

Fully Integrated In-line Water Pump

EtaLine Pro

Type Series Booklet



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Type Series Booklet EtaLine Pro

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Contents

Heating / Air-conditioning / Ventilation 4

- In-line Pumps 4
 - EtaLine Pro 4
 - Main applications 4
 - Fluids handled 4
 - Operating data 4
 - Design details 4
 - Designation 5
 - Materials 5
 - Coating and preservation 6
 - Product benefits 6
 - Product information 6
 - Acceptance tests and warranty 6
 - Overview of product features / selection tables 7
 - Pressure limits and temperature limits 7
 - Technical data 8
 - Selection charts 9
 - Characteristic curves 10
 - Dimensions 19
 - Connection types 20
 - Flange design 21
 - Installation types 22
 - Accessories 23

Heating / Air-conditioning / Ventilation

In-line Pumps

EtaLine Pro



Main applications

- Service water supply systems
- Heating systems
- Industrial recirculation systems
- Air-conditioning systems
- Cooling circuits
- Water supply systems¹⁾

Fluids handled

- Fluids not chemically or mechanically aggressive to the materials

Further information on fluids handled

Overview of fluids handled (⇒ Page 7)

Operating data

Table 1: Operating properties

Characteristic	Value	
Flow rate	Q [m³/h]	≤ 63,6
	Q [l/s]	≤ 18
Head	H [m]	≤ 42,9
Fluid temperature	T [°C]	≥ -20
		≤ +120
Operating pressure	p [bar]	≤ 10

Design details

Design

- Compact pumps consisting of pump and drive unit
- Close-coupled design / in-line design
- Single-stage
- Horizontal installation / vertical installation
- Rigid connection between pump and motor
- Variable speed version

Pump casing

- Radially split volute casing
- In-line design

Drive

- Surface-cooled synchronous motor (TEFC), designed for operation in a compact pump set
- Efficiency class IE5 to IEC 60034-30
- Rated voltage of pump set 3 ~380 - 400 V +/-10 %, 50/60 Hz
- Enclosure IP55
- Duty type: continuous duty S1
- Thermal class F

Shaft seal

- KSB mechanical seal

Impeller type

- Closed radial impeller

Bearings

- Radial ball bearings in the motor housing
- Grease lubrication

¹ No drinking water in acc. with UBA (German drinking water regulations to German Environment Agency)

Designation

Table 2: Designation example

Position																					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
E	3	0	B	-	H	0	6	5	G	P	S	V	1	1	3	5	0	7	5	O	O

Table 3: Designation key

Position	Code	Description
1-4	Pump type series/generation	
	E30B	EtaLine Pro
5	Model	
	-	Standard
	P	Pro
6	Installation position of control panel	
	H	Horizontal
	V	Vertical
7-9	Size [mm], e.g.	
	065	Nominal diameter of suction and discharge nozzles
10	Pump casing material	
	G	Grey cast iron EN-GJL-250/A48CL35
11	Impeller material	
	P	PPS-GF40
12	Design	
	S	Standard
13	Shaft seal design	
	V	Single mechanical seal with vented chamber (A-type cover)
14-15	Seal code, single mechanical seal	
	11	BQ1EGG DIN 24960 $\geq -20 - \leq +120$ [°C]
16-17	Nominal speed [rpm]	
	35	3500
18-20	Rated output power [W]	
	075	750
21	Field bus module	
	O	None
22	Optional component	
	O	None

Materials

Table 4: Materials

Part No.	Description	Material
102	Volute casing	Grey cast iron EN-GJL 250 with cathodic E-coating
161	Casing cover	Grey cast iron EN-GJL 250 with cathodic E-coating
230	Impeller	PPS-GF40/1.4021
411.01/.02	Joint ring	A4/AISI 316
411.03	Joint ring	DPAF
412	O-ring	EPDM
433	Mechanical seal	BQ1EGG
741	Vent valve	CUZN+GAL NI
903.01/.02	Screw plug	A4/AISI 316
920	Hexagon nut	A4/AISI 316
930	Lock washers	ST+FLZNNC
940	Key	1.4571+C/A276 TP 316 COND B

Coating and preservation

- Coating and preservation to manufacturer's standard

Product benefits

- Improved efficiency and NPSHreq by experimentally verified hydraulic design of impellers (vanes)
- Little wear, low vibration levels and excellent smooth running characteristics thanks to good suction performance and virtually cavitation-free operation across a wide operating range
- Casing sealed reliably – even in varying operating conditions – by confined casing gasket
- Low-noise, low-vibration motors specially designed for EtaLine Pro
- Straightforward commissioning thanks to default factory parameter settings
- Space-saving thanks to integrated electronics and high output per size of the compact pump

Product information

Product information as per Regulation No. 1907/2006 (REACH)

For information as per European chemicals regulation (EC) No. 1907/2006 (REACH) see <https://www.ksb.com/en-global/company/corporate-responsibility/reach>.

Product information as per Regulation No. 547/2012 (for water pumps with a maximum shaft power of 150 kW) implementing "Ecodesign" Directive 2009/125/EC

- Minimum efficiency index: see name plate, key to name plate
- The benchmark for the most efficient water pumps is MEI ≥ 0.70 .
- Year of construction: see name plate, key to name plate
- Manufacturer's name or trade mark, commercial registration number and place of manufacture: see data sheet or order documentation
- Product's type and size identifier: see name plate, key to name plate
- Hydraulic pump efficiency (%) with trimmed impeller: see data sheet²⁾
- Pump performance curves, including efficiency characteristics: see documented characteristic curve
- The efficiency of a pump with a trimmed impeller is usually lower than that of a pump with the full impeller diameter.²⁾ Trimming of the impeller will adapt the pump to a fixed duty point, leading to reduced energy consumption. The minimum efficiency index (MEI) is based on the full impeller diameter.
- Operation of this water pump with variable duty points may be more efficient and economic when controlled, for example, by the use of a variable speed drive that matches the pump duty to the system.
- Information relevant for disassembly, recycling or disposal at end of life: see installation/operating manual
- Information on benchmark efficiency or benchmark efficiency graph for MEI = 0.70 (0.40) for the pump based on the model shown in the Figure are available at: <http://www.europump.org/efficiencycharts>

Acceptance tests and warranty

Materials inspection and testing

- Test report 2.2 on request

Hydraulic test

- The duty point of each pump with a delivery address or final destination in Europe is guaranteed to ISO 9906/3B.

 Other inspections/tests on request

Warranty

- Warranties are given within the scope of the valid terms and conditions of sale and delivery.

²⁾ There is no trimmed impeller for this type series.

Overview of product features / selection tables

Overview of fluids handled

Table 5: Excerpt from the overview of fluids handled with associated material variants

Fluid handled	Fluid temperature		Seal code
	Min.	Max.	BQ ₁ EGG
	[°C]		11
Service water	-	-	X
Heating water ³⁾	-	+120	X
Condensate	-	-	X
Cooling water without antifreeze	-	+60	X
Cooling water with antifreeze, pH ≥ 7.5 ⁴⁾	-20	+110	X
Pure water	-	+60	X

Overview of functions

Table 6: Overview of functions

Functions / firmware	EtaLine Pro
Protective functions	
Electronic motor protection	X
Mains voltage monitoring	X
Phase failure, motor side	X
Short-circuit monitoring, motor side (phase to phase and phase to earth)	X
Operating point estimation and characteristic curve control	X
Operating mode	
Constant Speed	X
Constant-pressure Control (Δp -const.)	X
Proportional-pressure Control (Δp -var.)	X
Dynamic Control (Δp -var.)	X
Operation and monitoring	
Display of process values (head, flow rate, speed, electric power)	X
Fault history	X
Operating hours counter	X
Fault reporting via relay	X
Pump set functions	
Adjustable start ramp and operating ramp	X
Field-oriented control (vector control)	X
External message via digital input	X
Generation of test alert	X
Flow rate estimation	X
Operation	
Control element	X ⁵⁾
Bluetooth LE interface	X

Pressure limits and temperature limits

Table 7: Pressure limits and temperature limits as a function of material variant

T ⁶⁾	Test pressure ⁷⁾	Operating pressure
[°C]	[bar]	[bar]
-20 to +120	≤ 15	≤ 10

³⁾ Treatment to VdTÜV 1466; additional requirement: O₂ t ≤ 0.02 mg/l

⁴⁾ The mechanical seal used as standard, type BQ1EGG, is suitable for antifreeze agents on ethylene glycol basis (not inhibited) and glycols (pure). In the case of applications involving antifreeze agents on ethylene glycol basis (inhibited, closed / open system) or on propylene glycol basis (inhibited, closed / open system) leakage may occur at the mechanical seal used. To prevent this, using an alternative pump type series with the option of selecting the mechanical seal material is recommended.

