

## Request for Approval

Project:	<b>PROPOSED ADDITIONS &amp; ALTERATIONS TO EXISTING 6 STOREY SINGLE USER WAREHOUSE DEVELOPMENT ON LOT 09517T MK27 AT 1 CHANGI SOUTH STREET 2, SINGAPORE 486760</b>				Our Ref:	Cosby/DHLCS/RFA/M&E/054
To:	<input checked="" type="checkbox"/> DHL Global Forwarding SG	<input type="checkbox"/> ID Architects	<input type="checkbox"/> BK Consulting Engineers	<input checked="" type="checkbox"/> Pdc Consultants	Date Submitted:	04.08.2023
Attention:	Mr Hosea				Date Required:	11.08.2023

## Description

Submission of Chilled &amp; Condenser Water Pumps

Requested By: Lee Yoon Lin for Cosby Pte Ltd

(Name &amp; Sign)

Designation: Project Manager

Date: 04.08.2023

## Reply

☐ Approved☒ Approved with comment☐ Resubmit as per comments

Please submit the updated test certificate (within 5 years) and job reference.

Consultant: Hosea 13.09.2023

(Name &amp; Sign)

Date:

## Distribution List

☒ DHL Global Forwarding Singapore☐ BK Consulting Engineers☒ ID Architects☐ RTO (Archi/C&S/M&E)☐ Pdc Consultants☐ Others

## Follow Up: (Cosby Staff Only)

Name

Sign

Date

**MATERIAL SUBMISSION FOR APPROVAL**

REF NO : DHL2/CA/MAT/59

SUBMITAL NO :

Material/Sample specified : Chilled and Condenser Water Pump

Location to be installed : Roof Cooling Tower Area

Equipment/Brand submitted : KSB Etanorm

Model /Size : ETN 125-100-250 GB / ETN 150-125-200 GB

Country of Origin : Germany

Supplier : KSB Singapore (Asia Pacific) Pte Ltd

Compliance with Specification : Refer to material catalogue

Compliance with Standards : Refer to material catalogue

Date of Submission : 8/4/2023

Date of Approval Required : 8/11/2023

Remarks :

Submitted By : 

Approval By :

Carrier Singapore Pte. Ltd.

Client

Kyi Maw Naing / 04-08-2023

Name (Project Engineer )/Date

Name /Date

☐ Approved, Subject to comments

☐ Rejected

Comments :

☐ ID Architects Pte Ltd

Ms Anelia

Date :

☐ BK Consulting Singapore Pte Ltd

Mr Ke Lun

Date :

☐ Pdc Consultants Pte Ltd

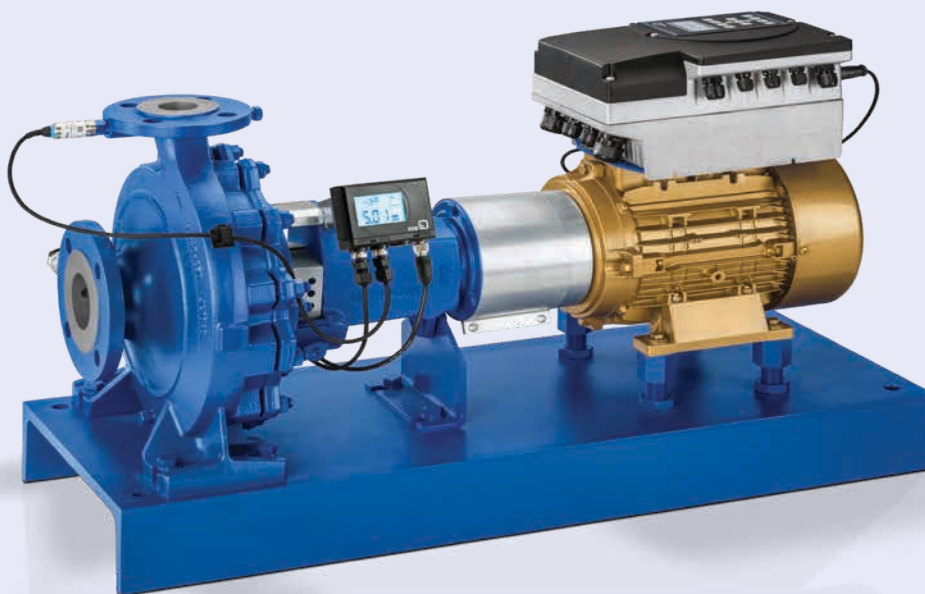
Mr Loke Hosea

Date :

☐ Others

Date :

## Etabloc / Etanorm – Standardised Water Pumps



Etanorm with PumpMeter, KSB SuPremE® IE5 motor\* and PumpDrive

### Applications:

Pure liquids not chemically or mechanically aggressive to the pump materials

- Water supply systems
- Cooling circuits
- Swimming pools
- Fire-fighting systems
- General irrigation systems
- Drainage systems
- Heating systems
- Air-conditioning systems
- Spray irrigation systems

### More information:

[www.ksb.com](http://www.ksb.com)



Etabloc with KSB SuPremE® IE5 motor\*, PumpMeter and PumpDrive



Etanorm (from size 150-125-510)

### Intelligent monitoring



KSB Guard

# Etabloc / Etanorm – Standardised Water Pumps

## Excellent energy efficiency

- Advanced hydraulic system with high efficiencies:  
As standard, the impeller diameter is trimmed to match the duty point.
- Intelligent pump monitoring with KSB's PumpMeter (optional)
- Intelligent variable speed system with KSB's PumpDrive and KSB SuPremE® motor: energy savings of up to 60 percent
- ErP Directive (MEI  $\geq 0.4$ ): Minimum requirements are exceeded by far.

## Reliable operation

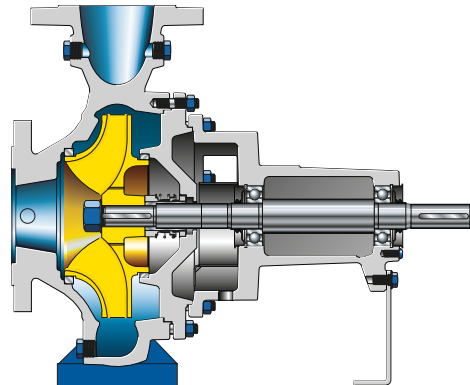
- Pump hydraulic system with low NPSH values and optimum suction characteristics
- Confined volute casing gasket
- Large stud diameters and threads (M12/M16)
- The shaft protecting sleeve prevents wear of the pump shaft.
- The conical seal chamber of the mechanical seal prevents internal circulation and improves venting and flushing.

