GPW
Series

PRODUCT GUIDE

Rev 1.0

INDEX

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GPW is the new diesel generator series designed for all mobile applications/distribution channels: Constructions, Sports and recreation, Events, industries, rental companies and all application where is required a robust genset that can be easily move and transport.

PRAMAC, after a long experience on selling traditional diesel generator for mobile and rental applications has developed this new generation of **mobile diesel genset** based on

GLOCAL AND SCALABLE CONCEPTS

GPW is a product able to satisfy mobile and rental market positioning where quality, reliability and durability together with scalability are essential to define the **best value for price avoiding over specs proposal**.
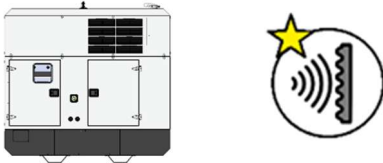
This solution will allow create a competitive product proposal and in the meantime reduce the demand for customized solutions.

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1   KEY FEATURES GPW SERIES

GPW is the new diesel generator series designed for mobile applications. After a long experience of PRAMAC in selling genset for mobile applications and a deep market analysis and trend, has been defined three main product key features:

1.1 GPW KEY FEATURES - CREATE GENSET WITH FEATURES MORE SUITABLE FOR MOBILE APPLICATION

ROBUST STRUCTURE	Improved robust structure, suitable for frequent handling.
ROBUST LIFTING BRIDGE, WITH A SINGLE ROOF LIFTING POINT.	GPW can be handling by: - crane through roof lifting point - Forklift (behind base frame and with GSB) - Pallet truck (*small canopy sizes only with feet*)
GALVANIZED SKID BASE AVAILABLE AS OPTION, ALLOWS TO MOVE AND DRAG THE GENSET IN ANY CONDITION AND PROTECT THE GENSET BASEMENT FROM UNEVEN GROUND	
METAL AIR INLET GRID, ALLOWS TO: - **REDUCE NOISE EMISSIONS LEVELS** - **REDUCE WATER INGRESS INSIDE THE ENCLOSURE IN CASE OF HEAVY RAIN** - **INCREASE ENCLOSURE IP PROTECTION**	
EXTRA SILENT ENCLOSURE AVAILABLE AS OPTION. THIS SPECIAL ENCLOSURE IS PARTICULARLY SUITABLE IN CASE OF INSTALLATION NEAR CITY CENTER OR WHERE A LOW NOISE LEVEL IS REQUIRED.	
SEVERAL FUEL TANK WITH DIFFERENT CAPACITIES, MADE OF PLASTIC AND METAL.	✓ **PFT Plastic fuel tank** 8/12h aut. ✓ **MFT-XS** Metal Fuel tank Small size** 6/8 aut. ✓ **MFT-S Metal Fuel tank Small size** 8/12h aut. ✓ **MFT-M Metal Fuel tank Medium size** 20/24h aut.
SOCKETS PANEL	✓ **Sockets panel separated by control/power panels allows to have high flexibility on sockets kit scope of supply** ✓ **Several sockets kit available**
NEW CONTROL PANEL CONCEPT DESIGN, WITH TWO SEPARATE METAL CABINETS, ONE FOR CONTROL SECTION AND ONE FOR POWER SECTION.	**THIS NEW PRODUCT CONCEPT DESIGN HAS SEVERAL ADVANTAGES:** ✓ More flexibility on scope of supply of the panel ✓ Designed to fit all the circuit breakers sizes required by all Voltages around the world ✓ Complete segregation between control and power panels, allows higher level of safety for the operator ✓ Improved quality of the panels ✓ High level of protection from adverse weather conditions, dust and sand ingress, thanks to its position inside the enclosure protected by canopy door.

1.2 GPW KEY FEATURES - INCREASE THE FLEXIBILITY AND THE VARIETY OF EQUIPMENT AVAILABLE IN ORDER TO REDUCE PECS

SEVERAL NEW OPTIONS HAS BEEN INTRODUCED*. In the past available only as special product. **Compared with actual GSW equipped with option suitable for mobile application.*	Introduced new option** as: ✓ **EXS – Extra-silent Enclosure** ✓ **ERDF – Bus bar arrangement to allow have different neutral scheme connections, Genset start with GCB open and three led for voltage presence and phase rotation.** ✓ **PWL – Power Lock** ✓ **BRB – Base frame Rubber Bumper** ✓ **WANF – No AMF function on AC04** ✓ **EAG – Engine analogic gauges** ✓ **EFP – Electric Fuel Pump** ✓ **QFC – Quick Fuel Connectors** ✓ **GDH – Genset Document Holder** ✓ **SBT – Switch Breaker Trip** ✓ **AHM – Analogic Hour Meter** ✓ **FAG – Fuel Analogic Gauge** ✓ **…**

SCALABILITY OF CONTROL, POWER AND SOCKETS PANELS.
 	
A SCALABLE PRODUCT THAT OFFER BEST VALUE FOR PRICE AVOIDING OVERSPECS PROPOSAL
	✓ **More flexibility on choosing scope of supply of Control and Power panels**
	✓ **More space to fit:**
	  - **all optional suitable for mobile application**
	  - **all circuit breakers sizes required by all Voltages of most country around the world**
	✓ **Sockets panel separated from control/power panels allow to have complete flexibility on scope of supply of sockets kit**

**option availability may vary according to size

1.3 GPW KEY FEATURES - GLOCAL product

A PRODUCT SOLD ON AN INTERNATIONAL SCALE WHICH MEETS THE LOCAL CUSTOMER NEEDS	

2   GPW SIZES

GPW series cover a power range from 10KVA up to 820KVA circa, 50/60Hz.

GPW is composed by 8 canopy size:
- **A10**
- **A18**
- **B10**
- **B20**
- **B25**
- **C10**
- **C20**
- **C30**

GPW genset are available with the following Alternator brands for all power range: Mecc Alte.

Mecc Alte alternator ECP3-ECO40 standard configuration/equipment:
- 4 poles
- Insulation class H
- 12 wiring
- MAUX
- DSR (ECP3 to ECO38), DER1 (ECO40)
- Frame made of FEP12 steel, C45 steel for the shaft and cast iron for the end-brackets
- IP23
- Winding Protection: STANDARD type for ECP3, STANDARD+ type for ECP28 and ECP32, GREY type for ECP34 to ECO40.

For more info regarding Alternator features, see Glossary.

GPW genset are available with the following Engine brands:

	Perkins	**Scania**	**Volvo**	**Yanmar**
A10	■			■
A18	■			■
B10	■			
B20	■			
B25	■		■	
C10	■		■	
C20	■	■	■	
C30	■	■	■	

GPW genset are available with the following Voltages:

	50Hz	**60Hz**
Single Phase*	230V Single phase 50Hz	220V Single Phase 60Hz
		240V Single Phase 60Hz
Three Phases	400V Three phases 50Hz	480V Three phases 60Hz
		440V Three phases 60Hz
		380V Three phases 60Hz
		240/120V Three phases 60Hz
	230V Three phases 50Hz	240/138V Three phases 60Hz
		220V Three phases 60Hz
		208V Three phases 60Hz

Available up to A18 size

3 POWER DEFINITIONS AND NORMATIVE

3.1 GENSET POWER DEFINITIONS

In order to align our market proposal to our main competitors, GPW series will be declared with the following Power definitions according to ISO 8528:

ESP - Emergency Standby Power:
It is the maximum power available during a variable electrical power sequence, under the stated operating conditions, for which a generating set is capable of delivering in the event of a utility power outage or under test conditions for up to 200 h of operation per year with the maintenance intervals and procedures being carried out as prescribed by the manufacturers. The permissible average power output over 24 h of operation shall not exceed 70 % of the ESP.

Alternator Power ref.: Temperature Rise 163°C, Ambient Temperature 27°C

PRP - Prime Power:
It is defined as being the maximum power which a generating set is capable of delivering continuously whilst supplying a variable electrical load when operated for an unlimited number of hours per year under the agreed operating conditions with the maintenance intervals and procedures being carried out as prescribed by the manufacturer. The permissible average power output over 24 h of operation shall not exceed 70 % of the prime power.

Alternator Power ref.: Temperature Rise 125°C, Ambient Temperature 40°C, Class H temperature Rise.

3.2 GENSET NORMATIVES COMPLIANCE

GPW genset are compliant with EC mark which includes the following directives:
- 2006/42/CE Machinery safety.
- 2014/30/UE Electromagnetic compatibility.
- 2014/35/UE electrical equipment designed for use within certain voltage limits
- 2000/14/EC Sound Power level. Noise emissions outdoor equipment. (amended by 2005/88/EC) – where applicable
- 97/68/EC Emissions of gaseous and particulate pollutants. (amended by 2002/88/EC & 2004/26/EC) – where applicable
- EN 12100, EN 13857, EN 60204

GPW genset are also design according to ISO 8528.

4 PRODUCT NAMING GUIDE

GPW genset commercial name follow this new rules:

$$\text{GPW} \underset{1}{\boxed{80}} \; \underset{2}{\boxed{P}} \; / \; \underset{3}{\boxed{F}} \; \underset{4}{\boxed{NE}}$$

1   This number identify the PRP genset power in KVA

2   This letter identify the Engine brand mounted in the genset:
- P – Perkins
- S – Scania
- V – Volvo
- Y – Yanmar

3   This letter identify the Frequency of the genset:
- F – 50Hz
- S – 60Hz

4   This letter identify the Pollution Emission level:
- NE – Non Emission Certified
- S2 – EU Stage 2
- S3A – EU Stage 3A
- SV – EU Stage V
- T3 – EPA Tier 3
- T4 – EPA Tier 4
- T4i – EPA Tier 4 interim

5 MODULAR SCALABLE CONCEPT AND OPTIONS

The GPW key product feature is the **MODULAR SCALABLE STRUCTURE.**

On GPW, the standard machine is a **BASIC MACHINE without specific MOBILE equipment**.
This allow to don't offer an over specs basic machine, keeping price for value.

Each customer can create their standard machine matching parts from each BLOCK:

HANDLING BLOCK		EXHAUST SYSTEM BLOCK
CONTROL SECTION BLOCK		ENCLOSURE BLOCK
POWER SECTION BLOCK		OTHER EQUIPMENTS BLOCKS
BASEFRAME BLOCK		FUEL TANK BLOCK

In the table below are listed the optional available for each BLOCK.

Options*	
ENGINE OPTIONS	
PHS	Pre-Heating System
ASV	Air Shut-Off Valve
EEG	Electronic Engine Governor
HDF	Heavy-Duty Air Filter
WSP	Water Separator Filter
WSP2	Water Separator filter 2
CDP	Coolant draining pipe
ALTERNATOR OPTIONS	
WTP	Winding Total Protection
ACH	Anti-Condensation Heater
PMG	Permanent Magnet Generator on alternator
BASEFRAME OPTIONS	
LPT	Leak Proof Tray
FUEL TANK OPTIONS	
PFT	Plastic Fuel Tank
MFT-S	Metal Fuel Tank-Small
MFT-M	Metal Fuel Tank-Medium
TWF	Three Way Fuel valve
EFP	Electric Fuel Pump
QFC	Quick Fuel Connectors
ENCLOSURE OPTIONS	
EXS	Extra Silent Enclosure
DCC2	Canopy Colour RAL3000
DCCX	Different Canopy Colour RAL to be define
BRB	Baseframe Rubber Bumper
GDH	Genset Document Holder
PSM	Premium Soundproof Material
LIFTING/HANDLING OPTIONS	
GSB	Galvanized skid base with fork lift pockets
EXHAUST SYSTEM OPTIONS	
ESA	Exhaust Spark Arrestor
HPP	Hot Parts Protection
BATTERY OPTIONS	
MBS	Manual battery Switch
BAT	Genset Starting Battery
TRAILER OPTIONS	
STR	Site Trailer with connection ball hitch type
RTR	Road Trailer with connection ball hitch type
TEX	Towing Eye for STR/RTR
CONTROL PANEL OPTIONS	
MRS+GCB2	Manual Remote Start Panel + Genset Circuit Breaker 4P Automatic
ACP+GCB2	Automatic Control Panel + Genset Circuit Breaker 4P Automatic
MPP+GMB2	Modular Parallel Panel + Genset Circuit Breaker 4P Motorized
ASP+4P	Automatic Simple Panel + 4P Automatic CB
MSP+4P	Manual Simple Panel + 4P Automatic CB
RGW1	CM-GPRS + Antenna
RGW3	CM-Ethernet
RGW4	CM-4G-GPS + Antenna
RGW5	CM-RS232-485
ARM1	EM-BIO8-EFCP
ARM2	IGS-PTM
ARM3	IR-B8 24V
ARM4	IR-B8 12V
ARM5	IGL-RA15
ARM	EM-BIO8-EFCP + Toroid for Earth fault protection from AMF25
WAMF	No AMF function on AC03 (only with ACP)
EAG	Engine analogic gauges (water temp / oil pressure)
AHM	Analogic Hour Meter
FAG	Fuel Analogic Gauge
VMT	Voltmeter with selector switch (L1-L2-L3)
AMT	Ammeters (N°3, one each phase)
RSS	Remote Start and Stop
POWER PANEL OPTIONS	
ETB	External Terminal Board
ETB-G	External Terminal Board for German market
DFS	Dual Frequency Switch (50/60Hz) (Only with ACP and MPP)
IMD	Insulation Monitoring Device
ADI	Adjustable Differential Protection
ERDF	Bus Bar Arrangement
SBT	Switch Breaker Trip
TNC	Genset suitable for TN-C system
IT1	Genset suitable for IT system without Neutral
IT2	Genset suitable for IT system with Neutral

Options*	
SOCKET PANEL & POWERLOCK OPTIONS	
SPB1	Socket Panel Box 1
SPB2	Socket Panel Box 2
SPB3	Socket Panel Box 3
SPB4	Socket Panel Box 4
SPB5	Socket Panel Box 5
SPB6	Socket Panel Box 6
SPB8	Socket Panel Box 8
SPB9	Socket Panel Box 9
SPB10	Socket Panel Box 10
SPB12	Socket Panel Box 12
SPB13	Socket Panel Box 13
SPB16	Socket Panel Box 16
SPB17	Socket Panel Box 17
SPB18	Socket Panel Box 18
SPB19	Socket Panel Box 19
SPB20	Socket Panel Box 20
SPB21	Socket Panel Box 21
SPB22	Socket Panel Box 22
SPB23	Socket Panel Box 23
SLB1	Sockets Light Box 1
SLB2	Sockets Light Box 2
SLB3	Sockets Light Box 3
PWL	Power lock

Availability of the option can vary according to genset size. More details for each size, available on chapters below.

6   GENERAL FEATURES A10-B25

6.1 CANOPY VERSION

➢ **BASIC SCOPE OF SUPPLY - The basic scope of supply of canopy version is:**
- Monoblock
- No Fuel tank as Standard: base frame with bottom panel
- Base frame equipped with screwed feet that allows handling by forklift
- Basic four lifting points from base frame
- Lifting bridge with single Roof Lifting Point
- Control panel and Power panels***
- No Starting batteries as standard
- Exhaust Manifold Insulation
- Water temperature and lube oil pressure sensors(OWS)**
- Manual Oil Pump
- Tray ready to fit main options

**in case of MRS and MSP is not included
***Available five different basic machines configuration:
- *ASP + 4P (only for A10 & A18)*
- *MSP + 4P (only for A10 & A18)*
- *MRS + GCB2*
- *ACP + GCB2*
- *MPP + GMB2 (from B10)*

> **All additional equipment can be choose by optional according to the specific market requirements and customers needs.**

➢ **MAIN FEATURES - GPW Enclosure is designed with the following features:**
- ✓ The enclosure is designed with **modular panels**.
- ✓ The enclosure **modular panels are made of zinc-plated sheet metal**
- ✓ The enclosure modular panels are externally fastened with **zinc-plated nuts, bolts, fastener, and bolts**.
- ✓ Enclosure doors equipped with **zinc-plated hinges**.
- ✓ The enclosure modular panels and base frame are treated and painted with epoxy powder **smooth finishing**.
- ✓ The Air Inlet openings are created by a process that cut the metal part of the enclosure, them an intake duct is add inside the enclosure. This allow to improve the waterproofing of the genset.
- ✓ The soundproofing material is polyester fibre with **Class 1 / Bs2d0 fire reaction**.
- ✓ Enclosure IP is IP23**.**

A

Metal Air Inlet, made of zinc-plate punched sheet metal. Prevent water ingress and reduce noise level.

B

Weatherproof enclosure made of zinc-plated sheet metal to prevent rusting formation.

C

Three large canopy doors, allow an easy access for service and maintenance.

D

✓ Lateral Cables passage, positioned on the base frame below control panel.
✓ Control panel protected by canopy door.

E Sturdy robust doors, thanks to metal oblique reinforcements.

F Key lockable handle, avoid access to the genset from unauthorized persons

G Robust metal bridge connected to genset base frame allow to lift the genset by crane through a Single roof lifting point.

H
✓ Feet height hallow to handling the genset by pallet trucks* and forklift.
✓ Galvanized Skid Base available as optional
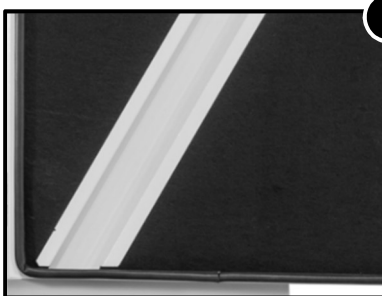
I Enclosure equipped with a thick layer of soundproofing material.
This allow a significant noise levels reduction.

L Removable bottom from the base frame

M Reduced Noise levels thanks to a residential silencer installed inside the canopy
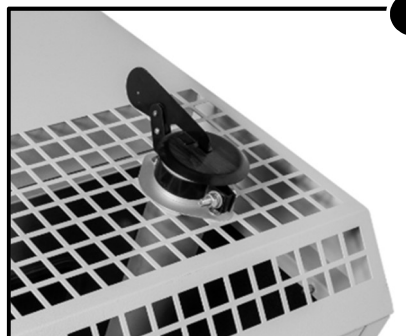
N Genset equipped with Rain flap. It avoid rain, snow and animals ingress inside the exhaust system.

PRODUCT GUIDE – GPW Series

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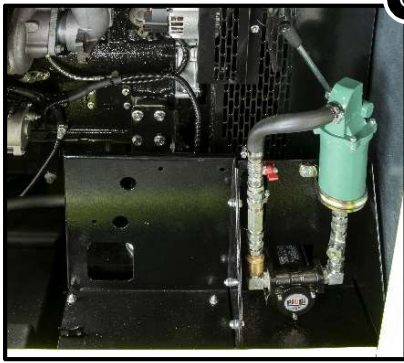
O — Dedicate tray to fit Main option requested. This allow to have the possibility to easy retrofit these options.

P — Easy access to the starting batteries from the outside. Long batteries connection cable for easy movement and replacing.

Q — Internal fuel refiling point, protected by lockable door, prevent fuel theft

R — Anti-vibration support.
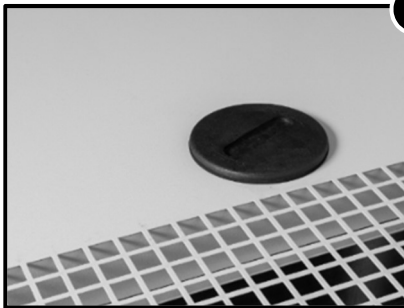
S — Easy access point on the roof for radiator cooling liquid refiling.

T — Easy access to sockets panel, located in the frontal side.

U — Exhaust Manifold Insulation cover, protect from direct contact and reduce heat dissipation inside the enclosure.
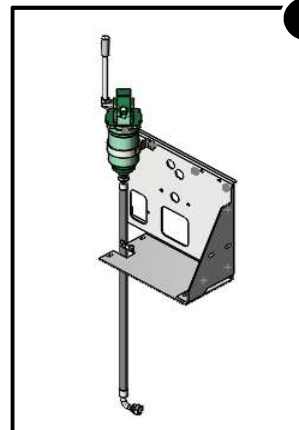
V — Manual Oil Pump allows to drain the oil from the engine easily and cleanly

6.2 CONTROL AND POWER PANELS

GPW series is equipped with two separated metal cabinets: one for Control parts and one for Power parts. This allow to have complete segregation between control and power section and more flexibility on control panel optional.

Different Control/Power panel cabinet dimensions according to genset size, with enough space to fit several options.

Control and power section cabinets are joined together and lay on genset base frame.

Three **Control section** are available with their own power section:

- **MRS + GCB2** – Manual Remote Start Panel + Genset Circuit Breaker 4P Automatic
- **ACP + GCB2** – Automatic Control Panel + Genset Circuit Breaker 4P Automatic
- **MPP + GMB2** – Modular Parallel Panel + Genset Circuit Breaker 4P Motorized

Genset Current	Control Section	Power Section	
		GCB2	GMB2
10 ÷ 125A	MRS	X	NA
	ACP	X	NA
≥ 125A	MRS	X	NA
	ACP	X	NA
	MPP	NA	X

For more info regarding Power/Control panel configuration and scope of supply, see *ANNEX A – CONTROL PANELS* and *ANNEX B – POWER PANELS.*

Control/power panels IP when genset canopy door is open is IP31.
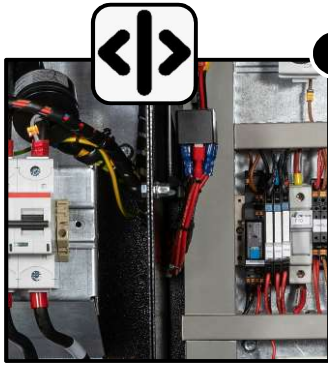
A

Control and power panels fit into two separate metal cabinets.