⁵⁾ Some functions can only be parameterised and/or displayed using the KSB FlowManager app or the KSB ServiceTool.

⁶⁾ Fluid temperature; for hot water heating systems to DIN 4752, Section 4.5, application limits must be observed.

⁷⁾ The casing components are checked for leakage by means of internal pressure tests to AN 1897/75-03D00 with water.

Technical data
EtaLine Pro pump set

The power cable must meet the following requirements:

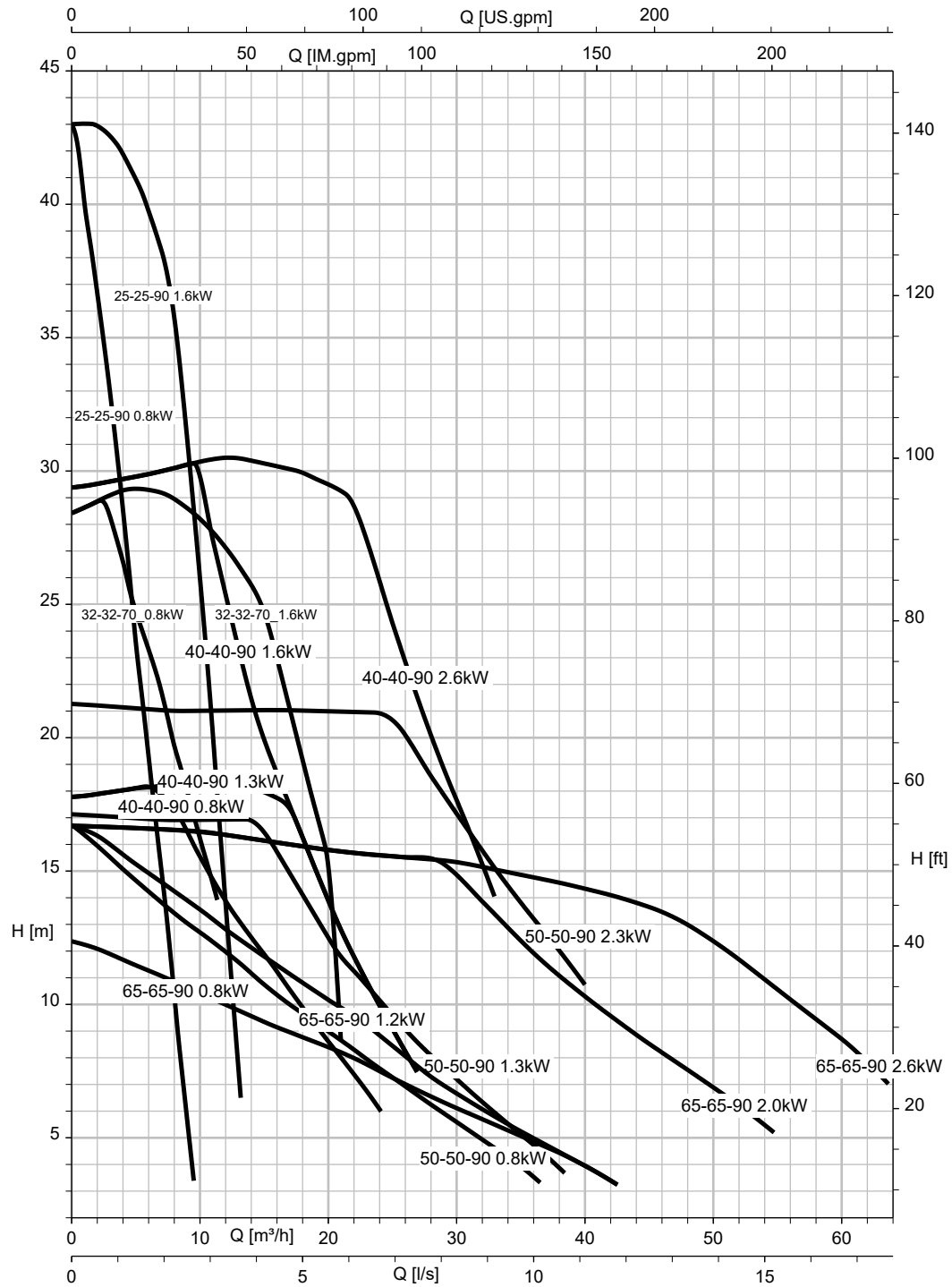
- Clamping range for M25 cable gland: 8 to 17 mm
- Maximum core cross-section: 2.5 mm²

Table 8: Technical data

Size	Nominal speed	Current input I ₁		Power input P ₁		Weight
		3~ 400 V				
	[rpm]	[A]	[kW]	[kg]		
025-025-090 0,8	5900	1,5	0,8	16		
025-025-090 1,6	5900	3,8	1,6	16		
032-032-070 0,8	6000	1,5	0,8	19		
032-032-070 1,6	6000	3,8	1,6	19		
040-040-090 0,8	3500	1,4	0,8	21,2		
040-040-090 1,3	3500	3,1	1,3	21,2		
040-040-090 1,6	4500	3	1,6	21,2		
040-040-090 2,6	4500	4,7	2,6	22,6		
050-050-090 0,8	3450	1,5	0,8	23,2		
050-050-090 1,3	3500	3,1	1,3	23,2		
050-050-090 2,3	3900	4,1	2,3	24,6		
065-065-090 0,8	2850	1,5	0,8	28,8		
065-065-090 1,2	3300	2,9	1,2	28,8		
065-065-090 2,0	3300	3,6	2	30,2		
065-065-090 2,6	3300	4,7	2,6	32,3		

Selection charts

EtaLine Pro



Characteristic curves

General

Test class

Characteristic curves to ISO 9906 Class 3B

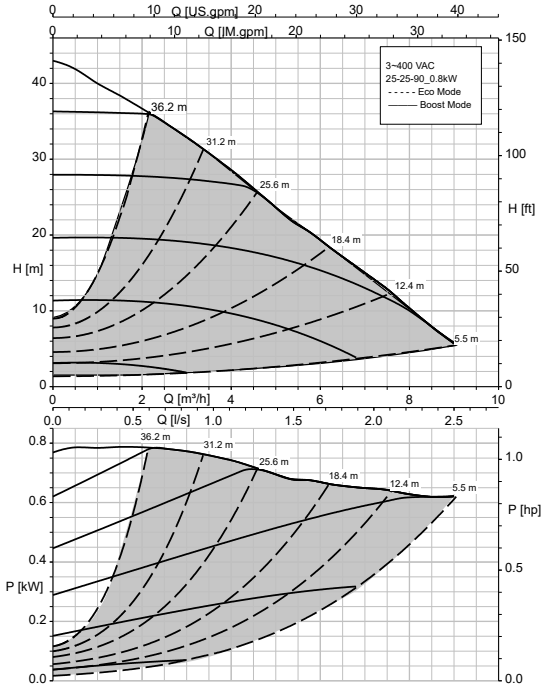
Density of the fluid handled

The indicated heads and performance data apply to pumped fluids with a density $\rho = 1.0 \text{ kg/dm}^3$ and a kinematic viscosity of up to $20 \text{ mm}^2/\text{s}$ max. If the density $\neq 1.0$, the performance data must be multiplied by ρ . For a viscosity $> 20 \text{ mm}^2/\text{s}$ the corresponding data for cold water has to be calculated and the impact on the pump's performance has to be determined.

