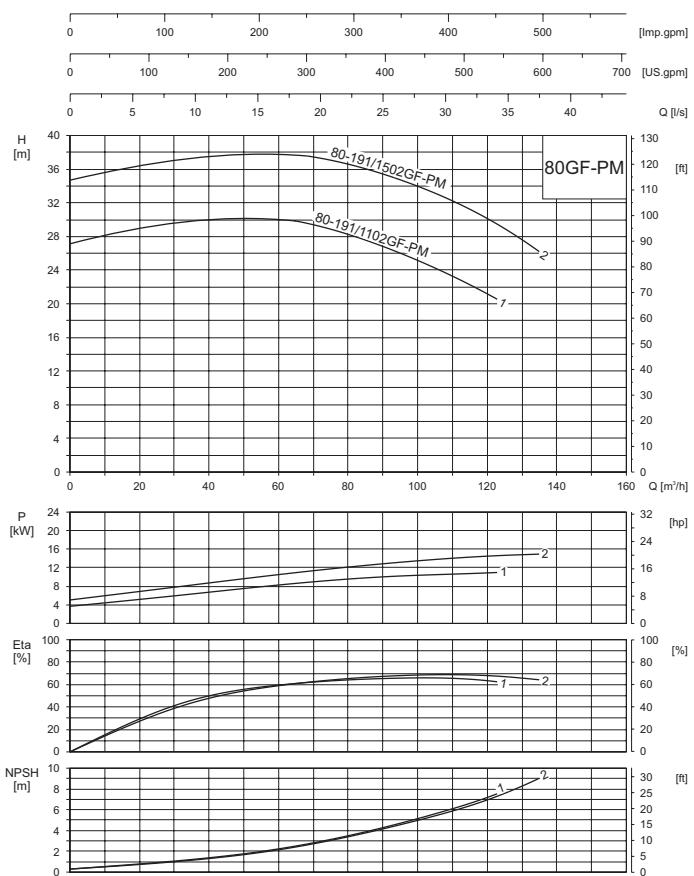
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**3000 min<sup>-1</sup>**

