



# PRODUCT GUIDE



**GAS ENGINE TECHNOLOGY**  
reliable • efficient • worldwide

# IGNITION CONTROLLERS & HARNESSES



**MIC3**   
MOTORTECH IGNITION CONTROLLER



**MIC4**   
MOTORTECH IGNITION CONTROLLER



**MIC5**   
MOTORTECH IGNITION CONTROLLER

## Characteristics MIC Series

### General

- For 2- and 4-stroke engines
- Ignition technology pulse width modulated
- Technical restriction to 6000 rpm
- Max. trigger impulses 16+1 or 500 teeth on the flywheel
- CSA certified (Class I, Div. 2, Group C,D; T4)

### Technical Data & Functions

- Ignition timing to 0.1° crankshaft
- Magnetic, Hall effect or inductive pickup
- Control of ignition timing optional by
  - Potentiometer (except MIC3 series)
  - Speed curve
  - 0-20 mA analog input
  - 0-10 V analog input
- Control of the ignition energy by the patented MOST (MOTORTECH Output Stage Technology)
- Programmable firing order
- Overspeed shutdown function
- Access controlled
- Programmable spark duration

- Energy output control
- 2 programmable speed curves with max. 8 speed points (speed/ignition timing)
- Diagnostic memory
- System status display
- Error memory

### Ignition Diagnostics

- Runtime data
- Alarm and error messages
- Data logging
- Primary, secondary misfire detection
- Cylinder individual high-voltage calculation (kV)

### Interfaces

- CAN Bus 2.0b interface (CANopen/SAE J1939 protocol)
- RS485 interface (Modbus RTU)
- USB 2.0 interface

### Inputs

- Digital ignition release (start/stop)

- Configurable digital input (GPI)
- Digital input for schedule A/B

### Outputs

- 1 Auxiliary Synchronization Output (ASO) which can support a detonation control system (e.g. DetCon) or fuel injection pump controllers
- 1 multipurpose output (GPO)
- Go/NoGo output

### Configuration

- Using the graphic user interface MICT (MOTORTECH Integrated Configuration Tool, see page 01/5)

### Scope of Supply

- Configuration software MICT (MOTORTECH Integrated Configuration Tool)
- Interlink cable USB 2.0
- Vibration dampers
- Ground strap
- Fastening material
- Operating manual



## Technical Data

	Feature	MIC3 Series	MIC4 Series	MIC5 Series
General	Max. number of ignition outputs	6/12	8/16	20
	Max. number of pickups	1, 2	1, 2, 3	1, 2, 3
	Power supply	10 – 32 VDC	10 – 32 VDC	18 – 32 VDC
	Permitted ambient temperature	-40 °C to +60 °C -40 °F to +140 °F	-40 °C to +60 °C (LD) -40 °F to +140°F (LD)	-40 °C to +60 °C -40 °F to +140 °F
Output	Max. primary voltage	250 VDC	250 VDC	250 VDC
	Max. ignition energy	200 mJ (300 mJ) boost for start phase)	300 mJ (500 mJ) boost for start phase)	500 mJ (700 mJ) boost for start phase)
	Max. programmable spark duration	100 – 700 µsec	100 – 1000 µsec	100 – 1500 µsec
Housing	Available housing versions <sup>1)</sup>	Light Duty (LD)	Panel Mount (PM), Light Duty (LD), Heavy Duty (HD)	Heavy Duty (HD)
	Dimensions	250 mm x 240mm x 89,5 mm	304 mm x 240 mm x 97,5 mm (LD)	371 mm x 240mm x 114,5mm
	Protection class	IP54 (LD)	IP20 (PM), IP54 (LD), IP65 (HD)	IP65 (HD)
	Engine installation	not permitted	not permitted	not permitted
	Number of potentiometers for manual timing adjustment	0	2 (continuous)	2 (continuous)
	Input connection	35 pole, pin, MIL	terminal strip (standard)	terminal strip (standard)
	Output connection	17 pole, socket, MIL	17 pole, socket, MIL (LD/HD) terminal strip (PM)	35 pole, socket, MIL
	Number of status LEDs	5	6	6

<sup>1)</sup> Please contact your MOTORTECH partner for information on the availability of housing styles.

# IGNITION CONTROLLERS & HARNESES

## MOST

MOTORTECH OUTPUT STAGE TECHNOLOGY

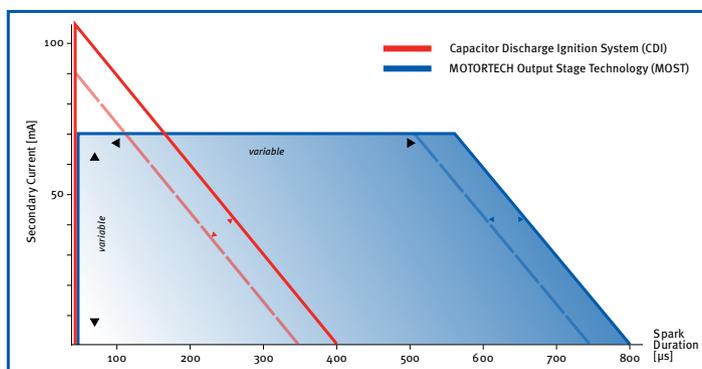
### Patented Technology for MIC3/MIC4/MIC5\*

Efficiency-enhanced engines, highly compressed mixtures, as well as the use of a great variety of gas types are putting greater demands on the entire ignition system, including:

- reliable ignition even with weak or fluctuating calorific values of the gas
- compliance with the strictest emission regulations
- avoidance of knocking and misfiring
- reduction of maintenance costs through longer spark plug runtimes

\*Patent No.: US 8,893,692 BS

The graphic compares the behavior of a conventional Capacitor Discharge Ignition System (CDI) and Ignition System with MOST



These requirements can only be met by precision ignition behavior and efficient control of the ignition spark. MOTORTECH Output Stage Technology (MOST) was developed by MOTORTECH for this.

**MOST works with the following principles:**

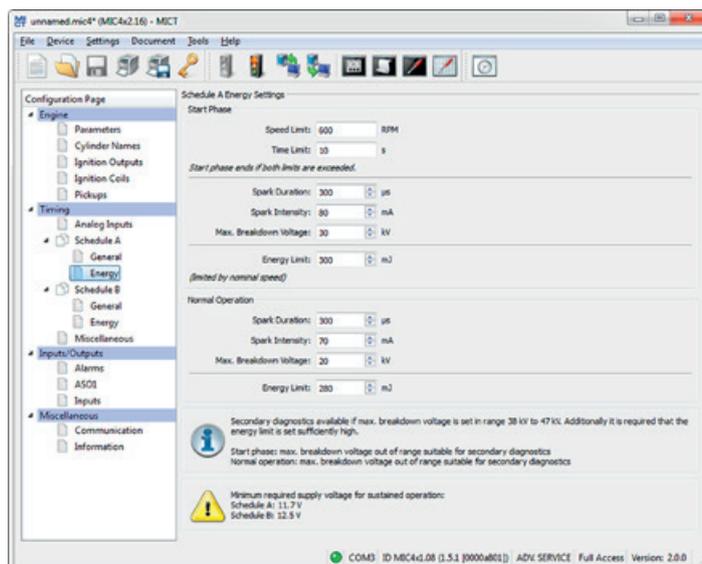
- adjustable ignition spark duration with different available ignition voltages
- constant spark intensity via adjusted ignition spark duration
- 200 to 700 mJ of primary energy (device dependent) are available

### Capacitor Discharge Ignition System (CDI)

The red curve shows that a high peak current is reached during ignition. Afterwards, the current decreases sharply. To achieve longer spark duration, the energy supply must be increased. The result of this is a higher peak current.

### Ignition System with MOST

The blue curve shows that a lower peak current is reached during ignition with MOST. The current remains at a constant level until the energy supply ends. Thereafter, the current drops. In this case as well, more energy is supplied for a longer spark duration, however the peak current is not increased in the process.



### Settings for MOST in MICT

The settings for MOST are made using the MICT configuration software. On the configuration side *Timing – Schedule A/B – Energy*, you can define different values for the spark duration, spark intensity, breakdown voltage and energy limit for the start phase and normal operation. That way starting difficulties of the engine can be caught. Different energy settings for the two schedules A and B support, for example, optimally matched two gas operation. The settings are dependent on the ignition coils that are used, among other things. They must be suitable for MOST and set correctly on the configuration side *Engine – Ignition Coils*. To optimize the energy settings for an engine, the ignition behavior must be observed and analyzed (misfiring, knock behavior, emission values, etc.). The secondary side diagnostics with MICT, among other things, can help here.

# MICT

MOTORTECH INTEGRATED CONFIGURATION TOOL

The MICT is the graphical user interface for all controllers of the MIC3, MIC4 and MIC5 series. With a laptop all configurations can be done and runtime data of the engine can be checked and adjusted.

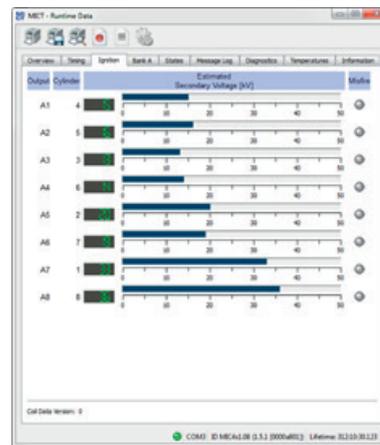
- Language selectable (German/English/Chinese)
- Microsoft® Windows XP/Vista/7 compatible
- Included data base offers engine information such as firing order, firing sequence, number of ignition coils per cylinder and typical number of teeth on flywheel for easy engine configuration
- Print function of a given moment in the operation can be used for external problem analysis, etc.
- Context sensitive online help
- Different access levels to avoid accidental misconfigurations

## Sample Screens – Runtime Data



### Overview

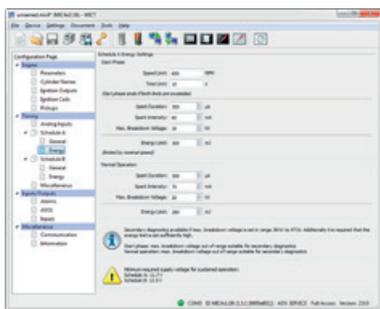
In the overview schedule the most important current runtime data such as speed, ignition timing or system status can be registered at a glance.



### Breakdown Voltage

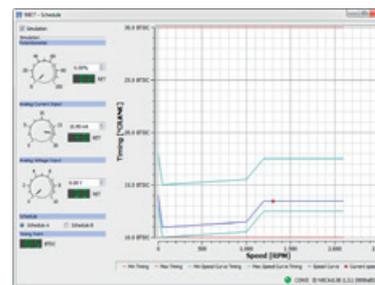
The MICT offers a lot of real time and detailed information about the status of each individual ignition output. Important data will be visually prepared, so that any irregularities will stand out easily. For example, secondary voltage will be displayed as bar graph, and the type of misfiring carries a warning light as symbol.

## Sample Screens – Parameter Set



### Energy Settings

For start phase and normal operation of the engine, durations at different high voltage levels and ignition spark intensity can be adjusted with the advanced energy settings.

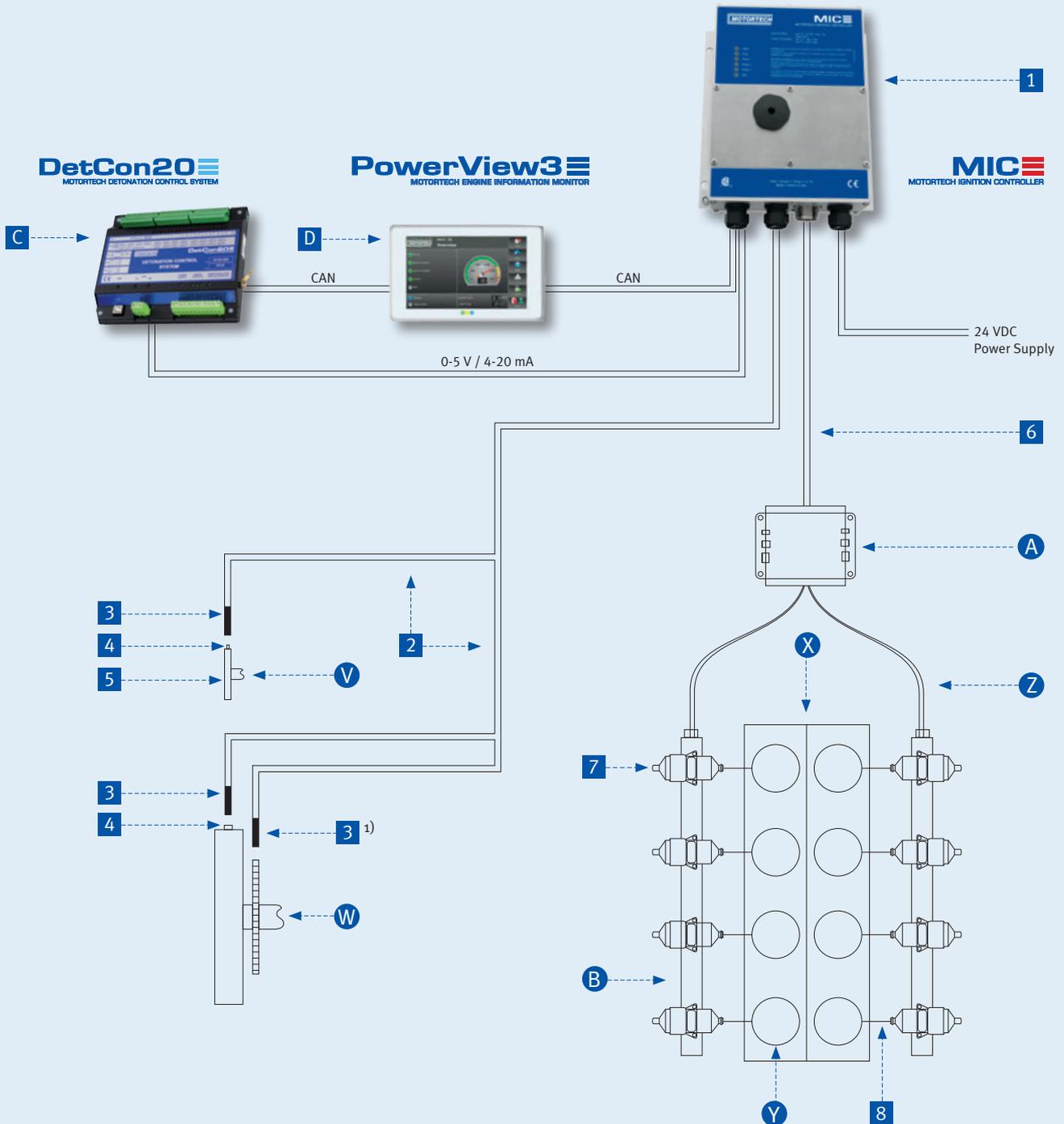


### Configuration Visualisation

The graphic display of the parameter set A and B offers a fast, visual control of the configured values.

# IGNITION CONTROLLERS & HARNESSES

## System Overview MIC Series



<sup>1)</sup> in combination with the MIC3 only one crankshaft pickup possible

## Legend

### Necessary Components

- 1 MIC ignition controller
  - 2 Pickup lead\*
  - 3 Pickup\*
  - 4 Trigger pins/magnets
- alternative*
- 5 Trigger disc
- alternative*
- Trigger drive
- 6 Output harness\*
  - 7 Ignition coil\*
  - 8 1 Primary lead/spark plug lead per ignition coil

\* Shielded and unshielded versions available.

### Accessories

- A Junction box
- B AlphaRail-\*/ LiteRail – ignition wiring rail

### System Enhancement

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

### Description

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

## Established Pickup Arrangements

### 3-Pickup Arrangement for 4-Stroke Engines

- 1) Crankshaft (Reset)  
Magnetic pickup  
(holes, pins, teeth, screws)
- 2) Crankshaft (Speed)  
Magnetic pickup  
(holes, pins, teeth, screws)
- 3) Camshaft (Reset)  
Hall effect pickup  
(magnets)

*alternative*

- 3) Camshaft (Reset)  
Inductive pickup  
(pins, screws, slots)

### 1-Pickup Arrangement for 4-Stroke Engines

- 1) Camshaft (N+1/N-1)  
Hall effect pickup  
(disc with magnets)
- alternative*
- 1) Camshaft (N+1/N-1)  
Inductive pickup  
(disc with pins, screws, slots)

### 2-Pickup Arrangement for 2-Stroke Engines

- 1) Crankshaft (Reset)  
Magnetic pickup  
(holes, pins, teeth, screws)
- 2) Crankshaft (Speed)  
Magnetic pickup  
(holes, pins, teeth, screws)

# IGNITION CONTROLLERS & HARNESES



## Ignition Controllers – Light Duty – Standard

P/N	max. Outputs	Connector Style	Connector		Pickup Voltage	Equivalent to
			Input	Output		
66.00.310-6	6	MIL	35 pole pin	17 pole socket	programmable via MICT	
66.00.310-12	12	MIL	35 pole pin	17 pole socket	programmable via MICT	

## Input Harnesses for Ignition Controllers – Light Duty – Standard

P/N	Description	Interfaces	Connector	Length	Pickup
06.02.034-160	Input harness for P/N 66.00.310-6/-12	CAN Bus/RS485	35 pole socket, 180°	160 in.	inductive
06.02.036-160	Input harness for P/N 66.00.310-6/-12	CAN Bus/RS485	35 pole socket, 180°	160 in.	Hall effect

## Output Harnesses for Ignition Controllers – Light Duty – Standard<sup>1)</sup>

P/N	Description	Connector	Length	Equivalent to
95.40.217-L	Output harness for P/N 66.00.310-6/-12	17 pole pin, 180°	"L" = 5/15/25/50 ft.	

<sup>1)</sup> For CSA applications flex conduit has to be ordered separately or supplied by customer.

## Junction Box & Accessories

P/N	Figure	Description
06.05.075	1	Junction box
15.07.134	2	Flex conduit, 3/4 in. <sup>1)</sup>
15.07.231	3	Fitting, 3/4 in., junction box to flex conduit

<sup>1)</sup> Flex conduit needs to be ordered in m/ft. in required quantity.



1



2



3

# MIC4

MOTORTECH IGNITION CONTROLLER



## Ignition Controllers – Light Duty – Standard

P/N	max. Outputs	Connector Style	Connector		Pickup Voltage	Equivalent to
			Input	Output		
66.00.410-8	8	MIL /terminal strip	terminal strip	17 pole socket	programmable via MICT	
66.00.410-16	16	MIL/terminal strip	terminal strip	17 pole socket	programmable via MICT	
66.00.424-8	8	MIL	35 pole pin	17 pole socket	programmable via MICT	
66.00.424-16	16	MIL	35 pole pin	17 pole socket	programmable via MICT	

## Ignition Controllers – Panel Mount – Standard



P/N	max. Outputs	Connector Style	Connector		Pickup Voltage	Equivalent to
			Input	Output		
66.00.400-8	8	terminal strip	terminal strip	terminal strip	programmable via MICT	
66.00.400-16	16	terminal strip	terminal strip	terminal strip	programmable via MICT	

## Ignition Controllers – Heavy Duty – Standard



P/N	max. Outputs	Connector Style	Connector		Pickup Voltage	Equivalent to
			Input	Output		
66.00.440-8	8	MIL /terminal strip	terminal strip	17 pole socket	programmable via MICT	
66.00.440-16	16	MIL/terminal strip	terminal strip	17 pole socket	programmable via MICT	

## Input Harnesses for Ignition Controllers – Light Duty – Standard

P/N	Description	Interfaces	Connector	Length	Pickup
06.02.034-160	Input harness for P/N 66.00.424-8/-16	CAN Bus/RS485	35 pole socket, 180°	160 in.	inductive
06.02.036-160	Input harness for P/N 66.00.424-8/-16	CAN Bus/RS485	35 pole socket, 180°	160 in.	Hall effect

## Output Harnesses for Ignition Controllers<sup>1)</sup> – Light Duty and Heavy Duty



P/N	Description	Connector	Length	Equivalent to
95.40.217-L	Output harness for P/N 66.00.410-8/-16 and P/N 66.00.440-8/-16	17 pole pin, 180°	"L" = 5/15/25/50 ft.	

<sup>1)</sup> For CSA applications flex conduit has to be ordered separately or supplied by customer.

## Junction Box & Accessories

P/N	Figure	Description
06.05.075	<b>1</b>	Junction box
15.07.134	<b>2</b>	Flex conduit, 3/4 in. <sup>1)</sup>
15.07.231	<b>3</b>	Fitting, 3/4 in., junction box to flex conduit

Light Duty (LD)



Panel Mount (PM)



Heavy Duty (HD)



back

# IGNITION CONTROLLERS & HARNESES

## MIC4-ZS MOTORTECH IGNITION CONTROLLER

Based on the MIC4 series, MOTORTECH produces a special controller version as a replacement for the TEM-ZS1 and TEM-ZS3 ignition system used on MWM®/DEUTZ® gas engines. Designed as an exchange device, the MIC4-ZS enables a quick conversion without great effort.

In addition to the MIC4-ZS ignition controller, the prepared conversion kits include the required high-performance ignition coils. Pre-chamber spark plugs or spark plug leads can be re-used, as these ignition coils have the same secondary connections as the original ones. The ignition coils – designed for MOTORTECH ignition controllers with MOST technology – guarantee the ideal performance support, especially when it comes to alternative combustibles with alternating or relatively low fuel value, e.g. biogas, mine gas, woodgas, sewage gas, landfill gas etc.



### MIC4-ZS Kits

P/N	Description	Quantity	Equivalent to
75.30.150-08	MIC4-ZS kit for MWM®/DEUTZ® 8 cylinder engines <i>Contains:</i> MIC4-ZS ignition controller P/N 66.00.425-16 High-performance ignition coil P/N 06.50.065	1 pc. 8 pcs.	1229 8101 KM (TEM-ZS1) 1232 0993 KZ (TEM-ZS3)
75.30.150-12	MIC4-ZS kit for MWM®/DEUTZ® 12 cylinder engines <i>Contains:</i> MIC4-ZS ignition controller P/N 66.00.425-16 High-performance ignition coil P/N 06.50.065	1 pc. 12 pcs.	1229 8101 KM (TEM-ZS1) 1232 0993 KZ (TEM-ZS3)
75.30.150-16	MIC4-ZS kit for MWM®/DEUTZ® 16 cylinder engines <i>Contains:</i> MIC4-ZS ignition controller P/N 66.00.425-16 High-performance ignition coil P/N 06.50.065	1 pc. 16 pcs.	1229 8101 KM (TEM-ZS1) 1232 0993 KZ (TEM-ZS3)

### Accessories (optional)

P/N	Description	Quantity	Equivalent to
06.85.179-20	PolyMot™ spark plug lead for MWM®/DEUTZ® • TBG series	8, 12 or 16 pcs. per kit	1230 0136
06.85.310H-11	PolyMot™ spark plug lead for MWM®/DEUTZ® • TCG series	8, 12 or 16 pcs. per kit	1227 8370
GL3-3	DENSO® spark plug • Thread M18x1.5, reach 19 mm/0.750 in. • Hex 20.8 mm/13/16 in. • Iridium/platinum alloy • <b>Recommended for natural gas applications</b>	8, 12 or 16 pcs. per kit	1242 0290 1242 0480
GL3-5	DENSO® spark plug • Thread M18x1.5, reach 19.0 mm/0.750 in. • Hex 20.8 mm/13/16 in. • Iridium/iridium alloy • <b>Recommended for special gas/natural gas applications</b>	8, 12 or 16 pcs. per kit	1242 0290 1242 0480



# MIC5

MOTORTECH IGNITION CONTROLLER

## Ignition Controllers – Heavy Duty – Standard

P/N	max. Outputs	Connector Style	Connector		Pickup Voltage	Equivalent to
			Input	Output		
66.00.540-20	20	MIL /terminal strip	terminal strip	35 pole socket	programmable via MICT	
66.00.541-20	20	MIL	35 pole pin	35 pole socket	programmable via MICT	

## Input Harnesses for Ignition Controllers – Heavy Duty – Standard

P/N	Description	Interfaces	Connector	Length	Pickup
06.02.034-160	Input harness for P/N 66.00.541-20	CAN Bus/RS485	35 pole socket, 180°	160 in.	inductive
06.02.036-160	Input harness for P/N 66.00.541-20	CAN Bus/RS485	35 pole socket, 180°	160 in.	Hall effect

## Output Harnesses for Ignition Controllers<sup>1)</sup> – Heavy Duty – Standard



P/N	Description	Connector	Length	Equivalent to
95.40.235-L	Output harness for P/N 66.00.540-20 and P/N 66.00.541-20	35 pole pin, 180°	"L"= 5/15/25/50 ft.	

<sup>1)</sup> For CSA applications flex conduit has to be ordered separately or supplied by customer.

## Ignition Controllers – Heavy Duty – Special



P/N	max. Outputs	Connector Style	Connector		Pickup Voltage	Equivalent to
			Input	Output		
66.00.542-20	20	MIL /terminal strip	terminal strip	14/17 pole socket	programmable via MICT	WOODWARD® IC9xx, MIC850 P/N 66.00.851-24/-24-D

## Output Harnesses for Ignition Controllers<sup>1)</sup> – Heavy Duty – Special



P/N	Description	Connector	Length	Equivalent to
95.40.214-L	Output harness for P/N 66.00.542-20	14 pole pin, 180°	"L"= 5/15/25/50 ft.	
95.40.217-L	Output harness for P/N 66.00.542-20	17 pole pin, 180°	"L"= 5/15/25/50 ft.	

<sup>1)</sup> For CSA applications flex conduit has to be ordered separately or supplied by customer.

## Junction Box & Accessories

P/N	Figure	Description
06.05.075	1	Junction box
15.07.134	2	Flex conduit, 3/4 in. <sup>1)</sup>
15.07.231	3	Fitting, 3/4 in., junction box to flex conduit

<sup>1)</sup> Flex conduit needs to be ordered in m/ft. in required quantity.



1



2



3

# IGNITION CONTROLLERS & HARNESSES



## Ignition Control Visualization

The operating data of MIC3, MIC4 and MIC5 series ignition controllers will be completely visualized via HMI module (Human Machine Interface). The overview sheet shows the relevant information as engine speed, ignition timing and status of pickups, ignition outputs or active parameter set. The PowerView3 also allows justification of various ignition parameters such as ignition timing and energy. Functions as the selftest 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!



1

The PowerView3 is also available for data visualization of:

- DetCon Detonation Control
- TempScan20 Temperature Scanner

## Sample Screens



### MIC Overview

Screen shows the most important operating data of the connected ignition controller.



### Ignition

Misfiring and estimated secondary voltage of each individual cylinder will be shown.



### Secondary Voltages Recording

Visualization of secondary voltage trend data.

## PowerView3 HMI Module & Activation Codes



P/N	Figure	Description
06.05.085	1	PowerView3 HMI module
06.05.185	2	PowerView3 HMI module, built into stainless steel enclosure
06.05.086-F		PowerView3 activation code for visualization of MIC3/MIC4/MIC5 data – Activation code has to be ordered separately with each PowerView3 HMI module
06.05.086-U		PowerView3 activation code for visualization of MIC3/MIC4/MIC5 data – Only available for upgrade of existing PowerView3 HMI module in the field

2



# MOT601

MOTORTECH SINGLE CYLINDER IGNITION SYSTEM

The self-powered MOT601 is a Capacitor Discharge (CD) Ignition System for use on spark-ignited, single cylinder engines with large flywheels. Engine mounted, very close to the flywheel, the electronic components are supplied with power by magnetic charging circuitry.



## Ignition System for Single Cylinder Engines

P/N	Figure	Description	Equivalent to
MOT601	1	MOT601 CD ignition system for single cylinder engines	AEI® FM601 ARROW® SFI-KIT MURPHY® 72-70-0125

## Subcomponents

P/N	Figure	Description	Equivalent to
M-400A-8814	2	Electronic ignition module	AEI® 400A-8814 ARROW® A400A-8814 MURPHY® 72-00-0024
M-260D-8810	3	Charging generator	AEI® 260D-8810 ARROW® A260D-8810 MURPHY® 72-00-0025
M-270A-8817	4	Magnetic pickup harness	AEI® 270A-8817 ARROW® A400A-8817 MURPHY® 72-00-0026
M-400A-8813	5	Magnetic charging bar	AEI® 400A-8813 ARROW® A400A-8813 MURPHY® 72-00-0027
M-400A-8811	6	Magnetic trigger bar	AEI® 400A-8811 ARROW® A400A-8811 MURPHY® 72-00-0028
06.50.055	7	Ignition coil	AEI® 1187 ARROW® 330-2-AI-46 MURPHY® 72-70-0235



# IGNITION COILS



## UNSHIELDED

### New MOTORTECH Style

Ignition coils are becoming more and more important in modern, state of the art ignition systems. MOTORTECH offers a series of high performance ignition coils produced in its European facilities which are specially designed for use with newest technologies of MOTORTECH ignitions controllers:

- MOST – MOTORTECH Output Stage Technology of MOTORTECH MIC3, MIC4 and MIC5 ignition controllers
- Ideally suited for ignition of alternative fuels such as biogas



P/N	Color	Primary Termination	HV Termination	Polarity	MOST	Equivalent to
06.50.100	red	#10-32 UNF studs	M6	(-) ground	x	
06.50.102	red	#10-32 UNF studs	female	(-) ground	x	
06.50.104	blue	#10-32 UNF studs	M6	(-) ground	x	
06.50.105	blue	#10-32 UNF studs	female	(-) ground	x	
06.50.300 <sup>1)</sup>	blue	#10-32 UNF studs	M6	(-) ground	x	
06.50.301 <sup>1)</sup>	blue	#10-32 UNF studs	female	(-) ground	x	

<sup>1)</sup> Only for use with MIC3 series ignition controllers.

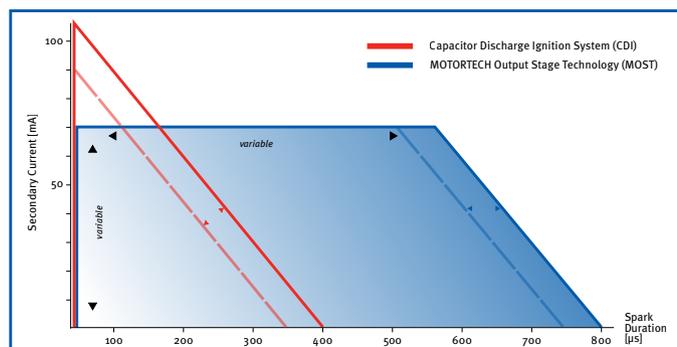
## MOST

MOTORTECH OUTPUT STAGE TECHNOLOGY

MOST\* works with the following principles:

- adjustable ignition spark duration with different available ignition voltages
- constant spark intensity via adjusted ignition spark duration
- 200 to 700 mJ of primary energy (device dependent) are available

\* Patented Technology US 8,893,692 BS



## MOTORTECH Style

Several EPOXY ignition coils with different ignition characteristics are available for unshielded applications. These coils, commonly used with MIC500 and MIC850 or ALTRONIC® CPU95 series ignition controllers, feature a screw type high voltage termination and are designed to function with the appropriate high voltage indication systems.



P/N	Supersedes	Color	Primary Termination	HV Termination	Polarity	MOST	Equivalent to
06.50.003 <sup>1)</sup>	06.50.007	black	#10-32 UNF studs	M6	(-) ground	not applicable	118257
06.50.060 <sup>2)</sup>		black	#10-32 UNF studs	M6	(-) ground	not applicable	76.64.302

<sup>1)</sup> For use with MIC500 and MIC850.

<sup>2)</sup> For use with CPU95.

## ALTRONIC® Style

For existing installations with ALTRONIC® ignition coils, MOTORTECH offers a series of replacement products. The ignition coils are designed to have the same characteristics in regards of standard and extended duration as well as the electrical characteristics to function with the ALTRONIC® patented “Spark Reference“ high voltage indication system. See chart below for cross reference numbers.



P/N	Color	Primary Termination	HV Termination	Polarity	MOST	Equivalent to
06.50.053	black	#10-32 UNF studs	female	(+) ground	not applicable	291001, 1215 3964
06.50.054	red	#10-32 UNF studs	female	(-) ground	not applicable	591010, 69694B, 4W5439
06.50.055	blue	#10-32 UNF studs	female	(-) ground	not applicable	501061, 69694, 2W3747, 1215 3965
06.50.065	black	#10-32 UNF studs	female	(-) ground	x	

Thousands of smaller gas engines (including CUMMINS®) are equipped with low cost ignition controllers like ALTRONIC® CD1 or CD200 series that use this compact coil. MOTORTECH offers an alternative.



P/N	Color	Primary Termination	HV Termination	Polarity	MOST	Equivalent to
06.50.103	black	#10-32 UNF studs	male	(-) ground	not applicable	591040, 3394578

# IGNITION COILS



## UNSHIELDED

### Ignition Coils for CATERPILLAR® Gas Engines

The rising demand for specialized ignition coils has led MOTORTECH to the decision to design a new series of ignition coils, specially made for use with CATERPILLAR® gas engines.

- Compatible with original ignition coils
- Support CATERPILLAR® ignition systems
- Made in Europe



#### For CATERPILLAR® G3400 & G3500 Series Gas Engines (Non CSA Applications)

P/N	Color	Primary Termination	HV Termination	Polarity	MOST	Equivalent to
06.50.141	white	DEUTSCH® connector	female	(-) ground	not applicable	437-4049, 232-6348, 165-1591, 131-3277, 129-8802, 108-0615
06.50.145 <sup>1)</sup>	white	DEUTSCH® connector	female	(-) ground	x	437-4049, 232-6348, 165-1591, 131-3277, 129-8802, 108-0615
06.50.143	white	DEUTSCH® connector	female	(-) ground	not applicable	232-6352, 213-7443
06.50.147 <sup>1)</sup>	white	DEUTSCH® connector	female	(-) ground	x	232-6352, 213-7443
06.50.151	white	DEUTSCH® connector	female	(-) ground	not applicable	418-4861, 232-6346, 165-1589, 124-0749
06.50.155 <sup>1)</sup>	white	DEUTSCH® connector	female	(-) ground	x	418-4861, 232-6346, 165-1589, 124-0749
06.50.153	white	DEUTSCH® connector	female	(-) ground	not applicable	437-4106, 232-6350
06.50.157 <sup>1)</sup>	white	DEUTSCH® connector	female	(-) ground	x	437-4106, 232-6350

<sup>1)</sup> Ignition coils only for use with MIC3, MIC4 or MIC5 ignition controllers.



#### For CATERPILLAR® G3400 & G3500 Series Gas Engines (CSA Applications)

P/N	Color	Primary Termination	HV Termination	Polarity	MOST	Equivalent to
06.50.142	white	DEUTSCH® connector	female	(-) ground	not applicable	232-6349, 165-1592, 122-8070
06.50.146 <sup>1)</sup>	white	DEUTSCH® connector	female	(-) ground	x	232-6349, 165-1592, 122-8070
06.50.144	white	DEUTSCH® connector	female	(-) ground	not applicable	232-6353, 213-7444
06.50.148 <sup>1)</sup>	white	DEUTSCH® connector	female	(-) ground	x	232-6353, 213-7444
06.50.152	white	DEUTSCH® connector	female	(-) ground	not applicable	437-4047, 232-6347, 165-1590
06.50.156 <sup>1)</sup>	white	DEUTSCH® connector	female	(-) ground	x	437-4047, 232-6347, 165-1590
06.50.154	white	DEUTSCH® connector	female	(-) ground	not applicable	418-4862, 259-2078
06.50.158 <sup>1)</sup>	white	DEUTSCH® connector	female	(-) ground	x	418-4862, 259-2078

<sup>1)</sup> Ignition coils only for use with MIC3, MIC4 and MIC5 ignition controllers.

Please see page 02/9 for suitable ignition coil extensions and extension overhaul kits.



For CATERPILLAR® G3520C & G3600 Series with Ignition Coil Extension

P/N	Supersedes	Color	Primary Termination	HV Termination	Polarity	MOST	Equivalent to
06.50.164	06.50.161	white	MIL Style 3 pole pin	female	(-) ground	not applicable	438-5682, 310-3180
06.50.165 <sup>1)</sup>	06.50.162	white	MIL Style 3 pole pin	female	(-) ground	x	438-5682, 310-3180

<sup>1)</sup> Ignition coil only for use with MIC3, MIC4 and MIC5 ignition controllers.



For CATERPILLAR® GCM34 Series with Ignition Coil Extension

P/N	Supersedes	Color	Primary Termination	HV Termination	Polarity	MOST	Equivalent to
06.50.174		white	MIL Style 3 pole pin	female	(-) ground	not applicable	193-468157, 258-4893
06.50.175 <sup>1)</sup>		white	MIL Style 3 pole pin	female	(-) ground	x	193-468157, 258-4893

<sup>1)</sup> Ignition coil only for use with MIC3, MIC4 and MIC5 ignition controllers.



For PERKINS® 4016-E61TRS Gas Engines

P/N	Color	Primary Termination	HV Termination	Polarity	MOST	Equivalent to
06.50.111	white	DEUTSCH® connector	female	(-) ground	not applicable	837/9, 10000-06176

# IGNITION COILS

## UNSHIELDED

### Ignition Coil for WÄRTSILÄ® Gas Engines

For WÄRTSILÄ® 25SG, 28SG and 220G/SG Gas Engines

P/N	Color	Primary Termination	HV Termination	Polarity	MOST	Equivalent to
06.50.059	black	2 pole pin	female	(-) ground	not applicable	1469-008



## Ignition Coil Conversion Kits for CUMMINS® Gas Engines

For CUMMINS® gas engines series QSK60G and QSV81/91G, MOTORTECH designed special ignition coil conversion kits which allow an easy, fast and cost effective conversion to the latest MOTORTECH equipment.

- For CUMMINS® gas engines QSK60G and QSV81G/ QSV91G
- Easy and fast conversion (plug & play) of existing OEM ignition coil
- Cost effective solution
- For unshielded applications (non CSA)

### 1 Ignition Coil

- MOTORTECH ignition coil with specific flange
- Pressure proof metal housing
- Diagnostic interface (BNC connector) for easy monitoring of high voltage traces via MOTORTECH SparkView or digital oscilloscope

### 2 Adaptor Flange

### 3 Engine specific PolyMot™ Spark Plug Extension

- High quality TEFLON® for long life
- Special top thread for easy removal with MOTORTECH removal tool (P/N 44.99.912)
- Built in 5 kOhm resistor for RFI suppression
- Internal silicon seal for spark plug insulator

### 4 Fastening Material



P/N	Description	Equivalent to
75.30.143	Ignition coil conversion kit for CUMMINS® QSK60G Includes: flange ignition coil with diagnostic interface and integrated primary lead, adaptor flange with fastening material, PolyMot™ spark plug extension	2881124, 4011615
75.30.144	Ignition coil conversion kit for CUMMINS® QSV81G/QSV91G Includes: flange ignition coil with diagnostic interface and integrated primary lead, adaptor flange with fastening material, PolyMot™ spark plug extension	2881124, 4011615

# IGNITION COILS

## Ignition Coil Extensions

Extensions for **MOTORTECH/CATERPILLAR®** Ignition Coils – For CATERPILLAR® G3520C and G3600 Series Gas Engines

P/N	Figure	Description	Application	Resistance	Extension Length	Extension Diameter	Fits Ignition Coil P/N	Equivalent to
06.80.459H <sup>1)</sup>	<b>1</b>	Ignition coil extension	G3520C/G3600 Non CSA	0 kΩ	248 mm	26 mm	06.50.161, 06.50.162, 283-5270	283-5271, 308-1380
06.80.600	<b>2</b>	Ignition coil extension	G3520C/G3600 Non CSA	0 kΩ	252 mm	26 mm	06.50.164, 06.50.165	

<sup>1)</sup> Supersedes spark plug extensions P/N 06.80.375H and 06.80.446H.

Extensions for **MOTORTECH/CATERPILLAR®** Ignition Coils – For CATERPILLAR® GCM34 Series Gas Engines

P/N	Figure	Description	Application	Resistance	Extension Length	Extension Diameter	Fits Ignition Coil P/N	Equivalent to
06.80.1013-T	<b>3</b>	Ignition coil extension	GCM34	5 kΩ	530 mm	26 mm	193-468157, 258-4893, 06.50.170	263210167, 3400.7- 21.07.02-03
06.80.602	<b>4</b>	Ignition coil extension	GCM34	5 kΩ	534 mm	26 mm	06.50.174 06.50.175	

Extensions for **WÄRTSILÄ®** Gas Engines

P/N	Description	Application	Resistance	Extension Length	Extension Diameter	Fits Ignition Coil P/N	Equivalent to
06.80.460	Ignition coil extension	34SG series	5 kΩ	18 in.	26 mm		0012E002200
06.80.461	Ignition coil extension	34SG series	5 kΩ	17 in.	26 mm		0012E006500
06.80.145-1	Ignition coil extension	220G/SG series	5 kΩ	13 in.	24 mm		3340063
06.80.145-2	Ignition coil extension	220G/SG series	5 kΩ	13 in.	24 mm		3341380



## Ignition Coil Extension Overhaul Kits

Kits for **MOTORTECH** Ignition Coils – For CATERPILLAR® G3400 and G3500 Series Gas Engines

P/N	Figure	Supersedes	Description	Application	Extension Length	Extension Diameter	Fits Ignition Coil P/N
06.80.741	5		Extension overhaul kit	G3400 - Non CSA	95 mm	30 mm	06.50.141, 06.50.145
06.80.742	5		Extension overhaul kit	G3400 - CSA	97 mm	30 mm	06.50.142, 06.50.146
06.80.743	5		Extension overhaul kit	G3400 - Non CSA	107 mm	30 mm	06.50.143, 06.50.147
06.80.744	5		Extension overhaul kit	G3400 - CSA	109 mm	30 mm	06.50.144, 06.50.148
06.80.751	5		Extension overhaul kit	G3500 - Non CSA	118 mm	30 mm	06.50.151, 06.50.155
06.80.752	5		Extension overhaul kit	G3500 - CSA	105 mm	30 mm	06.50.152, 06.50.156
06.80.753	5		Extension overhaul kit	G3500 - Non CSA	112 mm	30 mm	06.50.153, 06.50.157
06.80.754	5		Extension overhaul kit	G3500 - CSA	105 mm	30 mm	06.50.154, 06.50.158

Kits for **CATERPILLAR®** Ignition Coils – For CATERPILLAR® G3400 and G3500 Series Gas Engines

P/N	Figure	Supersedes	Description	Application	Extension Length	Extension Diameter	Fits Ignition Coil P/N
06.80.419H	5		Extension overhaul kit	G3400 - Non CSA	95 mm	30 mm	232-6348, 165-1591, 131-3277, 129-8802, 108-0615
06.80.742	5	06.80.418H	Extension overhaul kit	G3400 - CSA	97 mm	30 mm	232-6349, 165-1592, 122-8070
06.80.420H	5		Extension overhaul kit	G3400 - Non CSA	107 mm	30 mm	232-6352, 213-7443
06.80.744	5	06.80.417H	Extension overhaul kit	G3400 - CSA	109 mm	30 mm	232-6353, 213-7444
06.80.515H	5	06.80.315H	Extension overhaul kit	G3500 - Non CSA	118 mm	30 mm	232-6346, 165-1589, 124-0749
06.80.752	5	06.80.415H	Extension overhaul kit	G3500 - CSA	105 mm	30 mm	232-6347, 165-1590
06.80.480	5		Extension overhaul kit	G3500 - Non CSA	112 mm	30 mm	232-6350
06.80.754	5	06.80.415H	Extension overhaul kit	G3500 - CSA	105 mm	30 mm	259-2078



5

# IGNITION COILS

## Accessories for Unshielded Ignition Coils

Different ignition coil styles require different boots to seal the primary or secondary terminals. MOTORTECH boots are all made from highest grade of silicone (482 °F / 250 °C).

The boots will remain soft and flexible over a long time and protect the operator from touching any low or high voltage terminations. The boots also ensure that the critical areas stay clean and dry even in the worst environment.

### Boots for MOTORTECH Ignition Coils

P/N	Figure	Ignition Coil Side		Outlet		Ignition Coil 06.50. ...													
		Primary	Secondary	90 °	180 °	003	053	054	055	060	065	100	102	103	104	105	300	301	
06.80.037	1	x		x		x	x	x	x	x	x								
06.84.082	2	x		x								x	x		x	x	x	x	
06.84.021	3	x		x										x <sup>1)</sup>					
06.80.005	4	x			x	x	x	x	x	x	x								
06.84.083	5		x	x								x			x		x		
06.80.006	6		x		x	x				x									
06.84.006	7		x		x		x	x	x		x		x			x			x

<sup>1)</sup> Two boots needed for each ignition coil.



### Boots for ALTRONIC® Ignition Coils

P/N	Figure	Ignition Coil Side		Outlet		Ignition Coil
		Primary	Secondary	90 °	180 °	
06.80.037	1	x		x		291001, 591010, 501061
06.80.036	2	x			x	291001, 591010, 501061
06.84.006	3		x		x	291001, 591010, 501061



## Secondary Connections

P/N	Figure	Description	Ignition Coil 06.50. ...												
			003	053	054	055	060	065	100	102	103	104	105	300	301
06.80.261	<a href="#">1</a>	Coil terminal, 180°, requires p/n 06.80.126		x	x	x		x		x			x		x
06.80.091	<a href="#">2</a>	Coil terminal, 180°, requires P/N 06.80.126							x <sup>1)</sup>		x	x <sup>1)</sup>		x <sup>1)</sup>	
06.80.108	<a href="#">3</a>	Crimp terminal base	x				x	x			x		x		
06.80.116	<a href="#">4</a>	Crimp terminal, 90°, requires P/N 06.80.108	x				x								
06.80.116-180	<a href="#">5</a>	Crimp terminal, 180°, requires P/N 06.80.108						x			x		x		
06.80.126	<a href="#">6</a>	Crimp terminal base		x	x	x		x	x <sup>1)</sup>	x	x	x <sup>1)</sup>	x	x <sup>1)</sup>	x
06.84.024	<a href="#">7</a>	Coil terminal, 90°, including terminal P/N 02.85.920									x				
06.84.025	<a href="#">8</a>	Coil terminal, 180°, including terminal P/N 02.85.920									x				
22.80.009	<a href="#">9</a>	Coil terminal, 90°, 1 kΩ resistor, requires P/N 06.80.126								x			x		x

<sup>1)</sup> When using SAE contact pin P/N 06.51.223.



