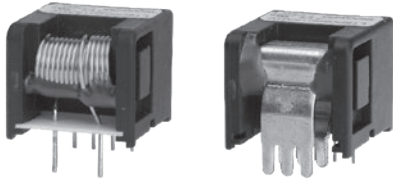


## Magnetic Proportion System

# L18PxxxD15AHV SERIES



### ABSOLUTE MAXIMUM RATINGS

Parameters	Symbol	Unit	Value	Comment
Supply voltage	V <sub>cc</sub>	V	± 18V	

### ISOLATION CHARACTERISTICS

Parameters	Symbol	Unit	Value	Comment
Insulation voltage	V <sub>d</sub>	—	AC3000V, for 1minute (Sensing current 0.5mA)	Primary ⇔ Secondary
Impulse withstand voltage	V <sub>w</sub>	kV	6.0	Primary ⇔ Secondary Input waveform : • Front time 1.2μs • Time to half value 50μs • single
Insulation resistance	R <sub>is</sub>	—	≥ 500M Ω (at DC500V)	Primary ⇔ Secondary
Clearance distance	d <sub>ci</sub>	—	9.2mm (MIN)	Primary ⇔ Secondary
			7.9mm (MIN)	
Creepage distance	d <sub>cp</sub>	—	9.2mm (MIN)	Primary ⇔ Secondary
Case material	—	—	UL94 V-0	
Comparative Tracking Index ; (CTI)	CTI	V	175 (group III a)	

### ENVIRONMENTAL AND MECHANICAL CHARACTERISTICS

Parameters	Symbol	Unit	Value			Comment
			MIN	TYP	MAX	
Ambient operating	T <sub>A</sub>	°C	− 30		+ 80	
Ambient storage temperature	T <sub>S</sub>	°C	− 40		+ 85	
Mass	m	g		7		

## SPECIFICATIONS

$T_A = +25^\circ\text{C}$ ,  $R_L = 10\text{k}\Omega$ ,  $V_{CC} = +5\text{V}$

Parameters		Symbol	Unit	Value			Comment
				MIN	TYP	MAX	
Primary nominal current	L18P003D15AHV	$I_{PN}$	A		3		
	L18P005D15AHV				5		
	L18P010D15AHV				10		
	L18P015D15AHV				15		
	L18P020D15AHV				20		
	L18P025D15AHV				25		
	L18P030D15AHV				30		
	L18P040D15AHV				40		
	L18P050D15AHV				50		
	L18P060D15AHV				60		
Primary current, measuring range * 1,2	L18P003D15AHV	$I_{PM}$	A	9			
	L18P005D15AHV			15			
	L18P010D15AHV			30			
	L18P015D15AHV			45			
	L18P020D15AHV			60			
	L18P025D15AHV			75			
	L18P030D15AHV			90			
	L18P040D15AHV			120			
	L18P050D15AHV			150			
	L18P060D15AHV			180			
Supply Voltage		$V_{CC}$	V	$\pm 12 (\pm 5\%)$	$\pm 15 (\pm 5\%)$		
Consumption current		$I_{CC}$	mA		14	18	
Rated output voltage	L18PxxxD15AHV xxx=003~030	$V_O$	V	3.960	4.000	4.040	at $I_{PN}$
	L18PxxxD15AHV xxx=040~060			3.950	4.000	4.050	
Offset voltage * 3	L18PxxxD15AHV xxx=003~030	$V_{OF}$	V	- 0.040	0.000	0.040	at $I_P = 0A$
	L18PxxxD15AHV xxx=040~060			- 0.050	0.000	0.050	
Hysteresis error	L18PxxxD15AHV xxx=003~030	$V_{OH}$	mV	- 25		25	at $0A \rightarrow I_{PN} \rightarrow 0A$
	L18PxxxD15AHV xxx=040~060			- 40		40	
Temperature coefficient of $V_O$		$TcV_O$	$\%/^\circ\text{C}$	- 0.1		+0.1	Without $TcV_{OF}$
Temperature coefficient of		$TcV_{OF}$	$\text{mV}/^\circ\text{C}$	- 1.5		+1.5	at $I_P = 0A$
Linearity error ( $0A \sim I_{PN}$ )		$\varepsilon_L$	%	- 1.0		+1.0	
Response time * 4		$t_r$	$\mu\text{s}$			5	$di/dt = I_{PN}/\mu\text{s}$

Anti-Sulfurated PCB coating : HumiSeal®, Resistors : Thick film (General purpose)  
dv/dt improvement type

\*1 Also operate at  $V_{CC} = \pm 12\text{V}$  power supplies , measuring range reduced to  $2.5 \times I_{PM}$ .

