Technical Catalog

ABB component drives
ACS150, 0.5 to 5 hp

Power and productivity
for a better world™

Contents

Choice 1: Simply contact your local ABB drives sales office and let them know what you want. Use page 4 as a reference section for more information.

OR

Choice 2: Build up your own ordering code using the simple 7-step approach below. Then, contact your local ABB Drives sales office.

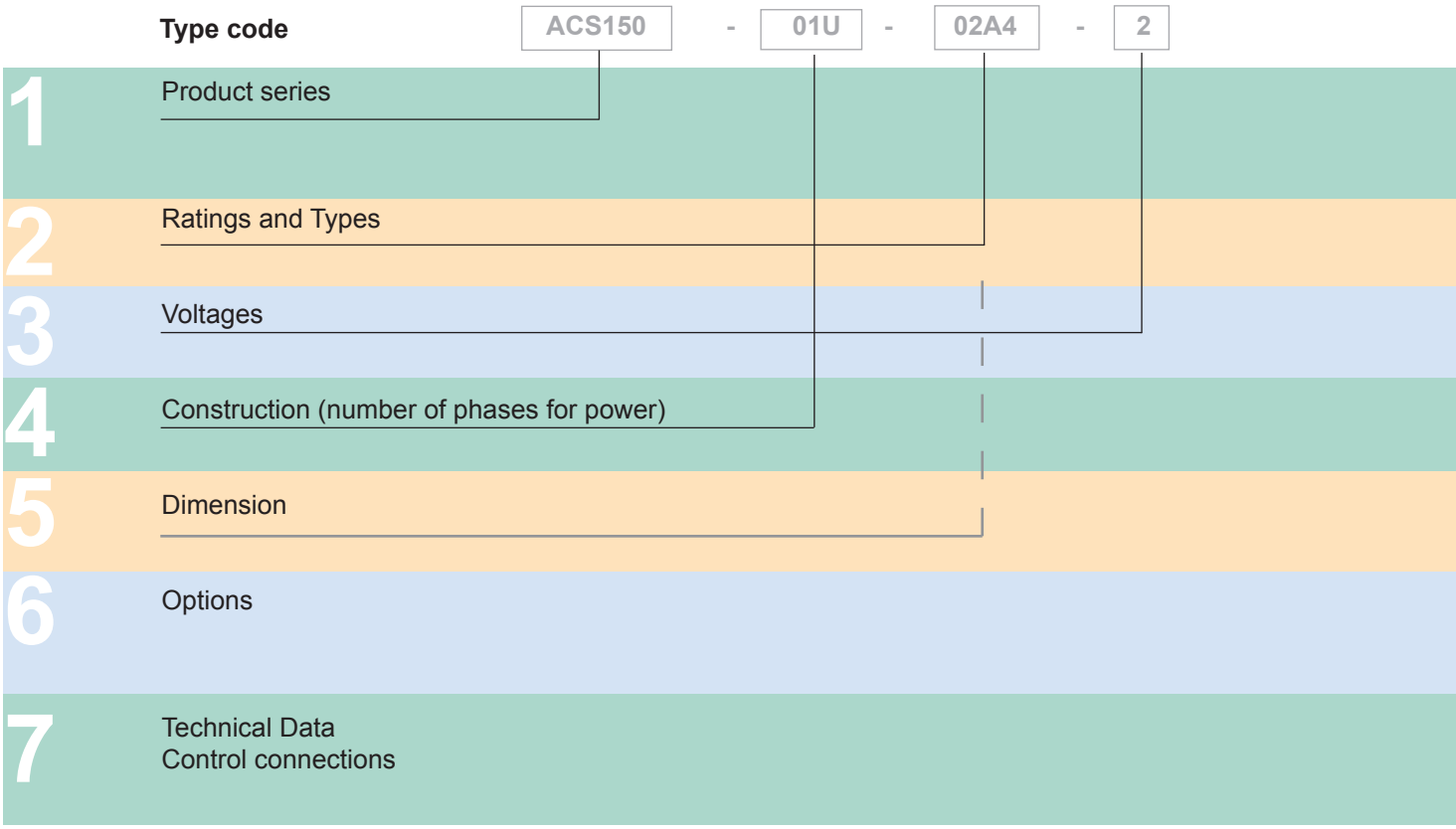


ABB Component Drive, ACS150

ABB Component Drives

ACS150 - 01U - 02A4 - 2

What is the ACS150 customer value?

