



# BREAKERS

## STANDARD FAMILY CODE IR 4000 SERIES F

Mounting Position	Vertical
Control Voltage Rating Uc [Vdc]	24 - 36 - 48 - 72 - 110 <sup>1</sup>
Auxiliary Contact Blocks	5 a1 + 6 b0
Block Type	Reed
Arc chute Material	Ceramic
Main Contacts tips Material	AgSnO <sub>2</sub>
Arcing Contacts tips Material	AgW
Electric Diagram HC	42870649C
Electric Diagram PM	42870648C
Layout Drawing HC 900V - 1800V	42870622C
Layout Drawing PM 900V - 1800V	42870668C
Layout Drawing HC 3600V	42870687C
Layout Drawing PM 3600V	42870668C

Type			
Voltage	Holding System	Thermal Current	
		3000 A	4500 A
900 V	Holding Coil	<b>IR 4030 FC 09M</b>	<b>IR 4045 FC 09M</b>
	Permanent Magnet	<b>IR 4030 FP 09M</b>	<b>IR 4045 FP 09M</b>
1800 V	Holding Coil	<b>IR 4030 FC 18M</b>	<b>IR 4045 FC 18M</b>
	Permanent Magnet	<b>IR 4030 FP 18M</b>	<b>IR 4045 FP 18M</b>
3600 V	Holding Coil	<b>IR 4030 FC 36M</b>	<b>IR 4045 FC 36M</b>
	Permanent Magnet	<b>IR 4030 FP 36M</b>	<b>IR 4045 FP 36M</b>



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## Description

DC single pole, magnetic blowout, trip free, air circuit breaker. The closing mechanism is motor-operated independent type while the holding mechanism is magnetic type, provided with holding coil or permanent magnet. The breaker is equipped with a direct acting over-current trip device, which may be either unidirectional or bi-directional. Reference standard IEC 61992 and IEC 60947.

Insulation Characteristics	09M	18M	36M
Rated Operational Voltage $U_{Ne}$ [V <sub>dc</sub> ] <sup>1</sup>	900	1800	3600
Max Operational Voltage [V <sub>dc</sub> ]	1000	2000	4000
Rated Insulation Voltage [V <sub>dc</sub> ] @ OV4/PD3A	2300	3000	3600
Rated Insulation Voltage [V <sub>dc</sub> ] @ OV3/PD3	2300	3000	4800
Electrical Characteristics	09M	18M	36M
Conventional Free Air Thermal Current [A] at 40°C <sup>2</sup>	3000 / 4500	3000 / 4500	3000 / 4500
Occasional Overloads [A] for 120'	3800 / 4800	3800 / 4800	3800 / 4800
Occasional Overloads [A] for 30'	4600 / 5800	4600 / 5800	4600 / 5800
Occasional Overloads [A] for 7'	6300 / 8000	6300 / 8000	6300 / 8000
Occasional Overloads [A] for 40"	12000 / 15000	12000 / 15000	12000 / 15000
Breaking Capacity [kA/ms]			
Rated Short Circuit	125/100	100/63	50/63
Duty F: Maximum Fault	125 / 0 (peak 180KA)	100 / 0 (peak 148KA)	50 / 0 (peak 71KA)
Duty E: Maximum Energy	62.5 / 50	50 / 31.5	35 / 31.5
Duty D: Distant Fault	8 / 100	8 / 63	8 / 63
Rated Duty Cycle	0 - 15s - CO - 15s - CO - 60s - CO	0 - 15s - CO - 15s - CO - 60s - CO	0 - 15s - CO - 15s - CO - 60s - CO
Peak arc voltage [Û <sub>arc</sub> ]	up to 4 x U <sub>n</sub>	up to 4 x U <sub>n</sub>	up to 4 x U <sub>n</sub>
Standard Bidirectional direct acting trip device [kA] <sup>3</sup>			
Setting Range A1	1 ÷ 1.6	1 ÷ 1.6	1 ÷ 1.6
Setting Range A2	1.6 ÷ 2.6	1.6 ÷ 2.6	1.6 ÷ 2.6
Setting Range A3	2.5 ÷ 4	2.5 ÷ 4	2.5 ÷ 4
Setting Range A4 & B1	4 ÷ 6.4	4 ÷ 6.4	4 ÷ 6.4
Setting Range A5	5.8 ÷ 9.3	5.8 ÷ 9.3	-
Setting Range A6	8 ÷ 13	8 ÷ 13	-
Setting Range B7	9.4 ÷ 15	-	-
Setting Range C8	12.5 ÷ 20	-	-
Blow Out Circuit Type	Coil	Coil	Coil
Mechanical Characteristics			
Mechanical Endurance (cycles)	4x50000		
Electrical durability [ $I_{Ne}$ @ U <sub>Ne</sub> ]	4x200		
Shock and Vibrations (IEC61373)	Cat.1 - Class B		
Weight [kg] for 09M & 18M / 36M	160 / 175		

