# Specifications

## Eaton 139559

Eaton Moeller® series DILM Contactor, 380 V 400 V 160 kW, 2 N/O, 2 NC, 220 - 240 V 50/60 Hz, AC operation, Screw connection

| General specifications | |
|---|---|
| **PRODUCT NAME** | Eaton Moeller® series DILM Contactor |
| **CATALOG NUMBER** | 139559 |
| **MODEL CODE** | DILM300A-S/22(220-240V50/60HZ) |
| **EAN** | 4015081363377 |
| **PRODUCT LENGTH/DEPTH** | 208 mm |
| **PRODUCT HEIGHT** | 189 mm |
| **PRODUCT WIDTH** | 140 mm |
| **PRODUCT WEIGHT** | 7.1 kg |
| **CERTIFICATIONS** | UL Category Control No.: NLDX<br>CSA Class No.: 3211-04<br>IEC/EN 60947-4-1<br>VDE 0660<br>UL File No.: E29096<br>UL 60947-4-1<br>UL/CSA<br>CSA File No. 1017510<br>North America (UL listed, CSA certified)<br>EN 45545: Fire protection on railway vehicles<br>IEC 61373: Vibration and shock, tested for category 1 class B<br>CE marking |
| **CATALOG NOTES** | • Contacts according to EN 50012<br>• EN 45545 - Fire protection on railway vehicles: Fire protection class of all plastics according to UL94: V-0 / plastic weight in total: 1.872 kg<br>• Conventional |

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| | thermal current Ith of main contacts (1-pole, open) at 60° |

## AC-1/Conventional thermal current Ith

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| **CONVENTIONAL THERMAL CURRENT ITH (1-POLE, ENCLOSED)** | 788 A |
| **CONVENTIONAL THERMAL CURRENT ITH (3-POLE, ENCLOSED)** | 315 A |
| **CONVENTIONAL THERMAL CURRENT ITH AT 40°C (3-POLE, OPEN)** | 490 A |
| **CONVENTIONAL THERMAL CURRENT ITH AT 50°C (3-POLE, OPEN)** | 438 A |
| **CONVENTIONAL THERMAL CURRENT ITH AT 55°C (3-POLE, OPEN)** | 418 A |
| **CONVENTIONAL THERMAL CURRENT ITH AT 60°C (3-POLE, OPEN)** | 400 A |
| **CONVENTIONAL THERMAL CURRENT ITH OF MAIN CONTACTS (1-POLE, OPEN)** | 1000 A |

## Climatic environmental conditions

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| **ALTITUDE** | Max. 2000 m |
| **AMBIENT OPERATING TEMPERATURE - MAX** | 60 °C |
| **AMBIENT STORAGE TEMPERATURE - MAX** | 80 °C |
| **AMBIENT OPERATING TEMPERATURE - MIN** | -40 °C |
| **AMBIENT OPERATING TEMPERATURE (ENCLOSED) - MAX** | 40 °C |
| **AMBIENT OPERATING TEMPERATURE (ENCLOSED) - MIN** | -40 °C |
| **AMBIENT STORAGE TEMPERATURE - MIN** | -40 °C |
| **CLIMATIC PROOFING** | Damp heat, cyclic, to IEC 60068-2-30<br>Damp heat, constant, to IEC 60068-2-78 |

## Contacts

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| **NUMBER OF AUXILIARY CONTACTS (NORMALLY CLOSED CONTACTS)** | 2 |
| **NUMBER OF AUXILIARY CONTACTS (NORMALLY OPEN CONTACTS)** | 2 |
| **NUMBER OF CONTACTS (NORMALLY CLOSED CONTACTS)** | 2 |
| **NUMBER OF CONTACTS (NORMALLY OPEN CONTACTS)** | 2 |

## Design verification

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|---|---|
| **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. |
| **10.13 MECHANICAL FUNCTION** | The device meets the requirements, provided the information in the instruction leaflet (IL) is observed. |
| **10.2.2 CORROSION** | Meets the product |

