



Product designation

Power contactor

Product type designation

BF12

**Contact characteristics**

|                                                                    |                    |       |
|--------------------------------------------------------------------|--------------------|-------|
| Number of poles                                                    | Nr.                | 3     |
| Rated insulation voltage $U_i$ IEC/EN                              | V                  | 690   |
| Rated impulse withstand voltage $U_{imp}$                          | kV                 | 6     |
| Operational frequency                                              | min Hz             | 25    |
|                                                                    | max Hz             | 400   |
| IEC Conventional free air thermal current $I_{th}$                 | A                  | 28    |
| Operational current $I_e$                                          | AC-1 (=40°C)       | A 28  |
|                                                                    | AC-1 (=55°C)       | A 23  |
|                                                                    | AC-1 (=70°C)       | A 20  |
|                                                                    | AC-3 (=440V =55°C) | A 12  |
|                                                                    | AC-4 (400V)        | A 7.9 |
| Rated operational power AC-3 (T=55°C)                              | 230V kW            | 3.2   |
|                                                                    | 400V kW            | 5.7   |
|                                                                    | 415V kW            | 6.2   |
|                                                                    | 440V kW            | 6.2   |
|                                                                    | 500V kW            | 7.5   |
|                                                                    | 690V kW            | 10    |
| Rated operational power AC-1 (T=40°C)                              | 230V kW            | 10    |
|                                                                    | 400V kW            | 18    |
|                                                                    | 500V kW            | 23    |
|                                                                    | 690V kW            | 32    |
| IEC max current $I_e$ in DC1 with L/R = 1ms with 1 poles in series | =24V A             | 17    |
|                                                                    | 48V A              | 15    |
|                                                                    | 75V A              | 13    |
|                                                                    | 110V A             | 6     |
|                                                                    | 220V A             | —     |
| IEC max current $I_e$ in DC1 with L/R = 1ms with 2 poles in series | =24V A             | 20    |
|                                                                    | 48V A              | 20    |
|                                                                    | 75V A              | 18    |
|                                                                    | 110V A             | 13    |
|                                                                    | 220V A             | 1     |
| IEC max current $I_e$ in DC1 with L/R = 1ms with 3 poles in series | =24V A             | 22    |
|                                                                    | 48V A              | 22    |
|                                                                    | 75V A              | 20    |
|                                                                    | 110V A             | 16    |

|                                                                      |          |      |     |
|----------------------------------------------------------------------|----------|------|-----|
|                                                                      | 220V     | A    | 11  |
| IEC max current Ie in DC1 with L/R = 1ms with 4 poles in series      |          |      |     |
|                                                                      | =24V     | A    | 20  |
|                                                                      | 48V      | A    | 20  |
|                                                                      | 75V      | A    | 20  |
|                                                                      | 110V     | A    | 16  |
|                                                                      | 220V     | A    | 12  |
| IEC max current Ie in DC3-DC5 with L/R = 15ms with 1 poles in series |          |      |     |
|                                                                      | =24V     | A    | 12  |
|                                                                      | 48V      | A    | 11  |
|                                                                      | 75V      | A    | 10  |
|                                                                      | 110V     | A    | 2   |
|                                                                      | 220V     | A    | –   |
| IEC max current Ie in DC3-DC5 with L/R = 15ms with 2 poles in series |          |      |     |
|                                                                      | =24V     | A    | 15  |
|                                                                      | 48V      | A    | 13  |
|                                                                      | 75V      | A    | 12  |
|                                                                      | 110V     | A    | 8   |
|                                                                      | 220V     | A    | 2   |
| IEC max current Ie in DC3-DC5 with L/R = 15ms with 3 poles in series |          |      |     |
|                                                                      | =24V     | A    | 18  |
|                                                                      | 48V      | A    | 18  |
|                                                                      | 75V      | A    | 15  |
|                                                                      | 110V     | A    | 12  |
|                                                                      | 220V     | A    | 6   |
| IEC max current Ie in DC3-DC5 with L/R = 15ms with 4 poles in series |          |      |     |
|                                                                      | =24V     | A    | 15  |
|                                                                      | 48V      | A    | 15  |
|                                                                      | 75V      | A    | 15  |
|                                                                      | 110V     | A    | 16  |
|                                                                      | 220V     | A    | 7   |
| Short-time allowable current for 10s (IEC/EN60947-1)                 |          | A    | 150 |
| Protection fuse                                                      |          |      |     |
|                                                                      | gG (IEC) | A    | 32  |
|                                                                      | aM (IEC) | A    | 12  |
| Making capacity (RMS value)                                          |          | A    | 120 |
| Breaking capacity at voltage                                         |          |      |     |
|                                                                      | 440V     | A    | 96  |
|                                                                      | 500V     | A    | 96  |
|                                                                      | 690V     | A    | 94  |
| Resistance per pole (average value)                                  |          | m?   | 2.5 |
| Power dissipation per pole (average value)                           |          |      |     |
|                                                                      | Ith      | W    | 2   |
|                                                                      | AC3      | W    | 0.4 |
| Tightening torque for terminals                                      |          |      |     |
|                                                                      | min      | Nm   | 1.5 |
|                                                                      | max      | Nm   | 1.8 |
|                                                                      | min      | lbin | 1.1 |
|                                                                      | max      | lbin | 1.5 |
| Tightening torque for coil terminal                                  |          |      |     |
|                                                                      | min      | Nm   | 0.8 |
|                                                                      | max      | Nm   | 1   |
|                                                                      | min      | lbin | 0.8 |

