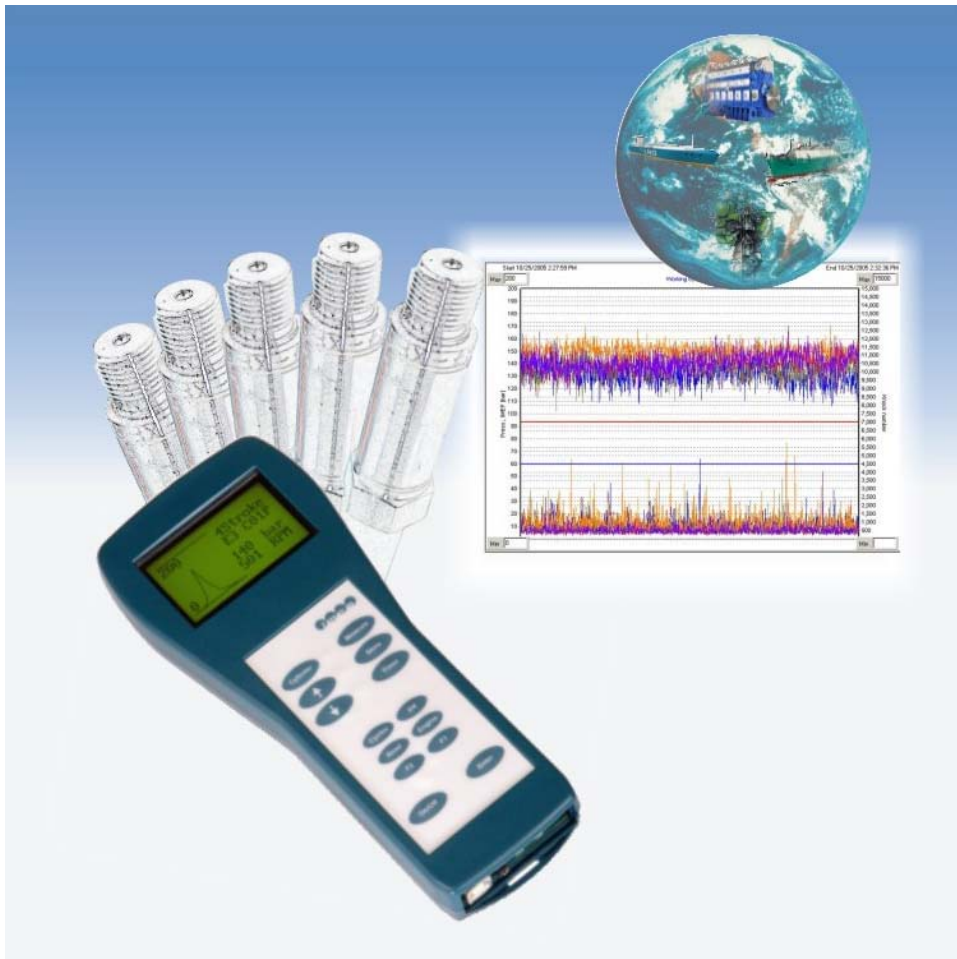




Intelligent Solutions in Engine Management

# Engine Analyzer EPM-XC





## Intelligent Solutions in Engine Management

- High accuracy
- Power- and MIP calculation
- User friendly equipment
- Combustion measurement
- On- and Offline analysis
- Online data of Pmax
- USB connection to PC





Intelligent Solutions in Engine Management

## Application:

- 2 stroke engines: 50 – 500 RPM
- 4 stroke engines: 300 – 2100 RPM

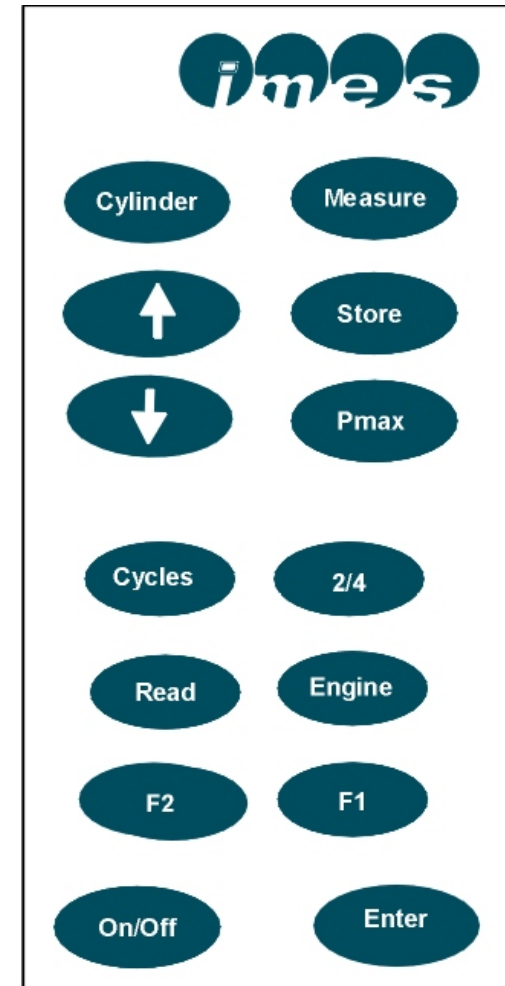




## Operation

Each button has only one function for operation.

