

Protective Measures with Prewarning Function



Xtra Combinations

Xtra Combinations from Moeller offers a range of products and services, enabling the best possible combination options for switching, protection and control in power distribution and automation.

Selection Guide **PFR Residual Current Relay with Ring-Type Transducer**

MOELLER 

Think future. Switch to green.

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Flexible fault current protection up to 1800 A current rating



Protection against the dangers of electrical energy with insulation faults

The new Moeller relay/transducer combination covers operating currents in a range from 1 to 1800 A. The wide spectrum of applications ranges from general power distribution tasks to individual motor controls. The fault currents which are detected and processed by the relay range from 30 mA to 5 A. The adjustable relay provides a pre-warning function which alerts before the set fault current is exceeded. The pre-warning allows preventative action to be taken to prevent shutdown of the electrical energy. The application range of the relay/transducer combinations extend – depending on the regulations which apply – from personnel protection to fire protection, and even extends

up to protection of systems for 1 to 4 pole power grids. The current relay signals that the set fault current has been exceeded with a changeover contact. Depending on the application, the contact signal can be subsequently processed in the controls, as well as by the shunt or under-voltage releases of a circuit-breaker which initiate the trip. The relay and transducer can be combined with every circuit-breaker. The compact ring-type transducer with no particular space requirement is placed at a suitable position on the cable run. The relay simply requires a free electrical cable connection.

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Compact, safe, adaptable ...

... just as it should be, the fault current protection which is particularly suited for cramped spaces such as for example in service distribution systems.

Ring-type transducers which are arranged in a space saving manner on the cabling run and the measuring relay which is simply snapped onto the DIN mounting rail, combine to form a functional unit.

After a critical fault current has been exceeded, the output signal can be optionally channelled to an acoustic/optical signalling device, upstream control or directly to the shunt or undervoltage release of a motor-protective circuit-breaker/circuit-breaker for instantaneous shutdown.

Three different relay variants are available for different protective tasks: 30 mA as well as 300 mA sensitivity with a fixed setting and 30 mA to 5 A adjustable in fixed steps, which can be combined with a time delay of 20 ms to 5 s.

The non-delayed standard devices are particularly suited for protection of systems. The time-delayed variants are intended for discriminative series connection of multiple switch/relay combinations. This ensures, that only the switch in the direct vicinity of the fault will trip.



Two colour LED's signal operating and fault states

Possible wiring faults between relay and transducers are indicated by illumination of both LED's. Diagnostics function with adjustable PFR-5 relay: If the set fault current is exceeded by more than 25, 50 or 75%, the red LED will flash at different frequencies. This alert feature ensures that trouble-shooting for the cause of the fault can commence before a critical state is reached.

Two pushbuttons enable test and reset of the relay

Test: The function of the relay electronics is tested and the trip signal can be used to control the shunt or undervoltage release of the connected circuit-breaker. This test checks the operation of the entire function chain comprised of measured value input, processing, signal routing as well as switch release.


Reset: The release signal is reset regardless of if it is received from a fault current or by operation of the test button.



7 ring-type transducers with differing diameters enable direct combination with switchgear devices of different frame sizes and current ratings. Suitable for cable cross-sections from 0.5 to 240 mm².

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Residual current relay with ring-type transducer

		Type	
		Article-No:	
 <p>Residual current relay Pulse current sensitive</p> <p>Rated control voltage: $U_S = 230V$ A.C. (50/60 Hz) Integrated auxiliary switch (1 changeover contact)</p>	Rated fault current $I_{\Delta n} = 0.03$ A	PFR-003 285555	
	Rated fault current $I_{\Delta n} = 0.3$ A	PFR-03 285556	
	Rated fault current $I_{\Delta n} = 0.03...5$ A Adjustable fault current and delay time	PFR-5 285557	PFR-5: Adjustable fault current: 0.03 - 0.1 - 0.3 - 0.5 - 1 - 3 - 5 A
	Fault current prewarning by flashing red LED		Adjustable delay time: 0.02 - 0.1 - 0.3 - 0.5 - 1 - 3 - 5 s


