# Presentación de producto

## Convertidor de frecuencia M100

ADAJUSA


LS IS

Nuevo Nombre de LG Industrial Systems

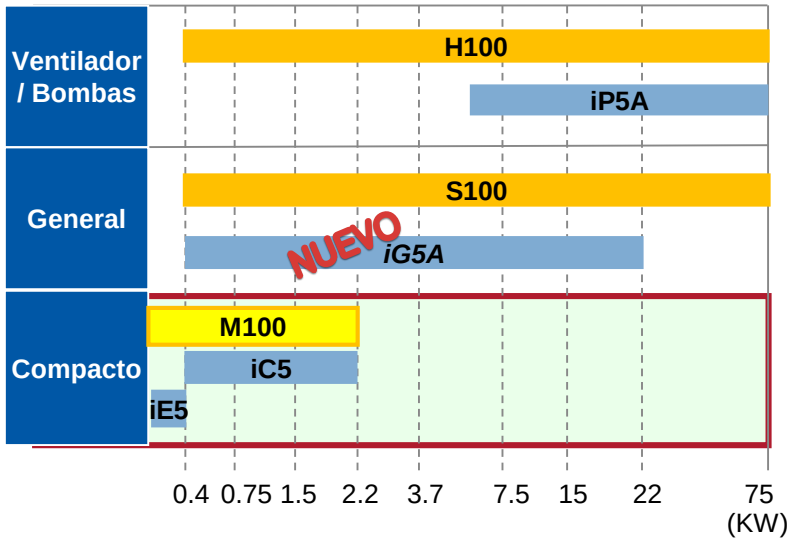
ADAJUSA

# M100

## Micro Drive, Serie M100


* Monofásico
200V 0.1~2.2kW

## Variador pequeño con grandes beneficios!




## Características destacables

- Filtro RFI integrado (Clase C2)
- Diseño compacto y estrecho
- Montaje carril DIN
- Instalación lado a lado
- Conexión de comunicación RS485 a través de conector RJ45 (Com.RS485. Smart Copier, Consola remota, Drive View7)
- Estándares : CE, UL (UL 61800-5-1)
- Modulo de frenado en unidades (≤1.5kW)
- Comunicación RS485 (Tipo avanzado)

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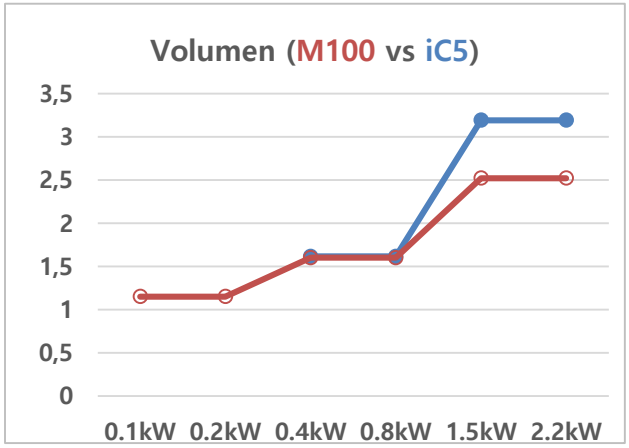
# M100

- **La serie M100 está compuesta de 3 tamaños. Los variadores son Compactos y estrechos Tienen integrado el filtro EMC.**