## Wide range of variants

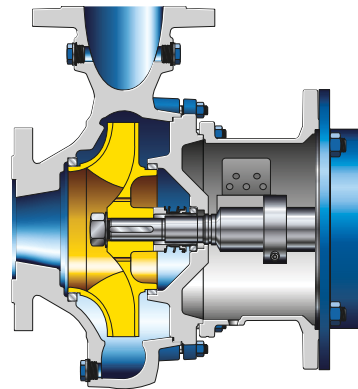
- Large range of shaft seals: single mechanical seal, gland packing and double mechanical seal as standard
- Large variety of materials for the most diverse of fluids handled
- Large number of pump sizes: 62 for Etanorm and 42 for Etabloc
- Flanges to EN 1092, optionally with ASME bolt hole pattern (Etanorm only)

## Ease of service

- Easily replaceable casing wear rings reduce wear at impeller and casing cover.
- Forcing screws at casing cover facilitate dismantling of the pump casing.
- Available as an option: KSB Guard for monitoring temperature and vibrations



Etanorm



Etabloc – without pump foot

\*IE5 in accordance with IEC/TS 60034-30-2 up to 15/18.5 kW (for 1500 rpm models rated 0.55 kW, 0.75 kW, 2.2 kW, 3 kW, 4 kW only: IE5 in preparation)

### Materials

Grey cast iron EN-GJL-250 / A48 Cl. 35B

Nodular cast iron EN-GJS-400-15 / A536 Gr. 60-40-18 / JS1025

Stainless steel 1.4408 / A743 Gr. CF8 M

Bronze CC480K-GS / B30 C90700

Technical data	Etabloc	Etanorm
Flow rate	Up to 640 m³/h (50 Hz) Up to 753 m³/h (60 Hz)	Up to 1930 m³/h (50 Hz) Up to 2321 m³/h (60 Hz)
Head	Up to 160 m (50 Hz) Up to 148 m (60 Hz)	Up to 160 m (50 Hz) Up to 160 m (60 Hz)
Fluid temperature	-30 °C to +140 °C	
Operating pressure	Up to 16 bar	



KSB SE & Co. KGaA  
Johann-Klein-Straße 9  
67227 Frankenthal (Germany)  
www.ksb.com



# SINGAPORE GREEN BUILDING PRODUCT CERTIFICATE

AWARDED TO

**KSB Singapore (Asia Pacific) Pte Ltd**

No 7 Woodlands Walk,  
KSB Regional Center  
Singapore 738320

FOR THE PRODUCT

**Chilled/Condenser Water Pump**

PRODUCT BRAND

**KSB- ETANORM**

PRODUCT MODEL

ETN 040-025-160, ETN 040-025-200, ETN 050-032-125, ETN  
050-032-250, ETN 050-032-250.1, ETN 065-040-125, ETN  
065-040-200, ETN 065-050-125, ETN 065-050-160, ETN  
065-050-200, ETN 065-050-250, ETN 065-050-315, ETN  
080-065-125, ETN 080-065-160, , ETN 080-065-200, ETN  
080-065-250, ETN 080-065-315, ETN 100-080-160, ETN  
100-080-200, ETN 100-080-250, ETN 100-080-315, ETN  
100-080-400, ETN 125-100-200, ETN 125-100-250, ETN  
125-100-315, ETN 150-125-200, ETN 150-125-250, ETN  
150-125-315, ETN 200-150-250, ETN 200-150-315, ETN  
200-150-400, ETNE 150-125-510, ETNE 200-150-510, ETNE  
250-200-275, ETNE 250-200-320, ETNE 250-200-375, ETNE  
250-200-435, ETNE 250-200-510, ETNE 300-250-295, ETNE  
300-250-295.1, ETNE 300-250-320, ETNE 300-250-375, ETNE  
300-250-435, ETNE 300-250-510, ETNE 350-300-350, ETNE  
350-300-350.1, ETNE 350-300-375, ETNE 350-300-435, ETNE  
350-300-510



THE PRODUCT HAS BEEN ASSESSED ACCORDING  
TO THE ASSESSMENT CRITERIA OF SINGAPORE  
GREEN BUILDING PRODUCT CERTIFICATION SCHEME.  
IT HAS BEEN AWARDED THE RATING:

A handwritten signature in black ink, appearing to be "M. S.", is positioned above a horizontal line.

Director  
SGBC Pte Ltd



Certificate Number	Original Issue Date	Revised Date	Valid Till
SGBP 4569	06 January 2022	-	05 January 2024

✓Good    ✓✓Very Good    ✓✓✓Excellent    ✓✓✓✓Leader

The use and reliance on this certificate is subject to the terms and conditions of the Singapore Green Building Product Certification Scheme. Revised certificates may also be issued at the discretion of the Council. The certification status may be verified at the Singapore Green Building Council website ([www.sgbc.sg](http://www.sgbc.sg)).

## Data sheet



Customer item no.:CHWP  
Communication dated: 31/07/2023  
Doc. no.: DHL at Changi South  
Quantity: 2

Number: ES 8002520200  
Item no.: 100  
Date: 31/07/2023  
Page: 1 / 8

### ETN 125-100-250 GBSAA10GC301104B

Version no.: 1

Low-pressure centrifugal pump Etanorm

#### Operating data

Requested flow rate	136.00 m <sup>3</sup> /h	Efficiency	82.0 %
Requested developed head	20.00 m	MEI (Minimum Efficiency Index)	≥ 0.70
Requested discharge pressure	1.96 bar.g	Power absorbed	9.03 kW
Pumped medium	Water	Pump speed of rotation	1467 rpm
	Clean water	NPSH required	2.16 m
Pumped medium details	Not containing chemical and mechanical substances which affect the materials	Shutoff head	23.02 m
Max. ambient air temperature	20.0 °C	Max. power on curve	10.70 kW
Min. ambient air temperature	20.0 °C	Min. allow. flow for continuous stable operation	23.00 m <sup>3</sup> /h
Fluid temperature	20.0 °C	Min. allow. mass flow for continuous stable operation	6.38 kg/s
Fluid density	998 kg/m <sup>3</sup>	Design	Single system 1 x 100 %
Fluid viscosity	1.00 mm <sup>2</sup> /s	Performance test	Yes
Vapour pressure	0.02 bar.a		
Suction pressure max.	0.00 bar.g		
Curve number	K1311.454/47		

#### Design

Pump standard	EN 733	Shaft seal	Single acting mechanical seal
Casing drain	Drilled and plugged.	Shaft seal manufacturer	KSB
Design	Baseplate mounted, long-coupled	Shaft seal type	1
Orientation	Horizontal	Material code	Q1Q1X4GG
Suction nominal dia.	DN 125	Shaft seal code	10
Suction nominal pressure	PN 16	Sealing plan	A Single-acting mechanical seal (A-type casing cover, taper bore)
Suction position	axial		
Suction flange dimension according to standard	EN1092-2	Seal chamber design	Conical seal chamber (A-type cover)
Suction flange drilled according to standard	EN1092-2	Contact guard	With
Discharge nominal dia.	DN 100	Wear ring	Casing wear ring
Discharge nominal pressure	PN 16	Impeller diameter	255.0 mm
Discharge position	top (0°/360°)	Free passage size	18.8 mm
Discharge flange dimension according to standard.	EN1092-2	Bearing bracket construction	Water standard standard
Discharge flange drilled according to standard	EN1092-2	Bearing bracket size	35
Surface type	Raised face form B1	Bearing seal	V ring
Recommended pipe size suction	DN 125	Bearing type	Anti-friction bearings
Recommended pipe size Discharge	DN 100	Lubrication type	Grease
		Color	Ultramarine blue (RAL 5002) KSB-blue

Customer item no.:CHWP  
 Communication dated: 31/07/2023  
 Doc. no.: DHL at Changi South  
 Quantity: 2

Number: ES 8002520200  
 Item no.: 100  
 Date: 31/07/2023  
 Page: 2 / 8

### ETN 125-100-250 GBSAA10GC301104B

Version no.: 1

Low-pressure centrifugal pump Etanorm

#### Driver, accessories

Coupling Manufacturer	LOVEJOY	Motorside drill	No
Coupling type	RRL	Driver type	Electric motor
Nominal size	110	Drive standard mech.	IEC
Spacer length	140.0 mm	Drive supplied by	Wonder motor
Coupling guard type	Lightweight, KSB India	Motor const. type	B3
Guard size	BZH07	Motor size	160M
Guard material	Steel ST	Frequency	50 Hz
Baseplate type	Welded steel	Rated power P2	11.00 kW
Baseplate size	BF101644	Available reserve	21.76 %
Baseplate drain	Drip tray	Number of poles	4
Baseplate fixing	Foundation bolts galvanized steel	EAC Approval	Yes

#### Materials GB

##### Notes 1

##### Notes 2

General criteria for a water analysis: pH-value  $\geq 6.5$ ; chloride content (Cl)  $\leq 250$  mg/kg. Chlorine (Cl<sub>2</sub>)  $\leq 0.6$  mg/kg. Ammonium (NH<sub>4</sub><sup>+</sup>)  $\leq 2$  mg/kg, free of H<sub>2</sub>S; Chlorine (Cl<sub>2</sub>)  $\leq 0.6$  mg/kg.

