



## Weld Checkers

- Multi-Function Weld Monitors
- Weld Thru Current & Force
- Miniature & Handheld Weld Checkers
- Electronic Force Gauges
- Displacement Monitors
- PC Data Collection
- High Speed Printers
- Large Selection of Toroidal Coils

# MONITOR & CHECKER DELIVERABLES

- Lower scrap rate
- · Improved process control
- ISO 9000 Data collection
- Decreased machine downtime
- · Accurate machine set up
- Weld optimization and Design of Experiments (DoE)
- Welding process diagnostics

#### WHY MONITOR?

Resistance welding derives it's ability to form a proper weld nugget from the simple formula for heat: H = I2xRxT, where "I" is the current, "R" is the resistance, and "T" is the time. The ability to keep these variables within predefined limits allows the process to be maintained. Weld consistency can vary over time due to a number of variables, which affect the heat delivered to the weld. The changes can result in:

- · Poor quality welds
- · Machine downtime
- High maintenance costs
- · Lost revenue

Amada Miyachi America's range of checkers provide the ability to monitor the variables that result in changes in weld heat such as current and time. Other factors that affect weld quality can also be monitored, such as voltage, displacement and force.





#### MM-380

Next Generation Hand-held Portable Weld Checker

#### **KEY FEATURES**

- Measures current, voltage and force, resistance, weld time
- Weld-through sensor
- Easy screen-menu navigation
- Intuitive waveform and data analysis
- Printer and RS232 output



Measure current, voltage and force Understand, optimize and benchmark your process and equipment

Weld through sensor

Measure force, current and voltage simultaneously at the electrodes

Easy screen navigation

Scroll through and select menus with rotary dial

Waveform and data analysis

Precise graphical displays of waveform time and amplitude

Printer option

Instant screen prints and waveforms

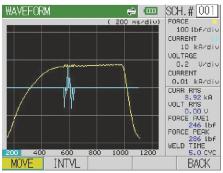
RS232 output

Color screen capture and data collection through COM port





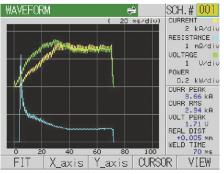


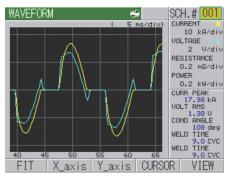


Drop-down Menu Navigation

Force and Current Timing

HISTORY			<b>⊕ □</b>
DATE	TIME	SCH	CURRENT (RMS)
~ 06/15	16:28:54	001	10.00 kA
~ 06/15	16:28:46	001	10.03 kA
~ 06/15	16:28:39	001	9.94 kA
~ 06/15	16:28:33	001	10.13 kA
06/15	16:28:27	001	9.82 kA
06/15	16:28:22	001	9.69 kA
06/15	16:28:16	001	8.70 kA
06/15	16:28:10	001	8.22 kA
06/15	16:26:50	001	7.93 kA
DATA	CHANGE S	CROLL	SELECT AL DEL





Weld History

Current, Voltage and Resistance

Zoom of Current and Voltage

## ACCESSORIES





Current Range	0.010 to 200.0kA
Force Range	MA-770A-01: 55 to 1102 lbf, (25 to 500 kgf)
	MA-771A-01: 110 to 2204 lbf, (50 to 1000 kgf)
	MA-520: 1.10 to 22.04 lbf, (0.50 to 10.00 kgf)
	MA-521: 11.0 to 220.4 lbf, (5.0 to 100.0 kgf)
	MA-522: 110 to 2204 lbf, (50 to 1000 kgf)
Voltage Range	0.30 to 20.0 Volts
Current Measurement Time	AC Current, Cycles: 0.5 to 600.0 Cycles at 60 Hz; AC Current, ms: 1 to 2000 ms
	DC Current, Cycles: 0.5 to to 120.0 Cycles at 60 Hz; DC Current, ms: 1 to 2000 ms
Force Measurement Time	1 to 6000 ms
Measurement Mode for Voltage and Current	Arithmetic Mean RMS or Maximum, (Peak)
Data Output	RS-232 and Optional External Printer
Number of Schedules	127
Dimensions Inches (mm) H x W x D	9.9 x 5.5 x 2.2 (252 x 140 x 56) Excluding Protrusions
Weight Lbs (kg)	2 (0.9)
Power Requirements, (AC Adapter)	100 - 240 VAC, 50/60Hz
Battery Operation Time	Approximately 2 hours with 1 battery, 4 hours with 2 batteries. 1 battery included.

