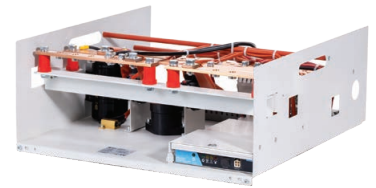# FIRST

nsm

Fully Integrated Ready-to-use System for Telecom

PMG-DCs

Permanent Magnet Generator
+ DCs System*
+ Actuator kit

PMG-DCh

Permanent Magnet Generator
+ DCh System*
+ Actuator kit

PMG-DCs/DCh includes:

Permanent Magnet Generator: variable speed, with built-in rectifier bridges directly granting a DC output, bearingless and brushless.

DCs/DCh System: controller + current sensors + contactor.

Actuator kit: to regulate the engine revolutions.

The systems work at **variable speed** with the aim of consistently adjusting the engine speed according to the power demand of load and battery. The output voltage is directly connected to the engine speed.

Each PMG-DCs/DCh is developed according to the specific engine model, gen-set control unit and battery pack, as it works as a battery charger thanks to the controller's smart battery management.

The settings are adjustable through a programmer, a USB pen drive or via serial connection (from the gen-set control unit).

The PMG-DCs is **Hybrid compatible** as it can host one or multiple 3,5kW DC/DC sun converter modules to work in parallel with the renewable energy source.

Redundancy and **load sharing** between two complete gen-sets operating in parallel.

Digital inputs/ouputs available for interfacing with other gen-set devices such as air conditioners, thermostats, water refill systems and so on (available on request).

*DCs system consists of a metal structure on which all the components are assembled and tested, whereas DCh is supplied as a kit of loose components (previously tested), to be assembled by the customer.