Volute casing (102)	Grey cast iron EN-GJL-250/A48CL35B
Casing cover (161)	Grey cast iron EN-GJL-250/A48CL35B
Shaft (210)	Chrome steel A276 TYPE 410 COND H
Impeller (230)	Tin bronze CC480K-GS / B30 C90700
Bearing bracket (330)	Grey cast iron EN-GJL-250/A48CL35B

Flat gasket (400)	DPAF DW001
Casing wear ring (502.1)	Tin bronze LTB4
Casing wear ring (502.2)	Tin bronze LTB4
Shaft sleeve (523)	CrNiMo steel
Shaft protecting sleeve (524)	Without
Stud (902)	Steel 8.8
Nut (920.01)	8+A2A/ 8+B633 SC1 TP3
Nut (920.95)	CrNiMo steel A4 / AISI 316

#### Packaging

Packaging category	B3 With desiccants in aluminium foil, heat-sealed water-vapour-proof, in wooden/plywood case, outdoor storage up to 24 months	Packaging for transport	Ship
Packaging for storage	Outdoor	Outdoor storage at -40 °C to +50°C, up to 24 months. Packet must be covered.	

#### Nameplates

Nameplates language	International
---------------------	---------------



## Data sheet



Customer item no.:CHWP  
Communication dated: 31/07/2023  
Doc. no.: DHL at Changi South  
Quantity: 2

Number: ES 8002520200  
Item no.: 100  
Date: 31/07/2023  
Page: 3 / 8

**ETN 125-100-250 GBSAA10GC301104B**  
Low-pressure centrifugal pump Etanorm

Version no.: 1

### Certifications

#### Hydraulic performance test

Acceptance standard	ISO 9906 class 3B; Below 10 kW acc. to paragraph 4.4.2
Quantity meas. points Q-H	5
Certificate	Inspection cert. 3.1 to EN 10204
Test participation	Non-witnessed
Quantity, non-witnessed	2
Quantity, witnessed	0

#### Hydrostatic test (room temp.)

Range	Volute casing and discharge cover
Test pressure	21.00 bar.g
Test time	1.0 min
Certificate	Test report 2.2 to EN 10204
Test participation	Non-witnessed

## Performance curve

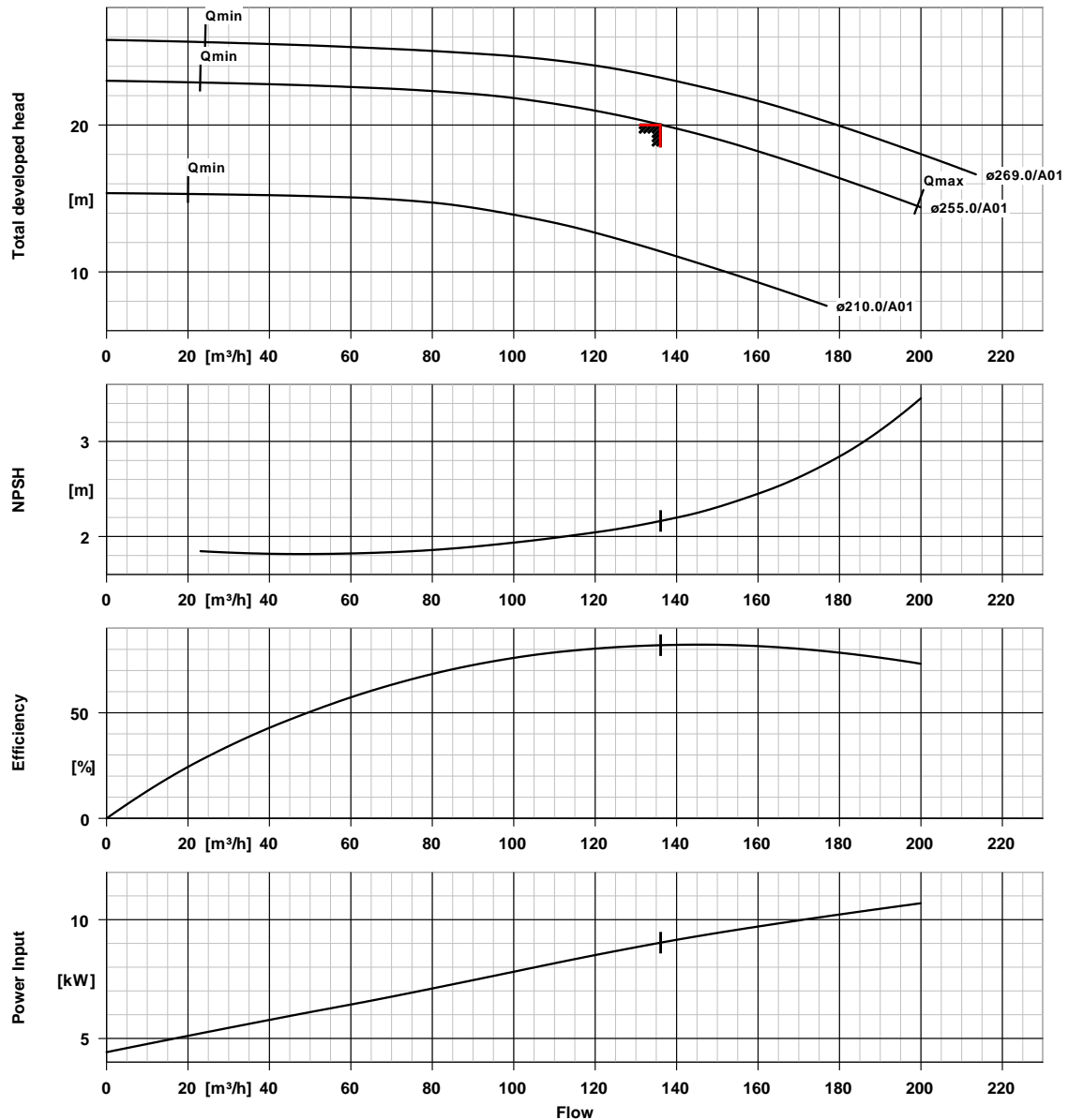


Customer item no.: CHWP  
Communication dated: 31/07/2023  
Doc. no.: DHL at Changi South  
Quantity: 2

Number: ES 8002520200  
Item no.: 100  
Date: 31/07/2023  
Page: 4 / 8

**ETN 125-100-250 GBSAA10GC301104B**  
Low-pressure centrifugal pump Etanorm

Version no.: 1



### Curve data

Speed of rotation	1467 rpm	Efficiency	82.0 %
Fluid density	998 kg/m <sup>3</sup>	MEI (Minimum Efficiency Index)	≥ 0.70
Viscosity	1.00 mm <sup>2</sup> /s	Power absorbed	9.03 kW
Flow rate	136.08 m <sup>3</sup> /h	NPSHR	2.16 m
Requested flow rate	136.00 m <sup>3</sup> /h	Curve number	K1311.454/47
Total developed head	20.02 m	Effective impeller diameter	255.0 mm
Requested developed head	20.00 m	Acceptance standard	ISO 9906 class 3B; Below 10 kW acc. to paragraph 4.4.2

