

Sealless Technology  
Unlimited



You select · We produce **V-Line**





# The Modular Chemical Pump



HERMETIC-Pumpen GmbH is a global leader in the market of sealless chemical pumps.

Modular fabrication and construction is one key element to success in the chemical processing industry. Since we built the first canned motor pump in 1955, for HERMETIC it has always been the main task to fulfill our customers needs and even more to work together with our customers to deliver the most reliable pumps in the highest quality.

## **The HERMETIC V-Line**

The HERMETIC V-Line is a defined selection of single- and multistage canned motor pumps for demanding chemical applications in a defined field of requirements with optimized delivery times at attractive prices. In proven HERMETIC quality.

This concept of pumps adapts to the modular concept of plant construction which means a standardization of components and interfaces.





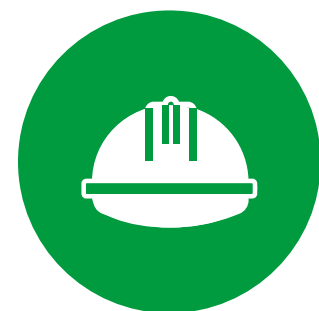
# Canned Motor Pumps. The Sealless, Reliable and Safe Alternative to Mag Drive – or Centrifugal Pumps with Mechanical Seals

## Safe



### The Secondary Containment Standard

Environmental protection and safety is maintained with the secondary containment shell which is not subject to damage by rotating parts. Eliminate any possibility of emissions or leakage, handle toxic, explosive, hazardous or critical chemical fluids.



### A Unique Motor and Pump Combination

The alignment an installation of a pump does always come with the risk of false alignment of motor and pump. With the motor and pump in one envelope there is no alignment of pump and motor. There is also only 50% of the place needed compared to a pump with external motor.



### Reduced Noise Levels

No motor cooling fans and no external rotating parts that produce noise or vibration. A pump that works silent and reliable.

# Canned Motor Pumps. The Sealless, Reliable and Safe Alternative to Mag Drive – or Centrifugal Pumps with Mechanical Seals

## Reliable



### Maintenance-Free Bearings

Mag drive pumps have at least six bearings to support all rotating components. Of course these come with higher risks of failure if not checked frequently. Our bearings are thermal shockproof and maintenance free. At optimal running conditions, HERMETIC pumps have zero axial and radial thrust. This means two times more safe than regular bearings.



### No Mechanical Seals

64% of all breakdowns can be related to mechanical sealings. Canned motor pumps avoid these major root of breakdown.



### Statistically Proven Reliability

Canned motor pumps have the best MTBF (mean time between failure) rating compared to other chemical pump technologies. If there is no contact between rotating parts, there is no wear. The V-Line contains ZART® design philosophy. The HERMETIC ZART® design philosophy combines several technical features to ensure an operation where no parts contact each other. This feature results in trouble free and wear free operation.

**ZART®**

*simply best balance*

# Canned Motor Pumps. The Sealless, Reliable and Safe Alternative to Mag Drive – or Centrifugal Pumps with Mechanical Seals