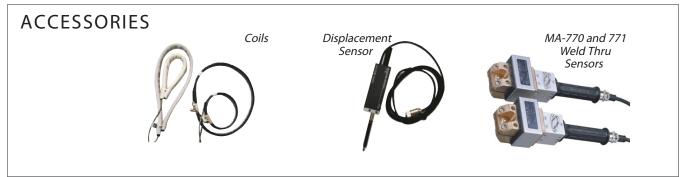


### MM-370 Next Generation Machine Mounted Weld Monitor

#### **KEY FEATURES**

- Measures current, voltage, force and displacement, resistance, weld time
- Set limits for all parameters
- Comprehensive machine I/O
- Measured data and waveform data can be saved in a USB memory device
- Easy screen-menu navigation
- Built-in printer and RS232/485 output





Current Range	0.010 to 200.0kA	
Force Range (MM-370A-00-01 Only)	MA-770A-01:55 to 1102 lbf, (25 to 500 kgf)	
	MA-771A-01: 110 to 2204 lbf, (50 to 1000 kgf); MA-520: 1.10 to 22.04 lbf,	
	(0.50 to 10.00 kgf)	
	MA-521: 11.0 to 220.4 lbf, (5.0 to 100.0 kgf); MA-522: 110 to 2204 lbf, (50 to 1000 kgf)	
Displacement Range	GS-1813A: 0 - 13mm, 1 micron accuracy; GS-1830A: 0 - 30mm, 1 micron accuracy	
	GS-5100A: 0 - 100mm, 10 micron accuracy	
Voltage Range	0.30 to 20.0 Volts	
Current Measurement Time	AC Current, Cycles: 0.5 to 600.0 Cycles at 60 Hz; AC Current, ms: 1 to 2000 ms	
	DC Current, Cycles: 0.5 to to 120.0 Cycles at 60 Hz; DC Current, ms: 1 to 2000 ms	
Force Measurement Time 1 to 6000 ms		
Measurement Mode for	Arithmetic Mean RMS or Maximum, (Peak)	
Voltage and Current		
Data Output	Data can be acquired using the built-in printer, USB port, or standard RS-232/RS-485 p	
Number of Schedules	127	
Dimensions Inches (mm) H x W x D	10.6 x 6.8 x 11.4 (269 x 172 x 290) Excluding Protrusions	
Weight Lbs (kg) 11 (5)		
Power Requirements	100 to 240 VAC, 50/60Hz, 0.7 Amps	



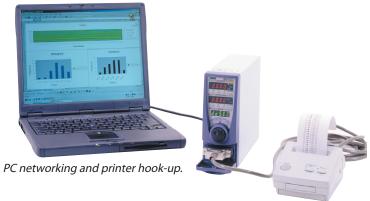
#### MM-122A

High Precision "Miniature" Weld Monitor

#### **KEY FEATURES**

- Measures single phase AC, DC inverter, AC inverter, capacitor discharge, transistor, single-phase rectified, 3-phase rectified, 3-phase low frequency
- Current Range: 0.010 199.9kA
- · RMS or PEAK values
- Conduction angle
- Measures time in milliseconds and cycles
- Upper and lower limits
- 31 weld schedules
- Data communications port RS-232/485
- "No weld current" detection
- Error signaling
- Printer connection with standard reports
- Analog output for waveforms
- · Weld counter
- Measures stepped weld sequences
- Good/No-Good, Hi/Low machine outputs





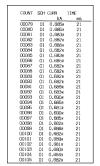
The MM-122A is the very latest in stand-alone weld checker technology. This full function, cost effective unit is designed to monitor every type of welding control. The unit's "miniature" design allows it to be mounted in any position on the welding machine. Limits for Peak or RMS current provide vital weld quality indicators. Multiple schedules, error signaling and versatile I/O make this unit as valuable for bench systems as it is for automated welding systems. Printer options or RS-232/485 provide for data collection and weld process analysis, critical in today's advanced manufacturing processes.

