

KOHLER[®]
SDMO[®]

APM403S

Product presentation

June 2017

www.kohlersdmo.com

APM403S presentation

01

KOHLER SDMO :

Product presentation

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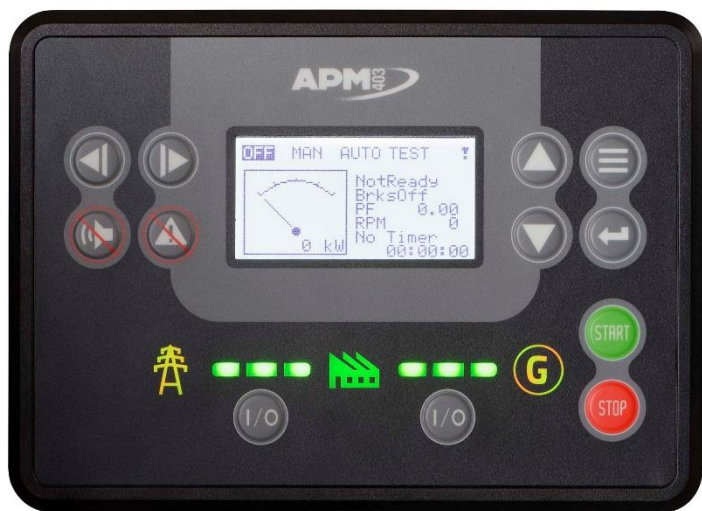

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APM403 product presentation

APM403

The APM403 is a all in one controller available in two different configurations to cover multiple applications. The APM403 is designed for LV (Low Voltage) applications. The APM403S is designed for simple Manual remote start application. The APM403 P embedd more application such as Auto Mains Failure mode, load sharing between multiple gensets, or genset in parallel to the mains to take over the load or to ensure peak shaving operation



APM403S – Available in price list from June 2017

APM403P – Available in price list from October 2017

APM403P



APM403 product presentation

Availability

The APM403 is available on KOHLER SDMO generating sets with power outputs from 66kVA

AVAILABILITY

The APM403 is available on KOHLER-SDMO generating sets, with power outputs from 66 kVA:

POWER PRODUCTS	APM403S/ APM403P
▶ ADRIATIC	X
▶ MONTANA	0*
▶ ATLANTIC	•
▶ OCEANIC	•
▶ PACIFIC II	•
▶ KD SERIES	•

RENTAL POWER	APM403P
▶ RENTAL COMPACT	0**
▶ RENTAL CONTENERGY	•

- Standard
- 0 Option
- X Not available
- * From 77 kVA (J77)
- ** Standard from 450 kVA (R450C3)



APM403 product presentation

The APM403 will be available both for the Industrial power products and for the rental power group.





APM403 product presentation



*APM403P



APM403S product features

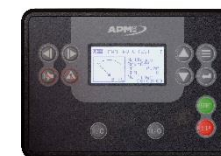
Product	APM403 Solo
Binary inputs / outputs	8/8
Analog inputs	4
Magnetic pickup	•
D+	•
Customized PCB design (E-Stop)	•
Fully back-lit line diagram	•
MRS	•
GCB	•
3ph Voltage Gen	•
3ph Current Gen	•
kW / kWh / kVA	•/•/•
Generator protections	•
Engine protections	•
Full history	>300
RTC / Battery	•
Remote Control	•
Active SMS / E-Mails	•
AirGate	•
WebSupervisor	•
USB	•
USB Host	•
RS485	•
Ethernet	Plug-in
GPRS	Plug-in
ECU-J1939	•
CAN (extension modules / ECU)	•
Modbus / SNMP	•
Plug-in modules slots	2
Fuel theft / Fuel consumption	•
Fuel pump control	•
Dummy load control	•
Temperature switch	•
Analog calibration	•
Connection type auto detect	-
Timers full calendar .
PLC • .



APM403 product presentation

APM403 product references

Référence	Nom
SDMO	
31613802703 APM403S controller	APM403S
31613802803 APM403P Controller	APM403P
31613802902 External I/O plug in module	APM403 - BIO8
31613803002 External binary I/O CAN module (8 input / 8 output)	APM403 -IO8/8
31613814901 External binary I/O CAN module (16 input/ 0 output)	APM403 -IO16/0
31613803102 External analog I/O CAN module	APM403 - AIN8





Communication protocols

- Base
 - CAN1 - Engine ECU communication and external binary or analog CAN module
 - CAN2* - Inter controller CAN communication
 - USB device
 - USB Host
 - RS485