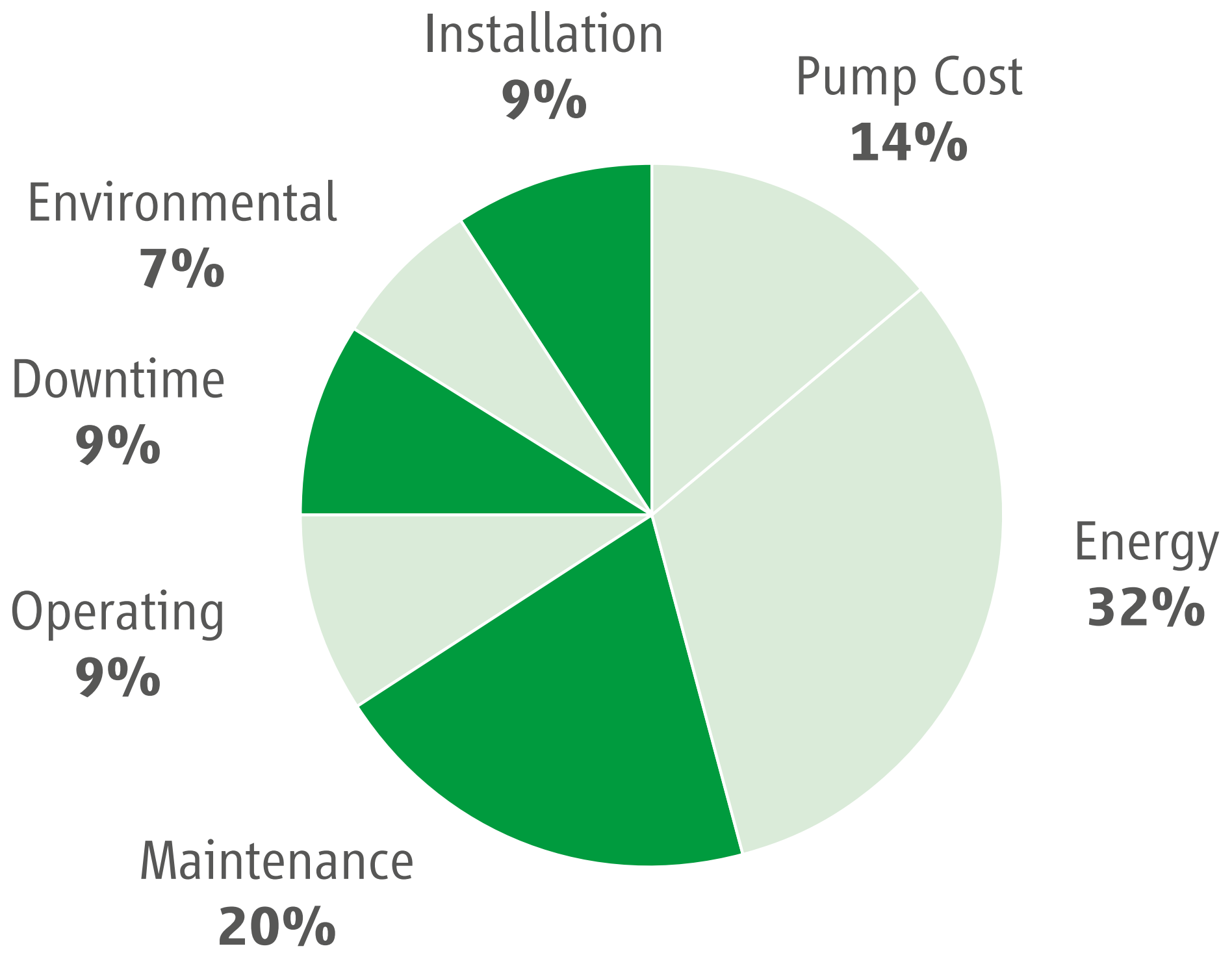
## Efficient



### Lowest LCC (Life Cycle Costs)

Typical life cycle cost of an industrial pump consist of initial costs, maintenance- and energy costs. 20% of the LCC are maintenance costs. With HERMETIC pumps these costs can be dramatically reduced. Main advantages in cost reductions are:

- lowest downtime costs
- low installation costs
- lowest maintenance costs



# Select Your Pump in Less Than 2 Minutes with the Exclusive **V-Line EXPERT TOOL**



## Quick Selection Based on Your Operating Data Such As:



- Operating Point (delivery head, temperature and volume flow)
- Plant parameters (net voltage, net frequency, system pressure, NPSHA)
- Liquid data (density, dyn. viscosity, vapor pressure etc.)
- Equipment (leveling monitoring, temperature monitoring, rotation monitoring)
- Accessories (drains, gaskets, flange design, inducer etc.)



- Real time simulation of your pump based on database of liquids or your own data
- Easy overview of all relevant performance values
- Comparison of pumps regarding the criteria you define (hydr. efficiency, power consumption etc.)
- Access to pump reports
- Share your pump project with your colleagues



# Select Your Pump in Less Than 2 Minutes with the Exclusive V-Line EXPERT TOOL

Select Your Parameters:

**PARAMETER INPUT**

**PUMP - DRIVE - PLANT**

- Single- or multiple-stage pumps
- Material: S1 1.0B19+N
- Net voltage  $U_r$ : 400 ±10% V
- Net frequency  $f_N$ : 50 Hz
- System pressure  $p_N$ : 16.00 bar
- NPSHA: 0.00 m
- ATEX: ATEX
- Explosion protection

