In-line Pump

Etaline L PumpDrive 2 Eco

Type Series Booklet

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Type Series Booklet Etaline L PumpDrive 2 Eco

Contents

Heating / Air-conditioning / Ventilation

In-line Pumps

Etaline L PumpDrive 2 Eco

Main applications

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

Fluids handled

- Fluids not chemically or mechanically aggressive to the materials

Further information on fluids handled

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Operating data

Operating properties

Characteristic		Value
Flow rate	Q [m³/h]	95
	Q [l/s]	26,3
Head	H [m]	21
Fluid temperature	T [°C]	-15 to +120
Operating pressure	p [bar]	≤ 10

Designation

Example: ETLL032-032-100 GGWAV11D2 PD2E

Designation key

Code	Description	
ETLL	Type series	
	ETLL	Etaline L
032	Nominal suction nozzle diameter [mm]	
032	Nominal discharge nozzle diameter [mm]	
100	Nominal impeller diameter [mm]	
G	Casing material	
	G	Grey cast iron
	B	Bronze
G	Impeller material	
	G	Grey cast iron
	B	Bronze
	P	Polysulphone
W	Design	
	P	Model with casing cover made of polysulphone
	W	WRAS-approved for drinking water
	X	Special design BT3D, BT3
A	Casing cover	
	A	Conical seal chamber
V	Type of seal	
	V	Conical seal chamber with vent
11	Seal code	
	11	BQ1EGG
	12[1)]	BQ1PGG
	13[1)]	BVPGG
	14[1)]	Q5Q1EGG
	15[1)]	Q5Q1PGG
D	Scope of supply	
	D	Pump, baseplate, coupling, coupling guard, motor
2	Shaft unit	
	2	Shaft unit 12
	4	Shaft unit 14
	6	Shaft unit 16
PD2E	PumpDrive	
	PD2E	PumpDrive 2 Eco

Further information on the designation

(⇨ Page 23)

1) Available upon request.

Design details

Design

- Close-coupled design / in-line design
- Single-stage
- Horizontal/vertical installation
- Rigid connection between pump and motor

Pump casing

- Radially split volute casing
- In-line design

Impeller type

- Closed radial impeller

Shaft seal

- KSB mechanical seal

Bearings

- Radial ball bearing in the motor housing
- Grease lubrication

Drive

- Surface-cooled squirrel-cage motor to KSB standard prepared for mounting a PumpDrive 2 Eco
- Efficiency class IE2 to IEC 60034-30 (≥ 0.75 kW)
- Winding 50 Hz, 3~220 - 240 V / 3~380 - 420 V
- Type of construction IM V1
- IP55 enclosure
- Duty cycle: continuous duty S1
- Thermal class F

PumpDrive

- Mains voltage: 3~ 380 V AC -10 % to 480 V AC +10 %
- Mains voltage: 1~ 220 V AC -10 % to 240 V AC +10 %
- Mains frequency 50 - 60 Hz ± 2 %
- IP55 enclosure

Materials

Overview of available materials

Part. No.	Description	Material	Material variant			
			GG	GP	BB	BP
102	Volute casing	Grey cast iron EN-GJL 200 / EN-GJL 250[2)]	✗	✗	-	-
		Bronze CC491K	-	-	✗	✗
230	Impeller	Grey cast iron EN-GJL-150	✗	-	-	-
		Bronze G-CuSn10Zn	-	-	✗	-
		Polysulphone PSU-GF30	-	✗	-	✗
341	Drive lantern	Aluminium AC-46500	✗	✗	✗	✗
412.50	O-ring	EPDM	✗	✗	✗	✗
554.03	Washer	CW508L	✗	✗	✗	✗
580	Cap, conical	Polyamide 66	✗	✗	✗	✗
		Polysulphone PSU-GF30	○[3)]	○[3)]	○[3)]	○[3)]
914.21	Hexagon socket head cap screw	A4	✗	✗	✗	✗

Coating and preservation

- Coating and preservation to KSB standard

Product benefits

- Improved efficiency and $NPSH_{req}$ 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
- Optimum match of pump to fluid handled by a large choice of materials for many applications as standard
- Low-noise low-vibration motors specially designed for Etaline L. Also available as 2-pole motors.

2) DN 80
3) Optional design with additional code P

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 data sheet
- The benchmark for the most efficient water pumps is MEI ≥ 0.70.
- Year of construction: see data sheet
- Manufacturer's name or trade mark, commercial registration number and place of manufacture: see data sheet or order documentation
- Product's type and size identificator: see data sheet
- Hydraulic pump efficiency (%) with trimmed impeller: see data sheet
- 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 full impeller diameter. 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

FluidFuture energy efficiency concept developed by KSB

www.ksb.com/fluidfuture

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.

Selection information

Power cables

Unshielded cables can be used as power cables.

The power cables must be designed with a cross-section suitable for the nominal mains current.

If a mains contactor is used in the power cable (before the frequency inverter), this must be configured for an AC1 duty rating; the rated current values of the frequency inverters used are added and the result is increased by 15 %.

Power cable properties

PumpDrive 2 Eco		P	Cable gland				Mains-side input current[4]	Maximum core cross-section	Cable cross-section KSB motor cable
			Mains power cable	Sensor cable	Motor cable	PTC thermistor			
		[kW]					[A]	[mm²]	
A	..000K37..	0,37	M20	M16	M20	M16	1,5	2,5	2,5
A	..000K55..	0,55	M20	M16	M20	M16	2,0	2,5	2,5
A	..000K75..	0,75	M20	M16	M20	M16	2,7	2,5	2,5
A	..001K10..	1,10	M20	M16	M20	M16	3,7	2,5	2,5
B	..001K50..	1,50	M25	M16	M25	M16	5,2	2,5	2,5
B	..002K20..	2,20	M25	M16	M25	M16	6,3	2,5	2,5
B	..003K00..	3,00	M25	M16	M25	M16	8,4	2,5	2,5

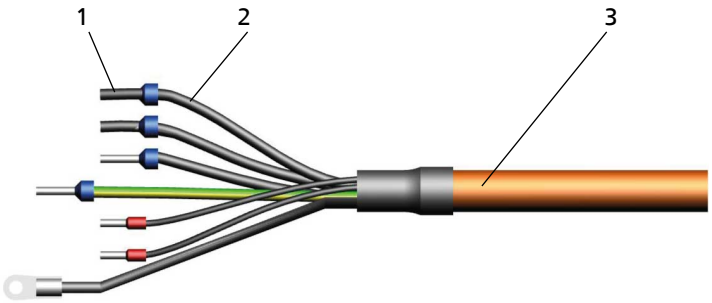


Fig. 1: Structure of electric cable

1	Wire end sleeve
2	Core
3	Cable

Cable cross-sections of control terminals

Control terminal	Core cross-section			Cable diameter[5]
	Rigid cores	Flexible cores	Flexible cores with wire end sleeves	
	[mm²]			[mm]
Terminal strip A, B, C	0,2 - 1,5	0,2 - 1,0	0,25 - 0,75	**M12**: 3,5 - 7,0 **M16**: 5,0 - 10,0