## Accessories

P/N	Figure	Description	Ignition Coil 06.50. ...												
			003	053	054	055	060	065	100	102	103	104	105	300	301
06.51.223	<a href="#">1</a>	SAE contact pin								x			x		x
06.90.264 <sup>1)</sup>	<a href="#">2</a>	Accessory kit incl. fastening screws and nuts							x	x		x	x	x	x
02.85.1012	<a href="#">3</a>	SAE spreading adaptor		x	x	x		x		x			x		x

<sup>1)</sup> Comes with each New MOTORTECH Style ignition coil.



# IGNITION COILS



## SHIELDED

### Flange Ignition Coils

MOTORTECH makes available the BLUE and RED flanged ignition coil as a replacement for the existing products sold by ALTRONIC® and the engine manufacturers.

Specially designed versions for use with newest technologies of MOTORTECH ignitions controllers are also available:

- MOST – MOTORTECH Output Stage Technology of MOTORTECH MIC3, MIC4 and MIC5 ignition controllers



### 3 Pole Primary Connector Arrangement

P/N	Color	Primary Termination	HV Termination	Polarity	MOST	Equivalent to
06.50.034	red	MIL Style 3 pole pin	female	(-) ground	not applicable	591012, 69694F, 7W4377
06.50.035	blue	MIL Style 3 pole pin	female	(-) ground	not applicable	591018, (A)69694G
06.50.036	red	MIL Style 3 pole pin	female	(-) ground	x	
95.09.100	steel	MIL Style 3 pole pin	female	(-) ground	x	
95.09.133	steel	MIL Style 3 pole pin	female	(+) ground	not applicable	
95.09.134	steel	MIL Style 3 pole pin	female	(-) ground	not applicable	591012, 69694F, 7W4377
95.09.135	steel	MIL Style 3 pole pin	female	(-) ground	not applicable	591018/ (A)69694G

## Flange Ignition Coils with integrated Primary Lead

Based on its known flange ignition coils, MOTORTECH offers a new series of coils with integrated primary leads. Different configurations with 90-degree and 180-degree 2 pole and 3 pole connectors are available to connect the ignition coil directly to a wiring rail or to replace OEM parts in the field.



**SHIELDED**

## AlphaRail MOTORTECH WIRING RAIL SYSTEM

### 2 Pole Primary Connector Arrangement – For use with AlphaRail Wiring Rails



P/N <sup>1)</sup>	Color	Wiring Rail Connector	HV Termination	Polarity	MOST	Equivalent to
06.50.034-L-C	red	MIL Style 2 pole pin, 180°	female	(-) ground	not applicable	
06.50.034-L-D	red	MIL Style 2 pole pin, 90°	female	(-) ground	not applicable	
06.50.035-L-C	blue	MIL Style 2 pole pin, 180°	female	(-) ground	not applicable	
06.50.035-L-D	blue	MIL Style 2 pole pin, 90°	female	(-) ground	not applicable	
06.50.036-L-C	red	MIL Style 2 pole pin, 180°	female	(-) ground	X	
06.50.036-L-D	red	MIL Style 2 pole pin, 90°	female	(-) ground	X	

<sup>1)</sup> Standard primary lead lengths (“-L-”) = 12 in., 18 in., 24 in., 30 in., 36 in., 42 in. Other lengths available on request.

### For use with **WAUKESHA® ESM Gas Engines**



P/N	Color	Primary Lead Length	Wiring Rail Connector	HV Termination	Polarity	MOST	Equivalent to
06.50.035-30-A	blue	30 in.	3 pole socket, 180°	female	(-) ground	not applicable	69957A
06.50.035-36-E	blue	36 in.	3 pole pin, 180°	female	(-) ground	not applicable	69957

# IGNITION COILS



## SHIELDED

### Flange Ignition Coils with Diagnostic Interface

These MOTORTECH ignition coils are designed for operators who want to monitor their high voltage traces in a simple way. Measuring high voltage peak (kV) and spark duration (µsec) of all cylinders of an engine with flange coils regularly, will allow easy maintenance of the equipment.

With a MOTORTECH SparkView or digital Scope Meter the operator can receive real time data.



### 3 Pole Primary Connector Arrangement

P/N	Color	Primary Termination	HV Termination	Polarity	MOST	Equivalent to
95.09.150	steel	MIL Style 3 pole pin	female	(-) ground	x	
95.09.153	steel	MIL Style 3 pole pin	female	(+) ground	not applicable	
95.09.154 <sup>1)</sup>	steel	MIL Style 3 pole pin	female	(-) ground	not applicable	591012, 69694F, 7W4377
95.09.155 <sup>2)</sup>	steel	MIL Style 3 pole pin	female	(-) ground	not applicable	591018, (A)69694G

<sup>1)</sup> Same coil winding as P/N 95.09.134, but with diagnostic interface. Thus also equivalent to P/N 591012, 69694F and 7W4377.

<sup>2)</sup> Same coil winding as P/N 06.50.035 / 95.09.135, but with diagnostic interface. Thus also equivalent to P/N 591018 and 69694G / A69694G.



Additional BNC connector for high voltage measurement

## SparkView

MOTORTECH 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. With a measuring clamp or cable and the display for up to 40 kV, it is easy to determine the condition of the spark plugs and the time at which they need to be replaced.



See chapter 07 page 1.

## Flange Ignition Coils with Diagnostic Interface and integrated Primary Lead

MOTORTECH flange ignition coils with diagnostic interface are also available with integrated primary leads. These include different connector arrangements for a direct wiring rail connection and to offer an upgrade and replacement to used OEM products.



## AlphaRail MOTORTECH WIRING RAIL SYSTEM

### 2 Pole Primary Connector Arrangement – For use with AlphaRails Wiring Rails



P/N <sup>1)</sup>	Color	Wiring Rail Connector	HV Termination	Polarity	MOST	Equivalent to
95.09.150-L-C	steel	MIL Style 2 pole pin, 180°	female	(-) ground	X	
95.09.150-L-D	steel	MIL Style 2 pole pin, 90°	female	(-) ground	X	
95.09.154-L-C	steel	MIL Style 2 pole pin, 180°	female	(-) ground	not applicable	
95.09.154-L-D	steel	MIL Style 2 pole pin, 90°	female	(-) ground	not applicable	
95.09.155-L-C	steel	MIL Style 2 pole pin, 180°	female	(-) ground	not applicable	
95.09.155-L-D	steel	MIL Style 2 pole pin, 90°	female	(-) ground	not applicable	

<sup>1)</sup> Standard primary lead lengths (“-L-”) = 12 in., 18 in., 24 in., 30 in., 36 in., 42 in. Other lengths available on request.

### For use with WAUKESHA® ESM Gas Engines



P/N	Color	Primary Lead Length	Wiring Rail Connector	HV Termination	Polarity	MOST	Equivalent to
95.09.155-30-A <sup>1)</sup>	steel	30 in.	3 pole socket, 180°	female	(-) ground	not applicable	69957A
95.09.155-36-E <sup>1)</sup>	steel	36 in.	3 pole pin, 180°	female	(-) ground	not applicable	69957

<sup>1)</sup> Same coil winding as P/N 06.50.035-30-A and 06.50.035-36-E, but with diagnostic interface. Thus also equivalent to P/N 69957A and 69957 for use on WAUKESHA® ESM gas engines.

### For use with CUMMINS® QSK60G and QSV81/91G Gas Engines

P/N	Color	Primary Lead Length	Wiring Rail Connector	HV Termination	Polarity	MOST	Equivalent to
95.09.156-20-B <sup>1)</sup>	steel	20 in.	3 pole socket, 180°	female	(-) ground	X	

<sup>1)</sup> Use of ignition coil only possible, if conversion kits P/N 75.30.143 or 75.30.144 previously were used.

# IGNITION COILS



## SHIELDED

### Externally Mounted Ignition Coils

Shielded – externally mounted – ignition coils are encapsulated in a steel housing with welded lids. A bracket is used to install the coils on a wiring rail or directly on the engine. This type of ignition coil is connected to the spark plug by a shielded spark plug lead with a 3/4 in. or 1 in. termination. Primary voltage connection is made by a 2 or 3 pole military style screw connector. All parts meet the CSA Class I, Division 2, Group C/D.



#### 3 Pole Primary Connector Arrangement

P/N	Supersedes	Color	Primary Termination	HV Termination	Polarity	MOST	Equivalent to
95.09.005		steel	MIL Style 3 pole pin	3/4-20 UNEF	(-) ground	x	
95.09.053	95.09.001	steel	MIL Style 3 pole pin	3/4-20 UNEF	(+) ground	not applicable	291001-S
95.09.054	95.09.003	steel	MIL Style 3 pole pin	3/4-20 UNEF	(-) ground	not applicable	591010-S
95.09.055	95.09.002	steel	MIL Style 3 pole pin	3/4-20 UNEF	(-) ground	not applicable	501061-S, 2881178



#### 2 Pole Primary Connector Arrangement

P/N	Supersedes	Color	Primary Termination	HV Termination	Polarity	MOST	Equivalent to
95.08.003	95.08.001/ 95.08.002	steel	MIL Style 2 pole pin	1-20 UNEF	(-) ground	x	PPT2477AD, PPT2477ADL
95.08.005		steel	MIL Style 2 pole pin	3/4-20 UNEF	(+) ground	not applicable	10-382040-1

## Integral Ignition Coils – Slim Design

Integral ignition coils are designed to be mounted directly on a dual threaded spark plug. No spark plug lead is required. These ignition coils are mostly used in hazardous applications. Coil life is effected by the temperature that is transferred into the coil by the spark plug. On occasions where the spark plug leaks, high combustion pressure enters the ignition coil and forces the base coil to blow out of its housing. MOTORTECH has designed a top cover safety ring that will not allow this to happen.



### 3 Pole Primary Connector Arrangement – ALTRONIC® Compatible

P/N <sup>1)</sup>	Supersedes	Color	Length	Primary Termination	HV Termination		Polarity	MOST	Equivalent to
					Outer Thread	Inner Thread			
95.09.022-6 <sup>2)</sup>	95.09.012-6, 95.09.040-6	steel	6.00 in.	MIL Style 3 pole pin		13/16-20 UNEF	(-) ground	not applicable	591011A, 107-2400
95.09.022-12 <sup>2)</sup>	95.09.012-12, 95.09.040-12	steel	12.00 in.	MIL Style 3 pole pin		13/16-20 UNEF	(-) ground	not applicable	591011B, 591011C, 215-2434, 69694D
95.09.023-6 <sup>2)</sup>	95.09.010, 95.09.030	steel	6.00 in.	MIL Style 3 pole pin	1-20 UNEF	13/16-20 UNEF	(-) ground	not applicable	591007, 4W4959, 60615F
95.09.033-6 <sup>3)</sup>	95.09.011, 95.09.031	steel	6.00 in.	MIL Style 3 pole pin	1-20 UNEF	13/16-20 UNEF	(+) ground	not applicable	591008

<sup>1)</sup> Ignition coils in 10 in. only available on special request.

<sup>2)</sup> For use with MIC500, ALT I, ALT III, ALT V, CD200, CD200D, DISN, CPU90, CPU95, CEC, CATERPILLAR® (163-6164, 163-6108).

<sup>3)</sup> For use with ALT II, DIS, CPU2000.

### 2 Pole Primary Connector Arrangement – FAIRBANKS MORSE® Style



P/N <sup>1)</sup>	Supersedes	Color	Length	Primary Termination	HV Termination		Polarity	MOST	Equivalent to
					Outer Thread	Inner Thread			
95.08.022-6 <sup>2)</sup>	95.08.010-6, 95.08.030-6	steel	6.00 in.	MIL Style 2 pole pin		13/16-20 UNEF	(-) ground	not applicable	PPT2477AA6
95.08.022-12 <sup>2)</sup>	95.08.010-12, 95.08.030-10	steel	12.00 in.	MIL Style 2 pole pin		13/16-20 UNEF	(-) ground	not applicable	PPT2477AA12

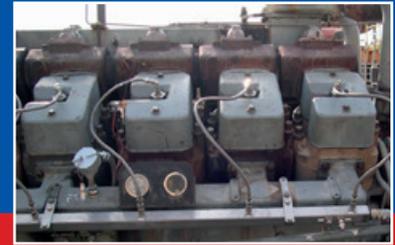
<sup>1)</sup> Ignition coils in 8 in. and 10 in. only available on special request.

<sup>2)</sup> For use with MIC500, MIC850.



Safety ring with included HEX for easy installation/deinstallation

# IGNITION COILS



## SHIELDED

### Integral Ignition Coils – Fat Design

Integral ignition coils are encapsulated in a steel housing to meet CSA requirements. For slow and mid speed engines it is favorable to have more spark energy available. MOTORTECH has a full line of these special coils with 3 pole primary connector for use with MOTORTECH MIC3, MIC4, MIC5, MIC500 and MIC850 series ignition controllers (includes support of ASC and MOST) available in different length to meet the application and spark plug requirement. Safety First!



### 3 Pole Primary Connector Arrangement – MIC3, MIC4, MIC5 Compatible

P/N <sup>1)</sup>	Supersedes	Color	Length	Primary Termination	HV Termination		Polarity	MOST	Equivalent to
					Outer Thread	Inner Thread			
95.09.142-11 <sup>2)</sup>	95.09.060-11	steel	11.00 in.	MIL Style 3 pole pin		13/16-20 UNEF	(-) ground	x	
95.09.143-6 <sup>2)</sup>	95.09.013-6, 95.09.050-6	steel	6.00 in.	MIL Style 3 pole pin	1-20 UNEF	13/16-20 UNEF	(-) ground	x	

<sup>1)</sup> Ignition coils in 12 in. and 14.5 in. only available on special request.

<sup>2)</sup> For use with MIC3, MIC4, MIC5, MIC500, MIC850.

P/N 95.09.142-11 for use on WAUKESHA® VHP-GSI with rain shield.

For existing installations with **ALTRONIC®** ignition controllers, MOTORTECH offers a special series of high energy integral ignition coils with 3 pole primary connector. The ignition coils

are designed to have the electrical characteristics to function with the ALTRONIC® patented “Spark Reference” high voltage indication system.



### 3 Pole Primary Connector Arrangement – ALTRONIC® Compatible

P/N <sup>1)</sup>	Supersedes	Color	Length	Primary Termination	HV Termination		Polarity	ASC	MOST	Equivalent to
					Outer Thread	Inner Thread				
95.09.122-11 <sup>2)</sup>	95.09.061-11	steel	11.00 in.	MIL Style 3 pole pin		13/16-20 UNEF	(-) ground	not applicable	not applicable	
95.09.123-6 <sup>2)</sup>	95.09.051-6	steel	6.00 in.	MIL Style 3 pole pin	1-20 UNEF	13/16-20 UNEF	(-) ground	not applicable	not applicable	

<sup>1)</sup> Ignition coils in 12 in. and 14.5 in. only available on special request.

<sup>2)</sup> For use with MIC500, ALT I, ALT III, ALT V, CD200, CD200D, DISN, CPU90, CPU95, CEC.

P/N 95.09.122-11 for use on WAUKESHA® VHP-GSI with rain shield.

MOTORTECH high energy integral ignition coils are also available with 2 pole primary connector for use with MOTORTECH MIC3, MIC4, MIC5, MIC500 and MIC850

(includes support of ASC and MOST feature) series ignition controllers.

### 2 Pole Primary Connector Arrangement – FAIRBANKS MORSE® Style



P/N <sup>1)</sup>	Supersedes	Color	Length	Primary Termination	HV Termination		Polarity	MOST	Equivalent to
					Outer Thread	Inner Thread			
95.08.142-11 <sup>2)</sup>	95.08.050-11	steel	11.00 in.	MIL Style 2 pole pin		13/16-20 UNEF	(-) ground	x	
95.08.143-6 <sup>2)</sup>	95.08.020-6, 95.08.040-6	steel	6.00 in.	MIL Style 2 pole pin	1-20 UNEF	13/16-20 UNEF	(-) ground	x	PPT2477AB6

<sup>1)</sup> Ignition coils in 12 in. and 14.5 in. only available on special request.  
<sup>2)</sup> For use with MIC3, MIC4, MIC5, MIC500, MIC850.  
 P/N 95.04.142-11 for use on WAUKESHA® VHP-GSI with rain shield.



Safety ring with included HEX for easy installation/deinstallation

### Teflon Grommets for Integral Ignition Coils

P/N	Supersedes	Description	Integral Ignition Coil Type	Engine Make and Model
06.84.116		Teflon grommet	Slim design	CATERPILLAR® G3300 series
06.84.117		Teflon grommet	Slim design	CATERPILLAR® G3400 series
06.84.069		Teflon grommet	Fat design	WAUKESHA® VHP and VGF series



# PICKUPS & TRIGGER DRIVES



## UNSHIELDED

### Pickups

A wide range of standard ignition pickups are available from MOTORTECH to allow service companies and operators to select what they need to do a professional installation.

High quality, designed to meet the application and temperature requirements, MOTORTECH pickups will last and ensure you are not experiencing any unexpected shut downs.

#### Magnetic Pickups – Thread Size 5/8-18 UNF<sup>1)</sup>



P/N	Figure	Supersedes	Thread Size	Thread Length	Trigger	Equivalent to
66.60.001-125	1	06.60.101	5/8-18 UNF	1.25 in.	holes, pins, teeth, screws	
66.60.001-175	1	06.60.105	5/8-18 UNF	1.75 in.	holes, pins, teeth, screws	691118-1
66.60.001-250	1	06.60.102	5/8-18 UNF	2.50 in.	holes, pins, teeth, screws	691118-2
66.60.001-400	1	06.60.103	5/8-18 UNF	4.00 in.	holes, pins, teeth, screws	691118-4
66.60.001-600	1	06.60.107	5/8-18 UNF	6.00 in.	holes, pins, teeth, screws	691118-6

<sup>1)</sup> Not for use with WAUKESHA® ESM system.

#### Hall Effect Pickups – Thread Size 5/8-18 UNF – Active Low



P/N	Figure	Supersedes	Thread Size	Thread Length	Trigger	Equivalent to
66.60.002-175	2	06.60.020	5/8-18 UNF	1.75 in.	magnets	791050-1
66.60.002-250	2	06.60.021	5/8-18 UNF	2.50 in.	magnets	791050-2
66.60.002-450	2	06.60.022	5/8-18 UNF	4.50 in.	magnets	791050-4
66.60.002-600	2		5/8-18 UNF	6.00 in.	magnets	791050-6

#### Hall Effect Pickups – Thread Size 5/8-18 UNF – Active High<sup>1)</sup>



P/N	Figure	Supersedes	Thread Size	Thread Length	Trigger	Equivalent to
66.60.012-175	2		5/8 in.-18UNF	1.75 in.	magnets	591014-1
66.60.012-250	2		5/8 in.-18UNF	2.50 in.	magnets	591014-2
66.60.012-450	2		5/8 in.-18UNF	4.50 in.	magnets	591014-4
66.60.012-600	2		5/8 in.-18UNF	6.00 in.	magnets	591014-6

<sup>1)</sup> For use with ALTRONIC® CPU90/CPU95/CPU2000 ignition controllers.

#### Inductive Pickups – Thread Size M12x1



P/N	Figure	Supersedes	Thread Size	Thread Length	Trigger	Equivalent to
66.60.003-60	3	06.60.027 / 06.60.042	M12x1	60 mm	pins, screws, slots	
66.60.003-100	3	06.60.023 / 06.60.040	M12x1	100 mm	pins, screws, slots	

**SHIELDED**

Magnetic Pickups – Thread Size 5/8-18 UNF<sup>1)</sup>



P/N	Figure	Supersedes	Thread Size	Thread Length	Trigger	Equivalent to
95.70.001-125	4		5/8-18 UNF	1.25 in.	holes, pins, teeth, screws	
95.70.001-175	4		5/8-18 UNF	1.75 in.	holes, pins, teeth, screws	691118-1
95.70.001-250	4		5/8-18 UNF	2.50 in.	holes, pins, teeth, screws	691118-2
95.70.001-400	4		5/8-18 UNF	4.00 in.	holes, pins, teeth, screws	691118-4
95.70.001-600	4		5/8-18 UNF	6.00 in.	holes, pins, teeth, screws	691118-6

<sup>1)</sup> Not for use with WAUKESHA® ESM system.

Hall Effect Pickups – Thread Size 5/8-18 UNF – Active Low



P/N	Figure	Supersedes	Thread Size	Thread Length	Trigger	Equivalent to
95.70.002-175	5		5/8-18 UNF	1.75 in.	magnets	791050-1
95.70.002-250	5		5/8-18 UNF	2.50 in.	magnets	791050-2
95.70.002-450	5		5/8-18 UNF	4.50 in.	magnets	791050-4
95.70.002-600	5		5/8-18 UNF	6.00 in.	magnets	791050-6

Hall Effect Pickups – Thread Size 5/8-18 UNF – Active High<sup>1)</sup>



P/N	Figure	Supersedes	Thread Size	Thread Length	Trigger	Equivalent to
95.70.012-175	5		5/8-18 UNF	1.75 in.	magnets	591014-1
95.70.012-250	5		5/8-18 UNF	2.50 in.	magnets	591014-2
95.70.012-450	5		5/8-18 UNF	4.50 in.	magnets	591014-4
95.70.012-600	5		5/8-18 UNF	6.00 in.	magnets	591014-6

<sup>1)</sup> For use with ALTRONIC® CPU90/CPU95/CPU2000 ignition controllers.

Inductive Pickups – Thread Size M12x1



P/N	Figure	Supersedes	Thread Size	Thread Length	Trigger	Equivalent to
95.70.003-60	6		M12x1	60 mm	pins, screws, slots	
95.70.003-100	6		M12x1	100 mm	pins, screws, slots	

Legend



slots



magnets



pins



teeth



screws



holes



See page 03/11 for available pickup thread adaptors.

Conversion: 1 inch = 25,4 mm / 1 foot = 0,3 m

# PICKUPS & TRIGGER DRIVES

## UNSHIELDED

### Special Application Pickups

For use with competitor ignition systems, MOTORTECH offers a special series of pickups. Based on the reliable design of MOTORTECH's standard versions, this series represents a

suitable replacement for existing competitor pickups in the field.

#### Magnetic Pickups – Thread Size 3/4-16 UNF<sup>1)</sup>



P/N	Figure	Thread Size	Thread Length	Trigger	Equivalent to
66.60.011-180	1	3/4-16 UNF	1.80 in.	holes, pins, teeth, screws	791015-1
66.60.011-340	1	3/4-16 UNF	3.40 in.	holes, pins, teeth, screws	791016-2

<sup>1)</sup> For use with ALTRONIC® CD1, CD200, CD200D and CD200EVS ignition controllers.

#### Magnetic Pickups – Thread Size M12x1<sup>1)</sup>



P/N	Figure	Thread Size	Thread Length	Trigger	Equivalent to
66.60.021-300	2	M12x1	3.00 in.	holes, pins, teeth, screws	791041-3, 10.362-1

<sup>1)</sup> For use with ALTRONIC® CD200, CD200D and CD200EVS ignition controllers.

#### Active Pickups – Thread Size M18x1<sup>1)</sup>



P/N	Figure	Thread Size	Thread Length	Trigger	Equivalent to
66.60.023-450	3	M18x1	4.50 in.	magnets	791037-4, 1229 9989

<sup>1)</sup> For use with MWM®/DEUTZ® gas engines.

#### Legend



slots



magnets



pins



teeth



screws



holes



1



2



3

Conversion: 1 inch = 25,4 mm / 1 foot = 0,3 m

**UNSHIELDED**

### Pickup Leads

The reliability of an electronic ignition system comes with its accessories. Every pickup needs a lead to connect to the ignition controller and ensure that the signal is transmitted without any malfunctions. MOTORTECH offers high grade pickup

leads that are all shielded against RFI interference. Preferably a 90° connector is used as it routes the wire downwards and puts less side load stress on the pickup.

#### Magnetic Pickup Leads



P/N	Figure	Supersedes	Connector	Length	Equivalent to
06.71.001-L	1		2 pole socket, 90°	"L" = 5/15/25/50 ft.	

#### Hall Effect Pickup Leads



P/N	Figure	Supersedes	Connector	Length	Equivalent to
06.71.002-L	2		3 pole socket, 90°	"L" = 5/15/25/50 ft.	

#### Inductive Pickup Leads



P/N	Figure	Supersedes	Connector	Length	Equivalent to
06.71.007	3		4 pole socket, 90°	400 in.	

**SHIELDED**

#### Magnetic Pickup Leads



P/N <sup>1)</sup>	Figure	Supersedes	Connector	Adaptor to Outlet Box	Equivalent to
95.60.010-L	4		2 pole socket, 180°	1/2-14 NPT	593048-L
95.60.020-L	4		2 pole socket, 90°	1/2-14 NPT	593054-L

<sup>1)</sup> Standard braid lengths ("L") = 6 in., 12 in., 18 in., 24 in., 36 in., 48 in., 72 in., 96 in., 120 in., 150 in., 180 in.; other lengths available on request.

#### Hall Effect Pickup Leads



P/N <sup>1)</sup>	Figure	Supersedes	Connector	Adaptor to Outlet Box	Equivalent to
95.60.030-L	5		3 pole socket, 180°	1/2-14 NPT	593052-L
95.60.040-L	5		3 pole socket, 90°	1/2-14 NPT	593057-L

<sup>1)</sup> Standard braid lengths ("L") = 6 in., 12 in., 18 in., 24 in., 36 in., 48 in., 72 in., 96 in., 120 in., 150 in., 180 in.; other lengths available on request.

#### Inductive Pickup Leads



P/N	Figure	Supersedes	Connector	Lead Length	Adaptor to Outlet Box	Equivalent to
95.60.050-400	6		4 pole socket, 90°	400 in.	M12x1.5	



# PICKUPS & TRIGGER DRIVES

## Trigger Discs

A large variety of different trigger discs is available to support upgrades performed by installing new electronic ignition systems on engines that used to be equipped with mechanical driven magnetos. Select between universal trigger discs with magnets, metal inlets or discs that are specially designed for particular engine models.



## Trigger Discs with Magnets

P/N	Supersedes	Description	Diameter	Events	Equivalent to
06.20.300		Trigger disc with magnet	5.00 in.	1	
06.20.301		Trigger disc with magnet	7.45 in.	1	
06.20.302		Trigger disc with magnets	5.00 in.	2+1	
06.20.303		Trigger disc with magnets	7.45 in.	2+1	
06.20.304		Trigger disc with magnets	5.00 in.	3+1	
06.20.305		Trigger disc with magnets	7.45 in.	3+1	
06.20.306		Trigger disc with magnets	5.00 in.	4+1	790114-1
06.20.307		Trigger disc with magnets	7.45 in.	4+1	790104-1
06.20.308		Trigger disc with magnets	5.00 in.	5+1	790115-1
06.20.309		Trigger disc with magnets	7.45 in.	5+1	790105-1
06.20.310		Trigger disc with magnets	3.40 in.	6+1	790165
06.20.311		Trigger disc with magnets	4.00 in.	6+1	790144
06.20.312		Trigger disc with magnets	5.00 in.	6+1	790169
06.20.313		Trigger disc with magnets	5.00 in.	6+1	790116-1
06.20.314		Trigger disc with magnets	7.45 in.	6+1	790106-1
06.20.316		Trigger disc with magnets	5.00 in.	8+1	790118-1
06.20.317		Trigger disc with magnets	7.45 in.	8+1	790150
06.20.318		Trigger disc with magnets	7.45 in.	8+1	790108-1
06.20.319		Trigger disc with magnets	7.45 in.	8+1	790022
06.20.321		Trigger disc with magnets	7.45 in.	12+1	790122-1
06.20.322		Trigger disc with magnets	7.45 in.	12+1	790151
06.20.323		Trigger disc with magnets	7.45 in.	12+1	790021

Conversion: 1 inch = 25,4 mm/1 foot = 0,3 m

### Trigger Discs with Magnets – Compatible with WAUKESHA® CEC Ignition System

P/N	Figure	Supersedes	Description	Application	Diameter	Events	Equivalent to
06.20.069-1	1		Trigger disc with magnet	WAUKESHA® VHP series	7.45 in.	1	
06.20.069-6	1		Trigger disc with magnets	WAUKESHA® VHP series – 6 cylinders	7.45 in.	6+1	305805R
06.20.069-12	1		Trigger disc with magnets	WAUKESHA® VHP series – 12 cylinders	7.45 in.	12+1	305805P
06.20.254	2		Trigger disc with magnet	WAUKESHA® VHP series	5.35 in.	1	
06.20.252	2		Trigger disc with magnets	WAUKESHA® VHP series – 16 cylinders	5.35 in.	8+1	305805N
06.20.026-1 <sup>1)</sup>	3		Trigger disc with magnet	WAUKESHA® VHP series	7.45 in.	1	
06.20.025 <sup>1)</sup>	3		Trigger disc with magnets	WAUKESHA® VHP series – 6 cylinders	7.45 in.	6+1	305805F
06.20.026 <sup>1)</sup>	3	06.20.025-1	Trigger disc with magnets	WAUKESHA® VHP series – 12 cylinders	7.45 in.	12+1	305805G
06.20.045-1	4		Trigger disc with magnet	WAUKESHA® VGF series	5.00 in.	1	
06.20.045-6	4		Trigger disc with magnets	WAUKESHA® VGF series – 6 cylinders	5.00 in.	6+1	305805
06.20.045-8	4		Trigger disc with magnets	WAUKESHA® VGF series – 8 cylinders	5.00 in.	8+1	305805A

<sup>1)</sup> Comes with lock nut.

### Accessories for Trigger Discs for WAUKESHA® VHP Series

P/N	Figure	Supersedes	Description	Application	Equivalent to
06.20.070	1B		Hub for trigger discs P/N 06.20.069-X	WAUKESHA® VHP series	A168368E

### Trigger Discs with Metal Inlets

P/N	Figure	Supersedes	Description	Diameter	Events	Equivalent to
06.20.400	5		Trigger disc with metal inlets	7.45 in.	2+1	790302-1
06.20.401	5		Trigger disc with metal inlets	7.45 in.	3+1	790303-1
06.20.402	5		Trigger disc with metal inlets	5.00 in.	4+1	790314-1
06.20.403	5		Trigger disc with metal inlets	5.00 in.	6+1	790316-1
06.20.404	5		Trigger disc with metal inlets	5.00 in.	8+1	790318-1

### Trigger Disc for IVECO® 5.9

P/N	Figure	Supersedes	Description	Diameter	Events	Equivalent to
06.20.251	6		Trigger disc with metal inlets	11.50 in.	3+1	



# PICKUPS & TRIGGER DRIVES

## Trigger Pins & Magnets

### Trigger Reluctor Pin

P/N	Figure	Supersedes	Description	Diameter	Length	Equivalent to
06.80.104	1		Trigger reluctor pin	0.25 in.	0.75 in.	

See page 03/11 for reluctor pin installation tool.

### Trigger Magnets

P/N	Figure	Supersedes	Description	Thread	Length	Equivalent to
06.60.900	2		Trigger magnet	1/4-20 UNC	0.65 in.	
06.60.922	2		Trigger magnet	M8x1.25	0.70 in.	720002
06.60.925	3		Trigger magnet for CATERPILLAR® G3500 series	M8x1.25	1.34 in.	260605, 260604

## Trigger Drives

### Trigger Conversion Kits for CATERPILLAR® G3300 & G3400 Series Gas Engines

P/N	Figure	Supersedes	Description	Events
75.30.131	4	75.30.101	Trigger conversion kit for CATERPILLAR® G3306	6+1
75.30.131-1	4	75.30.119-1 /101-1	Trigger conversion kit for CATERPILLAR® G3304/3306	1
75.30.132	4	75.30.119	Trigger conversion kit for CATERPILLAR® G3304	4+1
75.30.133	4	75.30.100	Trigger conversion kit for CATERPILLAR® G3406	6+1
75.30.133-1	4	75.30.100-1	Trigger conversion kit for CATERPILLAR® G3406	1

### Accessories for Trigger Conversion Kits for CATERPILLAR® G3300 & G3400 Series Gas Engines

P/N	Figure	Supersedes	Description	Engine
44.04.005	4a		Fork spanner, swan-necked	G3406



1



2



3

### Basic Trigger Conversion Kit for DOOSAN® GV222TI Gas Engine

P/N	Figure	Supersedes	Description	Events
75.30.137 <sup>1)</sup>	5		Trigger conversion kit for DOOSAN® GV222TI	6+1

<sup>1)</sup> Pickup P/N 66.60.003-60 and lead 06.71.007 required for above. Illustration shows mounted kit on existing camshaft gear.

### Trigger Drive for WHITE SUPERIOR® G825 & GT825 Gas Engines

P/N	Figure	Supersedes	Description	Events
06.22.400-1 <sup>1)</sup>	6		Trigger drive for WHITE SUPERIOR® G825/GT825	1
06.22.400-6 <sup>1)</sup>	6		Trigger drive for WHITE SUPERIOR® G825/GT825	6+1
06.22.400-8 <sup>1)</sup>	6		Trigger drive for WHITE SUPERIOR® G825/GT825	8+1

<sup>1)</sup> Pickup P/N 66.60.003-60 and lead 06.71.007 required for above.

### Trigger Drive for MAN® E2842E302 & DOOSAN® GV222TI Gas Engines

P/N	Figure	Supersedes	Description	Events
06.23.001 <sup>1)</sup>	7		Trigger drive for MAN® E2842E302 & DOOSAN® GV222TI	6+1

<sup>1)</sup> Pickup P/N 66.60.003-60 and lead 06.71.007 required for above.

### Trigger Drive for MAN® E2866E302 Gas Engine

P/N	Figure	Supersedes	Description	Events
06.23.004 <sup>1)</sup>	8		Trigger drive for MAN® E2866E302	6+1

<sup>1)</sup> Pickup P/N 66.60.003-60 and lead 06.71.007 required for above.



4



5



6

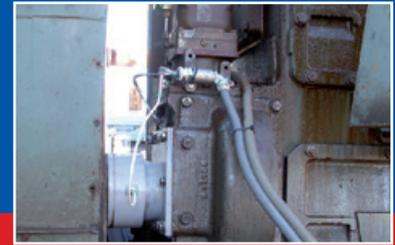
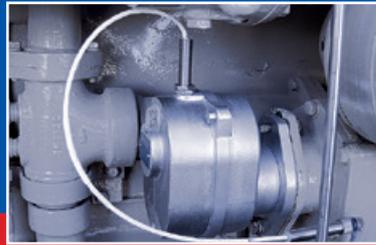


7



8

# PICKUPS & TRIGGER DRIVES



## Trigger Devices

For applications where a trigger disc can not be mounted due to difficult camshaft access, a trigger device is available. This unit is mounted at the location where the ignition magneto was installed. A built in trigger disc will sense the events necessary to trigger the ignition control unit. One (1) to a maximum of eight (8) trigger events are possible.

This covers most of the engines up to 16 cylinders operated in the field today. A proper mounting flange can be selected from a variety of flange designs typically used in the industry. Heavy duty bearings and a smart product design offer a long operating life cycle.

## Specification Table

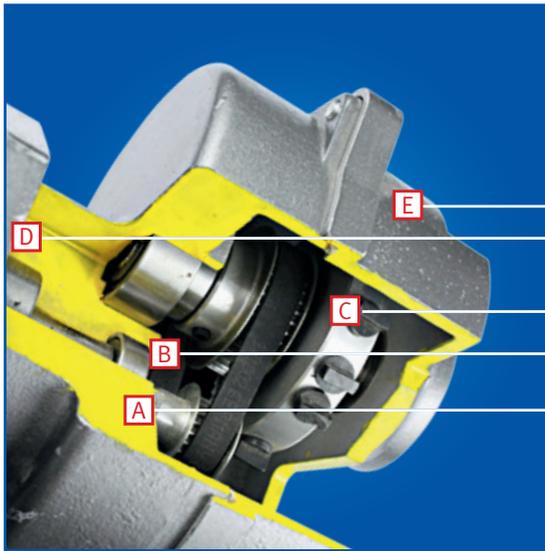
Before trying to specify the correct trigger device, please make available the ignition magneto part number. For details you might even want to look up the ALTRONIC® application chart. That information will lead you to the MOTORTECH TriDev part number.

If any help is required, please call your nearest MOTORTECH sales partner.

ALTRONIC III MEDIUM ENGINES, 3-16 CYLINDERS		IDENTIFICATION FORM AIR AL 13-95
ALTRONIC III UNIT PART NO. DESIGNATION		
R A P P H T E S S		
MOUNTING	A = Vertical Flange, 1 slot B1 = Base Mount, #10x36 C1 = Horizontal Flange, 1 slot, 2 slots D = Base Mount, 2 slots E1 = Horizontal Flange, 2 slots G1 = Horizontal Flange, gear coupling G2 = Vertical Flange, 2 slots, gear coupling H = Vertical Flange, 1 slot	
OPTIONS	M = High Output Option T = Electronic Timing Option	
SWITCH WINDING	1 = 24V 500 2 = 24V 1000 3 = 24V 1500 4 = 24V 2000 5 = 24V 3000	
GEAR RATIO	1 = 1 2 = 2 3 = 3 4 = 4 5 = 5 6 = 1:10:1	
FRINGE PATTERNS	A = Gear Fringe Pattern Other Letters = Old Fringe Pattern	
NO CYLINDERS	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 16	

Refer to **ALTRONIC III Application List – Chapter Identification** – and choose **Gear Ratio** from **Part Number Designation** of former used magneto.

ALTRONIC III MEDIUM ENGINES, 3-16 CYLINDERS		APPLICATION LIST FORM AIR AL 13-95				
ENGINE MODEL NO.	DRIVE METHOD	ROTA-TION	ALTRONIC III UNIT NO.	WINDING NUMBER	GEAR RATIO	FRINGE PATTERN
<b>CATERPILLAR</b>						
3208	1.0	CCW	3000101	8	1	A
3208	1.0	CCW	3000102	8	2	A
3208	1.0	CCW	3000103	8	3	A
3208	1.0	CCW	3000104	8	4	A
3208	1.0	CCW	3000105	8	5	A
3208	1.0	CCW	3000106	8	6	A
3208	1.0	CCW	3000107	8	7	A
3208	1.0	CCW	3000108	8	8	A
3208	1.0	CCW	3000109	8	9	A
3208	1.0	CCW	3000110	8	10	A
3208	1.0	CCW	3000111	8	12	A
3208	1.0	CCW	3000112	8	16	A
3208	1.0	CCW	3000113	8	1	A
3208	1.0	CCW	3000114	8	2	A
3208	1.0	CCW	3000115	8	3	A
3208	1.0	CCW	3000116	8	4	A
3208	1.0	CCW	3000117	8	5	A
3208	1.0	CCW	3000118	8	6	A
3208	1.0	CCW	3000119	8	7	A
3208	1.0	CCW	3000120	8	8	A
3208	1.0	CCW	3000121	8	9	A
3208	1.0	CCW	3000122	8	10	A
3208	1.0	CCW	3000123	8	12	A
3208	1.0	CCW	3000124	8	16	A
3208	1.0	CCW	3000125	8	1	A
3208	1.0	CCW	3000126	8	2	A
3208	1.0	CCW	3000127	8	3	A
3208	1.0	CCW	3000128	8	4	A
3208	1.0	CCW	3000129	8	5	A
3208	1.0	CCW	3000130	8	6	A
3208	1.0	CCW	3000131	8	7	A
3208	1.0	CCW	3000132	8	8	A
3208	1.0	CCW	3000133	8	9	A
3208	1.0	CCW	3000134	8	10	A
3208	1.0	CCW	3000135	8	12	A
3208	1.0	CCW	3000136	8	16	A
3208	1.0	CCW	3000137	8	1	A
3208	1.0	CCW	3000138	8	2	A
3208	1.0	CCW	3000139	8	3	A
3208	1.0	CCW	3000140	8	4	A
3208	1.0	CCW	3000141	8	5	A
3208	1.0	CCW	3000142	8	6	A
3208	1.0	CCW	3000143	8	7	A
3208	1.0	CCW	3000144	8	8	A
3208	1.0	CCW	3000145	8	9	A
3208	1.0	CCW	3000146	8	10	A
3208	1.0	CCW	3000147	8	12	A
3208	1.0	CCW	3000148	8	16	A
3208	1.0	CCW	3000149	8	1	A
3208	1.0	CCW	3000150	8	2	A
3208	1.0	CCW	3000151	8	3	A
3208	1.0	CCW	3000152	8	4	A
3208	1.0	CCW	3000153	8	5	A
3208	1.0	CCW	3000154	8	6	A
3208	1.0	CCW	3000155	8	7	A
3208	1.0	CCW	3000156	8	8	A
3208	1.0	CCW	3000157	8	9	A
3208	1.0	CCW	3000158	8	10	A
3208	1.0	CCW	3000159	8	12	A
3208	1.0	CCW	3000160	8	16	A
3208	1.0	CCW	3000161	8	1	A
3208	1.0	CCW	3000162	8	2	A
3208	1.0	CCW	3000163	8	3	A
3208	1.0	CCW	3000164	8	4	A
3208	1.0	CCW	3000165	8	5	A
3208	1.0	CCW	3000166	8	6	A
3208	1.0	CCW	3000167	8	7	A
3208	1.0	CCW	3000168	8	8	A
3208	1.0	CCW	3000169	8	9	A
3208	1.0	CCW	3000170	8	10	A
3208	1.0	CCW	3000171	8	12	A
3208	1.0	CCW	3000172	8	16	A
3208	1.0	CCW	3000173	8	1	A
3208	1.0	CCW	3000174	8	2	A
3208	1.0	CCW	3000175	8	3	A
3208	1.0	CCW	3000176	8	4	A
3208	1.0	CCW	3000177	8	5	A
3208	1.0	CCW	3000178	8	6	A
3208	1.0	CCW	3000179	8	7	A
3208	1.0	CCW	3000180	8	8	A
3208	1.0	CCW	3000181	8	9	A
3208	1.0	CCW	3000182	8	10	A
3208	1.0	CCW	3000183	8	12	A
3208	1.0	CCW	3000184	8	16	A
3208	1.0	CCW	3000185	8	1	A
3208	1.0	CCW	3000186	8	2	A
3208	1.0	CCW	3000187	8	3	A
3208	1.0	CCW	3000188	8	4	A
3208	1.0	CCW	3000189	8	5	A
3208	1.0	CCW	3000190	8	6	A
3208	1.0	CCW	3000191	8	7	A
3208	1.0	CCW	3000192	8	8	A
3208	1.0	CCW	3000193	8	9	A
3208	1.0	CCW	3000194	8	10	A
3208	1.0	CCW	3000195	8	12	A
3208	1.0	CCW	3000196	8	16	A
3208	1.0	CCW	3000197	8	1	A
3208	1.0	CCW	3000198	8	2	A
3208	1.0	CCW	3000199	8	3	A
3208	1.0	CCW	3000200	8	4	A
3208	1.0	CCW	3000201	8	5	A
3208	1.0	CCW	3000202	8	6	A
3208	1.0	CCW	3000203	8	7	A
3208	1.0	CCW	3000204	8	8	A
3208	1.0	CCW	3000205	8	9	A
3208	1.0	CCW	3000206	8	10	A
3208	1.0	CCW	3000207	8	12	A
3208	1.0	CCW	3000208	8	16	A
3208	1.0	CCW	3000209	8	1	A
3208	1.0	CCW	3000210	8	2	A
3208	1.0	CCW	3000211	8	3	A
3208	1.0	CCW	3000212	8	4	A
3208	1.0	CCW	3000213	8	5	A
3208	1.0	CCW	3000214	8	6	A
3208	1.0	CCW	3000215	8	7	A
3208	1.0	CCW	3000216	8	8	A
3208	1.0	CCW	3000217	8	9	A
3208	1.0	CCW	3000218	8	10	A
3208	1.0	CCW	3000219	8	12	A
3208	1.0	CCW	3000220	8	16	A
3208	1.0	CCW	3000221	8	1	A
3208	1.0	CCW	3000222	8	2	A
3208	1.0	CCW	3000223	8	3	A
3208	1.0	CCW	3000224	8	4	A
3208	1.0	CCW	3000225	8	5	A
3208	1.0	CCW	3000226	8	6	A
3208	1.0	CCW	3000227	8	7	A
3208	1.0	CCW	3000228	8	8	A
3208	1.0	CCW	3000229	8	9	A
3208	1.0	CCW	3000230	8	10	A
3208	1.0	CCW	3000231	8	12	A
3208	1.0	CCW	3000232	8	16	A
3208	1.0	CCW	3000233	8	1	A
3208	1.0	CCW	3000234	8	2	A
3208	1.0	CCW	3000235	8	3	A
3208	1.0	CCW	3000236	8	4	A
3208	1.0	CCW	3000237	8	5	A
3208	1.0	CCW	3000238	8	6	A
3208	1.0	CCW	3000239	8	7	A
3208	1.0	CCW	3000240	8	8	A
3208	1.0	CCW	3000241	8	9	A
3208	1.0	CCW	3000242	8	10	A
3208	1.0	CCW	3000243	8	12	A
3208	1.0	CCW	3000244	8	16	A
3208	1.0	CCW	3000245	8	1	A
3208	1.0	CCW	3000246	8	2	A
3208	1.0	CCW	3000247	8	3	A
3208	1.0	CCW	3000248	8	4	A
3208	1.0	CCW	3000249	8	5	A
3208	1.0	CCW	3000250	8	6	A
3208	1.0	CCW	3000251	8	7	A
3208	1.0	CCW	3000252	8	8	A
3208	1.0	CCW	3000253	8	9	A
3208	1.0	CCW	3000254	8	10	A
3208	1.0	CCW	3000255	8	12	A
3208	1.0	CCW	3000256	8	16	A
3208	1.0	CCW	3000257	8	1	A
3208	1.0	CCW	3000258	8	2	A
3208	1.0	CCW	3000259	8	3	A
3208	1.0	CCW	3000260	8	4	A
3208	1.0	CCW	3000261	8	5	A
3208	1.0	CCW	3000262	8		



P/N 06.22. **A B C - D - E**

A	Gear Ratio		
1	1:1		
2	2:1		
3	3:1		
6	1.5:1		
B	Rotation		
1	CW (clockwise)		
2	CCW (counterclockwise)		
C	Trigger Arrangement		
1	1 only	Pin	Multiple pickup arrangement
2	2+1	Pin	Single pickup arrangement
3	3+1	Pin	Single pickup arrangement
4	4+1	Pin	Single pickup arrangement
6	6+1	Pin	Single pickup arrangement
8	8+1	Pin	Single pickup arrangement
9	1 only	Magnet	Multiple pickup arrangement
D	Flange		
A	Flange mount, vertical, 1 slot		
B	Base mount		
D	Flange mount, horizontal, 3 in. pilot, 2 slots		
G	Flange mount, horizontal, 2 slots		
GL	Flange mount, horizontal, flex coupling		
GN	Flange mount, horizontal, gear coupling		
GO	Flange mount, horizontal, 2 slots		
GV	Flange mount, vertical, 2 slots		
GVN	Flange mount, vertical, gear coupling		
J	Flange mount, vertical, 3 slots		
E	Pickup Port Arrangement		
A	Pickup port - M12x1	- for inductive pickup	
F	Pickup port - 5/8-18 UNF	- for Hall effect pickup	

NOTE: Pickup and lead have to be ordered separately.

