

Difgen CC

Continuous control of pressure or flow during grid disconnection

The Difgen CC (continuous control, previously called the Difgen Stable) is an optional addition to the system. It ensures uninterrupted flow or pressure control in circumstances where the power cannot be delivered to the grid – such as grid failure.

When a grid problem is detected, the load will be transferred to the Difgen CC, providing uninterrupted and continuous control of pressure or flow either with an unstable grid or during a longer grid outage. Once the grid connection has been restored, electricity generation will be redirected back to the grid without interrupting the control functionality of the Difgen.

The Difgen CC is available in various configurations to provide sufficient time to verify grid problems and potentially to shut off or re-route the water. If required, it can also be configured for a lengthy duration.

Components

The Difgen CC comes with one or more direct current controllers (DCCs) and one or more load banks (R banks) installed in a protective cage.

- The Difgen CC monitors the voltage level of the Difgen control and power module (CPM) DC bus, and opens the connection to the load bank when voltage exceeds the specified limits.
- The load banks are air-cooled resistive elements with forced cooling.
- The load banks are delivered with a cage, preventing exposure of hot surfaces when the load banks are in operation.

Basics

Standard scope

Delivery comprises:

- DCC in cabinets (incorporated in CPM cabinet for +CC01/+CC02/+CC05, separate cabinet for +CC03/+CC04))
- R Banks with air fan and VFD (+CC05 is without air fan and VFD)
- Ventilated R bank cage to protect personnel from hot surfaces
- Overtemperature sensors
- VFD and fans for generator forced cooling power supply

Options

- Together with a grid protection unit (GPU), additional parameters can be used to control Difgen CC takeover. These include rate of change of frequency (ROCOF)
- Water-cooled inductive/resistive load banks (contact Zeropex for further details)

Installation guidelines

- +CC01/+CC02/+CC05: The Difgen CC DCC is installed inside the Difgen CPM cabinet.
- +CC03/+CC04: The second Difgen CC DCC is installed in separate cabinet, connected to the CPM by a DC cable with a minimum rating of 1 kV. Max cable length 3 meter.
- The R banks are connected to the DCC by similar cables. Max cable length 10 meter.
- R banks can become hot, and must be protected and marked in accordance with relevant HSE requirements
- The air-cooled resistor load bank will heat the air around/above it. Consideration must be given to ensuring that the room temperature does not exceed appropriate limits, and precautions taken if necessary
- The fans are dimensioned for high air volumes. The room where the load bank is installed must permit sufficient air exchange when the Difgen CC is in operation (700 l/s for +CC03, 1400 l/s for +CC04). If mechanical ventilation is used, emergency power must be utilised to run the fans.

Read more

An in-depth white paper – TDO11806, Methods for controlling Difgen during loss of mains – is available from Zeropex on request.

Configurations

Choosing a CC model is governed by the combined load capacity and duration required. The shorter the duration, the smaller the model that can be chosen.

Durations in excess of 600 seconds can handle the load for a lengthy period. For applications where more than 600 seconds of duration are required, select the model that matches 600 seconds.

Applications

A typical scenario, particularly for short-duration requirements, is that the PLC/SCADA shuts down/reroutes the flow when the Difgen reports loss of mains. The duration for the load can be determined on the basis of the minimum allowable closing time for the valves.

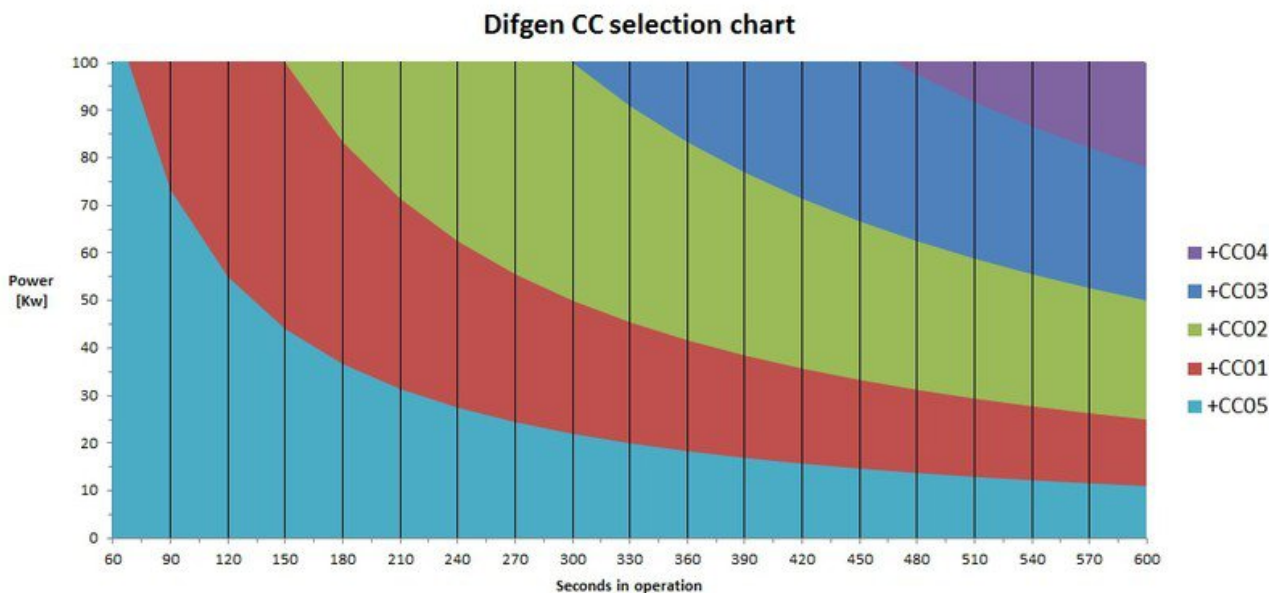
The Difgen is equipped with discrete hardwired alarms or field bus communication (optional) for interfacing with PLC/SCADA. See Difgen documentation.

