

Part Number: MKU45/18x60- (See designation table)

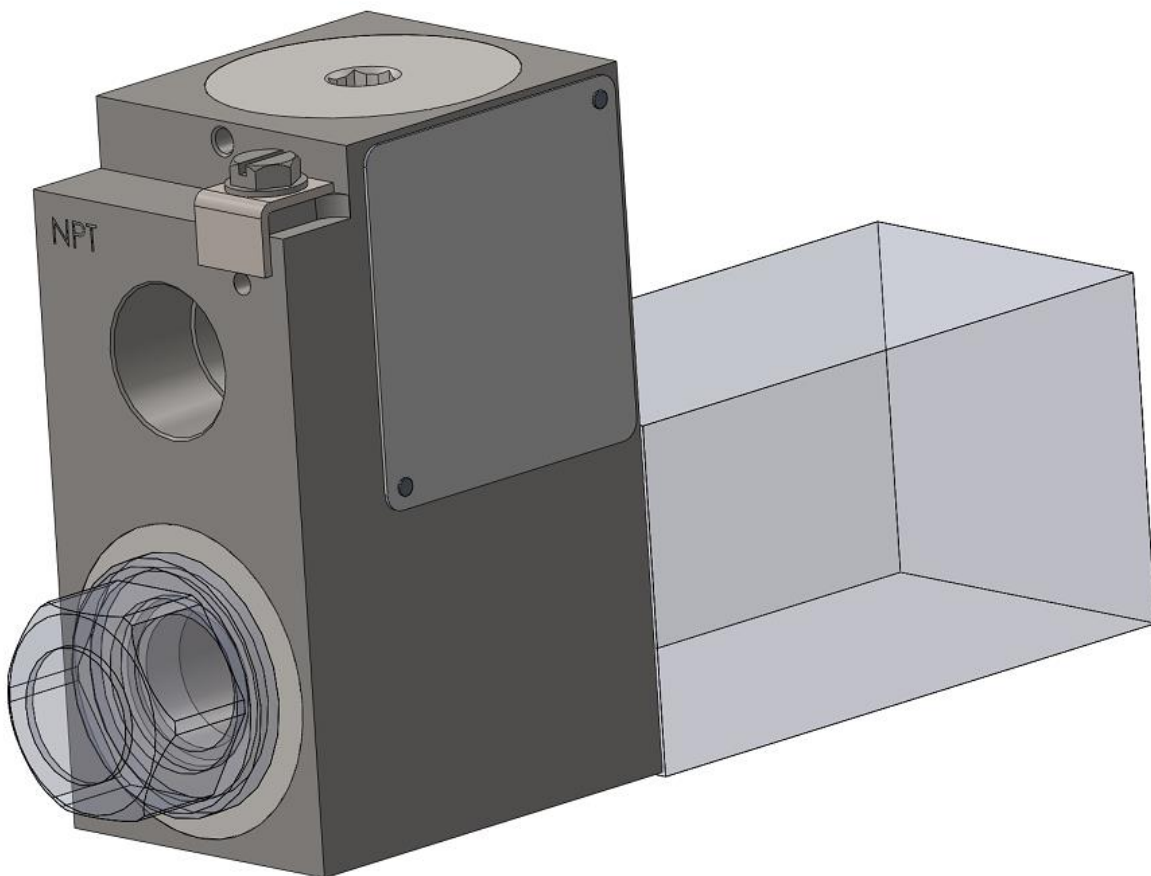
Series: HAZ-LOC® Coil

Coil Voltage: See Designation Table

Description: **HAZ-LOC®**

HAZ-LOC® 045 Size

For Use with Ø18mm Hydraulic Solenoid Tube, Valve Systems



Hazardous Location Certification Ratings:



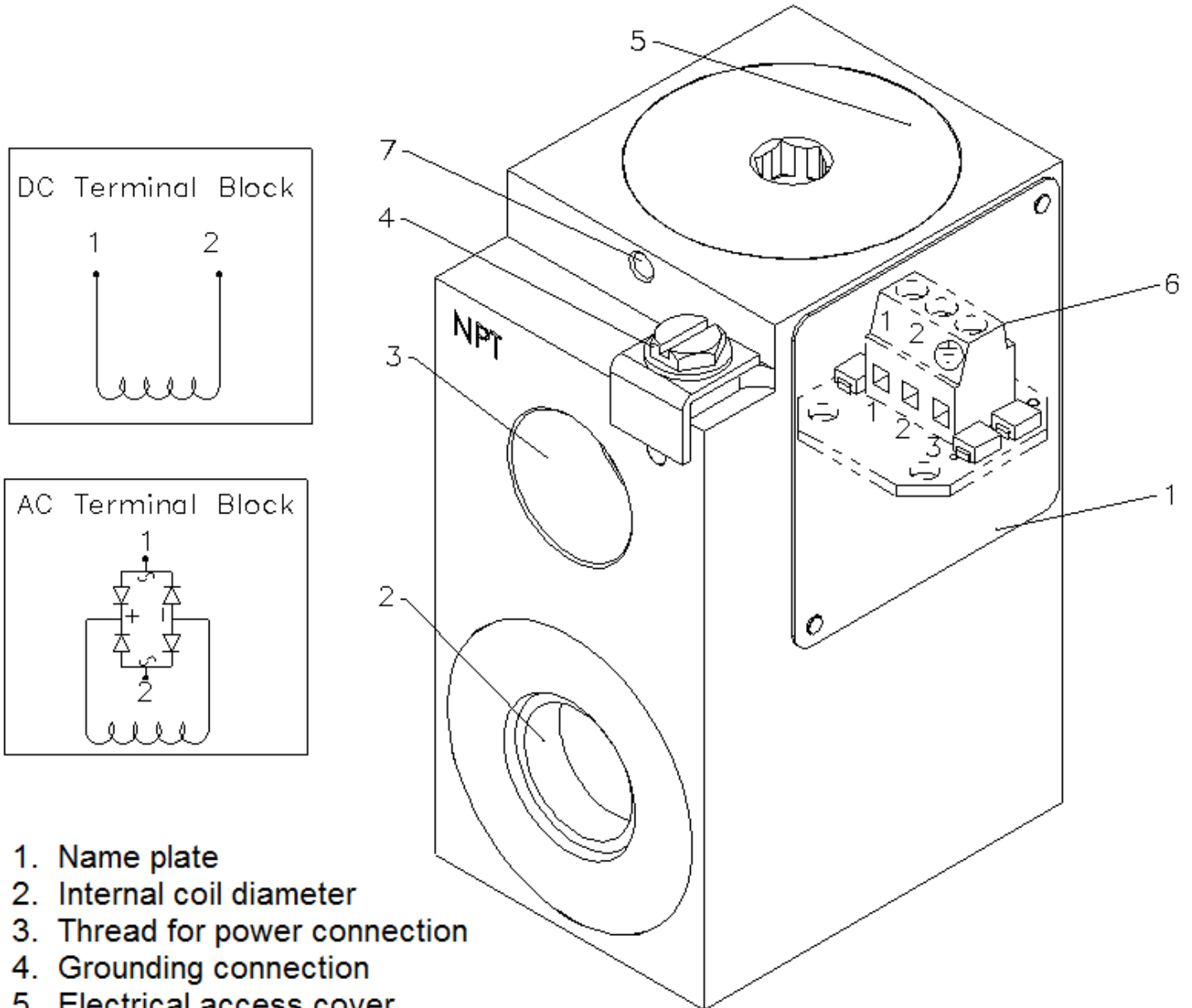
NEC 500	CLASS I, DIV. 1 GROUP A, B, C, D, T4	CLASS II & III, DIV. 1 GROUP E, F, G, T4
NEC 505	CLASS I, ZONE 1, AEx d IIC T4 Gb	CLASS II, ZONE 21, AEx tb IIIC T135 Db
CANADA	Ex d IIC T4 Gb (Zone 1)	Ex tb IIIC T4 Db (Zone 21)
ATEX	 II 2 G Ex d IIC T4 Gb (Zone 1)	 II 2 D Ex tb IIIC T135C Db (Zone 21)
IECEX	Ex d IIC T4 Gb (Zone 1)	Ex tb IIIC T4 Db (Zone 21)

Table 1: Hazardous Location Certifications



Conforms to ANSI/ISA STD 60079-31, UL STDS 1203, 50, 50E, 60079-0 & 60079-1
Certified to CAN/CSA STD C22.2 Nos. 30, 25, 0.4, 0.5, 60079-0, 60079-1 & 60079-31

ETL Listed Mark is used with express written consent of Intertek Group plc.