# PICKUPS & TRIGGER DRIVES

## Tools & Accessories

### Installation Tool for Reluctor Pin

P/N	Figure	Description	Equivalent to
44.99.011	1	Installation tool for reluctor pin	

### Thread Adaptors

P/N	Figure	Supersedes	Outer Thread	Inner Thread	Length	Equivalent to
06.60.908	2		5/8-18 UNF	M12x1	40 mm	
06.60.926	2		M18x1	M12x1	40 mm	
06.95.058	2		3/4-16 UNF	M12x1	24 mm	

### Drive Coupling for Magnetos and TriDev Trigger Devices

P/N	Figure	Supersedes	Description	Equivalent to
06.75.103	3	06.75.102	Drive coupling with roll pin	510454-P, 510454-U



# PRIMARY LEADS



## SHIELDED

### Primary Leads – New Flex Style

In addition to its conventional primary leads, MOTORTECH offers a new type of primary lead that is produced with a special wire. The new primary leads are compliant with CSA Class I, Division 2, Group D, and they offer a significantly higher flexibility than conventional leads, shielded with braided steel, while being highly resistant to all kinds of environmental conditions.

The multi-layer design of the wire is free of entrapped air and prevents the accumulation of condensed water which can result in primary voltage flash-overs. Several different configurations with durable 90-degrees and 180-degrees 2-pole and 3-pole connectors are available.



The oil and UV resistant multi-conductor wire is specially designed for shielded CSA certified primary leads. It consists of a multi layer design:

- Fine bare copper wire
- PVC/Nylon insulation
- Aluminum-plated foil and tinned copper braid
- PVC jacket
- Temperature range -40° C to +90° C (-40° F to +194° F)

This design ensures that no humidity can be trapped in the lead.



### Primary Leads – 3 Pole Ignition Coil Connection – NPT Adaptors to Outlet Box



Shielded		Unshielded	Ignition Coil Connector	Outlet Box Adaptor	Conductor	Equivalent to
New Flex Style	Conventional Style					
P/N <sup>1)</sup>						
95.01.110-L	95.01.010-L		MIL Style 3 pole socket, 180°	1/2-14 NPT, 180°	2 wire	593022-L
95.01.110-L-3	95.01.010-L-3		MIL Style 3 pole socket, 180°	3/8-18 NPT, 180°	2 wire	LT73002-L
95.01.120-L	95.01.020-L		MIL Style 3 pole socket, 90°	1/2-14 NPT, 180°	2 wire	593027-L
95.01.120-L-3	95.01.020-L-3		MIL Style 3 pole socket, 90°	3/8-18 NPT, 180°	2 wire	LT73012-L
95.01.121-L	95.01.021-L		MIL Style 3 pole socket, 90°	1/2-14 NPT, 180°	2 wire	593029-L
95.01.122-L	95.01.022-L		MIL Style 3 pole socket, 90°	1/2-14 NPT, 180°	2 wire <sup>2)</sup>	593036-L
95.01.123-L	95.01.023-L		MIL Style 3 pole socket, 180°	1/2-14 NPT, 180°	2 wire <sup>2)</sup>	593035-L

<sup>1)</sup> Standard braid lengths (“-L”) = 6 in., 9 in., 12 in., 15 in., 18 in., 24 in., 30 in., 36 in., 42 in., 48 in., 54 in., 60 in., 72 in., 84 in., 96 in., 108 in., 120 in., 135 in., 138 in., 150 in.; other lengths available on request.

<sup>2)</sup> Wire length is double of braid length.

### Repair Kits for Conventional Style Shielded Primary Leads – 3 Pole Ignition Coil Connection



P/N	Description	Lead length	Ignition Coil Connector	Conductor	For use with Primary Lead, Length 10 – 180 in.	Equivalent to
95.01.010-42-RC	Repair kit	42 in.	MIL Style 3 pole socket, 180°	2 wire	95.01.010-L, 593022-L	583017-42
95.01.010-60-RC	Repair kit	60 in.	MIL Style 3 pole socket, 180°	2 wire	95.01.010-L, 593022-L	583017-60
95.01.010-96-RC	Repair kit	96 in.	MIL Style 3 pole socket, 180°	2 wire	95.01.010-L, 593022-L	583017-96
95.01.010-180-RC	Repair kit	180 in.	MIL Style 3 pole socket, 180°	2 wire	95.01.010-L, 593022-L	583017-180
95.01.020-42-RC	Repair kit	42 in.	MIL Style 3 pole socket, 90°	2 wire	95.01.020-L, 593027-L	583018-42
95.01.020-60-RC	Repair kit	60 in.	MIL Style 3 pole socket, 90°	2 wire	95.01.020-L, 593027-L	583018-60
95.01.020-96-RC	Repair kit	96 in.	MIL Style 3 pole socket, 90°	2 wire	95.01.020-L, 593027-L	583018-96
95.01.020-180-RC	Repair kit	180 in.	MIL Style 3 pole socket, 90°	2 wire	95.01.020-L, 593027-L	583018-180



# PRIMARY LEADS

## Primary Leads – 2 Pole Ignition Coil Connection – NPT Adaptors to Outlet Box



Shielded		Unshielded	Ignition Coil Connector	Outlet Box Adaptor	Conductor	Equivalent to
New Flex Style	Conventional Style					
P/N <sup>1)</sup>						
95.06.110-L	95.06.010-L		MIL Style 2 pole socket, 180°	1/2-14 NPT, 180°	2 wire	A754-L, LT2001-L
95.06.120-L	95.06.020-L		MIL Style 2 pole socket, 90°	1/2-14 NPT, 180°	2 wire	B754-L, LT2011-L
	95.06.030-L		MIL Style 2 pole socket, 180°	5/8-24 NPT, 90°	2 wire	C754-L, LT2100-L

<sup>1)</sup> Standard braid lengths (“-L”) = 6 in., 9 in., 12 in., 15 in., 18 in., 24 in., 30 in., 36 in., 42 in., 48 in., 54 in., 60 in., 72 in., 84 in., 96 in., 108 in., 120 in., 135 in., 138 in., 150 in.; other lengths available on request.

## Primary Leads – 3 Pole Ignition Coil Connection – Special



Shielded		Unshielded	Ignition Coil Connector	Electronic Box Connector	Conductor	Equivalent to
New Flex Style	Conventional Style					
P/N <sup>1)</sup>						
95.01.130-L	95.01.030-L		MIL Style 3 pole socket, 90°	MIL Style 3 pole socket, 180°	2 wire	593069-L
95.01.131-L	95.01.031-L		MIL Style 3 pole socket, 90°	MIL Style 3 pole pin, 90°	2 wire	
95.01.133-L	95.01.033-L		MIL Style 3 pole socket, 90°	MIL Style 3 pole socket, 180°	3 wire	

<sup>1)</sup> Standard braid lengths (“-L”) = 6 in., 9 in., 12 in., 15 in., 18 in., 24 in., 30 in., 36 in., 42 in., 48 in., 54 in., 60 in., 72 in., 84 in., 96 in., 108 in., 120 in., 135 in., 138 in., 150 in.; other lengths available on request.

## Primary Lead – 2 Pole Ignition Coil Connection – Special



Shielded		Unshielded	Ignition Coil Connector	Electronic Box Connector	Conductor	Equivalent to
New Flex Style	Conventional Style					
P/N <sup>1)</sup>						
95.01.132-L	95.01.032-L		MIL Style 2 pole pin, 90°	MIL Style 2 pole pin, 90°	2 wire	

<sup>1)</sup> Standard braid lengths (“-L”) = 6 in., 9 in., 12 in., 15 in., 18 in., 24 in., 30 in., 36 in., 42 in., 48 in., 54 in., 60 in., 72 in., 84 in., 96 in., 108 in., 120 in., 135 in., 138 in., 150 in.; other lengths available on request.



### Cable Assemblies – NPT Adaptors to Outlet Box



Shielded		Unshielded	Ignition Coil Connector	Outlet Box Adaptor	Conductor	Equivalent to
New Flex Style	Conventional Style					
P/N <sup>1)</sup>						
95.01.111-L	95.01.011-L		MIL Style 3 pole socket, 180°	1/2-14 NPT, 180°	3 wire	
95.01.124-L	95.01.024-L		MIL Style 3 pole socket, 90°	1/2-14 NPT, 180°	3 wire	593024-L
	95.01.025-L		MIL Style 4 pole socket, 90°	1/2-14 NPT, 180°	5 wire	593025-L
	95.01.026-L		MIL Style 5 pole socket, 90°	1/2-14 NPT, 180°	6 wire	593026-L

<sup>1)</sup> Standard braid lengths ("L") = 6 in., 9 in., 12 in., 15 in., 18 in., 24 in., 30 in., 36 in., 42 in., 48 in., 54 in., 60 in., 72 in., 84 in., 96 in., 108 in., 120 in., 135 in., 138 in., 150 in.; other lengths available on request.

### Special Application Primary Leads

#### Primary Leads for ROLLS-ROYCE® Gas Engines



Shielded		Unshielded	Ignition Coil Connector	Wiring Rail Connector	Conductor	Equivalent to
New Flex Style	Conventional Style					
P/N <sup>1)</sup>						
	95.01.012-11		MIL Style 3 pole socket, 90°	3 pole socket, 90°	2 wire	702930, 593068-1
	95.01.013-30		MIL Style 3 pole socket, 90°	3 pole socket, 180°	2 wire	705165, 593068-2

<sup>1)</sup> Standard braid lengths 11 in. and 30 in.; other lengths available on request.

#### Primary Leads for WAUKESHA® ESM Gas Engines



Shielded		Unshielded	Ignition Coil Connector	Wiring Rail Connector	Conductor	Equivalent to
New Flex Style	Conventional Style					
P/N <sup>1)</sup>						
95.01.107-24		A740746-MOT	MIL Style 3 pole socket, 90°	3 pole socket, 180°	2 wire	A740746
		740746B-MOT	2 wire, 180°	3 pole socket, 180°	2 wire	740746B

<sup>1)</sup> Standard lead length 24 in.; other lengths available on request.



WAUKESHA® ESM Gas Engines

# PRIMARY LEADS



## Primary Leads for MOTORTECH AlphaRail Wiring Rails

Shielded		Non-Shielded	Ignition Coil Connector	Wiring Rail Connector	Conductor	Equivalent to
New Flex Style	Conventional Style	P/N <sup>1)</sup>				
95.01.140-L	95.01.040-L	06.01.040-L	MIL Style 3 pole socket, 180°	MIL Style 2 pole pin, 180°	2 wire	
95.01.141-L	95.01.041-L	06.01.041-L	MIL Style 3 pole socket, 90°	MIL Style 2 pole pin, 180°	2 wire	
95.01.142-L	95.01.042-L	06.01.042-L	MIL Style 2 pole socket, 180°	MIL Style 2 pole pin, 180°	2 wire	
95.01.143-L	95.01.043-L	06.01.043-L	MIL Style 2 pole socket, 90°	MIL Style 2 pole pin, 180°	2 wire	
95.01.144-L	95.01.044-L	06.01.044-L	MIL Style 3 pole socket, 180°	MIL Style 2 pole pin, 90°	2 wire	
95.01.145-L	95.01.045-L	06.01.045-L	MIL Style 3 pole socket, 90°	MIL Style 2 pole pin, 90°	2 wire	
95.01.146-L	95.01.046-L	06.01.046-L	MIL Style 2 pole socket, 180°	MIL Style 2 pole pin, 90°	2 wire	
95.01.147-L	95.01.047-L	06.01.047-L	MIL Style 2 pole socket, 90°	MIL Style 2 pole pin, 90°	2 wire	

<sup>1)</sup> Standard lead lengths (“-L”) = 6 in., 9 in., 12 in., 15 in., 18 in., 24 in., 30 in., 36 in., 42 in., 48 in., 54 in., 60 in., 72 in., 84 in.; other lengths available on request. Add suffix “-X” to part number for cross wired primary leads for positive grounded ignition systems.

# SPARK PLUG LEADS & EXTENSIONS



UNSHIELDED

**PolyMot™**  
MOTORTECH SPARK PLUG LEADS & EXTENSIONS

## Spark Plug Leads – Patented PolyMot™ Style\*

The PolyMot™ spark plug lead was globally patented in 1996. Since then more than one million leads were manufactured to this patented design.

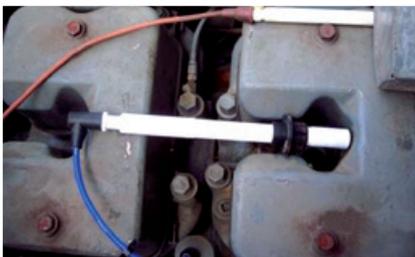
\*Patent No.: 19611283



### Features:

The unique structure has achieved tremendous reliability records in the field.

- Rigid design
- TEFLON® extension up to 36 in. length
- Ceramic insert with 5 kΩ resistor for RFI supression (0 kΩ available on request)
- Reliable ignition coil and spark plug terminal
- The blue silicone spark plug wire is specially designed for high dielectric strength
- Critical high voltage areas are protected with a silicone seal against water and dirt
- Designed to match the engine model, the spark plug type and application
- Leads are labeled with P/N and production code for easy traceability
- Long life product



Comparison between OEM part (slim) and MOTORTECH PolyMot™



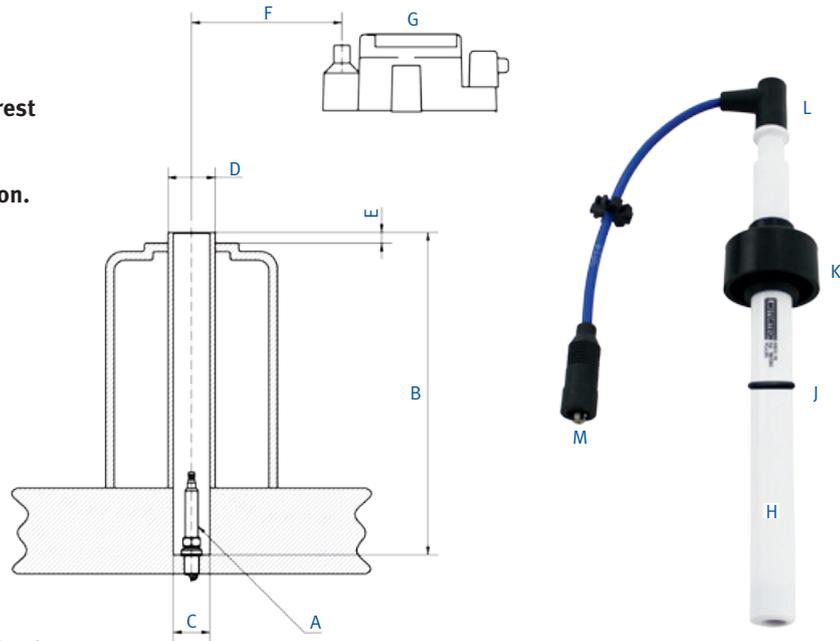
Perfect fit



Water flood test

## Specification Chart

Please consult factory or your nearest **MOTORTECH** distributor to get the correct PolyMot™ spark plug lead, specified for your engine application.



Questionnaire for PolyMot™ specification.

Engine make	
Series	
Engine model	
Spark plug make and model <b>A</b>	
Spark plug well depth <b>B</b>	
Spark plug well inner diameter <b>C</b>	
Spark plug well outer diameter <b>D</b>	
Spark plug well to cover distance <b>E</b>	
Length of wire <b>F</b>	
Ignition coil make and model <b>G</b>	
Built in 5 kΩ ceramic resistor (recommended) <b>H</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
Seal ring on Teflon insulator <b>J</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
Grommet to cover the spark plug well <b>K</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
Lead output from Teflon insulator <b>L</b>	<input type="checkbox"/> 90° <input type="checkbox"/> 180°
Terminal to ignition coil (preferred) <b>M</b>	<input type="checkbox"/> 90° <input type="checkbox"/> 180°

# SPARK PLUG LEADS & EXTENSIONS

## UNSHIELDED

PolyMot™ Spark Plug Leads – for common Applications

P/N	Engine Make	Model	Spark Plug	P/N Silicone Seal Ring	Extension Length	Resistance <sup>1)</sup>	Lead Output from Extension	Wire Length <sup>2)</sup>	Ignition Coil Connection
06.85.908-22	AJAX®	2802	3076	06.84.059	6 in.	6 kΩ	180°	17 in.	6
06.85.751-18	CATERPILLAR®	G3400 series	GE3-5/RN79G	06.84.059	13 in.	5 kΩ	90°	18 in.	1
06.85.1019-16	CATERPILLAR®	G3400 series	GE3-5/RN79G	06.84.059	13 in.	6 kΩ	90°	18 in.	6
06.85.594-22	CATERPILLAR®	G3500 series	GI3-3/FB77WPCC	06.84.040	15 in.	5 kΩ	90°	16 in.	1
06.85.954-16	CATERPILLAR®	G3500 series	GI3-3/FB77WPCC	06.84.040	15 in.	6 kΩ	90°	16 in.	6
06.85.966-35	CLARK®	TCV-16	GK3-5/RC78PYP	06.84.044	11 in.	5 kΩ	180°	24 in.	5A
06.85.1020-24	CLARK®	TCVD12	RW80N	06.84.040	7 in.	5 kΩ	90°	24 in.	5A
06.85.505-18	CLARK®	TLA-6	RW80N	06.84.040	11 in.	5 kΩ	90°	18 in.	5A
06.85.670-16	COOPER®	GMV-8	RW77PP	06.84.040	11 in.	5 kΩ	90°	12 in.	5A
06.85.910-18	COOPER®	LSV-16 (Centre Spark Plug)	RW80PP	06.84.040	22 in.	5 kΩ	90°	18 in.	1
06.85.958-16	COOPER®	LSV-16 (Centre Spark Plug)	RW80PP	06.84.040	22 in.	5 kΩ	90°	16 in.	5A
06.85.909-24	COOPER®	LSV-16 (Side Spark Plug)	RW80PP	06.84.040	14 in.	5 kΩ	90°	24 in.	1
06.85.957-22	COOPER®	LSV-16 (Side Spark Plug)	RW80PP	06.84.040	14 in.	5 kΩ	90°	22 in.	5A
06.85.083-22	CUMMINS®	5.9/GTA 8.3	GK3-5/RC78PYP	06.84.033	6 in.	5 kΩ	180°	16 in.	4
06.85.683-18	CUMMINS®	G855	GK3-5/RC78PYP	06.84.044	12 in.	5 kΩ	90°	18 in.	1
06.85.1014-12	CUMMINS®	KTA19GC	GE3-5/RN79G	06.84.059	14 in.	5 kΩ	90°	12 in.	1
06.85.1013-12	CUMMINS®	KTA19GC	GE3-5/RN79G	06.84.059	14 in.	5 kΩ	90°	12 in.	4
06.85.320H-18	DEUTZ®/MWM®	234 series	GE3-5/RN79G	06.84.059	6 in.	5 kΩ	90°	18 in.	1
06.85.310H-11	DEUTZ®/MWM®	616 series	GL3-3/RB75WPCC	06.84.040	9 in.	5 kΩ	90°	11 in.	1
06.85.179-20	DEUTZ®/MWM®	620 series	GL3-3/RB75WPCC	06.84.040	10 in.	5 kΩ	90°	20 in.	1
06.85.178-20	DEUTZ®/MWM®	620 series	GL3-3/RB75WPCC	06.84.040	10 in.	5 kΩ	90°	20 in.	2
06.85.998-20	DEUTZ®/MWM®	620 series	GL3-3/RB75WPCC	06.84.040	10 in.	5 kΩ	90°	20 in.	7
06.85.926-20	IVECO®	GE8291SRG75	GK3-5/RC78PYP	06.84.044	10 in.	5 kΩ	90°	20 in.	1
06.85.487-18	LIEBHERR®	G924 / G926	GK3-5/RC78PYP	06.84.033	6 in.	5 kΩ	180°	12 in.	2
06.85.873-18	LIEBHERR®	G926TI	GK3-5/RC78PYP	06.84.033	6 in.	5 kΩ	180°	12 in.	7
06.85.709H-18	MAN®	E0834E/LE/E0836E	GK3-5/RC78PYP	06.84.044	6 in.	5 kΩ	180°	10 in.	1
06.85.988-18	MAN®	E0834E/LE/E0836E	GK3-5/RC78PYP	06.84.044	6 in.	5 kΩ	180°	10 in.	1A
06.85.577H-16	MAN®	E0834E/LE/E0836E	GK3-5/RC78PYP	06.84.044	6 in.	5 kΩ	180°	10 in.	2
06.85.717H-24	MAN®	E0834E/LE/E0836E	GK3-5/RC78PYP	06.84.044	6 in.	6 kΩ	180°	18 in.	6
06.85.1037-16	MAN®	E0834E/LE/E0836E	B4321	06.84.044	6 in.	5 kΩ	180°	10 in.	7
06.85.839H-16	MAN®	E0834E/LE/E0836E	GK3-5/RC78PYP	06.84.044	6 in.	5 kΩ	180°	10 in.	7
06.85.1030-16	MAN®	E0836LE/E28 series	B4321	06.84.044	6 in.	5 kΩ	180°	10 in.	1
06.85.580H-18	MAN®	E0836LE/E28 series	GE3-5/RN79G	06.84.059	6 in.	5 kΩ	180°	12 in.	1
06.85.989-18	MAN®	E0836LE/E28 series	GE3-5/RN79G	06.84.059	6 in.	5 kΩ	180°	10 in.	1A
06.85.415H-16	MAN®	E0836LE/E28 series	GE3-5/RN79G	06.84.059	6 in.	5 kΩ	180°	10 in.	2
06.85.1031-16	MAN®	E0836LE/E28 series	B4321	06.84.044	6 in.	5 kΩ	180°	10 in.	7

<sup>1)</sup> For 0 kΩ resistance, please add “-0” to part number (e.g. 06.85.908-22-0).

<sup>2)</sup> Other lengths in 2 in. increments available on request. For loose connector and 36 in. length add “-K” to part number (e.g. 06.85.908-K)

### PolyMot™ Spark Plug Leads – for common Applications

P/N	Engine Make	Model	Spark Plug	P/N Silicone Seal Ring	Extension Length	Resistance <sup>1)</sup>	Lead Output from Extension	Wire Length <sup>2)</sup>	Ignition Coil Connection
06.85.836H-16	MAN®	E0836LE/E28 series	GE3-5/RN79G	06.84.059	6 in.	5 kΩ	180°	10 in.	7
06.85.1005-24	MAN®	E28 series	GL3-5	06.84.040	7 in.	5 kΩ	180°	17 in.	1A
06.85.1038-20	MAN®	E26 series	B4321	06.84.044	11 in.	5 kΩ	180°	10 in.	7
06.85.929-20	MAN®	E26 series	GK3-5/RC78PYP	06.84.044	11 in.	5 kΩ	180°	10 in.	7
06.85.1023-18	MAN®	E32 series	B4321	06.84.044	10 in.	5 kΩ	180°	13 in.	7
06.85.959-18	MAN®	E32 series	GE3-5/RN79G	06.84.059	10 in.	5 kΩ	180°	13 in.	7
06.85.1042-18	MAN®	E32 series	GL3-5	06.84.040	10 in.	5 kΩ	180°	10 in.	7
06.85.479	PERKINS®	4000 series	GI3-3/FB77WPCC	06.84.040	12 in.	5 kΩ	180°	13 in.	1
06.85.271	WÄRTSILÄ®	25SG series	GE3-5/RN79G	06.84.059	17 in.	5 kΩ	90°	14 in.	4
06.85.272	WÄRTSILÄ®	25SG series	GI3-3/FB77WPCC	06.84.040	17 in.	5 kΩ	90°	14 in.	4
06.85.312	WÄRTSILÄ®	25SG series	GI3-3/FB77WPCC	06.84.040	16 in.	5 kΩ	90°	14 in.	4
06.85.281	WÄRTSILÄ®	28SG series	GI3-3/FB77WPCC	06.84.040	21 in.	5 kΩ	180°	14 in.	4
06.85.306-18	WAUKESHA®	VGF series	GI3-3/FB77WPCC	06.84.040	12 in.	5 kΩ	90°	18 in.	1
06.85.326-16	WAUKESHA®	VGF series	GI3-3/FB77WPCC	06.84.040	10 in.	5 kΩ	180°	6 in.	1
06.85.429-14	WAUKESHA®	VGF series	GI3-3/FB77WPCC	06.84.040	11 in.	5 kΩ	90°	14 in.	1
06.85.357-26	WAUKESHA®	VGF series	GI3-3/FB77WPCC	06.84.040	12 in.	5 kΩ	180°	14 in.	2
06.85.423-16	WAUKESHA®	VHP GL series	GT3-1/RM77N	06.84.040	11 in.	5 kΩ	90°	16 in.	1
06.85.739-16	WAUKESHA®	VHP GL series	GT3-1/RM77N	06.84.040	9 in.	5 kΩ	90°	16 in.	1
06.85.945-16	WAUKESHA®	VHP GL series	GT3-1/RM77N	06.84.040	9 in.	6 kΩ	90°	16 in.	6
06.85.649-16	WAUKESHA®	VHP GL series	GT3-1/RM77N	06.84.040	11 in.	5 kΩ	90°	24 in.	5A
06.85.422-16	WAUKESHA®	VHP GU series	GT3-1/RM77N	06.84.040	13 in.	5 kΩ	90°	16 in.	1
06.85.688-16	WAUKESHA®	VHP GU series	GI3-1/FB77WPCC	06.84.040	11 in.	5 kΩ	90°	16 in.	1
06.85.993-24	WAUKESHA®	VHP GU series	D14/D14N	06.84.077	13 in.	5 kΩ	90°	24 in.	1
06.85.699-16	WAUKESHA®	VHP GU/GSI series	M82N	06.84.040	12 in.	5 kΩ	90°	16 in.	1
06.85.705-16	WAUKESHA®	VHP GU/GSI series	GT3-1/RM77N	06.84.040	12 in.	5 kΩ	90°	16 in.	1
06.85.720-18	WAUKESHA®	VHP GU/GSI series	GT3-1/RM77N	06.84.040	12 in.	5 kΩ	90°	18 in.	1
06.85.894-18	WAUKESHA®	VHP GU/GSI series	GT3-1/RM77N	06.84.040	14 in.	6 kΩ	90°	18 in.	6

<sup>1)</sup> For 0 kΩ resistance, please add “-0” to part number (e.g. 06.85.908-22-0).

<sup>2)</sup> Other lengths in 2 in. increments available on request. For loose connector and 36 in. length add “-K” to part number (e.g. 06.85.908-K)

### Ignition Coil Connections



5A = ALTRONIC® style; 5B = BENDIX® style; 5C = MOTORTECH

# SPARK PLUG LEADS & EXTENSIONS

## UNSHIELDED

PolyMot™ Spark Plug Leads – for common Applications

P/N	Engine Make	Model	Spark Plug	P/N Silicone Seal Ring	Extension Length	Resistance <sup>1)</sup>	Lead Output from Extension	Wire Length <sup>2)</sup>	Ignition Coil Connection
06.85.672H-22	WAUKESHA®	VHP GU/GSI series	GI3-3/FB77WPCC	06.84.040	14 in.	5 kΩ	90°	22 in.	5A
06.85.714-24	WAUKESHA®	VHP/AT series	GI3-3/FB77WPCC	06.84.040	18 in.	5 kΩ	90°	24 in.	1
06.85.678-24	WAUKESHA®	VSG series	GE3-5/RN79G	06.84.059	5 in.	5 kΩ	180°	18 in.	1
06.85.667-26	WHITE SUPERIOR®	G825 series	GT3-1/RM77N	06.84.040	8 in.	5 kΩ	90°	24 in.	1
06.85.723-24	WHITE SUPERIOR®	GTLB825	D16	06.81.005	6 in.	5 kΩ	90°	24 in.	1
06.85.999-14	WORTHINGTON®	MLV (Centre Spark Plug)	RW80N	06.84.040	15 in.	5 kΩ	90°	14 in.	5A
06.85.1000-14	WORTHINGTON®	MLV (Side Spark Plug)	RW80N	06.84.040	22 in.	5 kΩ	90°	14 in.	5A
06.85.913-30	WORTHINGTON®	MLV10 (Centre Spark Plug)	RW82P	06.84.040	20 in.	5 kΩ	90°	30 in.	5A
06.85.912-24	WORTHINGTON®	MLV10 (Side Spark Plug)	GK3-5/RC78PYP	06.84.044	17 in.	5 kΩ	90°	24 in.	5A

<sup>1)</sup> For 0 kΩ resistance, please add “-0” to part number (e.g. 06.85.908-22-0).

<sup>2)</sup> Other lengths in 2 in. increments available on request. For loose connector and 36 in. length add “-K” to part number (e.g. 06.85.908-K)

Silicone Seal Rings<sup>1)</sup> for PolyMot™ Spark Plug Leads

P/N	Description	Dimensions	Quantity	Equivalent to
06.84.033-100	Silicone seal ring	10.0 x 5.0 mm	100 pcs.	
06.84.034-100	Silicone seal ring	12.0 x 4.0 mm	100 pcs.	
06.84.038-100	Silicone seal ring	14.4 x 2.8 mm	100 pcs.	
06.84.040-100	Silicone seal ring	14.6 x 2.7 mm	100 pcs.	
06.84.044-100	Silicone seal ring	10.0 x 5.0 mm	100 pcs.	
06.84.059-100	Silicone seal ring	11.0 x 4.0 mm	100 pcs.	
06.84.077-100	Silicone seal ring	13.5 x 4.0 mm	100 pcs.	

<sup>1)</sup> Silicone seal rings require replacement every 3000 running hours. See MOTORTECH homepage for appropriate instruction for replacing silicone seal rings.

Installation Tool for WAUKESHA® Grommet

P/N	Description	Equivalent to
07.99.016	Installation tool for WAUKESHA® VHP grommet	

Flange Kit for Spark Plug Leads for WAUKESHA® VHP/AT and CATERPILLAR® G3500 Series

P/N	Description	Equivalent to
06.51.248	Flange kit for use with P/N 06.85.714-L, P/N 06.85.594-L and P/N 06.85.954-L	



### Spark Plug Leads for CATERPILLAR® Gas Engines – Low Cost Style

P/N	Supersedes	Engine Make	Model	Spark Plug	P/N Silicone Seal Ring	Extension Length	Resistance <sup>1)</sup>	Lead Output from Extension	Wire Length <sup>2)</sup>	Ignition Coil Connection
06.88.009-16 <sup>3)</sup>	06.88.008-L/-K	CATERPILLAR®	G3300 series	GE3-5/ RN79G GN3-1/ RL85G	06.84.059	3.75 in.	0 kΩ	180°	12 in.	<b>1</b>
06.88.010-16		CATERPILLAR®	G3300 series	GE3-5/ RN79G	06.84.059	4.25 in.	0 kΩ	180°	12 in.	<b>2</b>
06.85.751-18 <sup>4)</sup>	06.88.003-L/-K 06.85.687-L	CATERPILLAR®	G3400 series	GE3-5/ RN79G	06.84.059	13.00 in.	5 kΩ	90°	18 in.	<b>1</b>
06.85.939-18		CATERPILLAR®	G3400 series	GE3-5/ RN79G	06.84.059	13.00 in.	5 kΩ	90°	18 in.	<b>5A</b>
06.85.1019-16		CATERPILLAR®	G3400 series	GE3-5/ RN79G	06.84.059	13.00 in.	6 kΩ	90°	18 in.	<b>6</b>
06.88.004-20		CATERPILLAR®	G342/G379/ G398/G399	GE3-5/ RN79G	06.84.059	4.25 in.	0 kΩ	180°	16 in.	<b>2</b>
06.88.005-20		CATERPILLAR®	G342/G379/ G398/G399	GN3-1/ RL85G	06.84.044	4.25 in.	0 kΩ	180°	16 in.	<b>3</b>
06.88.006-20	06.88.001-L/-K	CATERPILLAR®	G342/G379/ G398/G399	GE3-5/ RN79G	06.84.059	4.25 in.	0 kΩ	180°	16 in.	<b>1</b>
06.88.007-20	06.88.002-L/-K	CATERPILLAR®	G342/G379/ G398/G399	GI3-3/ FB77WPCC	06.84.040	3.70 in.	0 kΩ	180°	16 in.	<b>1</b>
06.88.011-20		CATERPILLAR®	G342/G379/ G398/G399	GE3-5/ RN79G	06.84.059	4.25 in.	0 kΩ	180°	16 in.	<b>9</b>
06.85.674-16		CATERPILLAR®	G342/G379/ G398/G399	GT3-1/ RM77N	06.84.040	5.00 in.	0 kΩ	90°	16 in.	<b>9</b>

<sup>1)</sup> For 0 kΩ resistance, please add “-0” to part number (e.g. 06.85.939-18-0).

<sup>2)</sup> Other lengths in 2 in. increments available on request. For loose connector and 36 in. length add “-K” to part number (e.g. 06.85.751-K)

<sup>3)</sup> P/N 06.88.009-16 equivalent to P/N 7W2479.

<sup>4)</sup> P/N 06.85.751-18 equivalent to P/N 7W8542/2624855/2502149.

### Ignition Coil Connections



5A = ALTRONIC® style; 5B = BENDIX® style; 5C = MOTORTECH

# SPARK PLUG LEADS & EXTENSIONS

## UNSHIELDED

Spark Plug Leads – for common Applications (Non PolyMot™ Style)

P/N	Engine Make	Model	Spark Plug	P/N Silicone Seal Ring	Extension Length	Resistance <sup>1)</sup>	Lead Output from Extension	Wire Length <sup>2)</sup>	Ignition Coil Connection
06.85.697-20	AJAX®	230	GT3-1/RM77N	06.84.040	5 in.	0 kΩ	90°	20 in.	1
06.85.719-16	AJAX®	230	W18	06.81.017	5 in.	0 kΩ	90°	16 in.	1
06.85.698-30	AJAX®	230	GT3-1/RM77N	06.84.040	5 in.	0 kΩ	90°	30 in.	5A
06.85.773-15	AJAX®	230	GT3-1/RM77N	06.84.034	5 in.	0 kΩ	90°	15 in.	5A
06.85.860-16	ARROW®	VRG176/ VRG220/ VRG330	J6C / J8C	06.84.059	5 in.	1 kΩ	90°	14 in.	6
06.85.514-16	CLARK®	TLA-6	RW80N	06.84.038	8 in.	0 kΩ	90°	16 in.	5A
06.85.903-22 <sup>3)</sup>	CUMMINS®	GTA 8.3	GK3-5/RC78PYP		5 in.	5 kΩ	180°	17 in.	8
06.85.949-10	DEUTZ®	2015 series	B4321/14GZ6-77-2	06.84.033	9 in.	6 kΩ	90°	10 in.	6
06.85.953-10	DOOSAN®	GV222TIC	GK3-5/RN79G	06.81.071	12 in.	5 kΩ	90°	10 in.	1
06.88.015-48	INGERSOLL RAND®	KVSR12	RW80N	06.84.040	4 in.	0 kΩ	180°	14 in.	5A
06.85.964-20	LIEBHERR®	G9408	GK3-5/RC78PYP	06.81.071	6 in.	5 kΩ	180°	14 in.	2
06.85.690-24	WHITE SUPERIOR®	G825 series	GK3-5/RC78PYP	06.84.044	8 in.	0 kΩ	90°	24 in.	1
06.85.695-24	WHITE SUPERIOR®	G825 series	D14N	06.84.040	8 in.	0 kΩ	90°	24 in.	5A
06.85.689-24	WHITE SUPERIOR®	G825 series (Lean Burn)	GK3-5/RC78PYP	06.84.044	4 in.	0 kΩ	90°	24 in.	1

<sup>1)</sup> For 0 kΩ resistance, please add “-0” to part number (e.g. 06.85.949-10-0).

<sup>2)</sup> Other lengths in 2 in. increments available on request. For loose connector and 36 in. length add “-K” to part number (e.g. 06.85.697-K)

<sup>3)</sup> P/N 06.85.903-22 is equivalent to P/N 4989132.

## Spark Plug Lead Kits

P/N	Engine Make	Model	Spark Plug	Number of included Leads	Extension Length	Resistance	Lead Output from Extension	Ignition Coil Connection
06.85.1006	ARROW®	VR330CF	GE3-5/RN79G	6	5 in.	5 kΩ	180°	6
06.85.952 <sup>1)</sup>	GM®	V8	GK3-5/RC78PYP	8	4 in.	0 kΩ	180°	4
06.85.379 <sup>2)</sup>	MAN®	E2866E302	GE3-5/RN79G	6	5 in.	5 kΩ	180°	6
06.85.380 <sup>2)</sup>	MAN®	E2842E302	GE3-5/RN79G	12	5 in.	5 kΩ	180°	6

<sup>1)</sup> Spark plug lead kit also includes connecting leads from ignition coil to distributor.

<sup>2)</sup> Spark plug lead kit also includes distributor caps and connecting leads from ignition coil to distributor.

## Ignition Coil Connections



5A = ALTRONIC® style; 5B = BENDIX® style; 5C = MOTORTECH

### Unshielded Safety Leads for Shielded Spark Plugs

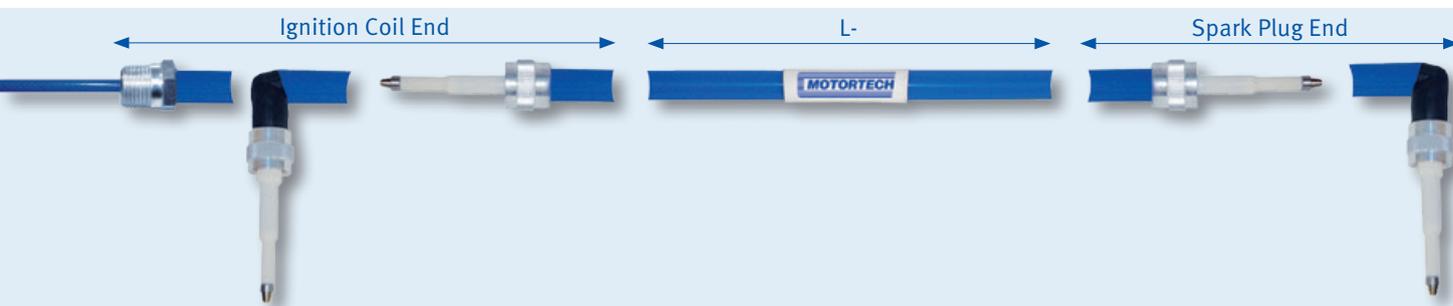
P/N <sup>1)</sup>	SP Termination Well Depth	Spark Plug End	Ignition Coil End	Inductive Pickup Spacer	5 kΩ Resistor	Ignition Coil	Equivalent to
09.02.1000-L	2.125 in.	180°	180°			291001-S, 501061-S, 591010-S	USL2A-"L" A/ AWH81-"L"
09.02.1001-L	2.125 in.	90°	180°			291001-S, 501061-S, 591010-S	USL2LA-"L" A
09.02.1310-L	2.125 in.	180°	90°	x	x	291001-S, 501061-S, 591010-S	RSL2AL-"L" AIPS
09.02.1311-L	2.125 in.	90°	90°	x	x	291001-S, 501061-S, 591010-S	RSL2LAL-"L" AIPS
09.02.3110-L	2.125 in.	180°	90°	x		PPT2477AD, PPT2477AD-L	USL2CL-"L" AIPS
09.02.4000-L	2.125 in.	180°	180°			291001, 501061, 591010	USL2E-"L" A/ AWH72-"L"
09.02.4001-L	2.125 in.	90°	180°			291001, 501061, 591010	USL2LE-"L" A
09.02.4100-L	2.125 in.	180°	180°	x		291001, 501061, 591010	USL2E-"L" AIPS
09.02.4101-L	2.125 in.	90°	180°	x		291001, 501061, 591010	USL2LE-"L" AIPS
09.02.4110-L	2.125 in.	180°	180°	x		291001, 501061, 591010	USL2E-"L" A w. 06.80.261
09.02.4201-L	2.125 in.	90°	180°		x	291001, 501061, 591010	RSL2LE-"L" A
09.02.4301-L	2.125 in.	90°	180°	x	x	291001, 501061, 591010	RSL2LE-"L" AIPS

<sup>1)</sup> "-L" can be any lead length from 8 in. to 36 in. in 2 in. increments. Consult factory for other configurations.

### Unshielded Safety Leads for Conventional Spark Plugs

P/N <sup>1)</sup>	Fits max. Ceramic Diameter	Spark Plug End	Ignition Coil End	Inductive Pickup Spacer	5 kΩ Resistor	Ignition Coil	Equivalent to
09.09.1000-L	0.580 in.	180°	180°			291001-S, 501061-S, 591010-S	USLA78SPB-"L" A
09.09.2000-L	0.580 in.	180°	180°			10-320790-1, 10-382040-1	USLB78SPB-"L" A
09.10.2000-L	Silicone Boot	180°	180°			10-320790-1, 10-382040-1	USLBSB180-"L" A

<sup>1)</sup> "-L" can be any lead length from 8 in. to 36 in. in 2 in. increments. Consult factory for other configurations.



Conversion: 1 inch = 25,4 mm / 1 foot = 0,3 m

# SPARK PLUG LEADS & EXTENSIONS

## Accessories for Unshielded Spark Plug Leads

### Ignition Cables – Nickel Plated Copper Wire

P/N	Figure	Description	Color	Equivalent to
02.85.757	1	Ignition cable, 7 mm silicone, 17-19 stends, 100 ft. spool	blue	5419-100
02.85.758 <sup>1)</sup>	2	Ignition cable, 7 mm silicone, 17-19 stends, 100 ft. spool	orange	757, 5419-151

<sup>1)</sup> Ignition cable with stainless steel wire available on special request.

### Silicone Hoses

P/N	Figure	Description	Outer Diameter	Color	Equivalent to
02.85.965-82	3	Silicone hose, 8x2 mm, 82 ft. spool	12 mm	blue	21606
02.85.914-82	3	Silicone hose, 12x1.5 mm, 82 ft. spool	15 mm	blue	SO-5
02.85.865-82	3	Silicone hose, 8x2 mm, 82 ft. spool	12 mm	orange	
02.85.814-82	3	Silicone hose, 12x1.5 mm, 100 ft. spool	15 mm	orange	

### Inductive Pickup Spacer

P/N	Figure	Description	Position	Quantity	Equivalent to
06.84.010-100	4	Inductive pickup spacer	end of lead	100 pcs.	
06.84.043-100	5	Inductive pickup spacer	middle of lead	100 pcs.	

### Spark Plug Connectors (for 14 mm Spark Plugs only)

P/N	Figure	Description	Quantity	Equivalent to
06.84.024-100	6	Spark plug connector, 90°, silicone for use with 7 mm ignition cable, including terminal P/N 02.85.920	100 pcs.	ST-22XL
06.84.025-100	7	Spark plug connector, 180°, silicone for use with 7 mm ignition cable, including terminal P/N 02.85.920	100 pcs.	ST-33XL



Conversion: 1 inch = 25,4 mm / 1 foot = 0,3 m

### Spark Plug Boots

P/N	Figure	Description	Quantity	Equivalent to
06.84.008-100	8	Spark plug boot, 90°, silicone for use with 7 mm ignition cable and terminal P/N 22.85.803	100 pcs.	
06.84.009-100	9	Spark plug boot, 180°, silicone for use with 7 mm ignition cable and terminal P/N 22.85.802	100 pcs.	W54883

### Terminals for Spark Plug Boots

P/N	Figure	Description	Quantity	Equivalent to
02.85.920-100	10	Terminal, for use with spark plug boot P/N 06.84.024 and P/N 06.84.025	100 pcs.	D-199
22.85.802-100	11	Terminal, for use with spark plug boot P/N 06.84.009	100 pcs.	
22.85.803-100	12	Terminal, for use with spark plug boot P/N 06.84.008	100 pcs.	5419-150

### Spark Plug Connectors

P/N	Figure	Description	Quantity	Equivalent to
02.85.924-100	13	Spark plug connector, 90°, for use with 7 mm ignition cable	100 pcs.	T-22, 21459
02.85.925-100	14	Spark plug connector, 180°, for use with 7 mm ignition cable	100 pcs.	T-33, 21418

### Ignition Coil Connectors

P/N	Figure	Description	Quantity	Equivalent to
06.80.261-100	15	Ignition coil connector, 180°, 0 kΩ resistance, requires crimp terminal P/N 06.80.126	100 pcs.	
22.80.009-100	16	Ignition coil connector, 90°, 1 kΩ resistance, requires crimp terminal P/N 06.80.126	100 pcs.	
06.80.091-100 <sup>1)</sup>	17	Ignition coil connector, 180°, 0 kΩ resistance, requires crimp terminal P/N 06.80.126	100 pcs.	

<sup>1)</sup> For ignition coils with positive secondary termination.



# SPARK PLUG LEADS & EXTENSIONS

## Crimp Terminals

P/N	Figure	Description	Quantity	Equivalent to
06.80.012-100	1	Crimp terminal, 180°, for use with spreading adaptor P/N 02.85.1012	100 pcs.	
06.80.116-100	2	Crimp terminal, 90°, for use with MOTORTECH style ignition coils	100 pcs.	
06.80.116-180-100	3	Crimp terminal, 180°, for use with New MOTORTECH style ignition coils	100 pcs.	
06.80.108-100	4	Crimp terminal base, for use with crimp terminals P/N 06.80.116-100 and P/N 06.80.116-180-100	100 pcs.	
06.80.126-100	5	Crimp terminal base, for use ignition coil terminals P/N 06.80.261 and P/N 22.80.009	100 pcs.	

## Spreading Adaptor

P/N	Figure	Supersedes	Description	Quantity	Equivalent to
02.85.1012-100	6	02.85.1004-100	Spreading adaptor for ALTRONIC® style ignition coils	100 pcs.	