Length of motor connection cable

If the frequency inverter is not mounted on the motor to be controlled, longer motor connection cables may be required. The stray capacitance of the connection cables may result in high-frequency discharge currents flowing to ground. The sum of the discharge currents and motor current may exceed the output-side rated current of the frequency inverter. This will activate the frequency inverter's protection equipment and the motor will be stopped. The following motor connection cables are recommended depending on the power range:

Length of motor connection cable

Power range	Cable length	Stray capacitance
	Max.	
[kW]	[m]	[nF]
≤ 11 (Class B)	5	≤ 5
≥ 15 (Class A, Group 1)	50	≤ 5

4) Observe the information on the use of line chokes provided in the Accessories and Optional Equipment section.
5) Impairment of protection provided by enclosure when cable diameters other than those specified are used.

Output filter

If the length or stray capacitance of the power cable exceed the values indicated, we recommend installing a suitable output filter between the frequency inverter and the motor to be controlled. These filters reduce the voltage ramp-up time of the frequency inverter output voltages and limit their peaks.

Electrical protection equipment

Back-up fuses

Provide 3 fast-acting fuses in the mains power supply line to the frequency inverter. The fuse size must be suitable for the nominal mains current supplied to the frequency inverter.

Motor protection switch

Separate motor protection is not required because the frequency inverter has its own safety devices (e.g. electronic overcurrent trip). Available motor protection switches must be rated for 1.4 times the nominal motor current.

Residual current device

If fixed connections and appropriate supplementary earthing are used (to DIN VDE 0160), RCDs are not mandatory for frequency inverters.

If residual current devices (RCDs) are used, three-phase frequency inverters must in accordance with DIN VDE 0160 be connected via universal AC/DC sensitive residual current devices (RCDs), as potential direct-current components may cause standard AC sensitive RCDs to either fail to respond or respond erroneously.

For sizes A, B and C a residual current device with a rated current of 150 [mA] must be used.

If you are using a long shielded cable for the mains connection / motor connection, the residual-current monitoring device may be triggered by the discharge current that flows to earth (triggered by the carrier frequency). Remedies: Replace the RCD (residual current device) or lower the response limit.

Information on electromagnetic compatibility

Electromagnetic interference from other electrical devices can affect the frequency inverter. The frequency inverter itself can also produce interference.

The interference emitted by the frequency inverter can generally be conducted through the motor connection cables. The following measures are proposed for interference suppression:

- Shielded motor connection cables must be used for cable lengths > 70 cm and for frequency inverters with low power ratings.
- If shielded power cables cannot be used, use metal cable ducts made from a single piece with a minimum coverage of 80 %.

Installation at site/Environment

Install the frequency inverter in a metal cabinet for more effective shielding.

When installing the power components in the control cabinet, make sure they are not too close to other devices (control devices and monitoring devices).

Maintain a minimum distance of 0.3 metres between the cabling and power components as well as other cabling in the control cabinet.

Connecting the cables

Use different earth bus bars for the control cable and the power cable / motor connection cable.

The shield on the power cable must consist of a single piece. It must be earthed at both ends on the appropriate earth terminal or on the earth bus bar (do not connect it to the earth bus bar in the control cabinet).

The shielded cable ensures that the high-frequency current flows through the shielding. Otherwise the high-frequency current would flow as a discharge current from the motor housing to earth or between the individual conductors.

Connect the shield for the control cable to the designated connection points in the control cable terminal compartment (connection on frequency inverter side only). The shield also serves as protection against radiated emission.

In applications with long shielded motor cables, additional reactive resistors or output filters must be provided to compensate the capacitive stray current to earth and reduce the rate of voltage rise on the motor. These measures help reduce radio frequency interference further. Using just ferrite rings or reactive resistors does not ensure compliance with the limit values defined in the EMC directive.

NOTE! If you are using shielded cables that are longer than 10 m, check the stray capacitance to ensure that the diffusion between the phases or to earth is not excessive, which could cause the frequency inverter to stop.

Routing cables

Route the control cable and power cable / motor connection cable in separate cable ducts.

When routing the control cable observe a minimum distance of 0.3 metres between the control cable and the power cables / motor connection cables.

If crossing of control cable and power cable / motor connection cable cannot be avoided, cross them at 90 degrees to each other.

Earth connection

The frequency inverter must be properly earthed.

To ensure greater interference immunity, a wide contact face is required for the different earth connections.

In the case of cabinet mounting, use two separate copper earth bus bars (mains power connection / motor connection and control connection bar) with a suitable size and cross-section for earthing the frequency inverter. All the earth connections are connected to these.

The bars are connected to the earthing system at one point only.

The control cabinet is earthed via the mains earthing system.

Line chokes

The line input currents indicated in the selection information are for orientation purposes only; they refer to operation at nominal rating. These currents may vary depending on the actual line impedance. In low-impedance mains, higher currents may occur. The input current can be limited by using external line chokes in addition to the integrated line chokes (in the power range up to and including 45 kW). Line chokes reduce mains feedback and improve the power factor.

Line chokes connected in series in the line to the consumer installation ensure that the required short circuit voltage of 4 % to the mains is complied with and reduce mains feedback. Mains feedback occurring in the form of harmonics may cause problems in the public power supply mains. The charge currents of the DC link capacitors can be limited, which will increase the service life of these primary components. Line chokes reduce the reactive power component and thus improve the effective power factor. The scope of DIN EN 61000-3-2 must be heeded.

