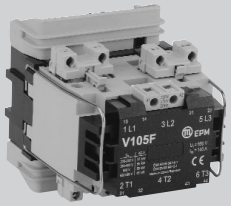
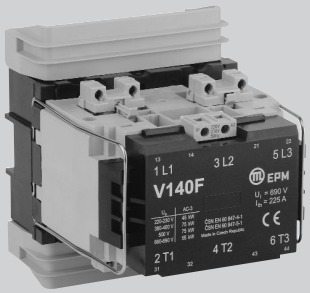
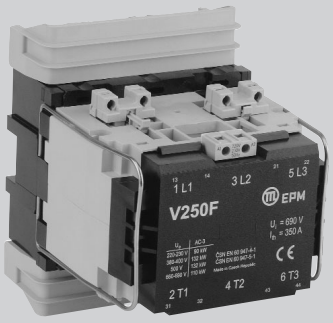
# 1.5 Contactors series “V..F”

## 1.5.1 Table-No. 15 – rating



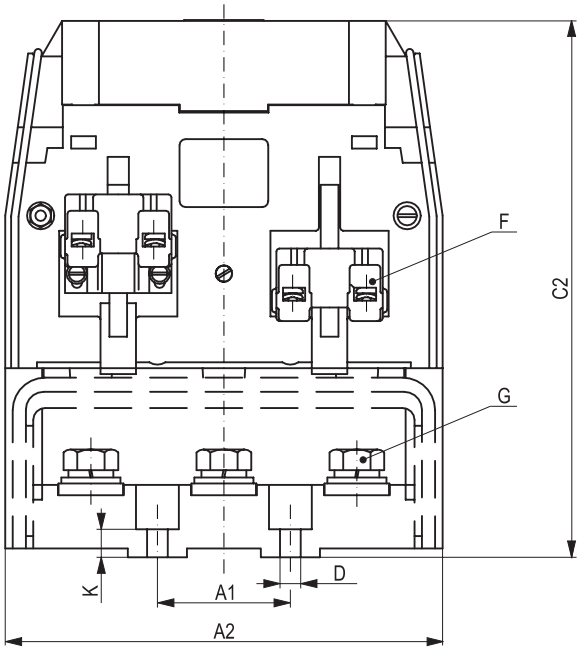



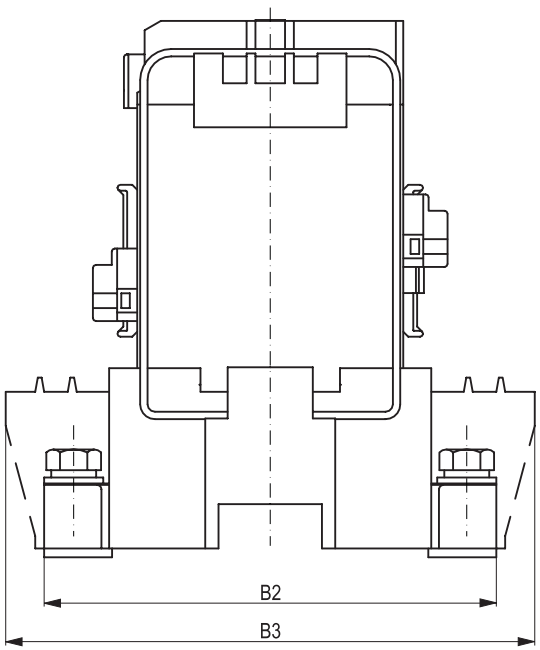



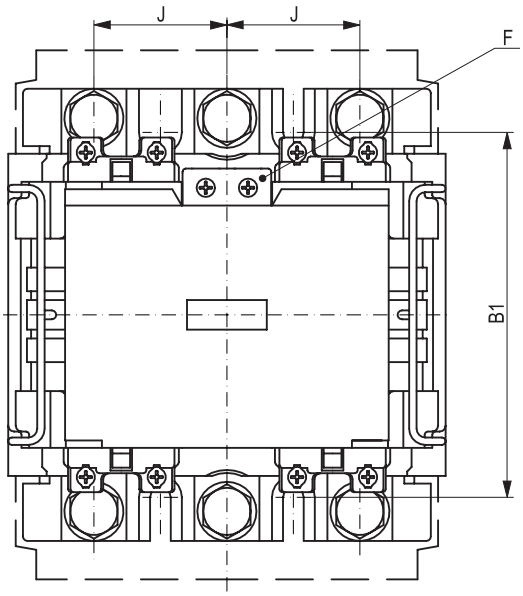

| Type |
|---|
| **Main poles** |
| Rated insulation voltage $U_i$ [V]<br>Impulse withstand voltage $U_{imp}$ [kV]<br>Conventional free air thermal current $I_{th}$ [A]<br>Rated operational current $I_{e\ (AC-1)}$ at 400 V [A]<br>Rated operational current $I_{e\ (AC-3)}$ at 400 V [A |
| **Max. output power of controlled motor in AC-3 (AC-4)**<br>**at 220-230 V [kW]**<br>**at 380-400 V [kW]**<br>**at 500 V [kW]**<br>**at 660-690 V [kW]**<br>**Max. number of on-load op. cycles per hour in AC-1**<br>**Max. number of on-load op. cycles per hour in AC-3, AC-4** |
| Electrical durability in AC-1 at 380-400 V [op. cycles] |
| Electrical durability in AC-3 at 380-400 V [op. cycles] |
| Recommended fuse char. aM [A]<br>Type of co-ordination with SCPD |
| Mechanical durability – AC controlled [op. cycles]<br>Mechanical durability – DC controlled [op. cycles] |
| **Auxiliary contacts**<br>Rated insulation voltage $U_i$ [V]<br>Impulse withstand voltage $U_{imp}$ [kV]<br>Conventional free air thermal current $I_{th}$ [A]<br>Rated operational current $I_{e\ (AC-15)}$ at 230 V [A]<br>Rated operational current $I_{e\ (AC-15)}$ at 400 V [A]<br>Electrical durability in AC-15 at 220-230 V, 4 A [op. cycles]<br>Electrical durability in AC-15 at 380-400 V, 2 A [op. cycles] |
| **Control circuit**<br>Range of AC coil control voltages at 50 Hz [V]<br>Range of AC coil control voltages at 60 Hz [V]<br>Pull-in input power of AC control coil, ±10 % [VA]<br>Hold-in input power of AC control coil, ±10 % [VA/W]<br><br>Range of DC “D“ coil control voltages [V]<br>Pull-in input power of DC „D“ coil [W]<br>Hold-in input power of DC „D“ coil [W]<br><br>Range of DC coil control voltages [V] (series rezistor)<br>Pull-in input power of DC control coil, ±10 % [W] (series rezistor)<br>Hold-in input power of DC control coil, ±15 % [W] (series rezistor) |