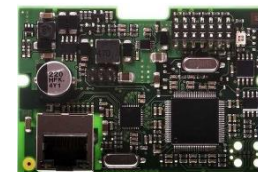
* For the APM403P from October 2017



Communication media

- Optional (assuming additional plug in modules)
 - 4G, 3G, GSM, GPRS, Ethernet

Référence	Nom
GPAO SDMO	
31613811902	APM403- CM-ETHERNET
31613821301	APM403-CM-4G-GPS
31613821401	APM403-CM-GPRS





APM403 product presentation

APM403 references

Référence

Nom

31613822501

APM403-ANT-4G&GPS

Antena 3G/4G & GPS assuming use of 3G/4G plug in modules





Communication protocols

- Optional assuming plug-in modules
 - 4G, 3G, GSM, GPRS, Ethernet

Example – optional 4G plug in module inserted in the Slot B of the controller





Communication protocols

- Base
 - ModBUS
- Optional
 - 4G, 3G, GSM
 - Ethernet TCP/IP
 - SNMP



OPERATION CONDITIONS	
▶ Operating temperature	- 20°C / + 60°C
▶ Storage temperature	- 20°C / + 70°C
EMC	
▶ Certification	CE/UL
▶ Electromagnetic compatibility directive	2014/30/UE
SAFETY	
▶ Low voltage directive	2014/35/UE
ELECTRICAL MEASUREMENTS	
▶ Frequency	50Hz / 60Hz
▶ Nominal voltage range	86,6 à 480VAC phase / phase
▶ Nominal current range	In = 5A
▶ Battery range	8 à 36V
LANGUAGES	
▶ English, French, Spanish, Italian, Dutch, German, Brazilian Portuguese, Turkish, Norwegian, Polish, Chinese, Russian	

02

KOHLER SDMO :

APM403 application modes

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Configurations APM403

The APM403S is designed for simple Manual remote start application. The APM403 P embedd more configuration such as Auto Mains Failure mode, load sharing between multiple gensets, or genset in parallel to the mains to take over the load or to ensure peak shaving operation

A612	A622	A631	A633	A651	A661
<p>APM403S</p>  <p>APM403P</p> 	<p>APM403P</p> 	<p>APM403P</p> 	<p>APM403P</p> 	<p>APM403P</p> 	<p>APM403P</p> 

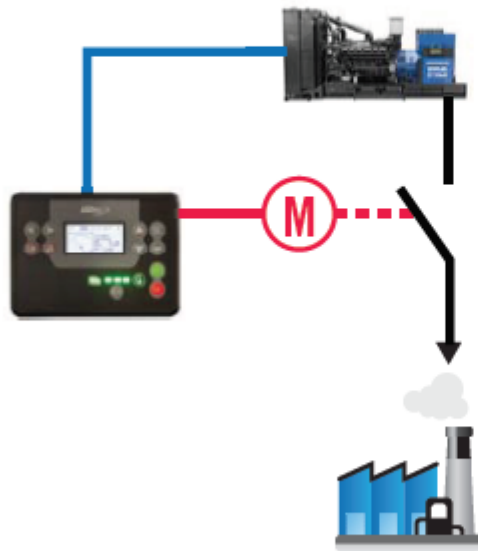


Configuration APM403S

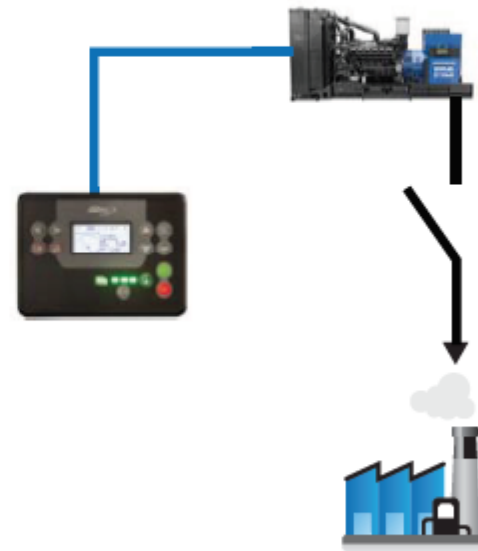
CONFIGURATION A612

Single generating set, without mains power, without coupling, without automatic transfer switch

WITHOUT MAINS PARALLELING	With self-regulating automatic transfer switch	A612
	With manual circuit breaker	A612



▶ With self-regulating automatic transfer switch



▶ With manual circuit breaker

Circuit breaker control

Current and voltage measurement



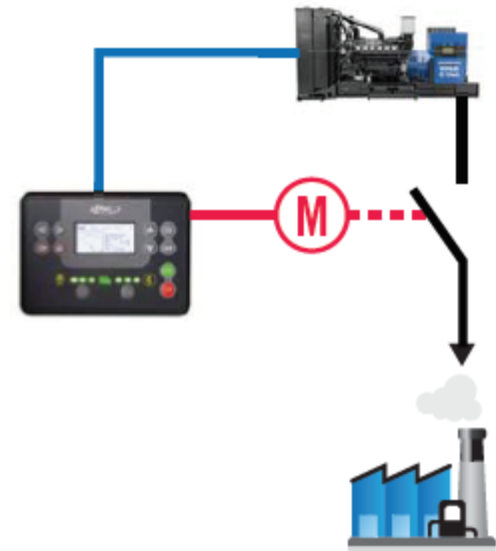
▶ APM403P

CONFIGURATION A612

Single generating set, without mains power, without coupling, without automatic transfer switch, with motorized circuit breaker controlled by the APM403

WITHOUT MAINS PARALLELING	With motorized circuit breaker controlled by the APM403	A612
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 Circuit breaker control
  Current and voltage measurement

