



Upgrade Kits

For WAUKESHA® VHP G/GU/GSI/GL
12 Cylinder Engines



GAS ENGINE TECHNOLOGY

reliable • efficient • worldwide

Ignition and Detonation Control Upgrade Kits

For WAUKESHA® VHP G/GU/GSI/GL 12 Cylinder Engines

Upgrade your workhorse to the latest Systems and Accessories

MOTORTECH's ignition and detonation control upgrade kits are specially designed for a complete and simple conversion of WAUKESHA® VHP series gas engines. Prefabricated and prewired components make the conversion easier and reduce costs based on engine downtime.

Don't go Low-Tech and take the risk of engine down time because of failing equipment. Eliminate the need for constant rewiring, connector exchanges or straightening out weak and bent aluminum wiring rails.

Upgrade your engine to the latest systems and increase reliability and efficiency.

Benefits

- Kits include all necessary components for a successful ignition or detonation control upgrade
- Available in different versions for unshielded or shielded applications
- Prefabricated components guarantee easy installation
- High quality materials and design last longer
- Upgrade kits can be extended individually

Sample System Overview – Ignition Control

Necessary Components

- 1 MIC4 ignition controller
- 2 Pickup lead*
- 3 1 Hall effect pickup*
- 4 Trigger disc and hub
- 5 Output harness*
- 6 Ignition coil*
- 7 1 Primary lead/PolyMot™ spark plug lead per ignition coil*