\*2 The value of measured current which indicates an output with a greater than  $\pm 10\%$  deviation from the theoretical output value.

\*3 Offset voltage value is after removal of core hysteresis.

\*4 The response time is the time difference from 10% of the applied input step current to 90% of the sensor output signal.

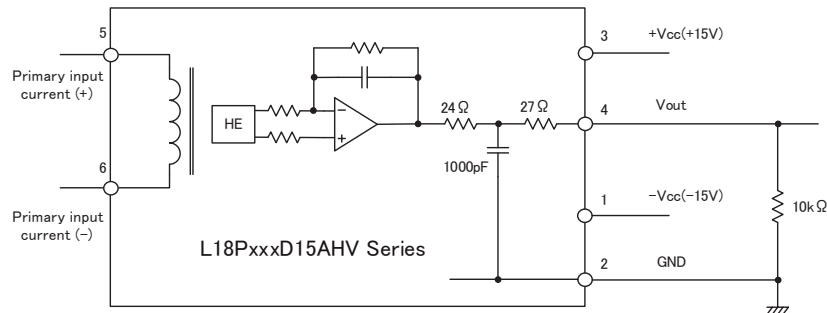
## STANDARDS

UL508, CSA22.2 No.14 (UL File No.E243511)

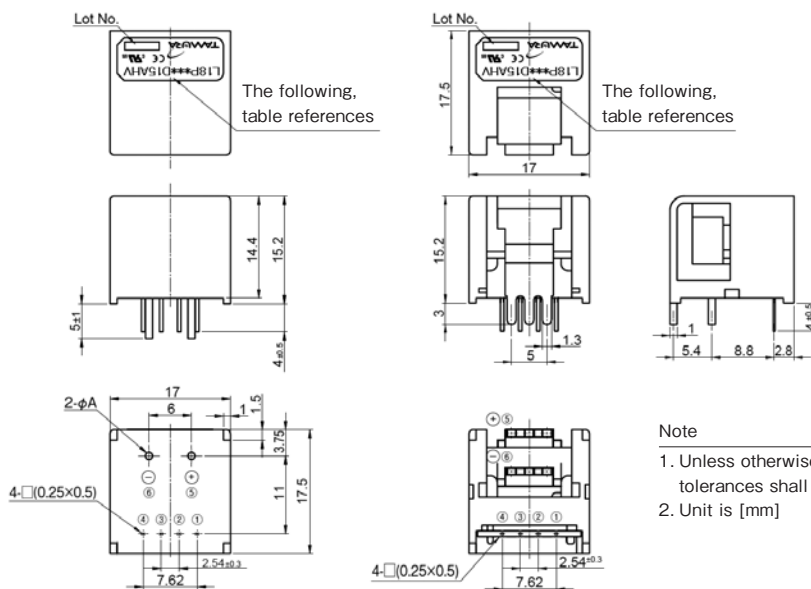
EN 62477-1, IEC/EN61800-5-1

※ Please refer to the another sheet about conditions of UL Recognition.

## CONNECTION



## DIMENSIONS (mm)



Terminal number

- ① -Vcc (-15V)
- ② GND
- ③ +Vcc (+15V)
- ④ Vout
- ⑤ Primary input current (+)
- ⑥ Primary input current (-)

Current	***	φA
3A	003	φ0.6
5A	005	φ0.8
10A	010	φ1.1
15A	015	φ1.4
20A	020	φ1.6
25A	025	φ1.6
30A	030	φ1.6
40A	040	Busbar
50A	050	Busbar
60A	060	Busbar

Note

- 1. Unless otherwise specified, tolerances shall be  $\pm 0.5\text{mm}$
- 2. Unit is [mm]

## TYPE DESIGNATION

**L18 P \*\*\* D 15 AHV**  
① ② ③ ④ ⑤ ⑥

- ① Model (4 figures)  
L18 : Series
- ② Mounting configuration (1 figure)  
P : PCB Mounting type
- ③ Measurement current range (3 figures)  
Ex) 050 : 50A
- ④ Control power supply type (1 figure)  
D : Dual supply
- ⑤ Power supply voltage (2 digits)  
15 : 15V
- ⑥ Special specification  
Dust-proof PCB coating : HumiSeal®  
dv/dt improvement type