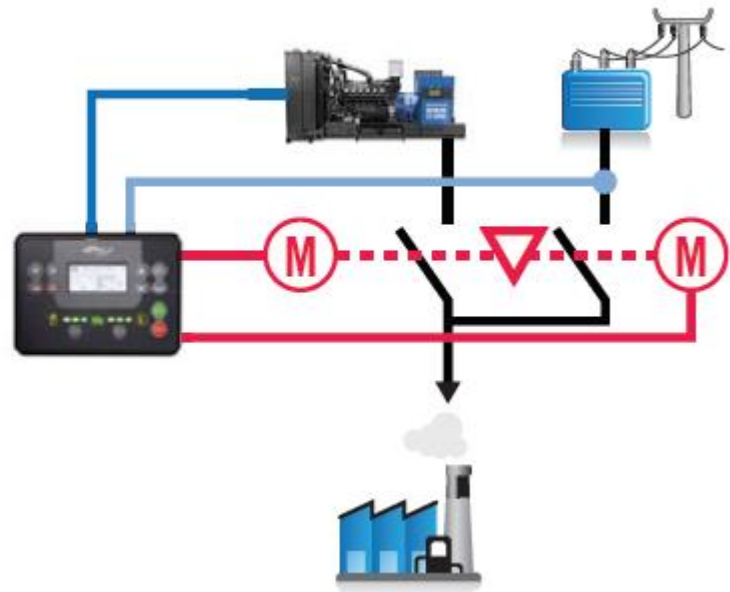




CONFIGURATION A622

Single generating set, with mains power, without coupling, with automatic transfer switch controlled by the APM403

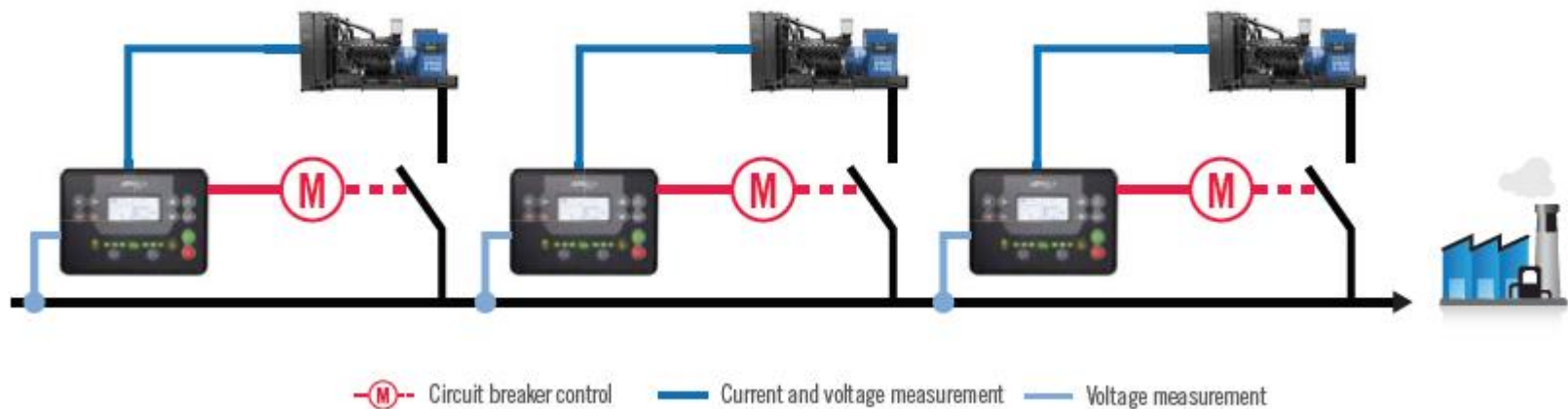
-  Circuit breaker control
-  Current and voltage measurement
-  Mechanical locking on the transfer switch
-  Voltage measurement





CONFIGURATION A631

Generating sets coupled as a power plant, without mains power, without automatic transfer switch, **droop power distribution**

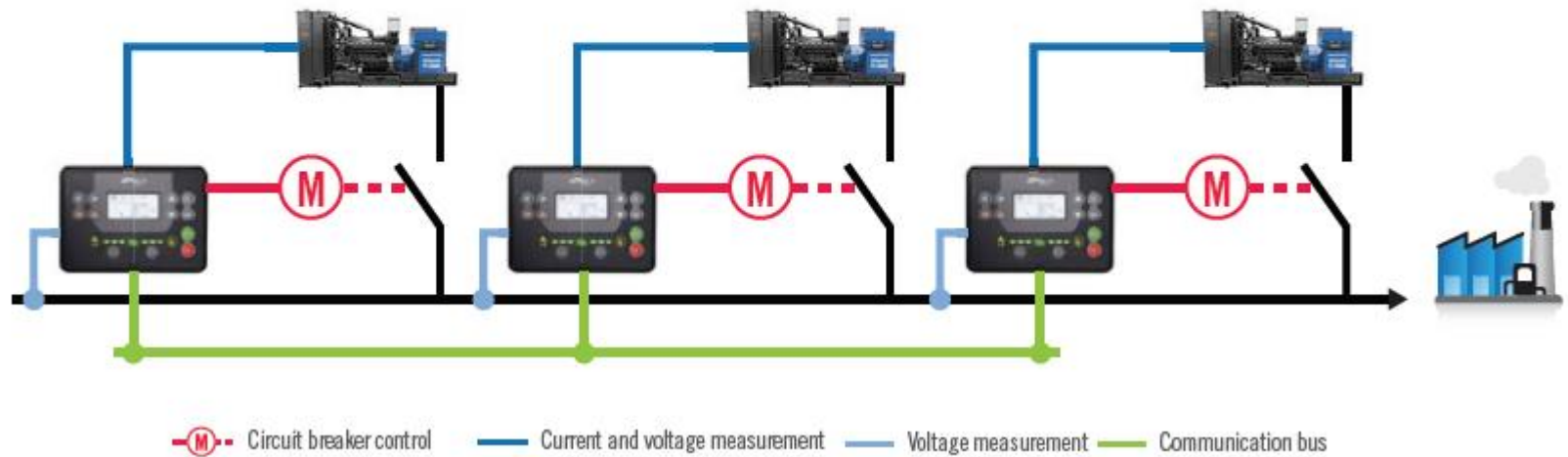




Configuration APM403P

CONFIGURATION A633

Generating sets coupled as a power plant, without mains power, without automatic transfer switch, **regulation of active and reactive power by digital communication bus**