Technical characteristics

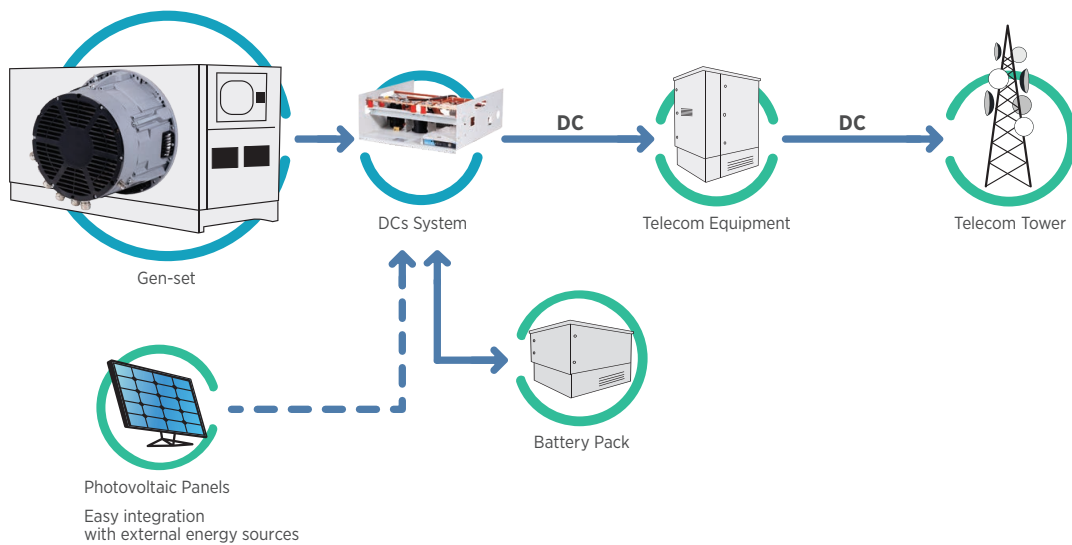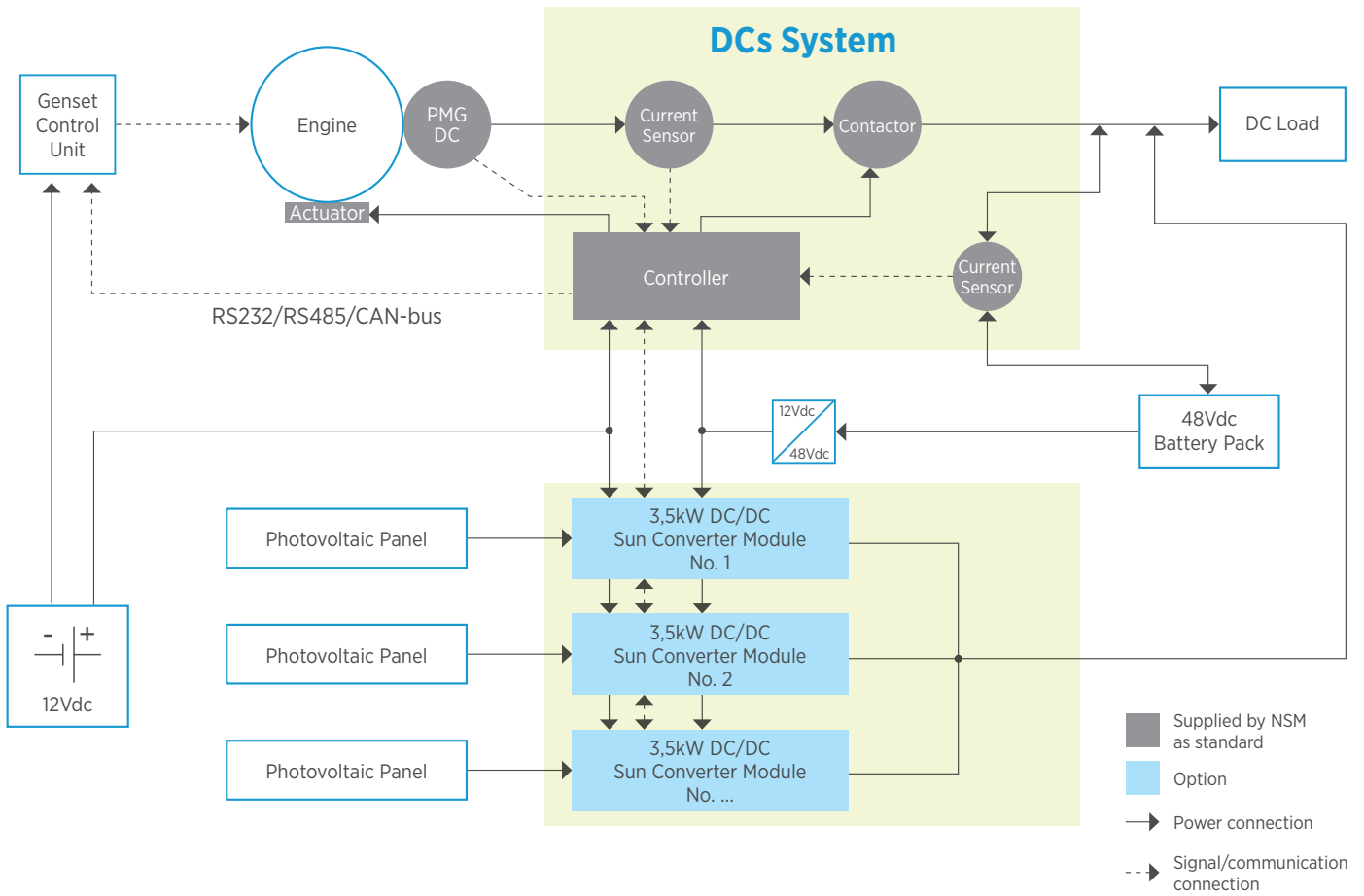|	
Nominal voltage 48Vdc	
Output voltage 56Vdc	
Protection	IP 21 (PMG) IP 00 (DCs - DCh System)
Voltage accuracy ± 100 mV	
Battery charger current accuracy ± 1 %	
Communication ports RS232 / RS485 / CAN-bus	
Operating temperature -10°C / +60°C (derating above 50°C)	

Safety features:
- Output short circuit protection
- Output reverse voltage protection (battery) on request
- Under and over-voltage protection
- Under and over-speed protection
- Over-temperature protection
- Overload protection