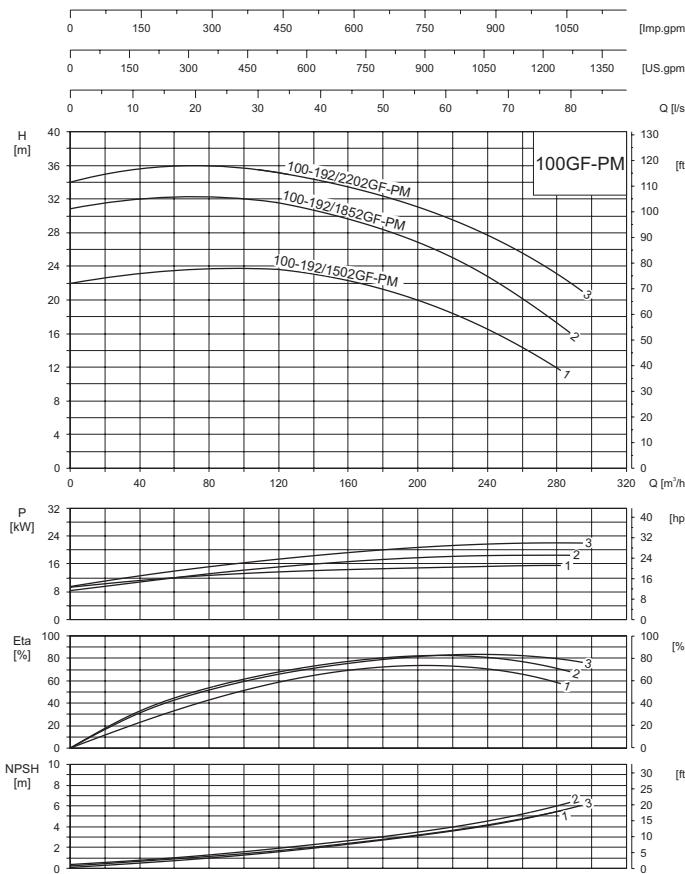
## DN 80



## DN 80



## DN 100

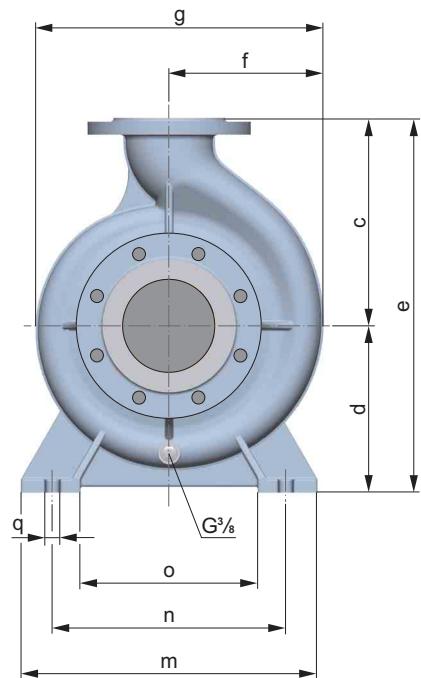
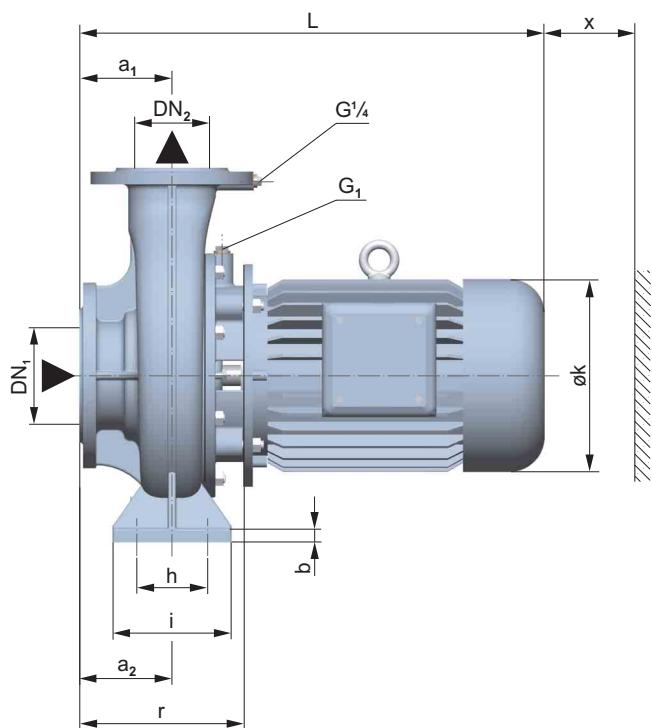


Q [l/s]

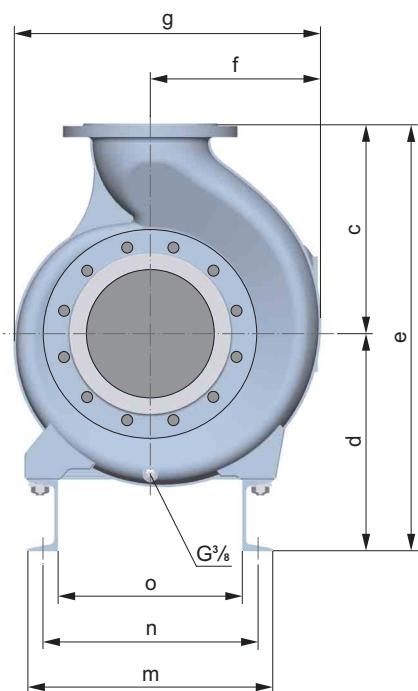
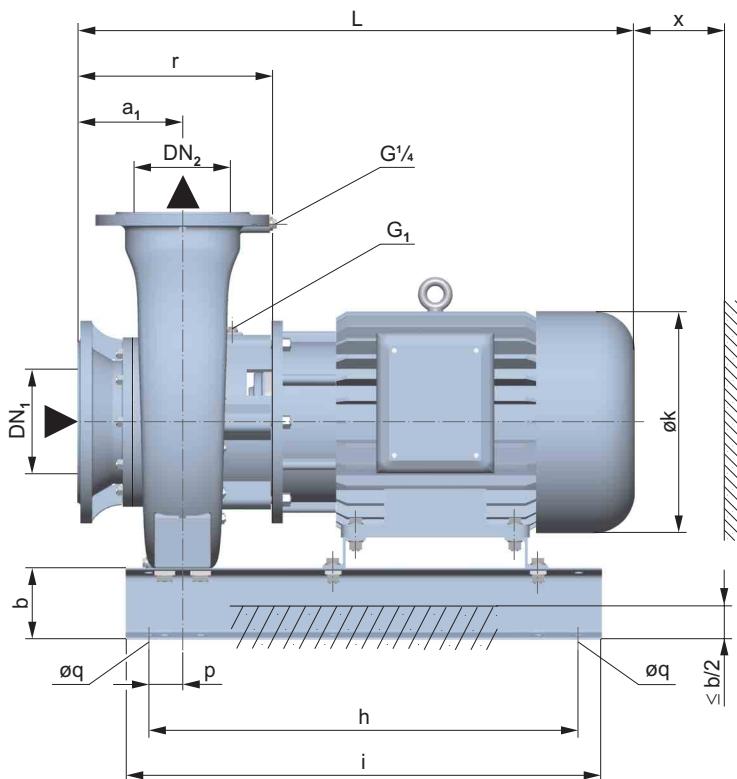
Q [l/s]

## Dimensions

### Standard



### Base rail $\geq 37 \text{ kW}$



Flange connection dimensions according to DIN 2501 PN 10  
Dimensions with frequency converter for direct installation on request.

