



TRAINING MANUAL

MARCH 2000

Vacuum contactors TRAINING



Merlin Gerin

Modicon

Square D

Telemecanique

Schneider
 **Electric**

LC1-V Vacuum Contactor

Objectives

- the standard big size air break contactors do not meet all the requirements in special markets
- Schneider as a world wide leading company doesn't offer this products up to now
- the high performance above 500 VAC enables us to have a better position in front of the customer
- in order to have a considerably good product offer it is necessary to have these as complementary products especially for the project business
- To complement / to replace bar contactors range



LC1-V Vacuum Contactor

Technical presentation

- **three ratings** : 160 A, 320 A and 610 A (the AC 3)



- **three power poles with 2 auxiliary contacts fitted (1NO+1NC)**
- **up to 1500 V AC application (IEC),**

LC1-V Vacuum Contactor

Technical presentation

- DC switching not possible AC operated
- dual frequency coils 50/60 Hz
- 110-120 V, 220-240 V, 380-415 V, 440-480 V, 550-600 V
- conform to IEC 60947-4-1
- approvals : CSA

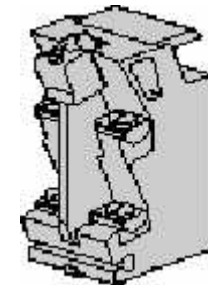


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Accessories

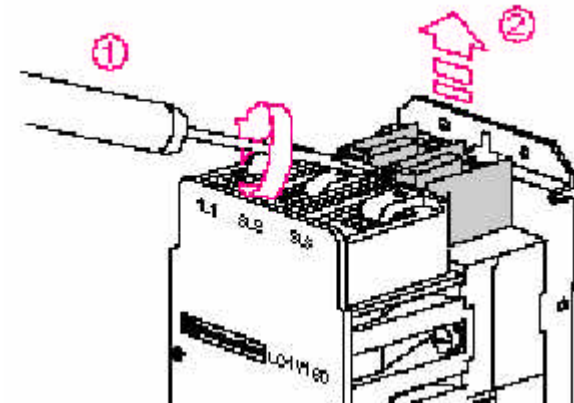
■ Auxiliary contacts LA1-V...

- same contact attachment for three contactor sizes
- two contacts per contact attachment
- configuration : 1 NO/1 NC, 2 NO or 2 NC
- up to 8 contacts per contactor
- can be added by the customer easily



■ No main contacts and bottle replacement

- contact gaps are very small
- tend to be difficult to set
- price of the replacement bottles is very high



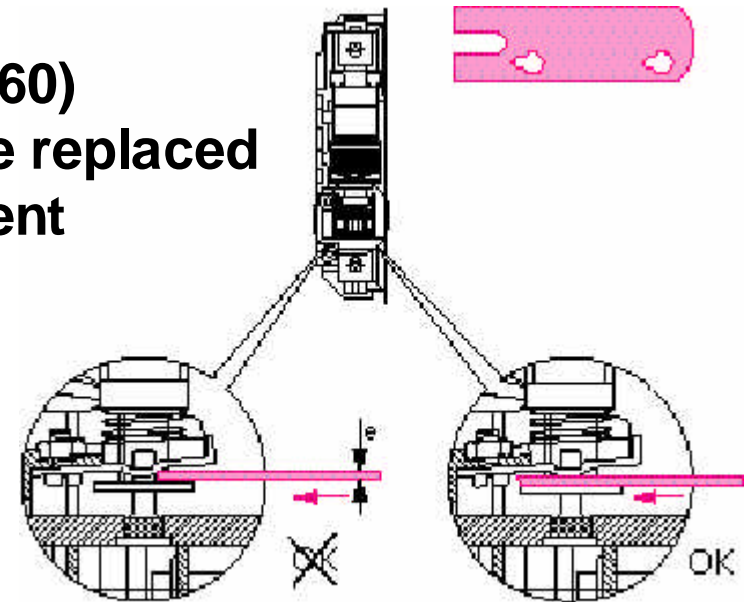
LC1-V Vacuum Contactor

Checking the power contacts

Contact wear allowance

- when the contactor is fully closed there is a gap between the pivot plate and the bottle system
- as contacts wear this gap decreases
- when any gap goes below 0.25 mm (LC1-V 160) or 0.5 mm (LC1-V 320/610) the unit should be replaced
- use the overtravel gauge for this measurement

CAUTION : - do not re-adjust the bottle nuts
- to reset overtravel as the bottles wear !



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Reversing kits & Coils

Reversing kits LA9-V...

