

DFS Series RCCB Earth Leakage Circuit Breakers

RCCB Series compact Earth Leakage Circuit Breakers detect and interrupt earth (ground) faults. They are VDE approved for the European system of protecting people, animals, equipment and property from dangerous line-to-ground and shock hazard currents.

US applications include ground-fault protection of equipment (GFPE) using the 10mA and 30mA fault current ratings, especially when high distributed capacitance or other leakages cause excessive nuisance trips at lower fault currents. Applications for the 300mA and 500mA ratings are equipment protection and fire prevention, limiting the energy of a fault to less than the minimum ignition energy for many materials.

Type Designation

RP (a) (b) (c)

(a): 11 = 16A, 12 = 25A, 13 = 40A, 14 = 63A, 15 = 80A, 16 = 100A, 17 = 125A

(b): 2 = 10mA, 4 = 30mA, 6 = 300mA, 7 = 500mA

(c): 601 = 2 pole, 911 = 4 pole



DFS2



DFS4



| Maximum Rated Line Current | Fault Trip Current | Cat. No. | Supersedes | Fault Trip Current | Cat. No. | Supersedes |
|----------------------------|--------------------|-----------------|------------|--------------------|-----------------|------------|
| 16A | 10mA | 09112601 | RP2101 | | | |
| 25A | 30mA | 09124601 | RP2203 | 30mA | 09124911 | RP4203 |
| 25A | 300mA | 09126601 | RP2230 | 300mA | 09126911 | RP4230 |
| 25A | | | | 500mA | 09127911 | RP4250 |
| 40A | 30mA | 09134601 | RP2303 | 30mA | 09134911 | RP4303 |
| 40A | 300mA | 09136601 | RP2330 | 300mA | 09136911 | RP4330 |
| 40A | | | | 500mA | 09137911 | RP4350 |
| 63A | 30mA | 09144601 | RP2403 | 30mA | 09144911 | RP4403 |
| 63A | 300mA | 09146601 | RP2430 | 300mA | 09146911 | RP4430 |
| 63A | 500mA | | | 500mA | 09147911 | RP4450 |
| 80A | | | | 30mA | 09154911 | RP4503 |
| 80A | | | | 300mA | 09156911 | RP4530 |
| 80A | | | | 500mA | 09157911 | RP4550 |
| 100A | | | | 30mA | 09164911 | RP4603 |
| 100A | | | | 300mA | 09166911 | RP4630 |
| 100A | | | | 500mA | 09167911 | RP4650 |
| 125A | | | | 30mA | 09174911 | RP4703 |
| 125A | | | | 300mA | 09176911 | RP4730 |
| 125A | | | | 500mA | 09177911 | RP4750 |

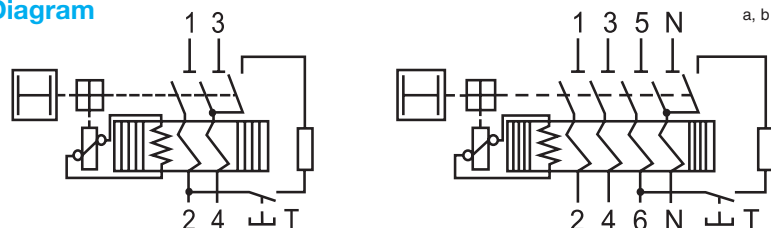
Stock items are shown in BOLD.

| | | |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Voltage Rating (maximum) | 230V AC, 50Hz | 400Y/230V AC, 50Hz |
| Min Operating Voltage Bank of Test Circuit | 150V | 200V |
| Short Circuit Withstand Rating | No back-up fuse: Rated current (RC) 16/25/40A: 500A; RC 63/80A: 800A; RC 100A: 1000A; RC 125A-1250A. With back-up fuse: 10kA; Size of fuse: (2 pole version): RC 25/40/63: 100A; (4 pole version): RC 25/40/63A: 100A; RC 80/100/125A: 125A | |
| Fault Trip Current Calibration | FI trips are calibrated at less than fault trip current for ensured safety (Typical trip range between 66.6-83.3% fault trip current, e.g., typical trip at 20-25mA for fault RC of 30mA) | |
| Typical Life | Fully functional after 5,000 operations to DIN/VDE 0664T10, IEC 61008-1 and 2000 additional fault current trips. | |
| Standard Pack and Weight | 1/230g (0.6 lb.) | 1/420-460g (0.9 lb.-1.0 lb.) |
| Terminal Size Acceptability | 1.5-50mm ² (16-1 AWG) | 1.5-50mm ² (16-1 AWG) |
| Terminal Torque | 3Nm (26.5 lb.in.) | 3Nm (26.5 lb.in.) |

a For 2-Phase applications, terminal 5 and 6 (next to Neutral terminals) must be connected to one phase for the test circuit to be operable.

b For voltage systems without a neutral conductor. Please use jumper from "1" or "3" to top "N" terminal. This will assure proper functioning of the "test" circuit.