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| **RESISTANCE** | standard's requirements. |
| **10.2.3.1 VERIFICATION OF THERMAL STABILITY OF ENCLOSURES** | Meets the product standard's requirements. |
| **10.2.3.2 VERIFICATION OF RESISTANCE OF INSULATING MATERIALS TO NORMAL HEAT** | Meets the product standard's requirements. |
| **10.2.3.3 RESIST. OF INSUL. MAT. TO ABNORMAL HEAT/FIRE BY INTERNAL ELECT. EFFECTS** | Meets the product standard's requirements. |
| **10.2.4 RESISTANCE TO ULTRA-VIOLET (UV) RADIATION** | Meets the product standard's requirements. |
| **10.2.5 LIFTING** | Does not apply, since the entire switchgear needs to be evaluated. |
| **10.2.6 MECHANICAL IMPACT** | Does not apply, since the entire switchgear needs to be evaluated. |
| **10.2.7 INSCRIPTIONS** | Meets the product standard's requirements. |
| **10.3 DEGREE OF PROTECTION OF ASSEMBLIES** | 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. |
| **10.9.2 POWER-FREQUENCY ELECTRIC STRENGTH** | Is the panel builder's responsibility. |
| **10.9.3 IMPULSE WITHSTAND VOLTAGE** | Is the panel builder's responsibility. |
| **10.9.4 TESTING OF ENCLOSURES MADE OF INSULATING MATERIAL** | Is the panel builder's responsibility. |
| **EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT PVID** | 0 W |
| **HEAT DISSIPATION** | 0 W |

| CAPACITY PDISS | |
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| **HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID** | 7 W |
| **RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)** | 300 A |
| **STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS** | 4.8 W |

## Electrical rating

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| **INRUSH CURRENT** | Max. 30 x Ie (peak) |
| **RATED BREAKING CAPACITY AT 1000 V** | 950 A |
| **RATED BREAKING CAPACITY AT 220/230 V** | 3000 A |
| **RATED BREAKING CAPACITY AT 380/400 V** | 3000 A |
| **RATED BREAKING CAPACITY AT 500 V** | 3000 A |
| **RATED BREAKING CAPACITY AT 660/690 V** | 3000 A |
| **RATED INSULATION VOLTAGE (UI)** | 1000 V |
| **RATED MAKING CAPACITY (COS PHI TO IEC/EN 60947)** | 3000 A |
| **RATED OPERATIONAL CURRENT (IE)** | 307 A at up to 525 V (Individual compensation, three-phase capacitors, open)<br>177 A at 690 V (Individual compensation, three-phase capacitors, open) |
| **RATED OPERATIONAL CURRENT (IE) AT AC-1, 380 V, 400 V, 415 V** | 490 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-3, 1000 V** | 95 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-3, 220 V, 230 V, 240 V** | 300 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-3, 380 V, 400 V, 415 V** | 300 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-3, 440 V** | 300 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-3, 500 V** | 300 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-3, 660 V, 690 V** | 185 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-4, 1000 V** | 76 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-4, 220 V, 230 V, 240 V** | 240 A |

## General information

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| **ACCESSORIES** | Fitting options auxiliary contacts: on the side: 2 x DILM820-XHI11(V)-SI; 2 x DILM820-XHI11-SA |
| **APPLICATION** | Contactors for Motors |
| **CONNECTION** | Screw terminals |
| **DEGREE OF PROTECTION** | IP00 |
| **ELECTROMAGNETIC COMPATIBILITY** | Designed for operation in industrial environments. Its use in residential environments may cause radio-frequency interference, requiring additional noise suppression. |
| **FITTED WITH:** | Suppressor circuit in actuating electronics |
| **LIFESPAN, ELECTRICAL** | 100,000 Operations (at Condensor operation) |
| **LIFESPAN, MECHANICAL** | 10,000,000 Operations (AC operated) |
| **OPERATING FREQUENCY** | 3000 mechanical Operations/h (AC operated)<br>200 Operations/h |
| **OVERVOLTAGE CATEGORY** | III |
| **POLLUTION DEGREE** | 3 |
| **PRODUCT CATEGORY** | Contactors |
| **PROTECTION** | Finger and back-of-hand proof with terminal shroud or terminal block, Protection against direct contact when actuated from front (EN 50274) |
| **RATED IMPULSE WITHSTAND VOLTAGE (UIMP)** | 8000 V AC |
| **RESISTANCE** | 500 mΩ (Admissible transitional contact resistance - of the external control circuit device when actuating A11) |
| **SHOCK RESISTANCE** | 8 g, N/C auxiliary contact, Mechanical, according to IEC/EN 60068-2-27, Half-sinusoidal shock 10 ms<br>10 g, N/O main contact, Mechanical, according to IEC/EN 60068-2-27, Half- |

