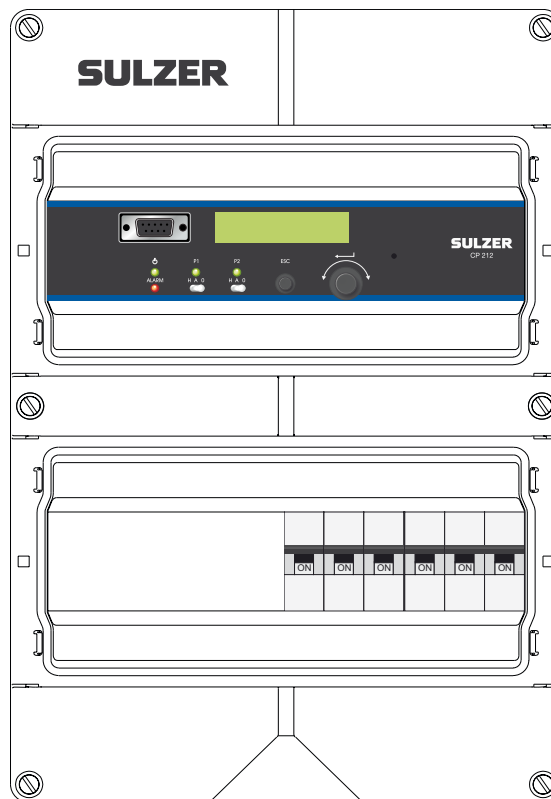

Control Panel Type ABS CP 112/212



Copyright © 2014 Sulzer. All rights reserved.

This manual, as well as the software described in it, is furnished under license and may be used or copied only in accordance with the terms of such license. The content of this manual is furnished for informational use only, is subject to change without notice, and should not be construed as a commitment by Sulzer. Sulzer assumes no responsibility or liability for any errors or inaccuracies that may appear in this book.

Except as permitted by such license, no part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, recording, or otherwise, without the prior written permission of Sulzer.

Sulzer reserves the right to alter specifications due to technical developments.

CONTENTS

About this guide, audience and concepts	4
1 Overview of functions and usage	5
2 Menus: Status and settings	7
2.1 Select language	7
2.2 Menus: status information and all settings	7
3 Technical data and EMC compatibility	11
3.1 Technical data	11
3.2 Maximum load	11
3.3 Electromagnetic compatibility	11

ABOUT THIS GUIDE, AUDIENCE AND CONCEPTS

This guide describes the pump control panels CP 112/212. The difference between the two products is that CP 112 is intended for one pump whereas CP 212 can control two pumps. CP 112 does not include any circuit breaker, whereas CP 212 includes a 3-pole circuit breaker for each pump.

Audience This guide is intended for users of control panel CP 112/212. There is a separate document *Installation Guide* that describes how to physically install the control panel (printed document in the installation package, and also a PDF on the CD).

Prerequisites This guide assumes that you already are acquainted with those pumps you are set to control and the sensors connected to CP 112/212.

The control panel can either use an analogue level-sensor, which measures the water level in the pit, for precise control over start and stop levels, or it can use simple float switches placed at start and stop levels. It is also possible to use only a start float, and let the pump(s) stop after a certain time or when the measured phase angle of the motor current indicates that the pump is running dry.

An analogue level-sensor has the advantage over float switches that it is more robust (can not get stuck or be mechanically jammed), is more accurate, and is more flexible (you can easily change the start and stop levels). Also, you can get a reading of the water level in the pit.

Float switches can be used in addition to an analogue level-sensor, as a backup, and as an additional alarm input.

It is also possible to employ an alternative stop level, usually a lower level than normal, that is effective once after a number of pump starts. This can be useful if it is desirable to “completely” empty the pit once in a while.

You need to know if the pump(s) should be exercised in case of long idle periods. If the installation has two pumps, you need to know if the pumps should alternate.

Reading guide For installation, see the separate document *Installation Guide*, which covers both CP 112/212 and CP 116/216. Before you make any settings, or use the control panel, read [Chapter 1 Overview of functions and usage](#); it describes the general functionality and the meaning and usage of the controls on the panel. Finally, make sure that all settings according to [Chapter 2 Menus: status and settings](#) are suitable for your application. The default settings are listed in the *Installation Guide*.

Glossary and conventions Text in blue indicates a hypertext link. If you read this document on a computer, you can click on the item, which will take you to the link destination.

Pump exercising: Long idle periods in a corrosive contaminated environment are not good for pumps. As a countermeasure, they can be “exercised” at regular intervals, which will reduce corrosion and other detrimental effects.