SCHEDU F 01 -				٦	Г
CURRENT LOW	:	0.500	kΑ		
CURRENT HIGH	:	0.600	kA		
WELD TIME LOW	:	9	ms		
FIRST TIME LAST TIME	:	5	ms		
LAST TIME	:	30	ms		
RANGE	:	1,999	kA		
RANGE PEAK/RMS	:	RMS			
PULSATION	:	0			
SCHEDULE 02 -			_		
CURRENT LOW	:	0.000	kA		
CURRENT HIGH	:	1.999	kA		
WELD TIME LOW	:	20	ms		
WELD TIME HIGH	:	30	ms		
FIRST TIME LAST TIME	:	0	ms		
LAST TIME	:	2000	ms		
RANGE	:	1.999	kA		
PEAK/RMS	:	RMS			
PULSATION	:	0			
SCHEDULE 03 -			_		
CURRENT LOW	:	0.200	kA		1
CURRENT HIGH	:	0.300	kΑ		1
WELD TIME LOW	:	90	ms		1

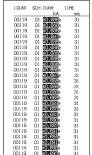


SCHEDULE		01	
OURRENT (RMS	;) e :	0.687	kΑ
(PE/	(K) :	0.888	kΑ
WELD TIME	:	31	ms
COUNT	:	00117	
WELD TIME			
1 ms•			_
2 ms@			
3 m∋•			
	0.711		
	0.710		
	0.707		
	0.707		
	0.708		
	0.706		
10 ms● 11 ms●			
12 ms			
12 ms			
14 ns			
15 ns			
16 ne			
17 ms			
18 ms			
19 на			
20 nse			
21 mse			
22 ms@			

Schedule Info



Error Only or all Summary Data



Hi/Low Indication

Power Supply	Single Phase 100 – 240 VAC ±10% 50/60 Hz or 24 VDC ±10%
Current Sensor	Toroidal coil (see table in this brochure)
Current Range	0.010-0.199kA (X10 coil), 0.100-1.999kA, 1.00-19.99A, 10.0-199.9kA
Monitored Value	RMS or PEAK
Time Range	0.5 to 500.0 cycles (AC and DC), 1-2000 mS (AC and DC), 0.50-25.00 mS (transistor)
	0.50 9.99 mS / 05.0-99.9 mS (capacitor) Tp, Th
Conduction Angle	30°-180°
Data Output	RS-232 / 485 or optional printer
Dimensions W x D x H Inches (mm)	2.8 x 9.7 x 7.5 (70 x 246 x 190)
Weight Lbs. (Kg)	4.2 (1.9)



## MM-315B Pocket Weld Testers

#### **KEY FEATURES**

- Simple current measurement in the palm of your hand
- For AC and Inverter power supplies
- Measures current, cycles, milliseconds and conduction degrees
- Impulse memory, 9 welds
- Rechargeable batteries or AC
- Includes coil, charger and carrying case
- Easy-view LCD
- Memory function for easy recall of impulses





The perfect pocket size troubleshooter.

#### **SPECIFICATIONS**

Power Supply	Rechargeable battery and AC charger
Current Sensor	Toroidal coil (see table in this brochure)
Current Range	1.00-9.99A, 5.0-49.9kA
Time Range	1 – 99 cycles or 0.01 – 0.80 sec
Conduction Angle	30° – 180°
Dimensions W x D x H In (mm)	2.95 x 1.18 x 6.7 (75 x 30 x 170)
Weight Lbs. (Kg)	1.1 (0.5)

#### **ELECTRONIC FORCE GAUGE**



Portable force setting and verification tool.

#### MM-601A

#### **KEY FEATURES**

- Simple and accurate handheld External I/O for analog out and force measurement measurement hold
- Hold and zero functions
- Easy-view LCD
- One touch tare setting
- Analog force output
- · Rechargeable batteries or AC

Power Supply	Rechargeable battery and AC charger
Force Sensor	MA-520: 1.10 to 22.04 lbf (0.50 to 10.00 kgf)
	MA-521: 11.0 to 220.4 lbf (5.0 to 100.0 kgf)
	MA-522: 110 to 2204 lbf (50 to 1000 kgf)
Accuracy	±3% full scale
Measurement Speed	Approx. 4 times per second
Dimensions W x D x H In (mm)	2.95 x 1.18 x 6.7 (75 x 30 x 170)
Weight Lbs. (Kg)	1.1 (0.5)