## Speed curve



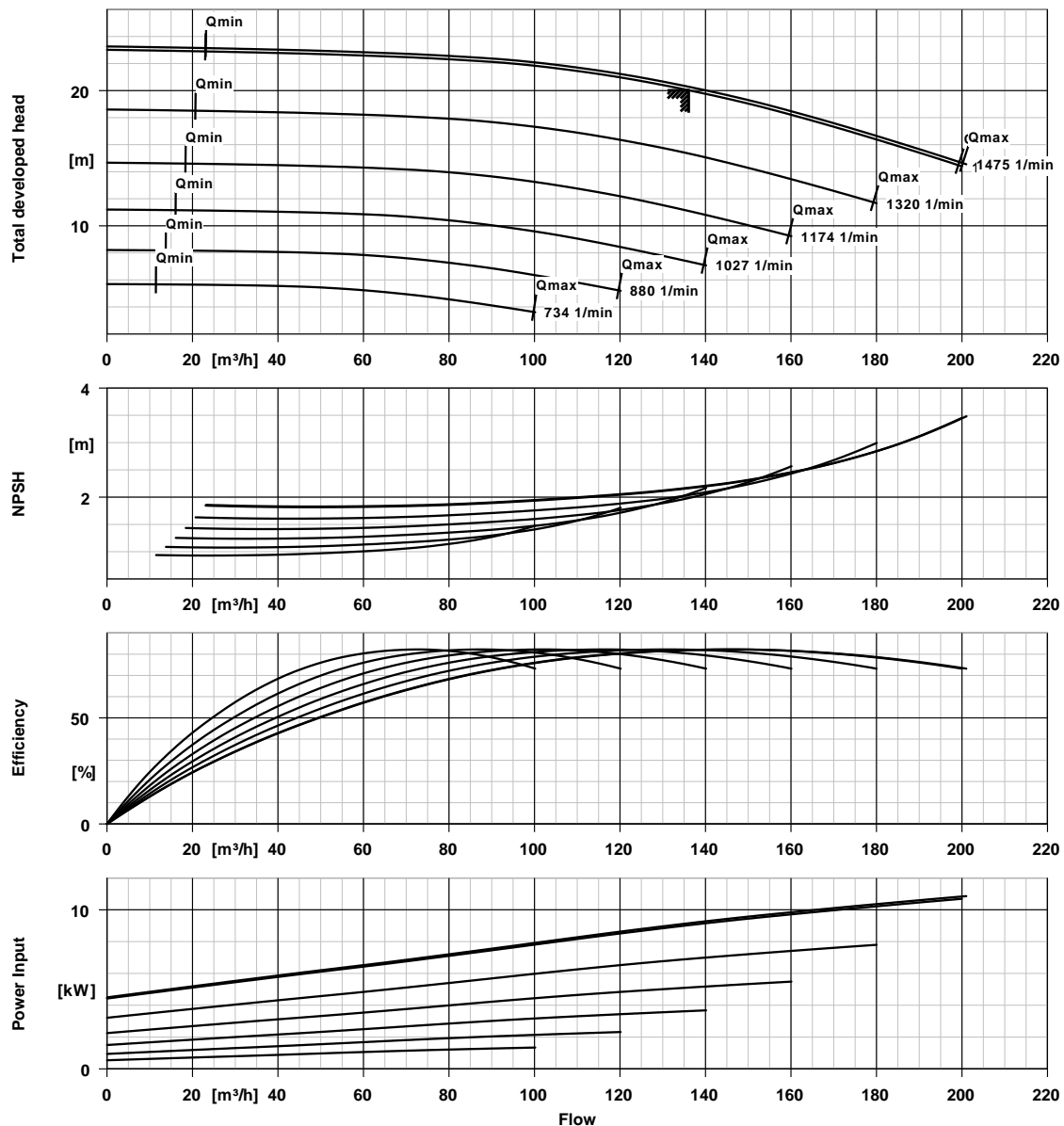
Customer item no.:CHWP  
Communication dated: 31/07/2023  
Doc. no.: DHL at Changi South  
Quantity: 2

Number: ES 8002520200  
Item no.:100  
Date: 31/07/2023  
Page: 5 / 8

**ETN 125-100-250 GBSAA10GC301104B**

Version no.: 1

Low-pressure centrifugal pump Etanorm



### Curve data

Fluid density 998 kg/m<sup>3</sup>  
Viscosity 1.00 mm<sup>2</sup>/s  
Flow rate 136.08 m<sup>3</sup>/h  
Requested flow rate 136.00 m<sup>3</sup>/h

Total developed head 20.02 m  
Requested developed head 20.00 m  
MEI (Minimum Efficiency Index)  $\geq 0.70$   
Effective impeller diameter 255.0 mm

## Installation plan

Preliminary Drawing only

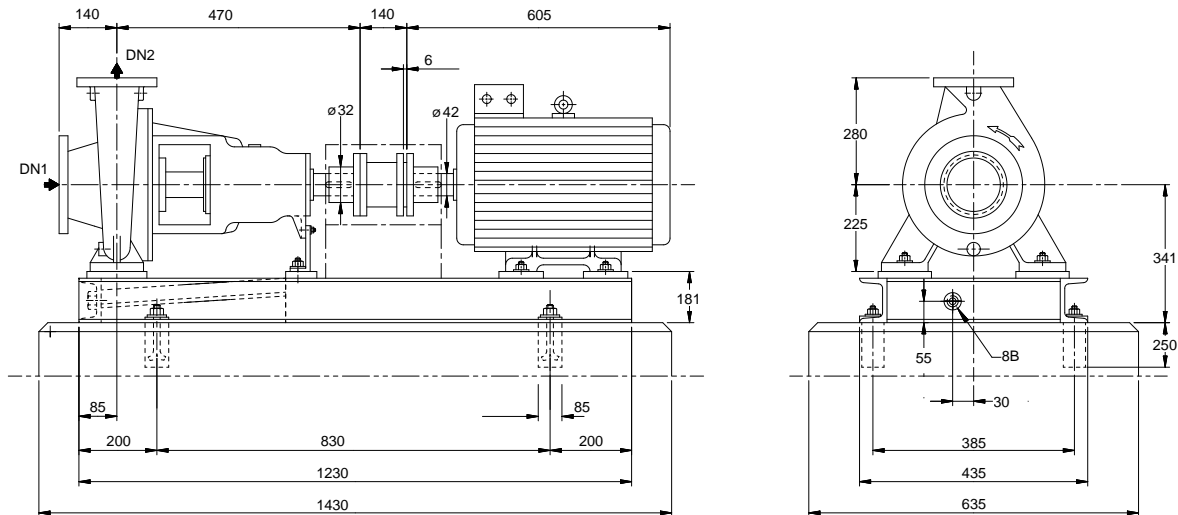


Customer item no.:CHWP  
Communication dated: 31/07/2023  
Doc. no.: DHL at Changi South  
Quantity: 2

Number: ES 8002520200  
Item no.:100  
Date: 31/07/2023  
Page: 6 / 8

**ETN 125-100-250 GBSAA10GC301104B**  
Low-pressure centrifugal pump Etanorm

Version no.: 1



*Drawing is not to scale*

*Dimensions in mm*

### Motor

Motor size	160M
Motor power	11.00 kW
Number of poles	4
Speed of rotation	1467 rpm

