

WORLDWIDE English

AC-1 Conventional free air thermal current, 3 pole, 50 - 60 Hz enclosed [ $t_{\rm ft}$ ]

## 315 A

AC-1 Conventional free air thermal current, 1 pole open [\thin] 875 A

AC-1 Conventional free air thermal current, 1 pole enclosed [ $l_{th}$ ] 785 A

## Max. rating for three-phase motors, 50 - 60 Hz

AC-3 220 V 230 V [P] 90 kW

AC-3 380 V 400 V [P] 160 kW

### AC-3

660 V 690 V [P] 170 kW

AC-3 1000 V [P] 132 kW

AC-4 220 V 230 V [P] 75 kW

AC-4 380 V 400 V [P] 132 kW

AC-4

660 V 690 V [P] 137 kW

### AC-4

1000 V [P] 108 kW

Contact sequence  $1^{A1} 1^{1} 1^{3} 1^{5} 1^{13} 1^{21} 1^{31} 1^{43}$ 

Can be combined with auxiliary contact DLLM820-XHL  $\ldots$ 

Actuating voltage RA 250: 110 - 250 V 40 - 60 Hz/110 - 350 V DC

Voltage AC/DC AC and DC operation

### Contacts

N/O = Normally open 2 N/O

N/C = Normally closed 2 NC

## Auxiliary contacts

possible variants at auxiliary contact module fitting options on the side: 2 x DILM820-XH11(V)-SI; 2 x DILM820-XH11-SA

Side mounting auxiliary contacts



### Instructions

Interlocked opposing contacts according to IEC/EN 60947-5-1 Appendix L, inside the auxiliary contact module Auxiliary contacts used as mirror contacts according to IEC/EN 60947-4-1 Appendix F (not N/C late open)

### Instructions

integrated suppressor circuit in actuating electronics 660 V, 690 V or 1000 V: not directly reversing

# **TECHNICAL DATA**

### General

Standards IEC/EN 60947, VDE 0660, UL, CSA

Lifespan, mechanical AC operated [Operations] 10 x 10<sup>6</sup>

Lifespan, mechanical DC operated [Operations] 10 x 10<sup>6</sup>

Operating frequency, mechanical AC operated [Operations/h] 3000

Operating frequency, mechanical DC operated [Operations/h] 3000

Climatic proofing Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30 Anbient temperature Open -40 - +60 °C

Ambient temperature Enclosed - 40 - + 40 °C

Ambient temperature Storage - 40 - + 80 °C

Mounting position +

Mechanical shock resistance (IEC/EN 60068-2-27) Half-sinusoidal shock, 10 ms Main contacts NO contact 10 g

Mechanical shock resistance (IEC/EN 60068-2-27) Half-sinusoidal shock, 10 ms Auxiliary contacts NO contact 10 g

Mechanical shock resistance (IEC/EN 60068-2-27) Half-sinusoidal shock, 10 ms Auxiliary contacts NC contact 8 g

Degree of Protection

Protection against direct contact when actuated fromfront (EN 50274) Finger and back-of-hand proof with terminal shroud or terminal block

## Altitude

Max. 2000 m

### Weight AC operated 7.1 kg

Weight DC operated 7.1 kg

Weight Weight 7.1 kg Terminal capacity main cable Rexible with cable lug 50 - 240 mm<sup>2</sup>

Terminal capacity main cable Stranded with cable lug 70 - 240 mm<sup>2</sup>

Terminal capacity main cable Solid or stranded 2/0 - 500 MCMAWG

Terminal capacity main cable Flat conductor [Lamellenzahl x Breite x Dicke ] Fixing with flat cable terminal or cable terminal blocks See terminal capacity for cable terminal blocks mm

Terminal capacity main cable Busbar [Width] 25 mm

Main cable connection screw/bolt M10

Tightening torque 24 Nm

Terminal capacity control circuit cables Solid 1 x (0.75 - 2.5) 2 x (0.75 - 2.5) mm<sup>2</sup>