Complete segregation between control and power panels

B

Modular design allow a high flexibility of the scope of supply of control and power panels.

Large metal cabinets with space for several option.

C

Lateral cables passage, positioned on the base frame, below control panel, made of pierceable and removable cable entry plate.
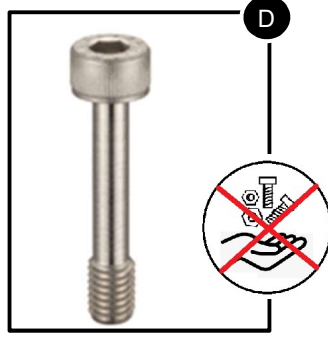
D

Panel doors closed with special falling-out-prevention bolts.
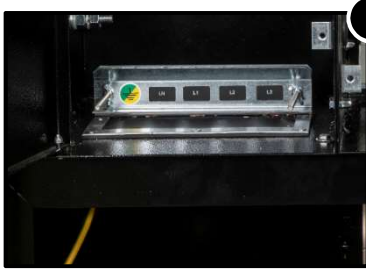
E

Cables ingress from the bottom of control panel.

F

Control and Power panels fit inside the enclosure, protected by a key lockable door.

Door equipped with a big window that allows to see the status of control unit (canopy version).

G

Power panel cabinet designed to accommodate all different circuit breaker sizes necessary for all Voltages around the world (according to genset size)
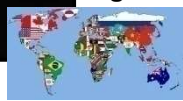
H

Genset equipped with emergency stop button located in an easily accessible side of generator

For A10 and A18 size only, are available also simple panel that include Control and Power section in the same small box:

- **ASP** – Automatic Simple Panel + Genset Circuit Breaker 4P Automatic

- **MSP** – Manual Simple Panel + Genset Circuit Breaker 4P Automatic

These two panels include an essential design and scope of supply that consist in control unit and 4 poles circuit breaker.
These panels have a reduced number of supplements compatibility.
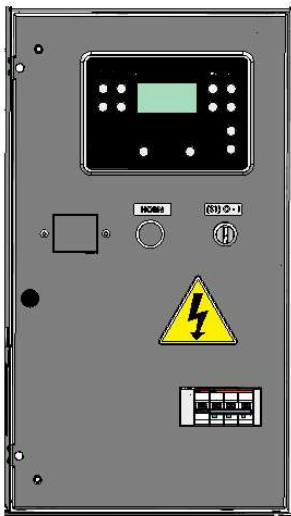
ASP design
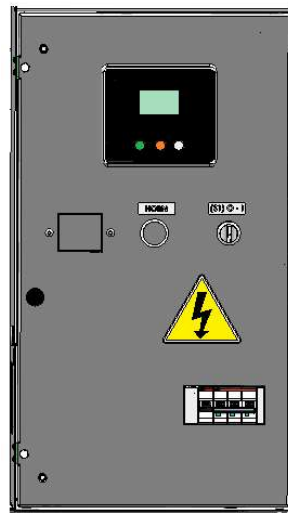
MSP design

Control/power panels IP when genset canopy door is open is IP31.

6.3 SOCKET PANEL BOX

GPW series is designed to be equipped with a socket panel located in the front of the generator.

Sockets panel separated from control/power panels allow to have complete flexibility on scope of supply of sockets kit.

Available several Socket Panel Box with their own protections. Sockets kits showed in the table below are valid only for 400V three phases 50Hz.

		Canopy Size							
		A10	A18	B10	B20	B25	C10	C20	C30
Socket Panel Box*	SPB1	X							
	SPB2		X	X	X	X	X	X	X
	SPB3	X							
	SPB4		X	X	X	X	X	X	X
	SPB5	X							
	SPB6		X	X	X	X	X	X	X
	SPB8				X	X	X	X	X
	SPB9			X					
	SPB10			X					
	SPB12	X	X	X	X	X	X	X	X
	SPB13			X	X	X	X	X	X
	SPB16	X							
	SPB17		X	X	X	X	X	X	X
	SPB18	X							
	SPB19		X	X	X	X	X	X	X
	SPB20	X							
	SPB21		X	X	X	X	X	X	X
	SPB22		X	X	X	X	X	X	X
	SPB23			X					

*With all Panel Box is mandatory include ETB supplement.

For more info regarding Sockets panel compatibilities and scope of supply, see *ANNEX C – SOCKETS PANEL BOX*

For A10 and A18 size only, are available also simple socket kit:

SLB1 – Socket Light Box 1

SLB2 – Socket Light Box 2

SLB3 – Socket Light Box 3

These three panels include an essential design and consist in a simple panel box on the front of control panel

ETB is not compatible with Socket Light Box.
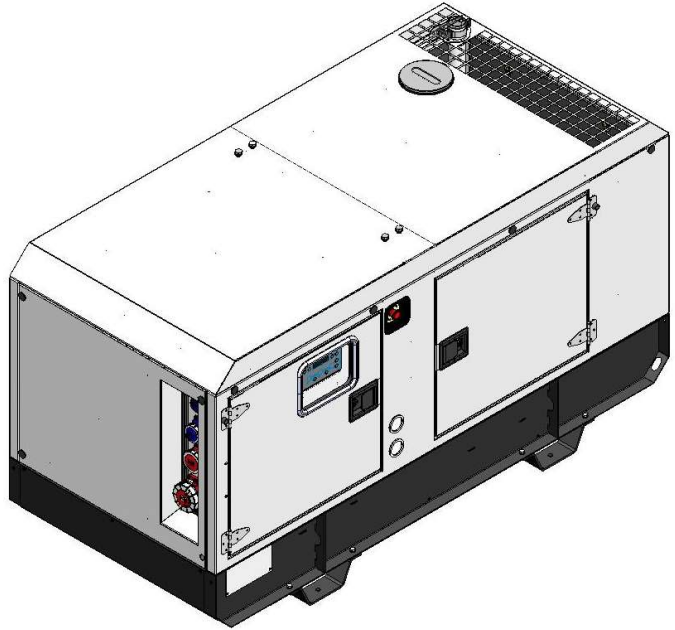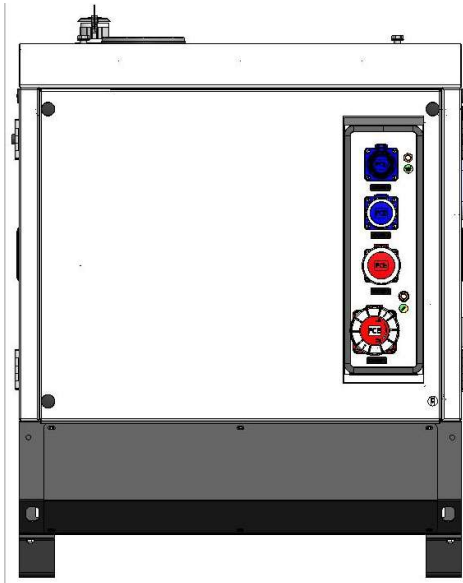
For more info regarding Sockets panel compatibilities and scope of supply, see *ANNEX C – SOCKETS PANEL BOX*

A18

7   SIZE A18

7.1   A18 – POWER RANGE AND MONOBLOCK SELECTION

A18 size cover these power node PRP:
- 50Hz: from 30kVA up to 60kVA
- 60Hz: from 36kVA up to 69kVA

A18 size include these engine brands:
- YANMAR
- PERKINS

7.1.1   A18 – GENSET MODELS @50Hz

Monoblocks selection for Voltages:
- **400V Three phases 50Hz**
- **230V Three phases 50Hz**
- **230V Single Phase 50Hz**

GPW Genset model	Engine Brand	Engine model	Engine emission level	Alternator brand	Alternator model
GPW30P/FNE	PERKINS	1103A-33G	Not Emis Cert	Mecc Alte	ECP28-VL C
GPW45P/FNE		1103A-33TG1	Not Emis Cert	Mecc Alte	ECP32-2S C
GPW60P/FNE		1103A-33TG2	Not Emis Cert	Mecc Alte	ECP32-2M C
GPW36Y/FS3A	YANMAR	4TNV98-ZGPGE	EU Stage 3A	Mecc Alte	ECP32-1S C
GPW35Y/FS3A		4TNV98-IGPGE	EU Stage 3A	Mecc Alte	ECP32-1S C
GPW45Y/FS2		4TNV98T-GPGE	EU Stage 2	Mecc Alte	ECP32-2S C
GPW45Y/FS3A		4TNV98T-ZGPGE	EU Stage 3A	Mecc Alte	ECP32-2S C

Complete Power outputs according to Voltages available on Product Card.

7.1.2   A18 – GENSET MODELS @60Hz

Monoblocks selection for Voltages:
- **480V Three phases 60Hz**
- **440V Three phases 60Hz**

GPW Genset model	Engine Brand	Engine model	Engine emission level	Alternator brand	Alternator model
GPW35P/SNE	PERKINS	1103A-33G	Not Emis Cert	Mecc Alte	ECP28-VL C
GPW55P/SNE		1103A-33TG1	Not Emis Cert	Mecc Alte	ECP32-2S C
GPW70P/SNE		1103A-33TG2	Not Emis Cert	Mecc Alte	ECP32-2M C
GPW40Y/ST4i	YANMAR	4TNV98-ZGPGE	EPA Tier 4 Interim	Mecc Alte	ECP32-1S C
GPW40Y/SNE		4TNV98-GPGE	Not Emis Cert	Mecc Alte	ECP32-1S C
GPW50Y/SNE		4TNV98T-GPGE	Not Emis Cert	Mecc Alte	ECP32-2S C
GPW50Y/ST4i		4TNV98T-ZGPGE	EPA Tier 4 Interim	Mecc Alte	ECP32-2S C

Monoblocks selection for Voltages:
- **380V Three phases 60Hz**
- **240/120V Three phases 60Hz**
- **240/138V Three phases 60Hz**
- **220V Three phases 60Hz**
- **208V Three phases 60Hz**
- **220V Single Phase 60Hz**
- **240V Single Phase 60Hz**

GPW Genset model	Engine Brand	Engine model	Engine emission level	Alternator brand	Alternator model
GPW35P/SNE	PERKINS	1103A-33G	Not Emis Cert	Mecc Alte	ECP28-VL C
GPW55P/SNE		1103A-33TG1	Not Emis Cert	Mecc Alte	ECP32-2S C
GPW70P/SNE		1103A-33TG2	Not Emis Cert	Mecc Alte	ECP32-2M C
GPW40Y/ST4i	YANMAR	4TNV98-ZGPGE	EPA Tier 4 Interim	Mecc Alte	ECP32-1S C
GPW40Y/SNE		4TNV98-GPGE	Not Emis Cert	Mecc Alte	ECP32-1S C
GPW50Y/SNE		4TNV98T-GPGE	Not Emis Cert	Mecc Alte	ECP32-2S C
GPW50Y/ST4i		4TNV98T-ZGPGE	EPA Tier 4 Interim	Mecc Alte	ECP32-2S C

Complete Power outputs according to Voltages available on Product Card.

7.2 A18 – GENSET OVERALL DIMENSIONS

Version	Genset dimensions*LxWxH [mm]	
	with RLP + SCREWED FEET	with GSB + RLP
CANOPY*	2200x1020x1313	2200x1020x1416
EXS*	2200x1020x1904	2200x1020x2007

- **Feet height:** 97mm
- **GSB height:** 200mm
- **Roof Lifting Point height:** 21mm (considering from the rain flap) 106mm (considering from roof plane)
- **Rain flap height*:** 85mm (considering from roof plane)

Genset dimensions refer to basic version including rain flap, Roof Lifting Point and Screwed feet. Final dimensions may vary according to option ordered.

A18 canopy size is stackable in its basic version with standard base frame with screwed feet and roof lifting point. Not possible with subbase and or GSB and or ESX.
This allow to optimize container load, maximizing the number of genset in container space.

7.3   A18 – OPTIONS

7.3.1   A18 – ENGINE OPTIONS

7.3.1.1 A18 – PHS - Pre-Heating System

Compatibility: All genset.

Incompatibility: JNFS.

Available as: Supplement

The PHS option consist in a heater that keep engine circuit warm.
PHS guarantee a fast and prompt engine start, especially when the ambient temperature drop below 3°C.
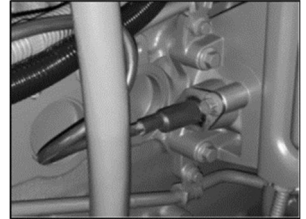
GPW Genset model	rpm	Engine Brand	Engine model	Power consumption	Heater Type
GPW30P/FNE	1500	PERKINS	1103A-33G	600W	Immersion
GPW35P/SNE	1800		1103A-33G		
GPW45P/FNE	1500		1103A-33TG1		
GPW55P/SNE	1800		1103A-33TG1		
GPW60P/FNE	1500		1103A-33TG2		
GPW70P/SNE	1800		1103A-33TG2		
GPW36Y/FS3A	1500	YANMAR	4TNV98-ZGPGE	400W	
GPW40Y/ST4i	1800		4TNV98-ZGPGE		
GPW35Y/FS3A	1500		4TNV98-IGPGE		
GPW40Y/SNE	1800		4TNV98-GPGE		
GPW40Y/FS2	1500		4TNV98T-GPGE		
GPW50Y/SNE	1800		4TNV98T-GPGE		
GPW40Y/FS3A	1500		4TNV98T-ZGPGE		
GPW50Y/ST4i	1800		4TNV98T-ZGPGE		

7.3.1.2 A18 – ASV - Air Shut-Off Valve

Compatibility: All genset.

Incompatibility: ARM1 (Included).

Available as: Supplement

ASV option consist in an air shut-off valve that allows the automatic genset stop when engine overruns in environments rich of hydrocarbons.
The air shut-off valve provide emergency over speed shutdown protection for diesel engines and are the most effective way of preventing a runaway situation.
This valve completely block the engine air intake system, cutting off an uncontrolled external fuel source and the air required to keep the engine running.

In case of ASV, If is required additional I/O is Mandatory to order both ARM2 and ARM4.

GPW Genset model	rpm	Engine Brand	Engine model	Brand	Model
GPW30P/FNE	1500	PERKINS	1103A-33G	Chalwin	SVX300 Non-Hazardous Areas
GPW35P/SNE	1800		1103A-33G		
GPW45P/FNE	1500		1103A-33TG1		
GPW55P/SNE	1800		1103A-33TG1		
GPW60P/FNE	1500		1103A-33TG2		
GPW70P/SNE	1800		1103A-33TG2		
GPW36Y/FS3A	1500	YANMAR	4TNV98-ZGPGE		
GPW40Y/ST4i	1800		4TNV98-ZGPGE		
GPW35Y/FS3A	1500		4TNV98-IGPGE		
GPW40Y/SNE	1800		4TNV98-GPGE		
GPW40Y/FS2	1500		4TNV98T-GPGE		
GPW50Y/SNE	1800		4TNV98T-GPGE		
GPW40Y/FS3A	1500		4TNV98T-ZGPGE		
GPW50Y/ST4i	1800		4TNV98T-ZGPGE		

7.3.1.3 A18 – EEG - Electronic Engine Governor

Compatibility: Genset with mechanical governor as standard.

Incompatibility: None.

Available as: Supplement

EEG consist in a genset equipped with an engine with electronic governor, Electronic governor provides more accurate engine speed adjustment from no-load condition to full load.

It allows to have better engine performance compared to the one with mechanical governor.

GPW Genset model	rpm	Engine Brand	Engine model	Brand
GPW30P/FNE	1500	PERKINS	1103A-33G	Available
GPW35P/SNE	1800			
GPW45P/FNE	1500		1103A-33TG1	
GPW55P/SNE	1800			
GPW60P/FNE	1500		1103A-33TG2	
GPW70P/SNE	1800			
GPW36Y/FS3A	1500	YANMAR	4TNV98-ZGPGE	Included as standard
GPW40Y/ST4i	1800			
GPW35Y/FS3A	1500		4TNV98-IGPGE	Not available
GPW40Y/SNE	1800		4TNV98-GPGE	
GPW40Y/FS2	1500		4TNV98T-GPGE	
GPW50Y/SNE	1800			
GPW40Y/FS3A	1500		4TNV98T-ZGPGE	Included as standard
GPW50Y/ST4i	1800			

  if necessary additional I/O and EEG is present, is mandatory to order both ARM1 and ARM4.

7.3.1.4 A18 – HDF - Heavy-Duty Air Filter

Compatibility: All genset.

Incompatibility: none.

Available as: Supplement

The HDF option consist of a bigger air filter that allows working in dusty environments and allows a lengthening of maintenance intervals.

The HDF is a two-stage air cleaner with built-in high efficiency pre-cleaner.
Air Cleaner is designed especially for on and off road equipment operating in medium to heavy dust environments.
HDF Easily serviced with clamp-on cover design.

GPW Genset model	rpm	Engine Brand	Engine model	Brand	Model
GPW30P/FNE	1500	PERKINS	1103A-33G	Donaldson	D080070 (V) With Vac Valve
GPW35P/SNE	1800		1103A-33G		
GPW45P/FNE	1500		1103A-33TG1		
GPW55P/SNE	1800		1103A-33TG1		
GPW60P/FNE	1500		1103A-33TG2		
GPW70P/SNE	1800		1103A-33TG2		
GPW36Y/FS3A	1500	YANMAR	4TNV98-ZGPGE		
GPW40Y/ST4i	1800		4TNV98-ZGPGE		
GPW35Y/FS3A	1500		4TNV98-IGPGE		
GPW40Y/SNE	1800		4TNV98-GPGE		
GPW40Y/FS2	1500		4TNV98T-GPGE		
GPW50Y/SNE	1800		4TNV98T-GPGE		
GPW40Y/FS3A	1500		4TNV98T-ZGPGE		
GPW50Y/ST4i	1800		4TNV98T-ZGPGE		

7.3.1.5 A18 – WSP - Water Separator Filter (Racor)

Compatibility: All genset.

Incompatibility: WSP2.

Available as: Supplement

WSP option consist in Water separator fuel filter. This fuel filter allows to filter water and dirty from the fuel before it entry into the engine.
This option is particularly suitable when fuel quality is not guaranteed and it may compromise the proper engine operation. WSP protects the precision components of your engine from dirt, rust, algae, asphaltenes, varnishes and especially water, which is prevalent in low distillate fuels.

Filter brand: Racor

Filter model: 500FG10

Filters capacity: 10 micron

How It Works

WSP remove Contaminants from fuel by three-stage-process:

Stage 1 – Separation using the fuel flow, the stationary turbine separates large solids and free water through enhanced centrifugal force.
Stage 2 – Coalescing Smaller water droplets and solids coalesce on the conical baffle and fall into the collection bowl.
Stage 3 – Filtration Engines will benefit from near 100% water separation and fuel filtration with Racor's proprietary Aquabloc® water repelling media.

The replaceable filters are available in 2, 10, and 30 micron ratings.

7.3.1.6 A18 – WSP2 - Water Separator Filter 2 (Mann Hummel)

Compatibility: All genset.

Incompatibility: WSP.

Available as: Supplement

WSP2 option consist in Water separator fuel filter. This fuel filter allows to filter water and dirty from the fuel before it entry into the engine.
This option is particularly suitable when fuel quality is not guaranteed and it may compromise the proper engine operation.

Filter brand: Mann Hummel

Filter model: Preline 100/2

Filters capacity: 4 micron

WSP Manual pump included in the scope of supply.

✓ Use with diesel fuel DIN ISO 590 (5 % FAME) DIN 51 628 (7 % FAME)
✓ Up to 100 l/h volume flow rate
✓ 93% water separation

All pictures shown in this document are for illustration purpose only. Actual product features may vary due to product enhancement without notice.

7.3.1.7 A18 – CDP - Coolant Draining Pipe

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement

CDP option consist in a pipe with a valve in the end that allow an easy and clean coolant radiator drainage.
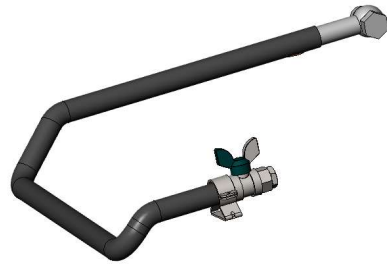
7.3.2 A18 – ALTERNATOR OPTIONS

For more info regarding Alternator option **WTP, ACH** scope of supply, see *ANNEX H – ALTERNATOR OPTION*.

7.3.2.1 A18 – PMG - Permanent Magnet Generator on alternator

This option is under definition for this canopy size.

7.3.3 A18 – BASEFRAME OPTIONS

7.3.3.1 A18 – LPT - Leak Proof Tray

Compatibility: All genset.

Incompatibility: MFT-S, MFT-M (equipped with fully bounded subbase).

Available as: Supplement

LPT option consist in a **tray inside the base frame** that avoid leak of fuel, oil, cooling in the ground.

LPT also included **Leak detection sensor**.

This option is required by many national legislation around the word.

LPT design: **tray**

LPT weight: **40Kg**

Leak detection sensor: **Electromagnetic level sensor**

Open Genset dimensions with LPT: **standard dimensions**, LPT fit inside standard base frame

Canopy Genset dimensions with LPT: **standard dimensions**, LPT fit inside standard base frame

7.3.4 A18 – FUEL TANK OPTIONS

7.3.4.1 A18 – PFT - Plastic Fuel Tank

Compatibility: All genset.