| Main dimensions W × H × D [mm]<br>Mass [kg]<br>Degree of protection acc. to VDE 0106, part 100 |

| V85F | V105F | V140F | V170F | V205F | V250F |
|---|---|---|---|---|---|
| 690<br>8<br>140<br>105<br>85 (30) | 690<br>8<br>140<br>140<br>105 (38) | 690<br>8<br>225<br>160<br>140 (44) | 690<br>8<br>225<br>200<br>170 (50) | 690<br>8<br>350<br>300<br>205 (60) | 690<br>8<br>350<br>350<br>250 (72) |
| **25**<br>**45 (15)**<br>**45 (15)**<br>**37**<br>**300**<br>**600** | **30**<br>**55 (18,5)**<br>**55 (18,5)**<br>**45**<br>**300**<br>**600** | **45**<br>**75 (22)**<br>**75 (25)**<br>**55**<br>**300**<br>**600** | **55**<br>**90 (25)**<br>**90 (30)**<br>**75**<br>**300**<br>**600** | **65**<br>**110 (30)**<br>**110 (37)**<br>**90**<br>**300**<br>**600** | **75**<br>**132 (37)**<br>**132 (45)**<br>**110**<br>**300**<br>**600** |
| $0,5x10^6$ | $0,5x10^6$ | $0,5x10^6$ | $0,5x10^6$ | $0,5x10^6$ | $0,5x10^6$ |
| $0,9x10^6$ | $0,7x10^6$ | $0,65x10^6$ | $0,5x10^6$ | $0,5x10^6$ | $0,5x10^6$ |
| 100<br>2 | 100<br>2 | 160<br>2 | 160<br>2 | 250<br>2 | 250<br>2 |
| $10x10^6$<br>$5x10^6$ | $10x10^6$<br>$5x10^6$ | $10x10^6$<br>$5x10^6$ | $10x10^6$<br>$5x10^6$ | $5x10^6$<br>$10^6$ | $5x10^6$<br>$10^6$ |
| 690<br>8<br>12<br>4<br>2<br>$0,8x10^6$<br>$10^6$ | 690<br>8<br>12<br>4<br>2<br>$0,8x10^6$<br>$10^6$ | 690<br>8<br>12<br>4<br>2<br>$0,8x10^6$<br>$10^6$ | 690<br>8<br>12<br>4<br>2<br>$0,8x10^6$<br>$10^6$ | 690<br>8<br>12<br>4<br>2<br>$0,8x10^6$<br>$10^6$ | 690<br>8<br>12<br>4<br>2<br>$0,8x10^6$<br>$10^6$ |
| 24..690<br>24..660<br>208<br>37/6,9<br><br><br><br>24..250<br>72<br>12 | 24..690<br>24..660<br>208<br>37/6,9<br><br><br><br>24..250<br>72<br>12 | 42..690<br>42..660<br>365<br>61/14,5<br>24..220<br>56..70<br>3,7..5,1<br>24..250<br>110<br>12 | 42..690<br>42..660<br>365<br>61/14,5<br>24..220<br>56..70<br>3,7..5,1<br>24..250<br>110<br>12 | 110..690<br>110..660<br>700<br>75/23<br>24..220<br>130..150<br>4,2..7,2<br>24..250<br>117<br>9 | 110..690<br>110..660<br>700<br>75/23<br>24..220<br>130..150<br>4,2..7,2<br>24..250<br>117<br>9 |
| 108x124x140<br>1,4<br>IP20/IP10 | 108x124x140<br>1,4<br>IP20/IP10 | 148x179x178,5<br>3,7<br>IP20/IP10 | 148x179x178,5<br>3,7<br>IP20/IP10 | 154x204x191,5<br>5,7<br>IP20/IP10 | 154x204x191,5<br>5,7<br>IP20/IP10 |