Terminal capacity control circuit cables Hexible with ferrule  $1 \times (0.75 - 2.5)$  $2 \times (0.75 - 2.5) \text{ rm}^2$ 

Terminal capacity control circuit cables Solid or stranded 18 - 14 AWG

Control circuit cable connection screw/bolt MB.5

Tightening torque 1.2 Nm

Tool Main cable Width across flats 16 mm

Tool Control circuit cables Pozidriv screw driver 2 Size

Main conducting paths

Rated impulse withstand voltage  $\left[ U_{mp} \right]$  8000 V AC

Overvoltage category/pollution degree III/3

Rated insulation voltage [U] 1000 V AC

Rated operational voltage [U\_e] 1000 V AC

Safe isolation to EN 61140 between coil and contacts 500 V AC

Safe isolation to EN 61140 between the contacts 500 V AC

Making capacity (p.f. to IEC/EN 60947) 3600 A

Breaking capacity 220 V 230 V 3000 A

Breaking capacity 380 V 400 V 3000 A

Breaking capacity 500 V 3000 A

Breaking capacity 660 V 690 V 3000 A

Breaking capacity 1000 V 950 A

 $\begin{array}{l} \mbox{Component lifespan} \\ \mbox{AC1: See} \rightarrow \mbox{Engineering, characteristic curves} \\ \mbox{AC3: See} \rightarrow \mbox{Engineering, characteristic curves} \\ \mbox{AC4: See} \rightarrow \mbox{Engineering, characteristic curves} \\ \end{array}$ 

Short-circuit rating Short-circuit protection maximumfuse Type "2" coordination 400 V [gG/gL 500 V] 400 A

Short-circuit rating Short-circuit protection maximumfuse Type "2" coordination 690 V [gG/gL 690 V] 315 A Short-circuit rating Short-circuit protection maximum fuse Type "2" coordination 1000 V [gG/gL 1000 V] 160 A

Short-circuit rating Short-circuit protection maximumfuse Type "1" coordination 400 V [gG/gL 500 V] 500 A

### Short-circuit rating Short-circuit protection maximumfuse Type "1" coordination 690 V [gG/gL 690 V] 400 A

Short-circuit rating Short-circuit protection maximum fuse Type "1" coordination 1000 V [gG/gL 1000 V] 200 A

## AC

AC-1 Rated operational current Conventional free air thermal current, 3 pole, 50 - 60 Hz Open at 40  $^{\circ}C[t_{h}=t_{e}]$ 490 A

## AC-1

Rated operational current Conventional free air thermal current, 3 pole, 50 - 60 Hz Open at 50 °C [ $l_{th} = l_{o}$ ] 438 A

### AC-1

Rated operational current Conventional free air thermal current, 3 pole, 50 - 60 Hz Open at 55  $^{\circ}C[t_{h}=t_{e}]$ 418 A

### AC-1

Rated operational current Conventional free air thermal current, 3 pole, 50 - 60 Hz Open at 60  $^{\circ}C[t_{h}=t_{e}]$ 400 A

## AC-1

Rated operational current Conventional free air thermal current, 3 pole, 50 - 60 Hz enclosed [ $l_{h}$ ] 315 A

#### AC-1

Rated operational current Conventional free air thermal current, 3 pole, 50 - 60 Hz Notes At maximum permissible ambient air temperature.

#### AC-1

Rated operational current Conventional free air thermal current, 1 pole Note at maximum permissible ambient air temperature

### AC-1

Rated operational current Conventional free air thermal current, 1 pole open [\thin] 875 A

#### AC-1

Rated operational current Conventional free air thermal current, 1 pole enclosed [ $l_{th}$ ] 785 A

### AC-3

Rated operational current Open, 3-pole: 50 – 60 Hz Notes At maximum permissible ambient temperature (open.)