- **Dramatically reduced programming time and costs**
  - Replicate parameters in seconds with no power to the drive with new FlashDrop technology
  - Pre-configure drives prior to delivery
  - Replicate parameter sets across machines
  - Hide selected parameters
  - Spare drives are configured
- **Optimal installation layout with unified height and depth for all frames.**
- **Reduced cost with built-in brake chopper and EMC filter**
- **Reduced wiring time and costs for I/O and quick, simple and easy access control connections**

The ABB component drives meet the requirements of OEMs, system integrators and panel builders. It is a component that is bought together with other components. The drive is stocked, and the number of options and variants are optimized for distribution.

Where can it be used?

ABB component drives are designed to meet the requirements of an extensive range of machinery applications. The drive is ideal for food and beverage, material handling, textile, printing, rubber and plastics and woodworking applications.

Highlights

- FlashDrop- easy to set and select parameters without power
- Integral operator interface - clear display with buttons
- Integral potentiometer for frequency setting
- Integrated EMC filter for 2nd environment
- Built-in brake chopper as standard
- Coated boards as standard
- Unified height and depth
- NEMA 1 Kit
- Flexible installation
- RoHS (verify label)

Applications

- Fans
- Pumps
- Gate control
- Material handling
- Conveyors

What are the ACS150's main features and benefits supporting customer value?

Features	Benefits	Notes
FlashDrop	Easy and time-saving. Cost-saving for machine builders.	Fast and trouble free parameter set up without power.
Fixed interface	Integrated non-removable control panel. Clear LCD display with backlight and buttons.	Simple to use
Fixed potentiometer	Integrated potentiometer. Settings shown on the control panel	Easy speed setting.
Built-in EMC filter	No extra space, parts, time and cost required	2nd environment built in filter complying with IEC61800-3 as standard
Built-in brake chopper	Reduced cost. Gives freedom to choose the resistor supplier.	100% braking capability.
Flexible installation	All units fit in the same sized cabinet	Unified height and depth for all frame sizes for optimal use of cabinet space. Sideways, side by side and DIN-rail mounting configuration
Coated boards	Longer lifetime in hostile environments. Reduced service.	Protection against moisture and hostile particles as standard

Technical Specification

ACS150 - 01U - 02A4 - 2

Input power connection

Voltage and power range	1-phase, 200 to 240 V ±10% 0.37 to 2.2 kW (0.5 to 3 hp) 3-phase, 200 to 240 V ±10% 0.37 to 2.2 kW (0.5 to 3 hp) 3-phase, 380 to 480 V ±10% 0.37 to 4 kW (0.5 to 5 hp)
Frequency	48 to 63 Hz
Power factor	0.98

Motor connection

Voltage	3-phase, from 0 to U_{supply}
Frequency	0 to 500 Hz
Continuous loading capability (constant torque at a max. ambient temperature 40°C)	Rated output current I_{2N}
Overload capability (at a max. ambient temperature of 40°C)	At heavy duty use 1.5 x I_{2N} for 1 minute every 10 minutes At start 1.8 x I_{2N} for 2 s
Switching frequency	
Default	4 kHz
Selectable	4 to 12 kHz with 4 kHz steps (16 kHz, v1.31b+)
Acceleration time	0.1 to 1800 s
Deceleration time	0.1 to 1800 s
Braking	Inbuilt brake chopper standard (100% braking capability)

Environmental limits

Ambient temperature	-10 to 40°C (14 to 104°F), no frost allowed, 50°C (122°F) with 10% derating
Altitude	
Output current	Rated current available at 0 to 1000 m (0 to 3281 ft) reduced by 1% per 100 m (328 ft) over 1000 to 2000 m (3281 to 6562 ft)
Relative humidity	Lower than 95% (without condensation)
Protection class	IP 20 / Protected Chassis
Enclosure color	NCS 1502-Y, RAL 9002, PMS 420 C
Contamination levels	IEC721-3-3 No conductive dust allowed
Storage	Class 1C2 (chemical gases) Class 1S2 (solid particles)
Transportation	Class 2C2 (chemical gases) Class 2S2 (solid particles)
Operation	Class 3C2 (chemical gases) Class 3S2 (solid particles)