Accessories

- A Junction box
- B AlphaRail ignition wiring rail

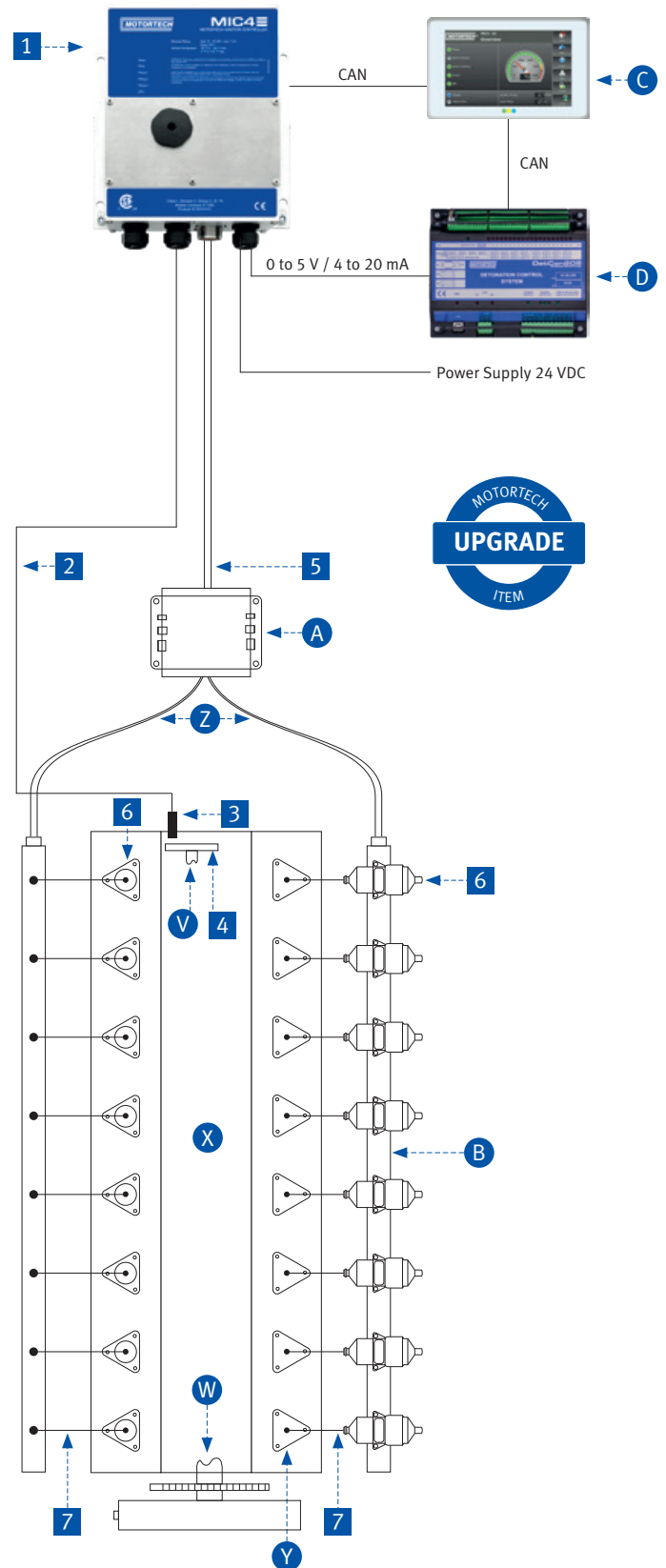
System Enhancement

- C PowerView3 – HMI module
- D DetCon20 – Detonation controller

Description

- V Camshaft
- W Crankshaft
- X Engine
- Y Cylinder
- Z Harness to connect the ignition wiring rails and the junction box

* Shielded and unshielded versions depending on upgrade kit.



Ignition Control Upgrade Kit Components



MIC4 Ignition Controller

Efficiency-enhanced engines, stricter emission regulations, highly compressed mixtures, as well as the use of a great variety of gas types are putting even greater demands on the entire ignition system. Based on the MOTORTECH ignition controller platform, the MIC4 series fulfills these greater demands.

With 300 mJ primary energy, the MIC4 series provides a reliable combustion on engines up to 16 cylinders even with weakest or fluctuating caloric values of the gas. Next to high variable ignition energy (MOST – MOTORTECH Output Stage Technology*) an accurate spark timing and diversified online diagnostics help to improve engine efficiency, spark plug life and availability of the equipment under the strictest emission regulations.

- Adjustable spark duration and intensity
- Constant spark intensity via adjusted duration
- Patented technology (MOST*)
- 300 mJ primary energy (500 mJ boost for start phase)
- Ignition diagnostics (primary and secondary)
- Fault memory with trend data
- Integrated CANopen and Modbus RTU interface
- Easy access per USB port

*Patent No.: US 8,893,692 B2



Ignition coils

Special high performance ignition coils are designed for use with latest technologies of MOTORTECH ignition controllers (MOST). Different designs are available either for direct rail mounting in combination with spark plug leads or as integral ignition coil to allow installation directly on the spark plug.



AlphaRail Wiring Rail System for Ignition and Detonation Control

MOTORTECH stainless steel, vibration resistant rail assembly will withstand any harsh environment commonly found in the oil & gas industry. The proven design is made for engine manufacturers and the global aftermarket. Do not go Low-Tech and take the risk of engine down time because of equipment being under repair. Eliminate the need for constant rewiring, connector exchanges or straightening out weak and bent aluminum wiring rails.

- Made of stainless steel
- Rigid military style connectors
- Rails are filled with special foam to ensure that all wires are separated from ground and will not vibrate
- Water proof design – built to last in uncovered environment
- Wiring rails can be used for shielded and unshielded applications
- Due to base rail structure easy for stocking
- Quick service access with quick-disconnect connections



Shielded Ignition Control Upgrade Kit

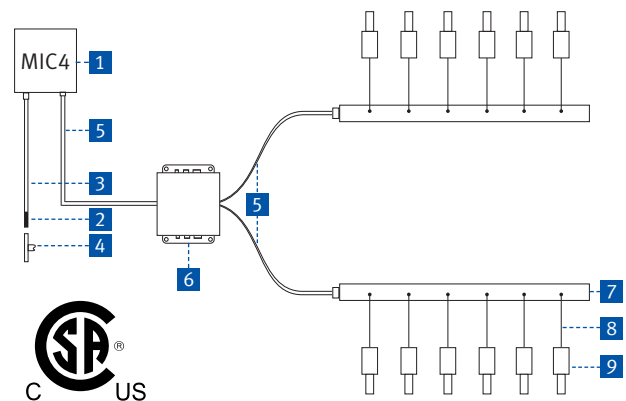
SHIELDED

With MIC4 Series Ignition Controller

For **WAUKESHA® VHP G/ GU/ GSI** 12 Cylinder Engines

Upgrade kit contains:

