

Attracting Tomorrow

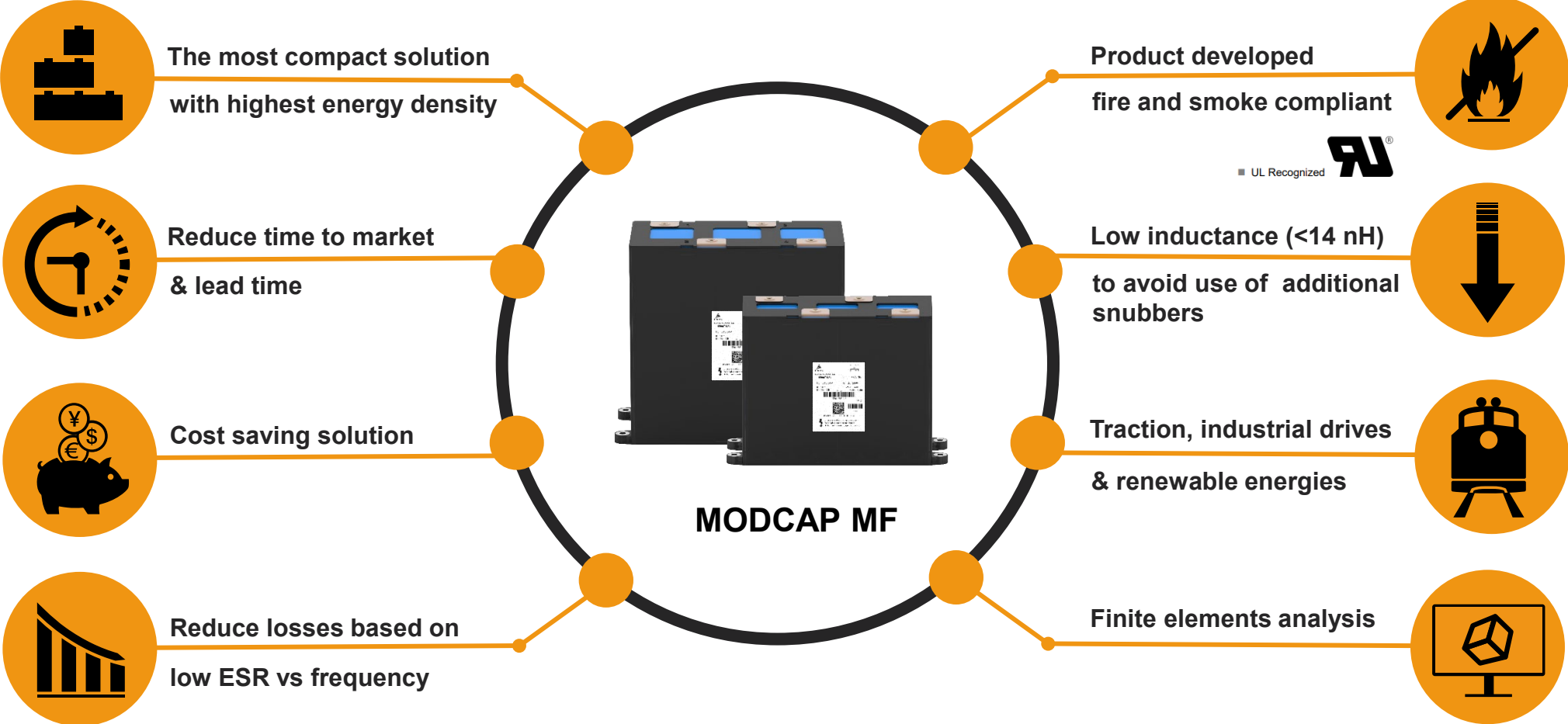


Product presentation – ModCap MF

DCR Modular | New Modular Standard Series

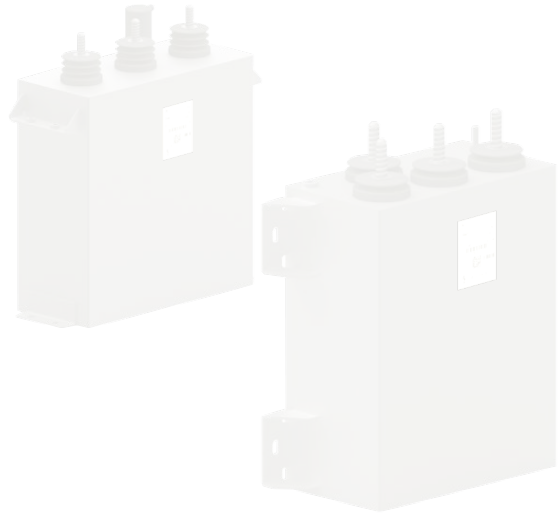
TDK Electronics AG
FILM ES PEC HP
Málaga, Spain
Sept 1st, 2022

Introducing the New Modular Standard series Highlights



ModCap series | B25645

~ AC FILTER



MKK-HP

= DC-LINK / DC FILTER



ModCap / MKK-DCR / MKK-DCi-R / MKK-DCi-H

ModCap series | B25645

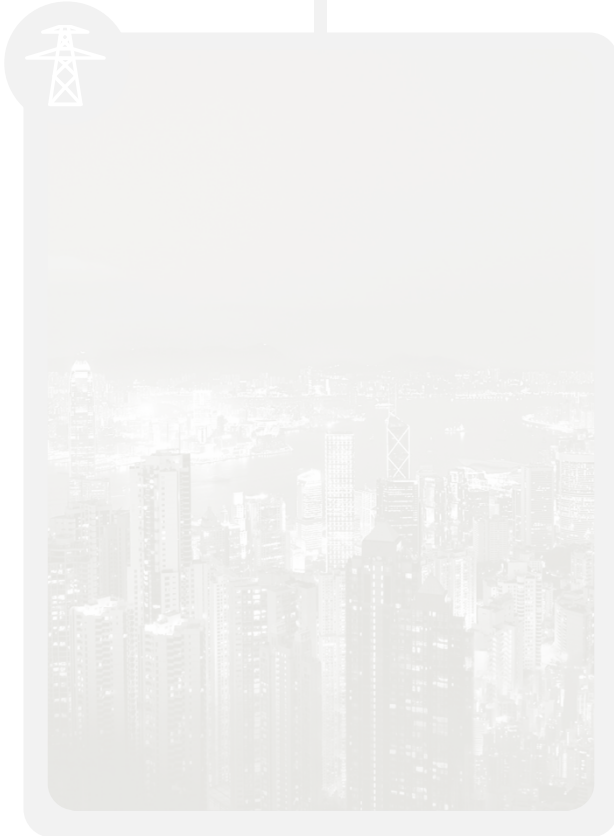
DC-Link applications

