Company name:
Created by:
Phone:

Date: 18/01/2017

Position	Qty.	Description
	1	**UPS 40-80/2 F**

Note! Product picture may differ from actual product

Product No.: 96402762

The pump is of the canned rotor type, i.e. pump and motor form an integral unit without shaft seal and with only two gaskets for sealing.
The bearings are lubricatd by the pumped liquid.

In order to avoid problems in connection with disposal, great importance has been attached to using as few different materials as possible.

The pump is characterized by:

* 3 speed motor.
* Ceramic radial bearings.
* Carbon axial bearing.
* Stainless steel rotor can, bearing plate and rotor cladding.
* Aluminium alloy stator housing.
* Cast iron pump housing.
* Stator with built-in thermal switch.

The motor is a 1-phase motor.

The pump is supplied with a standard module in the terminal box.
The standard module is to be connected to the mains supply via external contactor.

Controls:

Relay:	with relay

Liquid:

Pumped liquid:	Water
Liquid temperature range:	-10 .. 120 °C
Liquid temp:	60 °C
Density:	983.2 kg/m³

Technical:

Approvals on nameplate:	CUL

Materials:

Pump housing:	Cast iron EN-JL1040 ASTM 35 B - 40 B
Impeller:	Stainless steel DIN W.-Nr. 1.4301 AISI 304

GRUNDFOS

Company name:
Created by:
Phone:

Date: 18/01/2017

Position	Qty.	Description

Installation:

Range of ambient temperature:	0 .. 40 °C
Maximum operating pressure:	10 bar
Flange standard:	USA Oval
Type of connection:	F
Pipe connection:	GF 40/43
Pressure stage:	145 psi
Port-to-port length:	342 mm

Electrical data:

C run:	40 µF
Power input in speed 1:	440 W
Power input in speed 2:	450 W
Max. power input:	480 W
Mains frequency:	60 Hz
Rated voltage:	1 x 115 V
Current in speed 1:	4.4 A
Current in speed 2:	4.4 A
Current in speed 3:	4.45 A
Cos phi in speed 1:	0,87
Cos phi in speed 2:	0,89
Cos phi:	0,94
Capacitor size - run:	40 µF/250 V
Number of poles:	2
Enclosure class (IEC 34-5):	X4D
Insulation class (IEC 85):	F

Others:

Net weight:	18.1 kg
Gross weight:	20.8 kg
Shipping volume:	0.059 m^3

Company name:
Created by:
Phone:

Date: 18/01/2017

Description	Value
General information:	
Product name:	UPS 40-80/2 F
Product No:	96402762
EAN number:	5700390680503
Price:	On request
Technical:	
Speed no:	3
Head max:	80 dm
Approvals on nameplate:	CUL
Model:	C
Materials:	
Pump housing:	Cast iron
	EN-JL1040
	ASTM 35 B - 40 B
Impeller:	Stainless steel
	DIN W.-Nr. 1.4301
	AISI 304
Installation:	
Range of ambient temperature:	0 .. 40 °C
Maximum operating pressure:	10 bar
Flange standard:	USA Oval
Type of connection:	F
Pipe connection:	GF 40/43
Pressure stage:	145 psi
Port-to-port length:	342 mm
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	-10 .. 120 °C
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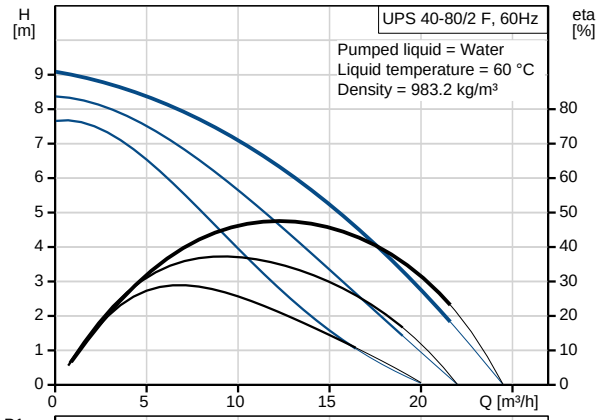
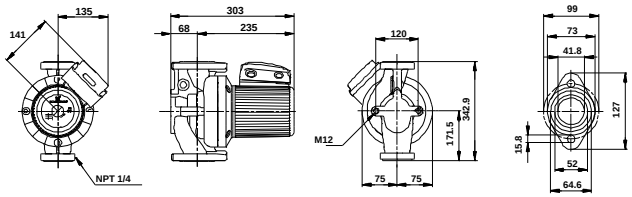
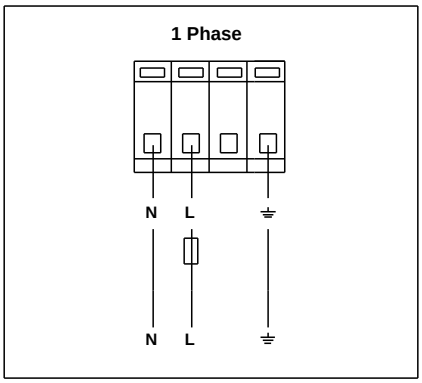
Rated voltage:	1 x 115 V
Current in speed 1:	4.4 A
Current in speed 2:	4.4 A
Current in speed 3:	4.45 A
Cos phi in speed 1:	0,87
Cos phi in speed 2:	0,89
Cos phi:	0,94
Capacitor size - run:	40 µF/250 V
Number of poles:	2
Enclosure class (IEC 34-5):	X4D
Insulation class (IEC 85):	F
Motor protec:	CONTACT
Thermal protec:	internal
R a:	5.6 - 7.35 ohm
R s1:	1.84 - 2.42 ohm
R s2:	4.5 - 5.9 ohm
Controls:	







