

Description

The Argus range of numerical overcurrent protection devices combine the power and flexibility of microprocessor technology with decades of experience in the field of overcurrent protection.

Thus a wide range of protection elements and characteristics are supplemented by advanced features such as metering, data storage and communications.

The directional members of the family provide the ability to apply bi-directional control to each protection stage independently.

Different settings can be applied for operation in the forward and reverse zones. The advantage of this capability is that a single Argus 2 relay can perform the function of two traditional directional relays.

Phase-fault directional elements are polarised by the quadrature phase-phase connection, and earth fault elements are polarised by the system residual voltage obtained from the open delta tertiary winding of a voltage transformer or alternatively the relay will itself calculate the residual voltage internally from the three applied phase to neutral voltages. Alternatively, current polarised earth fault elements are available. Characteristic angles (or MTA) are selectable.

A two-out-of-three gating feature is available in 3Ø variants. When this feature is enabled, a protection algorithm will only be permitted to operate if 2 out of 3 poles measure fault current in the operate zone. This provides absolute discrimination between two directional overcurrent protections in systems where - 1:+2:-1 current distributions may be encountered.

The Argus range includes single pole, three pole and four pole directional overcurrent relays. These compact units are housed in withdrawable size E4, E6 and E8 cases. A single pole directional sensitive earth fault relay is also available.

Argus 2 100 series - 1 pole directional
Argus 2 300 series - 3 pole directional
Argus 2 400 series - 4 pole directional
Argus 2 500 series - 4 pole directional + power metering

Applications

- Parallel feeders
- Ring feeders
- Distribution feeders
- Transformers

Features

Protection

- IDMTL phase fault directional OC stage (51/67)
- Three DTL phase fault directional OC stages (50/67)
- IDMTL directional earth-fault (51N/67N)
- Three DTL directional earth-fault (50N/67N)
- Two stage circuit breaker failure (50BF)
- Two instantaneous and DTL SEF/REF stages with harmonic rejection (50N/64R)
- Over/under voltage (59/27)*

* Available only in Argus 500 Model

Control

- The basic Argus 2 relay contains 11 programmable output relays, 3 of which have 1 CO contact and 8 have 1 NO contact
- The basic Argus 2 relay contains 5 programmable digital (status) input, with an additional 4 provided in expanded relays
- Single pole directional Argus 2 relay contains 7 programmable output relays, 3 of which have 1 CO contact and 4 have 1 NO contact 3 pole and 4 pole variants can provide 4 extra output relays, each having 1 NO contact
- Single pole directional Argus 2 relay contains 1 programmable digital (status) input, with an additional 4 or 8 provided in 3 pole or 4 pole relays



Digital Directional Overcurrent Protection Relay - Argus 2



- Tri-state directional element
- Independent direction control for each protection characteristic
- Different settings for forward and reverse operation
- Voltage or current polarized directional earth fault
- Open delta tertiary winding not necessary for directional earth fault*
- Voltage controlled change of setting groups*
- Separate outputs for forward & reverse direction*

* Available only in Argus 500 Model

Monitoring

- Trip circuit supervision (95)
- Current Transformer (CT) supervision
- Circuit breaker maintenance
- Storage of 500 time-tagged event records
- Storage of 5 wave form records
- Records for upto last 5 faults
- Self-monitoring capability

Metering

- Primary/secondary current Ia, Ib, Ic, Ise
- Primary/secondary phase to phase voltages*
- Primary/secondary phase voltages*
- Apparent power, real and reactive power*
- Power factor*
- Forward/reverse WHr, VARHr*
- Rolling and maximum demand for Ia, Ib, Ic
- Rolling & maximum demand for W & VAR*
- Direction

* Applicable only for Argus 500 Model

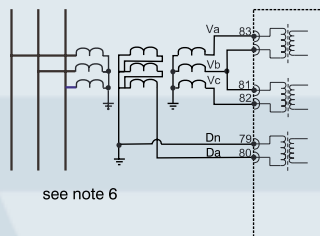
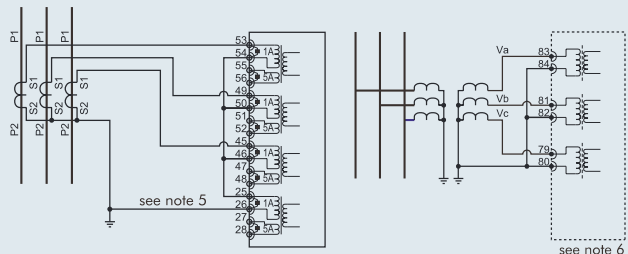
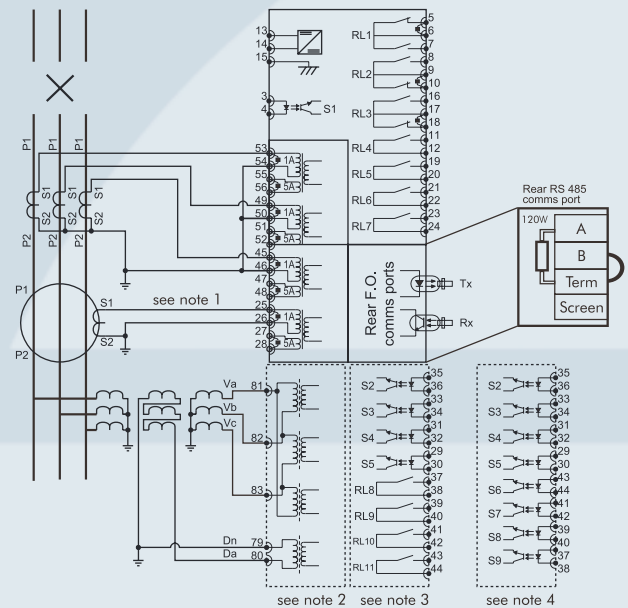
User Interface