Energy transmission

Renewable energies

Traction

Industry



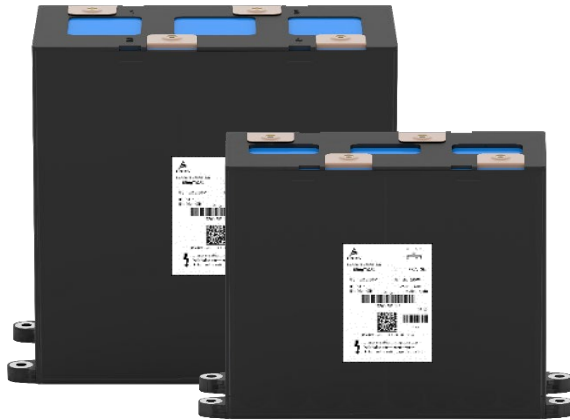
General overview

B25645 series

=

ModCap (dry-modular)

NEW



Recommended applications

Features

- Capacitance range from 335 μF up to 3900 μF and voltage from 900 V up to 2,300 V
- Low ESL <14 nH
- Temperature range up to 90 °C hotspot
- IEC 61071, IEC 61881-1, EN 45545-2 HL3 R23 (fire and smoke)
- Filled with polyurethane resin (dry technology)
- Plastic case (opened)
- Flat windings