# Dimensions

**1500 min<sup>-1</sup>**

Model	DN <sub>1</sub>	DN <sub>2</sub>	G <sub>1</sub>	L	a <sub>1</sub>	a <sub>2</sub>	b	c	d	e	f	g	h	øk	i	o	n	m	p	q	r	x <sub>min.</sub>	2) [kg]
25-110/0034GF-PM	32	25	1/4	420	100	95	15	120	112	232	122	204	70	138	100	90	140	190	-	14	204	150	22
25-111/0034GF-PM	32	25	1/4	420	100	95	15	120	112	232	122	204	70	138	100	90	140	190	-	14	204	150	22
25-112/0034GF-PM	32	25	1/4	420	100	95	15	120	112	232	122	204	70	138	100	90	140	190	-	14	204	150	22
25-161/0034GF-PM	32	25	1/4	420	100	100	15	150	132	282	122	229	70	138	100	140	190	240	-	14	204	150	28
25-181/0034GF-PM	32	25	1/4	415	100	100	15	150	132	282	122	239	70	138	100	140	190	240	-	14	199	150	30
25-182/0034GF-PM	32	25	1/4	415	100	100	15	150	132	282	122	239	70	138	100	140	190	240	-	14	199	150	30
25-183/0034GF-PM	32	25	1/4	415	100	100	15	150	132	282	122	239	70	138	100	140	190	240	-	14	199	150	30
25-201/0054GF-PM	32	25	1/4	450	100	100	15	180	132	312	127	254	70	139	100	140	190	240	-	14	205	150	40
32-201/0054GF-PM	40	32	1/4	445	100	100	15	180	160	340	141	268	70	139	100	140	190	240	-	14	204	150	40
32-202/0054GF-PM	40	32	1/4	445	100	100	15	180	160	340	141	268	70	139	100	140	190	240	-	14	204	150	40
32-201/0074GF-PM	40	32	1/4	445	100	100	15	180	160	340	141	268	70	139	100	140	190	240	-	14	204	150	41
40-161/0034GF-PM	50	40	1/8	425	110	110	15	160	132	292	122	229	70	138	100	140	190	240	-	14	209	150	34
40-161/0054GF-PM	50	40	1/4	450	110	110	15	160	132	292	119	226	70	139	100	140	190	240	-	14	209	150	40
40-221/0114GF-PM	50	40	1/4	470	110	110	15	200	160	360	158	295	70	157	100	165	212	265	-	14	204	150	47
40-221/0154GF-PM	50	40	1/4	495	110	110	15	200	160	360	158	295	70	176	100	165	212	265	-	14	204	150	49
50-161/0034GF-PM	65	50	1/8	430	115	115	15	180	132	312	138	251	70	138	100	140	190	240	-	14	216	150	36
50-161/0054GF-PM	65	50	1/4	460	115	115	15	180	132	312	138	251	70	139	100	140	190	240	-	14	216	150	42
50-161/0074GF-PM	65	50	1/4	460	115	115	15	180	132	312	138	251	70	139	100	140	190	240	-	14	216	150	43
50-191/0114GF-PM	65	50	3/8	480	115	115	15	200	160	360	152	279	70	157	100	165	212	265	-	14	215	150	50
50-191/0154GF-PM	65	50	3/8	510	115	115	15	200	160	360	152	279	70	176	100	165	212	265	-	14	215	150	53
50-241/0224GF-PM	65	50	3/8	520	115	115	18	220	180	400	167	317	95	177	125	190	250	320	-	14	203	150	68
50-241/0304GF-PM	65	50	3/8	530	115	115	18	220	180	400	167	317	95	196	125	190	250	320	-	14	213	150	77
65-191/0114GF-PM	80	65	3/8	490	125	125	15	210	160	370	165	303	95	157	125	150	212	280	-	14	225	150	55
65-191/0154GF-PM	80	65	3/8	520	125	125	15	210	160	370	165	303	95	176	125	150	212	280	-	14	225	150	58
65-243/0224GF-PM	80	65	3/8	525	115	115	18	230	180	410	182	338	95	177	125	190	250	320	-	14	205	150	72
65-243/0304GF-PM	80	65	3/8	535	115	115	18	230	180	410	182	338	95	196	125	190	250	320	-	14	215	150	81
