3

Operation principle and hardware description

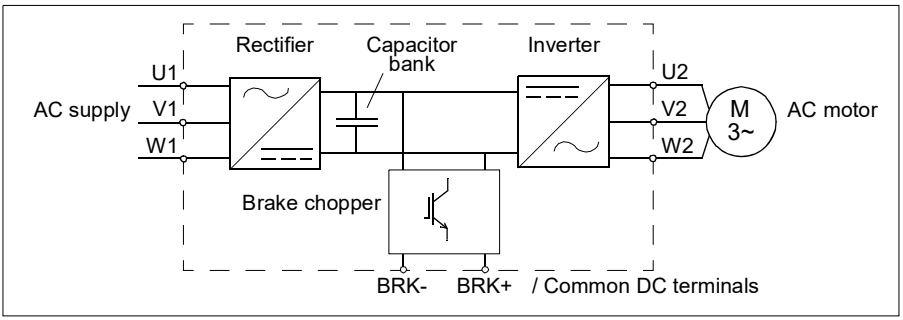
What this chapter contains

The chapter briefly describes the operation principle, layout, type designation label and type designation information. It also shows a general diagram of power connections and control interfaces.

Operation principle

The ACS355 is a wall or cabinet mountable drive for controlling asynchronous AC induction motors and permanent magnet synchronous motors.

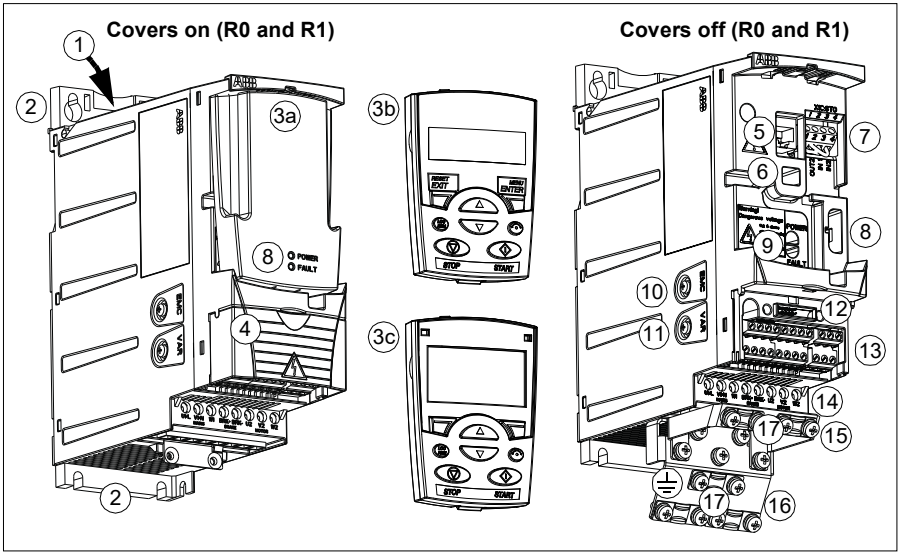
The figure below shows the simplified main circuit diagram of the drive. The rectifier converts three-phase AC voltage to DC voltage. The capacitor bank of the intermediate circuit stabilizes the DC voltage. The inverter converts the DC voltage back to AC voltage for the AC motor. The brake chopper connects the external brake resistor to the intermediate DC circuit when the voltage in the circuit exceeds its maximum limit.



Product overview

Layout

The layout of the drive is presented below. The construction of the different frame sizes R0…R4 varies to some extent.

