

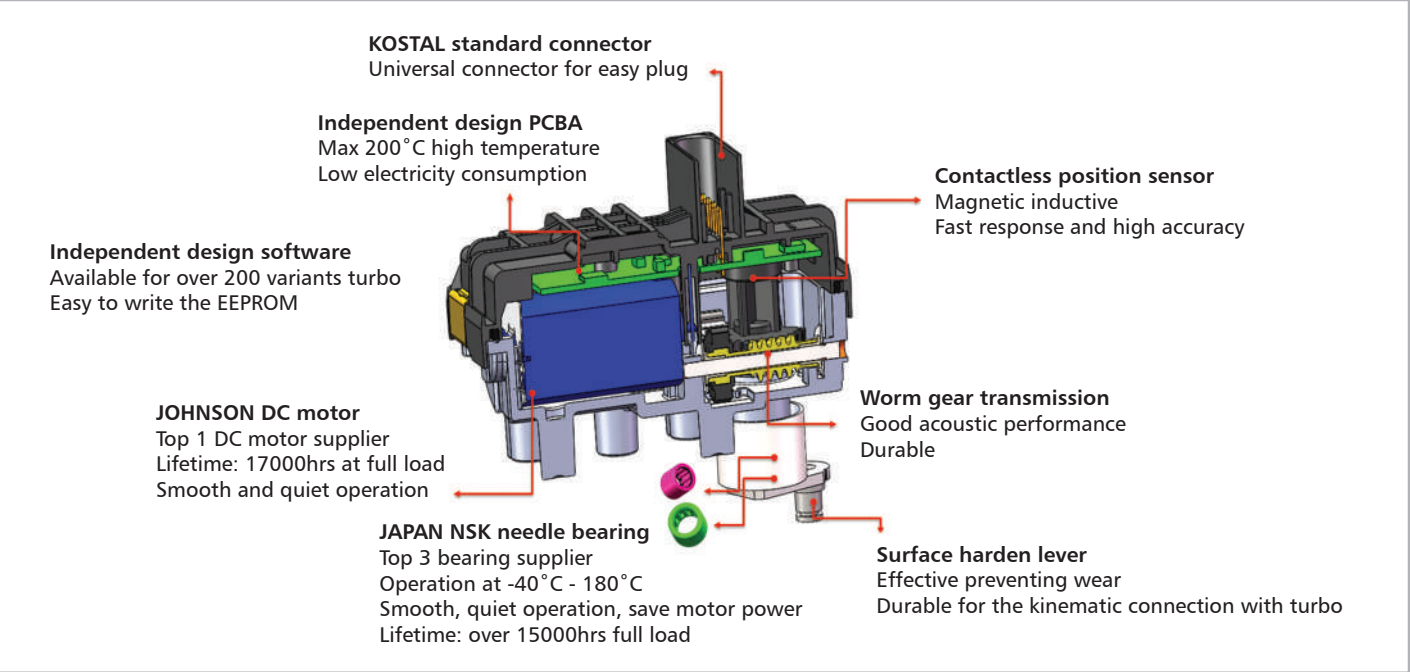
SMART ELECTRONIC ACTUATORS

ELECTRONIC TURBO ACTUATOR

SACER SA1140 Smart remote actuator is designed for the small displacement engine application with electronic control turbocharger, such as e-WGT, e-VG turbo. Smart rotating position feedback module and PWM interface feature provide high benefits for turbocharger effective control.



BENEFITS



SPECIFICATIONS

Motor torque output	Up to 60Ncm (25°C)
Resolution	0.26°
Response time	<1.2ms
Rotation travel	up to 120°
Operating temperature range	-40°C to 125°C
Communication	PWM
Power input	10.5-16V

TYPICAL APPLICATIONS

SACER Smart Electronic Actuators are typically used for Garrett VNT turbo (applications such as passenger car / LDV duty diesel engines to help provide optimum performance and enable compliance with current and future exhaust emissions standards.

- ▶ For Turbo application: Honeywell Garrett VNT turbocharger / BorgWarner BV VTG turbo
- ▶ For Garrett VNT Turbo Model: GT20 / GT27

- ▶ For BorgWarner BV turbo: BV40 / BV43
- ▶ Application information: Implemented for BMW / Audi / VW / Ford / Mercedes-Benz / GM / etc. popular diesel engine passenger cars



OUR MISSION

Our mission is to become a world leader in electronic turbo actuator for automotive aftermarket. We are committed to developing close partnerships with turbo customers, enabling them to minimise time-to-market, and maximise ROI.