65-243/0404GF-PM	80	65	3/8	595	115	115	18	230	180	410	182	338	95	196	125	190	250	320	-	14	215	150	88
65-270/0404GF-PM	80	65	3/8	575	100	100	18	225	200	425	182	347	120	196	160	200	280	360	-	18	198	150	87
65-270/0554GF-PM	80	65	3/8	605	100	100	18	225	200	425	181	346	120	220	160	200	280	360	-	18	198	150	95
65-301/0754GF-PM	80	65	3/8	650	125	125	18	270	225	495	226	427	120	258	160	240	315	400	-	18	221	150	117
65-302/0754GF-PM	80	65	3/8	650	105	105	14	270	225	495	215	411	120	258	160	240	320	400	-	18	221	150	140
65-302/1104GF-PM	80	65	3/8	730	105	105	14	270	225	495	215	411	120	260	160	240	320	400	-	18	217	150	162
80-171/0114GF-PM	100	80	1/8	495	125	125	15	220	160	380	170	302	95	157	125	150	212	280	-	14	229	150	60
80-171/0154GF-PM	100	80	1/8	520	125	125	15	220	160	380	170	302	95	176	125	150	212	280	-	14	229	150	63
80-241/0224GF-PM	100	80	3/8	535	125	125	18	250	200	450	211	379	120	177	160	200	280	360	-	18	216	150	76
80-241/0304GF-PM	100	80	3/8	540	125	125	18	250	200	450	211	379	120	196	160	200	280	360	-	18	221	150	84
80-241/0404GF-PM	100	80	3/8	600	125	125	18	250	200	450	211	379	120	196	160	200	280	360	-	18	221	150	93
80-242/0554GF-PM	100	80	3/8	655	125	125	18	250	200	450	201	366	120	220	160	200	280	360	-	18	248	150	108
80-255/0754GF-PM	100	80	3/8	680	125	125	18	270	225	495	212	386	120	258	160	240	315	400	-	18	249	150	132
80-331/1104GF-PM	100	80	3/8	745	125	125	20	280	250	530	236	457	120	260	160	240	315	400	-	18	235	150	163
80-332/1104GF-PM	100	80	3/8	760	125	125	20	315	247	562	250	464	120	260	160	240	315	400	-	18	247	150	189
80-332/1504GF-PM	100	80	3/8	795	125	125	20	315	247	562	250	464	120	313	160	240	315	400	-	18	247	150	217
100-201/0224GF-PM	125	100	3/8	575	160	160	18	280	200	480	210	369	120	177	160	200	280	360	-	18	256	150	84
100-201/0304GF-PM	125	100	3/8	580	160	160	18	280	200	480	210	369	120	196	160	200	280	360	-	18	261	150	93
100-201/0404GF-PM	125	100	3/8	640	160	160	18	280	200	480	210	369	120	196	160	200	280	360	-	18	261	150	100
100-270/0554GF-PM	125	100	3/8	630	125	125	18	280	225	505	206	384	120	220	160	240	315	400	-	18	222	150	107
100-270/0754GF-PM	125	100	3/8	655	125	125	18	280	225	505	206	384	120	258	160	240	315	400	-	18	222	150	125
100-270/1104GF-PM	125	100	3/8	745	125	125	18	280	225	505	206	384	120	258	160	240	315	400	-	18	235	150	151
100-270/1504GF-PM	125	100	3/8	785	125	125	18	280	225	505	243	421	120	313	160	240	315	400	-	18	235	150	180
100-333/1104GF-PM	125	100	3/8	745	125	125	20	290	250	540	228	433	120	260	160	240	315	400	-	18	235	150	171
100-333/1504GF-PM	125	100	3/8	785	125	125	20	290	250	540	243	448	120	313	160	240	315	400	-	18	235	150	199
100-332/1854GF-PM	125	100	3/8	890	140	140	20	370	280	650	318	561	150	315	200	300	400	500	-	24	290	150	248
100-332/2204GF-PM	125	100	3/8	915	140	140	20	370	280	650	318	561	150	350	200	3							

