E²PRECON-c20

E²PRECON-c20 processes data from up to 20 cylinder pressure sensors and provides real-time combustion characteristics for monitoring and closed-loop control.

With the E²PRECON family AVAT has pioneered cylinder pressure based engine control and offers comprehensive real-time cylinder pressure analysis in a compact size.

E²PRECON-c20 is designed for integration into systems for controlling combustion engines and supports a wide range of cylinder pressure sensors from various manufacturers. Using well-proven digital signal processing algorithms E²PRECON-c20 computes combustion characteristics for each cylinder and every combustion cycle. These are the key parameters engine builders need to implement advanced combustion control, monitoring and diagnosis.

Incorporating thermodynamic models, E²PRECON-c20 calculates the net heat release rate (netHRR). From this, important combustion parameters such as heat release (HR), start, duration and center of combustion (SoC / DoC / CoC) are computed. Indicated mean effective pressures (IMEP), peak pressures and knock levels are also provided.

Cylinder pressure, sensor health monitoring and signal plausibility checks are included.

E²PRECON-c20 is easily integrated into engine control systems and PLCs via CAN bus. Service tool assists in engine diagnostics and optimization.

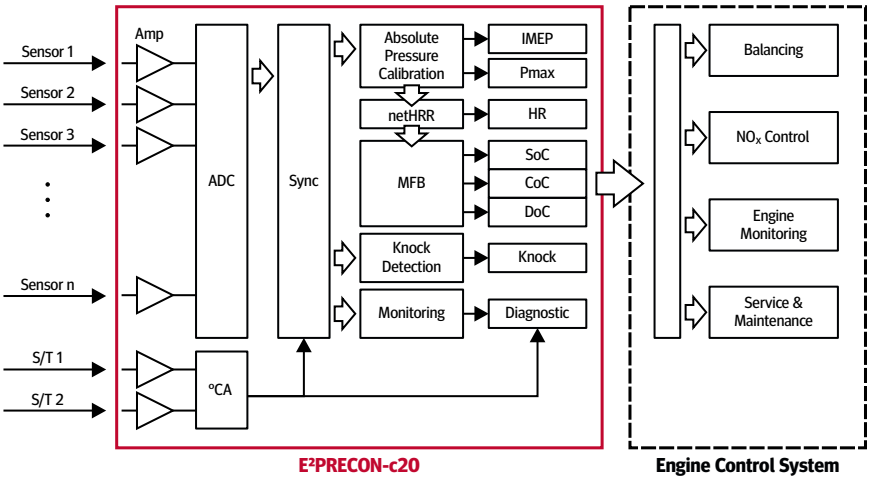
HIGHLIGHTS

- Real-time cylinder pressure analysis for up to 20 cylinders
- Cylinder-individual combustion characteristics
- Direct visualization and recording of cylinder pressure curves
- Enables balancing, misfire and knock detection
- Seamless integration with engine control and diagnostic systems
- Compact housing with DIN mounting rail

APPLICATION AREA

DESIGNATION	E²PRECON-c20
Part number	3 000 312
AMBIENT CONDITIONS	
Operating temperature	-25 ... +75 °C
Storage temperature	-25 ... +85 °C
Humidity	0 ... 95 % relative humidity; not condensing
Vibration resistance	IACS UR E10.7 vibration, IEC 60068-2-6 2 ... 25 Hz: s = ±1.6 mm; 25 ... 100 Hz: a = ±4 g
Protection class	IP20 (EN 60529)
ELECTRICAL DATA	
Supply voltage nom.	DC 24 V
Supply voltage max.	DC 18 ... 32 V
Typical current consumption	180 mA
Typical power consumption	4 W
EMC limit values	EN 61326-1[a)], DIN EN 61000-6-2 and DIN EN 61000-6-4
Input channels for cylinder pressure sensors 4 ... 20 mA (0 ... 5 V)[b)]	20 sensors
Input channels for speed / timing sensors	2 x passive 2-wire sensors: signal threshold 0 ... 100 V_{pp} or alternatively 2 x active sensors: input voltage range DC ±53 V
DATA INTERFACES	
Data link to ECS	CAN SAE-J1939 standard protocol or CANopen, DI and DO
Connection to service PC	USB 2.0
MECHANICAL DATA	
Dimensions (H×W×D)	119 mm × 165 mm × 61 mm
Installation	35 mm top hat-rail, DIN EN 60715

a) Impulse voltages >0.5 kV (line / line) or >1 kV (line / earth) require an external protective circuit.
b) On request.



E²PRECON-c20 computes IMEP, peak pressure, heat release, combustion timings and knock levels for each cylinder and every engine working cycle. This data is transmitted synchronously to the engine control system where it is used for various purposes, e.g. closed-loop combustion control (CLCC).