**Tamaño A**

**Tamaño B**

**Tamaño C**



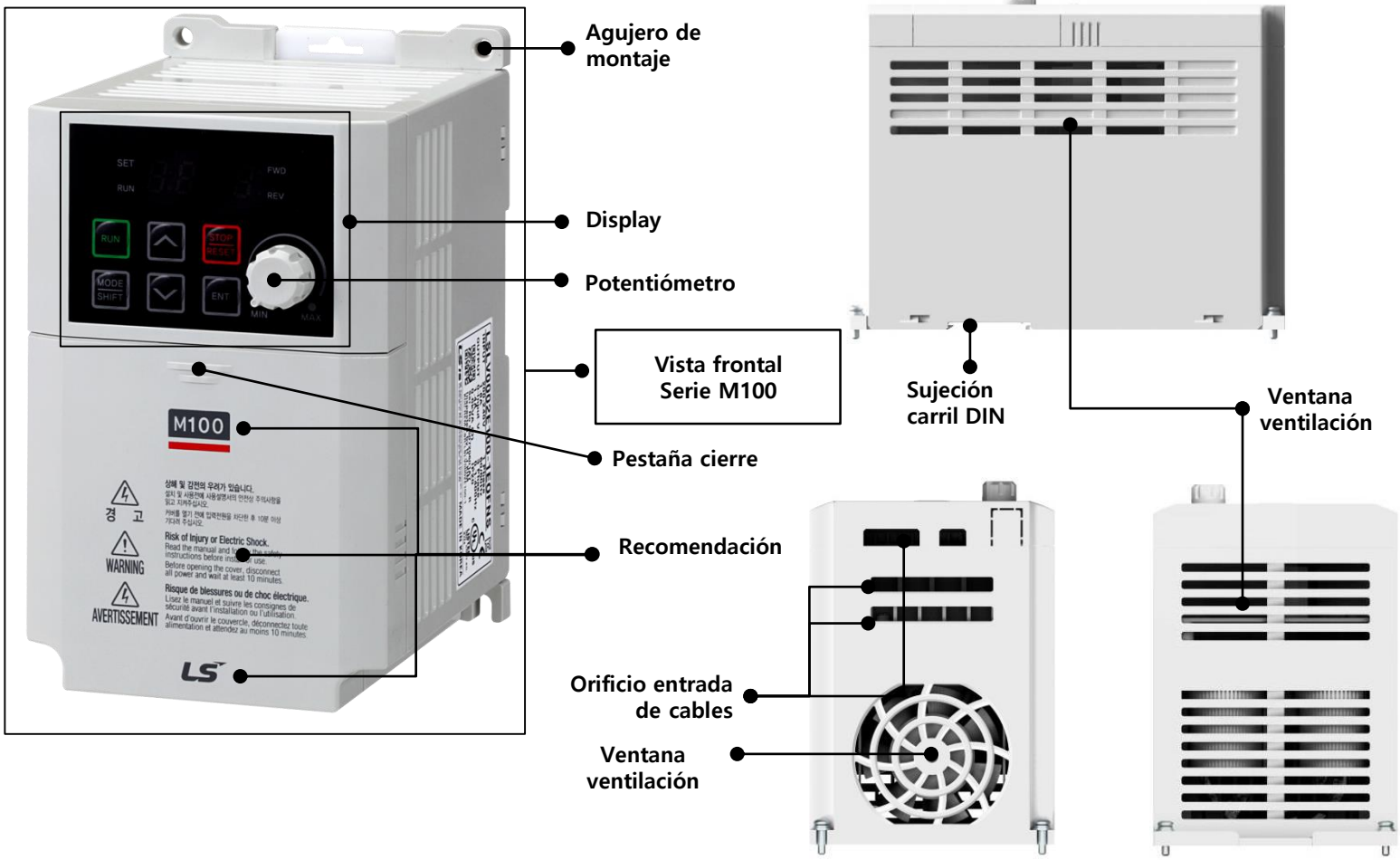

**<Redución del tamaño 89% comparado con iC5>**

| Tamaño | kW | Dimensiones[mm] | | | | Volumen [ℓ] (W1xH1xD1) | Ratio (vs iC5) |
|---|---|---|---|---|---|---|---|
| | | W1 | H1 | H3 | D1 | | |
| A Frame | 0.1/0.2 | 85 | 135 | 145 | 100 | 1.15 | - |
| B Frame | 0.4/0.8 | 85 | 153 | 163 | 123 | 1.6 | 99% |
| C Frame | 1.5/2.2 | 100 | 180 | 190 | 140 | 2.52 | 79% |

※ H1 : Sin orificio de montaje, H3 : Incluido orificio de montaje

# M100

**M100 sigue el estilo de la familia de variadores de LSIS, que también comparte. Su calidad general de diseño, fiabilidad y facilidad de uso.**



# M100

## Entradas y salidas

| LSLVxxxxM100-EOFNx | | | 0001 | 0002 | 0004 | 0008 | 0015 | 0022 |
|---|---|---|---|---|---|---|---|---|
| Motor | Heavy load | [HP] | 0.125 | 0.25 | 0.5 | 1.0 | 2.0 | 3.0 |
| | | [Kw] | 0.1 | 0.2 | 0.4 | 0.75 | 1.5 | 2.2 |
| Rated Output | Rated capacity (kVA) | | 0.3 | 0.6 | 0.95 | 1.9 | 3.0 | 4.5 |
| | Rated current (A) | | 0.8 | 1.4 | 2.4 | 4.2 | 7.5 | 10.0 |
| | Output frequency (Hz) | | 0 ~ 400 [Hz] | | | | | |
| | Output voltage (V) | | 3 phase 200 ~ 240V | | | | | |
| Rated Input | Working voltage (V) | | 3 phase 200 ~ 240Vac (-15% ~ +10%) | | | | | |
| | Input frequency (Hz) | | 50 ~ 60[Hz] (±5%) | | | | | |
| | Rated current (A) | | 1.0 | 1.8 | 3.7 | 7.1 | 13.6 | 18.7 |
| Cooling | | | Natural cooling | | Forced Cooling | | | |
| Weight (kg) | | | 0.66 | | 1 | | 1.45 | |

## Control

| | |
|---|---|
| Control method | V/F control, Slip compensation |
| Frequency settings power resolution | Digital command: 0.01Hz<br>Analog command: 0.06 Hz (60 Hz standard) |
| Frequency accuracy | 1% of maximum output frequency |
| V/F pattern | Linear, square reduction, user V/F |
| Overload capacity | 150% for 1minute |
| Torque boost | Manual torque boost, Automatic torque boost |

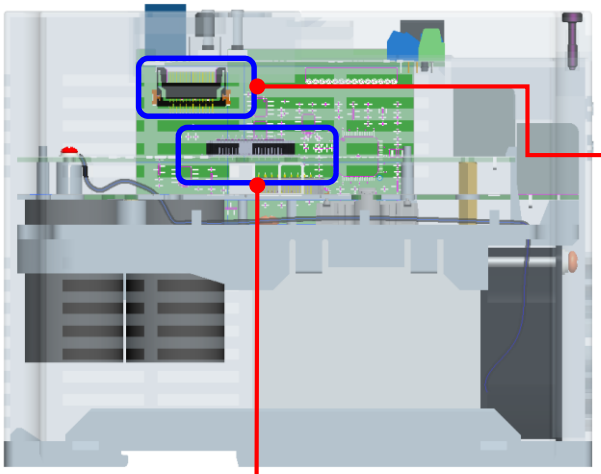
## Condiciones Ambientales

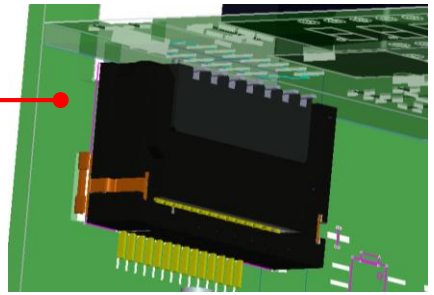
| | |
|---|---|
| Ambient temperature | -10–50℃ (14–122°F) (No ice or frost should be present.) |
| Ambient humidity | Relative humidity less than 95% RH (to avoid condensation forming) |
| Storage temperature | -20~65℃ |
| Surrounding environment | Prevent contact with corrosive gases, inflammable gases, oil stains, dust, and other pollutants (Pollution Degree 2) |
| Operation altitude/Oscillation | No higher than 3280ft (1,000 m). Less than 9.8 m/sec2 (1G) |
| Pressure | 70~106kPa |