- MIC4 series ignition controller **1** with 16 outputs and patented MOTORTECH Output Stage Technology (MOST*)
- 1 pickup arrangement (Hall effect **2**) incl. shielded pickup lead **3**, trigger disc and hub **4**
- Output wiring **5** and junction box **6** with fittings to connect ignition controller and wiring rails (flex conduit has to be ordered separately or supplied by customer)
- AlphaRail wiring rails **7** with hardware kit
- New Flex Style primary leads **8** for connection of wiring rails and integral ignition coils
- High energy integral ignition coils **9** (fat design)



Ordering Information

P/N	Description	Required Qty
95.75.120-12	Shielded ignition control upgrade kit for WAUKESHA® VHP G/ GU/ GSI 12 cylinder engines	1 pc

Ordering Information – Optional Parts

P/N	Description	Required Qty
ICPB812	ICP spark plug, M18x1.5, 0.500 in thread reach, J-type (I/r/Ir)	12 pcs
06.05.085	PowerView3 HMI module	1 pc
alternative 06.05.185	PowerView3 HMI module, built into stainless steel enclosure	1 pc
alternative 06.05.187	PowerView3 HMI module, built into steel enclosure with sight window	1 pc
06.05.086-F	PowerView3 activation code for MIC4 visualization	1 pc
15.07.112	Flex conduit, 1/2 in, black, for wiring of junction box to wiring rails	30 ft
15.07.134	Flex conduit, 3/4 in, black, for wiring of ignition controller to junction box	15 ft

Ordering Information – Tools and Accessories

P/N	Description	Required Qty
06.98.100-200	ScopeLite LED timing light	1 pc
07.99.022-2-18	Magnetic spark plug socket, 18 in length, HEX 15/16 in, 1/2 in drive	1 pc
44.01.023	Spark plug cleaning kit	1 pc

*Patent No.: US 8,893,692 B2

Unshielded Ignition Control Upgrade Kit



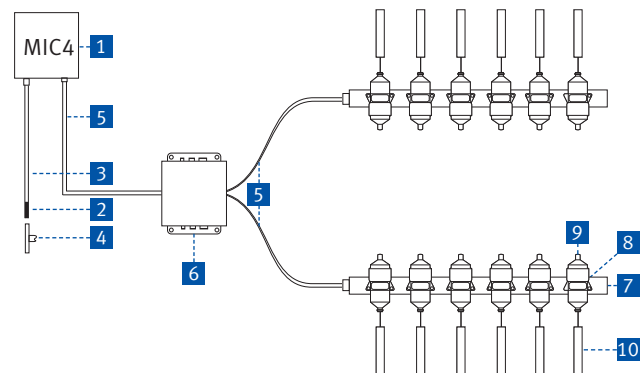
UNSHIELDED

With MIC4 Series Ignition Controller

For **WAUKESHA® VHP G/GU/GSI** 12 Cylinder Engines

Upgrade kit contains:

- MIC4 series ignition controller **1** with 16 outputs and patented MOTORTECH Output Stage Technology (MOST*)
- 1 pickup arrangement (Hall effect **2**) incl. pickup lead **3**, trigger disc and hub **4**
- Output wiring **5** and junction box **6** with fittings to connect ignition controller and wiring rails
- AlphaRail wiring rails **7** with hardware kit
- Primary lead and mounting kits **8** for connection of wiring rails and ignition coils
- High energy ignition coils **9**
- PolyMot™ spark plug leads **10**



Ordering Information

P/N	Description	Required Qty
77.75.120-12	Unshielded ignition control upgrade kit for WAUKESHA® VHP G/ GU/ GSI 12 cylinder engines	1 pc

Ordering Information – Optional Parts

P/N	Description	Required Qty
B8124	MHP spark plug, M18x1.5, 0.500 in thread reach, J-type (Ir/Ir)	12 pcs
alternative GT3-1	DENSO® spark plug, M18x1.5, 0.500 in thread reach, J-type (Ir/Pt)	12 pcs
06.05.085	PowerView3 HMI module	1 pc
alternative 06.05.185	PowerView3 HMI module, built into stainless steel enclosure	1 pc
alternative 06.05.187	PowerView3 HMI module, built into steel enclosure with sight window	1 pc
06.05.086-F	PowerView3 activation code for MIC4 visualization	1 pc