## Distance Collars

P/N	Figure	Description	Quantity	Equivalent to
06.86.001-100	7	Distance collar, for use with 7 mm ignition cable	100 pcs.	
06.86.002-100	8	Distance collar, for use with 7 mm ignition cable	100 pcs.	
06.86.003-100	9	Distance collar, for use with 7 mm ignition cable	100 pcs.	
06.86.005-100	10	Distance collar, for use with 7 mm ignition cable	100 pcs.	



### Silicone Seal Rings for Spark Plug Leads<sup>1)</sup>

P/N	Figure	Description	Dimensions	Quantity	Equivalent to
06.84.033-100	11	Silicone seal ring	10.0 x 5.0 mm	100 pcs.	
06.84.034-100	11	Silicone seal ring	12.0 x 4.0 mm	100 pcs.	
06.84.038-100	11	Silicone seal ring	14.4 x 2.8 mm	100 pcs.	
06.84.040-100	11	Silicone seal ring	14.6 x 2.7 mm	100 pcs.	
06.84.044-100	11	Silicone seal ring	10.0 x 5.0 mm	100 pcs.	
06.84.059-100	11	Silicone seal ring	11.0 x 4.0 mm	100 pcs.	
06.84.077-100	11	Silicone seal ring	13.5 x 4.0 mm	100 pcs.	

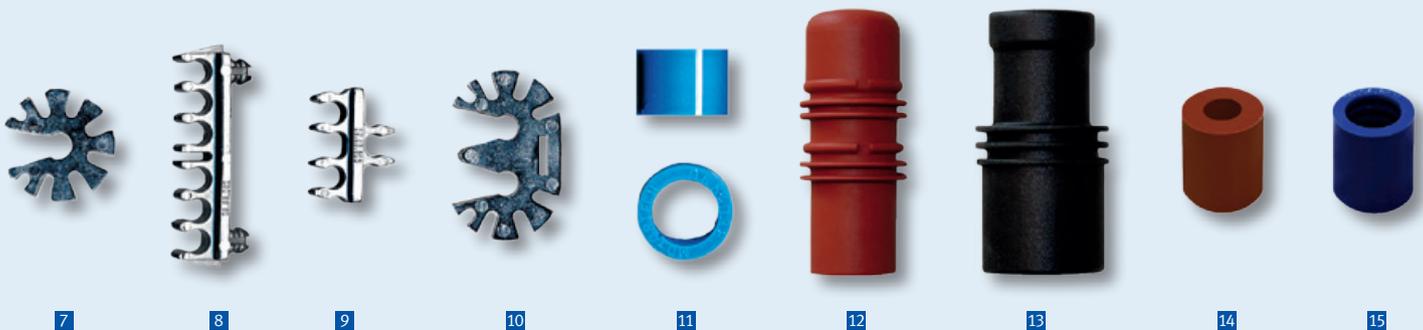
<sup>1)</sup> Silicone seal rings require replacement every 3000 running hours. See MOTORTECH homepage for appropriate instruction for replacing silicone seal rings.

### Grommets for CUMMINS® Ignition Coils

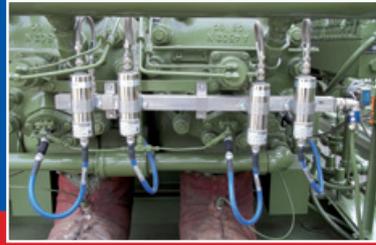
P/N	Figure	Description	Color	Quantity	Equivalent to
06.84.048-100	12	Grommet, for use with CUMMINS® ignition coil P/N 3930027	orange	100 pcs.	3938860
06.84.053-100	13	Grommet, for use with CUMMINS® 8.3 ignition coil	black	100 pcs.	3973945

### Silicone Seals for ALTRONIC®, BG®, CUMMINS® and WAUKESHA® Spark Plug Extensions

P/N	Figure	Description	Color	Quantity	Equivalent to
06.84.047-100	14	Silicone seal, for 14 mm spark plug extension	orange	100 pcs.	
06.84.049-100	15	Silicone seal, for 18 mm spark plug extension	blue	100 pcs.	740011



# SPARK PLUG LEADS



SHIELDED

**MOT-Blues**   
SHIELDED SPARK PLUG LEADS

## MOT-Blues Shielded Spark Plug Leads for Externally Mounted Ignition Coils

There is an alternative to the commonly failing conventional shielded spark plug leads. MOTORTECH has designed a CSA approved shielded spark plug lead for Class I, Division 2, Group D that will perform better than the industry standard. There is no need to convert to unshielded when you cannot keep the engine running with the conventional leads.



The MOT-Blues spark plug wire is specially designed for shielded CSA certified spark plug leads. It consists of a multi layer design:

- Nickel plated copper core
- 2 layers of silicone
- Stainless steel braid
- Silicone jacket

This design ensures that no humidity can be trapped in the lead.

MOTORTECH Style (1-20 UNEF Ignition Coil Termination)



P/N <sup>1)</sup>	Description	Spark Plug Terminal Well Depth <sup>2)</sup>	Spark Plug Termination	Ignition Coil Termination	Equivalent to
95.91.030-L	Shielded spark plug lead	2 in.	3/4-20 UNEF / 180°	1-20 UNEF / 180°	A755-L-2, HT2400-L

ALTRONIC® Style (3/4-20 UNEF Ignition Coil Termination)



P/N <sup>1)</sup>	Description	Spark Plug Terminal Well Depth <sup>2)</sup>	Spark Plug Termination	Ignition Coil Termination	Equivalent to
95.90.030-L	Shielded spark plug lead	2 in.	3/4-20 UNEF / 180°	3/4-20 UNEF / 180°	593030-L, HT2300-L

<sup>1)</sup> Standard lead lengths = "L" = 10 in., 13 in., 16 in., 18 in., 20 in., 21 in., 22 in., 24 in., 30 in., 35 in.; other lengths available on request.

<sup>2)</sup> Consult factory for 1 in. spark plug terminal well depth.  
All terminals made of ceramic. HEX-nut on spark plug side.



# SPARK PLUG LEADS & EXTENSIONS

## SHIELDED

### Conventional Shielded Spark Plug Leads for Externally Mounted Ignition Coils

#### MOTORTECH Style (1-20 UNEF Ignition Coil Termination)



P/N <sup>1)</sup>	Description	Spark Plug Terminal Well Depth <sup>2)</sup>	Spark Plug Termination	Ignition Coil Termination	Equivalent to
95.85.030-L	Shielded spark plug lead	2 in.	3/4-20 UNEF / 180°	1-20 UNEF / 180°	A755-L-2, HT2400-L

#### ALTRONIC® Style (3/4-20 UNEF Ignition Coil Termination)

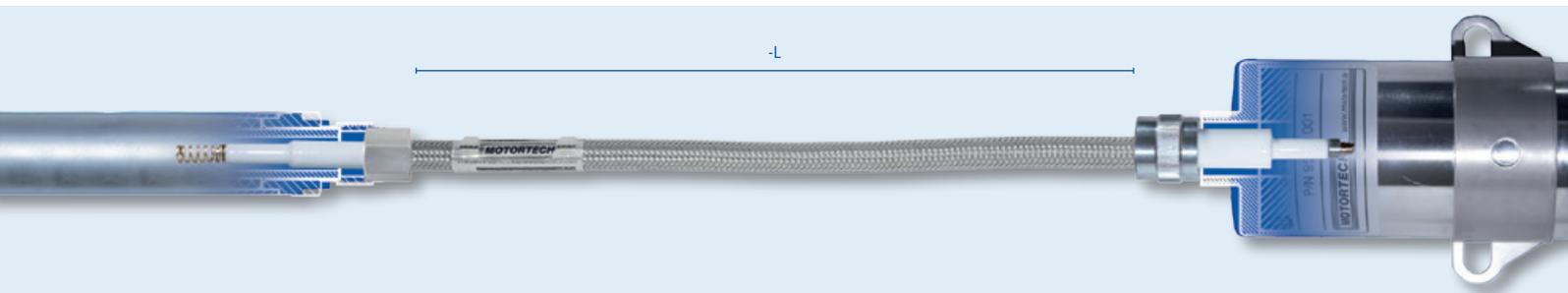


P/N <sup>1)</sup>	Description	Spark Plug Terminal Well Depth <sup>2)</sup>	Spark Plug Termination	Ignition Coil Termination	Equivalent to
95.80.030-L	Shielded spark plug lead	2 in.	3/4-20 UNEF / 180°	3/4-20 UNEF / 180°	593030-L, HT2300-L

<sup>1)</sup> Standard braid lengths = "L" = 10 in., 13 in., 16 in., 18 in., 20 in., 21 in., 22 in., 24 in., 30 in., 35 in.; other lengths available on request.

<sup>2)</sup> Consult factory for 1 in. spark plug terminal well depth.

All terminals made of ceramic. HEX-nut on both sides.



## Terminal Repair Kits

### Kits for **Shielded** Spark Plug Leads – MOT-Blues

P/N	Description	Stud Thread Size	Adaptor	Equivalent to
02.85.1006	Terminal repair kit - Spark plug	M3	3/4-20 UNEF, 2 in. terminal well depth <sup>1)</sup>	
02.85.1007	Terminal repair kit - Ignition coil	M3	3/4-20 UNEF, ALTRONIC® style	
02.85.1008	Terminal repair kit - Ignition coil	M3	1-20 UNEF, MOTORTECH style	

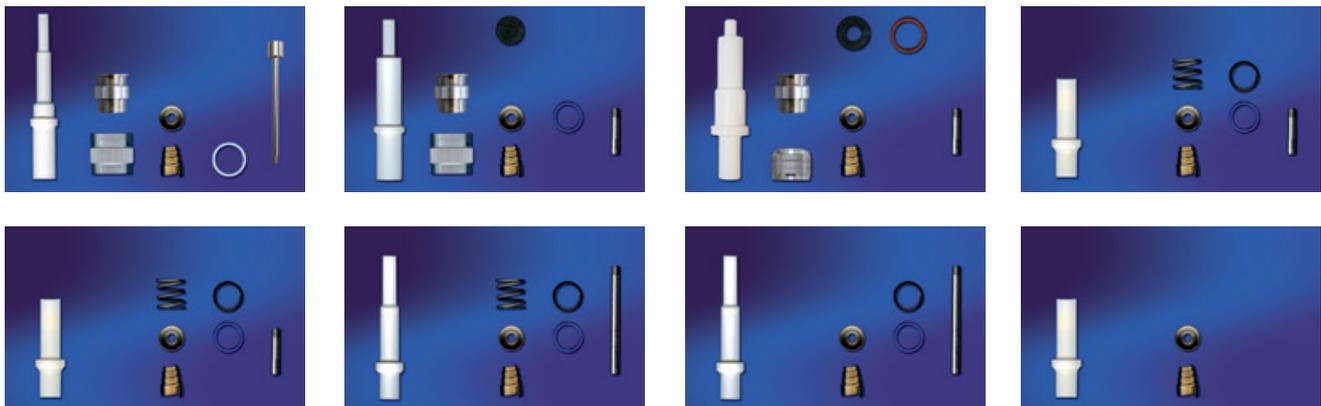
<sup>1)</sup> Consult factory for terminal kits to fit spark plugs with 3/4-20 UNEF thread and 1 in. terminal well depth.

### Kits for **Shielded** Spark Plug Leads – Conventional

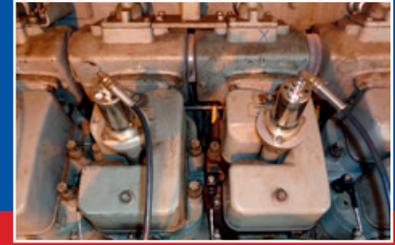
P/N	Description	Stud Thread Size	Adaptor	Equivalent to
02.85.991	Terminal repair kit - Spark plug	M3	3/4-20 UNEF, 1 in. terminal well depth	
02.85.991-2	Terminal repair kit - Spark plug	3/48 UNC	3/4-20 UNEF, 1 in. terminal well depth	SC1K, 504205
02.85.992	Terminal repair kit - Spark plug	M3	3/4-20 UNEF, 2 in. terminal well depth	
02.85.992-2	Terminal repair kit - Spark plug	3/48 UNC	3/4-20 UNEF, 2 in. terminal well depth	SC2K, 504137
02.85.979	Terminal repair kit - Spark plug	3/48 UNC	3/4-20 UNEF, 1 in. terminal well depth	
02.85.992-1	Terminal repair kit - Ignition coil	M3	3/4-20 UNEF, BENDIX® style	
02.85.992-3	Terminal repair kit - Ignition coil	3/48 UNC	3/4-20 UNEF, BENDIX® style	
02.85.996	Terminal repair kit - Ignition coil	M3	3/4-20 UNEF, ALTRONIC® style	
02.85.996-2	Terminal repair kit - Ignition coil	3/48 UNC	3/4-20 UNEF, ALTRONIC® style	ALTSS-2
02.85.997	Terminal repair kit - Ignition coil	M3	1-20 UNEF, MOTORTECH style	
02.85.997-2	Terminal repair kit - Ignition coil	3/48 UNC	1-20 UNEF, MOTORTECH style	

### Kits for **Non-Shielded** Spark Plug Leads – Conventional

P/N	Description	Stud Thread Size	Adaptor	Equivalent to
02.85.993	Terminal repair kit - Ignition coil	M3	3/4-20 UNEF, ALTRONIC® style	
02.85.993-2	Terminal repair kit - Ignition coil	3/48 UNC	3/4-20 UNEF, ALTRONIC® style	ALTOS-1, 510480
02.85.994	Terminal repair kit - Ignition coil	M3	3/4-20 UNEF, BENDIX® style	
02.85.994-2	Terminal repair kit - Ignition coil	3/48 UNC	3/4-20 UNEF, BENDIX® style	BENDOS-1
02.85.995	Terminal repair kit - Ignition coil	M3	1-20 UNEF, MOTORTECH style	
02.85.995-2	Terminal repair kit - Ignition coil	3/48 UNC	1-20 UNEF, MOTORTECH style	FMOS-1



# SPARK PLUG LEADS & EXTENSIONS



## UNSHIELDED

**PolyMot™**  
MOTORTECH SPARK PLUG LEADS & EXTENSIONS

### Spark Plug Extensions – Patented PolyMot™ Style\*

Besides all the successful spark plug leads, MOTORTECH has also designed a large number of spark plug extensions under the PolyMot™ patented design.

These extensions are unique and offer several advantages when being compared to the OEM or aftermarket competition. With the knowledge gathered in ignition control and coil manufacturing, a lot of the details were implemented into these products.

\*Patent No.: 19611283



#### Features:

The unique structure has achieved tremendous reliability records in the field.

- Rigid design
- TEFLON® extension up to 36 in. length
- Ceramic insert with 5 kΩ resistor for RFI suppression (0 kΩ available on request)
- Reliable ignition coil and spark plug terminal
- Spring loaded secondary terminal to ignition coil
- Critical high voltage areas are protected with a silicone seal
- Designed to match the engine model, the spark plug type and application
- Extensions are labeled with P/N and production code for easy traceability
- Top thread for easy removal with special tool
- Long life product



### PolyMot™ Spark Plug Extensions – for common Applications

P/N	Supersedes	Engine Make	Model	Extension Length	Resistance	Spark Plug	P/N Silicone Seal Ring	Thread on Top End	Equivalent to
06.80.320-T	06.80.320/H/H-T/ 06.80.381H/H-T	CATERPILLAR®	G3500 series	11 in.	5 kΩ	GI3-3/ FB77WPCC	06.84.040	x	123-4710
06.80.319-T	06.80.319/H/H-T	CATERPILLAR®	G3600 series	11 in.	5 kΩ	GI3-3/ FB77WPCC	06.84.040	x	123-8641
06.80.202-T	06.80.202	COOPER®	2400G series	9 in.	5 kΩ	GI3-3/ FB77WPCC	06.84.040		656-701-003
06.80.755-T <sup>1)</sup>		CUMMINS®	QSK60G	13 in.	5 kΩ	GI3-3/ FB77WPCC	06.84.040	x	
06.80.756-T <sup>1)</sup>		CUMMINS®	QSV81/91G	15 in.	5 kΩ	GI3-3/ FB77WPCC	06.84.040	x	
06.80.469-T		WAUKESHA®	APG series	10 in.	5 kΩ	GI3-3/ FB77WPCC	06.84.040	x	A211797M
06.80.206-T	06.80.206	WAUKESHA®	AT25 series	15 in.	5 kΩ	GT3-1/ RM77N	06.84.040	x	A211357Y
06.80.330-T	06.80.330	WAUKESHA®	AT25GL series	15 in.	5 kΩ	GI3-3/ FB77WPCC	06.84.040	x	A211797Y
06.80.213-T	06.80.213	WAUKESHA®	AT27GL series	15 in.	5 kΩ	GT3-1/ RM77N	06.84.040	x	A296064G
06.80.310-T	06.80.310	WAUKESHA®	AT27GL-LR series	14 in.	5 kΩ	GI3-3/ FB77WPCC	06.84.040	x	A296064H
06.80.309-T	06.80.309	WAUKESHA®	VGf series	9 in.	5 kΩ	GI3-3/ FB77WPCC	06.84.040	x	A211797J/ A211797K
06.80.321-T	06.80.321/H/H-T	WAUKESHA®	VHP-GL series	13 in.	5 kΩ	GI3-3/ FB77WPCC	06.84.040	x	A211797H/ A211797P
06.80.340-T	06.80.340	WAUKESHA®	VHP-4 series	13 in.	5 kΩ	GI3-3/ FB77WPCC	06.84.040	x	A211797G

<sup>1)</sup> Fits application only, if conversion kits P/N 75.30.143 or 75.30.144 previously were used.

### Removal Tool for Spark Plug Extensions with Thread on Top End

P/N	Description
44.99.912	Spark plug extension removal tool



# SPARK PLUG LEADS & EXTENSIONS

## Ignition Coil Extensions

Extensions for **MOTORTECH/CATERPILLAR®** Ignition Coils – For CATERPILLAR® G3520C and G3600 Series Gas Engines

P/N	Figure	Description	Application	Resistance	Extension Length	Extension Diameter	Fits Ignition Coil P/N	Equivalent to
06.80.459H <sup>1)</sup>	<b>1</b>	Ignition coil extension	G3520C/G3600 Non CSA	0 kΩ	248 mm	26 mm	06.50.161, 06.50.162, 283-5270	283-5271, 308-1380
06.80.600	<b>2</b>	Ignition coil extension	G3520C/G3600 Non CSA	0 kΩ	252 mm	26 mm	06.50.164, 06.50.165	

<sup>1)</sup> Supersedes spark plug extensions P/N 06.80.375H and 06.80.446H.

Extensions for **MOTORTECH/CATERPILLAR®** Ignition Coils – For CATERPILLAR® GCM34 Series Gas Engines

P/N	Figure	Description	Application	Resistance	Extension Length	Extension Diameter	Fits Ignition Coil P/N	Equivalent to
06.80.1013-T	<b>3</b>	Ignition coil extension	GCM34	5 kΩ	530 mm	26 mm	193-468157, 258-4893, 06.50.170	263210167, 3400.7- 21.07.02-03
06.80.602	<b>4</b>	Ignition coil extension	GCM34	5 kΩ	534 mm	26 mm	06.50.174, 06.50.175	

Extensions for **WÄRTSILÄ®** Gas Engines

P/N	Description	Application	Resistance	Extension Length	Extension Diameter	Fits Ignition Coil P/N	Equivalent to
06.80.460	Ignition coil extension	34SG series	5 kΩ	18 in.	26 mm		0012E002200
06.80.461	Ignition coil extension	34SG series	5 kΩ	17 in.	26 mm		0012E006500
06.80.145-1	Ignition coil extension	220G/SG series	5 kΩ	13 in.	24 mm		3340063
06.80.145-2	Ignition coil extension	220G/SG series	5 kΩ	13 in.	24 mm		3341380



## Ignition Coil Extension Overhaul Kits

Kits for **MOTORTECH** Ignition Coils – For CATERPILLAR® G3400 and G3500 Series Gas Engines

P/N	Figure	Supersedes	Description	Application	Extension Length	Extension Diameter	Fits Ignition Coil P/N
06.80.741	5		Extension overhaul kit	G3400 - Non CSA	95 mm	30 mm	06.50.141, 06.50.145
06.80.742	5		Extension overhaul kit	G3400 - CSA	97 mm	30 mm	06.50.142, 06.50.146
06.80.743	5		Extension overhaul kit	G3400 - Non CSA	107 mm	30 mm	06.50.143, 06.50.147
06.80.744	5		Extension overhaul kit	G3400 - CSA	109 mm	30 mm	06.50.144, 06.50.148
06.80.751	5		Extension overhaul kit	G3500 - Non CSA	118 mm	30 mm	06.50.151, 06.50.155
06.80.752	5		Extension overhaul kit	G3500 - CSA	105 mm	30 mm	06.50.152, 06.50.156
06.80.753	5		Extension overhaul kit	G3500 - Non CSA	112 mm	30 mm	06.50.153, 06.50.157
06.80.754	5		Extension overhaul kit	G3500 - CSA	105 mm	30 mm	06.50.154, 06.50.158

Above Kits contain following Subcomponents

P/N	P/N Extension including Seal	P/N included Spark Plug Seal	P/N included Extension Seal	P/N Lip Seal	P/N Secondary Terminal
06.80.741	06.80.741-2	06.84.059		06.81.051	02.85.881
06.80.742	06.80.742-2	06.84.059	06.81.084	06.81.051	06.51.134
06.80.743	06.80.743-2	06.84.059		06.81.051	06.51.136
06.80.744	06.80.744-2	06.84.059	06.81.084	06.81.051	06.51.133
06.80.751	06.80.751-2	06.84.040		06.81.051	02.85.881
06.80.752	06.80.752-2	06.84.040	06.81.084	06.81.051	02.85.870
06.80.753	06.80.753-2	06.84.040		06.81.051	02.85.881
06.80.754	06.80.754-2	06.84.040	06.81.084	06.81.051	02.85.870



# SPARK PLUG LEADS & EXTENSIONS

## Kits for CATERPILLAR® Ignition Coils – For CATERPILLAR® G3400 and G3500 Series Gas Engines

P/N	Figure	Supersedes	Description	Application	Extension Length	Extension Diameter	Fits Ignition Coil P/N
06.80.419H	1		Extension overhaul kit	G3400 - Non CSA	95 mm	30 mm	232-6348, 165-1591, 131-3277, 129-8802, 108-0615
06.80.742	1	06.80.418H	Extension overhaul kit	G3400 - CSA	97 mm	30 mm	232-6349, 165-1592, 122-8070
06.80.420H	1		Extension overhaul kit	G3400 - Non CSA	107 mm	30 mm	232-6352, 213-7443
06.80.744	1	06.80.417H	Extension overhaul kit	G3400 - CSA	109 mm	30 mm	232-6353, 213-7444
06.80.515H	1	06.80.315H	Extension overhaul kit	G3500 - Non CSA	118 mm	30 mm	232-6346, 165-1589, 124-0749
06.80.752	1	06.80.415H	Extension overhaul kit	G3500 - CSA	105 mm	30 mm	232-6347, 165-1590
06.80.480	1		Extension overhaul kit	G3500 - Non CSA	112 mm	30 mm	232-6350
06.80.754	1	06.80.415H	Extension overhaul kit	G3500 - CSA	105 mm	30 mm	259-2078

### Above Kits contain following Subcomponents

P/N	P/N Extension including Seal	P/N included Spark Plug Seal	P/N included Extension Seal	P/N Lip Seal	P/N Secondary Terminal
06.80.419H	06.80.279H	06.84.059		06.81.051	02.85.881
06.80.742	06.80.742-2	06.84.059	06.81.084	06.81.051	06.51.134
06.80.420H	06.80.280H	06.84.059		06.81.051	06.51.136
06.80.744	06.80.744-2	06.84.059	06.81.084	06.81.051	06.51.133
06.80.515H	06.80.335H-1	06.84.040		06.81.051	02.85.881
06.80.752	06.80.752-2	06.84.040	06.81.084	06.81.051	02.85.870
06.80.480	06.80.481	06.84.040		06.81.051	02.85.881
06.80.754	06.80.754-2	06.84.040	06.81.084	06.81.051	02.85.870

### Extensions for CATERPILLAR® Ignition Coils

P/N	Figure	Description	Extension Length	Extension Diameter	Equivalent to
06.80.356H	2	Ignition coil extension	118 mm	25 mm	133-5078
06.80.360H	2	Ignition coil extension	118 mm	30 mm	169-4295

### Extension Rods – Low Cost Style<sup>1)</sup>

P/N <sup>2)</sup>	Description	Primary Connection	Secondary Connection	Equivalent to
06.80.349-L	Extension rod	SAE	snap-on attachment	TCRC-“L”
06.80.376-L	Extension rod	SAE	#8-32 screw-on attachment	TCR-“L”
06.80.376-10	Extension rod	SAE	#8-32 screw-on attachment	TCR-10WM/207927A

<sup>1)</sup> We recommend using PolyMot spark plug leads.

<sup>2)</sup> Standard lengths (“-L”) = 3 in., 4 in., 5 in., 6 in., 8 in., 10 in., 12 in., 14 in., 16 in., 18 in., 20 in., 24 in.; other lengths available on request.



1



2



## Extensions for Integral Ignition Coils to Shielded Spark Plugs

SHIELDED



P/N <sup>1)</sup>	Figure	Description	Spark Plug Connection	Terminal Well Depth	Ignition Coil Connection	Terminal Well Depth	Equivalent to
95.07.010-L	1	Integral ignition coil extension	5/8-24 UNEF	1 in.	1-20 UNEF	2 in.	BG E Series
95.07.011-L	1	Integral ignition coil extension	3/4-20 UNEF	1 in.	1-20 UNEF	2 in.	593120-L / M"L"-2C
95.07.012-L	1	Integral ignition coil extension	3/4-20 UNEF	2 in.	1-20 UNEF	2 in.	593130-L / M"L"1C
95.07.013-L	1	Integral ignition coil extension	13/16-20 UNEF	2 in.	1-20 UNEF	2 in.	593140-L

<sup>1)</sup> Standard lengths ("L") = 1.5 in., 3 in., 6 in., 9 in., 11 in., 19 in.; other lengths available on request.

## Extensions for Shielded Spark Plugs to Shielded Secondary Leads



P/N <sup>1)</sup>	Figure	Description	Spark Plug Connection	Terminal Well Depth	High Tension Lead Connection	Terminal Well Depth	Equivalent to
95.07.020-L	2	Shielded spark plug extension	5/8-24 UNEF	1 in.	5/8-24 UNEF	1 in.	
95.07.021-L	2	Shielded spark plug extension	3/4-20 UNEF	1 in.	3/4-20 UNEF	1 in.	M"L"-2S
95.07.022-L	2	Shielded spark plug extension	3/4-20 UNEF	2 in.	3/4-20 UNEF	2 in.	M"L"-2E
95.07.023-L	2	Shielded spark plug extension	5/8-24 UNEF	1 in.	3/4-20 UNEF	2 in.	
95.07.024-L	2	Shielded spark plug extension	3/4-20 UNEF	1 in.	3/4-20 UNEF	2 in.	

<sup>1)</sup> Standard lengths ("L") = 4 in., 5 in., 6 in., 8 in., 10 in., 12 in., 18 in.; other lengths available on request.



# IGNITION WIRING RAILS & HARDWARE



SHIELDED

## AlphaRail

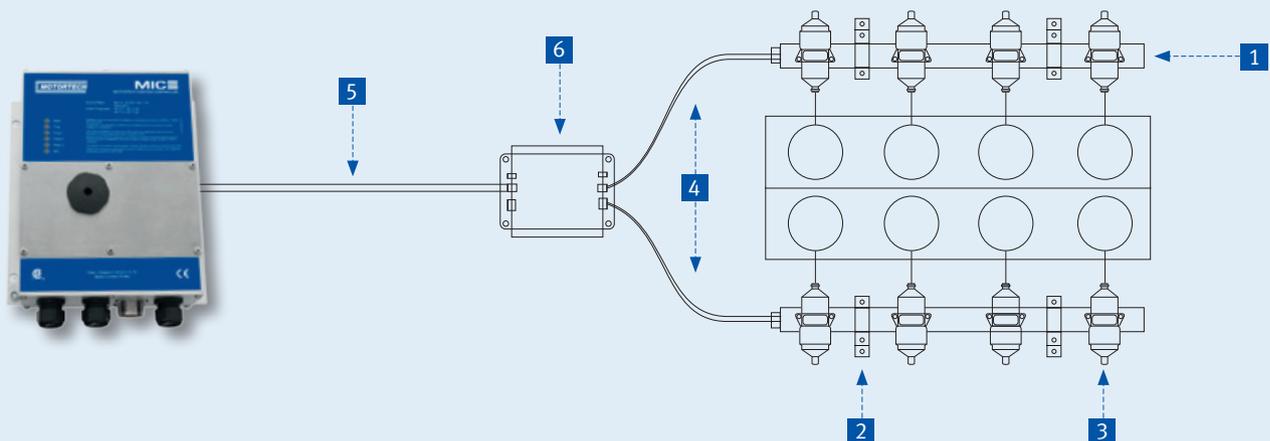
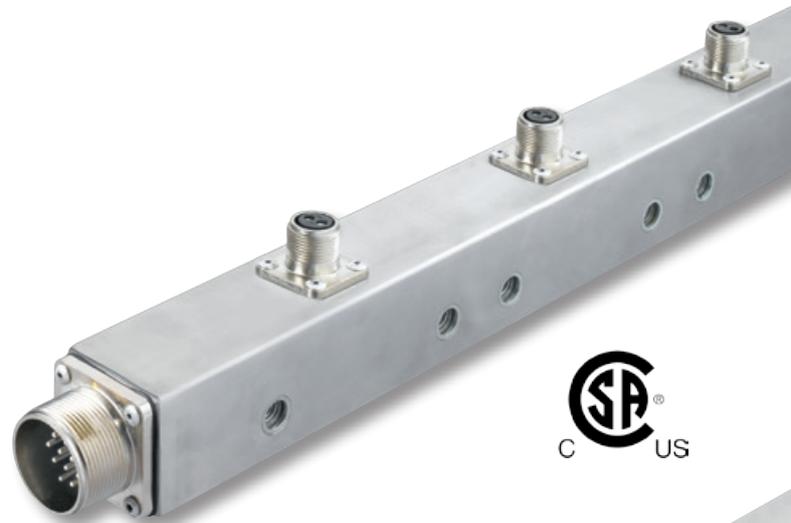
MOTORETECH WIRING RAIL SYSTEM

### Wiring Rail System for Ignition Control

MOTORETECH stainless steel, vibration resistant rail assembly will withstand any harsh environment commonly found in the oil & gas industry. Our 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
- Repairable by MOTORETECH's assigned distributors in the event of mechanically damage

- Ignition rails can be used for shielded and unshielded applications.
- Due to easy base rail structure easy for stocking
- Quick service access with quick-disconnect connections



## 1 AlphaRail for Ignition Control – Specification Table

P/N 95.8 **A** **B** **C** **D** **E** **F** **G** **H** **J**

A	Ignition Coils per Cylinder
6	Engine with one ignition coil per cylinder
7	Engine with two ignition coils per cylinder <sup>1)</sup>

<sup>1)</sup> See “HJ” for distance between two ignition coils.

B	Number of Cylinders per Bank		
1	Special version	5	5 cylinders
2	2 cylinders	6	6 cylinders
3	3 cylinders	8	8 cylinders
4	4 cylinders	0	10 cylinders

CD	Distance between the Cylinders		
04	4 in.	12	12 in.
06	6 in.	13	13 in.
07	7 in.	14	14 in.
08	8 in.	16	16 in.
10	10 in.	27	27 in.
11	11 in.	33	33 in.

E	Ignition Coil Mounting
N	STANDARD – NO ignition coil mounted

F	Double Rail <sup>1)</sup> – Length of Flex Conduit		
A	NO Double Rail	E	24 in.
B	12 in.	F	32 in.
C	16 in.	G	40 in.
D	20 in.	H	52 in.

<sup>1)</sup> Two ignition wiring rails connected by flex conduit.

G	Specification of Ignition Coil
N	STANDARD – NO ignition coil mounted <sup>1)</sup>

<sup>1)</sup> Ignition coils have to be ordered separately (see chapter 02 – Ignition Coils)

HJ	Distance between two Ignition Coils – Only for two Ignition Coils per Cylinder		
04	4 in.	16	16 in.
06	6 in.	18	18 in.
08	8 in.	20	20 in.
10	10 in.	22	22 in.
12	12 in.	24	24 in.
14	14 in.		

# IGNITION WIRING RAILS & HARDWARE



## 2 Bracket Configuration

P/N <sup>1)</sup>	Figure	Description
75.10.303	2A	Bracket, 40x40 mm (Standard)
75.10.097	2B	Flat bar, 180° (Standard)
75.10.120	2C	Flat bar, 150°
75.10.280	2D	Flat bar, 90°

<sup>1)</sup> For packs of ten please add suffix "-10" to part number.

## 3 Primary Lead Kits for Ignition Coils – Unshielded<sup>1)</sup>

P/N	Description	For use with Ignition Coil P/N 06.50. ...
06.99.200-1	Primary lead kit incl. fastening material	003/053/054/055/060/065
06.99.200-2	Primary lead kit incl. fastening material	100/102/104/105/300/301
06.99.200-3	Primary lead kit incl. fastening material	103

<sup>1)</sup> Primary lead kits have to be ordered separately in required quantity.

## 3 Primary Lead Kits for Ignition Coils – Shielded<sup>1)</sup>

P/N	Description	For use with Ignition Coil P/N
95.99.200-1	Primary lead kit incl. fastening material	95.08.003, 95.08.005
95.99.200-2	Primary lead kit incl. fastening material	95.09.005, 95.09.053, 95.09.054, 95.09.055

<sup>1)</sup> Primary lead kits have to be ordered separately in required quantity. See chapter 04 page 6 for primary leads for use with flange or integral ignition coils.

## 4 Harnesses to connect Wiring Rail and Junction Box<sup>1)</sup>

P/N	Description	Connector	Length
95.40.114-L	Harness	14 pole socket, 180°	"L" = 5/15/25/50 ft.
95.40.314-L	Harness	14 pole socket, 90°	"L" = 5/15/25/50 ft.

<sup>1)</sup> For CSA applications flex conduit has to be ordered separately or supplied by customer.



### 5 Harnesses to connect Ignition Controller and Junction Box – Specification Table

		P/N 95.4 A . B C D - E				
<b>A</b>	<b>Harness</b>					
0	Standard harness (with adaptor for 1/2" or 3/4" flex conduit)					
<b>B</b>	<b>Connector Arrangement</b>					
1	socket 180°					
2	pin 180°					
3	socket 90°					
4	pin 90°					
<b>CD</b>	<b>Number of Sockets/Pins in Connector</b>					
05	5pole with adaptor for 1/2" flex conduit					
07	7pole with adaptor for 1/2" flex conduit					
10	10 pole with adaptor for 1/2" flex conduit					
14	14 pole with adaptor for 1/2" flex conduit					
17	17 pole with adaptor for 3/4" flex conduit					
19	19 pole with adaptor for 3/4" flex conduit					
35	35 pole with adaptor for 3/4" flex conduit					
<b>E</b>	<b>Length of Harness</b>					
5	5 ft.					
15	15 ft.					
25	25 ft.					
50	50 ft.					

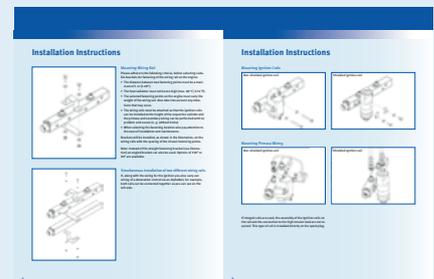
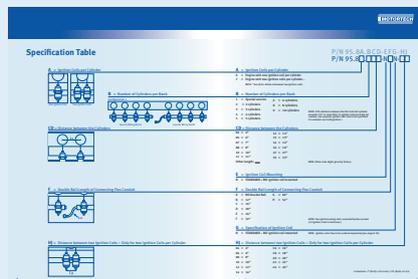
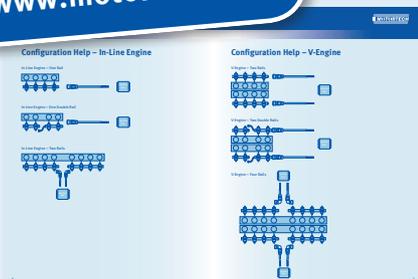
### 6 Accessories

P/N	Figure	Description
06.05.075	6A	Junction box
15.07.112-1	6B	Flex conduit, 1/2 in. <sup>1)</sup>
15.07.221	6C	Fitting, 1/2 in., junction box to connecting flex conduit
15.07.134	6B	Flex conduit, 3/4 in. <sup>1)</sup>
15.07.231	6C	Fitting, 3/4 in., junction box to connecting flex conduit

<sup>1)</sup> Flex conduit needs to be ordered in m/ft. in required quantity.



Specification Charts:  
[www.motortech.de](http://www.motortech.de)



# IGNITION WIRING RAILS & HARDWARE



## SHIELDED

### Ignition Wiring Rail Upgrade Kits

Wiring Rail Kits for CATERPILLAR® G3300 and G3400 Series Gas Engines – **Shielded Applications with Magneto**

P/N	Description
95.75.025-1-B	<b>Ignition wiring rail kit without ignition control unit for CATERPILLAR® G3304</b> <ul style="list-style-type: none"> <li>• Incl. harness to ALTRONIC® magneto</li> <li>• Mounting bracket welded to the rail</li> <li>• G-lead connector</li> <li>• <b>New Flex Style</b> shielded primary leads to fit 3 pole integral ignition coils<sup>1)</sup></li> <li>• Timing adaptor</li> </ul>
95.75.025-1	<b>Ignition wiring rail kit without ignition control unit for CATERPILLAR® G3304</b> <ul style="list-style-type: none"> <li>• Incl. harness to ALTRONIC® magneto</li> <li>• Mounting bracket welded to the rail</li> <li>• G-lead connector</li> <li>• <b>Conventional Style</b> shielded primary leads to fit 3 pole integral ignition coils<sup>1)</sup></li> <li>• Timing adaptor</li> </ul>
95.75.024-1-B	<b>Ignition wiring rail kit without ignition control unit for CATERPILLAR® G3306</b> <ul style="list-style-type: none"> <li>• Incl. harness to ALTRONIC® magneto</li> <li>• Mounting bracket welded to the rail</li> <li>• G-lead connector</li> <li>• <b>New Flex Style</b> shielded primary leads to fit 3 pole integral ignition coils<sup>1)</sup></li> <li>• Timing adaptor</li> </ul>
95.75.024-1	<b>Ignition wiring rail kit without ignition control unit for CATERPILLAR® G3306</b> <ul style="list-style-type: none"> <li>• Incl. harness to ALTRONIC® magneto</li> <li>• Mounting bracket welded to the rail</li> <li>• G-lead connector</li> <li>• <b>Conventional Style</b> shielded primary leads to fit 3 pole integral ignition coils<sup>1)</sup></li> <li>• Timing adaptor</li> </ul>
95.75.067-1-B	<b>Ignition wiring rail kit without ignition control unit for CATERPILLAR® G3406</b> <ul style="list-style-type: none"> <li>• Incl. harness to ALTRONIC® ignition control unit</li> <li>• Mounting bracket welded to the rail</li> <li>• G-lead connector</li> <li>• <b>New Flex Style</b> shielded primary leads to fit 3 pole integral ignition coils<sup>1)</sup></li> <li>• Timing adaptor</li> </ul>
95.75.067-1	<b>Ignition wiring rail kit without ignition control unit for CATERPILLAR® G3406</b> <ul style="list-style-type: none"> <li>• Incl. harness to ALTRONIC® ignition control unit</li> <li>• Mounting bracket welded to the rail</li> <li>• G-lead connector</li> <li>• <b>Conventional Style</b> shielded primary leads to fit 3 pole integral ignition coils<sup>1)</sup></li> <li>• Timing adaptor</li> </ul>

<sup>1)</sup> Integral ignition coils needs to be ordered separately. See chapter 02 page 17.