## ▪ Funcionamiento & Funciones

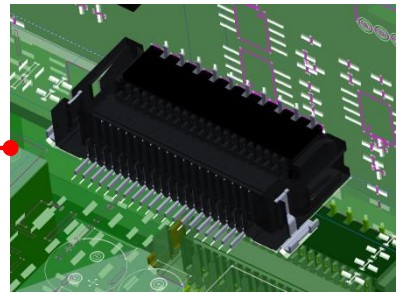
| Item | | Description | |
|---|---|---|---|
| **Operation type** | | Select key pad, terminal strip, or communication operation | |
| **Frequency settings** | | Analog type: V1terminal 0–10 V, I2 terminal (Advanced I/O) 0–20 mA and 0–10 V<br>Digital type: key pad input | |
| **Operation function** | | • Anti-forward and reverse direction rotation<br>• Frequency jump<br>• Frequency limit<br>• DC braking<br>• Jog operation<br>• Up-down operation<br>• 3-wire operation | • Dwell operation<br>• Slip compensation<br>• PID control<br>• Energy saving operation<br>• Speed search<br>• Automatic restart |
| **Input** | **Multi-function terminal** | Select PNP (Source) or NPN (Sink) mode.<br>The function can be set depending on the parameter settings at In65–69 (advanced I/O) or In65–67 (standard I/O) codes. | |
| | | • Forward direction operation<br>• Reset<br>• Emergency stop<br>• Multi-step speed frequency-high/med/low<br>• DC braking during stop<br>• Frequency increase<br>• 3-wire<br>• Select acc/dec/stop | • Reverse direction operation<br>• External trip<br>• Jog operation<br>• Multi-step acc/dec-high/med/low<br>• Second motor selection<br>• Frequency reduction<br>• Fix analog command frequency<br>• Transition from PID to general operation |
| **Output** | **Multi- function open collector terminal (standard I/O only)** | Fault output and inverter operation status output | Less than DC 24V, 50mA |
| | **Multi-function relay terminal** | | Less than (N.O., N.C.) AC 250V, 1A , DC 30V, 1A |
| | **Analog output** | 0–10 Vdc: Select frequency, output current, output voltage, DC terminal voltage and others | |

# M100





- Tarjeta I/O conectada con tarjeta de Control



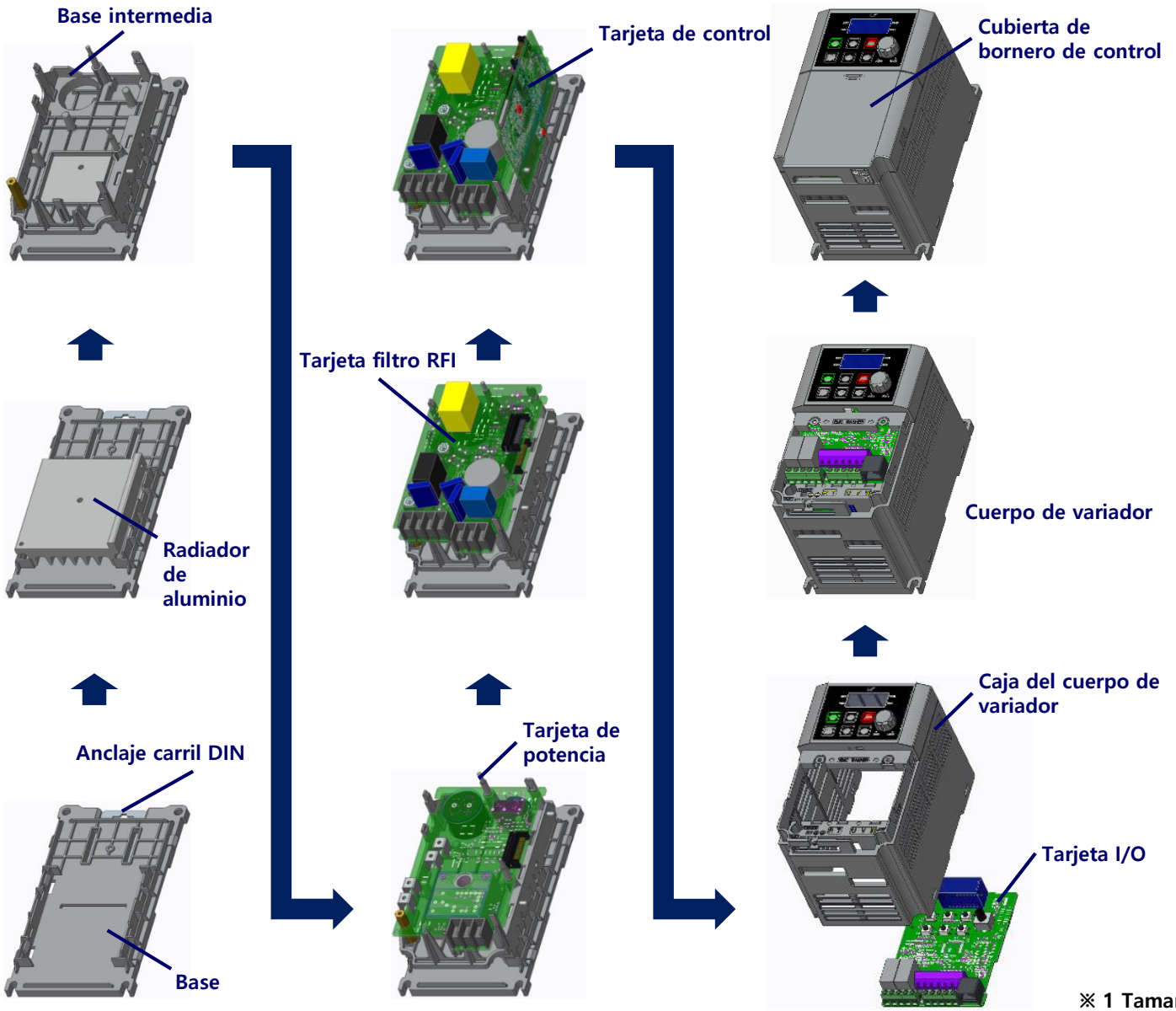
- Potencia, tarjeta de filtro RFI conectada con tarjeta de control