**LIQUID**

Medium: Water

- Density  $\rho(\theta_{op})$ : 0.998 kg/l
- Dyn. viscosity  $\mu(\theta_{op})$ : 1.002 cP
- Kin. viscosity  $\nu(\theta_{op})$ : 0.000 cSt
- Specific heat capacity  $c_p(\theta_{op})$ : 0.999 kcal/kgK
- Vapour pressure  $p_v(\theta_{op})$ : 0.02 bar
- Viscosity calculation: No

**OPERATING POINT**

Delivery head  $H_r$ : 40.00 m

Temperature  $\theta_{op}$ : 20.0 °C

Volume flow  $Q_r$ : 10.00 m³/h

**EQUIPMENT**

- Standard (without drains)
- Standard
- Standard (Type B1)
- Standard (Thermistor KL180)
- Drains
- Gaskets
- Flange designs
- Motor protection in winding
- Inducer
- Axial Control System

**ACCESSORIES**

- Qmax-orifice
- Levelling disc
- Level monitoring
- Temperature monitoring
- Rotation monitoring, external
- ROMI

**SIMULATION**

Simulate Your Pump:

**DESIGN DATA**

**Liquid**

- Operating temperature  $\theta_{op}$ : 20.0 °C
- Density  $\rho(\theta_{op})$ : 0.998 kg/l
- Dyn. viscosity  $\mu(\theta_{op})$ : 1.002 cP
- Specific heat capacity  $c_p(\theta_{op})$ : 0.999 kcal/kgK
- Vapour pressure  $p_v(\theta_{op})$ : 0.02 bar

**Operating point**

- Volume flow  $Q_r$ : 10.00 m³/h
- Delivery head  $H_r$ : 40.00 m
- Differential pressure  $p_{1-2,r}$ : 3.92 bar
- NPSHR: 0.83 m
- Hydr. efficiency  $\eta_h$ : 43.01 %
- Power consumption P: 2.53 kW
- Input power  $P_1$ : 3.59 kW
- Speed n: 2927 min⁻¹

**Plant**

- NPSHA: 0.00 m
- Net frequency  $f_N$ : 50 Hz
- Installation inlet pressure  $p_{A1}$ : 0.00 bar