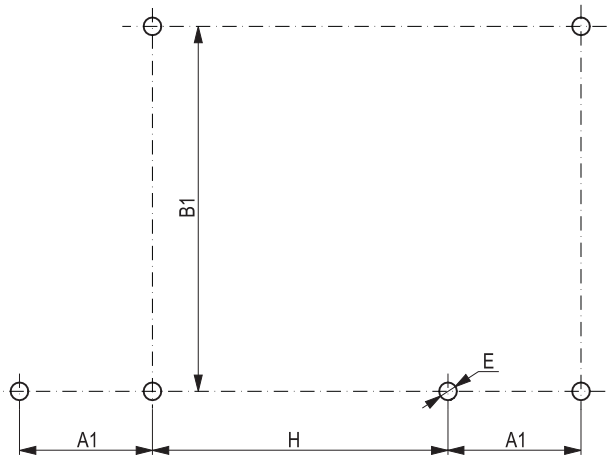
## 1.5.2 Outline drawing of contactors series „V..F“




Spacing of fixing holes (two pieces of contactors of the same type)



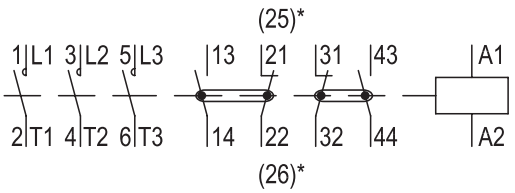

| Dimension | V85F/V105F | V140F/V170F | V205F/V250F |
|---|---|---|---|
| A1 | 32,5 | 45 | 50 |
| B1 | 87,5 | 125 | 150 |
| A2 | 108 | 148 | 154 |
| B2 | 100 | 153 | 176 |
| B3 | 124 | 179 | 204 |
| C2 | 140 | 178,5 | 191,5 |
| D | 6 | 7 | 7 |
| E | 3 x M5 | 3 x M6 | 3 x M6 |
| F | 10 x M3,5 | 10 x M3,5 | 10 x M3,5 |
| G | 6 x M6 | 6 x M10 | 6 x M10 |
| H | ≥ 77,5 | ≥ 105 | ≥ 106 |
| J | 32 | 45 | 50 |
| K | 4 | 9,5 | 9,5 |