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| **RATED OPERATIONAL CURRENT (IE) AT AC-4, 440 V** | 240 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-4, 500 V** | 240 A |
| **RATED OPERATIONAL CURRENT (IE) AT AC-4, 660 V, 690 V** | 150 A |
| **RATED OPERATIONAL POWER AT AC-3, 1000 V, 50 HZ** | 132 kW |
| **RATED OPERATIONAL POWER AT AC-3, 240 V, 50 HZ** | 100 kW |
| **RATED OPERATIONAL POWER AT AC-3, 380/400 V, 50 HZ** | 160 kW |
| **RATED OPERATIONAL POWER AT AC-3, 415 V, 50 HZ** | 175 kW |
| **RATED OPERATIONAL POWER AT AC-3, 440 V, 50 HZ** | 185 kW |
| **RATED OPERATIONAL POWER AT AC-3, 500 V, 50 HZ** | 210 kW |
| **RATED OPERATIONAL POWER AT AC-3, 690 V, 50 HZ** | 170 kW |
| **RATED OPERATIONAL POWER AT AC-4, 1000 V, 50 HZ** | 108 kW |
| **RATED OPERATIONAL POWER AT AC-4, 220/230 V, 50 HZ** | 75 kW |
| **RATED OPERATIONAL POWER AT AC-4, 240 V, 50 HZ** | 82 kW |
| **RATED OPERATIONAL POWER AT AC-4, 415 V, 50 HZ** | 142 kW |
| **RATED OPERATIONAL POWER AT AC-4, 440 V, 50 HZ** | 150 kW |
| **RATED OPERATIONAL POWER AT AC-4, 500 V, 50 HZ** | 170 kW |
| **RATED OPERATIONAL POWER AT AC-4, 660/690 V, 50 HZ** | 137 kW |
| **RATED OPERATIONAL VOLTAGE (UE) AT AC -** | 1000 V |
| | sinusoidal shock 10 ms<br>10 g, N/O auxiliary contact, Mechanical, according to IEC/EN 60068-2-27, Half-sinusoidal shock 10 ms |
| **USED WITH** | DILM185A-225A |
| **UTILIZATION CATEGORY** | AC-3: Normal AC induction motors: starting, switch off during running<br>AC-4: Normal AC induction motors: starting, plugging, reversing, inching<br>AC-1: Non-inductive or slightly inductive loads, resistance furnaces |
| **VOLTAGE TYPE** | AC |

| MAX | |
|---|---|
| **SAFE ISOLATION** | 1000 V AC, Between coil and contacts, According to EN 61140 |
| **SPECIAL PURPOSE RATING OF DEFINITE PURPOSE RATING** | 1800 A, LRA 600 V 60 Hz 3-ph, 100,000 cycles acc. to UL 1995, (UL/CSA)<br>300 A, FLA 600 V 60 Hz 3-ph, 100,000 cycles acc. to UL 1995, (UL/CSA)<br>2160 A, LRA 480 V 60 Hz 3-ph, 100,000 cycles acc. to UL 1995, (UL/CSA)<br>360 A, FLA 480 V 60 Hz 3-ph, 100,000 cycles acc. to UL 1995, (UL/CSA) |