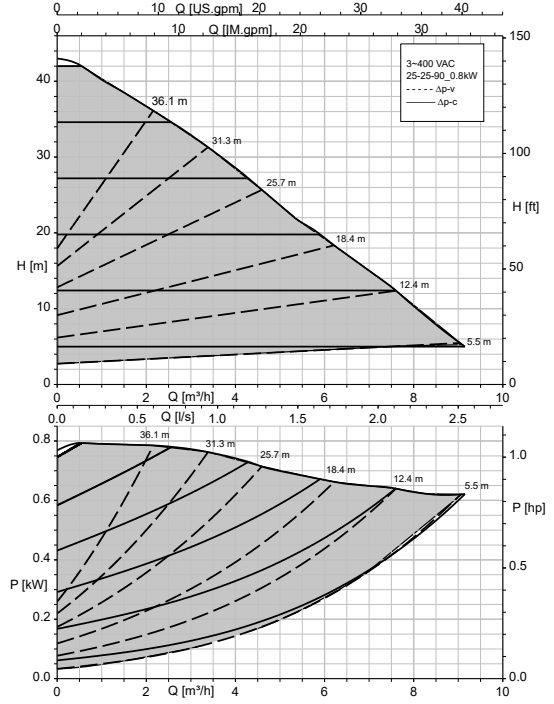
Correction factors

The characteristic curves apply to pumps with cast iron impellers, plastic impellers and bronze impellers.

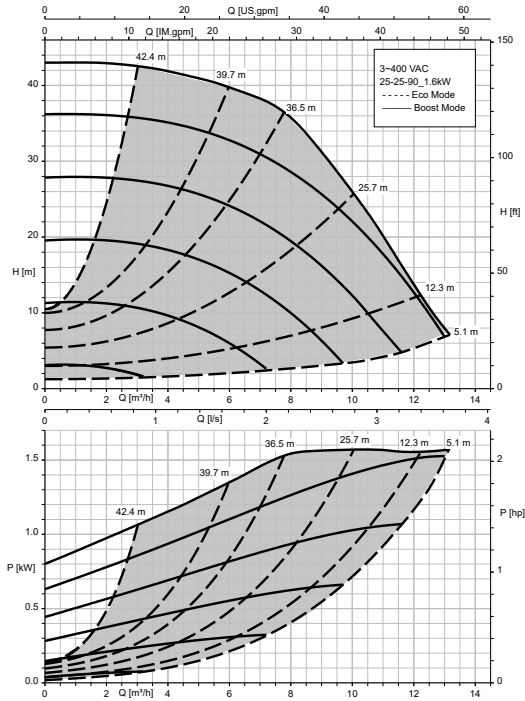
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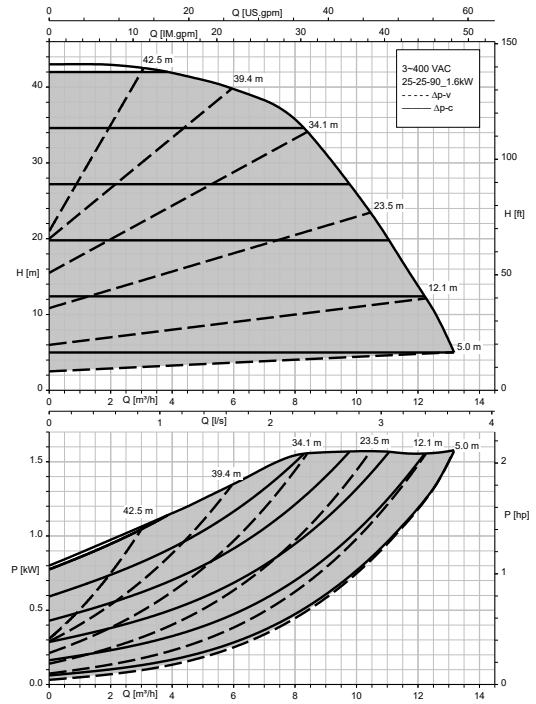
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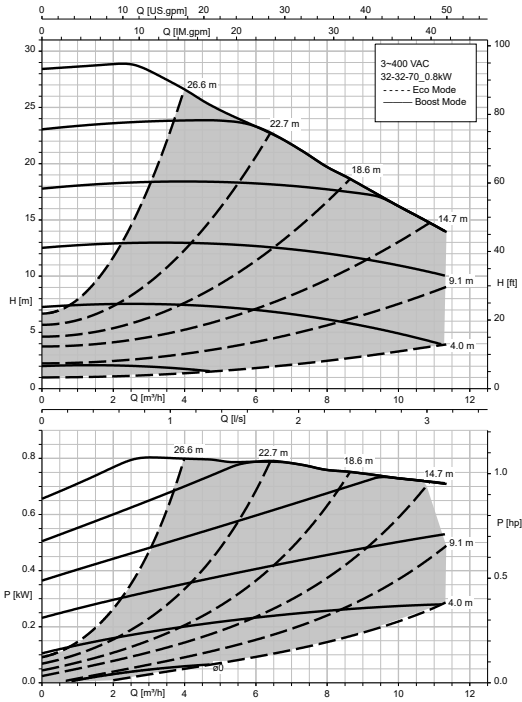
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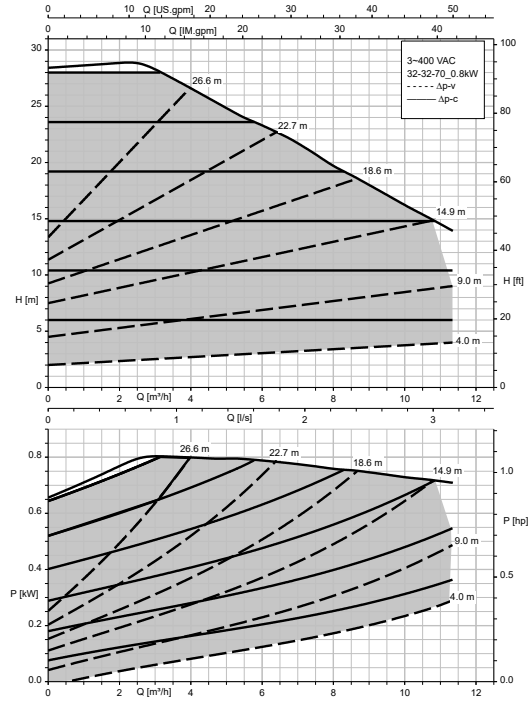
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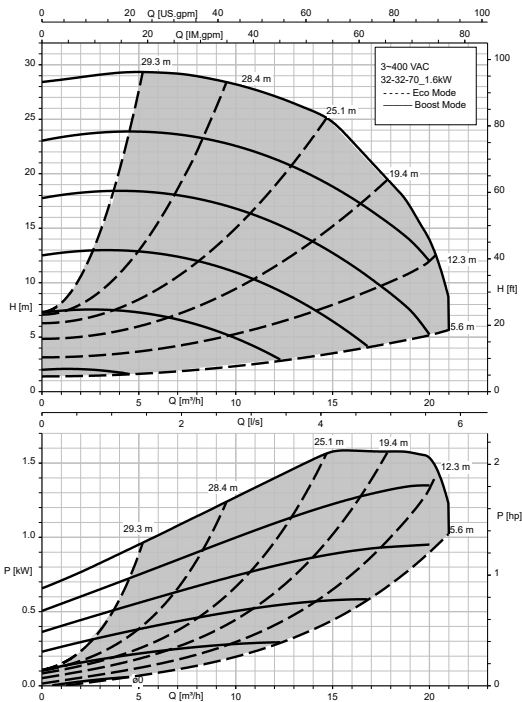
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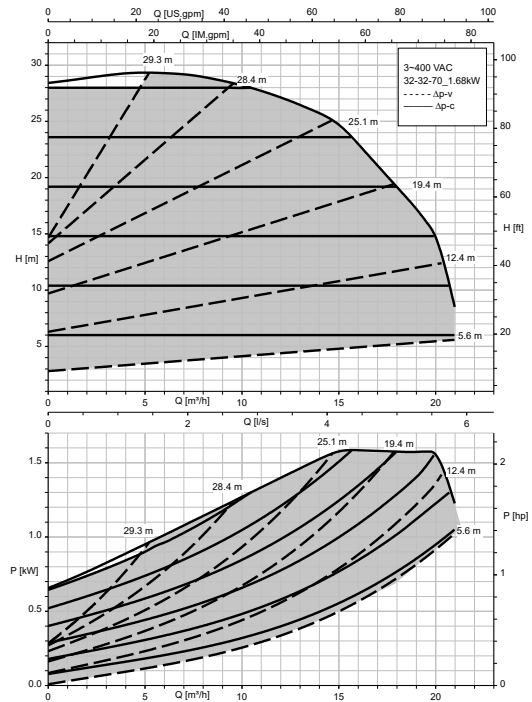
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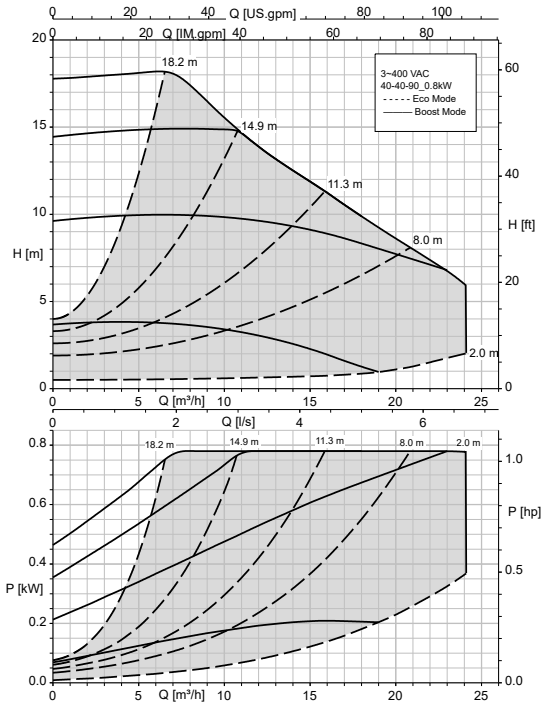
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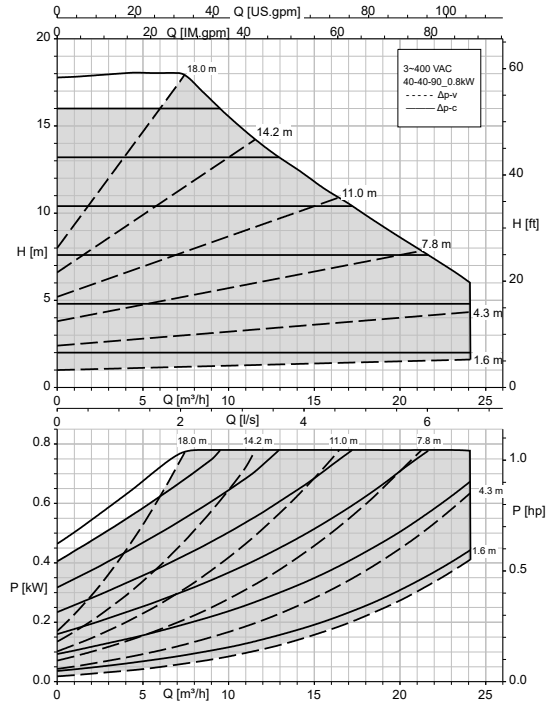
EtaLine Pro 032-032-070 1.6 kW, $\Delta p-v$, $\Delta p-c$