TURBO ACTUATOR PRODUCT RANGE



SA1130

CAR BRANDS/MODELS:
BMW / Audi / VW / Ford / Mercedes-Benz / GM

YEAR RANGE:
-

ENGINE:
Diesel

OE MANUFACTURER:
Hella



SA1142

CAR BRANDS/MODELS:
BMW / Audi / VW / Ford / Mercedes-Benz / GM

YEAR RANGE:
-

ENGINE:
Diesel

OE MANUFACTURER:
Hella



SA1150

CAR BRANDS/MODELS:
Volvo, Scania, DAF, Dodge Ram

YEAR RANGE:
2008-

ENGINE:
Diesel ISX 15, ISZ13, Q5X11.9

OE MANUFACTURER:
Cummins, PACCAR



T1

CAR BRANDS/MODELS:
Mercedes A-class / B-class / C-class / E-class / CLA / GLA / GLK / Vito

YEAR RANGE:
2007 - 2017

ENGINE:
180CDI / 200CDI / 220CDI

OE MANUFACTURER:
Siemens / VDO / Continental



T2

CAR BRANDS/MODELS:
BMW 1 Series / 3 Series / X1 / X3

YEAR RANGE:
2003 - 2012

ENGINE:
2.0D

OE MANUFACTURER:
Mitsubishi



T3

CAR BRANDS/MODELS:
BMW / Ford / VW / GM / etc. gasoline engine. Also for e-WGT diesel engine.

YEAR RANGE:
2006 - 2018

ENGINE:
2.0D

OE MANUFACTURER:
Bosch



T4

CAR BRANDS/MODELS:
Landrover Rangerover Sport / Discovery

YEAR RANGE:
2004 - 2009

ENGINE:
3.0TD / 3.6TD / 4.2 / 4.4 / 5.0

OE MANUFACTURER:
Sonceboz

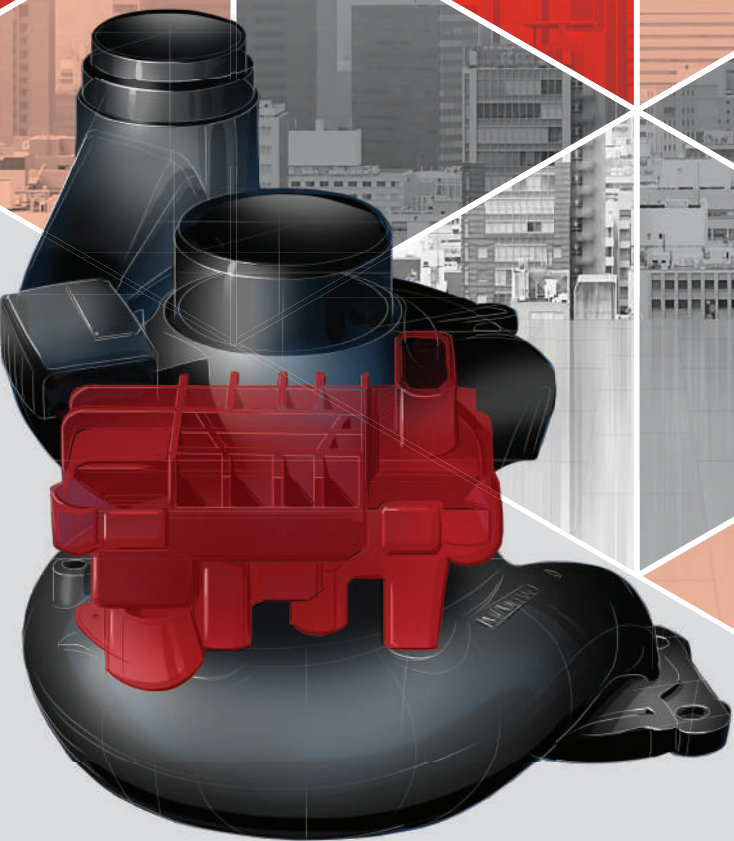
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SACER®
ELECTRONIC CONTROL SOLUTIONS



SMART ELECTRONIC ACTUATOR

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quality control standards. It is worth mentioning that all Sacer's electronic solutions, use the car gauge chips, to meet AEC-Q100 verification requirements.

► The turbocharged electronically controlled actuator independently developed by Sacer can realize CAN/LIN protocol communication and completely replace the internationally famous brand of similar products.