- User-friendly settings and indications
- Backlit liquid crystal alpha-numeric display with 16-characters, 2 lines
- LEDs for trip, starter and protection healthy status indications
- Push buttons for programming and resetting

Communication

- RS485 or fibre-optic communication port at rear
- Data communication using IEC 60870-5-103 or MODBUS RTU Protocol

Wiring Diagram



Notes

- 1 Diagram shows 3PF+SEF model using a ring core CT. See diagram below for alternative connection other CT mixes also available.
- 2 Diagram shows 3Ø and earth voltage inputs.
- 3 Optional expansion card, fitted only on models with 5 digital (status) inputs and 11 output relays.
- 4 Optional expansion card, fitted only on models with 9 digital (status) inputs and 7 output relays.
- 5 Diagram shows 3PF+EF using residual connection other CT mixes also available.
- 6 Voltage card shown can be fitted only on Argus 2 relays, type AG2-5xx.



Technical Information

CT input rating

AC current	1A/5A, 50/60Hz
AC voltage	110V line-line or 63.5V line-neutral

Settings

Phase fault	0.05 x In to 2.5 x In Δ 0.05 x In
Earth fault	0.05 x In to 2.5 x In Δ 0.05 x In
Highsets 1&2	0.05 x In to 2.5 x In Δ 0.05 x In 2.5 x In to 52.5 x In Δ 0.5 x In
Lowset	0.05 x In to 2.5 x In Δ 0.05 x In 2.5 x In to 52.5 x In Δ 0.5 x In
SEF/REF	0.005 x In to 0.96 x In Δ 0.005 x In

Definite time	0sec to 300sec
Time multiplier	0.025 to 1.6 Δ 0.025

Reset delay	0sec to 60sec Δ 1sec
-------------	----------------------

Phase Fault MTA	-90° to + 90° Δ 1°
-----------------	--------------------

Earth Fault MTA	-90° to + 90° Δ 1°
-----------------	--------------------

Over/under voltage	5-200 V*
--------------------	----------

NB. External resistors and metrosils can be calculated and supplied to complete REF schemes.

* In Argus 500 Model only

Directional Characteristics

Operating angle	±87.5 about MTA
-----------------	-----------------

Operate time	<20ms at MTA
--------------	--------------

DC Auxiliary supply

Nominal	Operating range
24, 30, 48V	18-60V
110, 220V	88-280V

Output relays

- The basic Argus 2 relay contains 11 programmable output relays, 3 of which have 1 CO contact and 8 have 1 NO contact
- Single pole directional Argus 2 relay contains 7 programmable output relays, 3 of which have 1 CO contact and 4 have 1 NO contact 3 pole and 4 pole variants can provide 4 extra output relays, each having 1 NO contact

Contact ratings

Carry continuously	- 5A AC or DC
Make and carry	- 30A AC or DC for 0.2sec
Resistive break	- 75W DC, 1250VA AC

DC digital (status) input

The basic Argus 2 relay contains 5 programmable numerical input, with an additional 4 provided in expanded relays. The digital (status) inputs have programmable pick-up and drop-off timers.

Auxiliary voltage	Operating range
30V DC	18-37.5V DC
48V DC	37.5- 60V DC
110/125V DC	87.5-137.5V DC
220/250V DC	175 - 280V DC

For relay with 110/125V DC or 220/225V DC auxiliary a 48 voltage input is supplied for use with external dropper resistors: 110/125V resistor 2K7 ± 5% 2.5W 220/250V resistor 8K2 ± 5% 6.0W

Burdens

AC current

1 A Phase/Earth	≤ 0.05 VA
-----------------	-----------

5 A Phase/Earth	≤ 0.2 VA
-----------------	----------

1 A SEF/REF	≤ 0.2 VA
-------------	----------

5 A SEF/REF	≤ 0.4 VA
-------------	----------

AC voltage	≤ 0.2 VA
------------	----------

DC voltage

Quiescent (Typical)	3 W
---------------------	-----

Maximum	10 W
---------	------

Indications

LEDs for trip, starter and protection healthy status indications
LCD - Alphanumeric display for setting, instruments and fault data

Environmental

Temperature	IEC 68- 2-1/2
-------------	---------------

Operating range	-10°C to + 55°C
-----------------	-----------------

Storage range	-25°C to + 70°C
---------------	-----------------

Humidity	IEC 68-2-3
----------	------------

Vibration	IEC 255 -21-1 class I
-----------	-----------------------

Shock and bump	IEC 255 -21-2 class I
----------------	-----------------------

Seismic	IEC 255 -21-3 class I
---------	-----------------------

Insulation	IEC 255-5
------------	-----------

2kVrms for 1 min between all terminals and earth.