Ring-type transducer

	Internal diameter 20 mm	PFR-W-20 285558	PFR-W-20 and PFR-W-30 incl. attachment clip for DIN top-hat rail
	Internal diameter 30 mm	PFR-W-30 285559	
	Internal diameter 35 mm	PFR-W-35 285600	PFR-W-35 and all larger transducers incl. screw fitting
	Internal diameter 70 mm	PFR-W-70 285601	Alternatively: attachment clip for DIN top-hat rail mounting
	Internal diameter 105 mm	PFR-W-105 285602	<i>Engineering note:</i> The transducer diameter must be selected to be 1.5 times larger than the diameter of the conductor lead through (see Technical Data).
	Internal diameter 140 mm	PFR-W-140 285603	
	Internal diameter 210 mm	PFR-W-210 285604	

Magnetic screening

	For use with PFR-W-35	PFR-WMA-35 286001	Necessary for load circuits with higher inrush currents $> 4 \times I_n$ such as with motors and capacitors
	For use with PFR-W-70	PFR-WMA-70 286002	
	For use with PFR-W-105	PFR-WMA-105 286003	
	For use with PFR-W-140	PFR-WMA-140 286004	
	For use with PFR-W-210	PFR-WMA-210 286005	

Attachment clip

	For DIN top-hat rail mounting of the transducer PFR-W-35 and all sizes	PFR-WC 286006	1 set = 2 pieces
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Technical Data

Residual current relay

Electrical

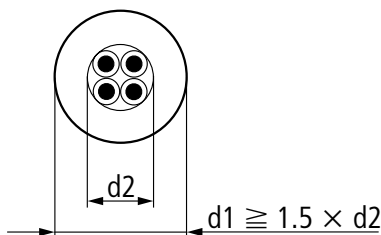
Version conform to				IEC 947-2, IEC755, IEC 1008, IEC1009
Sensitivity				Pulse current sensitive, type A
Rated control voltage		U_s	V	230 +/- 20% (50/60 Hz)
Rated operation power		P_e	W	3
Rated fault currents	PFR-003	$I_{\Delta n}$	A	0.03
	PFR-03	$I_{\Delta n}$	A	0.3
	PFR-5	$I_{\Delta n}$	A	0.03 - 0.1 - 0.3 - 0.5 - 1 - 3 - 5
Delay time	PFR-003	t_v	s	0.02 (non-delayed)
	PFR-03	t_v	s	0.02 (non-delayed)
	PFR-5	t_v	s	0.02 - 0.1 - 0.3 - 0.5 - 1 - 3 - 5
Relay contacts				1 changeover integrated
Rated voltage of the relay contacts			V	250 AC
			V	100 DC
Rated current of the relay current			A	6
Fault current prewarning via flashing red LED				
	PFR-5		Hz	0.5 25 % – 50 % $I_{\Delta n}$
			Hz	1 50 % – 75 % $I_{\Delta n}$
			Hz	2 75 % – < 100 % $I_{\Delta n}$

Mechanical

Standard dimension	mm	45
Device socket dimension	mm	85
Device width	mm	45
Mounting		Quick-fixing for top-hat rails to DIN46277, EN50022
Top and bottom terminals		Box terminals
Terminal protection		Finger and back-of-hand proof to BGVA2, VDE0106 Part 100
Terminal capacities	mm ²	2 x 0.75 - 2.5 solid, 2 x 0.75 - 1.5 flexible/ with ferrule
PFR-5 setting buttons		Setting can be sealed

Ring-type transducer

Max. rated current (A)		Diameter	
Power distribution	Motor/capacitor	Transducer type PFR-W-... d1	Max. conductor circumference d2
50	50	20	13
150	100	30	20
150	100	35	23
400	200	70	47
600	250	105	70
1200	630	140	93
1800	800	210	140