Cos φ : Cosine of the phase angle φ between the motor current and the voltage.

1 OVERVIEW OF FUNCTIONS AND USAGE

CP 112 and CP 212 are control panels for one and two pumps respectively. These units have the same functionality in terms of their capability to control pumps and manage alarms — the only difference is that CP 212 is intended for two pumps whereas CP 112 is intended for one pump.

Figure 1-1 shows the panel. The main view of the two-row display dynamically shows the pit status (the level in the pit or the status of start floats) and if there are any alarms. The unit will always revert to this view after 10 minutes of inactivity in any other view.

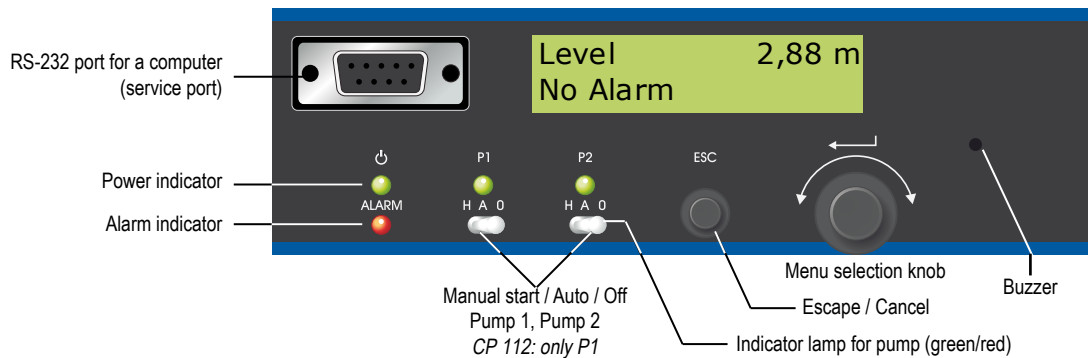


Figure 1-1 For each pump (P1 and P2), there is an indicator lamp showing whether the pump is running (green) or not (red), and below that, a switch that controls whether the pump is in Auto mode (A), is turned off (O), or you attempt to start it manually (H).

A green lamp at the very left indicates that the unit is powered (either battery or mains). The red alarm indicator will blink whenever there is an unacknowledged alarm. When the alarm is acknowledged, the light turns steady red, and remains lit until there are no active alarms.

The ESC button will cancel or reset the current menu operation, or revert to the main view. The menu selection knob has two functions: by rotating it in either direction, you scroll and select menu items; by pressing it, you enter into a menu, confirm a choice/operation, or acknowledge an alarm.

Power and alarm indicator

The two leftmost indicator lamps show:

- A green light indicates that the unit is powered.
- The red alarm indicator blinks whenever there is an unacknowledged alarm, and the display tells you the type of the alarm. When the alarm is acknowledged, the light turns steady red, and remains lit until there are no active alarms.

Pump switches

CP 212 has two switches, CP 112 has one switch, with which you can manually start or stop the pump(s). It is a 3-way switch with the following functions:

- The leftmost position (H) is a momentary state, which will attempt to start the pump, overriding the pump controller.
- The middle state (A) sets the pump in Auto, which means that the control panel is controlling the pump.
- The rightmost state (O) turns the pump off (disables it).

Pump indicator lamps

Above each switch, an indicator lamp shows:

- A green light indicates that the pump is running.
- A blinking green light indicates: attempting to start the pump.
- A red light indicates pump failure.

Escape/Cancel

The ESC button will cancel or reset the current menu operation, or revert to the main view.

- The menu selection knob** The menu selection knob has two functions:
- By rotating the knob in either direction, you do one of the following:
 - Scroll through menu items.
 - Change the value of a menu item (the value is either a number or an item in a list of alternatives; to confirm/save the change, press the knob).
 - By pressing the knob, you do one of the following:
 - Enter into a menu.
 - (You will then see a blinking cursor where a value can be changed.)
 - Confirm/save/perform a choice or an operation.
 - Acknowledge an alarm.
 - Turn the buzzer/alarm off (until a new alarm occurs).
- When the display shows that there is an unacknowledged alarm, press the knob to bring up a prompt to acknowledge the alarm, and if you press the knob once more, it acknowledges the alarm.
- When the display shows that there is an active alarm, press the knob to bring up a list of details about the alarms; rotate the knob to scroll the list. Press ESC to go back to the main view.
- To adjust the contrast** To adjust the contrast of the display, press the ESC button and rotate the knob.
- To enter values** Rotate the knob to the desired value. (A value is either a number or an item in a list of alternatives.)
- Battery backup** CP 112/212 includes a charger for a lead-acid battery backup. The battery itself is optional, and can be installed inside the cabinet. During battery operation (no 230 V power), the pump relays are always off. The power indicator will remain on, and the alarm indicator will be on. The alarm relay will function according to the setting in [Table 2-2](#) (Func Alarm Relay).