#### Options available on included Primary Leads



Ignition Wiring Rail



New Flex Style Primary Leads

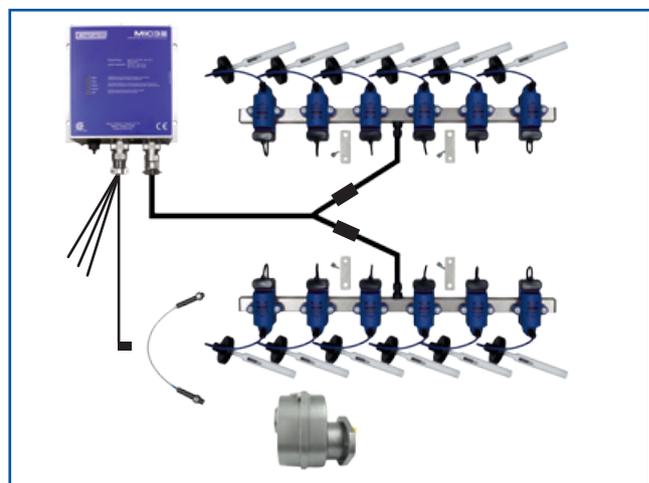


Conventional Style Primary Leads

**Ignition Upgrade Kits for CATERPILLAR® G3300 and G3400 Series Gas Engines to replace Magneto Ignition Systems  
Unshielded Applications**

P/N	Supersedes	Description
75.00.536	75.00.338	<b>Ignition upgrade kit for CATERPILLAR® G3304</b> <ul style="list-style-type: none"> <li>• Incl. MIC3 ignition controller</li> <li>• Input and output harnesses</li> <li>• AlphaRail wiring rail with high energy ignition coils and brackets</li> <li>• Spark plug leads</li> <li>• Mechanical trigger kit with disc (4+1), adapter ring, gaskets and pickup</li> <li>• Magneto drive cover kit</li> </ul>
75.00.537	75.00.337	<b>Ignition upgrade kit for CATERPILLAR® G3306</b> <ul style="list-style-type: none"> <li>• Incl. MIC3 ignition controller</li> <li>• Input and output harnesses</li> <li>• AlphaRail wiring rail with high energy ignition coils and brackets</li> <li>• Spark plug leads</li> <li>• Mechanical trigger kit with disc (6+1), adapter ring, gaskets and pickup</li> <li>• Magneto drive cover kit</li> </ul>
75.00.538	75.00.336	<b>Ignition upgrade kit for CATERPILLAR® G3406</b> <ul style="list-style-type: none"> <li>• Incl. MIC3 ignition controller</li> <li>• Input and output harnesses</li> <li>• AlphaRail wiring rail with high energy ignition coils and brackets</li> <li>• PolyMot™ spark plug leads</li> <li>• Mechanical trigger kit with disc (6+1), adapter ring, gaskets and pickup</li> <li>• Magneto drive cover kit</li> </ul>
75.00.539		<b>Ignition upgrade kit for CATERPILLAR® G3408</b> <ul style="list-style-type: none"> <li>• Incl. MIC3 ignition controller</li> <li>• Input and output harnesses</li> <li>• AlphaRail wiring rails with high energy ignition coils and brackets</li> <li>• PolyMot™ spark plug leads</li> <li>• TriDev trigger device and pickup</li> </ul>
75.00.540		<b>Ignition upgrade kit for CATERPILLAR® G3412</b> <ul style="list-style-type: none"> <li>• Incl. MIC3 ignition controller</li> <li>• Input and output harnesses</li> <li>• AlphaRail wiring rails with high energy ignition coils and brackets</li> <li>• PolyMot™ spark plug leads</li> <li>• TriDev trigger device and pickup</li> </ul>

**Kit for In-line Engines  
CATERPILLAR® G3304/G3306/G3406**

**Kit for V-Engines  
CATERPILLAR® G3408/G3412**


# IGNITION WIRING RAILS & HARDWARE



## SHIELDED

### Wiring Rail Kits for CATERPILLAR® G3600 Series Gas Engines

P/N	Description	Equivalent to
95.75.108-B	<b>Wiring rail kit, ignition/detonation control for CATERPILLAR® G3606</b> <ul style="list-style-type: none"> <li>AlphaRail wiring rail assembly</li> <li>Connecting harness, main junction box to wiring rail</li> <li><b>New Flex Style</b> shielded primary leads for AlphaRail</li> </ul>	213-6308
95.75.108	<b>Wiring rail kit, ignition/detonation control for CATERPILLAR® G3606</b> <ul style="list-style-type: none"> <li>AlphaRail wiring rail assembly</li> <li>Connecting harness, main junction box to wiring rail</li> <li><b>Conventional Style</b> shielded primary leads for AlphaRail</li> </ul>	213-6308
95.75.103-B	<b>Wiring rail kit, ignition/detonation control for CATERPILLAR® G3608</b> <ul style="list-style-type: none"> <li>AlphaRail wiring rail assembly</li> <li>Connecting harness, main junction box to wiring rail</li> <li><b>New Flex Style</b> shielded primary leads for AlphaRail</li> </ul>	219-9946
95.75.103	<b>Wiring rail kit, ignition/detonation control for CATERPILLAR® G3608</b> <ul style="list-style-type: none"> <li>AlphaRail wiring rail assembly</li> <li>Connecting harness, main junction box to wiring rail</li> <li><b>Conventional Style</b> shielded primary leads for AlphaRail</li> </ul>	219-9946
95.75.106-B	<b>Wiring rail kit, ignition/detonation control for CATERPILLAR® G3612</b> <ul style="list-style-type: none"> <li>AlphaRail wiring rail assembly, right and left bank</li> <li>Connecting harnesses, main junction box to wiring rails</li> <li><b>New Flex Style</b> shielded primary leads for AlphaRail</li> </ul>	191-5007 - right 191-5008 - left
95.75.106	<b>Wiring rail kit, ignition/detonation control for CATERPILLAR® G3612</b> <ul style="list-style-type: none"> <li>AlphaRail wiring rail assembly, right and left bank</li> <li>Connecting harnesses, main junction box to wiring rails</li> <li><b>Conventional Style</b> shielded primary leads for AlphaRail</li> </ul>	191-5007 - right 191-5008 - left
95.75.107-B	<b>Wiring rail kit, ignition/detonation control for CATERPILLAR® G3616</b> <ul style="list-style-type: none"> <li>AlphaRail wiring rail assembly, right and left bank</li> <li>Connecting harnesses, main junction box to wiring rails</li> <li><b>New Flex Style</b> shielded primary leads for AlphaRail</li> </ul>	198-2938 - right 198-2941 - left
95.75.107	<b>Wiring rail kit, ignition/detonation control for CATERPILLAR® G3616</b> <ul style="list-style-type: none"> <li>AlphaRail wiring rail assembly, right and left bank</li> <li>Connecting harnesses, main junction box to wiring rails</li> <li><b>Conventional Style</b> shielded primary leads for AlphaRail</li> </ul>	198-2938 - right 198-2941 - left

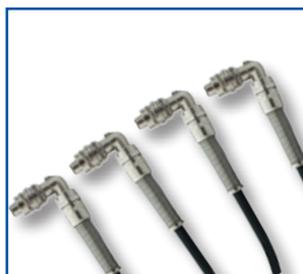
### Options available on included Primary Leads



AlphaRail Wiring Rail Assembly



Connecting Harness



New Flex Style Primary Leads



Conventional Style Primary Leads

### Wiring Rail Kits for WAUKESHA® VGF Series Gas Engines – Shielded Applications with CEC Ignition Controller

P/N	Description	Equivalent to
95.75.339	<b>Ignition wiring rail upgrade kit for WAUKESHA® VGF F18</b> <b>For use with existing WAUKESHA® CEC ignition controller</b> <ul style="list-style-type: none"> <li>• AlphaRail wiring rail and mounting brackets</li> <li>• Connecting harness, ignition controller to wiring rail</li> <li>• <b>New Flex Style</b> shielded primary leads for AlphaRail</li> </ul>	
95.75.340	<b>Ignition wiring rail upgrade kit for WAUKESHA® VGF H24</b> <b>For use with existing WAUKESHA® CEC ignition controller</b> <ul style="list-style-type: none"> <li>• AlphaRail wiring rail and mounting brackets</li> <li>• Connecting harness, ignition controller to wiring rail</li> <li>• <b>New Flex Style</b> shielded primary leads for AlphaRail</li> </ul>	



### Wiring Rail Kits for 12 Cylinder WAUKESHA® VHP ESM Series Engines

P/N	Description	Equivalent to
95.75.048-B	<b>Ignition wiring rail kit for 12 Cylinder WAUKESHA® VHP ESM Series Engines</b> <ul style="list-style-type: none"> <li>• AlphaRail wiring rails and mounting brackets</li> <li>• Connecting harness assembly, ESM to wiring rails</li> <li>• <b>New Flex Style</b> shielded primary leads for AlphaRail</li> </ul>	740283
95.75.048	<b>Ignition wiring rail kit for 12 Cylinder WAUKESHA® VHP ESM Series Engines</b> <ul style="list-style-type: none"> <li>• AlphaRail wiring rails and mounting brackets</li> <li>• Connecting harness assembly, ESM to wiring rails</li> <li>• <b>Conventional Style</b> shielded primary leads for AlphaRail</li> </ul>	740283

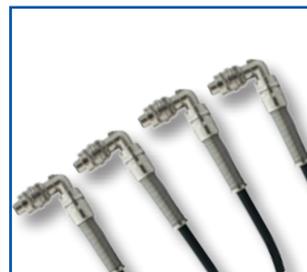
#### Options available on included Primary Leads



AlphaRail Wiring Rail



Connecting Harness Assembly



New Flex Style Primary Leads



Conventional Style Primary Leads

# IGNITION WIRING RAILS & HARDWARE



## Upgrade Kits for WAUKESHA® VHP G/ GU/ GSI 12 Cylinder Engines – Ignition and Detonation Control

P/N	Description
95.75.120-12	<p><b>Shielded ignition control upgrade kit for WAUKESHA® VHP G/GU/GSI 12 cylinder engines</b></p> <ul style="list-style-type: none"> <li>• MIC4 series ignition controller</li> <li>• 3 pickup arrangement (1 Hall effect, 2 magnetic) incl. shielded pickup leads, trigger disc and hub</li> <li>• Output wiring and junction box with fittings to connect ignition controller and wiring rails</li> <li>• AlphaRail wiring rails with hardware kit</li> <li>• High energy integral ignition coils</li> <li>• <b>New Flex Style</b> primary leads for connection of wiring rails and integral ignition coils</li> </ul>
77.75.120-12	<p><b>Unshielded ignition control upgrade kit for WAUKESHA® VHP G/GU/GSI 12 cylinder engines</b></p> <ul style="list-style-type: none"> <li>• MIC4 series ignition controller</li> <li>• 3 pickup arrangement (1 Hall effect, 2 magnetic) incl. shielded pickup leads, trigger disc and hub</li> <li>• Output wiring and junction box with fittings to connect ignition controller and wiring rails</li> <li>• AlphaRail wiring rails with hardware kit</li> <li>• High energy ignition coils</li> <li>• Primary lead and mounting kits for connection of wiring rails and ignition coils</li> <li>• PolyMot™ high tension leads</li> </ul>
95.75.121-12	<p><b>Shielded ignition control upgrade kit for WAUKESHA® VHP G/GU/GSI 12 cylinder engines</b>  <b>For use with existing WAUKESHA® CEC ignition controller</b></p> <ul style="list-style-type: none"> <li>• Output wiring and junction box with fittings to connect CEC ignition controller and wiring rails</li> <li>• AlphaRail wiring rails with hardware kit</li> <li>• Integral ignition coils to work with CEC Spark Reference System</li> <li>• <b>New Flex Style</b> primary leads for connection of wiring rails and integral ignition coils</li> </ul>
77.75.121-12	<p><b>Unshielded ignition control upgrade kit for WAUKESHA® VHP G/GU/GSI 12 cylinder engines</b>  <b>For use with existing WAUKESHA® CEC ignition controller</b></p> <ul style="list-style-type: none"> <li>• Output wiring and junction box with fittings to connect CEC ignition controller and wiring rails</li> <li>• AlphaRail wiring rails with hardware kit</li> <li>• Ignition coils to work with CEC Spark Reference System</li> <li>• Primary lead and mounting kits for connection of wiring rails and ignition coils</li> <li>• PolyMot™ high tension leads</li> </ul>
43.00.421-12	<p><b>Detonation control upgrade kit for WAUKESHA® VHP G/GU/GSI/GL 12 cylinder engines</b></p> <ul style="list-style-type: none"> <li>• DetCon20 detonation controller with 20 inputs</li> <li>• Harnesses to connect detonation controller and wiring rails</li> <li>• AlphaRail wiring rails with hardware kit</li> <li>• Leads for connection of wiring rails and detonation sensors</li> <li>• Detonation sensors to monitor each cylinder individually</li> <li>• Prepared cylinder head cap screws for each detonation sensor available on request</li> </ul>

## Ignition Kits For unshielded Applications

UNSHIELDED

### Ignition Kits for MAN® Gas Engines

P/N	Engine Model	Ignition Controller	Wiring Rail Type	Ignition Coil	High Tension Lead	Pickup	Mounting Kit for Wiring Rail <sup>1)</sup>
75.00.481	E0834E302/312/LE302	MIC3 series	LiteRail	06.50.300	06.85.839H-22	66.60.003-60	75.41.006
75.00.501	E0834E302/312/LE302	MIC4 series	LiteRail	06.50.104	06.85.839H-22	66.60.003-60	75.41.006
75.00.482	E0836E302/312	MIC3 series	LiteRail	06.50.300	06.85.839H-16	66.60.003-60	75.41.011
75.00.502	E0836E302/312	MIC4 series	LiteRail	06.50.104	06.85.839H-16	66.60.003-60	75.41.011
75.00.483	E0836LE202	MIC3 series	LiteRail	06.50.300	06.85.836H-16	66.60.003-60	75.41.011
75.00.503	E0836LE202	MIC4 series	LiteRail	06.50.104	06.85.836H-16	66.60.003-60	75.41.011
75.00.484	E2876E302/312/TE302	MIC3 series	LiteRail	06.50.300	06.85.836H-16	66.60.003-60	75.41.005
75.00.504	E2876E302/312/TE302	MIC4 series	LiteRail	06.50.104	06.85.836H-16	66.60.003-60	75.41.005
75.00.485	E2676LE202/212	MIC3 series	LiteRail	06.50.300	06.85.929-20	66.60.003-60	75.41.003
75.00.505	E2676LE202/212	MIC4 series	LiteRail	06.50.104	06.85.929-20	66.60.003-60	75.41.003
75.00.486	E2876LE202/212/302	MIC3 series	LiteRail	06.50.300	06.85.836H-16	66.60.003-60	75.41.014
75.00.506	E2876LE202/212/302	MIC4 series	LiteRail	06.50.104	06.85.836H-16	66.60.003-60	75.41.014
75.00.487	E2848LE322	MIC3 series	LiteRail	06.50.300	06.85.836H-16	66.60.003-100	75.41.002
75.00.507	E2848LE322	MIC4 series	LiteRail	06.50.104	06.85.836H-16	66.60.003-100	75.41.002
75.00.488	E2842E/LE312	MIC3 series	LiteRail	06.50.300	06.85.836H-16	66.60.003-100	75.41.013
75.00.508	E2842E/LE312	MIC4 series	LiteRail	06.50.104	06.85.836H-16	66.60.003-100	75.41.013
75.00.489	E2842LE202/322/332	MIC3 series	LiteRail	06.50.300	06.85.836H-16	66.60.003-100	75.41.001
75.00.509	E2842LE202/322/332	MIC4 series	LiteRail	06.50.104	06.85.836H-16	66.60.003-100	75.41.001
75.00.491	E3268LE212/222	MIC3 series	LiteRail	06.50.300	06.85.959-18	66.60.003-60 (2x)	75.41.023
75.00.511	E3268LE212/222	MIC4 series	LiteRail	06.50.104	06.85.959-18	66.60.003-60 (2x)	75.41.023
75.00.490	E3262LE202/212	MIC3 series	LiteRail	06.50.300	06.85.959-18	66.60.003-60 (2x)	75.41.023
75.00.510	E3262LE202/212	MIC4 series	LiteRail	06.50.104	06.85.959-18	66.60.003-60 (2x)	75.41.023

<sup>1)</sup> Mounting kits for wiring rails are not included in scope of supply and need to be ordered separately.

### Ignition Kits for LIEBHERR® Gas Engines

P/N	Engine Model	Ignition Controller	Wiring Rail Type	Ignition Coil	Spark Plug <sup>1)</sup>	Pickup <sup>2)</sup>	Mounting Kit for Wiring Rail
75.00.433	G944	MIC4 series	AlphaRail	06.50.104	not included	LIEBHERR® pickup	75.41.010
75.00.434	G946	MIC4 series	AlphaRail	06.50.104	not included	LIEBHERR® pickup	75.41.008
75.00.435	G9508	MIC4 series	AlphaRail	06.50.104	not included	LIEBHERR® pickup	75.41.022
75.00.436	G9512	MIC4 series	AlphaRail	06.50.104	not included	LIEBHERR® pickup	75.41.021

<sup>1)</sup> MOTORTECH XT L PLUG P/N B432BEX9-A107 has to be ordered separately in required quantity.

<sup>2)</sup> Scope of supply only includes pickup wiring.



# IGNITION TOOLS & TEST EQUIPMENT



## SparkView MOTORTECH 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. With a measuring clamp or cable and the display for up to 40 kV, it is easy to determine the condition of the spark plugs and the time at which they need to be replaced. This guarantees a constant performance of the engine and a maximum utilization of the spark plugs.

Quick and comfortable monitoring on a running engine makes it possible to detect

- Wear of spark plugs
- Failure of the ignition system (damaged ignition coil, spark plug lead or ignition controller)
- Faulty compression of a cylinder



### SparkView – High Voltage Indicator

P/N	Figure	Description
06.90.099-100	<a href="#">1</a>	SparkView high voltage indicator incl. SparkScan1 high voltage clamp P/N 06.90.100
06.90.099-105	<a href="#">2</a>	SparkView high voltage indicator incl. BNC cable P/N 06.90.105



# SparkScan1

MOTORTECH HIGH VOLTAGE CLAMP

SparkScan1 is designed for operators who want to monitor their high voltage traces in a simple way. The inductive high voltage clamp is connected to a Scope. When attaching the clamp to a conventional spark plug wire (7mm), the probe measures the high voltage pulse and via scope screen the operator can analyse the trace. Measuring high voltage peak (kV) and spark duration ( $\mu$ sec) of all cylinders of an engine in a routine manner, will allow preventive maintenance of the equipment.



## SparkScan1 – High Voltage Clamp

P/N	Description	Length
06.90.100	SparkScan1 high voltage clamp	2.0 m/7.0 ft.

## Scope Meter – Digital Oscilloscope

The Digital scopemeter is a compact 20 MHz or 40MHz two channel scope. Ideal for troubleshooting of industrial machinery, instrumentation, control and power systems. The Scopemeter has unique features like connect-and-view and trendplot that simplify taking measurements and reduce troubleshooting time when working in the field or in industrial environments.



## Digital Scope Meter

P/N	Description
06.98.005-110	Digital scope meter - 110V
06.98.005-220	Digital scope meter - 220V

## BNC Cable for use with SparkView or Scope Meter

P/N	Description	Length
06.90.105	BNC cable	2.0 m/7.0 ft.



# IGNITION TOOLS & TEST EQUIPMENT



MOTORTECH IGNITION COIL TESTER

This test equipment is designed to offer service companies a professional tool to test all different kinds of ignition coils that were sold by engine manufacturers or aftermarket companies. A built in CD ignition, high voltage clamp and a spark gap allow realistic testing.



## Ignition Coil Tester

P/N	Description
06.98.054	Ignition coil tester incl. adaptor kits for popular ignition coils

## Adaptor Kits<sup>1)</sup> – Standard – including Teflon Ignition Coil Adaptors and Connecting Leads

P/N	Description	Connections of included Lead	
		Ignition Coil	Ignition Coil Tester
06.98.054-1	Adaptor kit - CATERPILLAR® ignition coils	DEUTSCH® connector	XLR connector
06.98.054-2	Adaptor kit - ALTRONIC® style ignition coils	2 pole	XLR connector
06.98.054-3	Adaptor kit - MOTORTECH style ignition coils	2 pole	XLR connector
06.98.054-4	Adaptor kit - Flange ignition coils	MIL Style 3 pole socket, 180°	XLR connector
06.98.054-5	Adaptor kit - Integral ignition coils, outer thread	MIL Style 2/3 pole socket, 180°	XLR connector
06.98.054-6	Adaptor kit - Integral ignition coils, inner thread	MIL Style 2/3 pole socket, 180°	XLR connector
06.98.054-7	Adaptor kit - Externally mounted ignition coils	MIL Style 2/3 pole socket, 180°	XLR connector

<sup>1)</sup> All adaptor kits included in ignition coil tester.

## Adaptor Kits – Special – including Connecting Leads

P/N	Description	Connections of included Lead	
		Ignition Coil	Ignition Coil Tester
06.70.192-5	Adaptor kit - CUMMINS® ignition coil P/N 3964547	4 pole, 180°	XLR connector
06.70.192-6	Adaptor kit - GE JENBACHER® ignition coil P/N 369083	4 pole, 180°	XLR connector



**MOTORTECH IGNITION PICKUP SIMULATOR**

Anyone trying to troubleshoot electronic ignition systems has come to the conclusion that there are so many different things that can create problems.

The ignition pickup simulator allows the operator to simulate all pickup signals that are supposed to be generated by the different pickups installed on flywheel and camshaft. This way the ignition can actually be triggered with the appropriate amount of trigger events while the engine is not cranking. The IPS can be programmed for single and multiple pickup signal frequency.

A variety of adaptor harnesses is available to allow use of the IPS with different ignition controller brands and models.



**IPS – Ignition Pickup Simulator**

P/N	Description
07.98.047	IPS Ignition Pickup Simulator

**Adaptor Harnesses<sup>1)</sup> for IPS Ignition Pickup Simulator**

P/N	IPS Adaptor Harness for use with
07.70.001	WOODWARD® IC9xx series
07.70.002-1	MOTORTECH MIC500 series (P/N 06.00.508), WOODWARD® IC100 series with inductive pickup
07.70.002-2	MOTORTECH MIC500 series (P/N 06.00.508), WOODWARD® IC100 series with Hall effect pickup
07.70.002-3	MOTORTECH MIC500 series (P/N 06.00.508), WOODWARD® IC100 series with magnetic pickup
07.70.003	MOTORTECH MIC500 series (P/N 06.00.510)
07.70.004	MOTORTECH MIC500 series (P/N 06.00.513, 06.00.514), ALTRONIC® DIS & DISN, CATERPILLAR® 163-6164, 163-6108
07.70.005	FAIRBANKS MORSE® IQ250 series
07.70.006	ALTRONIC® CPU95 series
07.70.009	MOTORTECH MIC500 series (P/N 06.00.511)
07.70.010	MOTORTECH MIC500 series (P/N 06.00.515-6, 06.00.515-8, 06.00.516, 06.00.517), WAUKESHA® CEC (VHP/VGF series)
07.70.011	MOTORTECH MIC3 series (P/N 66.00.310-6/-12), MIC4 series (P/N 66.00.424-8/-16), MIC5 series (P/N 66.00.541-20)
07.70.012	FAIRBANKS MORSE® IQ750 series
07.70.013	MOTORTECH MIC500 series (P/N 06.00.520, 06.00.525, 06.00.530)
07.70.014	MOTORTECH MIC850 series
07.70.015	MOTORTECH MIC4 series (66.00.400-/410-/440-8/-16), MIC5 series (P/N 66.00.540-20, 66.00.542-20)

<sup>1)</sup> Need to be ordered separately.

# IGNITION TOOLS & TEST EQUIPMENT

## Test Adaptor for MIC3, MIC4 and MIC5 Series Ignition Controller

To enable operators and service personnel to check input signals to the ignition controller in a simple way, MOTORTECH offers a Test Adaptor that links between the 35 pole input connector and the appropriate harness.

Terminals located around the test box allow easy access to each input signal entering the ignition controller. By use of a commonly used Digital Scope Meter, the following signals can be checked:

- Input voltage
- Analog input signal (4-20mA)
- Pickup signals
- Start/Stop signal
- Go/NoGo signal
- Timing schedule selection switch (A/B)



P/N	Description	For use with specific controllers
06.98.130	Test adaptor	MIC3 (P/N 66.00.310-6/-12) MIC4 (P/N 66.00.424-8/-16) MIC5 (P/N 66.00.541-20)



# ScopeLite

MOTORTECH 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 conventional or MOT-Blues shielded spark plug leads. The signal is processed by the timing light and via LED technology a sequence of flashes is generated. On applications where MOTORTECH flange ignition coils with diagnostic interface are used, the ScopeLite can be attached directly to the BNC connector of the ignition coil.

Even on applications with integral or standard flange ignition coils, the clamp can be attached to the shielded primary lead. When timing is checked on engines with non-shielded spark plug leads, a selector switch needs to be pushed which then steps down sensitivity. The automatic time based shut-off function saves the 2 built in 9 V batteries in case the operator forgets to turn off power.

Make it easy and safe for the operator!



## ScopeLite – MOTORTECH Timing Light

P/N	Description
06.98.100-200	ScopeLite LED timing light, incl. clamp, 200 in. standard connecting lead and carrying case

## Connecting leads (Standard and Non Standard Lengths<sup>1)</sup>)

P/N	Description	Length
06.90.104-100	ScopeLite connecting lead	100 in.
06.90.104-200	ScopeLite connecting lead	200 in.
06.90.104-300	ScopeLite connecting lead	300 in.
06.90.104-400	ScopeLite connecting lead	400 in.
06.90.104-600	ScopeLite connecting lead	600 in.

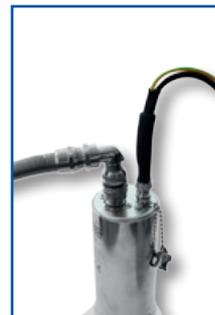
<sup>1)</sup> If non standard length is required, please order separately from above chart.



Use with MOT-Blues shielded spark plug leads.



Use with conventional shielded spark plug leads.



Use with MOTORTECH flange ignition coils with diagnostic interface or with shielded primary lead.



# IGNITION TOOLS & TEST EQUIPMENT

## Timing Light – Conventional Style

P/N	Description	Length
06.98.043-10	Timing light	3.0 m/10.0 ft.
06.98.043-30	Timing light	10.0 m/30.0 ft.



## Digital Protractor

The digital protractor is a compact rotational angle measuring tool. The unit is equipped with magnets for easy and flexible installation on flywheel, camshaft, pulley or any other rotating gear.

P/N	Description
06.98.096	Digital protractor



## Spark Plug Lead Removal Tool for MAN® Gas Engines

P/N	Description
44.99.918	Spark plug lead removal tool for MAN® gas engines



## Installation Tool for Reluctor Pin

P/N	Description
44.99.011	Installation tool for reluctor pin P/N 06.80.104

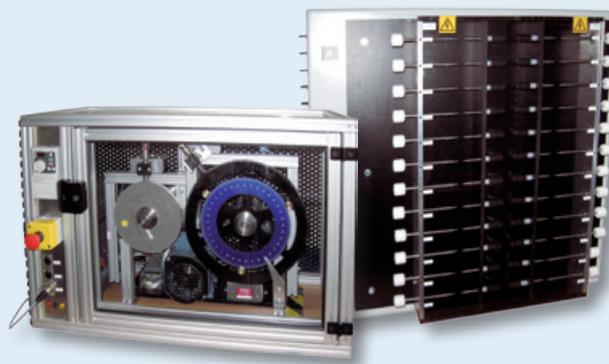


## Workshop Equipment

P/N	Figure	Description
06.05.903-1	1	Spark plug test stand for M14, M18 and 7/8" spark plugs
06.05.904-1	2	Engine simulator with 24 ignition coil rack



1



2

### Harness Connector Assembly Tools

P/N	Figure	Description
06.98.011	4	Crimping tool for stainless steel wire studs
06.98.017	1	Extraction tool for ITT® contacts “16S”
06.98.046	7	Installation tool for MIL style connector pins
06.98.051	6	Removal tool for MIL style connector pins

### High Tension Lead Assembly Tools

P/N	Figure	Description
06.98.011	4	Crimping tool for stainless steel wire studs
06.98.013	5	Crimping tool for P/N 06.80.116
06.98.019	2	Assembly tool for P/N 06.98.109
06.98.047	3	Crimping tool for P/N 06.80.126 (crimping tool insert P/N 06.98.048 already included)
06.98.048	8	Crimping tool insert for P/N 06.98.047 to crimp terminal P/N 06.80.126
06.98.050	9	Crimping tool insert for P/N 06.98.047 to crimp terminal P/N 22.85.802 and P/N 22.85.803



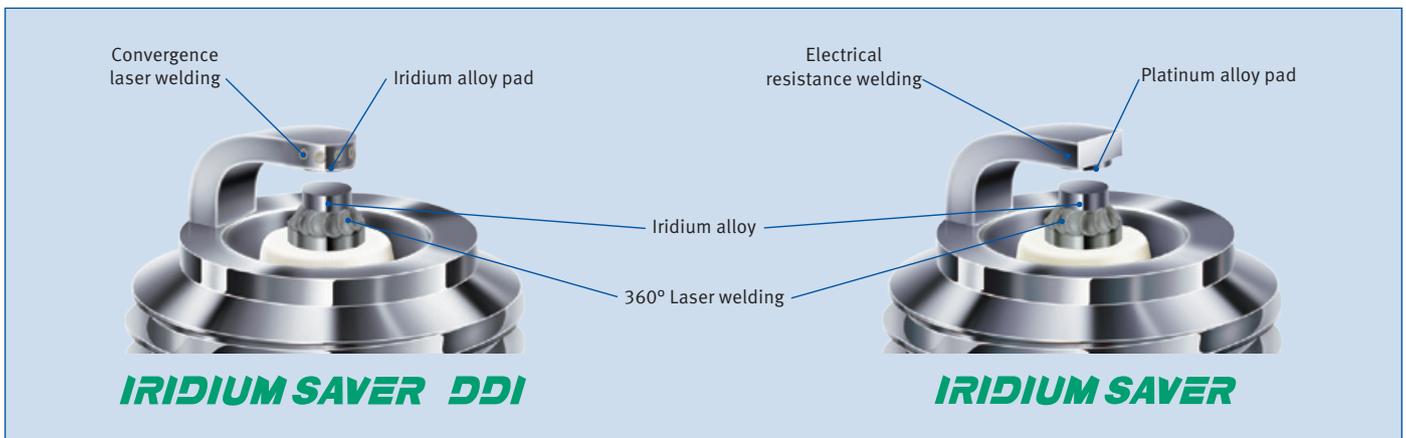
# SPARK PLUGS & ACCESSORIES



Key to high reliability

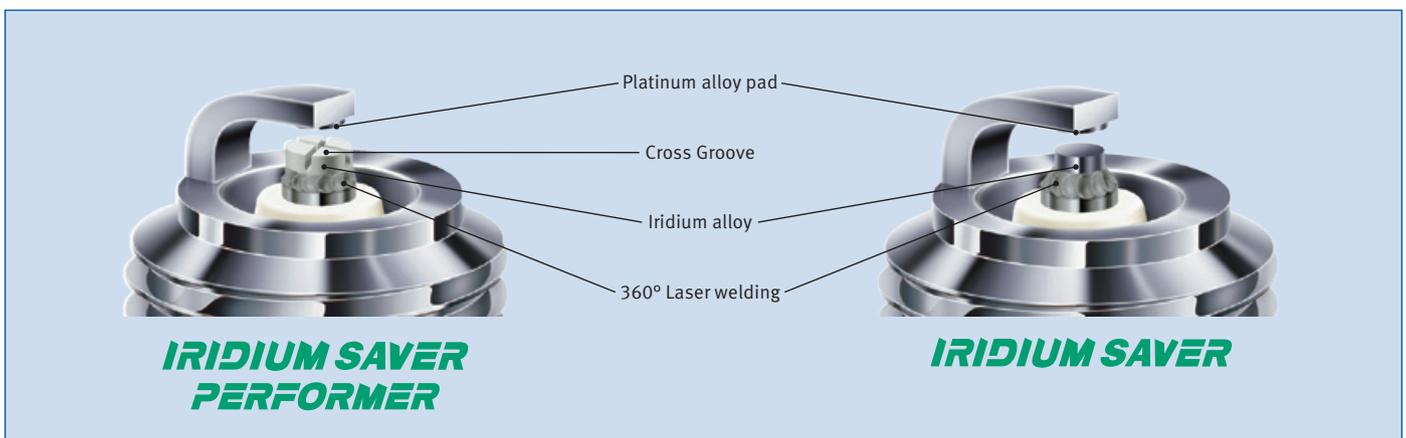
## The DDI's key to long plug life

DENSO has launched the latest generation of hard-wearing spark plugs – the DENSO DOUBLE IRIDIUM (DDI) spark plug. DDI spark plug technology improves and extends the spark plug's lifespan and requires significantly less maintenance than competitor spark plugs. The DDI spark plug is particularly effective when used in biogas engines. Try DENSO DDI spark plugs today.



## The SAVER's key to long plug life

DENSO's OEM expertise and commitment to innovation enables them to remain at the forefront of cutting-edge gas engine spark plug development. The unique and specialist technology used in the Iridium Saver and Iridium Saver Performer spark plugs range extends their lifespan, making them ideal for high-compression lean-burn engines. Iridium Saver and Iridium Performer spark plugs also help to maximise engine performance and deliver extra durability. Because they require minimal maintenance compared to standard plugs, Iridium Saver and Iridium Saver Performer spark plugs increase service interval times.



## Specifications and Cross References

for Gas Engines

**G I 3 - 1 (A)**

Installation Dimension and Tightening Torque					
No	Thread	Hex Size	Reach	Torque	
E	M14x1.25	20.8 mm	19 mm	with lubricant	20 Nm, 15 lb-ft
N			12.7 mm		
K		16 mm	19 mm	without lubricant	30 Nm, 22 lb-ft
L	M18x1.5	20.8 mm	20.6 mm	with lubricant	30 Nm, 22 lb-ft
I					
T		13.8 mm			

Initial Gap	
No	Normal Value
3	0.3 mm
4	0.4 mm
5	0.5 mm

Terminal Design		
No	SPEC.	
	none	solid
A	with nut	

Electrode Design	
1. <b>IRIDIUM SAVER</b>	
Iridium pad without cross groove on center electrode and Platinum pad on ground electrode.	
3. <b>IRIDIUM SAVER</b> For vehicle.	
5. <b>IRIDIUM SAVER DDI</b>	
Iridium pad without cross groove on center electrode and Iridium pad on ground electrode.	
1. <b>IRIDIUM SAVER PERFORMER</b>	
Iridium pad with cross groove on center electrode and Platinum pad on ground electrode.	
3. <b>IRIDIUM SAVER</b>	
Iridium pad without cross groove on center electrode and Platinum pad on ground electrode.	
5. <b>IRIDIUM SAVER DDI</b>	
Iridium pad without cross groove on center electrode and Iridium pad on ground electrode.	

## Cross References

	CHAMPION®	STITT®	ALTRONIC®	BERU®	IRIDIUM SAVER	IRIDIUM SAVER DDI	IRIDIUM SAVER PERFORMER
M14	RN79G (0.015)	407XL, R407XL	J1463DP	14R-3CPU, 14-3CPU, 14R-5DPU, 14R-4CDP	GE3-1	GE3-5	
	RN79G (0.020)			14R-4CIU (Z187), 14R-4CIU2 (Z215), 14R-4DIU2 (Z258), 14R-4DIU3, 14GZ-LL		GE3-5	
	RC78PYP, RC78PYP15			14FR-4DPUO	GK3-1	GK3-5	
	RC78WYP15			14FR-4DIU, 14GZ-LL-FR			
	RL85G, RL15B	407L, R407L	J1443DP	14R-5BPU, 14R-4ADP, 14R-5BIU	GN3-1		
M18	FB77WPCC, RB77WPCC, KB77WPCC, RB77CC, PB78WPC		L1863IP	18GZ4-77, 18GZ6-77-2	GI3-3	GI3-5	GI3-1
	RB75N, RB75PP	R807LL	L1863B, L1863DP	18GZ20	GI3-3	GI3-5	GI3-1
	RB75WPCC-1			18GZ5-77-2	GL3-3	GL3-5	GL3-1
	RB76N, RB76PP	R807LL		18GZ7	GI3-3	GI3-5	GI3-1
	RM77N	807, 827, 847, U827, U847	L1843B	18GZ22			GT3-1
	RM77PP		L1843IP				

# SPARK PLUGS & ACCESSORIES



## MOTORTECH Extended Barrel Spark Plugs

For certain applications extended barrel plugs are required. For example when the operator cannot get a conventional spark plug down the narrow spark plug well, he will need a special product that allows him to torque the plug from the top end. MOTORTECH offers an improved product to the market. Several of the known problems of products made by competitors are eliminated.

### Features

- No more trapped air in the extension barrel
- No more condensation
- No internal flash over
- Built in ceramics
- High dielectric strength
- Rigid welds

Besides an increase in reliability the spark plug runtime needed to be extended. To achieve this, MOTORTECH uses base plugs with Iridium alloy (J-Type) or Nickel/Aluminum alloy (X-Type) on center & ground electrode. MOTORTECH extended barrel spark plugs can be ordered in different lengths, terminal styles or with an integrated spark plug wire.



The **J-Type** ground electrode ensures better combustion, particularly on lean burn gas engines.



The alternative **X-Type** double-stage electrodes are ideally suited for slow-speed gas engines.

## XT-Plugs

MOTORTECH EXTENDED BARREL SPARK PLUGS

MOTORTECH XT-PLUGS are available with three different terminal styles to be connected directly to a spark plug lead or a short integral ignition coil.



The **“S2-Type”** has a 3/4 in. male thread and used to be called the AIRCRAFT STYLE spark plug. This spark plug is designed to be connected to a shielded spark plug lead.



The **“DCP-Type”** has a female thread to adapt to a short integral ignition coil. This combination is popular in some applications, where customers have had bad experiences with shielded spark plug leads.



The **“C-Type”** is an extended barrel plug that has a conventional ceramic insulator on the top end. This allows the use of a standard spark plug boot. Preferable a connector that includes a 5 kΩ resistor to suppress the RFI.

### Specification Table



P/N **A** **B** **C** **D** **E** - **F**

A	Spark Plug Style
C	C-Type - for use with high tension lead
DCP	DCP-Type - for use with integral ignition coil
S2	S2-Type - for use with shielded spark plug lead, unshielded safety lead

B	C	D	Thread Size	Thread Reach	Electrode Design
B4	1	2	M14x1.25	0.500 in.	J-Type
B4	3	2	M14x1.25	0.750 in.	J-Type
B8	1	1	M18x1.5	0.500 in.	X-Type
B8	1	2	M18x1.5	0.500 in.	J-Type
B8	3	1	M18x1.5	0.750 in.	X-Type
B8	3	2	M18x1.5	0.750 in.	J-Type
B8	4	2	M18x1.5	0.875 in.	J-Type
B8	5	2	M18x1.5	1.000 in.	J-Type
B7	3	1	7/8-18	0.750 in.	X-Type
B7	3	2	7/8-18	0.750 in.	J-Type

E	Extended Barrel Length – Other lengths available on request
BEX6	6 in.
BEX8	8 in.
BEX10	10 in.
BEX12	12 in.
BEX16	16 in.

*optional*

F	Electrode Gap
010	0.010 in./0.25 mm
012	0.012 in./0.30 mm
014	0.014 in./0.35 mm

Recommended Tightening Torque <sup>1)</sup>		
Thread Size	Tightening Torque (Cast Iron Head)	
M14x1.25	30-40 Nm	22-30 lb-ft
M18x1.5	50-60 Nm	37-44 lb-ft
7/8-18	70-80 Nm	52-59 lb-ft

<sup>1)</sup> Please observe the tightening torques rendered by each engine manufacturer.

Conversion 1 inch = 25,4 mm / 1 foot = 0,3 m

# SPARK PLUGS & ACCESSORIES



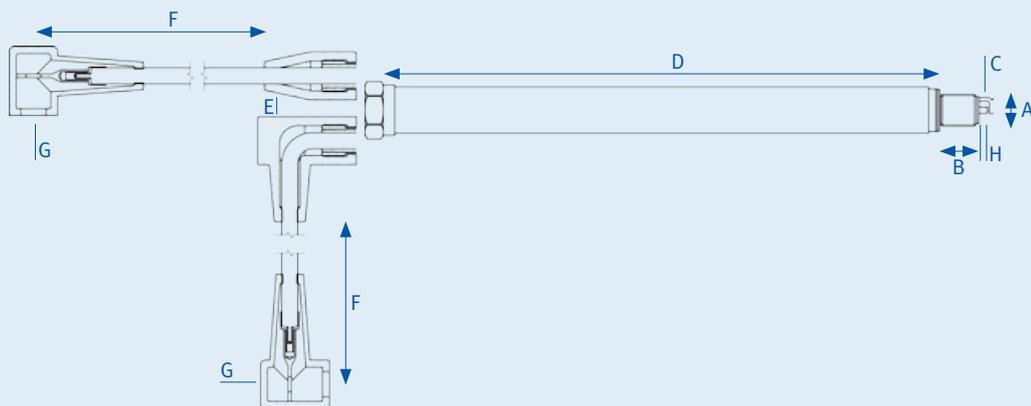
UNSHIELDED

## XTL-Plugs

MOTORTECH EXTENDED BARREL SPARK PLUGS

Based on the concept of the extended barrel spark plugs, MOTORTECH offers another style of spark plug. MOTORTECH XTL-PLUGS are manufactured with an integrated 7 mm spark plug lead, which allows a direct connection to an externally mounted ignition coil.

MOTORTECH XTL-PLUGS can be ordered with different barrel and lead lengths, different lead outputs from the barrel and a wide range of ignition coil connectors. This guarantees a custom-made spark plug which definitely fits your application.



Available Connectors to Ignition Coil



5A = ALTRONIC® style; 5B = BENDIX® style; 5C = MOTORTECH style

Specification Table – for unshielded Applications

P/N A B C D - E F G - H

A	B	C	Thread Size	Thread Reach	Electrode Design
B4	1	2	M14x1.25	0.500 in.	J-Type
B4	3	2	M14x1.25	0.750 in.	J-Type
B8	1	1	M18x1.5	0.500 in.	X-Type
B8	1	2	M18x1.5	0.500 in.	J-Type
B8	3	1	M18x1.5	0.750 in.	X-Type
B8	3	2	M18x1.5	0.750 in.	J-Type
B8	4	2	M18x1.5	0.875 in.	J-Type
B8	5	2	M18x1.5	1.000 in.	J-Type
B7	3	1	7/8-18	0.750 in.	X-Type
B7	3	2	7/8-18	0.750 in.	J-Type

D	Extended Barrel Length – Other lengths available on request
BEX6	6 in.
BEX8	8 in.
BEX10	10 in.
BEX12	12 in.
BEX16	16 in.

E	Lead Output from Extended Barrel
A	90°
B	180°

F	Lead length – Other lengths available on request
8	8 in.
10	10 in.
12	12 in.
14	14 in.
16	16 in.
18	18 in.

G	Connector to Ignition Coil
1	Non CSA ALTRONIC® Style - male, 180°
1A	Non CSA ALTRONIC® Style - female, 180°, with spreading adaptor
2	Non CSA MOTORTECH Style - M6, 90°
3	Non CSA ALTRONIC® Style - male, 180°
4	Non CSA ALTRONIC® Style - female, 90°
5A	CSA ALTRONIC® Style - Externally Mounted - 3/4-20 UNEF
5B	CSA BENDIX® Style - Externally Mounted - 3/4-20 UNEF
5C	CSA MOTORTECH Style - Externally Mounted - 1-20 UNEF
6	Non CSA ALTRONIC® Style - male, 90°
7	Non CSA New MOTORTECH Style - M6, 180°
8	Non CSA ALTRONIC® Style - female, 90°
9	Non CSA FM®-Style - male - no boot
10	CSA MOTORTECH Style - Igniter Assy, 180°

Recommended Tightening Torque <sup>1)</sup>		
Thread Size	Tightening Torque (Cast Iron Head)	
M14x1.25	30-40 Nm	22-30 lb-ft
M18x1.5	50-60 Nm	37-44 lb-ft
7/8-18	70-80 Nm	52-59 lb-ft

<sup>1)</sup> Please observe the tightening torques rendered by each engine manufacturer.

*optional*

H	Electrode Gap
010	0.010 in./0.25 mm
012	0.012 in./0.30 mm
014	0.014 in./0.35 mm

Conversion 1 inch = 25,4 mm / 1 foot = 0,3 m

# SPARK PLUGS & ACCESSORIES



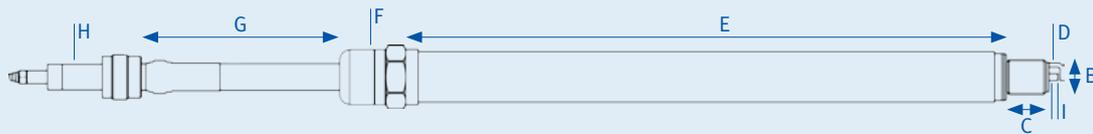
## SHIELDED

### XTL-Plugs

MOTORTECH EXTENDED BARREL SPARK PLUGS

MOTORTECH XTL-PLUGS are also available for shielded applications. To meet CSA requirements, this type of spark plug is fitted with an integrated and specially designed spark plug lead. This is also known from MOTORTECH's MOT-Blues high tension leads. The multi layer design ensures that no humidity can be trapped in the lead.

MOTORTECH XTL-PLUGS can be ordered with different barrel and lead lengths and suitable ignition coil connectors, to allow direct connection to a shielded ignition coil. This guarantees a custom-made spark plug which definitely fits your application.



The specially designed spark plug lead consists of a multi layer design:

- Nickel plated copper core
- 2 layers of silicone
- Stainless steel braid
- Silicone jacket

Specification Table – for shielded Applications

P/N **A** **B** **C** **D** **E** **F** **G** **H** **I**

A	Spark Plug Style
I	Shielded Application

B	C	D	Thread Size	Thread Reach	Electrode Design
B4	1	2	M14x1.25	0.500 in.	J-Type
B4	3	2	M14x1.25	0.750 in.	J-Type
B8	1	1	M18x1.5	0.500 in.	X-Type
B8	1	2	M18x1.5	0.500 in.	J-Type
B8	3	1	M18x1.5	0.750 in.	X-Type
B8	3	2	M18x1.5	0.750 in.	J-Type
B8	4	2	M18x1.5	0.875 in.	J-Type
B8	5	2	M18x1.5	1.000 in.	J-Type
B7	3	1	7/8-18	0.750 in.	X-Type
B7	3	2	7/8-18	0.750 in.	J-Type

E	Extended Barrel Length – Other lengths available on request
BEX6	6 in.
BEX8	8 in.
BEX10	10 in.
BEX12	12 in.
BEX16	16 in.

F	Lead Output from Extended Barrel
B	180°

G	Lead length – Other lengths available on request
8	8 in.
10	10 in.
12	12 in.
14	14 in.
16	16 in.
18	18 in.

Recommended Tightening Torque <sup>1)</sup>		
Thread Size	Tightening Torque (Cast Iron Head)	
M14x1.25	30-40 Nm	22-30 lb-ft
M18x1.5	50-60 Nm	37-44 lb-ft
7/8-18	70-80 Nm	52-59 lb-ft

<sup>1)</sup> Please observe the tightening torques rendered by each engine manufacturer.

H	Connector to Ignition Coil	
5A	CSA	ALTRONIC® Style - Externally Mounted - 3/4-20 UNEF
5B	CSA	BENDIX® Style - Externally Mounted - 3/4-20 UNEF
5C	CSA	MOTORTECH Style - Externally Mounted - 1-20 UNEF

*optional*

I	Electrode Gap
010	0.010 in./0.25 mm
012	0.012 in./0.30 mm
014	0.014 in./0.35 mm

# SPARK PLUGS AND ACCESSORIES

## MOTORTECH ICP Spark Plugs with Dual Thread for use with Integral Ignition Coils

For operators who prefer to use a long integral ignition coil, MOTORTECH manufactures the dual threaded spark plugs. These are available in M14 and M18 thread sizes. All plugs have iridium center and ground electrodes. For years these plugs have been successfully operated worldwide.



P/N <sup>1)</sup>	Description	Thread Size	Thread Reach	Electrode Design	Hex	Thread Size Ignition Coil	Equivalent to
ICPB412	ICP spark plug	M14x1.25	0.500 in.	J-Type - IR/IR	15/16 in.	13/16-20 UNEF	RTL85G, 9Y3985
ICPB432	ICP spark plug	M14x1.25	0.750 in.	J-Type - IR/IR	15/16 in.	13/16-20 UNEF	RTN79G, 4W2256
ICPB812	ICP spark plug	M18x1.5	0.500 in.	J-Type - IR/IR	15/16 in.	13/16-20 UNEF	RTM77N, RTM77PP, 60999G
ICPB832	ICP spark plug	M18x1.5	0.750 in.	J-Type - IR/IR	15/16 in.	13/16-20 UNEF	RTB77WPCC

<sup>1)</sup> MOTORTECH ICP spark plugs only available in packs of 4 pcs.



## Spark Plug Tools

### Spark Plug Gap Setting Tool – Basic Kits<sup>1)</sup>

P/N	Figure	Supersedes	Description
07.98.120-14	1	07.98.113	Spark plug gap setting tool – basic kit including thread adaptor for spark plugs with M14x1.25 thread
07.98.120-18	1	07.98.113	Spark plug gap setting tool – basic kit including thread adaptor for spark plugs with M18x1.5 thread
07.98.120-78	1	07.98.113	Spark plug gap setting tool – basic kit including thread adaptor for spark plugs with 7/8-18 thread

<sup>1)</sup> Needs appropriate accessory kit in addition.

### Thread Adaptors<sup>1)</sup>

P/N	Figure	Supersedes	Description
07.98.121-14	2		Thread adaptor for spark plugs with M14x1.25 thread
07.98.121-18	2		Thread adaptor for spark plugs with M18x1.5 thread
07.98.121-78	2		Thread adaptor for spark plugs with 7/8-18 thread

<sup>1)</sup> Can be ordered separately in addition to chosen basic kit.

### Accessory Kits<sup>1)</sup>

P/N	Figure	Supersedes	Description
07.98.122-A	3		Accessory kit for J-type spark plugs
07.98.122-B	3		Accessory kit for CHAMPION® N-type spark plugs
07.98.122-C	3		Accessory kit for BERU® spark plugs 18GZ44 (Z283), Super Blue Ignition (Z351)

<sup>1)</sup> Need to be ordered separately in addition to chosen basic kit.

### Feeler Gauges

P/N	Figure	Supersedes	Description	Size
07.98.037	4		Feeler gauge clamp tool	
07.98.059	5		Feeler gauge shim roll, 12.7 mm x 5.0 m	0.008/0.20 mm
07.98.034	5		Feeler gauge shim roll, 12.7 mm x 5.0 m	0.010/0.25 mm
07.98.035	5		Feeler gauge shim roll, 12.7 mm x 5.0 m	0.012/0.30 mm
07.98.036	5		Feeler gauge shim roll, 12.7 mm x 5.0 m	0.014/0.35 mm



# SPARK PLUGS & ACCESSORIES

## Spark Plug Cleaning Kit

Regular maintenance is required to achieve the maximum service life in particular with high price spark plugs with precious metal alloys.

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.



### Features

- Professional cleaning of spark plugs without pre-chamber
- Different nozzle sizes matching M14, M18 and 7/8" spark plugs
- Oil residues and deposits in the electrode area are removed without residues by high pressure
- Special blasting grit for gentle cleaning of the electrode and thread area
- Blasting grit is captured and can be reused
- No dust development

### Scope of Delivery

The spark plug cleaning kit is supplied with the following parts:

- Spark plug cleaning device with compressed air quick release coupling, blasting grit container and dust collector bag
- Cleaning nozzles for M14, M18 and 7/8" spark plugs
- Blasting grit, 1 kg, in separate container
- Operating manual
- Hard shell carrying case with foam insert



P/N	Supersedes	Description
44.01.023	44.01.000	Spark plug cleaning kit

### Subcomponents

P/N	Supersedes	Description
44.01.009		Blasting grit, 1 kg
44.01.024	44.01.005	Cleaning nozzles, kit for M14, M18 and 7/8" spark plugs
44.01.025	44.01.006	Dust collector bag for spark plug cleaning device

### Extended Barrel Magnetic Spark Plug Sockets – Standard Versions

P/N <sup>1)</sup>	Supersedes	Description	Hex	Drive
07.99.022-1-L	07.99.021-L	Magnetic spark plug socket	1 in.	1/2 in.
07.99.022-2-L	07.99.020-L	Magnetic spark plug socket	15/16 in.	1/2 in.
07.99.022-3-L	07.99.019-L	Magnetic spark plug socket	7/8 in.	1/2 in.
07.99.022-4-L	07.99.018-L	Magnetic spark plug socket	13/16 in.	1/2 in.
07.99.022-5-L		Magnetic spark plug socket	5/8 in.	1/2 in.