TOP LEVEL VIEW:


1. Name plate
2. Internal coil diameter
3. Thread for power connection
4. Grounding connection
5. Electrical access cover
6. Connection terminal
7. Set screw

SAFETY:

Application engineering and operation of the HAZ-LOC® coil must be in accordance with appropriate engineering practices and all applicable regulations and laws.

For installation in above ground electrical systems in explosive atmospheres, procedures for all applicable codes must be observed.

An appropriate fuse in accordance with its design current has to be connected in series as a short-circuit protection for every solenoid coil. Refer to technical data table.

To ensure correct, safe operation and a long service life, the instructions and the technical data described in this operating manual, and the information contained on the coil label must be observed.

Impairments to the intended operation of this coil must be prevented.

If used in hazardous locations, the labeling on the HAZ-LOC® coil and this operating manual must be strictly observed concerning ambient conditions and all ratings.

All work must be carried out by an electrician with adequate qualifications for hazardous locations.

Only the appropriate and permitted tools and measuring instruments are allowed for use in hazardous locations.

Make all electrical connections in a manner approved by the Authority Having Jurisdiction (AHJ).

ATTENTION!

- Prior to carrying-out any work on electrical circuits within hazardous locations, the electrical circuits must be switched off.
- Coil contains no serviceable parts. Do not attempt to service or repair by disassembling the coil housing.
- Conduit runs must have a sealing fitting connected within 18 inches of this coil.



Type Designation Table for 10 Watt (L10) Coil:

-Order Example:	MKU45	18x60	G12	L10
-Coil Type	MKU45 – 45 MM wide coil for Hazardous Locations			
- Tube Diameter X Length (mm)		18X60 - For tube 18 mm wide by 60 mm long		
- Rated Voltage			G12-12 VDC G24-24 VDC G125-125 VDC R115-115VAC R230-230VAC	
-Rated Wattage				L10 – 10 Watt

HAZ LOC ® Configurations			
Rated Wattage (Rated Voltage @ +20°C)	Ambient Temperature	For Use in	
		Dust	Gas
10 Watts	-40 to 70°C	CLASS II & III, DIV. 1 GROUP E, F, G, T4 CLASS II, ZONE 21, AEx tb IIIC T4 Db Ex tb IIIC T4 Db (Zone 21) Ⓢ II 2 D Ex tb IIIC T135C Db (Zone 21) Ex tb IIIC T4 Db (Zone 21)	CLASS I, DIV. 1 GROUP A, B, C, D, T4 CLASS I, ZONE 1, AEx d IIC T4 Gb Ex d IIC T4 Gb (Zone 1) Ⓢ II 2 G Ex d IIC T4 Gb (Zone 1)
	-40 to 90°C	Not for use with dust at this ambient temperature range.	

Type Designation Table for 12 Watt (L12) Coil:

-Order Example:	MKU45	18x60	G12	L12
-Coil Type	MKU45 – 45 MM wide coil for Hazardous Locations			
- Tube Diameter X Length (mm)		18X60 - For tube 18 mm wide by 60 mm long		
- Rated Voltage			G12-12 VDC G24-24 VDC G125-125 VDC R115-115VAC R230-230VAC	
-Rated Wattage				L12 – 12 Watt

HAZ LOC ® Configurations			
Rated Wattage (Rated Voltage @ +20°C)	Ambient Temperature	For Use in	
		Dust	Gas
12 Watts	-40 to 60°C	CLASS II & III, DIV. 1 GROUP E, F, G, T4 CLASS II, ZONE 21, AEx tb IIIC T4 Db Ex tb IIIC T4 Db (Zone 21)  II 2 D Ex tb IIIC T135C Db (Zone 21) Ex tb IIIC T4 Db (Zone 21)	CLASS I, DIV. 1 GROUP A, B, C, D, T4 CLASS I, ZONE 1, AEx d IIC T4 Gb Ex d IIC T4 Gb (Zone 1)  II 2 G Ex d IIC T4 Gb (Zone 1)
	-40 to 80°C	Not for use with dust at this ambient temperature range.	