### AC-3

Rated operational current Open, 3-pole: 50 - 60 Hz 220 V 230 V [Ie] 300 A

### AC-3

Rated operational current Open, 3-pole: 50 – 60 Hz 240 V [[<sub>e</sub>] 300 A

### AC-3

Rated operational current Open, 3-pole: 50 – 60 Hz 380 V 400 V [le] 300 A

## AC-3

Rated operational current Open, 3-pole: 50 – 60 Hz 415 V [le] 300 A

### AC-3

Rated operational current Open, 3-pole: 50 – 60 Hz 440V [l<sub>e</sub>] 300 A

### AC-3

Rated operational current Open, 3-pole: 50 – 60 Hz 500 V [le] 300 A

## AC-3

Rated operational current Open, 3-pole: 50-60 Hz 660 V 690 V [le]

## 185 A

AC-3 Rated operational current Open, 3-pole: 50-60 Hz 1000 V [le ] 95 A

AC-3 Motor rating [P] 220 V 230 V [P] 90 kW

## AC-3

Motor rating [P] 240V [P] 100 kW

### AC-3

Motor rating [P] 380 V 400 V [P] 160 kW

### AC-3

Motor rating [P] 415 V [P] 175 kW

### AC-3 Motor rating [P] 440 V [P] 185 kW

AC-3 Motor rating [P] 500 V [P] 210 kW

## AC-3

Motor rating [P] 660 V 690 V [P] 170 kW

### AC-3

Motor rating [P] 1000 V [P] 132 kW

## AC-4

Rated operational current Open, 3-pole: 50 – 60 Hz 220 V 230 V [le] 240 A

### AC-4

Rated operational current Open, 3-pole: 50 – 60 Hz 240 V [l₀] 240 A

### AC-4 Rated operational current Open, 3-pole: 50 – 60 Hz

380 V 400 V [l<sub>e</sub>] 240 A

#### AC-4

Rated operational current Open, 3-pole: 50-60 Hz 415 V [ $l_{e}$ ] 240 A

### AC-4

Rated operational current Open, 3-pole: 50-60 Hz 440 V [ $l_{e}$ ] 240 A

### AC-4

Rated operational current Open, 3-pole: 50 - 60 Hz $500 \text{ V} [l_{e}]$ 240 A

## AC-4

Rated operational current Open, 3-pole: 50 – 60 Hz 660 V 690 V [le] 150 A

### AC-4

Rated operational current Open, 3-pole: 50 - 60 Hz  $1000 \vee [I_{e}]$  76 A

### AC-4

Motor rating [P] 220 V 230 V [P] 75 kW

### AC-4 Motor rating [P] 240 V [P] 82 kW

AC-4

Motor rating [P] 380 V 400 V [P] 132 kW

### AC-4

Motor rating [P] 415 V [P] 142 kW

## AC-4

Motor rating [P] 440 V [P] 150 kW

### AC-4 Motor rating [P] 500 V [P] 170 kW

AC-4 Motor rating [P] 660 V 690 V [P] 137 kW

AC-4 Motor rating [P] 1000 V [P] 108 kW

## **Condensor operation**

Individual compensation, rated operational current l<sub>e</sub> of three-phase capacitors Open up to 525 V 307 A

Individual compensation, rated operational current l<sub>e</sub> of three-phase capacitors Open 690 V 177 A

Max. inrush current peak 30 x l<sub>e</sub>

 $\begin{array}{l} Component \ lifespan \ [Operations] \\ 0.1 \ x \ 10^6 \end{array}$ 

Max. operating frequency 200 Ops/h

## DC

Rated operational current, open DC-1 Notes see DILDC300/DILDC600 or on request

### **Current heat loss**

3 pole, at I<sub>th</sub> (60°) 37 W

Ourrent heat loss at Ie to AC-3/400 V 21 W

## Magnet systems

Voltage tolerance U<sub>S</sub> 110 - 250 V 40-60 Hz 110 - 350 V DC

Voltage tolerance AC operated [Pick-up] 0.7 x U<sub>Smin</sub> - 1.15 x U<sub>Smax</sub> Voltage tolerance DC operated [Rck-up] 0.7 x U<sub>S min</sub> - 1.15 x U<sub>S max</sub>

