



Product designation

Power contactor

Product type designation

BFS12

**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 ( $\leq 40^\circ\text{C}$ )                                              | A 28   |
|                                                                                | AC-1 ( $\leq 40^\circ\text{C}$ ) with 16mm <sup>2</sup> wire and fork end lug | A 0    |
|                                                                                | AC-1 ( $\leq 55^\circ\text{C}$ )                                              | A 23   |
|                                                                                | AC-1 ( $\leq 55^\circ\text{C}$ ) with 16mm <sup>2</sup> wire and fork end lug | A 0    |
|                                                                                | AC-1 ( $\leq 70^\circ\text{C}$ )                                              | A 20   |
|                                                                                | AC-1 ( $\leq 70^\circ\text{C}$ ) with 16mm <sup>2</sup> wire and fork end lug | A 0    |
|                                                                                | AC-3 ( $\leq 440\text{V } \leq 55^\circ\text{C}$ )                            | A 12   |
|                                                                                | AC-4 (400V)                                                                   | A 7.9  |
| Rated operational power AC-3 ( $T \leq 55^\circ\text{C}$ )                     |                                                                               |        |
|                                                                                | 230V                                                                          | kW 3.2 |
|                                                                                | 400V                                                                          | kW 5.7 |
|                                                                                | 415V                                                                          | kW 6.2 |
|                                                                                | 440V                                                                          | kW 5.5 |
|                                                                                | 500V                                                                          | kW 5   |
|                                                                                | 690V                                                                          | kW 5   |
| Rated operational power AC-1 ( $T \leq 40^\circ\text{C}$ )                     |                                                                               |        |
|                                                                                | 230V                                                                          | kW 10  |
|                                                                                | 400V                                                                          | kW 18  |
|                                                                                | 500V                                                                          | kW 23  |
|                                                                                | 690V                                                                          | kW 32  |
| IEC max current $I_e$ in DC1 with $L/R \leq 1\text{ms}$ with 1 poles in series |                                                                               |        |
|                                                                                | $\leq 24\text{V}$                                                             | A 17   |
|                                                                                | 48V                                                                           | A 15   |
|                                                                                | 75V                                                                           | A 13   |
|                                                                                | 110V                                                                          | A 6    |
|                                                                                | 220V                                                                          | A –    |
| IEC max current $I_e$ in DC1 with $L/R \leq 1\text{ms}$ with 2 poles in series |                                                                               |        |
|                                                                                | $\leq 24\text{V}$                                                             | A 20   |
|                                                                                | 48V                                                                           | A 20   |
|                                                                                | 75V                                                                           | A 18   |
|                                                                                | 110V                                                                          | A 13   |
|                                                                                | 220V                                                                          | A 1    |
| IEC max current $I_e$ in DC1 with $L/R \leq 1\text{ms}$ with 3 poles in series |                                                                               |        |
|                                                                                | $\leq 24\text{V}$                                                             | 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)                                  |          | mΩ   | 2.5 |
| Power dissipation per pole (average value)                           |          |      |     |
|                                                                      | Ith      | W    | 2   |
|                                                                      | AC-3     | W    | 0.4 |
| Tightening torque for terminals                                      |          |      |     |
|                                                                      | min      | Nm   | 1.5 |
|                                                                      | max      | Nm   | 1.8 |
|                                                                      | min      | Ibin | 1.1 |
|                                                                      | max      | Ibin | 1.5 |
| Tightening torque for coil terminal                                  |          |      |     |