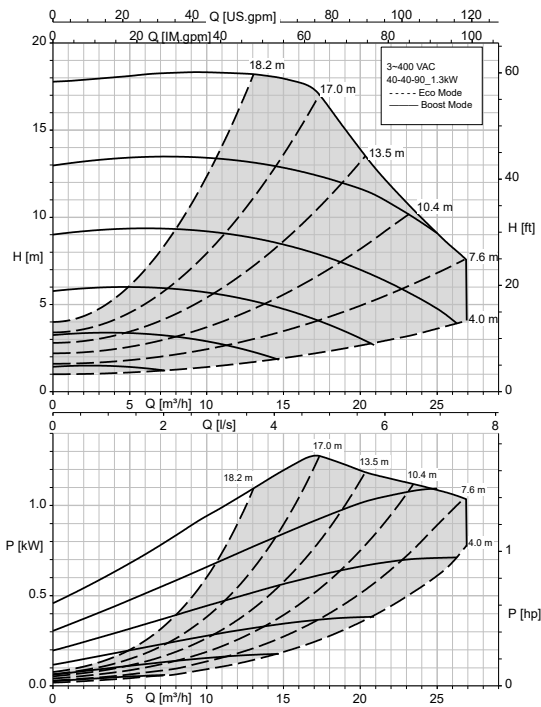
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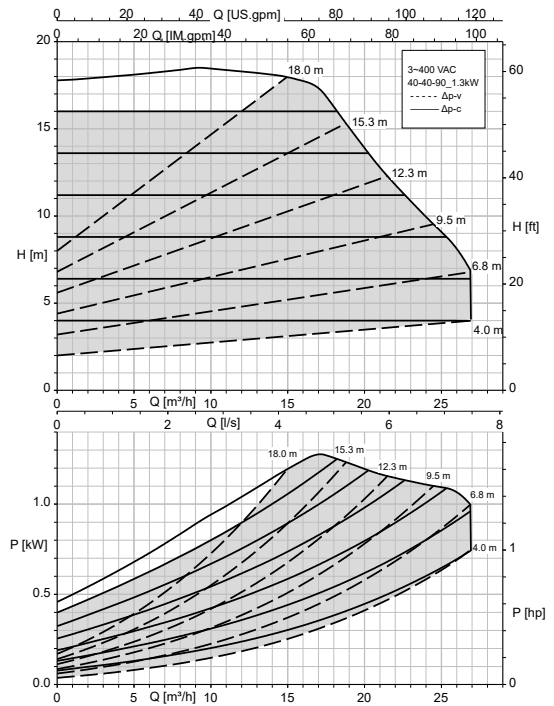
EtaLine Pro 040-040-090 0.8 kW, Δp -v, Δp -c



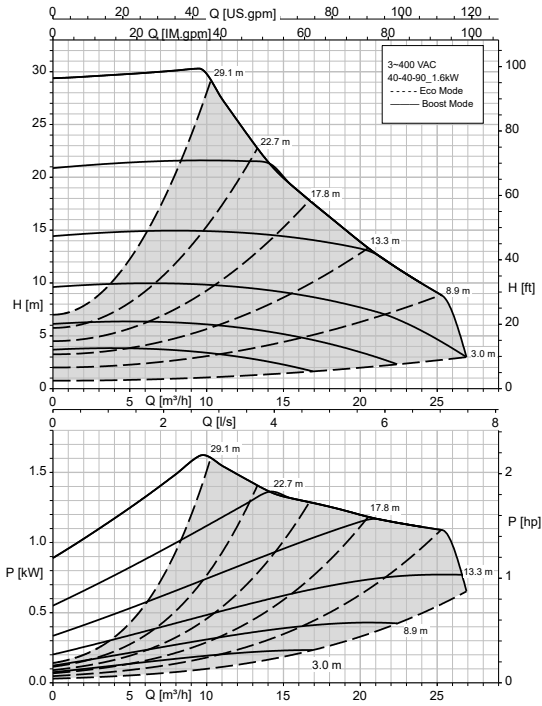
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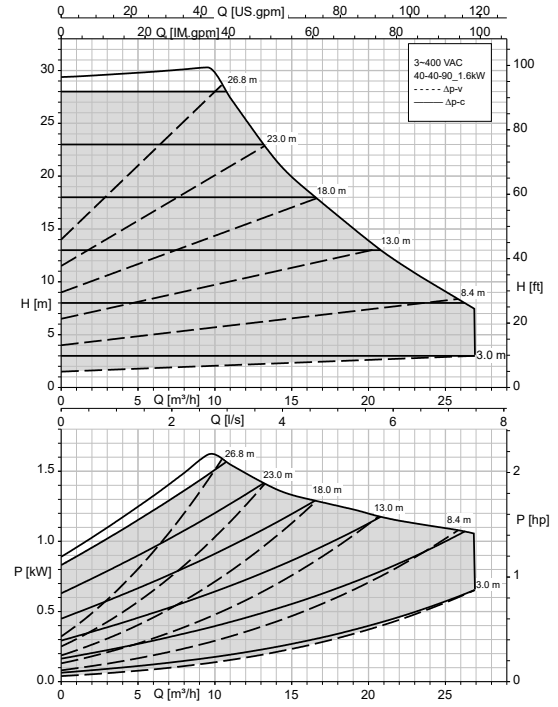
EtaLine Pro 040-040-090 1.3 kW, Δp -v, Δp -c