### Connections

Suction nominal size DN1	DN 125 / EN1092-2
Discharge nominal size DN2	DN 100 / EN1092-2
Nominal pressure suct.	PN 16
Rated pressure disch.	PN 16

### Baseplate

Design	Welded steel
Size	BF101644
Leakage drain baseplate (8B)	Rp1, Drip tray
Baseplate drain piping execution	Without
Foundation bolts	M16x200

### Coupling

Coupling manufacturer	LOVEJOY
Coupling type	RRL
Coupling size	110
Spacer	140.0 mm

### Weight net

Pump	100 kg
Baseplate	66 kg
Coupling	7 kg
Coupling guard	2 kg
Total	175 kg

**Connect pipes without stress or strain!**

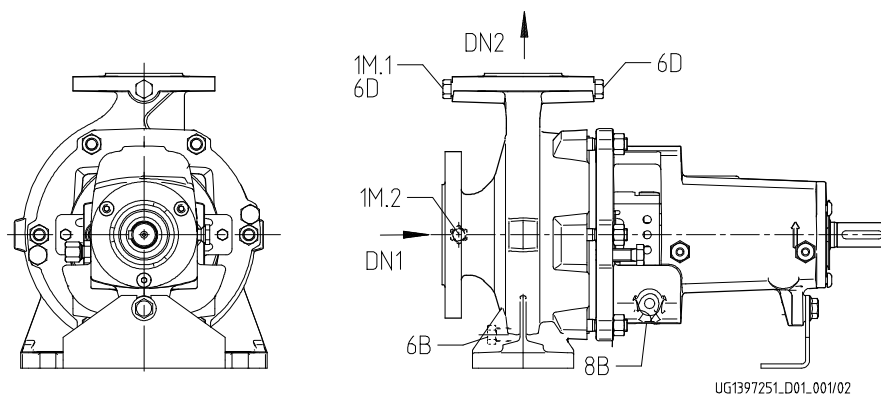
**For auxiliary connections see separate drawing.**

Customer item no.:CHWP  
Communication dated: 31/07/2023  
Doc. no.: DHL at Changi South  
Quantity: 2

Number: ES 8002520200  
Item no.:100  
Date: 31/07/2023  
Page: 7 / 8

**ETN 125-100-250 GBSAA10GC301104B**  
Low-pressure centrifugal pump Etanorm

Version no.: 1



### Connections

Pump casing variant	
6B Pumped liquid drain	G 1/2
6D Pumped medium - filling / venting	G 1/2
8B Leakage drain	1/2 NPT
1M.1 / 6D Pressure gauge or filling/venting connection	G 1/2
1M.2 Pressure gauge connection	G 1/2

XX48
Drilled and plugged.
Drilled and plugged.
Drilled
Drilled and plugged.
Drilled and plugged.

Force and Moment Limits

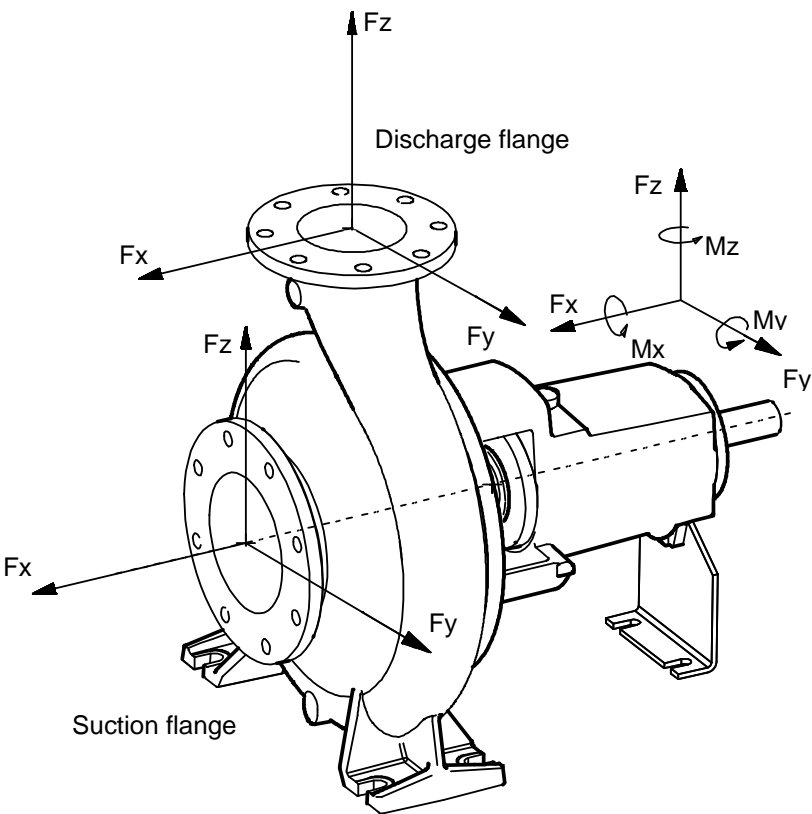


Customer item no.:CHWP  
Communication dated: 31/07/2023  
Doc. no.: DHL at Changi South  
Quantity: 2

Number: ES 8002520200  
Item no.:100  
Date: 31/07/2023  
Page: 8 / 8

**ETN 125-100-250 GBSAA10GC301104B**  
Low-pressure centrifugal pump Etanorm

Version no.: 1



Drawing is not to scale

Force and Moment Limits

Suction flange		Discharge flange	
$F_x$ s	1400 N	$F_x$ d	1050 N
$F_y$ s	1250 N	$F_y$ d (+)	950 N
$F_z$ s	1120 N	$F_z$ d	1180 N
$F_{res}$ s	2186 N	$F_{res}$ d	1843 N
$M_x$ s	740 Nm	$M_x$ d	620 Nm
$M_y$ s	530 Nm	$M_y$ d	440 Nm
$M_z$ s	670 Nm	$M_z$ d	510 Nm
		Valid for temperature	20.0 °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.

## Data sheet



Customer item no.: CWP  
Communication dated: 31/07/2023  
Doc. no.: DHL at Changi South  
Quantity: 2

Number: ES 8002520200  
Item no.: 200  
Date: 31/07/2023  
Page: 1 / 8

### ETN 150-125-200 GBSAA10GC301104B

Version no.: 1

Low-pressure centrifugal pump Etanorm

#### Operating data

Requested flow rate	170.00 m <sup>3</sup> /h	Efficiency	80.0 %
Requested developed head	15.00 m	MEI (Minimum Efficiency Index)	≥ 0.70
Requested discharge pressure	1.47 bar.g	Power absorbed	8.69 kW
Pumped medium	Water	Pump speed of rotation	1457 rpm
	Clean water	NPSH required	2.77 m
Pumped medium details	Not containing chemical and mechanical substances which affect the materials	Shutoff head	16.68 m
Max. ambient air temperature	20.0 °C	Max. power on curve	10.58 kW
Min. ambient air temperature	20.0 °C	Min. allow. flow for continuous stable operation	37.52 m <sup>3</sup> /h
Fluid temperature	20.0 °C	Min. allow. mass flow for continuous stable operation	10.40 kg/s
Fluid density	998 kg/m <sup>3</sup>	Design	Single system 1 x 100 %
Fluid viscosity	1.00 mm <sup>2</sup> /s	Performance test	Yes
Vapour pressure	0.02 bar.a		
Suction pressure max.	0.00 bar.g		
Curve number	K1311.454/50		