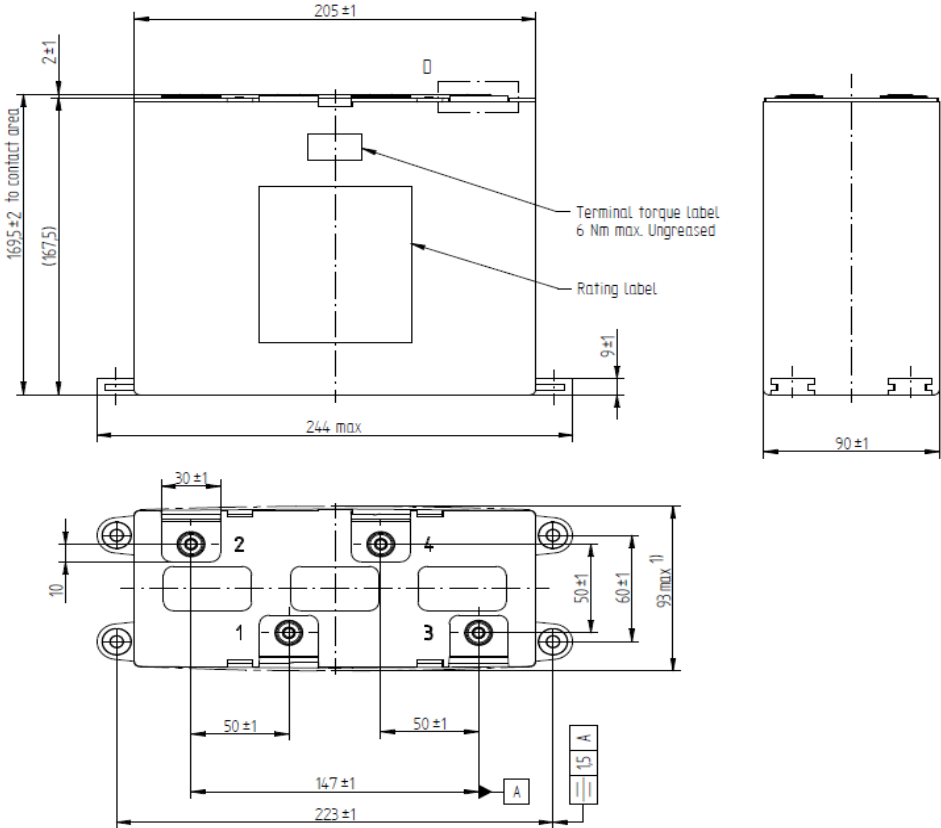
Benefits

- High energy density, ultra compact solution
- Modular concept for parallelization
- Snubber avoidance / low voltage overshoot
- Lifetime up to 200,000 hours
- Finite elements analysis available for the whole series
- Cost oriented solution
- Reduced time to market & lead time