2kVrms for 1 min between independent circuits.

1kVrms for 1 minute across NO contacts.

Transient overvoltage	IEC 255-5 class III
-----------------------	---------------------

5kV 1.2/50μs between

all terminals and earth

without damage or

flashover.

High frequency	IEC 255-22-1 class III
----------------	------------------------

disturbance

2.5kV common mode <3% deviation

1.0kV series mode <3% deviation

Electrostatic discharge	IEC255- 22-2 class III
-------------------------	------------------------

8kV direct without

maloperation or

damage

Radio frequency	IEC 255-22-3
-----------------	--------------

disturbance

20MHz to 1GHz at 10V/m <5% deviation

Fast transient	IEC 255-22-4 class IV
----------------	-----------------------

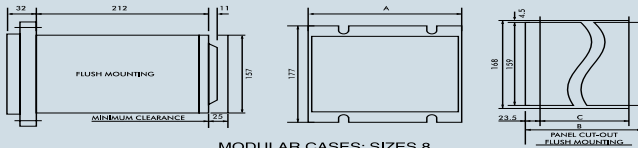
4kV 5/50ns <3% deviation

Mechanical Classification

Durability	10 ⁶ operations
------------	----------------------------



Cutout Details



MODULAR CASES: SIZES 8

SIZE 8 CASE		
A	B	C
206	203	155.5

MODULAR CASES: SIZES 4-8

SIZE 4 CASE			SIZE 6 CASE			SIZE 8 CASE		
A	B	C	A	B	C	A	B	C
103	99.5	52	155	151	103.5	206	203	155.5

Case

Argus 2-E4
Argus 2-E6
Argus 2-E8

Weight

3.3kg
4.8kg
6.6kg

Ordering Information

- Protection requirement
3P(D)+E(D), 3P(D)+SE, 2P(D)+E(D)+SE
- Auxiliary and digital (status) input voltages
- Voltage or current polarisation
- Fibre-optic or RS485 communication port

Qualification

ISO 9001 - 2000

The policy of Easun Reyrolle is one of continuous improvement and development. The company therefore reserves the right to supply equipment, which may differ slightly from that described and illustrated in this publication.

HOSUR WORKS

#98, Sipcot Industrial Complex,
Hosur 635 126, India.
Tel: +91 4344 401600/01/02
Fax: +91 4344 276397

BANGALORE WORKS

#17/3 Arakere,
Bannerghatta Road,
Bangalore-560 076, India.
Tel: +91 80 26581023 / 3268
Fax: +91 80 26580642
Email: blrworks@easunreynolle.net

SWITCHGEAR WORKS

Ernavur,
Chennai-600 057, India.
Tel: +91 44 25733715/358
Fax: +91 44 25733468
Email: switchgear@easunreynolle.net

AUTOMATION DIVISION

"Ashirwad", #25, 29th Main,
4th B Cross, BTM Layout 2nd Stage,
Bangalore-560 076, India.
Tel: +91 80 26685496/51311405
Fax: +91 80 26685446
Email: smabp@easunreynolle.net

EXPORTS DIVISION

#17/3 Arakere,
Bannerghatta Road,
Bangalore-560 076, India.
Tel: +91 80 26581023 / 3268
Fax: +91 80 26580642
Email: exports@easunreynolle.net

Sales Offices

Mumbai

Tel: +91 22 22022270/22855415
Fax: +91 22 22825703
Email: mumbai@easunreynolle.net

Bangalore

Tel: +91 80 26685496/51311405
Fax: +91 22 26685446
Email: blroffice@easunreynolle.net

Bhopal

Telefax: +91 755 2684221
Email: bhopal@easunreynolle.net

Delhi

Tel: +91 11 25747321/25747322
Fax: +91 11 25747320
Email: delhi@easunreynolle.net

Chennai

Tel: +91 44 24346425/24347608
Fax: +91 44 24346435
Email: chennai@easunreynolle.net

Kolkata

Tel: +91 33 22848320
Fax: +91 33 22848326
Email: kolkata@easunreynolle.net

Secunderabad

Telefax: +91 40 27817847
Email: hyderabad@easunreynolle.net



EASUN REYROLLE

Corporate Office

Easun Reyrolle Limited, 98 Sipcot Industrial Complex
Hosur 635 126 India. Tel: +91 4344 401600/01/02
Fax: +91 4344 276397
www.easunreynolle.com