Programmable control connections

One analog input	
Voltage signal	0 (2) to 10 V, R_{in} > 312 kΩ
Current signal	0 (4) to 20 mA, R_{in} = 100 Ω
Resolution	0.1 %
Accuracy	±1%
Potentiometer reference	10V ±1% max, 10 mA R< 10 kΩ
Auxiliary voltage	24 V DC ±10%, max. 200 mA
Five digital inputs	12 to 24 V DC with internal or external supply, PNP and NPN, pulse train 0 to 16 kHz.
Input impedance	2.4 kΩ
One relay output	
Type	NO + NC
Maximum switching voltage	250 V AC/30 V DC
Maximum switching current	0.5 A/30 V DC; 5 A/230 V AC
Maximum continuous current	2 A rms

Product compliance

Low voltage Directive 73/23/EEC with supplements
Machinery Directive 98/37/EC
EMC Directive 89/336/EEC with supplements
Quality assurance system ISO 9001
Environmental system ISO 14001
UL, cUL, and CE approvals, C-Tick, GOST-R

EMC (according to EN61800-3)

2nd environment filter, unrestricted distribution with 30 m (98 ft) cable, built-in as standard.

EMC standards in general

EN 61800-3/A11 (2000), product standard	EN 61800-3 (2004), product standard	EN 55011, product family standard for industrial, scientific and medical (ISM) equipment
1st environment, unrestricted distribution	Category C1	Group 1 Class B
1st environment, restricted distribution	Category C2	Group 1 Class A
2nd environment, unrestricted distribution)	Category C3	Group 2 Class A
2nd environment, restricted distribution	Category C4	Not applicable

Ratings, Types, Voltages and Construction

ACS150 - 01U - 02A4 - 2

Type code

This is a unique reference number that clearly identifies the drive by power rating, voltage, and construction. Once you have selected the type code, the frame size can be used to determine the drives dimensions, shown below.

Voltages

The ACS150 is available in two voltage ranges:
2 = 200 - 240 V
4 = 380 - 480 V

Construction

"01U" and "03U" within the type code indicates the number of phases for power.

01 = 1-phase (200 - 240V only)
03 = 3-phase (200 - 240V and 380 - 480V)
U = EMC filter disconnected, 60 Hz motor data
(In case the filter is required it can easily be connected.)

Type code	Frame size	Ratings		
		P_N hp	P_N kW	I_{2N} A
1-phase supply voltage 200 - 240 V units				
ACS150-01U-02A4-2	R0	0.5	0.37	2.4
ACS150-01U-04A7-2	R1	1	0.75	4.7
ACS150-01U-06A7-2	R1	1.5	1.1	6.7
ACS150-01U-07A5-2	R2	2	1.5	7.5
ACS150-01U-09A8-2	R2	3	2.2	9.8
3-phase supply voltage 200 - 240 V units				
ACS150-03U-02A4-2	R0	0.5	0.37	2.4
ACS150-03U-03A5-2	R0	0.75	0.55	3.5
ACS150-03U-04A7-2	R1	1	0.75	4.7
ASC150-03U-06A7-2	R1	1.5	1.1	6.7
ACS150-03U-07A5-2	R1	2	1.5	7.5
ACS150-03U-09A8-2	R2	3	2.2	9.8
3-phase supply voltage 380 - 480 V units				
ACS150-03U-01A2-4	R0	0.5	0.37	1.2
ACS150-03U-01A9-4	R0	0.75	0.55	1.9
ACS150-03U-02A4-4	R1	1	0.75	2.4
ACS150-03U-03A3-4	R1	1.5	1.1	3.3
ACS150-03U-04A1-4	R1	2	1.5	4.1
ACS150-03U-05A6-4	R1	3	2.2	5.6
ACS150-03U-08A8-4	R1	5	4	8.8

Dimensions, weight and noise

Frame Size	H1 (in)	H2 (in)	H3 (in)	W (in)	D (in)	Weight (lbs)	Noise level dBA
R0	6.65	7.95	9.41	2.76	5.59	2.4	50
R1	6.65	7.95	9.41	2.76	5.59	2.9/2.6[1)]	60
R2	6.65	7.95	9.41	4.13	5.59	3.3	60

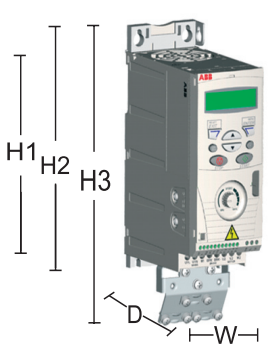
[1)] U_N=200...240 V: 1.3 kg / 2.9 lb, U_N=380...480 V: 1.2 kg / 2.6 lb