|                                                     |                     |                 |                          |
|-----------------------------------------------------|---------------------|-----------------|--------------------------|
|                                                     | max                 | lbin            | 0.74                     |
| Max number of wires simultaneously connectable      |                     | Nr.             | 2                        |
| Conductor section                                   |                     |                 |                          |
| AWG/Kcmil                                           | max                 |                 | 10                       |
| Flexible w/o lug conductor section                  | min                 | mm <sup>2</sup> | 1                        |
|                                                     | max                 | mm <sup>2</sup> | 6                        |
| Flexible c/w lug conductor section                  | min                 | mm <sup>2</sup> | 1                        |
|                                                     | max                 | mm <sup>2</sup> | 4                        |
| Flexible with insulated spade lug conductor section | min                 | mm <sup>2</sup> | 1                        |
|                                                     | max                 | mm <sup>2</sup> | 4                        |
| Power terminal protection according to IEC/EN 60529 |                     |                 | IP20 when wired          |
| <b>Mechanical features</b>                          |                     |                 |                          |
| Operating position                                  | normal<br>allowable |                 | Vertical plan<br>±30°    |
| Fixing                                              |                     |                 | Screw / DIN rail<br>35mm |
| Weight                                              |                     | g               | 490                      |
| Conductor section                                   |                     |                 |                          |
| AWG/kcmil conductor section                         | max                 |                 | 10                       |
| <b>Auxiliary contact characteristics</b>            |                     |                 |                          |
| Thermal current I <sub>th</sub>                     |                     | A               | 10                       |
| IEC/EN 60947-5-1 designation                        |                     |                 | A600 - P600              |
| Operating current AC15                              | 230V                | A               | 3                        |
|                                                     | 400V                | A               | 1.9                      |
|                                                     | 500V                | A               | 1.4                      |
| Operating current DC12                              | 110V                | A               | 5.7                      |
| Operating current DC13                              | 24V                 | A               | 5.7                      |
|                                                     | 48V                 | A               | 2.9                      |
|                                                     | 60V                 | A               | 2.3                      |
|                                                     | 110V                | A               | 1.25                     |
|                                                     | 125V                | A               | 1.1                      |
|                                                     | 220V                | A               | 0.55                     |
|                                                     | 600V                | A               | 0.2                      |
| <b>Operations</b>                                   |                     |                 |                          |
| Mechanical life                                     |                     | cycles          | 20000000                 |
| Electrical life                                     |                     | cycles          | 2000000                  |
| <b>Safety related data</b>                          |                     |                 |                          |
| Performance level B10d according to EN/ISO 13489-1  | rated load          | cycles          | 2000000                  |
|                                                     | mechanical load     | cycles          | 20000000                 |
| Mirror contacts according to IEC/EN 60947-4-1       |                     |                 | yes                      |
| EMC compatibility                                   |                     |                 | yes                      |
| <b>DC coil operating</b>                            |                     |                 |                          |
| DC rated control voltage                            |                     | V               | 24                       |

## DC operating voltage

pick-up

|     |     |     |
|-----|-----|-----|
| min | %Us | 70  |
| max | %Us | 125 |

drop-out

|     |     |    |
|-----|-----|----|
| min | %Us | 10 |
| max | %Us | 40 |

## Average coil consumption =20°C

|         |   |     |
|---------|---|-----|
| in-rush | W | 5.4 |
| holding | W | 5.4 |

