

Etaline 032-032-160 GG

ETL 032-032-160-GGSCV10 WSEBS4HAB

Operating point 1

Dimensioning operating point

Operating conditions (purchaser requirements)

Target flow rate		Vapour pressure determined	0,008895 bar.a
Target head		Minimum inlet pressure	-0,3 bar.r
Fluid	Water, cooling water	required	
Fluid variant	closed cooling circuit	Specified ambient temperature	20 °C
Specified fluid temperature	7 °C	Installation altitude above sea level	1.000 m
Density Fluid handled	999,8 kg/m³		
Kinematic viscosity Fluid handled	1,454 mm²/s		

Operating conditions (performance)

Flow rate	16 m³/h	Maximum power input at duty point	1,726 kW
Minimum permissible flow rate	2,744 m³/h	Maximum power input / curve	2,215 kW
Head	23 m	Pump speed	3.000 1/min
Shut-off head	27,32 m	Discharge pressure-max.	2,678 bar.r
Efficiency Pump	58,04 %		
NPSH required	2,68 m		

Design data pump

Scope of supply Pump supplied by KSB	Pump + motor	Input voltage and frequency	Without
Pump standard	EN 733	Mains voltage	400 V
Shaft axis position	Vertical	Mains frequency	50 Hz
Pump design	Close-coupled	Minimum efficiency index MEI	0,7
Pump system design	Single-pump system	Minimum permissible fluid temperature	0 °C
Specification of wetted parts	Manufactured without paint wetting impairment substances	Maximum permissible fluid temperature	90 °C
Pump direction of rotation, viewed from casing side	Counterclockwise	Quantity Stages, single-entry	1
Impeller diameter D2	139 mm	Installation chamber Casing cover	Conical (A-type cover)
Impeller type	Radial, closed, multi-channel	Bearing bracket size / shaft unit	25
Free passage	5,4 mm	Pump directive	CE
Hydraulic casing foot	Yes		

Nozzle connections pump

Nominal diameter Suction nozzle	DN 32	Nominal diameter Discharge nozzle	DN 32
Nominal pressure Suction nozzle	PN 16	Nominal pressure Discharge nozzle	PN 16
Suction nozzle position	Opposite of discharge nozzle	Discharge nozzle position	0 deg
Suction nozzle design acc.to	EN1092-2	Discharge nozzle design acc.to	EN1092-2
Suction flange bolt hole pattern as per standard	EN1092-2	Discharge flange bolt hole pattern as per standard	EN1092-2
Flange facing type Inlet	Raised face (B,RF)		
Flange facing type Outlet	Raised face (B,RF)		

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ETL 032-032-160-GGSCV10 WSEBS4HAB

Auxiliary connections pump

6B Fluid Drain	G 1/4 Drilled and plugged	1M Pressure gauge Discharge nozzle	G 1/4 Drilled and plugged
6D Fluid Filling and venting	G 1/4 Drilled and plugged	1M Pressure gauge Suction nozzle	G 1/4 Drilled and plugged
5B Venting and drain	G 1/4 Manual globe valve, fitted		

Shaft sealing

Shaft seal type	Single-acting mechanical seal with vented chamber (A-type casing cover, taper bore) - AV	Shaft seal code Shaft seal manufacturer inboard	Code 10 KSB's choice
Determined pressure Seal chamber	1,71 bar.r	Mechanical seal type inboard Material Shaft seal inboard	KSB's choice QQXGG

Materials

Material Volute casing (102)	EN-GJL-250/A48 CL 35B	Material Bolts/Screws Volute casing (902.01)	8.8
Material Casing cover (161)	EN-GJL-250/A48 CL 35B	Material Nut Impeller fastening (920.95)	(ST)
Material Shaft	C45+N		
Material Impeller (230)	EN-GJL-250/A48 CL 35B		
Material Static seal Volute casing (400.10)	DPAF DW001		
Material Casing wear ring suction-side (502.01)	JL/LAMELLAR GRAPHITE CAST IRON		
Material Shaft protecting sleeve (523)	(CRNIMO ST INT)		
Material Static seal Discharge cover	DPAF DW001		
Material Drive lantern	EN-GJL-250/A48 CL 35B		
Material Support foot	WITHOUT		