Three-phase line choke:

- Enclosure IP00
- Thermal class F
- Maximum ambient temperature 40 °C

Overview of line chokes for asynchronous motors and KSB SuPremE motors

PumpDrive 2 Eco		P	I_n	I_N	I_{sat}	L	B	H	Mat. No.	
			Line choke inductance	Nominal motor current	Maximum current					
		[kW]	[mH]	[A]	[-]	[mm]	[mm]	[mm]		[kg]
A	..000K37..	0,37	7,0	6,0	1,5 I_n	150	85	155	01665518	3,6
A	..000K55..	0,55	7,0	6,0	1,5 I_n	150	85	155	01665518	3,6
A	..000K75..	0,75	7,0	6,0	1,5 I_n	150	85	155	01665518	3,6
A	..001K10..	1,10	7,0	6,0	1,5 I_n	150	85	155	01665518	3,6
A	..001K50..	1,50	7,0	6,0	1,5 I_n	150	85	155	01665518	3,6
B	..002K20..	2,20	2,0	11	1,5 I_n	150	85	150	01093105	3,6
B	..003K00..	3,00	2,0	11	1,5 I_n	150	85	150	01093105	3,6

Overview of product features / selection tables

Overview of fluids handled

Combinations of fluids handled and material variants (✘ = standard)

Fluid handled	T[6]		Material variant				Seal code		Comments
			Grey cast iron/ grey cast iron	Grey cast iron/ polysulphone	Tin bronze/tin bronze	Tin bronze/ polysulphone	BQ_1EGG	Q_SQ_1EGG	
	Min.	Max.	GG	GP	BB	BP	11	14[7]	
	[°C]								
Service water	-	-	✘	✘	-	-	✘	-	-
Heating water[8]	-	-	✘	✘	-	-	✘	-	-
Condensate	-	-	✘	✘	-	-	✘	-	-
Cooling water without antifreeze	-	≤ +60	✘	✘	-	-	✘	-	Open circuit: use material variant BB/ BP.
Cooling water with antifreeze, pH ≥ 7.5	≥ -30	≤ +60	✘	✘	-	-	✘	-	Open circuit: use material variant BB/ BP.
Cooling water with antifreeze, pH ≥ 7.5	≥ +60	≤ +110	✘	✘	-	-	-	✘	Open circuit: use material variant BB/ BP.
Pure water	-	≤ +60	✘	✘	-	-	✘	-	-
Swimming pool water: filtration	-	≤ +40	-	-	✘	✘	✘	-	Use pumps with additional code P.
Swimming pool water, water features without turbulences and/or air content	-	≤ +40	-	-	✘	✘	✘	-	Use pumps with additional code P.
Partly desalinated water	-	≤ +120	✘	✘	-	-	✘	-	-
Fully desalinated (deionised) water, boiler feed water	-	≤ +110	✘	✘	-	-	✘	-	-
Cooling brine, inorganic; pH > 7.5, inhibited	≥ -30	≤ +25	✘	✘	-	-	✘	-	-
Water with antifreeze, pH ≥ 7.5	≥ -30	≤ +60	✘	✘	-	-	✘	-	-
Water with antifreeze, pH ≥ 7.5	≥ +60	≤ +120	✘	✘	-	-	-	✘	-

6) T = fluid temperature
7) Special design
8) Treatment to VdTÜV 1466; additional requirement: O2 t < 0.02 mg/l

Overview of functions

Overview of functions

Functions / Firmware	PumpDrive 2 Eco
Protective functions	
Thermal motor protection	✗
Monitoring mains voltage	✗
Phase failure, motor side	✗
Short-circuit monitoring, motor side (phase to phase and phase to earth)	✗
Dynamic overload protection by speed limitation (i^2t control)	✗
Suppression of resonant frequencies	✗
Cable integrity monitoring (Live Zero)	✗
Protection against dry running and hydraulic blockage (sensorless via learning function)	✗
Dry running protection (external control signal)	✗
Operating point estimation and characteristic curve control	✗
Open-loop control	
Open-loop control mode	✗
Closed-loop control	
Closed-loop control mode via integrated PID controller	✗
Pressure/differential pressure control (Δp const)	✗
Pressure/differential pressure control with dynamic pressure compensation (Δp var)	✗
Flow rate control	✗
Sensorless differential pressure control (Δp const) in a single-pump configuration	✗
Sensorless differential pressure control with dynamic pressure compensation (Δp var) in a single-pump configuration	✗
Sensorless flow rate control	✗
Level control	✗
Temperature control	✗
Operation and monitoring (display)	
Display of measured values (pressure, head, speed, electric power, motor voltage, motor current, and torque)	✗
Fault history	✗
Operating hours counter	✗
Fault reporting via relay	✗
Frequency inverter functions	
Programmable start and stop ramps	✗
Field-oriented control (vector control), V/f control	✗
Configurable motor control method (asynchronous motor, KSB SuPremE)	✗
Automatic motor adaptation (AMA)	✗
Motor standstill heater	✗
Manual-0-automatic mode	✗
External OFF	✗
External minimum speed	✗
Sleep mode (stand-by mode)	✗
Pump functions	
Flow rate estimation	✗
M12 module with PumpMeter bus connection	✗
M12 module for dual pump configuration	✗
M12 module for multiple pump configuration with up to 6 pumps	✗
Functional check run	✗
Integrated dual pump configuration (1×100 % with redundant pump or 2×50 % without redundant pump)	✗
Multiple pump configuration with up to 6 pumps	✗
Operation	
Control panel	✗[9)]
Service interface	✗

9) Some functions can only be parameterised or displayed using the Service Tool (see operating manual).

Protective functions

Sensorless protection against dry running and hydraulic blockage
Dry running of the pump is detected and the pump set is stopped before components are damaged.

Hydraulic blockage is detected and initially a warning is displayed. If the blockage persists for a prolonged period of time, the pump set is stopped. These protective functions do not require sensors. They are based on an automatic learning function which needs to be run once during commissioning.

Dynamic overload protection by speed limitation (I^2t control)
The frequency inverter is equipped with current sensors that record and limit the motor current. When the defined load limit or temperature limit is reached, the speed is lowered in order to reduce the power (I^2t control). The frequency inverter then no longer operates in closed-loop control mode but maintains the operative function at a lower speed.

Characteristic curve control
The frequency inverter indicates continuous operation outside the permissible range, such as extremely low flow or extreme overload. The frequency inverter monitors the current operating point on the basis of the motor input power and the speed. In the case of extreme part load or overload, a message is output and, depending on the settings, the pump set is switched off as required.

Open-loop and closed-loop control

Sensorless differential pressure control for single-pump configurations
The configurable differential pressure is kept almost constant over a broad operating range without the need for sensors. This can also be achieved using the dynamic pressure compensation function. The speed is adjusted as a function of the power input so that the required differential pressure is maintained.

Dynamic pressure/differential pressure compensation
The dynamic pressure/differential pressure compensation function compensates for pipe friction losses, which need to be considered if the pressure/differential pressure sensor is installed close to the pump or if sensorless differential pressure control is used. This ensures a virtually constant pressure/differential pressure at the consumer (e.g. heating) regardless of the flow. The dynamic pressure compensation function requires signals from two pressure sensors or one differential pressure sensor. Alternatively, sensorless dynamic differential pressure compensation can be used. The differential pressure setpoint is increased as a function of the (estimated or measured) flow rate or the speed.