# Dimensions

**3000 min<sup>-1</sup>**

Model	DN <sub>1</sub>	DN <sub>2</sub>	G <sub>1</sub>	L	a <sub>1</sub>	a <sub>2</sub>	b	c	d	e	f	g	h	øk	i	o	n	m	q	r	x <sub>min.</sub>	1) [kg]
25-110/0032GF-PM	32	25	1/4	420	100	95	15	120	112	232	122	204	70	138	100	90	140	190	14	204	150	21
25-110/0052GF-PM	32	25	1/4	420	100	95	15	120	112	232	122	204	70	138	100	90	140	190	14	204	150	22
25-110/0072GF-PM	32	25	1/4	445	100	95	15	120	112	232	112	212	70	139	100	90	140	190	14	204	150	27
25-181/0112GF-PM	32	25	1/4	440	100	100	15	150	132	282	117	234	70	139	100	140	190	240	14	199	150	35
25-181/0152GF-PM	32	25	1/4	465	100	100	15	150	132	282	119	236	70	157	100	140	190	240	14	199	150	40
25-181/0222GF-PM	32	25	1/4	490	100	100	15	150	132	282	148	265	70	176	100	140	190	240	14	199	150	41
32-131/0072GF-PM	40	32	1/4	435	100	100	15	130	112	242	112	212	70	139	100	90	140	190	14	193	150	32
32-131/0112GF-PM	40	32	1/4	435	100	100	15	130	112	242	112	212	70	139	100	90	140	190	14	193	150	33
32-131/0152GF-PM	40	32	1/4	460	100	100	15	130	112	242	119	219	70	157	100	90	140	190	14	193	150	36
32-161/0222GF-PM	40	32	1/4	495	100	100	15	150	132	282	148	255	70	176	100	140	190	240	14	204	150	43
32-191/0302GF-PM	40	32	1/4	530	100	100	15	170	132	302	140	265	70	177	100	140	190	240	14	215	150	56
32-191/0402GF-PM	40	32	1/4	595	100	100	15	170	132	302	140	265	70	196	100	140	190	240	14	215	150	63
32-202/0552GF-PM	40	32	1/4	635	100	100	15	180	160	340	150	300	70	196	100	140	190	240	14	227	150	87
32-203/0552GF-PM	40	32	1/4	635	100	100	15	180	160	340	150	300	70	196	100	140	190	240	14	227	150	87
32-201/0752GF-PM	40	32	1/4	635	100	100	15	180	160	340	150	300	70	196	100	140	190	240	14	227	150	87
40-161/0222GF-PM	50	40	1/4	495	110	110	15	150	132	282	148	255	70	176	100	140	190	240	14	202	150	45
40-192/0302GF-PM	50	40	1/4	535	110	110	15	170	132	302	150	300	70	177	100	140	190	240	14	224	150	57
40-192/0402GF-PM	50	40	1/4	600	110	110	15	170	132	302	150	300	70	196	100	140	190	240	14	224	150	64
40-193/0552GF-PM	50	40	1/4	645	110	110	15	170	180	350	136	252	70	196	100	140	190	240	14	237	150	72
40-192/0752GF-PM	50	40	1/4	645	110	110	15	170	180	350	136	252	70	196	100	140	190	240	14	237	150	84
40-221/0552GF-PM	50	40	-	620	110	110	15	200	160	360	158	296	70	196	100	165	212	265	14	214	150	75
40-221/0752GF-PM	50	40	-	620	110	110	15	200	160	360	158	296	70	196	100	165	212	265	14	214	150	87
50-161/0152GF-PM	65	50	1/4	480	115	115	15	160	132	292	120	227	70	157	100	140	190	240	14	214	150	44
50-161/0222GF-PM	65	50	1/4	505	115	115	15	160	132	292	148	255	70	176	100	140	190	240	14	214	150	47
50-161/0302GF-PM	65	50	1/4	535	115	115	15	160	132	292	129	254	70	177	100	140	190	240	14	224	150	57
50-161/0402GF-PM	65	50	1/4	600	115	115	15	160	132	292	136	261	70	196	100	140	190	240	14	224	150	63
50-181/0552GF-PM	65	50	1/4	630	110	110	15	180	160	340	150	300	70	196	100	140	190	240	14	221	150	81
50-181/0752GF-PM	65	50	1/4	630	110	110	15	180	160	340	150	300	70	196	100	140	190	240	14	221	150	93
50-181/1102GF-PM	65	50	1/4	650	110	110	15	180	160	340	200	350	70	258	100	140	190	240	14	217	150	111
65-161/0222GF-PM	80	65	1/8	520	125	125	15	180	160	340	148	260	95	176	125	150	212	280	14	226	150	54
65-161/0302GF-PM	80	65	1/4	550	125	125	15	180	160	340	137	262	95	177	125	150	212	280	14	236	150	64
65-161/0402GF-PM	80	65	1/4	615	125	125	15	180	160	340	137	262	95	196	125	150	212	280	14	236	150	70
65-161/0552GF-PM	80	65	1/4	660	125	125	15	180	160	340	150	300	95	196	125	150	212	280	14	251	150	82
65-162/0552GF-PM	80	65	1/8	605	100	100	15	180	160	340	150	300	95	196	125	150	212	280	14	197	150	77
65-161/0752GF-PM	80	65	1/4	660	125	125	15	180	160	340	150	300	95	196	125	150	212	280	14	251	150	94
65-162/0752GF-PM	80	65	1/8	605	100	100	15	180	160	340	150	300	95	196	125	150	212	280	14	197	150	89
65-181/0752GF-PM	80	65	1/4	650	125	125	15	200	160	360	150	300	95	196	125	150	212	280	14	243	150	94
65-181/1102GF-PM	80	65	1/4	670	125	125	15	200	160	360	200	350	95	258	125	150	212	280	14	238	150	109
65-181/1502GF-PM	80	65	1/4	750	125	125	15	200	160	360	202	352	95	258	125	150	212	280	14	238	150	131
65-191/1102GF-PM	80	65	1/4	670	125	125	15	200	160	360	200	350	95	258	125	150	212	280	14	241	150	111
65-191/1502GF-PM	80	65	1/4	755	125	125	15	200	160	360	202	352	95	258	125	150	212	280	14	241	150	133
80-161/1102GF-PM	100	80	-	670	125	125	18	225	180	405	200	350	95	258	125	190	250	320	14	237	150	120
80-161/1502GF-PM	100	80	-	750	125	125	18	225	180	405	202	352	95	258	125	190	250	320	14	237	150	142
80-191/1102GF-PM	100	80	1/4	665	120	120	18	230	180	410	200	350	95	258	125	190	250	320	14	235	150	117
80-191/1502GF-PM	100	80	1/4	745	120	120	18	230	180	410	202	352	95	258	125	190	250	320	14	235	150	139
100-192/1502GF-PM	125	100	-	750	125	125	18	280	200	480	202	353	120	258	160	200	280	360	18	238	150	160
100-192/1852GF-PM	125	100	-	785	125	125	18	280	200	480	243	400	120	313	160	200	280	360	18	238	150	188
100-192/2202GF-PM	125	100	-	800	125	125	18	280	200	480	243	400	120	313	160	200	280	360	18	238	150	204

1) Total weight of the pump

Flange connection dimensions according to DIN 2501 PN 10

Dimensions with frequency converter for direct installation on request.