Voltage tolerance AC operated [Drop-out] 0.2 x U<sub>S max</sub> - 0.6 x U<sub>S min</sub>

Voltage tolerance DC operated [Drop-out] 0.2 x U<sub>S max</sub> - 0.6 x U<sub>S min</sub>

Power consumption of the coil in a cold state and 1.0 x  $U_S$  Note on power consumption Control transformer with  $u_k \ \square \ 6\%$ 

Power consumption of the coil in a cold state and 1.0 x  $U_{S}$  Pull-in power [Pck-up] 380 VA

Power consumption of the coil in a cold state and 1.0 x  $U_{S}$  Pull-in power [Pck-up] 250 W

Power consumption of the coil in a cold state and 1.0 x  $U_{S}$  Sealing power [Sealing] 10.5 VA

Power consumption of the coil in a cold state and 1.0 x  $U_S$  Sealing power [Sealing] 5.5 W

Duty factor 100 % DF

Changeover time at 100 % U<sub>S</sub> (recommended value) Main contacts Closing delay 100 ms

 $\begin{array}{l} \mbox{Changeover time at 100 \% U}_{S} \mbox{ (recommended value)} \\ \mbox{Main contacts} \\ \mbox{Opening delay} \\ \mbox{110 ms} \end{array}$ 

Behaviour in marginal and transitional conditions Sealing Voltage interruptions  $(0 \dots 0.2 \times U_{c\,min}) \Box 10 \,ms$  Time is bridged successfully

Behaviour in marginal and transitional conditions Sealing Voltage interruptions  $(0 \dots 0.2 \text{ x } U_{c\,min}) > 10 \text{ ms}$  Drop-out of the contactor

Behaviour in marginal and transitional conditions Sealing

 $\begin{array}{l} \mbox{Voltage drops} \\ (0.2 \ldots 0.6 \mbox{ } U_{c\,min}) \ \Box \ 12 \mbox{ } ms \\ \mbox{Time is bridged successfully} \end{array}$ 

Behaviour in marginal and transitional conditions Sealing Voltage drops  $(0.2 \dots 0.6 \times U_{c min}) > 12 \text{ ms}$ Drop-out of the contactor

Behaviour in marginal and transitional conditions Sealing Voltage drops  $(0.6\ldots0.7 \text{ x U}_{c\,\text{min}})$  Contactor remains switched on

Behaviour in marginal and transitional conditions Sealing Excess voltage (1.15...1.3 x U<sub>c max</sub>) Contactor remains switched on

Behaviour in marginal and transitional conditions Sealing Rck-up phase  $(0 \dots 0.7 \times U_{cmin})$  Contactor does not switch on

Behaviour in marginal and transitional conditions Sealing Rck-up phase  $(0.7 \times U_{c \min} \dots 1.15 \times U_{c \max})$ Contactor switches on with certainty

Admissible transitional contact resistance (of the external control circuit device when actuating A11)  $\Box$  500 m  $\Omega$ 

PLC signal level (A3 - A4) to IEC/EN 61131-2 (type 2) High 15 V  $\,$ 

PLC signal level (A3 - A4) to IEC/EN 61131-2 (type 2) Low 5  $\vee$ 

### Electromagnetic compatibility (EMC)

Electromagnetic compatibility This product is designed for operation in industrial environments (environment A). Its use in residential environments (environment B) may cause radio-frequency interference, requiring additional noise suppression measures.