Operation and monitoring

Display
Various physical data, such as the pressure, flow rate, speed, motor voltage, motor current, electric power, torque and others, can be displayed using the control panel or the service software.

Message history
The last 100 messages of the frequency inverter can be viewed. All messages are provided with a time stamp (real-time clock).

Statistics function
The frequency inverter generates utilisation statistics on the operating hours to date, runtime and number of starts.

Frequency inverter functions

Motor control method
The frequency inverter's motor control method can be set for either an asynchronous motor or the KSB SuPremE motor.

Automatic motor adaptation
Automatic motor adaptation (AMA) is a method for measuring the electric parameters of the motor with the motor at a standstill. The frequency inverter's motor control method is optimised to ensure optimum motor performance and efficiency.

Stand-by mode (sleep mode)
Sleep mode allows the single-pump system or multiple pump system to be started and stopped in line with demand. If sleep mode is activated, the frequency inverter stops the pump in the case of low flow rates, i.e. when the low flow limit or stop speed is reached. In pressure control applications, an accumulator can be filled during brief operation with an increased setpoint prior to stopping. If a drop in pressure and, thus, a flow rate requirement are detected, the pump restarts.

Dual-pump configuration

Dual-pump operation serves to control two pumps of identical design. Two operating modes can be set:

- In "1 pump" operating mode, the dual pump system is designed to achieve the setpoint with one pump operating at rated values (1 x 100 %).
- In "2 pumps" operating mode, the system's rated operating point is achieved with both pumps operating at rated values (2 x 50 %).

Both frequency inverters are quickly and easily connected to the respective M12 modules (accessories) by way of pre-configured cables (accessories). The PumpMeter sensor signal can also be redundantly connected to the second frequency inverter as an option using a pre-configured "PumpMeter Crosslink" bus cable.

10) Fluid temperature; for hot water heating systems to DIN 4752, Section 4.5, application limits must be observed.
11) The casing components are checked for leakage by means of internal pressure tests to AN 1897/75-03D00 with water.

Pressure limits and temperature limits

Pressure limits and temperature limits as a function of material variant

Material variant	T[10)]	Test pressure[11)]	Operating pressure
	[°C]	[bar]	[bar]
GG, GP	-15 to +120	≤ 15	≤ 10
BB, BP	-15 to +120	≤ 15	≤ 10

Technical data

Motor, n = 2900 rpm

50 Hz

Etaline L PumpDrive 2 Eco n = 2900 rpm	P_N IE2[12)] [kW]	I_N 1~230 V [A]	I_N 3~400 V [A]	Motor	[kg]
025-025-063	0,25	-	0,76	63	12,17
025-025-063	0,25	2,00	-	63	13
025-025-070.1	0,12	-	0,48	63	13
025-025-070.1	0,12	1,20	-	63	13
025-025-071	0,25	-	0,76	63	12,17
025-025-071	0,25	2,00	-	63	12,48
025-025-080	0,25	-	0,76	63	13
025-025-080	0,25	2,00	-	63	13
025-025-080	0,37	-	0,92	63	13
025-025-085	0,18	-	0,60	63	14
025-025-105	0,37	-	0,92	63	15
032-032-063	0,25	-	0,76	63	12,4
032-032-071	0,25	-	0,76	63	12,4
032-032-080	0,25	-	0,76	63	13
032-032-080	0,25	2,00	-	63	13
032-032-080	0,37	-	0,92	63	13
032-032-100	0,25	-	0,76	63	18,9
032-032-100	0,25	2,00	-	63	18,9
032-032-105	0,55	-	1,60	63	20,1
032-032-105	0,55	4,20	-	63	20,4
032-032-125	0,75	-	1,60	71	20,6
032-032-125	0,75	4,75	-	71	22,7
040-040-060	0,25	-	0,76	63	19
040-040-060	0,25	2,00	-	63	19,2
040-040-060	0,37	-	0,92	63	19
040-040-090	0,55	-	1,60	63	26,5
040-040-090	0,55	4,20	-	63	23
040-040-090	0,75	-	1,60	71	22
040-040-100	0,75	-	1,60	71	23
040-040-100	0,75	4,75	-	71	25,4
040-040-100	1,10	-	2,25	80	23
050-050-090	0,55	-	1,60	63	22
050-050-090	0,55	4,20	-	63	22,6
050-050-100	0,75	-	1,60	71	24
050-050-100	0,75	4,75	-	71	25
050-050-110	1,10	-	2,25	80	29
050-050-110	1,10	6,90	-	80	28,8
050-050-110	1,80	-	3,40	90S	31
050-050-125	1,80	-	3,40	90S	35,24
065-065-100	1,10	-	2,25	80	36
065-065-100	1,10	6,90	-	80	36
065-065-115	1,80	-	3,40	90S	39

12) ≥ 0.75 kW = IE2

Etaline L PumpDrive 2 Eco n = 2900 rpm	P_N IE2[12)] [kW]	I_N 1~230 V [A]	I_N 3~400 V [A]	Motor	[kg]
065-065-125	3,00	-	5,60	90L	43
080-080-105	1,10	-	2,25	80	40
080-080-105	1,10	6,90	-	80	40
080-080-115	1,80	-	3,40	90S	42,5
080-080-125	3,00	-	5,60	90L	47

Motor, n = 1450 rpm

50 Hz

Etaline L PumpDrive 2 Eco n = 1450 rpm	P_N IE2[13)] [kW]	I_N 1~230 V [A]	I_N 3~400 V [A]	Motor	[kg]
025-025-080	0,12	-	0,48	63	12,6
025-025-080	0,12	1,20	-	63	12,9
032-032-080	0,12	-	0,48	63	12
032-032-080	0,12	1,20	-	63	12,5
032-032-125	0,12	-	0,48	63	18,6
032-032-125	0,12	1,20	-	63	19
040-040-100	0,12	-	0,48	63	21
040-040-100	0,12	1,20	-	63	21,3
050-050-100	0,12	-	0,48	63	21
050-050-100	0,12	1,20	-	63	21,4
050-050-125	0,18	-	0,66	63	24,8
050-050-125	0,18	1,60	-	63	25,4
050-050-160	0,75	-	1,71	80	39
050-050-160	0,75	5,75	-	80	35
065-065-125	0,37	-	1,25	63	34
065-065-125	0,37	3,20	-	63	34
080-080-125	0,37	-	1,25	63	37,5
080-080-125	0,37	3,20	-	63	38