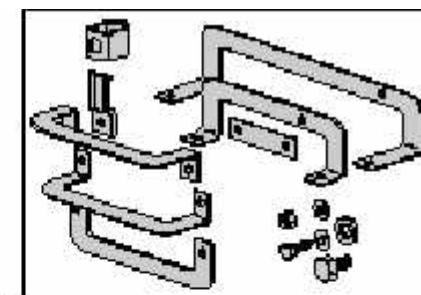
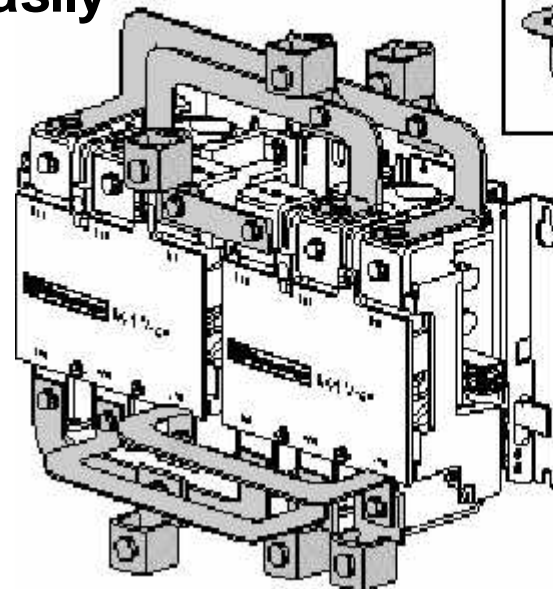
- mechanical interlock and power connection
- horizontally mounted
- can be added by the customer easily

Coils LX1- V...

- easy to change in order to adapt voltage
- 5 basic voltages

 KIT LC1V160 , LC1V320

 KIT LC1V610



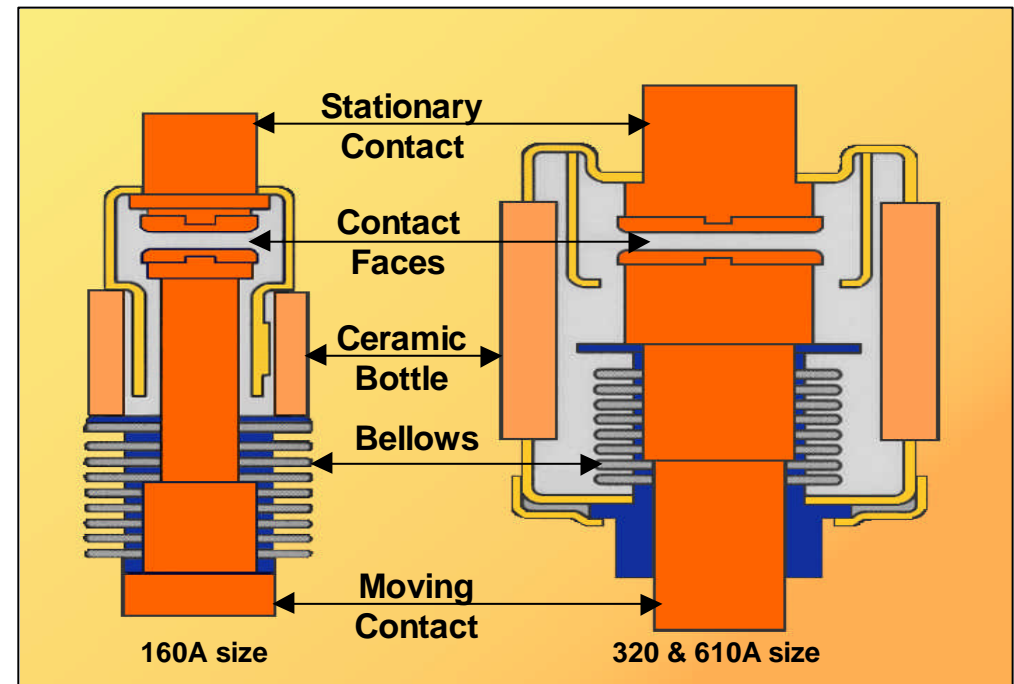
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Technology



How it works :

- contacts are sealed within air evacuated ceramic tubes.
- arc is extinguished as current passes through zero.
- stainless steel bellows allow the moveable contact to operate while maintaining vacuum.



LC1-V Vacuum Contactor



Strong points

Benefits compared with the traditional air break contactor

- **no environmental effects**
- **smaller dimensions**
- **lower weight**
- **longer life**
- **no maintenance**
- **any mounting position**

LC1-V Vacuum Contactor

Applications

Power contacts are immune to environment such as humidity, chemicals, contamination due to dust, etc.