#### Design

Pump standard	EN 733	Shaft seal	Single acting mechanical seal
Casing drain	Drilled and plugged.	Shaft seal manufacturer	KSB
Design	Baseplate mounted, long-coupled	Shaft seal type	1
Orientation	Horizontal	Material code	Q1Q1X4GG
Suction nominal dia.	DN 150	Shaft seal code	10
Suction nominal pressure	PN 16	Sealing plan	A Single-acting mechanical seal (A-type casing cover, taper bore)
Suction position	axial		
Suction flange dimension according to standard	EN1092-2	Seal chamber design	Conical seal chamber (A-type cover)
Suction flange drilled according to standard	EN1092-2	Contact guard	With
Discharge nominal dia.	DN 125	Wear ring	Casing wear ring
Discharge nominal pressure	PN 16	Impeller diameter	224.0 mm
Discharge position	top (0°/360°)	Free passage size	21.1 mm
Discharge flange dimension according to standard.	EN1092-2	Bearing bracket construction	Water standard standard
Discharge flange drilled according to standard	EN1092-2	Bearing bracket size	35
Surface type	Raised face form B1	Bearing seal	V ring
Recommended pipe size suction	DN 150	Bearing type	Anti-friction bearings
Recommended pipe size Discharge	DN 125	Lubrication type	Grease
		Color	Ultramarine blue (RAL 5002) KSB-blue

Customer item no.: CWP  
 Communication dated: 31/07/2023  
 Doc. no.: DHL at Changi South  
 Quantity: 2

Number: ES 8002520200  
 Item no.: 200  
 Date: 31/07/2023  
 Page: 2 / 8

### ETN 150-125-200 GBSAA10GC301104B

Version no.: 1

Low-pressure centrifugal pump Etanorm

#### Driver, accessories

Coupling Manufacturer	LOVEJOY	Motorside drill	No
Coupling type	RRL	Driver type	Electric motor
Nominal size	110	Drive standard mech.	IEC
Spacer length	140.0 mm	Drive supplied by	Wonder motor
Coupling guard type	Lightweight, KSB India	Motor const. type	B3
Guard size	BZH07	Motor size	160M
Guard material	Steel ST	Frequency	50 Hz
Baseplate type	Welded steel	Rated power P2	11.00 kW
Baseplate size	BF101669	Available reserve	26.63 %
Baseplate drain	Drip tray	Number of poles	4
Baseplate fixing	Foundation bolts galvanized steel	EAC Approval	Yes

#### Materials GB

##### Notes 1

##### Notes 2

General criteria for a water analysis: pH-value  $\geq 6.5$ ; chloride content (Cl)  $\leq 250$  mg/kg. Chlorine (Cl<sub>2</sub>)  $\leq 0.6$  mg/kg. Ammonium (NH<sub>4</sub><sup>+</sup>)  $\leq 2$  mg/kg, free of H<sub>2</sub>S; Chlorine (Cl<sub>2</sub>)  $\leq 0.6$  mg/kg.

Volute casing (102)	Grey cast iron EN-GJL-250/A48CL35B
Casing cover (161)	Grey cast iron EN-GJL-250/A48CL35B
Shaft (210)	Chrome steel A276 TYPE 410 COND H
Impeller (230)	Tin bronze CC480K-GS / B30 C90700
Bearing bracket (330)	Grey cast iron EN-GJL-250/A48CL35B

Flat gasket (400)	DPAF DW001
Casing wear ring (502.1)	Tin bronze LTB4
Casing wear ring (502.2)	Tin bronze LTB4
Shaft sleeve (523)	CrNiMo steel
Shaft protecting sleeve (524)	Without
Stud (902)	Steel 8.8
Nut (920.01)	8+A2A/ 8+B633 SC1 TP3
Nut (920.95)	CrNiMo steel A4 / AISI 316

#### Packaging

Packaging category	B3 With desiccants in aluminium foil, heat-sealed water-vapour-proof, in wooden/plywood case, outdoor storage up to 24 months	Packaging for transport	Ship
Packaging for storage	Outdoor	Outdoor storage at -40 °C to +50 °C, up to 24 months. Packet must be covered.	

#### Nameplates

Nameplates language	International
---------------------	---------------



## Data sheet



Customer item no.:CWP  
Communication dated: 31/07/2023  
Doc. no.: DHL at Changi South  
Quantity: 2

Number: ES 8002520200  
Item no.: 200  
Date: 31/07/2023  
Page: 3 / 8

**ETN 150-125-200 GBSAA10GC301104B**  
Low-pressure centrifugal pump Etanorm

Version no.: 1

### Certifications

#### Hydraulic performance test

Acceptance standard	ISO 9906 class 3B; Below 10 kW acc. to paragraph 4.4.2
Quantity meas. points Q-H	5
Certificate	Inspection cert. 3.1 to EN 10204
Test participation	Non-witnessed
Quantity, non-witnessed	2
Quantity, witnessed	0

#### Hydrostatic test (room temp.)

Range	Volute casing and discharge cover
Test pressure	21.00 bar.g
Test time	1.0 min
Certificate	Test report 2.2 to EN 10204
Test participation	Non-witnessed