GRUNDFOS

Company name:
Created by:
Phone:

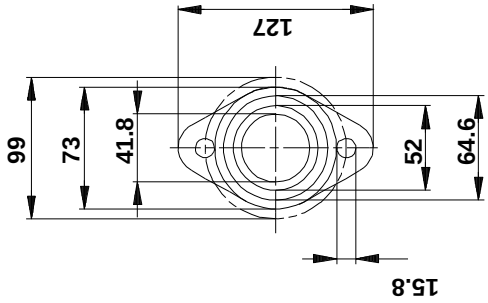
Date: 18/01/2017

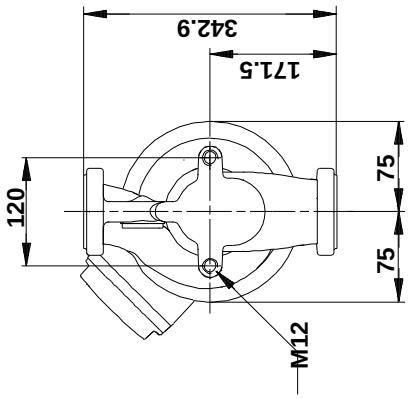
Description	Value
Relay:	with relay
Pos term box:	1.30H
Others:	
Net weight:	18.1 kg
Gross weight:	20.8 kg
Shipping volume:	0.059 m³
Sales region:	Namreg

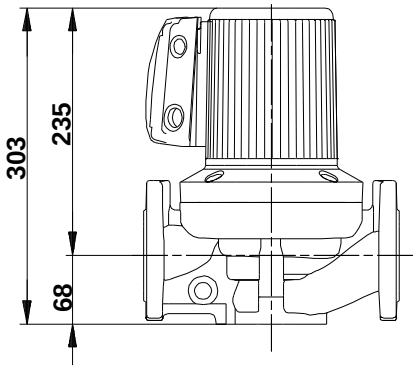
Company name:
Created by:
Phone:

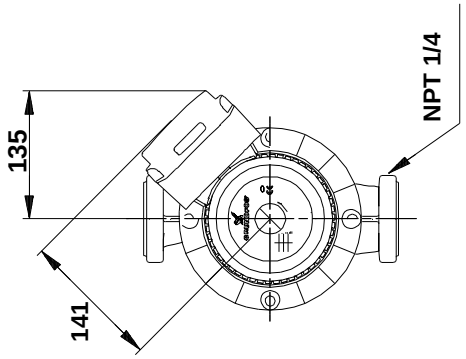
Date: 18/01/2017

96402762 UPS 40-80/2 F 60 Hz



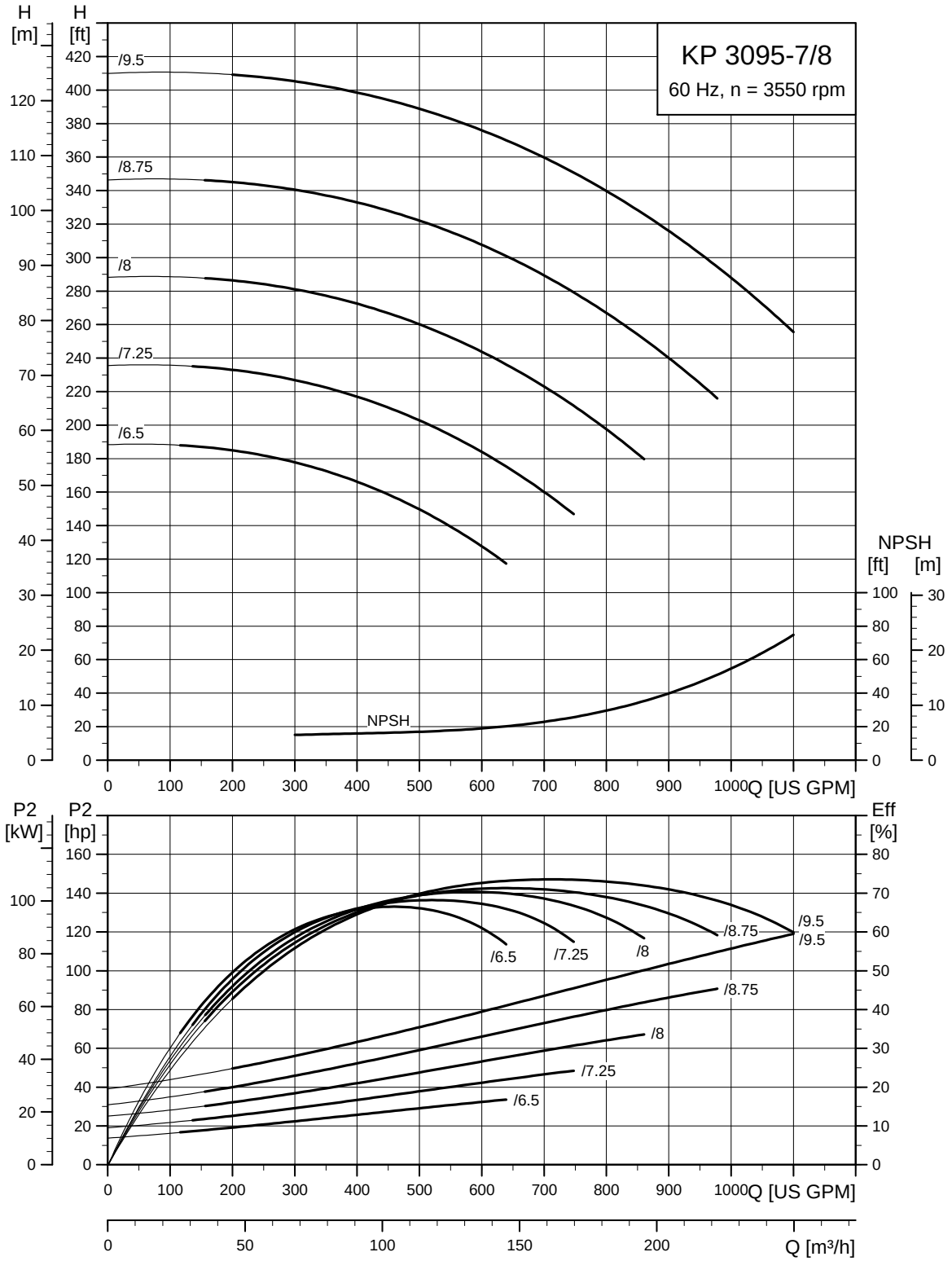






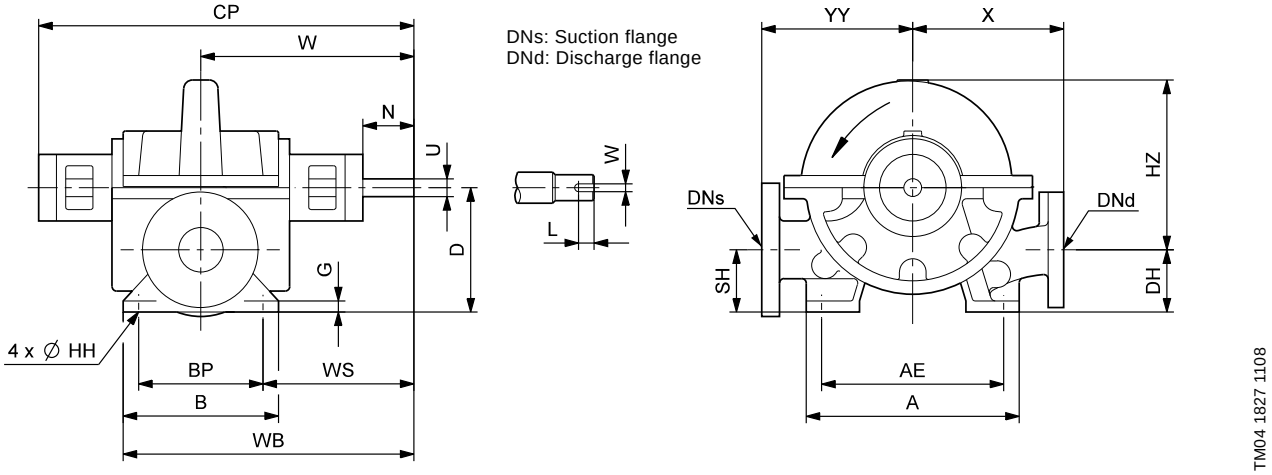
Note! All units are in [mm] unless others are stated.
Disclaimer: This simplified dimensional drawing does not show all details.

KP 3095-7/8 [2-pole]



TM05 5010 3212

Dimensional sketch



Dimensions

All dimensions are in inches.

Pump size	K(WxL)	YY	X	G	U	N	WS	CP		WB
								PACK	SEAL	
2095-1/2	1/4x1/8	8-1/2	8-1/2	5/8	1	2-7/8	8-1/2	21-1/8	19-3/4	16-3/8
2013-5/6	1/4x1/8	10	10	5/8	1	2-7/8	8-1/2	21-1/8	19-3/4	16-3/8
3095-7/8	1/4x1/8	11	11	3/4	1 XE 1-3/16	2-7/8	8-1/2	21-1/8	19-3/4	16-3/8
3014-7/8	3/8x3/16	12	12	7/8	1-1/2	2-3/4	9-7/8	26-1/4	24-1/2	20
4012-1/2	3/8x3/16	12	12	7/8	1-1/2	2-3/4	9-7/8	26-1/4	24-1/2	20
4012-7/8	3/8x3/16	12	12	7/8	1-1/2	2-3/4	9-7/8	26-1/4	24-1/2	20
4015-9/0	3/8x3/16	14-1/16	14-1/16	1	1-1/2	2-3/4	8-1/2	26-1/4	24-1/2	21-3/8
5012-7/8	3/8x3/16	13	13	1	1-1/2	2-3/8	11-3/8	30-1/4	30-1/4	22-1/2