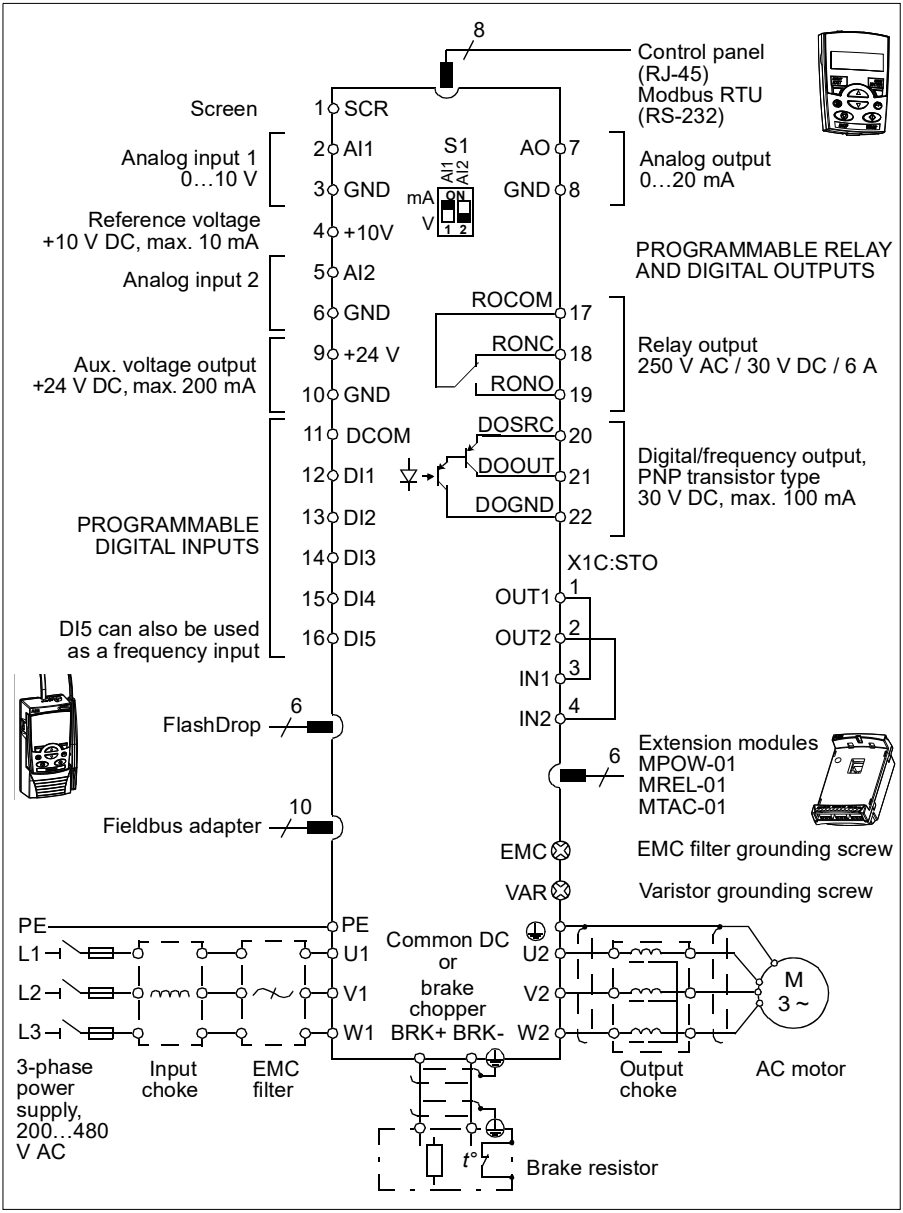


1	Cooling outlet through top cover
2	Mounting holes
3	Panel cover (a) / basic control panel (b) / assistant control panel (c)
4	Terminal cover (or optional potentiometer unit MPOT-01)
5	Panel connection
6	Option connection
7	STO (Safe torque off) connection
8	FlashDrop connection
9	Power OK and Fault LEDs. See section *LEDs* on page *374*.

10	EMC filter grounding screw (EMC). **Note:** The screw is on the front in frame size R4.
11	Varistor grounding screw (VAR)
12	Fieldbus adapter (serial communication) connection
13	I/O connections
14	Input power connection (U1, V1, W1), brake resistor connection (BRK+, BRK-) and motor connection (U2, V2, W2).
15	I/O clamping plate
16	Clamping plate
17	Clamps

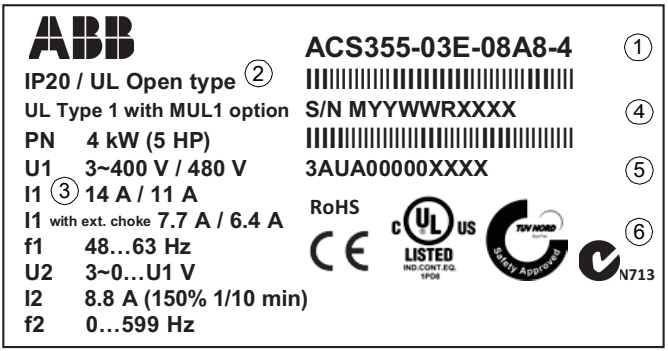
Overview of power and control connections

The diagram gives an overview of connections. I/O connections are parameterable. See chapter *Application macros* on page *107* for I/O connections for the different macros and chapter *Electrical installation* on page *49* for installation in general.