Etaline 032-032-160 GG

ETL 032-032-160-GGSCV10 WSEBS4HAB

Power Drive System

Drive concept	Electric actuator	Rated speed Motor	3.000 1/min
Drive standard, mechanical	IEC	Number of motor poles	4
Drive standard electric	IEC	Rated power Motor	2,2 kW
Motor manufacturer	KSB	Motor power reserve determined	27,4 %
Customer supply Drive	No	Rated voltage Motor	400 V
Motor construction type	IM V1 (IM3011) IEC 60034-7	Motor winding	- / 400 V
Motor size	90L	Rated frequency Motor	100Hz
Efficiency class	IE5 (Ultra Premium)	Motor switching type	Star
Material motor housing	AL	Maximum current Unit	0 A
Enclosure Motor	IP55 (TEFC)	Rated current Motor	5,6 A
Thermal class	155 (F) nach IEC 60085	Cos phi at 4/4 load	0,71
Temperature sensor motor	3 PTC thermistors	Motor efficiency at 4/4 load	88,9 %
Terminal box position of motor (looking at the motor shaft)	360 °	Explosion protection directive	Without Drive
Operation on a frequency inverter permitted	Required by design	Marking according to directive	CE
Sound pressure level Motor	70 dBa		
Type series Motor manufacturer	SuPremE C2		

Coating

Aggregate

Surface preparation	Free from dirt, grease, rust
Properties Primer coat	Hydro dip primer, water-dilutable
Thickness Primer coat	60 µm
Properties Top coat	Acrylate dispersion water-thinned
Thickness Top coat	40 µm
Colour Top coat	RAL5002 Ultramarine Blue

Packaging

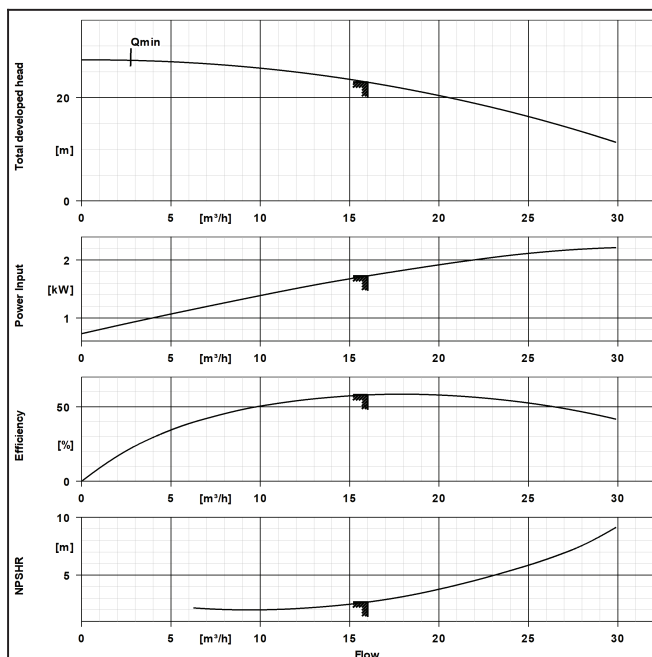
Suitable for transport	Truck transport
Suitable for storage	Indoor storage
Packaging category	KSB's choice (A0)
Packing label text 1	LEFORT FRANCHETEAU
Packing label text 2	CHANTIER HELIOS 2
Packing label text 3	PS-SS2-07
Packing label text 4	PS-SS2-08
Packing label text 5	EG VDI

Nameplates

Duplicate name plate	No
Name plate Line 1 Product 01	LEFORT FRANCHETEAU
Name plate Line 2 Product 01	HELIOS 2
Name plate Line 3 Product 01	EG VDI
Name plate Line 1 Product 02	LEFORT FRANCHETEAU
Name plate Line 2 Product 02	HELIOS 2
Name plate Line 3 Product 02	EG VDI
Additional text Name plate	Yes

Etaline 032-032-160 GG

ETL 032-032-160-GGSCV10 WSEBS4HAB

**Design data pump**

Pump standard	EN 733
Pump design	Close-coupled
Nominal diameter Suction nozzle	DN 32
Suction nozzle design acc.to	EN1092-2
Suction flange bolt hole pattern as per standard	EN1092-2
Nominal diameter Discharge nozzle	DN 32
Discharge nozzle design acc.to	EN1092-2
Discharge flange bolt hole pattern as per standard	EN1092-2
Nominal pressure Suction nozzle	PN 16
Nominal pressure Discharge nozzle	PN 16
Shaft/Stem seal	Inboard single mechanical seal
Material Shaft seal inboard	QQXGG
Shaft seal code	Code 10
Hydraulic impeller diameter	138,6 mm
Free passage	5,4 mm
Specification of wetted parts	Manufactured without paint wetting impairment substances
Explosion protection directive	Not relevant
Pump/Valve for destination	