Pump

Overview

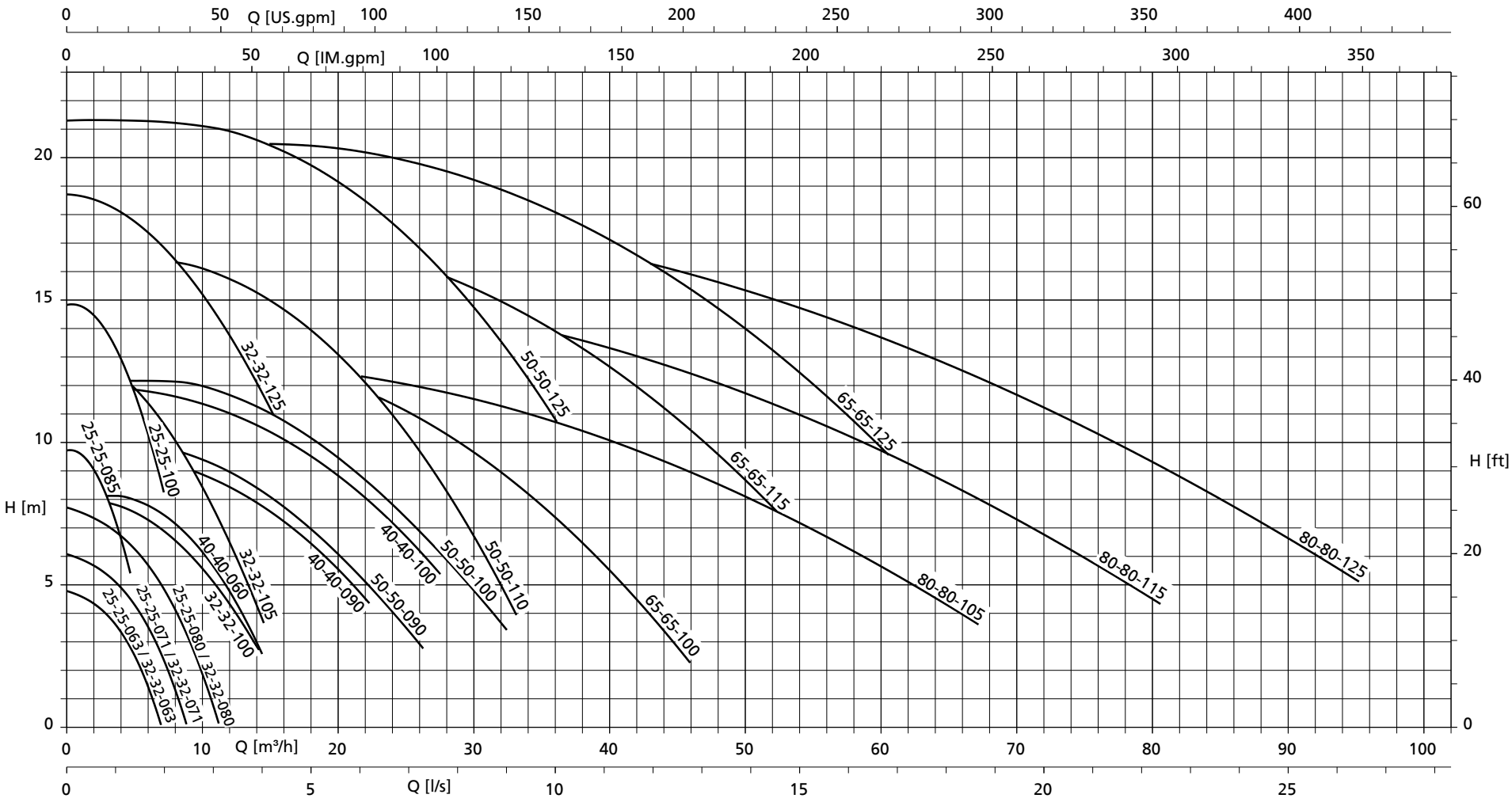
Etaline L	Shaft unit	Impeller diameter	Speed limit	
			Minimum	Maximum
		[mm]	[rpm]	[rpm]
025-025-063	WE 12	63	500	3000
025-025-070.1	WE 12	70	500	3000
025-025-071	WE 12	71	500	3000
025-025-080	WE 12	80	500	3000
025-025-085	WE 12	85	500	3000
025-025-105	WE 12	105	500	3000
032-032-063	WE 12	63	500	3000
032-032-071	WE 12	71	500	3000
032-032-080	WE 12	80	500	3000
032-032-100	WE 12	80	500	3000
032-032-105	WE 12	105	500	3000
032-032-125	WE 12	125	500	3000
040-040-060	WE 12	80	500	3000
040-040-090	WE 12	90	500	3000
040-040-100	WE 12	98	500	3000
040-040-100	WE 14	98	500	3000
050-050-090	WE 12	90	500	3000
050-050-100	WE 12	98	500	3000