|                                                     |                   |                 |                          |
|-----------------------------------------------------|-------------------|-----------------|--------------------------|
|                                                     | min               | Nm              | 0.8                      |
|                                                     | max               | Nm              | 1                        |
|                                                     | min               | Ibin            | 0.8                      |
|                                                     | max               | Ibin            | 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 properly wired |
| Cable stripping lenght                              |                   |                 |                          |
|                                                     | main circuit      | mm              | 0                        |
|                                                     | command circuit   | mm              | 0                        |
|                                                     | auxiliary circuit | mm              | 0                        |
| <b>Mechanical features</b>                          |                   |                 |                          |
| Operating position                                  |                   |                 |                          |
|                                                     | normal allowable  |                 | Vertical plan ±30°       |
| Fixing                                              |                   |                 | Screw / DIN rail 35mm    |
| Weight                                              |                   | g               | 354                      |
| <b>Auxiliary contact characteristics</b>            |                   |                 |                          |
| Thermal current Ith                                 |                   | A               | 10                       |
| IEC/EN 60947-5-1 designation                        |                   |                 | A600 - Q600              |
| Operating current AC15                              |                   |                 |                          |
|                                                     | 230V              | A               | 3                        |
|                                                     | 400V              | A               | 1.9                      |
|                                                     | 500V              | A               | 1.4                      |
| Operating current DC12                              |                   |                 |                          |
|                                                     | 24V               | A               | 0                        |
|                                                     | 48V               | A               | 0                        |
|                                                     | 60V               | A               | 0                        |
|                                                     | 125V              | A               | 0                        |
|                                                     | 220V              | A               | 0                        |
|                                                     | 600V              | A               | 0                        |
| Operating current DC13                              |                   |                 |                          |
|                                                     | 110V              | A               | 1.25                     |
|                                                     | 125V              | A               | 0.55                     |
|                                                     | 600V              | A               | 0.1                      |
| <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>Electrical characteristics</b>             |                 |          |          |
| Operating current DC13                        |                 |          |          |
|                                               | 250V            | A        | 0.27     |
|                                               | 440V            | A        | 0.15     |
|                                               | 500V            | A        | 0.13     |
| <b>AC coil operating</b>                      |                 |          |          |
| Rated AC voltage at 50/60Hz                   |                 | V        | 230      |
| AC operating voltage                          |                 |          |          |
| of 50/60Hz coil powered at 50Hz               |                 |          |          |
| pick-up                                       | min             | %Us      | 80       |
|                                               | max             | %Us      | 110      |
| drop-out                                      | min             | %Us      | 20       |
|                                               | max             | %Us      | 55       |
| of 50/60Hz coil powered at 60Hz               |                 |          |          |
| pick-up                                       | min             | %Us      | 85       |
|                                               | max             | %Us      | 110      |
| drop-out                                      | min             | %Us      | 20       |
|                                               | max             | %Us      | 55       |
| AC average coil consumption at 20°C           |                 |          |          |
| of 50/60Hz coil powered at 50Hz               | in-rush         | VA       | 75       |
|                                               | holding         | VA       | 9        |
| of 50/60Hz coil powered at 60Hz               | in-rush         | VA       | 70       |
|                                               | holding         | VA       | 6.5      |
| of 60Hz coil powered at 60Hz                  | in-rush         | VA       | 75       |
|                                               | holding         | VA       | 9        |
| Dissipation at holding ≤20°C 50Hz             |                 | W        | 2.5      |
| <b>DC coil operating</b>                      |                 |          |          |
| DC operating voltage                          |                 |          |          |
| pick-up                                       | min             | %Us      | 0        |
|                                               | max             | %Us      | 0        |
| drop-out                                      | min             | %Us      | 0        |
|                                               | max             | %Us      | 0        |
| Average coil consumption ≤20°C                | in-rush         | W        | 0        |
|                                               | holding         | W        | 0        |
| <b>Max cycles frequency</b>                   |                 |          |          |
| Mechanical operation                          |                 | cycles/h | 3600     |
| <b>Operating times</b>                        |                 |          |          |
| Average time for Us control                   |                 |          |          |
| in AC                                         |                 |          |          |
| Closing NO                                    | min             | ms       | 8        |

|       |            |     |    |    |
|-------|------------|-----|----|----|
| in AC | Opening NO | max | ms | 24 |
|       |            | min | ms | 10 |
|       | Closing NC | max | ms | 20 |
|       |            | min | ms | 14 |
|       | Opening NC | max | ms | 28 |
|       |            | min | ms | 7  |
|       |            | max | ms | 18 |
|       |            |     |    |    |
|       | Closing NO | min | ms | 0  |
|       |            | max | ms | 0  |
| in DC | Opening NO | min | ms | 0  |
|       |            | max | ms | 0  |
|       | Closing NC | min | ms | 0  |
|       |            | max | ms | 0  |
|       | Opening NC | min | ms | 0  |
|       |            | max | ms | 0  |
|       |            | min | ms | 0  |
|       |            | max | ms | 0  |
|       | Closing NO | min | ms | 0  |
|       |            | max | ms | 0  |