<sup>1)</sup> Standard barrel lengths ("L") = 6 in., 12 in., 16 in., 18 in. Other lengths available on request.



### Extended Barrel Magnetic Spark Plug Sockets – Special Versions

P/N	Supersedes	Description	Hex	Drive
07.99.022-3-36		Magnetic spark plug socket – NORDBERG®	7/8 in.	1/2 in.
07.99.022-6-6		Magnetic spark plug socket – MAN®	13/16 in.	1/2 in.
07.99.022-6-1		Magnetic spark plug socket – MAN®, LIEBHERR®	5/8 in.	1/2 in.

### Spark Plug Socket for XTL Spark Plugs

P/N	Supersedes	Description	Hex	Drive
07.99.022-6-2		Spark plug socket	7/8 in.	1/2 in.



### Torque Wrench

P/N	Supersedes	Description	Torque	Drive
07.98.065	07.98.063	Torque wrench	10 to 100 Nm / 7.4 to 74 ft./lb.	1/2 in.



# SPARK PLUGS & ACCESSORIES

## Seat & Thread Reconditioner

Use seat & thread reconditioner to clean cylinder threads and gasket seats in one operation.

P/N	Supersedes	Description	Thread Size	Thread Reach
07.98.114-12	07.98.022	Seat & thread reconditioner	M14x1.25	1/2 in.
07.98.114-34	07.98.023	Seat & thread reconditioner	M14x1.25	3/4 in.
07.98.118-12	07.98.024	Seat & thread reconditioner	M18x1.5	1/2 in.
07.98.118-34	07.98.025	Seat & thread reconditioner	M18x1.5	3/4 in.
07.98.178-58	07.98.026	Seat & thread reconditioner	7/8-18	5/8 in.
07.98.178-78	07.98.026-1	Seat & thread reconditioner	7/8-18	7/8 in.



## Extended Barrel Seat & Thread Reconditioners – 1/2 Inch Drive

P/N	Supersedes	Description	Thread Size	Thread Reach
07.98.114-12-BEX6		Seat & thread reconditioner, 6 in. length	M14x1.25	1/2 in.
07.98.114-12-BEX12		Seat & thread reconditioner, 12 in. length	M14x1.25	1/2 in.
07.98.114-34-BEX6		Seat & thread reconditioner, 6 in. length	M14x1.25	3/4 in.
07.98.114-34-BEX12		Seat & thread reconditioner, 12 in. length	M14x1.25	3/4 in.
07.98.118-12-BEX6		Seat & thread reconditioner, 6 in. length	M18x1.5	1/2 in.
07.98.118-12-BEX12		Seat & thread reconditioner, 12 in. length	M18x1.5	1/2 in.
07.98.118-34-BEX6		Seat & thread reconditioner, 6 in. length	M18x1.5	3/4 in.
07.98.118-34-BEX12		Seat & thread reconditioner, 12 in. length	M18x1.5	3/4 in.
07.98.178-58-BEX6		Seat & thread reconditioner, 6 in. length	7/8-18	5/8 in.
07.98.178-58-BEX12		Seat & thread reconditioner, 12 in. length	7/8-18	5/8 in.
07.98.178-78-BEX6		Seat & thread reconditioner, 6 in. length	7/8-18	7/8 in.
07.98.178-78-BEX12		Seat & thread reconditioner, 12 in. length	7/8-18	7/8 in.



## Installation & Service Kit for MOTORTECH XTL Spark Plugs

Spark plugs play a crucial role in an ignition system. Maintenance and, in particular, the correct handling of spark plugs is vital to ensure flawless functioning and long

service life. MOTORTECH provides an Installation and service kit that is specifically designed for XTL spark plugs with integrated ignition cable and M14 thread.

P/N	Description	For Spark Plugs with	
		Thread Size	Thread Reach
07.98.214-34	Installation & service kit for MOTORTECH XTL spark plugs	M14x1.25	3/4 in.

## Spark Plug Accessories

### Gaskets for Spark Plugs

P/N	Description	For Thread Size	Quantity
02.85.015-100	Spark plug gasket	M14x1.25	100 pcs.
02.85.016-100	Spark plug gasket	M18x1.5	100 pcs.
02.85.017-100	Spark plug gasket	7/8-18	100 pcs.



### Gaskets for MOTORTECH ICP Spark Plugs

P/N	Description	Quantity
75.90.295-100	Spark plug gasket, copper	100 pcs.



### Thread Lubricant

This lubricant is non-metallic and non-conductive. Guarantees easy spark plug removal and prevents thread damage. Also for use with seat & thread reconditioner.

P/N	Description
07.98.718	Thread lubricant (4 oz/115 g)



# GAS ENGINE CONTROL SYSTEMS



## DetCon

MOTORTECH DETONATION CONTROL SYSTEM

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 DetCon2 or DetCon20. Single cylinder sensors constantly monitor the sound level of the combustion chamber. If detonation is detected the system will take steps to eliminate detonation immediately.

Upgrade your engines and increase availability of the equipment!



### Detonation Sensor

Can be installed on cylinder head bolt or stud. Measures the detonation signal and transfers it to the controller.



### Detonation Software

DetCon comes with a WINDOWS® based software package that allows the operator to analyze all data in real time on his PC.

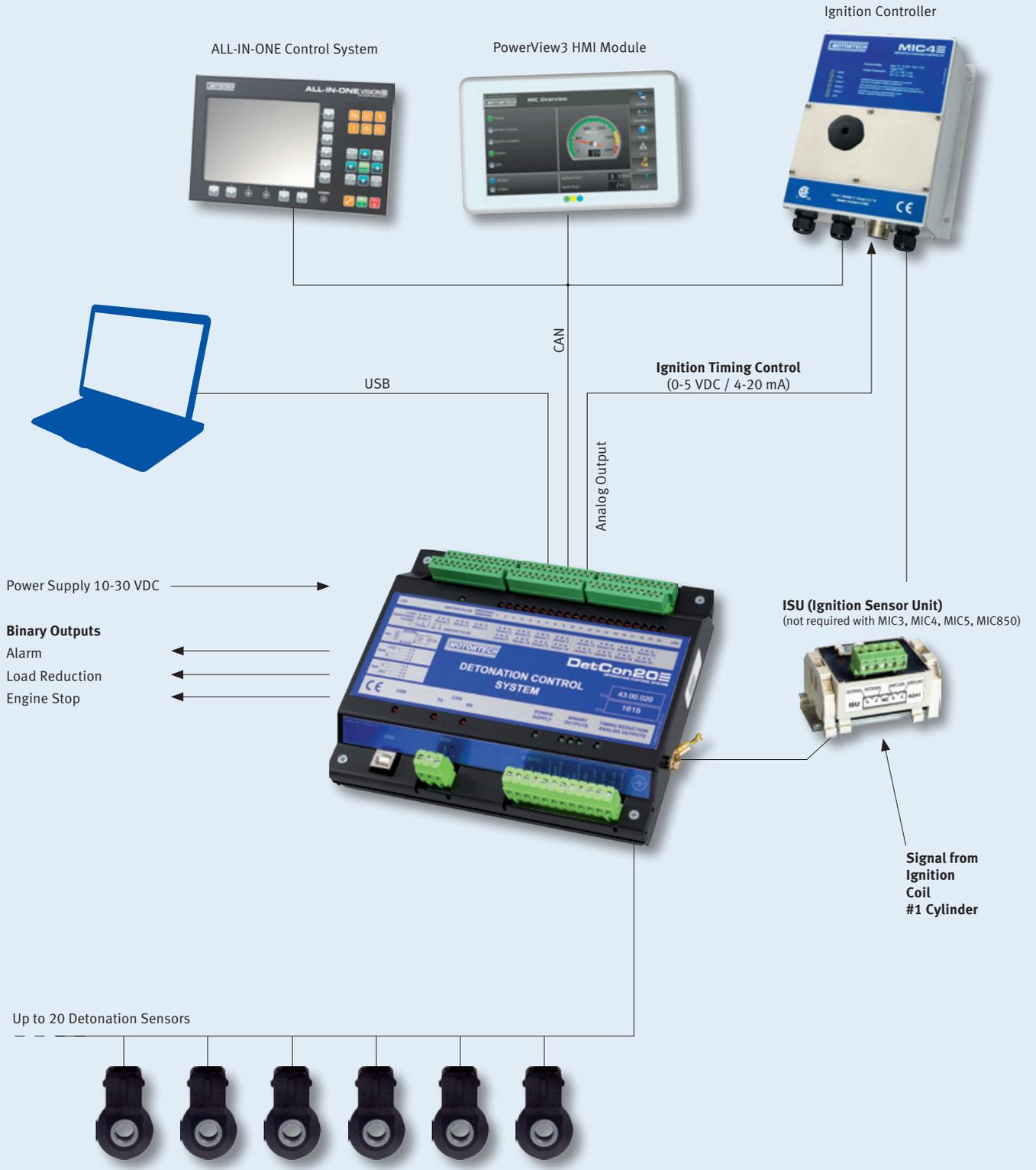
### Function

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 0-5 V or 4-20 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.



... THIS FROM HAPPENING!



# GAS ENGINE CONTROL SYSTEMS

## DetCon20 – Control Units



P/N	Figure	Description
43.00.020 <sup>1)</sup>	1	DetCon20 control unit, 20 inputs, CSA, IP20
43.00.120		DetCon20 control unit, 20 inputs, built into an CSA enclosure, includes ISU ignition sensor unit P/N 43.20.002
43.00.220 <sup>2)</sup>		DetCon20 control unit, 20 inputs, built into an CSA enclosure

<sup>1)</sup> The control unit has to be installed in (CSA approved) control panel or enclosure.

<sup>2)</sup> For use with MIC3, MIC4, MIC5 and MIC850 series ignition controllers. Ignition sensor unit is not required.

## DetCon2 – Control Units



P/N	Figure	Description
43.00.002 <sup>1)</sup>	2	DetCon2 control unit, 2 inputs, CSA, IP20
43.00.102		DetCon2 control unit, 2 inputs, built into an CSA enclosure, includes ISU ignition sensor unit P/N 43.20.002
43.00.202 <sup>2)</sup>		DetCon2 control unit, 2 inputs, built into an CSA enclosure

<sup>1)</sup> The control unit has to be installed in (CSA approved) control panel or enclosure.

<sup>2)</sup> For use with MIC3, MIC4, MIC5 and MIC850 series ignition controllers. Ignition sensor unit is not required.

## Detonation Sensor Lead (1 per Detonation Sensor required)

P/N	Figure	Description
43.30.004-60	3	Detonation sensor lead, 60 ft.

## Detonation Sensor (1 per Cylinder required)

P/N	Figure	Description
43.20.001	4	Detonation sensor w/o lead, 2 pole

## Detonation Sensor Adaptor for DEUTZ®/MWM® 604/620 Series (1 per Detonation Sensor required)

P/N	Description
43.20.018	Detonation sensor adaptor

## ISU Ignition Sensor Unit (1 per System required)

P/N	Figure	Description
43.20.002	5	ISU ignition sensor unit <sup>1)</sup>

<sup>1)</sup> Not required if MIC3, MIC4, MIC5, MIC850 or DetCon control unit P/N 43.00.102 or 43.00.120 is used.



1



2



3



4



5

# PowerView3

MOTORTECH ENGINE INFORMATION MONITOR

## Detonation Control Visualization

The operating data of DetCon Detonation Control system will be completely visualized via HMI module (Human Machine Interface). The overview screen shows the relevant information as engine knocking, knock intensity and status for activated load reduction or emergency shutdown of engine.

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!

The PowerView3 is also available for data visualization of:

- MIC Ignition Control (MIC3, MIC4 and MIC5 series)
- TempScan20 Temperature Scanner



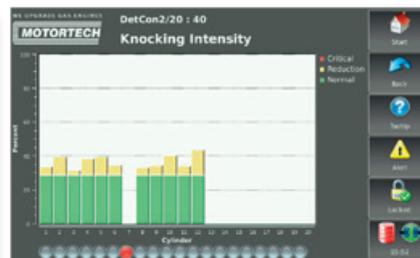
1

## Sample Screens



### Overview

Screen shows the most important operating data of the connected DetCon control unit.



### Knocking Intensity

Visualization of knocking intensity of each monitored cylinder. Different colors inform about the system status (Normal – Reduction – Critical).



### Trending Knocking Intensity

Visualization of knocking intensity trend data for each individual cylinder.

## PowerView3 HMI Module

P/N	Figure	Description
06.05.085	1	PowerView3 HMI module
06.05.185	2	PowerView3 HMI module, built into stainless steel enclosure
06.05.087-F		PowerView3 activation code for visualization of DetCon data – Activation code has to be ordered separately with each PowerView3 HMI module
06.05.087-U		PowerView3 activation code for visualization of DetCon data – Only available for upgrade of existing PowerView3 HMI module in the field



2

# GAS ENGINE CONTROL SYSTEMS

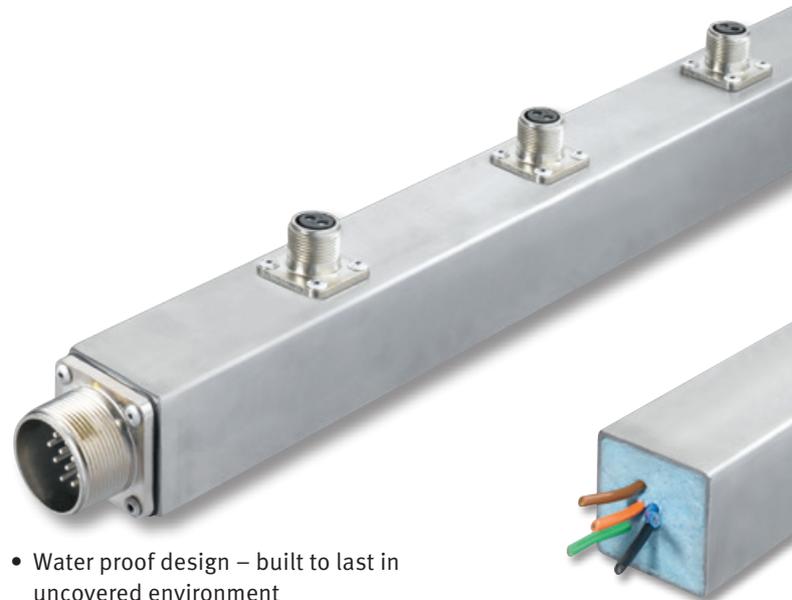


## AlphaRail MOTORTECH WIRING RAIL SYSTEM

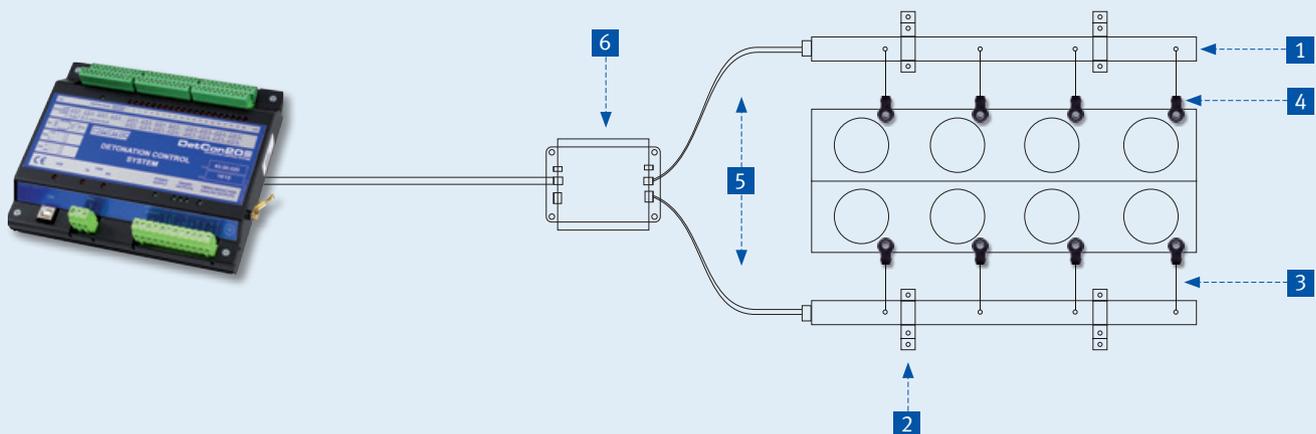
### Wiring Rail System for Detonation Control

MOTORTECH stainless steel, vibration resistant rail assembly will withstand any harsh environment commonly found in oil & gas industry. Our 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 which performs better than aluminum in harsh environments (and where operators use any kind of equipment to hold or stand on)
- Made to perfectly fit the application
- Rigid military style connectors are securely fastened into the stainless steel
- Rails are filled with special foam to ensure that all wires are separated from ground and will not vibrate and eventually short out to ground



- Water proof design – built to last in uncovered environment
- Repairable by MOTORTECH's assigned distributors in the event of mechanically damage



**1** AlphaRail for Detonation Control – Specification Table

P/N 77.8 **A**.**B** **C** **D**-**E** **F**

<b>A</b>	<b>Sensor System</b>
1	Detonation control

<b>B</b>	<b>Number of Sensors per Bank</b>
1	Special version
2	2 sensors
3	3 sensors
4	4 sensors
5	5 sensors
6	6 sensors
8	8 sensors

<b>CD</b>	<b>Distance between the Sensors</b>
04	4 in.
06	6 in.
07	7 in.
08	8 in.
10	10 in.
11	11 in.
12	12 in.
13	13 in.
14	14 in.
16	16 in.
27	27 in.
33	33 in.

<b>E</b>	<b>Output Design</b>
D	MIL connector, 3 pole, pin

<b>F</b>	<b>Double Rail<sup>1)</sup> – Length of Flex Conduit</b>
A	NO Double Rail
B	12 in.
C	16 in.
D	20 in.
E	24 in.
F	32 in.
G	40 in.
H	52 in.

<sup>1)</sup> Two wiring rails connected by flex conduit.

# GAS ENGINE CONTROL SYSTEMS

## 2 Bracket Configuration

P/N <sup>1)</sup>	Figure	Description
75.10.303	2A	Bracket, 40x40 mm (Standard)
75.10.097	2B	Flat bar, 180° (Standard)
75.10.120	2C	Flat bar, 150°
75.10.280	2D	Flat bar, 90°

<sup>1)</sup> For packs of ten please add suffix "-10" to part number.

## 3 Leads to connect Wiring Rail and Detonation Sensor (1 per Sensor required)

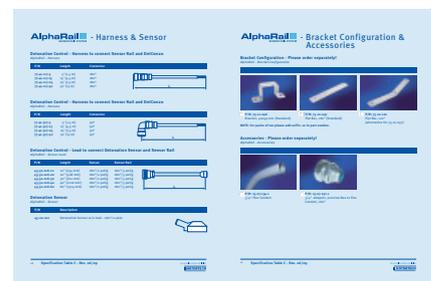
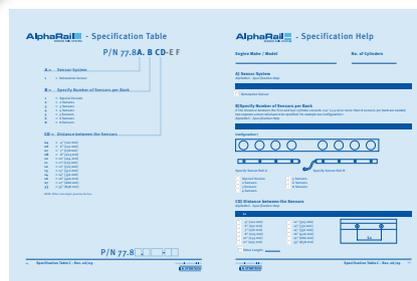
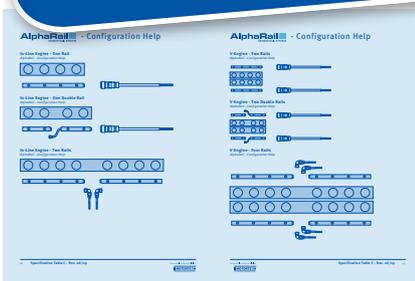
P/N	Figure	Description	Sensor Connector	Rail Connector	Length <sup>1)</sup>
43.30.016-25	3A	Sensor lead	2 pole socket, 180°	3 pole socket, 180°	25 in.
43.30.016-30	3A	Sensor lead	2 pole socket, 180°	3 pole socket, 180°	30 in.
43.30.016-40	3A	Sensor lead	2 pole socket, 180°	3 pole socket, 180°	40 in.

<sup>1)</sup> Other lengths available on request.

## 4 Detonation Sensor (1 per Cylinder required)

P/N	Figure	Description
43.20.001	4	Detonation sensor w/o lead, 2 pole

Specification Charts:  
[www.motortech.de](http://www.motortech.de)



**5** Harnesses to connect Wiring Rail and DetCon Control Unit (1 per Rail required)

P/N	Description	Rail Connector	Length
77.41.117-L	Harness	17 pole pin, 180°	"L" = 5/15/25/50 ft.
77.41.317-L	Harness	17 pole pin, 90°	"L" = 5/15/25/50 ft.

**6** Accessories

P/N	Figure	Description
06.05.075	<a href="#">6A</a>	Junction box
15.07.134	<a href="#">6B</a>	Flex conduit, 3/4 in. <sup>1)</sup>
15.07.231	<a href="#">6C</a>	Fitting, 3/4 in., junction box to flex conduit



<sup>1)</sup> Flex conduit needs to be ordered in m/ft. in required quantity.



[2A](#)



[2B](#)



[2C](#)



[2D](#)



[3A](#)



[4](#)



[6B](#)



[6C](#)

# GAS ENGINE CONTROL SYSTEMS

## TempScan20 MOTORTECH TEMPERATURE SCANNER

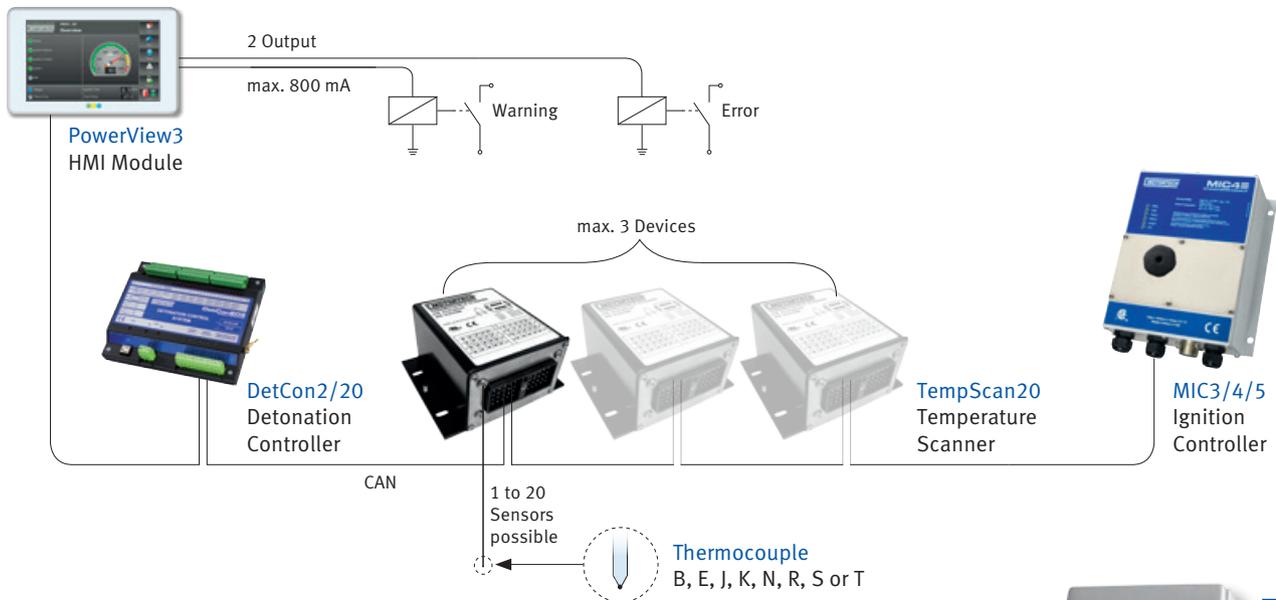
### Temperature Scanner with 20 Channels

The TempScan20 temperature scanner monitors up to 20 thermocouples and provides the temperature information to the PowerView3 HMI module via CANopen.

- Channels are independently configurable as Type J, K, B, E, N, R, S or T thermocouples
- Temperature information can include
  - o Exhaust temperature
  - o Winding temperature
  - o Fluid temperature
- No additional programming or configuration required
- Integral diagnostics determine thermocouple integrity
- All channels are fully isolated from the CAN line and from the power supply.
- The temperature module features rugged packaging and watertight connectors for an IP65 rating.



1



### TempScan20 Temperature Scanner

P/N	Figure	Description
63.03.002-20		TempScan20 temperature scanner, including connector package for power supply, CAN Bus and thermocouple wiring, operating manual
63.03.012-20		TempScan20 temperature scanner, built into stainless steel enclosure, including connector package for power supply, CAN Bus and thermocouple wiring, operating manual



2

# PowerView3

MOTORTECH ENGINE INFORMATION MONITOR

## Temperature Scanner Visualization

The operating data of the TempScan20 temperature scanner will be completely visualized via HMI module (Human Machine Interface). The overview screen shows the relevant information as combustion chamber temperature individually by cylinder or status of programmed temperature thresholds (Low – Normal – High – Switching Digital Output).

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!

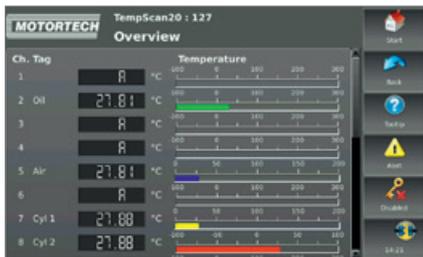
The PowerView3 is also available for data visualization of:

- MIC Ignition Control (MIC3, MIC4 and MIC5 series)
- DetCon Detonation Control



1

## Sample Screens



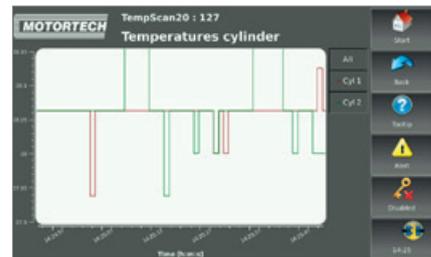
### Overview

Screen shows the currently measured temperatures individually for each programmed channel/cylinder. Different colored gauges inform about programmed temperature thresholds (Low – Normal – High – Switching Digital Output).



### Channel Settings

Channels can be configured individually and include options like user defined channel names, thermocouple type and temperature thresholds.



### Trending Cylinder Temperatures

Visualization of temperature trend data for each individual cylinder.

## PowerView3 HMI Module

P/N	Figure	Description
06.05.085	<b>1</b>	PowerView3 HMI module
06.05.185	<b>2</b>	PowerView3 HMI module, built into stainless steel enclosure
06.05.088-F		PowerView3 activation code for visualization of TempScan data – Activation code has to be ordered separately with each PowerView3 HMI module
06.05.088-U		PowerView3 activation code for visualization of TempScan data – Only available for upgrade of existing PowerView3 HMI module in the field



2

# GAS ENGINE CONTROL SYSTEMS



## AlphaRail<sup>®</sup> MOTORETECH WIRING RAIL SYSTEM

### Wiring Rail System for Temperature Control

The stainless steel wiring rails which are water tight due to a well approved foaming process, offer an easy and fast installation of accessory control systems such as

- Pyrometer/temperature control
- Gas valve systems

With individual outlet port connectors, the sensors can be individually connected and easily wired to the rail. A disconnect able main harness routs all sensors to one main control unit or individual wiring boxes.

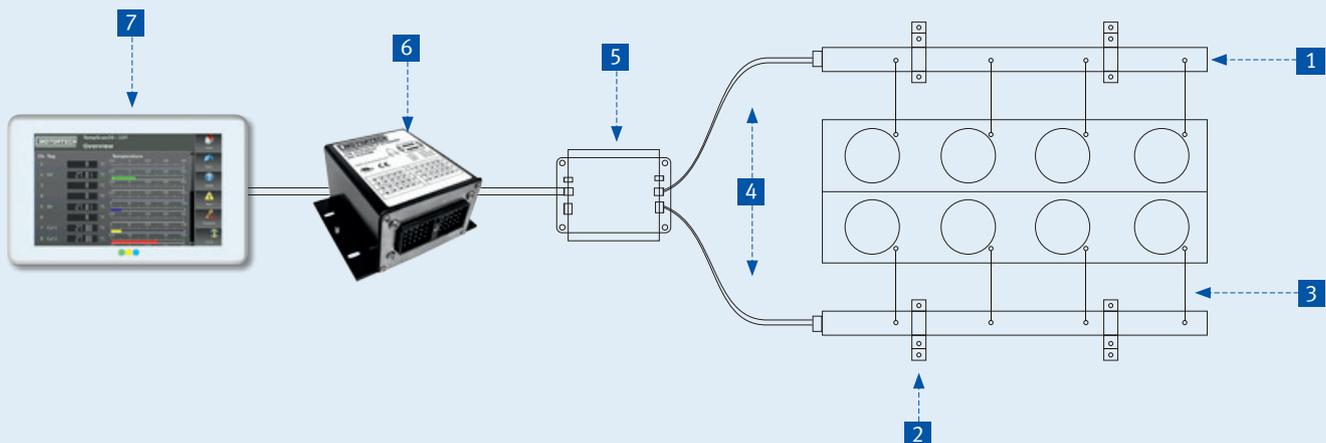
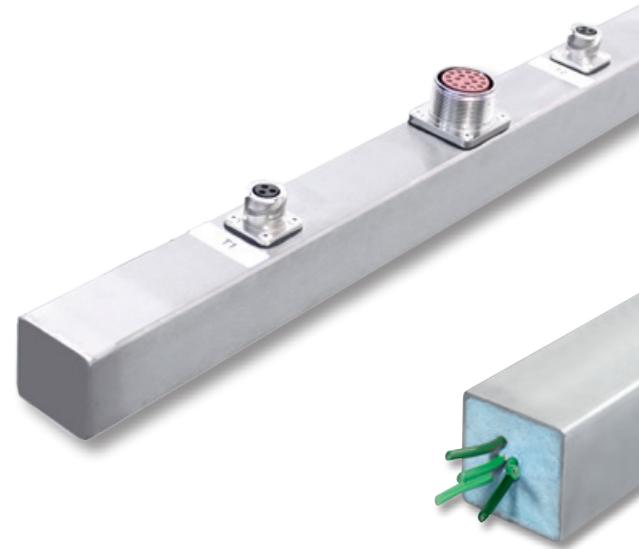
#### Details on the Pyrometer/ Thermocouple Wiring Rail:

- Up to 10 exhaust sensor inputs per rail
- Additionally 2 turbocharger thermocouples
- All sensors need to be Type K (NiCrNi) sensors
- Made of stainless steel which performs better than aluminum in harsh environments (and where operators use any kind of equipment to hold or stand on)

- Made to perfectly fit the application
- Rigid military style connectors are securely fastened into the stainless steel
- Rails are filled with special foam to ensure that all wires are separated from ground and will not vibrate and eventually short out to ground
- Water proof design – built to last in uncovered environment
- Repairable by MOTORETECH's assigned distributors in the event of mechanical damage

#### General Details:

- Low voltage signals can be grouped in one rail. It is not recommended to have low and high voltage signals in one rail. In this case, detonation sensors and thermocouple leads match perfectly.
- Ignition and gas valve control wire work together well.



1 AlphaRail for Temperature Control – Specification Table

P/N 77.8 **A** **B** **C** **D** **E** **F**

A	Sensor System
2	Temperature control

B	Number of Thermocouples per Bank
1	Special version
2	2 thermocouples
3	3 thermocouples
4	4 thermocouples
5	5 thermocouples
6	6 thermocouples
8	8 thermocouples
10	10 thermocouples

CD	Distance between the Thermocouples
04	4 in.
06	6 in.
07	7 in.
08	8 in.
10	10 in.
11	11 in.
12	12 in.
13	13 in.
14	14 in.
16	16 in.
27	27 in.
33	33 in.

E	Output Design
H	MIL connector, 3 pole, socket, bayonet

F	Double Rail <sup>1)</sup> – Length of Flex Conduit
A	NO Double Rail
B	12 in.
C	16 in.
D	20 in.
E	24 in.
F	32 in.
G	40 in.
H	52 in.

<sup>1)</sup> Two wiring rails connected by flex conduit.

# GAS ENGINE CONTROL SYSTEMS

## 2 Bracket Configuration

P/N <sup>1)</sup>	Figure	Description
75.10.303	2A	Bracket, 40x40 mm (Standard)
75.10.097	2B	Flat bar, 180° (Standard)
75.10.120	2C	Flat bar, 150°
75.10.280	2D	Flat bar, 90°

<sup>1)</sup> For packs of ten please add suffix "-10" to part number.

## 3 Thermocouples with Lead and Rail Connector – 90° (1 per Cylinder required)

P/N	Figure	Description	Rail Connector	Length
56.01.090-10	3A	Thermocouple Type K (NiCrNi)	3 pole, pin, 180°, bay.	10.00 in.
56.01.090-20	3A	Thermocouple Type K (NiCrNi)	3 pole, pin, 180°, bay.	20.00 in.
56.01.090-25	3A	Thermocouple Type K (NiCrNi)	3 pole, pin, 180°, bay.	25.00 in.
56.01.090-30	3A	Thermocouple Type K (NiCrNi)	3 pole, pin, 180°, bay.	30.00 in.
56.01.090-40	3A	Thermocouple Type K (NiCrNi)	3 pole, pin, 180°, bay.	40.00 in.
56.01.090-60	3A	Thermocouple Type K (NiCrNi)	3 pole, pin, 180°, bay.	60.00 in.
56.01.090-K <sup>1)</sup>	3A	Thermocouple Type K (NiCrNi)	3 pole, pin, 180°, bay.	177.00 in.

## 3 Thermocouples with Lead and Rail Connector – 180° (1 per Cylinder required)

P/N	Figure	Description	Rail Connector	Length
56.01.180-10	4A	Thermocouple Type K (NiCrNi)	3 pole, pin, 180°, bay.	10.00 in.
56.01.180-20	4A	Thermocouple Type K (NiCrNi)	3 pole, pin, 180°, bay.	20.00 in.
56.01.180-25	4A	Thermocouple Type K (NiCrNi)	3 pole, pin, 180°, bay.	25.00 in.
56.01.180-30	4A	Thermocouple Type K (NiCrNi)	3 pole, pin, 180°, bay.	30.00 in.
56.01.180-40	4A	Thermocouple Type K (NiCrNi)	3 pole, pin, 180°, bay.	40.00 in.
56.01.180-60	4A	Thermocouple Type K (NiCrNi)	3 pole, pin, 180°, bay.	60.00 in.
56.01.180-K <sup>1)</sup>	4A	Thermocouple Type K (NiCrNi)	3 pole, pin, 180°, bay.	177.00 in.

<sup>1)</sup> Comes with loose connector and 177 in. lead length.



2A



2B



2C



2D

#### 4 Harness to connect Wiring Rail (1 per Rail required)

P/N	Description	Rail Connector	Length
77.42.317-L	Harness for wiring rails with up to 8 thermocouples	17 pole, pin, 90°	"L"= 5/15/25/50 ft.
77.42.327-L	Harness for wiring rails with more than 8 thermocouples	17&10 pole, pin, 90°	"L"= 5/15/25/50 ft.

#### 5 Accessories

P/N	Description
06.05.076	Junction box

#### 6 TempScan20 – Temperature Scanner with 20 Channels

P/N	Figure	Description
63.03.002-20	6	TempScan20 temperature scanner, including connector package for power supply, CAN Bus and thermocouple wiring, operating manual
63.03.012-20		TempScan20 temperature scanner, built into stainless steel enclosure, including connector package for power supply, CAN Bus and thermocouple wiring, operating manual

#### 7 PowerView3 HMI Module

P/N	Figure	Description
06.05.085	7	PowerView3 HMI module
06.05.185		PowerView3 HMI module, built into stainless steel enclosure
06.05.088-F		PowerView3 activation code for visualization of TempScan data – Activation code has to be ordered separately with each PowerView3 HMI module
06.05.088-U		PowerView3 activation code for visualization of TempScan data – Only available for upgrade of existing PowerView3 HMI module in the field



3A



4A



6



7

# GAS ENGINE CONTROL SYSTEMS

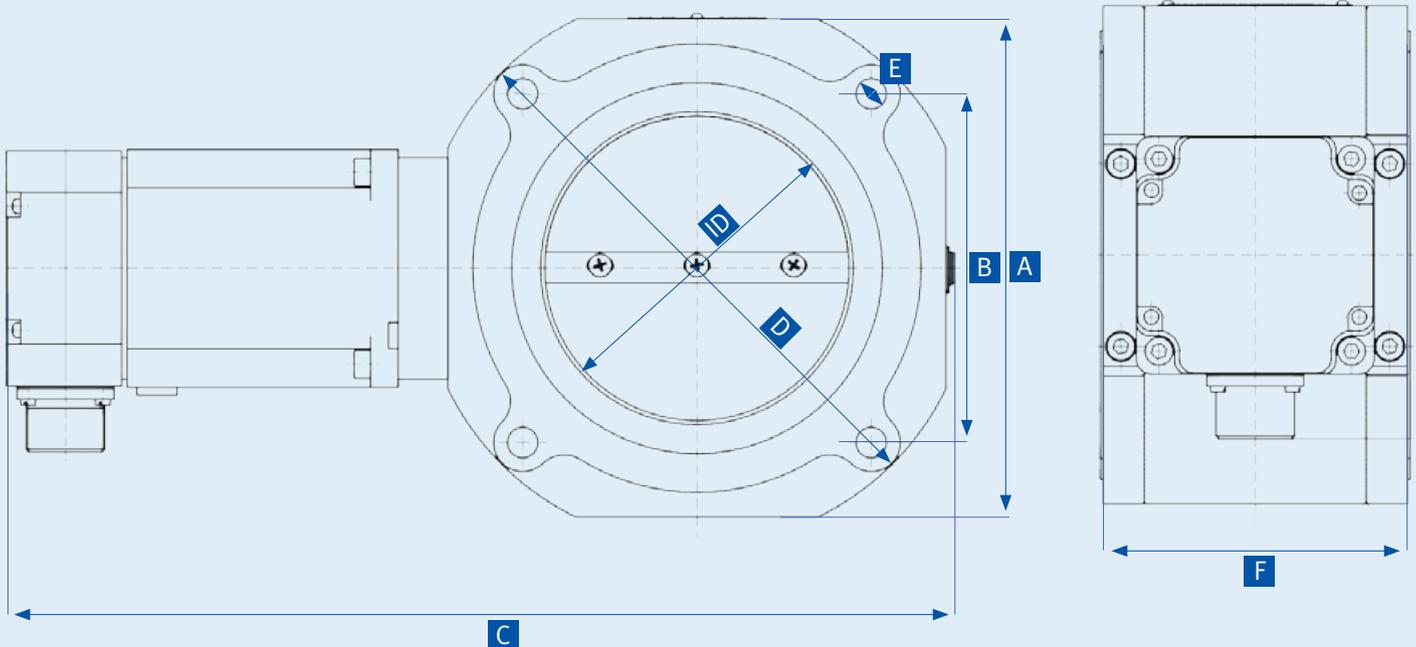


## ITB

MOTORTECH INTEGRATED THROTTLE BODY

### Throttle Bodies with Integrated Stepper Motor

- For naturally aspirated and turbocharged engines
- For use with natural gas, biogas (minor H<sub>2</sub>S content), mine gas, etc.
- Available as Series 50, 100, 140, 200
- Butterfly diameter 42 – 115 mm (1.65 – 4.53 in.), other dimensions available on request
- Rigid design
- High resolution stepper motor
- Controlled by MOTORTECH VariStep3 stepper motor driver
- Applicable for temperatures up to 257 °F/125 °C, high temperature types (-HT) up to 392 °F/200 °C



### Series 50 (41 – 42 mm)

P/N	Description	A	B	C	D	E	F	Inner Diameter
30.42.050-42	Integrated throttle body	88 mm	57 mm	245 mm	96 mm	8 mm	56 mm	42 mm
30.42.050-42-HT	Integrated throttle body	88 mm	57 mm	270 mm	96 mm	8 mm	56 mm	42 mm

### Series 100 (48 – 68 mm)

P/N	Description	A	B	C	D	E	F	Inner Diameter
30.42.100-60	Integrated throttle body	113 mm	75 mm	270 mm	130 mm	11 mm	61 mm	60 mm
30.42.100-60-HT	Integrated throttle body	113 mm	75 mm	295 mm	130 mm	11 mm	61 mm	60 mm
30.42.100-68	Integrated throttle body	113 mm	75 mm	270 mm	130 mm	11 mm	61 mm	68 mm
30.42.100-68-HT	Integrated throttle body	113 mm	75 mm	295 mm	130 mm	11 mm	61 mm	68 mm

### Series 140 (73 – 85 mm)

P/N	Description	A	B	C	D	E	F	Inner Diameter
30.42.140-75	Integrated throttle body	150 mm	95 mm	307 mm	166 mm	11 mm	76 mm	75 mm
30.42.140-75-HT	Integrated throttle body	150 mm	95 mm	332 mm	166 mm	11 mm	76 mm	75 mm
30.42.140-80	Integrated throttle body	150 mm	95 mm	307 mm	166 mm	11 mm	76 mm	80 mm
30.42.140-80-HT	Integrated throttle body	150 mm	95 mm	332 mm	166 mm	11 mm	76 mm	80 mm
30.42.140-85	Integrated throttle body	150 mm	95 mm	307 mm	166 mm	11 mm	76 mm	85 mm
30.42.140-85-HT	Integrated throttle body	150 mm	95 mm	332 mm	166 mm	11 mm	76 mm	85 mm

### Series 150 (82 – 104 mm)

P/N	Description	A	B	C	D	E	F	Inner Diameter
30.42.150-100	Integrated throttle body	150 mm	110 mm	310 mm	196 mm	9 mm	86 mm	100 mm
30.42.150-100-HT	Integrated throttle body	150 mm	110 mm	348 mm	196 mm	9 mm	86 mm	100 mm

### Series 200 (98 – 125 mm)

P/N	Description	A	B	C	D	E	F	Inner Diameter
30.42.200-100	Integrated throttle body	180 mm	126 mm	342 mm	200 mm	11 mm	110 mm	100 mm
30.42.200-100-HT	Integrated throttle body	180 mm	126 mm	381 mm	200 mm	11 mm	110 mm	100 mm
30.42.200-105	Integrated throttle body	180 mm	126 mm	342 mm	200 mm	11 mm	110 mm	105 mm
30.42.200-105-HT	Integrated throttle body	180 mm	126 mm	381 mm	200 mm	11 mm	110 mm	105 mm
30.42.200-115	Integrated throttle body	180 mm	126 mm	342 mm	200 mm	11 mm	110 mm	115 mm
30.42.200-115-HT	Integrated throttle body	180 mm	126 mm	381 mm	200 mm	11 mm	110 mm	115 mm

### Stepper Motor Harness

P/N	Description
31.01.942	Stepper motor harness, MIL Style 10 pole socket , 90°

### VariStep3 Stepper Motor Driver

P/N	Description
31.01.960	VariStep3 stepper motor driver

# GAS ENGINE CONTROL SYSTEMS



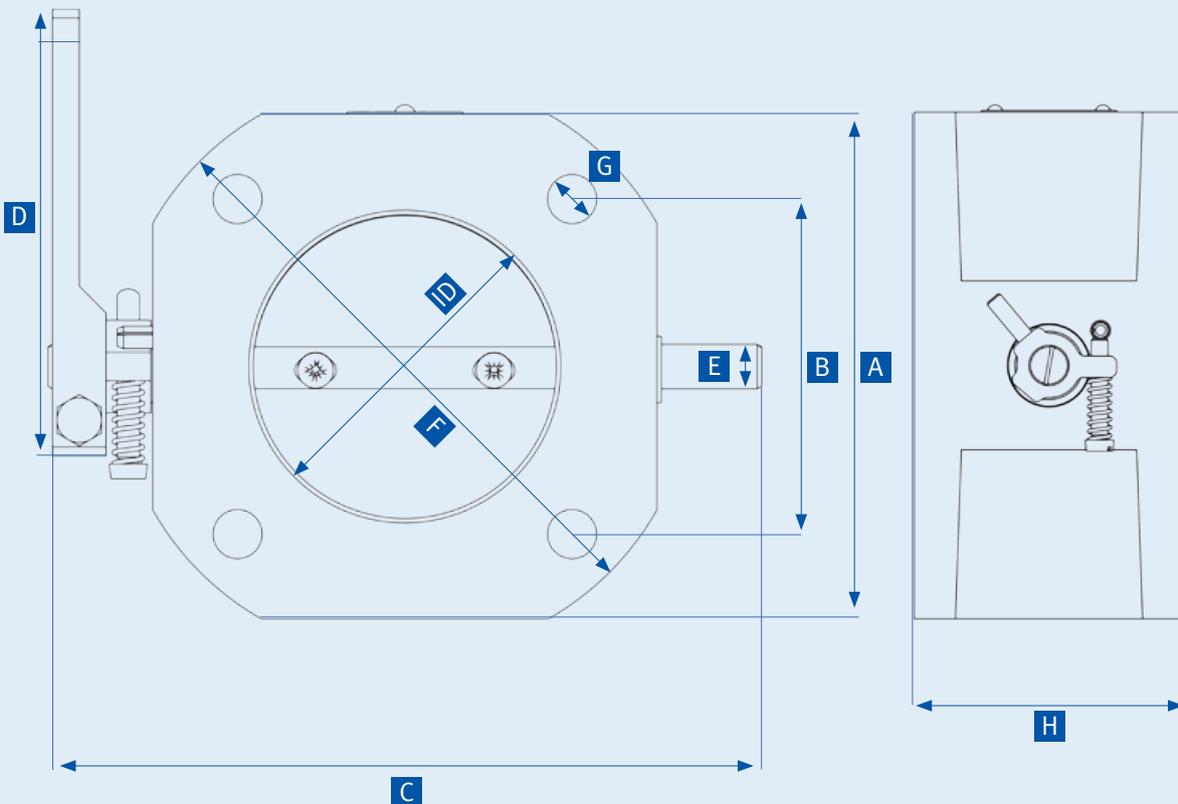
## Throttles

MOTORTECH THROTTLES/BUTTERFLY VALVES

### Throttle Bodies

Various throttles are available. All moving parts are made of stainless steel to survive in the harshest environments including H<sub>2</sub>S.