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2. This product is intended to be used in general electronics applications (electric home appliances, business equipment, information equipment, communication terminal equipment, measuring devices, industrial equipment, and so on). This product is neither intended nor warranted for use in following equipment or devices:  
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  - Use in liquids such as water, oil, chemical solutions, or organic solvents, and use in locations where the product will be exposed to such liquids.
  - Use that involves exposure to direct sunlight, outdoor exposure, or dusty conditions.
  - Use in locations where corrosive gases such as sea winds, Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, or NO<sub>2</sub>, are present. (Some product improves durability)
  - Use in environments with strong static electricity or electromagnetic radiation.
  - Use that involves placing inflammable material next to the product.
  - Use of this product either sealed with a resin filling or coated with resin.
  - Use of water or a water soluble detergent for flux cleaning.
  - Use in locations where condensation is liable to occur.
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# Application notes

## <General Considerations>

1. The sensor uses polar electronic components. When the polarity of the power supply is mistaken, the sensor is damaged.
2. Static electricity or excessive voltage can increase an offset voltage in the Hall element, and cause offset voltage to change. Please exercise care in handling and application.
3. In order to prevent the influence of noise, the use of twisted cable or shielded cable for the output line is recommended
4. If using this device within a magnetic field generated by other devices, the specified accuracy may not be obtainable.
5. Our products (several models are excluded ) are adjusted with the trimming method by the measurement condition (Load resistance, Power supply voltage) of specification sheets. Therefore, characteristics (Offset, Output, etc.) and its deviation may be changed in different circuit conditions from the measurement condition. All change characteristic items are not indicated on specification sheets.
6. The performance of current sensors with through-hole (aperture) is dependent on the position of the primary conductor. Tamura specifications are based on a primary conductor completely filling the through-hole (aperture) area.
7. The current sensor rated current in DC Amps.
8. Please use mating connector with equivalent terminal plating material to insure proper operation and avoid possibility of 'galvanic corrosion' .
9. Please do not store in high-temperature and high-humidity storage environment. Please use it after confirming soldering when it is kept for six months or more. (product soldered with substrate)
10. We recommend performing a zero offset adjustment by measuring the offset voltage at startup. In continuously operation for a few months, or at change of ambient temperature or humidity is large, we recommend regularly performing a zero offset adjustment at being idling (it is clear that the current is not apply) .
11. The current sensor doesn't have built-in protection circuit (devices and fuses, etc.). As a failure mode of the sensor, there is a short circuit and open state. In the case of a short-circuit state, the abnormal temperature rise of the internal parts is assumed, and there is a possibility to smoke and to ignite. If it is used in safety critical circuit blocks, please take appropriate measures by protection devices, protection circuits, etc. For closed loop -type sensors and flux gate (closed loop type) sensors, the consumption current of the secondary power supply varies in proportion to the measurement current.

## <Open loop>

1. High frequency primary current may result in excessive heating in iron magnetic core and cause damage to internal circuitry; for high frequency applications select current sensor with ferrite core material.
2. If the measured current exceeds the rated current, magnetic core saturation will occur and the output voltage signal will not be linearly proportional to the measured current.

## <Closed Loop>

1. For closed loop current sensors please insure the power supply voltage is balanced, symmetrical, and, applied simultaneously to avoid potential increase in DC offset error.
2. Maximum rated current measurement duration is timedependent. Maximum rated current applied in excess of the time limit can result in damage to internal electronic circuitry; please consult Tamura for assistance.
3. When using a measurement resistor to convert current output to voltage output select a resistor with stable temperature characteristic to insure accuracy of the output voltage.
4. Compensation current supplied to the secondary winding varies in proportion to the measured current based on the conversion ratio. (If/KN; KN = secondary turns) Please insure the PSU has required current capacity to supply compensation current to the secondary winding.

## <Flux-Gate>

1. Compensation current supplied to the secondary winding varies in proportion to the measured current. Please insure the PSU has required current capacity to supply compensation current to the secondary winding.
2. There is 450kHz ripple voltage present on the output and reference output voltage signals . An external capacitor maybe added if necessary.

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