5015-9/0	3/8x3/16	15	14	1	1-1/2	2-3/8	11-7/8	31-1/4	31-1/4	23
6012-3/4	3/8x3/16	16	14	1	1-1/2	2-3/8	11-7/8	31-1/4	31-1/4	23
6015-3/4	3/8x3/16	16	15	1-1/8	1-3/4	3-11/16	11-3/4	36-5/16	36-5/16	29
6019-7/8	(X5)3/8x3/16 (X6)1/2x1/4	17	17	1	(X5)1-3/4 (X6)2	(X5)3-11/16 (X6)3	13-1/4	(X5)34-11/16 (X6)35-1/2	(X5)34-3/16 (X6)35-1/2	26-1/4
6020-3/4	1/2x1/4	19	17	1	2-1/8	3-16/16	15-1/2	39-1/8	39-1/8	28-1/2
8012-5/6	3/8x3/16	17	15	1-1/8	1-3/4	3-11/16	13	36-5/16	36-5/16	27-3/4
8015-3/4	3/8x3/16	19	19	1-1/8	1-3/4	3-11/16	11-5/8	37-1/16	37-1/16	30-1/8
8020-5/6	5/8x5/16	22	16-5/16	1-3/8	2-1/2	4-1/4	21-1/2	53-11/16	53-11/16	39-1/8
1012-1/2	3/8x3/16	19-1/2	19-1/2	1-1/8	1-3/4	3-11/16	12-1/8	38-1/16	38-1/16	30-5/8
1015-3/4	1/2x1/4	23	17	1-1/8	2-1/4	6-1/8	17-5/8	41-1/8	41-1/8	30-5/8
1020-3/4	3/4x3/8	26	20	1-3/8	3-1/8	6-7/8	23-3/8	54-11/16	54-11/16	41-5/16
1024-3/4	3/4x3/8	28	24	1-3/8	3-1/8	9-5/16	23-3/8	53-1/2	53-1/2	41-5/16
1220-5/6	5/8x5/16	28	23	1-3/8	2-1/2	4-1/4	21-1/2	54-3/4	54-3/4	39-1/8
1415-1/2	-	25-3/5	21-13/20	-	2-1/2	-	-	51-7/10	51-7/10	-