## Max cycles frequency

## Mechanical operation

cycles/h 3600

## Operating times

### Average time for Us control

in AC

Closing NO

|     |    |    |
|-----|----|----|
| min | ms | 8  |
| max | ms | 24 |

Opening NO

|     |    |    |
|-----|----|----|
| min | ms | 10 |
| max | ms | 20 |

Closing NC

|     |    |    |
|-----|----|----|
| min | ms | 14 |
| max | ms | 28 |

Opening NC

|     |    |    |
|-----|----|----|
| min | ms | 7  |
| max | ms | 18 |

in DC

Closing NO

|     |    |    |
|-----|----|----|
| min | ms | 54 |
| max | ms | 66 |

Opening NO

|     |    |    |
|-----|----|----|
| min | ms | 14 |
| max | ms | 17 |

Closing NC

|     |    |    |
|-----|----|----|
| min | ms | 24 |
| max | ms | 30 |

Opening NC

|     |    |    |
|-----|----|----|
| min | ms | 47 |
| max | ms | 57 |

## UL technical data

### Full-load current (FLA) for three-phase AC motor

|         |   |    |
|---------|---|----|
| at 480V | A | 11 |
| at 600V | A | 11 |

### Yielded mechanical performance

for single-phase AC motor

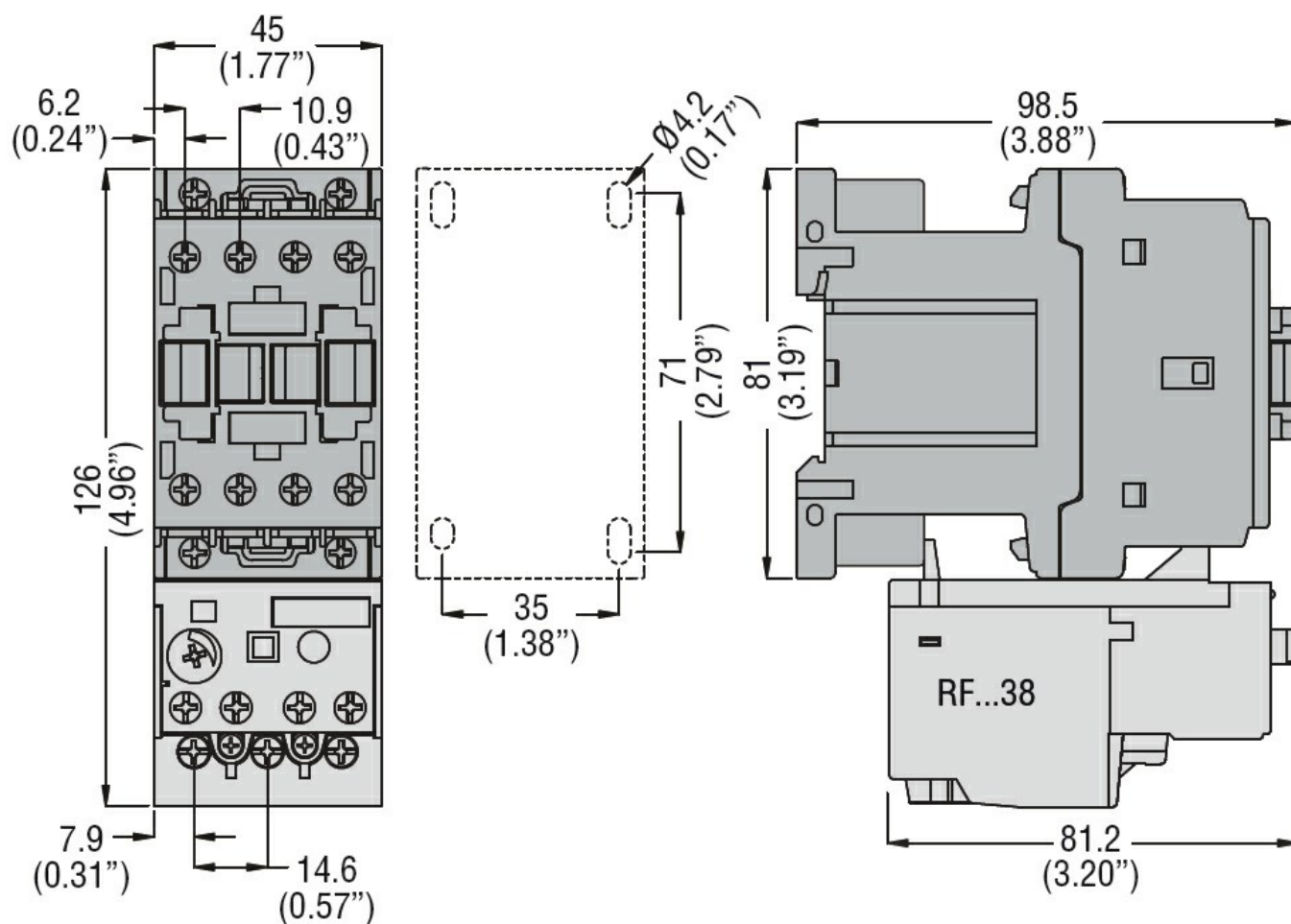
|          |    |   |
|----------|----|---|
| 110/120V | HP | 1 |
| 230V     | HP | 2 |