- Selection of each cylinder
- Display of measured curve
- Selection up to 5 engines
- Selection up to 20 cylinders
- Storing up to 1500 measurements
- Selection of 2 or 4 stroke engine





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Scope of supply

⇒ Instrument case





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## Scope of supply

⇒ EPM-XC incl. Battery  
2300 mAh





## Scope of supply

⇒ Cylinder pressure sensor  
HTT-04





## Scope of supply

⇒ Thompson Adaptor incl. cooling element





## Scope of supply

⇒ Charging station  
(100 -240 ADC)





## Scope of supply

⇒ Pickups

Magnetic- , inductive pickups





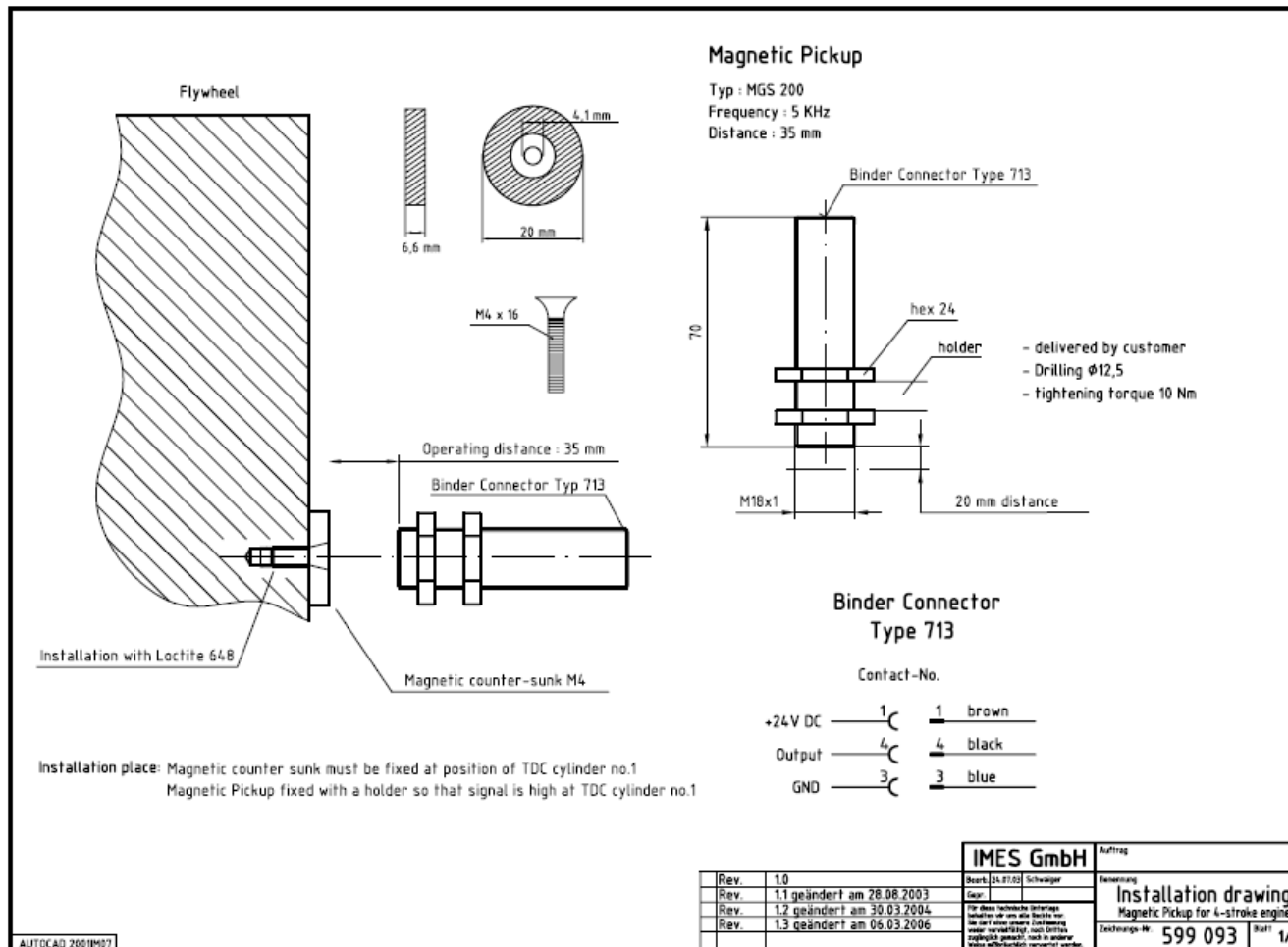
## Installation

⇒ Connection of sensor and pickups to EPM-XC unit