Materials

Material Volute casing	EN-GJL-250/A48 CL 35B
Material Casing cover	EN-GJL-250/A48 CL 35B
Material Support foot	WITHOUT
Material Shaft	C45+N
Material Impeller	EN-GJL-250/A48 CL 35B

Dimensioning operating point

Fluid	Water, cooling water
Fluid variant	closed cooling circuit
Specified ambient temperature	20 °C
Specified fluid temperature	7 °C
Flow rate	16 m³/h
Head	23 m
Efficiency Pump	58 %
Minimum efficiency index MEI	0,7
Maximum power input at duty point	1,726 kW

Pump speed	3.000 1/min
Pump system design	Single-pump system
NPSH required	2,68 m

Driver

Drive concept	Electric actuator
Drive standard, mechanical	IEC
Drive standard electric	IEC
Efficiency class	IE5 (Ultra Premium)
Rated speed Motor	3.000 1/min
Rated frequency Motor	100Hz
Rated voltage Motor	400 V
Rated power Motor	2,2 kW
Motor power reserve determined	27,4 %

Etaline 032-032-160 GG

ETL 032-032-160-GGSCV10 WSEBS4HAB

country	Rated current Motor	5,6 A
Explosion protection directive Not relevant	Thermal class	155 (F) nach IEC 60085
Drive for destination country	Enclosure Motor	IP55 (TEFC)
	Temperature sensor motor	3 PTC thermistors
	Mains voltage	400 V
	Motor switching type	Star
	Operation on a frequency inverter permitted	Required by design
	Sound pressure level Motor	70 dBa
	Terminal box position of motor (looking at the motor shaft)	360 °

PumpDrive 2

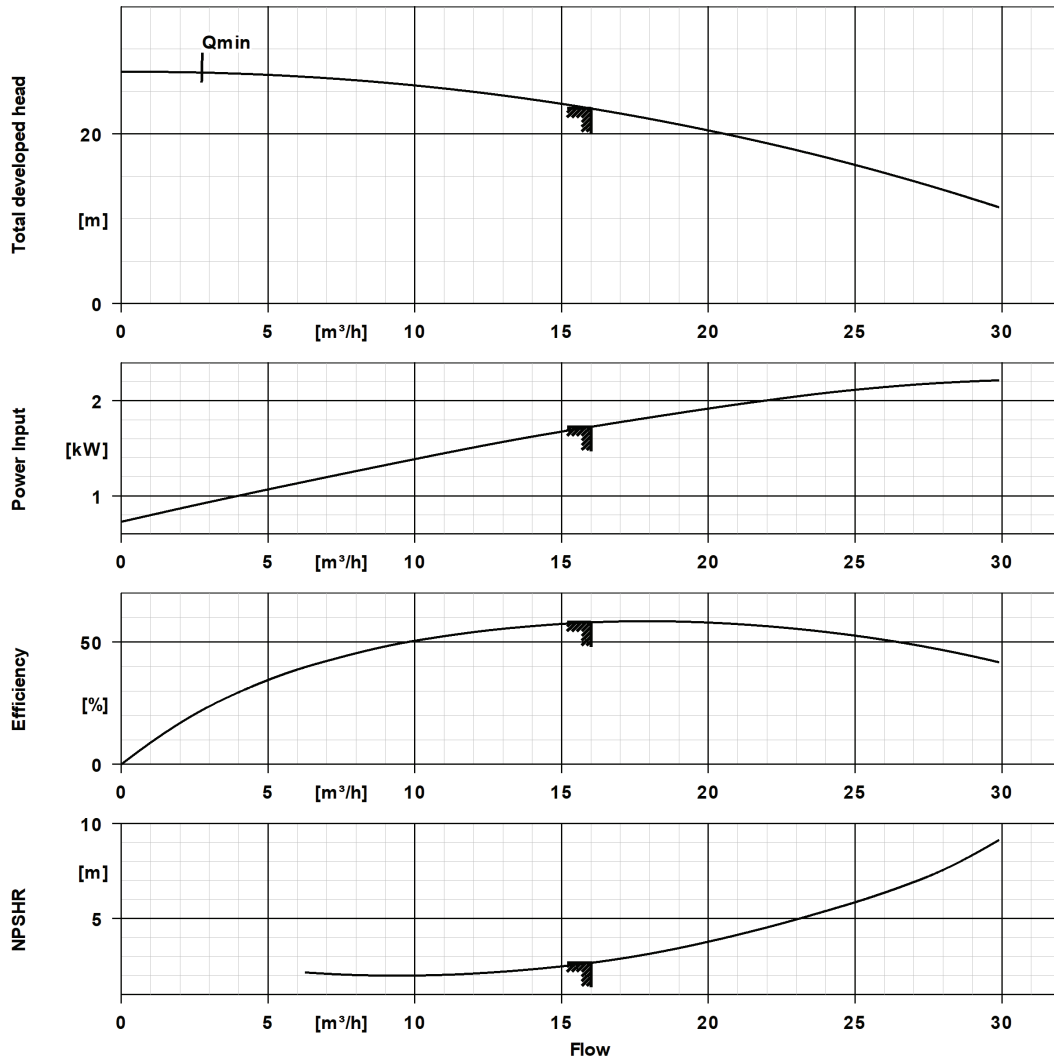
Design concept	Eco
Display type	With standard control panel
Rated power Control unit	2,2 kW
Maximum output current Control unit	6 A
M12 module	Without
Field bus module	Modbus RTU
Integrated connection hardware for self-parameterisation	Without
Mains voltage	400 V
Mains frequency	50 Hz
Enclosure Motor	IP55 (TEFC)
Minimum ambient temperature	20 °C
Maximum ambient temperature	20 °C