■ Análisis de conexión (LS y Schneider)

| | M100 | Altivar12 <modelo 022-1 > |
|---|---|---|
| No. of PCB | 4 | 4 |
| No. de cables | 1 (Ventilador) | 6 |
| No. de conectores | 3 | 1 (Soldadura) |
| No. piezas de molde | 5 | 10 |

La estructura inalámbrica de la unidad M100
Minimiza las tasas de error!

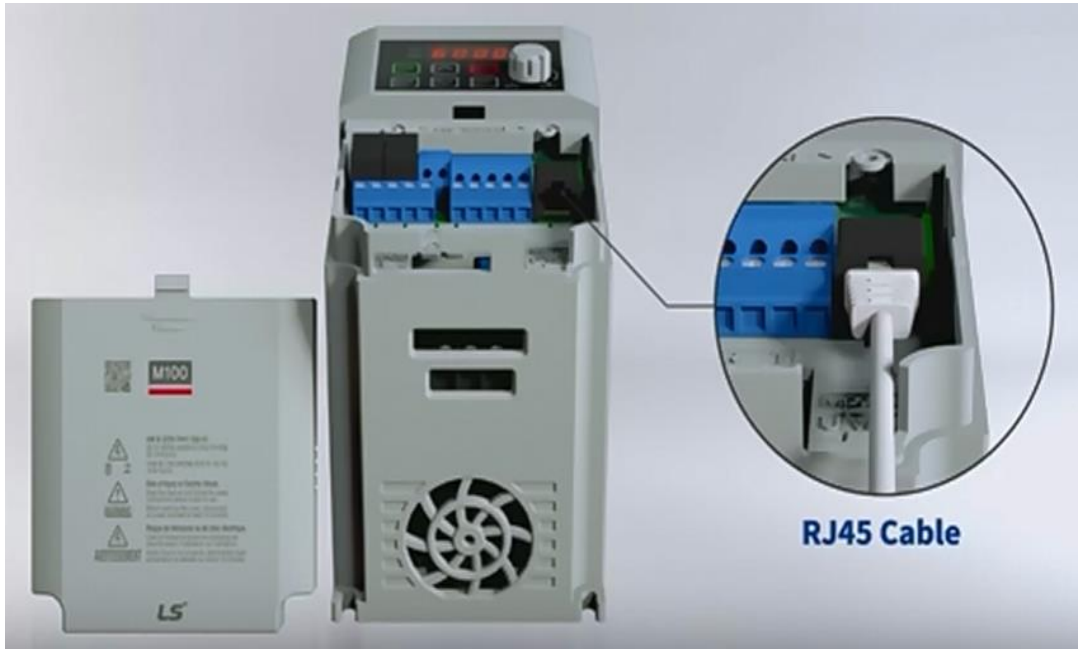
## ▪ Ensamblaje de apilamiento vertical




※ 1 Tamaño

# M100

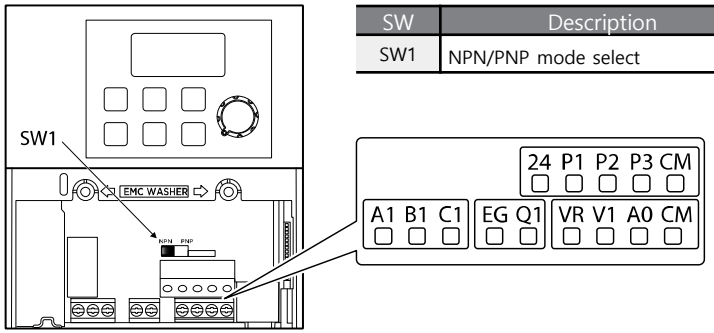
- **Puerto RJ45 – Fácil conexión con otros periféricos**



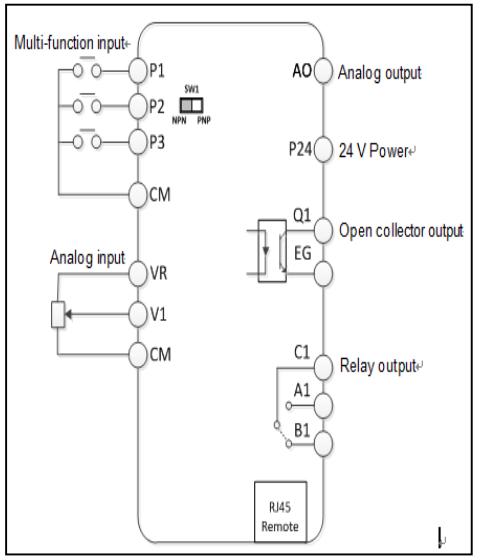

★ **Conexión para Comunicación RS-485**
**( Modbus RTU o LS Bus)**
**Smart Copier**
**Consola remota**
**Conexión PC (Driveview7)**