#### UL technical data

Rated operational voltage AC (UL) V 600

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 - Q600

## Ambient conditions

### Temperature

#### Operating temperature

|     |    |     |
|-----|----|-----|
| min | °C | -50 |
| max | °C | 70  |

#### Storage temperature

|     |    |     |
|-----|----|-----|
| min | °C | -60 |
| max | °C | 80  |

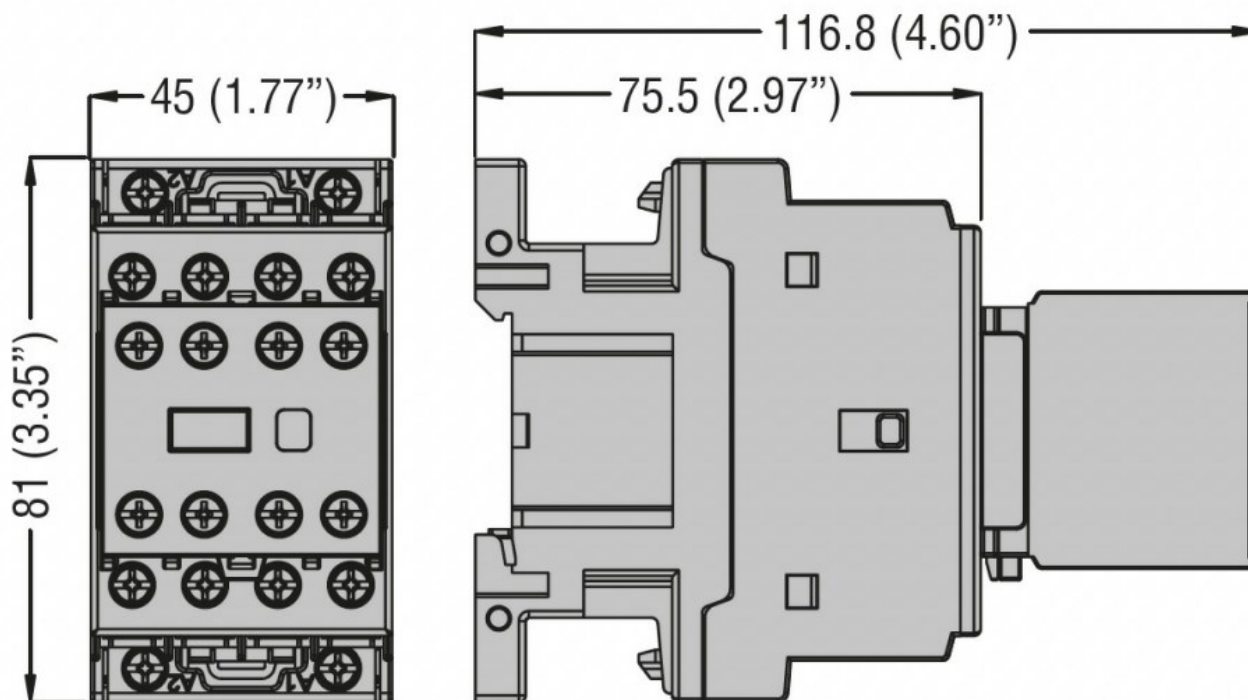
#### Max altitude

|   |      |
|---|------|
| m | 3000 |
|---|------|

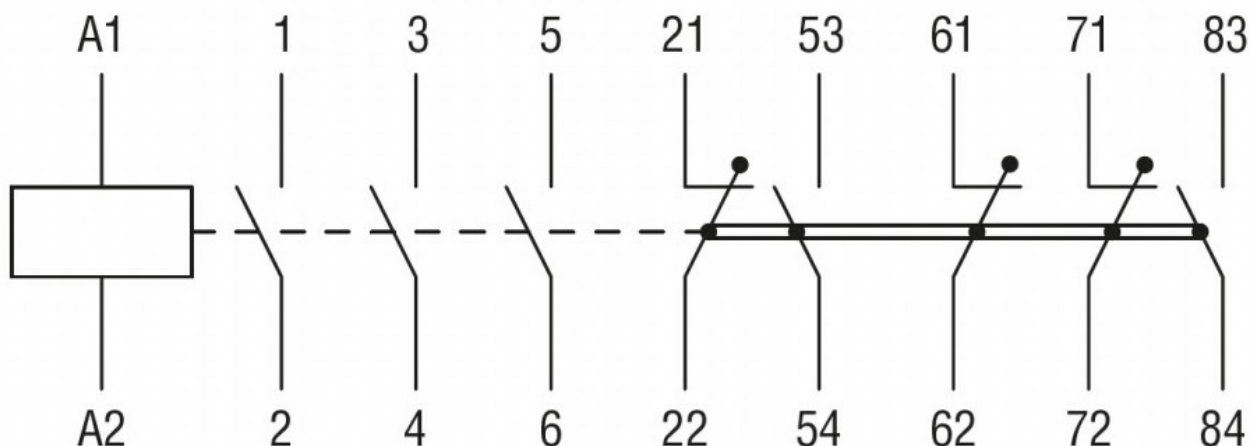
## Resistance & Protection

|                                   |   |
|-----------------------------------|---|
| Impact resistance                 | 0 |
| Vibration resistance              | 0 |
| Special thermic treatments        | 0 |
| Pollution degree                  | 3 |
| Resistance to flame (GWT)         | 0 |
| Flame retardant according to UL94 | 0 |

## Dimensions



## Wiring diagrams



## Certifications and compliance

### Compliance

CSA C22.2 n° 60947-1

CSA C22.2 n° 60947-4-1

IEC/EN/BS 60947-1

IEC/EN/BS 60947-4-1

IEC/EN/BS 60947-5-1

UL 60947-1

UL 60947-4-1

### Certificates

cULus

UL listed for USA and Canada

## ETIM classification

ETIM 8.0

EC000066 -  
Power contactor,  
AC switching