Performance Curve (Pump)



Page: 1 / 1

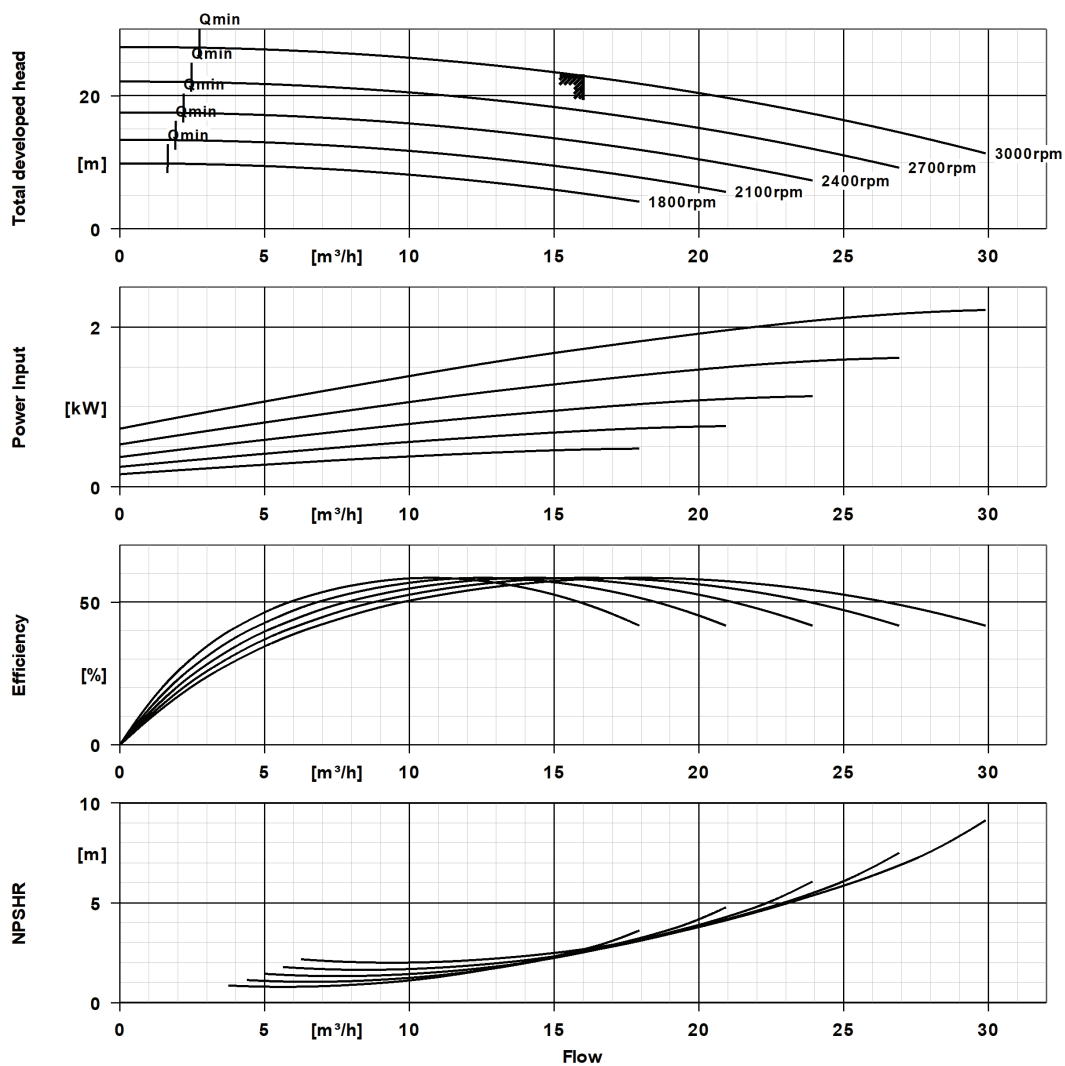
Etaline 032-032-160 GG ETL 032-032-160-GGSCV10 WSEBS4HAB