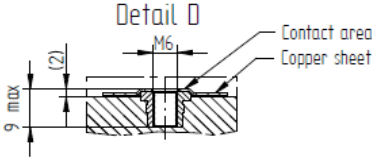
Construction A

Simplified drawing & 3-D

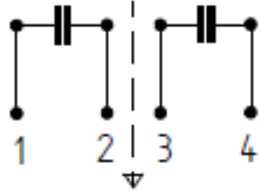
Main dimensions: 243 x 169.5 x 90 mm



Terminal



Electric diagram



No active insulation between 1-3 and 2-4

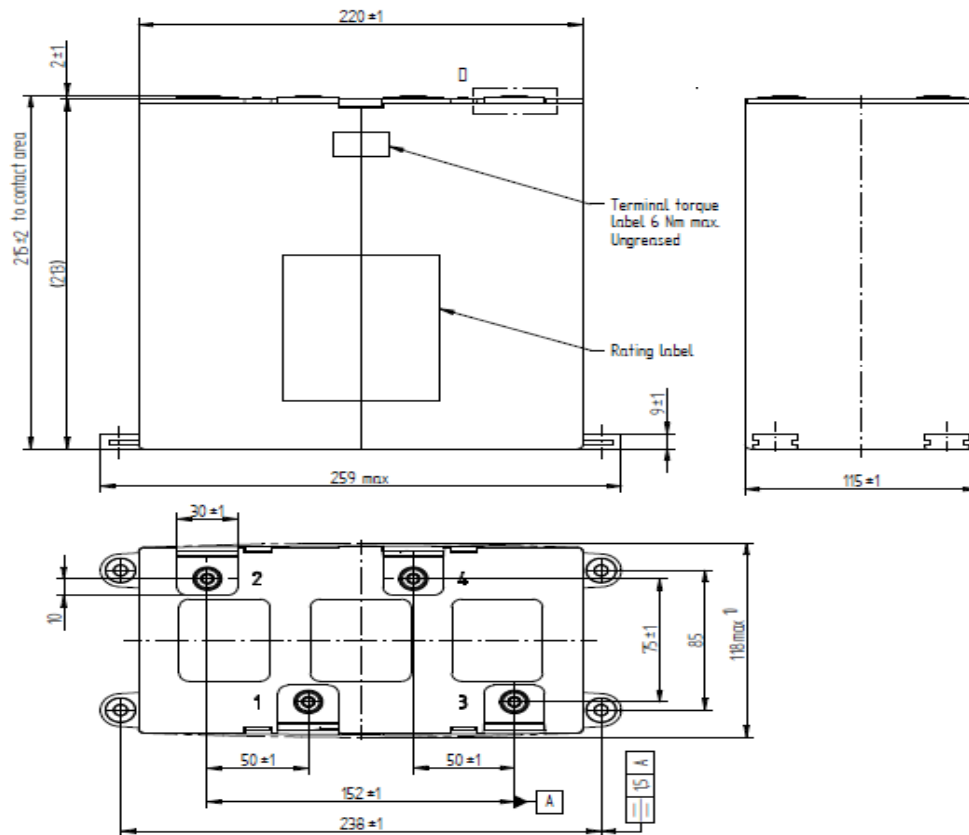
3D



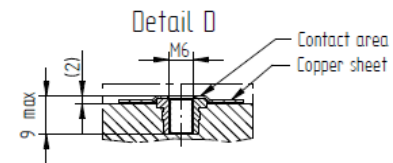
Construction B

Simplified drawing & 3-D

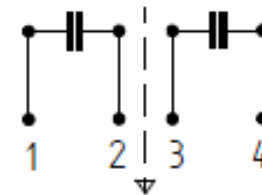
Main dimensions: 258 x 215 x 115 mm



Terminal



Electric diagram



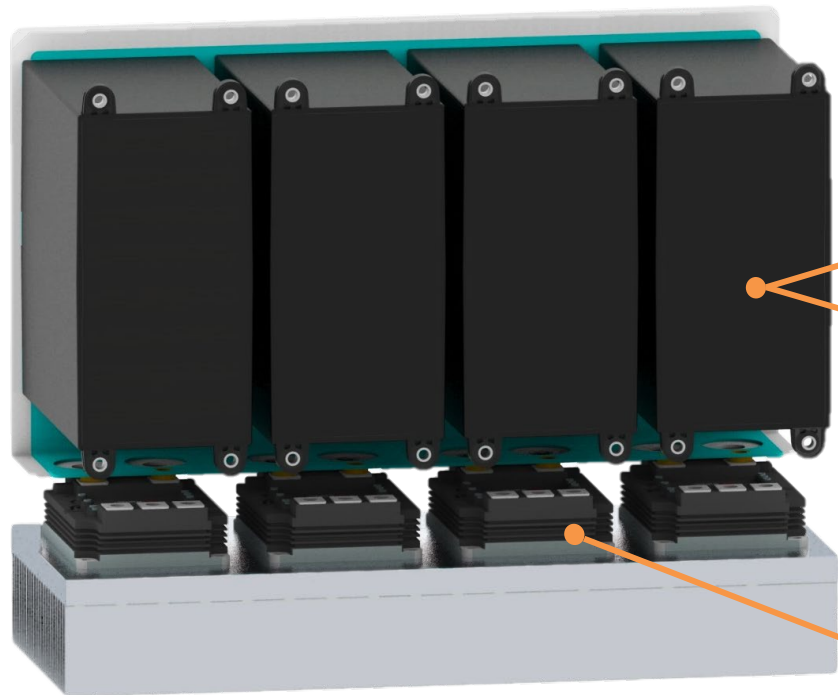
No active insulation between 1-3 and 2-4