Selection

Based on load capacity and duration, select the Difgen CC model from the charts/tables below. The table shows the maximum load for any combination of duration and Difgen CC model:

Model	Duration in seconds																		
	60	90	120	150	180	210	240	270	300	330	360	390	420	450	480	510	540	570	600
+CC01	-	-	110	100	83	71	63	56	50	45	42	38	36	33	31	29	28	26	25
+CC02	-	-	-	-	-	-	-	110	100	91	83	77	71	67	63	59	56	53	50
+CC03	-	-	-	-	-	-	-	-	-	-	-	110	104	98	92	87	82	78	
+CC04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	110	105	100	
+CC05	110	73	55	44	37	31	28	24	22	20	18	17	16	15	14	13	12	12	11

The same table, presented in chart form:



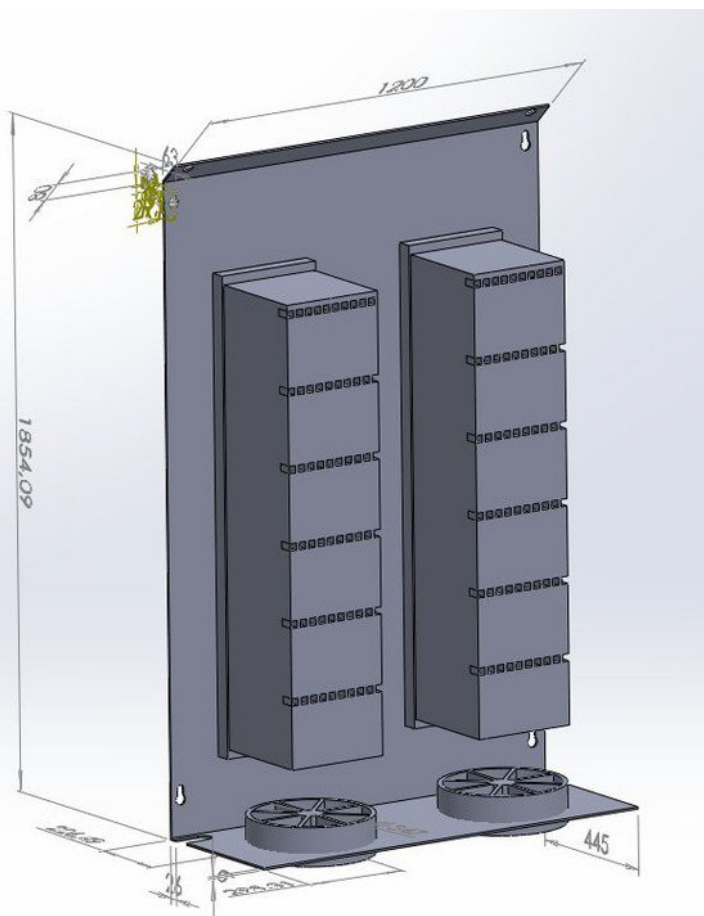
Example: To handle 25kW for an unknown duration, select 600 seconds. The option will then be the +CC01.

Example: To handle 25kW for 240 seconds, go to the 240 column and locate the smallest model able to deal with at least 25kW over the period. In this case, the +CC05 can handle up to 28kW for 240 seconds, and is therefore sufficient.

Dimensions

Type	DCC	R-bank	DCC cabinet size (note 1)	R Bank size including cage (each)
	No of units	No of units	WxDxH	WxDxH
+CC01	1	1	N/A	600 x 445 x 1 860mm
+CC02	1	2	N/A	1 200 x 445 x 1 860mm
+CC03	2	3	600 x 400 x 800mm	1 800 x 445 x 1 860mm
+CC04	2	4	600 x 400 x 800mm	2 400 x 445 x 1 860mm
+CC05	1	1	N/A	600 x 445 x 1 860mm

Note 1: The first DCC is installed in the Difgen CPM cabinet, and does not need an additional cabinet. The +CC03/+CC04 cabinets contains the second DCC and are intended for wall mounting



Note: +CC05 does not have a fan for forced cooling of the R-bank.

This datasheet is for European models. Please refer to specific datasheet for US models.



Braywick House West
Windsor Road, Maidenhead
SL6 1DN Berkshire
+44 7831 523 518

www.zeropex.com

Contact

NORWAY: Roar Carlsen, phone +47 977 81 720, mail: rc@zeropex.com

GREAT BRITAIN: Duncan Collins, phone: +44 7831 523518, mail: dc@zeropex.com