Curve Data

Pump speed	3.000 1/min	Efficiency Pump	58 %
Density Fluid handled	1.000 kg/m^3	Minimum efficiency index MEI	0,7
Kinematic viscosity Fluid handled	1,45 mm^2/s	Maximum power input at duty point	1,73 kW
Flow rate	16 m^3/h	NPSH required	2,68 m
Head	23 m	Hydraulic impeller diameter	138,6 mm
		Hydraulic calculation according to standard/ class	EN ISO 9906 Class 3B

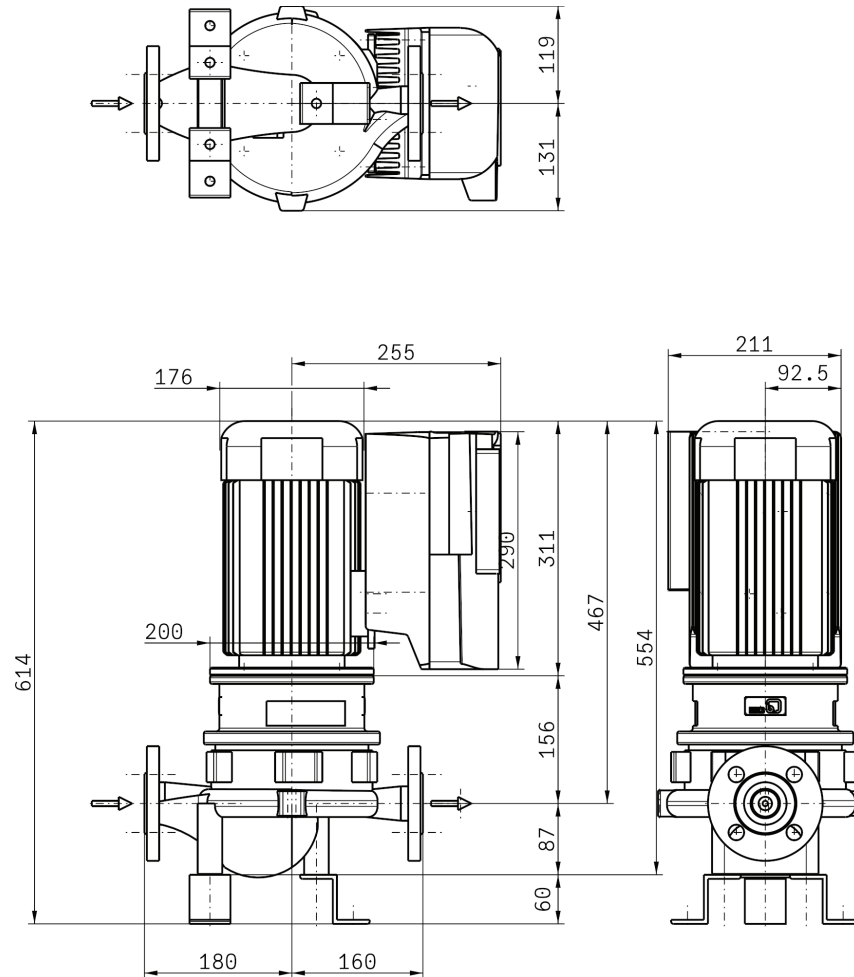
Etaline 032-032-160 GG ETL 032-032-160-GGSCV10 WSEBS4HAB



