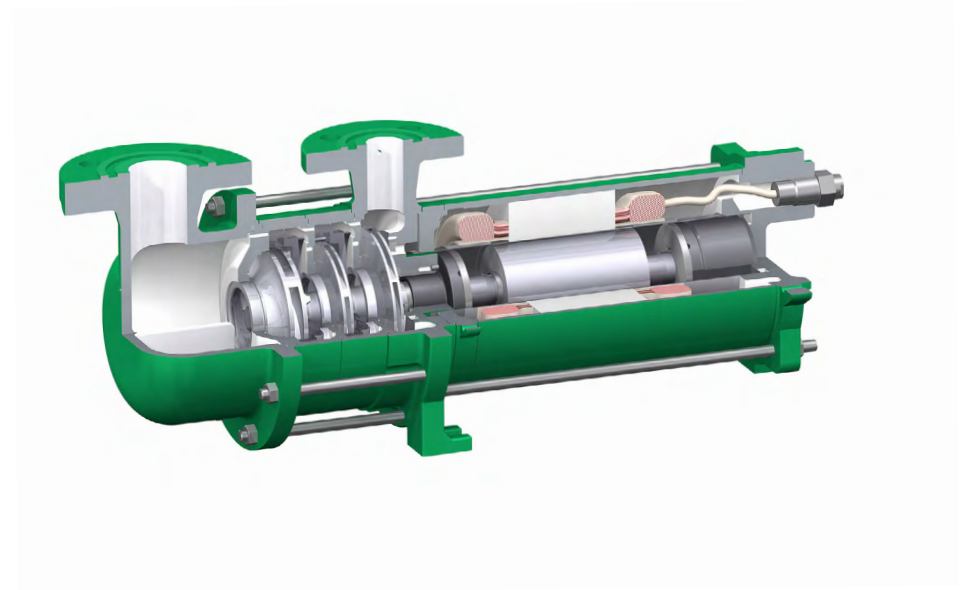
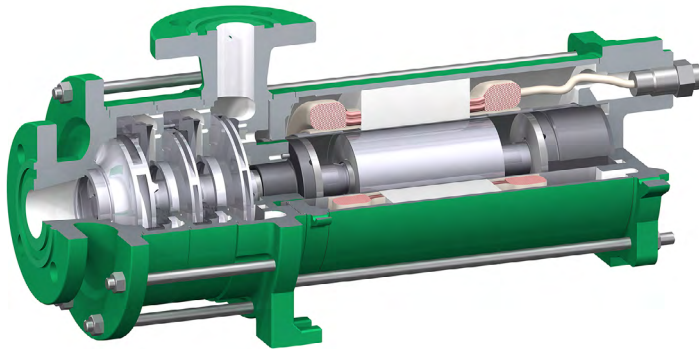


SERIES INFORMATION  
CANNED MOTOR PUMP TYPE CAM / CAMR

# REFRIGERATION ENGINEERING



## Information

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### Applications

- Food industry: Cooling and deep-freezing with natural and synthetic refrigerants
- Sports and leisure facilities, such as: Bobsled tracks, ice rinks or ice hockey stadiums
- Electronics and power converters: modules in mobile (railway) and stationary (offshore wind turbines) applications
- Cooling modules in the chemical industry (optionally in explosion-proof design)
- Freeze-drying and oil-cooling systems for transformers
- CO<sub>2</sub> cooling for mainframes and server centres
- Absorption refrigeration applications with lithium bromide and NH<sub>3</sub>

### Pumped media

Liquids and liquefied gases, such as NH<sub>3</sub> (R717), CO<sub>2</sub> (R744), R22, R134a, hydrocarbons, R404a, R11, R12, Baysilone (M3, M5), methanol, silicone oil KT3, Syltherm XLT, water glycol mixtures. In principle, the refrigerant pumps are suitable for conveying all types of refrigerant. However, this must be checked for each case.

### Type /design

Horizontal, seal-less section-type pumps with completely closed canned motor, with radial impellers, multi-stage, single-flow.

### Canned motor pump type CAM

This pump is suitable for conveying liquids near vapour pressure and for standard applications.