Frame Size	H4 (in)	H5 (in)	W (in)	D (in)	Weight (lbs)	Noise level dBA
R0	10.12	11.02	2.76	5.59	3.3	50
R1	10.12	11.02	2.76	5.59	3.7/3.5[2)]	60
R2	10.12	11.10	4.13	5.59	4.2	60

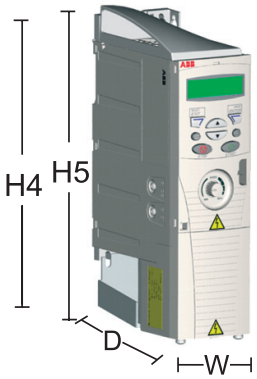
[2)] U_N=200...240 V: 1.7 kg / 3.7 lb, U_N=380...480 V: 1.6kg / 3.5 lb

NOTES:
H1 = Height without fastenings and clamping plate.
H2 = Height with fastenings but without clamping plate.
H3 = Height with fastenings and clamping plate.
H4 = Height with fastenings and NEMA 1 connection box.
H5 = Height with fastenings, NEMA 1 connection box and hood.
W = Width
D = Depth

Cabinet-mounted drives (UL open)

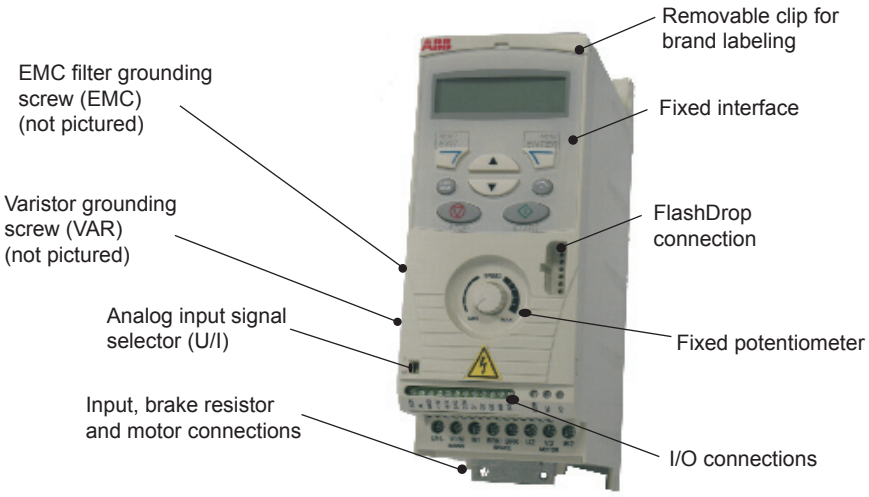


Wall-mounted drives (NEMA 1)



Interface

ACS150	-	01U	-	02A4	-	2



Options

FlashDrop (MFDT-01)

FlashDrop (MFDT-01) is a powerful palm sized tool for fast and easy parameter selecting and setting. This tool can be used to download parameters to a drive in as little as two seconds. Using this tool, it is also possible to hide selected parameters to protect the machine. Only the parameters needed in the application are shown. FlashDrop does not require the drive to be powered. The drives shipping container is also designed to allow use of the FlashDrop tool without removing the drive. The MFDT-01 includes the DrivePM (Drive Parameter Manager) software tool to create, edit and copy parameter sets.

FlashDrop (MFDT-01)

DrivePM requirements

- Windows 2000/XP
- Free serial port from a PC

FlashDrop tool includes

- FlashDrop
- DrivePM software on a CD-rom
- User's manual in pdf-format on the previous CD-rom
- Cable for connection between the PC and FlashDrop
- Battery charger

NEMA 1 Kit (MUL1-R1)

The NEMA 1 kit MUL1-R1 includes a conduit box and hood for protection against dirt and dust. The MUL1-R1 covers all ACS150 frame sizes.