## 1.5.3 Marking of terminals, configuration of contacts and conductor cross-sections

Marking of terminals – main circuit

auxiliary contacts

coil




**25 *26 is marking of the time-delayed auxiliary NC-contact, which is inherent in DC controlled contactors series V..F*

Circuit diagram of DC „D" controlled contactors series V..F

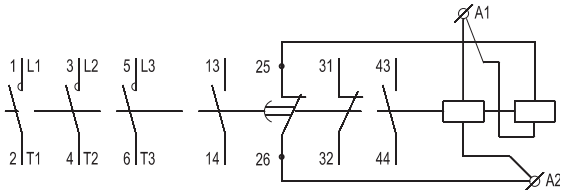



**Table-No. 16**

| Contactor type | Main poles | | | | Auxiliary contacts and coil | | | |
|---|---|---|---|---|---|---|---|---|
| | Terminal width [mm] | Terminal type | Screw size | Conductor cross-section [mm²] | Terminal type | Screw size | Conductor cross-section [mm²] | |
| | | | | | | | Rigid | Flexible |
| V85F, V105F | 15 | Lug terminal | hexagonal head M6 | 16..50 | screw-type | M3,5 | 1..2,5 | 0,75..1,5 |
| V140F, V170F | 21,5 | Lug terminal | hexagonal head M10 | 35..150 | screw-type | M3,5 | 1..2,5 | 0,75..1,5 |
| V205F, V250F | 25 | Lug terminal | hexagonal head M10 | 70..150 | screw-type | M3,5 | 1..2,5 | 0,75..1,5 |

*Screw type terminals of coils and auxiliary contacts facilitate the connection of either a single conductor, or two of the same conductors resp. by cross-sections differing by one degree.*
*All screws M3.5 have the combined slot [PH2 + simple].*
*Flexible conductors must not be compacted by brazing!*

## 1.5.4 Spare parts

**Table-No. 17 – Spare coils to the contactors series „V..F"**
Coils are common for the following specified pairs of contactor types:

| Coil | | V85F, V105F | V140F, V170F | V205F, V250F |
|---|---|---|---|---|
| Control voltage [V] | Frequency [Hz] | | | |
| 24 | 50 | I | | |
| 48 | 50 | I | I | |
| 110 | 50 | I | I | I |
| 127 | 50 | I | I | I |
| 220-230 | 50 | I | I | I |
| 380-400 | 50 | I | I | I |
| 110 | 60 | I | I | I |
| 220 | 60 | I | I | I |
| 24 | DC | I | I | I |
| 48 | DC | I | I | I |
| 220 | DC | I | I | I |

*Coils for other various control voltages within the ranges specified in the rating table can be supplied on a special request and for a supplementary charge.*

**Sets of spare contacts for main circuits**

The set consists of 6 main fix contact pieces, 3 main contact bridge pieces, 3 main contact spring pieces, and 3 insulating insert pieces.

**Attention!**

Working surfaces of the contacts are exposed to very high temperatures, which locally exceed the melting point of the contact material. Because of this, “run in” contacts are not to be held for worn off. It is not allowed to shape the working surface in any way, e. g. to file, scrape, etc.

If the contacts have been eroded and need to be changed, it is necessary to test the insulation of the contactor. In this case, a dielectric test is to be applied to the contactor according the Art.-No 8.3.3.4.2.a)1) of EN 60947-4-1.

## 1.5.5 Maintenance

**Instructions for replacing the contactor coil on the “V..F“ series**

0. It is not necessary to remove the contactor from the mounting panel.
1. Disconnect wires from the coil terminals.
2. Loosen two shaped springs by means of a screwdriver and remove the upper part of contactor – the side label shall be broken.
3. By means of a screwdriver, push and loosen four black cover resilient pins through the holes in the contactor body. Remove the cover.
4. Pull out the magnet core with rubber absorbers; do not forget its original positioning.
5. Replace the coil and push the magnet core into the contactor body, being sure to position it correctly. Otherwise, the contactor may seal imperfectly and whirr.
6. Put the cover back in its place and affix the contactor body with two shaped springs. Press the rods of the auxiliary contacts and check to make sure the contact carrier moves properly.
7. Reconnect coil wires

## 1.5.6 Overload and short circuit protection

Overload protection sets consist of the thermal overload relay T17 I/1 A (or T17 II/1 A) and 3 pcs of protective series “M“ transformers, and are designed to provide overload protection when used with series “V..F“ contactors. Fuses, circuit breakers, or another SCPD (short-circuit protective device) must be used.

## 1.5.7 Contactors type SF V250F

**Utilization**

These contactors are designed for conducting middle-frequency currents up to 10 000 Hz. They are allowed to neither make nor break such currents.

**Description**

Contactors carry four auxiliary contacts acc. to EN 60947-5-1, 2NO/2NC or optionally 1NO/3NC. The main circuit poles consist of non-magnetic materials. The ratings for the auxiliary and control circuits are the same as the ratings for V250F.

**Marking**

Contactors are marked by “SF“ on the upper cover, near the type marking “V250F“.

### 1.5.8 Example of order

| Type | Coil control voltage | No. of pcs |
|---|---|---|
| V85F | 220-230 V/50 Hz | 15 pcs |
| V205F | 110 V DC | 10 pcs |
| SF V250F | 220-230 V/50 Hz 1NO/3NC | 3 pcs |