ACH GEN2 100-800 V | 320-700 ARMS

High-voltage inverters

The ACH GEN2 is a family of inverters that gives you the freedom to design your vehicles with the functions your customers want. The ACH can be used for traction and generator applications in hybrid or battery-powered electric vehicles and machines.

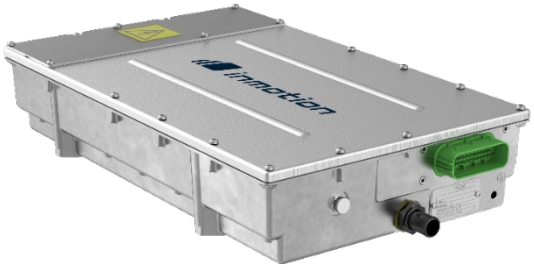
Choose between different nominal input voltages and a range of output power levels.

The weather protection ensures a reliable performance without the need for maintenance, even for your off-road vehicles.

The ACH meets industry standards for cybersecurity, functional and electrical safety to let you focus on your core business without worrying about service issues.

Our PLASMA software platform offers you a highly customizable collection of standard vehicle functions that meet demanding functional safety requirements. With PLASMA, you benefit from many years of experience with different kinds of applications.

Size M ACH 35M30
ACH 65M30



Size L ACH 35L70
ACH 65L50

Inmotion is a long-term, global supplier of electric motors, motor controllers, inverters and auxiliary equipment for commercial vehicles. Our "In-region, for-region" manufacturing strategy brings our production facilities closer to yours. This gives you higher quality at a lower cost and shorter lead time. We work in close cooperation with you to integrate and configure our products to your specific needs. Realize your vehicles for emission-free transport solutions.

ACH is a flexible standard platform

- **Continuous power** levels up to **300 kVA** make the ACH ideally suited **for hybrid and fully electric** vehicle applications
- **Nominal** voltage **350 V/650 V**. Fully operational from **100-450 V/100-800 V bus voltage**
- 4-quadrant, synchronous or asynchronous AC motor control, with speed, torque and DC voltage **control modes**
- Standard firmware with **extensive configurability** ensures optimal system functionality
- Application software **can be configured by you** or by Inmotion
- **Internal DC EMC filter** with **common mode and differential mode** reduces high frequency electromagnetic interference and eliminates DC bus oscillations
- The DC EMC filter allows for **free cable lengths** and **parallel operation** of several ACH controllers and auxiliary equipment **Vector control**, adjustable for different motor types

Functional safety

- Assured **software quality** through development and review processes in compliance with **Automotive SPICE©**
- Hazardous Voltage Interlock Loop (**HVIL**) for **personal safety**
- Redundant **discharge** of DC capacitors for **personal safety**
- **Automatic protection** against overheating and over-voltage
- CAN communication, **CANopen** and/or **J1939**, with support for **diagnostics** and **software download**

Maximize operating time by minimizing service time

- Working **life** in **excess of 60 000 hours**
- **Liquid** (WEG) **cooled**
- Optional adapter kit for **pre-assembly** of shielded high voltage cables **saves time** and **ensures high quality**
- Extensive and powerful **event handling** and **data logging** simplify troubleshooting and **minimize vehicle down time**
- **Best in class quality and reliability**, achieved through superior design, world class manufacturing processes and field experience

For on-road and off-road vehicles alike

- Rugged **IP6K9K** design withstands close-range high pressure, high-temperature spray downs
- **Field proven control software** platform for on-road and off-road vehicles

Optional adapter kit

ACH with optional adapter kit and cables (cables not included)

Part number: Contact Inmotion

The adapter kit consists of:

- AC adapter plate
- DC adapter plate
- Cable glands (suitable for shielded 50 or 70 mm^2 cables)
- Built-in magnets for HVIL-switches
- Screws for mounting

AC adapter plate with cable glands and mounting screws

DC adapter plate with cable glands and mounting screws

GENERAL

Compatible motor types	Induction machines, PMAC, Sync. Reluctance
Motor feedback types	Resolver or incremental encoder/analog (sin-cos)
Communication	CAN (CANopen, J1939)
Switching frequency	1, 2, 4 and 6 kHz, (8 kHz with de-rating)
Fundamental frequency	0-1 200 Hz (limited to 599 Hz for dual use)
Control mode	Torque, speed or DC voltage control
Efficiency[1]	> 98 %
Logic supply voltage	8-36 V

[1] At nominal DC voltage, running at rated continuous current

CONNECTIONS

Logic connector	TE Leavyseal
Power connectors	M8 cable lugs

TEMPERATURE AND COOLING

Required WEG coolant flow	5-18 l/min
Permissible coolant temperature	≤ 60 °C
Pressure drop (WEG 50 %/50 % @ 60 °C (140 °F))	< 30 kPa @ 18 l/min (ACH35M30 & ACH65M30) < 40 kPa @ 18 l/min (ACH35L70 & ACH65L50)
Ambient operating temperature (with WEG cooling active according to product manual)	-40 °C to 85 °C
Maximum operating altitude above sea level	4 000 m
Recommendations for short-term storage/transportation Temperature Relative humidity	 - 40 °C to + 85 °C < 60 % (non-condensing)
Recommendations for long-term storage Temperature Relative humidity	 + 10 °C to + 30 °C < 60 % (non-condensing)

ELECTRICAL SAFETY AND PROTECTION

Protection class	IP6K9K (cleaning and liquid agent resistant)
Hazard voltage interlock loop (HVIL) discharge protective earth	According to R100
High voltage safety	According to ECE R100
EMC	According to ECE R10

RATINGS

Description	**ACH 35**	**ACH 65**
Nominal DC voltage	350 V	650 V
Hardware overvoltage trip	495 V ± 2 %	898 V ± 2 %
Full current available at	100–450 V	100–800 V
Current de-rating	< 100 V 450–470 V	< 100 V 800–850 V

MODELS

ACH model	Nominal voltage [V DC]	Peak current[1] [ARMS]	Continuous current[2] [ARMS]	Peak power[3] [kVA]	Continuous power[3] [kVA]
35M30	350	320	225	137	96
35L70		700	400	299	172
65M30	350	320	225	137	96
	650			255	179
65L50	350	500	375	214	161
	650			398	299

[1] 60 sec rating at 4 kHz switching frequency and 25ºC ambient temperature

[2] 1 h rating at 4 kHz switching frequency, 60ºC coolant temperature, 85ºC ambient temperature and 18 l/min coolant flow

[3] At nominal DC bus voltage

I/O SUMMARY

I/O	Resolver version number of pins	Encoder version number of pins
General digital inputs	2	2
Hardware ID	2	2
Resolver interface	1	-
Encoder interface	-	1
Sensor supply	-	1
Logic supply/unit enable	1	1
Motor torque off/Digital input	2	2
HVIL (IN/OUT)	2	2
High side out/Low side out	1	1
Motor temperature sensor	2	2
CAN Main interface	1	1
CAN Auxiliary interface	1	1

WEIGHT AND DIMENSIONS

	ACH size M	ACH size L
Weight [kg]	18	25
Dimensions [mm]