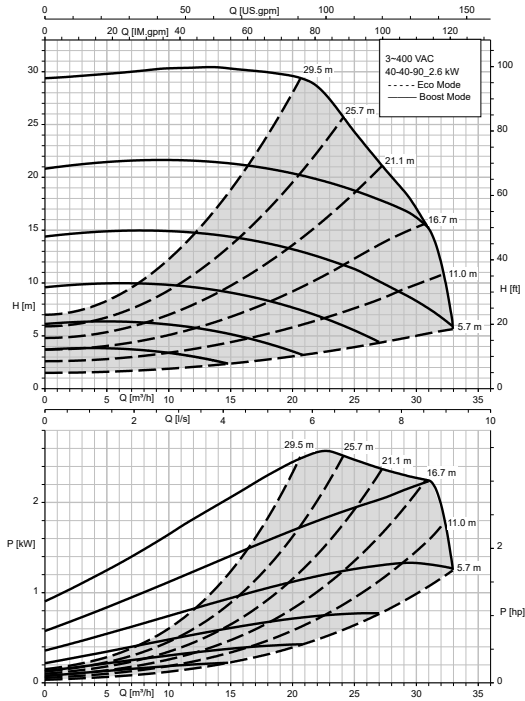
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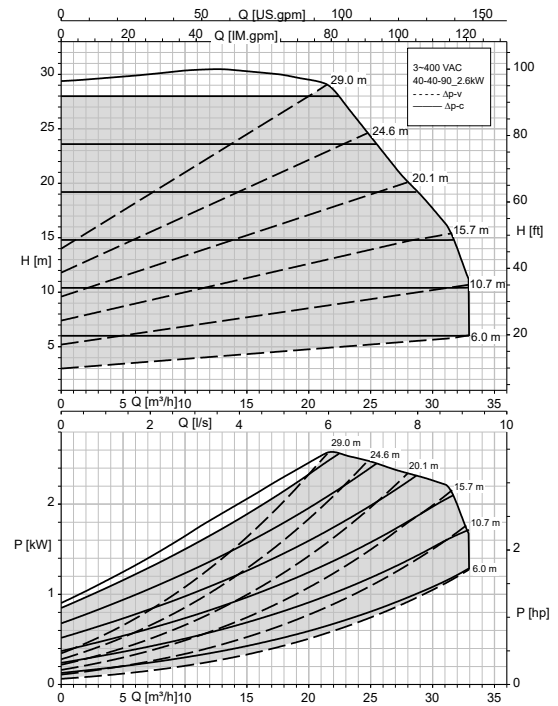
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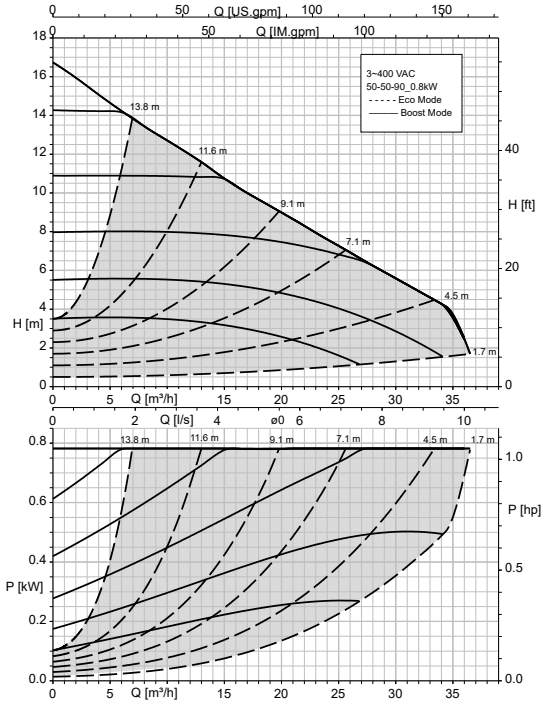
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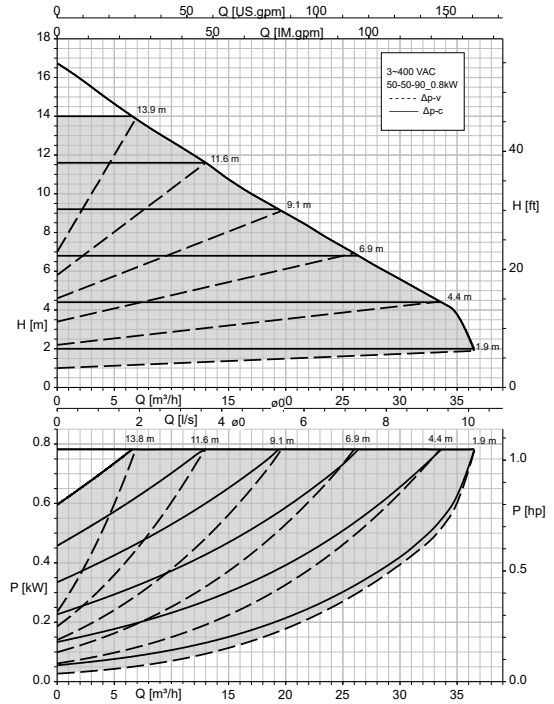
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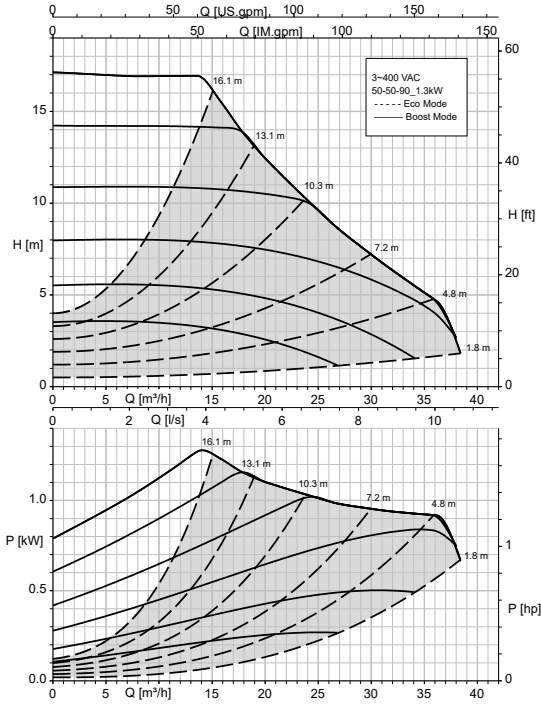
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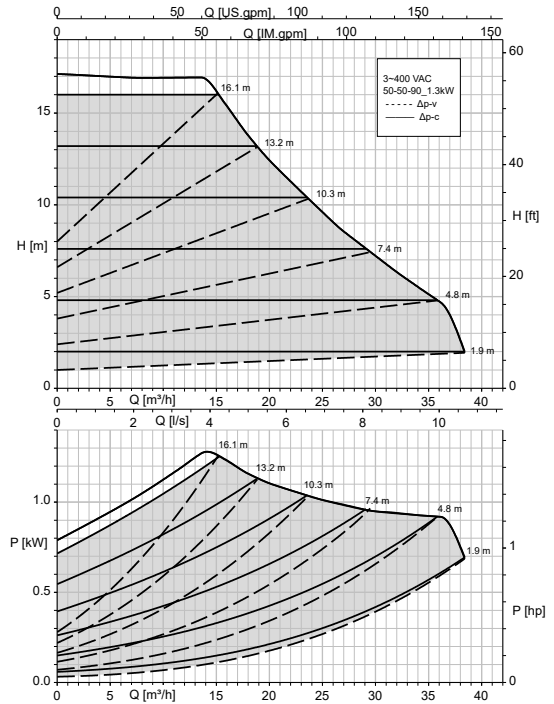
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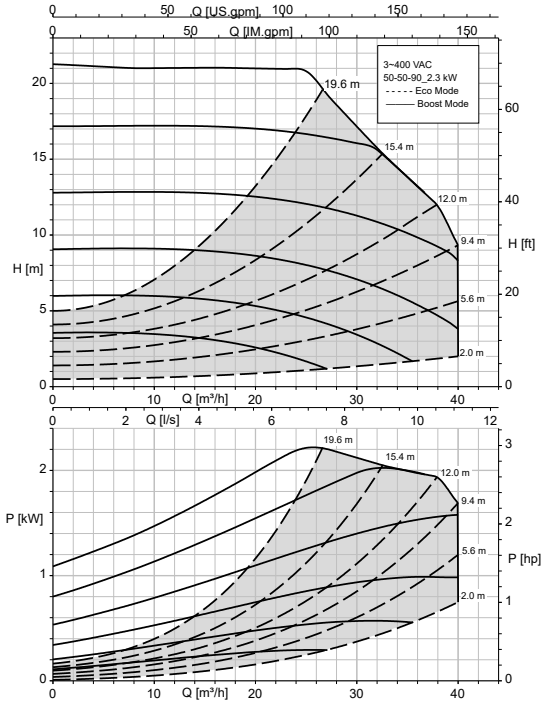
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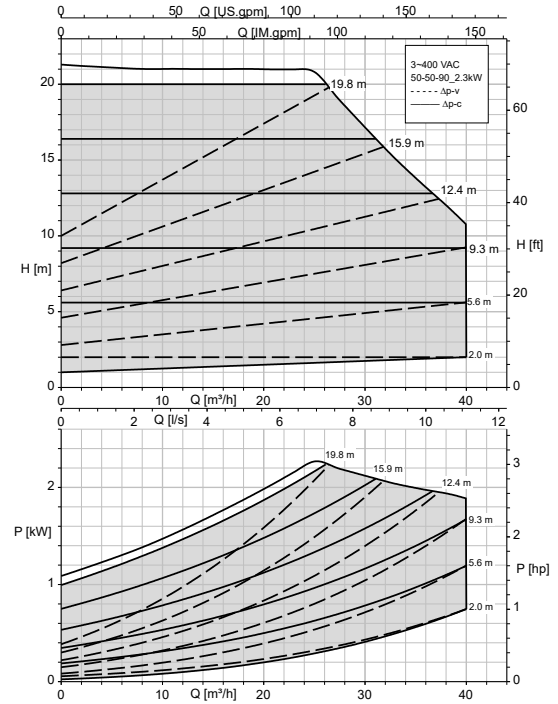
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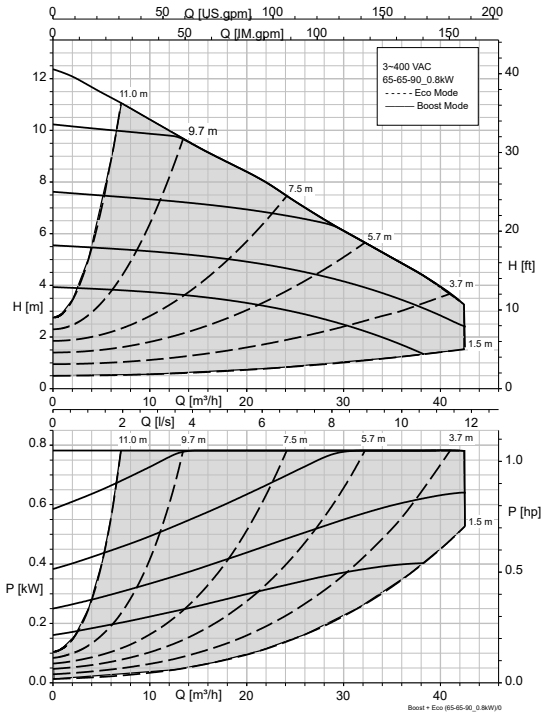