2 MENUS: STATUS AND SETTINGS

This chapter describes all settings that need to be properly set before the pump controller is used. How to use the menu selection knob to enter and save values is described in [Chapter 1 Overview of functions and usage](#). The default settings are listed in the Installation Guide.

2.1 Select language

1. Rotate the menu selection knob anticlockwise one step (or until you see the menu item Select Language).
2. Press the knob.
3. Scroll to the desired language by rotating the knob.
4. Press the knob to save the choice.

2.2 Menus: status information and all settings

The first clockwise items are only intended to show the current status. Table 2-1 shows these items. The other menu items are settings you can make. Table 2-2 shows all those items.

The menu system adapts dynamically to show only those items that currently are “usable”; for instance, if Sensor Type is set to Start/Stop float rather than Analogue, you will not see the menu items for setting start and stop levels. Likewise, the menu on CP 112 will not show items related to pump 2.

Table 2- 1. Menu items that show current status, sorted clockwise

Menu item	Value
Pit status	The main view, which shows the pit status (the level in the pit or the status of start floats) and alarm status.
Current P1	The electric current and its phase angle.
Cosine φ P1	
Current P2	
Cosine φ P2	
Run. Time P1	The accumulated running time of the pump. (This value can be edited.)
Run. Time P2	
No. Starts P1	The accumulated number of times the pump has started. (This value can be edited.)
No. Starts P2	
Back-Pressure	The current value of the back-pressure (if such a sensor is used).

Table 2- 2. Settings, sorted clockwise (Sheet 1 of 2)

Menu item	Value	Comment
Sensor Type	{Analogue, Air Pressure, Start/stop float}	Choose method of level control: an analogue level-sensor or start/stop floats.
Scaling 100% =	Value in m/ft/bar	<p><i>If Sensor Type is Analogue or Air Pressure.</i></p> <p>For Unit, select the unit you will use for scaling. (For ft, you get foot with decimals, not foot/inch.)</p>
Scaling 0% =	Value in m/ft/bar	
Unit	{m, ft, bar}	
Filter	Seconds	
High-Level Alarm	Chosen unit	
Low-Level Alarm	Chosen unit	
Start Level P1	Chosen unit	
Stop Level P1	Chosen unit	
Start Level P2	Chosen unit	
Stop Level P2	Chosen unit	
Start Criteria	{2 start floats, 1 float + time}	<i>If CP212, and Sensor Type is Start/stop float.</i>
Time to Start P2	Seconds	Unless Start Criteria is 2 start floats, the second pump will start Time to Start seconds after the (single) float is triggered.
Stop Criteria	{Stop float, Time, Delta cos φ Cos φ or Time}	<p><i>If Sensor Type is Start/stop float.</i></p> <p>If Stop Criteria is Time, a single pump will stop Time to Stop seconds after the start float releases, whereas two running pumps will stop after half that time.</p>
Stop Float NO/NC	{Normally open, Normally closed}	If Stop Criteria is Delta cos φ , the pump(s) will stop when cosine of the phase angle φ has changed Delta cos φ . See note ¹ for details.
Time to Stop	Seconds	If Stop Criteria is Cos φ or Time, both criteria described above are used, whichever is achieved first.
Delta cos φ	Value 0 –1	
Func. Back-Press.	{Off, Block Pump, Only Alarm, Alarm + Block.}	<i>If a back-pressure sensor is connected (mA input 2).</i>
Scaling 100% =	Value in m/ft/bar	
Scaling 0% =	Value in m/ft/bar	
Hi Pressure Lim	Value in m/ft/bar	
Alternation	{Off, Both stopped, Each pump stop}	Unless Off, it will switch to the other pump, either after each pump stop, or after both pumps have stopped.
Max Run. Pumps	{Max 1 pump, 2 pumps}	If 2 pumps would consume more power than available fuse, set it to run maximum 1 pump.
Pmp 2 Connected?	{Yes, No}	CP 212: If set to No, menu will be simplified.
Start Delay	Seconds	To suppress spikes and noise, triggered thresholds from sensors can be required to persist for a certain time before a state change is accepted.
Stop Delay	Seconds	
Alternative Stop Level	{On, Off}	<i>If alternative stop level is employed.</i>
Starts to Alt.	Integer	<p>The Alternative Stop Level, usually a lower level than normal, is effective once every Starts to Alt. number of pump starts.</p> <p>By setting an Alt Stop Delay, the actual level at which the pump stops will be even lower. (Any low-level alarm or low-level float is blocked, but a dry-run detect will still block the pump.)</p>
Alt. Stop Level	Chosen unit	
Alt. Stop Delay	Seconds	