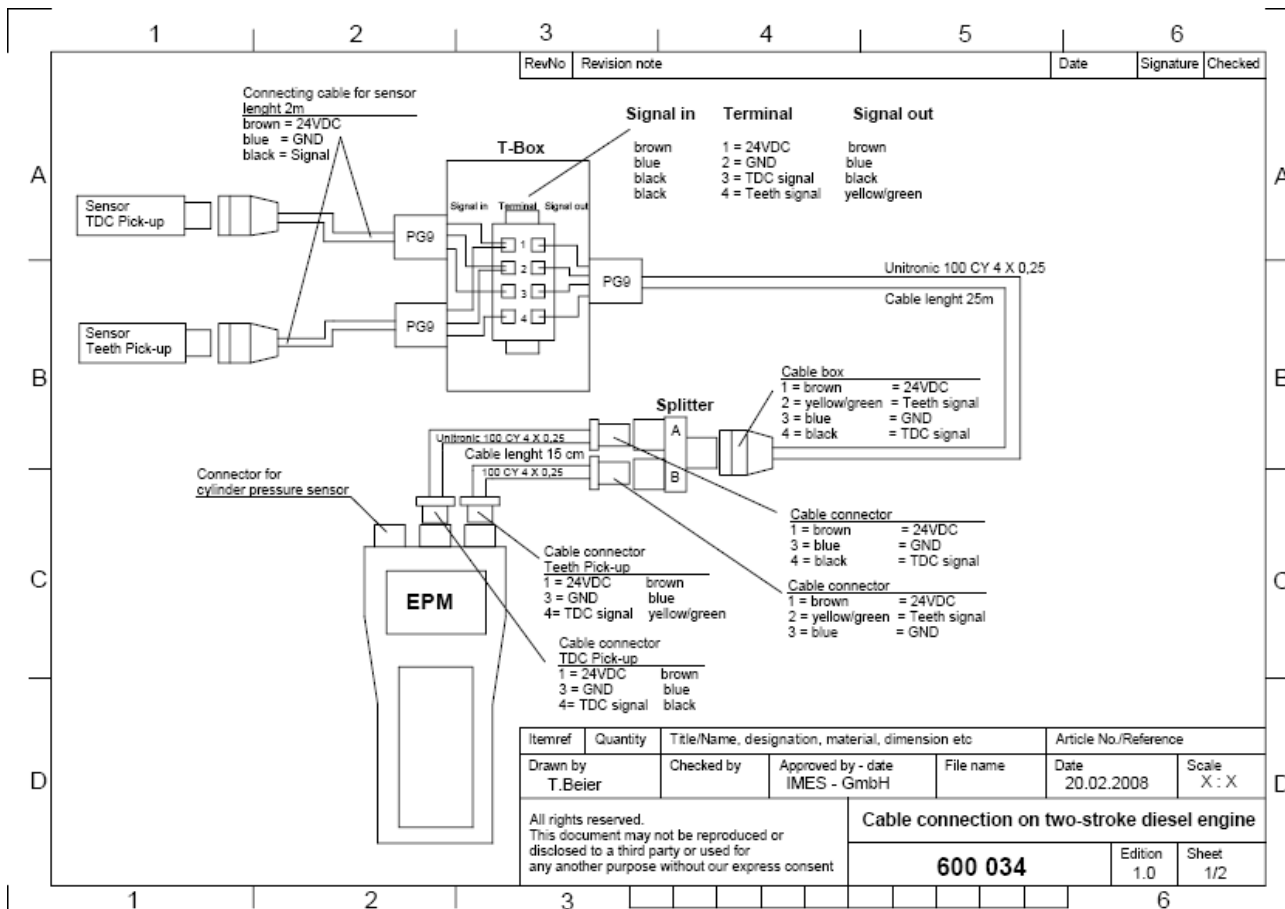


# Installation ⇒ Magnetic pickup on a 4-stroke engine



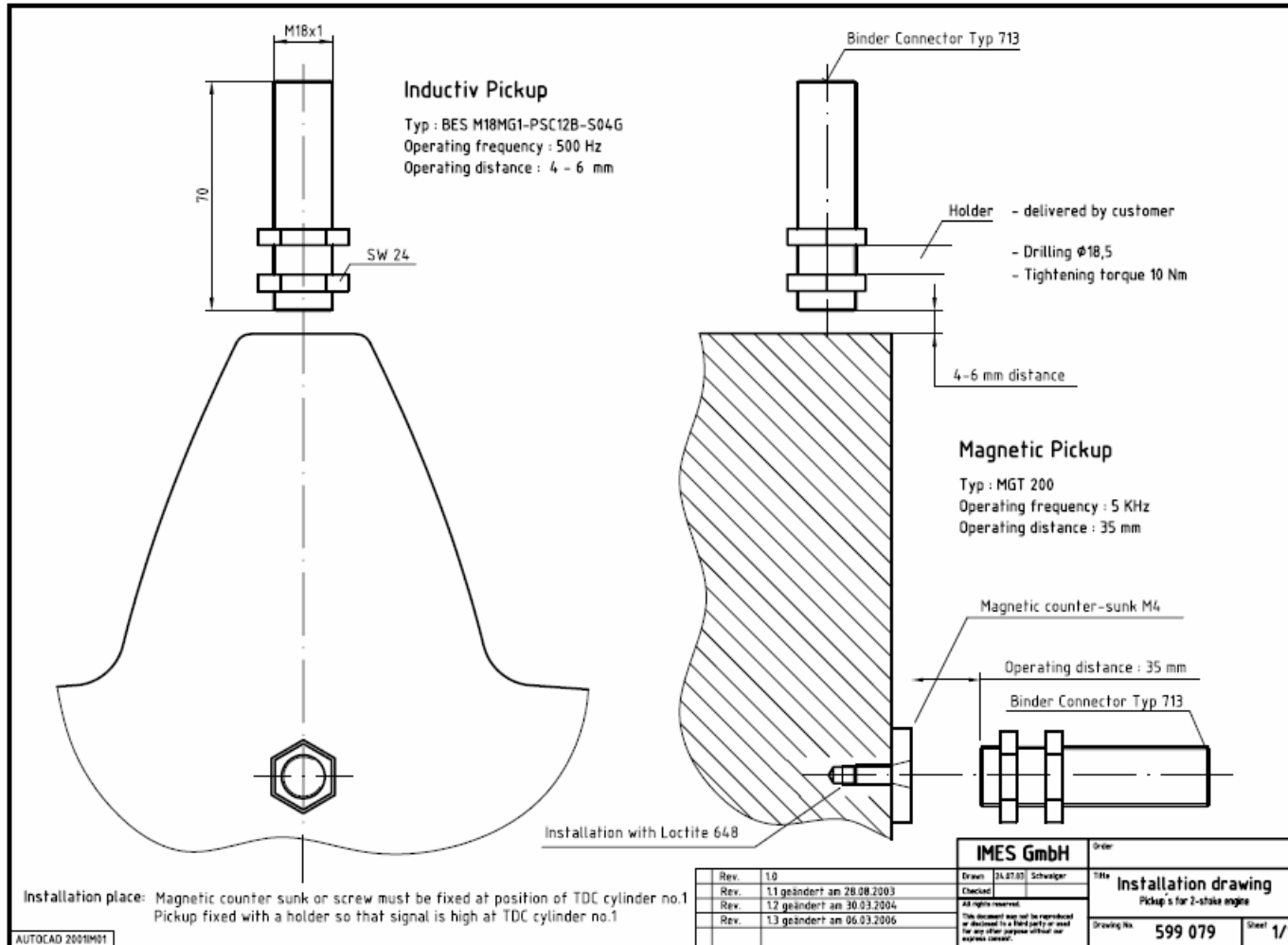


# Installation Cable for pickup connection to EPM-XC on 2-stroke engines





# Installation: ⇒ Pickups on a 2 stroke engine





## Installation

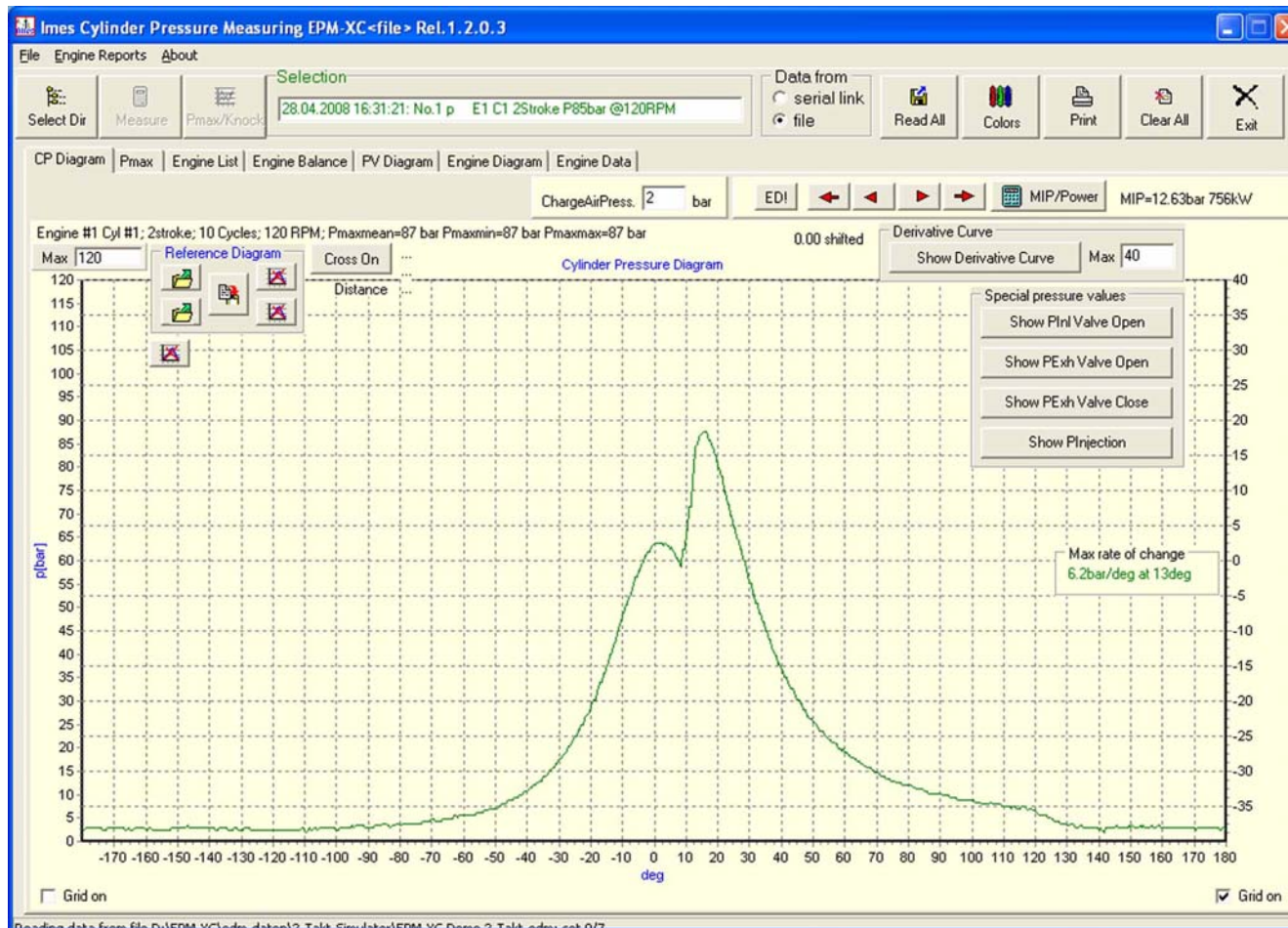
⇒ Cylinder pressure sensors  
at indicator cock