Circuit Diagram



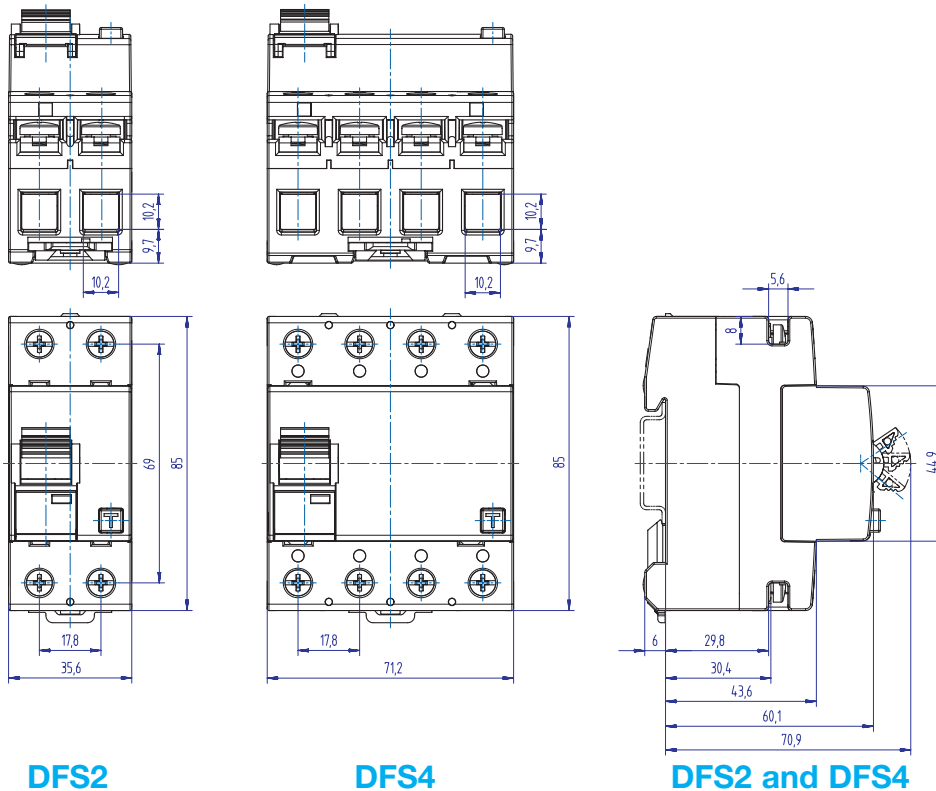
DHI11 - Auxiliary Switches / Error Signal Switch

| Contact Rating | Wire Size | Torque | Cat. No. | Supersedes | Circuit Diagram |
|-------------------------------------------------------------------------|----------------------------------|-------------------------|--------------|------------|-----------------|
| 6A / 230V AC 1A / 110V DC | 1-1.5mm ² (16 AWG) | max. 0.8Nm (7lb.in.) | DHI11 | RH11 | |
| Std. Pk.: 1 Unit Weight: 45 grams (0.12 lb.) Width: 9mm (.354in.) | | | | | |

Note: If the power system has a marked conductor, it must connect through the FI and not be grounded at any point downstream.



Dimensions in mm



DFS2

DFS4

DFS2 and DFS4

Temperature Range Environmental Information marked with “Snowflake” approval for -25°C to 40°C (-13°F to 104°F) ambient temperature. (Temperature effect on RC: for every 10°C temperature rise above 40°C decrease RC by 7%.)

Fluctuating Climate Conditions According to IEC 60068-2-30: heat (25°C–55°C), relative humidity (93%–95%)

Electrical Shock Protection Uninsulated electrically live parts within 30mm of the operating handle are “finger safe” (terminal screw heads) and uninsulated live parts within 100mm of the operating handle are “back-of-hand safe” (terminals).

Impact/Shock Protection 20g with impact force half-cycle sinusoidal and 20ms duration, 18 impacts total with 6 on each principal axis (3 impacts each face). FI is DIN Rail mounted during the test, and electrically loaded with 25% of Fault RC. Successful testing required no trip during the test, no damage and no loosened parts.

Vibration/Seismic Resistance 5g, at frequency of ≤80Hz, applied for 30 minutes along each of the three principal axes, plus 5 minutes of application at every established critical resonant frequency. FI is DIN Rail mounted during the test, and loaded with 25% Fault RC. To pass, the FI did not trip at 25% Fault RC, but did trip between each of the principal axis tests when the fault current was raised to 125% Fault RC, and there was no damage and no loosened parts. Suitable for machinery and mobile vehicle applications.

Protection Class IP20; higher protection Class is dependent on housing.

Non-Sinusoidal Fault The FI is tested and approval stamped for tripping sensitivity to non-sinusoidal fault currents, which become zero or almost zero within one cycle of the line frequency. Waveforms and allowed trip-current ranges are as follows:

1. AC Sinusoidal Fault - 0.5-1.0 times Fault RC
- 2a. Pulsating DC Fault;
Positive and Negative Half-Waves - 0.35-1.4 times Fault RC
- 2b. Phased Half-Wave, 90° - 0.25-1.4 times Fault RC
Phased Half-Wave, 135° - 0.11-1.4 times Fault RC
3. Pulsating DC on 6mA
DC (continuous) Base - Max. 1.4 times Fault RC + 6mA

Insulation Category At VDE rated voltage, suitable for Class C environments with relatively high dust and moisture levels and little HVAC control, e.g., industrial, commercial, agricultural; on machine tools, hoists, warehouse equipment, etc.; in boiler rooms, unheated storage, covered shipping/receiving, open workshops, etc.

UL 489

UL 508

UL 1077

UL 1077
Equipment Breakers

Earth Leakage
Circuit Breakers

ANNEX