**Pump**

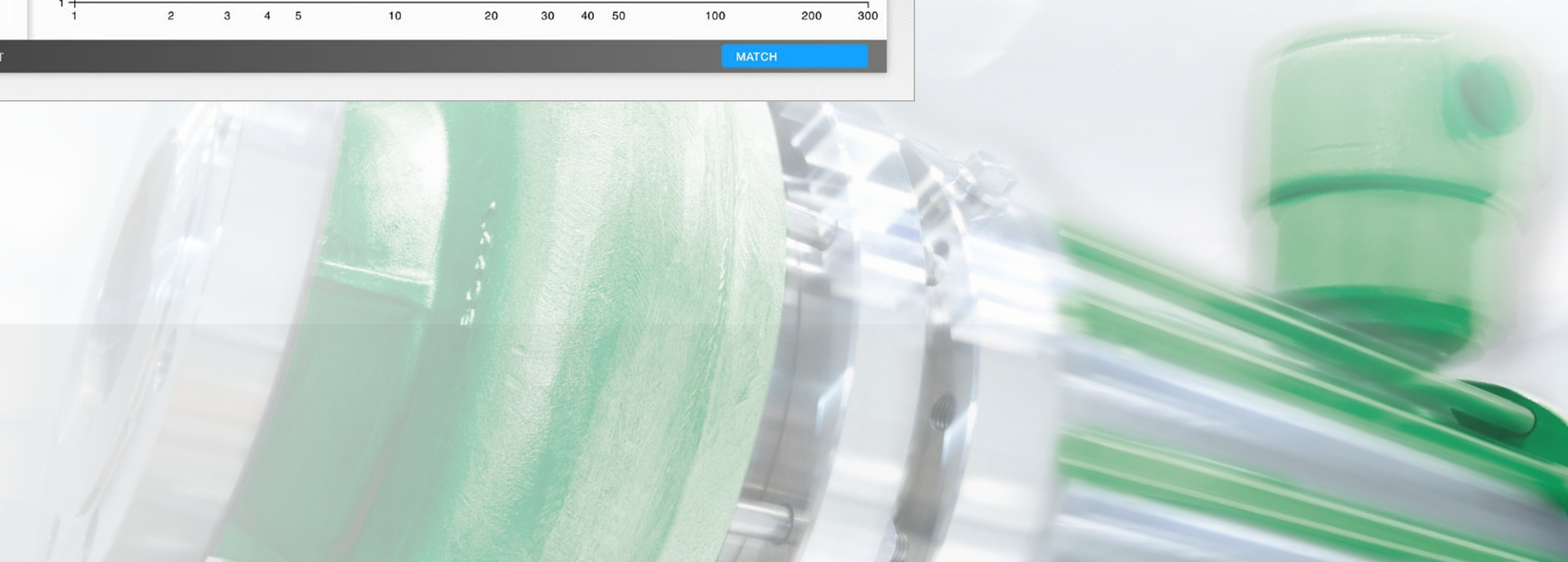
- Stages: CAM 30/2
- Stages: 2
- Pump standard: EN ISO 2858
- Impeller diameter  $D_{2,max}$ : Ø 145.0 mm
- Impeller diameter  $D_2$ : Ø 133.8 mm
- Impeller diameter  $D_{2,min}$ : Ø 125.0 mm
- Volume flow  $Q_{r,max}$ : 16.40 m³/h
- Volume flow  $Q_{r,opt}$ : 12.43 m³/h
- Volume flow  $Q_{r,min}$ : 2.42 m³/h
- Volume flow ratio  $Q_r/Q_{r,opt}$ : 80.43 %
- Delivery head  $H_0$ : 49.10 m
- Delivery head  $H_{opt}$ : 33.86 m
- Delivery head ratio  $H_0/H_r$ : 122.75 %
- Suction spec. speed  $n_{ss}$ : 149 min⁻¹
- Shut off pressure  $p_{1-2,0}$ : 4.81 bar
- Sound pressure level  $L_{pA}$ : 52.0 dB

**Drive**

- Drive: N24N-2
- Rated input power  $P_{1,N}$ : 8.60 kW

**CURVE H(Q) [m] x [m³/h]**

The graph shows the pump's performance curve, with a peak efficiency of 43.01% at a flow rate of 10.00 m³/h and a head of 40.00 m. The graph is overlaid with a green shaded area representing the operating range.





# Select Your Pump in Less Than 2 Minutes with the Exclusive V-Line EXPERT TOOL

Safe or Share Your Selection:

Canned motor pump design "V-LINE"  
**CAM 30/2, N24N-2**

**Design data and rated values**

Liquid: WATER  
Operating temperature  $\theta_{ho}$ : 20.0 °C  
Density  $\rho_{ho}$ : 0.998 kg/m³  
Dyn. viscosity  $\mu_{ho}$ : 1.002 cP  
Specific heat capacity  $c_{p,ho}$ : 0.999 kcal/kgK  
Vapour pressure  $p_{v,ho}$ : 0.02 bar

Operating point  
Volume flow  $Q_v$ : 10.00 m³/h  
Delivery head  $H_d$ : 40.00 m  
Differential pressure  $P_{1-2}$ : 3.92 bar  
NPSH<sub>r</sub>: 0.83 m  
High efficiency  $\eta_h$ : 43.01 %  
Power consumption P: 2.53 kW  
Input power  $P_1$ : 3.59 kW  
Speed n: 2927 min⁻¹

Plant  
NPSH<sub>A</sub>: 0.00 m  
Net frequency  $f_N$ : 50 Hz  
Installation inlet pressure  $p_{A1}$ : 0.00 bar