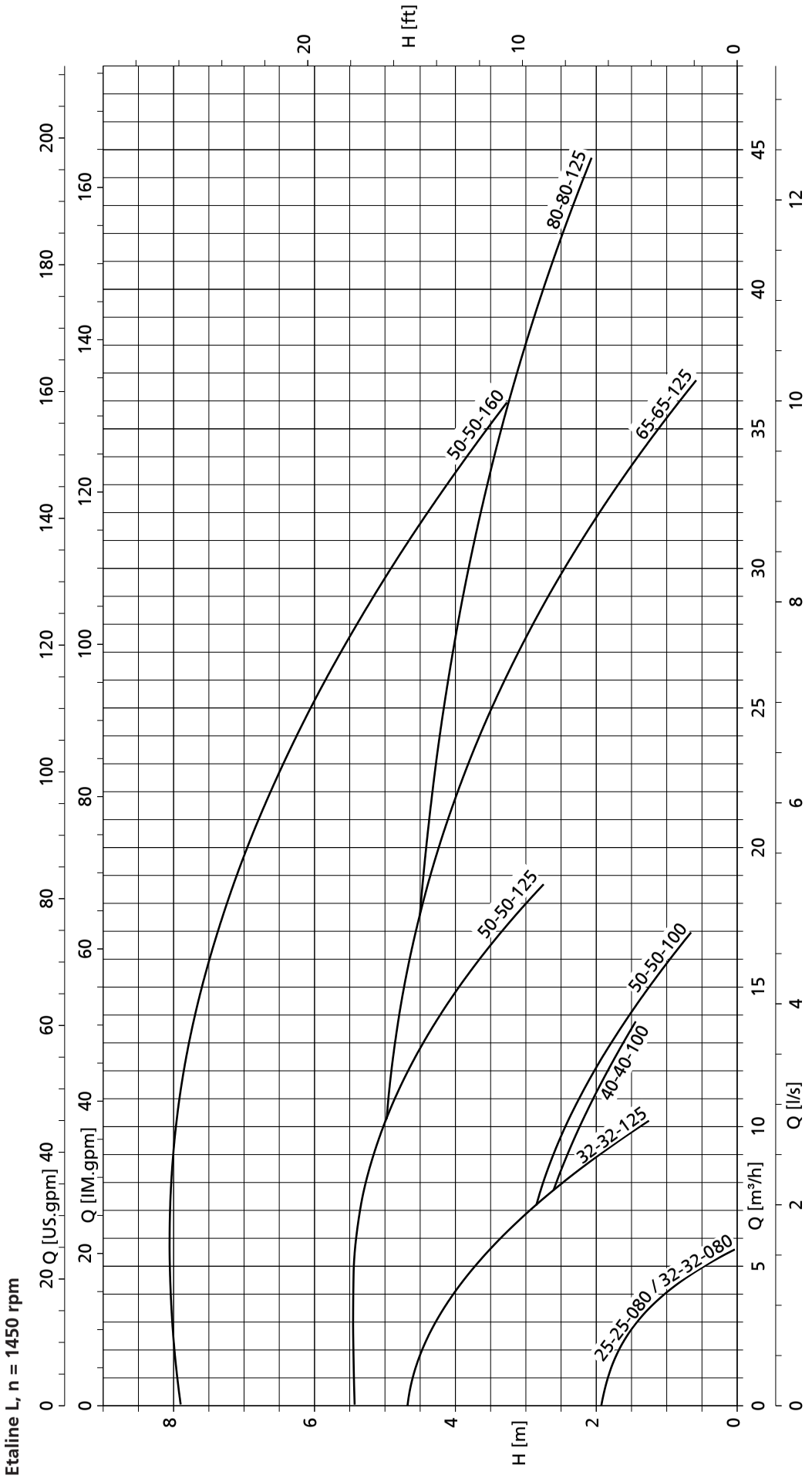
13) ≥ 0.75 kW = IE2

Etaline L	Shaft unit	Impeller diameter	Speed limit	
			Minimum	Maximum
		[mm]	[rpm]	[rpm]
050-050-110	WE 14	109	500	3000
050-050-125	WE 12	125	500	3000
050-050-125	WE 16	125	500	3000
050-050-160	WE 14	159	500	3000
050-050-160	WE 16	159	500	3000
065-065-100	WE 14	100	500	3000
065-065-115	WE 16	113	500	3000
065-065-125	WE 12	125	500	3000
065-065-125	WE 16	125	500	3000
080-080-105	WE 14	100	500	3000
080-080-115	WE 16	112	500	3000
080-080-125	WE 12	126,5	500	3000
080-080-125	WE 16	126,5	500	3000

Selection charts

Etaline L, n = 2900 rpm




Etaline L, n = 1450 rpm
H [m]
H [ft]
Q [US.gpm]
Q [IM.gpm]
Q [m³/h]
Q [l/s]
80-80-125
50-50-160
65-65-125
50-50-125
50-50-100
40-40-100
32-32-125
25-25-080 / 32-32-080

Dimensions and connections

Pump set dimensions

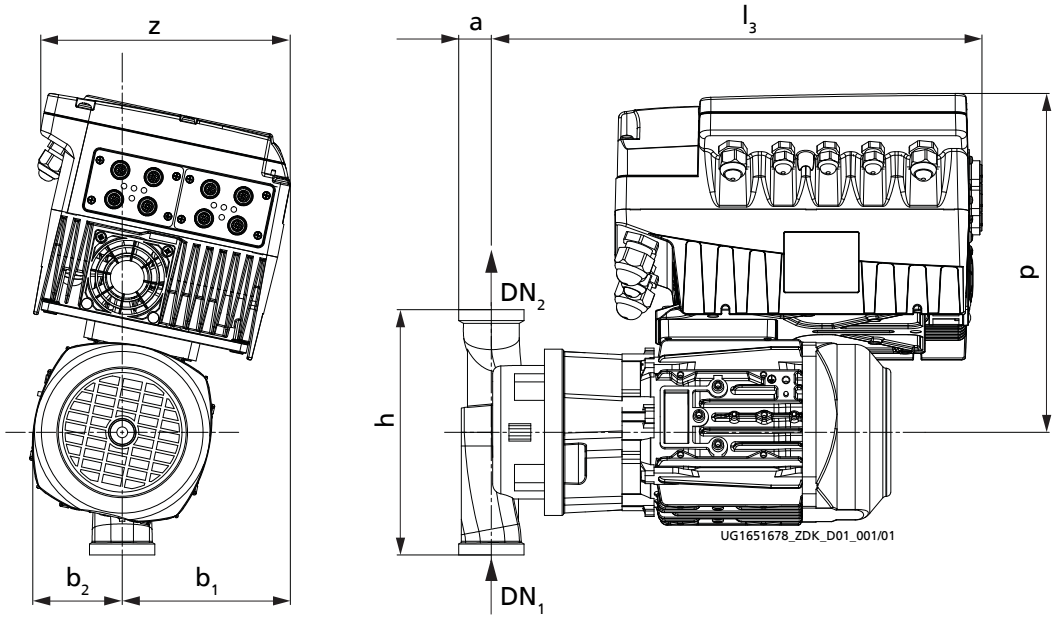


Fig. 2: Dimensions of screw-ended pump set with PumpDrive 2 Eco, size < 032-032-100