Ordering Information – Tools and Accessories

P/N	Description	Required Qty
06.90.099-100	SparkView high voltage indicator with SparkScan1 high voltage clamp	1 pc
06.98.100-200	ScopeLite LED timing light	1 pc
07.99.022-3-18	Magnetic spark plug socket, 18 in length, HEX 7/8 in, 1/2 in drive	1 pc
44.01.023	Spark plug cleaning kit	1 pc
06.84.040-100	Silicone seal rings for PolyMot™ spark plug leads, pack of 100 pcs	1 pc

Shielded Ignition Wiring Rail Upgrade Kit

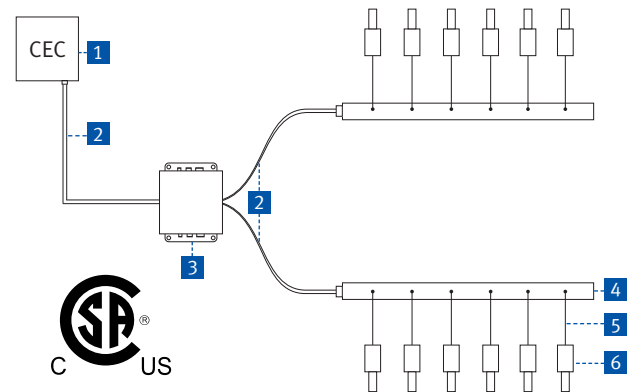
SHIELDED

For use with existing WAUKESHA® CEC Ignition Controller

For WAUKESHA® VHP G/GU/GSI 12 Cylinder Engines

Upgrade kit contains:

- Output wiring **2** and junction box **3** with fittings to connect existing CEC ignition controller **1** and wiring rails (flex conduit has to be ordered separately or supplied by customer)
- AlphaRail wiring rails **4** with hardware kit
- New Flex Style primary leads **5** for connection of wiring rails and integral ignition coils
- Integral ignition coils **6** (fat design) to work with CEC Spark Reference System



1 CEC ignition controller, input wiring and pickup not included in scope of supply.

Ordering Information

P/N	Description	Required Qty
95.75.121-12	Shielded ignition wiring rail upgrade kit for WAUKESHA® VHP G/ GU/ GSI 12 cylinder engines	1 pc

Ordering Information – Optional Parts

P/N	Description	Required Qty
ICPB812	ICP spark plug, M18x1.5, 0.500 in thread reach, J-type (I/I)	12 pcs
15.07.112	Flex conduit, 1/2 in, black, for wiring of junction box to wiring rails	30 ft
15.07.134	Flex conduit, 3/4 in, black, for wiring of ignition controller to junction box	15 ft

Ordering Information – Tools and Accessories

P/N	Description	Required Qty
06.98.100-200	ScopeLite LED timing light	1 pc
07.99.022-2-18	Magnetic spark plug socket, 18 in length, HEX 15/16 in, 1/2 in drive	1 pc
44.01.023	Spark plug cleaning kit	1 pc

Unshielded Ignition Wiring Rail Upgrade Kit



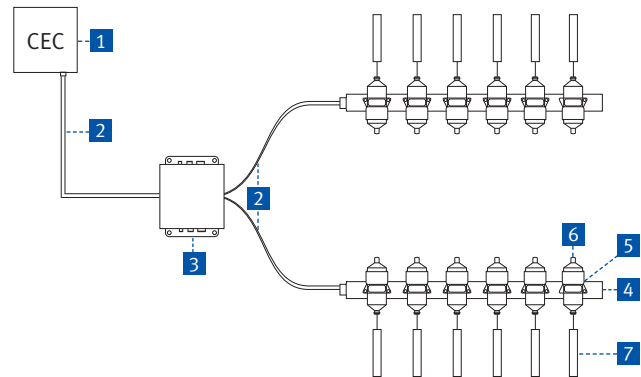
UNSHIELDED

For use with existing WAUKESHA® CEC Ignition Controller

For WAUKESHA® VHP G/GU/GSI 12 Cylinder Engines

Upgrade kit contains:

- Output wiring **2** and junction box **3** with fittings to connect existing CEC ignition controller **1** and wiring rails
- AlphaRail wiring rails **4** with hardware kit
- Primary lead and mounting kits **5** for connection of wiring rails and ignition coils
- Ignition coils **6** to work with CEC Spark Reference System
- PolyMot™ spark plug leads **7**