Pump  
Stages: 2  
Pump standard: EN ISO 2858  
Impeller diameter  $DZ_{max}$ : 0 145.0 mm  
Impeller diameter  $DZ_{min}$ : 0 135.8 mm  
Impeller diameter  $DZ_{nom}$ : 0 125.0 mm  
Volume flow  $Q_{v,max}$ : 16.40 m³/h  
Volume flow  $Q_{v,nom}$ : 12.43 m³/h  
Volume flow  $Q_{v,min}$ : 2.42 m³/h  
Volume flow ratio  $Q_{v,max}/Q_{v,nom}$ : 80.43 %  
Delivery head  $H_d$ : 49.10 m  
Delivery head  $H_{d,net}$ : 33.86 m  
Delivery head ratio  $H_{d,net}/H_d$ : 122.75 %  
Suction spec. speed  $n_{ss}$ : 149 min⁻¹  
Shut off pressure  $p_{s,shut}$ : 4.81 bar  
Sound pressure level  $L_{pA}$ : 52.2 dB

Drive  
N24N-2  
Rated input power  $P_{1,N}$ : 8.60 kW  
Rated output power  $P_{2,N}$ : 6.00 kW  
Frequency  $f_N$ : 50 Hz  
Rated speed  $n_N$ : 2930 min⁻¹  
Rated voltage  $U_N$ : 400.0 ±10% V  
Rated current  $I_N$ : 15.2 A  
Starting current ratio  $i_{st}/I_N$ : 3.9  
Power factor  $\cos \phi$ : 0.84  
Temperature class: F  
Rated temperature  $\theta_{ho}$ : 40.0 °C  
Insulation class: H

**Equipment and Accessories**

General  
Pump absorbs forces and torques according to ISO  
 $U_{10}$  tolerance: +10%  
All canned motors are suitable for inverter operation  
Drive protection class: IP 67 (stator), IP 55 (terminal)

Drive marking: (D) 3 2G Ex de IC T3-T6  
Base plate: included  
Connection for PFT02: yes

Explosion protection: ATEX according to Directive 2014/52/EU  
Certificates: Standard  
Drains: Standard (without drain)  
Flange design: Standard (Type B1)  
Motor protection in winding: Standard/Thermistor

Accessories  
Position monitoring, external: RCM (for motor IC)  
Level monitoring: -  
Temperature monitoring: -  
Levelling disc: -  
Grease orifice: -

Canned motor pump design "V-LINE"  
**CAM 30/2, N24N-2**

**Theoretical Curves**

**Delivery range**

Parameter	$Q_{v,del}$	$Q_v$	$Q_{v,max,del}$	MU
Volume flow $Q_v$	2.42	10.00	16.40	m³/h
Delivery head H	48.40	40.00	18.67	m
NPSH <sub>r</sub>	0.51	0.83	1.69	m
High efficiency $\eta_h$	17.74	43.01	34.00	%
Power consumption P	1.80	2.53	2.41	kW
Speed n	2948	2927	2931	min⁻¹

Canned motor pump design "V-LINE"  
**CAM 30/2, N24N-2**

**Documentation and Tests information**

Documentation according to HERMETIC Standard, consisting of:  
Operating manual for the HERMETIC pump  
Technical specifications  
Dimensional drawings  
Cable connection diagram  
Pump characteristic curve design  
Acceptance report and pump characteristic curve  
Electric test report  
Slip ring report / gap site report, slide bearing clearances  
Factory certificates according to DIN EN 10 204 / 2.2  
EC type-examination certificate PTB 99 ATEX  
EU Declaration of Conformity  
TUV certificates

Coating according to HERMETIC Standard  
Thickness: 100-200 µm (primer, then 2 coats)  
Colour: RAL 7030 (stone grey)  
Base plate: powder-coated

Standardsprüfungen  
Hydrostatic pressure test with 1.5x nominal pressure  
Factory certificates according to DIN EN 10 204 / 2.2  
Test run according to DIN EN ISO9006, Klasse 2 B 9 (5 measuring points)  
Balancing of the shaft and impellers according to DIN ISO 194E, 6.3 (without protocol)  
Axial thrust measurement  
Leak test for the complete pump with  $n_N$  at 6 bar

Optional test  
NPSH-test

**Materials**

Material version S1 / Pressure rating PN40

VMA-No.	Parts designation	Material
101	Pump casing	1.6460 / 1.0370
108	Stage casing	1.6460
162	Suction cover	S 316L/2H
171	Diffuser insert	A 1030
200	Impellers	A 1030
360		
400		
412		
472		
509		
545		
816		
819		
820	Parts that do not	
811		
812		

(1) Tangent circle  
(2) Material number

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