Flow

Minimum flow rate

The pump must not run against a closed discharge valve, as this will cause an increase in temperature/ formation of steam in the pump. This may cause shaft damage, impeller erosion, short life of bearings, stuffing boxes with packing rings or mechanical seals due to stress or vibration.

The minimum, continuous flow rate must be at least 25% of the flow rate at best-efficiency point (BEP).

KP Impeller Max Sphere Size

Split Case Model	Max Sphere Size [inches]
2095-1/2	0.19
2013-5/6	0.16
3095-7/8	0.31
3014-7/8	0.31
4012-1/2	0.38
4012-7/8	0.75
4015-9/0	0.25
5012-7/8	0.63
5015-9/0	0.75
6012-3/4	1.00
6015-3/4	0.81
6019-7/8	0.75
6020-3/4	0.75
8012-5/6	0.88
8015-3/4	1.00
8020-5/6	1.03
1012-1/2	1.00
1015-3/4	1.25
1020-3/4	1.20
1024-3/4	1.17
1220-5/6	1.87
1415-1/2	1.25

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October 2010

Variable Speed Pumping Logic for Otsego Apartments, Jackson, Michigan

Control: TCS Basys Microprocessor-Based PID Controller—Addendum
VFD: Grundfos CUE—Variable Frequency Drive

Control Logic:
The Basys control monitors the system's supply and return water temperatures using a water sensor in a well. Each sensor sends a signal to its own transmitter which in turn sends a signal to the control's microprocessor. The microprocessor has been programmed** to maintain a 20 degree F differential between the supply water temperature and the returning water temperature. If the control sees the differential getting less than 20F (ie 16F) it sees this as a building load reduction and signals (0-10VDC) the VFD Drive to slow down the pump's RPM. If the differential increases greater than 20F (ie 24F) the control sees this as an increase in building load and signals the drive to speed up the RPM.
** Please refer to the Basys Manual for all program settings and operation.
NOTE: Per Basys, Only One (1) CUE may be turned on at any given time, so the Basys control may deliver a proper operating signal.

CUE VFD Settings & Logic:
In the CUE's Start-Up Guide, you first scroll down through the start-up menu putting in the pump information from the pump's Data Rating Plate.
SCREENS: 1/16 thru 8/16 (screen 8/16 control mode– set to "Open Loop")
The CUE will then operate the pump and will check the pump's direction of rotation. Once this is correct, the CUE exits the set-up mode.

Now, using side arrows, scroll to 3.0 Installation Mode (scroll down for settings)
3.1 Control Mode set for Open Loop.
3.3 External Setpoint is set to Active.
3.3A External Setpoint is set for: Minimum 0.00V and Maximum 10.0V
3.6 Set to Active
3.8 Set for Pump 1
3.18 Operating Range: Set Minimum to 25% and Maximum to 100%
NOTE: In the terminal section, Dip Switch "A53" must be set to the "U" position.