## TOROIDAL COILS



MB-400K	400mm long 1.0 x sensitivity, 5 ln. l.D.* (127mm)
MB-800K	800mm long 1.0 x sensitivity, 10 ln. l.D. (254mm)
MB-29F	10 x sensitivity, ¾" I.D. (29mm)
MB-35E	1.0 x sensitivity, ¾" I.D. (35mm)
MB-45F	10 x sensitivity, ¾" l.D. (45mm)
MB-60E	1.0 x sensitivity, 2/2" I.D. (60mm)
MB-500-15	500mm long 1.0 x sensitivity, 3" l.D. (76mm)

Extension cables for toroidal coils are optional. \*Inner Diameter

## **FORCE SENSORS & ACCESSORIES**

#### FORCE AND CURRENT SENSORS



Part Number	Description	Product
MA-520	Force sensor 1.10 to 22.04 lbf (0.50 to 10.00 kgf)	MM-601A, MA-770A-01, MA-771A-01
MA-521	Force sensor 11.0 to 220.4 lbf (5.0 to 100.0 kgf)	MM-601A, MA-770A-01, MA-771A-01
MA-522	Force sensor 110 to 2204 lbf (50 to 1000 kgf)	MM-601A, MA-770A-01, MA-771A-01

#### **ACCESSORIES**

Part Number	Description	Product
145-013	Rechargeable battery, 1.2V 500MAH (4 required for checker)	MM-315B, MM-601A
TP-50KM-A60	Printer paper, 60mm x 25mm (W x L)	MM-370A, MM-380A Optional Printer
18-042-01	Toroidal coil extension (specify length)	All Checkers

## DATA COLLECTION SOFTWARE - WINWEDGE

Taltech Winwedge software can be used to collect data from most checker models. Amada Miyachi America has written some front-end programs that accept basic data to start you on the road to process control and data collection. Exports data directly into Microsoft Excel

Applicable Models	MM-122A*, MM-370A, MM-380A
Part Number	10-900-02

\*MM-122A has its own software - MA-716A

<sup>•</sup> For use with all current monitors.



MODEL	MM-122A	MM-315B	MM-370A	MM-380A	MM-601A
Current	✓	✓	✓	1	-
Voltage	-	-	/	1	-
Time	✓	✓	✓	1	1
Force	-	-	✓	1	1
Displacement	_	-	1	_	-
Schedules	31	-	127	127	_
Stand-Alone	✓	-	1	_	_
Hand Held	_	✓	_	1	1
Pocket	_	✓	_	_	1
Communications	232/485	-	232/485	232	_
Printer	Option	_	✓	Option	_
Battery Powered	_	✓	_	1	✓
Line Powered	✓	✓	/	1	✓

## ORDERING INFORMATION

Part Number	Description			
MM-122A	Weld Checker AC/DC/CD current (RMS and PEAK), cycles/mS. counter, data output (RS-232/485),31 measuri schedules. Current 0.100-1.999KA, 1.00-19.99KA, 10-199.9KA 1 x coil, sold separately			
MM-315B	Weld Checker, pocket-size, AC/DC current, memory up to 9 impulses. Measure conduction angle, cycles, an RMS currentDual range: 1-9.99 and 5-49.9 kA Includes MB-500-15 coil, battery charger, carrying case.			
MM-370A-00-00	Weld Checker with current, voltage, power, resistance, time. Toroidal coil and voltage sense cable include			
MM-370A-00-01	Weld Checker with current, voltage, power, resistance, force, displacement, time. Toroidal coil and voltage sense cable included. Displacement sensor sold separately			
MM-370A-KIT 1	Weld Checker with GS-1630A 30mm displacement sensor. Toroidal coil included.			
MM-380A-KIT 1	Weld Checker with charger, voltage measuring cable and MB-800K toroidal coil. Case sold separately.			
MM-380A-KIT 2	Weld Checker with charger, voltage measuring cable, MB-800K toroidal coil, printer, wheeled case.			
MM-380A-KIT 3	Weld Checker with charger, voltage measuring cable, MB-800K toroidal coil, printer, wheeled case, 1100lb weld thru sensor.			
MM-380A-KIT 4	Weld checker with charger, voltage measuring cable, MB-800K toroidal coil, printer, wheeled case, 2200lb weld thru sensor.			
MM-601A	Weld pressure gauge, analog output, hold output. Includes: battery charger and carrying case. Force sens sold separately. Requires MA-520, MA-521 or MA-522.			