56Vdc

Model	Max Power	Max Current	Max Power	Max Current	Max Power	Max Current	Max Power	Max Current	Weight			
									PMG cone	PMG SAE	DCs System	Actuator
	[kW]	[A]	[kW]	[A]	[kW]	[A]	[kW]	[A]	[kg]	[kg]	[kg]	[kg]
	1500rpm		2000rpm		2400rpm		3000rpm					
PMG-DCs/DCh 150SC	3,0	54	4,0	71	4,8	86	6,0	107	11,5	---	9	1,6
PMG-DCs/DCh 185SC	4,5	80	6,0	107	7,5	134	9,0	160	17	16	9	1,6
PMG-DCs/DCh 185SF	7,5	134	8,4	150	9,0	160	9,0	160	21	20	9	1,6
PMG-DCs/DCh 185PF	7,5	134	11,0	196	13,8	246	16,8	300	---	22	9	1,6
PMG-DCs/DCh 295RB	13,0	232	16,0	286	18,5	330	22,0	393	---	41,5	9	1,6
PMG-DCs/DCh 295RF	19,0	339	24,0	429	28,0	500	33,6	600	---	49,5	9	1,6
PMG-DCs/DCh 295PH	28,0	500	30,8	550	32,5	580	33,6	600	---	63,5	9	1,6

Fully Integrated Ready-to-use System for Telecom

Block Diagrams

DCs System

| Genset Control Unit | | Engine | PMG DC | | Current Sensor | | Contactor | | DC Load |

Actuator

Controller

RS232/RS485/CAN-bus

Current Sensor

12Vdc / 48Vdc

48Vdc Battery Pack

Photovoltaic Panel → 3,5kW DC/DC Sun Converter Module No. 1

Photovoltaic Panel → 3,5kW DC/DC Sun Converter Module No. 2

Photovoltaic Panel → 3,5kW DC/DC Sun Converter Module No. ...

12Vdc

- Supplied by NSM as standard
- Option
- → Power connection
- ---> Signal/communication connection

Gen-set → DCs System → **DC** → Telecom Equipment → **DC** → Telecom Tower

Photovoltaic Panels
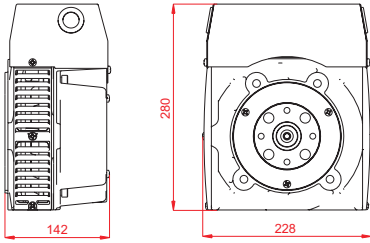Easy integration with external energy sources

Battery Pack

nsm

Fully Integrated Ready-to-use System for Telecom
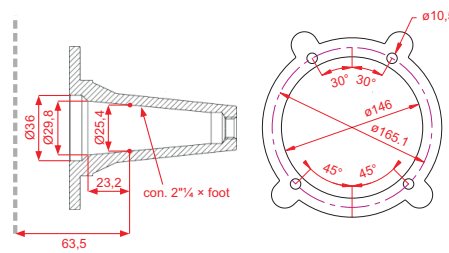
Overall Dimensions

CONE

PMG 150

J609a
C 19

con. 2"¼ × foot
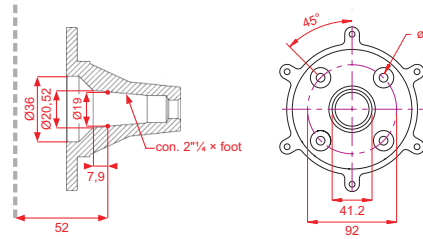
PMG 185

J609b
C 25,4
C 35

con. 2"¼ × foot
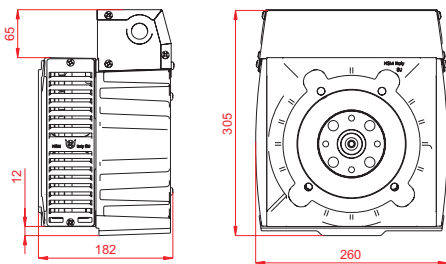
Cone	J609a	J609b
PMG 150	x	x
PMG 185		x

SAE

PMG 185
185S-   185P-

140 (SAE 4)
150 (SAE 5)