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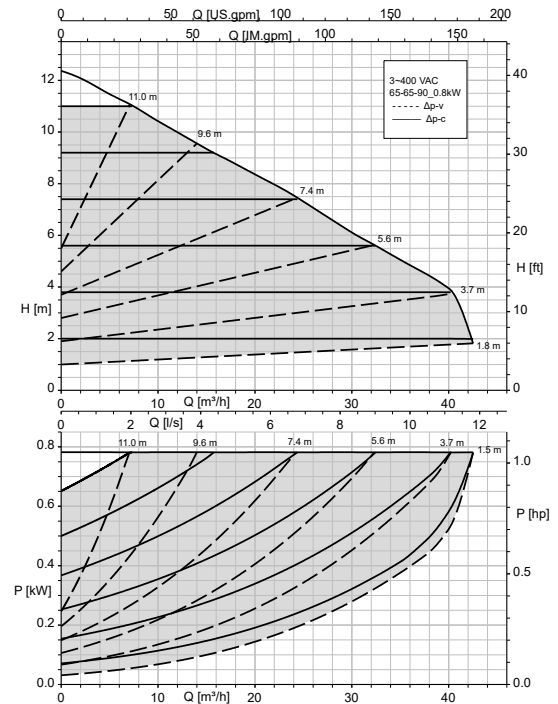
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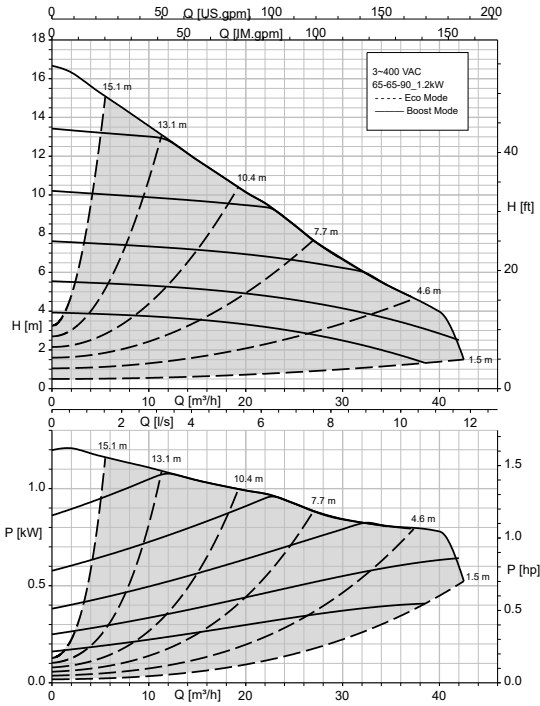
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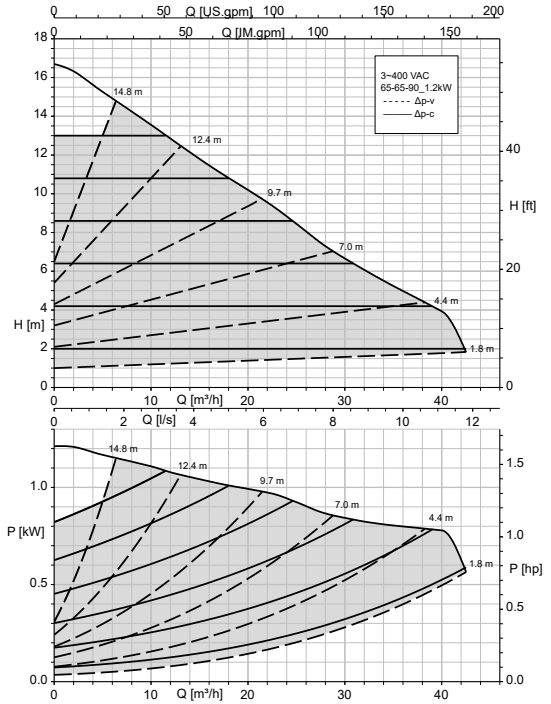
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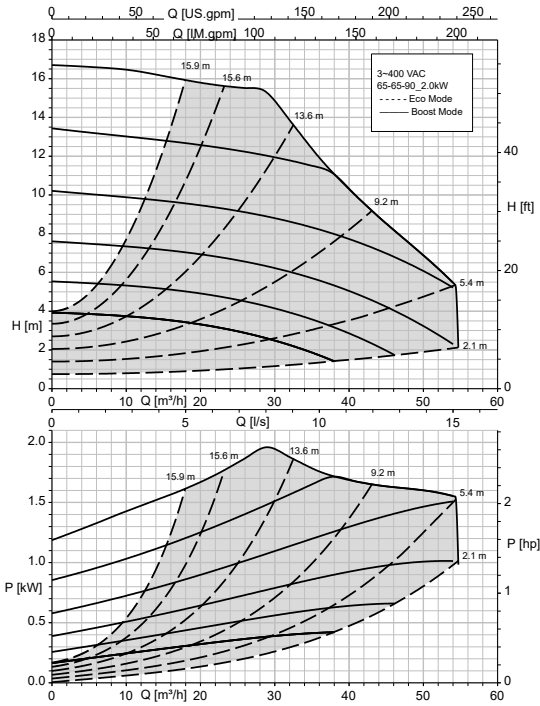
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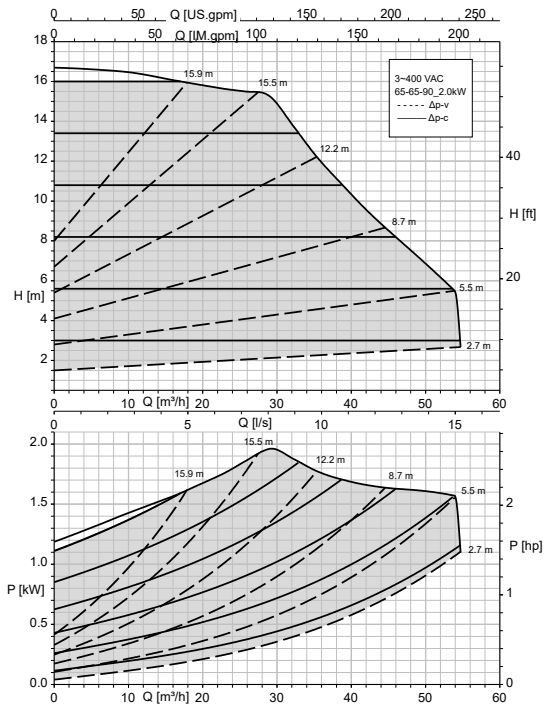
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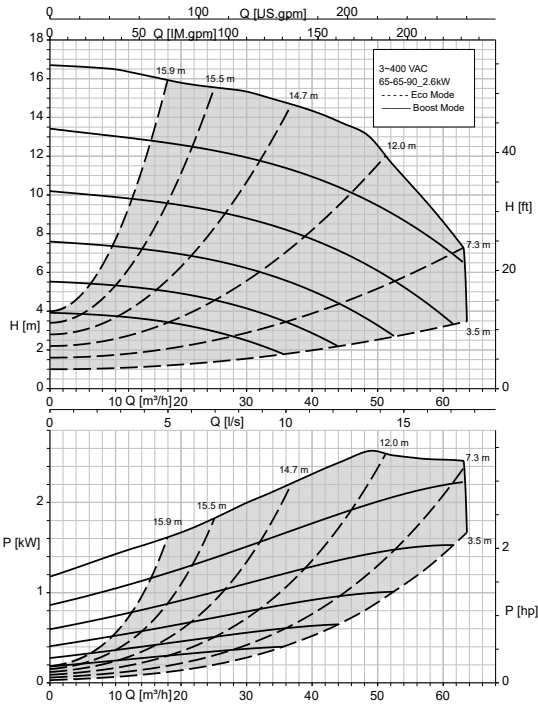
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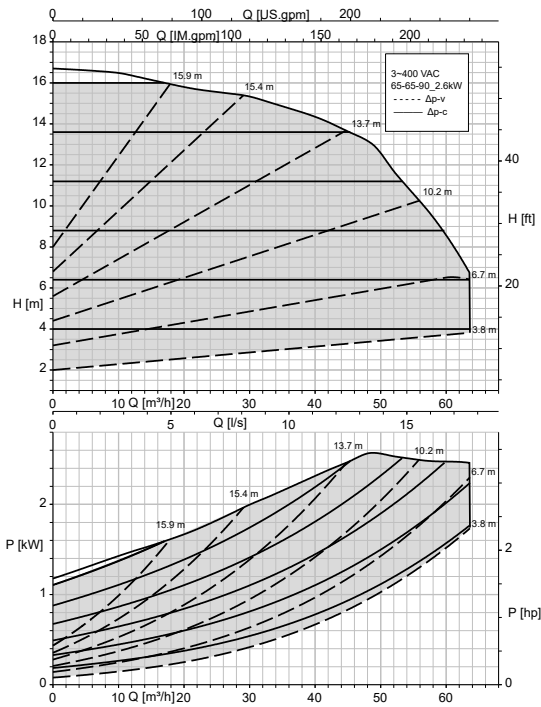
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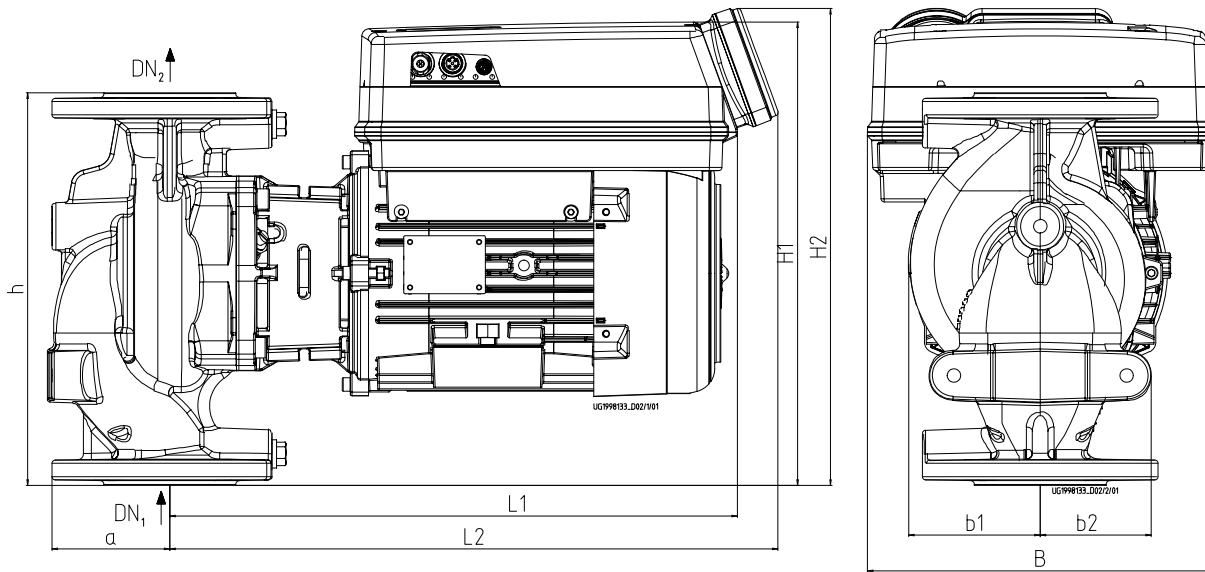