3D

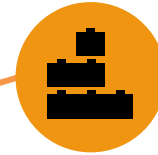


Highlights: Compactness, low ESL & higher operation temperature

Compact power unit



- Capacitors can be mounted very close to the power modules to reduce loop inductance.

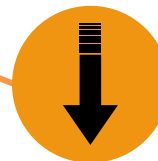


→ Ultra compact solution



→ **Less investment on cooling**

- Very short connection between capacitor and semi-conductor



→ Low inductance

→ **Possible snubber capacitors avoidance**

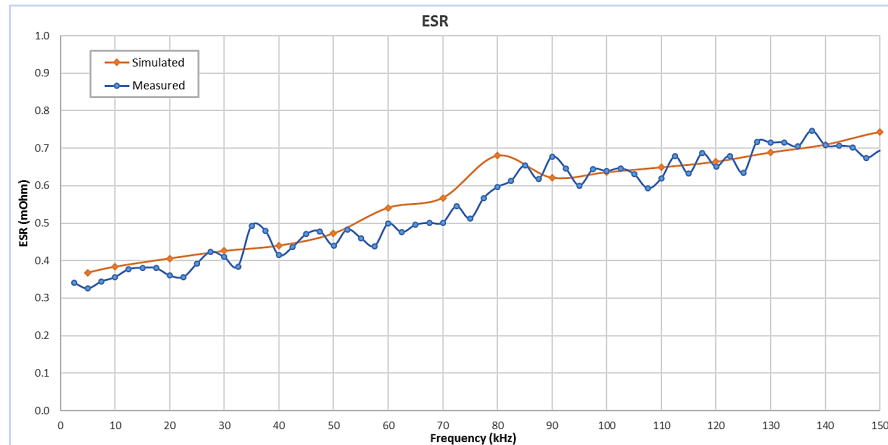
Electromagnetic behavior of Modular Standard Series

Electromagnetic: modelling

Customer Input
Current-frequency spectrum

TDK Input
Capacitor design

Simulation
Capacitor electrical model: including ESL and ESR Vs Freq
Total losses and its internal distribution (must for accurate thermal simulation)

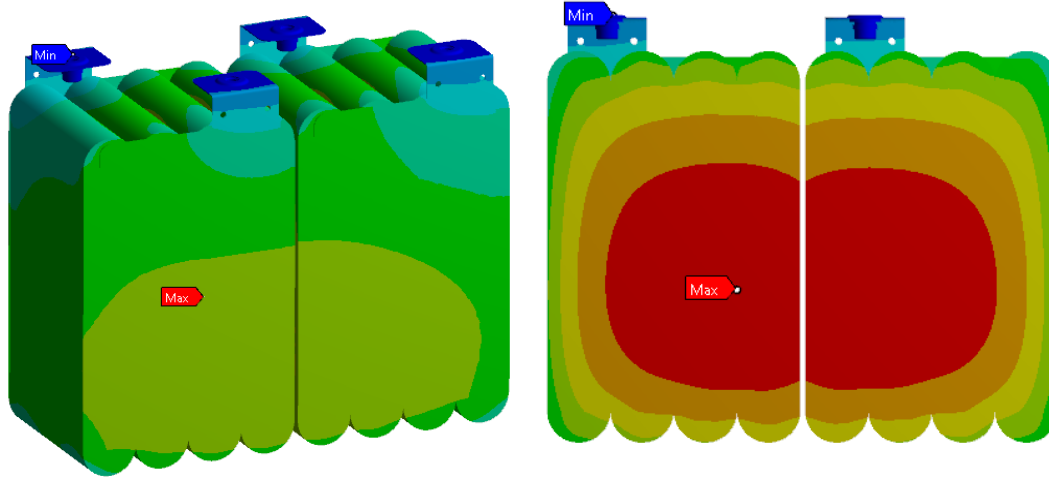
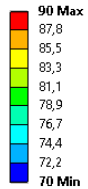


