

## 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

Maximum Rated Line Current	Fault Trip Current	Cat. No.	Supersedes
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16A	10mA	<b>09112601</b>	RP2101
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25A	30mA	<b>09124601</b>	RP2203
25A	300mA	<b>09126601</b>	RP2230
25A			

40A	30mA	<b>09134601</b>	RP2303
40A	300mA	<b>09136601</b>	RP2330
40A			

63A	30mA	09144601	RP2403
63A	300mA	09146601	RP2430
63A	500mA		

80A			
80A			
80A			

100A			
100A			
100A			

125A			
125A			
125A			



DFS4



Fault Trip Current	Cat. No.	Supersedes
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30mA	<b>09124911</b>	RP4203
300mA	<b>09126911</b>	RP4230
500mA	09127911	RP4250

30mA	<b>09134911</b>	RP4303
300mA	<b>09136911</b>	RP4330
500mA	09137911	RP4350

30mA	<b>09144911</b>	RP4403
300mA	<b>09146911</b>	RP4430
500mA	09147911	RP4450

30mA	09154911	RP4503
300mA	09156911	RP4530
500mA	09157911	RP4550

30mA	09164911	RP4603
300mA	09166911	RP4630
500mA	09167911	RP4650

30mA	09174911	RP4703
300mA	09176911	RP4730
500mA	09177911	RP4750

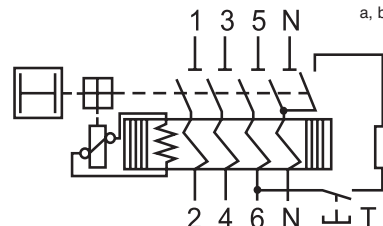
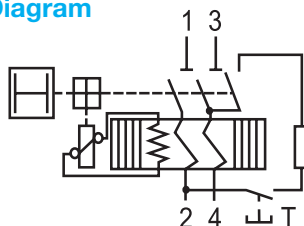
Stock items are shown in BOLD.

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 <sup>2</sup> (16-1 AWG)	1.5-50mm <sup>2</sup> (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



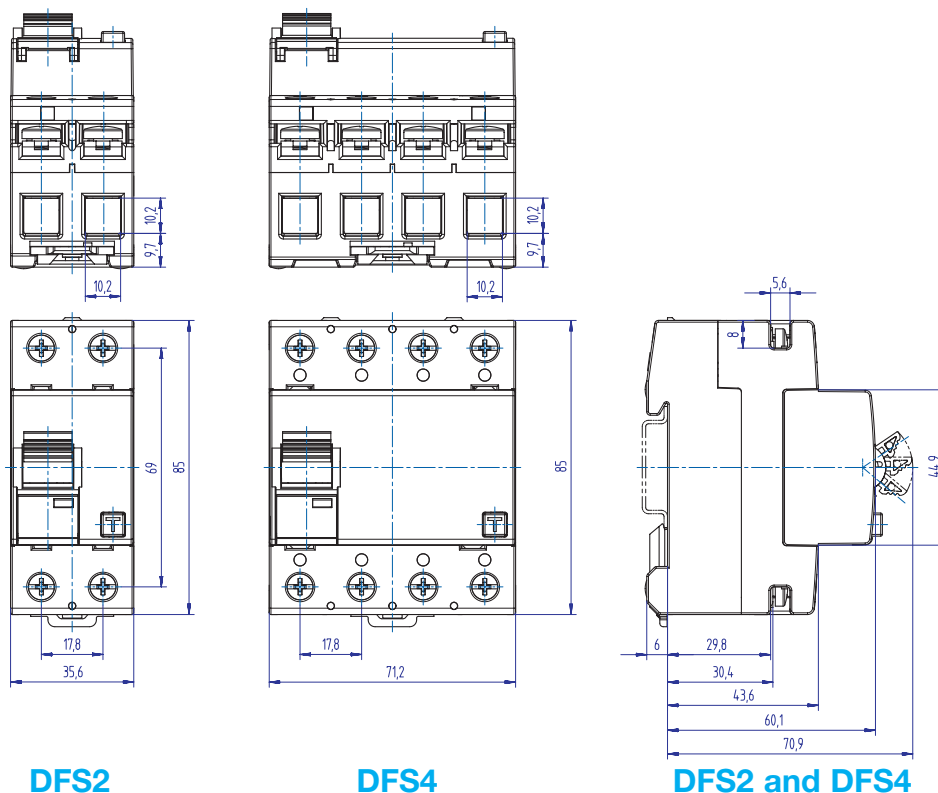
### DHI11 - Auxiliary Switches / Error Signal Switch

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

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

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