ACS150 with MUL1-R1 NEMA 1 kit

Options

Brake resistors

All ACS150 drives are configured with a built-in brake chopper capable of 100% braking. By connecting an external resistor you can enable the dynamic braking function. The minimum and maximum resistance and the required power is shown in the table. Ensure the resistor purchased does not exceed the maximum resistance nor is smaller than the minimum resistance. For more information about the selection of brake resistors, see the *ACS150 User's Manual (3AFE68576032) and PowerOhm Resistor Inc. Price List (LVD-PNPL02U-EN REVC) effective June 1, 2009.*

Selection table

Type code	Frame size	R_{min} ohm	R_{max} ohm	P_{BRmax} hp	P_{BRmax} kW
1-phase supply voltage 200 - 240 V units					
ACS150-01U-02A4-1	R0	70	390	0.5	0.37
ACS150-01U-04A7-1	R1	40	200	1	0.75
ACS150-01U-06A7-1	R1	40	130	1.5	1.1
ACS150-01U-07A5-1	R2	30	100	2	1.5
ACS150-01U-09A8-1	R2	30	70	3	2.2
3-phase supply voltage 200 - 240 V units					
ACS150-03U-02A4-2	R0	70	390	0.5	0.37
ACS150-03U-03A5-2	R0	70	260	0.75	0.55
ACS150-03U-04A7-2	R1	40	200	1	0.75
ASC150-03U-06A7-2	R1	40	130	1.5	1.1
ACS150-03U-07A5-2	R1	30	100	2	1.5
ACS150-03U-09A8-2	R2	30	70	3	2.2
3-phase supply voltage 380 - 480 V units					
ACS150-03U-01A2-4	R0	310	1180	0.5	0.37
ACS150-03U-01A9-4	R0	175	800	0.75	0.55
ACS150-03U-02A4-4	R1	165	590	1	0.75
ACS150-03U-03A3-4	R1	150	400	1.5	1.1
ACS150-03U-04A1-4	R1	130	300	2	1.5
ACS150-03U-05A6-4	R1	100	200	3	2.2
ACS150-03U-08A8-4	R1	70	110	5	4

Technical data

Cooling

The ACS150 is configured with cooling fans as standard. The cooling air must be free from corrosive materials and must not be above the maximum ambient temperature of 40°C (50°C with derating). For more specific limits, see the Technical specification - Environmental limits in this catalog.

Cooling air flow

Type code	Frame size	Heat dissipation W	Heat dissipation BTU/Hr	Air flow m^3/h	Air flow ft^3/min
1-phase supply voltage 200 - 240 V units					
ACS150-01U-02A4-2	R0	25	85	-*)	-*)
ACS150-01U-04A7-2	R1	46	157	24	14
ACS150-01U-06A7-2	R1	71	242	24	14
ACS150-01U-07A5-2	R2	73	249	21	12
ACS150-01U-09A8-2	R2	96	328	21	12
3-phase supply voltage 200 - 240 V units					
ACS150-03U-02A4-2	R0	19	65	-*)	-*)
ACS150-03U-03A5-2	R0	31	106	-*)	-*)
ACS150-03U-04A7-2	R1	38	130	24	14
ASC150-03U-06A7-2	R1	60	205	24	14
ACS150-03U-07A5-2	R1	62	212	21	12
ACS150-03U-09A8-2	R2	83	283	21	12
3-phase supply voltage 380 - 480 V units					
ACS150-03U-01A2-4	R0	11	38	-*)	-*)
ACS150-03U-01A9-4	R0	16	55	-*)	-*)
ACS150-03U-02A4-4	R1	21	72	13	8
ACS150-03U-03A3-4	R1	31	106	13	8
ACS150-03U-04A1-4	R1	40	137	13	8
ACS150-03U-05A6-4	R1	61	208	19	11
ACS150-03U-08A8-4	R1	94	321	24	14

*) Frame size R0 with free convection cooling.

Free space requirements

Enclosure type	Space above mm/in	Space below mm/in	Space on left/right mm/in
All frame sizes	75/2.95	75/2.95	0/0

Fuses

Standard fuses can be used with the ACS150. Recommended fuse ratings are shown in the table below.