Customer benefits

- Electromagnetic model available for specific simulation according to current-frequency spectrum defined by the customer.
- Capacitor electrical model available in time and frequency domain
- Losses at defined current-frequency spectrum and its internal distribution
- Graphs with simulated ESR fully available for further thermal calculations by calculating losses all along the complete range of frequency

Thermal: hot spot & temperature mapping

B: 2kHz Spectrum
Naked
Type: Temperature
Unit: °C
Time: 1

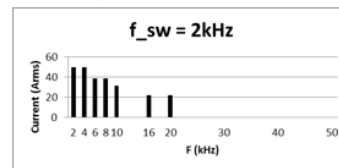


- Capacitance: 1 mF
- Current: 155 A
- Power losses: 11 W
- DeltaT = 15 K

Boundary conditions considered:

- Ambient temp: 70 °C
- Busbar temp: 80 °C
- Natural convection

Current spectrum considered



Customer benefits

- Thermal model available for specific simulation according to spectrum and boundary conditions defined by the customer.
- Thermal simulations to be integrated as part of the type test report.
- Thermal Simulations may reduce the complexity and time of technical approvals, no further specific thermal stability test on lab.
- Detailed Temperature mapping allows customer to estimate in advance hot spot areas
- Thermal Simulation to be done as per specific customer requirements (customized current spectrum and thermal boundary conditions)
- Heating Transference from bus bar may be analyzed in advance

ModCap Ordering Code System

| Nominal voltage (V) | Capacitance ±10% (µF) | Nominal current (A) | Surge current (kA) | Repetitive peak current (kA) | Dimensions (LxWxH, mm) | Construction | Part Number |
|---------------------|-----------------------|---------------------|--------------------|------------------------------|------------------------|--------------|------------------------|
| 900 | 2075 | 200 | 225 | 5 | 205x90x170 | A | B25645A9218K003 |
| | 3900 | 155 | 250 | 5 | 220x115x215 | B | B25645A9398K003 |
| 1000 | 1705 | 190 | 220 | 5 | 205x90x170 | A | B25645A1178K003 |
| | 3210 | 150 | 245 | 5 | 220x115x215 | B | B25645A1328K003 |
| 1100 | 1330 | 180 | 215 | 5 | 243x169.5x90 | A | B25645A1138K003 |
| | 2525 | 140 | 240 | 5 | 258x215x115 | B | B25645A1258K003 |
| 1250 | 1045 | 170 | 210 | 5 | 243x169.5x90 | A | B25645A1118K003 |
| | 1985 | 135 | 235 | 5 | 258x215x115 | B | B25645A1198K003 |
| 1350 | 980 | 160 | 205 | 5 | 243x169.5x90 | A | B25645A1108K013 |
| | 1865 | 130 | 230 | 5 | 258x215x115 | B | B25645A1188K003 |
| 1600 | 710 | 150 | 200 | 5 | 243x169.5x90 | A | B25645A1757K003 |
| | 1375 | 120 | 225 | 5 | 258x215x115 | B | B25645A1138K013 |
| 1800 | 525 | 140 | 195 | 5 | 243x169.5x90 | A | B25645A1567K003 |
| | 1025 | 115 | 220 | 5 | 258x215x115 | B | B25645A1108K003 |
| 2000 | 415 | 130 | 185 | 5 | 243x169.5x90 | A | B25645A2447K003 |
| | 820 | 110 | 210 | 5 | 258x215x115 | B | B25645A2827K003 |
| 2300 | 335 | 120 | 175 | 5 | 243x169.5x90 | A | B25645A2367K003 |
| | 670 | 105 | 200 | 5 | 258x215x115 | B | B25645A2677K003 |

Get more info [here](#)



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