## Performance curve

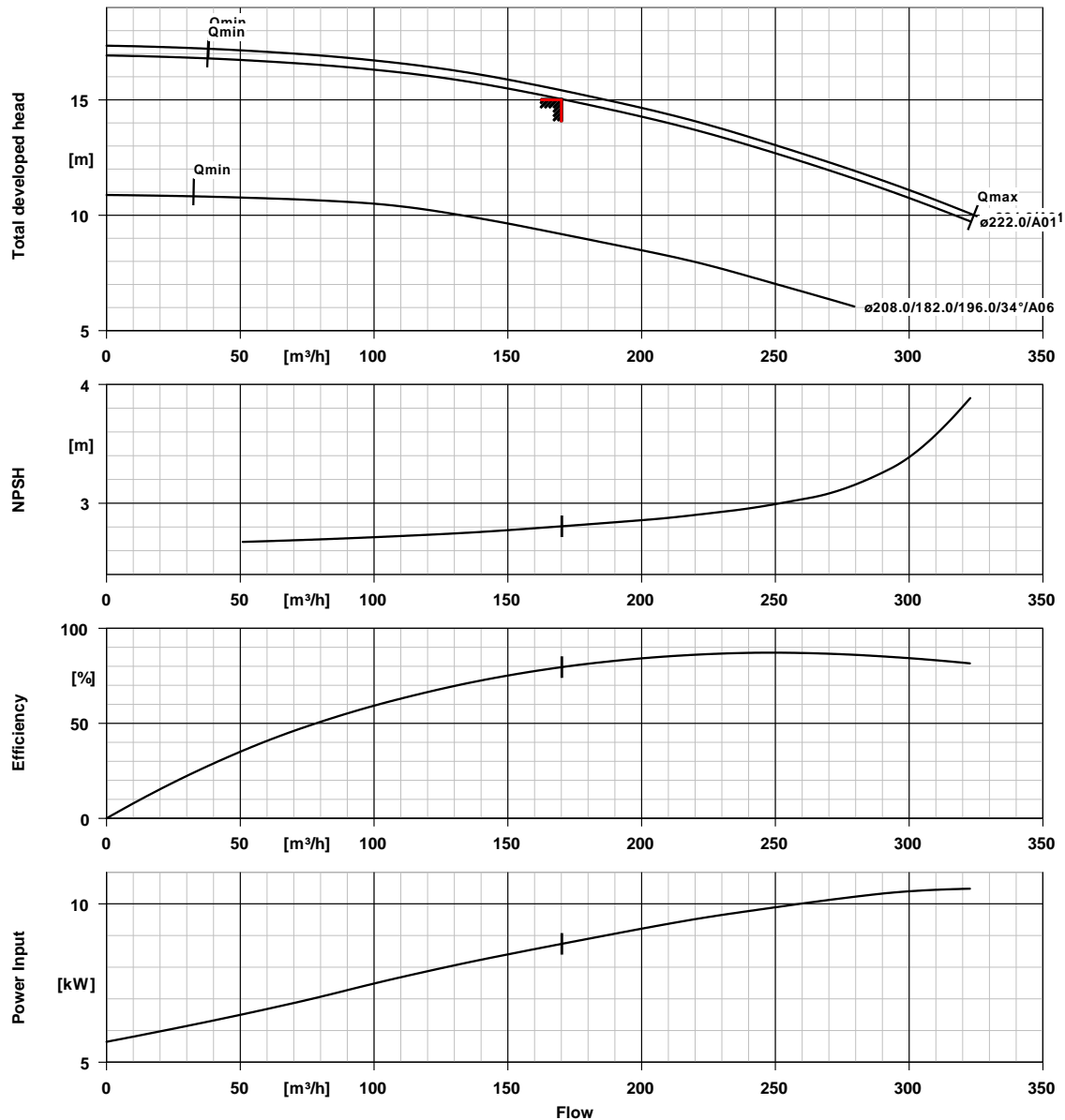


Customer item no.:CWP  
Communication dated: 31/07/2023  
Doc. no.: DHL at Changi South  
Quantity: 2

Number: ES 8002520200  
Item no.:200  
Date: 31/07/2023  
Page: 4 / 8

**ETN 150-125-200 GBSAA10GC301104B**  
Low-pressure centrifugal pump Etanorm

Version no.: 1



### Curve data

Speed of rotation	1457 rpm	Efficiency	80.0 %
Fluid density	998 kg/m <sup>3</sup>	MEI (Minimum Efficiency Index)	≥ 0.70
Viscosity	1.00 mm <sup>2</sup> /s	Power absorbed	8.69 kW
Flow rate	170.16 m <sup>3</sup> /h	NPSHR	2.77 m
Requested flow rate	170.00 m <sup>3</sup> /h	Curve number	K1311.454/50
Total developed head	15.03 m	Effective impeller diameter	224.0 mm
Requested developed head	15.00 m	Acceptance standard	ISO 9906 class 3B; Below 10 kW acc. to paragraph 4.4.2

## Speed curve



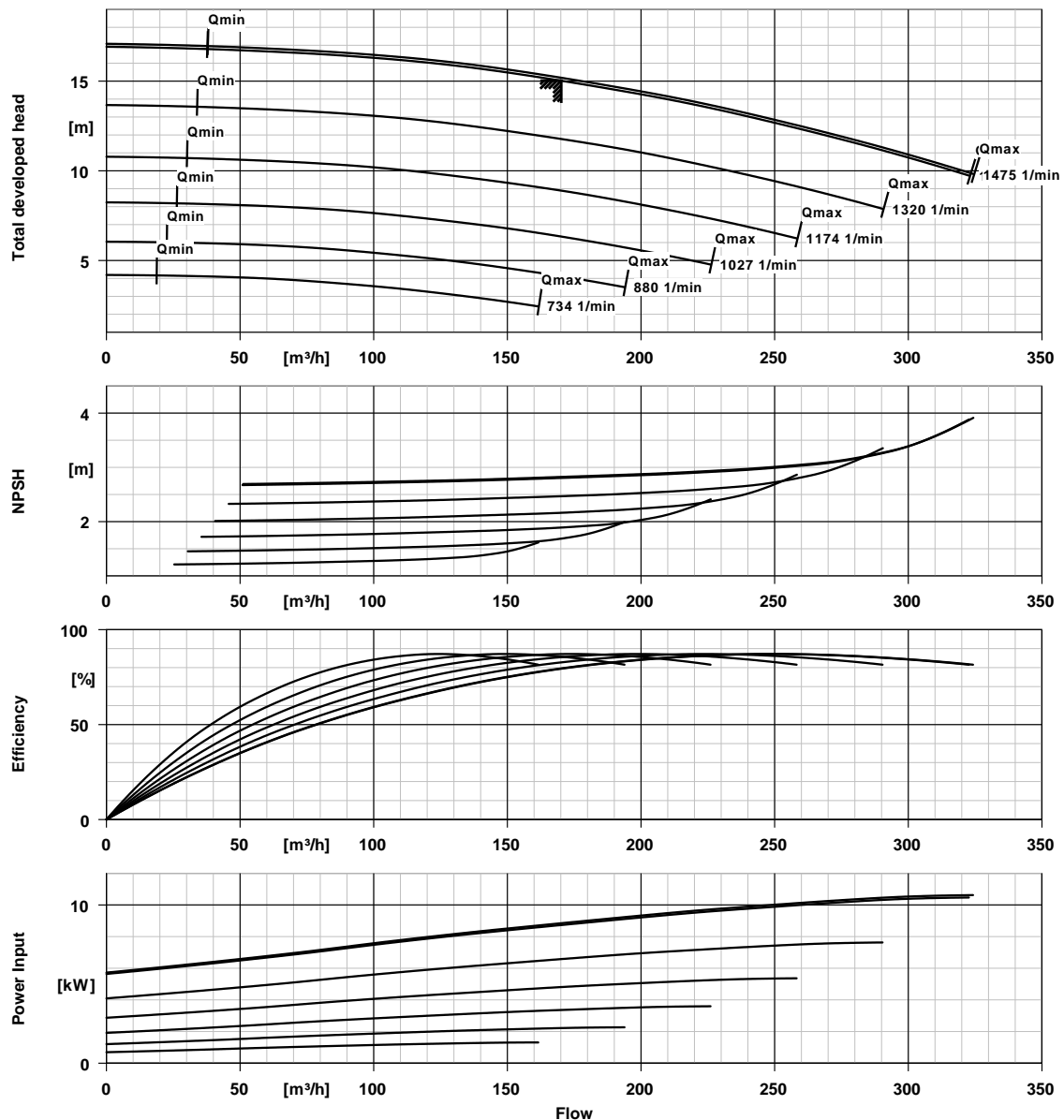
Customer item no.: CWP  
Communication dated: 31/07/2023  
Doc. no.: DHL at Changi South  
Quantity: 2

Number: ES 8002520200  
Item no.: 200  
Date: 31/07/2023  
Page: 5 / 8

**ETN 150-125-200 GBSAA10GC301104B**

Version no.: 1

Low-pressure centrifugal pump Etanorm



### Curve data

Fluid density 998  $\text{kg}/\text{m}^3$   
Viscosity 1.00  $\text{mm}^2/\text{s}$   
Flow rate 170.16  $\text{m}^3/\text{h}$   
Requested flow rate 170.00  $\text{m}^3/\text{h}$