1 CEC ignition controller, input wiring and pickup not included in scope of supply.

Ordering Information

P/N	Description	Required Qty
77.75.121-12	Unshielded ignition wiring rail upgrade kit for WAUKESHA® VHP G/ GU/ GSI 12 cylinder engines	1 pc

Ordering Information – Optional Parts

P/N	Description	Required Qty
B8124	MHP spark plug, M18x1.5, 0.500 in thread reach, J-type (Ir/Ir)	12 pcs
alternative GT3-1	DENSO® spark plug, M18x1.5, 0.500 in thread reach, J-type (Ir/Pt)	12 pcs

Ordering Information – Tools and Accessories

P/N	Description	Required Qty
06.90.099-100	SparkView high voltage indicator with SparkScan1 high voltage clamp	1 pc
06.98.100-200	ScopeLite LED timing light	1 pc
07.99.022-3-18	Magnetic spark plug socket, 18 in length, HEX 7/8 in, 1/2 in drive	1 pc
44.01.023	Spark plug cleaning kit	1 pc
06.84.040-100	Silicone seal rings for PolyMot™ spark plug leads, pack of 100 pcs	1 pc

Detonation Control Upgrade Kit Components

Detonation Control Upgrade for WAUKESHA® VHP Series Gas Engines

Next to the ignition system, MOTORTECH also offers complete system upgrades for detonation control. Prefabricated and prewired components make the conversion easier and reduce costs based on engine downtime.

Upgrade your engine and increase availability of the equipment!



DetCon20 Control Unit

The gas engine operators are calling for increased power output from their engines. More load means higher temperatures, pressures and tougher operation. This mostly ends in catastrophic engine damages due to detonation or pre-ignition.

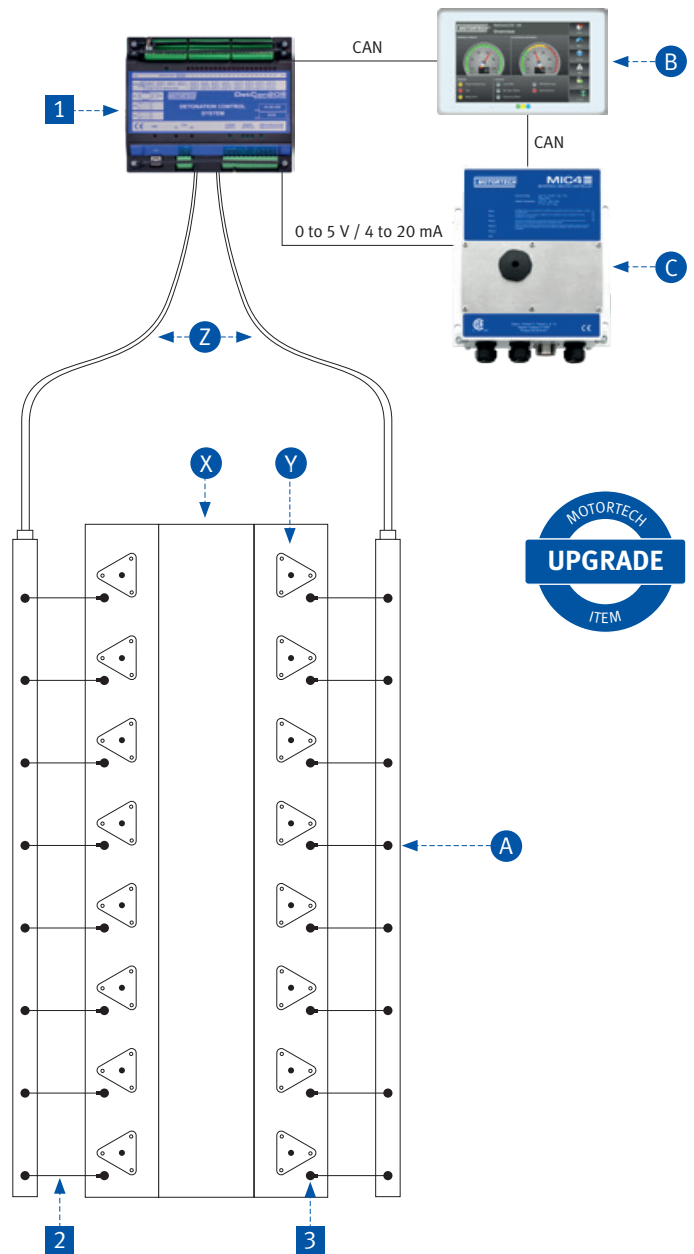
As MOTORTECH has proven for years, detonation can be detected professionally with the DetCon20. Single cylinder sensors constantly monitor the sound level of the combustion chamber. Once the controller detects soft detonation on one of the sensors (this is a specific stage before real detonation occurs), several steps will take place:

- Alarm signal turns on
- Ignition retard by 0 to 5 V or 4 to 20 mA analog output
- If this action does not cure the detonation, the load reduction output will be activated.
- If the load drop does not stop the engine from detonating the engine STOP output will be activated.



Detonation Sensor

Installed on the cylinder head screw it measures the detonation signal and transfers it to the controller.



Sample System Overview – Detonation Control

Necessary Components

- 1 DetCon20 control unit*
- 2 Detonation sensor lead
- 3 Detonation sensor

Accessories

- A AlphaRail detonation wiring rail

System Enhancement

- B PowerView3 – HMI module
- C MIC4 – Ignition controller

Description

- X Engine
- Y Cylinder
- Z Harness to connect the detonation wiring rails and the control unit

* Shielded and unshielded versions available.

Detonation Control Upgrade Kit

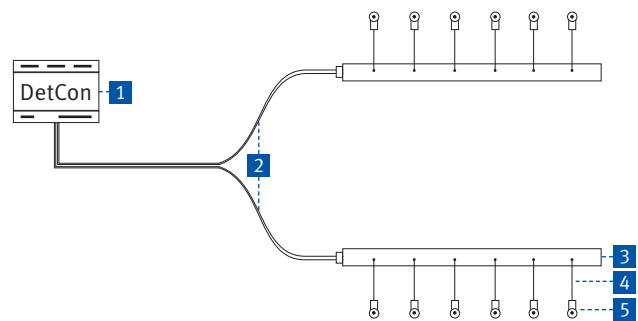


With DetCon20 Detonation Controller

For **WAUKESHA® VHP G/GU/GSI/GL** 12 Cylinder Engines

Upgrade kit contains:

- DetCon20 detonation controller **1** with 20 inputs, CSA certified (has to be installed in CSA approved control panel or enclosure), IP20
- Harnesses to connect detonation controller and wiring rails **2**
- AlphaRail wiring rails **3** with hardware kit
- Leads for connection of wiring rails and detonation sensors **4**
- Detonation sensors **5** to monitor each cylinder individually



For use in hazardous and non-hazardous environments.

Ordering Information

P/N	Description	Required Qty
43.00.421-12	Detonation control upgrade kit for WAUKESHA® VHP G/ GU/ GSI/ GL 12 cylinder engines	1 pc

Ordering Information – Optional Parts

P/N	Description	Required Qty
06.05.085 ¹⁾	PowerView3 HMI module	1 pc
06.05.087-F	PowerView3 activation code for DetCon20 visualization	1 pc
43.20.002 ²⁾	Ignition sensor unit	1 pc
169994B-DS	Cylinder head screw, VHP series, prepared for detonation sensor	12 pcs

¹⁾ If HMI module is already ordered with ignition upgrade kit, it is only necessary to order the activation code for DetCon20 visualization.

²⁾ Ignition sensor unit only needs to be ordered separately when WAUKESHA® CEC or ALTRONIC® CPU95 ignition controller is used with DetCon20.