That enables them ideally to be used

- in heavy duty and harsh environments and where maintenance opportunities are irregular

Typical application areas :

- mining
- oil / steel industry
- waste water treatment
- pulp and paper industry
- hoisting
- food industry

LC1-V Vacuum Contactor

Additional comments

Page 2 - Objectives:

- *in most of the cases where contactors are used they are air break contactors and that will keep on for the next futur*
- *the LC1V vacuum contactors will not replace the F contactors but can easily replace bar contactor (hoisting ect...)*
- *they (LC1V) will complete them (F)*
- *the vacuum technology is not new but well proved in the medium and high voltage*
- *this products allow us to learn more about the technology as well as about that specific market*

Page 3 and 4 - Technical presentation:

- *two physical sizes*
- *box lugs for the LC1V160, screws for the LC1V320 and 610*
- *screw mounting*
- *AC1 rating: 160A, 320A & 630A*
- *AC4 rating: 130A, 270A & 540A*
- *1000V is the limit for IEC but all tests were carried out at 1500V*
- *DC switching is not possible because, in order to interrupt the current, a current zero is necessary.*
- *Although we will not sell this product in USA, (not UL), we will have a CSA approval.*

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Additional comments

Page 5 - Accessories - auxiliary and power contacts:

- *auxiliary contacts are not in a vacuum*
- *max. 8 available contacts except the LC1V160: one contact is used for the coil.*
- *costs of the power contacts are about 65% of the contactor*

Page 6 - Checking the power contacts:.

- *the easiest way to check the gap is to energize the coil*

Page 7- Accessories - reversing kits:

in order to fix the mechanical interlock it is necessary to remove two contact blocks of each contactor

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Additional comments

Page 8 - Technology:

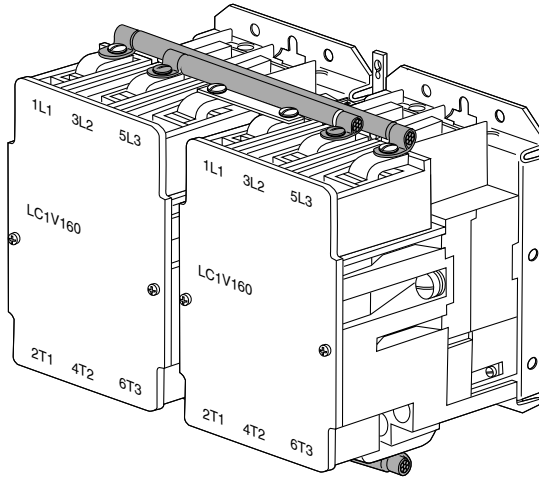
- *three separate vacuum tubes, one per phase*
- *atmospheric pressure + springs ensure a strong contact force*
- *vapor arc instead of arc ‘bolt‘*
- *less mechanical wear due to short stroke*
- *external bellow for the 160A device*
- *internal bellow for the 320A and 610A device*

Page 9 - Strong points:

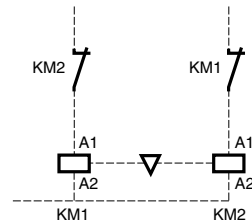
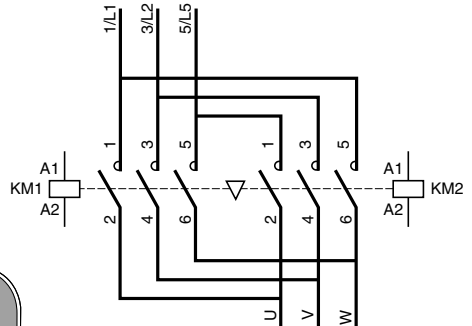
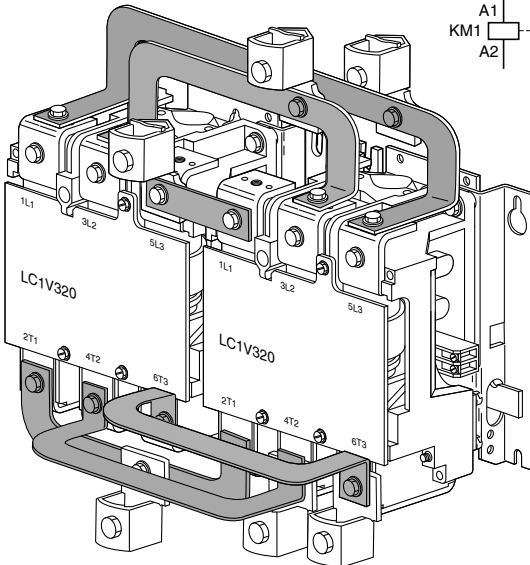
- *no environmental influence : main contacts sealed in ceramic bottles and main contacts protected against contaminants & corrosion*
- *smaller dimensions and lower weight due to no arc chambers and smaller contacts*
- *longer life and lower noise due to vacuum technology*

Inverseur / Reversing swith / Umschalter / Inversor

LC1-V160



LC1-V320



LC1-V610