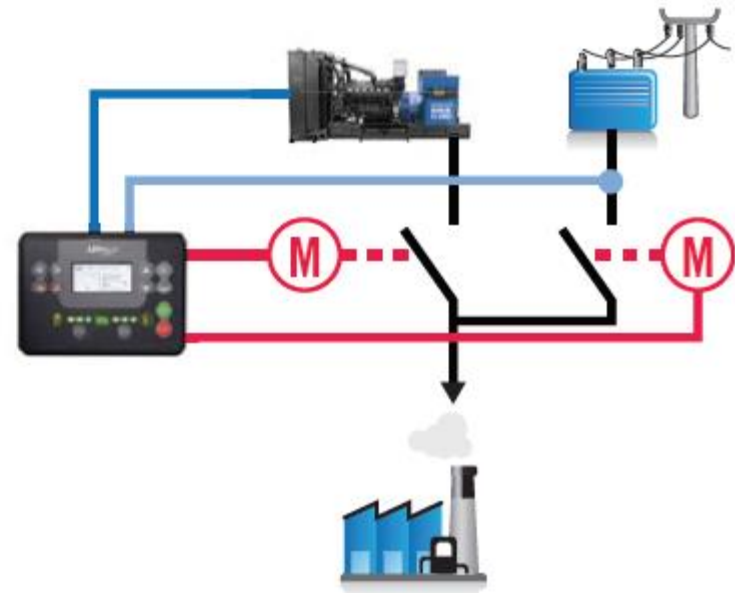


CONFIGURATION A651

Single generating set, with mains power, with automatic transfer switch, **short time paralleling on mains return**

- Circuit breaker control
- Current and voltage measurement
- Voltage measurement

Adapted genset safety features
Adapted mains safety features



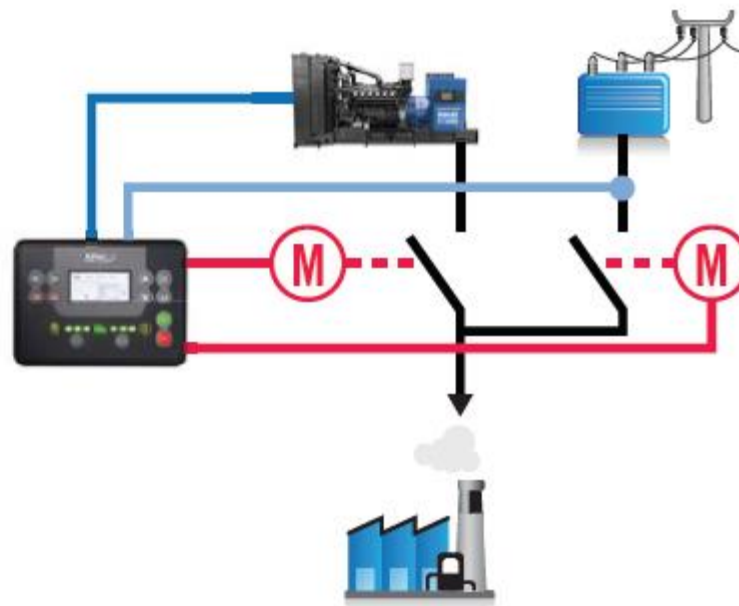


CONFIGURATION A661

Single generating set, with mains power, with automatic transfer switch, **long time paralleling**

-  Circuit breaker control
-  Current and voltage measurement
-  Voltage measurement

Adapted genset safety features
Adapted mains safety features



03

KOHLER SDMO :

List of options and
configurations
available from June
1st, 2017

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List of option available as of 1st of June

- In black – Available

CA100	EN	Fixed remote contacts pack. (genset ON,general failure,fuel low level alarm(Except tank with retent. bund)
CA220	EN	Configurable remote contacts pack. (Up to 6 carries can be selected)
CA221	EN	Genset ON
CA222	EN	Genset in automatic mode
CA223	EN	Genset in non-automatic mode
CA224	EN	Genset in manual mode
CA225	EN	Genset in test mode
CA226	EN	Genset in stop mode
CA227	EN	EJP informations
CA22A	EN	General fault
CA22B	EN	Non-starting fault
CA22C	EN	Oil pressure fault
CA22D	EN	Water temperature fault
CA22E	EN	Low coolant water fault (Select CA415)
CA22F	EN	Overspeed fault
CA22G	EN	Alternator voltage fault
CA22I	EN	Alternator overload fault (Select CA402)
CA22J	EN	Emergency stop push button engaged fault (2 carries)
CA22K	EN	Fuel leakage level fault (Select FD04)
CA22L	EN	Earth fault protection fault (Select CA420)
CA22M	EN	Low fuel level fault for separate fuel tank (Select CA616)
CA22N	EN	Mains U voltage presence (Only if GES opt CA613)
CA22O	EN	GES Alarm
CA22S	EN	General alarm
CA22T	EN	Low fuel level alarm (if separate tank select CA617)
CA22U	EN	Low coolant heater alarm (Select CA603)
CA22V	EN	Battery low voltage alarm
CA22W	EN	Battery chargeur fault alarm (Select CA604)
CA402	EN	Prewiring for auto start-up