The CUE receives a 0 to 10VDC signal from the Basys Control and uses this signal as the External Setpoint. Based on the signal provided, the CUE either increases or decreases the pump's RPM. A 0VDC signal equals 25%^^ RPM operation and a 10VDC signal equals 100%^^ RPM operation. The 0—10VDC signal is supplied to terminals 53 (external setpoint) and 55 (ground).

Page 2 & 3 are setting pages from the CUE Manual (manual pages 20 & 21).
^^NOTE: VSP Logic Addendum
There is a possibility, under some conditions, that the pump can be operating at its minimum set point (25%) and the differential could be less than 20F. This **IS NOT** a problem, it just means that even at minimum operation the building load is less than the minimum set point. This logic could also occur in reverse at 100% pump operation with a greater than 20F differential potential.

US

9. Menu overview

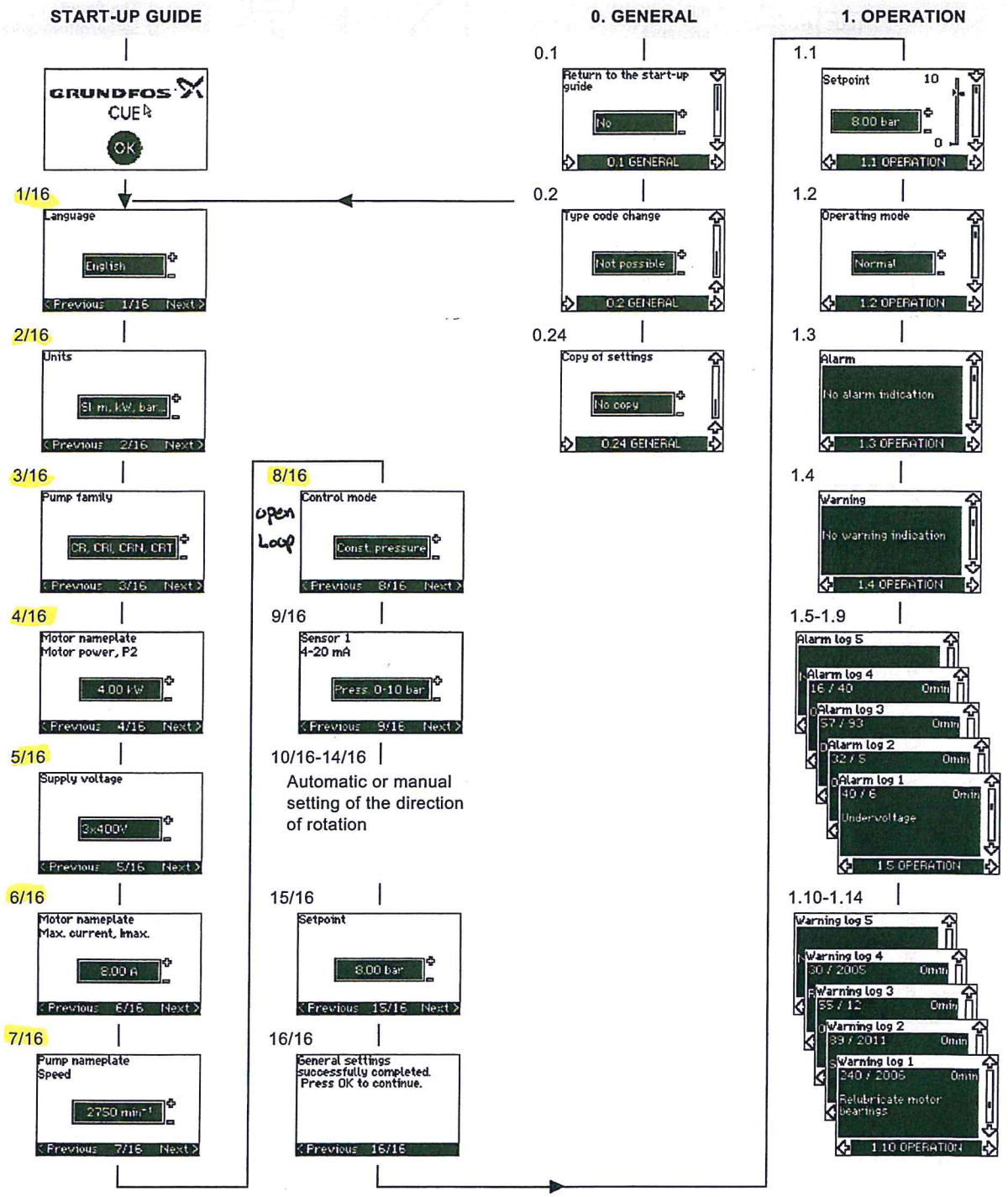
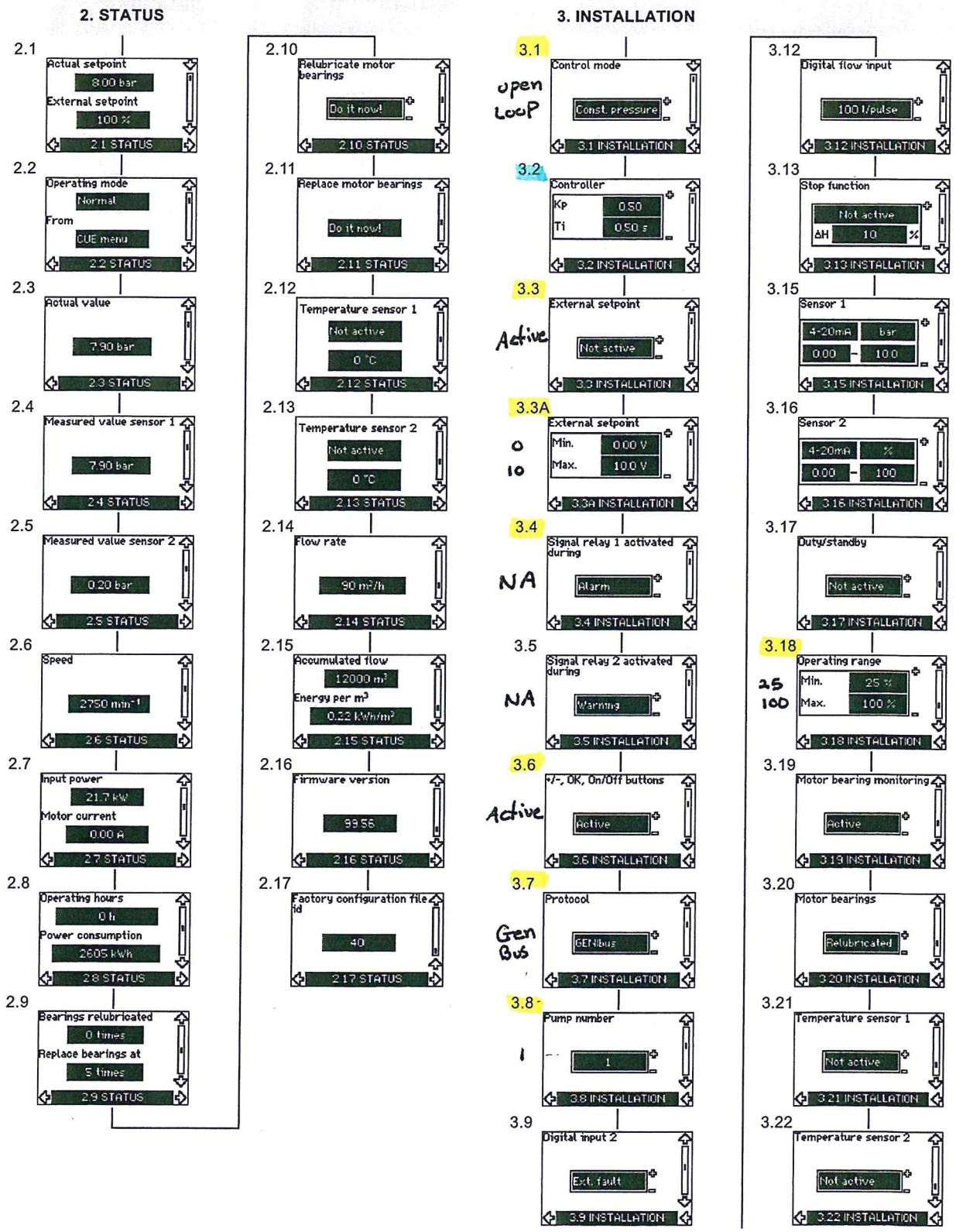