Type Designation Table for 17 Watt (L17) Coil:

-Order Example:	MKU45	18x60	G12	L17
-Coil Type	MKU45 – 45 MM wide coil for Hazardous Locations			
- Tube Diameter X Length (mm)		18X60 - For tube 18 mm wide by 60 mm long		
- Rated Voltage			G12-12 VDC G24-24 VDC G125-125 VDC R115-115VAC R230-230VAC	
-Rated Wattage				L17 – 17 Watt

HAZ LOC ® Configurations			
Rated Wattage (Rated Voltage @ +20°C)	Ambient Temperature	For Use in	
		Dust	Gas
17 Watts	-40 to 50°C	CLASS II & III, DIV. 1 GROUP E, F, G, T4 CLASS II, ZONE 21, AEx tb IIIC T4 Db Ex tb IIIC T4 Db (Zone 21) ⊕ II 2 D Ex tb IIIC T135C Db (Zone 21) Ex tb IIIC T4 Db (Zone 21)	CLASS I, DIV. 1 GROUP A, B, C, D, T4 CLASS I, ZONE 1, AEx d IIC T4 Gb Ex d IIC T4 Gb (Zone 1) ⊕ II 2 G Ex d IIC T4 Gb (Zone 1)
	-40 to 70°C	Not for use with dust at this ambient temperature range.	

Type Designation Table for 21 Watt (L21) Coil:

-Order Example:	MKU45	18x60	G12	L21
-Coil Type	MKU45 – 45 MM wide coil for Hazardous Locations			
- Tube Diameter X Length (mm)		18X60 - For tube 18 mm wide by 60 mm long		
- Rated Voltage			G12-12 VDC G24-24 VDC G125-125 VDC R115-115VAC R230-230VAC	
-Rated Wattage				L21 – 21 Watt

HAZ LOC ® Configurations			
Rated Wattage (Rated Voltage @ +20°C)	Ambient Temperature	For Use in	
		Dust	Gas
21 Watts	-40 to 40°C	CLASS II & III, DIV. 1 GROUP E, F, G, T4 CLASS II, ZONE 21, AEx tb IIIC T4 Db Ex tb IIIC T4 Db (Zone 21) ⊕ II 2 D Ex tb IIIC T135C Db (Zone 21) Ex tb IIIC T4 Db (Zone 21)	CLASS I, DIV. 1 GROUP A, B, C, D, T4 CLASS I, ZONE 1, AEx d IIC T4 Gb Ex d IIC T4 Gb (Zone 1) ⊕ II 2 G Ex d IIC T4 Gb (Zone 1)
	-40 to 60°C	Not for use with dust at this ambient temperature range.	

Part Examples:

MKU45/18x60-R230/L10

Solenoid coil 230 volt 50/60 Hz, 10 watts. It is usable in gas and dust hazardous locations with a 70°C Max. ambient temperature. With gas only locations it can be in a 90°C Max. ambient temperature location. 1/2" NPT thread for electrical connection.

MKU45/18x60-G12/L21

Solenoid coil 12 volt direct current, 21 watts. It is usable in gas and dust hazardous locations with a 40°C Max. ambient temperature. With gas only locations it can be in a 60°C Max. ambient temperature location. In both cases the coil is rated at a T4 hazardous location temperature code. 1/2" NPT thread for electrical connection.

Main Features and Prescribed Operation:

The HAZ-LOC® coil is intended for use with a hydraulic actuator tube, thereby creating a complete solenoid. The resulting solenoid can drive hydraulic valves of various functions.

The hydraulic actuator must meet certain requirements to function properly. Among these are:

- Proper dimensional sizes for critical fits required per outline drawing in Appendix 1.
- The combined weight of the valve actuator core and the valve assembly must meet or exceed a minimum mass of 2.50# [1.1kg].
- The valve surface area must meet or exceed 31 in² [0.02 m²] to effectively remove heat from the coil.