List of option available as of 1st of June

- In black – Available

CA403	EN	Automatic full pack (charger 12V + relay and engine preheating resistor 220/240V)(Select CA402)
CA404	EN	Automatic full pack (charger 24v + relay and engine preheating resistor)(Select CA402)
CA406	EN	Adjustable mains sensing relay and ATS control inside control panel (U lower or equal to 440 V)
CA407	EN	Display screen with analogical values (OP/WT/GO)(12 V) (Std for 24 V)
CA408	EN	Remote control box
CA409	EN	Battery ammeter
CA41	EN	APM403 (J20-J250)(12V)
CA410	EN	Voltage adjustment
CA411	EN	Speed adjustment (If elec governor possible and fitted)
CA412	EN	Audible alarm fitted in the control panel
CA415	EN	Low coolant level fault
CA416	EN	Frame tank low fuel level protection (alarm in standard if frame tank included)
CA420	EN	Adjustable differential protection(A, AC type) (time and threshold) (TT-TNCR-TNCUR)
CA421	EN	Supply of the leak detection of the fuel tank (if different of FD06/FD07)
CA422	EN	12 or 24Volt DC start
CA423	EN	Supply of fuel tracking on separated external fuel tank
CA42	EN	APM403 (D250U - D330)(24V)
CA43	EN	APM403 ((V250U-V700C2) (D400U - D830)) (24V)
CA601	EN	Oil T° information
CA603	EN	Low coolant temperature
CA604	EN	Charger fault alarm (12/24 V) (Select CA403/4)
CA605	EN	EJP pack (Detection, warning management, forcing key)
CA606	EN	Adjustable differential protection (time and threshold)
CA607	EN	Insulation controller with neutral (ITAN)
CA608	EN	Insulation controller without neutral (ITSN)
CA610	EN	NFPA110 module level 1 (60 Hz) See description
CA611	EN	Remote NFPA annunciator surface mounted (Select CA610)
CA612	EN	degraded operation
CA613	EN	GES pack - NFE37312 standard (French market)
CA615	EN	GES remote contacts box (Select CA613)
CA616	EN	Low fuel level fault for separate tank
CA617	EN	Low fuel level alarm for separate tank
CA618	EN	New language integration (See the present list in the description)



List of option available as of 1st of June

- In black – Available
- *In blue – At later stage*

CEA12	<i>Télegestion via report ETHERNET (date de lancement à définir)</i>
CEA72	<i>Télegestion via GSM (date de lancement à définir)</i>
CEA73	<i>Télegestion via 4G (date de lancement à définir)</i>

05

KOHLER SDMO :