Incompatibility: all MFT.

Available as: Supplement

PFT option consist in a plastic fuel tank integrated in the genset **standard base frame.**

Tank material: **Plastic**

Tank capacity: **80 litre**

Tank weight: **9 Kg**

Genset dimensions with PFT: **standard dimensions**, PFT fit inside standard base frame
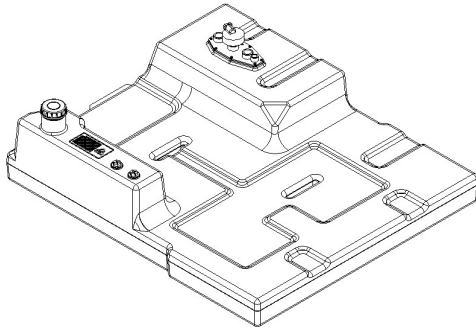
For specific genset model autonomy with different tanks, see product data sheet.

7.3.4.2 A18 – MFT-XS - Metal Fuel Tank-Extra Small

Compatibility: All genset.

Incompatibility: PFT, MFT-S, MFT-M.

Available as: Supplement

MFT-XS option consist in an extra small size metal fuel tank integrated in the **genset standard base frame.**

Tank material: **Metal**

Tank capacity: **65 litre**

Tank weight: **35 Kg**

Genset dimensions with MFT-L LxWxH*: **standard dimensions**, PFT fit inside standard base frame
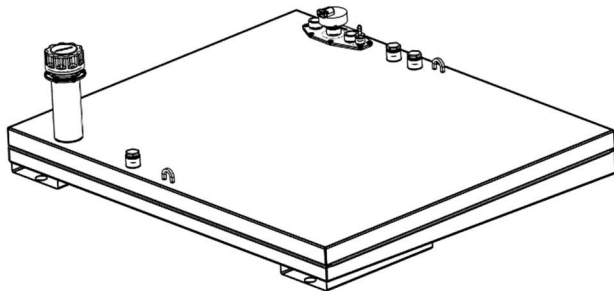
For specific genset model autonomy with different tanks, see product data sheet.

7.3.4.3 A18 – MFT-S - Metal Fuel Tank-Small

Compatibility: All genset.

Incompatibility: PFT, MFT-XS, MFT-M, LPT.

Available as: Supplement

MFT-S option consist in a small size metal fuel tank integrated in a **bigger genset subbase, fully bounded leak proof.**

Tank material: **Metal**

Tank capacity: **120 litre**

Tank + subbase weight: **145 Kg**

Genset dimensions with MFT-L LxWxH*: **2200x1020x1506 mm**

refer to standard genset with screwed feet and roof lifting point.
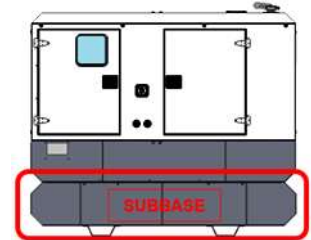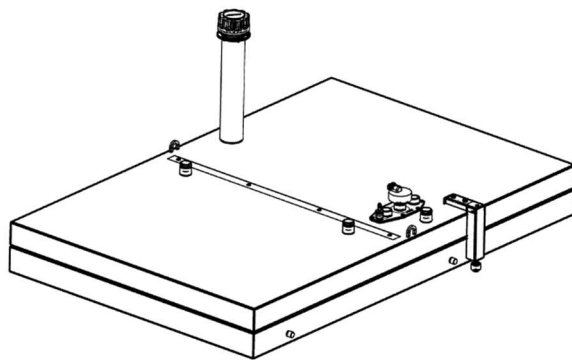
For specific genset model autonomy with different tanks, see product data sheet.

7.3.4.4 A18 – MFT-M - Metal Fuel Tank-Medium

Compatibility: Open and Canopy version. All genset.

Incompatibility: PFT, MFT-XS, MFT-S, LPT.

Available as: Supplement

MFT-M option consist in a medium size metal fuel tank integrated in a **bigger genset subbase, fully bounded leak proof.**

Tank material: **Metal**

Tank capacity: **245 litre**

Tank + subbase weight: **172 Kg**

Genset dimensions with MFT-L LxWxH*: **2200x1020x1506 mm**

refer to standard genset with screwed feet and roof lifting point.

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For specific genset model autonomy with different tank, see product data sheet.

All pictures shown in this document are for illustration purpose only. Actual product features may vary due to product enhancement without notice.
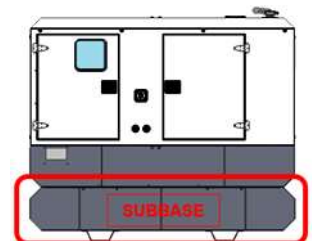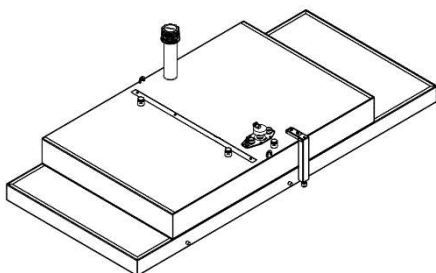
7.4   A18 – TWF – Three Way Fuel valve

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement

TWF option consist in a six way valve designed for use the fuel from external tank and increase the autonomy of the generator.
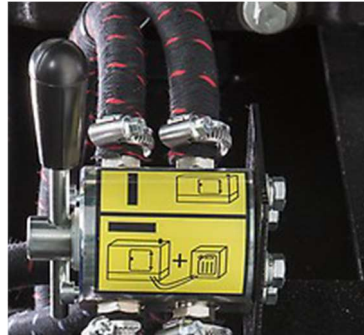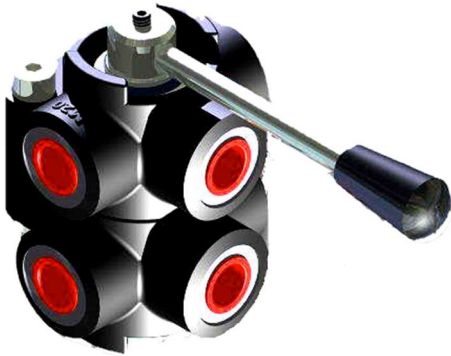
7.5   A18 – EFP – Electric Fuel Pump

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement

EFP option consist in an electric pump useful when is necessary to fill the genset tank from an external fuel tank.

High Performance heavy duty electronic pump:
Brand: Motor Components, LLC
Model: Duralift

Flow rate @ 0,4 bar	26,5 l/min
Voltage	12 DC V
Maximum operation pressure	0,79 bar

7.6 A18 – QFC – Quick Fuel Connectors

Compatibility: All genset. Mandatory include TWF supplement.

Incompatibility: None.

Available as: Supplement

The QFC option installed on the six way valve allows the rapidly increase of the autonomy of the generator through an external tank.

QFC consist of:
- ✓ six way fuel valve
- ✓ two connectors:
  - • Inlet male
  - • Outlet female

This option is supplied with rubber cap.

7.6.1 A18 – ENCLOSURE OPTIONS

For more info of enclosure options DCC2, DCCX, BRB, GDH, PSM scope of supply, see *ANNEX I – ENCLOSURE OPTIONS.*

7.6.1.1 A18 – EXS - Extra Silent Enclosure

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement.

EXS option consist in an Extra Silent enclosure that allows to have a low noise emissions, reducing noise level up to -4dB(A) compared to standard enclosure.

It include an additional roof module that thanks to internal soundproofing partitions reduce the noise coming from air expulsion area.

This option is particularly suitable for installation near city centre and in any place where severe noise emission restriction are present.

Genset dimensions with EXS LxWxH*: **2200x1020x1904 mm**

EXS weight: **197 kg**

refer to standard genset with screwed feet and roof lifting point.
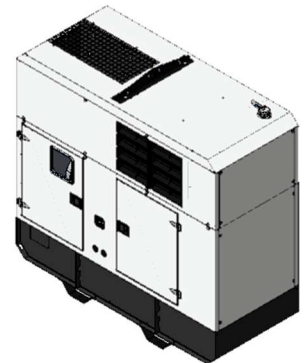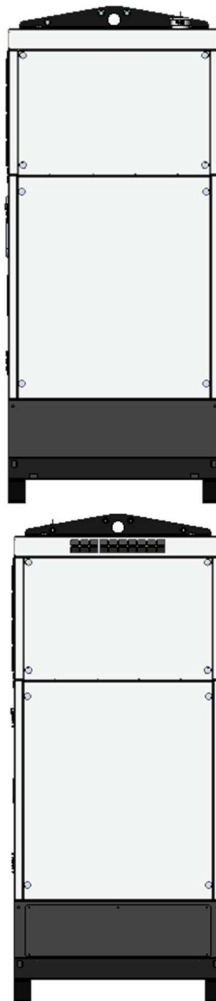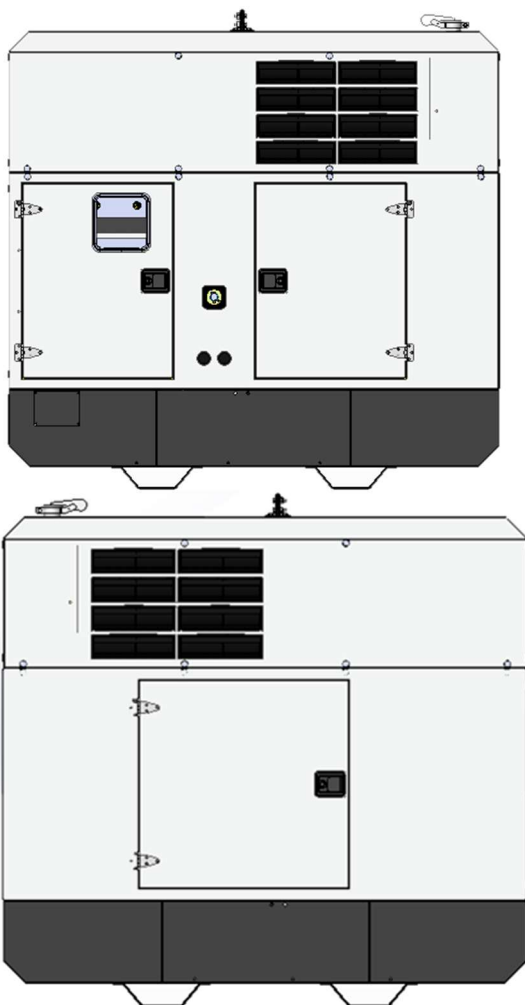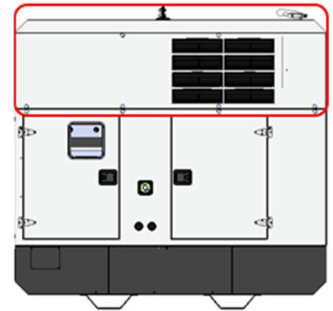
7.6.2   A18 – LIFTING/HANDLING OPTIONS

7.6.2.1 A18 – GSB - Galvanized skid base with fork lift pockets

Compatibility: All genset.

Incompatibility: None.

Available as: Accessory

GSB option consist in a galvanized skid base that can be screwed to the genset base frame (removing feet). This option allow to protect the genset base frame from the ground and being equipped with fork lift pockets, it also allow a better handling by forklift.

Canopy Genset overall dimensions with GSB LxWxH*: **2200x1020x1416 mm**

GSB weight: **68 kg**

GSB material: **S235 hot-dipped galvanized**

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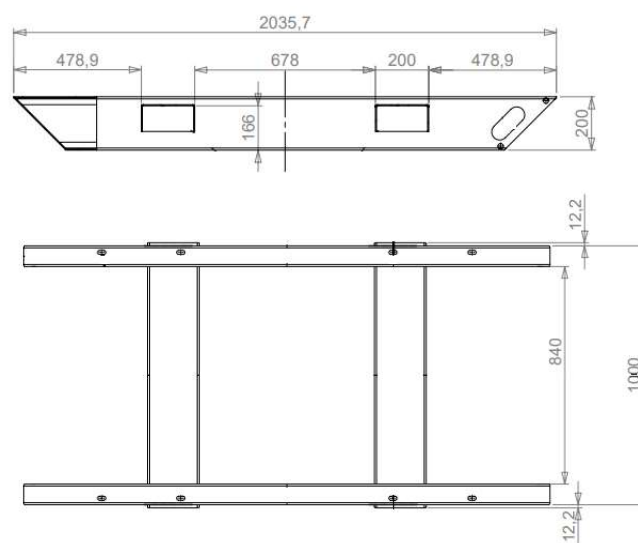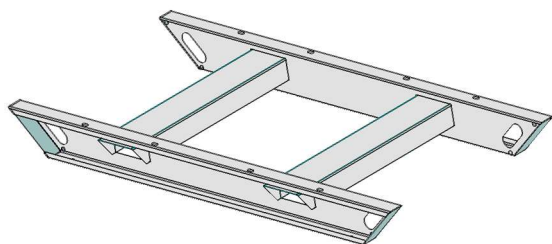
* refer to standard genset with roof lifting point.

7.6.3   A18 – EXHAUST SYSTEM OPTIONS

7.6.3.1 A18 – ESA - Exhaust Spark Arrestor

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement

The exhaust spark arrestor allows preventing the emission of flammable debris from combustion sources.
Diesel Engine exhaust spark arrestors are a basic, but key safety feature for both hazardous areas and lower risk diesel engine applications such as agriculture or forestry where a spark from the exhaust system may cause ignition of combustible material.
Those Spark Arrestors are designed as a safety device, specifically for preventing the risk of fire caused by the spread of sparks emitted from diesel engines.
All diesel engines have the potential to emit sparks even the latest clean engines. This is due to the high carbon particulate content, carbon build up and the high ratio of free oxygen in the exhaust gas when on and off load. The amount of energy carried by these sparks and the risk of them being transmitted over large areas in the presence of flammable materials, gases or dust can significantly increase the chances of igniting fires or causing explosions.

Spark Arrestors are mandatory equipment in many industries where potentially explosive environments are common:
- *Oils & Gas Industries*
- *Pharmaceutical*
- *Petrochemical Industries*
- *Mining*
- *Timber/Paper Handling & Processing*
- *Military Munitions/Aviation*
- *Agriculture/Forestry*

This Spark arrestor is ATEX certified.

7.6.3.2 A18 – HPP – All genset

Compatibility: All genset.

Incompatibility: none.

Available as: Supplement

HPP option consist in metal grid protections that protect engine hot parts from possible direct contact.

7.6.4 A18 – BATTERY OPTIONS

7.6.4.1 A18 – MBS - Manual Battery Switch

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement

MBS option consist in handle connected to the genset starting batteries that allows to disconnect batteries from the electrical circuit.
This option is particularly suitable when genset is not operating and avoid batteries discharging.

MBS is located in common option tray, it allow to find MBS always in the same position.

General features:
- ✓ IP665
- ✓ Operating temperature: -40ºC a +85ºC
- ✓ Nominal Intensity: 250 A
- ✓ Voltage: 12/24 VDC
- ✓ Maximum capacity: 2500A for 5 sec

All pictures shown in this document are for illustration purpose only. Actual product features may vary due to product enhancement without notice.
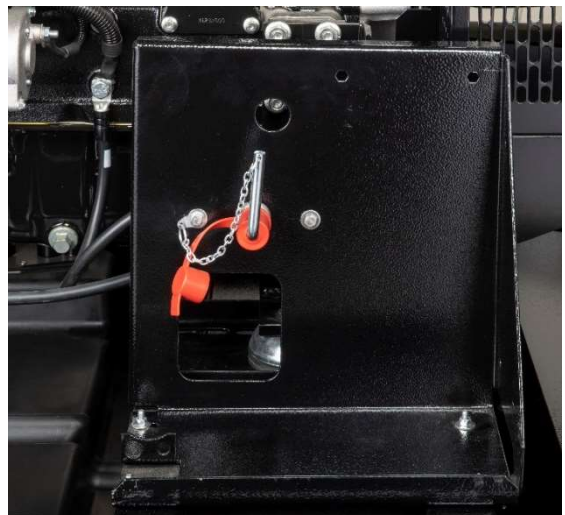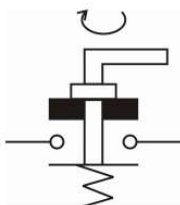
7.6.4.2 A18 – BAT - Genset Starting Battery

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement

BAT option consist in starting genset batteries.

GPW Genset model	rpm	Engine Brand	Engine model	Number of batteries	Batteries capacity	Voltage
GPW30P/FNE	1500	PERKINS	1103A-33G	1	80Ah	12V
GPW35P/SNE	1800		1103A-33G			
GPW45P/FNE	1500		1103A-33TG1			
GPW55P/SNE	1800		1103A-33TG1			
GPW60P/FNE	1500		1103A-33TG2			
GPW70P/SNE	1800		1103A-33TG2			
GPW36Y/FS3A	1500	YANMAR	4TNV98-ZGPGE			
GPW40Y/ST4i	1800		4TNV98-ZGPGE			
GPW35Y/FS3A	1500		4TNV98-IGPGE			
GPW40Y/SNE	1800		4TNV98-GPGE			
GPW40Y/FS2	1500		4TNV98T-GPGE			
GPW50Y/SNE	1800		4TNV98T-GPGE			
GPW40Y/FS3A	1500		4TNV98T-ZGPGE			
GPW50Y/ST4i	1800		4TNV98T-ZGPGE			

7.6.5 A18 – TRAILER OPTION

7.6.5.1 A18 – STR – Site Trailer with connection ball hitch type

Compatibility: All genset.

Incompatibility: RTR.

Available as: Supplement and Accessory.

STR option consist in a trailer not homologated for road use. To be defined during the order

7.6.5.2 A18 – RTR – Road Trailer with connection ball hitch type

Compatibility: All genset.

Incompatibility: STR.

Available as: Supplement and Accessory.

RTR option consist in a trailer homologated for road use. To be defined during the order.

7.6.5.3 A18 – TEX – Towing Eye for STR/RTR

Compatibility: Generator with STR or RTR option. All genset.

Incompatibility: None.

Available as: Supplement and Accessory.

TEX option to be defined during the order

7.6.6 A18 – CONTROL PANEL OPTIONS

For more info regarding Power/Control panel compatibilities and ASP, MSP,MRS and ACPscope of supply. See _ANNEX A – CONTROL PANELS a_   MPP not available for A18.

7.6.6.1 – A18 – WAMF – Without AMF

Compatibility: All genset with ACP.

Incompatibility: MRS. Genset with motorized circuit breaker (GMB2).

Available as: Supplement

WAMF option allows to have the ACP control panel without AMF option.

7.6.6.2 A18 – RSS – Remote Start and Stop

RSS option consist in two signals on control panel that allow to have start and stop of genset from remote, when these two signals are connected to an external cu.

This option is under final definition and design.

7.6.6.3 A18 - Analogue Gauges

For more info regarding Analogue Gauges EAG, AHM, FAG, VMT, AMT scope of supply, see _ANNEX F – ANALOG GAUGES._

For more info regarding Power/Control panel configuration and scope of supply, see *CONTROL AND POWER PANELS* **and** *ANNEX B – POWER PANELS.*

For more info regarding Connection System TN-S , TNC **and** IT , **see** *ANNEX G – CONNECTION SYSTEM*.

7.6.7.1 A18 – ETB - External Terminal Board

Compatibility: GCB2. Mandatory include with of SPBx supplement.

Incompatibility: ERDF, ETB-G, GMB2 (Included with MPP).

Available as: Supplement

The External terminal board consist of robust copper bars that allows an easy external power cables connection.
ETB is included as standard in all GCB2 Power Panels with a current >400A.
ETB is included as standard in all GMB2 Power Panels.

Current size [A]	ETB Number of copper bars	ETB Section of copper bars [mm2]	ETB Recommended cable size [3Ph+N+PE] [mm2]
32A	5	5x (15x5)	5x[6]
40A-50A		5x (15x5)	5x[10]
63A		5x (15x5)	5x[16]
80-100A		5x (15x5)	3x(25)+1x16+1x16
125A		5x (15x5)	3x(35)+1x16+1x16
160A		5x(15x5)	3x(50)+1x25+1x25
250A		5x(20x5)	3x(95)+1x50+1x50

7.6.7.2 A18 – ETB-G - External Terminal Board for German market

Compatibility: All genset. GCB2, GMB2.

Incompatibility: ETB, ERDF.

Available as: Supplement

The External terminal board consist of robust copper bars that allows an easy external power cables connection.

ETB-G is a special terminal board suitable for German market, where all copper bar have same dimension (3 phases and N + PE) and power cables from the monoblock have same section.

Current size	ETB-G Number of copper bars	ETB-G Section of copper bars	ETB-G Recommended cable size
			[3Ph+N+PE]
[A]		[mm2]	[mm2]
32A		5x (15x5)	5x[6]
40A-50A		5x (15x5)	5x[10]
63A		5x (15x5)	5x[16]
80-100A	5	5x (15x5)	5x[25]
125A		5x (15x5)	5x[35]
160A		5x(15x5)	5x[50]
250A		5x(20x5)	5x[95]

7.6.7.3 A18 DFS – Dual Frequency Switch (50/60Hz)

Compatibility: ACP. Engine must be switchable and with electronic governor.