# M100

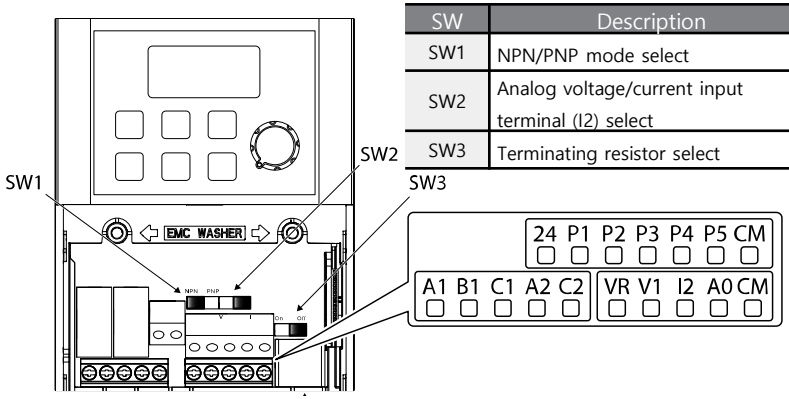
## ▪ Estándar I/O



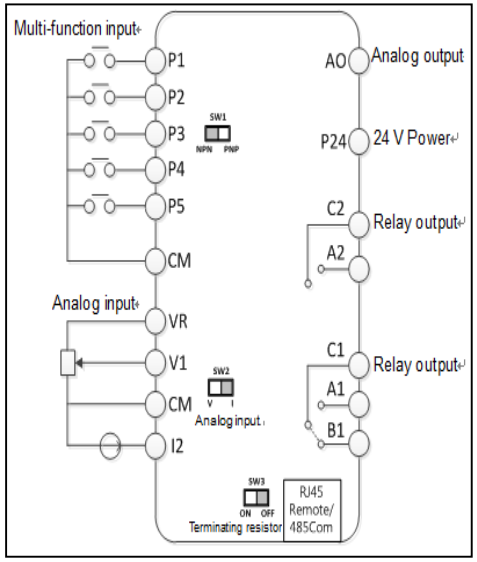

| SW | Description |
|---|---|
| SW1 | NPN/PNP mode select |




## ▪ Avanzado I/O




| SW | Description |
|---|---|
| SW1 | NPN/PNP mode select |
| SW2 | Analog voltage/current input terminal (I2) select |
| SW3 | Terminating resistor select |



# M100

| ITEM | | M100 | iC5 | Altivar12 | ACS55 | FC51 | J1000 | VFD-L |
|---|---|---|---|---|---|---|---|---|
| Input Voltage | | 200~240Vac (+10%,-15%) | 200~230Vac | 200~240Vac (+10%,-15%) | 200~240Vac (+10%,-15%) | 200~240Vac (+10%,-10%) | 200~240Vac (+10%,-15%) | 200~240Vac (+10%,-10%) |
| Control | Control | V/F | V/F, Sensorless | V/F, SLVC | V/F | V/F, VVC+ | V/F | V/F |
| | Torque boost | O | O | O | X | O | O | O |
| | Output Freq. | 0~400Hz | 0~400Hz | 0.5~400Hz | 0~120/130Hz | 0~400Hz | max. 400Hz | 1~400Hz |
| | Overload | 150% 60s | 150% 60s | 150% 60s | 150% 60s | 150% 60s | 150% 60s | 150% 60s |
| | Carrier Freq. (Derating) | 1 ~ 15kHz | 1 ~ 15kHz (2.2kW:8kHz) | 2 ~ 16kHz (8kHz) | 5, 16kHz (-) | 2 ~ 16kHz (-) | 2 ~ 15kHz (8, 10kHz) | 3 ~ 10kHz (-) |
| Display | Display method | 7 Segment (4-Digit) | 7 Segment (3-Digit) | 7 Segment (4-Digit) | X | LCD | 7 Segment (4-Digit) | 7 Segment (4-Digit) |
| DB Unit | | O (≤1.5kW) | X | △ | X | O (≤1.5kW) | O | X |
| Side by Side | | O | X | O | O (≤1.5kW) | O | O | X |
| Din-rail mount | | O | X | △ | O | △ | △ | O |
| Certification | | CE, UL | CE, UL | UL, CSA, NOM, GOST and C-Tick | CE, UL, cUL, C-Tick, and GOST-R | CE, UL, cUL | CE, UL, cUL | CE, UL, cUL |
| Internal EMC Filter | | 1Φ200V C2 | 1Φ200V C3 | 1Φ200V C2 | 1Φ200V C1 | 1Φ200V C3 | X (External Option) | X |
| Protection degree | | IP20 | IP20 | IP20 | IP20 | IP20 | IP20 | IP20 |
| Operation temperature (Derating excl.) | | -10℃~50℃ | -10℃~50℃ | -10℃~60℃ (Derating : 40℃,≥ 0.75kW /50℃, ≤1.5kW) | -20℃~50℃ (Derating : Above 40℃) | -10℃~40℃ | -10℃~50℃ | -10℃~40℃ |
| Storage temperature | | -20℃~65℃ | -20℃~65℃ | -25℃~70℃ | -40℃~70℃ | -25℃~65℃ | -20℃~60℃ | -20℃~60℃ |
| Humidity | | Below 95% RH | Below 90% RH | Below 95% RH | Below 95% RH | Below 95% RH | Below 95% RH | Below 90% RH |
| Pollution degree (EN 60664-1) | | PD2 | PD2 | PD2 | Class 3C2 (IEC60721-3-3) | PD2 | PD2 | PD2 |

