

ACS GEN7

The 7th generation ACS motor controllers

Inmotion is the premier global supplier of AC drives and related products to the vehicle industry. AC Superdrive (ACS) is a family of drives with power levels from 5 to 50kVA, for system voltages between 24V and 80V. The ACS is designed with traction, hydraulic pump and generator applications in mind which makes it an ideal choice for most battery-powered electric vehicles.

With ACS GEN7 Inmotion offers very high power density and unparalleled flexibility in application customization together with compliance to demanding functional safety requirements.

In addition to CAN bus communication, all ACS models are available with optional vehicle control I/O to facilitate distribution of vehicle control functionality in a larger control system, or for stand-alone operation.



PRODUCT FEATURES

- **Best in class quality and reliability** achieved through superior design and manufacturing processes
- **Rugged design** suitable for the demanding environment of electric vehicles. Protected against ingress of dust and water
- **Powerful ARM processor** and operating system allows parallel execution of customized vehicle control tasks and motor control tasks
- **I/O version** allows vehicle control to reside in the ACS, directly interfacing vehicle sensors and actuators
- Software Quality is assured through development and review processes designed for compliance with **Automotive SPICE®** and **ISO 13849-1**
- Industry standard **CANopen (Slave or Master)** and **J1939** protocols for reliable communication in the vehicle
- Extensive and powerful event handling and data logging simplifies troubleshooting and ensures **minimized vehicle down time**
- Supports **AC induction, AC synchronous** and **brushless DC motors**. Selected models have optional **DC motor** output
- Standard firmware with built-in support for **traction, pump or generator applications** in electric/hybrid vehicles, including functions such as hill-hold, programmable braking/acceleration characteristics, and dual traction
- **Auto tuning** functionality for pairing the controller with a motor already installed in a vehicle
- Limitation of the output as a function of **motor speed, motor and controller temperature, battery voltage, DC power, DC current** and/or **motor torque** to protect powertrain components
- State of the art vector control with **optimal efficiency** throughout the full speed range
- **Dual CPUs** and **dual feedback** channels for redundant cross monitoring and supervision allows **ISO13849-1, cat. 3** implementation of safety functions to achieve **PL=c/d**

GENERAL

Motor type	Induction AC, Synchronous AC, Brushless DC
Communication	CAN
Switching frequency	4, 8, 12, 16 kHz
Operating stator frequency	0-599 Hz
Control mode	Speed (rpm), Torque (Nm), Current (ARMS) or Voltage (VDC)
Connector	AMP SEAL 23-pin or AMP SEAL 35-pin
Operating temperature	-40°C to + 55°C (-40°F to +131°F)
Storage temperature	-40°C to +70°C (-40°F to +158°F), ambient humidity of 95%
Protection class	IP65
Standards	UL 583 and EC declaration of incorporation of partly completed machinery according to directive 2006/42/EC and 2014/30/EU i.e. C-standard EN 1175-1 and EN 12895

CURRENT AND OUTPUT RATINGS

AC Superdrive model	Nominal DC supply voltage U _{dc}	Rated current (S2, 2min) ARMS**	Rated current (S2, 1h) ARMS***	Rated power (S2, 2min) kVA**	Rated power (S2, 1h) kVA***	Figure
ACS S						
ACS24S35*	24	350	150	10.3	4.4	1
ACS36S35*	36	350	150	15.4	6.6	1
ACS48S28*	48	280	120	16.5	7.1	1
ACS M						
ACS24M55	24	550	275	16.2	8.1	2a, 2b
ACS36M45	36	450	225	19.8	9.9	2a, 2b
ACS36M55	36	550	275	24.2	12.1	2a, 2b
ACS48M35	48	350	175	20.6	10.3	2a, 2b
ACS48M45	48	450	225	26.5	13.2	2a, 2b
ACS48M55	48	550	275	32.3	16.2	2a, 2b
ACS80M25	80	250	125	24.5	12.2	2a, 2b
ACS80M35	80	350	175	34.3	17.1	2a, 2b
ACS80M40	80	400	200	39.2	19.6	2a, 2b
ACS L						
ACS36L70	36	700	350	30.9	15.4	3a, 3b
ACS36L90	36	900	450	39.7	19.8	3a, 3b
ACS48L70	48	700	350	41.2	20.6	3a, 3b
ACS48L90	48	900	450	52.9	26.5	3a, 3b
ACS80L50	80	500	250	49.0	24.5	3a, 3b
ACS80L60	80	600	300	58.8	29.4	3a, 3b
ACS80L70	80	700	350	68.6	34.3	3a, 3b

* Available with optional 1-quadrant DC motor output (S3 15 % rating same as 2 min rating). Not available with 23-pin connector

** 2 minute rating at 8 kHz switching frequency and 25 °C ambient temperature

*** 1h rating at 8 kHz switching frequency, 40 °C ambient temperature, and 6 m/s air flow through finned heat sink

DIMENSIONS [MM]