Incompatibility: MRS.

Available as: Supplement

DFS option consist in two position selector mounted inside the control panel, which allows the possibility to switch from 50Hz @400V to 60Hz @480V. When the DFS is combined with socket panel box the sockets can only be used at 400/230V voltage output (to verify).
The DFS option includes a precision potenciometer (1kOhm) for voltage adjustament (mounted inside the control panel).

Frequency switch with two position   *Potentiometer for voltage adjustment*

All pictures shown in this document are for illustration purpose only. Actual product features may vary due to product enhancement without notice.

7.6.7.4 A18 IMD – Insulation Monitoring Device

Compatibility: All genset.

Incompatibility: ADI

Available as: Supplement

The IMD supplements is an insulation monitoring for mobile generators. It monitors the insulation resistance RF of an unearthed AC system of 0V up to 300 V to earth that is supplied by a mobile generator. The currently measured insulation resistance is indicated on the LC display. In this way, any changes, for example, when circuits of loads are connected to the system, can be recognized easily. The maximum permissible system leakage capacitance Cemax is 5 µF.

The IMD is useful to comply with the German legislation. It is use in many kind of applications:

- IEC 60364-7-717, DIN VDE 0100-717 (2005) Electrical installations in mobile or transportable units
- DIN VDE 0100-551 (VDE 0100-551), IEC 60364-5-551 Low-voltage generating sets (mobile generators)
- GW 308 "Mobile Stromerzeuger für Rohrleitungsbaustellen 8/00" (Mobile auxiliary power generators on pipeline site") (DVGW)
- BGI 867 (German Berufsgenossenschaft Information) Auswahl und Betrieb von Ersatzstromerzeugern auf Bau- und Montagestellen (Selecting and operating standby generators on construction and installation sites).

Operating elements:

- 1- Power On LED "ON", flashes in case of interruption of the connecting leads E/KE orL1/L2
- 2- Alarm LED "AL1", lights when the value falls below the set response value Alarm 1 and flashes

in case of interruption of the connecting leads E/KE or L1/L2

- 3- Alarm LED "AL2", lights when the value falls below the set response value Alarm 2 and flashes in case of interruption of the connecting leads E/KE or L1/L2
- 4- LC display
- 5- Test button "T": to call up the self-test. Arrow up button: parameter change, to move up in the menu
- 6- Reset button "R": to delete stored insulation fault alarms parameter change, to move down in the menu
- 7- "MENU" button: to call up the menu system. Enter button: to confirm parameter changes.

7.6.7.5 A18 – ADI - Adjustable Differential Protection

Compatibility: all genset.

Incompatibility: IMD.

Available as: Supplement.

ADI is an adjustable differential protection external to the control board.
It is a residual current relay with external toroidal transformer, useful to detect leakage current. The advantage of this type of differential protection is that is possible to set sensitivity and intervention time.

- ✓ **Type** A (up to IDn=5 A)
- ✓ **Operating voltage** 230-400 Vac +10% / -15%
- ✓ **Auxiliary supply frequency** 50-60 Hz
- ✓ **Operating temperature** -25….+70 °C
- ✓ **Sensitivity settings IDn** 0.03-0.1-0.3-0.5-1-2-3-5-10-30 A
- ✓ **Tripping time settings Dt** 0-0.06-0.2-0.3-0.5-1-2-3-5-10 s
- ✓ **Protection degree** IP20
- ✓ **Standards** IEC/EN 60947-2; IEC/EN 62020

ADI placed at the front of Control Panel

Toroid placed at the Power Panel

7.6.7.6 A18 – ERDF – Bus Bar Arrangement

Compatibility: All genset.

Incompatibility: ETB, ETB-G.

Available as: Supplement.

The option Bus Bar Arrangement allows to have different neutral scheme connections, Genset start with GCB open and 3 led for voltage presence and phase rotation.

ERDF Option is under definition on A18.

7.6.7.7 A18 – SBT – Switch Breaker Trip

Compatibility: Only with ACP.

Incompatibility: MRS

Available as: Supplement.

The option SBT allows higher protection against direct contact.

When the generator is working in case of unexpected opening of the doors, the circuit breaker open and the load is disconnected and an alarm is present in the control unit.

7.6.8   A18 – SOCKETS PANEL AND POWER LOCK OPTION

For more info regarding Sockets panel compatibilities and scope of supply, see *6.3 SOCKET PANEL BOX* and *11 ANNEX C – SOCKETS PANEL BOX*.

Socket Panel Box dimension for A18 LxWxH [mm] 570x511x208.
Auxiliary Power Input Socket included as standard.
Supplement ETB included with socket panel Box.
On A10-A18 the SLBx doesn't require ETB.

7.6.8.1   A18 – PWL – POWERLOCK

Compatibility: All genset.

Incompatibility: None. Supplement under definition.

Available as: Supplement.

PWL option consist in a Power Lock Box is a 3 phase high power-connecting unit, used as a termination point for power cables. The boxes include a number of safety features to prevent incorrect connection and disconnection.

All power lock devices are 'keyed' to eliminate the possibility of connecting with the wrong line, and color coded to suit international 3 phase standards.

PWL are directly protected by the main circuit breaker of the generator.

Features:
- ✓ Current rating: **400A**
- ✓ Connect with standard Power Lock connectors
- ✓ Sequential connecting ensures
- ✓ Ground/Earth is connected before
- ✓ Available color coded to suit European, North American and Australian 3 phase standards (specify during the order)
- ✓ All ports are keyed to prevent incorrect connection
- ✓ Finger protected
- ✓ Lock to prevent interference
- ✓ Environmentally sealed connector ports to protection level IP65

Final design is under definition

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All pictures shown in this document are for illustration purpose only. Actual product features may vary due to product enhancement without notice.

B10

8 SIZE B10

8.1 B10 – POWER RANGE AND MONOBLOCK SELECTION

B10 size cover these power node PRP:
- 50Hz: from 60kVA up to 80kVA
- 60Hz: from 67kVA up to 92kVA

B10 size include these engine brands:
- PERKINS

8.2 B10 – GENSET MODELS @50Hz

Monoblocks selection for Voltages:
- **400V Three phases 50Hz**
- **230V Three phases 50Hz**

GPW Genset model	Engine Brand	Engine model	Engine emission level	Alternator brand	Alternator model
GPW60P/FS3A	PERKINS	1104D-44TG2	EU Stage 3A	Mecc Alte	ECP32-2M
GPW65P/FS3A		1104D-44TG3	EU Stage 3A		ECP32-2M
GPW80P/FNE		1104A-44TG2	Not Emis Cert		ECP32-2L

Complete Power outputs according to Voltages available on Product Card.

8.3 B10 – GENSET MODELS @60Hz

Monoblocks selection for Voltages:
- **480V Three phases 60Hz**
- **440V Three phases 60Hz**

GPW Genset model	Engine Brand	Engine model	Engine emission level	Alternator brand	Alternator model
GPW70P/ST3	PERKINS	1104D-44TG2	EPA Tier 3	Mecc Alte	ECP32-2M
GPW95P/SNE		1104A-44TG2	Non Emis Cert		ECP32-2L

Monoblocks selection for Voltages:
- **380V Three phases 60Hz**
- **240/120V Three phases 60Hz**
- **240/138V Three phases 60Hz**
- **220V Three phases 60Hz**
- **208V Three phases 60Hz**

GPW Genset model	Engine Brand	Engine model	Engine emission level	Alternator brand	Alternator model
GPW70P/ST3	PERKINS	1104D-44TG2	EPA Tier 3	Mecc Alte	ECP32-2M
GPW95P/SNE		1104A-44TG2	Non Emis Cert		ECP32-2L

Complete Power outputs according to Voltages available on Product Card.

8.4 B10 – GENSET OVERALL DIMENSIONS

Version	Genset dimensions*LxWxH [mm]	
	with RLP + SCREWED FEET	with GSB + RLP
CANOPY*	2400x1040x1741	2400x1040x1844
EXS*	2400x1040x2332	2400x1040x2435

- **Feet height:** 97mm
- **GSB height:** 200mm
- **Roof Lifting Point height:** 16mm (considering from the rain flap) 106mm (considering from roof plane)
- **Rain flap height*:** 90mm (considering from roof plane)

Genset dimensions refer to basic version including rain flap, Roof Lifting Point and Screwed feet. Final dimensions may vary according to option ordered.

8.5 B10 – OPTIONS

8.5.1 B10 – ENGINE OPTIONS

8.5.1.1 B10 – PHS - Pre-Heating System

Compatibility: All genset.

Incompatibility: none.

Available as: Supplement

The PHS option consist in a heater that keep engine circuit warm.
PHS guarantee a fast and prompt engine start, especially when the ambient temperature drop below 3°C.

Genset model	rpm	Engine brand	Engine model	Power consumption	Heater Type
GPW60P/FS3A	1500		1104D-44TG2		
GPW65P/FS3A	1500		1104D-44TG3		
GPW70P/ST3	1800	Perkins	1104D-44TG2	600W	Immersion
GPW80P/FNE	1500		1104A-44TG2		
GPW95P/SNE	1800		1104A-44TG2		

8.5.1.2 B10 – ASV - Air Shut-Off Valve

Compatibility: All genset.

Incompatibility: ARM1 (Included).

Available as: Supplement

ASV option consist in an air shut-off valve that allows the automatic genset stop when engine overruns in environments rich of hydrocarbons.
The air shut-off valve provide emergency over speed shutdown protection for diesel engines and are the most effective way of preventing a runaway situation.
This valve completely block the engine air intake system, cutting off an uncontrolled external fuel source and the air required to keep the engine running.

In case of ASV, If is required additional I/O is Mandatory to order both ARM2 and ARM4.

Genset model	rpm	Engine brand	Engine model	Brand	Model
GPW60P/FS3A	1500		1104D-44TG2		
GPW65P/FS3A	1500		1104D-44TG3		SVX300+2xHAX309
GPW70P/ST3	1800	Perkins	1104D-44TG2	Chalwin	Non-Hazardous
GPW80P/FNE	1500		1104A-44TG2		Areas
GPW95P/SNE	1800		1104A-44TG2		

8.5.1.3 B10 – EEG - Electronic Engine Governor

Compatibility: Genset with mechanical governor as standard.

Incompatibility: MPP (Included)

Available as: Supplement

EEG consist in a genset equipped with an engine with electronic governor, Electronic governor provides more accurate engine speed adjustment from no-load condition to full load.

It allows to have better engine performance compared to the one with mechanical governor.

If necessary additional I/O and EEG is present, is mandatory to order both ARM1 and ARM4.

8.5.1.4 B10 – HDF - Heavy-Duty Air Filter

Compatibility: All genset.

Incompatibility: none.

Available as: Supplement

The HDF option consist of a bigger air filter that allows working in dusty environments and allows a lengthening of maintenance intervals.

The HDF is a two-stage air cleaner with built-in high efficiency pre-cleaner.
Air Cleaner is designed especially for on and off road equipment operating in medium to heavy dust environments.
HDF Easily serviced with clamp-on cover design.

Genset model	rpm	Engine brand	Engine model	Brand	Model
GPW60P/FS3A	1500	Perkins	1104D-44TG2	Donaldson	D080069 (H) With Vac Valve
GPW65P/FS3A	1500		1104D-44TG3		
GPW70P/ST3	1800		1104D-44TG2		
GPW80P/FNE	1500		1104A-44TG2		
GPW95P/SNE	1800		1104A-44TG2		
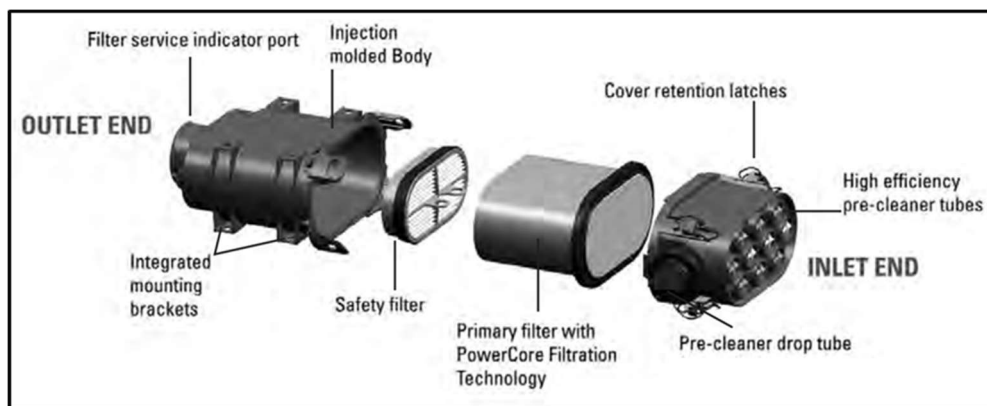
8.5.1.5 B10 – WSP - Water Separator Filter (Racor)

Compatibility: All genset.

Incompatibility: WSP2.

Available as: Supplement

WSP option consist in Water separator fuel filter. This fuel filter allows to filter water and dirty from the fuel before it entry into the engine.
This option is particularly suitable when fuel quality is not guaranteed and it may compromise the proper engine operation. WSP protects the precision components of your engine from dirt, rust, algae, asphaltenes, varnishes and especially water, which is prevalent in low distillate fuels.

Filter brand: Racor
Filter model: 500FG
Filters capacity: 10 micron

How It Works
WSP remove Contaminants from fuel by three-stage-process:
Stage 1 – Separation using the fuel flow, the stationary turbine separates large solids and free water through enhanced centrifugal force.
Stage 2 – Coalescing Smaller water droplets and solids coalesce on the conical baffle and fall into the collection bowl.
Stage 3 – Filtration Engines will benefit from near 100% water separation and fuel filtration with Racor's proprietary Aquabloc® water repelling media.

The replaceable filters are available in 2, 10, and 30 micron ratings.

8.5.1.6 B10 – WSP2 - Water Separator Filter 2 (Mann Hummel)

Compatibility: All genset.

Incompatibility: WSP.

Available as: Supplement

WSP2 option consist in Water separator fuel filter. This fuel filter allows to filter water and dirty from the fuel before it entry into the engine.
This option is particularly suitable when fuel quality is not guaranteed and it may compromise the proper engine operation.

Filter brand: Mann Hummel
Filter model: Preline 270
Filters capacity: 6 micron

✓ Use with diesel fuel DIN ISO 590 (5 % FAME) DIN 51 628 (7 % FAME)
✓ Up to 270 l/h volume flow rate
✓ 93% water separation

8.5.1.7 B10 – CDP - Coolant Draining Pipe

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement

CDP option consist in a pipe with a valve in the end that allow an easy and clean coolant radiator drainage.

8.5.2   B10 – ALTERNATOR OPTIONS

For more info regarding Alternator option WTP, ACH scope of supply, see *ANNEX H – ALTERNATOR OPTION*.

8.5.2.1 B10 – PMG - Permanent Magnet Generator on alternator

This option is under definition for this canopy size.

8.5.3   B10 – BASEFRAME OPTIONS

8.5.3.1 B10 – LPT - Leak Proof Tray

Compatibility: All genset.

Incompatibility: with MFT set in fully bounded subbase.

Available as: Supplement

LPT option consist in a **tray inside the base frame** that avoid leak of fuel, oil, cooling in the ground.

LPT also included **Leak detection sensor**.

This option is required by many national legislation around the word.

LPT design: **tray**

LPT weight: **61Kg**

Leak detection sensor: **Electromagnetic level sensor**

Canopy Genset dimensions with LPT: **standard dimensions**, LPT fit inside standard base frame

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All pictures shown in this document are for illustration purpose only. Actual product features may vary due to product enhancement without notice.

8.5.4 B10 – FUEL TANK OPTIONS

8.5.4.1 B10 – PFT - Plastic Fuel Tank

Compatibility: All genset.

Incompatibility: all MFT.

Available as: Supplement

PFT option consist in a plastic fuel tank integrated in the genset **standard base frame.**

Tank material: **Plastic**

Tank capacity: **209 litre**

Tank weight: **16 Kg**

Genset dimensions with PFT: **standard dimensions**, PFT fit inside standard base frame

For specific genset model autonomy with different tanks, see product data sheet.

8.5.4.2 B10 – MFT-S - Metal Fuel Tank-Small

Compatibility: All genset.

Incompatibility: PFT, MFT-M.

Available as: Supplement

MFT-S option consist in a small size metal fuel tank integrated in the genset **standard base frame.**

Tank material: **Metal**

Tank capacity: **120 litre**

Tank weight: **38 Kg**

Genset dimensions with MFT-S: **standard dimensions**, MFT-S fit inside standard base frame
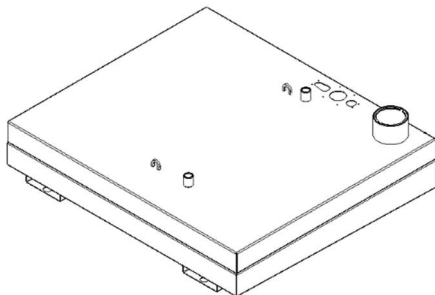
For specific genset model autonomy with different tanks, see product data sheet.

8.5.4.3 B10 – MFT-M - Metal Fuel Tank-Medium

Compatibility: All genset.

Incompatibility: PFT, MFT-S.
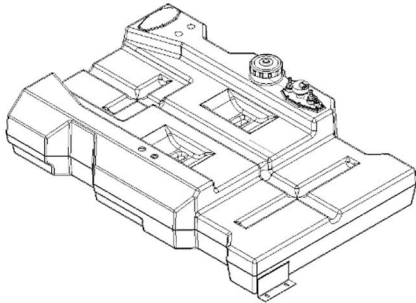
Available as: Supplement

MFT-M option consist in a medium size metal fuel tank integrated in the genset **standard base frame.**

Tank material: **Metal**

Tank capacity: **300 litre**

Tank weight: **61 Kg**

Genset dimensions with MFT-M: **standard dimensions**, MFT-M fit inside standard base frame
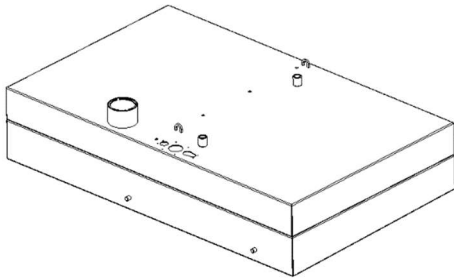
For specific genset model autonomy with different tank, see product data sheet.

8.5.4.4 B10 – TWF – Three Way Fuel valve

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement

TWF option consist in a six way valve designed for use the fuel from external tank and increase the autonomy of the generator.
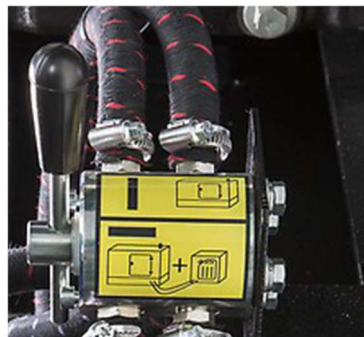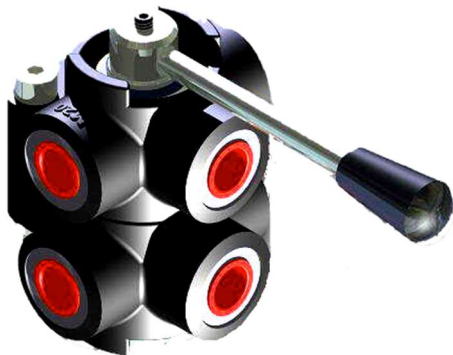
8.5.4.5 B10 – EFP – Electric Fuel Pump

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement

EFP option consist in an electric pump useful when is necessary to fill the genset tank from an external fuel tank.

High Performance heavy duty electronic pump:
Brand: Motor Components, LLC
Model: Duralift

Flow rate @ 0,4 bar	26,5 l/min
Voltage	12 DC V
Maximum operation pressure	0,79 bar

8.5.4.6 B10 – QFC – Quick Fuel Connectors

Compatibility: All genset. Mandatory include TWF supplement.

Incompatibility: None.

Available as: Supplement

The QFC option installed on the six way valve allows the rapidly increase of the autonomy of the generator through an external tank.
QFC consist of:
- ✓ six way fuel valve
- ✓ two connectors:
  - • Inlet male
  - • Outlet female

This option is supplied with rubber cap.

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8.5.5 B10 – ENCLOSURE OPTIONS

For more info enclosure options DCC2, DCCX, BRB, GDH, PSM scope of supply, see *ANNEX I – ENCLOSURE OPTIONS.*

8.5.5.1 B10 – EXS - Extra Silent Enclosure

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement.

EXS option consist in an Extra Silent enclosure that allows to have a low noise emissions, reducing noise level up to -4dB(A) compared to standard enclosure.

It include an additional roof module that thanks to internal soundproofing partitions reduce the noise coming from air expulsion area.

This option is particularly suitable for installation near city centre and in any place where severe noise emission restriction are present.