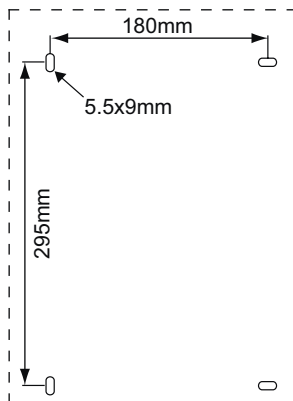
Table 2- 2. Settings, sorted clockwise (Sheet 2 of 2)

	Menu item	Value	Comment
P1	Nominal Curr. P1	Amperes	CP 112 /212 has a current transformer for each pump. Note: It is important to set Nominal Curr. to the reading you get in normal conditions! If left at zero, it disables all pump blockings and alarms related to current or phase loss. The setting in Dry Run Detect, determines if the Low Current or Delta cos ϕ is shown. Set a value that indicates that the pump is running dry.
	Dry Run Det. P1	{Off, Low current, Delta cos ϕ }	
	Low Current P1	Amperes	
	Delta cos ϕ P1	Value 0 –1	
P2	Nominal Curr. P2	Amperes	If Low Current is selected, the pump will be blocked when the current is < Low Current. If Delta cos ϕ is selected, the pump will be blocked when cos ϕ changes more than Delta cos ϕ .
	Dry Run Det. P2	{Off, Low current, Delta cos ϕ }	
	Low Current P2	Amperes	
	Delta cos ϕ P2	Value 0 –1	
	Dry Run Reset	Minutes	If Dry Run Reset is > 0, the dry-run alarm will be reset (and the pump deblocked) after that time.
	Curr Alarm-Delay	Seconds	
	P1 Backup Start	{On, Off}	If set to On, and the high-level float turns on, the pump(s) will run for a period of Backup Run Time after the float has turned off.
	P2 Backup Start	{On, Off}	
	Backup Run Time	Seconds	
	Exercise P1	{On, Off}	Can "exercise" the pumps if they have been standing still for Max Still Time. If the current level is below the stop level/stop float, the pump(s) will run for Exercise Time, otherwise, the pump(s) will run until stop level/stop float is reached.
	Exercise P2	{On, Off}	
	Exercise Time	Seconds	
	Max Still Time	Hours	
	Leakage Mon. P1	{Off, Normal, Block pump}	Leakage monitor. With Normal, an alarm will be issued when the leakage monitor conducts, but the pump will not be blocked.
	Leakage Mon. P2	{Off, Normal, Block pump}	
	Temp. Monitor P1	{Off, Man reset, Auto reset}	Temperature monitor, usually a PTC element. When the temperature exceeds the element's threshold, the pump will be blocked. With Auto reset, the alarm (and blocked state) will be reset when the temperature goes down again. With Man reset, it must be manually reset.
	Temp. Monitor P2	{Off, Man reset, Auto reset}	
	Panel Buzzer	{On, Off}	If On, a buzzer will sound according to Alert On-Time and Alert Pause Time, described below under Func Alarm Relay set to Alarm alert.
	Backlight Time	Minutes	A value of zero means that the backlight will always be on.
	Func Alarm Relay	{Alarm alert, High level, Active alarm}	If set to Alarm alert, the relay will switch as follows: It switches to active alarm if one or more alarms occur, and remains active for Alert On-Time, turns off for Alert Pause Time and then repeats. It turns off (inactive) if you press the menu selection knob or the alarm disappears. If Alert On-Time is zero, there is no pause. If set to High level, it will be active as long as the level is too high (either high-level float or analogue sensor). If set to Active alarm, it will be active as long as there is an active alarm.
	Alert On-Time	Minutes	
	Alert Pause Time	Minutes	
	Password	{On, Off}	If the setting is changed, you must enter the current password. The default password is 2.
	Change Password	Integer	If you have forgotten the password, contact the distributor to unlock the controller.
	Station Id	Integer	
	CP 112 /212 Ver	Version	
	Select Language	Select a language	

i. Cos ϕ is measured about 5 seconds after the pump has started. If either Stop Criteria or Dry Run Detect is set to Delta cos ϕ , then the measured value, subtracted by the chosen Delta cos ϕ , is the threshold that will stop the pump. If both functions are active, please set Delta cos ϕ for the Stop Criteria lower than Delta cos ϕ for the Dry Run Detect — the pump will then stop without Dry Run Detect issuing an alarm.