### Canned motor pump type CAMR

The CAMR pump with radial suction port is particularly suitable for compact systems with small collecting tanks. Due to the degassing on the suction side, the pump is ready for operation sooner after switching off. The pump can be suspended directly under the tank to save space.

### Drive

The rotor lining - one of our core competencies - is manufactured by impact extrusion and, as a nickel-based alloy, is an essential component of the highly efficient canned motor. The liquid-filled canned motor accelerates to operating speed within seconds and operates wear-free and maintenance-free in continuous operation due to the hydrodynamic plain bearings. The canned motor is low-noise and low-vibration and offers double security against leakage.

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**Information**

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**Operating data**

**Temperature**

Areas of application -50 °C to +30 °C

**Canned motors**

Output	up to 25.0 kW
Speed	2800 rpm or 3500 rpm (frequency control possible – with frequency converter from 1500 rpm to 3500 rpm)
Voltage	230, 400, 480, 500, 575, 690 Volt
Frequency	50 Hz or 60 Hz
Type of protection	IP 55

**Pump and hydraulics designations**

**CAM 2 / 3 AGX 3.0**

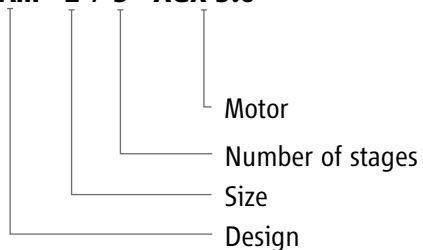


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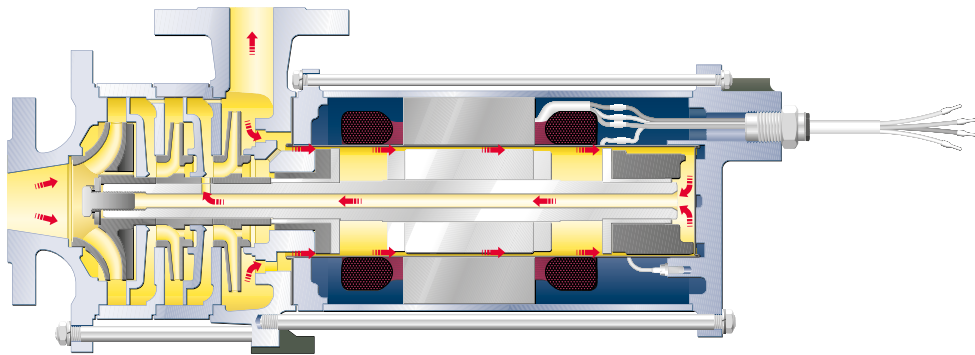
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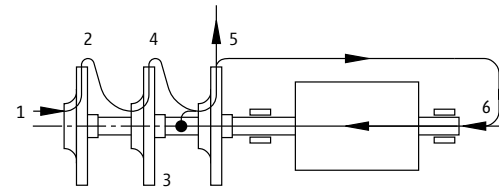


### CAM function

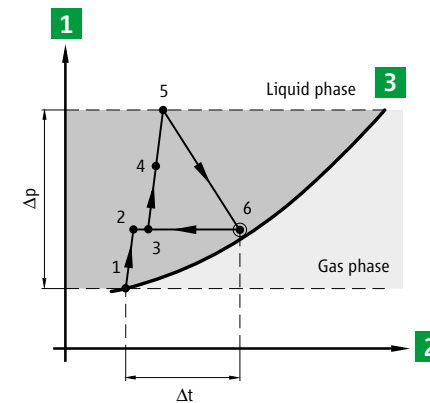
The partial flow for cooling the motor and lubricating the bearing is taken from the pressure side after the last impeller and passed through the motor chamber. The partial flow is not returned to the suction side of the pump through the hollow shaft but to an area with increased pressure between two impellers. Therefore, point 3 in the pressure-temperature diagram that corresponds to the greatest heating has sufficient distance from the vapour pressure curve to prevent gasification within the pump.