Type designation label

The type designation label is attached to the left side of the drive. An example label and explanation of the label contents are shown below.



1	Type designation, see section *Type designation key* on page *31*
2	Degree of protection by enclosure (IP and UL/NEMA)
3	Nominal ratings, see section *Ratings* on page *376*.
4	Serial number of format MYYWWRXXXX, where M: Manufacturer YY: 10, 11, 12, … for 2010, 2011, 2012, … WW: 01, 02, 03, … for week 1, week 2, week 3, … R: A, B, C, … for product revision number XXXX: Integer starting every week from 0001
5	ABB MRP code of the drive
6	CE marking and C-Tick, C-UL US, RoHS and TÜV NORD marks (the label of your drive shows the valid markings)

Type designation key

The type designation contains information on the specifications and configuration of the drive. You find the type designation on the type designation label attached to the drive. The first digits from the left express the basic configuration, for example ACS355-03E-07A3-4. The optional selections are given after that, separated by + signs, for example +J404. The explanations of the type designation selections are described below.

ACS355-03E-07A3-4+J404+...

ACS355 product series

1-phase/3-phase
01 = 1-phase input
03 = 3-phase input

Configuration
E = EMC filter connected, 50 Hz frequency
U = EMC filter disconnected, 60 Hz frequency
See section *Differences between the default values in E and U type drives*.

Output current rating
In format xxAy, where xx indicates the integer part and y the fractional part, eg, 07A3 means 7.3 A.
For more information, see section *Ratings* on page *376*.

Input voltage range
2 = 1-phase 200 … 240 V AC ±10%. This is indicated on the type designation label as typical input voltage level 1 ~ 230 V AC.
OR
3-phase 200 … 240 V AC ±10%. This is indicated on the type designation label as typical input voltage level 3 ~ 230 V AC.
4 = 3-phase 380 … 480 V AC ±10%. This is indicated on the type designation label as typical input voltage level 3 ~ 400/480 V AC.

Options

B063 = IP66/IP67/UL Type 4x enclosure (product variant)
J400 = ACS-CP-A assistant control panel [1)]
J404 = ACS-CP-C basic control panel [1)]
J402 = MPOT-01 potentiometer
K451 = FDNA-01 DeviceNet
K452 = FLON-01 LONWORKS®
K454 = FPBA-01 PROFIBUS DP
K457 = FCAN-01 CANopen
K458 = FMBA-01 Modbus RTU
K462 = FCNA-01 ControlNet
K466 = FENA-01EtherNet/IP / Modbus TCP/PROFINET IO
K469 = FECA-01 EtherCAT
K470 = FEPL-02 Ethernet POWERLINK
K473 = FENA-11EtherNet/IP / Modbus TCP/PROFINET IO
K475 = FENA-21EtherNet/IP / Modbus TCP/PROFINET IO
H376 = Cable gland kit (IP66/IP67/UL Type 4x)
F278 = Input switch kit
C169 = Pressure compensation valve

Extension modules
G406 = MPOW-01 auxiliary power extension module
L502 = MTAC-01 pulse encoder interface module
L511 = MREL-01 output relay module

1) The ACS355 is compatible with panels that have the following panel revisions and panel firmware versions. To find out the revision and firmware version of your panel, see page *76*.

Panel type	Type code	Panel revision	Panel firmware version
Basic control panel	ACS-CP-C	M or later	1.13 or later
Assistant control panel	ACS-CP-A	F or later	2.04 or later
Assistant control panel (Asia)	ACS-CP-D	Q or later	2.04 or later

Note that unlike the other panels, the ACS-CP-D is ordered with a separate material code.