- For naturally aspirated and turbocharged engines
- Flange gaskets, lever, end stop and idle speed adjustment included
- Stainless steel ball bearings
- Other sizes and custom made designs on request.
- Applicable for temperatures up to 284 °F/140 °C, high temperature types (-HT) up to 392 °F/200 °C



### Series 50 (41 – 42 mm)

P/N	Supersedes	Description	A	B	C	D	E	F	G	H	Inner Diameter
30.40.051-42	30.40.050-42	Throttle body	88 mm	57 mm	135 mm	100 mm	10 mm	96 mm	8 mm	40 mm	42 mm
30.40.051-42-HT		Throttle body	88 mm	57 mm	135 mm	100 mm	10 mm	96 mm	8 mm	40 mm	42 mm

### Series 100 (48 – 68 mm)

P/N	Supersedes	Description	A	B	C	D	E	F	G	H	Inner Diameter
30.40.101-60	30.40.100-60	Throttle body	113 mm	75 mm	160 mm	100 mm	10 mm	130 mm	11 mm	61 mm	60 mm
30.40.101-60-HT		Throttle body	113 mm	75 mm	160 mm	100 mm	10 mm	130 mm	11 mm	61 mm	60 mm
30.40.101-68	30.40.100-68	Throttle body	113 mm	75 mm	160 mm	100 mm	10 mm	130 mm	11 mm	61 mm	68 mm
30.40.101-68-HT		Throttle body	113 mm	75 mm	160 mm	100 mm	10 mm	130 mm	11 mm	61 mm	68 mm

### Series 140 (73 – 85 mm)

P/N	Supersedes	Description	A	B	C	D	E	F	G	H	Inner Diameter
30.40.141-75	30.40.140-75	Throttle body	150 mm	95 mm	200 mm	150 mm	12 mm	166 mm	11 mm	76 mm	75 mm
30.40.141-75-HT		Throttle body	150 mm	95 mm	200 mm	150 mm	12 mm	166 mm	11 mm	76 mm	75 mm
30.40.141-80	30.40.140-80	Throttle body	150 mm	95 mm	200 mm	150 mm	12 mm	166 mm	11 mm	76 mm	80 mm
30.40.141-80-HT		Throttle body	150 mm	95 mm	200 mm	150 mm	12 mm	166 mm	11 mm	76 mm	80 mm
30.40.141-85	30.40.140-85	Throttle body	150 mm	95 mm	200 mm	150 mm	12 mm	166 mm	11 mm	76 mm	85 mm
30.40.141-85-HT		Throttle body	150 mm	95 mm	200 mm	150 mm	12 mm	166 mm	11 mm	76 mm	85 mm

### Series 150 (82 – 104 mm)

P/N	Supersedes	Description	A	B	C	D	E	F	G	H	Inner Diameter
30.40.151-100	30.40.150-100	Throttle body	150 mm	110 mm	200 mm	150 mm	12 mm	196 mm	9 mm	80 mm	100 mm
30.40.151-100-HT		Throttle body	150 mm	110 mm	200 mm	150 mm	12 mm	196 mm	9 mm	80 mm	100 mm

### Series 200 (98 – 125 mm)

P/N	Supersedes	Description	A	B	C	D	E	F	G	H	Inner Diameter
30.40.201-100	30.40.200-100	Throttle body	180 mm	126 mm	260 mm	150 mm	12 mm	200 mm	11 mm	110 mm	100 mm
30.40.201-100-HT		Throttle body	180 mm	126 mm	260 mm	150 mm	12 mm	200 mm	11 mm	110 mm	100 mm
30.40.201-105	30.40.200-105	Throttle body	180 mm	126 mm	260 mm	150 mm	12 mm	200 mm	11 mm	110 mm	105 mm
30.40.201-105-HT		Throttle body	180 mm	126 mm	260 mm	150 mm	12 mm	200 mm	11 mm	110 mm	105 mm
30.40.201-115	30.40.200-115	Throttle body	180 mm	126 mm	260 mm	150 mm	12 mm	200 mm	11 mm	110 mm	115 mm
30.40.201-115-HT		Throttle body	180 mm	126 mm	260 mm	150 mm	12 mm	200 mm	11 mm	110 mm	115 mm

### IMPCO® Replacement Series 100/1401)

P/N	Supersedes	Description	Inner Diameter	Equivalent to
30.40.101-68AT2-7		Throttle body	68 mm	AT2-7
30.40.141-94AT2-9		Throttle body	94 mm	AT2-9

<sup>1)</sup> Common applications e.g. CATERPILLAR® G379, G3306, G3406 and WAUKESHA® F1197

### Series 160 for CATERPILLAR® G3400 and G3500 Series

P/N	Supersedes	Description	Inner Diameter	Equivalent to
30.40.161-106		Throttle body	106 mm	7E1585, 7E1589

# GAS ENGINE CONTROL SYSTEMS



## ALL-IN-ONE

MOTORTECH GENERATOR & CHP CONTROL SYSTEM

For monitoring, controlling, regulating and system protection. ALL-IN-ONE is an expandable controller for both single and multiple gen-sets operating in standby or parallel modes, especially in cogeneration (CHP) and other complex applications.

Modular design (consisting of AIO controller and display unit) allows easy installation with the ability to add many different extension modules designed to suit individual customer requirements.

Built-in synchronizing, digital isochronous load sharing and air-fuel-ratio functions (requires additional dongle) allow a total integrated solution for gen-sets in standby, island, parallel or mains parallel. Native co-operation of up to 32 gen-sets is a standard feature.



AIO supports many standard ECU (electronic control unit) types and is specially designed to easily integrate new ones. A powerful graphic display with user-friendly controls allows any user whatever their ability to find the information they need. The display on the basic version is capable of displaying graphical languages (e.g. Chinese).

### Benefits

- Support of engines with ECU (Electronic control unit)
- Excellent configurability to match customer's needs exactly
- Complete integrated gen-set solution incorporating built-in PLC and signal sharing via CAN bus – minimum external components needed
- Many communication options – easy remote supervising and servicing
- Perfect price / performance ratio
- Gen-set performance log for easy problem tracing
- Air-Fuel-Ratio function for lean burn gas engine (requires additional hardware dongle)

### Features

- CHP support (programmable PID loops and other built-in PLC functions)
- Support of engines with ECU (J1939, Modbus and other proprietary interfaces); alarm codes displayed in text form
- Automatic synchronizing and power control (via speed governor or ECU)
- Baseload, Import/Export, TempByPower
- Peak shaving

- Voltage and PF control (AVR)
- Generator measurement: U, I, Hz, kW, kVAR, kVA, PF, kWh, kVAhr
- Mains measurement: U, I, Hz, kW, kVAR, PF
- Selectable measurement ranges for AC voltages and currents – 120/277 V, 0–1/0–5 A
- Inputs and outputs configurable for various customer needs
- Controller redundancy
- 2x RS232/RS485 interface with Modbus protocol
- Support; Analog/GSM/ISDN/CDMA modem communication support; SMS messages; ECU Modbus interface; secondary RS485 converter is isolated
- Event-based history (up to 1000 records) with customer-selectable list of stored values; RTC; statistic values
- Integrated PLC programmable functions
- Interface to remote display units (3x AIO.NT- or AIO.Vision-display)
- USB 2.0 slave interface
- Dimensions 284 x 180 mm (front panel)
- Sealed to IP65

### Integrated fixed and configurable protections

- 3 phase integrated generator protections (U + f)
- IDMT overcurrent + shortcurrent protection
- Overload protection
- Reverse power protection
- Earth fault protection
- 3 phase integrated mains protections (U + f)
- Vector shift protection
- All binary/analog inputs free configurable for various protection types: HistRecOnly/Alarm Only/Alarm + History indication/Warning/Off load/Slow stop/BreakerOpen&Cooldown/Shutdown/Shutdown override/Mains protect/sensor fail
- Phase rotation and phase sequence protection
- Additional 160 programmable protections configurable for any measured value to create customer-specific protections
- Application security

**InteliMains**

- Import/Export
- Load Sharing
- Power Plant Management
- Grid Monitoring
- Running Hours Optimization

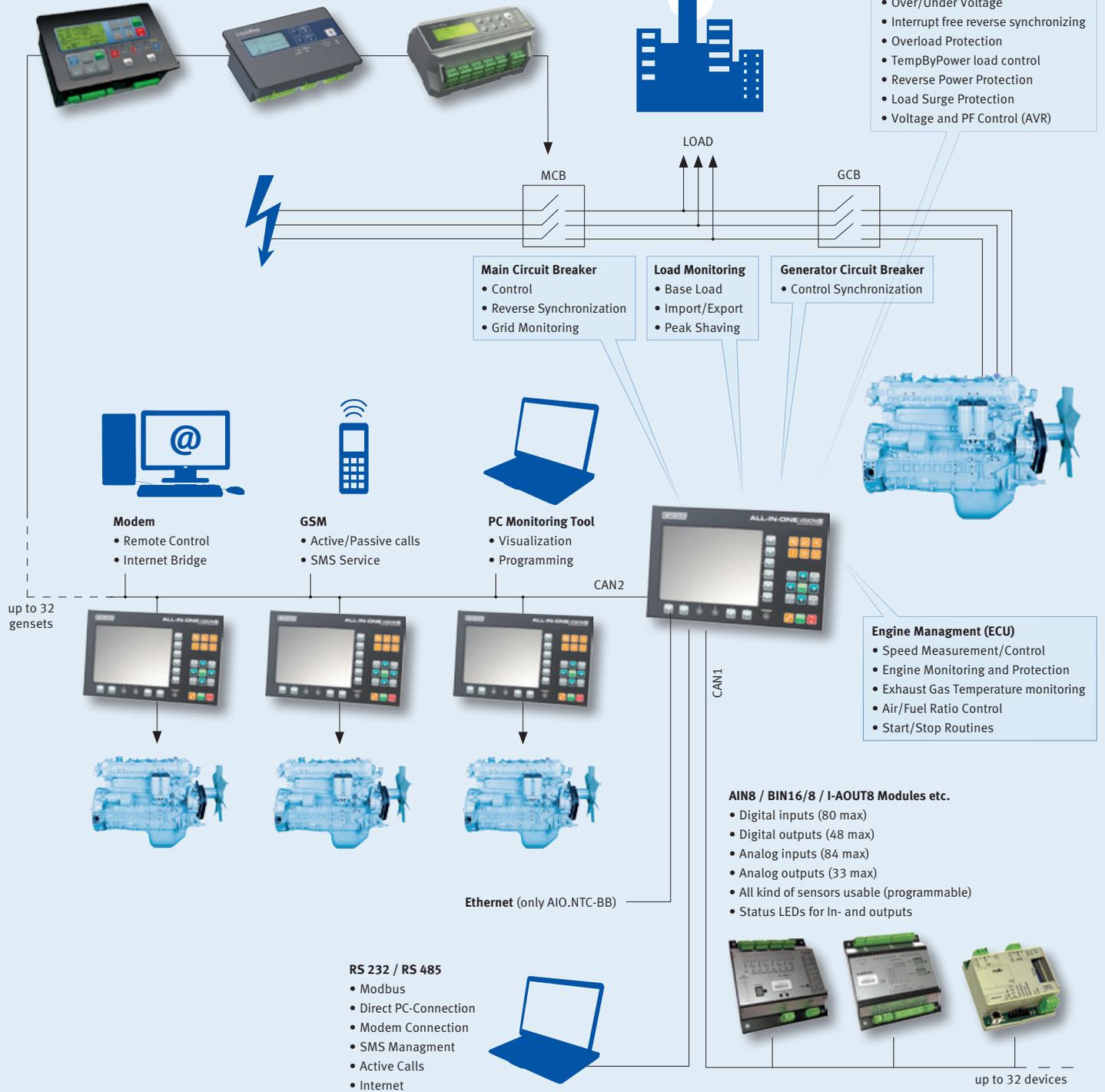
**InteliPro**

- Designed to meet utility protection requirements
- Combines standard and optional features
- Advanced communications
- Data/event logging

or

**MainsPro**

- Protective functionalities
- Free assignment of 5 relay outputs
- 4 binary switches to remotely change operation of the unit
- Last trip recorded in order to provide the evidence of cause of trip



**Generator**

- 3 Phase Monitoring
- Over/Under Frequency
- Over/Under Voltage
- Interrupt free reverse synchronizing
- Overload Protection
- TempByPower load control
- Reverse Power Protection
- Load Surge Protection
- Voltage and PF Control (AVR)

**Main Circuit Breaker**

- Control
- Reverse Synchronization
- Grid Monitoring

**Load Monitoring**

- Base Load
- Import/Export
- Peak Shaving

**Generator Circuit Breaker**

- Control Synchronization

**Modem**

- Remote Control
- Internet Bridge

**GSM**

- Active/Passive calls
- SMS Service

**PC Monitoring Tool**

- Visualization
- Programming

**Engine Management (ECU)**

- Speed Measurement/Control
- Engine Monitoring and Protection
- Exhaust Gas Temperature monitoring
- Air/Fuel Ratio Control
- Start/Stop Routines

**AIN8 / BIN16/8 / I-AOUT8 Modules etc.**

- Digital inputs (80 max)
- Digital outputs (48 max)
- Analog inputs (84 max)
- Analog outputs (33 max)
- All kind of sensors usable (programmable)
- Status LEDs for In- and outputs

**RS 232 / RS 485**

- Modbus
- Direct PC-Connection
- Modem Connection
- SMS Management
- Active Calls
- Internet

# GAS ENGINE CONTROL SYSTEMS

## Controllers

P/N	Description
63.50.104	ALL-IN-ONE.NTC controller - universal Gen-Set controller (incl. AFR control <sup>1)</sup> and AirGate® technology)
63.50.104-HSS	ALL-IN-ONE.NTC controller - universal Gen-Set controller P/N 63.50.104 incl. Plug-on module I-HSS-BIN6/10
63.50.082	Mini-ALL-IN-ONE controller - universal controller for small Gen-Sets (incl. AFR control <sup>2)</sup> )

<sup>1)</sup> Requires hardware dongle P/N 63.50.061 or 63.50.062 for activation.

<sup>2)</sup> Requires hardware dongle P/N 63.50.085 for activation (**for applications up to 75 kWel only**).

## Display Units for ALL-IN-ONE.NTC Controllers

P/N	Supersedes	Description
63.50.105		ALL-IN-ONE.Vision display - 5.7 in. color display unit for ALL-IN-ONE.NT and ALL-IN-ONE.NTC controller
63.50.101		ALL-IN-ONE.Vision display - 8.0 in. color display unit for ALL-IN-ONE.NT and ALL-IN-ONE.NTC controller
63.50.120	63.50.115	ALL-IN-ONE.Vision display - 17.0 in. color touch display unit for ALL-IN-ONE.NT and ALL-IN-ONE.NTC controller
63.50.103		ALL-IN-ONE.NT display - detachable display unit for ALL-IN-ONE.NT and ALL-IN-ONE.NTC controller

## Dongles

P/N	Supersedes	Description
63.50.061		Hardware dongle for ALL-IN-ONE.NTC controllers - AFR-PCM <ul style="list-style-type: none"> <li>• Enables single isolated parallel with mains</li> <li>• Air/Fuel Ratio function for lean burn gas engines</li> </ul>
63.50.062		Hardware dongle for ALL-IN-ONE.NTC controllers - AFR-PCLSM+PMS <ul style="list-style-type: none"> <li>• Enables multiple isolated parallel or multiple parallel with mains</li> <li>• Power management operation (with CAN Bus)</li> <li>• Digital load sharing</li> <li>• Digital VAR sharing</li> </ul>
63.50.085		Hardware dongle for Mini-ALL-IN-ONE - miniAFR-PCM <ul style="list-style-type: none"> <li>• Enables single isolated parallel with mains</li> <li>• Air/Fuel Ratio function for lean burn gas engines</li> <li>• <b>For applications up to 75 kWel only</b></li> </ul>



- Optimizing number of running engines: Power management; kW, kVA or % load based
- Air/Fuel Ratio function for lean burn gas engines

## AIO Controllers

AIO.NTC Controller  
P/N 63.50.104



Mini AIO Controller  
P/N 63.50.082



## Available Display Units for AIO.NTC Controllers



AIO.Vision (17.0 in.)  
P/N 63.50.120



AIO.Vision (8.0 in.)  
P/N 63.50.101



AIO.Vision (5.7 in.)  
P/N 63.50.105



AIO.NT  
P/N 63.50.103

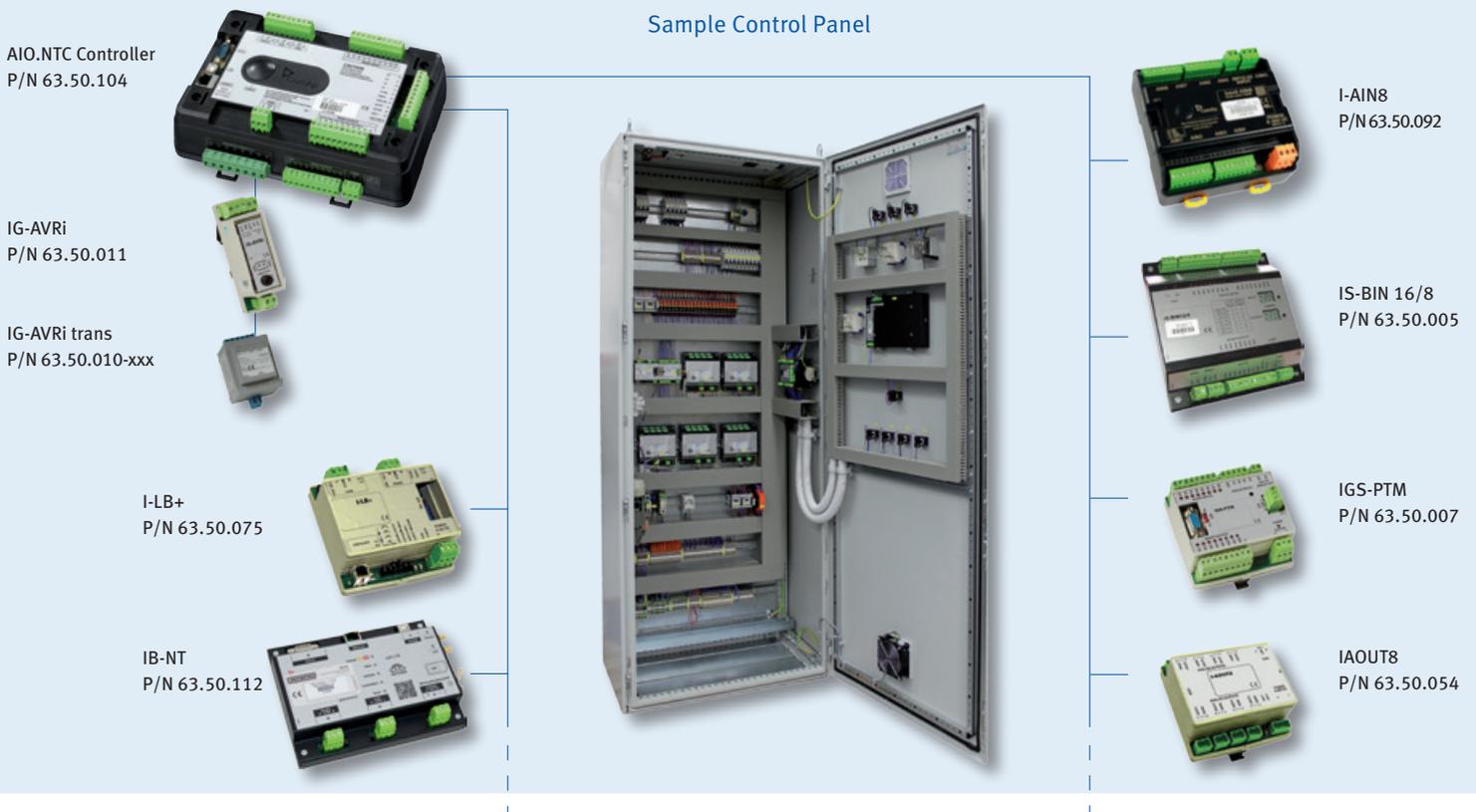
### Other Controllers

P/N	Supersedes	Description
63.50.064		Mains supervision controller - IM-NT
63.50.064-BTB		Mains supervision controller Bus Tie Breaker- IM-NT BTB
63.50.064-MCB		Mains supervision controller Main Circuit Breaker - IM-NT MCB

### Accessories

P/N	Supersedes	Description
63.50.092		Analog input extension module - I-AIN8
63.50.002		Analog input extension module - IS-AIN8
63.50.093		Analog input extension module for thermocouples only - I-AIN8TC
63.50.108		Analog input extension module for thermocouples only - IS-AIN8TC
63.50.118		Extension module inputs/outputs - IO8/8
63.50.005		Binary input/output module, 16 inputs, 8 outputs - IS-BIN16/8
63.50.007		Analog/binary input/output module - IGS-PTM
63.50.007-HSS		Analog/binary input/output module P/N 63.50.007 incl. plug-on module I-HSS-BIN8
63.50.011		AVR interface module - IG-AVRi
63.50.010-100		Power supply transformer for IG-AVRi module, 100-120 VAC, 50-60 Hz
63.50.010-230		Power supply transformer for IG-AVRi module, 230-480 VAC, 50-60 Hz
63.50.054		Analog output module - I-AOUT8
63.50.075	63.50.006	Modem extension unit - I-LB+
63.50.112	63.50.022	Internet bridge communication module - IB-NT
63.50.088		CAN repeater module - I-CR

### Sample Control Panel



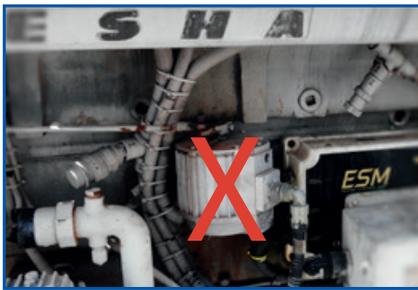
# GAS ENGINE CONTROL SYSTEMS

## MOT-Actuator MOTORTECH ELECTRIC ESM EXT ACTUATOR

### MOTORTECH Actuator Replacement Kit for WAUKESHA® VHP Series Four® with ESM and Extender® Series Engines

#### Features

- Drop in replacement
- Eliminates HEINZMANN® actuator
- Works on WAUKESHA® VHP L5774LT, L5794GSI/LT and L7044GSI



#### Replacement Kit for WAUKESHA® VHP Series Four® with ESM and Extender® Series Engines

P/N	Supersedes	Description	Equivalent to
63.04.176		Actuator replacement kit	214046



- Plug and play connection
- Does **not** require any
  - ESM software adjustment
  - or harness modification



- Mounting bracket, included
- Allows easy drop in installation



- Lever, included
- Simple connection to existing linkage

**INSTALLATION NOTICE:** If used on 6 cylinder WAUKESHA® VHP engines the IMPCO® throttle needs to be readjusted by flipping it over 180 degrees.

# SENSOR SYSTEMS



## Thermocouple Rails for WAUKESHA® 12 Cylinder VHP Engines

MOTORTECH offers a series of different Thermocouple Rail Upgrade Kits. The new rails are installed in the “Vee” or on the side of the engine. These rail kits replace any prior system if installed.

- Direct replacement for WAUKESHA® Thermocouple Conduit Assembly
- Available in different versions
- Prefabricated system guarantees easy exchange and installation
- Serviceable stainless steel wiring rail, no foam inside
- 14 thermocouples, Type K (NiCrNi), 90°
- Harness with flex conduit and J-Box or a large connector to fit the ESM
- Rail mounting brackets included in each kit
- 3 Versions Available



Thermocouples, Type K, NiCrNi, 90°



Harness with flex conduit and fitting

### Rail kit with 8 ft. harness to J-Box

Thermocouple wiring rail kit contains:

- 14 thermocouples Type K (NiCrNi), 90°, equivalent to WAUKESHA® P/N 211288S
- 8.5 ft. harness with flex conduit and fitting
- Rail mounting bracket (2 sets)
- Junction box P/N 06.05.076 with 44 terminals



P/N	Description	Equivalent to
D211359G-MOT	Thermocouple wiring rail kit	D211359G

### Rail kit with 50 ft. harness for direct wiring

Thermocouple wiring rail kit contains:

- 14 thermocouples Type K (NiCrNi), 90°, equivalent to WAUKESHA® P/N 211288S, but 50 ft. cable length
- 50 ft. harness with flex conduit and fitting
- Rail mounting bracket (2 sets)



P/N	Description	Equivalent to
77.75.068-50	Thermocouple wiring rail kit	

### Rail kit with 8 ft. harness and connector to ESM wiring system

Thermocouple wiring rail kit contains:

- 14 thermocouples Type K (NiCrNi), 90°, equivalent to WAUKESHA® P/N 211288S
- 8 ft. harness with flex conduit and 33 pole connector, socket
- Rail mounting bracket (2 sets)



P/N	Description	Equivalent to
77.75.066	Thermocouple wiring rail kit	214036D

### Spare Parts

P/N	Description	Lead Length	For Use with	Equivalent to
56.01.094-23	Thermocouple Type K (NiCrNi), 90°	23 ft.	D211359G-MOT, 77.75.066	211288S
56.01.094-59	Thermocouple Type K (NiCrNi), 90°	59 ft.	77.75.068-50	

### Optional Parts

P/N	Description	Required Quantity	Equivalent to
64.40.038	Swagelok® fitting, 1/4 in., outer thread 1/4 in. NPT	14 pcs. per rail kit	194929



# SENSOR SYSTEMS

## Thermocouple for CATERPILLAR® G3500 Series Gas Engines

P/N <sup>1)</sup>	Description	Version	Connector	Length	Equivalent to
56.01.092-28	Thermocouple Type K (NiCrNi)	90°	2 pole pin, 180°	28.00 in.	2149591, 3832989

<sup>1)</sup> Other lengths available on request.



## Thermocouple with Lead and Rail Connector for AlphaRails – For CUMMINS® QSK60G and QSV81/91G

P/N <sup>1)</sup>	Description	Version	Rail Connector	Length	Equivalent to
56.01.091-25	Thermocouple Type K (NiCrNi)	90°	3 pole pin, 180°	25.00 in.	

<sup>1)</sup> Other lengths available on request.

## Thermocouples for DEUTZ®/MWM® Gas Engines

P/N	Description	Engine Model
1229 6754	Thermocouple	616 series
1229 9487	Thermocouple	616 series
1229 3602	Thermocouple	620 series
1229 9387	Thermocouple	620 series
1232 2279	Thermocouple	2016 series



### Thermocouples for WAUKESHA® Gas Engines

P/N	Description	Version	Connector	Length	Equivalent to
56.01.005-42	Thermocouple Type K (NiCrNi)	180°	3 pole socket, 180°	42.00 in.	295962
56.01.005-53	Thermocouple Type K (NiCrNi)	180°	3 pole socket, 180°	53.00 in.	295962A
56.01.005-70	Thermocouple Type K (NiCrNi)	180°	3 pole socket, 180°	70.00 in.	295962B
56.01.005-81	Thermocouple Type K (NiCrNi)	180°	3 pole socket, 180°	81.00 in.	295962C



## AlphaRail

MOTORTECH WIRING RAIL SYSTEM

### Thermocouples for use with AlphaRail Wiring Rail System for Temperature Control

P/N	Description	Version	Rail Connector	Length	Equivalent to
56.01.090-10	Thermocouple Type K (NiCrNi)	90°	3 pole pin, 180°	10.00 in.	
56.01.090-20	Thermocouple Type K (NiCrNi)	90°	3 pole pin, 180°	20.00 in.	
56.01.090-25	Thermocouple Type K (NiCrNi)	90°	3 pole pin, 180°	25.00 in.	
56.01.090-30	Thermocouple Type K (NiCrNi)	90°	3 pole pin, 180°	30.00 in.	
56.01.090-40	Thermocouple Type K (NiCrNi)	90°	3 pole pin, 180°	40.00 in.	
56.01.090-60	Thermocouple Type K (NiCrNi)	90°	3 pole pin, 180°	60.00 in.	
56.01.090-K <sup>1)</sup>	Thermocouple Type K (NiCrNi)	90°	3 pole pin, 180°	177.00 in.	
56.01.180-10	Thermocouple Type K (NiCrNi)	180°	3 pole pin, 180°	10.00 in.	
56.01.180-20	Thermocouple Type K (NiCrNi)	180°	3 pole pin, 180°	20.00 in.	
56.01.180-25	Thermocouple Type K (NiCrNi)	180°	3 pole pin, 180°	25.00 in.	
56.01.180-30	Thermocouple Type K (NiCrNi)	180°	3 pole pin, 180°	30.00 in.	
56.01.180-40	Thermocouple Type K (NiCrNi)	180°	3 pole pin, 180°	40.00 in.	
56.01.180-60	Thermocouple Type K (NiCrNi)	180°	3 pole pin, 180°	60.00 in.	
56.01.180-K <sup>1)</sup>	Thermocouple Type K (NiCrNi)	180°	3 pole pin, 180°	177.00 in.	



<sup>1)</sup> Comes with loose connector and 177 in. lead length.

# SENSOR SYSTEMS

## Sensors

For several years MOTORTECH offers Oxygen sensors that can be used as replacements for the OEM part. Shielded and unshielded versions can be selected.

To increase life time of these critical sensors, there is also a stainless steel hub available that is welded into the exhaust pipe.

A heat shield can be screwed on top. This way the sensor does reach directly into the exhaust gas stream with all its deposits and the heat shield protects the sensor against transient temperature from the hot exhaust manifold.



### Oxygen Sensors for CATERPILLAR® G3400 and G3500 Series Gas Engines

P/N	Figure	Description	Connector	Length	Equivalent to
19.60.027	1	Oxygen sensor, non shielded	6 pole pin, 180°	10.00 in.	196-5391
19.60.029	2	Oxygen sensor, shielded	6 pole pin, 180°	51.00 in.	141-2494

### Oxygen Sensor for WAUKESHA® Gas Engines

P/N	Figure	Description	Connector	Length	Equivalent to
A740106E-MOT	3	Oxygen sensor	2 pole pin, 180°	17.00 in.	A740106E

### Oxygen Sensor Harness for WAUKESHA® Gas Engines

P/N	Figure	Description	Connector	Length	Equivalent to
06.30.110		Oxygen sensor harness	9 pole pin, 180°	90.00 in.	A740735

### UEGO Oxygen Sensor

P/N	Figure	Description	Connector	Length	Equivalent to
19.60.007	4	UEGO oxygen sensor	8 pole pin, 180°	15.75 in.	DL08311001
19.71.013		UEGO oxygen sensor lead	8 pole socket, 180°	79.00 in.	DL08311003



Conversion: 1 inch = 25,4 mm / 1 foot = 0,3 m

### Oxygen Sensor – Heated

P/N	Figure	Description	Connector	Length	Equivalent to
19.60.015		Oxygen sensor, heated	4 pole pin, 180°	0.35 m	
19.71.015-2		Oxygen sensor lead	4 pole socket, 180°	2.00 m	
19.71.015-3		Oxygen sensor lead	4 pole socket, 180°	3.00 m	
19.71.015-15		Oxygen sensor lead	4 pole socket, 180°	15.00 m	
19.71.015-30		Oxygen sensor lead	4 pole socket, 180°	30.00 m	

### Accessories for Oxygen Sensors

P/N	Figure	Description	Equivalent to
19.60.022	5	Heat shield	
19.60.023	6	Weld hub	

### MAT – Manifold Air Temperature Sensors

P/N	Figure	Supersedes	Description	Thread	Fitting Length	Equivalent to
56.01.004	7	56.01.021	MAT sensor	G1/2 in.	50 mm	
56.01.011	7		MAT sensor	G1/2 in.	75 mm	
56.01.017	7		MAT sensor	G1/2 in.	100 mm	

### MAP – Manifold Absolute Pressure Sensor (Automotive)

P/N	Figure	Description	Connector	Length	Equivalent to
19.60.002	8	MAP sensor	3 pole socket		6910-314
19.71.002		MAP sensor lead	3 pole pin, 180°	8.00 m	DL08220604

### MAP – Manifold Absolute Pressure Sensors (Industrial)

P/N	Figure	Supersedes	Description	Thread	Pressure Range	Equivalent to
56.01.001	9		MAP sensor	G1/4 in.	0 - 10,0 bar	
56.01.002	9		MAP sensor	G1/4 in.	0 - 6,0 bar	
56.01.010	9		MAP sensor	G1/4 in.	0 - 16,0 bar	
56.02.017	9	56.02.016	MAP sensor	G1/4 in.	0 - 3,0 bar	



# AIR/FUEL RATIO CONTROL SYSTEMS



## VariFuel2 MOTORTECH AIR/GAS MIXER

The VariFuel2 is a high-tech variable Venturi type mixer that can constantly adjust to any fuel changes and allows the engine to operate at its most efficient point. Series 100, 140, 200 and 250 are available for engines with an air requirement up to 5.200 m<sup>3</sup>/h. Coupled to an air/fuel ratio controller, lean-burn or stoichiometric, it precisely regulates the mixture. It is very popular for applications with constant changes in calorific value of fuel.

VariFuel2 uses a high precision stepper motor with an exclusive reprogrammable driver board (VariStep3). Various flow bodies and flexible inlet and outlet configurations allow fully flexible cross section adjustment.

### Suitable for nearly all gas types:

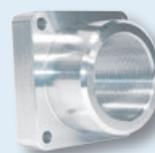
- Natural gas
- Biogas
- Landfill gas
- Sewage gas
- Wood gas
- Wellhead gas
- Mine gas



Stepper Motor Driver



Flow Bodies



Gas Inlet Flanges



Outlet Flange Kits



## Features

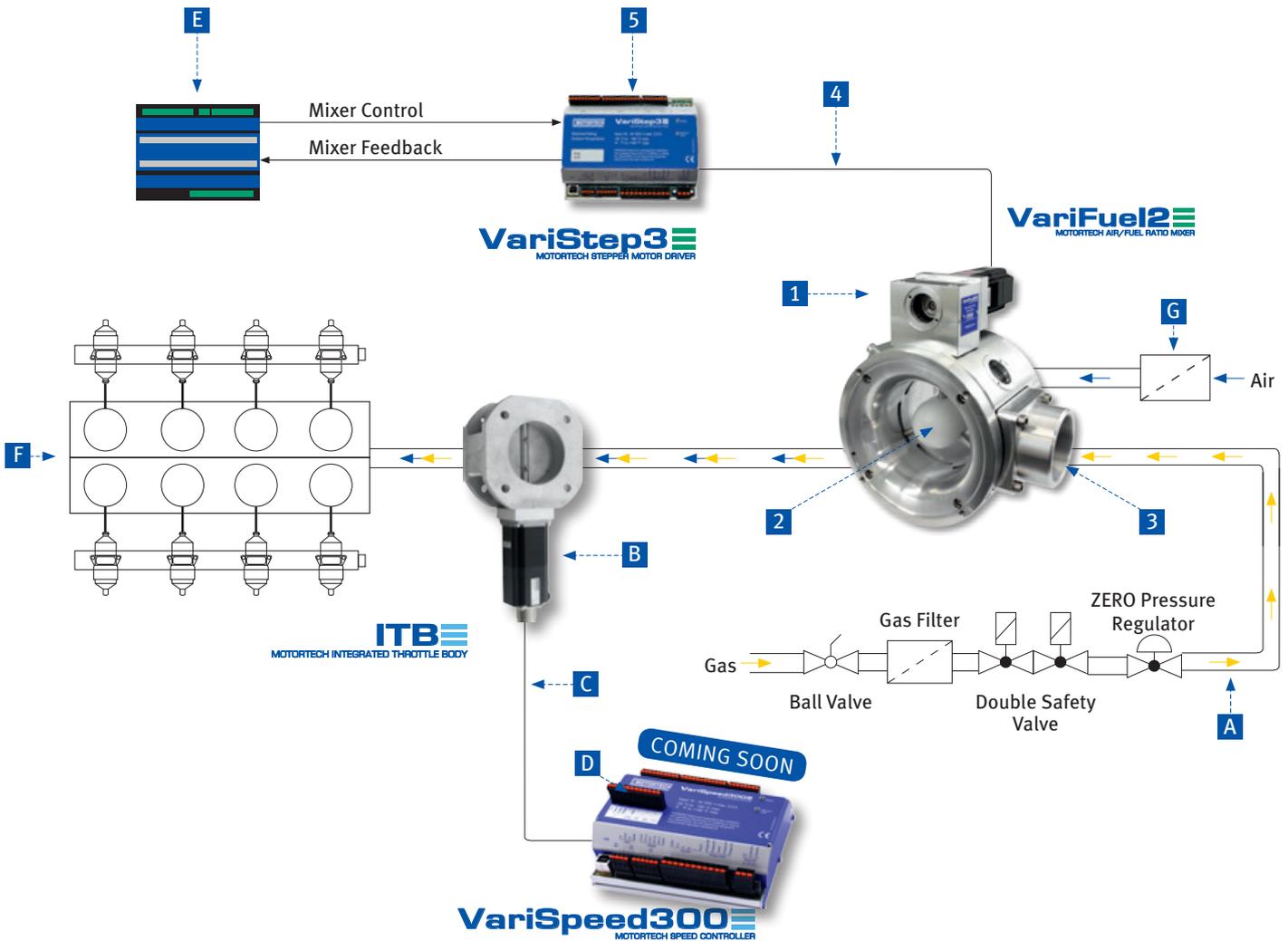
VariFuel2 Series	100-60	140-80	200-120	250-150
Air requirement	100–650 m <sup>3</sup> /h	200–1350 m <sup>3</sup> /h	500–3200 m <sup>3</sup> /h	1800–5200 m <sup>3</sup> /h
Available flow body sizes	23.0–55.0 mm in steps of 2.5 mm	23.0–72.5 mm in steps of 2.5 mm	23.0–107.5 mm in steps of 2.5 mm	23.0–110.0 mm in steps of 2.5 mm
Flexible inlet and outlet configuration	x	x	x	x
Driven by timing belt	x	x	x	x
Number of gas pressure gauge connections	1	1	1	1
Number of air pressure gauge connections	1	1	1	1
Hose connection for air inlet	x	x	x	x
Various flange connections for outlet	x	x	x	x
Various flange connections for gas inlet	x	x	x	x
The central flow body is fixed with 3 profiles. Their numerous small gas inlets provide an optimum mixture of gas and circulating air, granting a constant level of homogenization of the air-fuel mix.	x	x	x	x

Please consult the factory or your nearest MOTORTECH Sales Partner to get the correct VariFuel2 series specified for your engine application. Question form to identify your suitable VariFuel2 Air/Gas Mixer:

Engine manufacturer	<input type="text"/>	Series	<input type="text"/>
Engine model	<input type="text"/>	Nominal speed (rpm)	<input type="text"/>
Stroke	<input type="checkbox"/> 2 stroke <input type="checkbox"/> 4 stroke		
Cylinder arrangement	<input type="checkbox"/> In-line engine <input type="checkbox"/> V-engine		
Turbocharged engine	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Intercooler	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Fuel	<input type="text"/>	Fuel consumption	<input type="text"/>
Air consumption	<input type="text"/>		
Calorific value	<input type="text"/>		
Air ratio $\lambda$	<input type="text"/>		

# AIR/FUEL RATIO CONTROL SYSTEMS

## System Overview



### Required Accessories

- 1 VariFuel2 air/gas mixer
- 2 Flow body
- 3 Gas inlet flange
- 4 Stepper motor harness
- 5 VariStep3 Stepper Motor Driver

### Accessories

- A Gastrain (ZERO Pressure Regulator required)
- B ITB throttle body with integrated stepper motor
- C Stepper motor harness
- D VariSpeed300 speed controller
- E Emissions control system

### Description

- F Engine
- G Air filter

## 1 VariFuel2 Air/Gas Mixer – with Digital Stepper Motor

P/N	Supersedes	Description
30.45.100-60D	30.45.100-50D	VariFuel2 air/gas mixer – series 100-60
30.45.140-80D	30.45.140-65D	VariFuel2 air/gas mixer – series 140-80
30.45.200-120D	30.45.200-100D	VariFuel2 air/gas mixer – series 200-120
30.45.250-150D		VariFuel2 air/gas mixer – series 250-150



## VariFuel2 Air/Gas Mixer – Manually Adjustable

P/N	Supersedes	Description
30.45.100-60M	30.45.100-50M	VariFuel2 air/gas mixer – series 100-60
30.45.140-80M	30.45.140-65M	VariFuel2 air/gas mixer – series 140-80
30.45.200-120M	30.45.200-100M	VariFuel2 air/gas mixer – series 200-120
30.45.250-150M		VariFuel2 air/gas mixer – series 250-150



## 2 Flow Bodies

P/N	Description	Diameter	100-60D/M	140-80D/M	200-120D/M	250-150D/M
31.01.720-23.0-3	Flow body	23,0 mm	x	x	x	x
31.01.720-25.0-3	Flow body	25,0 mm	x	x	x	x
31.01.720-27.5-3	Flow body	27,5 mm	x	x	x	x
31.01.720-30.0-3	Flow body	30,0 mm	x	x	x	x
31.01.720-32.5-3	Flow body	32,5 mm	x	x	x	x
31.01.720-35.0-3	Flow body	35,0 mm	x	x	x	x
31.01.720-37.5-3	Flow body	37,5 mm	x	x	x	x
31.01.720-40.0-3	Flow body	40,0 mm	x	x	x	x
31.01.720-42.5-3	Flow body	42,5 mm	x	x	x	x
31.01.720-45.0-3	Flow body	45,0 mm	x	x	x	x
31.01.720-47.5-3	Flow body	47,5 mm	x	x	x	x
31.01.720-50.0-3	Flow body	50,0 mm	x	x	x	x
31.01.720-52.5-3	Flow body	52,5 mm	x	x	x	x
31.01.720-55.0-3	Flow body	55,0 mm	x	x	x	x
31.01.720-57.5-3	Flow body	57,5 mm		x	x	x
31.01.720-60.0-3	Flow body	60,0 mm		x	x	x
31.01.720-62.5-3	Flow body	62,5 mm		x	x	x
31.01.720-65.0-3	Flow body	65,0 mm		x	x	x
31.01.720-67.5-3	Flow body	67,5 mm		x	x	x
31.01.720-70.0-3	Flow body	70,0 mm		x	x	x
31.01.720-72.5-3	Flow body	72,5 mm		x	x	x
31.01.720-75.0-3	Flow body	75,0 mm			x	x
31.01.720-77.5-3	Flow body	77,5 mm			x	x
31.01.720-80.0-3	Flow body	80,0 mm			x	x
31.01.720-82.5-3	Flow body	82,5 mm			x	x
31.01.720-85.0-3	Flow body	85,0 mm			x	x
31.01.720-87.5-3	Flow body	87,5 mm			x	x
31.01.720-90.0-3	Flow body	90,0 mm			x	x



D= VariFuel2 with digital stepper motor; M= VariFuel2 manually adjustable  
 Conversion: 1 inch = 25,4 mm / 1 foot = 0,3 m

# AIR/FUEL RATIO CONTROL SYSTEMS

## 2 Flow Bodies

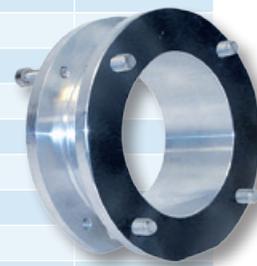
P/N	Description	Diameter	100-60D/M	140-80D/M	200-120D/M	250-150D/M
31.01.720-92.5-3	Flow body	92,5 mm			x	x
31.01.720-95.0-3	Flow body	95,0 mm			x	x
31.01.720-97.5-3	Flow body	97,5 mm			x	x
31.01.720-100.0-3	Flow body	100,0 mm			x	x
31.01.720-102.5-3	Flow body	102,5 mm			x	x
31.01.720-105.0-3	Flow body	105,0 mm			x	x
31.01.720-107.5-3	Flow body	107,5 mm			x	x
31.01.720-110.0-3	Flow body	110,0 mm				x

D= VariFuel2 with digital stepper motor; M= VariFuel2 manually adjustable

## Outlet Flange Kits

P/N	Description	100-60D/M	140-80D/M	200-120D/M	250-150D/M
31.01.764	Outlet flange kit, gas relaxation section for throttle, series 50	x			
31.01.765	Outlet flange kit, gas relaxation section for throttle, series 100	x			
31.01.766	Outlet flange kit, gas relaxation section for throttle, series 50	x			
31.01.768	Outlet flange kit, for MAN® E0834LE302/ E0836LE202	x			
31.01.750	Outlet flange kit, for MAN® E2876LE202/ 212/ 302		x		
31.01.752	Outlet flange kit, welding neck flange, DN100		x		
31.01.753	Outlet flange kit, for MAN® E0836LE202		x		
31.01.755	Outlet flange kit, DN65-PN6		x		
31.01.756	Outlet flange kit, for MAN® E2842E312		x		
31.01.757	Outlet flange kit, for throttle, series 100		x		
31.01.762	Outlet flange kit, gas relaxation section for throttle, series 100		x		
31.01.763	Outlet flange kit, gas relaxation section for throttle, series 140		x		
31.01.773	Outlet flange kit, for LIEBHERR® G934/ G944		x		
31.01.781	Outlet flange kit, for LIEBHERR® G946		x		
31.01.751	Outlet flange kit, welding neck flange, DN150			x	
31.01.754	Outlet flange kit, for MAN® E2842LE312			x	
31.01.758	Outlet flange kit, hose connection, DN200			x	
31.01.759	Outlet flange kit, for MAN® E2876LE202/ 212/ 302			x	
31.01.761	Outlet flange kit, welding neck flange, DN150 - aluminum			x	
31.01.767	Outlet flange kit, for DEUTZ® TCG2015V6/ V8			x	
31.01.772	Outlet flange kit, for SHENGDONG® 600GF1-PS			x	
31.01.774	Outlet flange kit, for LIEBHERR® G936			x	
31.01.775	Outlet flange kit, for LIEBHERR® G9508			x	
31.01.776	Outlet flange kit, for LIEBHERR® G9512			x	
31.01.777	Outlet flange kit, for LIEBHERR® G946/ DOOSAN® GV158.3013.D			x	
31.01.778	Outlet flange kit, for LIEBHERR® G9508			x	
31.01.779	Outlet flange kit, linkage for 2 VariFuel2 - series 200-1xx			x	
31.01.780	Outlet flange kit, for MAN® E2848/ 42LE322/ E3268/62LE2xx			x	

D= VariFuel2 with digital stepper motor; M= VariFuel2 manually adjustable



### 3 Gas Inlet Flanges

P/N	Description	Thread	100-60D/M	140-80D/M	200-120D/M	250-150D/M
30.30.102	Gas inlet flange	G 1	x	x		
30.30.102-NPT	Gas inlet flange	1 NPT	x	x		
30.30.103	Gas inlet flange	G 1 1/4	x	x		
30.30.103-NPT	Gas inlet flange	1 1/4 NPT	x	x		
30.30.104	Gas inlet flange	G 1 1/2	x	x		
30.30.104-NPT	Gas inlet flange	1 1/2 NPT	x	x		
30.30.106	Gas inlet flange	G 1 1/2			x	
30.30.106-NPT	Gas inlet flange	1 1/2 NPT			x	
30.30.107	Gas inlet flange	G 2			x	
30.30.107-NPT	Gas inlet flange	2 NPT			x	
30.30.108	Gas inlet flange	G 2 1/2			x	
30.30.108-NPT	Gas inlet flange	2 1/2 NPT			x	
30.30.114	Gas inlet flange	G 4				x



D= VariFuel2 with digital stepper motor; M= VariFuel2 manually adjustable

### 4 Stepper Motor Harness

P/N	Description	100-60D	140-80D	200-120D	250-150D
31.01.942	Stepper motor harness, MIL Style 10 pole socket , 90°	x	x	x	x

D= VariFuel2 with digital stepper motor

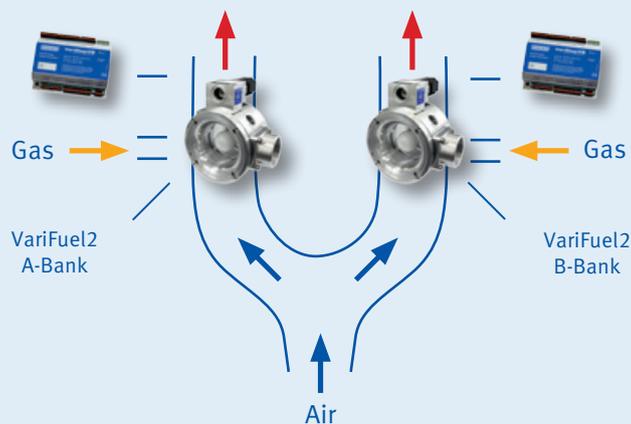
### 5 VariStep3 Stepper Motor Driver

P/N	Supersedes	Description	100-60D	140-80D	200-120D	250-150D
31.01.960	31.01.955	VariStep3 stepper motor driver	x	x	x	x

<sup>1)</sup> For multiple mixer applications each VariFuel2 air/fuel ratio mixer needs a single VariStep stepper motor card.