Transient Voltage Protection:

The HAZ-LOC® coil does not have transient voltage protection. However, protection shall be made during installation to protect equipment from transient voltage spikes.

Installation and Commissioning:**Method of Electrical Connection:**

Installation of the HAZ-LOC® must be made in accordance with relevant and valid standards.

During the installation work there is no hazardous location protection provided; therefore all work must only be carried out if no explosive atmosphere is present.

«Once installed, do not open the device when an explosive gas atmosphere is present. »

«ATTENTION – NE PAS OUVRIR SI UNE ATMOSPHÈRE EXPLOSIVE GAZEUSE PEUT ÊTRE PRÉSENTE»

The coil is delivered with a terminal block within the housing for connection to wire leads. Conductor dia. 0.75 – 2.5 mm² / 20 - 14 AWG.

Connection to internal ground (Potential Equalization) required, via pin 3 of terminal block shown with the ground symbol. A supplemental external ground is provided on the housing.

To access this terminal block, the electrical access cover is to be removed with 8mm or 5/16" hex key. The electrical access cover must be replaced after installation of lead connections. Tighten electrical access cover securely to 40 Nm / 30 ft-lb.

Secure the electrical access cover with M4 set screw with 2.1 Nm of torque.

WARNING!

«Conduit runs must have a sealing fitting connected within 457 mm of this coil. »

«UN SCCELLEMENT DOIT ÊTRE INSTALLÉ À MOINS DE 457 mm DU BOÎTIER»

When powering the HAZ-LOC® coil with a non-constant source, ensure the operating voltage does not exceed 10% rated voltage and ripple does not exceed 10% for DC operated coils.

To prevent an over-temperature condition, it is the end-user's responsibility to ensure that the voltage and current which is supplied to the HAZ-LOC® coil does not exceed the maximum specified level.

If the HAZ-LOC® coil fails to operate, the correct function of the cable connections and the power-supply must be examined outside the hazardous location.

Modifying or repairing the HAZ-LOC® coil is not an intended use.

Method of Mounting

Install the HAZ-LOC® coil on a hydraulic tube with an outer diameter of Ø17.8 to Ø18.0 mm as prescribed in the outline drawing.

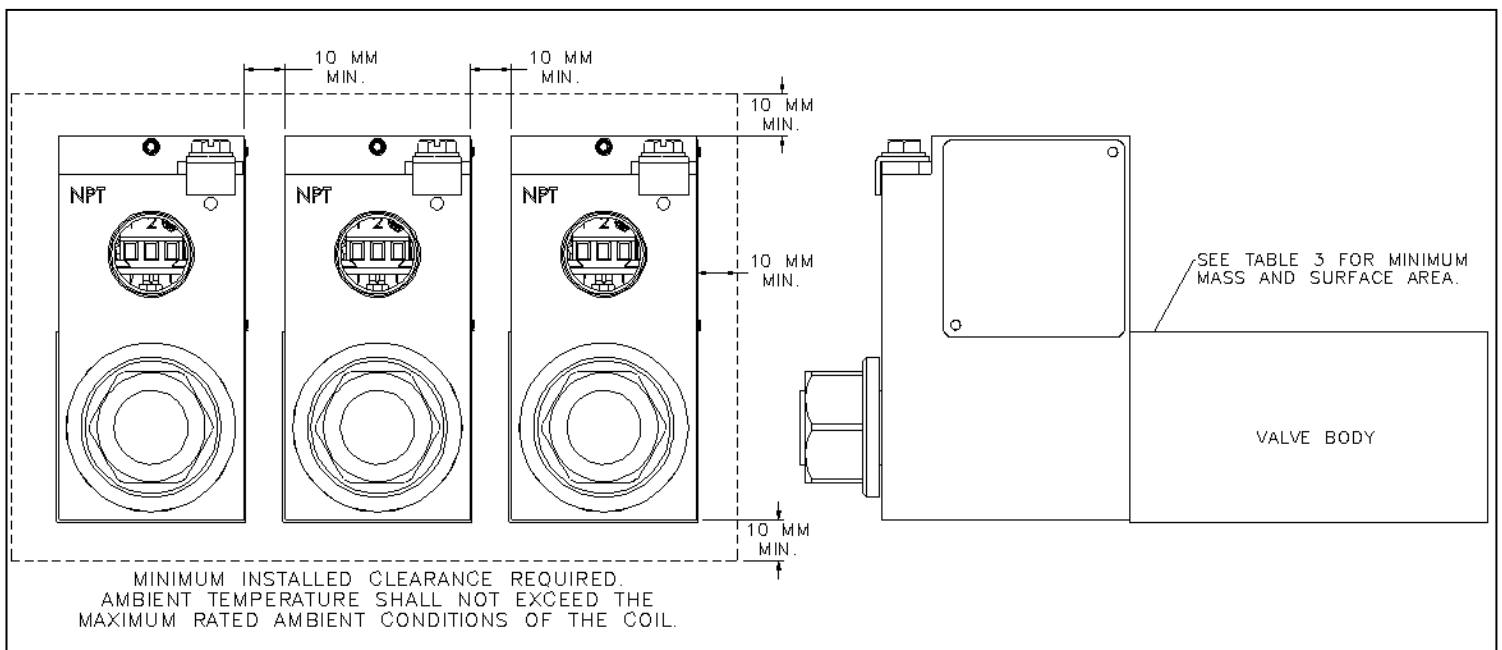
Only install HAZ-LOC® coils onto a hydraulic valve which provides a method of removing heat at least as well as aluminum. The hydraulic tube and valve system, (without the coil), must have a minimum mass of 2.50lb [1.1 kg]. The valve must have at least 18in² [0.012m²] of cooling surface.