Selection table

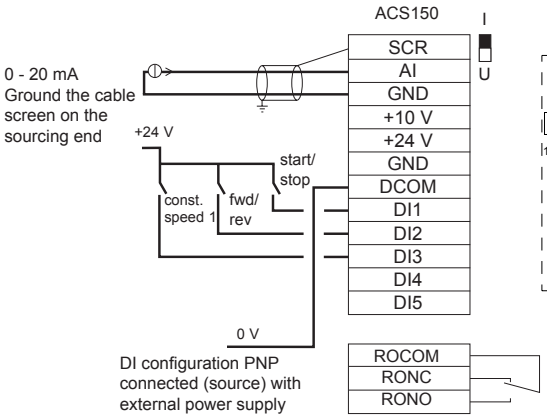
Type code	Frame size	IEC Fuses A	IEC Fuses Fuse type*)	UL Fuses A	UL Fuses Fuse type*)
1-phase supply voltage 200 - 240 V units					
ACS150-01U-02A4-2	R0	10	gG	10	UL class T
ACS150-01U-04A7-2	R1	16	gG	20	UL class T
ACS150-01U-06A7-2	R1	20	gG	25	UL class T
ACS150-01U-07A5-2	R2	25	gG	30	UL class T
ACS150-01U-09A8-2	R2	35	gG	35	UL class T
3-phase supply voltage 200 - 240 V units					
ACS150-03U-02A4-2	R0	10	gG	10	UL class T
ACS150-03U-03A5-2	R0	10	gG	10	UL class T
ACS150-03U-04A7-2	R1	10	gG	15	UL class T
ASC150-03U-06A7-2	R1	16	gG	15	UL class T
ACS150-03U-07A5-2	R1	16	gG	15	UL class T
ACS150-03U-09A8-2	R2	16	gG	20	UL class T
3-phase supply voltage 380 - 480 V units					
ACS150-03U-01A2-4	R0	10	gG	10	UL class T
ACS150-03U-01A9-4	R0	10	gG	10	UL class T
ACS150-03U-02A4-4	R1	10	gG	10	UL class T
ACS150-03U-03A3-4	R1	10	gG	10	UL class T
ACS150-03U-04A1-4	R1	16	gG	15	UL class T
ACS150-03U-05A6-4	R1	16	gG	15	UL class T
ACS150-03U-08A8-4	R1	20	gG	25	UL class T

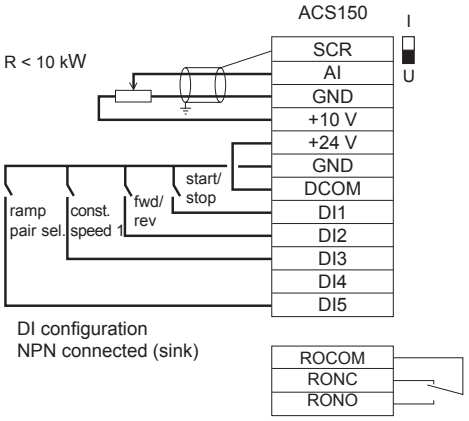
*) According to IEC-60269 standard.

Control Connections

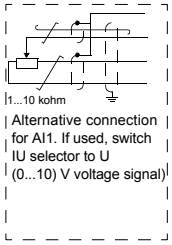
These connections are shown as examples only. Please refer to the *ACS150 User's Manual (3AFE68576032)* for more detailed information.

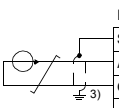
ABB Standard macro





Default I/O connections





I/O connection[4]

SCR	Signal cable shield (screen)
AI	**Frequency reference**: 0...20 mA
GND	Analog input circuit common
+10V	Reference voltage: +10 VDC, max. 10 mA
+24V	Auxiliary voltage output: +24 VDC, max. 200 mA
GND	Auxiliary voltage output common
DCOM	Digital input common
DI1	**Stop (0) / Start (1)**
DI2	**Forward (0) / Reverse (1)**
DI3	**Constant speed selection**[1]
DI4	**Constant speed selection**[1]
DI5	**Acceleration and deceleration selection**[2]

Relay connection[5]

COM	Relay output
NC	**No fault [Fault (-1)]**
NO	

[1] See parameter group *12 CONSTANT SPEEDS:*

DI3	DI4	Operation (parameter)
0	0	Set speed through intergrated potentiometer
1	0	Speed 1 *(1202)*
0	1	Speed 2 *(1203)*
1	1	Speed 3 *(1204)*

[2] 0 = ramp times according to parameters *2202* and *2203*.
1 = ramp times according to parameters *2205* and *2206*.

[3] 360 degree grounding under a clamp.

[4] Tightening torque = 0.22 Nm / 2 lbf. in.

[5] Tightening torque = 0.5 Nm / 4.4 lbf. in.

DIP switch analog inputs

Notes

Notes

Contact us

ABB Inc.
Low Voltage Drives
16250 W. Glendale Drive
New Berlin, WI 53151 USA
Phone: (800) 752-0696
Fax: (262) 785-0397
Web: www.abb.us/drives

ABB Inc.
2117, 32nd Avenue
Lachine, QC H8T 3J1
Phone: (514) 420-3111 ext: 3505
Fax: (514) 420-3138

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