# Visualisation software

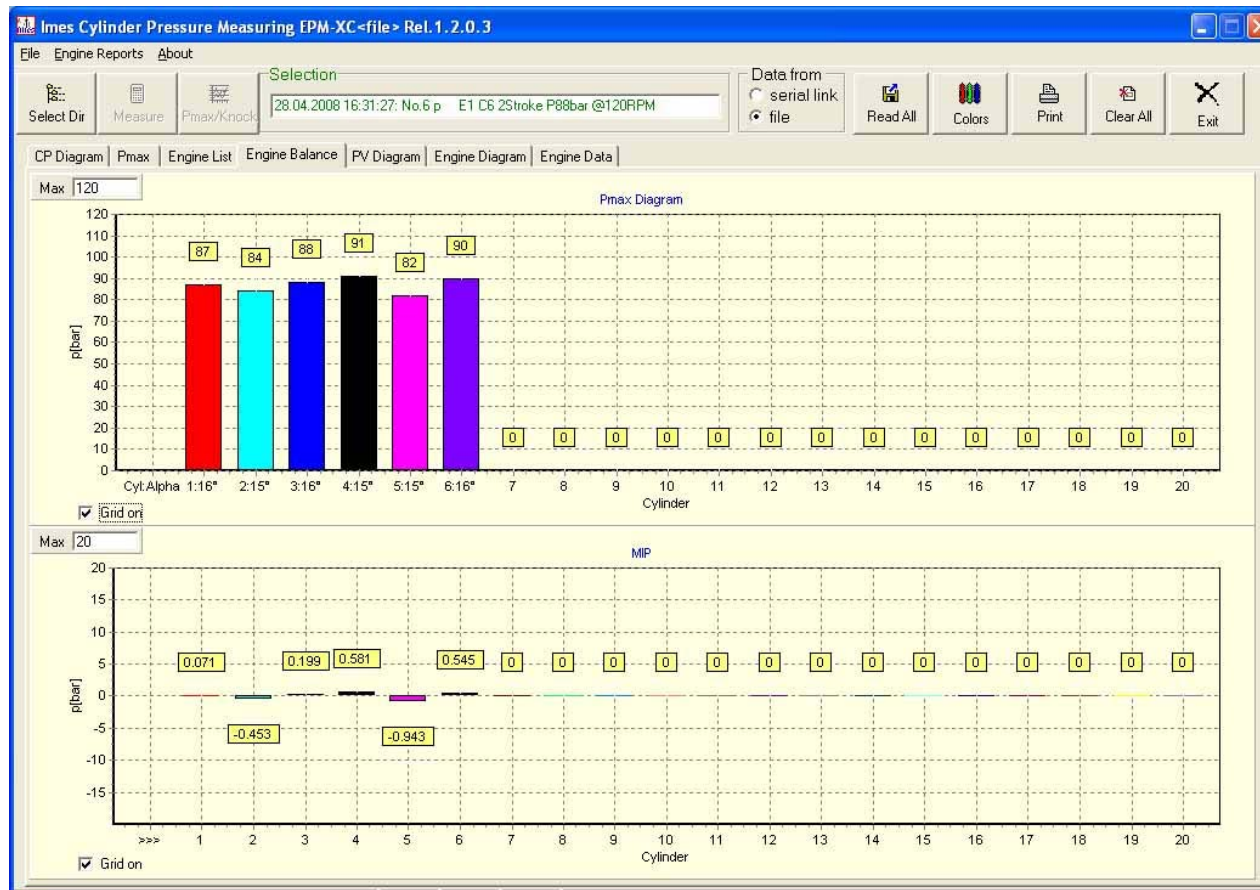
## P/alpha diagram





# Visualisation software

## Pmax- and MIP-balance diagram