<u>Genset dimensions with EXS LxWxH*:</u> **2400x1040x2332 mm**

<u>EXS weight:</u> **215 kg**

*refer to genset with screwed fit and no other options. Roof Lifting Point included.
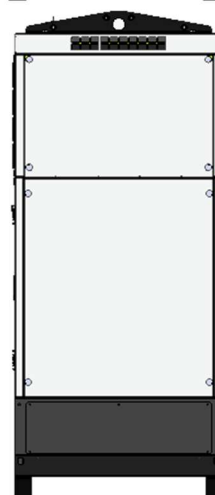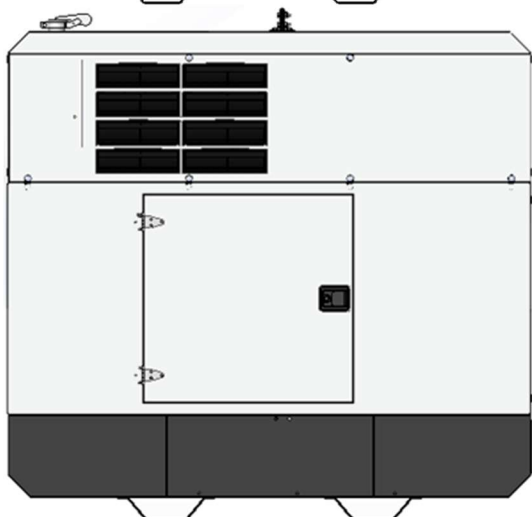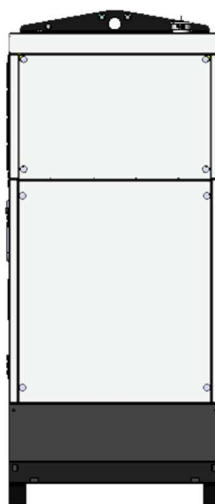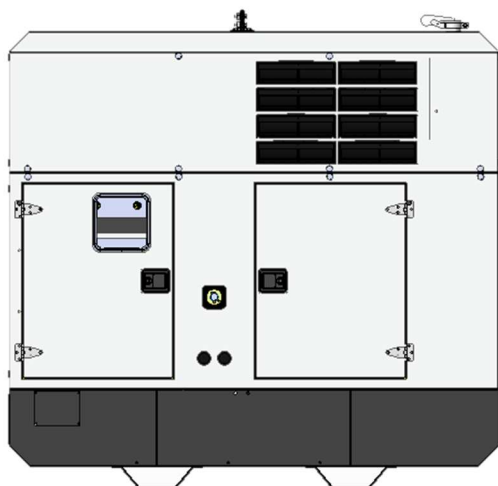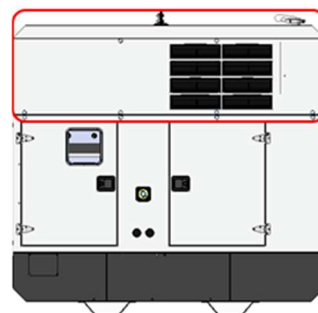
8.5.6 B10 – LIFTING/HANDLING OPTIONS

8.5.6.1 B10 GSB - Galvanized skid base with fork lift pockets

Compatibility: All genset.

Incompatibility: None.

Available as: Accessory/ Supplement

GSB option consist in a galvanized skid base that can be screwed to the genset base frame (removing feet). This option allow to protect the genset base frame from the ground and being equipped with fork lift pockets, it also allow a better handling by forklift.

Canopy Genset overall dimensions with GSB LxWxH*: **2400x1040x1844 mm**

GSB weight: **72 kg**

GSB material: **S235 hot-dipped galvanized**

refer to genset with Roof Lifting Point and no other option included.

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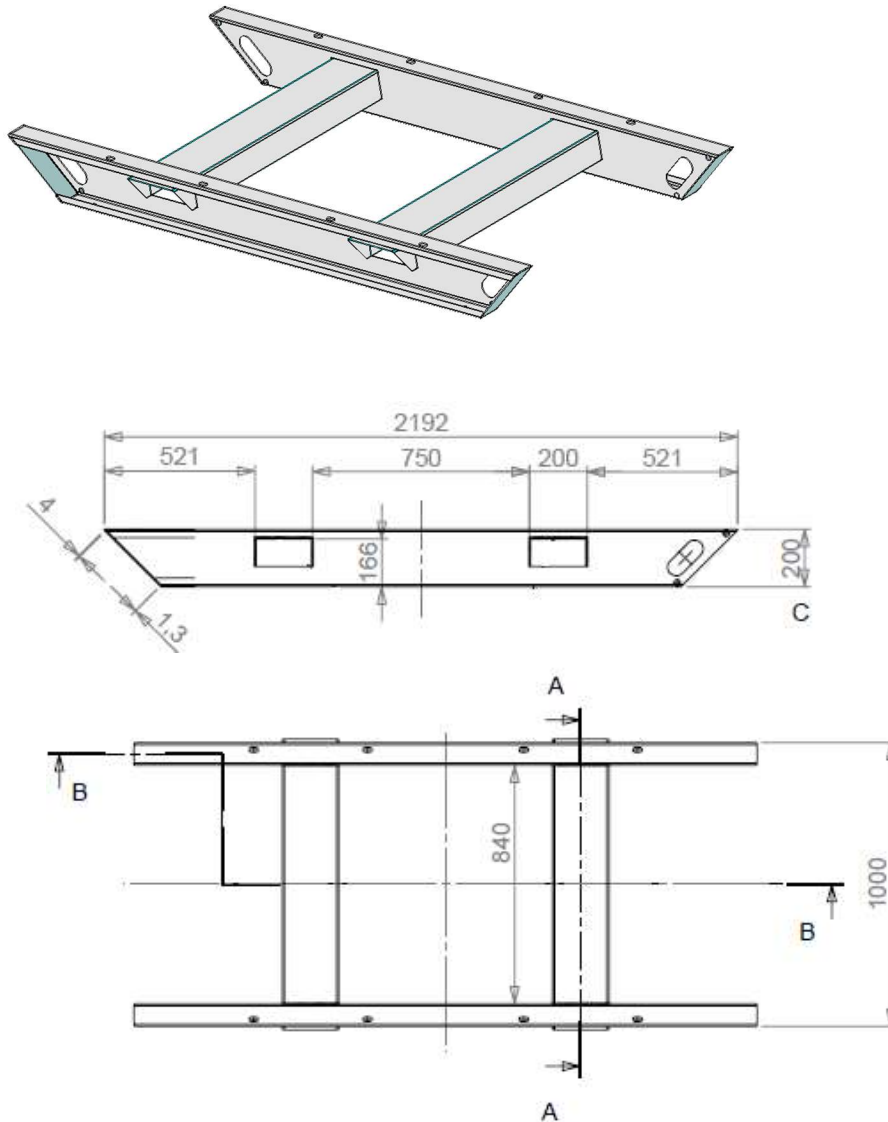
8.5.7 B10 – EXHAUST SYSTEM OPTIONS

8.5.7.1 B10 – ESA - Exhaust Spark Arrestor

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement

The exhaust spark arrestor allows preventing the emission of flammable debris from combustion sources.

Diesel Engine exhaust spark arrestors are a basic, but key safety feature for both hazardous areas and lower risk diesel engine applications such as agriculture or forestry where a spark from the exhaust system may cause ignition of combustible material.

Those Spark Arrestors are designed as a safety device, specifically for preventing the risk of fire caused by the spread of sparks emitted from diesel engines.

All diesel engines have the potential to emit sparks even the latest clean engines. This is due to the high carbon particulate content, carbon build up and the high ratio of free oxygen in the exhaust gas when on and off load. The amount of energy carried by these sparks and the risk of them being transmitted over large areas in the presence of flammable materials, gases or dust can significantly increase the chances of igniting fires or causing explosions.

Spark Arrestors are mandatory equipment in many industries where potentially explosive environments are common:

- *Oils & Gas Industries*
- *Pharmaceutical*
- *Petrochemical Industries*
- *Mining*
- *Timber/Paper Handling & Processing*
- *Military Munitions/Aviation*
- *Agriculture/Forestry*

This Spark arrestor is ATEX certified.

8.5.7.2 B10 – HPP - Hot Parts Protection

Compatibility: All genset.

Incompatibility: none.

Available as: Supplement

HPP option consist in metal grid protections that protect engine hot parts from possible direct contact.

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All pictures shown in this document are for illustration purpose only. Actual product features may vary due to product enhancement without notice.

8.5.8 B10 – BATTERY OPTIONS

8.5.8.1 B10 – MBS - Manual Battery Switch

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement

MBS option consist in handle connected to the genset starting batteries that allows to disconnect batteries from the electrical circuit.
This option is particularly suitable when genset is not operating and avoid batteries discharging.

MBS is located in common option tray, it allow to find MBS always in the same position.

General features:
- ✓ IP665
- ✓ Operating temperature: -40ºC a +85ºC
- ✓ Nominal Intensity: 250 A
- ✓ Voltage: 12/24 VDC
- ✓ Maximum capacity: 2500A for 5 sec
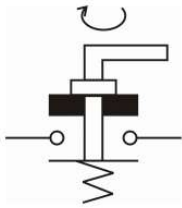
8.5.8.2 B10 – BAT - Genset Starting Battery

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement

BAT option consist in starting genset batteries.

Genset model	rpm	Engine brand	Engine model	Number of batteries	Batteries capacity	Voltage
GPW60P/FS3A	1500		1104D-44TG2			
GPW65P/FS3A	1500		1104D-44TG3			
GPW70P/ST3	1800	Perkins	1104D-44TG2	1	80 Ah	12 V
GPW80P/FNE	1500		1104A-44TG2			
GPW95P/SNE	1800		1104A-44TG2			

8.5.9 B10 – TRAILER OPTION

8.5.9.1 B10 – STR – Site Trailer with connection ball hitch type

Compatibility: All genset.

Incompatibility: RTR.

Available as: Supplement and Accessory.

STR option consist in a trailer not homologated for road use. To be defined during the order

8.5.9.2 B10 – RTR – Road Trailer with connection ball hitch type

Compatibility: All genset.

Incompatibility: STR.

Available as: Supplement and Accessory.

RTR option consist in a trailer homologated for road use. To be defined during the order.

8.5.9.3 B10 – TEX – Towing Eye for STR/RTR

Compatibility: Generator with STR or RTR option. All genset.

Incompatibility: None.

Available as: Supplement and Accessory.

TEX option to be defined during the order

8.5.10 – B10 – CONTROL PANEL OPTIONS

For more info regarding Power/Control panel compatibilities and MRS , ACP and MPP scope of supply see *ANNEX A – CONTROL PANELS*

8.5.10.1 – B10 – WAMF – Without AMF

Compatibility: All genset with ACP.

Incompatibility: MRS, MPP. Genset with motorized circuit breaker (GMB2).

Available as: Supplement

WAMF option allows to have the ACP control panel without AMF option.

8.5.10.2 B10 – RSS – Remote Start and Stop

RSS option consist in two signals on control panel that allow to have start and stop of genset from remote, when these two signals are connected to an external cu.

This option is under final definition and design.

8.5.10.3 B10 – Analogue Gauges

For more info regarding Analogue Gauges EAG, AHM, FAG, VMT, AMT scope of supply, see *ANNEX F - ANALOG GAUGES*

8.5.11 B10 – POWER PANEL OPTION

For more info regarding Power/Control panel configuration and scope of supply, see *CONTROL AND POWER PANELS* **and** *ANNEX B – POWER PANELS.*

For more info regarding Connection System TN-S, TNC and IT, see *ANNEX G – CONNECTION SYSTEM*.

8.5.11.1 B10 – ETB - External Terminal Board

Compatibility: GCB2. Mandatory include with SPBx option.

Incompatibility: ERDF, ETB-G, GMB2 (Included with MPP).

Available as: Supplement

The External terminal board consist of robust copper bars that allows an easy external power cables connection.
ETB is included as standard in all GCB2 Power Panels with a current >400A.
ETB is included as standard in all GMB2 Power Panels (MPP).

Current size [A]	Number of copper bars	Section of copper bars [mm2]	Recommended cable size [3Ph+N+PE] [mm2]
100A	5	15x5	3x35 + 1x16 + 1x16
125A		15x5	3x50 + 1x25 + 1x25
160A			3x70 + 1x35 + 1x35
250A		5 x (20x5)	3x95 + 1x50 + 1x50
320/400A		5 x (20x10)	3x(2x70) + 1x70 + 1x70

8.5.11.2 B10 – ETB – G - External Terminal Board for German Market

Compatibility: All genset. GCB2 (ACP), GMB2.

Incompatibility: ETB, ERDF.

Available as: Supplement

The External terminal board consist of robust copper bars that allows an easy external power cables connection.

ETB-G is a special terminal board suitable for German market, where all copper bar have same dimension (3 phases and N + PE) and power cables from the monoblock have same section.

Current size [A]	ETB-G Number of copper bars	ETB-G Section of copper bars [mm2]	ETB-G Recommended cable size [3Ph+N+PE] [mm2]
100A	5	5x (15x5)	5x[25]
125A		5x (15x5)	5x[35]
160A		5x(15x5)	5x[50]
250A		5x(20x5)	5x[95]
320A		5 x (20x10)	5x[2X50]
400A		5 x (20x10)	5x[2X70]

8.5.11.3 B10 DFS – Dual Frequency Switch (50/60Hz)

Compatibility: ACP, MPP. Engine must be switchable.

Incompatibility: MRS.

Available as: Supplement

DFS option consist in two position selector mounted inside the control panel, which allows the possibility to switch from 50Hz @400V to 60Hz @480V. When the DFS is combined with socket panel box the sockets can only be used at 400/230V voltage output (to verify).
The DFS option includes a precision potenciometer (1kOhm) for voltage adjustament (mounted inside the control panel).

Frequency switch with two position

Potentiometer for voltage adjustment

8.5.11.4 B10 IMD – Insulation Monitoring Device

Compatibility: All genset.

Incompatibility: ADI

Available as: Supplement

The IMD supplements is an insulation monitoring for mobile generators. It monitors the insulation resistance RF of an unearthed AC system of 0V up to 300 V to earth that is supplied by a mobile generator. The currently measured insulation resistance is indicated on the LC display. In this way, any changes, for example, when circuits of loads are connected to the system, can be recognized easily. The maximum permissible system leakage capacitance Cemax is 5 µF.

The IMD is useful to comply with the German legislation. It is use in many kind of applications:

- IEC 60364-7-717, DIN VDE 0100-717 (2005) Electrical installations in mobile or transportable units
- DIN VDE 0100-551 (VDE 0100-551), IEC 60364-5-551 Low-voltage generating sets (mobile generators)
- GW 308 "Mobile Stromerzeuger für Rohrleitungsbaustellen 8/00" (Mobile auxiliary power generators on pipeline site") (DVGW)
- BGI 867 (German Berufsgenossenschaft Information) Auswahl und Betrieb von Ersatzstromerzeugern auf Bau- und Montagestellen (Selecting and operating standby generators on construction and installation sites).

Operating elements:

- 1- Power On LED "ON", flashes in case of interruption of the connecting leads E/KE orL1/L2
- 2- Alarm LED "AL1", lights when the value falls below the set response value Alarm 1 and flashes

in case of interruption of the connecting leads E/KE or L1/L2

- 3- Alarm LED "AL2", lights when the value falls below the set response value Alarm 2 and flashes in case of interruption of the connecting leads E/KE or L1/L2
- 4- LC display
- 5- Test button "T": to call up the self-test. Arrow up button: parameter change, to move up in the menu
- 6- Reset button "R": to delete stored insulation fault alarms parameter change, to move down in the menu
- 7- "MENU" button: to call up the menu system. Enter button: to confirm parameter changes.

8.5.11.5 B10 – ADI - Adjustable Differential Protection

Compatibility: All genset.

Incompatibility: IMD.

Available as: Supplement.

ADI is an adjustable differential protection external to the control board.
It is a residual current relay with external toroidal transformer, useful to detect leakage current. The advantage of this type of differential protection is that is possible to set sensitivity and intervention time.

- ✓ **Type** A (up to IDn=5 A)
- ✓ **Operating voltage** 230-400 Vac +10% / -15%
- ✓ **Auxiliary supply frequency** 50-60 Hz
- ✓ **Operating temperature** -25….+70 °C
- ✓ **Sensitivity settings IDn** 0.03-0.1-0.3-0.5-1-2-3-5-10-30 A
- ✓ **Tripping time settings Dt** 0-0.06-0.2-0.3-0.5-1-2-3-5-10 s
- ✓ **Protection degree** IP20
- ✓ **Standards** IEC/EN 60947-2; IEC/EN 62020

ADI placed at the front of Control Panel

Toroid placed at the Power Panel

8.5.11.6 B10 – ERDF – Bus Bar Arrangement

Compatibility: All genset.

Incompatibility: ETB.

Available as: Supplement.

The option Bus Bar Arrangement allows to have different neutral scheme connections, Genset start with GCB open and 3 led for voltage presence and phase rotation.

Current size [A]	Number of copper bars	Section of copper bars [mm2]	Recommended cable size [3Ph+N+PE] [mm2]
100A	5	15x5	3x35 + 1x16 + 1x16
125A			3x50 + 1x25 + 1x25
160A			3x70 + 1x35 + 1x35
250A		5 x (20x5)	3x95 + 1x50 + 1x50
320/400A		5 x (20x10)	3x(2x70) + 1x70 + 1x70

8.5.11.7 B10 – SBT – Switch Breaker Trip

Compatibility: Only with ACP.

Incompatibility: MPP(Included), MRS

Available as: Supplement.

The option SBT allows higher protection against direct contact.

When the generator is working in case of unexpected opening of the doors, the circuit breaker open and the load is disconnected and an alarm is present in the control unit.

8.5.12 B10 – SOCKETS PANEL AND POWER LOCK OPTION

For more info regarding Sockets panel compatibilities and scope of supply, see *6.3 SOCKET PANEL BOX* and *11 ANNEX C – SOCKETS PANEL BOX*.

Socket Panel Box dimension for A18 LxWxH [mm] 570x511x208.
Auxiliary Power Input Socket included as standard.
Mandatory include ETP supplement with SPBx.

8.5.12.1 B10 – PWL – POWERLOCK

Compatibility: All genset.

Incompatibility: None. Supplement under definition.

Available as: Supplement.

PWL option consist in a Power Lock Box is a 3 phase high power-connecting unit, used as a termination point for power cables. The boxes include a number of safety features to prevent incorrect connection and disconnection.

All power lock devices are 'keyed' to eliminate the possibility of connecting with the wrong line, and color coded to suit international 3 phase standards.

PWL are directly protected by the main circuit breaker of the generator.

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Features:
- ✓ Current rating: **400A**
- ✓ Connect with standard Power Lock connectors
- ✓ Sequential connecting ensures
- ✓ Ground/Earth is connected before
- ✓ Available color coded to suit European, North American and Australian 3 phase standards (specify during the order)
- ✓ All ports are keyed to prevent incorrect connection
- ✓ Finger protected
- ✓ Lock to prevent interference
- ✓ Environmentally sealed connector ports to protection level IP65

Final design is under definition

Annexes

9   ANNEX A – CONTROL PANELS

9.1 MRS – Manual Remote Start Control Panel

Compatibility: All genset.

Incompatibility: ACP, MPP, RGWx, ARMx, OWS

Available as: Standard basic configuration with GCB2.

MRS control panel consist in a Manual Control Panel with the function of remote start.
This panel is equipped with:
- ✓ Control unit: **Comap Intelinano NT Plus**
- ✓ Selector switch
- ✓ Alarm Horn

For general features and control/power panels compatibilities,
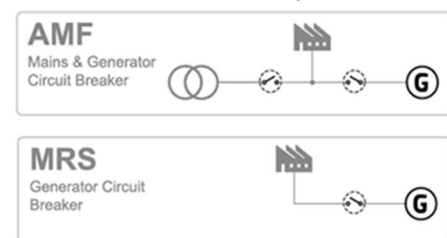see paragraph *6.2 CONTROL AND POWER PANELS*.

Intelinano NT Plus:

Main Features:
- ✓ AMF and MRS controller with current measurement and support for efi engine
- ✓ Stand-by and prime power application in one model
- ✓ 1/3 Phase generator voltage measurement (3/3 phase when used as MRS controller)
- ✓ 1 Phase generator current measurement
- ✓ 3 Phase mains voltage measurement
- ✓ Connection type and voltage auto detect
- ✓ Various generator and engine protections
- ✓ Icon menu, no text
- ✓ Automatic or manual MCB and GCB control
- ✓ "Zero" power consumption mode
- ✓ Battery voltage, Service time and Running hours indication
- ✓ All set points and I/O's configurable via front panel
- ✓ Ability to catch up on running engine (for manual engine start)
- ✓ Event log (10 events)
- ✓ Up to 3 analog inputs (shared with binary inputs)
- ✓ Up to 6 binary inputs (1 binary input is shared with binary output)
- ✓ 2 high side - high current outputs
- ✓ 4 high side binary outputs
- ✓ D+ pre-excitation terminal
- ✓ ECU support (CAN J1939)
- ✓ USB

Functions and Protections (with ANSI code)**:**
- ✓ Over voltage 59
- ✓ Under voltage 27
- ✓ Over frequency 81H
- ✓ Under frequency 81L
- ✓ Phase rotation* 47
- ✓ Gas level 71

9.2 ACP – Automatic Control Panel

Compatibility: All genset.

Incompatibility: MRS, MPP.

Available as: Standard basic configuration with GCB2.

ACP control panel consist in an Automatic Control Panel with AMF and MRS functions.
This panel is equipped with:
- ✓ Control unit: **Comap InteliLite AMF25**
- ✓ Selector switch
- ✓ Alarm Horn

For general features and control/power panels compatibilities, see chapter *6.2 CONTROL AND POWER PANELS*.