Partial flow return between the stages



Pressure-temperature diagram



- 1 Pressure
- 2 Temperature
- 3 Vapour pressure curve

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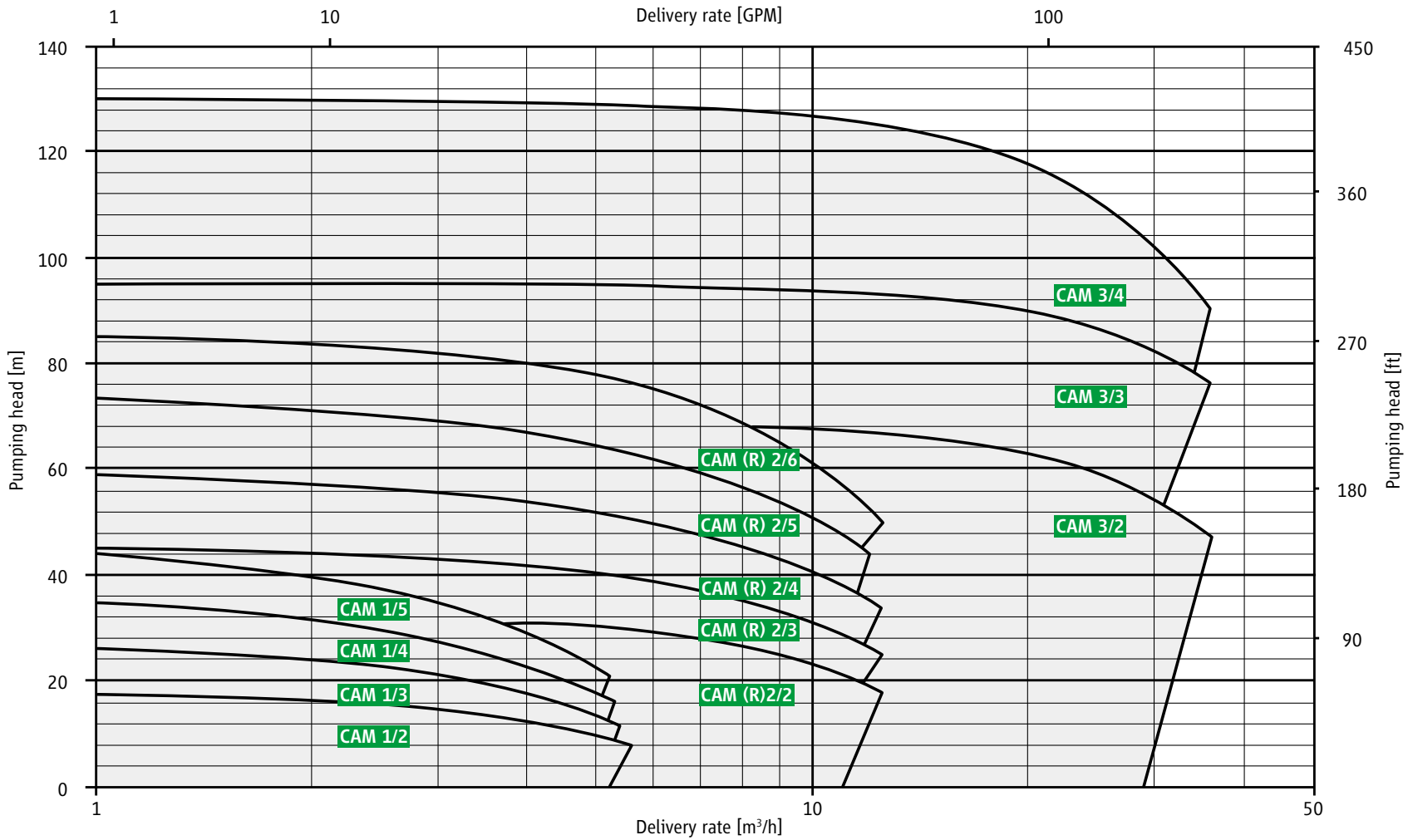
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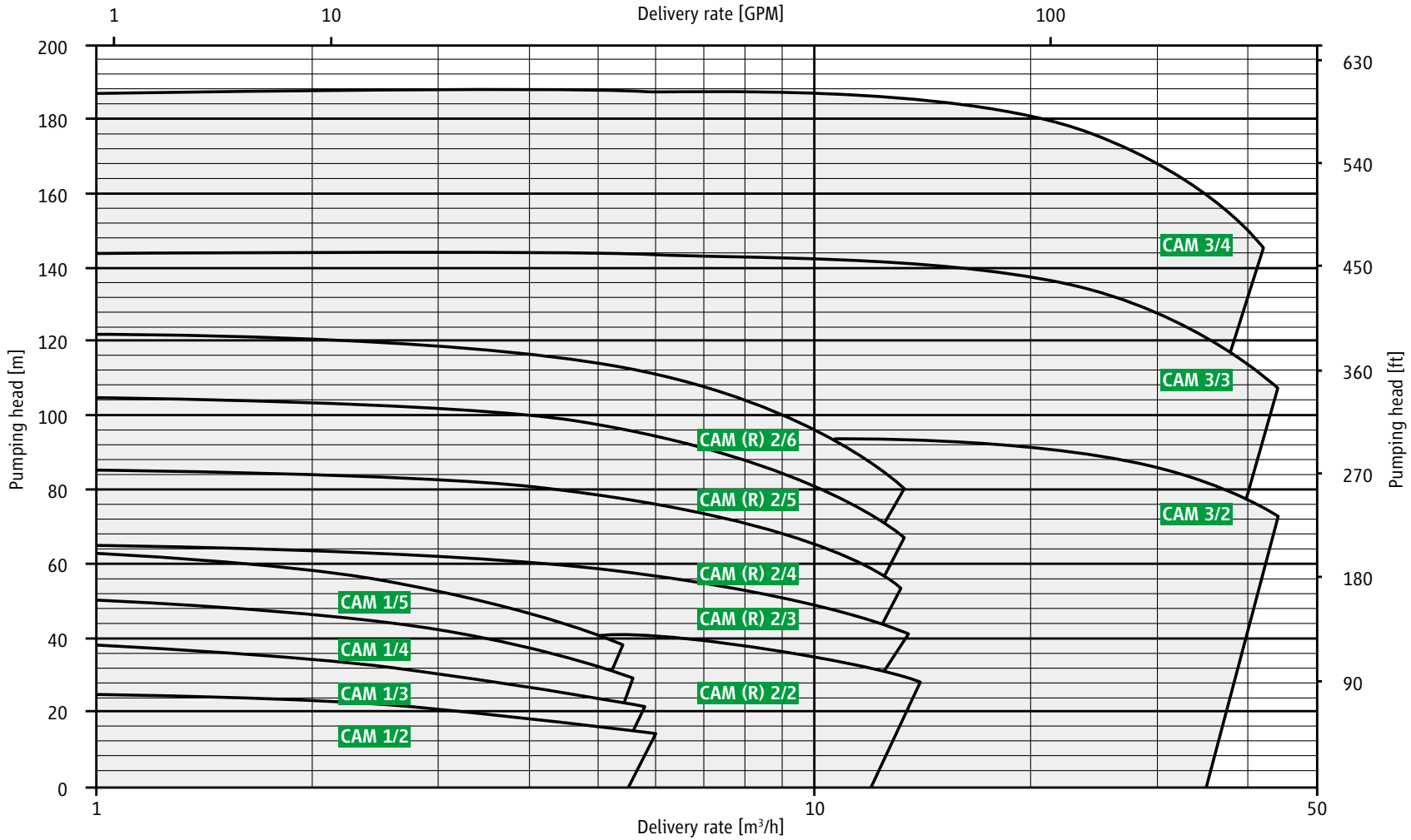
2900 rpm 50 Hz