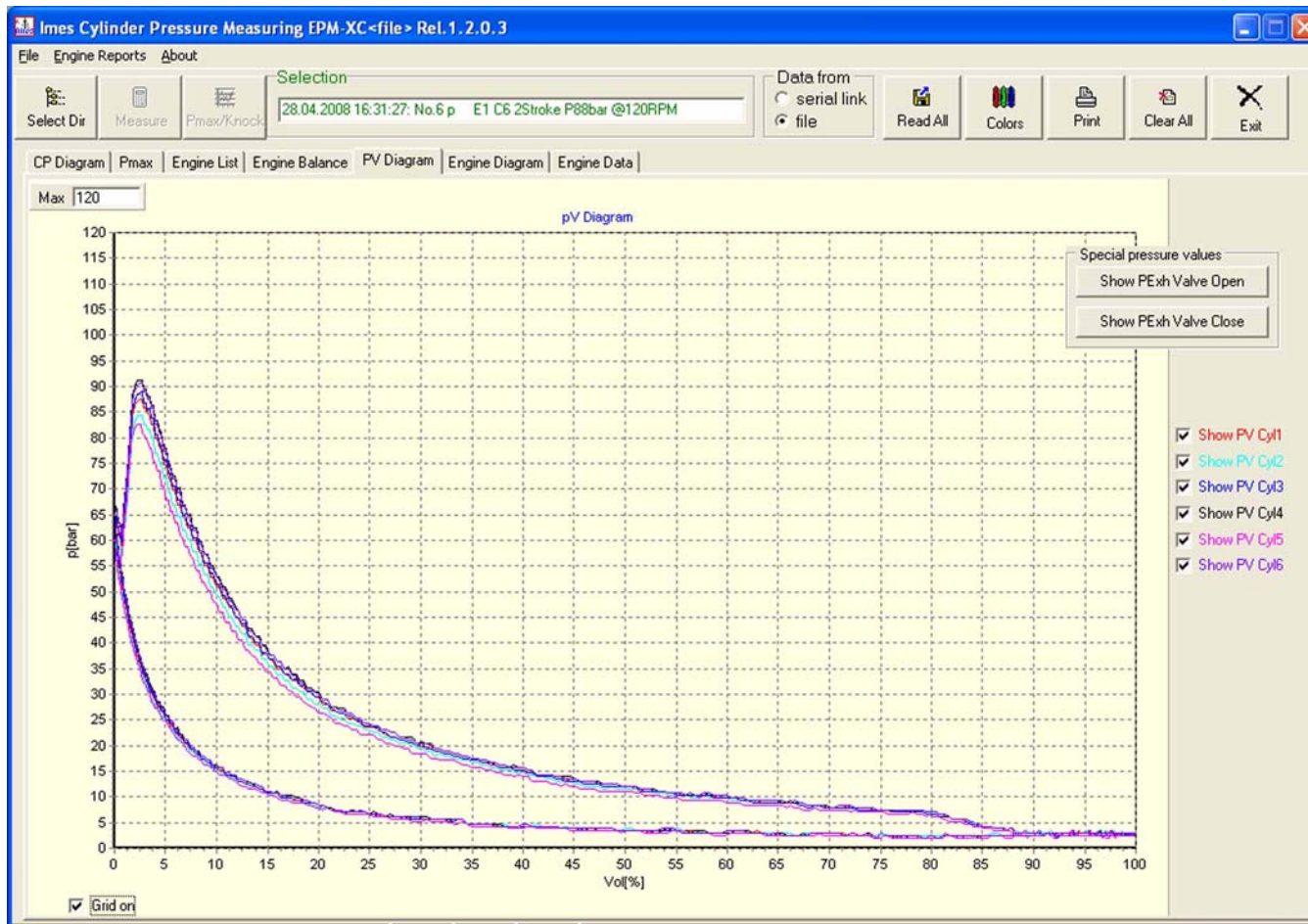




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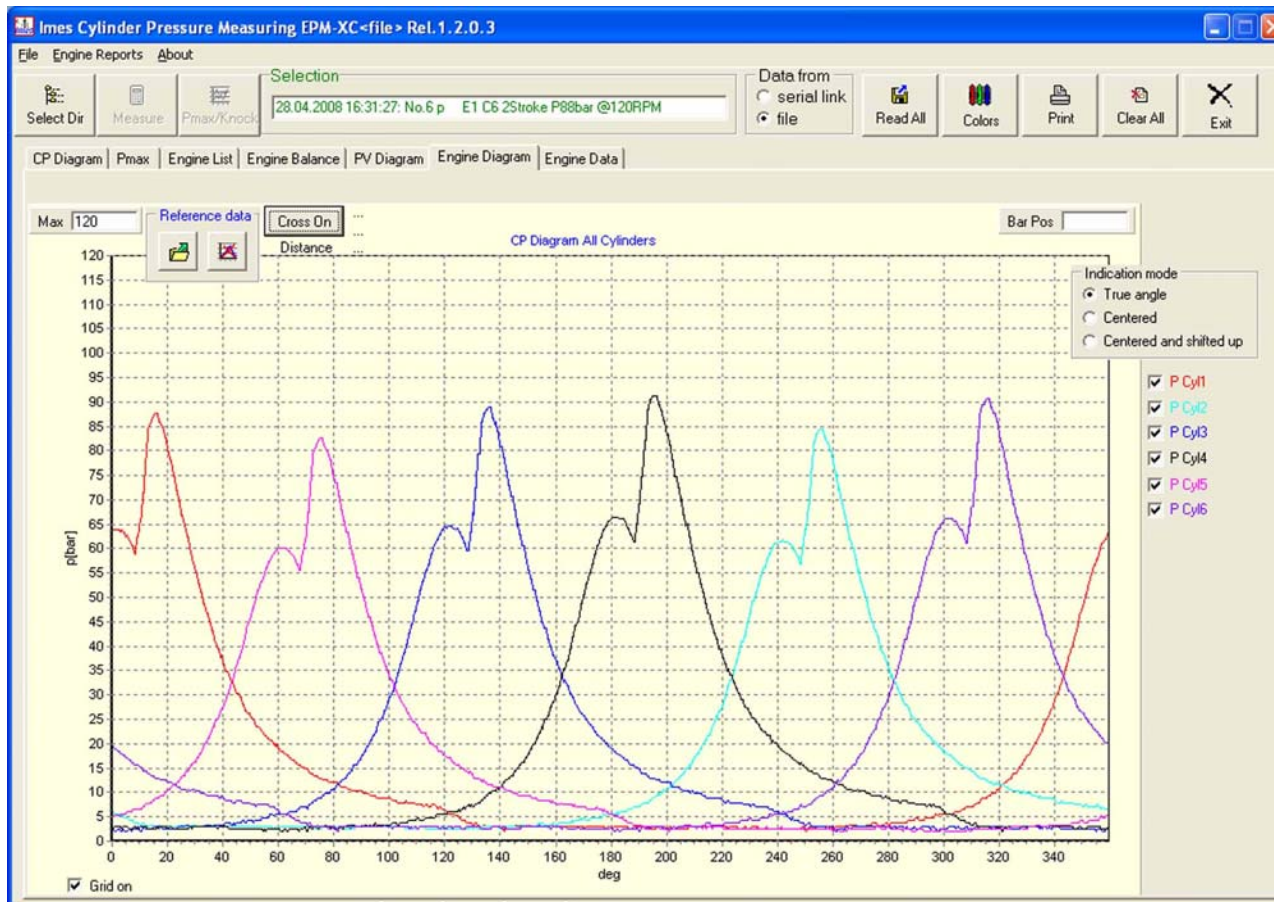
# Visualisation software