InteliLite AMF25:

Main Features:
- ✓ 5 languages in the controller & translator functionality
- ✓ 3 levels of password
- ✓ 3 sets of alternative configurations
- ✓ Magnetic pickup
- ✓ ECU support & Tier 4 Final ready
- ✓ 2 slots for plug-in modules
- ✓ CAN modules support
- ✓ Power over USB for controller's adjustment
- ✓ In-built PLC, complemented with a monitoring/debugging tool
- ✓ 8 binary outputs, 8 binary inputs, 4 analog inputs
- ✓ high-current binary outputs
- ✓ Run Hours source selector
- ✓ Activation of outputs based on
- ✓ inputs/power/temperature
- ✓ Real time clock
- ✓ Multipurpose flexible timers
- ✓ Comprehensive history log with up to 350 events
- ✓ 3 maintenance timers (counting even under zero)
- ✓ Possibility to disable protections

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All pictures shown in this document are for illustration purpose only. Actual product features may vary due to product enhancement without notice.

Compliance to:
- ✓ EN 61000-6-2
- ✓ EN 61000-6-4
- ✓ EN 61010-1
- ✓ EN 60068-2-1 (-20 °C/16 h for std)
- ✓ EN 60068-2-2 (70 °C/16 h)
- ✓ EN 60068-2-6 (2÷25 Hz / ±1,6 mm; 25÷100 Hz / 4,0 g)
- ✓ EN 60068-2-27 (a=500 m/s2; T=6 ms)
- ✓ EN 60068-2-30:2005 25/55°C, RH 95%, 48hours
- ✓ EN 60529 (front panel IP65, back side IP20)

Functions and Protections (with ANSI code)**:**
- ✓ Over voltage 59
- ✓ Under voltage 27
- ✓ Voltage asymmetry and Phase rotation** 47
- ✓ Under frequency 81L
- ✓ Over current* 50 + 51
- ✓ Current unbalance
- ✓ Load shedding 32P
- ✓ Overload 32
- ✓ Power factor 55
- ✓ Over frequency 81H
- ✓ Temperature 49T
- ✓ Earth fault current 50N + 64 (available as option)

Remote control and Expansion modules available:
- - **RGW1 - CM-GPRS + Antenna**
- - **RGW3 - CM-Ethernet**
- - **RGW4 - CM-4G-GPS + Antenna**
- - **RGW5 - CM-RS232-485**
- - **ARM1 - EM-BIO8-EFCP**
- - **ARM6 - EM-BIO8-EFCP + Toroid**
- - **ARM2 - IGS-PTM**
- - **ARM3 - IR-B8 24V**
- - **ARM4 - IR-B8 12V**
- - **ARM5 - IGL-RA15**

For detailed info of each modules, see paragraph *12 ANNEX D – EXPANSION MODULES.*

9.3 MPP - Modular Parallel Panel

Compatibility: All genset.

Incompatibility: MRS, ACP. ETB (included with MPP).

Available as: Standard basic configuration with GMB2.

MPP control panel consist in a Modular Parallel Panel with MINT and SPtM functions.

This panel is equipped with:
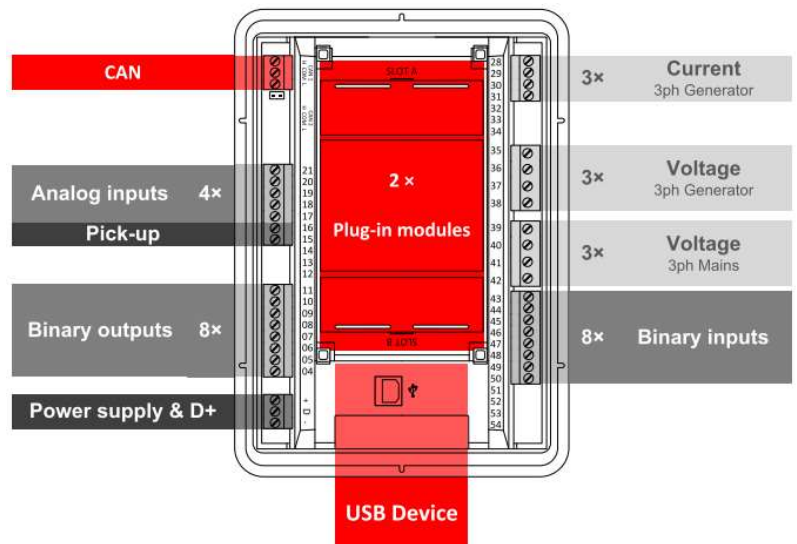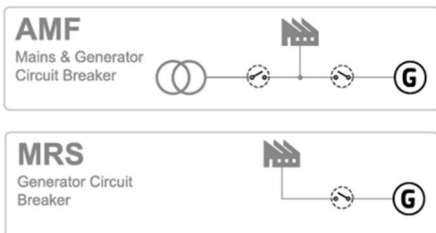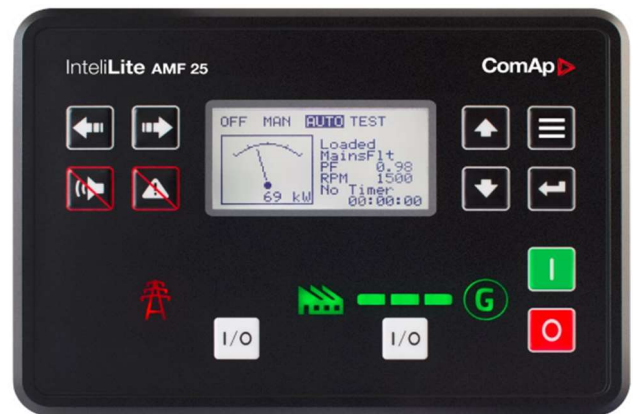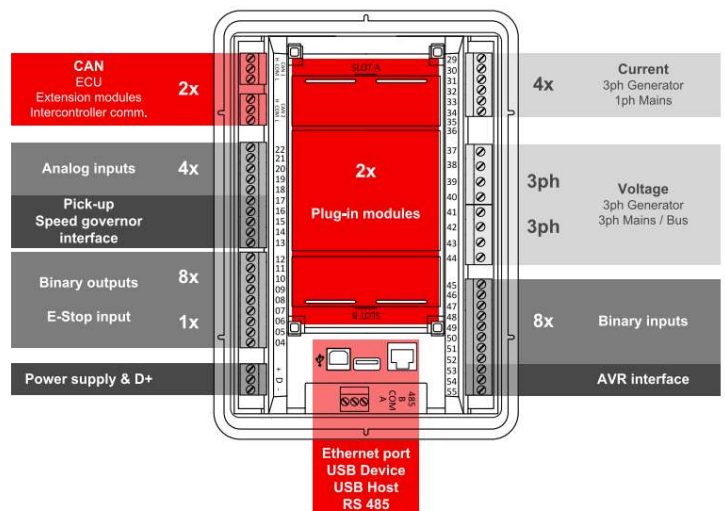- ✓ Control unit: **Comap InteliGen 500**
- ✓ Selector switch
- ✓ Alarm Horn

For general features and control/power panels compatibilities see chapter .

InteliGen 500:

Main Features:
- ✓ Comprehensive paralleling gen-set controller
- ✓ Parallel operation for up to 32 gen-sets
- ✓ Direct communication with ECU
- ✓ Multiple Island or Single Parallel to Mains applications both in one controller
- ✓ Two types of synchronizations: Phase Match or Slip Synchro
- ✓ Two types of Load/VAr Sharing: Isochronous (CAN) or Droop, including Emergency Droop
- ✓ PLC support with PLC editor and monitor
- ✓ Perfect solution for rental applications:
- ✓ Load sharing and VAr sharing via CAN
- ✓ Integrated USB for configuration
- ✓ Isolated RS485 port on board for MODBUS
- ✓ Integrated USB Host for uploading/downloading FW/Configuration with USB key
- ✓ Integrated Ethernet port
- ✓ Up to 5 languages in the controller
- ✓ Detailed history with up to 500 events
- ✓ Load shedding, dummy load capability
- ✓ 5" TFT color screen with 800x480 pixel resolution
- ✓ Automatic temperature based cooling/heating
- ✓ Comprehensive gen-set protections
- ✓ Multipurpose flexible timers with full calendar
- ✓ True RMS measurement

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All pictures shown in this document are for illustration purpose only. Actual product features may vary due to product enhancement without notice.
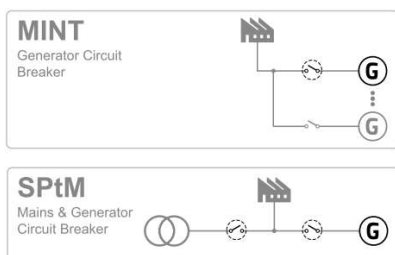
Compliance to:
- ✓ EN 61000-6-2
- ✓ EN 61000-6-4
- ✓ EN 61010-1
- ✓ EN 60068-2-1 (-20 °C/16 h for std version)
- ✓ EN 60068-2-2 (70 °C/16 h)
- ✓ EN 60068-2-6 (2÷25 Hz / ±1,6 mm; 25÷100 Hz / 4,0 g)
- ✓ EN 60068-2-27 (a=500 m/s2; T=6 ms)
- ✓ EN 60068-2-30:2005 25/55°C, RH 95%, 48hours
- ✓ EN 60529 (front panel IP65, back side IP20)

Protections (with ANSI code)**:**
- ✓ Synchronism check 25
- ✓ Earth fault current 50N + 64
- ✓ Under voltage 27
- ✓ Overcurrent (IDMT) 51
- ✓ Overload 32
- ✓ Power factor 55
- ✓ Load shedding 32P
- ✓ Over voltage 59
- ✓ Reserve power 32R
- ✓ Gas (fuel) level 71
- ✓ Excitation loss 40
- ✓ Vector shift 78
- ✓ Current unbalance 46
- ✓ Over frequency 81H
- ✓ Voltage asymmetry and Phase rotation 47
- ✓ Under frequency 81L
- ✓ Temperature 49T
- ✓ ROCOF 81R
- ✓ Generator overcurrent 50

Remote control and Expansion modules available:
- - **RGW1 - CM-GPRS + Antenna**
- - **RGW4 - CM-4G-GPS + Antenna**
- - **RGW5 - CM-RS232-485**
- - **ARM1 - EM-BIO8-EFCP**
- - **ARM6 - EM-BIO8-EFCP + Toroid**
- - **ARM2 - IGS-PTM**
- - **ARM3 - IR-B8 24V**
- - **ARM4 - IR-B8 12V**
- - **ARM5 - IGL-RA15**

For detailed info of each modules, see paragraph *12 ANNEX D – EXPANSION MODULES.*

10   ANNEX B – POWER PANELS

10.1 GCB2 - Genset Circuit Breaker panel 2

Compatibility: Only with MRS or ACP

Incompatibility: MPP.

Available as: Standard basic configuration with MRS, ACP, ASP, MSP.

GCB2 consist in a metal cabinet with all power cables and circuit breaker 4 poles.
ETB is available as option and included as standard from 400A size.

Circuit breaker size*	Brand	Model
32A		S204-B32
40A		S204-B40
50A		S204-B50
63A		S204-B63
80A		S204-B80
100 A		S204-B100
125 A	ABB	S804C-B125
160 A		XT2N 160 TMG 4P
250 A		XT3N 250 TMG 4P
320/400 A		T5N 400 PR221DS 4P

* Circuit breaker size define for each genset model, available in product card

For general features and control/power panels compatibilities see chapter *6.3 CONTROL AND POWER PANELS*.
For more info related to ETB option, see chapter *A18 – ETB - External Terminal Board* , *B10 – ETB - External Terminal Board.*

10.2 GMB2 - Genset Motorized Breaker panel 2

Compatibility: Only with MPP.

Incompatibility: MRS, ACP.

Available as: Standard basic configuration with MPP.

GMB1 consist in a metal cabinet with all power cables and motorized circuit breaker 4 poles.

ETB available as standard.

Circuit breaker size	Brand	Model
160 A		XT2N 160 TMG 4P + MOE
250 A	ABB	XT3N 250 TMG 4P + MOE
320/400 A		T5N 400 PR221DS 4P + MOE

* Circuit breaker size define for each genset model, available in product card

For general features and control/power panels compatibilities see chapter *6.3 CONTROL AND POWER PANELS*.
For more info related to ETB option, see chapter *A18 – ETB - External Terminal Board* , *B10 – ETB - External Terminal Board.*

11 ANNEX C – SOCKETS PANEL BOX

11.1 SPB1 – Sockets Panel Box 1

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with ETB.

Incompatibility: All other Sockets Kits.

Available as: Supplement

SPB1 option consist in:
- ✓ 1 x 400V CEE 32A 3P+N+T IP67
- ✓ 1 x 400V CEE 16A 3P+N+T IP67
- ✓ 1 x 230V CEE 16A 2P+T IP67
- ✓ 1 x 230V 16A Schuko IP68
- ✓ Common differential protection type A for three phase sockets
- ✓ Each three phases sockest with its own circuit breaker
- ✓ Each single phase provided with Residual Current Circuit Breakers with Overcurrent Protection RCBO
- ✓ Plug for auxiliary power supply 230V 16A

11.2 SPB2 – Sockets Panel Box 2

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with ETB.

Incompatibility: All other Sockets Kits.

Available as: Supplement

SPB2 option consist in:
- ✓ 1 x 400V CEE 63A 3P+N+T IP67
- ✓ 1 x 400V CEE 32A 3P+N+T IP67
- ✓ 1 x 400V CEE 16A 3P+N+T IP67
- ✓ 1 x 230V CEE 16A 2P+T IP67
- ✓ 1 x 230V 16A Schuko IP68
- ✓ Common differential protection type A for three phase sockets
- ✓ Each three phases socket with its own circuit breaker
- ✓ Each single phase provided with Residual Current Circuit Breakers with Overcurrent Protection RCBO
- ✓ Plug for auxiliary power supply 230V 16A

11.3 SPB3 – Sockets Panel Box 3

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with ETB.

Incompatibility: All other Sockets Kits.

Available as: Supplement

SPB3 option consist in:
- ✓ 1 x 400V CEE 32A 3P+N+T IP67
- ✓ 3 x 230V CEE 32A 2P+T IP67
- ✓ Three phase socket without differential protection
- ✓ Each three phases sockets with its own circuit breaker
- ✓ Each single phase provided with Residual Current Circuit Breakers with Overcurrent Protection RCBO
- ✓ Plug for auxiliary power supply 230V 16A

11.4 SPB4 – Sockets Panel Box 4

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with ETB.

Incompatibility: All other Socket Kits.

Available as: Supplement

SPB4 option consist in:

- ✓ 1 x 400V CEE 63A 3P+N+T IP67
- ✓ 3 x 230V CEE 32A 2P+T IP67
- ✓ Three phase socket without differential protection
- ✓ Each three phases socket with its own circuit breaker
- ✓ Each single phase provided with Residual Current Circuit Breakers with Overcurrent Protection RCBO
- ✓ Plug for auxiliary power supply 230V 16A

11.5 SPB5 – Sockets Panel Box 5

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with ETB.

Incompatibility: All other Sockets Kits.

Available as: Supplement

SPB5 option consist in:
- ✓ 1 x 400V CEE 32A 3P+N+T IP67
- ✓ 1 x 400V CEE 16A 3P+N+T IP67
- ✓ 2 x 230V Schuko IP68
- ✓ Common differential protection type A for three phase sockets
- ✓ Each three phases socket with its own circuit breaker
- ✓ Each single phase provided with Residual Current Circuit Breakers with Overcurrent Protection RCBO
- ✓ Plug for auxiliary power supply 230V 16A

11.6 SPB6 – Sockets Panel Box 6

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with ETB.

Incompatibility: All other Socket Kits.

Available as: Supplement

SPB6 option consist in:
- ✓ 1 x 400V CEE 63A 3P+N+T IP67
- ✓ 1 x 400V CEE 32A 3P+N+T IP67
- ✓ 1 x 400V CEE 16A 3P+N+T IP67
- ✓ 2 x 230V Schuko IP68
- ✓ Common differential protection type A for three phase sockets
- ✓ Each three phases sockets with its own circuit breaker
- ✓ Each single phase provided with Residual Current Circuit Breakers with Overcurrent Protection RCBO
- ✓ Plug for auxiliary power supply 230V 16A

11.7 SPB8 – Sockets Panel Box 8

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with ETB.

Incompatibility: All other Socket Kits.

Available as: Supplement

SPB8 option consist in:
- ✓ 1 x 400V CEE 125A 3P+N+T IP67
- ✓ 1 x 400V CEE 63A 3P+N+T IP67
- ✓ 1 x 400V CEE 32A 3P+N+T IP67
- ✓ 1 x 400V CEE 16A 3P+N+T IP67
- ✓ 1 x 230V CEE 16A 2P+T IP67
- ✓ 1 x 230V 16A Schuko IP68
- ✓ Common differential protection type A for three phase sockets (ONLY 63/32/16A)
- ✓ Single differential protection for 125A socket
- ✓ Each three phase socket with its own circuit breaker
- ✓ Each single phase provided with Residual Current Circuit Breakers with Overcurrent Protection RCBO
- ✓ Plug for auxiliary power supply 230V 16A

11.8 SPB9 – Sockets Panel Box 9

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with ETB.

Incompatibility: All other Socket Kits.

Available as: Supplement

SPB9 option consist in:
- ✓ 1 x 400V CEE 125A 3P+N+T IP67
- ✓ 1 x 400V CEE 63A 3P+N+T IP67
- ✓ 3 x 230V CEE 32A 2P+T IP67
- ✓ Three phases sockets without differential protection
- ✓ Each single phase socket provided with its own differential protection type A
- ✓ Each three socket with its own circuit breaker
- ✓ Socket 125A protected by main genset circuit breaker
- ✓ Each single phase provided with Residual Current Circuit Breakers with Overcurrent Protection RCBO
- ✓ Plug for auxiliary power supply 230V 16A

11.9 SPB10 – Sockets Panel Box 10

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with ETB.

Incompatibility: All other Socket Kits.

Available as: Supplement

SPB10 option consist in:
- ✓ 1 x 400V CEE 125A 3P+N+T IP67
- ✓ 1 x 400V CEE 63A 3P+N+T IP67
- ✓ 1 x 400V CEE 32A 3P+N+T IP67
- ✓ 1 x 400V CEE 16A 3P+N+T IP67
- ✓ 2 x 230V Schuko IP68
- ✓ Common differential protection type A for three phase sockets (ONLY 63/32/16A)
- ✓ Each single phase socket provided with its own differential protection type A
- ✓ Socket 125A protected by main genset circuit breaker
- ✓ Each three phases socket with its own circuit breaker (ONLY 63/32/16A)
- ✓ Each single phase provided with Residual Current Circuit Breakers with Overcurrent Protection RCBO

All pictures shown in this document are for illustration purpose only. Actual product features may vary due to product enhancement without notice.

✓ Plug for auxiliary power supply 230V 16A

11.10   SPB12 – Sockets Panel Box 12

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with ETB.

Incompatibility: All other Socket Kits.

Available as: Supplement

SPB12 option consist in:
✓ 2 x 32A 500V 3ph IP66 Industrial Clipsal outlet
✓ 3 x 15A 250V 1ph IP66 Auto Switched
✓ Each three phases sockets with its own circuit breaker
✓ Common differential protection type A for three phase sockets
✓ Each single phase provided with Residual Current Circuit Breakers with Overcurrent Protection RCBO
✓ Plug for auxiliary power supply 230V 16A

11.11   SPB13 – Sockets Panel Box 13

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with ETB.

Incompatibility: All other Socket Kits.

Available as: Supplement

SPB13 option consist in:
✓ 3 x 32A 500V 3ph IP66 Industrial Clipsal outlet
✓ 3 x 15A 250V 1ph IP66 Auto Switched
✓ Each three phases sockets with its own circuit breaker
✓ Common differential protection type A for three phase sockets
✓ Each single phase socket provided with its own differential protection
✓ Each single phase provided with Residual Current Circuit Breakers with Overcurrent Protection RCBO
✓ Plug for auxiliary power supply 230V 16A

11.12   SPB16 – Sockets Panel Box 16

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with ETB.

Incompatibility: All other Socket Kits. IMD.

Available as: Supplement

SPB16 option consist in:
✓ 1 x 400V CEE 32A 3P+N+T IP67
✓ 1 x 400V CEE 16A 3P+N+T IP67
✓ 1 x 230V 16A Schuko IP68
✓ 1 x 230V 16A Schuko IP68
✓ Common differential protection type A 125A 30mA not adjustable for three phase sockets
✓ Each socket with its own circuit breaker
✓ Each single phase provided with earth fault protection
✓ Plug for auxiliary power supply 230V 16A
✓ TNS connection
✓ Included sticker Stromerzeuger Typ C / D on the enclosure above control/power panel
✓ Included sticker Stromerzeuger Typ D next to the ETB

11.13 SPB17 – Sockets Panel Box 17

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with ETB.

Incompatibility: All other Socket Kits. IMD

Available as: Supplement

SPB17 option consist in:
- ✓ 1 x 400V CEE 63A 3P+N+T IP67
- ✓ 1 x 400V CEE 32A 3P+N+T IP67
- ✓ 1 x 400V CEE 16A 3P+N+T IP67
- ✓ 1 x 230V 16A Schuko IP68
- ✓ Common differential protection type A 125A 30mA not adjustable for three phase sockets
- ✓ Each socket with its own circuit breaker
- ✓ Each single phase provided with earth fault protection
- ✓ Plug for auxiliary power supply 230V 16A
- ✓ TNS connection
- ✓ Included sticker Stromerzeuger Typ C / D on the enclosure above control/power panel
- ✓ Included sticker Stromerzeuger Typ D next to the ETB

11.14 SPB18 – Sockets Panel Box 18

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with ETB.