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3500 rpm 60 Hz



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## Versions CAM / CAMR

Type	Motor	Pump data		Motor data 50 Hz / 60 Hz		Weight kg	PN
		Q <sub>min</sub> m <sup>3</sup> /h	Q <sub>max</sub> m <sup>3</sup> /h	Output kW [P2]	Rated current at 400 V / 480 V		
CAM 1/2	AGX 1.0	0.5	5.0	1.0 / 1.2	2.7	27.0	40
CAM 1/3	AGX 1.0	0.5	5.0	1.0 / 1.2	2.7	28.0	40
CAM 1/4	AGX 1.0	0.5	5.0	1.0 / 1.2	2.7	29.0	40
CAM 1/5	AGX 1.0	0.5	5.0	1.0 / 1.2	2.7	30.0	40
CAM (R) 2/2	AGX 3.0	1.0	13.0	3.0 / 3.4	7.1	48.0	40
CAM (R) 2/2	AGX 4.5	1.0	14.0	4.5 / 5.6	10.4	56.0	40
CAM (R) 2/3	AGX 3.0	1.0	13.0	3.0 / 3.4	7.1	52.0	40
CAM (R) 2/3	AGX 4.5	1.0	14.0	4.5 / 5.6	10.4	60.0	40
CAM (R) 2/3	AGX 6.5	1.0	14.0	6.5 / 7.5	15.2	63.0	40
CAM (R) 2/4	AGX 3.0	1.0	14.0	3.0 / 3.4	7.1	56.0	40
CAM (R) 2/4	AGX 4.5	1.0	14.0	4.5 / 5.6	10.4	68.0	40
CAM (R) 2/4	AGX 6.5	1.0	14.0	6.5 / 7.5	15.2	71.0	40
CAM (R) 2/5	AGX 3.0	1.0	14.0	3.0 / 3.4	7.1	60.0	40
<b>CAM (R) 2/5</b>	<b>AGX 4.5</b>	<b>1.0</b>	<b>14.0</b>	<b>4.5 / 5.6</b>	<b>10.4</b>	<b>74.0</b>	<b>40</b>
CAM (R) 2/5	AGX 6.5	1.0	14.0	6.5 / 7.5	15.2	77.0	40
CAM (R) 2/6	AGX 3.0	1.0	14.0	3.0 / 3.4	7.1	64.0	40
CAM (R) 2/6	AGX 4.5	1.0	14.0	4.5 / 5.6	10.4	78.0	40
CAM (R) 2/6	AGX 6.5	1.0	14.0	6.5 / 7.5	15.2	81.0	40
CAM 3/2	AGX 8.5	6.0	30.0	8.5 / 9.7	19.0	120.0	40
CAM 3/2	CKPx 12.0	6.0	30.0	13.5 / 15.7	31.0	150.0	25 / 40
CAM 3/3	AGX 8.5	6.0	30.0	8.5 / 9.7	19.0	138.0	40
CAM 3/3	CKPx 12.0	6.0	30.0	13.5 / 15.7	31.0	168.0	25 / 40
CAM 3/3	CKPx 19.0	6.0	30.0	22.0 / 25.0	49.5	213.0	25 / 40
CAM 3/4	CKPx 12.0	6.0	35.0	13.5 / 15.7	31.0	186.0	25 / 40
CAM 3/4	CKPx 19.0	6.0	35.0	22.0 / 25.0	49.5	231.0	25 / 40

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## Materials / pressure stages / flanges

Housing	JS 1025
Suction cover (suction housing CAMR 2)	JS 1025
Stage casing (CAM 1, CAM 2, CAMR 2)	1.0460
Stage casing (CAM 3)	JS 1025
Diffuser (guide wheel CAM 3)	JL 1030
Impellers	JL 1030
Slide bearing	1.4021 / carbon
Shaft	1.4021
Rotor lining	1.4571
Seals	AFM 34*
Pressure rating	PN 40**, PN 25 (for motors CKPx 12.0 and CKPx 19.0)
Flanges	according to DIN EN 1092-1, PN 40 and PN 25 type D

\* asbestos-free aramid fibre, \*\* test pressure 60 bar

## Noise expectancy values

Motors	AGX 1.0	AGX 3.0	AGX 4.5	AGX 6.5	AGX 8.5	CKPx 12.0	CKPx 19.0
Output power [P2 at 50 Hz]	1.0 kW	3.0 kW	4.5 kW	6.5 kW	8.5 kW	13.5 kW	22.0 kW
max. expected sound pressure level dB(A) at 50 Hz	48	52	54	56	57	59	61
Output power [P2 at 60 Hz]	1.2 kW	3.4 kW	5.6 kW	7.5 kW	9.7 kW	15.7 kW	25.0 kW
max. expected sound pressure level dB(A) at 60 Hz	48	52	55	56	57	59	61