## Technical specifications

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**1500 min<sup>-1</sup>**

P <sub>2</sub> [kW]	P <sub>1</sub> [kW]	λ/Δ	dB(A)
0,37	0,46	λ	52
0,55	0,68	λ	52
0,75	0,9	λ	52
1,1	1,29	λ	52
1,5	1,7	λ	55
2,2	2,49	λ	55
3,0	3,35	λ	55
4,0	4,44	λ	56
5,5	5,98	λ	61
7,5	8,15	λ	63
11,0	11,89	λ	63
15,0	16,29	λ	65
18,5	19,94	λ	65
22,0	23,4	λ	67
30,0	31,85	λ	67
37,0	39,19	λ	70
45,0	47,47	λ	70
55,0	57,89	λ	71

**3000 min<sup>-1</sup>**

P <sub>2</sub> [kW]	P <sub>1</sub> [kW]	λ/Δ	dB(A)
0,37	0,46	λ	61
0,55	0,66	λ	61
0,75	0,89	λ	61
1,1	1,29	λ	61
1,5	1,73	λ	61
2,2	2,51	λ	67
3,0	3,39	λ	67
4,0	4,52	λ	67
5,5	6,15	λ	68
7,5	8,29	λ	68
11,0	11,83	λ	74
15,0	15,96	λ	74
18,5	20,07	λ	74
22,0	23,84	λ	75

