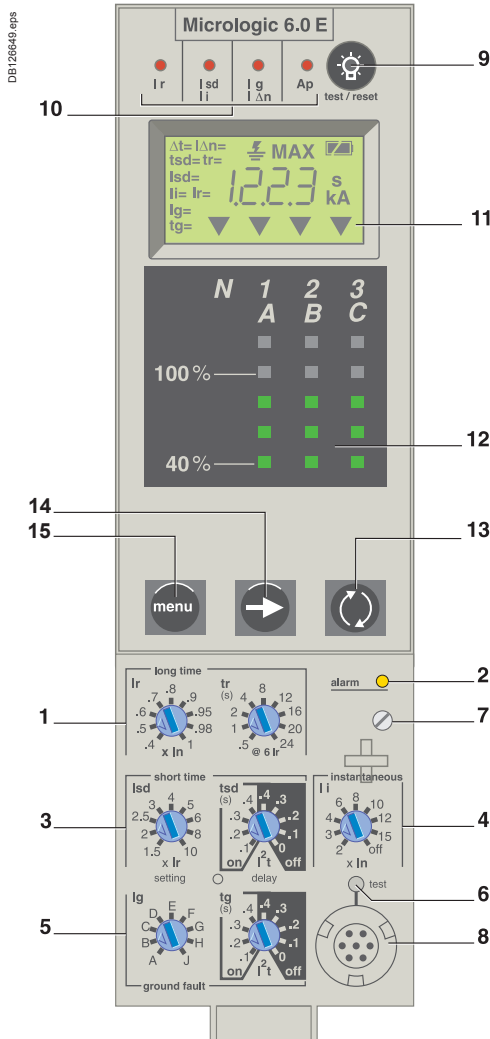


Micrologic E control units protect power circuits. They also offer measurements, display, communication and current maximeters. Version 6 provides earth-fault protection.



- 1 long-time threshold and tripping delay
- 2 overload alarm (LED) at 1, 125 Ir
- 3 short-time pick-up and tripping delay
- 4 instantaneous pick-up
- 5 earth-leakage or earth-fault pick-up and tripping delay
- 6 earth-leakage or earth-fault test button
- 7 long-time rating plug screw
- 8 test connector
- 9 lamp test, reset and battery test
- 10 indication of tripping cause
- 11 digital display
- 12 three-phase bargraph and ammeter
- 13 navigation button "quick View" (only with Micrologic E)
- 14 navigation button to view menu contents
- 15 navigation button to change menu

(1) Display on FDM121 only.

**Note:** Micrologic E control units come with a transparent lead-seal cover as standard.

### "Energy meter" measurements

**In addition to the ammeter measurements of Micrologic A**

Micrologic E control units measure and display:

- current demand
- voltages: phase to phase, phase to neutral, average <sup>(1)</sup> and unbalanced <sup>(1)</sup>
- instantaneous power: P, Q, S
- power factor: PF
- power demand: P demand
- energy: Ep, Eq <sup>(1)</sup>, Es <sup>(1)</sup>.

Accuracy of active energy Ep is 2 % (including the sensors). The range of measurement is the same as current with Micrologic A, depending of an external power supply module (24 V DC).

### Communication option

In conjunction with the COM communication option, the control unit transmits the following:

- settings
- all "ammeter" and "energy" measurements
- enable connection to FDM121
- tripping causes
- maximeter / minimeter readings.

### Protection

Protection thresholds and delays are set using the adjustment dials.

#### Overload protection

True rms long-time protection.

Thermal memory: thermal image before and after tripping.

Setting accuracy may be enhanced by limiting the setting range using a different long-time rating plug. Overload protection can be cancelled using a specific LT rating plug "Off".

#### Short-circuit protection

Short-time (rms) and instantaneous protection.

Selection of I<sup>2</sup>t type (ON or OFF) for short-time delay.

#### Earth-fault protection

Source ground return earth fault protection.

Selection of I<sup>2</sup>t type (ON or OFF) for delay.

#### Neutral protection

On three-pole circuit breakers, neutral protection is not possible.

On four-pole circuit breakers, neutral protection may be set using a three-position switch: neutral unprotected (4P 3d), neutral protection at 0.5 Ir (4P 3d + N/2), neutral protection at Ir (4P 4d).

#### Zone selective interlocking (ZSI)

A ZSI terminal block may be used to interconnect a number of control units to provide total discrimination for short-time and earth-fault protection, without a delay before tripping.

### Overload alarm

A yellow alarm LED goes on when the current exceeds the long-time trip threshold.

### M2C programmable contacts

The M2C (two contacts) programmable contacts may be used to signal events (Ir, Isd, Alarm Ir, Alarm Ig, Ig). They can be programmed using the keypad on the Micrologic E control unit or remotely using the COM option (BCM ULP).

### Fault indications

LEDs indicate the type of fault:

- overload (long-time protection Ir)
- short-circuit (short-time Isd or instantaneous li protection)
- earth fault (Ig)
- internal fault (Ap).

### Trip history

The trip history displays the list of the last 10 trips. For each trip, the following indications are recorded and displayed:

- the tripping cause: Ir, Isd, li, Ig or Auto-protection (Ap) trips
- the date and time of the trip (requires communication option).