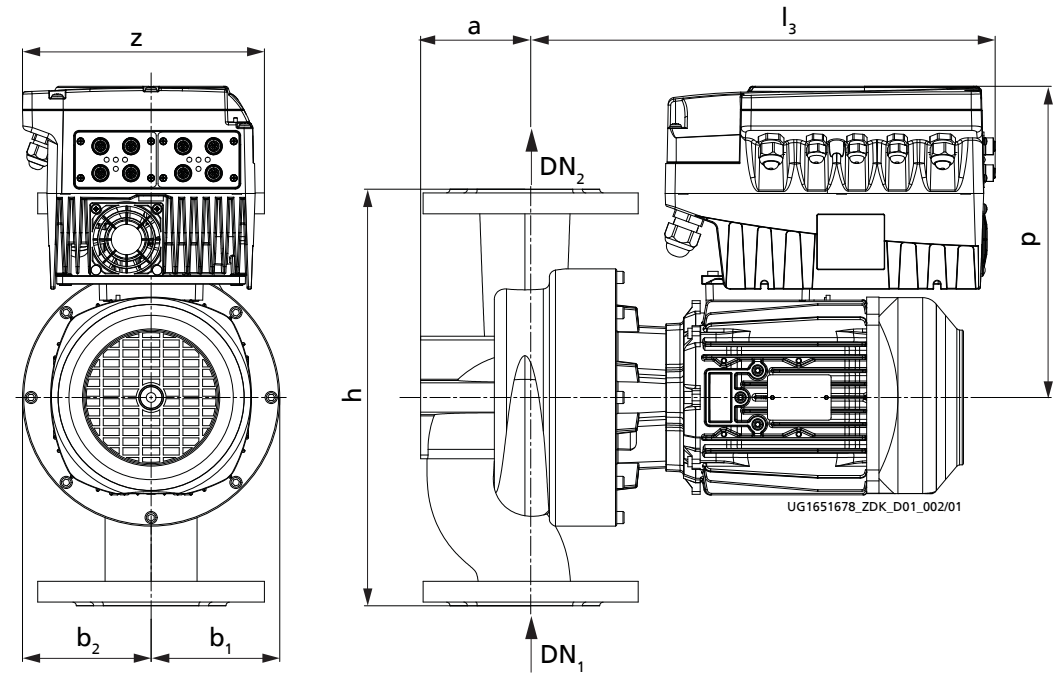


Fig. 3: Dimensions of flanged pump set with PumpDrive 2 Eco, size ≥ 032-032-100

Dimensions, n = 2900 rpm

Size	P	DN	Connection	a	b_1	b_2	h	l_3	p	z
	[kW]	[mm]	Thread	[mm]						
025-025-063	0,25	25	G 1 1/2	30	123	68	180	368	246	190
025-025-070.1	0,12	25	G 1 1/2	24	123	75	180	368	246	190
025-025-071	0,25	25	G 1 1/2	30	123	68	180	368	246	190
025-025-080	0,25	25	G 1 1/2	30	123	68	180	368	246	190
025-025-080	0,37	25	G 1 1/2	30	123	68	180	368	246	190
025-025-085	0,18	25	G 1 1/2	35	85	105	200	376	237	190
025-025-105	0,37	25	G 1 1/2	35	85	105	200	376	237	190
032-032-063	0,25	32	G 2	30	123	68	180	364	246	190
032-032-071	0,25	32	G 2	30	123	68	180	364	246	190

Size	P	DN	Connection	a	b_1	b_2	h	l_3	p	z
	[kW]	[mm]	Thread	[mm]						
032-032-080	0,25	32	G 2	30	123	68	180	364	246	190
032-032-080	0,37	32	G 2	30	123	68	180	364	246	190
032-032-100	0,25	32	-	70	85	105	220	368	237	190
032-032-105	0,55	32	-	70	88	105	260	365	237	190
032-032-125	0,75	32	-	70	88	85	260	365	245	190
040-040-060	0,25	40	-	70	123	75	250	367	246	190
040-040-060	0,37	40	-	70	123	75	250	367	246	190
040-040-090	0,55	40	-	75	85	105	250	368	237	190
040-040-090	0,75	40	-	75	85	85	250	368	245	190
040-040-100	0,75	40	-	75	85	85	250	368	245	190
050-050-090	0,55	50	-	85	86	105	280	355	237	190
050-050-100	0,75	50	-	85	86	85	280	355	345	190
050-050-110	1,10	50	-	85	94	85	280	362	254	190
050-050-110	1,80	50	-	85	94	105	280	389	268	210
050-050-125	1,80	50	-	85	94	105	280	389	268	210
065-065-100	1,10	65	-	95	105	105	340	370	254	190
065-065-115	1,80	65	-	95	105	105	340	397	268	210
065-065-125	3,00	65	-	95	105	118	340	397	268	210
080-080-105	1,10	80	-	105	130	105	360	377	254	190
080-080-115	1,80	80	-	105	130	105	360	404	268	210
080-080-125	3,00	80	-	105	130	118	360	404	268	210

Dimensions, n = 1450 rpm

Size	P	DN	Connection	a	b_1	b_2	h	l_3	p	z
	[kW]	[mm]	Thread	[mm]						
025-025-080	0,12	25	G 1 1/2	30	123	68	180	368	246	190
032-032-080	0,12	32	G 2	30	123	68	180	364	246	190
032-032-125	0,12	32	-	70	88	105	260	365	237	190
040-040-100	0,12	40	-	75	85	105	250	368	237	190
050-050-100	0,12	50	-	85	86	105	280	355	237	190
050-050-125	0,18	50	-	85	94	105	280	362	237	190
050-050-160	0,75	50	-	87	155	105	340	370	254	190
065-065-125	0,37	65	-	95	105	105	340	370	237	190
080-080-125	0,37	80	-	105	130	105	360	377	237	190

Connections

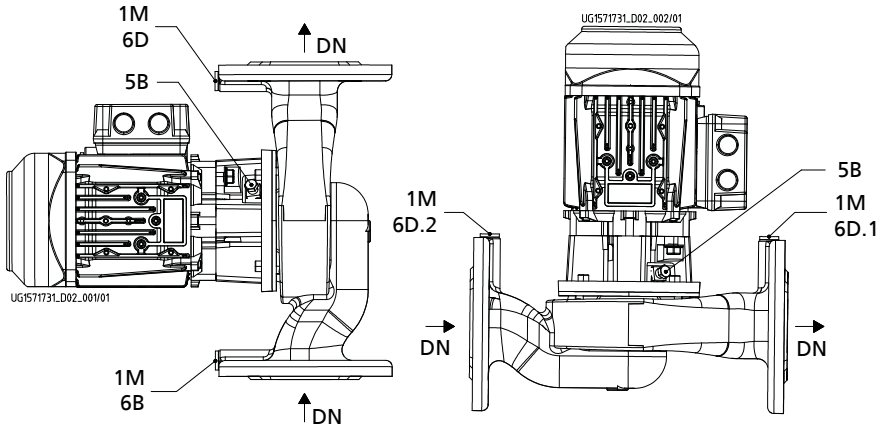


Fig. 4: Connections

Connection types

Connection	Description	Configuration	Position
1M	Pressure gauge connection	Drilled and closed, or pressure sensor for PumpMeter (if selected)	Suction flange and discharge flange
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	Fluid priming and venting	Drilled and closed	Volute casing

Connection

Size	1M, 6B, 6D, 6D.1, 6D.2
032-032-100	G 1/4
032-032-105	G 1/4
032-032-125	G 1/4
040-040-060	G 1/4
040-040-090	G 1/4
040-040-100	G 1/4
050-050-090	G 1/4
050-050-100	G 1/4

Size	1M, 6B, 6D, 6D.1, 6D.2
050-050-110	G 1/4
050-050-125	G 1/4
050-050-160	G 1/4
065-065-100	G 1/4
065-065-115	G 1/4
065-065-125	G 1/4
080-080-105	G 1/4
080-080-115	G 1/4
080-080-125	G 1/4