for three-phase AC motor

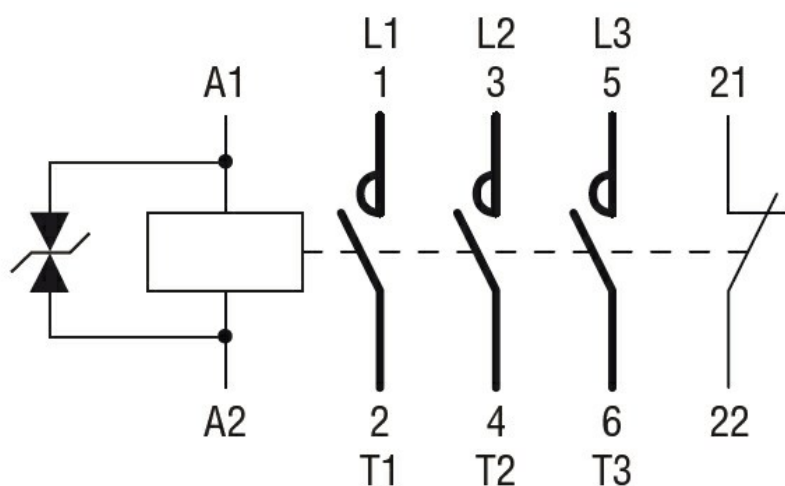
|          |    |     |
|----------|----|-----|
| 200/208V | HP | 5   |
| 220/230V | HP | 5   |
| 460/480V | HP | 7.5 |
| 575/600V | HP | 10  |

## General USE

|                                                      |  |                       |    |             |
|------------------------------------------------------|--|-----------------------|----|-------------|
| Contactor                                            |  | AC current            | A  | 28          |
| Auxiliary contacts                                   |  | AC voltage            | V  | 600         |
|                                                      |  | AC current            | A  | 10          |
|                                                      |  | DC voltage            | V  | 250         |
|                                                      |  | DC current            | A  | 1           |
| Short-circuit protection fuse, 600V                  |  |                       |    |             |
| High fault                                           |  | Short circuit current | kA | 100         |
|                                                      |  | Fuse rating           | A  | 30          |
|                                                      |  | Fuse class            |    | J           |
| Standard fault                                       |  | Short circuit current | kA | 5           |
|                                                      |  | Fuse rating           | A  | 70          |
| Contact rating of auxiliary contacts according to UL |  |                       |    | A600 - P600 |
| Ambient conditions                                   |  |                       |    |             |
| Temperature                                          |  |                       |    |             |
| Operating temperature                                |  | min                   | °C | -50         |
|                                                      |  | max                   | °C | 70          |
| Storage temperature                                  |  | min                   | °C | -60         |
|                                                      |  | max                   | °C | 80          |
| Max altitude                                         |  |                       | m  | 3000        |
| Resistance & Protection                              |  |                       |    |             |
| Pollution degree                                     |  |                       |    | 3           |
| Dimensions                                           |  |                       |    |             |



## Wiring diagrams



## Certifications and compliance

### Compliance

CSA C22.2 n° 60947-1  
CSA C22.2 n° 60947-4-1  
IEC/EN 60947-1  
IEC/EN 60947-4-1  
UL 60947-1  
UL 60947-4-1

### Certificates

CCC

cULus

EAC

ETIM classification

ETIM 8.0

EC000066 -  
Power contactor,  
AC switching