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# M100

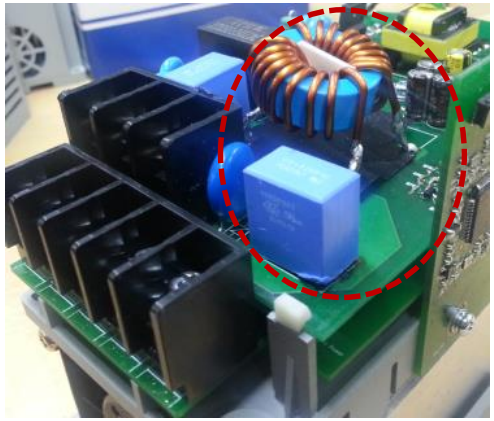
| ITEM | | M100 (Standard) | M100 (Advanced) | iC5 | Altivar12 | ACS55 | FC51 | J1000 | VFD-L |
|---|---|---|---|---|---|---|---|---|---|
| Display | | Segment | Segment | Segment | Segment | O(S/W, LED) | LCD | Segment | Segment |
| Input | Multi-function | 3(3P) | 5(5P) | 5(5P) | 4(4P) | 3(3P) | 5(5P) | 5(5P) | 4(4P) |
| | Potential | O | O | O | O | O | O(Selectable) | △(Conn.) | O |
| | A/I(Current) | X | X | 1(1P) | X | X | 1(1P) | X | X |
| | A/I(Voltage) | 1(1P) | 1(1P) | 1(1P) | X | X | X | X | X |
| | A/I(V/C) | X | 1(1P) | X | 1(1P) | 1(2P) | 1(1Port) | 1(1P) | 1(1P) |
| Output | Opencollector | 1(2P) | X | 1(2P) | 1(2P) | X | X | X | X |
| | Relay | 1(3P) | 2(5P) | 1(3P) | 1(3P) | 1(2P) | 1(3Port) | 1(3P) | 1(2P) |
| | A/O(Voltage) | 1(1P) | 1(1P) | 1(1P) | 1(1P) | X | X | 1(1P) | X |
| | A/O(Current) | X | X | X | X | X | 1(1Port) | X | X |
| Safety | Safety function | X | X | X | X | X | X | X | X |
| Comm. | RS 485 | X | O(RJ45) | △(Conn.) | O(RJ45) | X | O(3P) | △(Conn.) | O(RJ45) |
| Power | 24V | 1(1P) | 1(1P) | 1(1P) | 1(1P) | 1(1P) | 1(1P) | X | X |
| | VR | 1(1P) | 1(1P) | 1(1P) | 1(1P) | 1(1P) | 1(1P) | 1(1P) | 1(1P) |
| | CM(GND) | 2(2P) | 2(2P) | 2(2P) | 2(2P) | 2(2P) | 2(2P) | 3(3P) | 1(1P) |
| I/O Terminal | I/O terminal | 14 | 17 | 17 | 15 | 11 | 18 | 14 | 9 |
| | Option CN | X | X | 1 | X | 1 | X | 1 | X |
| | RJ45 CN | 1 | 1 | X | 1 | X | X | X | 1 |
| | Terminal Pitch | 5mm | 5mm | 5mm | 5mm | 3.5mm | 3.5mm | 3.5mm | 5mm |
| I/O Option | | Remote Keypad Parameter Copier | Remote Keypad Parameter Copier PC S/W (Drive View7) | 485 Comm. | Remote Keypad Parameter Copy PC S/W (SoMove) bluetooth Adapter | Potentiometer (ACS50-POT) PC S/W (Drive Config) | PC S/W(MCT-10) | 485 Comm. Remote Keypad Parameter Copy PC S/W (Drive Wizard Plus) | X |

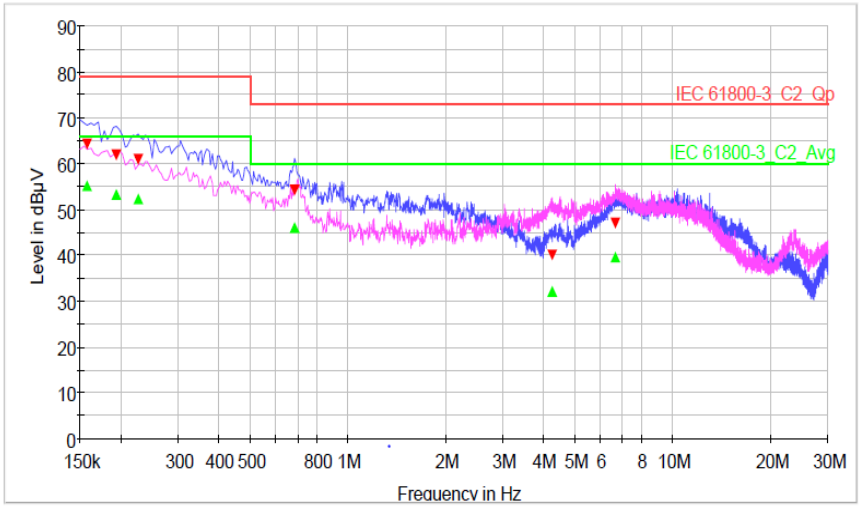
M100

# Alta fiabilidad

**Filtro EMC (Clase C2) para una perfecta integración en la instalación eléctrica.**

- El alto grado de compatibilidad electromagnética minimiza las emisiones de EMC en todos los entornos que cumplan con la condición EN61800-3 Categoría C2 (primer
- Su estructura de filtro integrado ahorra tiempo y espacio en la instalación del variador