Tighten the aluminum coil nut until turning or loosening of the solenoid coil by jarring is not possible.

Proper Ventilation

HAZ-LOC® coils are not designed to be mounted on a surface plate, except, the surface opposite of the conduit or cable gland opening, (the coils are allowed to have contact on the side designated to the valve body), see drawing below. The maximum ambient conditions require a continual flow of renewable air by natural convection on all exposed surfaces for proper dissipation of heat.

Side-by-side mounting (stack assembly) of coils requires a minimum of **10 mm** spacing, side-to-side, for proper heat exchange.



It is the end-user's responsibility to maintain correct center-to-center spacing.

Surface Protection:

HAZ-LOC® coils have zinc-nickel plating for corrosion protection.

The addition of paint or other coatings will negatively influence heat dissipation, which is an unintended use. It is the end-user's responsibility to not impede the heat dissipation of the HAZ-LOC® coil.

Enclosure Features:

The encapsulated coil is dust-tight and rain-tight after appropriate installation intended for indoor or outdoor use.

The solenoid coil must only be connected through suitable cable and conductor entrances, resp. piping systems, which are certified for this purpose and which have at least the appropriate protection class as designated by the installation location.

This solenoid coil has a maximum IP66 rating when used with corresponding rated connection.

Materials and Finishes:

Steel body – zinc/nickel chromate plated

Brass tube, Nickel plated

Magnet wire: copper wire, polyester (amide)(imide) with polyamideimide insulation (NEMA MW 35-C) (Heavy build)

Solder, lead-free

Epoxy resins – potting compounds

Not rated for use of the following chemicals:

- a) Acetic Acid (Glacial);
- b) Acetone;
- c) Ammonium Hydroxide (20 percent by weight);
- d) ASTM reference fuel C;
- e) Diethyl Ether;
- f) Ethyl Acetate;
- g) Ethylene Dichloride;
- h) Furfural;
- i) n-Hexane;
- j) Methyl Ethyl Ketone;
- k) Methanol;
- l) 2-Nitropropane; and
- m) Toluene.

Thermoplastic bobbin

O-Rings: Silicon

Not rated for use of the following chemicals:

- a) Acetic Acid (Glacial);
- b) Acetone; 2-Nitropropane
- c) Furfural
- d) Methyl Ethyl Ketone (MEK)

Printed Circuit Board: FR-4 board with solder mask.
 Components include terminal block with ground to coil body.
 Full Wave Rectifier (115VAC and 230VAC).

Internal lead wires: Teflon coated

Do not expose the internal components (Please refer to the above mentioned materials), to mediums (chemicals, gases, vapors, etc.) to which they are not compliant.