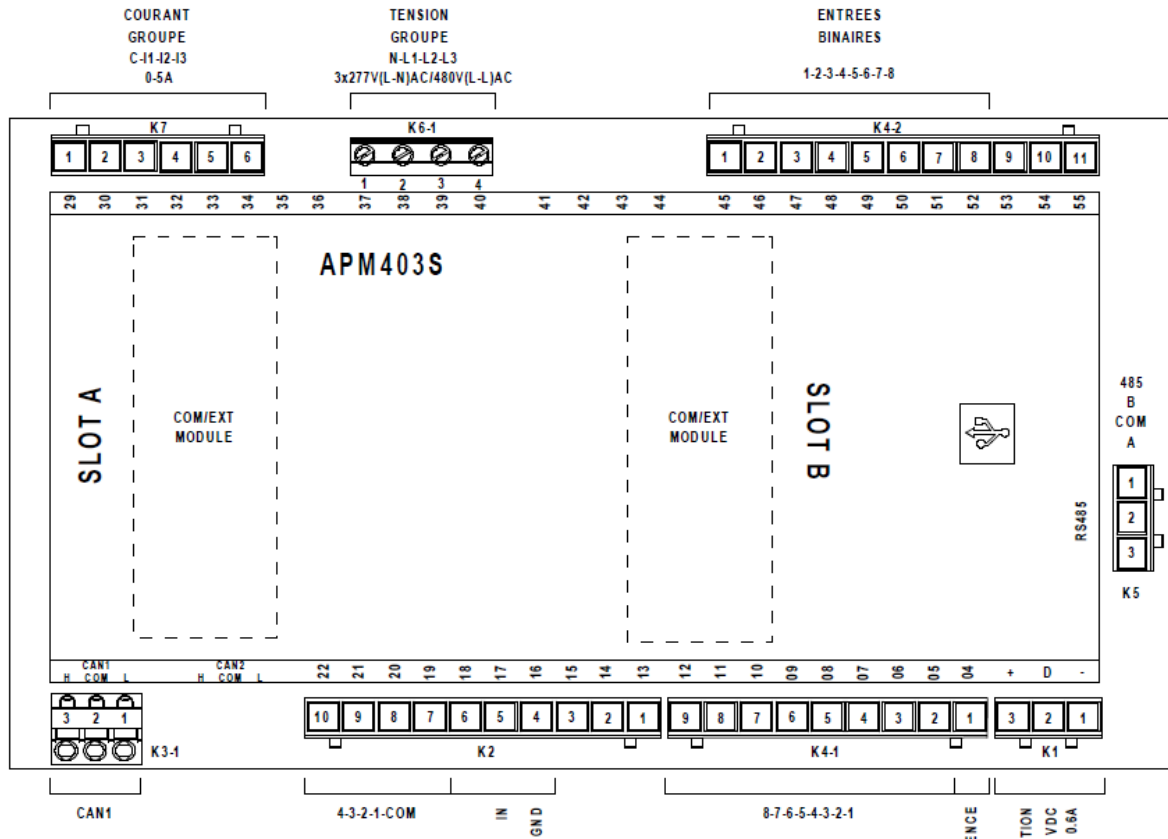
Electrical interfaces



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APM403S interfaces



REFERENCE CONNECTEUR - BROCHE CONNECTEUR

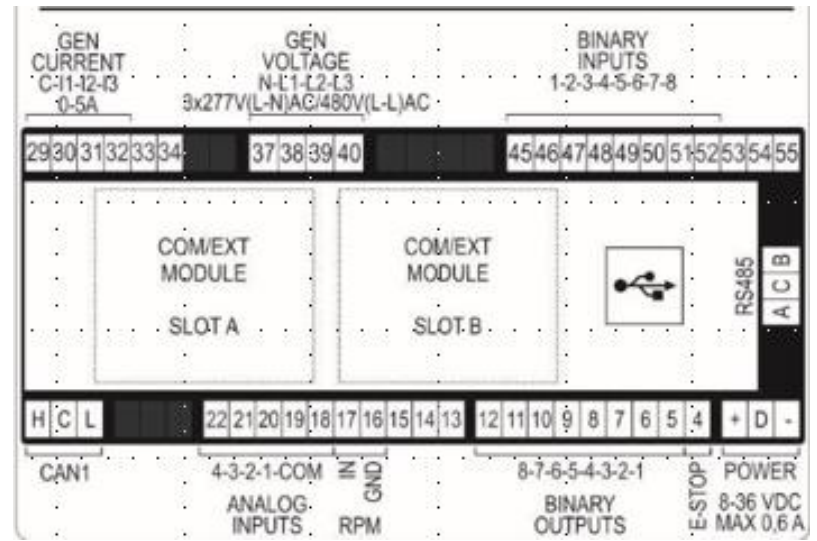
- K1 → 31613550101 - 3x31613550301
- K2 → 31613803803 - 10x31613550301
- K3-1 → 31613614301
- K4-1 → 31613803703 - 9x31613550301
- K4-2 → 31613803903 - 11x31613550301
- K5 → 31613550101 - 3x31613550301
- K6-1 → 31613803503
- K7 → 31613803603 + 6x31613550401



APM403S interfaces

Current measurements characteristics

Current measurement		Rating	Accuracy / Comments
T29	COM	-	
T30	L1	5A	1.5% full scale. Max allowed current 200%
T31	L2	5A	1.5% full scale. Max allowed current 200%
T32	L3	5A	1.5% full scale. Max allowed current 200%