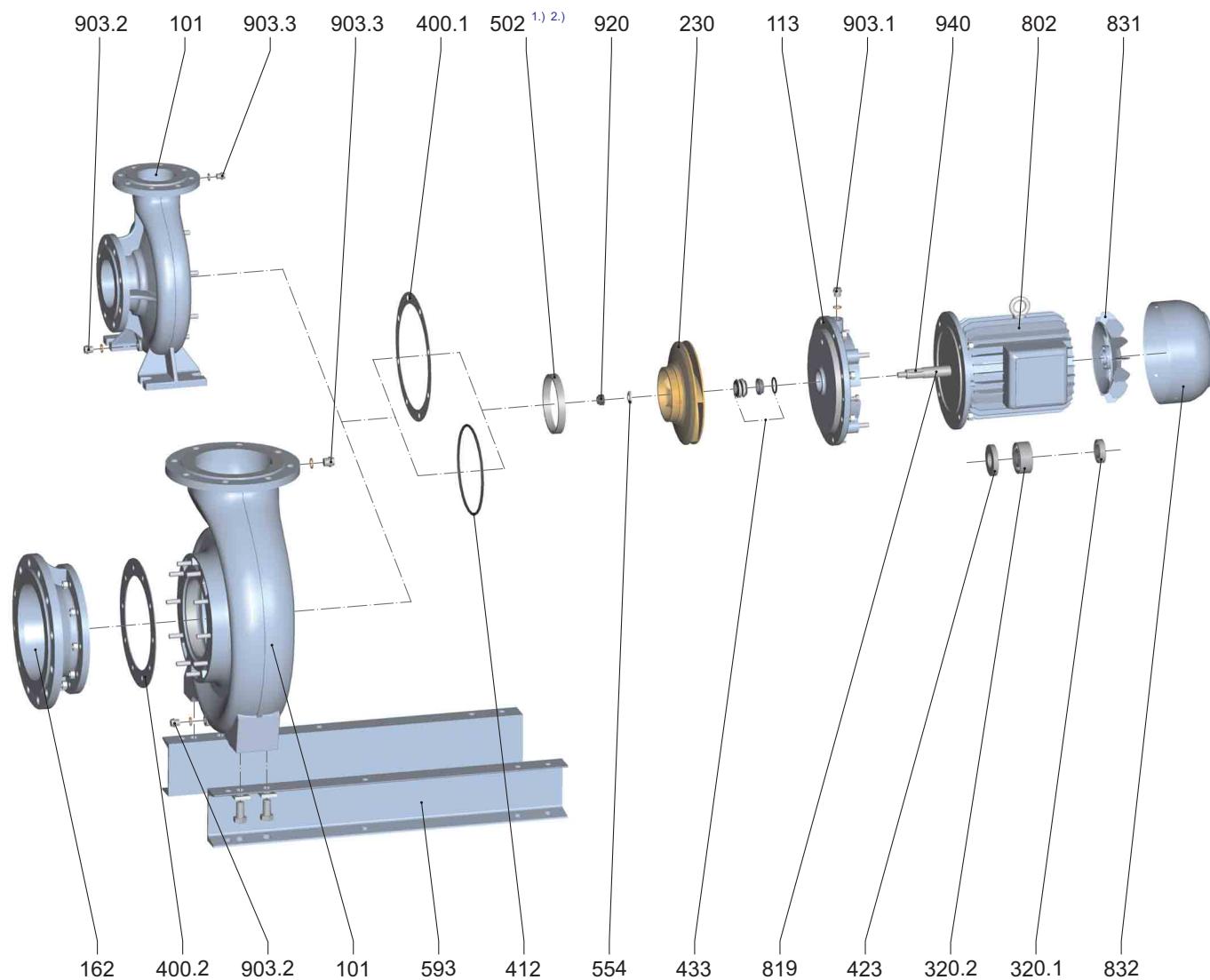
**Legend:**

P<sub>2</sub>: Nominal output

P<sub>1</sub>: Affective power

dB(A): Sound pressure level (complete pump)

## Exploded view



### Individual components

101	Pump casing	554	Washer
113	Intermediate casing	593	Rail
162	Suction cover	802	Block motor
230	Impeller	819	Motor shaft
320.1	Anti-friction bearing (non drive side)	831	Fan
320.2	Anti-friction bearing (drive side)	832	Fan hood
400.1	Gasket	903.1	Screwed plug
400.2	Gasket	903.2	Screwed plug
412	O-ring	903.3	Screwed plug
423	Labyrinth ring	920	Nut
433	Mechanical seal	940	Key
502 <sup>2)</sup>	Casing wear ring		

<sup>1)</sup> Only available in a construction with closed multi vane impeller in material version W3.

<sup>2)</sup> In 150-401/... second casing wear ring available.

## Highest efficiency:

### Advantages in comparison with asynchronous motors

In comparison with the asynchronous motors mainly used in swimming pool technology, the synchronous motor (PM motor) has clear advantages. This is because asynchronous motors have a lower efficiency than synchronous motors due to rotor slippage. The smaller the asynchronous motor, the higher the losses and thus the worse the efficiency. In these applications, PM motors are the optimum alternative: with their efficiencies, they are already grouped above motors according to IE3, which means that they achieve even better efficiencies than required for IE3 according to the IEC code.

### Motor technology with energy efficiency IE3

The new PM motor (synchronous motor) technology offers three decisive advantages:

- More performance due to very high efficiencies
- Fewer operating costs due to high energy savings
- Fewer CO<sub>2</sub> emissions due to lower power consumption

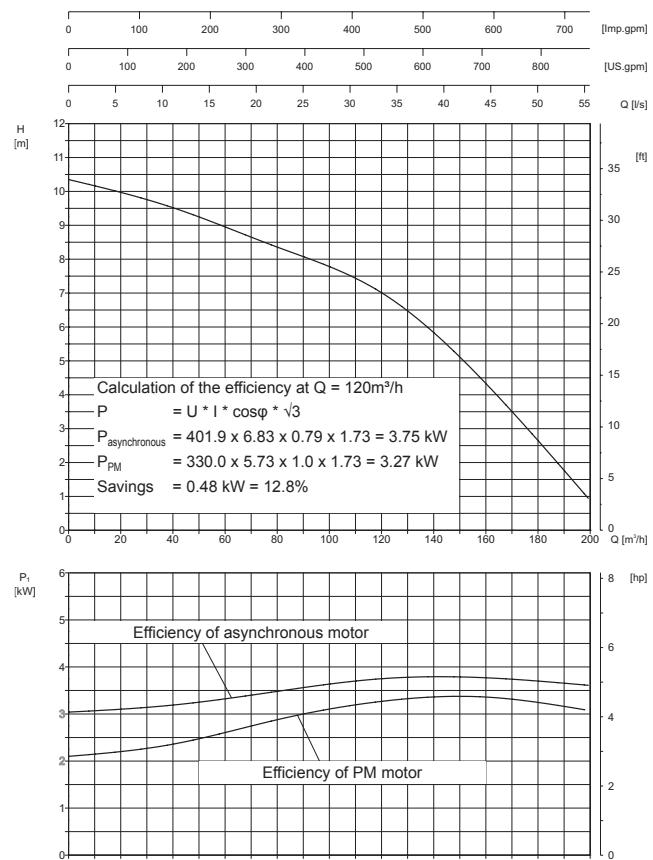
PM motors already achieve the efficiencies now that will be required by law starting in 2015. They have a constant motor efficiency above IE3 (premium efficiency class).