Starting from the design plan, DV verification standards, endurance experiments, to mass productions, the APQP development process in IATF16949 is strictly followed. Through long time study, we formed a complete set of Sacer technological development standards and strict

Throttle Position Sensor

Clutch servo unit

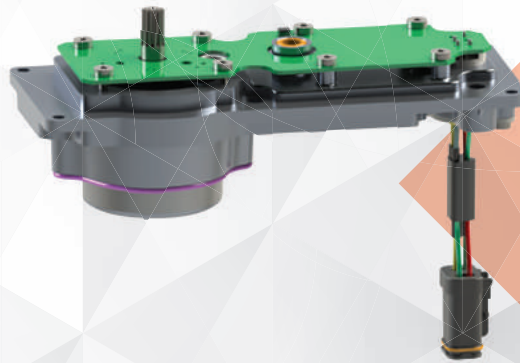
Solenoid valve control clutch servo



BENEFITS

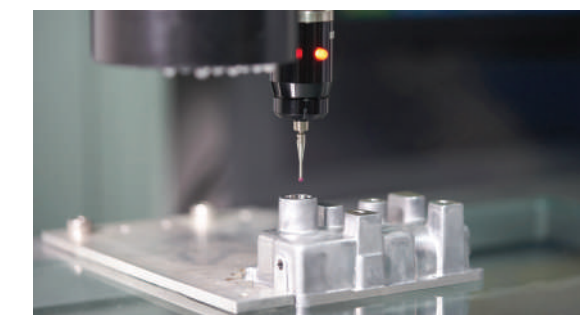
24V compatibility provides application flexibility

Peak torque output	Up to 5.0Nm
Continuous torque output	Up to 4.5Nm
Resolution	0.26°
Response time	<120ms
Rotation travel	up to 120°
Operating temperature range	-40°C to 125°C
Communication	CAN J1939
Power input	24V
Cooling system	Water-cooling



- ▶ For turbo application: Cummins Holset VGT turbocharger
- ▶ For Holset turbo models: HE400VG, HE451VE, HE500VG, HE561VE
- ▶ For engine models: see table.

Year	Engine brand	Displacement	Engine type	Engine Family	Engine Version
2005-2015	Cummins	6.7	Diesel	ISX07	Dodge Ram series
	Cummins	15		ISX15	CM2250 SN / CM2250 / CM2350 X101 / CM2350 X11 / CM570 / CM870 / CM871 E / CM871
		13		ISZ13	CM2150 SN
		11.9		QXSX11.9	CM2250 ECF
		13		QSZ13	CM2150 Z101 / CM2150 Z10
		15		QXSX15	CM2250 ECF / CM2250 / CM2350 X105 / CM2350 X10 / CM570
2007-Now	Cummins			ISX 15	Volvo Truck
2010-Now	PACCAR	13		PACCAR MX13	DAF



- ▶ Design department is responsible for 3D/2D design of the e-Actuators and components
- ▶ Collaboration with PE and CAE to ensure technical optimisation proposal can achieve the certain target
- ▶ Modular Design / Customized interface
- ▶ Standardised PCBA design configuration
- ▶ FEA - Finite Element Analysis
- ▶ Housing TMF
- ▶ Parts heat distribution & transforming
- ▶ Support vibration fatigue
- ▶ Machine model & harmonic response
- ▶ 360° analysis of all risks. Provide durable engineering validation testing methods to guarantee performance and lifetime

ITEM	TESTING NAME	TARGET
1	HALT testing	Thermal cycle (high temperature & low temperature cycle)
2	Vibration testing	Sine sweeping frequency
3	Corrosion testing	300hrs salt spraying testing
4	RT durability testing	2000hrs (3 million duty cycle) RT full load durability testing
5	High/low temperature ageing testing	400hrs +135°C heat (-40°C) testing within OVEN room
6	Water proof testing	IEC60529-IP65 water directly crash testing
7	Drop testing	2m height drop
8	EMC	Radiated emission / conducted emission / Harmonic / flicker
9	ROHS & REACH testing	CCC/EC certification
10	Individual Parts DV testing	According to drawing
11	Vehicle durability	SA1130/SA1140 more than 100K kilometers real vehicle testing score, SA1150 more than 6 month real vehicle testing

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graph LR
    OP40[OP40] --> OP50[OP50]
    OP50 --> OP60[OP60]
    OP60 --> OP70[OP70]
    OP70 --> Packaging[Packaging]
  
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OP40	OP50	OP60	OP70
PCBA function and performance testing	Write program into MCU/IC	Performance testing	PQC checking
PPK/CPK	POKA-YOKA	POKA-YOKA	
100% process monitor by machine	100% process monitor by machine	100% process monitor by machine	
100% measuring			Packaging