Incompatibility: All other Socket Kits. IMD.

Available as: Supplement

SPB18 option consist in:
- ✓ 1 x 400V CEE 32A 3P+N+T IP67
- ✓ 1 x 400V CEE 16A 3P+N+T IP67
- ✓ 1 x 230V 16A Schuko IP68
- ✓ 1 x 230V 16A Schuko IP68
- ✓ Common differential protection type B 63A 30mA for three phase sockets 32A & 16A
- ✓ Each Schuko provided with its own differential protection type B 16A 30mA
- ✓ Each socket with its own circuit breaker
- ✓ Each single phase provided with earth fault protection
- ✓ Plug for auxiliary power supply 230V 16A
- ✓ TNS connection
- ✓ Included sticker Stromerzeuger Typ C / D on the enclosure above control/power panel
- ✓ Included sticker Stromerzeuger Typ D next to the ETB

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All pictures shown in this document are for illustration purpose only. Actual product features may vary due to product enhancement without notice.

11.15   SPB19 – Sockets Panel Box 19

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with ETB.

Incompatibility: All other Socket Kits. IMD.

Available as: Supplement

SPB19 option consist in:
- ✓ 1 x 400V CEE 63A 3P+N+T IP67
- ✓ 1 x 400V CEE 32A 3P+N+T IP67
- ✓ 1 x 400V CEE 16A 3P+N+T IP67
- ✓ 1 x 230V 16A Schuko IP68
- ✓ Common differential protection type B 63A 30mA for three phase sockets 32A & 16A
- ✓ Three phase socket 63A and shuko provided with their own differential protection type B respectively 500mA & 30mA
- ✓ Each socket with its own circuit breaker
- ✓ Each single phase provided with earth fault protection
- ✓ Plug for auxiliary power supply 230V 16A
- ✓ TNS connection
- ✓ Included sticker Stromerzeuger Typ C / D on the enclosure above control/power panel
- ✓ Included sticker Stromerzeuger Typ D next to the ETB

11.16   SPB20 – Sockets Panel Box 20

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with IMD.

Incompatibility: All other Socket Kits.

Available as: Supplement

SPB20 option consist in:
- ✓ 1 x 400V CEE 32A 3P+N+T IP67
- ✓ 1 x 400V CEE 16A 3P+N+T IP67
- ✓ 1 x 230V 16A Schuko IP68
- ✓ 1 x 230V 16A Schuko IP68
- ✓ Each socket provided with its own differential protection type B 30mA
- ✓ Each socket with its own circuit breaker
- ✓ Each single phase provided with earth fault protection
- ✓ Plug for auxiliary power supply 230V 16A
- ✓ IT connection
- ✓ ETB not needed (the connection is made directly to the circuit breaker)
- ✓ Included sticker Stromerzeuger Typ B on the enclosure above control/power panel

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All pictures shown in this document are for illustration purpose only. Actual product features may vary due to product enhancement without notice.

11.17   SPB21 – Sockets Panel Box 21

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with IMD.

Incompatibility: All other Socket Kits.

Available as: Supplement

SPB21 option consist in:
- ✓ 1 x 400V CEE 63A 3P+N+T IP67
- ✓ 1 x 400V CEE 32A 3P+N+T IP67
- ✓ 1 x 400V CEE 16A 3P+N+T IP67
- ✓ 1 x 230V 16A Schuko IP68
- ✓ Each socket provided with its own differential protection type B 30mA while three phase socket 63A with RCD 500mA
- ✓ Each socket with its own circuit breaker
- ✓ Each single phase provided with earth fault protection
- ✓ Plug for auxiliary power supply 230V 16A
- ✓ IT connection
- ✓ ETB not needed (the connection is made directly to the circuit breaker)
- ✓ Included sticker Stromerzeuger Typ B on the enclosure above control/power panel

11.18   SPB22 – Sockets Panel Box 22

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX. Mandatory order with IMD.

Incompatibility: All other Socket Kits.

Available as: Supplement

SPB22 option consist in:
- ✓ 1 x 400V CEE 125A 3P+N+T IP67
- ✓ 1 x 400V CEE 63A 3P+N+T IP67
- ✓ 1 x 400V CEE 32A 3P+N+T IP67
- ✓ 1 x 400V CEE 16A 3P+N+T IP67
- ✓ 1 x 230V 16A Schuko IP68
- ✓ Each socket provided with its own differential protection type B 30mA while three phase socket 63A with RCD 500mA.
- ✓ Three phase socket 125A without differential protection
- ✓ Each socket with its own circuit breaker while three phase socket 125A under genset circuit breaker.
- ✓ Each single phase provided with earth fault protection
- ✓ Plug for auxiliary power supply 230V 16A
- ✓ IT connection for genset
- ✓ ETB not needed (the connection is made directly to the circuit breaker)
- ✓ Included sticker Stromerzeuger Typ B on the enclosure above control/power panel

11.19   SPB23 – Sockets Panel Box 23

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX.

Incompatibility: All other Socket Kits.

Available as: Supplement

SPB23 option consist in:
- ✓ 1 x 400V CEE 125A 3P+N+T IP67
- ✓ 1 x 400V CEE 63A 3P+N+T IP67
- ✓ 1 x 400V CEE 32A 3P+N+T IP67
- ✓ 1 x 400V CEE 16A 3P+N+T IP67

- ✓ 1 x 230V CEE 16A 2P+T IP67
- ✓ 1 x 230V 16A Schuko IP68
- ✓ Common differential protection type A for three phase sockets 63/32/16A
- ✓ Three phase sockets with 63/32/16A its own circuit breaker - 125A protected by main genset circuit breaker
- ✓ Each single phase provided with Residual Current Circuit Breakers with Overcurrent Protection RCBO
- ✓ Plug for auxiliary power supply 230V 16A

11.20   SLB1 – Sockets Light Box 1

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX.

Incompatibility: All other Socket Kits. ETB.

Available as: Supplement

SLB1 option consist in:
- ✓ 1 x 400V CEE 32A 3P+N+T IP67
- ✓ 1 x 400V CEE 16A 3P+N+T IP67
- ✓ 1 x 230V CEE 16A 2P+T IP67
- ✓ 1 x 230V 16A Schuko IP68
- ✓ Three phase sockets with its own circuit breaker
- ✓ Common differential protection type A for three phase sockets
- ✓ Each single phase provided with Residual Current Circuit Breakers with Overcurrent Protection RCBO

11.21   SLB2 – Sockets Light Box 2

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX.

Incompatibility: All other Socket Kits. ETB.

Available as: Supplement

SLB2 option consist in:
- ✓ 1 x 400V CEE 63A 3P+N+T IP67
- ✓ 1 x 400V CEE 16A 3P+N+T IP67
- ✓ 1 x 230V CEE 16A 2P+T IP67
- ✓ 1 x 230V 16A Schuko IP68
- ✓ Three phase sockets with its own circuit breaker
- ✓ Common differential protection type A for three phase sockets
- ✓ Each single phase provided with Residual Current Circuit Breakers with Overcurrent Protection RCBO

11.22   SLB3 – Sockets Light Box 3

Compatibility: For compatibilities, see paragraph 6.3 SOCKET PANEL BOX.

Incompatibility: All other Socket Kits. ETB.

Available as: Supplement

SLB3 option consist in:
- ✓ 1 x 400V CEE 63A 3P+N+T IP67
- ✓ 1 x 400V CEE 16A 3P+N+T IP67
- ✓ 1 x 230V CEE 16A 2P+T IP67
- ✓ 1 x 230V 16A Schuko IP68
- ✓ Three phase sockets with its own circuit breaker
- ✓ Common differential protection 100A type A for three phase sockets
- ✓ Each single phase provided with Residual Current Circuit Breakers with Overcurrent Protection RCBO

12 ANNEX D – EXPANSION MODULES

12.1 RGW1 – CM-GPRS + Antenna

Compatibility: ACP, MPP. All genset.

Incompatibility: RGW3, RGW4, RGW5, MRS.

Available as: Supplement and Accessory

- ✓ Communication module providing wireless internet connectivity over GPRS and GSM communication
- ✓ Remote monitoring and control capabilities via **LiteEdit 2015**, **WebSuperviso**r and active SMS / Emails alerts and control
- ✓ **WebSupervisor** system support for web based monitoring and control of one or multiple controllers at the same time
- ✓ **AirGate** technology support for easy connection
- ✓ Automatic SMS message on alarm events
- ✓ SMS control of gen-set/engine

12.2 RGW3 – CM-Ethernet

Compatibility: ACP. All genset.

Incompatibility: RGW1, RGW4, RGW5, MRS, MPP.

Available as: Supplement and Accessory

- ✓ Internet / Ethernet module with 10/100 Mbit interface over RJ45 socket
- ✓ Embedded webserver for monitoring and basic adjustments
- ✓ ModBus TCP support
- ✓ ComAp TCP for remote access and full control over **LiteEdit 2015**
- ✓ Full SNMP support including traps (v1 & v2c)*
- ✓ SMTP protocol with authentication for active e-mails sending
- ✓ **AirGate** technology support for easy connection - no need of public and static IP address*
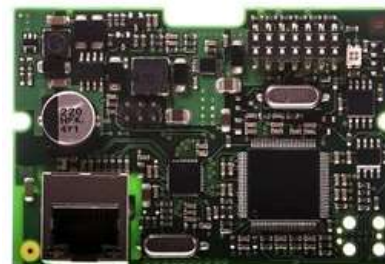
See Glossary for more info regarding LiteEdit 2015 and AirGate.

12.3 RGW4 – CM-4G-GPS + Antenna

Compatibility: ACP, MPP. All genset.

Incompatibility: RGW1, RGW3, RGW5, MRS.

Available as: Supplement and Accessory

✓ 4G and GPS plug-in communication module.

✓ Communication module providing wireless internet connectivity
  - **4G - LTE**
  - 3G - WCDMA, HSDPA, HSUPA, HSPA+
  - 2G - GPRS, EDGE

✓ Supported bands:

Network	Bands
4G (LTE)	B1,B2,B3,B4,B5,B7,B8,B20
3G (UMTS/HSPA)	B1,B2,B5,B8
2G (GPRS/EDGE)	850MHz,900MHz,1800MHz,1900MHz

✓ Remote monitoring and control capabilities via **LiteEdit 2015**, **WebSupervisor** and active SMS / Emails alerts and control
✓ **WebSupervisor** system support for web based monitoring and control of one or multiple controllers at the same time
✓ **AirGate** technology support for easy connection
✓ Automatic SMS message on alarm events
✓ SMS control of gen-set/engine
✓ **GPS location with geofencing and tracking**
✓ **Antenna for 4G and GPS support included in the option**

See Glossary for more info regarding LiteEdit 2015, AirGate and WebSupervisor.

12.4 RGW5 – CM-RS232-485

Compatibility: ACP, MPP. All genset.

Incompatibility: RGW1, RGW3, RGW4, MRS.

Available as: Supplement and Accessory

✓ Communication module with **dual port for RS232 and RS485** providing 2 separate and independent COM channels
✓ Supports Modbus RTU, ECU link and direct connection to **LiteEdit 2015**

See Glossary for more info regarding LiteEdit.

12.5 ARM1 – EM-BIO8-EFCP

Compatibility: ACP, MPP. All genset.

Incompatibility: MRS, ASV.

Available as: Supplement

Binary I/O plug-in module with earth fault current protection measurement.
- ✓ Extension module with 8 configurable binary terminals for inputs or outputs
- ✓ Possibility to connect a current transformer for earth fault current measurement and protection

In some case ARM1 is installed as standard to support some engines functions/reading or is included in some option (e.g. ASV, AFP and DES) to allow the proper operation.

12.6 ARM2 – IGS-PTM

Compatibility: ACP, MPP. All genset.

Incompatibility: MRS.

Available as: Supplement

Analog/Binary Input/Output Module

- ✓ Configurable 8 binary and 4 analog inputs
- ✓ Configurable 8 binary and 1 analog output
- ✓ LEDs indicate the state of binary inputs/outputs
- ✓ Measures values from Pt100 and Ni100 sensors
- ✓ Analog inputs (resistance range 0-250 Ohms, voltage range 0-100mV, current range 0-20mA - selectable via jumper)
- ✓ Up to 4 IGS-PTM can be connected to the controller
- ✓ UL certified

12.7 ARM3 – IR-B8 24V

Compatibility: ACP, MPP. All genset.

Incompatibility: MRS.

Available as: Supplement

The TLP option consist of a module with 8 INPUT/OUTPUT. This option allows to have additional input/output to control unit.
Not possible to order alone. Must be ordered together with other expansion module (e.g. ARM1).
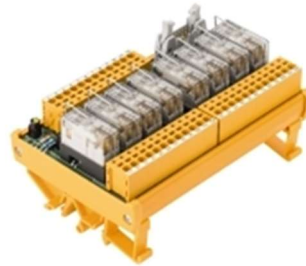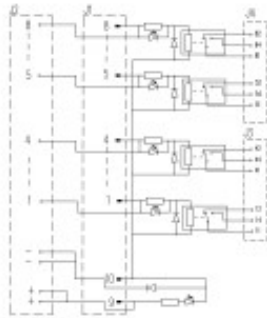
12.8 ARM4 – IR-B8 12V

Compatibility: ACP, MPP. All genset.

Incompatibility: MRS.

Available as: Supplement

The TLP option consist of a module with 8 INPUT/OUTPUT. This option allows to have additional input/output to control unit.
Possible to order alone only with Mechanical engines. With electronics engine must be ordered together with ARM1.
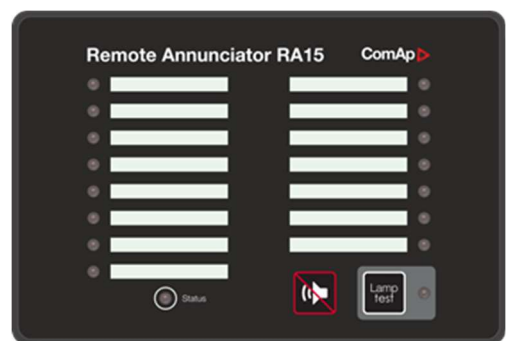

12.9 ARM5 – IGL-RA15

Compatibility: ACP, MPP. All genset.

Incompatibility: MRS.

Available as: Accessory

Remote Annunciator, allow to remote monitoring the status of may alarm/warning.

- ✓ 15 programmable LEDs with configurable colors red-green-yellow
- ✓ Lamp test function with status LED
- ✓ Customizable labels
- ✓ Local horn output
- ✓ Maximal distance 200 m from the controller
- ✓ Up to 4 units can be connected to the controller
- ✓ UL certified
- ✓ full NFPA 110 compliance

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All pictures shown in this document are for illustration purpose only. Actual product features may vary due to product enhancement without notice.

12.10 ARM6 – EM-BIO8-EFCP + Toroid for Earth fault protection from AMF25

Compatibility: ACP, MPP. All genset.

Incompatibility: ADI, TNC, IMD, MRS.

Available as: Supplement

Binary I/O plug-in module with earth fault current protection measurement.
- ✓ Extension module with 8 configurable binary terminals for inputs or outputs
- ✓ Possibility to connect a current transformer for earth fault current measurement and protection

SOCOMEC current transformers deliver to the secondary a standard current proportional to the primary current and adapted to the rating of the associated device.
They are equipped ad standard with removable terminal covers and double terminals allowing the secondary to be short-circuited without any risk.

- Accuracy class: 1
- Dielectric quality: 3 kV — 50 Hz — 1 min
- Operating frequency: 50 — 60 Hz.
- Permanent overload: 1.2 In
- Insulation class: E (120 °C)

In some case is installed as standard to support some engines functions/reading.

13 ANNEX E – SIMPLE CONTROL PANELS

13.1 MSP – Manual Simple Panel

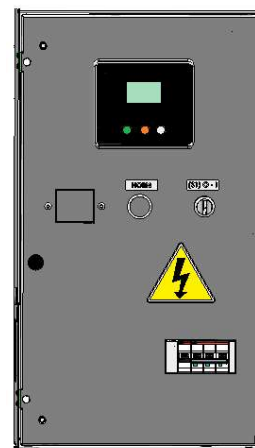**Compatibility:** A10 and A18 size. Open and Canopy version. Up to 100A.

Incompatibility: B10-C30 sizes. ACP, MPP, RGWx, ARMx, OWS, ETB, AHM, EAG, SBT, VMT, AMT, FAG.

Available as: Supplement

MSP panel consist in a simple Manual Control Panel with the function of remote start and circuit breaker.

This panel is equipped with:
- ✓ Control unit: **Comap Intelinano NT Plus**
- ✓ Selector switch
- ✓ Alarm Horn
- ✓ **4 poles circuit breaker**
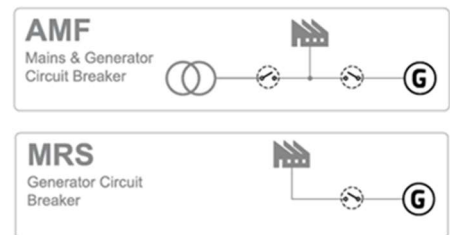
Intelinano NT Plus:

Main Features:

- ✓ AMF and MRS controller with current measurement and support for efi engine
- ✓ Stand-by and prime power application in one model
- ✓ 1/3 Phase generator voltage measurement (3/3 phase when used as MRS controller)
- ✓ 1 Phase generator current measurement
- ✓ 3 Phase mains voltage measurement
- ✓ Connection type and voltage auto detect
- ✓ Various generator and engine protections
- ✓ Icon menu, no text
- ✓ Automatic or manual MCB and GCB control
- ✓ "Zero" power consumption mode
- ✓ Battery voltage, Service time and Running hours indication
- ✓ All set points and I/O's configurable via front panel
- ✓ Ability to catch up on running engine (for manual engine start)
- ✓ Event log (10 events)
- ✓ Up to 3 analog inputs (shared with binary inputs)
- ✓ Up to 6 binary inputs (1 binary input is shared with binary output)
- ✓ 2 high side - high current outputs
- ✓ 4 high side binary outputs
- ✓ D+ pre-excitation terminal
- ✓ ECU support (CAN J1939)
- ✓ USB

Functions and Protections (with ANSI code)**:**

- ✓ Over voltage 59
- ✓ Under voltage 27
- ✓ Over frequency 81H
- ✓ Under frequency 81L
- ✓ Phase rotation* 47
- ✓ Gas level 71

13.2 ASP – Automatic Simple Panel

Compatibility: A10-A18 size. All genset. Up to 100A.

Incompatibility: B10-C30 sizes. ACP, MPP, RGWx, ARM2, ARM4, JNFS, ETB, AHM, EAG, SBT, VMT, AMT, FAG.

Available as: Supplement

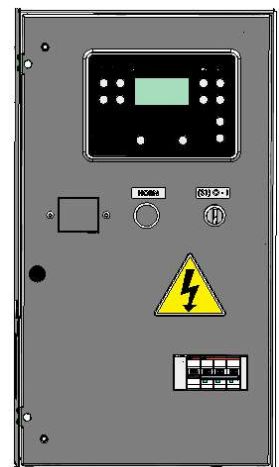ASP panel consist in a simple Automatic Control Panel with AMF and MRS functions and circuit breaker.