<b>Control Circuit</b>	
Control Voltage Range	0.7Uc ÷ 1.25Uc
Operated by	D.C. Motor
Holding closed by	Holding Coil or Permanent Magnet
Peak closing power and time [W x s]	500 x 0.01
Nominal closing power and time [W x s]	360 x 1.5
<b>Holding Coil version</b>	
Nominal holding power @ 20°C [W]	50
Nominal opening power @ 20°C [W]	0
Controlled opening time [ms]	< 50
Controlled opening time with FOD (optional) [ms] <sup>4</sup>	4 ÷ 6
<b>Permanent Magnet version</b>	
Controlled opening time with FOD (optional) [ms] <sup>4</sup>	4 ÷ 6
Nominal holding power @ 20°C [W]	0
Nominal opening power and time @ 20°C [W x s]	500 x 0.02
Controlled opening time [ms]	< 20
Controlled opening time with FOD (optional) [ms] <sup>4</sup>	4 ÷ 6

<b>Auxiliary Circuit</b>	
Type	Reed Contacts (Vacuum Technology)
Voltage [V <sub>dc</sub> ]	24 / 36 / 48 / 72 / 110 <sup>1</sup>
Rated Current [A]	5
Maximum Breaking Power with Inductive Load $\tau=2\text{ms}$ [W]	120
Maximum Breaking Current with Inductive Load $\tau=2\text{ms}$ [A]	3
Maximum Breaking Voltage with Inductive Load $\tau=2\text{ms}$ [V]	250
Minimum let-through Current at 24V <sub>dc</sub> [mA]	5
Electrical Connections	Fast-on 2.5 x 0.8mm or customized LV Connection <sup>1</sup>
<b>Environmental Conditions</b>	
Stock Temperature Range	-50°C ÷ +85°C
Operational Temperature Range	-30°C ÷ +70°C
Pollution Degree	PD3A
Clearance in air [mm]	40
Creepage distance [mm]	80
Comparative Tracking Index (CTI)	>600
Max Altitude without Performance Derating [m]	2000
Humidity <sup>5</sup>	10 ÷ 95% RH

<sup>1</sup> To be specified in order phase

<sup>2</sup> Device cabled according IEC 60947

<sup>3</sup> Tripping point reached up with di/dt=200A/s. Other setting range are available on request

<sup>4</sup> For optional fast opening device (FOD) information please contact Microelettrica Sales Department