## P/V diagram





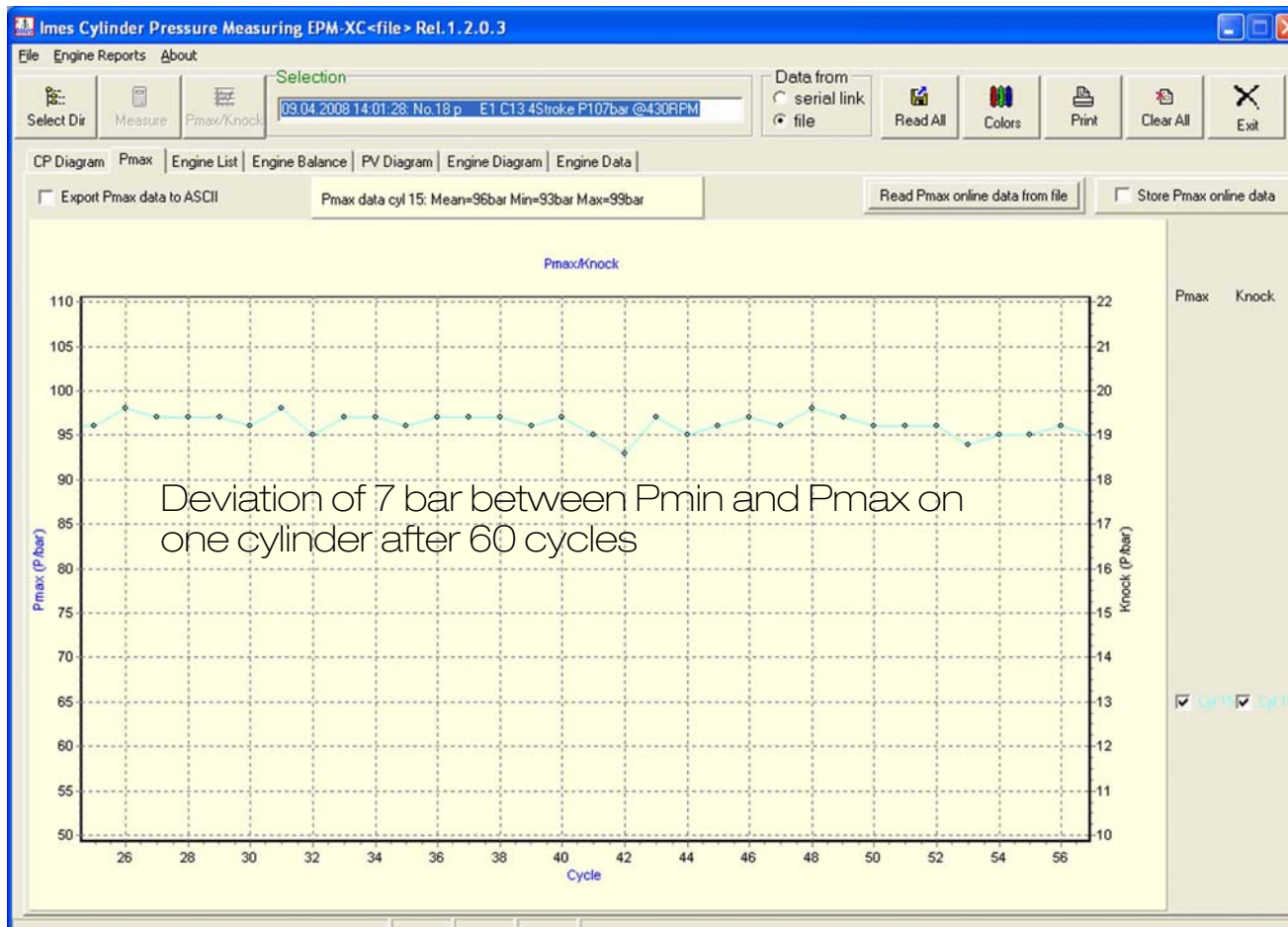
# Visualisation software: Engine diagram all cylinder





# Visualisation software

## Pmaxdata





# Condition based monitoring by using EPM-XC

Analysis of engine performance with important values:

Engine Report																					
Imes Cylinder Pressure Measuring System EPM-XC, Engine Report																					
Ship/Power station:					Engine type: Sulzer RTA 85					Data read:											
Engine Power: 4515 kW				Power A side:				Power B side:				Power diff. A/B:									
Load:		Loaded:		Ballast:		OBS Speed:		Wind: m/s - Knots:		Sea:											
Sea. Temp.		Engr. temp.		Temp.:		Viscosity:		Fuel quality:		Governor index:											
Fuel Info:		Fuel consumption:		Runnings hours since last report:		Cylinder oil cons. / kW & h:															
Consumption:		Running hour total: 12000																			
Running hours:		RPM:15000		Scav. air press.:		Scav. air temp.:		Ex. temp. before:		Ex. temp. after:											
T/C 1:		Press. drop cooler:		Cool temp. in:		Cool temp. out:		Luboil temp.: 85°C		Hrs overhaul:											
T/C 2:		RPM:		Scav. air press.: 2bar		Scav. air temp.:		Ex. temp. before:		Ex. temp. after:											
		Press. drop cooler:		Cool temp. in:		Cool temp. out:		Luboil temp.:		Hrs overhaul:											
Cylinder		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Pmaxmean	bar	87	84	88	91	82	90														
Pmaxmax	bar	88	86	87	93	83	91														
Pmaxmin	bar	86	85	86	90	81	89														
MIP	bar	12.63	12.10	12.75	13.14	11.61	13.10														
Alpha Pmax	deg.	16	15	16	15	15	16														
Pcomp	bar	66	66	66	66	66	66														
Pinj	bar	0	0	0	00	0	0														
Pintl_open	bar	0	0	0	0	0	0														
Pexh_open	bar	0	0	0	0	0	0														
Pexh_close	bar	0	0	0	0	0	0														
Max change	bar	6.4	6.4	6.4	6.4	6.4	6.4														
PMI Diff.	bar	0.07	-0.45	0.20	0.58	-0.94	0.54														
Pump Index	%																				
Pmax diff.	%																				
RPM	RPM	120	120	120	120	120	120														
Cycles	Cycles	10	10	10	10	10	10														
Power	KW	756.8	725.4	764.5	787.4	696.1	785.2														
Exhaust	°C	320	332	320	325	330	325														
Cool. water outl.	°C																				
Piston Cool.outl	°C																				
Exhaust valve	h																				
Liners	h																				
Info:																					