EtaLine Pro 065-065-090 2.6 kW, constant speed (open-loop control), Eco Mode



EtaLine Pro 065-065-090 2.6 kW, $\Delta p-v$, $\Delta p-c$



Dimensions
Pump set dimensions

Fig. 1: Pump set dimensions
Table 9: Pump set dimensions

Nominal diameter DN of discharge nozzle	$a^{8)}$	h	$b1^{8)}$	$b2^{8)}$	B	$L1$	$H1$	$L2$	$H2$
	[mm]								
25	63	180	67	62	220	362	255	388	264
32	63	220	63	63	220	362	270	388	279
40	78	250	84	70	220	362	295	388	304
50	103	280	90	70	220	366	320	392	329
65	123	340	114	90	220	369	340	395	349

⁸ Pump body overhang without flange OD/ Flange, see flange dimensions

Connection types

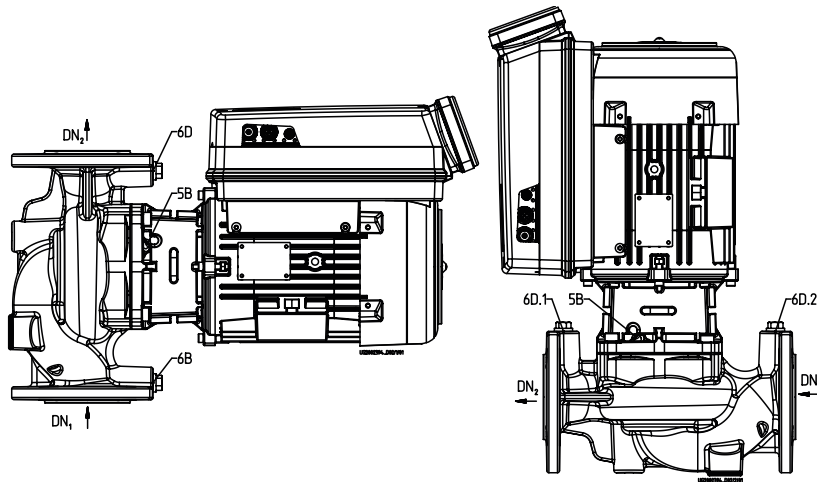


Fig. 2: Connections

Table 10: Connection type

Connection	Description	Configuration	Position
5B	Vent connection for the mechanical seal chamber	Plugged with vent plug	Casing cover
6B	Fluid drain	Drilled and closed	Volute casing
6D, 6D.1, 6D.2 ⁹⁾	Fluid priming and venting	Drilled and closed	Volute casing

Table 11: Connection

Size	6B, 6D, 6D.1, 6D.2
032-032-070	G 1/4
040-040-090	G 1/4
050-050-090	G 1/4
065-065-090	G 1/4

⁹⁾ On size DN25 connections 6B, 6D, 6D.1, 6D.2 are not available.