207

PMG 295
295P- 295R-

270 / 281
295R / 295P
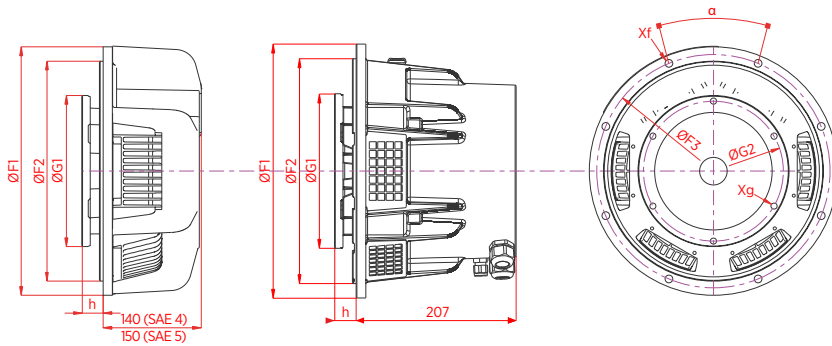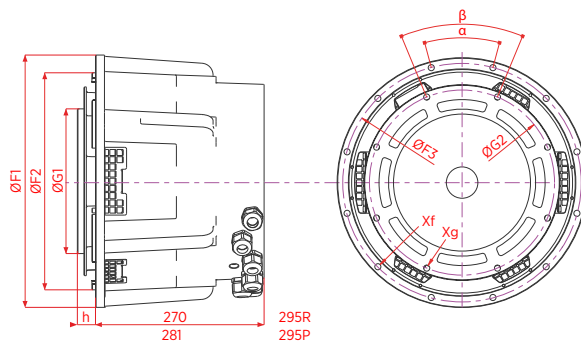
	Flange				
SAE	ØF1	ØF2	ØF3	Xf	α
	[mm]				
PMG 185S- 5	363	314,33	333,40	Ø11 (8)	45°
PMG 185S- 4	403	361,95	381	Ø11 (12)	30°
PMG 185P- 5	355	314,33	333,40	Ø11 (8)	45°
PMG 185P- 4	403	361,95	381	Ø11 (12)	30°
PMG 295R- 4	425	361,95	381	Ø11 (8)	30°
PMG 295P- 4	425	361,95	381	Ø11 (12)	30°
PMG 295P- 3	450	409,58	428,63	Ø11 (12)	30°

	Joint				
SAE	ØG1	ØG2	h	Xg	β
	[mm]				
6,5	215,90	200,02	30,2	Ø9 (6)	60°
7,5	241,30	222,25	30,2	Ø9 (8)	45°
11,5	352,42	333,37	39,6	Ø11 (8)	45°

	SAE	6,5	7,5	11,5
PMG 185	5	X	X	
PMG 185	4	X	X	
PMG 295	4	X	X	
PMG 295	3			X

PMG 185 SAE 3 and PMG 295 SAE 5 available on request

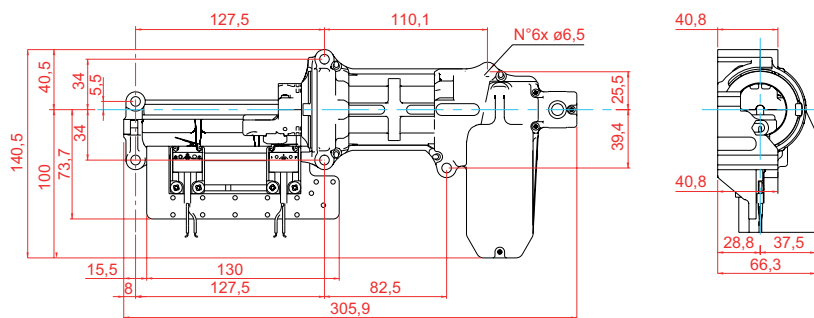## Fully Integrated Ready-to-use System for Telecom