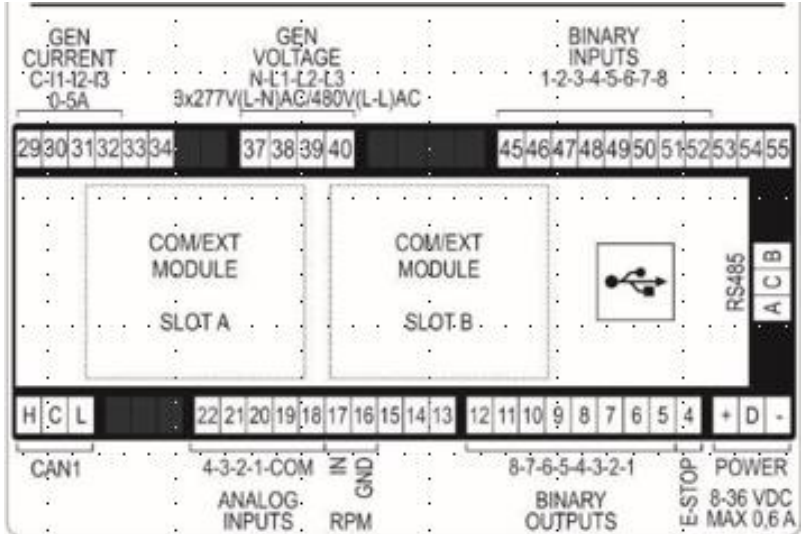




APM403S interfaces

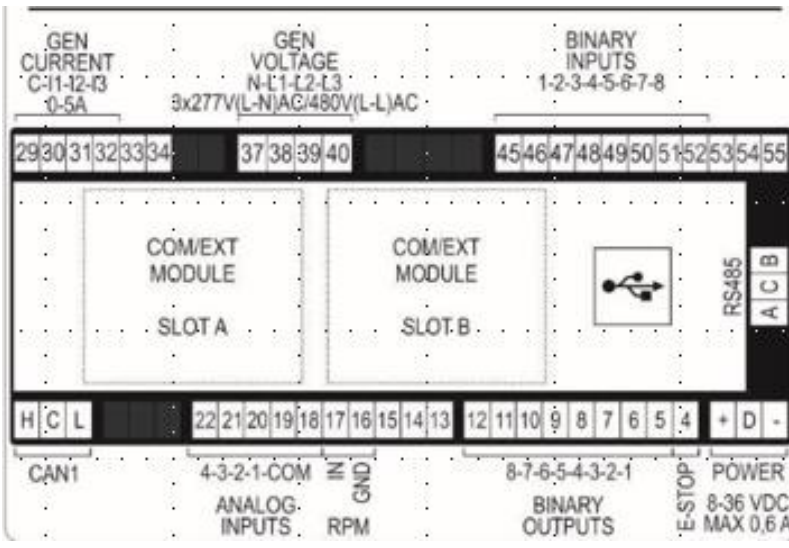
Voltage measurements characteristics

Mesures tension		Range	Accuracy / Comments
T37	Neutral	-	
T38	L1	277V (L-N) - 480 (L-L)	1 % full scale . Max allowed voltage 125% , resolution 1V
T39	L2	277V (L-N) - 480 (L-L)	1 % full scale . Max allowed voltage 125% , resolution 1V
T40	L3	277V (L-N) - 480 (L-L)	1 % full scale . Max allowed voltage 125% , resolution 1V





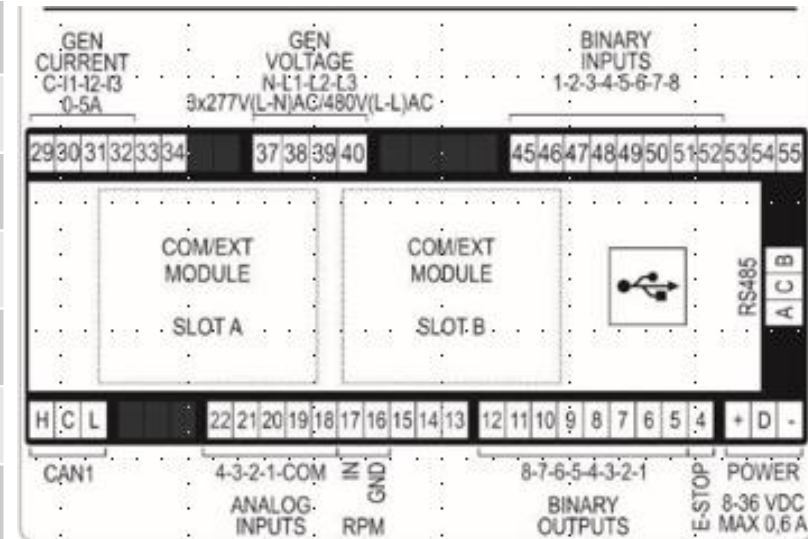
Binary inputs		Characteristics
T45	BIN1	0 – 2 VDC Close contact
T46	BIN2	0 – 2 VDC Close contact
T47	BIN3	0 – 2 VDC Close contact
T48	BIN4	0 – 2 VDC Close contact
T49	BIN5	0 – 2 VDC Close contact
T50	BIN6	0 – 2 VDC Close contact
T51	BIN7	0 – 2 VDC Close contact
T52	BIN8	0 – 2 VDC Close contact





Caractéristiques sorties binaires

Sorties binaires		Caractéristiques
T05	BOUT1	500 mAmps
T06	BOUT2	500 mAmps
T07	BOUT3	500 mAmps
T08	BOUT4	500 mAmps
T09	BOUT5	500 mAmps
T10	BOUT6	500 mAmps
T11	BOUT7	500 mAmps
T12	BOUT8	500 mAmps

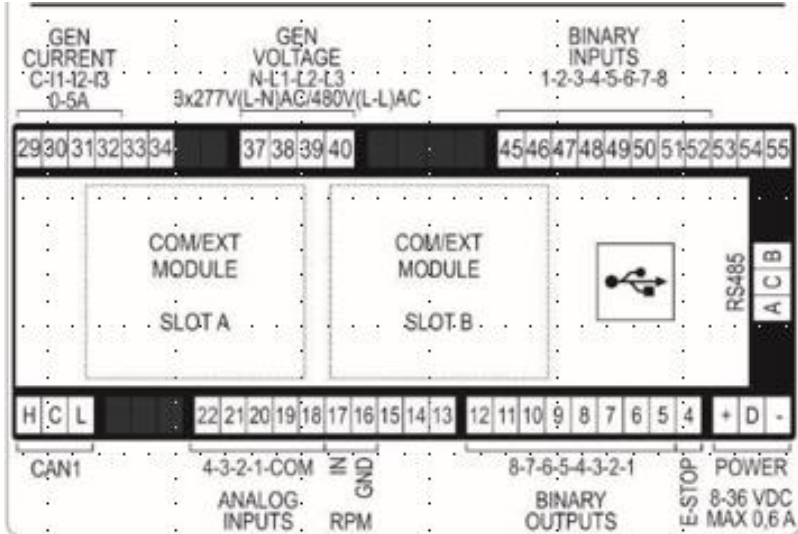




Interfaces APM403S

Analog input characteristics

Analog inputs		Characteristics	Accuracy / comments
T18	ACOM	-	
T19	A01	0-2500 Ω	0.1Ω ± 2% full scale
T20	A02	0-2500 Ω	0.1Ω ± 2% full scale
T21	A03	0-2500 Ω	0.1Ω ± 2% full scale
T22	A04	0-2500 Ω	0.1Ω ± 2% full scale