### Battery power

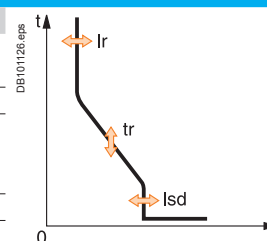
The fault indication LEDs remain on until the test/reset button is pressed. Under normal operating conditions, the battery supplying the LEDs has a service life of approximately 10 years.

### Test

A mini test kit or a portable test kit may be connected to the test connector on the front to check circuit-breaker operation. For Micrologic 6.0 E control units, the operation of earth-fault or earth-leakage protection can be checked by pressing the test button located above the test connector.

## Protection Micrologic 2.0 E

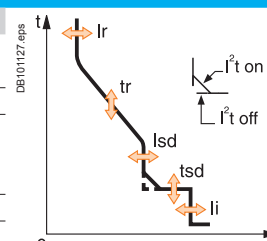
Long time											
Current setting (A)		0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1	
Tripping between 1.05 and 1.20 x Ir		Other ranges or disable by changing long-time rating plug									
Time setting	tr (s)	0.5	1	2	4	8	12	16	20	24	
Time delay (s)	Accuracy: 0 to -30 %	1.5 x Ir	12.5	25	50	100	200	300	400	500	600
	Accuracy: 0 to -20 %	6 x Ir	0.7 <sup>(1)</sup>	1	2	4	8	12	16	20	24
	Accuracy: 0 to -20 %	7.2 x Ir	0.7 <sup>(2)</sup>	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6
Thermal memory		20 minutes before and after tripping									
(1) 0 to -40 % - (2) 0 to -60 %											



Instantaneous											
Pick-up (A)	Isd = Ir x ...	1.5	2	2.5	3	4	5	6	8	10	
Accuracy: ±10 %											
Time delay		Max resettable time: 20 ms Max break time: 80 ms									

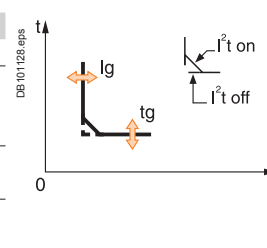
## Protection Micrologic 5.0 / 6.0 E

Long time		Micrologic 5.0 / 6.0 E									
Current setting (A)	Ir = In x ...	0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1	
Tripping between 1.05 and 1.20 x Ir		Other ranges or disable by changing long-time rating plug									
Time setting	tr (s)	0.5	1	2	4	8	12	16	20	24	
Time delay (s)	Accuracy: 0 to -30 %	1.5 x Ir	12.5	25	50	100	200	300	400	500	600
	Accuracy: 0 to -20 %	6 x Ir	0.7 <sup>(1)</sup>	1	2	4	8	12	16	20	24
	Accuracy: 0 to -20 %	7.2 x Ir	0.7 <sup>(2)</sup>	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6
Thermal memory		20 minutes before and after tripping									
(1) 0 to -40 % - (2) 0 to -60 %											



Short time												
Pick-up (A)	I <sub>sd</sub> = I <sub>r</sub> x ...		1.5	2	2.5	3	4	5	6	8	10	
Accuracy: ±10 %												
Time setting t <sub>sd</sub> (s)	Settings	I <sup>2</sup> t Off	0	0.1	0.2	0.3	0.4					
		I <sup>2</sup> t On	-	0.1	0.2	0.3	0.4					
Time delay (ms) at 10 x I <sub>r</sub> (I <sup>2</sup> t Off or I <sup>2</sup> t On)	t <sub>sd</sub> (max resettable time)		20	80	140	230	350					
	t <sub>sd</sub> (max break time)		80	140	200	320	500					
Instantaneous												
Pick-up (A)	I <sub>i</sub> = I <sub>n</sub> x ...		2	3	4	6	8	10	12	15	off	
Accuracy: ±10 %												
Time delay			Max resettable time: 20 ms Max break time: 50 ms									

Earth fault		Micrologic 6.0 E									
Pick-up (A)	Ig = In x ...	A	B	C	D	E	F	G	H	J	
Accuracy: ±10 %	In ≤ 400 A	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
	400 A < In < 1250 A	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
	In ≥ 1250 A	500	640	720	800	880	960	1040	1120	1200	
Time setting tg (s)	Settings	I²t Off	0	0.1	0.2	0.3	0.4				
		I²t On	-	0.1	0.2	0.3	0.4				
Time delay (ms)	tg (max resettable time)		20	80	140	230	350				
	at In or 1200 A (I²t Off or I²t On)	tg (max break time)	80	140	200	320	500				



## Energy Micrologic 2.0 / 5.0 / 6.0 E

Type of measurements	Range	Accuracy
Instantaneous currents	I1, I2, I3, IN	0.2 x In to 1.2 x In
	Ig (6.0 E)	0.05 x In to In
Current maximeters of	I1, I2, I3, IN	0.2 x In to 1.2 x In
Demand currents of I1, I2, I3, Ig		0.2 x In to 1.2 x In
Voltages	V12, V23, V31, V1N, V2N, V3N	100 to 690 V
Active power	P	30 to 2000 kW
Power factor	PF	0 to 1
Demand power	P demand	30 to 2000 kW
Active energy	Ep	-10 <sup>10</sup> GWh to 10 <sup>10</sup> GWh

**Note:** all current-based protection functions require no auxiliary source.  
The test / reset button resets maximeters, clears the tripping indication and tests the battery.