Overall Dimensions

DCs System

435
440
182
Controller

435
440
182
112,5
112,5 x n
Controller
203

3,5kW DC/DC Sun Converter Modules (Optional)
(different modules arrangements on request)
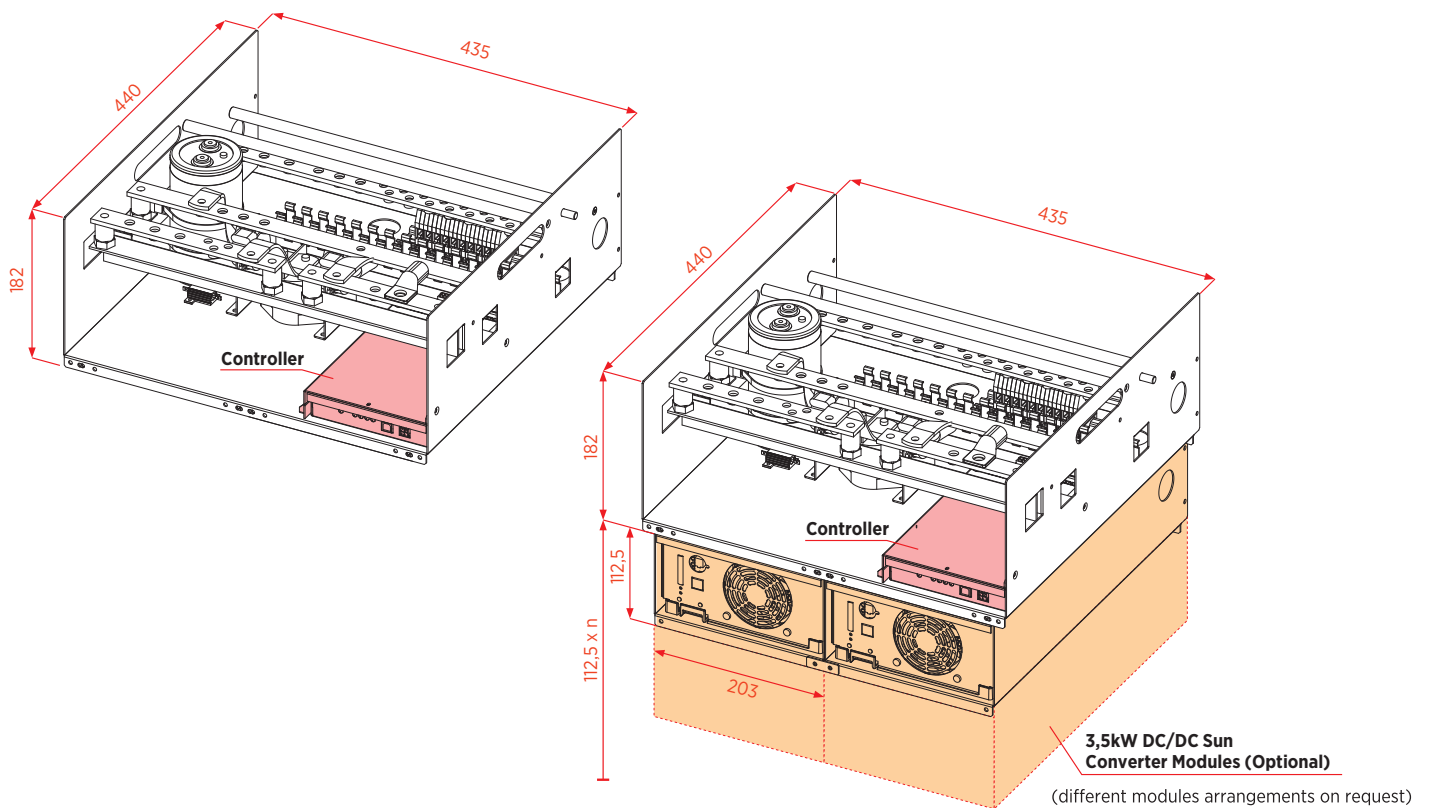
DCh System:

- logic board
- 2 current sensors + cables (max length 1m)
- contactor (optional)

Linear Actuator

127,5   110,1   N°6x ø6,5
40,5   34   5,5   25,5
140,5   100   34   73,7   39,4
15,5   130   82,5
8   127,5
305,9

40,8
40,8
28,8   37,5
66,3

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CE

amer group

PMG–DCs - PMG–DCh – 4 | 06-2019