Manual input by user:

- Lube oil p and t – value
- Fuel consumption value
- Turbo charger p and t
- Exhaustgas temperature

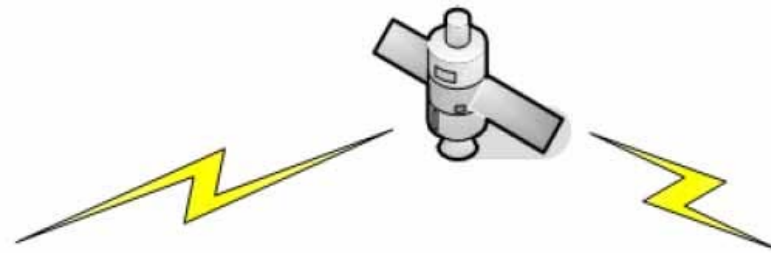
Measured data by EPM-XC:

- Combustion data
- Pmax; MIP ; lpower

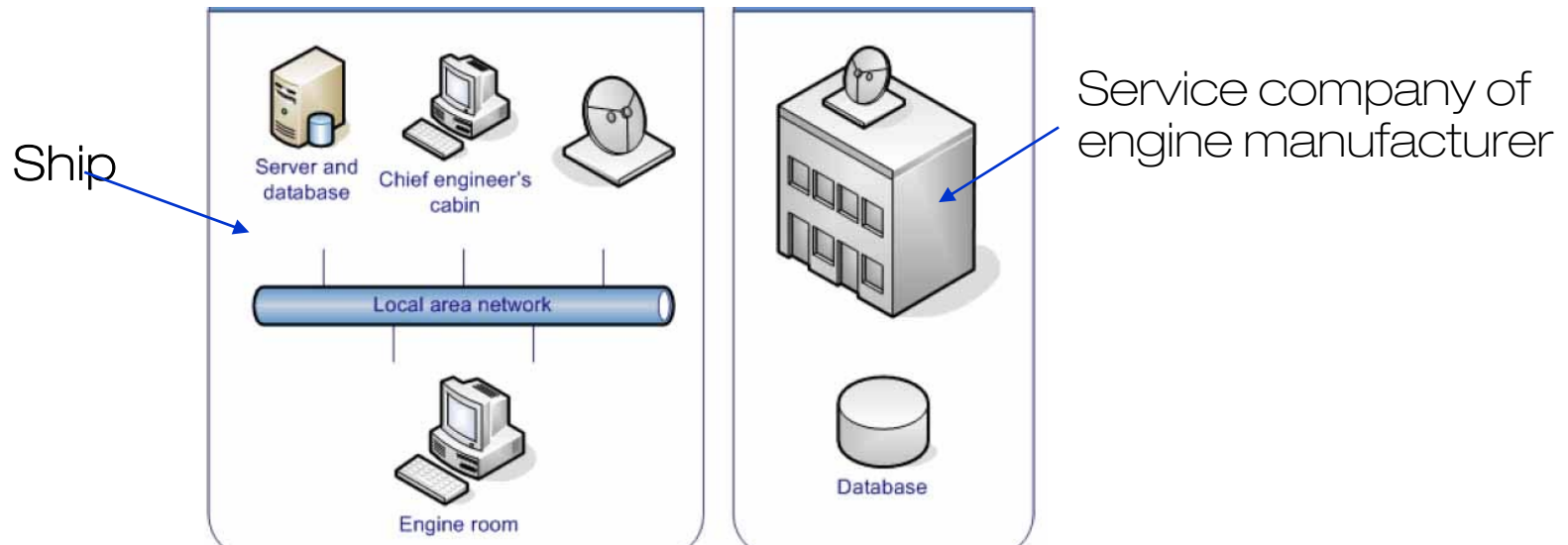


# Condition based monitoring by using EPM-XC

Analysis of engine performance with important values:



Engine performance data measured and saved with EPM-XC transferred by e-mail to service of engine manufacturer





## Technical-data

Engine Analyser EPM-XC	
HTT-04 Sensor	Data sheet HTT-04_en_06-2008
Measuring range pressure	0...300 bar
Max. temperature at measuring cell	300 °C
Thermal shock 1500 RPM pmi=9bar	≤ +/-0,5 bar
Function of Vis-Software	p/alpha- ; p/V- ; Engine diagram; Engine report
Storing capacity of engine sets	5 sets
Storing capacity	200 measurements
Interface	USB 1Mbit/s
Battery	4.8 V / 2300 mAh
Dimension	229 x 70 x 37.5 mm
Weight	500 g



## Summary

- One measuring unit for 2- and 4 stroke engines
- User friendly key board. Each button at the keyboard has only one function for operation
- Cylinder pressure sensor HTT-04 with high accuracy and calibration protocol
- Pmax function for storing max. 1500 working cycles/cylinder
- Additional manual input and storing of performance data for example: turbo charger speed, exhaust gas temperature, etc.
- Save measured data to ASCII format
- Connection to PC via USB port