## Rating data for approved types

Switching capacity Maximum motor rating Three-phase 200 V 208 V 100 HP Switching capacity Maximum motor rating Three-phase 230 V 240 V 125 HP

Switching capacity Maximum motor rating Three-phase 460 V 480 V 250 HP

Switching capacity Maximum motor rating Three-phase 575 V 600 V 300 HP

Switching capacity General use 350 A

Auxiliary contacts Filot Duty AC operated A600

Auxiliary contacts Filot Duty DC operated P300

Auxiliary contacts General Use AC 600 V

Auxiliary contacts General Use AC 15 A

Auxiliary contacts General Use DC 250 V

Auxiliary contacts General Use DC 1 A

Short Circuit Current Rating Basic Rating SCCR 18 kA

Short Circuit Current Rating Basic Rating max. Fuse

## 700 A

Short Circuit Current Rating Basic Rating max. CB 600 A

Short Circuit Current Rating 480 V High Fault SCCR (fuse) 18 kA

Short Circuit Current Rating 480 V High Fault max. Fuse 700 Class L A

Short Circuit Current Rating 480 V High Fault SCOR (CB) 65 kA

Short Circuit Current Rating 480 V High Fault max. CB 250 A

Short Circuit Current Rating 600 V High Fault SCOR (fuse) 18 kA

Short Circuit Current Rating 600 V High Fault max. Fuse 700 Class J A

Short Circuit Current Rating 600 V High Fault SCCR (CB) 18 kA

Short Circuit Current Rating 600 V High Fault max. CB 600 A

Special Rurpose Ratings Definite Rurpose Ratings (100,000 cycles acc. to UL 1995) LRA 480V 60Hz 3phase 2160 A

Special Rurpose Ratings Definite Rurpose Ratings (100,000 cycles acc. to UL 1995) RLA 480V 60Hz 3phase 360 A

Special Rurpose Ratings Definite Rurpose Ratings (100,000 cycles acc. to UL 1995) LRA 600V 60Hz 3phase 1800 A Special Purpose Ratings Definite Purpose Ratings (100,000 cycles acc. to UL 1995) FLA 600V 60Hz 3phase 300 A

## **DESIGN VERIFICATION AS PER IEC/EN 61439**

## Technical data for design verification

Rated operational current for specified heat dissipation  $[\![h_{\!T}]\!]$  300 A

Heat dissipation per pole, current-dependent  $[\mathrm{P}_{\mathrm{id}}]$  7 W

Equipment heat dissipation, current-dependent  $[\mathsf{P}_{\text{vid}}]$  0 W

Static heat dissipation, non-current-dependent  $[\mathrm{P}_{\mathrm{vs}}]$  5.5 W

Heat dissipation capacity  $[P_{\text{diss}}]$  0 W

Operating ambient temperature min. -40 °C

Operating ambient temperature max. +60  $^{\circ}\mathrm{C}$ 

### IEC/EN 61439 design verification

10.2 Strength of materials and parts 10.2.2 Corrosion resistance Meets the product standard's requirements.

10.2 Strength of materials and parts10.2.3.1 Verification of thermal stability of enclosuresMeets the product standard's requirements.

10.2 Strength of materials and parts10.2.3.2 Verification of resistance of insulating materials to normal heatMeets the product standard's requirements.

10.2 Strength of materials and parts10.2.3.3 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effectsMeets the product standard's requirements.

10.2 Strength of materials and parts 10.2.4 Resistance to ultra-violet (UV) radiation Meets the product standard's requirements. 10.2 Strength of materials and parts 10.2.5 Lifting Does not apply, since the entire switchgear needs to be evaluated.

10.2 Strength of materials and parts 10.2.6 Mechanical impact Does not apply, since the entire switchgear needs to be evaluated.

10.2 Strength of materials and parts 10.2.7 Inscriptions Meets the product standard's requirements.

10.3 Degree of protection of ASSEVBLIES Does not apply, since the entire switchgear needs to be evaluated.

10.4 Clearances and creepage distances Meets the product standard's requirements.

10.5 Protection against electric shock Does not apply, since the entire switchgear needs to be evaluated.

10.6 Incorporation of switching devices and components Does not apply, since the entire switchgear needs to be evaluated.