IEC energy class	IEC code	EFF code
Super premium efficiency	IE4	
Premium efficiency	IE3	
High efficiency	IE2	EFF1
Standard efficiency	IE1	EFF2
Below standard efficiency	-	EFF3

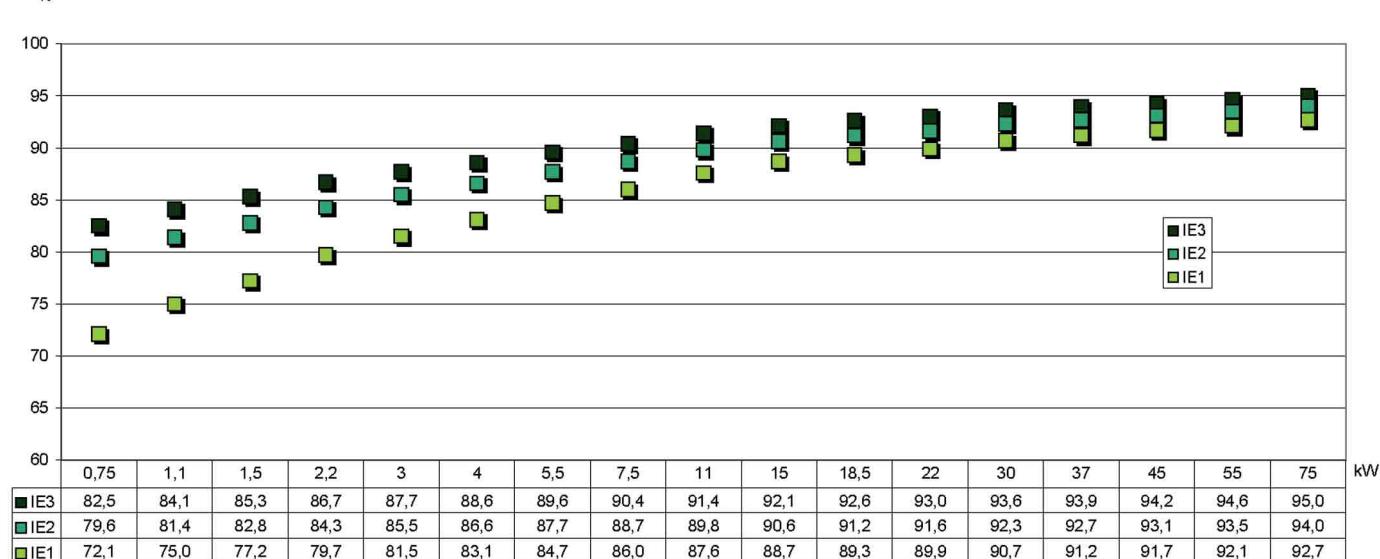
▶ Comparison of old EFF code and new IEC code

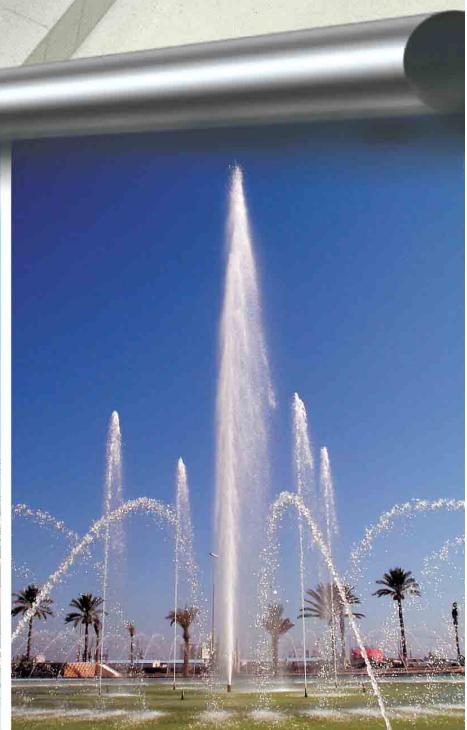
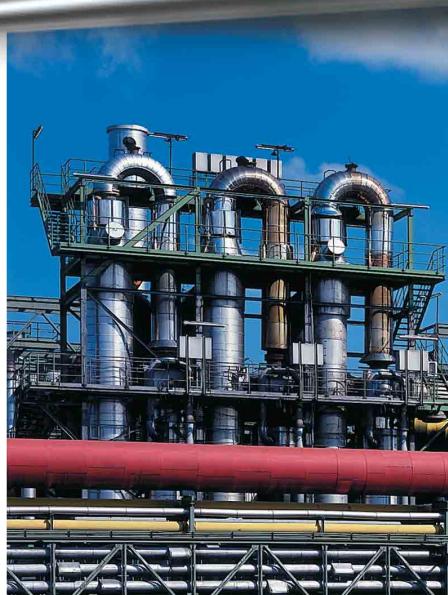
### Comparison of the efficiencies

The pump curve shown in the diagram with 3 kW drive output compares the electrical power consumption (efficiency) of the PM motor with an asynchronous motor. The PM motor has a considerably lower power consumption.



### Efficiency comparison of IE1 - IE2 - IE3 for 4-pole motors





*We reserve the right to make changes in line with technical further developments!*