D= VariFuel2 with digital stepper motor

### Multiple Mixer Application



# AIR/FUEL RATIO CONTROL SYSTEMS

## Tools for Repair and Maintenance

P/N	Figure	Description	100-50D/M	100-60D/M	140-65D/M	140-80D/M	200-100D/M	200-120D/M	250-150D/M
31.01.948-100	1	VariFuel2 adjustment tool for belt tension	x	x					
31.01.948-140	1	VariFuel2 adjustment tool for belt tension			x	x			
31.01.948-200	1	VariFuel2 adjustment tool for belt tension					x	x	
31.01.943	2	VariFuel2 locking tool for toothed pulley	x	x	x	x	x	x	x
31.01.949	3	VariFuel2 tool for inspection window	x	x	x	x	x	x	x

## Repair Kits

P/N	Description	100-50	100-60	140-65	140-80	200-100	200-120	250-150
31.01.997-1-100-50	VariFuel2 repair kit, basic kit, series 100-50	x(D/M)						
31.01.997-1-100-60	VariFuel2 repair kit, basic kit, series 100-60		x(D/M)					
31.01.997-1-140-65	VariFuel2 repair kit, basic kit, series 140-65			x(D/M)				
31.01.997-1-140-80	VariFuel2 repair kit, basic kit, series 140-80				x(D/M)			
31.01.997-1-200-100A	VariFuel2 repair kit, basic kit, series 200-100 (up to S/N 05010012)					x(D/M)		
31.01.997-1-200-100B	VariFuel2 repair kit, basic kit, series 200-100 (from S/N 05010267)					x(D/M)		
31.01.997-1-200-120	VariFuel2 repair kit, basic kit, series 200-120						x(D/M)	
31.01.997-1-250-150	VariFuel2 repair kit, basic kit, series 250-150							x(D/M)
31.01.997-2-100-50A	VariFuel2 repair kit, stepper motor kit, Rev.A, series 100-50	x(D)						
31.01.997-2-100-50B	VariFuel2 repair kit, stepper motor kit, Rev.B, series 100-50	x(D)						
31.01.997-2-A	VariFuel2 repair kit, stepper motor kit, Rev.A, series 140 to 200			x(D)		x(D)	x(D)	
31.01.997-2-B	VariFuel2 repair kit, stepper motor kit, Rev.B, series 140 to 250		x(D)	x(D)	x(D)	x(D)	x(D)	x(D)
31.01.997-3-100-50	VariFuel2 repair kit, inlet nozzle kit, series 100-50	x(D/M)						
31.01.997-3-100-60	VariFuel2 repair kit, inlet nozzle kit, series 100-60		x(D/M)					
31.01.997-3-140-65	VariFuel2 repair kit, inlet nozzle kit, series 140-65			x(D/M)				
31.01.997-3-140-80	VariFuel2 repair kit, inlet nozzle kit, series 140-80				x(D/M)			
31.01.997-3-200-100	VariFuel2 repair kit, inlet nozzle kit, series 200-100					x(D/M)		
31.01.997-3-200-120	VariFuel2 repair kit, inlet nozzle kit, series 200-120						x(D/M)	
31.01.997-3-250-150	VariFuel2 repair kit, inlet nozzle kit, series 250-150							x(D/M)
31.01.997-4	VariFuel2 repair kit, gauge port kit, series 100 to 200	x(D/M)	x(D/M)	x(D/M)	x(D/M)	x(D/M)	x(D/M)	x(D/M)



1



2



3

## Gaskets for Outlet Flange Kits

P/N VariFuel-Sided	P/N Engine-Sided	Included in	P/N
31.01.365	03.90.050	Outlet flange kit, gas relaxation section for throttle, series 50	31.01.764
31.01.365	03.90.100	Outlet flange kit, gas relaxation section for throttle, series 100	31.01.765
31.01.858	03.90.050	Outlet flange kit, gas relaxation section for throttle, series 50	31.01.766
31.01.858	31.01.365	Outlet flange kit, for MAN® E0834LE302/ E0836LE202	31.01.768
31.01.809	31.01.876	Outlet flange kit, for MAN® E2876LE202/ 212/ 302	31.01.750
31.01.809		Outlet flange kit, welding neck flange, DN100	31.01.752
31.01.809	31.01.858	Outlet flange kit, for MAN® E0836LE202	31.01.753
31.01.809	31.01.867	Outlet flange kit, DN65-PN6	31.01.755
31.01.809	31.01.871	Outlet flange kit, for MAN® E2842E312	31.01.756
31.01.809	03.90.100	Outlet flange kit, for throttle, series 100	31.01.757
31.01.809	03.90.100	Outlet flange kit, gas relaxation section for throttle, series 100	31.01.762
31.01.809	03.90.140	Outlet flange kit, gas relaxation section for throttle, series 140	31.01.763
31.01.809		Outlet flange kit, for LIEBHERR® G934/ G944	31.01.773
31.01.809		Outlet flange kit, for LIEBHERR® G946	31.01.781
31.01.828		Outlet flange kit, welding neck flange, DN150	31.01.751
31.01.828	31.01.863	Outlet flange kit, for MAN® E2842LE312	31.01.754
31.01.828		Outlet flange kit, hose connection, DN200	31.01.758
31.01.879	31.01.879	Outlet flange kit, for MAN® E2876LE202/ 212/ 302	31.01.759
31.01.828		Outlet flange kit, welding neck flange, DN150 - aluminum	31.01.761
31.01.828	31.01.886	Outlet flange kit, for DEUTZ® TCG2015V6/ V8	31.01.767
31.01.371, 31.01.828	31.01.371, 31.01.372	Outlet flange kit, for SHENGDONG® 600GF1-PS	31.01.772
31.01.828		Outlet flange kit, for LIEBHERR® G936	31.01.774
31.01.828		Outlet flange kit, for LIEBHERR® G9508	31.01.775
31.01.828		Outlet flange kit, for LIEBHERR® G9512	31.01.776
31.01.828		Outlet flange kit, for LIEBHERR® G946/ DOOSAN® GV158.3013.D	31.01.777
31.01.828		Outlet flange kit, for LIEBHERR® G9508	31.01.778
31.01.828	31.01.377	Outlet flange kit, linkage for 2 VariFuel2 - series 200-1xx	31.01.779
31.01.828	31.01.828	Outlet flange kit, for MAN® E2848/ 42LE322/ E3268/62LE2xx	31.01.780

<sup>1)</sup> Gaskets included in each outlet flange kit.

# AIR/FUEL RATIO CONTROL SYSTEMS



## VariStep3

MOTORTECH STEPPER MOTOR DRIVER

The stepper motor driver developed by MOTORTECH guarantees the ideal control of the various types of MOTORTECH VariFuel2 air/gas mixers and throttle bodies with integrated stepper motor.

- Precise mixer and throttle adjustment due to microstep operation
- Very fast response times
- Increased power output provides high torque and quick movement even when driving big stepper motors
- Accelerated reference run
- LEDs displaying unit status and activity
- Combination of several units without signal amplifier/splitter
- Integrated CANopen and Modbus RTU interface
- Configuration via MICT software
- Error data logging for improved diagnostic options
- Compact design
- Plug-in terminals
- Easy access to connectors and switches
- Switch board installation on DIN rail



### Stepper Motor Driver for VariFuel2 Air/Gas Mixer and Integrated Throttle Bodies

P/N	Supersedes	Description
31.01.960	31.01.955	VariStep3 stepper motor driver

#### Technical Data

- 18–32 VDC power supply
- -20 °C up to +60 °C (-4 °F up to 140 °F) ambient temperature
- 0-20 mA/ 0-10V analog input and output, flexible configuration
- 5 digital inputs, 5 to 32 V compatible, DC-isolated
- 6 digital outputs, up to 32 V, 100 mA, DC-isolated

#### Interfaces

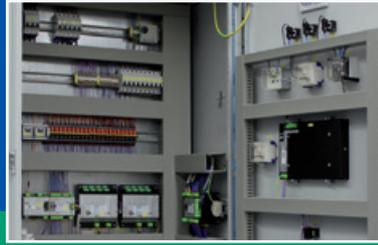
- CAN Bus 2.0b interface (CANopen protocol)
- RS485 interface (Modbus RTU)
- USB 1.1 interface

#### Configuration

- Using the graphic user interface MICT (MOTORTECH Integrated Configuration Tool)
- Manual control via push-button

#### Housing

- Protection class IP 20
- Dimensions 160 x 126 x 62 mm (6.3 x 5.0 x 2.4 in.)



## EmCon5

MOTORTECH LEAN-BURN EMISSION CONTROLLER

The EmCon5 is a lean-burn emission controller for gas engine co-generation units. It is designed to control the exhaust gas emission levels based on indirect measurements. Simply three input signals are required for the control purpose: manifold inlet pressure and temperature and engine load. A CH<sub>4</sub> input signal is optional. Use of an oxygen sensor is not required.

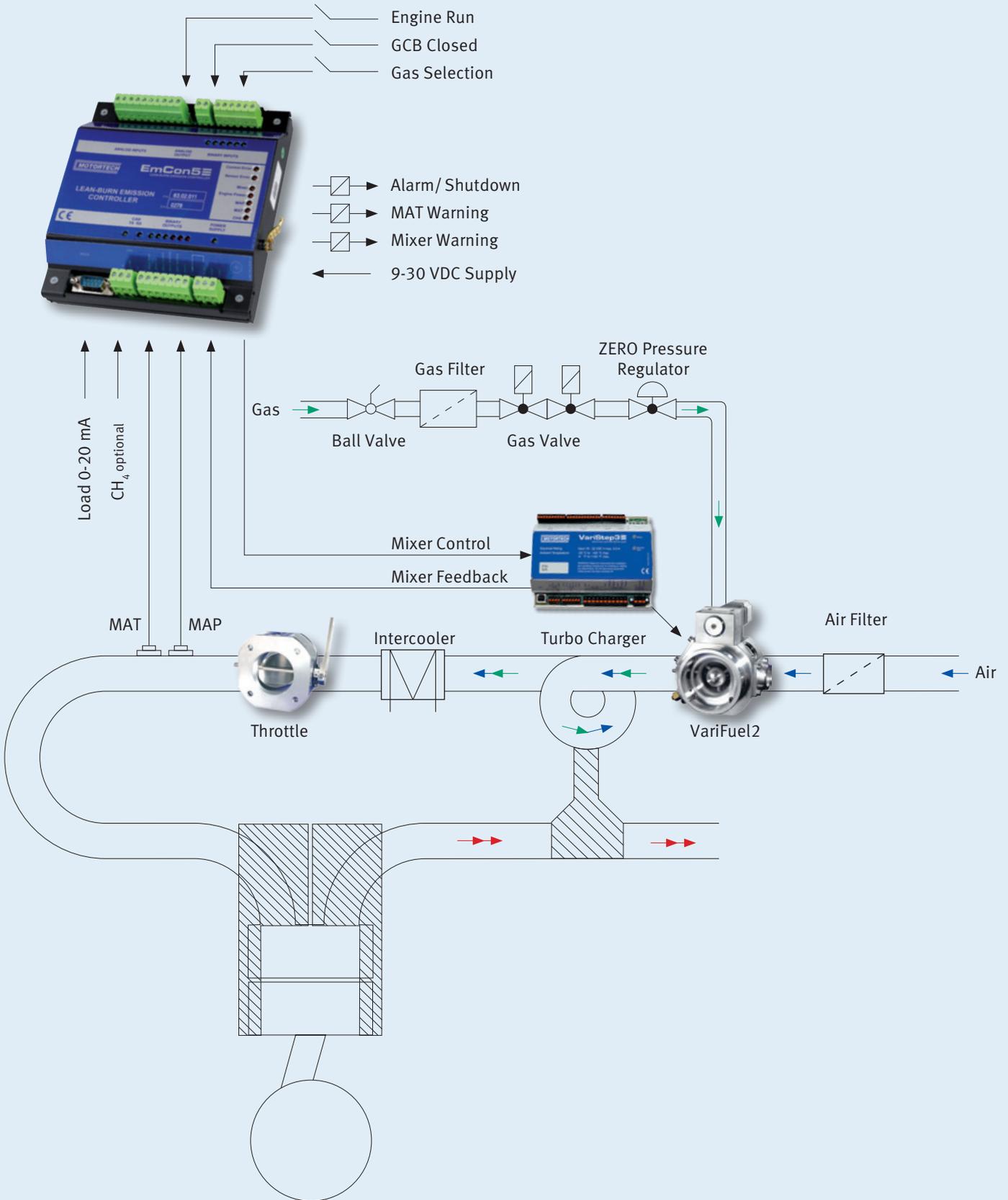
Following initial measurements of the engine emission levels and successful analysis, the EmCon5 guarantees optimal operation of the gas engine at the predefined emission limits. All controller parameters are freely programmable. The adjustments and modifications are made via the computer-program "WinScope". The EmCon5 fits perfectly with the VariFuel2.



### Features

- Standardized system available
- Operates without oxygen sensor
- Two gas qualities programmable
- Easy to use
- Available with complete sensor harness (optional)
- Data logging
- Flexible control for reliable operation with biogas

# AIR/FUEL RATIO CONTROL SYSTEMS



### Control unit

P/N	Figure	Description
63.02.011	<a href="#">1</a>	EmCon5 lean burn emission control unit

### Sensor Harness

P/N	Figure	Description
60.30.045	<a href="#">2</a>	EmCon5 sensor harness including MAT sensor P/N 56.01.004 and MAP sensor P/N 56.02.017

### Manifold Absolute Pressure Sensor

P/N	Figure	Supersedes	Description	Thread	Pressure Range
56.02.017	<a href="#">3</a>	56.02.016	MAP sensor	G 1/4	0 - 3,0 bar

### Manifold Air Temperature Sensors

P/N	Figure	Supersedes	Description	Thread	Fitting Length
56.01.004	<a href="#">4</a>	56.01.021	MAT sensor, PT100, two wire	G 1/2	50 mm
56.01.011	<a href="#">4</a>		MAT sensor, PT100, two wire	G 1/2	75 mm
56.01.017	<a href="#">4</a>	56.01.005	MAT sensor, PT100, two wire	G 1/2	100 mm

### Load Transducer

P/N	Figure	Supersedes	Description
63.02.013	<a href="#">5</a>		Load transducer 0-5 A --> 0-20 mA/4-20 mA/0-10 V/2-10 V



# GAS ENGINE ACCESSORIES



## OLC

MOTORTECH OIL LEVEL CONTROLLER

Combustion engines, compressors, turbines, slide bearings and gears – they all depend on a reliable supply of lubricating oil. For trouble-free operation, each of those systems, dependent on the design, requires a precisely defined oil level that may only be exceeded or undercut by a narrow margin. Moreover, the lubricating capacity of the oil is depleted after a certain operating time – it has to be changed.

Oil level monitoring, oil refill, and even an automated oil change – in other words, the complete management of the oil cycle – can be realized in a completely reliable manner with MOTORTECH's OLC oil level controller.

### Advantages for the User

- Elimination of regular monitoring of the oil level
- Operation is not interrupted for monitoring the oil level
- Operating errors are avoided, no overfilling/lack of oil
- Automated oil change possible
- Less work for staff, increase in operational safety
- Visual surveillance of the oil level during operation is possible
- Remote monitoring from a central location



### Features

- Housing made of a high-grade, saltwater-resistant aluminum alloy
- Individually and infinitely adjustable float switches with reed contacts
- Potential-free closing or opening switches, no voltage transfer
- One-shot switches with step response and unambiguous switching states
- Contacts do not come into contact with oil, protection class IP 65
- Vibration-proof, no interference caused by worn rods/valve seats
- 2, 3 or 4 contacts
- Optional analog level indicator 4-20 mA/0-10 V
- Floats resistant to all oils
- Contact protection thanks to integrated resistor
- Switch point adjustment requires the use of tools
- Fail-safe wires
- Suitable for mineral and synthetic oils
- 2 oil and 2 equalization connectors
- Pipe connections with standard inch threads
- Sight glass made of impact-resistant polycarbonate
- Glass sealed with Perbunan (NBR)
- Interior painted white for optimal recognition of oil level
- Slotted holes allow for height adjustment during installation
- Indication of engine wear based on refill frequency
- Indication of water in lubricating oil is possible

## Product Variants

### Oil Level Controller with Float Switches

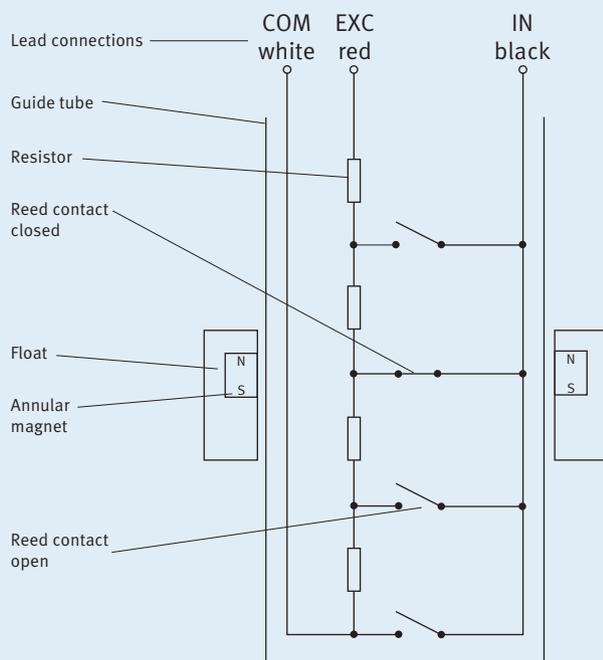
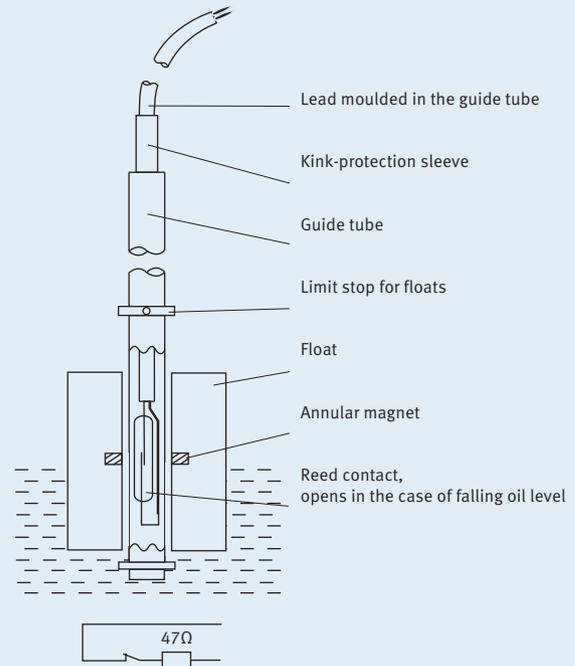
The devices of this OLC version are ideal for use with gas engines and they stand out for their reliable monitoring of the oil level.

The housing, made of a saltwater-resistant aluminum alloy, accommodates 2, 3 or 4 float switches. The float switches are screwed into the housing with a clamp screw connection. Any immersion depth can be adjusted with a swivel nut, which makes it possible to set the desired switch point. Subsequent readjustment is also possible without any problems.

A large sight glass made of impact-resistant polycarbonate enables the visual assessment of the current oil level. The white inner coating facilitates viewing even with poor light conditions.

The slotted holes and the optional use of the vertical or horizontal pipe connection threads constitute significant advantages during the installation.

### Float Switch (displayed as MIN Contact)



### Oil Level Controller with analog Level Sensor

Unlike an oil level controller with float switches, this OLC version uses reed contacts that are distributed evenly in the guide tube across the entire measuring range of 125 mm. Every reed contact is connected to a resistor. When the float rises or falls with the oil level, the magnetic forces of an annular magnet activate a reed contact through which an electrical current flows. The aforementioned resistors bring about a type of sliding resistance.

The variable electrical signal, created by different resistance values, is converted into a standard signal within a range of 4 to 20 mA by a measuring transducer that is connected by cable. This signal can be used in many different ways in a control system (e. g. ALL-IN-ONE). A visual display on a screen or an LED bar graph is also possible.

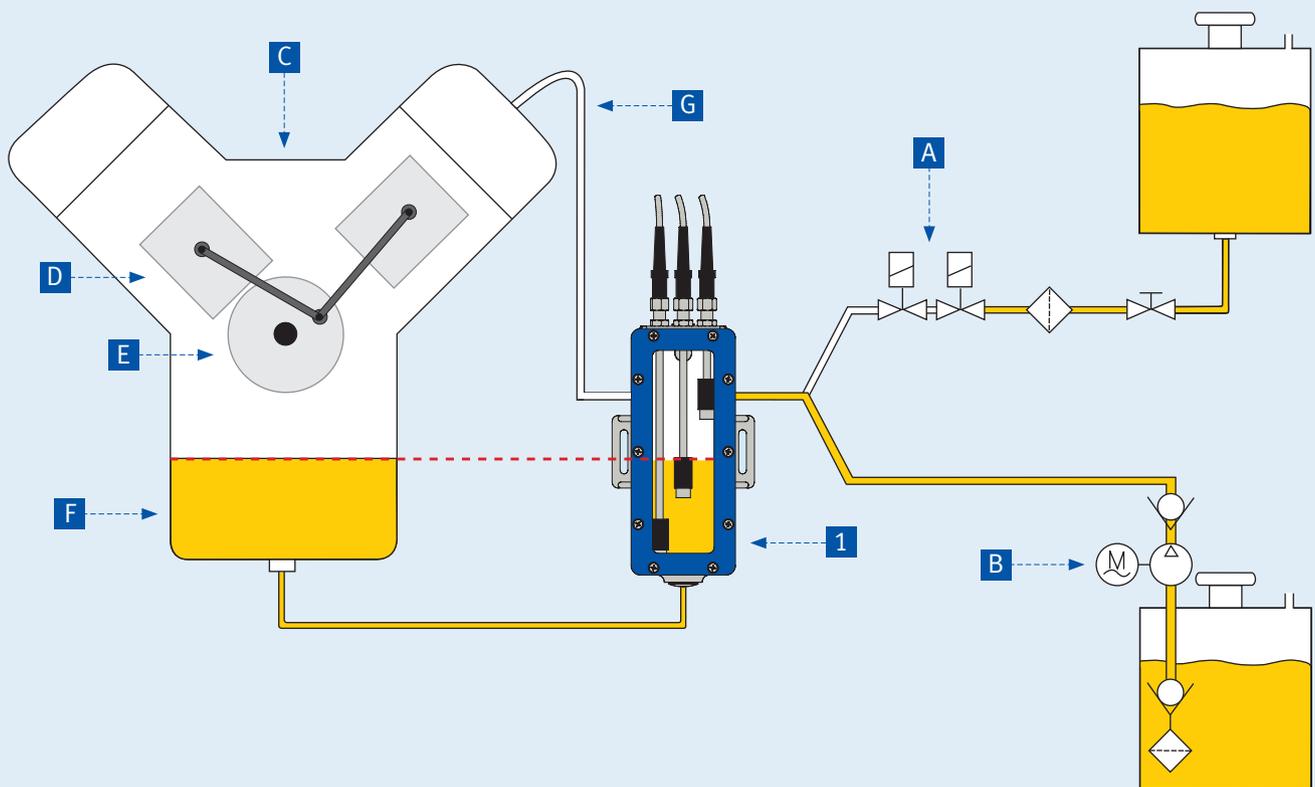
Two versions of the OLC can be equipped with one or two float switches in addition to the analog sensor in order to provide a redundant monitoring signal for the minimum or maximum oil level.

# GAS ENGINE ACCESSORIES

## Automatic Oil Refill

Monitoring the optimal oil level and signaling a lack of oil or overfilling with the OLC oil level controller is imperative for stationary gas engines that are in continuous operation. Therefore, upgrading to an automatic oil refill is logical and enables operation without supervision.

If the oil level falls short of the switch point for the refill contact (or the set electrical current with an analog sensor), then the engine control system sends a signal to the refill valve or to a refill pump. Fresh oil will be supplied to the engine until the refill contact interrupts the flow of oil.



### Required Accessories

- 1 OLC oil level controller

### Accessories

- A Solenoid/double solenoid valve<sup>1</sup>  
*alternative*
- B Oil pump<sup>2</sup>

### Description

- C Engine
- D Piston
- E Crankshaft
- F Oil pan
- G Compensation line

<sup>1</sup> An oil storage tank positioned above the engine, from which the oil flows by gravity, requires a solenoid valve for blocking, or better yet a double solenoid valve for reasons of redundancy.

<sup>2</sup> An oil storage tank located below the engine must be equipped with an electric pump.

### 1 Oil Level Controllers with Analog Level Sensor 4–20 mA – Transducer in Metal Housing

P/N	Description	Float Switch	Cable Length	Cable Insulation
80.01.214	OLC oil level controller with analog level sensor		4.0 m	PVC
80.01.214-1104	OLC oil level controller with analog level sensor	MIN	4.0 m	PVC
80.01.214-1204	OLC oil level controller with analog level sensor	MAX	4.0 m	PVC
80.01.214-2104	OLC oil level controller with analog level sensor	MIN/MAX	4.0 m	PVC

### 1 Oil Level Controllers with two Float Switches

P/N	Description	Cable Length	Cable Insulation
80.01.210-2001	OLC oil level controller	1.0 m	PVC
80.01.210-2004	OLC oil level controller	4.0 m	PVC

### 1 Oil Level Controllers with three Float Switches

P/N	Description	Cable Length	Cable Insulation
80.01.210-3001	OLC oil level controller	1.0 m	PVC
80.01.210-3004	OLC oil level controller	4.0 m	PVC

### 1 Oil Level Controllers with four Float Switches

P/N	Description	Cable Length	Cable Insulation
80.01.210-4001	OLC oil level controller	1.0 m	PVC
80.01.210-4004	OLC oil level controller	4.0 m	PVC

### A Double Solenoid Valves

P/N	Description	Coil Voltage	Maximum Pressure	Cable Length	Cable Insulation
81.00.310-01	Double solenoid valve, 2/2 way	230 V / 50 Hz	24 bar	1.0 m	PVC
81.00.310-04	Double solenoid valve, 2/2 way	230 V / 50 Hz	24 bar	4.0 m	PVC
81.00.311-01	Double solenoid valve, 2/2 way	24 V	16 bar	1.0 m	PVC
81.00.311-04	Double solenoid valve, 2/2 way	24 V	16 bar	4.0 m	PVC
81.00.312-01	Double solenoid valve, 2/2 way	12 V	16 bar	1.0 m	PVC
81.00.312-04	Double solenoid valve, 2/2 way	12 V	16 bar	4.0 m	PVC
81.00.313-01	Double solenoid valve, 2/2 way	24 V / 50 Hz	24 bar	1.0 m	PVC
81.00.313-04	Double solenoid valve, 2/2 way	24 V / 50 Hz	24 bar	4.0 m	PVC

### A Solenoid Valves

P/N	Description	Coil Voltage	Maximum Pressure	Cable Length	Cable Insulation
81.00.300-01	Solenoid valve, 2/2 way	230 V / 50 Hz	24 bar	1.0 m	PVC
81.00.300-04	Solenoid valve, 2/2 way	230 V / 50 Hz	24 bar	4.0 m	PVC
81.00.301-01	Solenoid valve, 2/2 way	24 V	16 bar	1.0 m	PVC
81.00.301-04	Solenoid valve, 2/2 way	24 V	16 bar	4.0 m	PVC
81.00.302-01	Solenoid valve, 2/2 way	12 V	16 bar	1.0 m	PVC
81.00.302-04	Solenoid valve, 2/2 way	12 V	16 bar	4.0 m	PVC
81.00.303-01	Solenoid valve, 2/2 way	24 V / 50 Hz	24 bar	1.0 m	PVC
81.00.303-04	Solenoid valve, 2/2 way	24 V / 50 Hz	24 bar	4.0 m	PVC

### B Oil Pumps

P/N	Description	Voltage	Connect- ed Load	Protection class	Max. pump capacity	Max Pressure
81.00.510	Oscillating piston pump	230 V / 50 Hz	30 W	IP 66	0.4 l/min.	0.7 bar
81.00.511	Oscillating piston pump	230 V / 50 Hz	60 W	IP 65	1.5 l/min.	2.5 bar

# GAS ENGINE ACCESSORIES

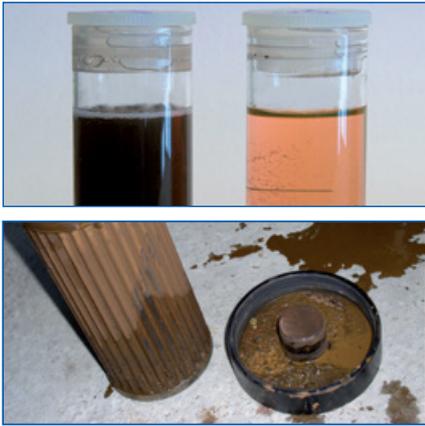


## Coolant Filtration

### Stainless Steel Coolant Filters for stationary applications

These bypass filters with stainless steel filter elements clean coolant liquids from all deposits. Elements can be washed and do not need to be disposed. Increases water pump life, cylinder head efficiency and equipment availability. Reduces service and maintenance cost.

### Coolant should be clean and clear!



### Features

- Easy to install
- Cleans and maintains coolant system from rust and contaminants
- Increases water pump life
- Reduces coolant deposits and increases cylinder head efficiency and life
- Stainless steel filter elements can be cleaned – NO WASTE
- Visual flow indicator (stationary applications)
- Easy to service – decreases maintenance cost
- Filter micron rating: standard – 50 micron optional – 25 micron
- Flow rate up to 30 GPM

### Technical Advantage

- Inhibits electro-chemical degradation of engine components. An industrial gas engine has the characteristics of a large battery when coolant is circulated through the engine block. Contaminants and suspended solids in the coolant act as a conductor, which more readily allows current to flow throughout the engine block, which degrades EPDM, buna, rubber, viton, and soft metal or alloy components / water pump bearings, impellers, etc.
- Cleaned coolant inhibits corrosion on engine components such as cylinder heads, cylinder liners and seals, water pump impellers and bearings, etc.
- Prevents “flash-off” in the cylinder heads when engine has an emergency stop; as the coolant can properly dissipate thermal loads
- Inhibits scale deposits on all coolant passages and interior thermal surfaces of the engine block.

### Standard (for Temperatures up to 200 °F /95 °C)

P/N	Description	Element Outside Diameter	Element Length	Micron Rating <sup>1)</sup>	Stand	Flow Indicator	Equivalent to
25.00.009-50-30	Coolant Filter	5.00 in.	9.00 in.	50	30.00 in.	X	489501
25.00.009-50	Coolant Filter	5.00 in.	9.00 in.	50		X	
25.00.018-50-49	Coolant Filter	5.00 in.	18.00 in.	50	49.00 in.	X	489625
25.00.018-50	Coolant Filter	5.00 in.	18.00 in.	50		X	

<sup>1)</sup> For 25 micron filter elements please change part number from -50 to -25.

### High Temperature (for Temperatures from 200 °F /95 °C up to 400 °F/205 °C)

P/N	Description	Element Outside Diameter	Element Length	Micron Rating <sup>1)</sup>	Stand	Flow Indicator	Equivalent to
25.00.009-50-30-HT	Coolant Filter	5.00 in.	9.00 in.	50	30.00 in.	X	
25.00.009-50-HT	Coolant Filter	5.00 in.	9.00 in.	50		X	
25.00.018-50-49-HT	Coolant Filter	5.00 in.	18.00 in.	50	49.00 in.	X	
25.00.018-50-HT	Coolant Filter	5.00 in.	18.00 in.	50		X	

<sup>1)</sup> For 25 micron filter elements please change part number from -50 to -25.

### Single Elements

P/N	Description	Element Outside Diameter	Element Length	Micron Rating	Equivalent to
25.00.109-25	Coolant Filter Element	5.00 in.	9.00 in.	25	
25.00.109-50	Coolant Filter Element	5.00 in.	9.00 in.	50	489508
25.00.118-25	Coolant Filter Element	5.00 in.	18.00 in.	25	
25.00.118-50	Coolant Filter Element	5.00 in.	18.00 in.	50	489626

### Shipping Cases for Elements

P/N	Description	Element Length	Equivalent to
25.00.209	Shipping Case	9.00 in.	
25.00.218	Shipping Case	18.00 in.	

# GAS ENGINE ACCESSORIES



## Lube Oil Filtration

### Stainless Steel Lube Oil Filters

The re-cleanable stainless steel filters for oil filtration are the environmentally friendly alternative to commonly used disposable filters.

Due to re-using of elements, payback starts immediately after installation. Filters are available as replacements for OEM filter elements or custom made to fit your application.



### Efficiency & Design Benefits

- 100% stainless construction
- Increased surface area and flow rates
- Longer Fluid Life
- High heat tolerances
- High resistance to chemicals and corrosion
- Extended maintenance intervals
- Improves filtration performance
- Absolute rated contaminant removal
- Direct OEM replacements which require no modification

### Economical Benefits

- Reduce inventory needs and costs
- A one-time cost that pays back quickly
- Environmentally friendly

### Environmental Benefits

- Eliminates disposal costs
- Eliminates disposal liability
- Reduce landfill waste and environmental harm
- Recyclable



### 100% Stainless Steel Construction

Stainless steel micronic wire cloth available in micron ratings of 3-400 absolute. Welded serial #, ID tag

304 or 316, 20-gauge stainless steel perforated inner/outer tube 3/16 in. on 1/4 in. centers

High heat resistant adhesive attaches end caps to filter

Seals available in Buna-N, HSN, Teflon and Viton to suit your application

### Stainless Steel Replacement Elements available for:

#### Engine and Compressor Filters

WAUKESHA®  
WHITE SUPERIOR®  
CATERPILLAR®  
INGERSOLL RAND®  
COOPER BESSEMER®  
AJAX®

HERCULES®  
GARDNER®  
DENVER®  
ATLAS®  
CORPCO®

#### Process and Hydraulic Filters

PECO®  
PALL®  
PEACOCK®  
CUNO®  
FILTERITE®  
NOWATA®  
SCHROEDER®  
POROUS MEDIA®  
FAIREY ARLON®  
UCC®  
STAUFF®

BALDWIN®  
FACET®  
FRAM®  
HILCO®  
REFILCO®  
NUGENT®  
VICKERS®  
GRESN®  
HYCON®  
PARKER®  
HYTREX®

### Element Kits<sup>1)</sup>

P/N	Description	Element Outside Diameter	Element Length	Micron Rating	Number of Elements	Application	Equivalent to
25.00.300-1-CA	Lube filter element kit	7.00 in.	30.00 in.	38	1	CATERPILLAR® G3508/12/16	
25.00.301-6-CA	Lube filter element kit	7.00 in.	13.00 in.	38	6	CATERPILLAR® G3606/08/12/16	
25.00.303-1-CA	Lube filter element kit	5.00 in.	9.00 in.	38	1	CATERPILLAR® G3406/08	
25.00.310-4-WA	Lube filter element kit	3.00 in.	15.00 in.	25	4	WAUKESHA®	167602B
25.00.310-7-WA	Lube filter element kit	3.00 in.	15.00 in.	25	7	WAUKESHA®	167602B
25.00.310-14WA	Lube filter element kit	3.00 in.	15.00 in.	25	14	WAUKESHA®	167602B
25.00.311-4-WA	Lube filter element kit	3.00 in.	30.00 in.	25	4	WAUKESHA®	168660B, 489493
25.00.311-7-WA	Lube filter element kit	3.00 in.	30.00 in.	25	7	WAUKESHA®	168660B, 489493
25.00.312-1-WA	Lube filter element kit	5.00 in.	7.00 in.	75	1	WAUKESHA®	208472B, 489488
25.00.313-1-WA	Lube filter element kit	5.00 in.	10.00 in.	75	1	WAUKESHA®	208472C, 489489
25.00.314-10-WA	Lube filter element kit	3.00 in.	30.00 in.	25	10	WAUKESHA®	168660H
25.00.320-3-WS	Lube filter element kit	4.00 in.	18.00 in.	25	3	WHITE SUPERIOR® 6G/GT/GTL/GTLA-B	
25.00.320-4-WS	Lube filter element kit	4.00 in.	18.00 in.	25	4	WHITE SUPERIOR® 8G/GT/GTL/GTLA-B/SGTB	
25.00.320-5-WS	Lube filter element kit	4.00 in.	18.00 in.	25	5	WHITE SUPERIOR® 12G/GT/GTL/GTLA-B/SGT/SGTA-B	
25.00.320-7-WS	Lube filter element kit	4.00 in.	18.00 in.	25	7	WHITE SUPERIOR® 16G/GT/GTL/GTLA-B/SGT/SGTA-B	
25.00.330-1-AR	Lube filter element kit	4.00 in.	9.00 in.	38	1	ARIEL®	A-661, A-0661

<sup>1)</sup> All steel lube filter element kits are supplied with a shipping case.

### Single Elements

P/N	Description	Element Outside Diameter	Element Length	Micron Rating	Element Kit	Engine Manufacturer	Equivalent to
25.00.300-CA	Lube filter element	7.00 in.	30.00 in.	38	25.00.300-1-CA	CATERPILLAR® (Triple Length Element)	
25.00.301-CA	Lube filter element	7.00 in.	13.00 in.	38	25.00.301-6-CA	CATERPILLAR®	1W4136
25.00.302-CA	Lube filter element	7.00 in.	10.00 in.	38		CATERPILLAR®	1R0726
25.00.303-CA	Lube filter element	5.00 in.	9.00 in.	38	25.00.303-1-CA	CATERPILLAR®	1R0716, B99
25.00.310-WA	Lube filter element	3.00 in.	15.00 in.	25	25.00.310-4/-7-WA	WAUKESHA®	167602B
25.00.311-WA	Lube filter element	3.00 in.	30.00 in.	25	25.00.311-4/-7-WA	WAUKESHA®	168660B, 489493
25.00.312-WA	Lube filter element	5.00 in.	7.00 in.	75	25.00.312-1-WA	WAUKESHA®	208472B, 489488
25.00.313-WA	Lube filter element	5.00 in.	10.00 in.	75	25.00.313.1-WA	WAUKESHA®	208472C, 489489
25.00.314-WA	Lube filter element	3.00 in.	30.00 in.	25	25.00.314-1-WA	WAUKESHA®	168660H
25.00.315-WA	Lube filter element	5.00 in.	17.00 in.	25		WAUKESHA®	489491, 305351E
25.00.316-WA	Lube filter element	4.00 in.	8.00 in.	25		WAUKESHA®	489495, 304126
25.00.317-WA	Lube filter element	5.00 in.	12.00 in.	25		WAUKESHA®	489490, 305315C
25.00.318-WA	Lube filter element	4.00 in.	16.00 in.	25		WAUKESHA®	172607, 489522
25.00.320-WS	Lube filter element	4.00 in.	18.00 in.	25	25.00.320-3/-4/-5/-7	WHITE SUPERIOR®	758-133
25.00.330-AR	Lube filter element	4.00 in.	9.00 in.	38	25.00.330-1-AR	ARIEL®	A-661, A-0661
25.00.335-EMD	Lube filter element	6.00 in.	30.00 in.	38		EMD® Locomotive Engines	8345482

### Accessories

P/N	Description	Element Kit
25.00.222	Pressure gauge, liquid filled	
25.00.226	Grommet seal	25.00.311-WA
25.00.228	Grommet seal, Viton	25.00.300-CA, 25.00.302-CA
25.00.229	Seal kit	25.00.330-1-AR
25.00.231	Grommet seal, Viton	25.00.310-WA, 25.00.311-WA, 25.00.314-WA

# GAS ENGINE ACCESSORIES



## Ultrasonic Cleaning Equipment

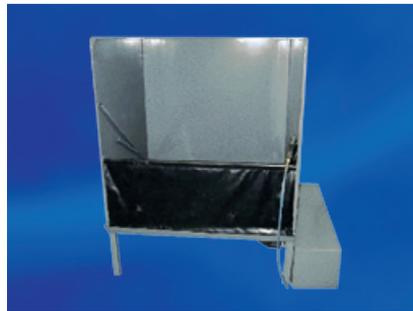
### Ultrasonic Cleaning Station

- 2,000 Watts of ultrasonic cleaning power
- All new, versatile size to meet a variety of parts cleaning needs
- Environmentally safe aqueous cleaning
- Easy-to-operate controls for time, temperature and cleaning cycle automation
- Stainless steel tank construction
- Dual filter system
- Oil removing surface sparger
- Optional on-board task light
- Heavy-duty locking casters
- High velocity ultrasonics, metallurgically attached transducers
- Ultrasonic frequency sweep to enhance cleaning performance



### Soak Tank

- Durable powder coated finish
- Inside tank dimensions 48 in. x 20 in. x 16 in.
- 1,500 Watt screw in heat element with built in thermostat
- 110 Volt power requirements
- Castor wheels for easy movement of unit
- Hinged lid
- Recirculation pump with 30 minute timer
- Optional heated tank



### Backwash Cabinet

- Powder coated finish
- Slotted subfloor parts rack
- Water backsplash curtain
- Adjustable parts rack
- Solids sediment waste water tank-3 stage
- High pressure washer not included



### Drying Cabinet

- 4,800 Watt – 16000 BTU heating unit 210 V
- Durable powder coated finish
- Inside cabinet dimensions 48 in. x 30 in. x 24 in.
- 30 minute timer
- Hinged door with latch closures

## Ultrasonic Cleaning Station

P/N	Description
25.00.001-110 <sup>1)</sup>	<p>Complete ultrasonic cleaning station, 110V</p> <p><b>Consisting of:</b></p> <ul style="list-style-type: none"> <li>• Ultrasonic cleaner</li> <li>• Soak tank</li> <li>• Backwash cabinet</li> <li>• Drying cabinet</li> </ul> <p><b>Included Accessories:</b></p> <ul style="list-style-type: none"> <li>• 13 Watt high intensity inspection light</li> <li>• Roll polytubing</li> <li>• Bag sealer</li> <li>• Soak solution, two barrels</li> <li>• Detergent for ultrasonic, two 20 liter pails</li> <li>• Syphon pump for transfer of soak solution</li> <li>• Cleaning video and cleaning procedures</li> <li>• Layout drawing for setting up station</li> <li>• Cleaning detergent for two years</li> </ul>
25.00.001-220 <sup>1)</sup>	<p>Complete ultrasonic cleaning station, 220V</p> <p><b>Consisting of:</b></p> <ul style="list-style-type: none"> <li>• Ultrasonic cleaner</li> <li>• Soak tank</li> <li>• Backwash cabinet</li> <li>• Drying cabinet</li> </ul> <p><b>Included Accessories:</b></p> <ul style="list-style-type: none"> <li>• 13 Watt high intensity inspection light</li> <li>• Roll polytubing</li> <li>• Bag sealer</li> <li>• Soak solution, two barrels</li> <li>• Detergent for ultrasonic, two 20 liter pails</li> <li>• Syphon pump for transfer of soak solution</li> <li>• Cleaning video and cleaning procedures</li> <li>• Layout drawing for setting up station</li> <li>• Cleaning detergent for two years</li> </ul>

<sup>1)</sup> Does not include high pressure washer. Customer preference; 2000 PSI required

Further Ultrasonic Cleaning Models and Accessories are available on request.



### Ultrasonic Cleaning Station Console Style Unit

- Inside tank dimensions (40 in. x 12 in. x 40 in.)
- Electric heater, thermostatically controlled, 4,000 watts
- Ultrasonics - 40 KHz, 3,000 watts with pulse and sweep
- Transducers mounted on one side wall of tank
- Mechanical timer (1 - 30 minutes)
- Stainless steel lift cover
- Power requirements 240 v, 10, 50/60 Hz, 8KVA



### Ultrasonic Cleaning Station Cabinet Model

- Inside tank dimensions (48 in. x 16 in. x 16 in.)
- 25 KHz
- Variable power controls
- Built-in heater
- "Neptune" Generator with pulse and sweep
- All stainless 316L cabinet construction
- Stainless lift off cover
- Heavy duty castors
- Recessed controls
- Recessed tank drain
- Available in 110 or 220 volt
- 2 year warranty on all components



### Cleaning Vessel

- Filtration of the cleaning fluid to enable maximum cleaning efficiency and extend cleaning solution life
- Pump is 110 V
- Filter unit consists of a stainless steel P2 vessel with a 1/2 HP hi-temperature pump, discharge and suction hose