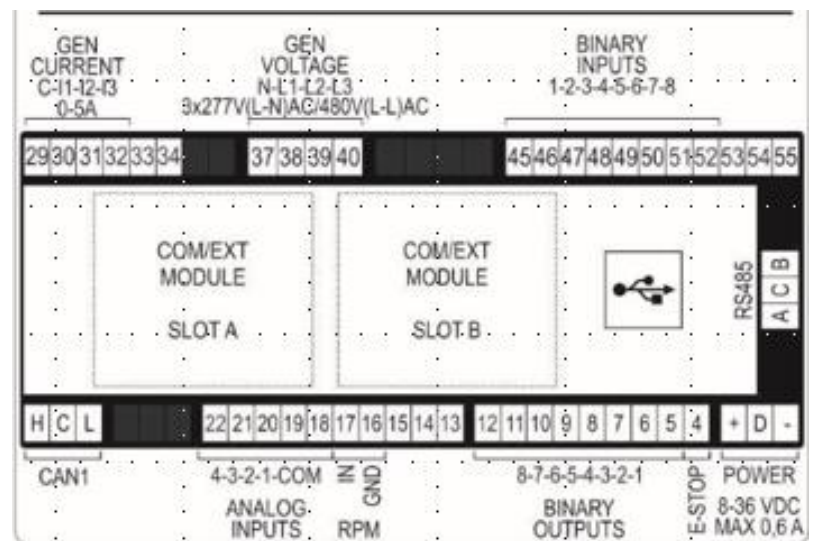
Interfaces APM403S

Power supply

VBAT		Range	Comments
T01	VBAT -	-	
T03	VBAT+	8 – 36 VDC	Consommation 255mA /12VDC

Charge alternator excitation

D+	Characteristics	Comments
T02	D+	300 mAmps





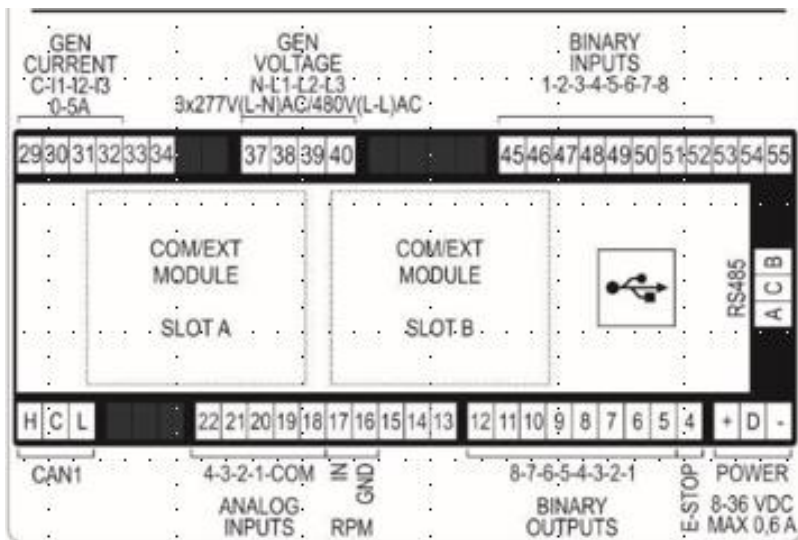
Interfaces APM403S

Pick up

Pick up		Range	Accuracy / comments
T16	RPM GND-	-	
T17	RPM IN	4hz – 10kHz	0.2% full scale

E-STOP

E-STOP	Characteristics	Accuracy / comments
T04		



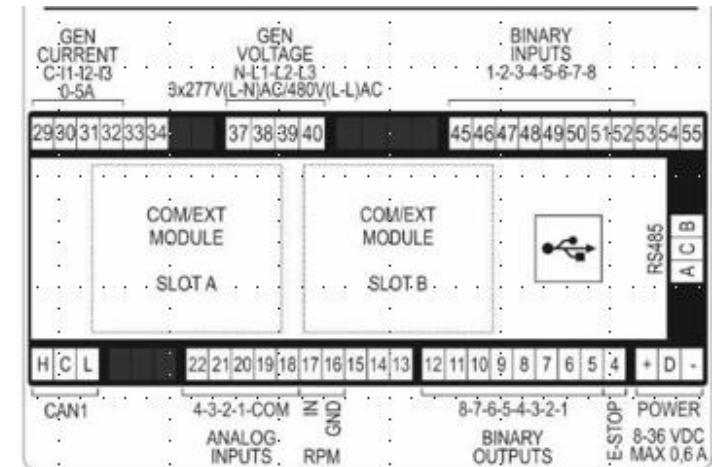


CAN1

CAN1		Characteristics
T26	L	Non isolated
T27	COM	CAN SAE J1939 250Kbps
T28	H	Bit sample point 87%

RS485

RS485		Caractéristiques
T56	B	Non isolated
T57	COM	
T58	A	



06

KOHLER SDMO :

APM403 Quick Start




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The APM403S quick start user guide is available under GAIA