10.7 Internal electrical circuits and connections Is the panel builder's responsibility.

10.8 Connections for external conductors Is the panel builder's responsibility.

10.9 Insulation properties 10.9.2 Pow er-frequency electric strength Is the panel builder's responsibility.

10.9 Insulation properties10.9.3 Impulse withstand voltageIs the panel builder's responsibility.

10.9 Insulation properties10.9.4 Testing of enclosures made of insulating material Is the panel builder's responsibility.

10.10 Temperature rise The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices.

10.11 Short-circuit rating Is the panel builder's responsibility. The specifications for the switchgear must be observed.

10.12 Electromagnetic compatibility Is the panel builder's responsibility. The specifications for the switchgear must be observed.

## **TECHNICAL DATA ETIM 7.0**

Low-voltage industrial components (EG000017) / Power contactor, AC switching (EC000066)

Electric engineering, automation, process control engineering / Low-voltage switch technology / Contactor (LV) / Power contactor, AC switching (ecl@ss10.0.1-27-37-10-03 [AAB718015])

Rated control supply voltage Us at AC 50HZ 110 - 250 V

Rated control supply voltage Us at AC 60HZ 110 - 250 V

Rated control supply voltage Us at DC 110 - 250 V

Voltage type for actuating AC/DC

Rated operation current le at AC-1, 400 V 490 A

Rated operation current le at AC-3, 400 V 300 A

Rated operation pow er at AC-3, 400 V 160 kW

Rated operation current le at AC-4, 400 V 240 A

Rated operation pow er at AC-4, 400 V 132 kW

Rated operation power NEVA 186 kW

Modular version No

Number of auxiliary contacts as normally open contact 2

Number of auxiliary contacts as normally closed contact 2

Type of electrical connection of main circuit Rail connection

Number of normally closed contacts as main contact 0

Number of main contacts as normally open contact 3

## **APPROVALS**

Product Standards IEC/EN 60947-4-1; UL 60947-4-1; CSA - C22.2 No. 60947-4-1-14; CE marking

UL File No. E29096

UL Category Control No. NLDX

CSA File No. 1017510

CSA Class No. 3211-04

North America Certification UL listed, CSA certified

Specially designed for North America No

# CHARACTERISTICS

Side mounting auxiliary contacts

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possible variants at auxiliary contact module fitting options on the side: 2 x DIL/M820-XH11(V)-SI; 2 x DIL/M820-XH11-SA

Characteristic curve

Normal switching duty Normal AC induction motor Operating characteristics Switch on: fromstop Switch off: during run Electrical characteristics: Switch on: up to 6 x Rated motor current Switch off: up to 1 x Rated motor current Utility category 100 % AC-3 Typical Applications Compressors Lifts Mxers Pumps Escalators Agitators fan Conveyor belts Centrifuges Hinged flaps Bucket-elevator Air-conditioning systems General drives for manufacturing and processing machines

Characteristic curve

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Extreme switching duty Squirrel-cage motor Operating characteristics Inching, plugging, reversing Electrical characteristics Make: up to 6 x rated motor current Break: up to 6 x rated motor current Utilization category 100 % AC-4 Typical applications Printing presses Wire-drawing machines Centrifuges Special drives for manufacturing and processing machines

Characteristic curve

Switching conditions for 3 pole, non-motor loads Operating characteristics Non inductive and slightly inductive loads Electrical characteristics Switch on: 1 x rated operational current Switch off: 1 x rated operational current Utilization category 100 % AC-1 Typical examples of application Electric heat

Characteristic curve

Short-time loading, 3-pole Time interval betw een two loading cycles: 15 minutes

## DIMENSIONS

□ DILVB20-XHI11(V)-SI □ DILVB20-XHI11-SA





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