Curve Data

Density Fluid handled	1.000 kg/m^3	Minimum efficiency index MEI	0,7
Kinematic viscosity Fluid handled	1,45 mm^2/s	Hydraulic impeller diameter	138,6 mm
Flow rate	16 m^3/h	Head	23 m

Etaline 032-032-160 GG
ETL 032-032-160-GGSCV10 WSEBS4HAB



Drawing is not to scale.

Dimensions are given in mm

Motor

Rated power Motor 2,2 kW
 Rated speed Motor 3.000 1/min

Connections

Nominal diameter Suction nozzle	DN 32
Suction flange bolt hole pattern as per standard	EN1092-2
Nominal diameter Discharge nozzle	DN 32
Discharge flange bolt hole pattern as per standard	EN1092-2
Nominal pressure Suction nozzle	PN 16
Nominal pressure Discharge nozzle	PN 16



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ETL 032-032-160-GGSCV10 WSEBS4HAB

Net weight

Total weight Pump	26,17 kg
Total weight Drive	18 kg
Total weight Control unit	0 kg
Total weight Pump set	54,78 kg
Total weight Assembly/transport aids	2,42 kg

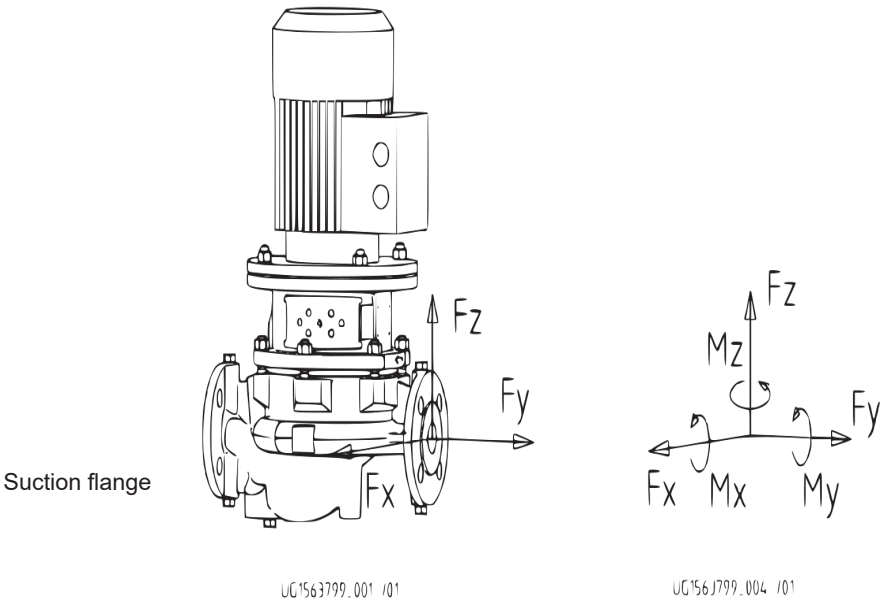
Connect pipelines stress-free

Dimensional tolerances for shaft axis height: DIN 747
Dimensions without tolerances, middle tolerances to: ISO 2768-m
Connection dimensions for pumps: EN735
Dimensions without tolerances - welded parts: ISO 13920-B
Dimensions without tolerances - gray cast iron parts: ISO 8062-CT9

Plan for additional connections see extra drawing

Etaline 032-032-160 GG
ETL 032-032-160-GGSCV10 WSEBS4HAB

Discharge flange



Drawing is not to scale.