Optional Parts

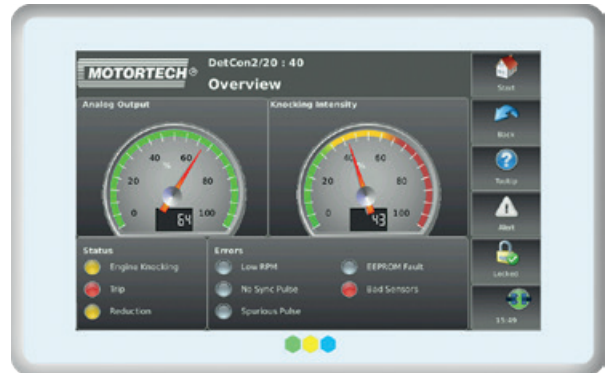
Ignition and Detonation Control Visualization

The operating data of the MIC4 series ignition controller and DetCon20 controller will be completely visualized via HMI module (Human Machine Interface). The overview screen shows the relevant ignition information as engine speed, ignition timing and status of pickups, ignition outputs or active parameter set or detonation control information as engine knocking, knock intensity and status for activated load reduction or emergency shutdown of engine.

The PowerView3 also allows justification of various ignition parameters such as ignition timing and energy. Functions as the self-test for error diagnostics can also be executed via HMI module. The control keys guarantee simple navigation through different display pages and menus. All in all the PowerView3 HMI module is also able to provide error diagnostics on-site without requiring a laptop!

PowerView3

MOTORTECH ENGINE INFORMATION MONITOR



General Features

- Visualization of ignition and detonation control via CAN bus
- Access control
- Display of CAN connection status
- Several display configurations (languages, date, display calibration, etc.)
- For assembly in control panels
- Day and night mode
- CSA® certified (Class I, Division 2, Group C, D; T4)



MIC Overview

- Status displays (pickup, ignition outputs, ignition enabled, system status, schedule)
- Displays the current engine speed
- Shows the current global ignition timing in ° crankshaft
- Displays the previous operating hours of the spark plugs



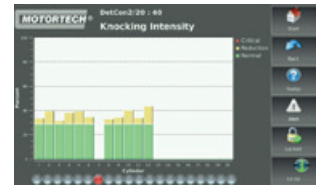
Ignition

- Displays the estimated ignition voltage for each individual cylinder
- Display of current and past misfires of each individual cylinder



DetCon Overview

- Status displays (engine knocking, active load reduction, emergency shutdown, signal errors)
- Displays the analog output signal strength
- Displays the knocking intensity in percent
- Display of sensor errors



Knocking Intensity

- Display of knocking intensity for each cylinder
 - Green: The detonation control does not register any excessive knocking intensity
 - Yellow: Detonation control reduces knocking
 - Red: Critical engine state
- Additional status display for sensor errors at the cylinder

Optional Parts



ICP-Plugs

For shielded applications where integral ignition coils are used, MOTORTECH manufactures the dual threaded spark plugs. The J-type electrode design and use of higher erosion resistance materials ensure better combustion particularly on lean burn gas engines and longest service life. The top thread for ignition coil connection with full 6 threads meets the CSA requirements. For years these plugs have been successfully operated worldwide.



MHP-Plugs

MHP spark plugs are designed to meet the requirements, both of modern and common engine developments and reliably deliver highest voltages and thus a strong spark down into the combustion chamber. The J-type electrode design with Iridium alloy discs on center and ground electrode provides reliable combustion and increased spark plug life and helps to reduce service costs due less spark plug changes.

Tools and Accessories



SparkView High Voltage Indicator

The SparkView is a handheld device developed by MOTORTECH that can monitor the high voltage required by the spark plug while the engine is running. The condition of the spark plugs and the time at which they need to be replaced can be determined with the SparkScan1 high voltage clamp or with a BNC cable.



Scopelite Timing Light

The self-powered ScopeLite is designed to work with fully shielded ignition systems. A special clamp picks up the small trigger signal through the braid of shielded spark plug leads. The signal is processed by the timing light and via LED technology a sequence of flashes is generated.



Spark Plug Cleaning Kit

Apart from readjusting the electrode gap, the spark plug should also be freed from deposits and residues that have formed during operation. By using the MOTORTECH spark plug cleaning kit these impurities can be removed easily and gently in the electrode area and on the thread within a regular maintenance interval. This will increase spark plug service life and cut maintenance costs.



Extended Barrel Magnetic Spark Plug Sockets

MOTORTECH offers a complete range of extended barrel magnetic spark plug sockets in various lengths for all types of HEX. Integrated strong magnets hold the spark plug securely in any position, which guarantees an easy assembly and disassembly work especially on large engines with deep spark plug wells.

Download now!



All Products at a Glance!

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