Specifications and Technical Data:

Technical Data	
Manufacturer	Magnet-Schultz of America, Inc. 401 Plaza Drive Westmont, IL 60559-1233
Coil-type	MKU45/18x60-xxx/Lxx
Model	HAZ-LOC®
Date of Production	Refer to device labelling
Tube	Ø.709 [Ø18mm] size tubes only [Ø17.8-Ø18.0] End-user provided – Rated in accordance with EPL
Coil rated voltage	U_N 12VDC, 24VDC, 125VDC, 115VAC 50/60 Hz, & 230VAC 50/60 Hz± 10% Ripple ≤ 10% for DC configurations
rated power at 20°C	W See Table 2 and 3
Ambient temperature	T_a See Table 2 and 3
Operating Environment	For Indoor or Outdoor Use (UL50E)
Ingress Protection Rating (IEC-60529)	IP66, with corresponding cable gland or conduit fitting
Mounting on tube on valve block Minimum Mass Minimum Valve Surface Area Material	2.50# [1.1kg] Tube & Body (LESS COIL) 31 in ² [0.02 m ²] Aluminum or better heat dissipation
Connection	3 Pin terminal block for 2 Power Leads + Internal Ground Lead, External Ground connection also available, see below
Cable gland or conduit connection	End-user provided – Appropriate for Area Classification

Short circuit protection	A fuse corresponding to the HAZ-LOC® coil's rated current (recommended 2 x, max. 3 x rated current acc. to IEC/EN 60127-2) or appropriate motor protective switch with short circuit and thermal rapid release (corresponding to rated current) have to be connected in series to each HAZ-LOC® coil. This fuse may be located in the accessory power supply unit or has to be connected in series separately. See Table 4.
Terminal for supplemental external ground (potential equalization) connection	5/16" [8 mm] Slotted Hex sufficient for 8 AWG [8.4 mm ²]

HAZ LOC ® Configurations			
Ambient Temperature T _a	Rated Wattage (Rated Voltage @ +20°C)	Temperature Code	For Use in Zone
-40 to 60°C	21	T4	CLASS I, DIV. 1 GROUP A, B, C, D, T* CLASS I, ZONE 1, AEx d IIC T* Gb Ex d IIC T* Gb (Zone 1) ⓧ II 2 G Ex d IIC T* Gb (Zone 1) Ex d IIC T* Gb (Zone 1)
-40 to 70°C	17	T4	
-40 to 80°C	12	T4	
-40 to 90°C	10	T4	

Table 2: Temperature Range for Gas Only Rating.

HAZ LOC ® Configurations				
Ambient Temperature T _a	Rated Wattage (Rated Voltage @ +20°C)	Temperature Code	For Use in Zones	
-40 to 40°C	21	T4	CLASS I, DIV. 1 GROUP A, B, C, D, T4 CLASS I, ZONE 1, AEx d IIC T4 Gb Ex d IIC T4 Gb (Zone 1) ⓧ II 2 G Ex d IIC T4 Gb (Zone 1) Ex d IIC T4 Gb (Zone 1)	CLASS II & III, DIV. 1 GROUP E, F, G, T4 CLASS II, ZONE 21, AEx tb IIIC T4 Db Ex tb IIIC T4 Db (Zone 21) ⓧ II 2 D Ex tb IIIC T135C Db (Zone 21) Ex tb IIIC T4 Db (Zone 21)
-40 to 50°C	17	T4		
-40 to 60°C	12	T4		
-40 to 70°C	10	T4		

Table 3: Temperature Range for Combined Gas and Dust Rating.

HAZ LOC ® Recommended Current Rating for Inline Fuse				
Nominal Voltage	Nominal Coil Wattage @ +20°C			
	10 Watt	12 Watt	17 Watt	21 Watt
12 VDC	1.6 A	2.5 A	3.15 A	4.0 A
24 VDC	0.8 A	1.25 A	1.6 A	2.0 A
125 VDC	0.16 A	0.19 A	0.27 A	0.34 A
115 VAC	0.2 A	0.315 A	0.4 A	0.4 A
230 VAC	0.1 A	0.160 A	0.2 A	0.2 A

Table 4: Recommended current rating for fuse inserts.