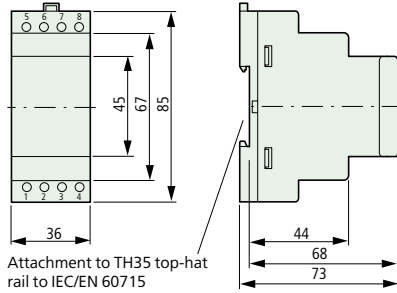


Rated operational voltage		U_e	V	690 (50/60Hz)
Attachment	PFR-W-20 PFR-W-30			Attachment clip for mounting on TH35 top-hat rail to DIN EN 60715
	PFR-W-35 PFR-W-70 PFR-W-105 PFR-W-140 PFR-W-210			Straps for screw fixing Optional: attachment clip for DIN top-hat rail mounting
Attachment clip	PFR-WC			For mounting transducer on TH35 top-hat rail to DIN EN 60715
Magnetic screening	PFR-WMA-...			Required for load circuits with high levels of inrush current > 4 x I_n such as with motors and capacitors.

Dimensions

Residual current relay

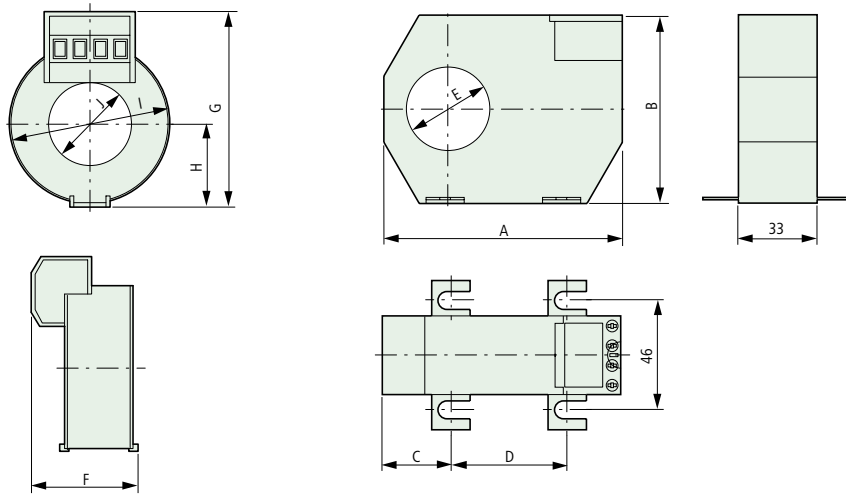
PFR-003, PFR-03, PFR-5



Ring-type transducer

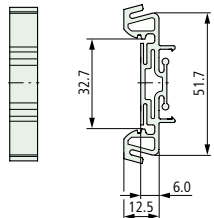
PFR-W-20, PFR-W-30

PFR-W-35 (-70, -105, -140, -210)

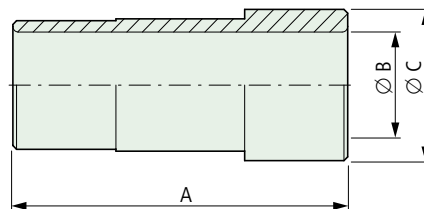


	A	B	C	D	E
PFR-W-35	100	79	26	48,5	35
PFR-W-70	130	110	32	66	70
PFR-W-105	170	146	38	94	105
PFR-W-140	220	196	48,5	123	140
PFR-W-210	299	284	69	161	210
	F	G	H	I	J
PFR-W-20	32	60	24	46	21
PFR-W-30	32	70	30	59	30

Attachment clip



Magnetic screening



	A	Ø B	Ø C
PFR-WMA-35	91	28	40
PFR-WMA-70	105	62	75
PFR-WMA-105	153	98	110
PFR-WMA-140	153	133	145
PFR-WMA-210	153	203	215

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