## Magnet system

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| **BEHAVIOR IN MARGINAL AND TRANSITIONAL CONDITIONS** | Sealing - Voltage interruptions 0 - 0.2 x Uc min) > 10 ms: Drop-out of the contactor<br>Sealing - Excess voltage (1.15 - 1.3 x Uc max): Contactor remains switched on<br>Sealing - Voltage interruptions (0 - 0.2 x Uc min ≤ 10 ms: Time is bridged successfully<br>Sealing - Voltage drops (0.2 - 0.6 x Uc min) > 12 ms: Drop-out of the contactor<br>Sealing - Pick-up phase (0 - 0.7 x Uc min: Contactor does not switch on<br>Sealing - Pick-up phase (0.7 x Uc min - 1.15 x Uc max): Contactor switches on with certainty<br>Sealing - Voltage drops (0.2 - 0.6 x Uc min ≤12 ms: Time is bridged successfully<br>Sealing - Voltage drops (0.6 - 0.7 x Uc min: Contactor remains switched on |
| **DROP-OUT VOLTAGE** | AC operated: 0.2 x US max - 0.4 x US min, AC operated<br>AC operated: 0.25 x US max - 0.6 x US min, AC operated |
| **DUTY FACTOR** | 100 % |
| **PICK-UP VOLTAGE** | 0.85 - 1.1 V AC x Us |
| **POWER CONSUMPTION** | Control transformer with uk ≤ 10% |
| **POWER CONSUMPTION, PICK-UP, 50 HZ** | 360 VA, Pull-in power, Coil in a cold state and 1.0 x Us<br><br>325 W, Pull-in power, Coil in a cold state and 1.0 x Us |
| **POWER CONSUMPTION, PICK-UP, 60 HZ** | 360 VA, Pull-in power, Coil in a cold state and 1.0 x Us<br><br>325 W, Pull-in power, Coil in a cold state and 1.0 x Us |
| **POWER CONSUMPTION, SEALING, 50 HZ** | 4.8 W, Coil in a cold state and 1.0 x Us<br>7.3 VA, Coil in a cold state and 1.0 x Us |

## Motor rating

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| **ASSIGNED MOTOR POWER AT 200/208 V, 60 HZ, 3-PHASE** | 100 HP |
| **ASSIGNED MOTOR POWER AT 230/240 V, 60 HZ, 3-PHASE** | 125 HP |
| **ASSIGNED MOTOR POWER AT 460/480 V, 60 HZ, 3-PHASE** | 250 HP |
| **ASSIGNED MOTOR POWER AT 575/600 V, 60 HZ, 3-PHASE** | 300 HP |

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| **POWER CONSUMPTION, SEALING, 60 HZ** | 4.8 W, Coil in a cold state and 1.0 x Us<br>7.3 VA, Coil in a cold state and 1.0 x Us |
| **RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 50 HZ - MAX** | 240 V |
| **RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 50 HZ - MIN** | 220 V |
| **RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 60 HZ - MAX** | 240 V |
| **RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 60 HZ - MIN** | 220 V |
| **SWITCHING TIME (AC OPERATED, MAKE CONTACTS, CLOSING DELAY) - MAX** | 55 ms |
| **SWITCHING TIME (AC OPERATED, MAKE CONTACTS, OPENING DELAY) - MAX** | 40 ms |

## Short-circuit rating

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| **SHORT-CIRCUIT CURRENT RATING (BASIC RATING)** | 600 A, max. CB, SCCR (UL/CSA)<br>700 A, max. Fuse, SCCR (UL/CSA)<br>18 kA, SCCR (UL/CSA) |
| **SHORT-CIRCUIT CURRENT RATING (HIGH FAULT AT 480 V)** | 700 A, Class L, max. Fuse, SCCR (UL/CSA)<br>18 kA, Fuse, SCCR (UL/CSA)<br><br>250 A, max. CB, SCCR (UL/CSA)<br>65 kA, CB, SCCR (UL/CSA)<br>700 A, Class L/450 A, Class J, max. Fuse, SCCR (UL/CSA)<br>18/100 kA, Fuse, SCCR (UL/CSA) |
| **SHORT-CIRCUIT CURRENT RATING (HIGH FAULT AT 600 V)** | 18 kA, Fuse, SCCR (UL/CSA)<br><br>18 kA, CB, SCCR (UL/CSA)<br>600 A, max. CB, SCCR (UL/CSA)<br>700 A, Class J, max. Fuse, SCCR (UL/CSA)<br>700 A, Class L/450 A, Class J, max. Fuse, SCCR (UL/CSA)<br>18/100 kA, Fuse, SCCR (UL/CSA) |
| **SHORT-CIRCUIT PROTECTION RATING (TYPE 1 COORDINATION) AT 1000 V** | 200 A gG/gL |
| **SHORT-CIRCUIT PROTECTION RATING (TYPE 1 COORDINATION) AT 400 V** | 400 A gG/gL |
| **SHORT-CIRCUIT PROTECTION RATING (TYPE 1 COORDINATION) AT 690 V** | 400 A gG/gL |
| **SHORT-CIRCUIT PROTECTION RATING (TYPE 2 COORDINATION) AT 1000 V** | 160 A gG/gL |
| **SHORT-CIRCUIT PROTECTION RATING (TYPE 2 COORDINATION) AT 400 V** | 400 A gG/gL |
| **SHORT-CIRCUIT PROTECTION RATING (TYPE 2 COORDINATION) AT 690 V** | 315 A gG/gL |