Flange dimensions

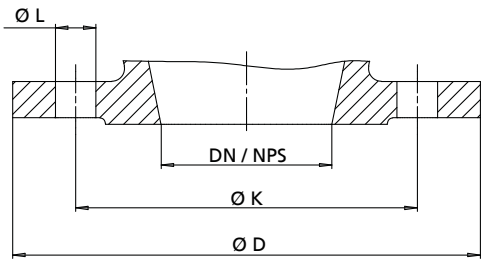


Fig. 5: Flange dimensions

14) For sizes < 032-032-100 only

Flange dimensions [mm]

DN / NPS	Standard							Comment
	EN 1092-2						DIN EN ISO 228-1	
	Material							
	G, B							
	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 / NPS11/4	100	140	4×∅19	90	140	4×∅14	G 2[14)]	Adapter flange PN6/ PN10
40 / NPS11/2	110	150	4×∅19	100	150	4×∅14	-	
50 / NPS2	125	165	4×∅19	110	165	4×∅14	-	
65 / NPS21/2	145	185	4×∅19	130	185	4×∅14	-	
80 / NPS3	160	200	8×∅19	-	-	-	-	-

Flange design

Flange design by materials

Material variant	Standard	Nominal size	Pressure class
GG, GP, BB, GP	DIN EN ISO 228-1	DN 25	PN 10
	DIN EN ISO 228-1	032-032-063 to 032-032-080	PN 10
	Drilled to EN 1092-2	DN 32 - DN 65	PN 6 / PN 10
	EN 1092-2	DN 80	PN 10

Typical installation positions

Horizontal installation

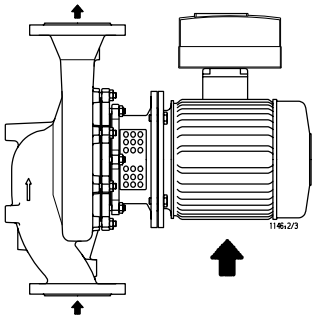


Fig. 6: Horizontal installation, direction of flow from bottom to top

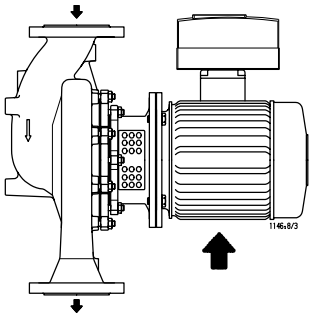


Fig. 7: Horizontal installation, direction of flow from top to bottom.

The volute casing and/or back pull-out unit must be turned by 180° so that the terminal box remains in its current position on top.

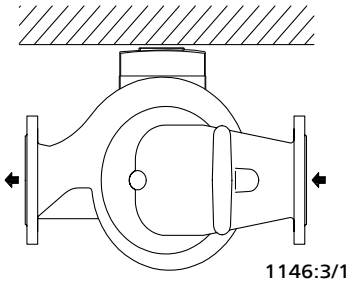


Fig. 8: Horizontal installation (for example under the ceiling)

The volute casing and/or back pull-out unit must be turned by 90° so that the terminal box remains in its current position on top.

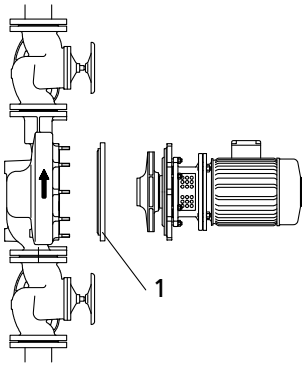


Fig. 9: Horizontal installation with blind flange (1 = blind flange, accessories)

If one of the pumps needs to be serviced, the pump chamber can be shut off by a blind flange so that the system remains operational.

Vertical installation

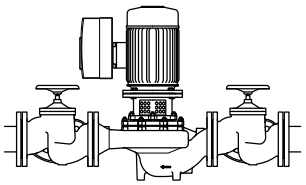


Fig. 10: Vertical installation/fastening without feet

Installed directly in the piping. Always anchor the pipes in close proximity to the pump in this case.

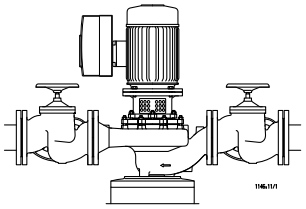


Fig. 11: Vertical installation/fastening with pump foot (accessories, available on request)

Accessories

Pump accessories

- Blind flange on request
- Pump foot on request

Detailed designation

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	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
E	T	L	L	0	2	5	-	0	2	5	-	0	6	3	-	G	G	-	A	V	1	1	D	2	0	0	1	2	2	C		A	A	T	B	I	E	3	P	D	2	E	M
See name plate and data sheet																									See data sheet																		

Designation key

Position		Code	Description
1-4	Pump type		
		ETLL	Etaline L
		ETLD	Etaline DL
5-16	Size		
		025	Nominal suction nozzle diameter [mm]
		025	Nominal discharge nozzle diameter [mm]
		063	Nominal impeller diameter [mm]
17	Pump casing material		
		G	EN-GJL-200 / EN-GJL-250
		B	CC491K
18	Impeller material		
		G	EN-GJL-150
		B	G-CuSn10Zn
		P	PSU-GF30
19	Design		
		X	Special design BT3D, BT3
		P	Model with casing cover made of polysulphone
		W	WRAS-approved for drinking water
20	Casing cover		
		A	Conical seal chamber
21	Type of seal		
		V	Conical seal chamber with vent
22-23	Seal code		
		11	BQ1EGG
		12[15)]	BQ1PGG
		13[15)]	BVPGG
		14[15)]	Q5Q1EGG
		15[15)]	Q5Q1PGG
24	Scope of supply		
		D	Pump, baseplate, coupling, coupling guard, motor
25	Shaft unit		
		2	Shaft unit 12
		4	Shaft unit 14
		6	Shaft unit 16
26-29	Motor rating (basis: 50 Hz)		
		0012	0,12 kW
		0018	0,18 kW
		0025	0,25 kW
		0037	0,37 kW
		0055	0,55 kW
		0075	0,75 kW
		0110	1,1 kW
		0180	1,8 kW
		0300	3,0 kW
30	Number of poles		
		2	2 poles
		4	4 poles
31	Motor design		
		C	3-phase AC motor 230 V / 400 V

15) Available upon request.

Position		Code	Description
31		M	1-phase AC motor 230 V
32	Blank		
33	Product generation		
		A	Product generation Etaline L / Etaline DL
34-36	Motor manufacturer		
		ATB	ATB
37-39	Efficiency class		
		IE1	IE1
		IE2	IE2
		IE3	IE3
		IE4	IE4
40-43	PumpDrive		
		PD2E	PumpDrive 2nd generation, Eco design
44	PumpMeter		
		M	Mit PumpMeter

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