3 TECHNICAL DATA AND EMC COMPATIBILITY

3.1 Technical data



Ambient operating temperature:	-20 to +50 °C
Ambient storage temperature:	-30 to +80 °C
Cabinet and mounting:	DIN rail, IP65. Mounting holes: see figure
Dimensions:	H x W x D: 370 x 250 x 123 mm
Weight:	< 5 kg, CP 212 with battery
Humidity:	0–95 % RH non-condensing
Power supply:	230/400 V AC, maximum 16 A fused
Power consumption:	< 16 VA
Contactors, max load:	ABB B7-30-10, 5.5 kW, 12 A, coil 24 V AC
Fuses (only CP 212):	3 x 10 A 3-pole type D circuit breakers
Fuse for external air pump:	500 mA slow blow
Max load on alarm relays:	250 V AC, 4 A, 100 VA resistive load
Max current from 12 V DC out:	50 mA
Input voltage at Digital In and Block Pump:	5–24 V DC
Resistance at Digital In and Block Pump:	5 kohm
Analogue sensor:	4–20 mA
Analogue input resistance:	110 ohm
Temperature sensor:	PTC, limit: 3 kohm
Leakage sensor:	Limit: 50 kohm
Maximum length of I/O cables:	30 meters
Charge for lead-acid battery:	Max 80 mA, 13.7 V DC

3.2 Maximum load

CP 112 Since it does not have fuses, it is only limited by the contactor. Maximum load is 5.5 kW, 12 A at 400 V AC.

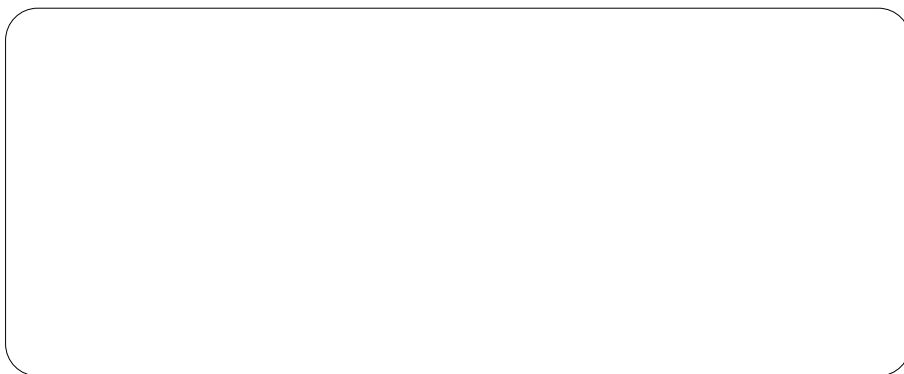
CP 212 This version has two fuses. Maximum load is 3.5 kW, 7.5 A at 400 V AC if both pumps can run simultaneously. If set so that only one pump may run (menu item Max Run. Pumps set to 1), a higher load is permitted: maximum load is limited by the fuses, which means about 4.3 kW, 9.5 A.

3.3 Electromagnetic compatibility

Description	Standard	Class	Level	Remarks	Criteria ⁱ
Electrostatic discharge immunity (ESD)	EN 61000-4-2	4	15 kV	Air discharge	B
		4	8 kV	Contact discharge	B
Fast transient/burst immunity	EN 61000-4-4	4	4 kV		A
Surge immunity 1.2 / 50 µs. See note ⁱⁱ	EN 61000-4-5	4	4 kV CMV		A
		4	2 kV NMV		A
Immunity to conducted disturbances, induced by RF fields	EN 61000-4-6	3	10 V	150 kHz – 80 MHz	A
Immunity to radiated RF fields	EN 61000-4-3	3	10 V/m	80 MHz – 1 GHz	A
Immunity to short interruptions and voltage variations	EN 61000-4-11				A

i. Performance criteria A = Normal performance within the specification limits.
Performance criteria B = Temporary degradation or loss of function or performance that is self-recoverable.

ii. Maximum length of I/O cables is 30 meters.



SULZER

Sulzer Pump Solutions Ireland Ltd, Clonard Road, Wexford, Ireland
Tel +353 53 91 63 200, Fax +353 53 91 42 335, www.sulzer.com