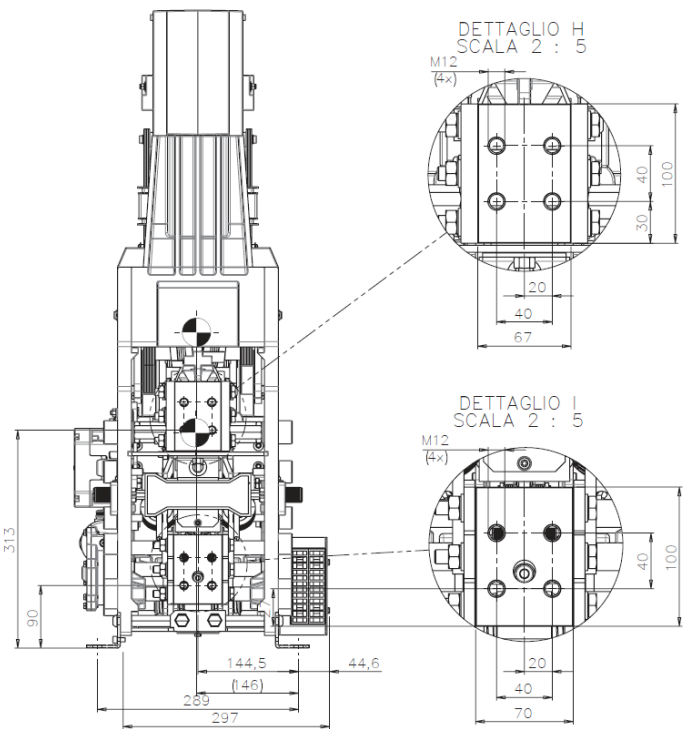
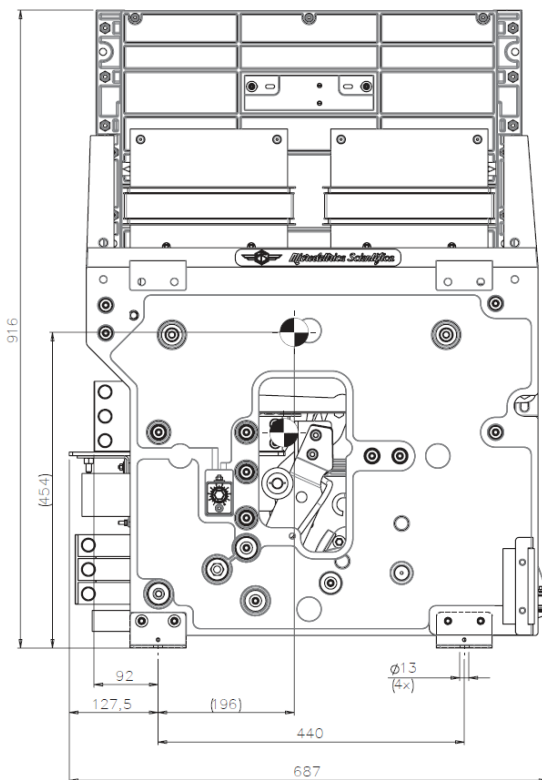
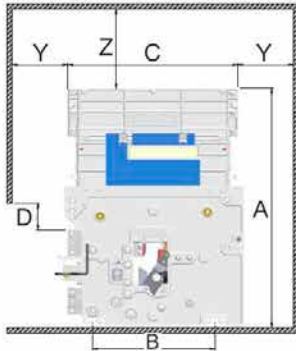
<sup>5</sup> According to EN 50125-1

<sup>6</sup> Reduced distances should be approved by Microelettrica

<sup>7</sup> These quotes are referred to a 50% surface opening grid

**Minimum clearances [mm] from<sup>6</sup>:**

Rated Operational Voltage [V <sub>dc</sub> ]		A <sup>7</sup>	B	C	D	E	X	Y	Z
900	Metal Parts	903	440	612	100	289	150	200	300
	Plastic Parts				100		150	200	200
1800	Metal Parts				100		150	200	300
	Plastic Parts				100		150	200	200
3600	Metal Parts				100		150	200	300
	Plastic Parts				100		150	200	200



The technical specifications reported are not binding and they should be agreed in the contract.

**For further technical information on our products visit [www.microelettrica.com](http://www.microelettrica.com)**

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