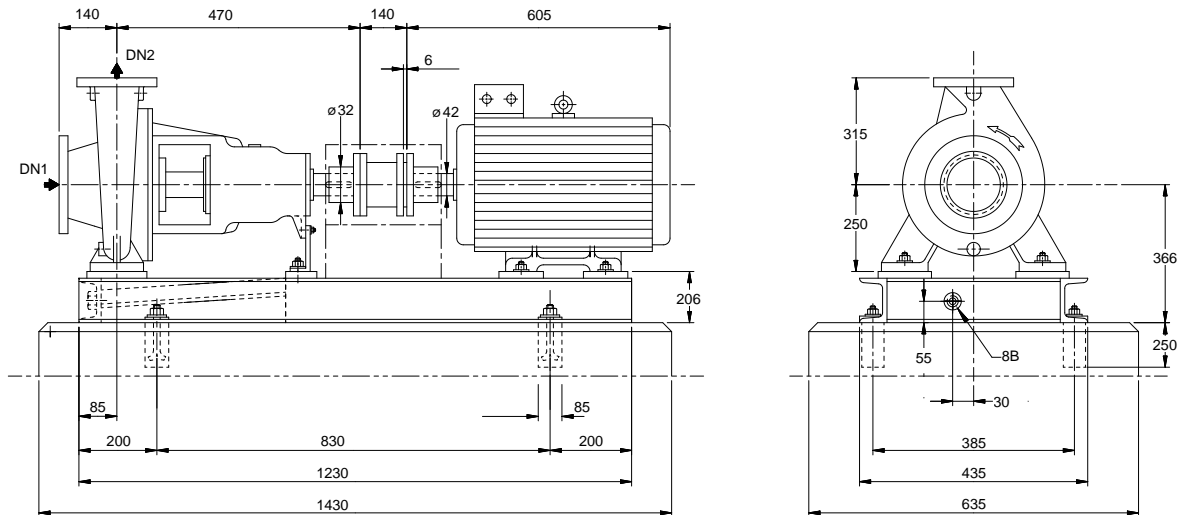
Total developed head 15.03 m  
Requested developed head 15.00 m  
MEI (Minimum Efficiency Index)  $\geq 0.70$   
Effective impeller diameter 224.0 mm

Customer item no.:CWP  
Communication dated: 31/07/2023  
Doc. no.: DHL at Changi South  
Quantity: 2

Number: ES 8002520200  
Item no.:200  
Date: 31/07/2023  
Page: 6 / 8

**ETN 150-125-200 GBSAA10GC301104B**  
Low-pressure centrifugal pump Etanorm

Version no.: 1



Drawing is not to scale

Dimensions in mm

## Motor

Motor size	160M
Motor power	11.00 kW
Number of poles	4
Speed of rotation	1467 rpm

## Baseplate

Design	Welded steel
Size	BF101669
Leakage drain baseplate (8B)	Rp1, Drip tray
Baseplate drain piping execution	Without
Foundation bolts	M16x200

## Connections

Suction nominal size DN1	DN 150 / EN1092-2
Discharge nominal size DN2	DN 125 / EN1092-2
Nominal pressure suct.	PN 16
Rated pressure disch.	PN 16

## Coupling

Coupling manufacturer	LOVEJOY
Coupling type	RRL
Coupling size	110
Spacer	140.0 mm

## Weight net

Pump	110 kg
Baseplate	65 kg
Coupling	7 kg
Coupling guard	2 kg
Total	184 kg

Connect pipes without stress or strain!

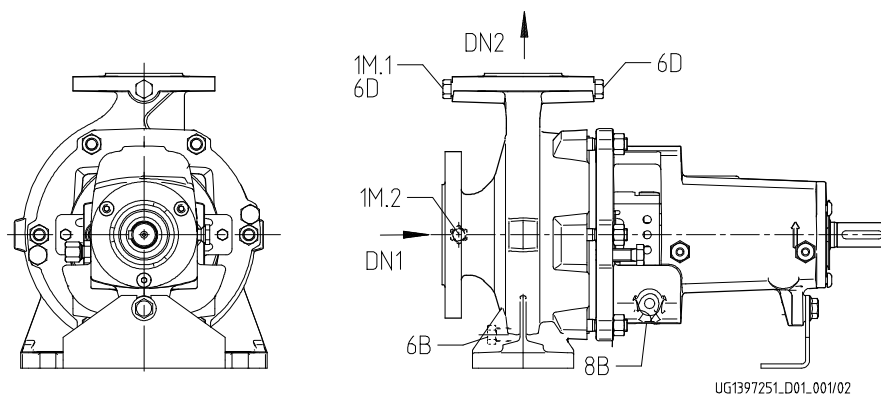
For auxiliary connections see separate drawing.

Customer item no.:CWP  
Communication dated: 31/07/2023  
Doc. no.: DHL at Changi South  
Quantity: 2

Number: ES 8002520200  
Item no.:200  
Date: 31/07/2023  
Page: 7 / 8

**ETN 150-125-200 GBSAA10GC301104B**  
Low-pressure centrifugal pump Etanorm

Version no.: 1



### Connections

Pump casing variant	
6B Pumped liquid drain	G 1/2
6D Pumped medium - filling / venting	G 1/2
8B Leakage drain	1/2 NPT
1M.1 / 6D Pressure gauge or filling/venting connection	G 1/4
1M.2 Pressure gauge connection	G 1/4

XX48
Drilled and plugged.
Drilled and plugged.
Drilled
Drilled and plugged.
Drilled and plugged.

## Force and Moment Limits

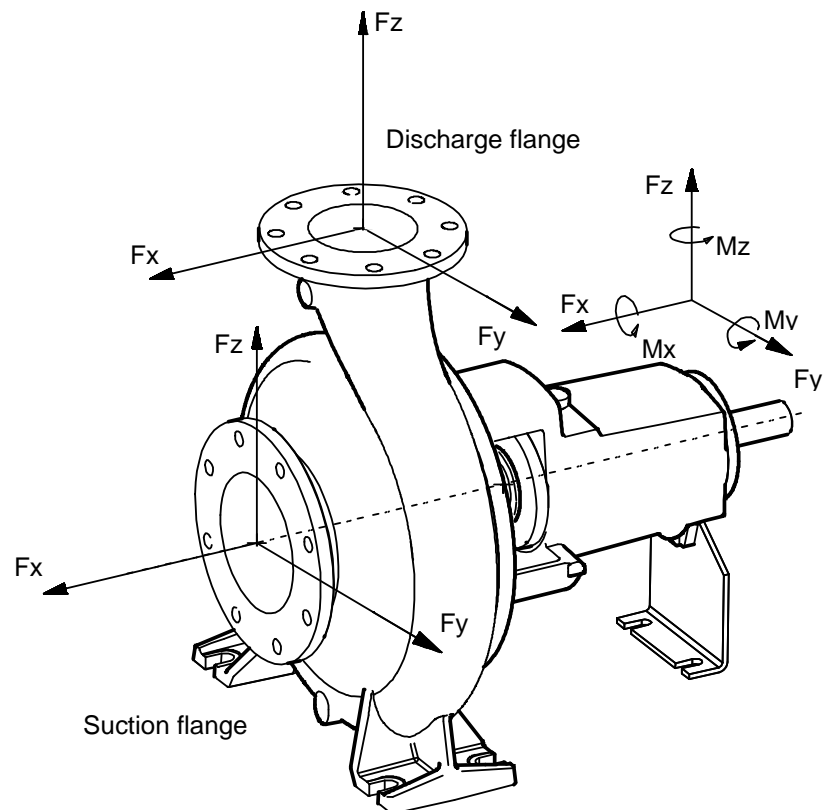


Customer item no.:CWP  
Communication dated: 31/07/2023  
Doc. no.: DHL at Changi South  
Quantity: 2

Number: ES 8002520200  
Item no.:200  
Date: 31/07/2023  
Page: 8 / 8

**ETN 150-125-200 GBSAA10GC301104B**  
Low-pressure centrifugal pump Etanorm

Version no.: 1



*Drawing is not to scale*

### Force and Moment Limits

Suction flange		Discharge flange	
Fx s	1750 N	Fx d	1250 N
Fy s	1600 N	Fy d (+)	1120 N
Fz s	1400 N	Fz d	1400 N
Fres s	2754 N	Fres d	2186 N
Mx s	880 Nm	Mx d	740 Nm
My s	610 Nm	My d	530 Nm
Mz s	720 Nm	Mz d	670 Nm
		Valid for temperature	20.0 °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.