Fig. 46 Menu overview

Menu structure

The CUE has a start-up guide, which is started at the first start-up. After the start-up guide, the CUE has a menu structure divided into four main menus:

1. **GENERAL** gives access to the start-up guide for the general setting of the CUE.
2. **OPERATION** enables the setting of setpoint, selection of operating mode and resetting of alarms. It is also possible to see the latest five warnings and alarms.
3. **STATUS** shows the status of the CUE and the pump. It is not possible to change or set values.
4. **INSTALLATION** gives access to all parameters. Here a detailed setting of the CUE can be made.


2. STATUS
2.1
Actual setpoint
8.00 bar
External setpoint
100 %
2.1 STATUS
2.2
Operating mode
Normal
From
CUE menu
2.2 STATUS
2.3
Actual value
7.90 bar
2.3 STATUS
2.4
Measured value sensor 1
7.90 bar
2.4 STATUS
2.5
Measured value sensor 2
0.20 bar
2.5 STATUS
2.6
Speed
2750 min-1
2.6 STATUS
2.7
Input power
21.7 kW
Motor current
0.00 A
2.7 STATUS
2.8
Operating hours
0 h
Power consumption
2605 kWh
2.8 STATUS
2.9
Bearings relubricated
0 times
Replace bearings at
5 times
2.9 STATUS
2.10
Relubricate motor bearings
Do it now!
2.10 STATUS
2.11
Replace motor bearings
Do it now!
2.11 STATUS
2.12
Temperature sensor 1
Not active
0 °C
2.12 STATUS
2.13
Temperature sensor 2
Not active
0 °C
2.13 STATUS
2.14
Flow rate
90 m³/h
2.14 STATUS
2.15
Accumulated flow
12000 m³
Energy per m³
0.22 kWh/m³
2.15 STATUS
2.16
Firmware version
9356
2.16 STATUS
2.17
Factory configuration file id
40
2.17 STATUS
3. INSTALLATION
3.1
open loop
Control mode
Const. pressure
3.1 INSTALLATION
3.2
Controller
Kp 0.50
Ti 0.50 s
3.2 INSTALLATION
3.3
Active
External setpoint
Not active
3.3 INSTALLATION
3.3A
0
10
External setpoint
Min. 0.00 V
Max. 10.0 V
3.3A INSTALLATION
3.4
NA
Signal relay 1 activated during
Alarm
3.4 INSTALLATION
3.5
NA
Signal relay 2 activated during
Warning
3.5 INSTALLATION
3.6
Active
+/-, OK, On/Off buttons
Active
3.6 INSTALLATION
3.7
Gen Bus
Protocol
GENIbus
3.7 INSTALLATION
3.8
1
Pump number
1
3.8 INSTALLATION
3.9
Digital input 2
Ext. fault
3.9 INSTALLATION
3.12
Digital flow input
100 l/pulse
3.12 INSTALLATION
3.13
Stop function
Not active
ΔH 10 %
3.13 INSTALLATION
3.15
Sensor 1
4-20mA bar
0.00 - 10.0
3.15 INSTALLATION
3.16
Sensor 2
4-20mA %
0.00 - 100
3.16 INSTALLATION
3.17
Duty/standby
Not active
3.17 INSTALLATION
3.18
25
100
Operating range
Min. 25 %
Max. 100 %
3.18 INSTALLATION
3.19
Motor bearing monitoring
Active
3.19 INSTALLATION
3.20
Motor bearings
Relubricated
3.20 INSTALLATION
3.21
Temperature sensor 1
Not active
3.21 INSTALLATION
3.22
Temperature sensor 2
Not active
3.22 INSTALLATION