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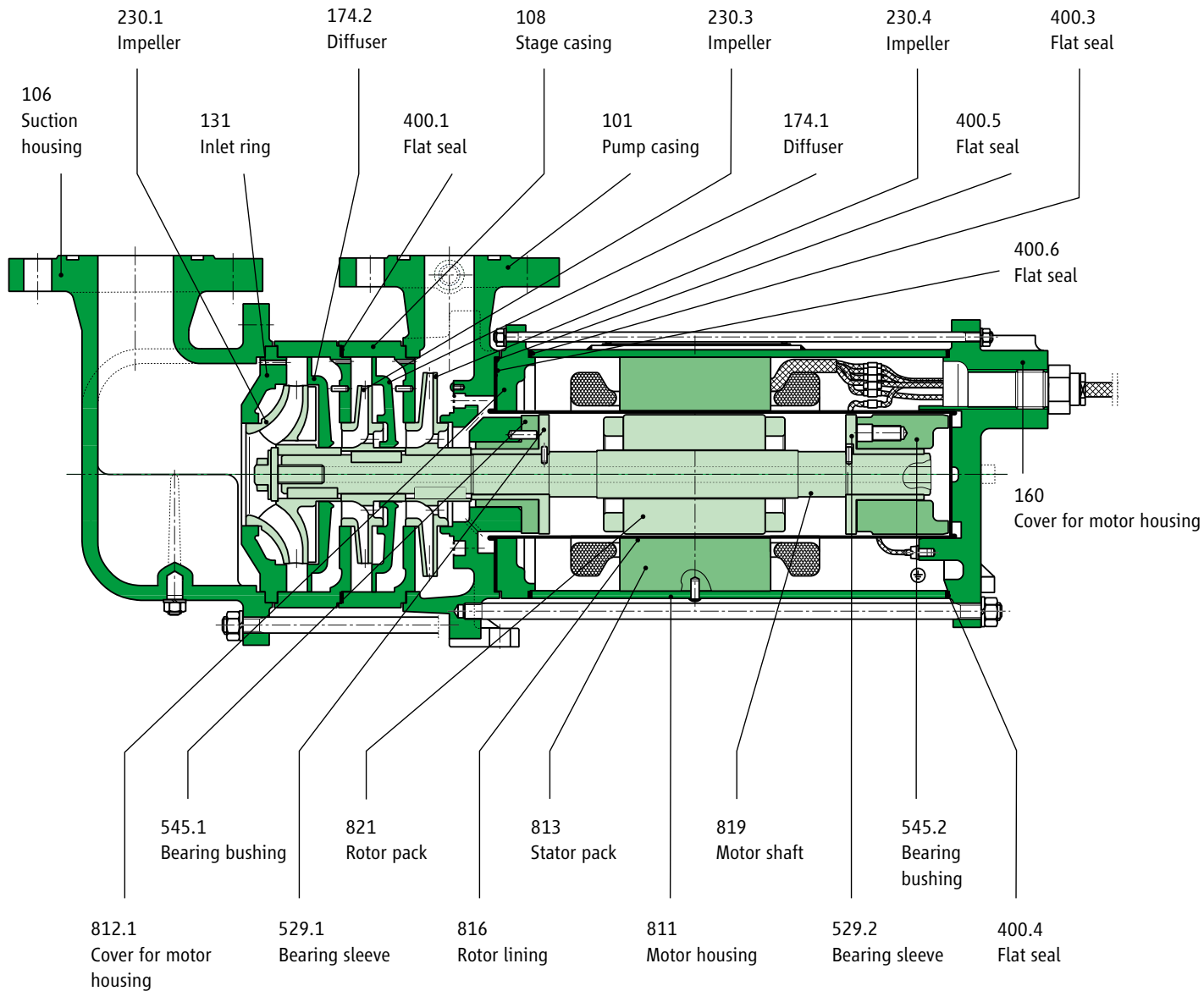
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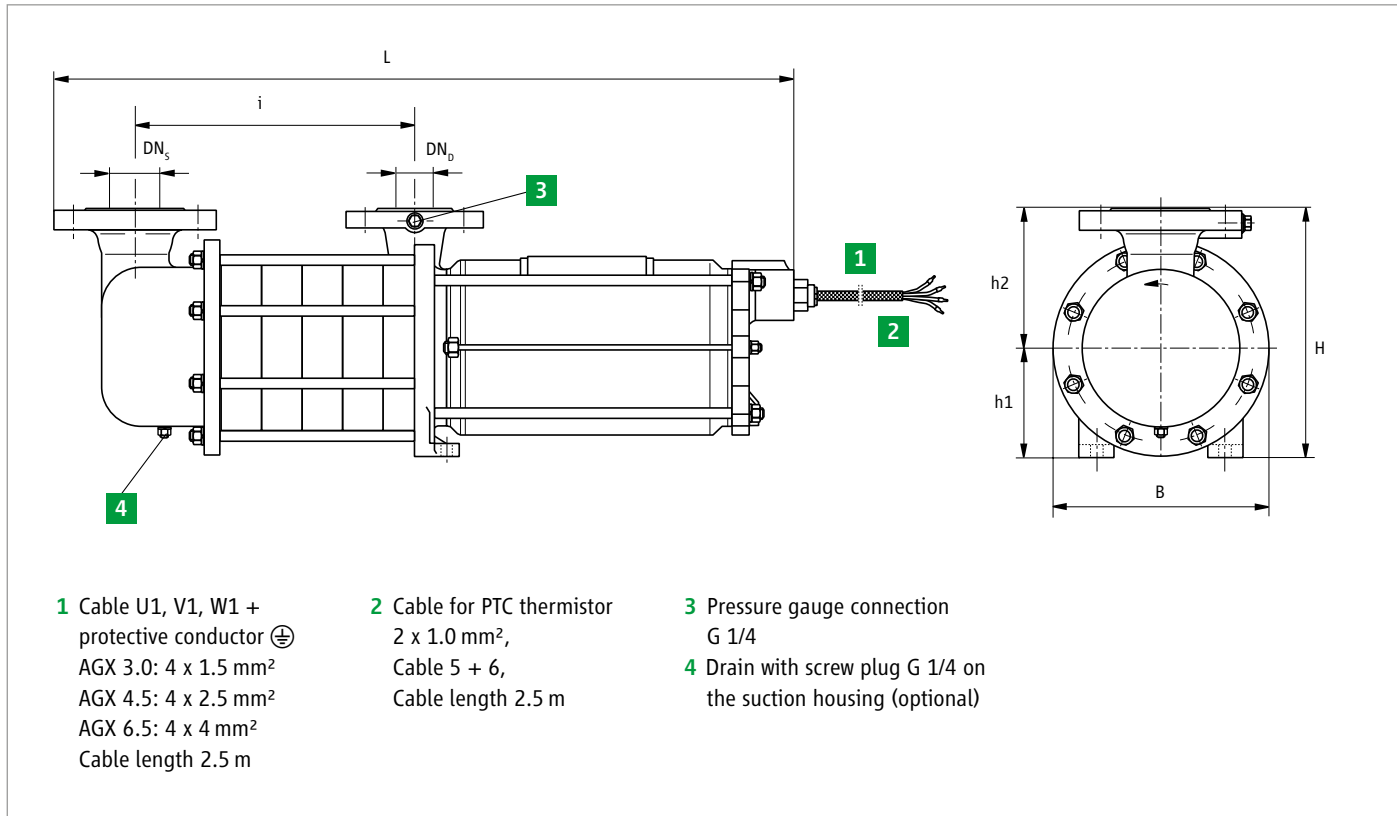
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**Dimension drawing for motors of size: AGX 3.0 / AGX 4.5 / AGX 6.5**

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## Versions CAMR 2

Dimensions	CAMR 2 / 2-stage	CAMR 2 / 3-stage	CAMR 2 / 4-stage	CAMR 2 / 5-stage	CAMR 2 / 6-stage
	AGX 3.0 / 4.5	AGX 3.0 to 6.5	AGX 3.0 to 6.5	AGX 3.0 to 6.5	AGX 3.0 to 6.5
Length / L	649	690	731	772	813
Width / W	218	218	218	218	218
Height / H	250	250	250	250	250
h1	110	110	110	110	110
h2	140	140	140	140	140
i	160	201	242	283	324
DN <sub>s</sub>	50	50	50	50	50
DN <sub>b</sub>	32	32	32	32	32

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[www.hermetic-pumpen.com](http://www.hermetic-pumpen.com)

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