Force and Moment Limits

Suction flange		Discharge flange	
F_x s (+/-)	320 N	F_x d (+/-)	320 N
F_y s (+/-)	370 N	F_y d (+/-)	370 N
F_z s (+/-)	300 N	F_z d (+/-)	300 N
F_{res} s (+/-)	574 N	F_{res} d (+/-)	574 N
M_x s (+/-)	390 Nm	M_x d (+/-)	390 Nm
M_y s (+/-)	265 Nm	M_y d (+/-)	265 Nm
M_z s (+/-)	300 Nm	M_z d (+/-)	300 Nm
		Temperature of validity	7 °C

The given force and moment limits are only applicable for static pipe loads. A computerized strength analysis is only available on special request. The values apply for installation on completely grouted baseplates bolted to a rigid, level foundation.

Design

Modular, self-cooling frequency inverter enabling continuously variable speed control of asynchronous and synchronous reluctance motors.

Design concept	Eco	Total weight Control unit	0 kg
Display type	With standard control panel	Maximum length	290 mm
Rated power Control unit	2,2 kW	Maximum width	171 mm
Maximum output current Control unit	6 A	Maximum height	144 mm
M12 module	Without		
Integrated connection hardware for self-parameterisation	Without		
Integrated master switch	No		
Field bus module	Modbus RTU		
Additional IO module	Without		
Mounting location	Motor		

Parameterized for driver

Motor manufacturer	KSB	Efficiency class	IE5 (Ultra Premium)
Type series Motor manufacturer	SuPremE C2	Number of motor poles	4
		Total weight Drive	18 kg

Packaging

Suitable for transport	Truck transport
Suitable for storage	Indoor storage
Packaging category	KSB's choice (A0)
Phytosanitary certificate	No

PumpDrive 2 Eco

PumpDrive2 [A]

Modular, self-cooling frequency inverter enabling continuously variable speed control of asynchronous and synchronous reluctance motors.

Installation options:

Motor-mounted, wall-mounted or cabinet-mounted from 0,37 - 11 kW

Protective functions:

- Full protection by means of over current limitation and PTC thermistor monitoring
- Automatic speed reduction at overload and excessive temperatures. Protection against phase failure motor side, short-circuit monitoring motor side (phase to phase and phase to earth), overvoltage/undervoltage.
- Protection against motor overload
- Suppression of resonant frequencies
- Cable integrity monitoring (live zero)
- Protection against dry running and hydraulic blockage (sensorless via learning function)
- Characteristic curve control

Open/closed-loop control

- Open-loop control via analog input, display or field bus
- Closed-loop control mode via integrated PID controller
- Controlled variables: pressure, differential pressure delta-p (constant) or delta-p (variable), temperature, level control, flow rate
- Sensorless differential pressure control (?p const) in a single-pump configuration
- Sensorless differential pressure control with dynamic pressure compensation (?p var) in a single-pump configuration
- Sensorless flow rate control
- Functional check run

Operation and display:

- Display of measured values and alerts and for setting parameters
- Operating point estimation (Q, H)
- Optical service interface for connection to KSB ServiceTool

PumpDrive functions:

- Programmable start and stop ramps
- Field-oriented control (vector control) with selectable motor control method (ASM, SuPremE)
- Automatic motor adaptation (AMA)
- Manual-0-automatic operation
- Sleep mode (stand-by mode)

Installation options:

- M12 module for bus connection of PumpMeter and for multiple pump operation of up to six pumps
- Wireless module for communication with a smartphone
- Field bus module Modbus RTU, as an alternative to the M12 module

Interference suppression class:

Motor ≤ 11 kW: EN 61800-3:2005-07 C1 / EN 55011 Class B / cable length < 5 m

Housing:

Heat sink: die-cast aluminium

Housing cover: polyamide, glass fibre reinforced

Control panel: polyamide, glass fibre reinforced

Mains voltage 3~380 V AC -10% to 480 V AC +10 %

Mains frequency 50 - 60 Hz ± 2 %

Internal power supply unit 24 V DC ± 10 %, max. 600 mA

Technical data sheet monitoring unit



Page: 3 / 3

Enclosure IP55 (to EN 60529)

Ambient temperature -10 to +50°C

Rel. humidity 5 to 85 % (non-condensing)

Note regarding outdoor installation: Provide the frequency inverter with suitable protection when installed outdoors to prevent condensation on the electronic equipment and exposure to excessive sunlight.

Service interface: optical

2 analog inputs, 0/2-10 V or 0/4-20 mA

1 analog output, 0-10 V or 4-20 mA

Digital inputs:

1 hardware enable input

3 parameterisable inputs

Relay output:

2 NO contact, parameterisable

Manufacturer KSB