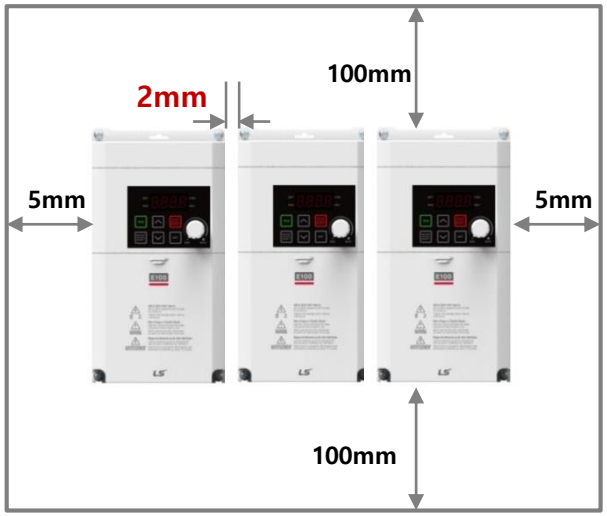

<Test M100 Emisiones conducidas>

**Módulo de frenado integrado**

- Alto rendimiento dinámico en la aceleración, así como en el frenado.
- M100 convierte la energía cinética de aplicación en potencia de frenado para ralentizar el motor.
- La unidad de frenado dinámico está incorporada a partir de 1,5 kW y superior.

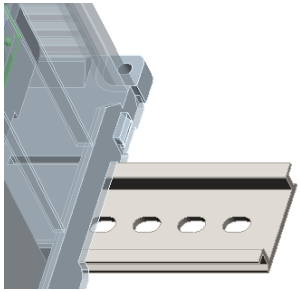
## Instalación lado a lado

- La posibilidad de instalar los variadores con una distancia mínima, hace que los armarios sean mucho mas reducidos.


## Montaje en Carril-Din

- El montaje en carril DIN hace que sea muy fácil y rápida la instalación ahorrando tiempo y costes de la instalación.



M100

# RAPIDA Y FÁCIL PUESTA EN MARCHA

- **Fácil ajuste (Con Smart Copier)**
  - Configuración rápida, fácil y segura sin conexión de alimentación para unidades en grandes cantidades.
  - Función de lectura/escritura de parámetros y descarga del sistema operativo
  -

- **Programación desde PC (Driveview 7)**
  - Copia fiable de los valores de los parámetros desde el PC a otras unidades, reduce cualquier error durante la configuración.

- **Teclado remoto**
  - Es la solución para puerta de armario o la consola de la máquina.

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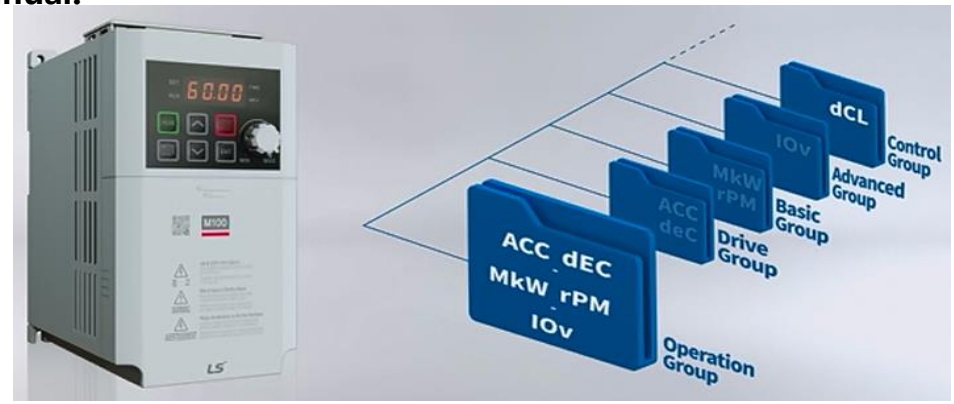
## Menú rápido

- El menú rápido permite acceder fácilmente a los parámetros más utilizados.
- La estructura intuitiva del grupo de parámetros requiere una lectura mínima del manual.




## Potenciómetro

- Configuración rápida y fácil funcionamiento mediante potenciómetros

## Comunicación RS 485 (para tipo avanzado)

- Integración completa con la red de procesos, para facilitar la comunicación con todas las partes de la máquina a través del enlace Modbus universal integrado.

- Comunicación con Max. 16 unidades son posibles a través del conector RJ45 con una interfaz física RS 485 de 2 hilos.

M100

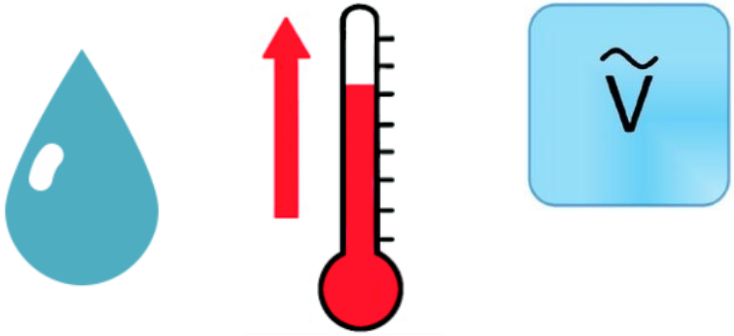
# REFUERZO DE SEGURIDAD

## Cumplimiento global

- Nuevo estándar UL (UL 61800-5-1) y certificado CE


## Condición ambiental mejorada

- Tensión de entrada extendida (230 · 240 [V]) y aumento del nivel de humedad (90 · 95 [%])
- Alta capacidad de sobrecarga 150% durante un minuto a 50 °C.