## Switching capacity

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|---|---|
| **SWITCHING CAPACITY (AUXILIARY CONTACTS, GENERAL USE)** | 1 A, 250 V DC, (UL/CSA)<br>15 A, 600 V AC, (UL/CSA) |
| **SWITCHING CAPACITY (AUXILIARY CONTACTS, PILOT DUTY)** | A600, AC operated (UL/CSA)<br>P300, DC operated (UL/CSA) |
| **SWITCHING CAPACITY (MAIN CONTACTS, GENERAL USE)** | 350 A, Maximum motor rating (UL/CSA) |

## Terminal capacities

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| **SCREW SIZE** | M3.5, Terminal screw, Control circuit cables<br>M10, Terminal screw, Main connections |
| **SCREWDRIVER SIZE** | 2, Terminal screw, Control circuit cables, Pozidriv screwdriver |
| **TERMINAL CAPACITY (BUSBAR)** | 25 mm width, Main connection |
| **TERMINAL CAPACITY (COPPER BAND)** | Fixing with flat cable terminal or cable terminal blocks; See terminal capacity for cable terminal blocks |
| **TERMINAL CAPACITY (FLEXIBLE WITH CABLE LUG)** | 50 - 240 mm² |
| **TERMINAL CAPACITY (FLEXIBLE WITH FERRULE)** | 2 x (0.75 - 2.5) mm², Control circuit cables<br>1 x (0.75 - 2.5) mm², Control circuit cables |
| **TERMINAL CAPACITY (SOLID)** | 2 x (0.75 - 2.5) mm², Control circuit cables<br>1 x (0.75 - 2.5) mm², Control circuit cables |
| **TERMINAL CAPACITY (SOLID/STRANDED AWG)** | 18 - 14, Control circuit cables<br>2/0 - 500 MCM, Main cables |
| **TERMINAL CAPACITY (STRANDED WITH CABLE LUG)** | 70 - 240 mm² |
| **TIGHTENING TORQUE** | 24 Nm, Main cable connection screw/bolt<br>1.2 Nm, Screw terminals, Control circuit cables |
| **WIDTH ACROSS FLATS** | 16 mm |

## Resources

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|---|---|
| BROCHURES | eaton-product-brochure-dilmdilh-power-contactors-brochure-br034010en-en-us.pdf |
| CHARACTERISTIC CURVE | eaton-contactors-component-dilm-characteristic-curve-003.eps<br><br>eaton-contactors-component-dilm-characteristic-curve-002.eps<br><br>eaton-contactors-component-dilm-characteristic-curve.eps<br><br>eaton-contactors-short-time-loading-dilm-characteristic-curve-002.eps |
| DECLARATIONS OF CONFORMITY | eaton-contactor-declaration-of-conformity-eu250619en.pdf<br><br>eaton-contactor-declaration-of-conformity-uk251102en.pdf |
| DRAWINGS | eaton-contactors-dilm-dimensions-007.eps<br><br>eaton-contactors-mounting-dilm-dimensions.eps<br><br>eaton-contactors-mounting-dilm-dimensions-002.eps<br><br>eaton-contactors-dilm-3d-drawing-004.eps<br><br>eaton-contactors-mounting-dilm-3d-drawing-002.eps |
| ECAD MODEL | DA-CE-ETN.DILM300A-S_22(220-240V50_60HZ) |
| INSTALLATION INSTRUCTIONS | eaton-contactor-dilm250s-to-dilm500s-il03406005z.pdf |
| MCAD MODEL | eaton-iec-contactors-mcad-3d-models-dilm250-300-s22.stp<br><br>eaton-iec-contactors-mcad-drawings-dilm250-300-s22.dwg |

| | |
|---|---|
| SYSTEM OVERVIEW | eaton-contactors-system55-dilm-explosion-drawing.eps |
| WIRING DIAGRAMS | eaton-contactors-contact-dilm-wiring-diagram-004.eps |

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|---|---|
| **PROJECT NAME:** | |
| **PROJECT NUMBER:** | |
| **PREPARED BY:** | |
| **DATE:** | |

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