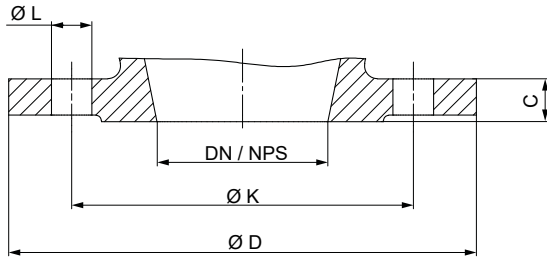
Flange design

Fig. 3: Flange dimensions

Table 12: Flange dimensions [mm]

DN / NPS	Standard							Note
	EN 1092-2						DIN EN ISO 228-1	
	PN 10			PN 6			Thread	
	Ø K	Ø D	Number of holes L	Ø K	Ø D	Number of holes L		
25	-	-	-	-	-	-	G 1 1/2	-
32 / NPS1 1/4	100	140	4xØ19	90	140	4xØ14	-	Adapter flange PN6/ PN10
40 / NPS1 1/2	110	150	4xØ19	100	150	4xØ14	-	
50 / NPS2	125	165	4xØ19	110	165	4xØ14	-	
65 / NPS2 1/2	145	185	4xØ19	130	185	4xØ14	-	

Table 13: Flange design by materials

Material variant	Standard	Nominal size	Pressure class
GG, GP, BB, BP	Drilled to EN 1092-2	DN 32 - DN 65	PN 6 / PN 10

Installation types

Horizontal installation

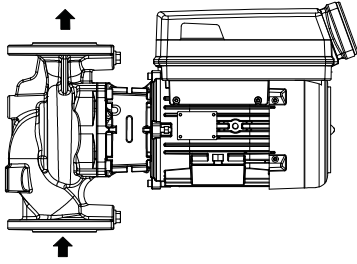


Fig. 4: Horizontal installation of pump set, direction of flow from bottom to top

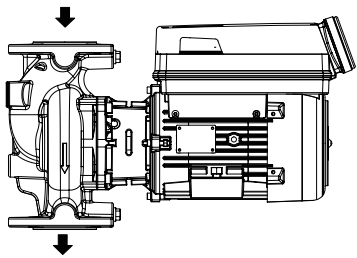


Fig. 5: Horizontal installation, direction of flow from top to bottom

Turn the volute casing and/or pull-out unit by 180° so that the electronic system and the control element remain in their current position on top and are easy to read.

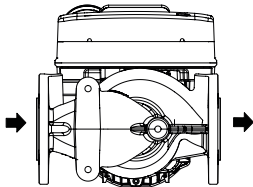
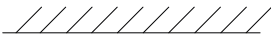


Fig. 6: Horizontal installation (for example under the ceiling)

Turn the volute casing and/or pull-out unit by 90° so that the frequency inverter remains in its current position on top.

Vertical installation

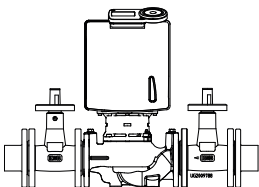


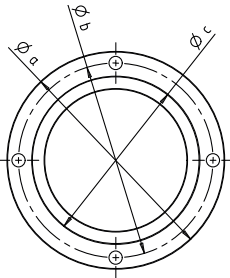
Fig. 7: Vertical installation / mounted without pump foot
 In this installation position the mechanical seal must be vented via the vent valve.

Accessories

Pump accessories

Table 14: Pump accessories

Component	$\varnothing a / \varnothing b / \varnothing c$	For size	Mat. No.	[kg]
	[mm]			
Blind flange with sealing element	150 / 134 / 115,8	DN25-DN65	05184959	1,8



Exploded view and list of components

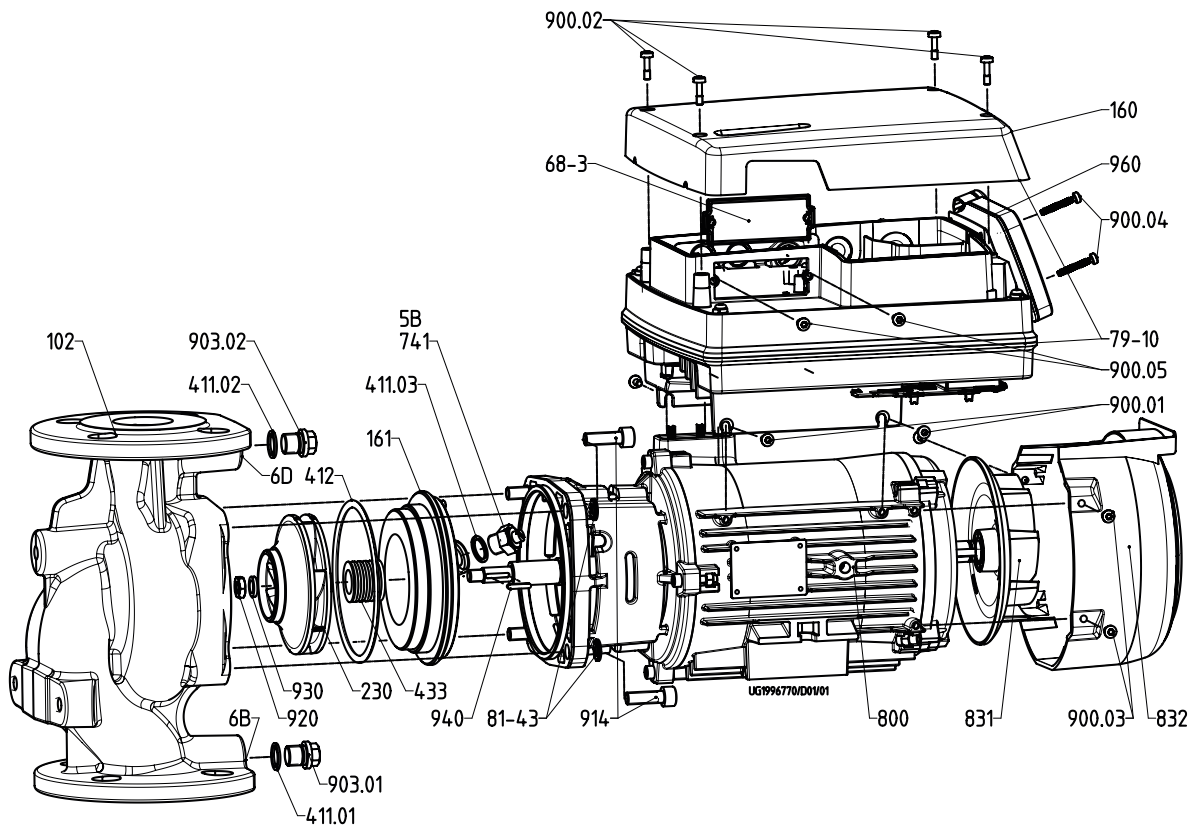


Fig. 8: Exploded view

Table 15: List of components

Part No.	Description	Part No.	Description
102	Volute casing	920	Hexagon nut
161	Casing cover	930	Safety device
160	Cover	940	Key
210	Shaft	960	Operating element
230	Impeller	59-2	Fan impeller
411.01/.02/.03	Joint ring	68-3	Cover plate
412	O-ring	79-10	Frequency inverter

Part No.	Description	Part No.	Description
433	Mechanical seal	81-43	Connection disc
741	Vent valve		
800	KSB motor	Auxiliary connections	
900.01/.02/.03/.04/.05	Bolt/screw	6B	Fluid drain
903.01/02	Screw plug	6D	Fluid priming and venting
914	Hexagon socket head cap screw	5B	Fluid venting (vertical installation)

Glossary

Close-coupled design

Motor directly fitted to the pump via a flange or a drive lantern

IE5

Efficiency class to IEC TS 60034-30-2:2016 = Ultra Premium Efficiency (IE = International Efficiency)

In-line design

A pump whose suction and discharge nozzle are arranged opposite each other and have the same nominal diameter.



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