This panel is equipped with:
- ✓ Control unit: **Comap InteliLite AMF25**
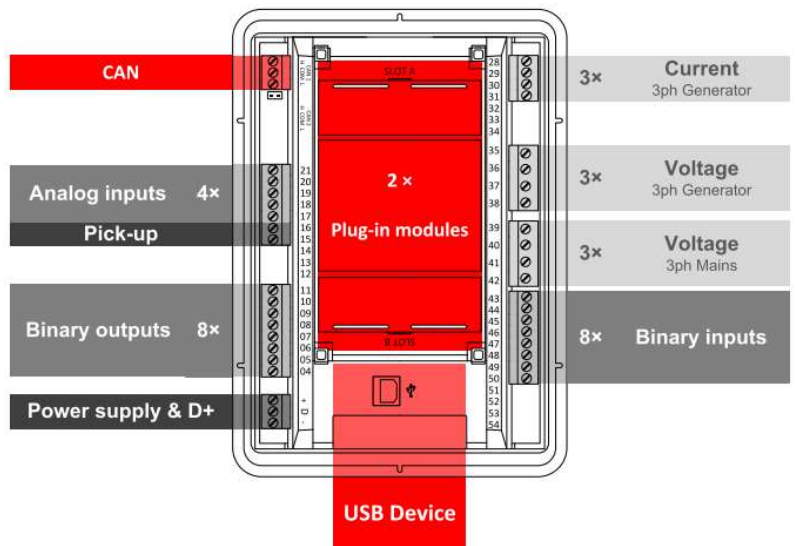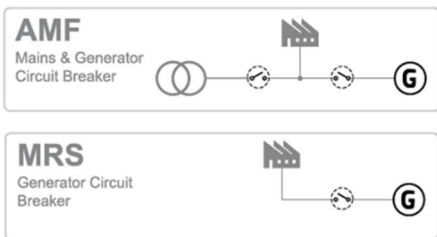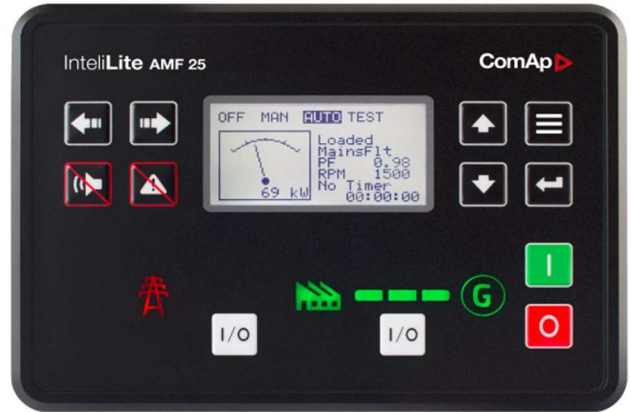- ✓ Selector switch
- ✓ Alarm Horn
- ✓ **4 poles circuit breaker**

InteliLite AMF25:

Main Features:

- ✓ 5 languages in the controller & translator functionality

- ✓ 3 levels of password
- ✓ 3 sets of alternative configurations
- ✓ Magnetic pickup
- ✓ ECU support & Tier 4 Final ready
- ✓ 2 slots for plug-in modules
- ✓ CAN modules support
- ✓ Power over USB for controller's adjustment
- ✓ In-built PLC, complemented with a monitoring/debugging tool
- ✓ 8 binary outputs, 8 binary inputs, 4 analog inputs
- ✓ high-current binary outputs
- ✓ Run Hours source selector
- ✓ Activation of outputs based on
- ✓ inputs/power/temperature
- ✓ Real time clock
- ✓ Multipurpose flexible timers
- ✓ Comprehensive history log with up to 350 events
- ✓ 3 maintenance timers (counting even under zero)
- ✓ Possibility to disable protections

Compliance to:
- ✓ EN 61000-6-2
- ✓ EN 61000-6-4
- ✓ EN 61010-1
- ✓ EN 60068-2-1 (-20 °C/16 h for std)
- ✓ EN 60068-2-2 (70 °C/16 h)
- ✓ EN 60068-2-6 (2÷25 Hz / ±1,6 mm; 25÷100 Hz / 4,0 g)
- ✓ EN 60068-2-27 (a=500 m/s2; T=6 ms)
- ✓ EN 60068-2-30:2005 25/55°C, RH 95%, 48hours
- ✓ EN 60529 (front panel IP65, back side IP20)

Functions and Protections (with ANSI code)**:**
- ✓ Over voltage 59
- ✓ Under voltage 27
- ✓ Voltage asymmetry and Phase rotation** 47
- ✓ Under frequency 81L
- ✓ Over current* 50 + 51
- ✓ Current unbalance
- ✓ Load shedding 32P
- ✓ Overload 32
- ✓ Power factor 55
- ✓ Over frequency 81H
- ✓ Temperature 49T
- ✓ Earth fault current 50N + 64 (available as option)

Remote control and Expansion modules available:
- **RGW1 - CM-GPRS + Antenna**
- **RGW3 - CM-Ethernet**
- **RGW4 - CM-4G-GPS + Antenna**
- **RGW5 - CM-RS232-485**
- **ARM1 - EM-BIO8-EFCP**
- **ARM6 - EM-BIO8-EFCP + Toroid**
- **ARM5 - IGL-RA15**

For detailed info of each modules, see paragraph *ANNEX D – EXPANSION MODULES*

14 ANNEX F – ANALOG GAUGES

14.1 EAG - Engine Analogue Gauges

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement

The EAG option consist of:
- ✓ Water Temperature sensor with Alarm on control unit and Analog gauge
- ✓ Oil Pressure sensor with Alarm on control unit and Analog gauge

14.2 AHM – Analogic Hour Meter

Compatibility: All genset.

Incompatibility: none.

Available as: Supplement

The AHM option consist of Analogic Hour Meter.
Hour meter allows to monitoring the running time of the genset. It is very suitable to control how much the genset is using, to take note of the hours running time when maintenance service and fuel refiling service are made.

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All pictures shown in this document are for illustration purpose only. Actual product features may vary due to product enhancement without notice.

14.3 FAG – Fuel Analogic Gauge

Compatibility: MFT.

Incompatibility: PFT.

Available as: Supplement

The FAG option consist of a Fuel level Analog gauge.

An additional fuel sensor is installed and the fuel level reading from the control unit (available as standard) is maintained.

14.4 VMT – Voltmeter with selector switch (L1-L2-L3)

Compatibility: MRS.

Incompatibility: ACP, MPP.

Available as: Supplement

The VMT option consist of a Voltmeter with selector switch (L1-L2-L3). The selector allow to visualize the Voltage between each phase (L1-L2;L1-L3;L2-L3).

14.5 AMT – Ammeters (N°3, one each phase)

Compatibility: MRS.

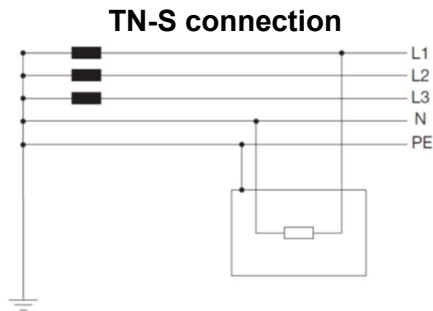**Incompatibility:** ACP, MPP.

Available as: Supplement

The AMT option consist of three Ammeters, one each phase.

15 ANNEX G – CONNECTION SYSTEM

As standard GPW genset are wired according to TN-S system, where the neutral conductor N and the protective conductor PE are separated.
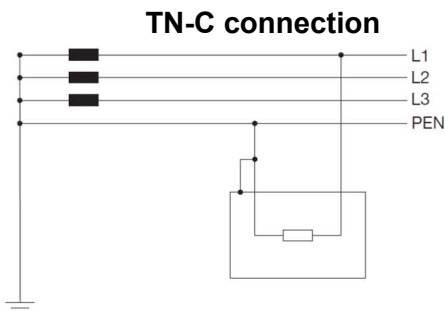
TN-S connection

15.1 TNC – Genset suitable for TN-C system

Compatibility: MRS, ACP, MPP.

Incompatibility: IT, ADI, IMD, ARM6.

Available as: Supplement

With TNC option, the genset is wired according to TN-C system, where the neutral and protective functions are combined into a single conductor, called PEN.
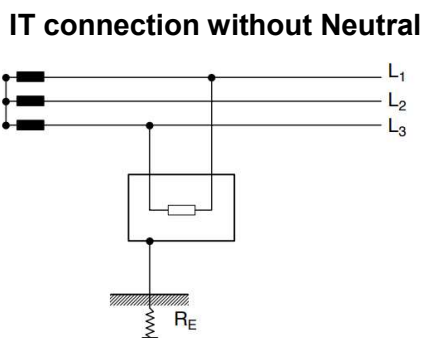
TN-C connection

### 15.2 IT1 – Genset suitable for IT system without Neutral

Compatibility: ACP, MPP.

Incompatibility: TNC, IT2, ADI, ARM6.

Available as: Supplement

With IT1 option, the genset is wired according to IT system without Neutral, where neutral is insulated from the ground.

IT connection without Neutral

15.3 IT2 – Genset suitable for IT system with Neutral

Compatibility: ACP, MPP.

Incompatibility: TNC, IT1, ADI, ARM6.

Available as: Supplement

With IT2 option, the genset is wired according to IT system with Neutral, where neutral is connected by an impedance.

IT connection with Neutral
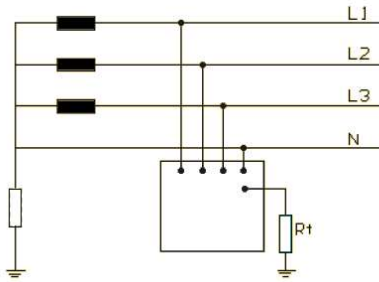
16 ANNEX H – ALTERNATOR OPTION

16.1 WTP – Winding Total Protection

Compatibility: All genset.

Incompatibility: none

Available as: Supplement

WTP OPTION consist in an alternator with an additional impregnation protection.
Winding total protection should be considered where:

- There is a high humidity [>95%]
- There is salty atmosphere [marine applications]
- Atmosphere is polluted with some abrasive elements [dust, solid particles]
- Atmosphere is polluted with some chemical aggressive elements [incombustible diesel particles, acids]

Alternator brand	Series	Protection available as standard	Protection available with WTP supplement
Mecc Alte	ECP3	STANDARD	GREY+
Mecc Alte	ECP28	STANDARD+	
Mecc Alte	ECP32		
Mecc Alte	ECP34	GREY	
Mecc Alte	ECO38		
Mecc Alte	ECO40		
Mecc Alte	ECO43		

All pictures shown in this document are for illustration purpose only. Actual product features may vary due to product enhancement without notice.

Protection Level Specifications:

Protection level: STANDARD

The Standard protection level is referred to a generator which has the sole impregnation resin applied to all the active parts. It should be noted that this level is standard on the Mecc Alte ECP3 generator series: voltages from turn to turn in this series are never dangerous for the insulation life, resulting in no need to apply any additional protection varnish.

Exciter Stator: resin
Main Stator: resin
Exciter Rotor: resin
Main Rotor: resin

Protection level: STANDARD +

With the Standard + protection system in addiction to the usual impregnation resin, the stator exciter is protected with a further layer of grey varnish EG43. Stator exciter is protected because it is the first active part that is cooled from the air cooling flux. The ECP 28, and ECP 32 series are built with this protection level as a standard.

Exciter Stator: resin + EG43
Main Stator: resin
Exciter Rotor: resin
Main Rotor: resin

Protection level: GREY

With the grey protection level, not only the exciter stator is coated with the EG43 but also the main power stator. This protection level, which is available as an option on some families and as a standard on some others, is the standard for the marine and nearly all the most demanding application. Main and exciter stator grey EG43 coating is usually sufficient to protect the windings, as all the rotating machine parts are subjected to much lower voltages and are cleaned centrifugally from the moisture and contaminating particles that could corrode the copper enamel. This level is the Mecc Alte standard for ECP 34, ECO 38, ECO 40, ECO 43 and ECO 46 families.

Exciter Stator: resin + EG43
Main Stator: resin + EG43
Exciter Rotor: resin
Main Rotor: resin

Protection level: GREY+

The Grey+ protection level is available as an option on the whole industrial range. With this protection level, the main stator is coated with the grey EG43 varnish and the exciter stator is upgraded to have the black severe environment protection. This acts as a physical barrier to moisture particles and chemical substances on this part.

Exciter Stator: resin + black compound
Main Stator: resin + EG43
Exciter Rotor: resin
Main Rotor: resin

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Varnish and resin Specifications:

Insulation Resin

The high quality bi-component insulation resin used from Mecc Alte, is a polyester specially developed to be used in vacuum impregnation or dip/ and trickle machines. It does have superior bond strength characteristics, high chemical and moisture resistance and is suitable for uses up to 212° C.

Grey Varnish

EG43 The EG43 grey varnish, is an high temperature insulating enamel that forms a tough and flexible film, with excellent moisture and chemical protection. It is water and oil proof, and also protects windings from abrasion. It is applied spraying an over coating layer over the impregnated winding, or dipping the stator in a varnish barrel for superior treatments.

Black Severe Environment Protection

The black severe environment protection is a system that makes Mecc Alte special. It is the ultimate winding treatment that offers truly superior performances when the environment is severe, or the application very demanding. It is a protection treatment used to replace epoxies and silicones winding encapsulation. The black protection cures to a tough, resilient, black coating that seals the copper against moisture and chemical attacks. Due to its encapsulation capability and durability, is also extremely resistant to the particle abrasion as it adsorbs the impacts. Moreover, this leads to a long trouble less life protection, as the protection layer follows elastically the thermal expansion cycles of the windings from the cold to the hot condition and vice versa without forming any cracks.

No alternator derating with WTP.

16.2 ACH – Anti-Condensation Heater

Compatibility: All genset.

Incompatibility: none.

Available as: Supplement

ACH option consist in an alternator equipped with heater in the windings and is used to prevent formation of condensation in the alternator's windings.

Anti-condensation heaters are designed to raise the temperature of the windings above the temperature of the surrounding material so that the condensation will not form on the windings.

It is recommended that anti-condensation heaters are fitted to all generators that are left switched off for any period of time. This is particularly important in applications where high humidity is a significant problem.

17 ANNEX I – ENCLOSURE OPTIONS

17.1 DCC2 - Different Canopy Colour RAL3000

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement

DCC2 option allow to have different canopy colour RAL3000 (RED).

17.2 DCCX - Different Canopy Colour RAL to be define

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement

DCCX option allow to have different canopy colour.

This allow to supply a customized canopy colour, in case of specific installation where a special colour is required (e.g. hotel, museum, hospital…) or to give the opportunity to the customer to differentiate their genset.

17.3 BRB – Base frame Rubber Bumper

Compatibility: All genset.

Incompatibility: None.

Available as: Supplement
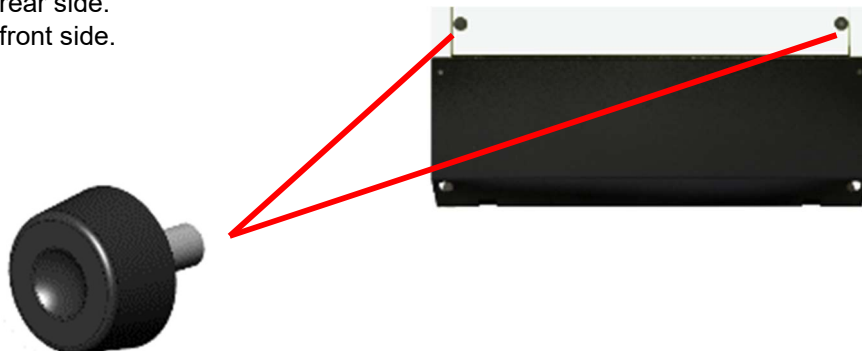
BRB option consist of n°4 rubber protection on base frame that allows to have higher protection during handling.

This rubber protection are positioned:
- N°2 in the rear side.
- N°2 in the front side.

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All pictures shown in this document are for illustration purpose only. Actual product features may vary due to product enhancement without notice.

17.4 GDH – Genset Document Holder

> **Compatibility:** All genset.
>
> **Incompatibility:** None.
>
> **Available as:** Supplement

GDH option consist in plastic document holder, placed in the internal side of the canopy door and allows the hold for documents, manuals and electrical drawings.

Box dimensions LxWxH: 23x7x35 mm

17.5 PSM – Premium Soundproof Material

> **Compatibility:** All genset.
>
> **Incompatibility:** None.
>
> **Available as:** Supplement

PSM option consist in a sturdy, washable soundproof material as alternative to the standard.
It is a polyether based foam with excellent fire resistant properties and acoustic performance.

Properties	Method	Specifications
Net density (kg/m³)	ISO 845	26 - 29
Flame test at thickness 13 mm	UL94	HF-1

18 GLOSSARY

18.1 A

AirGate:
AirGate it allows our controllers to connect to the internet using the existing network infrastructure, negotiating firewalls and VPN systems and removing the requirement for static and public IP addresses.
Once the AirGate technology in the controller is activated even if the IP address is changed, our configuration and monitoring tools will keep track of the remote equipment.

18.2 D

DSR – Mecc Alte alternator Regulator System:
Mecc Alte alternator from ECP3 to ECO38 series are equipped with DSR Digital Regulator System as standard.
Main features of DSR:
- ✓ Parallel operation supported
- ✓ Mains parallel supported
- ✓ Voltage accuracy +/-1%
- ✓ Soft Start supported
- ✓ Remote Voltage Control
- ✓ Alarm Log
- ✓ Analogue and Digital Configurable
- ✓ LAMS (Load Acceptance V/f)
- ✓ APO (Active Protection Output)

18.3 L

LiteEdit 2015:

LiteEdit is Windows based software which provides following main functions:
- ✓ Remote control and monitoring, parameters adjustment
- ✓ Controller configuration and programming, controller firmware upgrade, cloning of configuration
- ✓ Support of electronic engines
- ✓ Controller language translation
- ✓ Connection via USB, RS232, modem, internet or **AirGate**
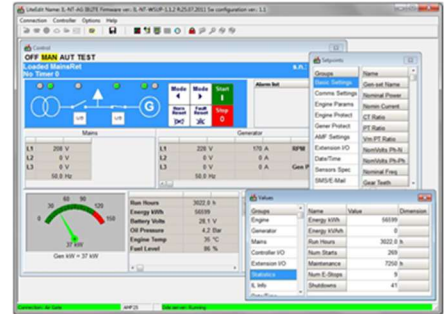
18.4 M

MAUX – Mecc Alte alternator Excitation System:

Mecc Alte alternator ECP and ECO series are equipped with MAUX excitation system as standard.

The MAUX Mecc Alte Auxiliary Winding is a separate winding within the main stators that feeds the regulator. This winding enables every one of our alternators to take an overload of 300% forced current (short circuit maintenance) for 20 seconds. This is ideal for motor starting requirements.
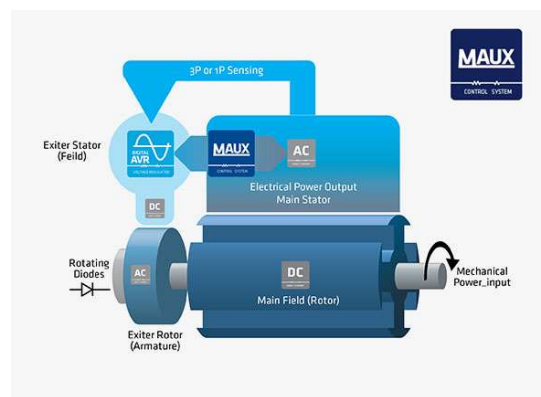
18.5 P

Performance Class:

According to IS0 8528, there are different performance cases associated with step load. These classes describe requirements for different parameters that a genset should fulfil.

In the table below, is showed a resume of the most significant parameters defined in the ISO 8528-5:

Parameter	G1	G2	G3
Steady State Frequency band	≤+/-2,5%	≤+/-1,5%	≤+/-0,5%
Steady State Voltage band	≤+/-5%	≤+/-2,5%	≤+/-1%
Frequency Recovery Time	≤10 s	≤5 s	≤3 s
Voltage Recovery Time	≤10 s	≤6 s	≤4 s

G1: Required for application where the connected loads only basic parameters of voltage and frequency need to be specified. Typically required in general purpose applications, lighting.

G2: Required for application where voltage characteristics requirements are very similar to those for the commercial public electrical utilities. Typically required in lighting systems, pumps.

G3: Required for application where the connected loads need high performance in terms of stability and level of the frequency, voltage and waveform characteristics.
Typically required in Telecommunications applications.

G4: In this performance class frequency, voltage or waveform characteristics of the electrical power supply are specifically adapted for the application. This performance is usually defined as an agreement between manufacturer and customer (AMC).
Same genset can be compliant to different performance class, considering different step load %.

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Websupervisor:

Websupervisor is a cloud-based system designed for monitoring and management of ComAp and 3rd party devices via the internet.

✓ WebSupervisor gives you an overview of all your devices status, location, and other important data and alerts - all on one screen. If an alarm occurs, you will be notified by email. **Detailed data-logging, historical trends, and device management** is all easily accessible. The system also offers **powerful reporting and sophisticated analysis tools** such as the Alarm Analyser or trends and heat maps that give you additional added value and help you to:
  - ✓ optimize revenue for fleet of gen-sets
  - ✓ reduce maintenance cost
  - ✓ increase gen-set up-time

✓ **Security is the top priority** with WebSupervisor. It runs on Microsoft Azure servers, which are some of the most popular and secure servers in the world.

✓ From your PC, tablet or mobile phone you can instantly reach the most important and relevant data. The **responsive desig**n ensures easy to use operation on any screen size.

✓ **Main features:**

- **List and map view of devices, tracking and geofancing**
  Have an overview about all devices in the fleet

- **Alarm Analyser**
  Alarm Analyser **evaluates alarms during selected period.** The result of analysis is **an alarm report** showing all kinds of alarms occurred, their frequency and the duration. This allows you to monitor frequent alarms that occur with the device and **reduce potential maintenance costs** due to device or user issues and increase a gen-set up – time.

- **Dashboard, Trends & Reports**
  The dashboard shows the statistics of an individual device, a selected group of devices or the whole fleet.
  Reports in WebSupervisor offer **monthly summaries of availability and other important parameter**s and can be generated for individual gen-sets or for groups of gen-sets. All values can be seen immediately **without additional calculation or manual merging** of several individual gen-set reports. The reports template can be configured according to your needs.

- **User activity logger**
  Administrators of the account can see history logs from every user, so they can monitor every user's actions, in order to identify who was monitoring the device when an issue occurred - increasing security and customer satisfaction.

- **WSV Screen editor**
  You can easily modify the detail view screen according your needs. The current version of Screen Editor offers several instruments including the ability to include **a feed from a webcam** which is useful for rental companies monitoring equipment **for theft protection**.

- **API**
  An API gives you the option to download and store complete data from WebSupervisor to your premises, integrate data into 3rd party SW as is ERP, CRM or used data in PowerBI or automate certain activities. The API documentation is available without login from **websupervisor.net page.**

www.websupervisor.net

* Some features described above are part WSV Pro subscription only

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