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# M100

★Estrictos requisitos de calidad en comparación con la anterior UL 508C inferior 4 puntos de inspección


- ✓ Requisitos de separación y fuga (espaciado entre pistas)
- ✓ Distancia Bus a circuito de comunicación 3.0 mm-> 5.5 mm
- ✓ Prueba de cortocircuito Sólo salida UWV-> Añadir prueba DCP-DCN
- ✓ Prueba de desgaste de componentes
- ✓ Bonding Test

| Subject | Summary – UL 61800-5-1 Significant Differences |
|---|---|
| Clearance and Creepage Requirements | • UL 840 is no longer a standard referenced as a standard for investigating clearances and creepages.<br>• Where protective separation is required, clearance and creepage requirements are greater than those required by UL 840 and UL 508C Tables 36.1 (columns B, C, and D), 36.3, and 36.4.<br>• Surge protective devices cannot be used to reduce the overvoltage category (and thus the required clearance) for protective separation. When reducing the overvoltage category where basic insulation is required, the SPD's are required to be monitored and an indication of their status provided. UL 840 did not require surge protective devices to be monitored with a fault status indication to reduce clearance requirements and also allowed surge protective devices to reduce the required clearances between any considered circuits/parts.<br>• Impulse test for reduced clearances is not allowed where protective separation is required and only allowed for basic and functional insulation if a homogeneous electrical field is present. UL 840 allowed for impulse test in lieu of clearances in any construction.<br>• Investigation of clearances and creepages is required on inner layers of PWB's. Alternatively, the inner layers can be investigated to solid insulation requirements. UL 508C waived requirements on inner layers of PWB's.<br>• *Note – where functional insulation is required the required clearances may be smaller* |
| Short Circuit Test | • All power outputs must be short circuit tested. UL 508C only required the motor output to be short circuit tested.<br>• *Note - Cotton indicator is required for all short circuit tests. UL 508C allowed for cotton to not be used when conducting the tests with circuit breakers.*<br>• *Note - Voltages of secondary circuits must be monitored and not exceed certain levels during the short circuit and breakdown of components tests, or the AC/DC voltage test must be conducted after the short circuit test. This was not part of UL 508C pass/fail criteria.* |
| Breakdown of Components Test | • The circuit used for the breakdown of components test must be capable of standard and high fault currents based on manufacturer's short circuit current rating; unless detailed analysis shows a different value is equivalent or more severe. UL 508C was not specific on the test circuit required for the breakdown of components test.<br>• *Note - Voltages of secondary circuits must be monitored and not exceed certain levels during the breakdown of components tests, or the AC/DC voltage test must be conducted after the breakdown of component test. This was not part of UL 508C pass/fail criteria.*<br>• *Note – Required branch circuit protection and other test set-up requirements are specified. These are the same as the short circuit test. UL 508C did not have test set-up specifics.* |
| Bonding Test | • Products with accessible conductive parts are required to comply with the protective bonding test. UL 508C did not require a test for bonding of accessible conductive parts.<br>• *Note - kits provided for bonding of multiple conduit entries in polymeric enclosures require a "CAUTION" marking. UL 508C did not require a "CAUTION" marking for bonding kits.* |

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# M100

(Enlace móvil) http://qr.lsis.com

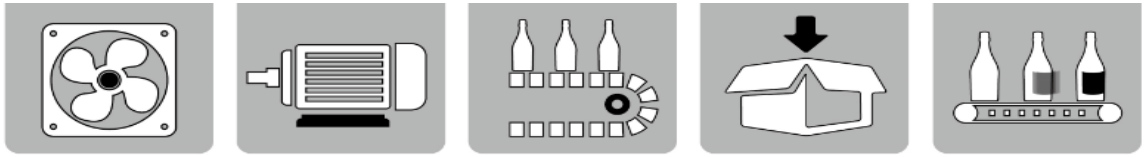



**LSIS pone recientemente Código-QR instantáneo en su tapa frontal para la ayuda rápida del cliente a través del móvil.**
**Con sólo un escaneo simple, los usuarios pueden acceder rápida y convenientemente a la información de instalación, operación y solución de problemas. Mejorará la experiencia de los usuarios haciendo posible comprobar la especificación de detalle y descargar el manual técnico.**

ADAJUSA

# M100

M100 es una solución perfecta para aplicaciones técnicas pequeñas y simples en el sector comercial e instaladores OEM. Combina una funcionalidad completa con tamaño estrecho y compacto y es fácil de integrar en una gran variedad de tipos de máquinas eléctricas.



## HVAC

Ventilador

Máquinas equipadas con un ventilador.

Bombas centrifugas, bombas de refuerzo

Bombas de circulación

## Textil

Máquinas de moldeo por inyección

(Rodillo y bobina)

## Maquinaria

Cintas para caminar

Puertas automáticas

Puertas de ascensores

Lavadoras

## Manipulación de materiales

Cintas transportadoras

Apiladores/paletizadoras

## Alimentos y bebidas

Licuadora, mezclador

Máquinas de etiquetado, embolsado)

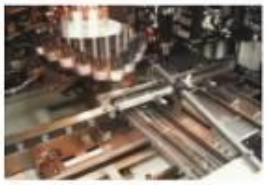
## Printing & Rubber

Rotativas

Envases de caucho

LS IS

# Aplicaciones



-EXTRACTORES
-VENTILADORES
-CINTAS TRANSPORTADORAS
-PUERTAS AUTOMÁTICAS
-CONTROL DE ACCESOS

-BOMBAS
-MÁQUINAS DE ENVASAJE Y EMBALAJE
-DOSIFICADORES
-POLIPASTOS


# Aplicaciones

- Ejemplo circuito control sobre-presión en un habitáculo para la ayuda de escape en caso de incendio. (Control PID)